Water Quality Management Plan
for
Butler, Clermont, Hamilton, and Warren Counties
in Ohio

OKI
Ohio · Kentucky · Indiana
Regional Council of Governments

June 2011 Update
EXECUTIVE SUMMARY

RECOVERY.GOV

This product was financed through a grant from the Ohio Environmental Protection Agency and the United States Environmental Protection Agency with funds from Section 604B of the Clean Water Act.

Purpose and Overview

The Ohio·Kentucky·Indiana Regional Council of Governments (OKI) brings together local governments, business organizations and community groups to collaborate on plans and programs for improving the Tri-State's quality of life. Members of OKI include almost 200 units of local government—cities, towns, villages and townships—in southwest Ohio (Butler, Clermont, Hamilton and Warren Counties), northern Kentucky (Boone, Campbell and Kenton Counties), and southeast Indiana (Dearborn County).

OKI is responsible for water quality management planning in the greater Cincinnati region as an outgrowth of the Federal Water Pollution Control Act Amendments of 1972, more commonly referred to as the Clean Water Act. The goal of the 1972 Clean Water Act has been "to restore and maintain the chemical, physical, and biological integrity of the nation's waters."

Section 208 of the Clean Water Act requires that areas with substantial water quality problems develop a management plan to control pollution on a regional or "areawide" basis, often referred to as a"208" plan for the sake of brevity. OKI was selected for this planning role both by its member governments and by the governors of Ohio, Kentucky and Indiana. As a result, OKI developed the original water quality management plan in the period between 1974 and 1977. The resulting 1977 plan for southwest Ohio, northern Kentucky, and southeast Indiana addressed point sources of pollution from publicly owned wastewater treatment works, nonpoint sources of pollution such as storm water runoff, and intermittent sources such as combined sewers (older sewers carrying both storm water and wastewater, the combination of which may bypass the treatment plant when the volume of flow increases with heavy rains).

Since OKI's original "208" plan was completed in late 1977 and adopted in early 1978, federal funding for water quality management planning has not been consistently available, and updates to OKI's plan were commensurately limited by lack of resources. The "208" work undertaken from the fall of 2009 through the early summer of 2011 has been the first opportunity for a major and fully integrated plan update for Butler, Clermont, Hamilton and Warren Counties in southwest Ohio, made by possible by federal funding through the American Recovery and Reinvestment Act of 2009 and by funding appropriated in the Ohio budget for state fiscal years 2010 and 2011.

The full plan update report is a document of over 350 pages with two extensive appendices, so this executive summary provides only highlights of its contents. The plan update provides a current look at surface water quality conditions in southwest Ohio based on data available from federal, state and local sources. It considers development trends and their implications for water quality and wastewater treatment needs. For areas without centralized wastewater treatment, the plan update provides information about onsite wastewater treatment systems such as septic tank-leach field systems and aerobic units, their water quality impacts, how they are currently regulated, and recommendations to improve their management.

The plan update also describes the impacts of nonpoint source pollution from diffuse sources like storm water runoff and stream bank erosion, identifies management needs and recommends management approaches. Organizations engaged in various aspects of watershed planning in southwest Ohio are described along with their work. Publicly owned wastewater facilities are identified and planning and management recommendations for them are provided in the plan update. Ongoing areawide or "208" planning is described along with procedures and considerations for amending the plan.

By consolidating a wealth of current information on water resources, water quality, water uses and demand and by recommending water management approaches in this plan update for southwest Ohio, OKI hopes to provide a valuable reference and a blueprint for the many agencies, organizations, and individuals who are responsible for implementing the plan. For example, by federal and state law, the Ohio EPA cannot issue construction or discharge permits for wastewater facilities that are substantially inconsistent with an adopted 208 plan, nor can

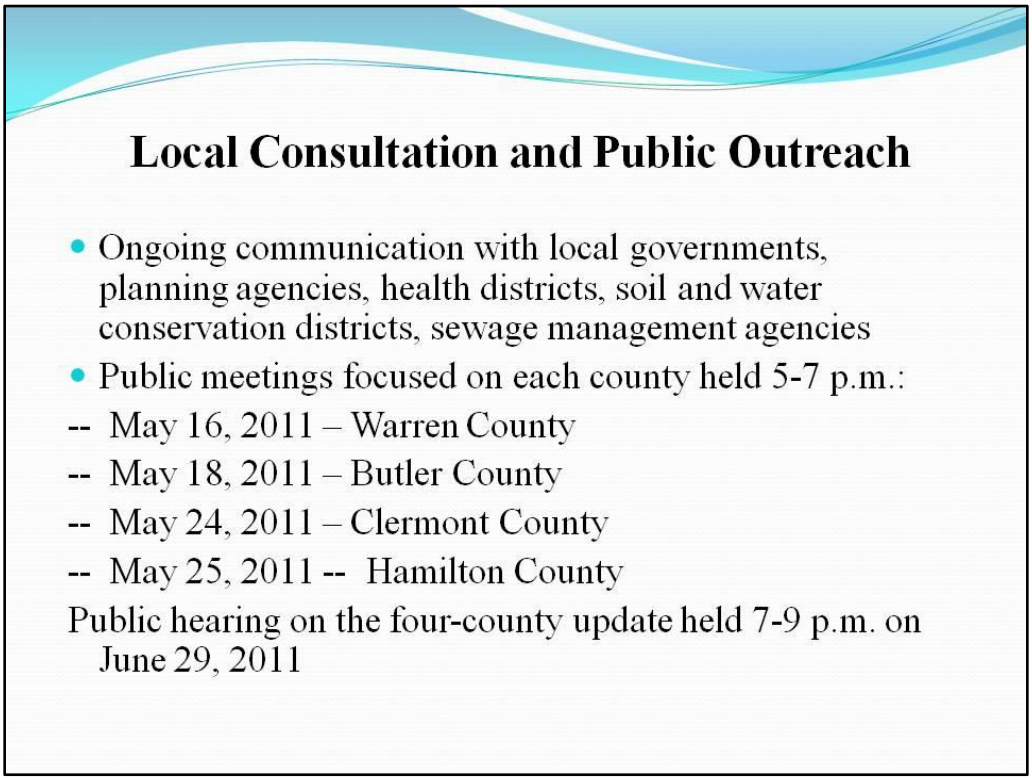
federal funding be released for wastewater facilities that are substantially inconsistent with "208" planning. Consequently, an updated 208 plan for southwest Ohio should help to enable permits for wastewater treatment facilities intended to address water quality issues.

Planning Partners and Process

OKI's work on the plan update would not have been possible without the support of many planning partners. Their knowledge, resources and input have been essential in assembling and interpreting data, conducting data analysis, describing water quality problems and issues, recommending management approaches and reviewing draft materials for the plan. These planning partners have included local governments, county planning agencies, health districts, soil and water conservation districts, local storm water managers, local wastewater management agencies, watershed planning groups, and staff from the Ohio EPA, the Ohio Department of Natural Resources, the U.S. EPA and the U.S. Geological Survey, and the public.

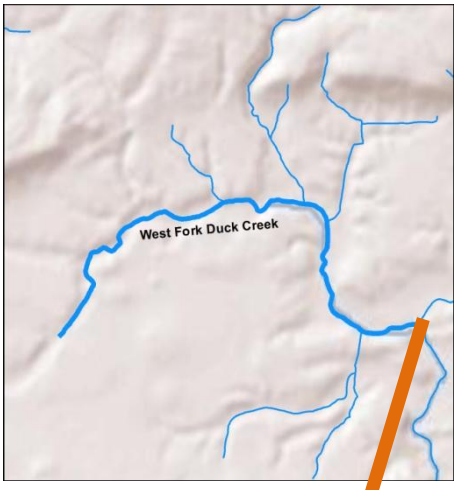
Draft materials from the plan update were taken out to four county-level public meetings publicized through the media, website postings by OKI and planning partners, social media (Facebook) announcements and blast emails to more than a thousand potentially interested individuals. Four public meetings were held in May 2011 and featured an overview PowerPoint presentation on major findings of the draft plan update, including material specific to the host county, as well as a question and answer session, a brief survey, and displays staffed by OKI personnel who had worked on the plan update and could answer questions and record verbal input from attendees.

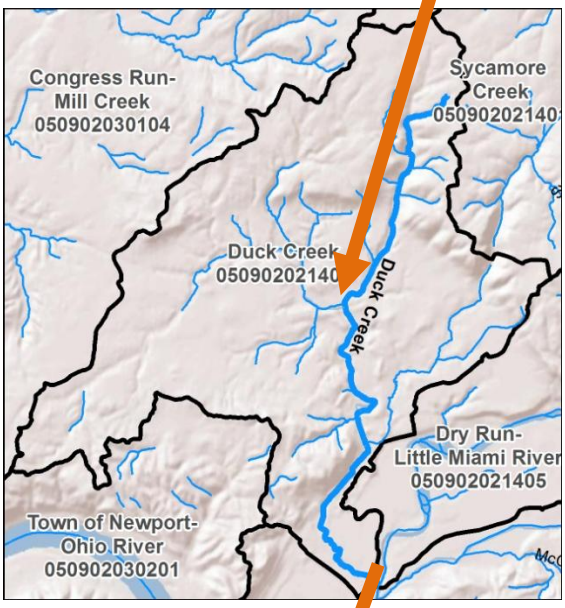
Following the public meetings, preparations were made for an additional 30-day public comment period and a public hearing on the draft plan update on June 29, 2011. The draft plan update was posted on OKI's website for review. Public notice was given through the placement of paid advertising and media advisories sent to the *Cincinnati Enquirer*, *Cincinnati Herald* and *La Journada*, along with website postings, social media announcements and blast emails. Public comments and a final draft plan update were provided to Ohio EPA in July. When action is taken by OKI to adopt the plan update, that action will also be forwarded to Ohio EPA. In turn, after Ohio EPA reviews the plan update and it is certified by Ohio's governor, it will be submitted to the U.S. EPA for approval.

