



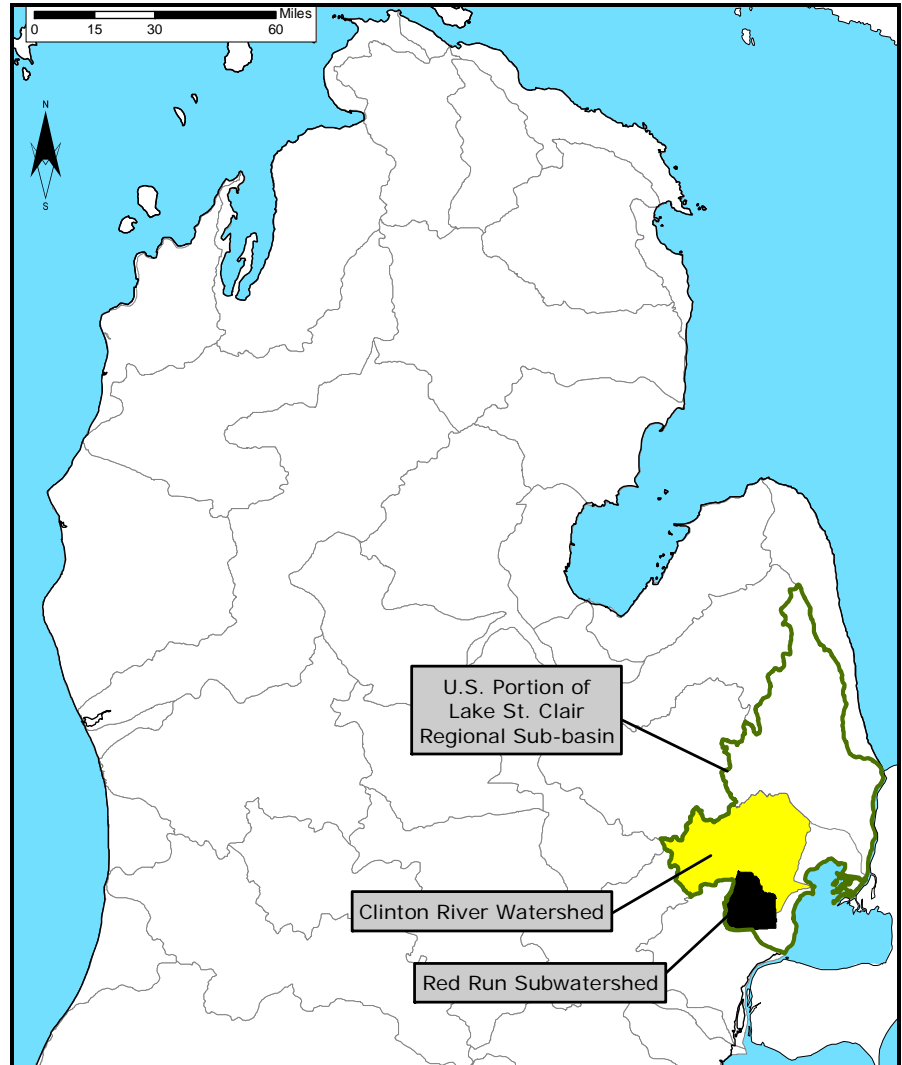
# 1. Introduction



## Geographic Scope

The Red Run Subwatershed (R2W), shown in Figure 1-1 is a hydrologically-based, Michigan Department of Environmental Quality (MDEQ)-approved basin of the Clinton River Watershed located in Southeast Michigan.

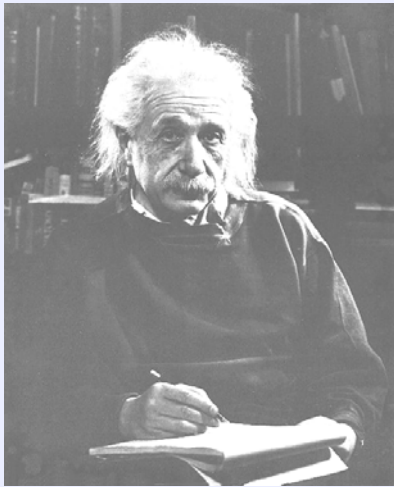
Figure 1-1. Location of Red Run Subwatershed.



## Quotable Quotation

“The significant problems we face cannot be solved at the same level of thinking we were at when they were created.”

- Albert Einstein



## Clinton River Watershed

The Clinton River Watershed includes portions of Macomb, Oakland, St. Clair, and Lapeer Counties. Historic drainage areas in Wayne County no longer drain to the Clinton River.

## Acronyms and Terms

A complete list of acronyms and terms and their respective definitions can be found in Appendix A.

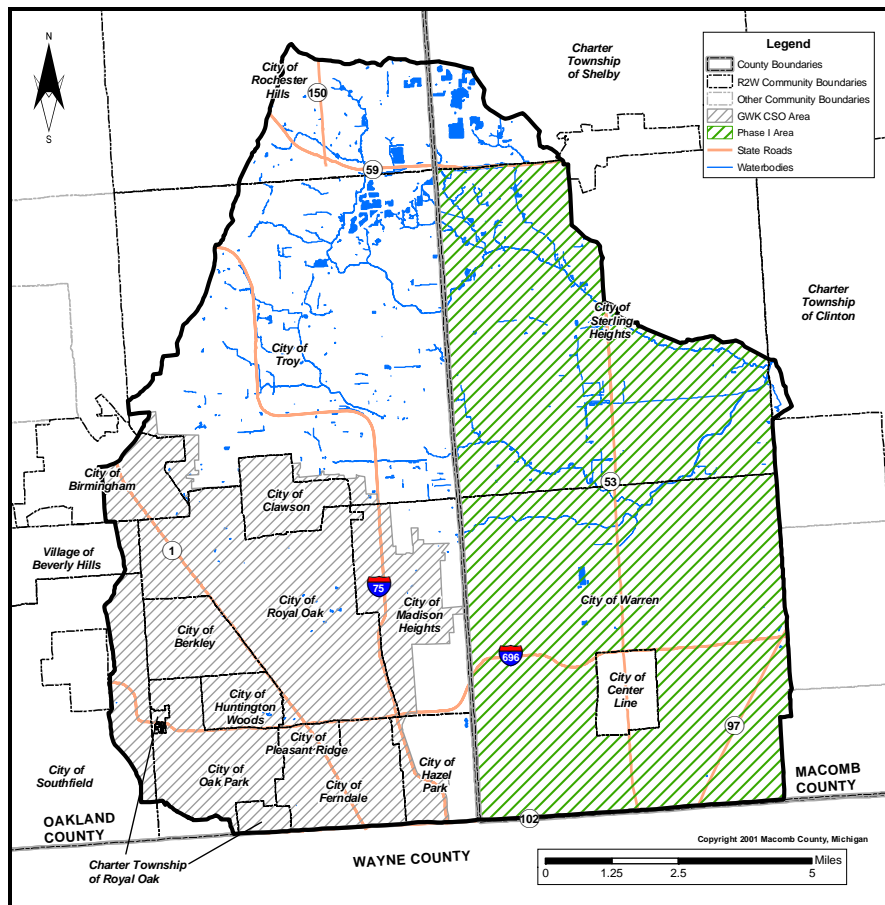
## Communities

The R2W includes all or part of five Macomb County communities and fifteen Oakland County communities as shown in Figure 1-2. See Table 1-1 for characteristics of these communities.

## Drainage Areas

The subwatershed covers approximately 142 square miles and consists of six drainage areas that are based on the topographically-derived United States Geological Survey (USGS) / Natural Resources Conservation Service (NRCS) classification system (see additional discussion later in chapter). A map showing the drainage areas is presented in Figure 1-3.

