OAKLAND COUNTY MS4 TMDL IMPLEMENTATION AND MONITORING PLAN

March 31, 2023

Prepared by the Oakland County Water Resources Commissioner's Office

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I. U.S. Environmental Protection Agency-Approved Total Maximum Daily Loads in Oakland County

The following U.S. Environmental Protection Agency (EPA)-Approved Total Maximum Daily Loads (TMDL's) have been identified to apply within Oakland County as of March, 2023:

- Kent Lake, Strawberry Lake and Brighton Lake - Huron River Watershed: Total Phosphorus
- Norton Creek - Huron River Watershed: Dissolved Oxygen and Sedimentation/Siltation
- Rouge River Watershed: *E. coli* and Biota (Sedimentation)
- Johnson Creek - Rouge River Watershed: Dissolved Oxygen
- Lower Clinton River, Red Run Drain and Bear Creek - Clinton River Watershed: *E. coli*
- Statewide TMDL for *E. coli*

A TMDL represents the maximum amount of pollutant that a waterway can receive without exceeding State water quality standards. The following waste load allocations (WLA's) or TMDL Targets, potential sources of water quality impairment from MS4's, and recommended strategies for pollutant reduction for each TMDL in the MS4-area are summarized in **Table 1**:

Table 1 - Summary of TMDL Targets, Common Sources of Impairments and Strategies for Meeting TMDL Targets

TMDL	*WLA or TMDL Target for Oakland County MS4*	*Common Sources of Impairment from Direct Discharges and Stormwater Runoff*	*Strategies for Meeting TMDL Targets*
E. coli	**300 *E. coli*/100 mL daily max and 130 *E. coli*/100 mL 30-day geometric mean for Total Body Contact (TBC) (May 1 – Oct. 31)** **1,000 *E. coli*/100 mL daily max for Partial Body Contact (PBC) (year-round)**	• Illicit connections of sanitary to storm sewers • Contaminated runoff during storm events from pets, feral animals, nuisance wildlife, improper garbage disposal, failing septic systems and re-suspended sediments • Combined Sewer Overflow (CSO) and Sanitary Sewer Overflows (SSO) Events	• Public education regarding pet waste and waterfowl waste management, and septic system inspection and maintenance • IDEP Implementation • Sanitary Sewer Operation and Maintenance to prevent SSO's • CSO Control • Catch basin cleaning • Street sweeping • Retention/Detention Basin Inspection and Maintenance • Waterfowl management

TMDL	*WLA or TMDL Target for Oakland County MS4*	*Common Sources of Impairment from Direct Discharges and Stormwater Runoff*	*Strategies for Meeting TMDL Targets*
		• Wastewater Treatment Plant (WWTP) and other NPDES Permitted Discharges	• Onsite Sewage Disposal System (OSDS) Inspection, Maintenance and Repair • Compliance with NPDES Permits
Total Phosphorus (TP)	**0.030 mg/L (in-lake concentration for Kent Lake)** **4,700 lb/year allocated to nonpoint source loads** **2,700 lb/year allocated to point source loads** **200 lb/year allocated to a margin of safety**	• Phosphorus-containing fertilizers • Soil erosion and sedimentation • Organic matter (leaves, grass clippings, etc.) • Pet and waterfowl waste • Illicit discharges (sewage, soaps, cleaners and industrial discharge nutrient sources) • Failed or misconnected OSDS' • CSO and SSO Events • WWTP and other NPDES Permitted Discharges	• Public education regarding proper fertilization practices, soil erosion prevention, yard waste and pet waste management • Implementation of IDEP • OSDS Inspection, Maintenance and Repair • Soil Erosion and Sedimentation Control (SESC) program implementation • Enforcement of Post-Construction Stormwater Standards on New and Redevelopments that require BMPs to stabilize runoff discharges and reduce flashy flows, improve infiltration of stormwater, and minimize sediment loading • Catch basin cleaning • Street sweeping • Drain maintenance cleaning and repair • Sanitary Sewer Operation and Maintenance to prevent SSO's • CSO Control • Compliance with NPDES Permits
Dissolved Oxygen (DO)	***5 mg/L minimum for warmwater fishery***	• Loss of in-stream and nearshore habitat	• Public education for riparian landowners on naturalized shorelines and homeowner associations regarding proper stormwater facility operation

