

TMDL Implementation Plan

This document establishes the plan to comply with the Total Maximum Daily Load (TMDL) elements of the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit. This plan identifies prioritized Best Management Practices (BMPs) and a TMDL monitoring plan for assessing the effectiveness of the implemented BMPs to make progress toward achieving the TMDL pollutant load reduction requirements.

This plan includes the following communities that have partnered with the Genesee County Drain Commissioner:

- Burton, City of
- Clio, City of
- Davison Township
- Davison, City of
- Fenton Charter Township
- Fenton, City of
- Flint Charter Township
- Flushing, City of
- Genesee Charter Township
- Genesee County
- Grand Blanc, City of
- Linden, City of
- Mt. Morris, Charter Township
- Mt. Morris, City of
- Swartz Creek, City of
- Vienna Charter Township

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Core Requirements

A TMDL implementation plan serves as a roadmap for achieving established pollutant reduction goals, ensuring compliance with regulatory standards, and ultimately restoring and maintaining the health of impaired water bodies. The core permit requirements for a TMDL implementation plan include:

- A procedure for identifying and prioritizing Best Management Practices (BMPs) to reduce the TMDL pollutants. Include a process for reviewing, updating, and revising BMPs to ensure progress toward meeting TMDL pollutant targets.
- A list of prioritized BMPs that will be implemented to reduce the TMDL pollutants.
- A monitoring plan to assess the effectiveness of the BMPs. Include a schedule for monitoring which includes monitoring at least two times during the permit cycle.
- For *E. coli* impaired watersheds, a minimum approach to monitoring includes (EGLE, 2023):
 - Wet weather sampling of the discharge points near the beginning of the permit to establish baseline conditions (e.g. Year 1) and potentially identify sources through microbial source tracking.
 - Align potential *E. coli* sources with land use activities and implement the prioritized BMPs to target the source.
 - Repeat the wet weather sampling later in the permit cycle (e.g., Year 4) to determine if the implemented BMPs were effective at reducing *E. coli*.

TMDL Documents

Total Maximum Daily Load (TMDL) documents are comprehensive regulatory frameworks designed to address water quality impairments within a specific watershed or waterbody. These documents serve as blueprints for understanding and managing the levels of pollutants that a waterbody can assimilate while still meeting established water quality standards.

Applicable TMDLs

The U.S. Environmental Protection Agency has approved the following TMDL assessments that apply to Genesee County:

- *E. coli* in C.S. Mott Lake – Bluebell Beach (Impoundment of the Flint River), June 2011 (MDEQ, 2011).
- Statewide TMDL for *E. coli*, July 2019 (EGLE, 2019) and a draft addendum for impaired water bodies and percent reductions (EGLE, 2023). The C.S. Mott Lake *E. coli* TMDL currently remains intact and is not superseded by the statewide TMDL.

There are also two statewide TMDL assessments for mercury (June 2018) and PCB (August 2013). These TMDLs cover the inland water bodies in the state primarily impacted by atmospheric deposition of the pollutant of concern. An implementation plan to address the atmospheric deposition of these pollutants is not required under the NPDES MS4 permit program currently.

Figure 1 illustrates the area covered by the TMDLs. Approximately 75% of Genesee County is included within the TMDLs area. The MS4 permit is limited to the urbanized area portion of the county, as illustrated in the figure.

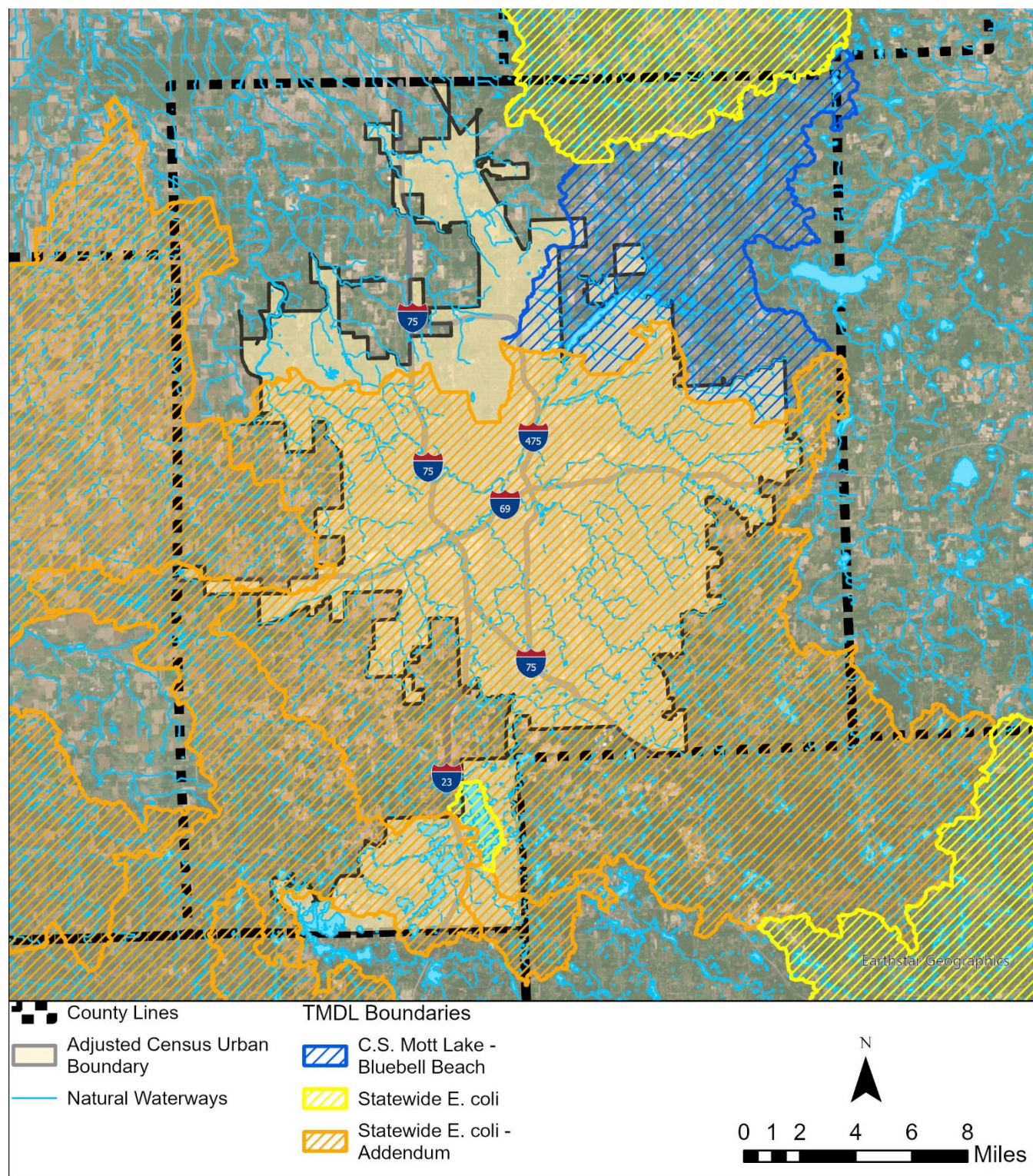


Figure 1 TMDL Areas

Numeric Target

The TMDLs utilize a water quality standard of 130 *E. coli* per 100 mL as a 30-day geometric mean and 300 *E. coli* per 100 mL as a daily maximum to protect the total body contact use from May 1 through October 31, and 1,000 *E. coli* per 100 mL as a daily maximum year-round to protect the partial body contact use (Rule 100 [R 323.1100] of the Part 4 Rules, WQS, promulgated under Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, as amended).

