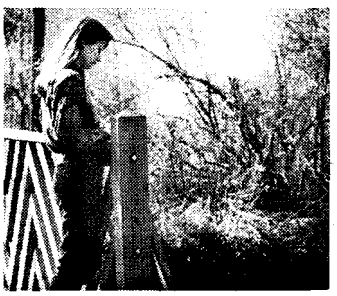
1994 Rouge River Remedial Action Plan Update





ROUGE RIVER RAP
REMEDIAL ACTION PLAN

This report is the result of contributions from many communities, agencies, and individuals.

Primary Michigan Department of Natural Resources staff on the project were Cathy Bean and Roy Schrameck.

Primary SEMCOG staff was Carla Davidson.

1994 Rouge River Remedial Action Plan Update

"Working to improve something about our lives that we can pass on to future generations is probably the second most important thing we can do in our lives. Restoring the Rouge River to a useable condition for present and future generations fits into this category. It is not only something that we should all diligently pursue but is something that we can all be proud of, that we contributed some small part to the overall effort."

Roy Schrameck, District Supervisor
MDNR Surface Water Quality Division

Facts About The Rouge River:

The Rouge River flows through Detroit's northern and western suburbs and empties into the Detroit River at Zug Island in Detroit. The watershed encompasses all land areas that drain to the River.

The Rouge River:

- is 125 miles in length with four main branches: The Main, Upper, Middle and Lower branches
- has more than 50 miles of parks adjacent to the river
- is home to many fish species including a threatened fish known as the redside dace

The Rouge River Watershed:

- covers 438 square miles and is inhabited by more than 1.5 million people in Wayne, Oakland, and Washtenaw Counties
- contains more than 400 lakes and ponds
- is over 66% developed and the land uses include residential, commercial, institutional, industrial and transportation
- is the most urbanized and densely populated watershed in Michigan