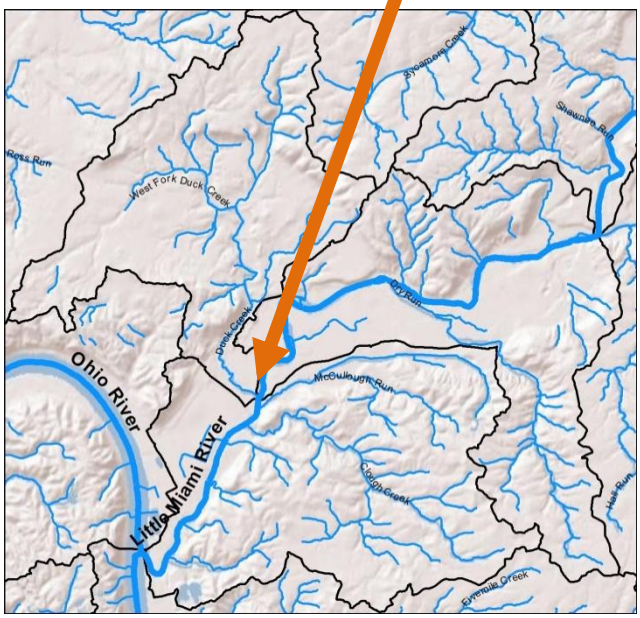


Water Resources

As part of fulfilling obligations under section 208 of the Clean Water Act, OKI performed an inventory of water resources in Butler, Clermont, Hamilton, and Warren Counties Ohio. The intent of this research was to give a physical description of the study area and to provide a basis of comparison for the future.







Watersheds and the Watershed Approach

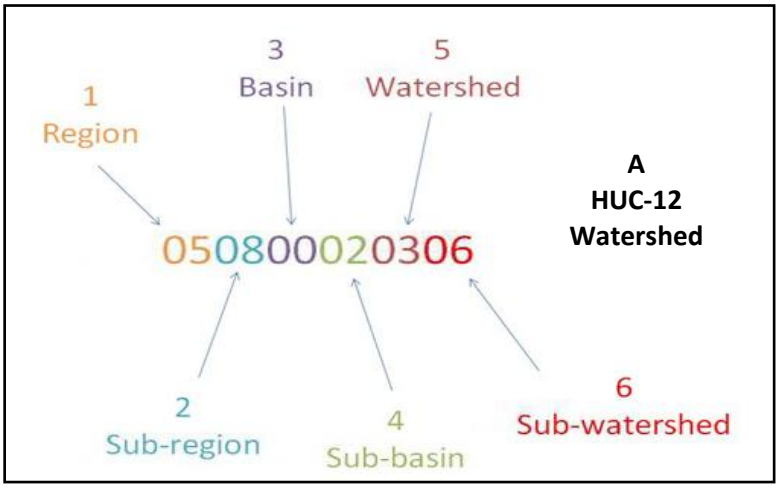
A watershed is a basin within which all surface water flow drains to a common watershed feature, such as a stream, river, or lake. This is shown to the left, where streams in the Duck Creek watershed drain to Duck Creek, and Duck Creek drains to the Little Miami River. The boundaries shown in black outline different watersheds. The codes below the watershed labels are Hydrologic Unit Codes, which are explained below.

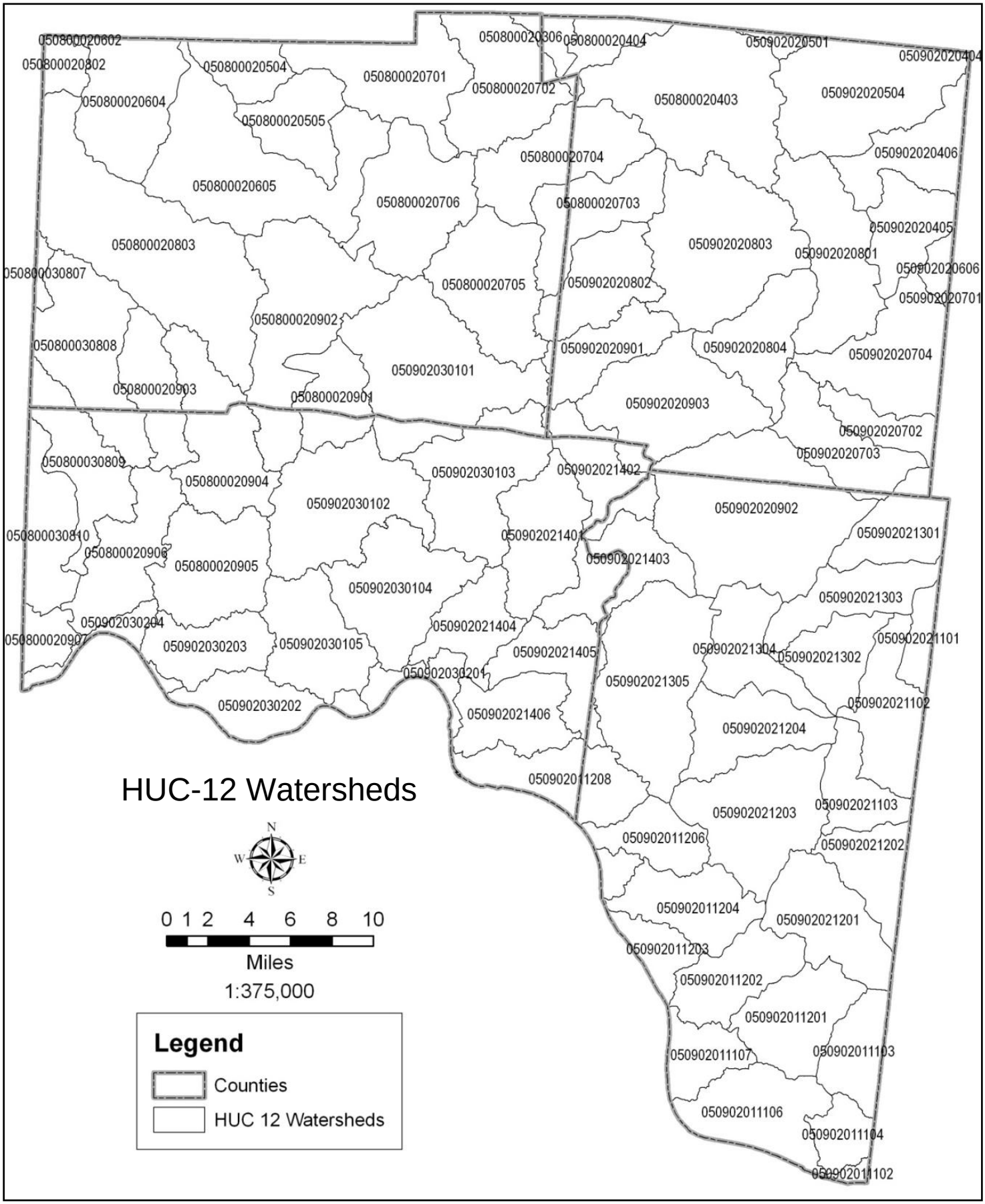
Because watershed boundaries and hydrologic features usually affect multiple communities, it is most effective to approach water quality management on a watershed level. In a watershed approach, water as a shared resource is managed by all affected communities in a combined effort.

What is a Hydrologic Unit Code?

A Hydrologic Unit Code (HUC) is a unique numeric code assigned to each water basin in the United States. Each HUC is made up of a series of smaller two digit codes, as seen in the figure below. The various levels of watershed described by these codes (region to sub-watershed), are assigned based on size and geographic location. From left to right each two digit code represents a subdivision of the code before it.

In HUC units, the watersheds on the left are described as sub-watersheds or HUC-12 units. The map on the next page shows all of the HUC-12 units in the Ohio portion of the OKI region.




050800020602
050800020306
050800020404
050902020501
050902020404
050800020302
050800020504
050800020701
050800020702
050800020403
050902020504
050800020604
050800020505
050800020704
050902020406
050800020605
050800020706
050800020703
050902020405
050800020803
050902020803
050902020801
050800030807
050800020705
050902020802
050902020606
050902020701
050800020902
050800030808
050902020901
050902020804
050902020704
050902030101
050800020903
050800020901
050902020903
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050902020703
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050902020902
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050902021303
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050902021404
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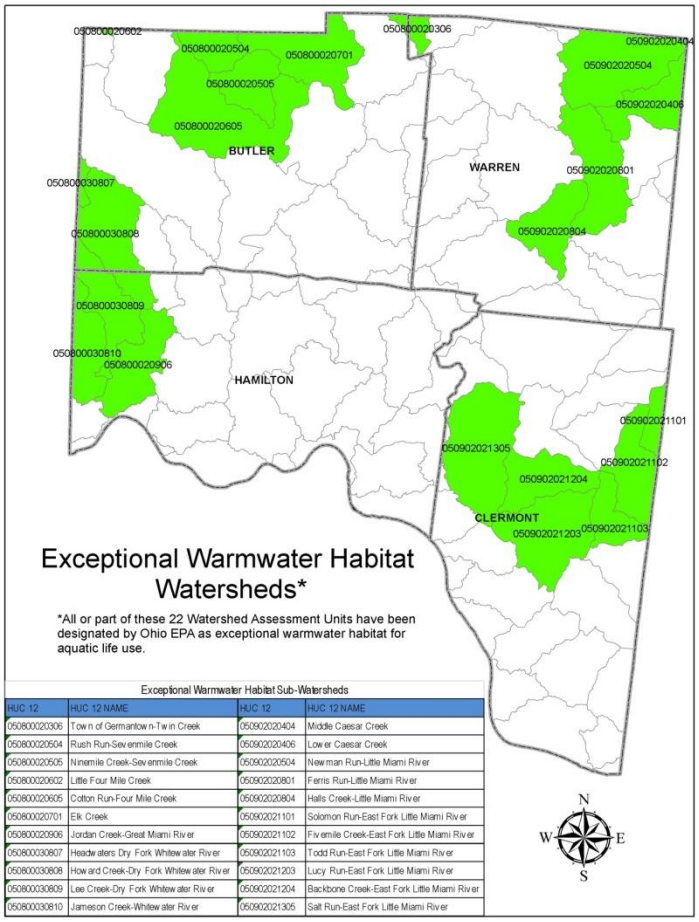
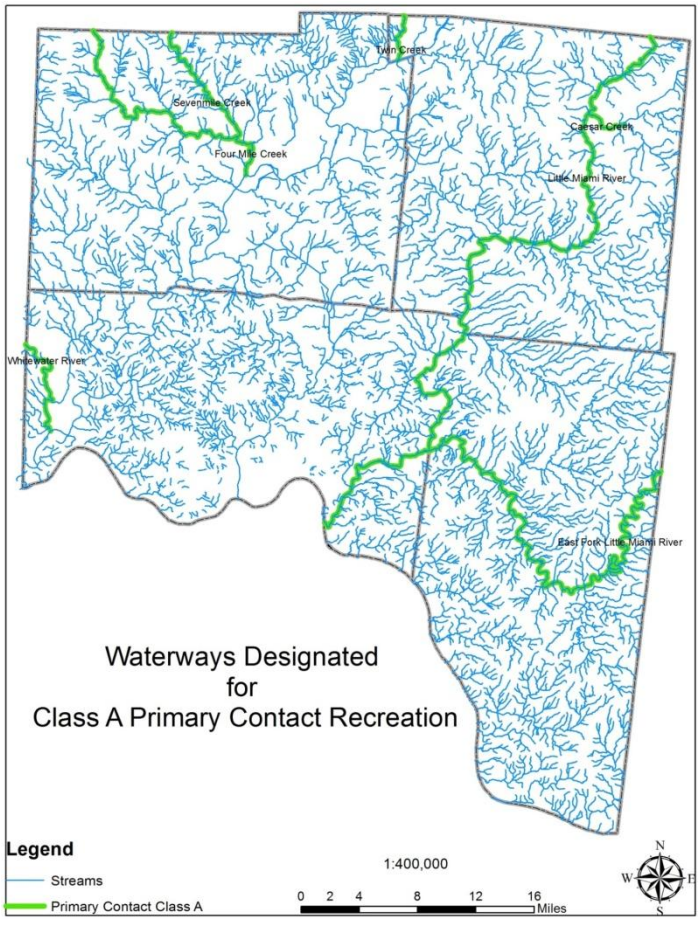
050902030203
050902030105
050902021405
050902021304
050902021302
050902021101
050902030201
050902021305
050902030202
050902021406
050902021102
050902021204
050902011208
050902021203
050902021103
050902011206
050902021202
050902011204
050902021201
050902011203
050902011202
050902011201
050902011107
050902011103
050902011106
050902011104
050902011102
HUC-12 Watersheds
N
W
E
S
0 1 2 4 6 8 10
Miles
1:375,000
Legend
Counties
HUC 12 Watersheds