Figure 1-2. Subwatershed communities.



### Regulated Areas

The NPDES Phase II program, discussed later in this chapter, regulates all urbanized areas (as defined by the U.S. Census) operating a separate storm sewer system. This includes all areas of the subwatershed except for the following:

- Sterling Heights and Warren (covered under NPDES Phase I); and
- The portions of communities in the GWK CSO system.

Table 1-1. Subwatershed communities.

Community	Community Size (sq. miles)	Percent of Community in Subwatershed	Total Area in Subwatershed (sq. miles)	Storm Sewer Area (sq. miles)	GWK CSO Area (sq. miles)
Berkley, City of	2.59	100.0%	2.59	---	2.59
Beverly Hills, Village of	8.03	4.5%	0.36	---	0.36
Birmingham, City of	4.81	42.0%	2.02	---	2.02
Center Line, City of	1.72	100.0%	1.72	1.72	---
Clawson, City of	2.21	100.0%	2.21	---	2.21
Clinton, Charter Township of	28.21	0.9%	0.27	0.27	---
Ferndale, City of	3.86	100.0%	3.86	---	3.86
Hazel Park, City of	2.83	100.0%	2.83	1.88	0.95
Huntington Woods, City of	1.47	100.0%	1.47	---	1.47
Madison Heights, City of	7.12	100.0%	7.12	3.02	4.10
Oak Park, City of	4.99	89.3%	4.45	---	4.45
Pleasant Ridge, City of	0.56	100.0%	0.56	---	0.56
Rochester Hills, City of	33.01	20.7%	6.82	6.82	---
Royal Oak, City of	11.83	100.0%	11.83	---	11.83
Royal Oak, Charter Township of	0.69	100.0%	0.69	---	0.69
Shelby, Charter Township of	35.18	8.3%	2.92	2.92	---
Southfield, City of	26.25	9.9%	2.59	---	2.59
Sterling Heights, City of	36.69	70.7%	25.93	25.93	---
Troy, City of	33.59	82.8%	27.80	26.96	0.83
Warren, City of	34.44	100.0%	34.44	34.44	---
<b>Total</b>	---	---	<b>142.49</b>	<b>103.97</b>	<b>38.51</b>

Source: SEMCOG, 2004.

## Red Run Subwatershed

The R2W encompasses the southeast portion of Oakland County and the southwest portion of Macomb County. Runoff from this area drains to the Red Run Drain which empties into the Clinton River. The runoff from the George W. Kuhn (GWK) Combined Sewer Overflow (CSO) area (see Figure 1-2) actually drains to the Detroit Water and Sewer District Waste Water Treatment Plant unless excessive flow rates cause an overflow to the Red Run Drain.

## Municipality Names

The municipality names used in this chapter reflect actual legal names. In following chapters of the plan, the names have been truncated to more common variations. For example, the 'Charter Township of Clinton' is referred to as 'Clinton Township'.

Figure 1-3. Subwatershed drainage areas.

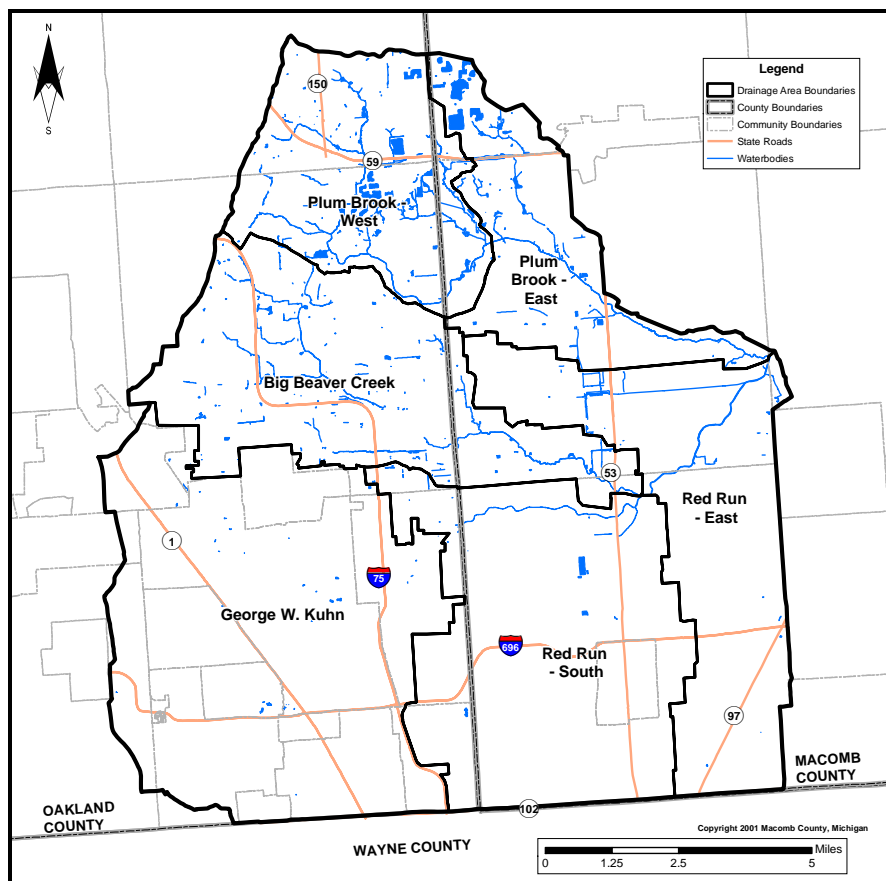


Table 1-2 presents a breakdown of the drainage areas with respect to the subwatershed and the communities.

Table 1-2. Subwatershed drainage areas.