Figure 1
Rouge River Watershed Location in Michigan

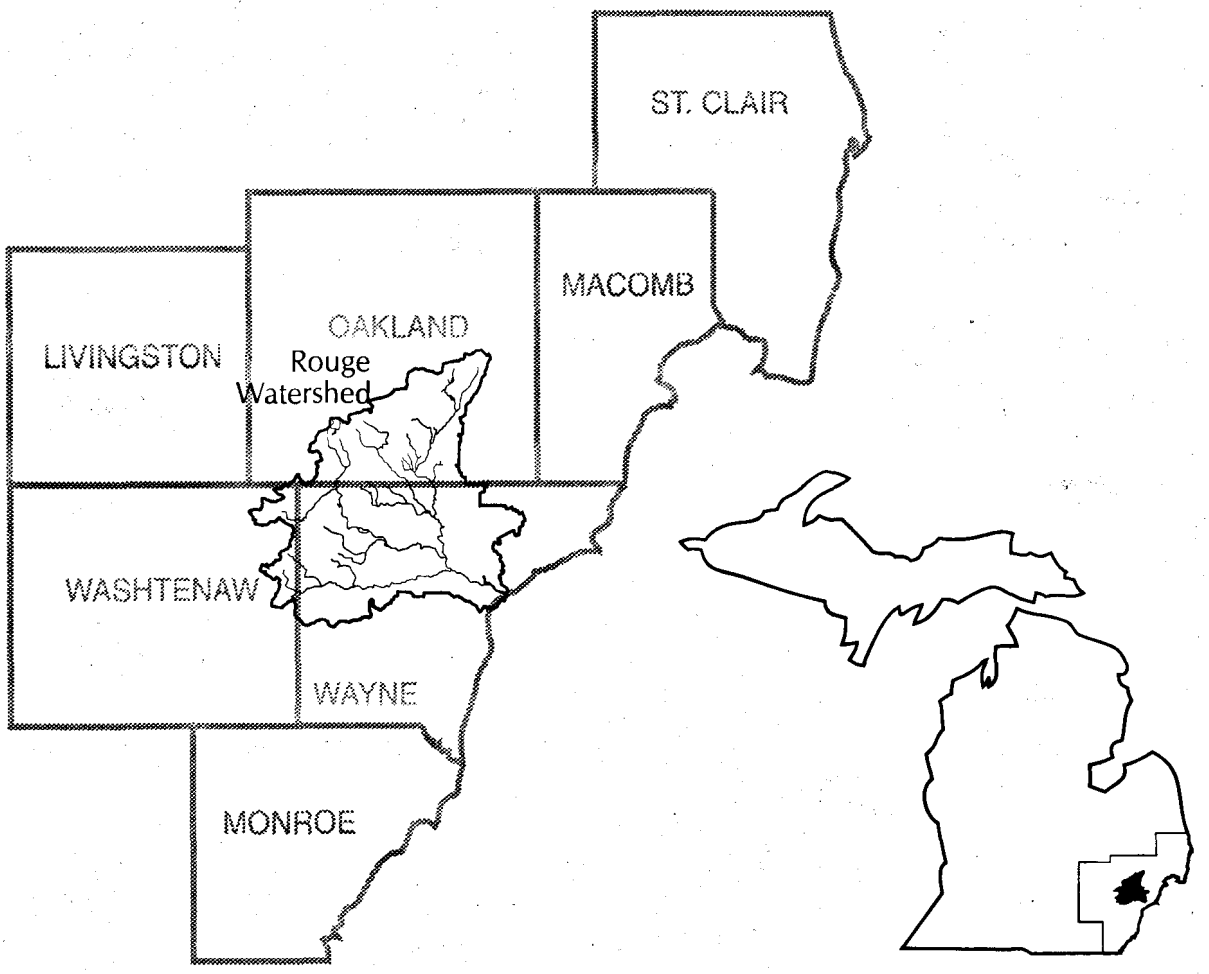


Figure 2
Rouge River Watershed

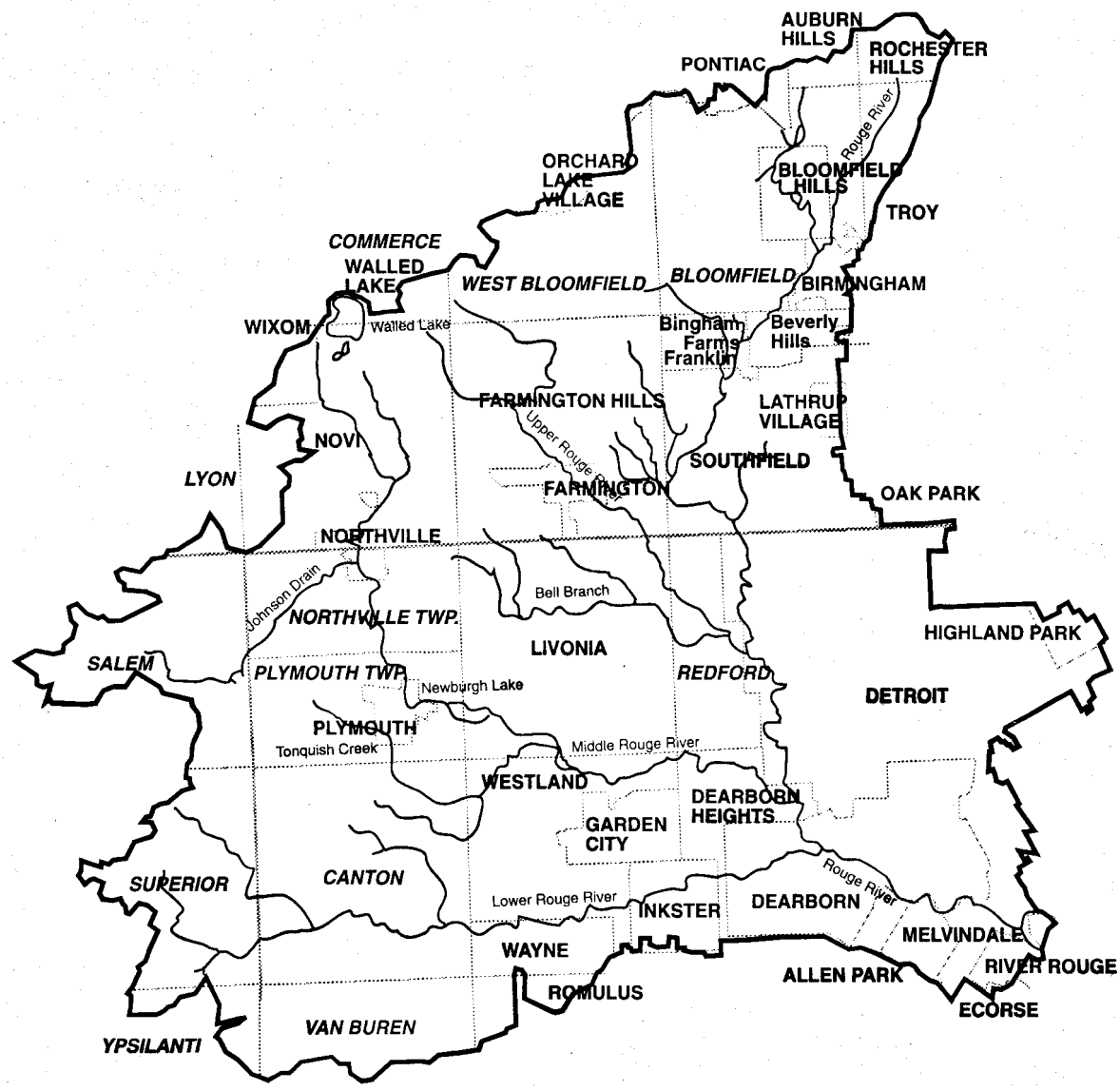
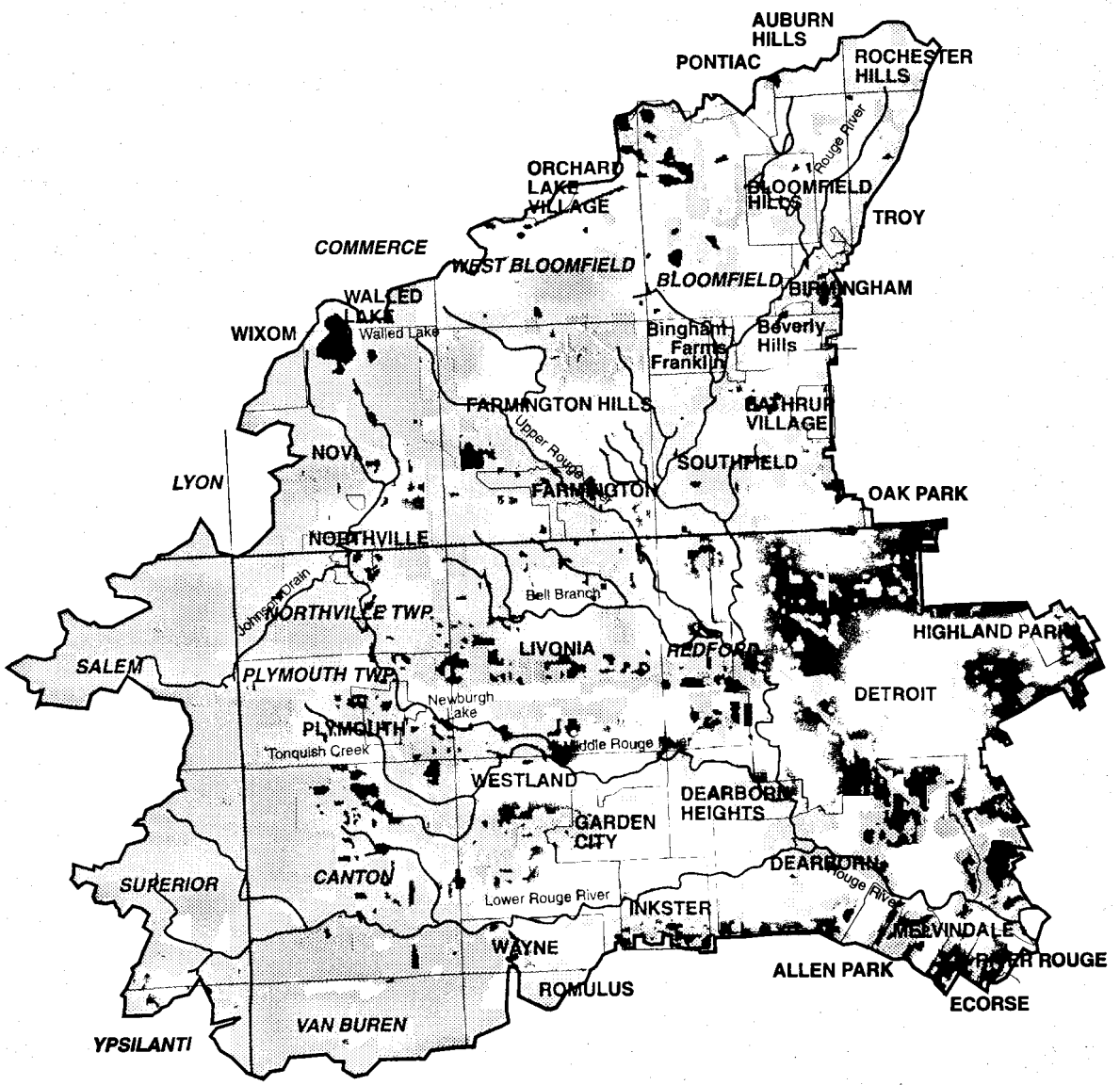