Exceptional Warmwater Habitat Sub-Watersheds

HUC 12	HUC 12 NAME	HUC 12	HUC 12 NAME
050800020306	Town of Germantown-Twin Creek	050902020404	Middle Caesar Creek
050800020504	Rush Run-Sevenmile Creek	050902020406	Lower Caesar Creek
050800020505	Ninemile Creek-Sevenmile Creek	050902020504	Newman Run-Little Miami River
050800020602	Little Four Mile Creek	050902020601	Ferris Run-Little Miami River
050800020605	Cotton Run-Four Mile Creek	050902020804	Halls Creek-Little Miami River
050800020701	Elk Creek	050902021101	Solomon Run-East Fork Little Miami River
050800020906	Jordan Creek-Great Miami River	050902021102	Fivemile Creek-East Fork Little Miami River
050800030807	Headwaters Dry Fork Whitewater River	050902021103	Todd Run-East Fork Little Miami River
050800030808	Howard Creek-Dry Fork Whitewater River	050902021203	Lucy Run-East Fork Little Miami River
050800030809	Lee Creek-Dry Fork Whitewater River	050902021204	Backbone Creek-East Fork Little Miami River
050800030810	Jameson Creek-Whitewater River	050902021305	Salt Run-East Fork Little Miami River



Assessing Water Quality

Beneficial Uses

The State of Ohio identifies five different categories of uses for surface water that are beneficial to humans:

1. Aquatic Life Habitat
2. Recreation
3. Human Health (fish contaminants)
4. State Resource Waters
5. Water Supply

Ohio Administrative Code (OAC) Chapter 3745-1 outlines the different types of uses in these categories, and assigns one type from each category to each major stream in the State of Ohio.

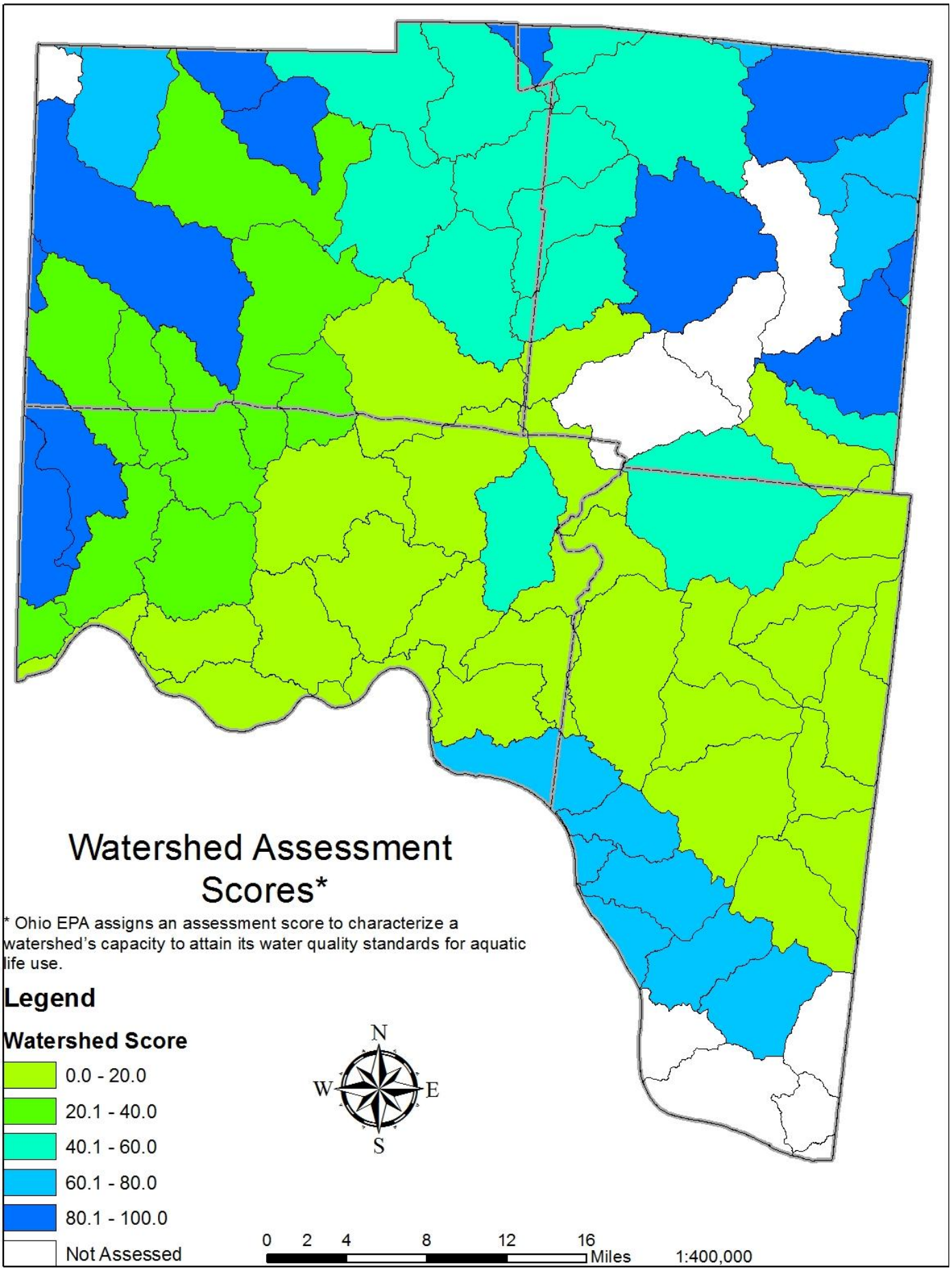
Two examples of these designations are shown on the left. The watersheds designated as Exceptional Warmwater Habitat all contain major streams capable of supporting and maintaining an exceptional or unusual community of warmwater aquatic organisms. The waterways designated as Class A Primary Contact Recreation are capable of supporting frequent full body contact activities. These specific use designations help to identify the region's highly functioning water resources.

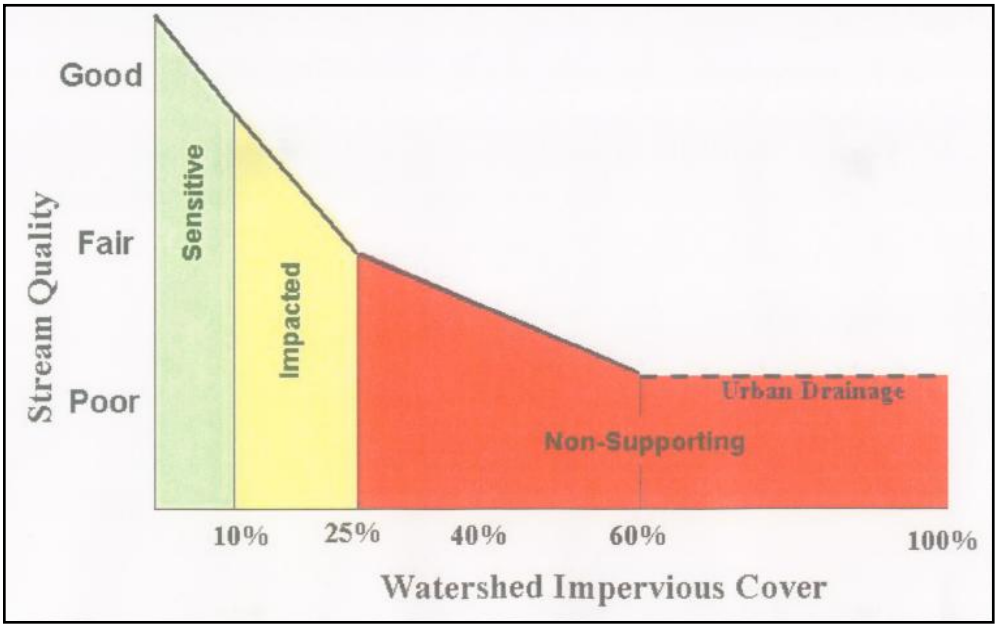
Water Quality Assessments

Beneficial use designations also provide a framework for assessing water quality. The Ohio Environmental Protection Agency (Ohio EPA) is responsible for monitoring and assessing the quality of all waters in the state. In order to accomplish this, the state has provided chemical, physical, and ecological criteria which must be met for a water body to support the beneficial uses assigned to it. Ohio EPA monitors and assesses these parameters for each major water body in the state, and reports them to U.S. EPA and the public. From this body of data, lists are generated which summarize water quality throughout Ohio. It is this data that OKI uses to characterize water quality in the region.

Watershed Assessment Scores

The map on the next page shows Watershed Assessment Scores, which indicate the relative health of rivers and streams in regard to supporting Aquatic Life. For example, the relatively undeveloped Whitewater River watershed is considered Exceptional Warmwater Habitat, and has a very high watershed score; much of the industrialized Mill Creek watershed is considered a Limited Resource Water and has a much lower watershed score.


Watershed Assessment Scores*
* Ohio EPA assigns an assessment score to characterize a watershed's capacity to attain its water quality standards for aquatic life use.
Legend
Watershed Score
0.0 - 20.0
20.1 - 40.0
40.1 - 60.0
60.1 - 80.0
80.1 - 100.0
Not Assessed
N
W
E
S
0 2 4 8 12 16
Miles
1:400,000



Managing Nonpoint Sources of Pollution

Nonpoint Sources

As defined by the U.S. EPA, nonpoint sources are diffuse pollution sources, where pollutants are generally carried off the land by storm water. Common Nonpoint Sources are agriculture, forestry, urban, mining, construction, dams, channels, land disposal, saltwater intrusion, and city streets.