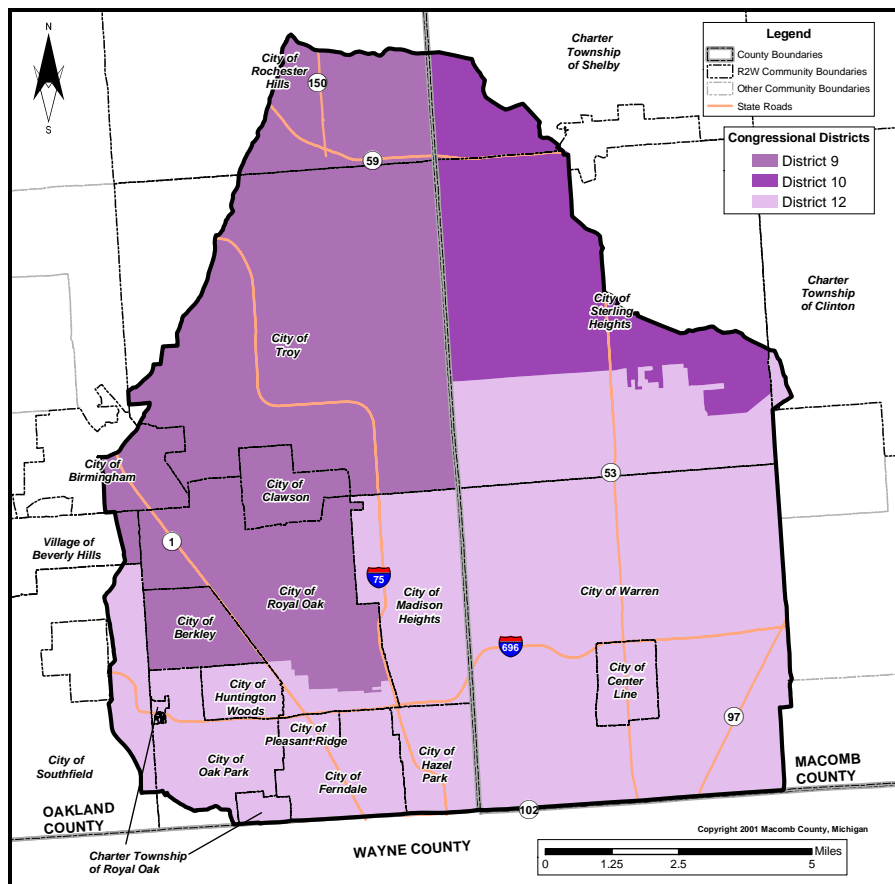
Community	Big Beaver Creek	George W. Kuhn	Plum Brook - East	Plum Brook - West	Red Run - East	Red Run - South	Total Area (sq mi)	Percent of Sub-watershed
Berkley, City of	---	2.59	---	---	---	---	2.59	1.8%
Beverly Hills, Village of	---	0.36	---	---	---	---	0.36	0.3%
Birmingham, City of	---	2.02	---	---	---	---	2.02	1.4%
Center Line, City of	---	---	---	---	---	1.72	1.72	1.2%
Clawson, City of	---	2.21	---	---	---	---	2.21	1.6%
Clinton, Charter Township of	---	---	0.01	---	0.26	---	0.27	0.2%
Ferndale, City of	---	3.86	---	---	---	---	3.86	2.7%
Hazel Park, City of	---	0.95	---	---	---	1.87	2.83	2.0%
Huntington Woods, City of	---	1.47	---	---	---	---	1.47	1.0%
Madison Heights, City of	---	4.10	---	---	---	3.02	7.12	5.0%
Oak Park, City of	---	4.45	---	---	---	---	4.45	3.1%
Pleasant Ridge, City of	---	0.56	---	---	---	---	0.56	0.4%
Rochester Hills, City of	---	---	---	6.82	---	---	6.82	4.8%
Royal Oak, City of	---	11.83	---	---	---	---	11.83	8.3%
Royal Oak, Charter Township of	---	0.69	---	---	---	---	0.69	0.5%
Shelby, Charter Township of	---	---	2.50	0.42	---	---	2.92	2.1%
Southfield, City of	---	2.59	---	---	---	---	2.59	1.8%
Sterling Heights, City of	4.18	---	10.35	2.09	9.31	---	25.93	18.2%
Troy, City of	19.02	0.83	---	7.36	---	0.59	27.80	19.5%
Warren, City of	0.56	---	---	---	12.54	21.34	34.44	24.2%
<b>Total</b>	<b>23.76</b>	<b>38.51</b>	<b>12.86</b>	<b>16.69</b>	<b>22.11</b>	<b>28.55</b>	<b>142.49</b>	<b>100.0%</b>

## Congressional Districts

The people of the subwatershed are represented in the United States House of Representatives through Michigan’s 9<sup>th</sup>, 10<sup>th</sup> and 12<sup>th</sup> Congressional Districts. A map showing the districts is presented as Figure 1-4.

Table 1-3 presents the district information on a community basis and includes state-level information (not pictured).

Figure 1-4. Congressional districts.



### U.S. Capitol Building – Washington D.C.



### Michigan Capitol Building – Lansing, Michigan



### Federal and State-Level Representatives (as of 10/06)

#### U.S. Senate

Carl Levin  
Debbie Stabenow

#### U.S. House of Representatives

9<sup>th</sup> District – Joe Knollenberg  
10<sup>th</sup> District – Candice Miller  
12<sup>th</sup> District – Sander Levin

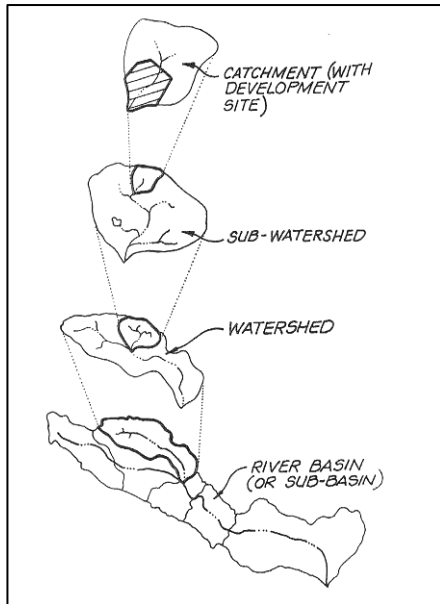
#### Michigan Senate

9<sup>th</sup> District – Dennis Olshove  
10<sup>th</sup> District – Michael Switalski  
11<sup>th</sup> District – Alan Sanborn  
12<sup>th</sup> District – Michael Bishop  
13<sup>th</sup> District – Shirley Johnson  
14<sup>th</sup> District – Gilda Z. Jacobs  
Mich. House of Representatives  
25<sup>th</sup> District – Steve Bieda  
26<sup>th</sup> District – Marie Donigan  
27<sup>th</sup> District – Andy Meisner  
28<sup>th</sup> District – Lisa Wojno  
30<sup>th</sup> District – Tory Rocca  
31<sup>st</sup> District – Fred Miller  
35<sup>th</sup> District – Paul Condino  
36<sup>th</sup> District – Brian Palmer  
40<sup>th</sup> District – Shelley Taub  
41<sup>st</sup> District – Robert Gosselin  
45<sup>th</sup> District – John Garfield

Table 1-3. Congressional districts by community.

Community	Congressional District	State House District	State Senate District
Berkley, City of	9	27	13
Beverly Hills, Village of	9	40	14
Birmingham, City of	9	40	13
Center Line, City of	12	28	9
Clawson, City of	9	41	13
Clinton, Charter Township of	12	31	10
Ferndale, City of	12	27	14
Hazel Park, City of	12	27	14
Huntington Woods, City of	12	27	14
Madison Heights, City of	12	26	13
Oak Park, City of	12	27 / 35	14
Pleasant Ridge, City of	12	27	14
Rochester Hills, City of	9	45	12
Royal Oak, City of	9 / 12	26	13
Royal Oak Charter Twp.	12	35	14
Shelby, Charter Township of	10	36	11
Southfield, City of	12	35	14
Sterling Heights, City of	10 / 12	25 / 30	10
Troy, City of	9	41	13
Warren, City of	12	25 / 28	9

## Drainage Areas



Source: CWP, 1998.

## Watershed Science

A drainage area, commonly referred to as a watershed, is any area of land that drains to a common point. That common point may be a lake, the outlet of a river, or any point within a river system. Throughout this document, a number of terms are used to describe the various classifications of drainage areas. The most commonly encountered system is the USGS / NRCS system. This system classifies drainage areas as follows (using the Hydrologic Unit Code [HUC] system):

<u>USGS/NRCS Hydrologic Units</u>	<u>Local Example</u>	<u>Local HUC</u>
Regional (2-digit code)	Great Lakes	(04)
Subregional (4-digit code)	St. Clair System	(0409)
Accounting (6-digit code)	- same area as above -	(040900)
Cataloging (8-digit code)	Clinton River	(04090003)
Watershed (10-digit code)	R2W	(0409000312)
Subwatershed (12-digit code)	Red Run - East*	(040900031220)

\* Note: The areas delineated for this plan do not perfectly coincide with the boundaries defined by the USGS/NRCS HUC system. The 12-digit areas utilized in this plan have been modified to account for man-made changes to drainage patterns (e.g., storm sewer systems).

An example of how drainage systems nest within each other is shown in the 'Drainage Areas' figure on the left-hand side of the page.