Figure 3
Population Density within the Rouge River Watershed



Population Density per Square Mile

- 0 persons
- 1 to 750 persons
- 751 to 6000 persons
- Greater than 6001 persons
- Water

GLOSSARY

The following is a glossary of acronyms and abbreviations for this report to assist the reader in understanding this document:

AOC	Area of Concern - IJC designated water body that significantly contributes to the pollution of the Great Lakes.
BMPs	Best Management Practices - Practices used to control pollution caused by stormwater runoff.
CSO	Combined Sewer Overflow - Concrete structure used to relieve high wastewater flows in combined sewer systems. CSO also signifies the wastewater discharge from CSOs.
CZMA	Coastal Zone Management Act
DOE	Department of Environment (Wayne County)
DWSD	Detroit Water & Sewerage Department
MDNR	Michigan Department of Natural Resources
	SWQD Surface Water Quality Division
	LWMD Land and Water Management Division
	ERD Environmental Response Division
	WMD Waste Management Division
DPW	Department of Public Works
FOTR	Friends of the Rouge - A nonprofit citizen group formed to help clean up the Rouge River.
GDRS	Greater Detroit Regional System (sewerage)
IJC	International Joint Commission - A United States and Canadian binational organization charged with water quality oversight in the boundary waters.
IPP	Industrial Pretreatment Program - State and Federal program to monitor, permit, and control commercial and industrial discharges to the sanitary sewer system. This program is implemented by the wastewater control authority and monitored by the MDNR.
MDA	Michigan Department of Agriculture
MDPH	Michigan Department of Public Health
MG	Million Gallons - Unit of measurement of liquid flows (wastewater)
MSU	Michigan State University
NPDES	National Pollutant Discharge Elimination System - Name of the permit required for discharges to a surface water.
NPS	Nonpoint Source Pollution - A group of pollutants, such as stormwater, that originate from diverse, and often uncontrolled, sources.
NRCS	Natural Resources Conservation Service (formerly the Soil Conservation Service)
OCDPW	Oakland County Department of Public Works
OCHD	Oakland County Health Division
OMOE	Ontario Ministry of the Environment
PAHs	Polynuclear Aromatic Hydrocarbons - A class of toxic chemicals.
PCBs	Polychlorinated Biphenyls - A class of organic chemicals that was a commonly used additive for various types of oils.
PIPP	Pollution Incident Prevention Plan - A plan to prevent pollution of surface waters from facilities that store petroleum-based materials such as gasoline and other hazardous materials.

PPM	Parts per Million - Unit of measurement for analytical data meaning one part of a contaminant to one million parts of water.
PPB	Parts per Billion - Unit of measurement for analytical data meaning one part contaminant to one billion parts water.
PRP	Potentially Responsible Party - Entity responsible for contamination of land, air, water. This is used in reference to Act 307 sites.
RAP	Remedial Action Plan - Cleanup plan developed for a Great Lakes Areas of Concern.
RISC	Rouge Implementation Steering Committee
RRAC	Rouge Remedial Action Plan Advisory Council - Multistakeholder committee formed to assist with the update and implementation of the Rouge River RAP. Subcommittees include: RRAC - Public Education RRAC - Headwaters RRAC - NPS (Nonpoint Source Pollution) RRAC - Contaminated Sites RRAC - On-Site Sewage Disposal RRAC - Habitat
RRNWWDP	Rouge River National Wet Weather Demonstration Project - Multimillion dollar project to determine the effects of wet weather discharges to the Rouge River and demonstrate various control measures. The project is being conducted by Wayne County Department of the Environment under a grant from the federal government.
RRWC	Rouge River Watershed Council
SEMCOG	Southeast Michigan Council of Governments
SEMHA	Southeast Michigan Health Association
SPAC	Statewide Public Advisory Council - Council made up of one member from each AOC in Michigan formed to share ideas and coordinate activities between various watersheds.
SRF	State Revolving Fund
TSD	Treatment, Storage and Disposal Facilities - Facilities that treat, store or dispose of hazardous wastes
U of M	University of Michigan - Ann Arbor Campus
U of M-D	University of Michigan - Dearborn Campus
USACE	United States Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
WACHD	Washtenaw County Health Department
WCDPW	Wayne County Department of Public Works
WCHD	Wayne County Health Department
WRC	Water Resources Commission (Michigan)
WSU	Wayne State University
WWTP	Waste Water Treatment Plant - Facility that receives and treats wastewater prior to discharge to surface waters.
YCUA	Ypsilanti Community Utilities Authority

Table of Contents

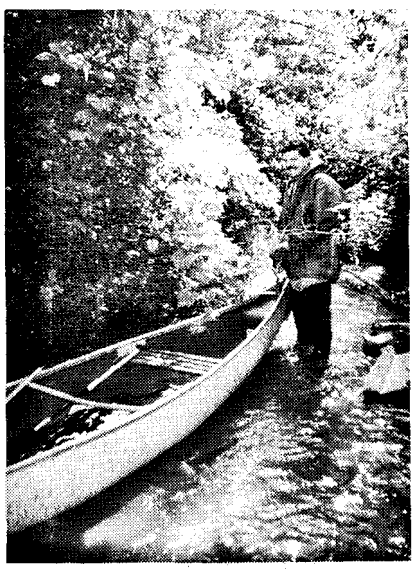
List of Figures

List of Tables

EXECUTIVE SUMMARY

"The Rouge RAP has provided the framework from which the 48 Rouge Watershed communities can collectively address the pollution problems causing the degradation of the river's water quality. Through Wayne County's Rouge River National Wet Weather Demonstration Project, the communities will be able to take a comprehensive watershed approach to achieving the goals of the Remedial Action Plan, effectively and efficiently pursuing the restoration of the Rouge River."

James Murray, Director
Wayne County Department of Environment and Energy



BACKGROUND

The Rouge River was once a vibrant waterway that provided a variety of uses to people, plants, animals, and insects. This waterway attracted industry and people as the metropolitan Detroit area developed. Today it is a waterway in the midst of one of the most populated and industrialized areas of Michigan. Combined sewer overflows (CSOs), polluted stormwater runoff, and industrial discharges are only a few of the pollutant sources that have plagued this river. Excessive levels of bacteria, heavy metals, organic chemicals, and other substances such as polychlorinated biphenyls (PCBs) are some of its major environmental hazards.