Common Pollutant Sources

The Statewide *E. coli* TMDL (EGLE, 2019) includes the following data discussion conclusions:

- *E. coli* concentrations varied widely by year of sampling.
- *E. coli* varied significantly by the month of sampling. July had the highest *E. coli* concentrations. One hypothesis on why July *E. coli* concentrations are the highest may be due to low flows.
- A strong positive correlation between *E. coli* and agricultural land covers (cultivated land and pasture/hay land cover) was found. This correlation does not indicate that agriculture is the primary cause of the relationship. Other commonly noted attributes of agricultural rural areas that may contribute *E. coli* to surface waters include aging/failing septic systems, illicit sanitary discharges to tile drains or direct discharges to surface water, and nuisance wildlife populations.
- In correlations between *E. coli* and each of the subsets of developed land (open, low density, medium density, and high density), low-density development had a stronger correlation with *E. coli* than medium and high-density development.
- A strong negative correlation between *E. coli* and forested land was found.

Implementation Recommendations in the TMDL Documents

The origins of pathogens and fecal indicator bacteria within Municipal Separate Storm Sewer Systems (MS4s) and the waters they discharge into are diverse, stemming from both animal and human activities. Accurately pinpointing and addressing these sources necessitates a comprehensive understanding of the land uses and practices occurring within the watershed. Table 1 furnishes an overview of potential bacteria sources, tailored to the unique conditions prevailing in a particular watershed. (UWRRC, 2014)

Table 1 Potential Sources of Bacteria

Category	Source / Activity
Municipal Sanitary infrastructure (piped)	Sanitary sewer overflows (SSOs)
	Combined sewer overflows (CSOs) – <i>not applicable to Genesee County</i>
	Leaky sewer pipes (exfiltration)
	Illicit sanitary connections to MS4
	WWTPs (if inadequate treatment or upsets) – <i>not applicable to Genesee County</i>
Other Human Sanitary Sources (some also attract urban wildlife)	Leaky or failing septic systems
	Homeless encampments
	Porta-Potties
	Dumpsters (e.g., diapers, pet waste, urban wildlife)
	Trash cans
Domestic Pets	Garbage trucks
	Dogs, cats, etc.
Urban Wildlife (naturally occurring and human attracted)	Rodent/vectors (rats, raccoons, squirrels, opossums)
	Birds (gulls, pigeons, swallows, etc.)

Category	Source / Activity
	Open space (foxes, beavers, feral cats, etc.)
Other Urban Sources (including areas that attract vectors)	Landfills
	Food processing facilities
	Outdoor dining
	Restaurant grease bins
	Bars/stairwells (washdown areas)
	Piers/docks
Urban Non-stormwater Discharges (Potentially mobilizing surface-deposited bacteria)	Power washing
	Excessive irrigation/overspray
	Car washing
	Pools/hot tubs
	Reclaimed water/graywater (if not properly managed)
Municipal Separate Storm Infrastructure (MS4)	Illegal dumping
	Illicit sanitary connections to MS4 (also listed above)
	Leaky sewer pipes (exfiltration) (also listed above)
	Biofilms/regrowth
	Decaying plant matter, litter, and sediment in the storm drain system
Recreational Sources	Bathers and/or boaters
	RVs (mobile)
Agricultural Sources (potentially including areas within MS4 boundary)	Livestock, manure storage (State regulated through MDARD)
	Livestock, pasture (State Regulated through MDARD)
	Livestock, corrals (State regulated through MDARD)
	Livestock, confined animal feeding operations (CAFO) (NPDES regulated)
	Manure spreading, pastures/crops (Farm practice through MDARD)
	Municipal biosolids re-use
	Reclaimed water
	Irrigation tailwater
	Slaughterhouses (NPDES regulated)
Natural Open Space/Forested Areas	Wildlife populations
	Grazing
	Decaying plant matter, litter, and sediment

Remedial Measures

Source Ranking

As discussed in the previous section, there are many different potential sources of bacteria. It is recommended to approach the potential sources of bacteria in the following priority ranking order:

Source Rank 1. Prioritize human sanitary sources of bacteria first given the greater public health risks they may present. Examples of these sources include leaky sewer pipes, sanitary sewer connections, homeless encampments, waste dumping (e.g. RV discharges), and septic systems.

Source Rank 2. The second priority is to control non-human anthropogenic sources of bacteria. Examples of these sources include pet waste, trash, and leakage from dumpsters and garbage trucks.

Source Rank 3. Urban wildlife attracted due to anthropogenic impacts on the landscape and environment is the third priority. This includes example sources such as rodents attracted to trash and waterfowl attracted to open spaces.

Source Rank 4. The fourth and lowest priority is to control non-anthropogenic sources. Examples of these sources include urban wildlife, plants, soils and decaying organic material.

Implement source controls first, then consider structural controls if the source controls are unsuccessful. Source controls related to correcting human sanitary sources are particularly important.

Reduction Strategies

Provided in Table 2 are general BMPs to reduce bacteria loads. The County and partnering communities are already implementing many of these BMPs.