The area commonly referred to as the 'Clinton River Watershed' is actually a 'Cataloging Unit'. However, for the purposes of this plan, the naming conventions have been modified to adhere to local customs and traditions. The adopted naming conventions to be used throughout this plan are:

## The Great Lakes Basin



<u>USGS/NRCS</u>	<u>Local Naming Convention</u>	<u>Local Example</u>
(2-digit code)	<b>Regional Basin</b>	Great Lakes Basin
(4-digit code)	<b>Regional Sub-basin</b>	Lake St. Clair Sub-basin
(6-digit code)	-- not used as it covers the same area as above --	
(8-digit code)	<b>Watershed</b>	Clinton River Watershed
(10-digit code)	<b>Subwatershed</b>	R2W
(12-digit code)	<b>Catchment</b>	Red Run - East
-- none*	<b>Sub-catchment</b>	Subdivision

\* Note: 14-digit codes exist and are in the process of being refined but have not been utilized during the development of this plan.

**Regional Basins** are the largest drainage areas typically utilized for management type activities (examples include the Great Lakes and Mississippi River; larger areas such as ocean basins are not practical management areas). The **Regional Sub-basins** comprising these drain to major receiving waters such as a large river, estuary or lake (such as Lake Michigan or the Missouri River). Within each **Regional Sub-basin** are a group of **Watersheds**, that are a mosaic of many diverse land uses, including forest, agriculture, range and urban areas. **Watersheds** are composed of a group of **Subwatersheds**, which, in turn, are composed of a group of **Catchments**. Within **Catchments** are **Sub-catchments**, which are the smallest units in a watershed, defined as the area that drains an individual or group of parcels to the first intersection with a waterbody or storm sewer catch basin.

## Current Approach to Control Water Pollution

### National Pollutant Discharge Elimination System

The National Pollutant Discharge Elimination System (NPDES) is a cornerstone of environmental protection at the federal level. When the NPDES was established in 1972 (under the Clean Water Act), only one third of our rivers, lakes, and coastal waters were considered fishable and swimmable. Today, approximately two thirds of our waters are healthy. This is due in no small part to the regulation of more than 50 categories of industry (including several hundred thousand businesses) and the nation's network of more than 16,000 municipal sewage treatment systems. The NPDES permits that regulate discharges from these facilities have resulted in the prevention of billions of pounds of conventional pollutants (e.g. suspended solids) and millions of pounds of toxic pollutants (e.g. dissolved heavy metals) from being discharged into 'waters of the United States' (EPA, 2001).

In 1990, the Environmental Protection Agency (EPA) promulgated Phase I of the NPDES stormwater rules. This required municipal separate storm sewer systems (MS4s) in areas with 100,000 or more people to regulate the quality of stormwater discharges to waters of the United States. As previously noted, the Cities of Sterling Heights and Warren are regulated under Phase I.

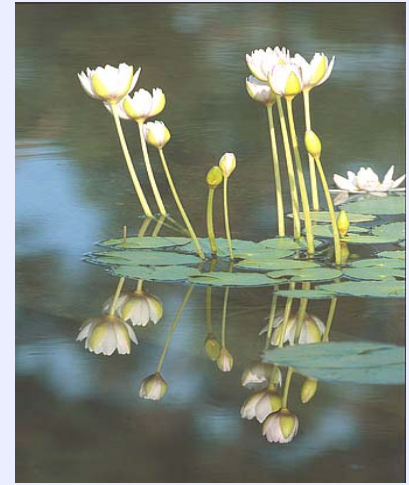
In 1999, the EPA promulgated Phase II of the NPDES stormwater rules. The Phase II requirements expand the coverage of MS4s to include those in urbanized areas (as defined by the U.S. Census) not previously covered under Phase I. The entirety of the R2W is considered urbanized area.

Michigan is one of forty-five states and territories authorized to implement the NPDES program. In implementing the Phase II requirements, the MDEQ has developed the NPDES General Permit No. MIG619000 for Coverage of Storm Water Discharges for Municipal Separate Storm Sewer Systems Subject to Watershed Plan Requirements (Appendix B). To date, this is the only instance of a watershed-based permitting approach under the NPDES program. The MDEQ has also developed a jurisdictional-based approach: NPDES General Permit No. MIS040000 for Coverage of Storm Water Discharges from Municipal Separate Storm Sewer Systems with Controls Based on Six Minimum Measures. This approach involves communities working independently to address stormwater discharges through: 1) Public Education and Outreach, 2) Public Participation / Involvement, 3) Illicit Discharge Detection and Elimination, 4) Construction Site Runoff Control, 5) Post- Construction Runoff Control, and 6) Pollution Prevention / Good Housekeeping.

### Development of the Watershed Management Plan

By March 10, 2003 municipalities within the R2W were required to submit an application to seek permit coverage. Acting as the R2W Subwatershed Advisory Group (SWAG), the communities filed to obtain coverage under General Permit No. MIG619000 requiring them to develop a watershed management plan (WMP). As such, the communities have all received Certificates of Coverage with stipulations for implementing various activities. The submittal due date for this WMP is November 1, 2006.

### State of Michigan Symbol of Water Quality



Effective April 21, 2004, the State of Michigan, by Public Act 78 of 2004, officially designated the American lotus blossom (*Nelumbo lutea*) as the state symbol for clean water. The American lotus is a showy plant that proliferates in shallow wetland areas during the summer months. Micro and macro invertebrates inhabit submerged portions of the plant, which in turn are used as food for fish and other wildlife. The adoption of this symbol demonstrates Michigan's commitment to wetland protection and clean water.

## One Vision

Incorporating the numerous and diverse requirements of the various programs and permits, the resultant plan has this one main purpose:

**“To improve and protect the ecological, hydrological, and cultural resources of the Red Run Subwatershed.”**

## Additional WMP Elements

In attempting to make the WMP as robust as possible, this plan has been developed to meet the elements of a number of additional programs, including:

- the Clean Michigan Initiative (CMI) bond grant program;
- the EPA Section 319 National Nonpoint Source Monitoring Program grant requirements;
- the EPA Great Lakes National Program Office grant requirements; and
- other Federal and State requirements for implementing the Clinton River Remedial Action Plan.

## Waters of the U.S.

The EPA defines these as:

- Navigable waters;
- Tributaries of navigable waters;
- Interstate waters; and
- Intrastate lakes, rivers, and streams which are:
  - Sources of fish or shellfish sold in interstate commerce;
  - Used by interstate travelers for recreation and other purposes; or
  - Utilized for industrial purposes by industries engaged in interstate commerce.

Source: EPA, no date.

## Benefits of the Watershed Management Plan Approach

Some benefits of the watershed approach include: access to grant funding; sharing of resources, expenses, products, information, and techniques; expanded schedules for watershed management planning, and choices on how and when implementation will occur. A watershed approach involves coordinated efforts with both public and private sectors focusing efforts to address the highest priority problems.

## Requirements of the Watershed Management Plan

As described in NPDES General Permit No. MIG619000, the WMP shall, at a minimum, contain the following:

- an assessment of the nature and status of the watershed ecosystem to the extent necessary to achieve the purpose of the WMP;
- short-term measurable objectives for the watershed;
- long-term goals for the watershed (which shall include both the protection of designated uses of the receiving waters as defined in Michigan's Water Quality Standards, and attaining compliance with any Total Maximum Daily Load (TMDL) established for a parameter within the watershed);
- determination of the actions needed to achieve the short-term measurable objectives for the watershed;
- determination of the actions needed to achieve the long-term goals for the watershed;
- assessment of both the benefits and costs of the actions identified above (a "cost/benefit analysis" is not required);
- commitments, identified by specific permittee or others as appropriate, to implement actions by specified dates necessary to achieve the short-term measurable objectives;
- commitments, identified by specific permittee or others as appropriate, to implement actions by specified dates necessary to initiate achievement of the long-term goals; and
- methods for evaluation of progress, which may include chemical or biological indicators, flow measurements, erosion indices, and public surveys.