By the mid-1980's, many residents of the Rouge River Watershed became angry about the deteriorated condition of their river. The clean, clear streams that ran through many residents' backyards had become more like open sewers. Many who could remember swimming and fishing in the river as children were deeply concerned that the river would never again be useable as a recreational resource.

The citizens of Southeast Michigan demanded that the Michigan Department of Natural Resources (MDNR) do something to cleanup the Rouge River. In response, the MDNR developed the Rouge River Basin Strategy that was adopted by the State Water Resources Commission on October 1, 1985. A key portion of this strategy called for the development of a cleanup plan, or remedial action plan (RAP), for the Rouge River consistent with the commitments made under the binational Great Lakes Water Quality Agreement (GLWQA). This agreement between the United States and Canada requires that RAPs be developed for the Rouge River as well as for 42 other pollution "hot spots," or Areas of Concern (AOCs), within the Great Lakes Watershed. The MDNR is responsible for the development and implementation of RAPs for the 14 AOCs in Michigan.

THE REMEDIAL ACTION PLAN

The original Rouge River RAP, a nine-volume document published in 1989, defined an ambitious 20-year program of actions needed to protect public health and to make substantial progress toward full cleanup of the river. The RAP provided an effective means of ensuring accountability, tracking progress and resolving conflicts in a comprehensive manner so that the river could be restored. At that time, the capital cost for full implementation of the RAP was estimated at over $900 million. Further study indicates that this dollar amount significantly underestimated the full cost of RAP implementation.

The 1989 RAP focused on sources of pollution, largely those that presented an immediate threat to human health and were easier to regulate and control such as sanitary sewer systems. Some sources of pollution, such as toxins in river sediments generated by historical industrial activities and abandoned dumpsites, were not adequately addressed. Another shortcoming of the document is that it did not take an ecosystem approach to the river's problems. Focusing primarily on sources of pollution, it did not specifically address broad issues such as loss of habitat or human health effects. Nor did it consider overall indicators of the river's health such as the diversity and strength of its aquatic insect populations. The 1994 Rouge River RAP Update begins to integrate more of an ecosystem approach into the Rouge RAP and contains goals to more directly address the Rouge River's impaired uses.

The RAP Process

The original Rouge RAP was completed in 1989, and since then, more specific guidelines for RAPs have been developed. The concept of "use impairments," or barriers to using water resources, was added to the GLWQA with a requirement that each be addressed in all 43 AOCs. Because the original Rouge River RAP was adopted prior to these changes, an addendum to the original RAP was required. This document serves as that addendum and focuses on the impaired uses of the Rouge River and the pollution sources that cause these impairments. The impairment *Restrictions to Navigation* was added specifically for the Rouge River Watershed. The restoration of use impairments will be the yardstick used to measure progress in the cleanup of the Rouge River.

The MDNR has recently revised its approach to the development and implementation of remedial action plans, recognizing that the RAP process is constantly changing and needs to take an ecosystem approach to environmental problem solving. This change was called for by the Statewide Public Advisory Council (SPAC). The SPAC is an advisory group made up of one public advisory council member from each of the AOCs in Michigan. MDNR and SPAC felt more public participation was needed, as well as more timely reviews of RAP documents. Designed for flexibility, the revised process includes updating RAP goals and recommendations, making necessary commitments for required remedial and preventative actions, and reporting on recent progress through a series of biennial reports. This report serves as the first in this series of reports for the Rouge River RAP.

Committee Structure

In 1993, the MDNR reorganized the existing committee structure to more adequately address the new RAP process. The MDNR designed the Rouge RAP Advisory Council (RRAC) to represent all parties with an interest in the cleanup of the Rouge River. Responsible for advising the MDNR on the update and implementation of the Rouge RAP, the RRAC has formed a number of subcommittees to deal with more specific issues such as habitat destruction, nonpoint source pollution (such as stormwater runoff), on-site sewage disposal, public education, contaminated sites, and headwater land use. Each of these subcommittees drafted goals and recommendations which were submitted to the MDNR's Rouge RAP Team for consideration. Most of these goals and recommendations, as modified by the RAP Team, are included in this report.

The RAP Team is the state-appointed body responsible for giving final MDNR approval of the RAP update document and ensuring that its recommendations are implemented. The RAP Team's membership includes technical experts from several MDNR divisions, Wayne County, and one member of the RRAC, who acts as a liaison between the RRAC and RAP Team. The RAP Team also developed goals and recommendations which are integrated into this document. In those cases where goals from the RRAC coincided with RAP team goals, efforts were made to create modified goals that incorporated both parties' concerns. Membership lists for both the RRAC and Rouge RAP Team can be found in Appendix F.

The Update

This document represents the first update of goals and recommendations for the Rouge River since the Rouge RAP was first published in 1989. This update supplements the original, nine-volume Rouge River RAP document and should not be considered a comprehensive, stand-alone document. More detailed information about the geology, history, and research on the Rouge River can be found in the original Rouge River RAP, which is housed at the MDNR's Southeast Michi-

gan District Office, the Southeast Michigan Council of Governments (SEMCOG), and the Rouge River archive at Wayne State University.

The *1992 Rouge River RAP Annual Progress Report* was published to heighten the awareness of watershed residents to the progress that had been made on the implementation of the original RAP goals and recommendations from 1989 to 1992. It was also designed to recognize the efforts of those communities, governments, organizations, and citizens who had been instrumental in implementing the RAP. This progress report did not, however, establish any new goals or recommendations for remediating the Rouge River and served only as a status report. Progress on RAP implementation activities since 1992 is detailed in this document and can be found in the "Progress to Date" sections.

The *Draft 1994 Rouge River RAP Update* was released in September of 1994 for review and comment by interested parties and the public at large. Comments on the document were accepted through October of 1994 and considered by the MDNR for inclusion in the final document. The final version of the *1994 Rouge River RAP Update* was published and distributed in February of 1995.

Status of Use Impairments

The use impairments, or barriers to using water resources, highlighted in this document deal specifically with the utilization of the river by fish, wildlife, aquatic organisms, and humans. The degradation of the Rouge River has negatively affected fish, wildlife, and aquatic insect habitats and populations and has severely restricted swimming, fishing, and the aesthetic appeal of the River.

Ten of the sixteen beneficial uses are known to be impaired in either all or portions of the river. Further study is needed to determine if three uses are impaired. No impairment exists for two use impairments. One impairment was not applicable to the Rouge River. Goals and recommendations for activities needed to restore use impairments and progress to date as well as the status of each impairment, its probable cause, and any known or potential sources of impairment are detailed in this document.