TMDL	*WLA or TMDL Target for Oakland County MS4*	*Common Sources of Impairment from Direct Discharges and Stormwater Runoff*	*Strategies for Meeting TMDL Targets*
		• Increased direct stormwater runoff from impervious surfaces • Increased peak flow velocities resulting in streambank and stream bed scouring • Loss of stream canopy and cover • Increased BOD/COD from sewage and industrial pollutants from illicit discharges and stormwater runoff sources • Nutrient loading resulting in excessive algal and plant growth • Soil erosion and sedimentation from construction sites, streambank erosion and TSS loading from improperly maintained stormwater infrastructure • Low flows during dry weather	and maintenance to improve habitat and water quality • Enforcement of Post-Construction Stormwater Standards on New and Redevelopments that require BMPs to stabilize runoff discharges and reduce flashy flows, improve infiltration of stormwater, and minimize sediment loading • Minimize clearing of tree canopy during routine drain maintenance; limit tree clearing to obstructions within open channel • Soil Erosion and Sedimentation Control (SESC) program implementation • Sanitary Sewer Operation and Maintenance to prevent SSO's • CSO Control
Sedimentation/Siltation (TSS)	***91 lb/day TSS for MS4's***	• Soil erosion and sedimentation from construction sites, streambank erosion and TSS loading from improperly	• SESC program implementation • Enforcement of Post-Construction Stormwater Standards on New and Redevelopments that require BMPs to stabilize runoff discharges and reduce

TMDL	*WLA or TMDL Target for Oakland County MS4*	*Common Sources of Impairment from Direct Discharges and Stormwater Runoff*	*Strategies for Meeting TMDL Targets*
		maintained stormwater infrastructure	flashy flows, improve infiltration of stormwater, and minimize sediment loading • Catch basin cleaning • Street sweeping • Drain maintenance cleaning and repair
Biota	***1˚ - Procedure 51 (or similar) Scores greater than or equal to "acceptable" for 2 successive years*** ***2 ˚ - Suspended solids less than or equal to 80 mg/L annual average during wet weather***	• Soil erosion and sedimentation from construction sites, streambank erosion and TSS loading from improperly maintained stormwater infrastructure	• SESC program implementation • Enforcement of Post-Construction Stormwater Standards on New and Redevelopments that require BMPs to stabilize runoff discharges and reduce flashy flows, improve infiltration of stormwater, and minimize sediment loading • Catch basin cleaning • Street sweeping • Drain maintenance cleaning and repair

II. Monitoring for Pollutants of Concern at Oakland County MS4 High Priority Facilities in the TMDL Areas

All Oakland County facilities with an MS4 in the regulated urbanized area were evaluated for their potential to discharge pollutants of concern in the TMDL areas to surface waters of the state. Based on the results of that prioritization process (as outlined in each department's "Municipal Inventory and Assessment"), the following facilities were found to be "High Priority" in each TMDL area:

Norton Creek DO and Sedimentation TMDL:

1. Lyon Oaks County Park (OCPRC)

Kent Lake Phosphorus TMDL:

1. Lyon Oaks County Park (OCPRC)

2. Commerce Twp WWTP (WRC)

Rouge River Watershed Biota (Sedimentation) and *E. coli* TMDL:

1. Walled Lake-Novi WWTP (WRC)
2. Glen Oaks County Park (OCPRC)

Red Run Drain *E. coli* TMDL:

1. Red Oaks County Park (OCPRC)

Other Facilities impacted by Statewide *E. coli* TMDL in Oakland County:

1. Main County Campus – East of Telegraph (FMO)
2. Public Works Building (WRC, FMO)
3. Waterford Oaks County Park (OCPRC)

Most of these facilities have developed and are implementing a Stormwater Pollution Prevention Plan (SWPPP) and conduct regular inspections of their stormwater BMPs and outfalls (the Glen Oaks and Lyon Oaks County Park SWPPP's are under development and expected to be complete by the end of 2023). The facilities that are in TMDL areas for *E. coli* will evaluate wet weather samples for *E. coli* twice per permit cycle from appropriate representative sample sites. In addition, facilities with a DO and Total Phosphorus TMDL will perform chemical analyses on wet weather samples twice per permit cycle from appropriate representative sample sites. Wet weather samples will be collected within 30 to 60 minutes of the start of a wet weather event in an effort to capture the first flush. A wet weather event is defined as a precipitation event that produces at least 0.25" of rain over a 24-hour period.

