



Areawide Water Quality Management Plan

Final 208 Plan

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May 15, 2011

This publication was financed in part or totally through a grant from the Ohio Environmental Protection Agency and the United States Environmental Protection Agency with funds from the State of Ohio, Section 604(b) of the Clean Water Act and the American Recovery and Reinvestment Act. The contents and views, including any opinions, findings, or conclusions or recommendations, contained in this product are those of the authors and have not been subject to any U.S. EPA or Ohio EPA peer or administrative review and may not necessarily reflect the views of either Agency, and no official endorsement should be inferred.



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1.0 Introduction

Regional and watershed-based water quality management planning began in the 1970s as a comprehensive means to address waste treatment management that included all sources of sewage, industrial wastewater, solid and hazardous waste, and nonpoint source pollutants of surface and ground waters. This type of planning was required in the 1970s and 1980s to secure Clean Water Act Construction Grant funds to build regional wastewater treatment plants (WWTPs, aka Publicly Owned Treatment Works or POTWs) and centralized sewer systems as required by Section 208 of the Water Pollution Control Act of 1972 (PL 92-500) as amended by the Clean Water Act (CWA) of 1977 (PL 95-217).

Areawide Water Quality Management Plans (also referred to as “208 Plans”) incorporate environmental goals and policies, describe the responsibilities of local governmental agencies to implement and provide sanitary sewerage service, and identify best management practices to control water pollution in an effort to achieve designated use water quality standards. The information from each 208 Plan is used by the Ohio Environmental Protection Agency (OEPA) as a guide for permitting wastewater collection and treatment systems, along with evaluating financial assistance.

1.1 AREAWIDE PLANNING IN THE MIAMI VALLEY REGION

The Miami Valley Regional Planning Commission (MVRPC) is the designated water quality planning agency for the following five counties: Darke, Greene, Miami, Montgomery, and Preble as shown in **Figure 1-1**. As such, MVRPC maintains an Areawide Water Quality Management Plan (AWQMP) and brings the region’s water quality management agencies together to discuss state and federal regulations, compare program strategies and outcomes, assess mutual progress and to coordinate water quality focused programs and policies.

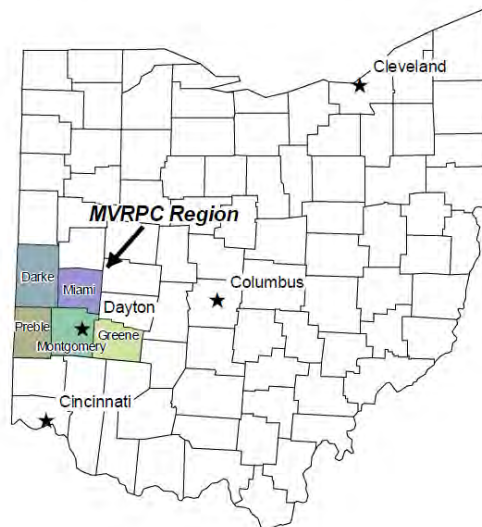


Figure 1-1. Miami Valley Region Location Map

MVRPC works in partnership with local stakeholders to develop and maintain a regional plan in response to federal mandates and provides leadership in various water quality forums. Within this context they are in a position to mediate potential conflicts, support local watershed planning initiatives, as well as provide expertise on regional trends in growth, transportation, land use, and environmental concerns, and how these may affect water resources.

Owners and operators of POTWs are identified as Designated Management Agencies (DMAs). Each DMA is responsible for developing and maintaining a Wastewater Treatment Facility Plan (FP) that identifies and prescribes wastewater management options in a surrounding Facility Planning Area (FPA). These management options represent current and best understanding about where sewers will be extended and where areas will remain unsewered over the course of the twenty year planning period.

MVRPC maintains the map of all FPAs in the region's five-county area. These maps are used by the Ohio EPA in determining where Permits-to-Install (PTIs) for new sewer lines may and may not be issued.

1.2 PURPOSE AND SCOPE

The current Areawide Water Quality Management Plan for the Miami Valley Region (AWQMP) consists of a Summary Report, (originally published in December 1982) five Planning Basin Reports, various updates and continual planning-related policies. The Miami Valley Regional Planning Commission (MVRPC) is the designated water quality planning agency responsible for developing the AWQMP. The AWQMP has been incorporated into the overall State Water Quality Management Plan (WMP) developed by the Ohio EPA.

Wastewater Treatment Facility Plans and their associated Facility Planning Areas are the cornerstones of the AWQMP. In response to Ohio EPA directives, the Planning Commission is currently updating the wastewater treatment-related portions of the AWQMP to ensure that current and future wastewater treatment needs are met in ways that are protective of the region's water resources. The update process is undertaken with the following objectives:

- Provide a regional inventory of the agencies responsible for wastewater treatment, planning areas, and surface water quality protection facilities and infrastructure;
- Define regional policies to guide future wastewater infrastructure planning and development; and
- Identify, evaluate, prioritize and recommend future water quality improvement projects intended to help surface water bodies attain Ohio EPA intended use designations.

As a result of this effort, the existing AWQMP has been updated and streamlined into a single, user-friendly document that is focused on wastewater treatment planning. In addition, a robust geographic information system (GIS) has been developed to include all available 208 planning-related information for the Miami Valley Region. MVRPC hired Stantec Consulting Services to assist in the development of this Plan and the associated GIS.

1.3 PLAN FORMAT

This Plan identifies the wastewater utilities providing sewer collection and treatment services in the Region, along with where and how these utilities provide service currently and within the next 20 years. Additionally, this Plan provides a summary of the current water quality conditions and measures that are being taken to improve these conditions in the Region.

This AWQMP will be used by the Ohio EPA to determine where new wastewater systems will be permitted. Ohio EPA cannot grant a wastewater discharge or system installation permit that conflicts with an approved 208 Plan. This Plan **will not** be used to set WWTP permit limits, regulate how local farms and industries will operate, or dictate what private property owners can do on their property.

This report is organized to present the Miami Valley Region's Areawide Water Quality Management Planning strategy as follows:

Section 2	Description of the Planning Area
Section 3	Summary of Current MVRPC Water Quality Management Plan
Section 4	AWQMP Update Process
Section 5	Stormwater Management
Section 6	Agricultural Impacts
Section 7	On-Site Sewage Treatment Systems
Section 8	Groundwater Protection
Section 9	Municipal and Industrial Point Source Discharge Permits
Section 10	Wastewater Collection and Treatment Systems Planning
Section 11	Prescriptions and Recommendations

Appendices located at the end of the report provide detailed information related to each County within the Miami Valley Region as follows.

APPENDIX A	Darke County
APPENDIX B	Preble County
APPENDIX C	Miami County
APPENDIX D	Montgomery County
APPENDIX E	Greene County

A list of the acronyms used throughout the plan is presented in **Table 1-1**. A list of resources utilized during the development of the updated 208 Plan is included in **Appendix F**.