Restrictions to swimming and other water-related recreational activities and loss of fish and wildlife habitat are the highest priority use impairments for restoring the Rouge River. As long as raw sewage from separate sewer overflows, combined sewer overflows, and leaking septic systems is still discharged into the Rouge River, watershed residents will be unable to freely enjoy the river without the threat of disease-causing organisms.

Suitable habitats for fish and wildlife in and around the stream are becoming more scarce due to poor water quality and the destruction of vegetation in wetlands, floodplains, and along streambanks. As the pressures from ever-increasing urbanization destroys habitats, the populations of fish, wildlife, and other aquatic creatures are reduced or eliminated. We have much work to do to address the destruction of fish and wildlife habitats in the Rouge River Watershed. Development of the few remaining healthy ecosystems in the headwaters of the river is occurring at an alarming rate. If property is not developed in an environmentally sensitive manner, the remaining useable wildlife habitats will be destroyed. Many of the goals and recommendations contained in this document focus on protecting and enhancing the few remaining natural areas in and around the Rouge River.

Although this paints a bleak picture, significant strides have been made toward the restoration of swimming and other water-related activities. Millions of dollars have been spent to eliminate untreated sanitary wastewater discharges from combined sewer overflows (CSOs), separate sewer bypasses, and illegal discharges to storm sewers. An investigation on the effects of leaking septic systems began in 1994, and with further study we will be able to determine the best course of action to eliminate this threat to public health and the environment. Some local governments have developed special programs to protect their water resources and control development.

As a long-term goal, we must eliminate all sources of impairment and restore the beneficial uses of the Rouge River. In order to achieve this goal, we need the assistance and cooperation of all residents, businesses, and governments within the watershed. To be totally successful, remediation efforts must be made using a watershed-wide approach instead of the piecemeal, segmented efforts that are presently being implemented. This may include watershed-wide permits and ordinances that will affect all entities equally within the River's drainage boundaries.

Sources of Impairment

The original 1989 RAP document cited separate and combined sewer overflows and toxic discharges as the highest priorities for cleanup of the river because these pollution sources posed a significant risk to public health and could also be addressed through the existing regulatory system. It also highlighted the need for identification and elimination of illegal discharges to storm sewers and the control of toxic discharges to combined sewers. Remediation efforts over the past several years have focused on the control or elimination of these sources, and we have made great strides in this area.

Addressing stormwater runoff and the pollutants it carries is our next challenge. Stormwater is a major contributor to nonpoint source pollution and can contain lawn fertilizers, pesticides, oils, soil particles, metals, and chemicals that can get picked up as it runs off into the Rouge River. Control of this form of pollution will be difficult because it is widespread, diverse, and abundant.

Combined Sewer Overflows

The 1989 Rouge River RAP estimated that approximately 7.8 billion gallons of combined sewage were discharged to the Rouge River annually. These discharges are a combination of stormwater, sewage and industrial wastewater and can contain toxic substances. Human disease-causing bacteria are also released in these discharges.

At the time that the original RAP was written, there were 168 CSOs in the watershed. Significant efforts have been made since that time to address the CSO issue not only in the Rouge River Watershed, but throughout the country. After extensive negotiations and with the participation of the federal court, MDNR issued final CSO discharge permits to all communities within the watershed with CSOs in 1992. These permits allow for a phased approach for the control or elimination of CSO discharges. Communities with combined sewers must decide either to separate their sewers into sanitary and storm sewers or construct basins or tunnels to store their wastewater until it can be routed to a wastewater treatment plant or treated before discharge to the river. Ten CSO control facilities and six sewer separation projects are being constructed as part of the multimillion dollar Rouge River National Wet Weather Demonstration Project (RRNWWDP) to demonstrate the effectiveness of various treatment options for control of CSO discharges and provide data to facilitate control decisions throughout the watershed. The design and construction of these projects is being funded by Michigan's state revolving fund, local dollars, and Wayne County's RRNWWDP.

Separate Sanitary Sewer Overflows

Separate sanitary sewer overflows occur during dry and wet weather when the capacity of the existing sewers is exceeded due to increased demand for sewer capacity from development and/or the seepage of groundwater into older sewer pipes. In the past, excess wastewater overflowed illegally to the river to prevent wastewater backup into homes and businesses when sewer capacity was exceeded. The original RAP highlighted these types of discharges as a high priority needing immediate attention. Several projects were recommended including Evergreen-Farmington, North Huron Valley/Rouge Valley, Pump Station 2A, Western Townships Utility Authority, and First Hamilton Relief Sewer. All of these projects are either completed or will be completed by 1995. This effort has been a significant step in the effort to cleanup the Rouge River and was achieved at a cost of over $600 million. A few minor sanitary sewer bypasses still exist within the watershed, but efforts are being made to resolve these final pollutant discharges.

Nonpoint Source Pollution

Nonpoint source pollution, particularly stormwater runoff, has become the next priority for cleanup of the Rouge River. Nonpoint source pollutants are generally transported over land to the river with rainwater runoff and snowmelt or through groundwater seepage. The sources of concern within the Rouge River Watershed include erosion from construction sites and streambanks, leaking septic systems, improper disposal of household hazardous wastes, air deposition, sites of environmental contamination, landfills, and animal wastes. Some efforts have been made to address these pollutants, but most efforts have been random and not watershed-wide.

Studies are still needed to determine which of these sources has the most significant impact on the degradation of the Rouge River. Wayne County's RRNWWDP will be spending several million dollars to determine which nonpoint sources are of most significance for the Rouge River and what treatment options will be most effective in their control. Implementation activities to address these pollution sources will also be initiated. The MDNR is planning to choose pilot areas to demonstrate stormwater control options as well.

Point Source Stormwater Discharges

Stormwater discharges from a designated pipe or "point source" are also of concern within the Rouge River Watershed. The state stormwater permits program requires that permits be obtained for discharges from most industrial facilities as well as construction sites larger than five acres. These permits require a stormwater control plan as well as monitoring of stormwater discharges by a state-certified operator. These types of facilities were not required to obtain a permit for these discharges in the past. This program should help to eventually eliminate pollutants carried to the river from point source stormwater discharges, but additional emphasis needs to be placed on controlling these pollutant sources.

Stream Flow

Extreme fluctuations in flow also impairs the river. The significant increase of impervious surfaces, such as concrete and asphalt, force rainwater to run off in higher volumes in shorter periods of time. Even when rainfalls are not significant, these changes can create flood conditions. Very low stream flows during dry weather may also occur because the pathway for rainwater to recharge groundwater, which in turn replenishes the streams, has been eliminated. These "flashy" flows destroy fish and aquatic insect habitat by increasing streambank erosion and creating wide, shallow streambeds. Efforts are being made to require more stringent control of stormwater discharges and to address the problem on a watershed-wide basis.