III. Monitoring for Pollutants of Concern on a Watershed Scale

In general, the monitoring strategy to be employed under this plan is intended to reflect water quality conditions at the watershed-scale. As such, the data results will be indicative of the health of waterways receiving inputs from MS4's situated in Oakland County communities, as well as WRC county drains within the TMDL watersheds. The assumption is that all of these MS4's are implementing a suite of BMPs as part of their Phase II stormwater permits and monitoring results should reflect improvements in water quality over many permit cycles.

With this in mind, monitoring locations under this TMDL implementation and monitoring plan have generally been selected at the lower terminus points of county drains or watershed outlets at the county line. This sampling protocol has been termed the "Pour Point Method" as defined in the "Technical Guidance for Designing a TMDL Effectiveness Monitoring Plan".

The proposed list of sampling locations is included below in **Table 2** and a summary list and map is provided in **Attachments 1A and 1B.**

Table 2 - List of Sampling Locations

Watershed	TMDL Area	Subwatershed	County Drain/Waterbody Name	Sample Location	Parameter/Pollutant of Concern to be Sampled
Huron River	Norton Creek	1. Norton Creek	1. Norton Creek	1. At Gibson Park, Wixom	*E. coli*, TP, DO and TSS
Huron River	Kent Lake	1. Norton Creek 2. Huron River 3. Hayes Creek	1. Norton Creek 2. Montante Drain 3. Hayes Creek	1. At Mont Eagle Bridge, Commerce Twp. 2. At Pontiac Rd and Haggerty, Commerce Twp. 3. At Outlet of Union Lake, Commerce Twp.	*E. coli*, TP
Huron River	Strawberry Lake	1. Davis Creek 2. Inchwagh Lake 3. Inchwagh Lake	1. Novi-Lyon Drain 2. Yerkes Drain 3. Underhill Drain	1. At Dixboro Rd, N. of 11 Mile Rd, Lyon Twp. 2. At Dixboro Rd and 10 Mile Rd, South Lyon 3. At Dixboro Rd and 9 Mile Rd, South Lyon	*E. coli*, TP
Clinton River	Lower Clinton River	1. Clinton River	1. Rewold Drain	1. At Dequindre and Avon Rd, Rochester Hills	*E. coli*
Clinton River	Red Run*	1. Plum Brook 2. Plum Brook 3. Red Run/Big Beaver Creek	1. Nelson Drain 2. Ireland Drain 3. GWK/Red Run	1. At Dequindre, N. of M-59, Troy 2. At Dequindre, N. of South Rd, Rochester Hills 3. GWK Basin Outlet to Red Run, Warren	*E. coli*
Clinton River	Bear Creek*	1. Bear Creek 2. Bear Creek 3. Bear Creek	1. Sharkey Drain 2. Kutchey Drain 3. McCoy Drain	1. At I-696, Madison Heights 2. At Dequindre and 10 Mile Rd, Hazel Park 3. At Dequindre and 12 Mile Rd, Madison Heights	*E. coli*
Clinton River	Statewide	1. Clinton Main	1. Mainland Drain	1. County Complex, Pontiac	*E. coli*
Rouge River	Rouge River	1. Belle Branch 2. Upper Rouge 3. Upper Rouge	1. Caddell Drain 2. Clarenceville Drain 3. Minnow Pond Drain	1. At 8 Mile and Gill Rd, Livonia 2. S. of 8 Mile Rd and Grand River, Livonia 3. At Halstead and 14 Mile Rd, Farmington Hills	*E. coli* and TSS

*****A separate collaborative TMDL implementation and monitoring plan was completed in January 2022 to address elevated *E. coli* levels from MS4's within the communities of Hazel Park, Madison Heights and Troy. The results of that implementation and monitoring plan will be incorporated into the data evaluation as part of this TMDL implementation and monitoring plan.