## Water Pollution Control in Michigan and the U.S.

The first formal water pollution control efforts came at the state level with the passage of Public Act 98 of 1913 which established the Health Department and required large communities to: 1) control and treat sewage, and 2) treat and distribute drinking water. The Conservation Department (today's Department of Natural Resources) was created by Public Act 17 of 1921 to help deal with flagrant and gross pollution of water as well as to protect other natural resources (Sweet, 2006).

The state established the Stream Control Commission in 1929 (Public Act 245) as the official pollution control agency of the state. However, the agency had little influence and any progress made during the 1930s was generally in response to outcries from urban populations that had to deal with the conditions caused by rampant pollution and raw sewage discharge into nearby waterbodies. The Commission wasn't recognized as a strong force until it won two court orders for enforcement in 1939 and 1940. The Commission was renamed the 'Water Resources Commission'

in 1949 by Public Act 245 which also expanded the definition of pollution and required approval for all new uses of state waters (Sweet, 2006).

At the federal level, water pollution control programs were initiated by the **1948 Water Pollution Control Act**, which focused on protection of human health, not the environment. The Act allotted funds to state and local governments for water pollution control, placing emphasis on the States' role in controlling and protecting water resources, with few, if any, federal goals, objectives, limits, or guidelines.

Congress became increasingly interested in water quality degradation from 1956 through 1966, and passed four laws to strengthen the federal role in water pollution control, including the **Water Pollution Control Act Amendments of 1956** and the **Federal Water Pollution Control Act Amendments of 1961**. These initiatives focused on giving additional funding to municipalities for constructing wastewater treatment works.

During this time, the State's Water Resources Commission instituted the first periodic water quality monitoring program. In addition, the Water Resources Commission was incorporated into the newly renamed Department of Natural Resources in 1965 and the legislature amended Act 245 to further regulate pollution and raw sewage discharge (Sweet, 2006).

The federal **Water Quality Act of 1965** represented a major regulatory advancement in water pollution control by requiring States to develop water quality standards for interstate waters by 1967. Michigan established minimum water quality standards for other state waters in 1968. The Water Quality Act also called for States to develop waste load allocations to quantify pollutant loadings that could be discharged without exceeding the water quality standards. Despite increasing public concern and increased public spending, only about half of the States developed water quality standards by 1971. Furthermore, enforcement of the federal legislation was minimal and there were no criminal or civil penalties to enforce the regulation.

The lack of success in developing adequate water quality standards programs, along with growing concern about the environment, prompted President Nixon to form the United States Environmental Protection Agency (EPA) in 1970 to enforce environmental compliance and consolidate federal pollution control activities. In 1972 (and again in 1978), the United States and Canada signed the Great Lakes Water Quality Agreement establishing the Great Lakes Water Quality Board and committing to 'restore and maintain the chemical, physical, and biological integrity of the waters of the Great Lakes Basin Ecosystem'. In November of 1972, Congress passed a comprehensive recodification and revision of federal water pollution control law, known as the **Federal Water Pollution Control Act Amendments of 1972** (more commonly known as the 'Clean Water Act' or CWA), marking a distinct change in the philosophy of water pollution control in the United States. The Amendments contained requirements for water quality-based controls, with an emphasis on technology-based, or end-of-pipe, control strategies (EPA, no date). Michigan updated its water quality standards in 1973 to fully reflect the requirements of the CWA (Sweet, 2006).

Subsequent enactments modified some of the earlier CWA provisions. Revisions in 1981 streamlined the municipal construction grants process, improving the capabilities of treatment plants built under the program.

## Goals and Principles of the Clean Water Act

The ambitious goals of the Clean Water Act include:

- "it is the national goal that the discharge of pollutants into navigable waters be eliminated by 1985";
- "it is the national goal that wherever attainable an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983"; and
- "it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited".

Other important principles include:

- The discharge of pollutants to navigable waters is not a right.
- A discharge permit is required to use public resources for waste disposal and limits the amount of pollutants that may be discharged;
- Wastewater must be treated with the best treatment technology economically achievable, regardless of the condition of the receiving water; and
- Effluent limits must be based on treatment technology performance, but more stringent limits may be imposed if the technology-based limits do not prevent violations of water quality standards in the receiving water.

Source: EPA, no date.

## Special Laws / Programs

Specific situations may invoke numerous other federal, state, and local programs that directly or indirectly relate to stormwater issues, including:

- The National Environmental Policy Act sets national policy for the environment and requires impact statements;
- The federal Safe Drinking Water Act establishes wellhead protection provisions that are implemented at the state or local level (MDEQ Water Wellhead Protection program);
- Coastal / shoreline areas have numerous federal laws such as the Coastal Zone Act and the Shoreline Erosion Protection Act, and state laws / programs such as Coastal Management, Sand Dune Protection, and Shoreland Management;
- Commercial/industrial sites have numerous laws and regulations to minimize environmental impacts. Laws include: the Surface Mining Control & Reclamation Act, the Resource Conservation and Recovery Act, the Federal Insecticide, Fungicide, and Rodenticide Act, and the Toxic Substances Control Act;
- The control of excessive aquatic plants and algae is regulated the Michigan Public Health Code;
- The River and Harbor Act of 1899 sets protocols for structural modifications to navigable waters;
- The federal Clean Air Act establishes state-enforceable emission standards of pollutants (some of which can degrade water quality);
- The federal 'Superfund' deals with the cleanup of abandoned hazardous waste sites;

Changes in 1987 replaced the construction grants program with the State Water Pollution Control Revolving Fund, more commonly known as the SRF. This new funding strategy addressed water quality needs by building on EPA-State partnerships.

Since passage of the CWA, numerous International, Federal, State (e.g. water quality standard updates), Regional, and Local actions have enhanced the control of water pollution in the R2W. These specific actions are discussed more thoroughly in Chapter 4 (along with a discussion of water quality trends), but some important programs are discussed briefly in the following sections.

## Relevant State Laws

### Natural Resources and Environmental Protection Act

Act 451 of 1994, the Natural Resources and Environmental Protection Act (NREPA), is designed to protect the environment and natural resources of the state by: regulating pollutant discharges; regulating land, water, and resource use; and prescribing penalties and remedies for violations.

Notable parts of the act relating to stormwater include: Part 17 – Environmental Protection; Part 31 – Water Resources Protection; Part 41 – Sewerage Systems; Part 87 – Groundwater and Freshwater Protection; Part 91 – Soil Erosion & Sedimentation Control; Part 301 – Inland Lakes and Streams; Part 303 – Wetland Protection; Part 305 – Natural Rivers Act; Part 307 – Inland Lake Levels; Part 309 – Inland Lake Improvement; Part 315 – Dam Safety; and Part 323 – Shorelands Protection and Management..

### Public Act 40 of 1956 – The Drain Code

The Drain Code sets forth procedures for the creation, maintenance and financing of county and inter-county drains in Michigan. It establishes the office and prescribes the duties and powers of the county drain commissioner. County drains are important to Phase II efforts because many of them are waters of the state, and most of them discharge directly or indirectly to waters of the state (Pratt, 2005). It should be noted that the Macomb County Public Works Office (MCPWO) contends county drains established before 1973 are exempt from certain state permits even though they are waters of the state.

## Relevant State Programs and Regulations

### Water Quality Standards

Under the auspices of the CWA and NREPA, the MDEQ defines water quality standards “to protect the Great Lakes, the connecting waters, and all other surface waters of the state” (MDEQ, 2006). Water quality standards are discussed in greater detail in Chapter 4.

### The Total Maximum Daily Load Program

MDEQ regulations (as authorized by the EPA under the CWA) require that “when a lake or stream does not meet water quality standards, a study must be completed to determine the amount of a pollutant that can be put in a waterbody from point sources and nonpoint sources and still meet water quality standards, including a margin of safety” (MDEQ, 2006). Any Total Maximum Daily Loads (TMDLs) relevant to this subwatershed are addressed in Chapter 8 (see Action 1-8).