Permitted Municipal and Industrial Discharges

Historically, municipal and industrial dischargers contributed significant amounts of pollutants to the Rouge River. Greater regulatory control over the last several years has led to a significant reduction in pollutant loadings from these sources. Many of the industrial facilities that are physically located within the watershed do not discharge wastewater to the Rouge River, but instead discharge to the Detroit sanitary sewer system. A total of 31 facilities are presently discharging to the Rouge River. Many of the permitted industrial operations only discharge uncontaminated non-contact cooling water and stormwater to the river. In general, monitoring of these facilities needs to be continued and any upsets, spills or illegal discharges must be addressed in a timely manner.

Illegal Dumping/Discharges

The illicit connections (illegal connections to storm sewers) project called for in the original RAP has had great success by eliminating 8,564 pounds of pollutants from the river annually. The Wayne County Health Department has surveyed over 729 facilities over the past two years and found that 13 percent had the potential to discharge wastewater illegally to storm sewers. This program has been highly successful and should be continued and expanded to more areas in Oakland and Washtenaw counties.

Financial and Institutional Arrangements

The 1989 RAP made several recommendations on funding mechanisms and institutional arrangements that would be required to implement the RAP, including a mechanism to establish a long-term water quality monitoring effort. Funding was provided for the construction of sanitary sewer projects through the state construction grants program (which later became the revolving loan program) and local dollars. Financial assistance for the construction of controls for CSO discharges as well as implementation of several of the recommendations of the original RAP has been provided through several federal multimillion dollar grants awarded to Wayne County.

Alternative methods of funding CSO controls are still needed for older urban communities, many of which may have combined sewers and insufficient financial resources to improve their sewer systems. Wayne County's RRNWWDP and its Steering Committee have been studying various financing and institutional options available for implementing the RAP in the future. Although a consensus option has not been identified, their latest report presents a range of financial and institutional actions that may be taken to advance implementation of the RAP. The report lays a foundation for critical examination of the opportunities and barriers to addressing water quality management on a watershed basis. To this end, the RRNWWDP is bringing together key stakeholders to evaluate alternative approaches and identify incentives that would encourage communities to pursue a watershed approach to stormwater management.

Education

Obviously, humans have had, and will continue to have, a great impact on the Rouge River. People are not always aware of their impact, however, or may believe that the river resource can never be useable again. A change in the attitude of watershed residents is needed so that they see the Rouge as a living, usable waterway and not as an open sewer. For example, lack of education about proper use of chemicals and disposal of household hazardous waste has contributed to the river's degradation. On a larger scale, communities have been slow to correct obvious pollution problems, such as combined sewer overflows, despite the risk to public health, because a clean river was not a high enough priority and funding was not readily available.

It has long been recognized that education of both the general public and local officials is crucial for the restoration of the river, because residents must understand the effects of their actions and the importance of committing resources toward its revitalization. A number of educational efforts have continued and been initiated since 1989. Friends of the Rouge, a grass-roots citizen's organization, continues its annual cleanup of large log jams and debris and a student monitoring project, which educates students across the watershed about water quality sampling and the importance of the Rouge River. This group has also expanded its efforts to include habitat improvement projects. The Rouge River Watershed Council carries on its efforts to educate local officials about important issues that affect the river. Also, many local governments have ongoing educational programs to heighten the awareness of their residents. Wayne County's RRNWWDP has begun a public education/involvement program that includes regular information updates for local officials as well as a planned "clean neighborhood" and "clean business" program for watershed residents and businesses. Continued efforts are needed to coordinate and expand the education of citizens and community leaders.

Recreation

When people enjoy the Rouge River, they are more likely to support efforts to protect it. It is important to provide safe, recreational opportunities that also enhance and protect the river's wildlife and habitats. Recreational use of the river has been severely impaired for many years due to poor water quality and, in some cases, lack of accessibility. As described previously, efforts to eliminate the threat to public health from contaminated water is well under way.

A number of efforts have also been undertaken since 1989 to increase recreational opportunities along the Rouge River. The Wayne County Parks and Recreation Department completed the $567,000 Middle Rouge Parkway Improvement Project and renovated Sumac Fishing Point at Newburgh Lake to provide greater access to this Rouge River impoundment. Local governments and citizens' groups have improved local parks to increase public access, and some have held annual events to promote recreational use of the river. The City of Detroit and the MDNR have completed a $1.3 million renovation of the Olympic-sized swimming pools in Detroit's River Rouge Park. Efforts such as these should be encouraged and supported in all areas of the watershed.

The River's Future

The only way that the Rouge River will have a better future is for all watershed stakeholders to share in the responsibility of cleaning it up. We must focus on efforts that will be implemented across the entire watershed and embrace a holistic approach to problem solving. We need to examine the costs and the benefits of all possible options before choosing to go forward so that wise choices will be made. The support of all communities, citizens, businesses, industries, and governments is crucial to bringing the Rouge back to a river of which we can all be proud. We must be innovative and open-minded in our approach to implementation of the RAP and its recommendations so that obstacles we may encounter will not stand in the way of progress and ultimate success.

The RAP is not just a document, but an ever-changing process to lead us toward success in restoring the Rouge River. We must use it as our guide for the future, but never be afraid to see beyond what the RAP holds to use better, more effective ways of doing business. We need to make the Rouge River a resource that not only the people in southeast Michigan can enjoy, but where wildlife can live and prosper for generations to come. This is our vision for the future . . . come join us!!

NOTE TO THE READER:

All goals and recommendations from the original 1989 RAP document have been incorporated into this document (whether they have been implemented or not). Recommendations from the original RAP that have already been addressed are listed in the "Progress to Date" sections of this report, while those that are not complete can be found in the "Goals and Recommendations" sections.

Original goals and recommendations are referenced through endnotes at the end of each chapter. Tables 1 and 2 summarize the status of the original and new RAP recommendations and reference the original and revised letter and number designation. If the wording of a 1989 goal or recommendation has been updated, the endnote states that it "refers to" a particular RAP recommendation. Those 1989 goals and recommendations that were not revised are noted as simply "RAP Goal" or "RAP Recommendation" with the letter and number designation from the original RAP document.

Goals and recommendations have been numbered for ease in identification and tracking progress in the future. The following key will assist the reader in interpreting this numbering system:

Example Designation

VII-1 Goal to address a use impairment (see Chapter 1)
  VII-1a Recommendation to address a use impairment
B-1 Goal to address a pollutant source (see Chapter 2)
  B-1a Recommendation to address a pollutant source

In order to prioritize the many RAP implementation activities detailed in this document, the RAP Team ranked the use impairments and pollutant sources by their relative importance and designated each goal and recommendation as either "short-term" or "long-term." Each team member rated the impairments and sources numerically and the results were then averaged. When sources and impairments have equal priority, they share the same ranking.