IV. Summary of Water Quality Monitoring Locations, Frequencies and Costs

The intent of this monitoring plan is that one representative stormwater quality sample will be taken from each high priority Oakland County facility's MS4 (as noted in Section II). The sampling frequency is intended to occur twice per permit cycle per sample site. The goal is to assess changes in water quality over the long-term as the implementation of established BMPs continues to take place. Samples will be taken during daytime work hours within the time period from May 1 through October 31 of any given year.

Table 3 below outlines a summary of the proposed water quality monitoring locations, parameter to be sampled and cost per sample analysis.

Table 3 - Summary of Water Quality Monitoring Locations, Parameter to be Sampled and Cost per Sample Analysis

County Facility/Drain/ Waterway Location	*Sample Location ID*	*Parameter to be Sampled*	*Cost per Sample Analysis*
Huron River Watershed			
Lyon Oaks County Park (OCPRC)	One representative sample site to be determined	DO TP Sediment (TSS) *E. coli*	$0.94 $20 $11 $23
Commerce Twp WWTP (WRC)	One representative sample site to be determined	TP *E. coli*	$20 $23
Drains/Waterways	7 sample sites - See **Table 2** and **Attachment 1A and 1B**	TP *E. coli*	$20 each $23
Rouge River Watershed			
Walled Lake-Novi WWTP (WRC)	One representative sample site to be determined or will use data collected from ARC Sample Site #MD17	*E. coli* Sediment (TSS)	$23 $11
Glen Oaks County Park (OCPRC)	One representative sample site to be determined	*E. coli* Sediment (TSS)	$23 $11
Drains/Waterways	3 sample sites - See **Table 2** and **Attachment 1A and 1B** (plus the data collected from the 18 sites via the ARC Collaborative TMDL)	*E. coli* Sediment (TSS)	$23 each $11 each
Clinton River Watershed			

County Facility/Drain/ Waterway Location	*Sample Location ID*	*Parameter to be Sampled*	*Cost per Sample Analysis*
Red Oaks County Park (OCPRC)	One representative sample site to be determined	*E. coli*	$23
Waterford Oaks County Park (OCPRC)	One representative sample site to be determined	*E. coli*	$23
1200 N. Telegraph – Main County Campus (FMO)	One representative sample site to be determined	*E. coli*	$23
Public Works Building (FMO/WRC)	One representative sample site to be determined	*E. coli*	$23
Drains/Waterways	7 sample sites - See **Table 2** and **Attachment 1A and 1B**	*E. coli*	$23 each

V. Sample Collection and Analysis Protocol

Sample collection, analytical method, holding time and sample bottle type are summarized below in **Table 4**. Grab samples will be collected carefully to make sure the most representative sample possible is obtained. Only clean containers will be used for collecting samples and the container will be rinsed several times first with the water to be sampled unless there is a reagent in the sample bottle. Samples will be analyzed as soon as possible after collection. Analysis protocols are provided in the "Walled Lake - Novi Wastewater Treatment Plant Laboratory, Standard Operating Procedures Manual" (see **Attachment 2**).

Table 4 - Summary of Sample Collection and Analysis Protocol

Parameter	*Sample Collection Method*	*Analytical Method**	*Holding Time*	*Bottle Type*
E. coli	Grab Sample*	Colilert MPN Method SM 9233 B 21st ed.	8-hours (refrigerated)	100 mL IDEXX bottles w/ dechlorinating powder
DO	In-situ measurement with CHEMets Visual Test Kit or with a Testing Probe/Sensor	Indigo Carmine ASTM D 888-87	N/A	N/A
TP	Grab Sample* or with a Testing Probe/Sensor	Ascorbic Acid Method SM 4500-P(E) 20th Ed.	31-days (refrigerated)	250 mL preserved (sulfuric acid) bottle

Parameter	*Sample Collection Method*	*Analytical Method**	*Holding Time*	*Bottle Type*
Sediment (TSS)	Grab Sample* or with a Testing Probe/Sensor	SM 2540D 21st Ed.	7-days (refrigerated)	1 L unpreserved bottle

Note: *All grab samples will be analyzed at the Walled Lake-Novi WWTP laboratory. QA/QC will also be performed at that time. The number of *E. coli* samples dropped to the lab should be kept to **10 or less,** dropped off before 1:00 p.m., Monday through Wednesday. TSS and TP can be analyzed Monday through Friday.