Table 1-1. List of Acronyms

AFPSC	Areawide Facility Planning Subcommittee
AWQMP	Areawide Water Quality Management Plan (aka 208 Plan)
BMP	Best Management Practices
CRP	Conservation Reserve Program
CWA	Clean Water Act
DMA	Designated Management Agency
FP	Facility Plan (aka, 201 Plan)
FPA	Facility Planning Area
GIS	Geographic Information System
GMR	Great Miami River (Basin)
HSTS	Home Sewage Treatment Systems
LMR(B)	Little Miami River (Basin)
MCD	Miami Conservancy District
MS4	Municipal Separate Storm Sewer Systems
MVRPC	Miami Valley Regional Planning Commission
NPDES	National Pollution Discharge Elimination System
OAC	Ohio Administrative Code
ODOD	Ohio Department of Development
ODNR	Ohio Department of Natural Resources
OEPA	Ohio Environmental Protection Agency
PL	Public Law
POTW	Publicly Owned Treatment Works
PTI	Permit-to-Install
SSA	Sole Source Aquifer
SWCD	Soil and Water Conservation District
TAZ	Traffic Analysis Zone
TMDL	Total Maximum Daily Load
TSD	Technical Support Document
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
U.S.EPA	United States Environmental Protection Agency
WAP	Watershed Action Plan
WLA	Waste Load Allocation
WMP	Water Quality Management Plan
WPCLF	Water Pollution Control Loan Fund
WWTP	Wastewater Treatment Plan

2.0 Description of the Planning Area

The 208 Planning Area for the Miami Valley Region consists of Darke, Preble, Miami, Montgomery, and Greene Counties in southwest Ohio. The 2,313 square mile region is drained by the Great Miami River and Little Miami River systems.

This section provides a brief overview of the general characteristics of the area.

2.1 POPULATION

General trends for the population in the Miami Valley Region are shown in **Table 2-1**. Further details are provided for each county in Appendices A through E.

Table 2-1. Miami Valley Region Population Trends

Year	Source of Data	County Population (growth since 1990)					
		Darke	Greene	Miami	Montgomery	Preble	Total
1990	ODOD ¹	52,620	136,730	93,180	573,810	40,110	896,450
2000	ODOD	53,310	147,890	98,870	559,060	42,340	901,470
2010	Census	52,959	161,573	102,506	535,153	42,270	894,461
2020	ODOD ²	52,550	156,590	106,770	528,800	45,070	889,780
2030	ODOD ³	52,710	158,860	107,930	524,060	45,380	888,940

2.2 LAND USE

Agriculture is the predominant land use in four of the five counties in the Miami Valley Region, with the exception of Montgomery County. In July 2007, MVRPC began a 4-year Regional Land Use Planning initiative and is working with various regional stakeholders to develop a future land use vision for the Miami Valley Region. Information presented in MVRPC's Phase I Report indicates that the Region has become increasingly urbanized and recent growth is characterized by decentralized, low density development patterns. Between 1950 and 2000, the Region's urban area physically expanded by nearly 400%. However, the population of these urban areas increased at the much lower rate of 109%. As a result, population density in the urban areas has decreased by almost half over the last 50 years.

Land development in the Miami Valley Region has been uneven geographically and has been shifting among land use types. The areas that have seen the largest increases in housing development are located to the east of I-675 and in the southern parts of the Region. Industrial land is highly concentrated along the Region's major highways, especially along I-75.

¹ Ohio Department of Development, Office of Strategic Research

² ODOD projections based upon the 2000 Census

³ ODOD projections based upon the 2000 Census

Commercial land is spread more widely throughout the Region, with concentrations being focused not only along the major highways, but also at the intersections of major roadways.

2.3 GEOLOGY, TOPOLOGY AND SOILS

The entire Miami Valley Region is located in a glaciated till plain. The topography is generally level to gently rolling in the western portion of the region, but becomes hillier towards the mouth of the Great Miami River. The glacial till in the area is up to 300 to 400 feet deep in the upper parts of the basin and is shallower in the southern parts. Overall, the depth of glacial till in southwestern Ohio averages about 50 feet. Bedrock formations lying beneath the glacial till and exposed in some locations are predominantly limestone, dolomite and shale of the of the Silurian and Ordovician system.

The Ohio Department of Natural Resources’ (ODNR) Soil Inventory and Evaluation Section, in conjunction with the U.S. Natural Resources Conservation Service and the Ohio Agricultural Research and Development Center, has developed soil surveys for all counties in Ohio. Soil survey mapping for the Region can be found on the internet at <http://soils.usda.gov>.

2.4 WATER RESOURCES

This section provides a brief summary of the water resources in the Miami Valley Region, as shown in **Figure 2-1**. These resources include rivers and streams, lakes and reservoirs, wetlands, and sole source groundwater aquifers.

2.4.1 Rivers and Streams

The larger streams included in **Table 2-2** comprise the major aquatic resources that are used and enjoyed by people in the Region for water supply, recreation, and other purposes. The quality of these perennial streams is strongly influenced by the condition of the small feeder streams (headwaters).

Table 2-2. Major Streams in the Miami Valley Region

State of Ohio River Basin	Large Rivers (Draining > 500 sq. mi)	Principal Streams (Draining 50 to 500 sq. mi)	
Little Miami Basin	Little Miami River	Painters Creek Massie Creek O'Bannon Creek	Cowan Creek Turtle Creek
Great Miami Basin	Great Miami River Mad River Stillwater River	Indian Creek Buck Creek Ludlow Creek Greenville Creek Swamp Creek	Loramie Creek Twin Creek Sevenmile Creek Fourmile Creek Dry Fork

Figure 2-1. Miami Valley Water Resources

The State of Ohio’s Scenic Rivers Act created a state program to protect Ohio’s remaining high quality streams for future generations. Approaches to protect designated scenic rivers include establishing a citizen’s advisory panel; ODNR’s review of publicly funded projects outside of municipal corporation limits; landowner assistance and education; and water resource protection provided by Ohio EPA, ODNR and local governments. The Stillwater River, Little Miami River and Greeneville Creek are designated as Scenic Rivers.

The designations of Superior High Quality, Outstanding State Waters, and Class A Primary Contact Recreation Streams offer the Region’s streams listed in the following tables additional protection under 3745-1-05 and 3745-1-07 of the Ohio Administrative Code.

Table 2-3. Superior High Quality Waters⁴

Water Body Name	Flows Into	Drainage Basin
Anderson Fork: Grog Run to mouth	Caesar Creek	Little Miami
Goose Creek: Downstream Winnerline Rd. to mouth	Great Miami River	Great Miami
Great Miami River: Sidney WW Dam to Loramie Creek	Great Miami River	Great Miami
Great Miami River: Lost Creek to CSX Railroad Bridge	Great Miami River	Great Miami
Honey Creek	Great Miami River	Great Miami
Lost Creek	Great Miami River	Great Miami
Massie Creek	Little Miami River	Little Miami
Yellow Springs Creek	Little Miami River	Little Miami

Table 2-4. Outstanding State Waters Based on Exceptional Ecological Values⁵

Water Body Name	Flows Into	Drainage Basin
Bantas Fork	Twin Creek	Great Miami
Little Miami River	Ohio River	Little Miami
Stillwater River: Riffle Rd. to Englewood Dam	Great Miami River	Great Miami
Twin Creek	Great Miami River	Great Miami

⁴ CRF 3745-1-05 (effective 3/1/5/2010)

⁵ CRF 3745-1-05 (effective 3/1/5/2010)

Table 2-5. Class A Primary Recreation Streams⁶

Water Body Name	Flows Into	Segment Description
Fourmile Creek	Great Miami River	Hueston Woods State Park to the mouth
Great Miami River	Ohio River	Indian Lake to the mouth
Greenville Creek	Stillwater River	Wagner Road in Coletown to the mouth
Little Miami River, East Fork	Little Miami River	West of Chasetown to the mouth
Little Miami River	Ohio River	Clifton Gorge to the mouth
Mad River	Great Miami River	State Route 68 in West Liberty to the mouth
Stillwater River	Great Miami River	Northwest of Covington to the mouth
Twin Creek	Great Miami River	East of West Alexandria to the mouth
Whitewater River	Great Miami River	Indiana border at Harrison to the mouth

2.4.2 Lakes and Reservoirs

Most area streams have very little natural storage capacity and due to historic flooding, have been modified by the construction of lowhead dams and flow retarding basins. There are four large MCD reservoirs in the area (Englewood, Taylorsville, Huffman and Germantown) that form behind flow-through type dams. The purpose of the dams and reservoirs are to provide flood retardation, recreational opportunities, and groundwater recharge points.