## Permits

Despite the NPDES permitting process that covers stormwater-specific issues, other permits may be required for a specific cases. Many state and federal permits are covered under the MDEQ/USACE Joint Permit Application package. The application covers activities relating to: wetlands, floodplains, marinas, dams, inland lakes and streams, great lakes bottomlands, critical dunes, and high-risk erosion areas. Other permits not included in the application include: the Sewerage System Construction Permit and the Groundwater Discharge Permit.

## Other Programs

State programs that directly enforce and assist in compliance with federal and state stormwater regulations include the following MDEQ Water Division groups: Storm Water, Soil Erosion and Sedimentation Control, NPDES Permits, and Nonpoint Source Pollution. State-level funding programs that support stormwater related projects include: the SRF, the Strategic Water Quality Initiative Fund, and the CMI.

## Supported Plans and Programs

It is imperative to support the goals and objectives of other plans and programs affecting the R2W to ensure a cohesive management strategy and eventual progress in plan implementation.

### St. Clair River and Lake St. Clair Comprehensive Management Plan

The comprehensive management plan was issued in 2004 by the USACE with assistance from the Great Lakes Commission. This joint effort between U.S. federal, state, and local, and Canadian federal and provincial authorities does four things with respect to the Lake St. Clair Regional Sub-basin:

- identifies the causes and sources of environmental degradation;
- addresses the continuous monitoring of contamination levels;
- provides for timely dissemination of information; and
- includes recommendations for potential restoration measures.

In providing cohesion between the two efforts, various elements of the plan influenced the content and structure of this document.

### Clinton River Watershed Remedial & Preventative Action Plan

The Remedial Action Plan (RAP) for the Clinton River Watershed was first developed by the Michigan Department of Natural Resources (MDNR) in 1988 in response to the Clinton River being listed as an Area of Concern (AOC) by the Great Lakes Water Quality Board of the International Joint Commission in 1985.

In 1995, the RAP (now a Remedial and Preventative Action Plan) was updated (by the Clinton River Public Advisory Council) to include the entire Clinton River Watershed and the nearshore area of Lake St. Clair impacted by the Clinton River and the Clinton River Spillway. A plan (consisting of 84 actions) was also prepared to address impairments as identified in Annex 2 of the Great Lakes Water Quality Agreement.

The current version of the RAP, issued in 1998, documents changes in the watershed, an updated list of actions (100), progress towards implementing the actions, and a new set of education related goals and recommendations.

## Special Laws / Programs (continued)

- The Oil Pollution Act authorizes federal response mechanisms designed to prevent catastrophic oil spills and requires submittal of plans to the Coast Guard and EPA; and
- The Water Resources Development Act provides for the conservation and development of water and related resources and authorizes studies and construction of improvement projects for navigation, flood damage reduction, dredging, ecosystem restoration, and water supply.

### Clinton River Area of Concern Information

For more information about the Clinton River Area of Concern, refer to the following Web site: <http://www.epa.gov/grtlakes/aoc/clintriv.html>.



### International Joint Commission

Established by the Boundary Waters Treaty of 1909, the commission investigates and monitors transboundary issues when requested to do so by the governments.

## What is a 'Run'?

Although the Red Run is commonly referred to as the Red Run Drain, this is not grammatically correct:

"Run" is a word commonly used in the Mid-Atlantic States to describe small rivers. Here in the Midwest, this definition seems to be rarely used and the population no longer understands its meaning. Red Run is a complete name and does not need the word creek added.

It is likely that settlers from the Mid-Atlantic states are responsible for this naming convention.

Source: Muller, 2006.

## The Clinton River

The Clinton River was originally called Nottawasippee by French settlers and Native Americans or the Huron River of St. Clair by the English. It was renamed for New York Governor DeWitt Clinton (1817-1823; 1825-1828) who is often referred to as the 'Father of the Erie Canal'.



Source: Wikipedia, 2006.

In 2005, Restoration Criteria for the Clinton River AOC were developed. These criteria describe a pathway that, when completed, will result in the delisting of the area as an AOC.

In developing this document, numerous elements of the various RAPs and associated restoration criteria were considered.

## Water Quality Management Plan for Southeast Michigan

The Water Quality Management Plan (WQMP) for Southeast Michigan was first prepared by the Southeast Michigan Council of Governments (SEMCOG) in 1978 and subsequently amended in 1979, 1981, and 1999. SEMCOG is the designated Areawide Water Quality Planning Agency for Southeast Michigan under the CWA and prepared the WQMP to assist the agencies and organizations that have a role in the stewardship of the region's water resources. To this end, the plan contains water quality management policies on a broad range of issues, including: infrastructure, monitoring, management, non-point source pollution, stormwater, pollution prevention, and public education.

The plan also contains regional goals and includes a guide to implementation. Additional implementation guidance was provided in the 2000 document *Putting Southeast Michigan's Water Quality Plan into Action: Tools for Local Governments*.

The WQMP and follow-up guidance has been considered in the development of this plan, specifically the elements related to regional goals and implementation.

## Developing the Watershed Management Plan

### Watershed Partners

The R2W SWAG spearheaded the efforts involved in developing this WMP. The SWAG was chaired by representatives from the Macomb County Public Works Office (MCPWO) and included representatives from:

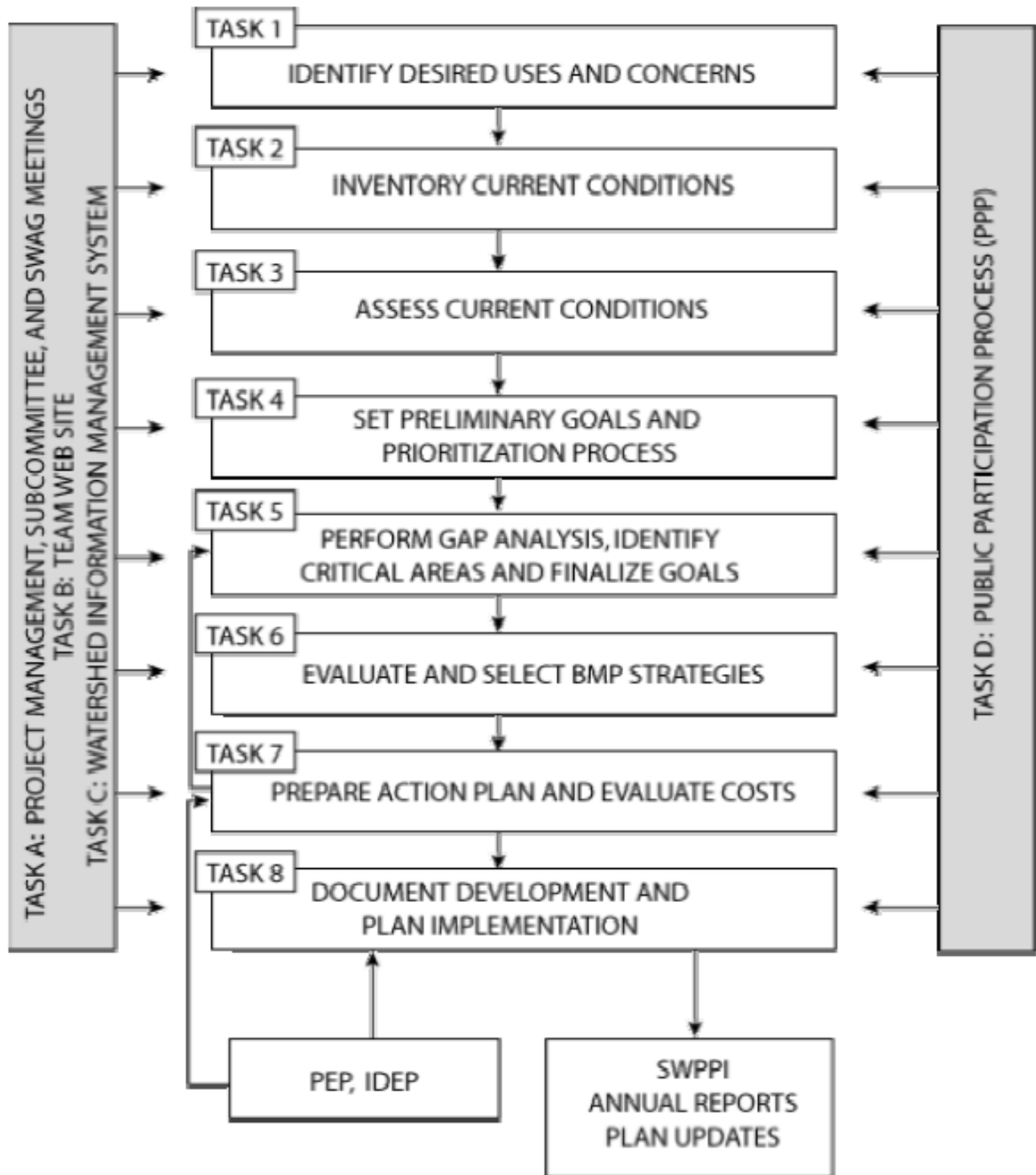
- each community in the subwatershed;
- Lamphere Public Schools and each nested school district in the subwatershed (see the 'Nested Jurisdictions' sub-section);
- the Clinton River Watershed Council (CRWC);
- the General Motors Technical Center;
- the Warren/Center Line/Sterling Heights Chamber of Commerce;
- the Macomb County Health Department (MCHD);
- the Macomb County Department of Planning and Economic Development (MCPED);
- the Macomb County Soil Conservation District (MCSCD);
- the Road Commission of Macomb County (RCMC);
- the Macomb County Prosecuting Attorney's Office (MCPAO);
- Oakland County;
- the Southeast Michigan Council of Governments (SEMCOG);
- the MDEQ;
- the US Army - Detroit Arsenal (a nested jurisdiction); and
- the USACE.