VI. Supporting Activities for Meeting TMDL Targets and Assessing Water Quality Conditions in TMDL Areas

There are many programs in place or in the planning stages that will be beneficial in meeting TMDL targets and assessing improvements in water quality within the TMDL watersheds as a whole to help guide future potential BMP efforts. The following programs are currently being conducted or planned in the TMDL watershed areas:

A. Dry Weather Screening and Illicit Discharge Investigation Water Quality Sample Data taken as part of the Oakland County MS4 Illicit Discharge Elimination Program (IDEP)

B. Surface Water Pollution Complaints and Spill Response
   - Oakland County operates a 24-hour Complaint Hotline for citizens to report pollution incidents to surface water throughout the County. WRC has trained spill responders and spill response procedures for dealing with spills of hazardous and polluting materials.

C. IDEP Investigations and Illicit Discharge Removal
   - WRC has trained IDEP inspectors that investigate illicit discharges discovered during dry weather screening of outfalls and discharge points, as well as in response to complaints. WRC has established procedures for prioritizing IDEP activities and working with local communities, EGLE, and other regulatory authorities to locate and eliminate illicit discharge sources. Details of Oakland County's IDEP, including schedules for dry weather screening, IDEP prioritization and investigation procedures, and surface water pollution complaint investigations can be found in Oakland County's Alternative IDEP.

D. IDEP Reporting and Data Sharing

- WRC and OCPRC data related to dry weather screening, IDEP investigations, complaint investigations and illicit discharge elimination activities are reported to EGLE on a biennial basis. This information is also summarized and provided to communities for use to assist in their MS4 permit reporting.

E. Clinton River Water Quality Sampling Project with the University of Michigan and the Office of the Great Lakes
   - Currently, monitoring includes only flow; there is potential that these monitoring sites could incorporate physical and chemical water quality sampling and analyses at some point in the future.

F. Alliance of Rouge Communities (ARC) Collaborative TMDL Monitoring Plan work in the Oakland County portion of the Rouge River Watershed
   - Eighteen (18) ARC sample locations being evaluated by Oakland County as part of this plan are included on the map and list in **Attachment 1**
   -

G. Great Lakes Water Authority (GLWA) Water Quality Monitoring Efforts
   - GLWA's Regional Water Quality Monitoring Program (RWQMP) was developed as part of their 2020 Wastewater Master Plan and includes the installation of permanent monitoring locations in the Clinton, Rouge and Detroit Rivers to collect long-term data. An overview of the efforts to date on this effort are available here. A summary of the work completed as part of this effort will be provided in future MS4 biennial reports.

H. USGS Monitoring for the GLWA WWMP Regional Water Quality Monitoring Program
   - In partnership with USGS, GLWA successfully launched Phase I of this program and will soon be instituting Phase II. An overview of the work to be completed under this effort is available here. A summary of the work completed as part of this effort will be provided in future MS4 biennial reports.

I. Michigan Department of Environment, Great Lakes and Energy's (EGLE) Biennial Integrated Monitoring Reports (Water Quality and Pollution Control in Michigan Sections 303(d), 305(b), and 314 Integrated Report) – Years 2024, 2026, etc.

J. EGLE Assessments of Michigan Waters Results (watersheds evaluated on 5-year rotating cycles) – see 2017 Monitoring Strategy Update: [NOTE: the sample size for determining the statewide biological condition (via benthic macroinvertebrate surveys and limited fish

surveys) in rivers and streams for 2016-2020 is only 250 sites – see Page 71/97 of reference monitoring strategy. Trends will not be calculated until 2020 when three cycles of biological surveys have been completed.]