Table 2 Sources and Strategies for Bacteria Reduction

Rank	Source	General Stormwater Control/Management Strategies	Status
1	Illicit Connections to MS4s	Implement an IDEP program to identify and remove illicit connections	Ongoing implementation
1	Leaking Sanitary Sewer Lines/Aging Sanitary Infrastructure	Conduct investigations to identify leaking sanitary sewer line sources and implement repairs. The County sanitary system is video inspected every 7 years looking for defects. Other local municipalities also video their sanitary system.	Implemented with IDEP program
1	Leaky or failing septic system	Conduct investigations to identify leaky or failing septic systems and implement repairs	Ongoing implementation with IDEP program and Health Dept programs
1	Homeless Populations	Support of city shelters and services to reduce homelessness Periodic cleanup of homeless camps near streams Providing public restrooms Partnering with non-governmental organizations to address homelessness	<i>Limited authority under this program</i>
1-2	Illegal Dumping	Implement a reporting hotline for illegal dumping and educate the public/industries that dumping to storm sewer systems is illegal	Ongoing implementation
1-3	Storm Sewer System and Stormwater Quality BMPs	Catch basin cleaning Street Sweeping O&M stormwater structural controls	Ongoing implementation Ongoing implementation Ongoing implementation
1-3	Stormwater Runoff from Urban Areas	Minimize directly connected impervious areas and manage stormwater runoff for at least the water quality treatment volume <i>Managing runoff from urban areas also addresses many of the problems associated with domestic pets, dry weather flow, and urban wildlife.</i>	Ongoing implementation
2	Domestic Pets (dogs and cats)	Adopt and enforce pet waste ordinances Implement public education programs to educate and promote pet waste collection and proper disposal Provide signage to pick up dog waste, providing pet waste bags and disposal containers Place dog parks away from environmentally sensitive areas and provide water quality treatment for the runoff from dog parks and kennels	Implemented through ordinances Ongoing implementation Ongoing implementation

Rank	Source	General Stormwater Control/Management Strategies	Status
2	Agricultural Sources	Work with the Conservation District to provide public education targeting agricultural operations within the urbanized area.	Ongoing implementation
2-3	Dry Weather Urban Flows (irrigation, car washing, power washing, etc.)	Implement public education programs to reduce dry weather flows from storm sewers related to lawn/park irrigation practices, car washing, power washing, and other non-stormwater flows	Ongoing implementation
		Inspection of commercial trash areas, grease traps, washdown practices, along with enforcement of ordinances	Ongoing implementation with IDEP, PEP, and County Health Dept
3	Urban Wildlife (rats, bats, raccoons)	Reduce food sources accessible to urban wildlife (e.g. manage restaurant dumpsters/grease traps, residential garbage, feed pets indoors)	Ongoing implementation with IDEP, PEP, and County Health Dept
		Conduct goose control program at public beaches	Ongoing (or past) practice with Parks and Recreation
		Goose Hunt	Ongoing (or past) practice with Parks and Recreation
3-4	Birds (e.g. Canada geese, gulls, pigeons)	Identify areas with high bird populations and evaluate deterrents, population controls, habitat modifications, and other measures that may reduce bird-associated bacterial loading	
3-4	Wildlife: (raccoons, beavers, deer, foxes, rats, mice)	Consult with state wildlife offices on strategies to reduce food, shelter, and habitat for overpopulated urban wildlife	
		Implement and enforce urban trash management practices	

Managing runoff from urban areas by minimizing directly connected impervious surfaces and providing water quality volume treatment addresses many of the problems associated with domestic pets, dry weather flow, and urban wildlife. This is one of the reasons why significant emphasis is placed on impervious surfaces.

Attainment of the *E. coli* recreational standards by only implementing structural stormwater control measures is unlikely based on performance data from the International Stormwater BMP Database. However, stormwater controls have many other water quality benefits and may still reduce bacteria loads (especially through volume reductions), even if concentration-based limits are not consistently attainable. When selecting structural stormwater controls, both concentration and volume reduction benefits should be considered.

Management measures that reduce stormwater flows are the most effective at reducing bacteria. These include practices such as infiltration trenches and basins. Bioretention and porous pavement systems can also be effective but are dependent on the presence and configuration of an underdrain. Constructed wetlands and wet ponds are also effective at reducing bacteria based on water retention and exposure to solar radiation.

Enhanced filtration systems may also help remove bacteria. For example, iron-enhanced filters and biochar-amended filters have both been demonstrated to improve bacteria removal. Using fungi as a biological filter has also been shown to reduce bacteria runoff. The use of enhanced treatment systems may be appropriate for areas with high bacteria loads and where source control measures are unsuccessful, and infiltration is not practical.

BMP Implementation

Targeted BMP implementation will occur in areas where *E. coli* levels from the wet weather sampling are above 1,000 *E. coli* per 100 mL. Selection of the appropriate BMPs will be based on an understanding of the tributary drainage area and potential *E. coli* sources. This may involve mapping exercises with GIS and field reconnaissance with the watershed before selecting and prioritizing additional BMPs.

Implementation of the selected BMPs may not be limited to the tributary drainage area with the high *E. coli* concentrations since only a limited number of outfalls are being tested. Evaluation of the effectiveness will be measured from a second round of sampling near the end of the permit term as discussed in the next Section and Table 5.

Monitoring

During rain events, stormwater runoff can transport a variety of pollutants, including fecal contaminants like *E. coli*, into receiving waters, posing risks to both human health and aquatic ecosystems. By systematically sampling and analyzing *E. coli* concentrations during wet weather conditions, we can better understand the patterns and variability of contamination, ultimately enhancing efforts to protect water resources and promote sustainable watershed management practices.

Prioritizing Locations

Phase II communities work collaboratively to test and identify outfalls in urbanized areas. There are approximately 3,000 outfalls in Genesee County, of which approximately 2,100 are in a TMDL watershed. A means to identify and prioritize outfalls for wet weather sampling was developed. The prioritization method included the following steps:

1. Based on the EGLE *E. coli* monitoring data (refer to Appendix A beginning on page 17), the tributary drainage areas to the sampling locations were ranked based on the average measured *E. coli* (using a geometric mean of all the sample data). The results of this step are shown in Figure 2 (page 11) and are displayed in terms of low, medium, and high *E. coli* averages. The tributary drainage areas for the medium and high *E. coli* averages were selected for the next step.
2. The sampling tributary drainage areas were reviewed, and areas outside the MS4 area and drainage areas with significant agricultural activity were discarded. Four (4) subwatersheds tributary to the EGLE monitoring point remain; refer to Table 3 (page 9).
3. The Carman Creek subwatershed (tributary to 21MICH_WQX-250343) was selected as the priority area for the wet weather monitoring sites. A single subwatershed was selected to group the future sampling points close together to support rapid sampling. Carman Creek was selected because it has the highest mean *E. coli* test results of the subwatersheds. Additional information is provided in Table 3 (page 9) supporting the subwatershed selection.
4. The Carman Creek subwatershed has 146 MS4 outfalls and point source discharge locations; refer to Figure 3 (page 12). Thirty-six (36) locations are point source discharges, which will be accounted for by sampling the outfalls. Fifteen (15) of the locations are roadside ditches, and potential sources could be seen, which are assumed not to be significant *E. coli* contributors and, therefore, are proposed not to be included in the sampling. Thirty-five (35) outfalls are 15-inch diameter pipes or smaller, which are proposed not to be sampled during this permit cycle. This leaves a total of 60 outfalls for consideration.