2.4.3 Wetlands

The ODNR publication “Ohio Wetland Restoration and Mitigation Strategy Blueprint” (ODNR/Ohio EPA, 1999) indicates that there are approximately 28,340 acres of wetlands within the Miami Valley Region. Many of the original wetland areas in the Region have been modified and are maintained in a modified state to facilitate rapid drainage for row crop production.

Thousands of years ago, retreating glaciers created unique wetland habitats that host some of Ohio’s most rare and beautiful species today. There are a number of glacial remnant wetlands known as “fens” and “bogs” in the Region. Fens are peat-forming alkaline or calcareous wetlands that are maintained by constant flows of cool ground water. Bogs are acidic in nature and are dominated by low-growing plants. These wetlands are very sensitive habitats and are of high importance for biodiversity.

Further information on the wetlands in the Region can be found in the MVRPC December, 1997 publication “*Miami Valley Wetlands Inventory: Clark, Darke, Greene, Miami, Montgomery, and Preble Counties in Southwest Ohio.*” The National Wetlands inventory can be accessed at <http://www.fws.gov/wetlands/>.

Wetland permitting is discussed in Section 3.2.4.

⁶ Table 7-16 of CFR 3745-1-07 (effective 3/31/2010)

2.4.4 Sole Source Aquifers

According to U.S.EPA, a sole source aquifer is defined as "a sole or principal source aquifer as one which supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. These areas have no alternative drinking water source(s) which could physically, legally, and economically supply all those who depend upon the aquifer for drinking water. For convenience, all designated sole or principal source aquifers are referred to as "sole source aquifers" (SSA)."

The locations of sole source aquifers in the Miami Valley Region are also shown on Figure 2-1.

2.5 STREAM WATER QUALITY

The Ohio EPA routinely conducts biological and water quality surveys, or 'biosurveys,' on a systematic basis statewide. A biosurvey is an interdisciplinary monitoring effort coordinated on a waterbody specific or watershed scale. Such efforts may involve a relatively simple setting focusing on one or two small streams, one or two principal stressors (a stimulant that causes stress), and a handful of sampling sites or a much more complex effort including entire drainage basins, multiple and overlapping stressors, and hundreds of sampling sites.

Each year Ohio EPA conducts biosurveys in 10 to 15 different study areas with an aggregate total of 300 to 400 sampling sites. Biological, chemical and physical monitoring and assessment techniques are employed in biosurveys in order to meet three major objectives:

- Determine the extent to which use designations assigned in the Ohio Water Quality Standards (WQS) are either attained or not attained;
- Determine if use designations assigned to a given water body are appropriate and attainable; and
- Determine if any changes in key ambient biological, chemical, or physical indicators have taken place over time, particularly before and after the implementation of point source pollution controls or best management practices.

The data gathered by a biosurvey is processed, evaluated and synthesized in a biological and water quality report. The findings and conclusions of each biological and water quality study may factor into regulatory actions taken by Ohio EPA and are incorporated into Water Quality Permit Support Documents (WQPSDs), the State Water Quality Management Plan, the Ohio Nonpoint Source Assessment, and the Ohio Water Resource Inventory (305[b] report). This information also provides the basis for the list of impaired and threatened waters required by Section 303(d) of the CWA. Once the field monitoring is completed, data analysis and reporting takes place. The end product is termed a Technical Support Document (TSD) which contains the summary and integration of the biological, chemical, and physical assessments.

2.5.1 303(d) Report

The 303(d) report is a list of "impaired waters" in Ohio, or bodies of water that do not meet the standards established by the U.S. Environmental Protection Agency. The 303(d) report is one portion of the *2010 Integrated Water Quality Monitoring and Assessment Report* released by the

U.S. EPA that represents the latest guide to water quality reporting to fulfill the regulations set forth by the CWA. The Ohio EPA's 2010 *Integrated Water Quality Monitoring and Assessment Report* presents water quality conditions in the state of Ohio.

All of the watersheds in the Miami Valley Region have significant source impairments. **Figure 2-2** presents the stream segments in the Region that are on the 303(d) list.

2.5.2 Sources of Water Quality Pollutants

All activities, natural and "man-made," on the earth produce some type of by-product. Under normal conditions these by-products, some known as pollutants, are recycled back into the environment. Natural environmental processes have the ability to correct an imbalance if given enough time. However, if a persistent overload of a pollutant is allowed to continue, the environment has little chance to self-clean.

Pollutants are introduced to waterways from both rural and urban land use landscapes. The main six types of pollutants that reduce the quality of water include the following:

- Sediment (wind and water erosion of soils);
- Nutrients (lawn and agricultural fertilizers, animal wastes, sewage treatment effluents);
- Pathogens (fecal coliform from livestock and septic systems);
- Pesticides (herbicides, insecticides, fungicides, etc.);
- Salt (mostly from applied road salt); and
- Toxics (manufactured and refined products like oil, paints and anti-freeze).

There are two general classifications of pollutant sources: Point and Nonpoint.

Point Source Pollution – Pollutants that are coming from a concentrated originating point like a pipe from a factory or a large feedlot with a specific point of discharge. All point sources are required to be "registered" and permitted under federal and state laws (National Pollutant Discharge Elimination System Permit (NPDES)). NPDES permits are required for WWTPs, industries, stormwater runoff from municipalities, stormwater runoff from certain industries and large-scale animal feedlots.

A summary of permitted point source discharges in the Miami Valley Region is provided in **Table 2-6**. Additional information on point source dischargers is provided in **Appendices A – E**.

Table 2-6. Number of Permitted Point Source Dischargers by Type in the Miami Valley Region

County	POTW	Minor WWTP	Industrial	Water Treatment	Basin Totals
Darke	10	12	3	1	24
Preble	12	7	5	0	24
Miami	8	11	7	3	29
Montgomery	10	10	34	0	55
Greene	9	1	13	1	25
Total	49	41	62	5	157