- Clinton River Watershed: To be conducted in Year 2024, 2029, etc.
- Flint River Watershed: To be conducted in Year 2023, 2028, etc.
- Huron River Watershed: To be conducted in Year 2027, 2032, etc.
- Rouge River Watershed: To be conducted in Year 2025, 2030, etc.
- Shiawassee River Watershed: To be conducted in Year 2025, 2030, etc.

K. Adopt-a-Stream (AAS) Program and Winter Stonefly Search Macroinvertebrate Data (available from Friends of the Rouge (FOTR) will be helpful to evaluate conditions in the Rouge River TMDL area for biota.

L. Frog and Toad Surveys (available from FOTR annually) or similar Amphibian/Fish Monitoring (FOTR began fish assessments in 2012) will be helpful to evaluate conditions in the Rouge River TMDL area for biota.

M. Long-term water quality monitoring in the Huron River Watershed for TP and TSS is done by the Huron River Watershed Council; however, it is primarily done outside of Oakland County. One long-term monitoring site is located just downstream of the Kent Lake dam in Livingston County (not too far from the Oakland County border). Evaluation of that data will also be useful to document the water quality trends coming out of Kent Lake that would be representative of what's happening upstream in the Huron River watershed in Oakland County. Data for 2010 - 2016 for this site is available here.

N. United States Geological Survey (USGS) Water Quality Monitoring Data and Reports (future availability undetermined – reports will be evaluated as they become available). National assessment data is available online here.
   - There is one continuous flow USGS gage stations funded by WRC within Oakland County. Their locations and flow data (Discharge [cfs] and gage height) is available at:
     i. Clinton River at Auburn Hills - #04161000

O. Soil Erosion and Sedimentation Control Programs
   - WRC is an Authorized Public Agency (APA) and implements SESC standards on all county drain projects. In addition, WRC is a County Enforcing Agency (CEA) and currently implements SESC programs in 48 of the 61 communities within Oakland County.

- OCPRC follows SESC standards that are in place for the community or county, as applicable.

VII. Prioritized BMPs at Oakland County MS4's in TMDL Areas

The BMPs selected as priority for implementation for Oakland County MS4's are based on 1) their ability to target multiple pollutants of concern at once, 2) the county department's regulatory authority to implement the BMP, and 3) funding/staff resources available to implement them.

The list of prioritized BMPs will be reviewed during the time of each biennial stormwater progress report that is due to EGLE to ensure that those activities are still the most appropriate to be targeting the Oakland County MS4's in the TMDL areas. The priority BMPs are likely to evolve over time as more efficient or new technologies /activities become available, as well as additional funding becomes available to improve existing stormwater management programs. As that information and funding becomes available, the BMPs will be added/revised in the Oakland County MS4 Stormwater Management Plan (SWMP).

Table 5 summarizes the prioritized BMPs that are currently being implemented to address the pollutants of concern at applicable MS4 facilities:

Table 5 - Summary of Prioritized BMPs at Applicable MS4 Facilities

Prioritized BMP	***TMDL Addressed***	***Responsible Party***	***Schedule/Location***
Public Education Program Activities			
Pet Waste, Waterfowl and Onsite Sewage Disposal System Management Education: **- Pet Waste Pickup Signage** **- Pet Waste Bag Stations** **- Oakland Lakefront Lifestyles Ads** **- Waterfront Wisdom Booklet** **- Seven Simple Steps to Clean Water Materials** **- Websites**	*E. coli* DO TP	OCPRC WRC FMO	Signage and Pet Waste Bag Stations installed at Lyon Oaks and Red Oaks Dog Parks Pet waste management ad published in April of each year and Septic Maintenance Ad published in August each year in the *Lakefront Lifestyles* magazine Public education materials distributed and Web sites available throughout the year
Illicit Discharge Elimination Program Activities			
- OSDS Permitting Program **- OSDS Operation and Maintenance at Oakland County Facilities:**	*E. coli* DO TP	OCHD WRC OCPRC	Proper permitting of new and replacement OSDS and response to failing OSDS complaints via OCHD Regular inspection and maintenance of community septic systems