> Short- and long-term designations were determined through majority vote of RAP team members. Short-term goals and recommendations are those scheduled for implementation between the years 1995 and 2000. Those goals and recommendations listed as long-term are scheduled for implementation between the years 2000 and 2010.

For further information about implementation activities, see the 1992 Rouge RAP Annual Progress Report and the 1993 and 1994 Rouge RAP Bulletins, available at SEMCOG, the Southeast Michigan Council of Governments.

Many resources were used to develop this report including information received by surveying the Rouge River communities, agencies and interest groups, the Rouge RAP Advisory Council (the public participation group for the Rouge RAP), MDNR's Rouge RAP Team, Wayne County (and its Rouge River National Wet Weather Demonstration Project), and SEMCOG.

Table 1

Completed Rouge RAP Projects

1989 RAP Reference	Recommended Project	1989 Estimate	Final Cost	Status	Agency
A	**Separate Sanitary Sewers**				
A-2	Evergreen-Farmington improvements	$44,500,000	$55,000,000	Completed	Oakland County, local governments
A-4	First-Hamilton Relief outlet sewer	$33,000,000	$39,100,000	Completed	DWSD, Oakland County, Wayne County, local governments
A-5	North Huron Valley-Rouge Valley interceptor	$39,100,000	$160,000,000	Completed	Wayne County
A-7	Western Townships Utilities Authority interceptor	$78,000,000	$94,000,000	Completed	Canton, Northville, and Plymouth Townships
A-8	Local sewer improvements for the WTUA project	Not estimated	Not estimated	Completed	Canton, Northville, and Plymouth Townships
A-9	Walled Lake, Novi and Oakland County sewer and/or treatment capacity	Not estimated	$10,000,000	Completed	Walled Lake, Novi, Oakland County
B	**Combined Sewer Overflows (CSOs)**				
B-2	Issue permits to CSO owners to reflect RAP recommendations	Not estimated	Not estimated	Completed. Permits issued 8/92	DNR-SWQD
B-5	Detailed local planning and design to meet Phase II CSO objectives	Not estimated	$20,520,000	Completed	* Local governments
F	**Resource Improvements**				
F-6	Middle Rouge Impoundments Recreation Study	$78,000	$78,000 + $567,000 implementation	Completed	Wayne County Parks Department
G	**Data Collection and Monitoring**				
G-5	Intensive biological survey of Evans Creek	Not estimated	Not estimated	Completed in 1989	MDNR-SWQD
G-6	Sediment sampling at Newburgh Lake	$70,000 for Lower and Middle Branches	$248,500 for Newburgh Lake Impoundment. No final cost for MDNR sampling	Completed	Wayne Co./RRNWWDP, MDNR-SWQD
G-6	Watershed-wide sediment sampling	Not estimated	$233,000	Completed	Wayne Co./RRNWWDP
I	**Institutions and Financing**				
I-2	Fund separate sanitary projects under the construction grant or SRF Loan Programs	$133,000,000	$79,960,000 to date	8 projects applied for $79,960,000 in SRF funds; also federal funds	MDNR, local governments

Completed Rouge RAP Projects, continued

1989 RAP Reference	Recommended Project	1989 Estimate	Final Cost	Status	Agency
I-3	Establish the SRF Loan Fund	Not estimated	Not estimated	Established	MDNR, local governments, state legislature
I-4	Pursue loans in the SRF program	Not estimated	Not estimated	$34,550,000 in SRF loans approved for 14 projects	Local governments
I-8	Incorporate flexibility into the permit process	Not estimated	Not estimated	Permits based on incremental progress resolved in 1992	MDNR, local governments, federal court, WRC
I-9	Incorporate flexibility into the permit process to address affordability	Not estimated	Not estimated	Cost-effective, watershed-wide permit process resolved in 1992	MDNR, local governments, federal court

Notes:

* Local Governments with sewage flows tributary to combined sewers:
Allen Park, Beverly Hills, Birmingham, Bloomfield Hills, Bloomfield Township, Canton Township, Dearborn, Dearborn Heights, Detroit, Farmington, Garden City, Inkster, Livonia, Melvindale, Northville, Northville Township, Novi, Plymouth Township, Redford Township, River Rouge, Romulus, Southfield, Van Buren Township, Wayne, Westland

Local Governments:
All of the above municipalities and Bingham Farms, Farmington Hills, Franklin, Lathrup Village, Lyon Township, Novi Township, Orchard Lake Village, Plymouth, Superior Township, Troy and Walled Lake

Table 2

New, Ongoing and Incompleted Projects

RAP Reference 1994	1989	Recommended Project	1989 Estimate	1994 Estimate	Status	Agency
II		**Loss of Fish and Wildlife Habitat**				
II-1 II-2 CA-1g	F-3	Improve aquatic habitat; Protect riparian wetlands and floodplains and their water retention capacity	Not estimated	Not estimated	Ongoing	Streambank owners, local governments, MDNR-LWMD, MDNR-Fisheries, environmental organizations, RRAC-Habitat
II-1 II-3 CA-1	F-4	Consider watershed-wide impacts of enclosures and discourage their use	Not estimated	Not estimated	Ongoing	MDNR-LWMD, MDNR-SWQD, MDNR-Fisheries, RRAC-Habitat, local governments
II-4c	--	*In-stream restoration demonstration projects*	*Not applicable*	*$700,000*	*Expected completion by 1996*	*Wayne Co./ RRNWWDP, local governments*
III	**F**	**Degradation of Fish Populations**				
III-1a	F-5	Prepare a fisheries management plan	Not estimated	$270,000 for an assessment	In progress	MDNR-Fisheries, Wayne Co./ RRNWWDP
A	**A**	**Separate Sewer Overflows**				
A-1a B-1a	B-4 A-1	Detroit Water and Sewerage Department Pump Station 2A and implementation of Detroit Flow Management Plan	$190,000,000	$190,000,000	Expected completion by 1995	DWSD
A-1b	A-3	Local sewer improvements in the Evergreen-Farmington area	Not estimated	Not estimated	Expected completion by 1995	Local governments
A-1c	A-6	Local sewer improvements in the North Huron Valley-Rouge Valley project	$21,400,000	Not revised	Nearly complete; some communities implement-ing corrective action plans	Local governments
A-1d	A-10	Operation and maintenance programs for local sewer systems	Not estimated	Not estimated	Ongoing	Local governments
A-1f	A-11	Monitoring of local sanitary sewer projects and improvements	Not estimated	Not estimated	Ongoing	MDNR-SWQD