Nine (9) additional outfalls were removed from the list for various reasons, such as problems finding the outfalls, the upstream area being woodlands, and the outfall being an open channel. The remaining fifty-one (51) outfalls are proposed to be included for wet weather sampling.

5. The plan is to sample half the outfalls in Permit Year 1 and 4 and the other half in Permit Year 2 and 5. Splitting the sampling into multiple years spreads out the program costs and reduces the number of individuals required to implement the program. Table 4 (page 10) lists the proposed outfalls and what year the sampling will be conducted, Figure 4 (page 13) provides the same information in an illustration.

Table 3 Priority Subwatersheds

Monitoring ID	Monitoring Location	<i>E. coli</i> monitoring results (details in Appendix A)	Comments
21MICH_WQX-250335	Swartz Creek at Hammerberg Road	1,369/100 mL mean 5,331/100 mL max	<i>E. coli</i> monitoring test results not as high as Carman Creek
21MICH_WQX-250339	Carman Creek at I-69	2,809/100 mL mean 8,393/100 mL max	<i>E. coli</i> monitoring test results were the highest of the subwatersheds considered.
21MICH_WQX-250343	Thread Creek at Dort Highway	1,303/100 mL mean 3,213/100 mL max	2 nd EGLE monitoring station (21MICH_WQX-250534) is approximately 2,000 feet upstream with much lower <i>E. coli</i> levels. There are no MS4 outfalls located between the monitoring sites. Hence, there are no locations for wet weather sampling.
21MICH_WQX-250560	Tributary to Mott Lake on Bray Road	2,793/100 mL max all data 6,376/100 mL 30-day max 39,136/100 mL max	The land cover is mostly comprised of woodlands and agriculture.

Table 4 Outfalls Selected for Wet Weather Sampling

Sampling Years 1 and 4				Sampling Years 2 and 5			
No.	Outfall ID	Outfall Owner	Dia. (in)	No.	Outfall ID	Outfall Owner	Dia. (in)
1	6601007	County	27	26	6705001	County	18
2	6601251	County	30	27	6705004	County	18
3	6601254	County	18	28	6705007	County	28
4	6601255	County	18	29	6705013	County	21
5	6601760	County	75	30	6705016	County	36
6	6707005	County	36	31	6705018	County	24
7	6707008	County	36	32	6705019	County	18
8	6707017	County	24	33	6705021	County	18
9	6707019	County	28	34	6705501	County	18
10	6707030	County	24	35	6705503	County	24
11	6707501	County	36	36	6705504	County	18
12	6707507	County	18	37	6705520	County	72
13	6707513	County	18	38	6706264	County	24
14	6707527	County	36	39	6706265	County	48
15	6707541	County	60	40	6706266	County	18
16	6707545	County	21	41	6706267	County	24
17	7625251	County	80	42	6706269	County	24
18	7625751	County	30	43	6706270	County	24
19	7625760	County	42	44	6706272	County	21
20	7636751	County	36	45	6708012	County	36
21	7636753	County	18	46	6708508	County	36
22	7731003	City of Burton	24	47	6717253	County	42
23	7731007	County	24	48	6717501	County	24
24	7731524	County	36	49	6717753	County	24
25	7731539	City of Burton	24	50	6717754	County	24
				51	6718751	County	30