Prioritized BMP	*TMDL Addressed*	*Responsible Party*	*Schedule/Location*
WRC operates and maintains the following community septic systems: • **Island Club Condominiums in Commerce Township** • **Woodbridge Lake Estates in Commerce Township** • **Belle Ann Falls Estates in Ortonville** • **Lower Pettibone Lake Community** • **Three systems at the following Oakland County Parks are maintained by WRC:** 1. **Addison Oaks County Park Lagoon System** 2. **Springfield Oaks County Park** 3. **Groveland Oaks County Park** **OCPRC operates and maintains six (6) septic systems**			Regular inspection and maintenance of onsite septic systems and lift stations
Illicit Discharge Elimination Program (ID's removed, CSO RTB Operation, WWTP Operation)	*E. coli* DO TP Sediment	OCPRC WRC FMO	Details provided in OC MS4 IDEP
Construction Runoff Control Program Activities			
Soil Erosion and Sedimentation Control Program Implementation	TP Sediment	WRC	Details provided in OC MS4 SWMP
Post-Construction Runoff Control Program Activities			
Implement Post-Construction Stormwater Standards	*E. coli* DO TP Sediment	OCPRC WRC FMO	Ongoing Newly built or redeveloped County facilities, as well as developments (new or re-developed) that tap into a county drain must implement post-construction BMPs that will address both water quality and quantity related to stormwater management from the site.

Prioritized BMP	*TMDL Addressed*	*Responsible Party*	*Schedule/Location*
			Low Impact Development BMPs will be encouraged in the stormwater management standards for TMDL areas within Oakland County.
Pollution Prevention and Good Housekeeping Program Activities			
Catch basin cleaning	*E. coli* DO TP Sediment	WRC OCPRC FMO	WRC: All catch basins that lie within paved surfaces and roadways, or are within reach of paved surfaces and roadways, were initially cleaned by the 2022 cycle. The next cleaning cycle will be on a 6-year cycle (2023 – 2028). Sediment build up will continue to be tracked to determine if the catch basins should be cleaned more or less frequently. Generally, sumps are two feet deep so the cleaning trigger is when sediment is no more than one foot beneath the lowest invert (or when sumps are no more than 50% full). OCPRC: Annually inspect catch basins associated with the drainage area of maintenance facilities and major public parking areas. Clean as needed. Sumps will be cleaned when they are no more than 50% full. FMO: Inspect every three years; sumps will be cleaned when they are no more than 50% full.
Detention/Retention Basins	*E. coli* DO TP Sediment	WRC OCPRC FMO	WRC: Inspect every four years; maintenance performed as needed. OCPRC: Inspect annually; maintenance performed as needed. FMO: Inlets/Outlets inspected annually; maintenance performed as needed.
Manufactured Treatment Devices (i.e. swirl chambers and oil/grit separators)	*E. coli* TP Sediment	WRC OCPRC	WRC: Inspect annually; clean as needed. Currently there are four (4) swirl chambers along the Tribute Drain in the City of Wixom (Huron River watershed). There is one (1) hydrodynamic separator on the Bungalows Drain in West Bloomfield Twp (Rouge River watershed) and one (1) swirl

Prioritized BMP	*TMDL Addressed*	*Responsible Party*	*Schedule/Location*
			concentrator on the Heron Drain in West Bloomfield Twp (Rouge River watershed). There are two (2) MTD's at the Clinton River WRRF in Pontiac (Clinton River watershed). OCPRC: Inspect annually; cleaning and televising of devices planned for a 7-year cycle. Currently there is one Contech Stormceptor installed at Glen Oaks County Park that filters drainage from the main public parking area prior to discharging to a wetland (Rouge River watershed).
Sanitary Sewer Maintenance	*E. coli* DO TP	WRC	All sanitary sewer interceptors are inspected on a 3-year cycle; laterals are inspected every 5-10 years and maintenance performed as issues are found.
Street Sweeping	*E. coli* DO TP Sediment	WRC OCPRC FMO	Street sweeping is not specifically conducted at WRC/OCPRC facilities as they do not receive inundation of sediment build-up along curb lines in parking lots. General good housekeeping and turf maintenance activities help to keep parking lots clear of debris and trash on a regular basis; however, special attention will be given to ensuring that catch basin grates and surrounding curb and gutter areas are free of debris and accumulated sediment in all parking lots. FMO: Campus streets and parking lots are swept in spring and fall, at minimum. WRC: Streets within subdivisions that have established Chapter 18 drains (in West Bloomfield Township) are swept once per year by the Road Commission for Oakland County.
MDNR-Permitted Egg and Nest Destruction and Goose Roundup Programs; In-house Dog-Goose Control	*E. coli* DO TP	OCPRC FMO	A combination of Goose Control methods is implemented annually as needed based on the size of the goose population and associated nuisance levels at most of the following County Parks.