Nonpoint Sources and Causes

In the study area, Ohio EPA has identified many causes and sources of impairment to surface waters. Of these causes and sources, most are typically considered to be indicative of nonpoint source pollution. Many nonpoint source problems are related to an agricultural activity, inadequate or failing onsite wastewater treatment, or a developed or developing area. Activities that ultimately lead to the alteration of natural stream channels, the compaction of soils, the removal of vegetation, or the installation of impervious surfaces like parking lots and roads will tend to increase nonpoint source pollution.

Storm Event Return Interval	Pre-Development Discharge (cfs)*	Post-Development Discharge (cfs)*	Percent Increase in Stream Discharges
2 years	21	27	29%
5 years	37	47	27%
10 years	43	55	28%
25 years	61	75	23%
50 years	70	85	21%
100 years	82	98	20%

*cfs = cubic feet per second

Impervious Cover

As seen in the figure above, when impervious cover increases in a watershed, stream quality generally decreases. A watershed that has more than 10% impervious cover is likely to be significantly impacted by nonpoint sources of impairment. Another perspective is provided by the table above, showing estimates for how much stream discharge increases as a result of development. During storm events, storm water collects pollutants from the Earth's surface, and rapidly makes its way over surfaces of low permeability and into nearby waterways. Along with the pollution caused by this runoff, stream discharge also increases. Increased stream discharge, in turn, creates other problems such as stream bank erosion, sedimentation, and flooding.

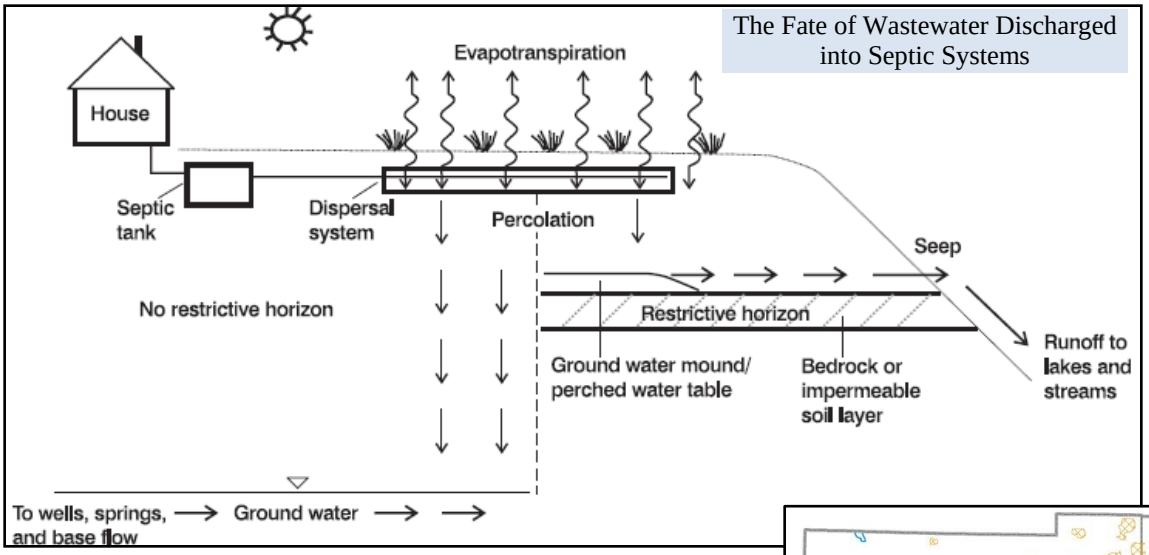
Best Management Practices

Because of the diffuse nature of nonpoint source pollution, it can often be difficult to determine its causes and sources. Managing nonpoint sources typically means using techniques to reduce runoff, thus lowering the levels of pollutants being carried to streams. These techniques are commonly referred to as Best Management Practices (BMPs). There are many BMPs, but the goal of most is to increase the infiltration of storm water into the ground, while slowing the erosion process. Common BMPs include rain gardens, grassed waterways, riparian buffers, conservation farming, retention basins, and many others.

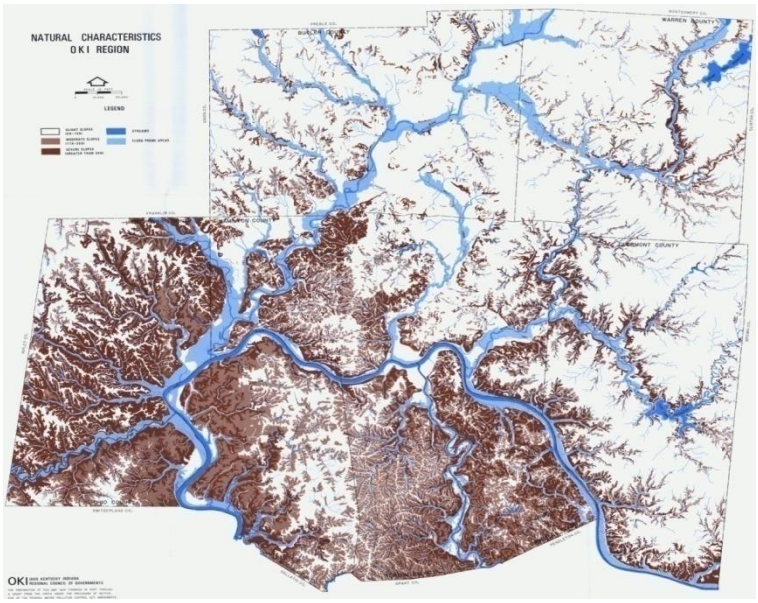
Rain Garden at the Hilltop Elementary School in the City of Reading

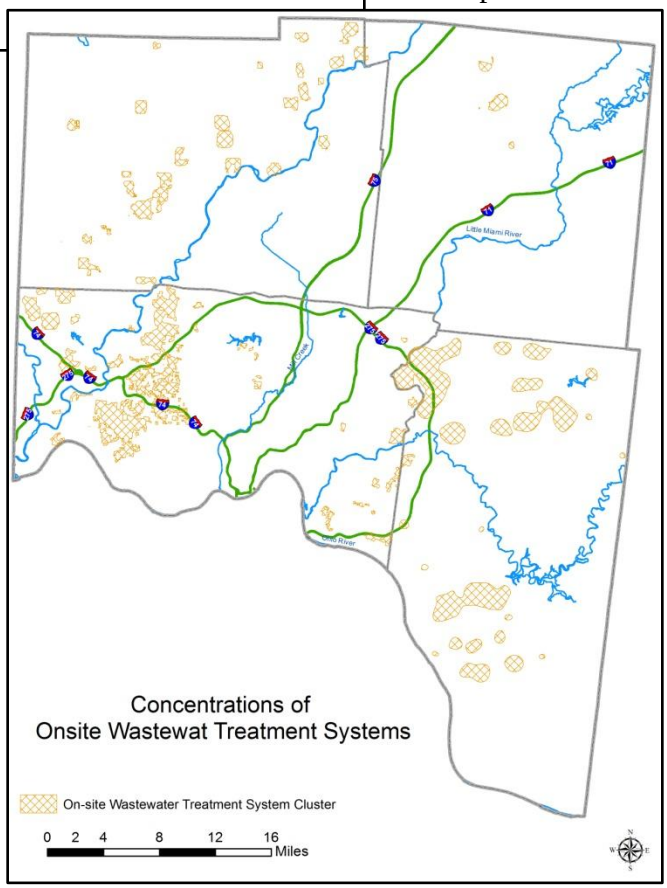
Management of Onsite Wastewater Treatment Systems

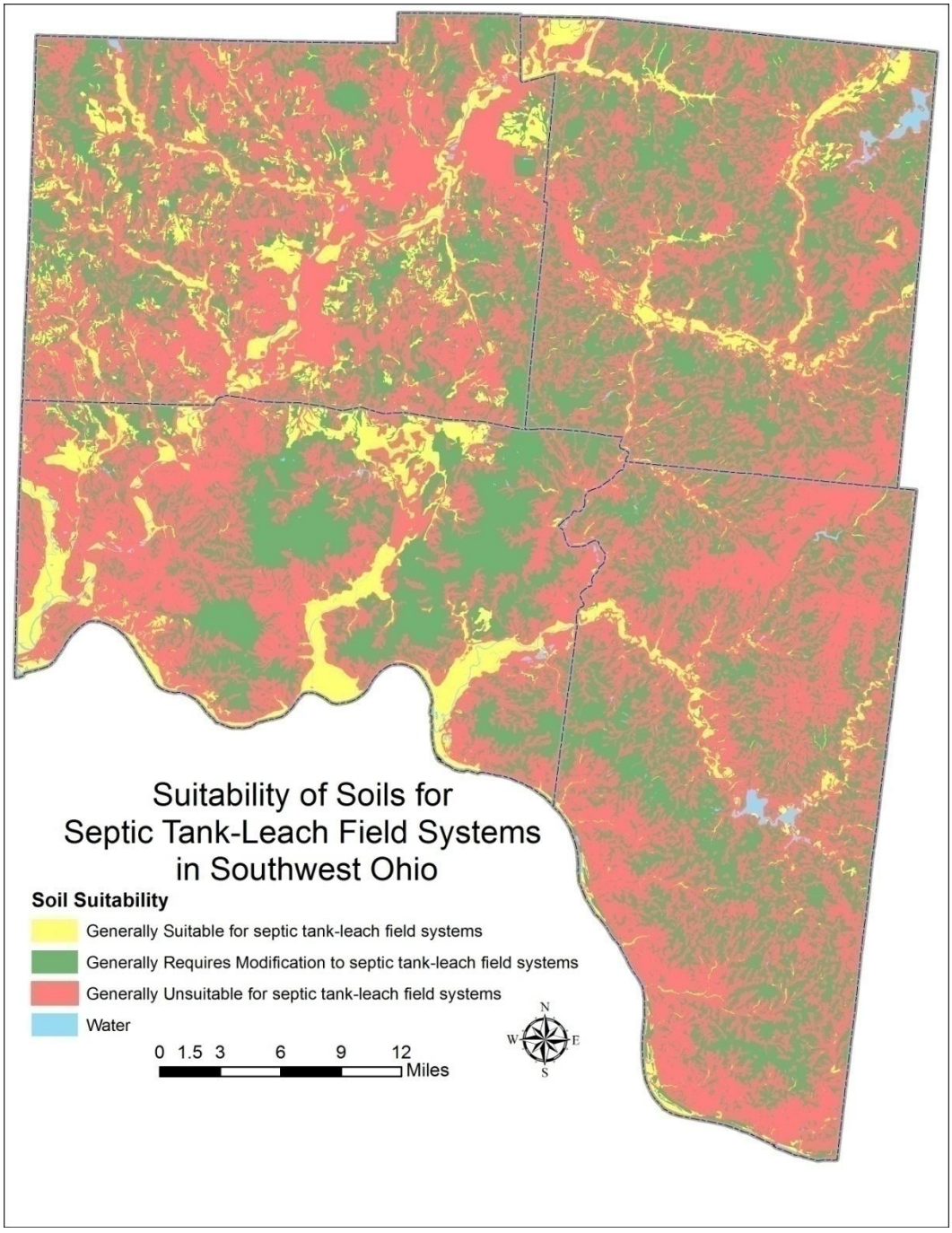
An onsite wastewater treatment system refers to a household sewage treatment system, as defined in the Ohio Revised Code (Chapter 3718.01): "any sewage treatment system or part of such a system that receives sewage from a single-family, two-family or three-family dwelling." In the OKI region, the most frequent method of onsite treatment is the septic tank-leach field system. Septic systems can be appropriate in low density areas that are not feasibly served by centralized sewage, but they must be properly located, designed, installed, operated and maintained. Serious problems arise when these conditions are not met.