Refer to Appendix C for the contact list of the SWAG members.

## Planning Process

The management plan was developed through an adaptive management process that had twelve distinct tasks (see Figure 1-5). Four of these tasks were continuous and denoted A, B, C, and D. The other eight were sequential and denoted 1, 2, 3, 4, 5, 6, 7, and 8. These tasks are discussed in the following topics.

Figure 1-5. Watershed management plan development.



## **Public Participation Process**

The public participation process was designed to elicit input from the general public and subwatershed stakeholders through a series of meetings and workshops. The general public was invited to two 'Community Forums': one at the beginning of the planning process to help guide plan development and one near the end to gather feedback on the draft version of the plan. Other stakeholders, such as government representatives, were also invited to two 'Stakeholder Workshops': again, one at the beginning and one near the end. A 'Focus Group Meeting' was also held with local developers and builders to get their specific input into the planning process.

More detail on the meetings and workshops and the feedback received at each is documented in Chapter 4.

## **Important Feedback to be Considered: Combined Sewer Overflows**

An important issue that came up at multiple public participation events is the impact of combined sewer overflows (CSOs). It is important to note that the communities with CSO systems are involved in stormwater management which will play a role in controlling overflow events. Additionally, these CSO systems are closely regulated by the MDEQ and the communities are striving to ensure proper operation in accordance with appropriate regulations.

### **Task A: Meetings**

This task consisted of monthly SWAG meetings, SWAG subcommittee meetings as necessary, and monthly project management meetings between representatives from the MCPWO, the consulting firm Tetra Tech, the USACE (until late 2005), and others as appropriate.

### **Task B: Website**

Various websites were used to coordinate the planning process, disseminate information, and receive feedback. The EPA hosted the initial project management website. Tetra Tech hosted the website during the final year of the project. The CRWC website was used throughout the project for posting relevant public information and receiving comments.

### **Task C: Watershed Information Management System**

A system for managing appropriate data for watershed planning was proposed and some work was initiated. However, this system was deemed more appropriate for development at the watershed level and has been incorporated in the Clinton River Watershed Initiative being executed through the Oakland County Drain Commissioner's Office with Tetra Tech as the primary contractor.

### **Task D: Public Participation Process**

The public participation process (PPP) was extensive and essential to the development of the watershed management plan. The 'Public Participation Process' sidebar describes this task. Detailed information on the efforts to implement the PPP and the public comments received and used to craft this plan are detailed in Chapter 4.

### **Task 1: Identify Desired Uses and Concerns**

This task involved evaluating the status of the State of Michigan's designated uses (see Chapters 3 and 5) and consolidating the information gathered during implementation of the PPP to identify desired uses for the subwatershed in addition to any specific concerns.

### **Task 2: Inventory Current Conditions**

This task involved collecting and summarizing existing data about the subwatershed. This generally included information about the history, natural environment and water quality, the people, and the infrastructure. This information is presented in Chapters 1, 2 and 3.

### **Task 3: Assess Current Conditions**

This task involved analyzing and presenting the data that was collected under Task 2 to facilitate planning decisions to be made throughout the project. This data is presented in Chapters 2, 3, and 5.

### **Task 4: Set Preliminary Goals and Prioritization Process**

This task involved developing a list of preliminary goals for the watershed management plan based on the data, analyses, and public input generated through the previous tasks. Certain prioritization and decision-making processes were also developed (implicitly and explicitly) to assist in executing the remaining tasks. These processes are reported in various locations throughout the plan.

### **Task 5: Gap Analysis, Identify Critical Areas, and Finalize Goals**

The gap analysis involved assessing the current level of watershed protection in the subwatershed and identifying the actions required to provide the necessary level of protection. This assessment is presented in Chapter 3. Additionally, current and future pollutant load calculations were performed and the areas of the watershed critical to controlling pollutant loads were identified. This information is presented in Chapter 5. Based on the preliminary goals developed under Task 4, the gap analysis, and critical area identification, the SWAG finalized the goals of the watershed management plan. The final goals of the plan, along with their associated objectives, are found in Chapter 6.

### **Task 6: Evaluate and Select BMP Strategies**

The first step in performing this task was to develop a comprehensive list of the actions that could be implemented to achieve the goals and objectives of the watershed management plan. The contents of Chapter 7 were developed from this list. The next step was to select the appropriate actions presented in the comprehensive list as the ones which would actually be implemented by the entities in the subwatershed. This decision was made considering all of the information compiled and generated under the previous tasks.

### **Task 7: Prepare Action Plan and Evaluate Costs**

Based on the actions that were selected for implementation, an action plan, or 'implementation roadmap', was developed. This roadmap is presented as Chapter 8 and includes such details as whether or not the action is a permit requirement, the schedule, milestones, the benefits of the actions, how the actions relate to the goals and objectives, cost estimates, implementation assistance required and potential sources, commitment levels, and the pollutant load reductions associated with the actions. This task also involved defining the evaluation mechanisms and revision procedures to update the plan in the future. This information is presented in Chapter 9.

### **Task 8: Document Development and Plan Implementation**

This task involved assembling all of the information generated during the planning process into the various chapters previously mentioned, in addition to Chapter 10, which defines institutionalization mechanisms and funding options, and other components of the plan such as the appendices, the cover, and the front end items (e.g. table of contents). This task also included compliance with other permit requirements such as the public education plan and implementation, illicit discharge elimination plan and implementation, and stormwater pollution prevention initiative and annual report submittals. For logistical reasons, the implementation of the plan and future updates to the plan are considered to occur under this task.