Prioritized BMP	*TMDL Addressed*	*Responsible Party*	*Schedule/Location*
			FMO contracts a goose control program on the County campus in the Spring and Fall.
No-mow Zones/Riparian Buffers	*E. coli* DO TP Sediment	OCPRC FMO	OCPRC: Glen Oaks County Park – 30500 13 Mile Rd, Farmington Hills Lyon Oaks County Park – 52221 Pontiac Trail, Wixom Red Oaks County Park – 29600 John R Rd, Madison Heights Waterford Oaks County Park – 2800 Watkins Lake Rd, Waterford White Lake Oaks County Park – 991 N Williams Lake Rd, White Lake FMO: 36 acres of the previously maintained turf area on the County campus is no longer mowed. There are also two protected forest areas totaling 26 acres, 6 acres of ponds and 12 acres of wetlands within the County campus.
Utilize low or no-phosphorus fertilizers on grounds	TP	OCPRC	The following County Parks comply with phosphorus regulations as MTESP-certified facilities per 451-1994-II-2-85, Section 324.8512b: • Glen Oaks County Park – 30500 13 Mile Rd, Farmington Hills • Lyon Oaks County Park – 52221 Pontiac Trail, Wixom • Red Oaks County Park – 29600 John R Rd, Madison Heights • White Lake Oaks County Park – 991 N Williams Lake Rd, White Lake
Implementation of Stormwater Pollution Prevention Plans (SWPPPs) at Facilities with High Potential to discharge pollutants to Surface Waters of the State	*E. coli* DO TP Sediment	OCPRC WRC FMO	OCPRC: Glen Oaks County Park – *expected to be complete by the end of 2023* – 30500 13 Mile Rd, Farmington Hills Lyon Oaks County Park – *expected to be complete by the end of 2023* – 52221 Pontiac Trail, Wixom Red Oaks County Park – 29600 John R Rd, Madison Heights Waterford Oaks County Park – 2800 Watkins Lake Rd, Waterford WRC: Clinton River WRRF – 155 Opdyke, Pontiac

Prioritized BMP	*TMDL Addressed*	*Responsible Party*	*Schedule/Location*
			Commerce WWTP – 649 Welch Rd, Walled Lake E. Blvd WWTP – 274 Martin Luther King Dr, Pontiac Walled Lake-Novi WWTP – 46351 West Rd, Novi Water North Maintenance Bldg – 522 S. Opdyke, Pontiac

VIII. Adaptive Management for Effective BMP Implementation

The first round of monitoring to be conducted under the new Oakland County MS4 NPDES Permit at Oakland County facilities is intended to provide a baseline measurement of current pollutant loading within the TMDL areas for the pollutants of concern. The first round of monitoring will take place in the second year of the permit cycle. A second round of sampling will take place in the latter half of the permit cycle (by year 5). Based on comparison of that data, the intent is to evaluate if the current suite of BMPs being implemented are adequate to address pollutants of concern. If pollutant concentrations are higher than the WLA that has been determined in the TMDL, this will help aid in re-evaluating the BMPs in place and figuring out if new BMPs should be implemented, or changes made to existing BMPs. This iterative process is intended to take place during each future permit cycle based on monitoring results.

IX. Recordkeeping and Reporting

All recordkeeping associated with water quality monitoring and sample analysis will be kept on file for at least three (3) years. The available water quality results will be reported in each of Oakland County's Biennial Stormwater Progress Reports submitted to EGLE.