The figure on the left shows the many potential flow paths of wastewater discharged to septic systems. When these systems are failing, inadequately treated wastewater is discharged to surface water and sometimes even ground water. In the OKI region, such problems are commonly caused by improper location in soils of poor permeability, or other undesirable attributes. For example, the figure below uses progressively darker shades of brown to show steeper slopes. These steep hillsides are highly unsuitable for septic systems. The figure on the right shows onsite system concentrations. If failing, these areas can be major contributors of water pollution.







Soil Suitability for Septic Tank-leach Field Systems

The map on the left shows all of the soil units in the study area categorized by their suitability for septic system installation. The categories were originally created in 1987 when septic systems were the most common type of onsite system for suburban development. For this plan update, OKI revisited and updated the map. Major contributors were staff from the Ohio Department of Natural Resources (ODNR) and county health departments, and each county's Natural Resources Conservation Service staff.

There are three different categories that were identified:

- Generally ***suitable*** for septic tank-leach field systems provided the systems are properly installed and maintained
- Generally ***require modifications*** to septic tank-leach field systems, such as an operational second leach field or an oversized leach field.
- Generally ***unsuitable*** for septic tank-leach field systems but may be suited for an alternative type of onsite wastewater treatment system. (Current alternatives include pretreatment to soil absorption trenches, sand mounds with pressure distribution, peat bio-filters with soil absorption, or septic tank and pretreatment to low pressure pipe.)

There are other factors affecting the location of septic tank-leach field systems including proximity to floodways, wetlands, and ground water wells. It is very important to note that these soil suitability categories are only meant for assessing septic systems; as noted above, there are many alternative types of onsite systems which may be appropriate where septic tank-leach field systems are not. It is also important to note that the groupings provide indications about one significant factor—soil suitability--and are not intended to replace site-specific investigations.

Current and Projected Development

Development inevitably affects water quality, not only because of increasing paved surfaces, soil compaction and runoff, but also because of decreasing vegetation which helps to slow and/or absorb storm water. If not properly managed, development can also cause modifications to natural stream channels and other hydrologic features.

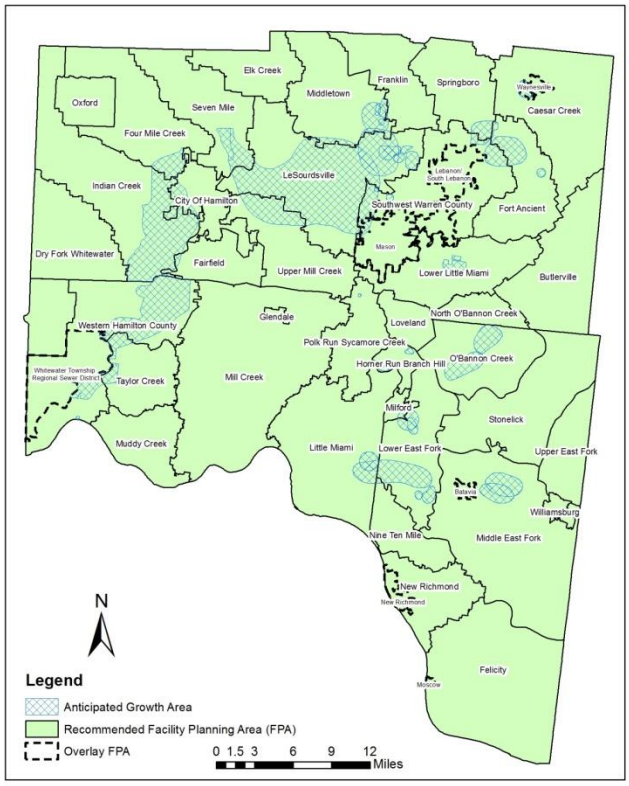
In the context of water quality management planning, development often causes additional demand for centralized wastewater treatment and increased discharge of treated wastewater to streams, called effluent, due to associated population increases. In southwest Ohio, effluent discharges account for more than half the flow volume of some waterways during dry seasons. While wastewater flows are typically well treated, some sewer systems in older communities were built to carry both wastewater and storm water, volumes of which have subsequently grown along with our cities. During storm events these combined sewers can contribute untreated overflows (known as combined sewer overflows or CSOs) to waterways.

Demographic Data

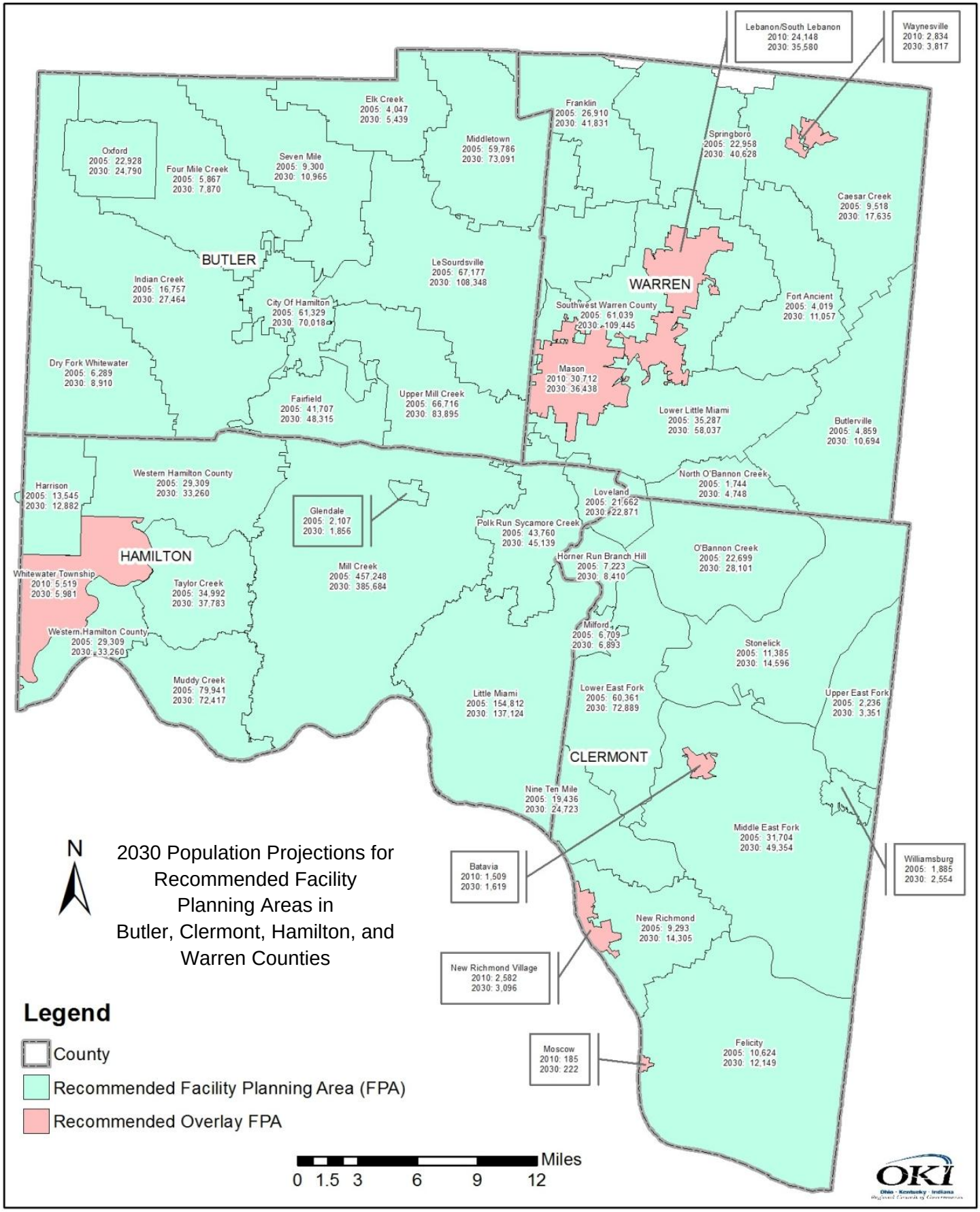
In order to analyze current and projected development patterns, OKI used housing and population data provided by the state. OKI is required to develop its population projections in the context of county level population control totals developed and issued by the Ohio Department of Development (ODOD). OKI has the prerogative to decide where in each county population gain or loss will occur over the projection period, but the total county population must equal the projection developed by ODOD for each analysis year. Using ODOD's county level population control totals (table above), OKI allocated current and projected population into internally created Wastewater Facility Planning Areas (FPAs) and then consulted with local government planners, engineers, wastewater personnel and other individuals knowledgeable about residential development trends in each county. These local partners helped to refine population projection assignments, to identify areas of anticipated growth (shown on the map at the left), to indicate areas where subdivisions have been approved, and to identify areas targeted for new water service, sewer service or both. OKI also reviewed development trends and comprehensive plans and considered build-out calculations to provide a ceiling for the allocation of future households.