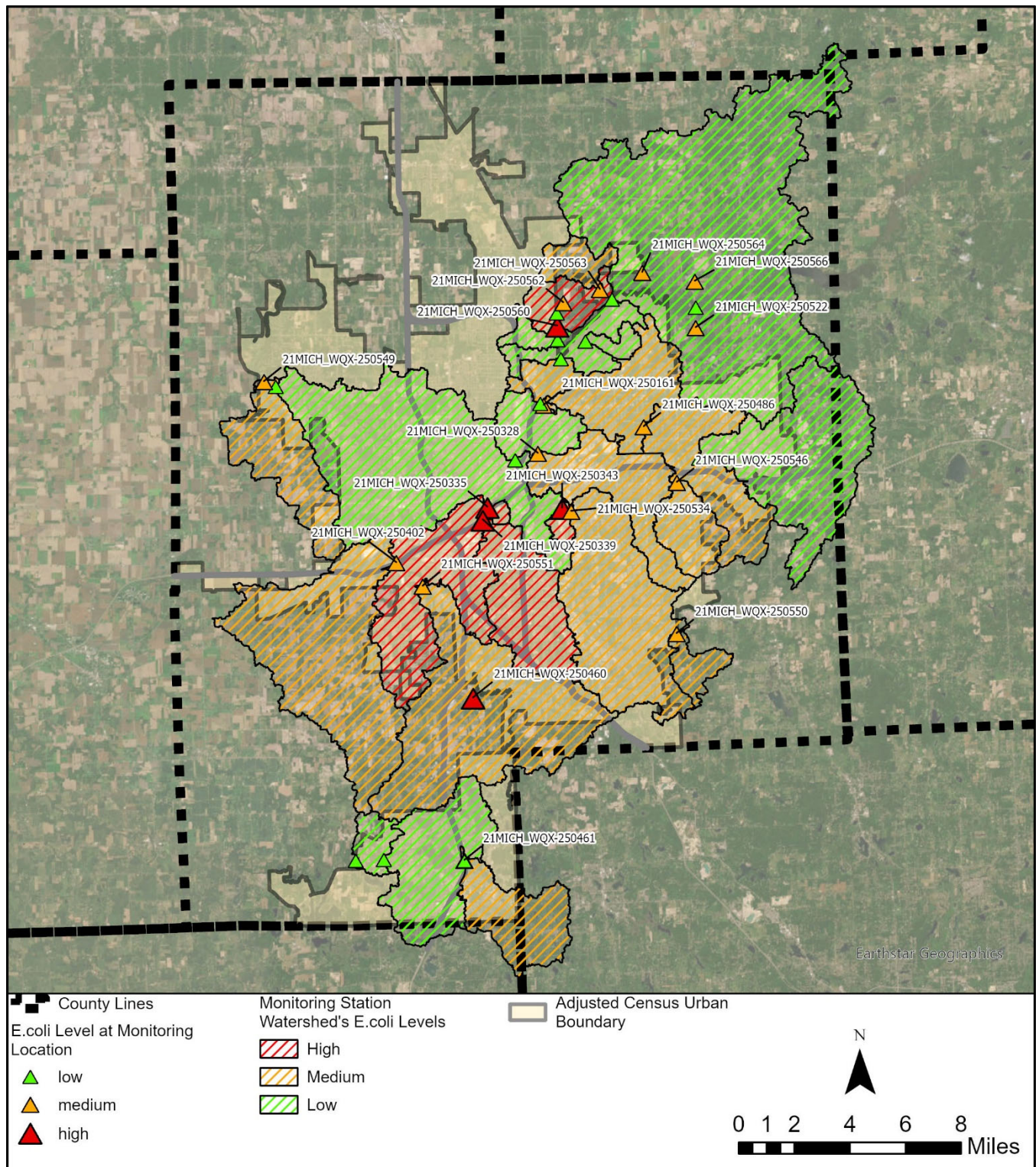


Figure 2 EGLE *E. coli* River Sampling Results

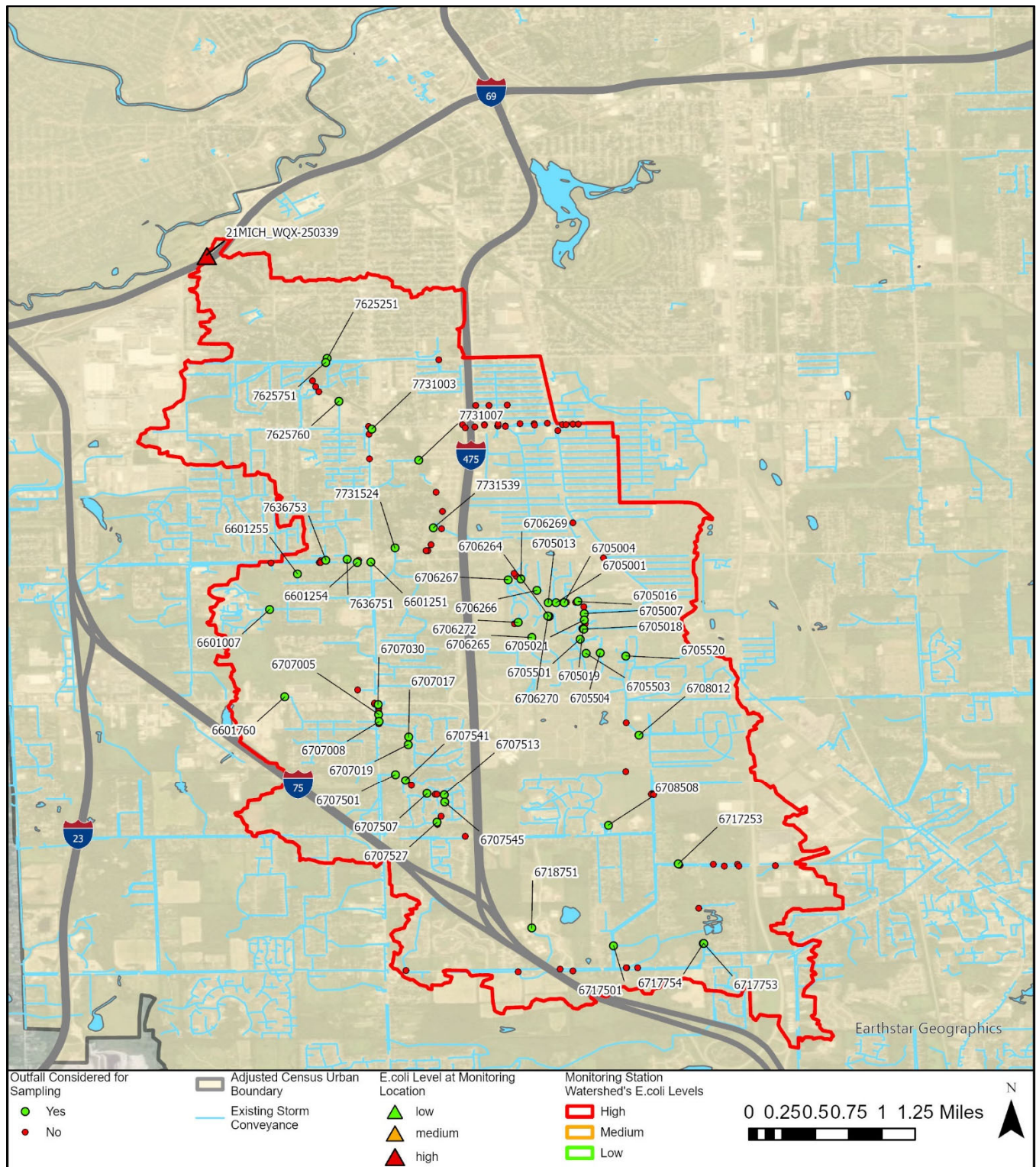


Figure 3 Carman Creek Subwatershed Outfalls and Point Source Discharges

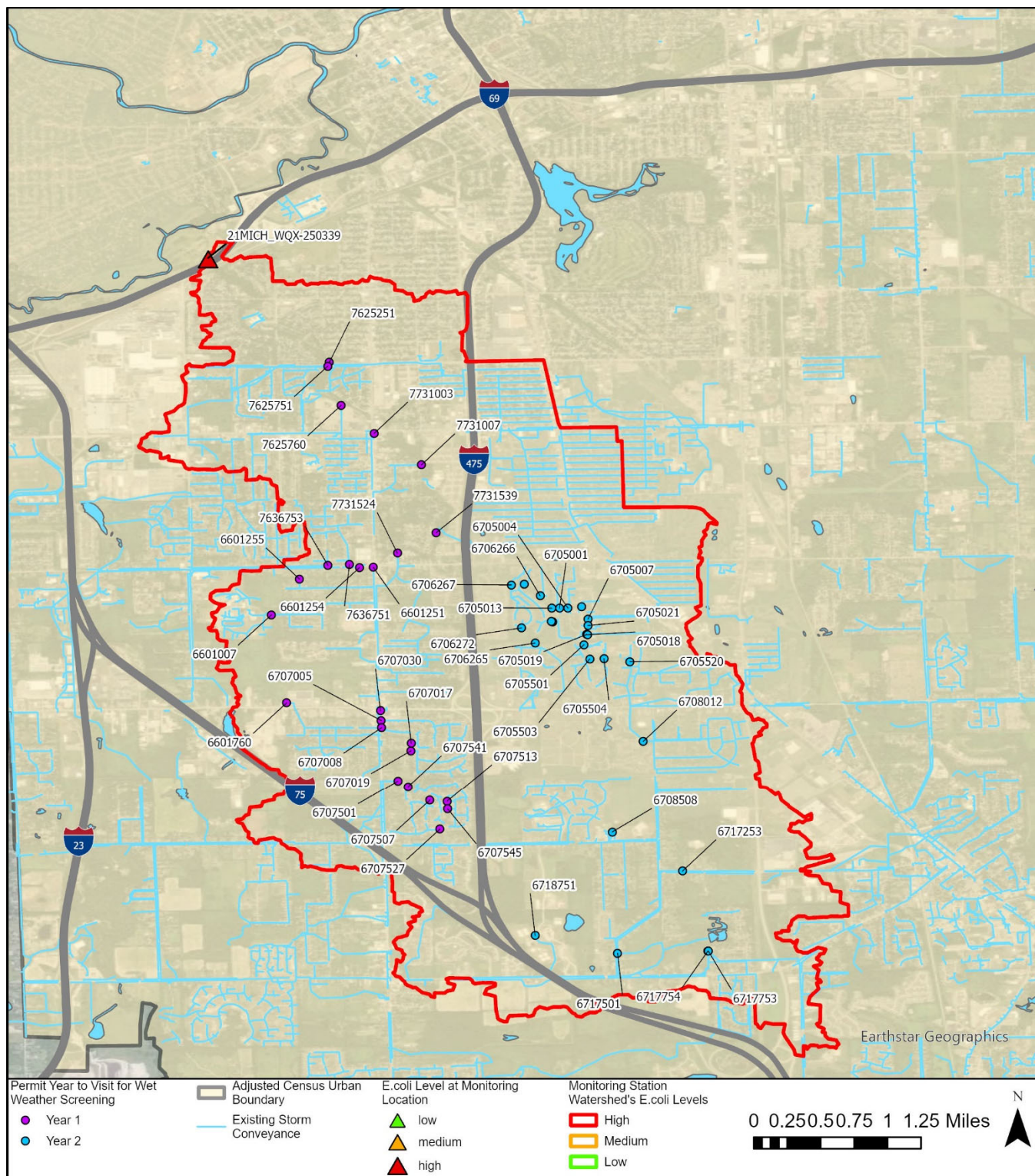


Figure 4 Carman Creek Subwatershed Wet Weather Sampling Years

Sampling Plan

The wet weather monitoring plan for sampling *E. coli* from separate storm sewer outfalls is provided in Table 5.

Table 5 Sampling Plan

Sampling Locations	Table 4 identifies sampling outfall locations. The intent is to sample the outfall; however, sampling may occur at an upstream structure in cases where the outfall is submerged, when it poses a health and safety risk, or at locations where access to the outfall is problematic.
Sampling Schedule	Outfalls will be sampled twice per permit cycle. Half will be sampled in Year 1 and again in Year 4 of the permit, and the other half will be sampled in Year 2 and Year 5 of the permit. Based on available resources and suitable rain events, the sampling will be as close to that timing as practicable. The years in which the sampling will be performed may be adjusted if needed based on annual weather conditions.
Sampling Conditions	Sampling of outfalls during wet weather conditions will be done. Rain events of sufficient size to produce enough runoff to influence local receiving streams will be targeted. Target rain events that • Have a total rainfall of at least 0.25 inches. • Are preceded by at least 48 hours of dry weather (less than 0.1 inches of rain). • Occur during Michigan's recreation season, which is May through October. Sampling may occur before May or after October based on seasonal conditions. * Sampling will not occur during any weather conditions deemed unsafe *
Sample Timing	The intent is to collect water samples during the first flush of the event, which commonly occurs within the first 30 to 60 minutes after the rainfall starts.
Sample Type	The intent is to do a single manual grab sample at each outfall. The use of an autosampler may be considered if grab sampling proves impractical.
Testing Parameter	Samples will be tested for <i>E. coli</i> . Additional samples may be collected for microbial source tracking markers of fecal contamination from various hosts.
Sample Handling	<i>E. coli</i> grab samples have a 6-hour hold duration until they are delivered to the laboratory for testing.

Beach Monitoring

The Environment Health Division of the County Health Department monitors and regulates public bathing beaches. Bathing areas are sampled weekly (on Monday or Tuesday) under various weather conditions from Memorial Day to Labor Day. Test results and information on closures or advisories are available from the Michigan Beach Guard (<https://www.egle.state.mi.us/beach/>). Table 6 lists the beaches in Genesee County.

Table 6 Beaches in Genesee County

Waterbody/Location Name	Description	Public or Private
Byram Lake – Clover Beach	Parks & Rec Facility	Public
Copneconic Lake	Camp Copneconic	Private
Copneconic Lake	Camp Copneconic Day Beach	Private
Covenant Hill Camp	Covenant Hill Camp	Public