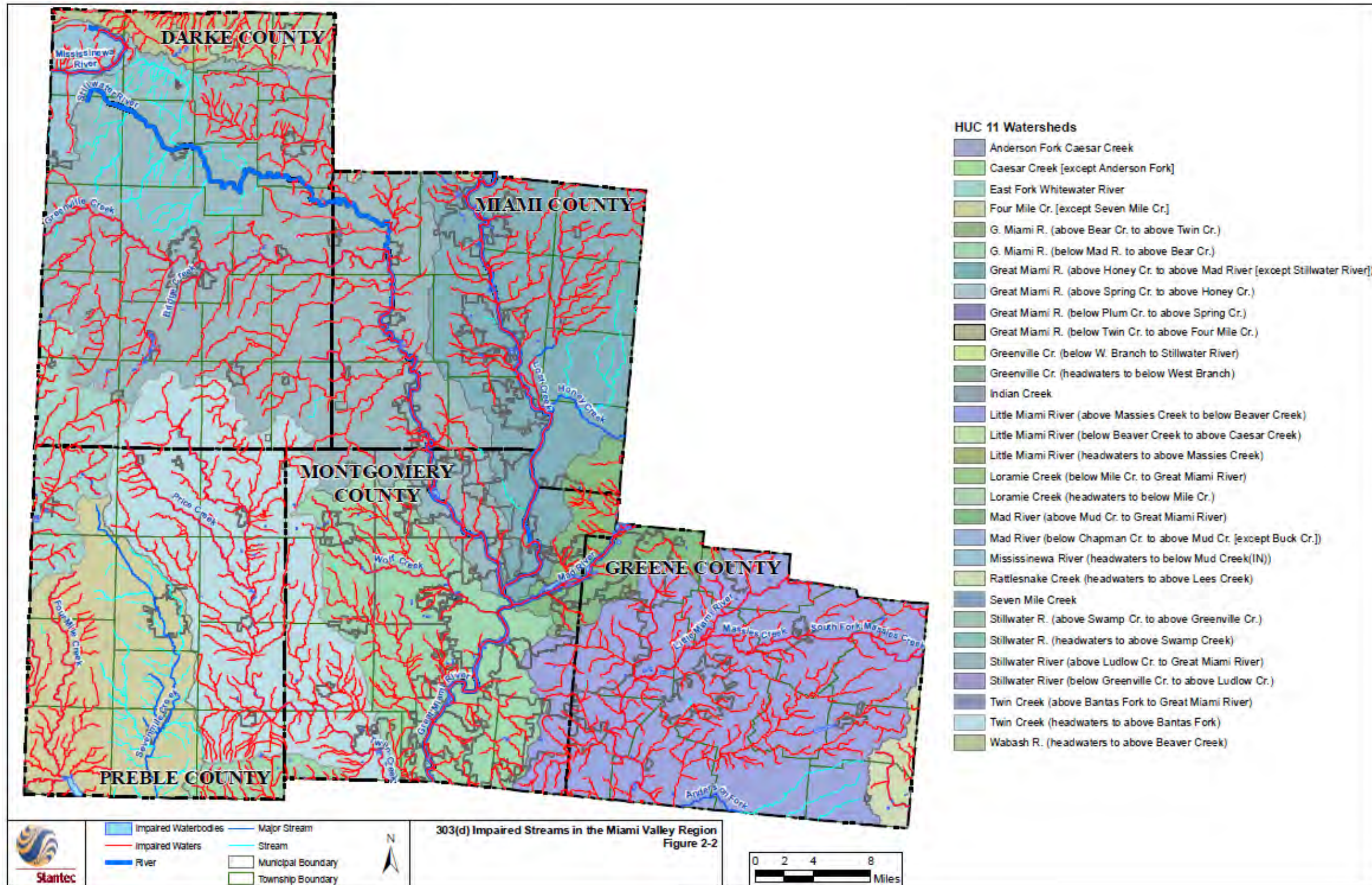


Figure 2-2. 303(d) Impaired Streams in the Miami Valley Region

Nonpoint Source Pollution – Pollutants from a source that is not required to have an individual NPDES Permit. Nonpoint source pollution (NPS) is pollution that cannot be traced back to a single origin or source such as stormwater runoff, water runoff from urban areas and failing septic systems.

Ohio EPA classifies nonpoint sources into two categories, polluted runoff and physical alterations. **Polluted runoff** is rain and snow melt flowing across the land surface or within ground water that picks up contaminants and carries them to the stream or into the aquifer. **Physical alterations** are changes to the stream channel or its corridor, including straightening, deepening, widening or changes in flow patterns that result in habitat or water quality impacts.

The water quality of rivers and streams within the Miami Valley Region are impacted by both point and nonpoint sources of pollution. This plan addresses point and nonpoint sources of stormwater runoff in Section 5, agricultural nonpoint sources in Section 6, nonpoint source pollution related to failing on-site sewage treatment systems in Section 7, groundwater protection activities in Section 8 and WWTP point sources in Section 9.

2.5.3 Total Maximum Daily Load Assessments

When water quality analyses indicate that water quality standards are not being met and technology-based controls are not adequate, Section 303(d) of the CWA establishes provisions for a total maximum daily load (TMDL) process to be undertaken by a regulatory agency (Ohio EPA). In the simplest terms, a TMDL can be thought of as a cleanup plan for a watershed that is not meeting water quality standards. A TMDL is defined as a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards and an allocation of that quantity among the sources of the pollutant. Ultimately, the goal of Ohio's TMDL process is full attainment of Water Quality Standards (WQS), which would subsequently lead to the removal of the waterbodies from the 303(d) list.

Watersheds in the Miami Valley Region that have been identified by Ohio EPA for inclusion in the TMDL Program are shown in **Figure 2-3**.

When a TMDL is developed for waters impaired by point sources only, the Ohio EPA may issue NPDES permits that provide the reasonable assurance that the waste load allocations contained in the TMDL will be achieved. When a TMDL is developed for waters impaired by both point and nonpoint sources, and the waste load allocation is based on an assumption that nonpoint source load reductions will occur, Ohio EPA includes recommendations for nonpoint source control measures that provide reasonable assurances that expected load reductions will be achieved. The Ohio EPA's TMDL reports provides references to the organizations and programs that have an important role or can provide assistance for meeting the goals and recommendations of specific TMDLs.

Issues pertinent to TMDLs in the watershed areas within Miami Valley Region study area are discussed briefly in the following sections. Ohio EPA prescriptive actions and recommendations identified in the TMDLs approved by U.S. EPA are presented in the appropriate County summaries located in Appendices A through E.