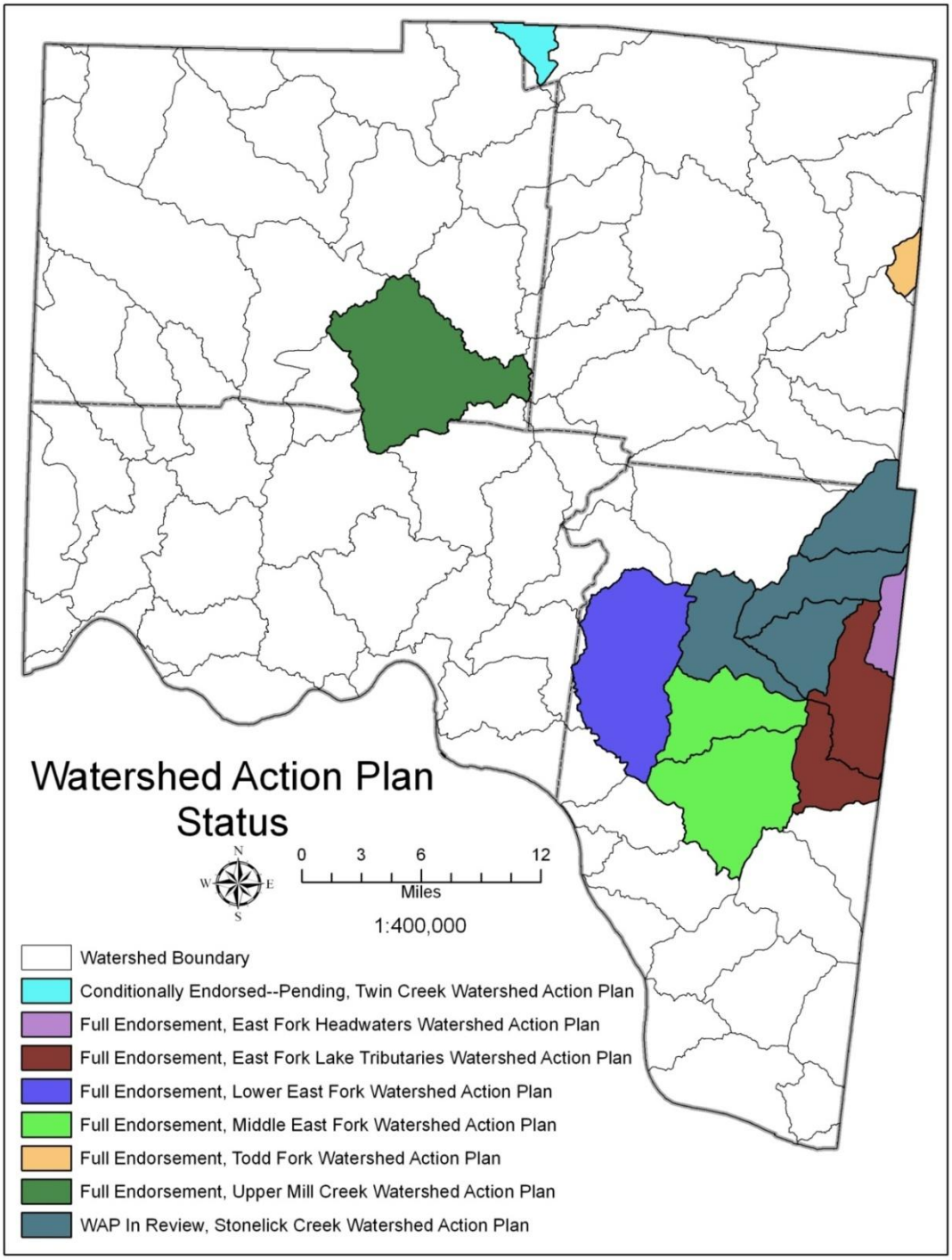
County	2005 Total Population Control Total	2030 Total Population Control Total	2005 Household Population Control Total	2030 Household Population Control Total
Butler	350,880	439,744	339,619	428,479
Clermont	190,230	245,003	188,765	243,525
Hamilton	825,710	730,571	804,619	707,935
Warren	184,210	338,350	177,779	331,966

Anticipated Growth Areas and
Recommended Facility Planning Areas in Butler, Clermont, Hamilton and Warren Counties



The resulting map of 2030 population projections by wastewater FPA is shown on the next page, as an aid to planning adequate and timely wastewater infrastructure improvements.


Lebanon/South Lebanon
2010: 24,148
2030: 35,580
Waynesville
2010: 2,834
2030: 3,817
Elk Creek
2005: 4,047
2030: 5,439
Franklin
2005: 26,910
2030: 41,831
Springboro
2005: 22,958
2030: 40,628
Oxford
2005: 22,928
2030: 24,790
Four Mile Creek
2005: 5,867
2030: 7,870
Seven Mile
2005: 9,300
2030: 10,965
Middletown
2005: 59,786
2030: 73,091
Caesar Creek
2005: 9,518
2030: 17,635
BUTLER
WARREN
LeSourdsville
2005: 67,177
2030: 108,348
Indian Creek
2005: 16,757
2030: 27,464
City Of Hamilton
2005: 61,329
2030: 70,018
Southwest Warren County
2005: 61,039
2030: 109,445
Fort Ancient
2005: 4,019
2030: 11,057
Dry Fork Whitewater
2005: 6,289
2030: 8,910
Mason
2010: 30,712
2030: 36,438
Fairfield
2005: 41,707
2030: 48,315
Upper Mill Creek
2005: 66,716
2030: 83,895
Lower Little Miami
2005: 35,287
2030: 58,037
Butlerville
2005: 4,859
2030: 10,694
Harrison
2005: 13,545
2030: 12,882
Western Hamilton County
2005: 29,309
2030: 33,260
Glendale
2005: 2,107
2030: 1,856
Loveland
2005: 21,662
2030: 22,871
North O'Bannon Creek
2005: 1,744
2030: 4,748
Polk Run Sycamore Creek
2005: 43,760
2030: 45,139
HAMILTON
Horner Run Branch Hill
2005: 7,223
2030: 8,410
O'Bannon Creek
2005: 22,699
2030: 28,101
Whitewater Township
2010: 5,519
2030: 5,981
Mill Creek
2005: 457,248
2030: 385,684
Taylor Creek
2005: 34,992
2030: 37,783
Milford
2005: 6,709
2030: 6,893
Western Hamilton County
2005: 29,309
2030: 33,260
Stonelick
2005: 11,385
2030: 14,596
Muddy Creek
2005: 79,941
2030: 72,417
Little Miami
2005: 154,812
2030: 137,124
Lower East Fork
2005: 60,361
2030: 72,889
Upper East Fork
2005: 2,236
2030: 3,351
CLERMONT
Nine Ten Mile
2005: 19,436
2030: 24,723
Middle East Fork
2005: 31,704
2030: 49,354
N
2030 Population Projections for
Recommended Facility
Planning Areas in
Butler, Clermont, Hamilton, and
Warren Counties
Batavia
2010: 1,509
2030: 1,619
Williamsburg
2005: 1,885
2030: 2,554
New Richmond
2005: 9,293
2030: 14,305
New Richmond Village
2010: 2,582
2030: 3,096
Moscow
2010: 185
2030: 222
Felicity
2005: 10,624
2030: 12,149
Legend
County
Recommended Facility Planning Area (FPA)
Recommended Overlay FPA
Miles
0 1.5 3 6 9 12
OKI
Ohio - Kentucky - Indiana



Watershed Planning

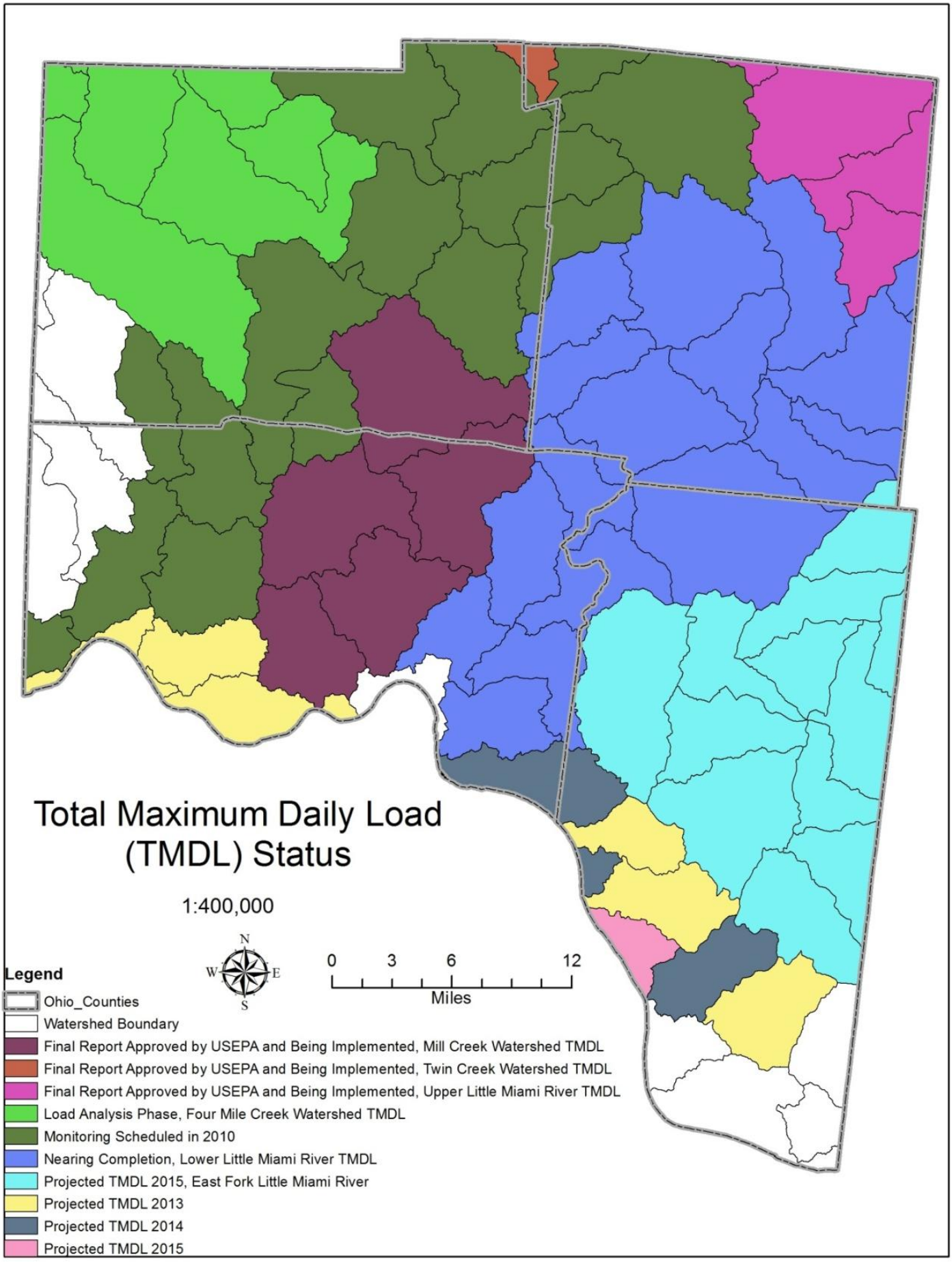
Watershed Groups

The purpose of watershed planning is to assess water quality issues and to provide management solutions. Nonprofit watershed groups often take on this responsibility. While OKI's planning efforts under section 208 of the Clean Water Act focus more on wastewater treatment, the planning efforts of watershed groups tend to focus more on managing nonpoint sources of pollution. Watershed groups that are active in southwest Ohio include: the East Fork Watershed Collaborative: Friends of the Great Miami: the Greenacres Water Quality Project: Little Miami Inc.; the Little Miami River Partnership; Mill Creek Restoration Project; Mill Creek Watershed Council of Communities; and Three Valley Conservation Trust.