Crane Lake	Crane Lake Beach	Private
Crooked Lake		Private
Dollar Lake		Private

Waterbody/Location Name	Description	Public or Private
Fenton Lake	Behind the Township Hall	Public
Golden Rod Lake		Private
Hasler Lake	Beach	Public
Hasler Lake	Campground	Public
Holloway Reservoir	Buttercup Beach	Public
Lake Callis		Public
Lake Helene	Lake Helene Beach	Public
Lake Linda		Public
Lake Shinangaug		Public
Loon Lake	Loon Lake Beach	Private
Marl Lake		Private
McCaslin Lake Beach		Public
McKane Lake	McKane Lake Beach	Public
Mott Lake – Bluebell Beach	County Parks & Rec Facility	Public
Myers Lake	Campground/Beach	Public
Otter Lake – Griswold Park		Public
Pinewood Lake	Pinewood Lake Beach	Private
Silver Lake	City Park Beach	Public
Squaw Lake	Squaw Lake Beach	Private
Thread Lake	Thread Lake Beach	Public
West Sister Lake		Public

Evaluating Effectiveness

Evaluation of the effectiveness of the implemented BMPs will primarily be based on the monitoring results. The samples collected in Year 1 will be compared to those taken at the same outfalls in Year 4. Similarly, samples collected in Year 2 will be compared to sampling in Year 5. This will be done to determine the effectiveness of the BMPs implemented upstream of the outfalls. Additional sampling may be considered near BMP installations to evaluate the effectiveness further. Where longer-term data is available, such as the beach monitoring data, the data will be analyzed for general trends.

For locations where the target reduction of *E. coli* is not achieved, additional investigations throughout the tributary drainage area will be conducted to attempt to locate the *E. coli* sources. Additional BMPs or changes to existing BMPs will be prioritized and implemented to work toward meeting the TMDL pollutant targets. Additional sampling data may be collected, recognizing that *E. coli* concentrations may be highly variable.

References

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Appendix A: EGLE Sampling Data

EGLE sampling data was downloaded from the USEPA Water Quality Portal

(<https://www.epa.gov/waterdata/water-quality-data>) for the sampling sites in Genesee County. The table in this appendix presents the raw data collected in the first 3 columns. The TMDLs utilize a water quality standard of 130 *E. coli* per 100 mL as a 30-day geometric mean and 300 *E. coli* per 100 mL as a daily maximum to protect the total body contact use from May 1 through October 31, and 1,000 *E. coli* per 100 mL as a daily maximum year-round to protect the partial body contact use. Values in the *E. coli*/100mL column that exceed 1,000 *E. coli* per 100 mL are conditionally formatted as red bold text. Values in the 30-day geometric mean column are conditionally formatted to show as red bold text when the value exceeds 130 *E. coli* per 100 mL. The last column calculates the geometric mean of all the sample results per monitoring site. The cells are conditionally formatted such that values less than 130 (low) are colored green, between 130 and 1,000 (medium) are colored yellow, and greater than 1,000 (high) are colored red.