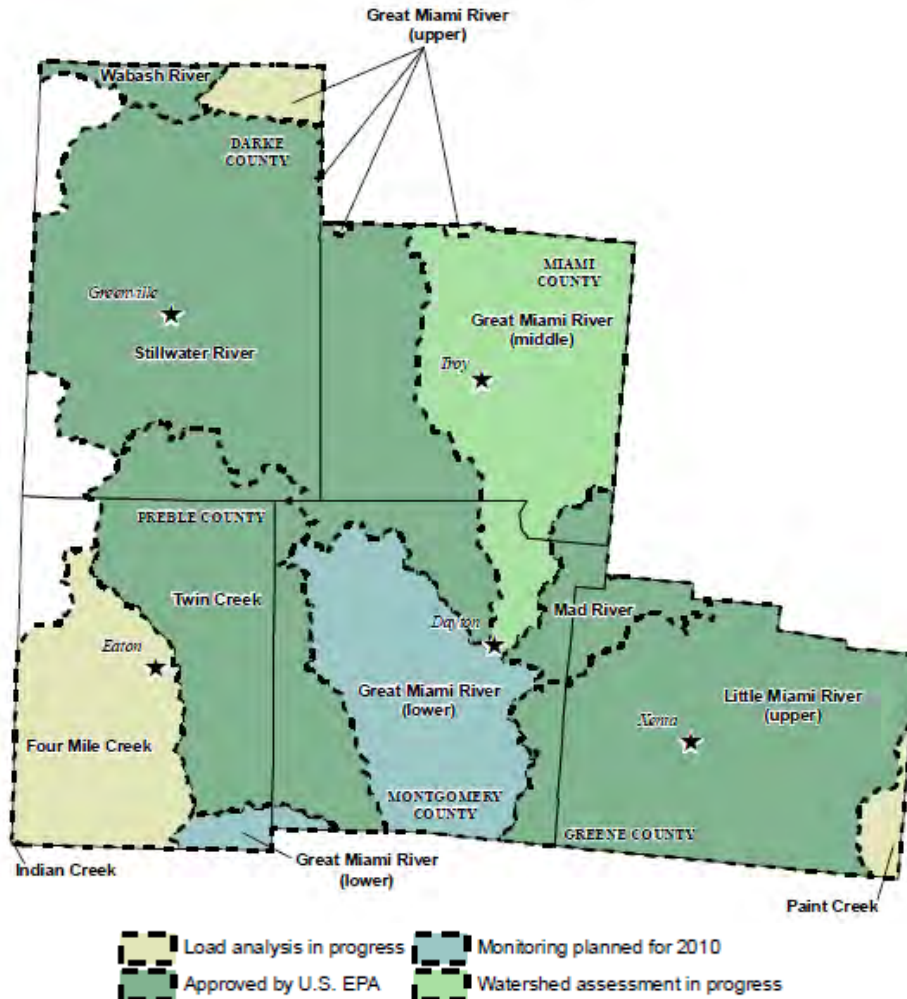


Figure 2-3. Watersheds with TMDLs within the Miami Valley Region⁷

2.5.3.1 Stillwater River TMDL (Darke, Miami and Montgomery Counties)

The Ohio EPA prepared a TMDL for the Stillwater River watershed (**Figure 2-4**) in 2004. Minor changes to the 2004 TMDL Report were made in 2010 that were based on an updated total phosphorus loading analysis. Land use in this watershed is dominated by agriculture (row crop and livestock production). Much of the stream network has been modified and is maintained in a modified state to facilitate rapid drainage for row crop production; consequently, habitat alterations are a major cause of impairment. Manure from concentrated animal feeding operations is applied to fields within the watershed. Direct runoff of manure to the streams and leaching of manure through the tile networks result in organic and nutrient enrichment as another major cause of impairment. Because the stream network is maintained for drainage, little or no riparian buffer exists on most headwater streams to filter errant manure. Additionally, various stream segments in the Stillwater River basin are not meeting water quality standards for aquatic life use due to municipal point sources or onsite wastewater systems.

⁷ <http://wwwapp.epa.ohio.gov/dsw/gis/tmdl/>

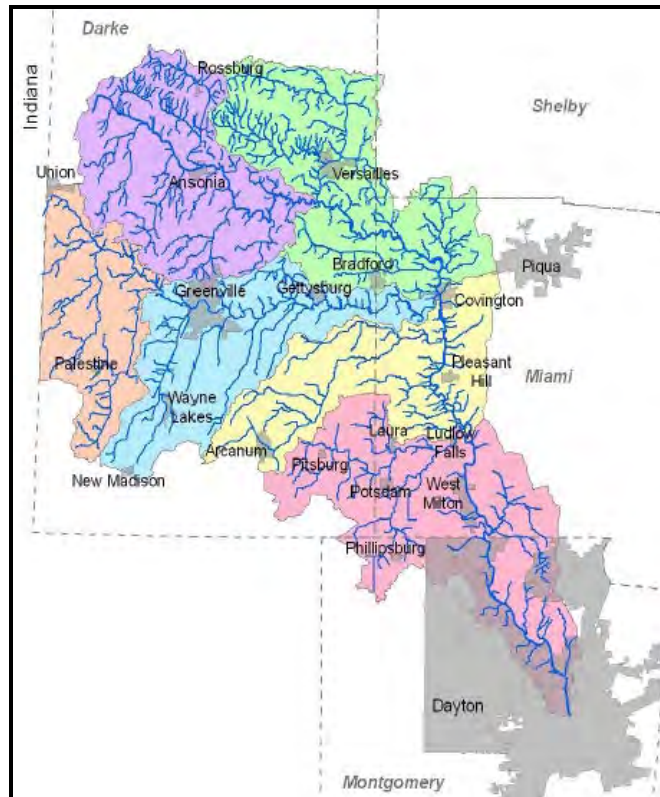


Figure 2-4. Stillwater River Watershed TMDL Location Map⁸ (Ohio EPA graphic)

The most pervasive problems facing streams in the basin is habitat destruction through channelization, which is the removal of trees from stream banks coupled with deepening and straightening the stream course. Channelization is a direct cause of sedimentation, and greatly magnifies the effects of introduced nutrients. This problem is prevalent in the northern portion of the basin where large amounts of synthetic and organic fertilizers are applied to the land. Other sources of water quality impairments in the watershed are organic and nutrient enrichment, primarily from land-applied animal manure and secondarily from failing septic systems and municipal wastewater treatment works.

The 2010 Stillwater River TMDL Report includes a complete water quality improvement strategy for the impaired stream segments in the studied Stillwater River basin. The strategy outlined by Ohio EPA includes animal waste management, drainage and channelization management, on-site sewage management, addressing urban issues, and point source controls.

2.5.3.2 Twin Creek TMDL (Darke, Preble and Montgomery Counties)

In 2005, Ohio EPA conducted a comprehensive physical, chemical and biological survey of a portion of the Twin Creek watershed (**Figure 2-5**). Survey results were published in 2007 that identified several problems, including nonpoint source pollution, regulated point source discharges, failing onsite treatment systems, livestock stream access and channel maintenance.

⁸ Ohio EPA, Total Maximum Daily Loads for the Stillwater River Basin, Final Report, August 3, 2009

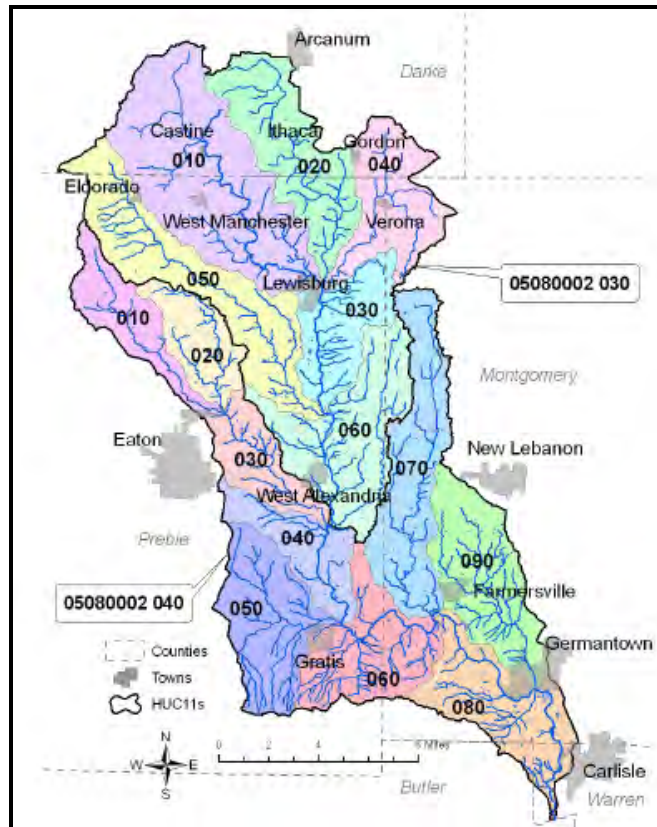


Figure 2-5. Twin Creek Watershed TMDL Location Map⁹ (Ohio EPA graphic)

Because portions of the Twin Creek and its tributaries did not attain their water quality goals for aquatic life and recreation, the Ohio EPA conducted a comprehensive TMDL analysis to address bacteria, sediment and habitat issues. Ohio EPA consulted with the Three Valley Conservation Trust's watershed coordinator during the development of the TMDL to leverage watershed action planning activities. The Twin Creek TMDL Report was approved by U.S. EPA on March 4, 2010.