### **An Example of a Critical Area for Hydrologic Flow in the Subwatershed – Urban Land Use**

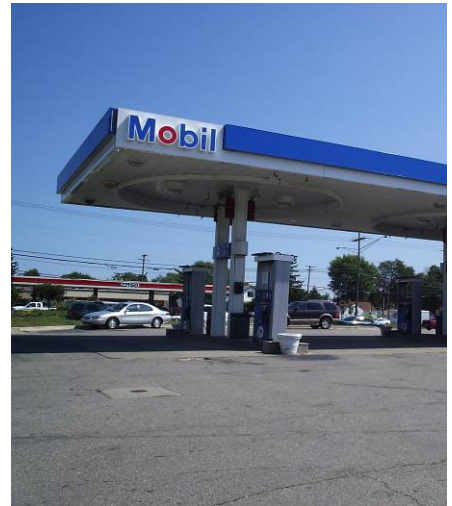


Photo courtesy of MCPWO.

### **The Planning Process in Action – A R2W SWAG Meeting**



Photo courtesy of MCPWO.

## Nested Jurisdictions

Nested jurisdictions in the subwatershed are associated with county-level government (except where indicated in parentheses) and include:

- Center Line Public Schools;
- Fitzgerald Public Schools;
- Troy School District;
- Van Dyke Public Schools;
- Warren Consolidated Schools;
- Warren Woods Public Schools;
- Avondale Schools;
- US Army - Detroit Arsenal (City of Warren); and
- Hazel Park Schools (City of Hazel Park).

Center Line  
Public Schools



Troy School District

Warren Consolidated Schools



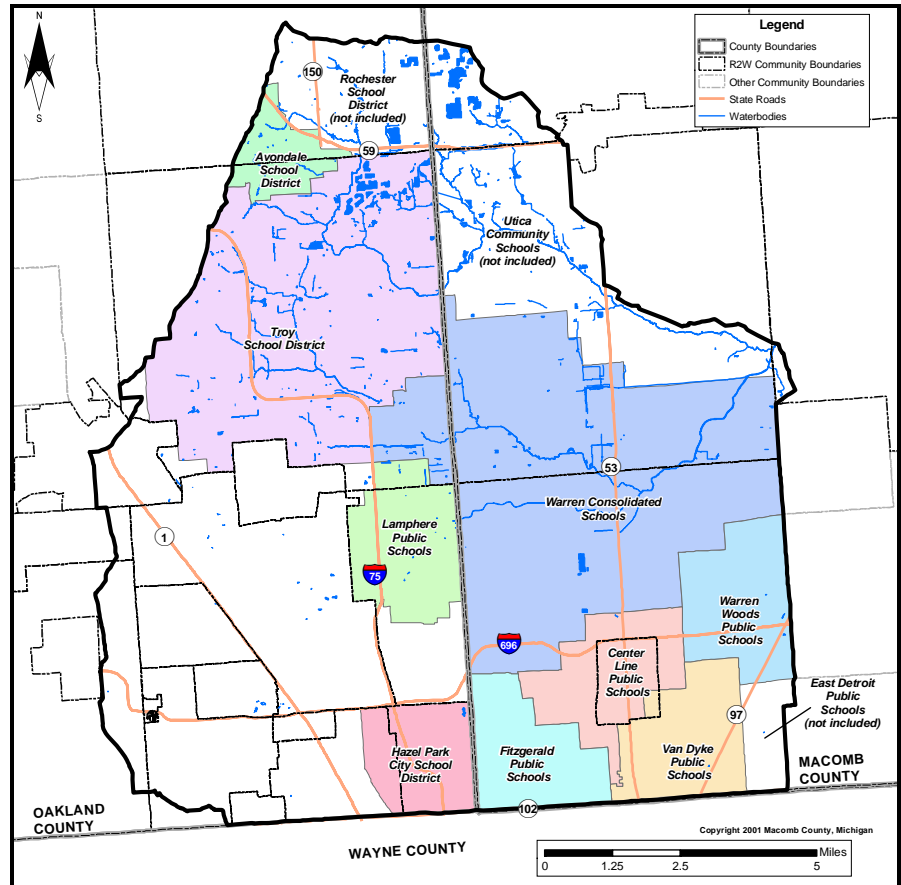
Hazel Park Community Schools  
*Where Excellence is a Given*

**AVONDALE SCHOOLS**

## Nested Jurisdictions

There exist additional facilities in the subwatershed that are covered by this plan (see the 'Nested Jurisdictions' sidebar). These facilities include those associated with the school districts that overlay the subwatershed (see Figure 1-6): The location of the actual schools can be seen in a figure in Chapter 2.

**Figure 1-6. School districts in the subwatershed.**



Utica Community Schools and East Detroit Public Schools each have land in the subwatershed and are nested under Macomb County's coverage but area addressed only in the WMPs for the Clinton River East Subwatershed (CREW) and Lake St. Clair Direct Drainage Subwatershed (LSCW), respectively.

The Rochester Community School District has its own jurisdictional permit and is not covered by this plan. Other districts not covered by this plan are those that are exempt from coverage because their facilities fall completely inside the GWK CSO area, including:

- Birmingham City School District;
- Clawson City School District;
- City of Royal Oak School District;
- Madison Public Schools;
- Ferndale Public Schools;
- Berkley School District;
- Oak Park City School District; and
- Southfield Public School District.

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- Pratt, Paul. "E-mail communication concerning Michigan's Drain Code". January 28, 2005.
- Southeast Michigan Council of Governments [SEMCOG]. "Community Profiles". Via: <http://www.semco.org/cgi-bin/comprof/profiles.cfm>. Last accessed: December 21<sup>st</sup>, 2004.
- Sweet, Bob. Document provided at meeting. Starts with pg. 9 'Chapter Three: Summary of Water Quality Conditions and Pollution Control Efforts in Michigan - Past, Present, and Future'. 2006.

## Subwatershed Photo Tour: The Nelson Drain in Troy

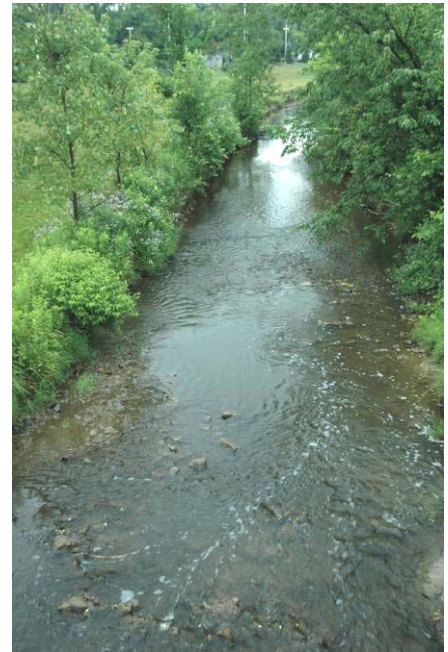


Photo courtesy of Tetra Tech.

## Pictures

### U.S. Capitol Building

[http://www.aoc.gov/cc/capitol/c\\_wf\\_1.cfm](http://www.aoc.gov/cc/capitol/c_wf_1.cfm)

### Michigan Capitol Building

<http://www.civics-online.org/library/formatted/images/micapitol.html>

### The Great Lakes Basin

<http://www.great-lakes.net/lakes/basinMap2.gif>

### DeWitt Clinton

[http://www.alexanderhamiltonexhibition.org/gallery/clinton\\_d.html](http://www.alexanderhamiltonexhibition.org/gallery/clinton_d.html)

## Subwatershed Photo Tour: Columbia Centre Offices in Troy



Photo courtesy of Tetra Tech.