Table 7 EGLE River Sampling Data

Monitoring Site	Date	<i>E. coli</i> /100mL	30-day Geometric Mean	Geometric Mean All Data
21MICH_WQX-250030	9/12/17	186	140	140
	9/19/17	170		
	9/26/17	129		
	10/3/17	46		
	10/10/17	290		
21MICH_WQX-250098	9/12/17	16	74	74
	9/19/17	91		
	9/26/17	120		
	10/3/17	39		
	10/10/17	176		
	10/17/17	132		
21MICH_WQX-250103	8/2/18	130	200	200
	8/9/18	1,429		
	8/16/18	24		
	8/23/18	115		
	8/30/18	606		
21MICH_WQX-250113	7/21/20	7	26	26
	7/21/20	10		
	7/21/20	40		
	7/28/20	50		
	7/28/20	74		
	7/28/20	90		
	7/28/20	90		
	8/4/20	20		
	8/4/20	10		
	8/4/20	6		
	8/11/20	20		

Monitoring Site	Date	<i>E. coli</i> /100mL	30-day Geometric Mean	Geometric Mean All Data
21MICH_WQX-250113 (cont.)	8/11/20	10		
	8/11/20	6		
	8/18/20	80		
	8/18/20	70		
	8/18/20	50		
	8/18/20	16		
	8/18/20	65		
21MICH_WQX-250119	7/21/20	210	259	259
	7/21/20	200		
	7/21/20	193		
	7/21/20	170		
	7/28/20	170		
	7/28/20	260		
	7/28/20	207		
	7/28/20	200		
	8/4/20	540		
	8/4/20	485		
	8/4/20	440		
	8/4/20	480		
	8/11/20	260		
	8/11/20	210		
	8/11/20	200		
	8/11/20	222		
	8/18/20	300		
	8/18/20	340		
	8/18/20	200		
	8/18/20	273		
	8/18/20	259		
21MICH_WQX-250161	9/12/17	597	337	337
	9/19/17	353		
	9/26/17	98		
	10/3/17	231		
	10/10/17	915		
21MICH_WQX-250164	9/12/17	195	186	186
	9/19/17	419		
	9/26/17	99		
	10/3/17	140		
	10/10/17	254		
	10/17/17	144		

Monitoring Site	Date	<i>E. coli</i> /100mL	30-day Geometric Mean	Geometric Mean All Data
21MICH_WQX-250309	5/20/09	16	18	40
	5/27/09	20		
	6/3/09	34	80	
	6/10/09	676		
	6/17/09	42		
	6/24/09	42		
	7/1/09	49	38	
	7/8/09	60		
	7/15/09	25		
	7/22/09	38		
	7/29/09	27		
	8/5/09	10	33	
	8/12/09	291		
	8/19/09	16		
	8/26/09	49		
	9/2/09	17		
21MICH_WQX-250328	9/12/17	663	285	285
	9/25/17	329		
	9/26/17	146		
	10/3/17	243		
	10/10/17	242		
21MICH_WQX-250335	8/2/18	1,602	1,369	1,369
	8/9/18	5,331		
	8/16/18	492		
	8/23/18	820		
	8/30/18	1,396		
21MICH_WQX-250339	8/2/18	2,429	2,809	2,809
	8/9/18	8,393		
	8/16/18	1,674		
	8/23/18	3,830		
	8/30/18	1,339		
21MICH_WQX-250343	8/2/18	2,438	1,303	1,303
	8/9/18	3,213		
	8/16/18	521		
	8/23/18	863		
	8/30/18	1,066		
21MICH_WQX-250402	8/2/18	821	921	921
	8/9/18	2,572		
	8/16/18	220		
	8/23/18	715		
	8/30/18	2,000		

Monitoring Site	Date	<i>E. coli</i> /100mL	30-day Geometric Mean	Geometric Mean All Data
21MICH_WQX-250460	8/2/18	1,528	1,190	1,190
	8/9/18	3,503		
	8/16/18	584		
	8/23/18	743		
	8/30/18	1,029		
21MICH_WQX-250461	7/20/15	336	545	545
	7/27/15	281		
	8/3/15	2,931		
	8/10/15	581		
	8/17/15	299		
21MICH_WQX-250462	7/21/20	170	210	210
	7/21/20	160		
	7/21/20	182		
	7/21/20	220		
	7/28/20	220		
	7/28/20	280		
	7/28/20	160		
	7/28/20	214		
	8/4/20	280		
	8/4/20	260		
	8/4/20	300		
	8/4/20	280		
	8/11/20	290		
	8/11/20	200		
	8/11/20	247		
	8/11/20	260		
	8/18/20	180		
	8/18/20	210		
	8/18/20	130		
	8/18/20	150		
	8/18/20	152		
21MICH_WQX-250486	5/19/11	2,265	2,265	381
	7/11/11	2,121	2,121	
	9/13/11	460	460	
	11/7/11	76	76	
	5/4/21	517	470	
	5/4/21	461		
	5/4/21	435		
	5/4/21	470		
	7/14/21	674	428	

Monitoring Site	Date	<i>E. coli</i> /100mL	30-day Geometric Mean	Geometric Mean All Data
21MICH_WQX-250486 (cont.)	7/14/21	687		
	7/14/21	687		
	7/14/21	649		
	7/21/21	289		
	7/21/21	214		
	7/21/21	345		
	7/21/21	326		
	7/28/21	387		
	7/28/21	403		
	7/28/21	411		
	7/28/21	411		
	8/4/21	461	446	
	8/4/21	461		
	8/4/21	435		
	8/4/21	488		
	8/11/21	387		
	8/11/21	435		
	8/11/21	411		
	8/11/21	517		
	8/11/21	436		
	9/21/21	435	506	
	9/21/21	506		
	9/21/21	770		
	9/21/21	387		
	11/9/21	79	69	
	11/9/21	69		
	11/9/21	74		
	11/9/21	55		
21MICH_WQX-250522	5/20/09	140	759	786
	5/27/09	132	1,622	
	6/3/09	530		
	6/10/09	983		
	6/17/09	26,212		
	6/24/09	507		
	7/1/09	508	769	
	7/8/09	377		
	7/15/09	848		
	7/22/09	1,725		
	7/29/09	959		