The Twin Creek TMDL Report includes a complete water quality improvement strategy for the impaired stream segments in the studied Twin Creek basin. The strategy outlined by Ohio EPA includes improving habitat along the streams, restoring streams, reducing nutrients through agricultural best management practices, fixing and replacing failing home sewage treatment systems, and improving treatment and operation at the Lewisburg WWTP.

2.5.3.3 Upper Little Miami River TMDL (Montgomery and Greene Counties)

The Upper Little Miami River TMDL Report was approved by U.S. EPA on July 2, 2002. The Little Miami River (LMR) mainstem (**Figure 2-6**) contains some of Ohio's most scenic and diverse riverine habitat and is a popular recreational resource. The LMR flows atop a buried

⁹ Ohio EPA, Twin Creek Final Total Maximum Daily Load Report, January 10, 2010.

valley aquifer composed of highly permeable sands and gravel. This aquifer is the major water source for the area and is a designated SSA.

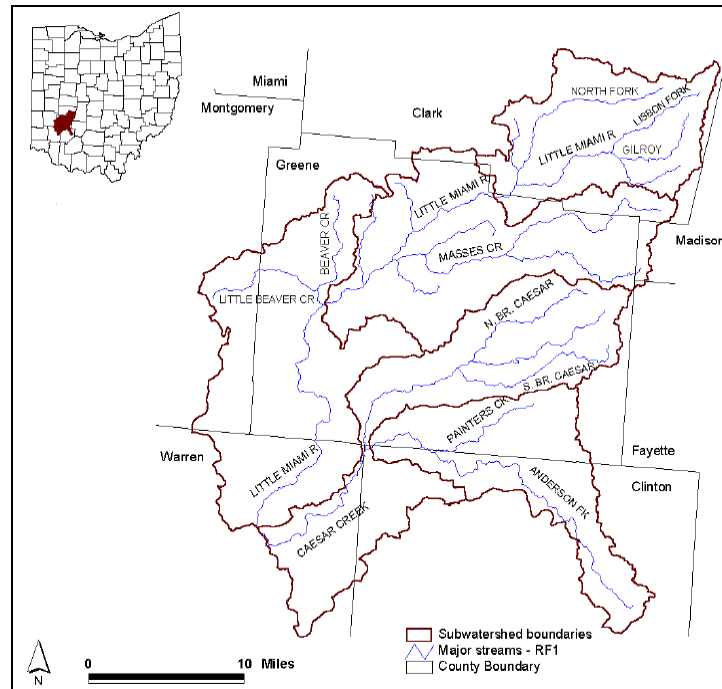


Figure 2-6. Upper Little Miami River Watershed TMDL Location Map¹⁰ (Ohio EPA graphic)

Ohio EPA conducted a detailed assessment of chemical, physical, and biological conditions in the watershed. The primary causes of impairment in the upper Little Miami River watershed are nutrient enrichment, low instream dissolved oxygen, sedimentation, and habitat degradation. The major sources of oxygen demanding substances and nutrients during the critical low flow periods are the municipal WWTPs located throughout the study area. Nonpoint sources are the predominant source of nutrients on a yearly average basis and are the largest source of sediment resulting in siltation and sedimentation. The lack of riparian cover and channelization, particularly in the upper reaches, also contributes to water quality impairment.

The 2002 Upper Little Miami River TMDL Report includes a complete water quality improvement strategy for the basin's impaired stream segments. The restoration options recommended by Ohio EPA include agricultural and urban runoff controls, habitat protection and restoration, septic system improvements, point source controls, and public education.

2.5.3.4 Mad River TMDL (Miami, Montgomery, and Greene Counties)

The Ohio EPA evaluated the biological health and water quality of the Mad River watershed (Figure 2-7) in 2003 and determined that several stream segments did not support designated aquatic life uses or recreational use. In the Mad River TMDL Report prepared by Ohio EPA in

¹⁰ Ohio EPA, Total Maximum Daily Loads for the Upper Little Miami River Watershed, Final Report, April, 2002

2009, the agency presents the loading analyses that were completed for fecal coliform, nitrate, habitat and sediment in the watershed and strategies for improvements.

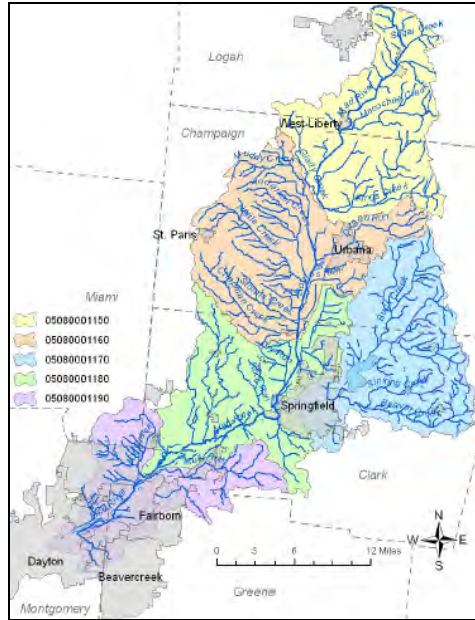


Figure 2-7. Mad River Watershed TMDL Location Map¹¹ (Ohio EPA graphic)

Fecal coliform impaired the primary contact recreation use. Fecal coliform can be reduced through the elimination of cattle access to streams, the elimination of failing home sewage treatment systems, and the use of agricultural best management practices (BMPs) to filter nutrients and bacteria from surface runoff. Nitrate was found to be elevated in the groundwater, including aquifers used for drinking water. Because of nitrate’s soluble nature, the elevated concentrations can be reduced through reductions in nitrate loadings to streams via surface runoff and groundwater infiltration.

¹¹ Ohio EPA, Total Maximum Daily Loads for the Mad River Watershed, Final Report, December 18, 2009

3.0 Summary of Current MVRPC Water Quality Management Plan

The management of the Miami Valley Region's water quality is described in a number of management strategy documents, including the MVRPC 1982 AWQMP and its technical reports, amendments and updates, MVRPC adopted planning and related policies, including the State of Ohio's Water Quality Management Plan and other Ohio EPA regulated programs, such as the MS4 Stormwater Program.

This section provides a brief overview of the provisions covered by these strategies.

3.1 1982 MVRPC AWQMP

A comprehensive AWQMP was developed by MVRPC in 1982 to fulfill mandates of Section 208 of the Water Pollution Control Act of 1972 (PL 92-500) as amended by the CWA of 1977 (PL 95-217). The 1982 planning document, associated detailed technical reports, adopted policies, periodic updates and modifications constitute the five-county Miami Valley Region's Areawide Water Quality Management (208) Plan.

The 1982 AWQMP provisions were based on the water quality standards of the State of Ohio, published as Chapter 3745.1 of the Ohio Administrative Code (OAC). Recommendations were provided that addressed the following:

- Municipal (201) Facility Plans
- Industrial Point Source Controls
- Residual Disposal
- Nonpoint Source Control
- Onsite System Management
- Groundwater Protection

The key water quality issues identified and addressed with specific provisions in the 1982 AWQMP included the following:

- The quality of water in the region's stream reaches could not be determined due to limited in-stream data available at the time (except for the lower reaches of the Great Miami River.)
- Available information suggested stream segments in which water quality standards could be frequently violated, however, most violations were assumed to be infrequent, very localized, and primarily attributed to municipal treatment plant discharges.
- Although the potential for nonpoint pollution problems due to agricultural activities were noted, the preliminary and theoretical analysis performed at the time indicated that nonpoint pollution was less of a concern than municipal point sources.
- Onsite systems were determined to constitute a significant water quality issue in the region. At the time, approximately 60% of all housing units in the region utilized on-site treatment systems and were outside of centralized sewer areas.
- Groundwater contamination from biosolids disposal and liquid waste impoundment sites was of immediate concern at several locations.