Watershed Action Plans and Total Maximum Daily Load (TMDL) Plans

A Watershed Action Plan (WAP) is a comprehensive plan for the assessment and management of a specific watershed, often produced by a watershed group, which requires full endorsement from Ohio EPA. The figure above shows the status of watershed planning in southwest Ohio.

A TMDL is a written, quantitative assessment of water quality problems in a waterbody and contributing sources of pollution, developed by Ohio EPA. It specifies the amount a pollutant needs to be reduced to meet water quality standards, allocates pollutant load reductions, and provides the basis for taking actions needed to restore a waterbody. The figure on the next page shows the status of TMDL planning for southwest Ohio.


Total Maximum Daily Load
(TMDL) Status
1:400,000
N
W
E
S
0 3 6 12
Miles
Legend
Ohio_Counties
Watershed Boundary
Final Report Approved by USEPA and Being Implemented, Mill Creek Watershed TMDL
Final Report Approved by USEPA and Being Implemented, Twin Creek Watershed TMDL
Final Report Approved by USEPA and Being Implemented, Upper Little Miami River TMDL
Load Analysis Phase, Four Mile Creek Watershed TMDL
Monitoring Scheduled in 2010
Nearing Completion, Lower Little Miami River TMDL
Projected TMDL 2015, East Fork Little Miami River
Projected TMDL 2013
Projected TMDL 2014
Projected TMDL 2015

Wastewater Facilities Planning

Federal and State Oversight of Public Wastewater Treatment Plants

The intent of the Clean Water Act is for our water resources to support a variety of uses—not only the disposal of municipal and industrial waste but also drinking water supply, agriculture, recreation, and aquatic life—by addressing pollution sources. The significance of any pollutant depends on the extent to which it inhibits the ability of a body of water to support a diversity of uses. The level of pollution control required is related to a stream's assimilative capacity, its ability to purify itself by using dissolved oxygen to decompose organic waste.

After state governments determine the uses a stream should be able to accommodate, they establish water quality standards to enable these uses. Water quality standards are expressed in terms of physical and chemical parameters that are considered minimum requirements, not to be diminished by the impacts of wasteloads, such as the discharge of effluent from treatment plants. Effluent limitations are developed for all wastewater plants in a process called wasteload allocation. Depending on the pollutant in question, an effluent limitation may permit some discharge or no discharge at all. In addition, U.S. EPA requires industries discharging to public treatment plants to pretreat their wastes to reduce or remove elements that cannot be handled by the public plant's treatment processes.

The Clean Water Act created an oversight system for wastewater dischargers called the National Pollution Discharge Elimination System (NPDES) permit which includes requiring that effluent limitations must be identified and met. In Ohio, the Ohio EPA sets effluent limitations and issues NPDES permits, which must then be renewed every 5 years or whenever significant modifications or expansions are made to the treatment plant.

Ohio EPA also conducts reviews and issues permits for the construction of wastewater facilities whether they involve sewer collection systems, treatment plants, or expansions or improvements to these systems and plants. Because of federal and state law, the discharge permits and construction permits issued by Ohio EPA cannot be "substantially inconsistent" with the water quality management planning required under Section 208 of the Clean Water Act. In addition, Ohio EPA provides oversight of system operations and compliance by requiring that treatment facilities submit monthly operating reports that indicate effluent quality and any monitored exceedances of the parameters identified in their NPDES permits.

In general, water quality problems caused by wastewater facilities are related to inadequacies in treatment levels, plant size, or operation and maintenance. By-passing is the water quality problem caused most often by inadequate plant size. If a facility is not large enough to process the flows conveyed to it, untreated wastewater is by-passed into the receiving stream. Poor maintenance or operation of a treatment plant and poor maintenance of sewer collection systems are also causes of water quality problems. Systems with cracked joints and broken pipes allow groundwater infiltration, which may substantially increase the volume of water delivered to a treatment plant. Drains connected to a sewer system from rooftops and foundations contribute to inflow problems. Infiltration and inflow (often referred to as "I/I") problems can be quite serious in poorly constructed or maintained systems.

OKI's Work with Public Wastewater Facilities for "208" Planning

As explained previously, OKI is responsible for water quality management planning in the greater Cincinnati region, including Butler, Clermont, Hamilton and Warren Counties. The governor of Ohio designated OKI for this role because of Section 208 of the Clean Water Act. Section 208 requires that areas with substantial water quality problems develop a management plan to control pollution on a regional basis, so these plans are often referred to as "208" plans.

A key aspect of "208" planning is to identify areas in which the feasibility of public wastewater treatment alternatives can be investigated, areas called wastewater facility planning areas or FPAs, and to designate management agencies or DMAs for each FPA. In updating FPAs and DMAs for this "208" plan update, OKI

has gathered information and consulted extensively with local wastewater management agencies in Butler, Clermont, Hamilton and Warren Counties, meeting with neighboring agencies to discuss information, issues and alternatives. The FPAs are intended to permit an analysis of alternatives where cost savings, management advantages or environmental gains may result.

In updating FPA boundaries and management agency designations, OKI has considered several factors, including natural drainage; existing wastewater infrastructure and management; the status of local facility planning; municipal, county, and state boundaries; the timing of service in relation to needs to protect and improve water quality; and input received from local governments and the public. Because of existing infrastructure and inter-local agreements, OKI's approach has typically been that while more than one local agency (multiple DMAs) might be designated to provide sewage collection within an FPA, only one local agency or DMA would be designated to provide wastewater treatment within an FPA. This approach helps to avoid duplication of effort and its associated costs.

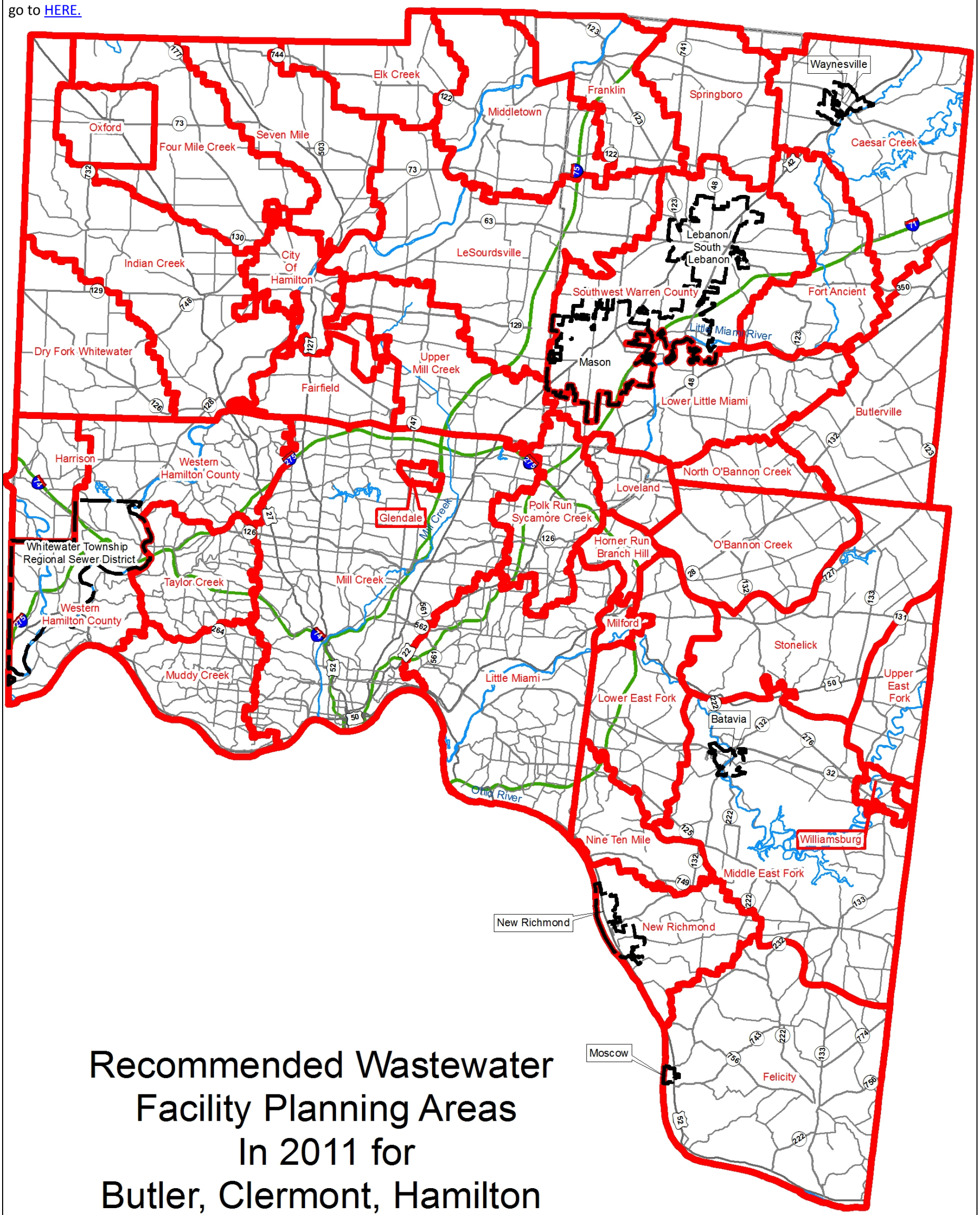
The map on the next page shows recommended wastewater facility planning areas (FPAs) for Butler, Clermont, Hamilton and Warren Counties. The recommended FPA boundaries are shown either with red solid lines or with black dashed lines. The black dashed lines indicate "overlay FPAs" as the management agencies already serving them have been designated to provide service within their jurisdictional boundaries, which have changed and may change again over time.