Monitoring Site	Date	<i>E. coli</i> /100mL	30-day Geometric Mean	Geometric Mean All Data
21MICH_WQX-250522 (cont.)	8/5/09	725	908	
	8/12/09	1,816		
	8/19/09	376		
	8/26/09	2,210		
	9/2/09	565		
21MICH_WQX-250533	5/7/13	60	60	139
	7/15/13	688	688	
	9/25/13	2,446	2,446	
	11/13/13	4	4	
21MICH_WQX-250534	5/7/13	35	35	287
	7/15/13	675	675	
	9/25/13	167	167	
	11/13/13	56	56	
	9/11/17	193	567	
	9/18/17	573		
	9/25/17	1,232		
	10/2/17	318		
	10/9/17	1,352		
21MICH_WQX-250545	9/11/17	102	58	58
	9/18/17	36		
	9/25/17	70		
	10/2/17	23		
	10/9/17	116		
21MICH_WQX-250546	9/11/17	816	373	567
	9/18/17	229		
	10/2/17	147		
	10/9/17	3,774		
21MICH_WQX-250547	9/12/17	70	105	129
	9/19/17	77		
	9/26/17	130		
	10/3/17	79		
	10/10/17	230		
	10/17/17	371		
21MICH_WQX-250549	8/2/18	520	989	989
	8/9/18	2,065		
	8/16/18	991		
	8/23/18	849		
	8/30/18	1,046		
21MICH_WQX-250550	8/2/18	399	445	445
	8/9/18	950		

Monitoring Site	Date	<i>E. coli</i> /100mL	30-day Geometric Mean	Geometric Mean All Data
21MICH_WQX-250550 (cont.)	8/16/18	270		
	8/23/18	281		
	8/30/18	605		
21MICH_WQX-250551	8/2/18	785	445	445
	8/9/18	998		
	8/16/18	357		
	8/23/18	169		
	8/30/18	370		
21MICH_WQX-250559	5/20/09	34	77	194
	5/27/09	171	599	
	6/3/09	63		
	6/10/09	1,160		
	6/17/09	3,566		
	6/24/09	495		
	7/1/09	469	228	
	7/8/09	100		
	7/15/09	357		
	7/22/09	176		
	7/29/09	212		
	8/5/09	151	97	
	8/12/09	319		
	8/19/09	36		
	8/26/09	131		
	9/2/09	37		
21MICH_WQX-250560	5/20/09	4,226	3,699	2,793
	5/27/09	3,239	6,376	
	6/3/09	1,523		
	6/10/09	1,469		
	6/17/09	39,136		
	6/24/09	18,871		
	7/1/09	723	3,508	
	7/8/09	2,533		
	7/15/09	5,005		
	7/22/09	6,060		
	7/29/09	9,565		
	8/5/09	3,778	1,027	
	8/12/09	663		
	8/19/09	582		
	8/26/09	5,482		
	9/2/09	143		

Monitoring Site	Date	<i>E. coli</i> /100mL	30-day Geometric Mean	Geometric Mean All Data
21MICH_WQX-250561	5/20/09	443	362	73
	5/27/09	296		
	6/3/09	58	235	
	6/10/09	130		
	6/17/09	6,815		
	6/24/09	60		
	7/1/09	36	30	
	7/8/09	36		
	7/15/09	21		
	7/22/09	44		
	7/29/09	20		
	8/5/09	46	38	
	8/12/09	87		
	8/19/09	33		
	8/26/09	56		
	9/2/09	10		
21MICH_WQX-250562	5/20/09	50	72	641
	5/27/09	104		
	6/3/09	61	1,527	
	6/10/09	898		
	6/17/09	41,959		
	6/24/09	2,375		
	7/1/09	796	807	
	7/8/09	669		
	7/15/09	1,543		
	7/22/09	865		
	7/29/09	482		
	8/5/09	402	609	
	8/12/09	317		
	8/19/09	363		
	8/26/09	4,180		
	9/2/09	433		
21MICH_WQX-250563	5/20/09	156	248	597
	5/27/09	396		
	6/3/09	365	1,464	
	6/10/09	1,549		
	6/17/09	9,786		
	6/24/09	830		
	7/1/09	640	598	
	7/8/09	677		

Monitoring Site	Date	<i>E. coli</i> /100mL	30-day Geometric Mean	Geometric Mean All Data
21MICH_WQX-250563 (cont.)	7/15/09	1,115		
	7/22/09	523		
	7/29/09	304		
	8/5/09	665	412	
	8/12/09	464		
	8/19/09	209		
	8/26/09	865		
	9/2/09	212		
21MICH_WQX-250564	5/20/09	234	318	583
	5/27/09	431	1,180	
	6/3/09	186		
	6/10/09	2,932		
	6/17/09	6,396		
	6/24/09	557		
	7/1/09	465	417	
	7/8/09	380		
	7/15/09	383		
	7/22/09	526		
	7/29/09	356		
	8/5/09	626	592	
	8/12/09	596		
	8/19/09	490		
	8/26/09	1,234		
	9/2/09	322		
21MICH_WQX-250565	5/20/09	18	22	65
	5/27/09	27	61	
	6/3/09	53		
	6/10/09	35		
	6/17/09	284		
	6/24/09	26		
	7/1/09	98	65	
	7/8/09	31		
	7/15/09	80		
	7/22/09	82		
	7/29/09	58		
	8/5/09	48	106	
	8/12/09	340		
	8/19/09	48		
	8/26/09	193		
	9/2/09	88		

Monitoring Site	Date	<i>E. coli</i> /100mL	30-day Geometric Mean	Geometric Mean All Data
21MICH_WQX-250566	5/20/09	360	914	955
	5/27/09	2,320		
	6/3/09	405	2,508	
	6/10/09	1,945		
	6/17/09	60,760		
	6/24/09	826		
	7/1/09	587	643	
	7/8/09	626		
	7/15/09	793		
	7/22/09	683		
	7/29/09	552		
	8/5/09	569	666	
	8/12/09	621		
	8/19/09	311		
	8/26/09	2,935		
	9/2/09	405		
21MICH_WQX-250567	5/20/09	318	501	208
	5/27/09	789		
	6/3/09	84	313	
	6/10/09	159		
	6/17/09	4,961		
	6/24/09	145		
	7/1/09	276	136	
	7/8/09	203		
	7/15/09	134		
	7/22/09	52		
	7/29/09	119		
	8/5/09	174	160	
	8/12/09	98		
	8/19/09	154		
	8/26/09	522		
	9/2/09	77		
21MICH_WQX-470503	7/20/15	710	42,219	1,047
	7/27/15	644		
	8/3/15	6,911		
	8/10/15	618		
	8/17/15	643		