Unresolved issues related to the 1982 AWQMP included funding for WWTP improvements, addressing industrial pollution point sources, and obtaining data necessary to develop site specific recommendations for nonpoint source pollution reduction.

The Ohio Department of Development (ODOD), Office of Strategic Research prepares the official population projections for the State of Ohio and allocates projections to the county level. MVRPC further disaggregates the State's county level projections into traffic analysis zones (TAZ) for its transportation planning counties (Greene, Miami, and Montgomery). This is accomplished by evaluating available land for development, combined with local zoning requirements and considerations of additional inputs where appropriate. The most recent TAZ population projections produced by MVRPC are used to size proposed wastewater collection and treatment facilities. In Darke and Preble Counties, where MVRPC-produced TAZ population projections do not exist, ODOD county-level projections are used for sizing wastewater collection and treatment facilities for facilities planning purposes.

Recent updates and amendments to the MVRPC AWQMP include the following:

- 2005 Amendment: Areawide Wastewater Facility Planning Policies;
- 2006 Update: Greene County Wastewater Treatment Facility Planning Area Updates;
- 2007 Amendment: new Water Quality Trading Credit Trading policy, two minor wastewater facility planning area (FPA) boundary changes in Montgomery County and a major FPA boundary update for all of Greene County;
- 2008 Amendment: 201 Plan updates for the Villages of Gettysburg and Yellow Springs and updated FPA boundaries for Northern Montgomery County; and
- 2010 Amendment: Wastewater Facilities Agreement for the Planning and Construction of Wastewater Facilities for the Western Portion of Bethel Township in Miami County.

Areawide Water Quality Management Plan Policies were adopted by MVRPC on September 1, 2005 (**Appendix G**). The guidance document: "Guidelines for Facility Plan and Facility Planning Area Update Proposals: Content, Submittal & Review", dated September 1, 2005 (**Appendix H**) provides the process by which changes to the 1982 208 Plan are handled.

The process undertaken by MVRPC to update the 1982 plan is described in Section 4.0 of this report.

3.2 STATE OF OHIO WATER QUALITY MANAGEMENT PLAN

Ohio's 2006 State Water Quality Management (WPM) Plan was formally certified and submitted to U.S. EPA on September 1, 2006 and U.S. EPA approved the Plan on November 14, 2006. In 2010, Ohio EPA is reviewing and updating the water quality management plans required by Sections 303 and 208 of the Clean Water Act. These plans describe and promote efficient and comprehensive programs for controlling water pollution control from point and nonpoint sources in a defined geographic area.

The 208 Plan for the Miami Valley Region is being updated as part of this effort by MVRPC. Other Areawide Water Quality Management Agencies and the Ohio EPA are addressing other

areas of the state. The Governor will certify the entire 208 Plan and submit it to the U.S.EPA for final approval.

The State WQM Plan includes the following nine elements:

1. Total maximum daily loads
2. Discharge effluent limits
3. Municipal and industrial waste treatment
4. Nonpoint source management and control
5. Management agencies
6. Implementation measures
7. Dredge and fill program
8. Basin plans
9. Groundwater

As stated in the WQM Plan, *“in layperson terms, the State WQM Plan is an encyclopedia of information used to plot and direct actions that abate pollution and preserve clean water. A wide variety of issues is addressed and is framed within the context of applicable laws and regulations. For some issues and locales, information about local communities may be covered in the Plan. Other issues are covered only at a statewide level. Many of the topics or issues overlap with the planning requirements of CWA Section 208 (items 3-9 above). The State WQM Plan includes, through references to separate documents, all 208 Plans [including the MVRPC AWQMP] in the State.”*

It should be noted that some of the nine elements listed above are statewide initiatives that are not influenced by local issues. Other issues are influenced at the local level and require local attention. The following sections present an overview of the State WQM plan and how it relates to issues affecting the Miami Valley Region.

3.2.1 Total Maximum Daily Loads

Currently, Ohio EPA has four Final TMDL Reports for watersheds in the Miami Valley Region summarized in the Section 2.5.3. The following approved TMDLs are included in the State WQMP by reference:

- Twin Creek Watershed, dated January 10, 2010
- Stillwater River Watershed, dated August 3, 2009
- Upper Little Miami River Watershed, dated April, 2002
- Mad River Watershed, dated December 18, 2009

3.2.2 Discharge Effluent Limitations

Ohio EPA issues National Pollutant Discharge Elimination System (NPDES) permits to wastewater dischargers for the protection of Ohio's water resources. These permits authorize the discharge of substances at levels that meet water quality standards (effluent limits) and establish other requirements related to issues such as combined and separate sewer overflows, pretreatment programs and acceptable bio-solids disposal practices.

Developing an NPDES permit requested by individual dischargers involves data acquisition, consideration of regulatory requirements, the development of Water Quality Permit Support Documents, preparation of a Draft Permit and Fact Sheet, public notification and a review/comment period prior to the Final Permit issuance. This process is undertaken by the Ohio EPA.

A listing of the individual NPDES permits that have been issued for discharges within the Miami Valley Region is available at <http://www.epa.state.oh.us/dsw/permits/npdeslist.html>. Details on the municipal and industrial NPDES permits within the Miami Valley Region are presented in Section 9.0 and Appendices A through E. The U.S. EPA provides the opportunity for the public to access effluent limits, compliance schedules and compliance histories, including two web based sources:

- Envirofacts Data Warehouse at <http://www.epa.gov/enviro/html/water.html#PCS>
- Enforcement and Compliance History Online at <http://www.epa.gov/echo/index.html>

Ohio EPA has the responsibility to develop effluent limits. As such, this AWQMP does not address this issue.

3.2.3 Ohio Nonpoint Source Pollution Control Programs

Nonpoint source pollution (NPS) is a result of activities that take place on the land surface and reflects how water runs off the land or seeps into the ground. Most land use activities have the potential to contribute to nonpoint pollution problems. Nonpoint sources can be classified into two categories: surface runoff and physical alteration of a stream channel or corridor.

The State WQM Plan reports that the Ohio EPA approach to nonpoint source pollution control is evolving. The current approach includes a funding process for nonpoint source control projects that are designed to restore, protect or improve Ohio's water resources. Additionally, the Agency's TMDL Program, ecological assessment and source water protection efforts integrates point source and nonpoint source programs. Further information on programs related to nonpoint source pollution underway in the Miami Valley Region is presented in Sections 5.0, 6.0, 7.0, and Appendices A through E of this Plan.

As stated in the State WQM Plan, "*Ohio relies heavily on watershed management plans to identify and outline actions to correct water quality problems caused by NPS pollution.*" These watershed management plans (also referred to as watershed action plans) are developed locally with the support of multiple state and federal agencies.

Although not directly mentioned in the State WQM Plan, most stormwater discharges are considered to be point sources by the Ohio EPA and require coverage by an NPDES permit. This permitting process is described in Section 5.0 of this report.

3.2.4 Dredge and Fill, 401 Water Quality Certification and Isolated Wetlands Permits

The Ohio EPA and the U.S. Army Corps of Engineers (USACE) are jointly responsible for protecting Ohio's wetlands and other waters from adverse impacts caused by dredging and filling. Section 404 of the CWA requires that anyone who wishes to discharge dredged or fill

material into the waters of the United States must obtain a Section 404 permit from the Corps. Section 401 of the CWA requires that any applicant for a Federal permit must obtain certification from the State that such a discharge will comply with state requirements, including water quality standards.