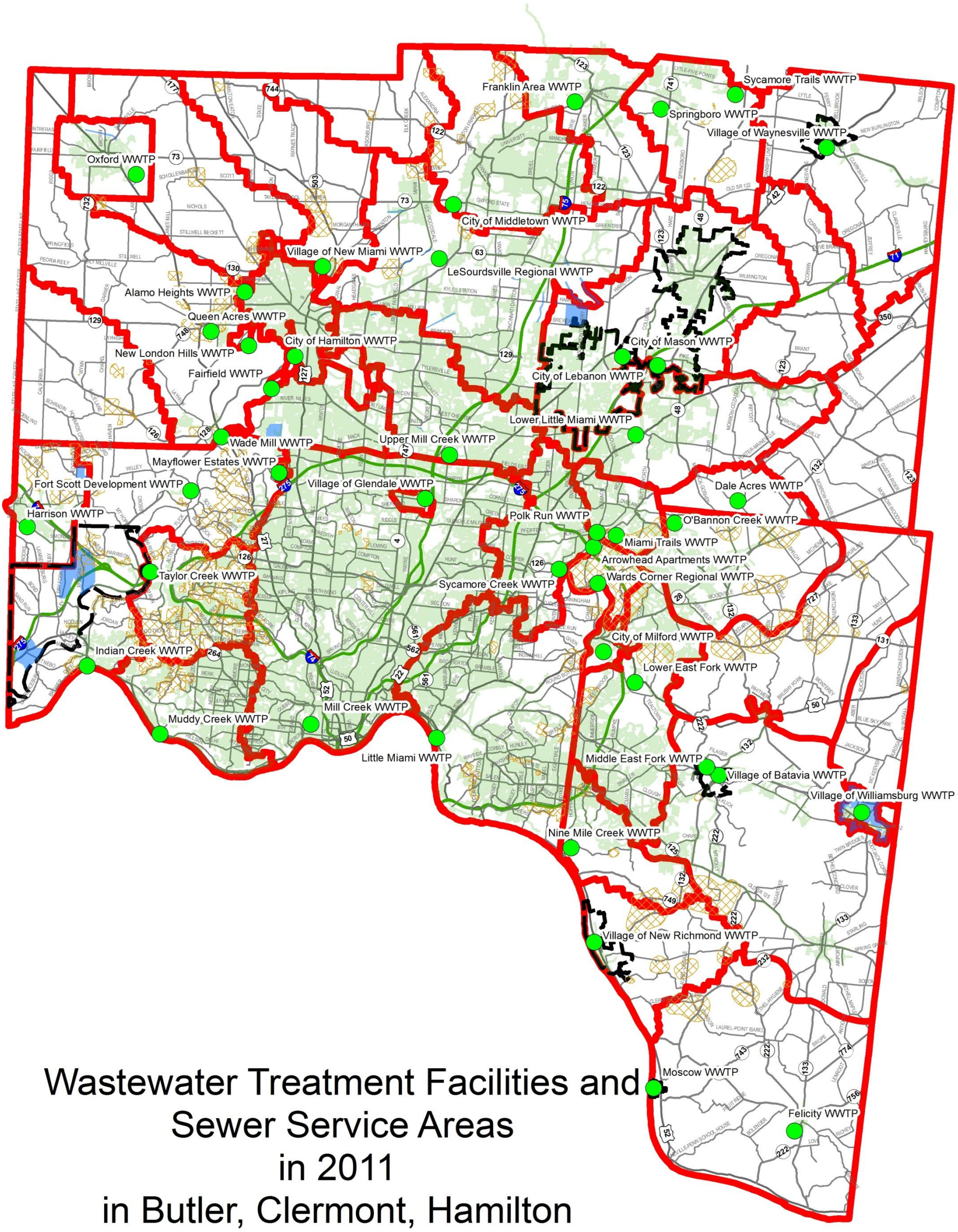
In addition, while southwest Ohio includes several small wastewater treatment "package" plants that are owned and managed by commercial enterprises or mobile home parks, this plan update focuses on publicly owned wastewater treatment works, as indicated in the final map of this summary.

More detail is provided about each of the recommended wastewater facility planning areas in the full plan update report, including a map for each FPA which shows the jurisdictions involved, areas of existing sewer service, areas of anticipated sewer service, and wastewater treatment facilities, along with descriptions of the management agencies recommended to address wastewater collection and/or treatment, population and projected population, water quality issues such as clusters of failing onsite wastewater treatment systems, plans for addressing such issues and for maintaining or improving appropriate treatment plant operations and capacity, watersheds and waterways. The FPA summaries in the full plan update report incorporate information provided by local wastewater management agencies and all of the summaries were provided to them for review and comment.

Figure 7-2

For the most current version of this map,
go to HERE.





Wastewater Treatment Facilities and Sewer Service Areas in 2011 in Butler, Clermont, Hamilton and Warren Counties

Wastewater Treatment Plant (WWTP)
Recommended Wastewater Facility Planning Area (FPA)
Recommended Overlay FPA
Sewer Service Area
Anticipated Sewer Service Area
Onsite Wastewater Treatment System Cluster

0 2 4 8
Miles

The Plan Amendment Process

In making updates and amendments to the plan, OKI follows a process that includes defining the issue(s) to be addressed; gathering and analyzing relevant information from local, state and federal sources; conferring with local management agencies and Ohio EPA; notifying potentially affected jurisdictions; seeking public input; preparing a staff report and recommendation; and presenting the report, amendment or update to the relevant OKI policy body for action. On a quarterly basis the 117-member OKI Board of Directors meets and acts as the policy body, and during the other months an OKI Executive Committee of approximately 30 members has been named to act as the policy body. After an update or amendment has been adopted by OKI, it is provided to the State of Ohio for certification before the State sends it to U.S. EPA for federal review and approval. When local jurisdictions request plan amendments from OKI, the following steps are involved:

Steps in Amending the "208" Plan

1) The jurisdiction notifies OKI of its desire for a plan amendment.

2) The jurisdiction meets with appropriate OKI staff for a pre-submittal conference to review the amendment process steps, documentation required, and background material.

3) The jurisdiction prepares the request letter and documentation required for the plan amendment and submits it to OKI.

4) OKI reviews the documentation and requests additional documentation as appropriate.

5) OKI makes arrangements for public notification and opportunity for input on the proposed amendment in keeping with federal and state requirements.

6) OKI prepares a staff report and recommendation and summarizes the results of public input for consideration by the OKI Executive Committee (which meets monthly) or Board of Directors (which meets quarterly).

7) The OKI Executive Committee or Board of Directors considers the amendment, staff recommendation and public input and takes action.

8) If approved, the amendment is forwarded to the appropriate state agency for certification by the governor.

Depending on the complexity of the amendment request and supporting documentation, the meeting schedule of the OKI Executive Committee and Board of Directors, and the level of interest from the public and potentially affected parties, it may take OKI from three to six months to go through the amendment process, assuming no additional information is requested of the applicant. The information required for evaluating plan amendment requests is tailored to the scope of the specific request, but typically includes some combination of these items:

Information Checklist for "208" Amendment Requests

1) A letter requesting the plan amendment, explaining the reason for the request

2) Appropriate map(s), preferably in digital form, showing:
   --the boundaries of the current sanitary sewer system and all existing wastewater treatment plants (including package plants)
   --the location of trunk lines and lift stations
   --the location of any system overflow points
   --the current Facility Planning Area (FPA) boundary
   --the proposed FPA boundary, if applicable
   --unsewered areas within existing and proposed FPAs
   --appropriate jurisdictional boundaries

3) Existing service population and twenty-year population projections for the (existing, and if applicable, proposed) FPA based on best available census data

4) Description of existing and proposed wastewater treatment options for the FPA including options for the unsewered/undeveloped areas within the FPA, e.g., onsite septic systems, package plants, etc.

5) Table(s) showing the plant permit number under the National Pollutant Discharge Elimination System (NPDES), current plant permit limits, current demand, existing plant design capacities, and projected plant capacities

6) Discussion of how the proposed wastewater treatment options will meet the needs of the proposed population

7) Discussion of how the proposed wastewater treatment options will be protective of water resources, including streams, rivers, lakes, wetlands, and groundwater

8) Summary of the entity's financial and managerial capability to undertake the proposed project and its projected financial impact on ratepayers

9) Documentation of any public participation involved in proposing the wastewater treatment improvements

10) Acknowledgements from other jurisdictions located within or adjacent to the existing FPA that they have been notified of the proposal, and copies of any relevant service agreements

General Criteria for Evaluating 208 Amendment Requests

OKI considers some general criteria when evaluating plan amendment requests, while also considering circumstances unique to each individual request. Because circumstances vary from request to request, the following general criteria are not listed in order of priority nor are they weighted:

1) Mitigation of public health hazards (such as those due to failing onsite systems)

2) Need for water quality maintenance or improvement and timeliness of service

3) Adequate wastewater treatment capacity for existing and projected needs

4) Opportunity for treatment on a watershed or sub-watershed basis (e.g. enables gravity sewers and eliminates lift stations)

5) Existing development patterns and population densities suitable for centralized wastewater treatment systems

6) Local comprehensive plans indicating growth areas for which new infrastructure will be needed, areas where slow growth or no growth is expected, and existing and projected population densities

7) Financial and institutional capability of management entity or entities

8) Impact on rate payers

9) Agreement or neutrality among jurisdictions affected and potentially affected

10) Degree and content of public participation

When approached with a plan amendment request, OKI encourages the applicant to consult with potentially affected jurisdictions to arrive at consensus before pursuing the amendment. OKI cannot compel potentially affected jurisdictions to agree but will attempt to facilitate communication. In the absence of agreement among the jurisdictions potentially affected by a proposed plan amendment, the OKI Board of Directors or Executive Committee will determine whether additional information or communication is needed before they take action on an amendment request.

For some circumstances involving designated management agencies (DMAs) and service agreements OKI does not require a "208" plan amendment. For example, when a DMA for wastewater collection wants to expand its sewer service area within an FPA where another DMA is responsible for wastewater treatment, and the treatment DMA is agreeable and has adequate capacity, no plan amendment is required if a service agreement is reached between the DMAs. If neighboring DMAs enter into a sanitary sewer service agreement that crosses an FPA boundary between them, they have the option of requesting a plan amendment to change the FPA boundary that is crossed, but OKI does not require it. OKI also does not require a "208" plan amendment when wastewater agencies that have been designated to manage collection and/or treatment within the limits of their corporate boundaries experience a change in those boundaries; such a change is made administratively by OKI when the DMAs provide documentation of their updated corporate boundaries.

Future Planning Activities

In response to requests from Ohio EPA, local jurisdictions and developers, OKI will continue to perform consistency reviews to determine if proposed wastewater facilities are substantially consistent with the "208" plan. OKI will also continue to evaluate plan amendment requests from local jurisdictions and provide related information to local governments and the public before taking the request and the input received to OKI's Board of Directors or Executive Committee for action. Based on available funding, OKI will determine scopes of work for future "208" plan updating in consultation with funding agencies and local jurisdictions in Butler, Clermont, Hamilton and Warren County.