Examples of the activities that require the permits include:

- Placing fill
- Mechanically clearing or building in a wetland
- Constructing a dam or dike
- Placing riprap for erosion protection
- Ditching or grading

Because the USACE and Ohio EPA are responsible for permitting these activities, this AWQMP does not address these topics. All guidance documents used by the Division of Surface Water for PTI reviews are available through the Ohio EPA Website:

<http://www.epa.state.oh.us/dsw/pti/PTIDocuments.aspx>

Isolated wetlands are not connected to other surface waters. For this reason they are not classified as waters of the United States by the USACE. Nevertheless, they are waters of the State of Ohio and are therefore regulated by the Ohio EPA, Division of Surface Water, Section 401 Wetlands and Streams Permitting Section.

More information on the Isolated Wetlands Permitting Process, including public notice and comment periods, is fully explained on the Ohio EPA website:

<http://www.epa.state.oh.us/dsw/401/IWP.aspx>.

3.2.5 Basin Plans

The Ohio EPA included a minor reference to Basin planning in the 2006 State WQM Plan. As stated in the report, "Ohio EPA has concluded that the relationship of applicable basin plans to the State Water Quality Management Plan updates can be discussed in a historical context only. Therefore, this topic is not addressed in this 208 Plan Update.

3.2.6 Groundwater Protection

Section 208 of the CWA requires states to identify the process by which it controls the disposal of pollutants on land or in subsurface excavations to protect ground and surface water quality. Presently, there are a significant number of federal and state laws and regulations that govern the disposal of materials on the surface of the land and in subsurface excavations. Regulatory programs in Ohio are listed in **Table 3-1**.

The administration of these programs by the Ohio EPA comprises the groundwater element of the State WQM Plan. While Ohio EPA is responsible for permitting and/or overseeing these activities; groundwater protection is a critical issue in the Miami Valley Region as a significant

percentage of the population’s drinking water supplies are from sole source aquifers. Further information on the region’s groundwater protection strategies is presented in Section 8.

Table 3-1. Groundwater-Related Regulatory Programs in Ohio

Program Type	Issue
Surface Water	Biosolids
	Land Application of Sewage
	Permits to Install
Other	Concentrated Animal Feeding Operations
	Hazardous Waste Management Program
	Industrial Solid Waste Landfill Facilities
	Sewage Sludge
	Underground Storage Tanks

3.2.7 Generic Wastewater Collection and Treatment Prescriptions

A key element in 208 Water Quality Management Planning is the development of a list of **Prescriptive Actions**. In Ohio EPA’s “*New Water Quality Management Plan Framework*,” the following definition is provided: “**Prescriptions for wastewater treatment** - The wastewater management option(s) agreed upon by local communities and the agency responsible for the 208 plan and included in the 208 plan. Prescriptions should be based upon up-to-date planning information and represent current judgments about: when and where central sewer service will be provided within a defined geographic area; through what means; and by which management agency(ies).”

In the State WQM Plan and Areawide 208 Plans, specific prescriptions can be associated with a defined Facility Planning Area and DMA who is responsible for wastewater planning, construction, operation and maintenance. Specific prescriptions are utilized to set limits on wastewater infrastructure development. When proposed sewer and/or treatment plant projects are in conflict with the prescriptions, NPDES permit and permit-to-install applications will be denied by the Ohio EPA until the application is amended to achieve consistency or the 208 Plan is amended.

Generic prescriptions presented in the State’s Plan were developed to reflect existing legal authorities and responsibilities regarding wastewater treatment and collection under State laws and regulations. The following generic prescriptions in the State WQM Plan apply to the Miami Valley Region:

New Wastewater Discharge Systems and Sewer Service Extensions

All NPDES dischargers are required to meet water quality standards. New dischargers are required to utilize best available technology. (Generic prescription #1)

All municipal MAs with home rule powers are responsible for sewage collection and treatment within their respective corporate boundaries. Such service may be provided by the management agency or through contracting for such services. Sewer service may be extended to annexed land, and to areas beyond the corporate boundaries, provided the

management agency has the capacity to adequately collect and treat all wastewater under the terms of its NPDES permit. When the proposed extension is beyond the corporate boundaries and within a sewer district established under ORC 6119 or 6117, and the land is not annexed, the extension of sewer service will be evaluated on a case by case basis.

(Generic prescription #2)

The Ohio EPA will only approve the installation of new wastewater collection and treatment system to serve a new or existing housing development if the applicant has submitted an acceptable plan documenting how the system will be managed, maintained and operated.

(Generic prescription #9)

On-Lot Sewage Treatment and Home Sewage Treatment Systems

The construction of new, or the replacement of existing, sewage treatment systems or non-discharging on-lot sewage treatment systems for semi-public, private, or industrial entities is not permitted where a public sewer is available. These facilities may be permitted where sewers are not available with the condition that they will be required to tap in when public sewers become available. (Generic prescription #3)

New or replacement home sewage treatment systems (HSTS) are not permitted in areas where a public sewer is available. Where sewers are not available new or replacement HSTS may be permitted if applicable sanitary codes are administered by the County Health Department or local health department are followed and with the condition that the HSTS will be required to tap in when public sewers become available. (Generic prescription #4)

Where sewers are not available, on-lot sewage treatment systems for semi-public, private or industrial entities may be installed if permitted by the Ohio EPA or, if the county health department has permitting authority for small systems (less than 1,000 gallons per day), permitted by the County Health Department. (Generic prescription #6)

The County Commissioners (or a sewer district under ORC 6119) are responsible for sewage collection and treatment in unincorporated communities. Where sewers are not available, approval of individual home sewage treatment systems (HSTS) is the responsibility of the County Health Department or local health department. (Generic prescription #5)

Unsanitary Conditions

When unsanitary conditions exist in unincorporated areas, the Ohio EPA may require that the County Commissioners fix the problem. If unsanitary conditions occur within an area where a sewer district has been organized under ORC 6119, the Ohio EPA may require the sewer district to eliminate unsanitary conditions. (Generic prescriptions #7 and 8)

3.3 WATER QUALITY CREDIT TRADING POLICY

The Ohio EPA's rules for establishing and operating water quality credit trading plans and programs, and their incorporation into the terms of NPDES permits for point sources were adopted on December 22, 2006 and became effective on January 1, 2007. These rules are described in OAC Chapter 3745-5. The rules allow point sources to purchase credits for nonpoint source reductions downstream of the discharge point. One element of these rules (found in OAC 3745-5-03(A)(5)) requires that such credit trading programs may not be in conflict with the Areawide Water Quality Management Plan for the subject area.

Trading programs provide opportunities for agricultural producers to receive funds to improve their operations in exchange for implementing nutrient reduction practices on their land. These “on the ground” projects then generate “credits” that WWTPs can use to meet regulatory requirements. Trading is expected to result in significant benefit to local waterways, including the reduction of pollutants, improved habitat, enhanced soil carbon storage, and stream bank stabilization.

In 2007, the MVRPC Board of Directors incorporated Policy 2007-01: Water Quality Credit Trading Plans (**Appendix G**). A pilot credit trading program established by the Miami Conservancy District (MCD) in March 2006 was not established under the Ohio EPA rules, but is exempt from Ohio EPA rules for a period of ten years, expiring in 2016. The AWQMP Water Quality Trading Policy recognizes the MCD program and confirms that the MCD program does not conflict with the AWQMP.

It is noted that the MVRPC has no role in the ongoing management or development of the MCD program, nor does it monitor or report on its accomplishments.