New, Ongoing and Incompleted Rouge RAP Projects, continued

RAP Reference 1994	1989	Recommended Project	1989 Estimate	1994 Estimate	Status	Agency
B	**B**	**Combined Sewer Overflows**				
B-1b B-1c B-1d	B-1 B-2 B-6 B-7	Control of each point of CSO discharge	Not estimated	Not estimated	In progress	MDNR-SWQD, local governments, Wayne Co./RRNWWDP
B-1b	B-3	Phase I interim controls: -monitoring -O & M programs -system optimization -use of in-system capacity -sewer separation	Included in costs of B-6	$175,000 plus GDRS cost	Underway per NPDES permit re-quirements. Design funding from the RRNWWDP	Local governments, Wayne Co./ RRNWWDP MDNR; local governments
B-1c	B-6 B-1 B-2	Phase II minimum level of CSO control for protection of public health including sewer separation and/or treatment basins	$500,000,000 (for control of all points of discharge)	$432,790,000 (for control of 1/3 of outfalls)	Construction planned 8/94-96. Some separation projects underway, expected completion 1995-1999.	Local governments, Wayne Co./ RRNWWDP, MDNR-SWQD
B-1d	B-7	Phase II regional CSO control program implemented in segments	Not estimated	Not estimated	To be implemented after evaluation of demonstration basins	Local governments, Wayne Co./RRNWWDP, Oakland Co.
B-1e	B-8	Phase III CSO controls to meet water quality standards; implementation after Phase I and II evaluation	Not estimated	Not estimated	Will begin after completion of Phase II projects	Local governments, Wayne and Oakland counties
B-1f	G-7	Monitoring of combined sewer overflows and industrial and municipal dischargers	$140,000	Not revised	Ongoing	MDNR, Wayne Co./ RRNWWDP, local governments
B-1g	B-9	Source control of toxic pollutants from industries discharged through CSOs	Not estimated	Not estimated	Ongoing	Local governments, industrial users
B-1h	B-11	Eliminate improper discharges of toxic pollutants to combined sewer system	Not estimated	Not estimated	Ongoing	DWSD, local governments, industrial users
B-1i	—	*Identify long-term maintenance & monitoring costs of CSO control projects*	*Not applicable*	*Not estimated*	*Not started*	*Wayne Co./ RRNWWDP, local governments*
B-1j	B-10	Full implementation of the Industrial Pretreatment Program	Not estimated	Not estimated	Ongoing	DWSD, MDNR-SWQD, industrial users

New, Ongoing and Incompleted Rouge RAP Projects, continued

RAP Reference 1994	1989	Recommended Project	1989 Estimate	1994 Estimate	Status	Agency
C	C	**Nonpoint Source Pollution**				
CA-1	C-2	Local stormwater management evaluation	$33,000	Not revised	Not initiated as planned; evaluation should be conducted as part of the RRNWWDP	Counties, MDNR-SWQD, local governments
CA-1a	G-3	Wet weather water quality survey	Not estimated	Over $9,000,000	Expected completion by 1996	Wayne Co./ RRNWWDP, MDNR-SWQD
CA-1 CA-2	C-3	Local stormwater management projects	Not estimated	Not estimated	Ongoing	Local governments, Wayne Co./RRNWWDP, MDNR-SWQD, MDNR-LWMD
CA-1h	—	*Prototype stormwater management control program*	*Not applicable*	*Not estimated*	*Planning underway*	*MDNR-SWQD*
CA-1i	—	*Model local stormwater ordinance*	*Not applicable*	*$80,000*	*Ongoing*	*Wayne Co./ RRNWWDP*
CA-1	C-4	Issue stormwater discharge permits to municipalities with NPS-caused impairments	Not estimated	Not estimated	Ongoing NPDES implementation.	MDNR-SWQD
CA-1d	—	*Traditional polluted stormwater runoff control measures evaluation*	*Not applicable*	*$1,030,000*	*Expected completion by 1996*	*Wayne Co./ RRNWWDP*
CA-1e	—	*Evaluation of wetlands as polluted stormwater runoff control Not applicable*	*$700,000*	*Expected*	*completion by 1996 Wayne Co./*	*RRNWWDP*
CA-2	—	*Educate stakeholders about controls for stormwater runoff*	*Not estimated*	*Not estimated*	*Ongoing*	*MDNR-SWQD, MDNR-LWMD, local governments, RRAC-NPS, Wayne Co./ RRNWWDP*
CB-1	C-5	Soil erosion control through Act 347	Not estimated	Not estimated	Ongoing	MDNR, counties, local enforcing agencies
CC-1a	—	*Identify the failure rate of septic systems in Farmington Hills and Southfield*	*Not applicable*	*$37,000*	*Initial study complete; further study planned in 1995*	*RRAC-On-Site Sewage Disposal, SEMHA, Oakland County Health Division, Wayne Co./ RRNWWDP*

New, Ongoing and Incompleted Rouge RAP Projects, continued

RAP Reference 1994	1989	Recommended Project	1989 Estimate	1994 Estimate	Status	Agency
CC-1d	Main-1 Sub basin Rec. 5	Connect residences in the Village of Franklin to the sanitary sewer system	Not estimated	$9,100,000	By 1995, 250 homes will be connected. All homes will have access by the fall of 1995	Village of Franklin, Oakland County
CD-1 CD-2	C-6	Controls on materials storage piles and Act 307 sites	Not estimated	Not estimated	Ongoing	MDNR-ERD, MDNR-SWQD, PRPs
CD-1 CD-2	E-1	Formulate an abandoned dumps identification, prioritization & remediation program	Not estimated	$1,350,000	Completion expected by 1996	Wayne Co./ RRNWWDP, USEPA, MDNR-ERD
CE-1	C-7	Household hazardous waste public education and collection	Not estimated	Not estimated	Ongoing	Local governments, NRCS, MDNR-WMD, FOTR, Wayne Co./RRNWWDP
CF-1a CF-1b	—	*Quantify atmospheric deposition of pollutants of concern overall*	*Not applicable*	*Over $838,000*	*Expected complete by 1996*	*Wayne Co./ RRNWWDP, U of M, DWSD*
CF-1b CF-1c	—	*Continue quantifying atmospheric deposition of concern for emissions generated within the watershed*	*Not applicable*	*Over $600,000*	*Expected complete by 1997*	*Wayne Co./ RRNWWDP, U of M, DWSD*
D	**C**	**Point Source Stormwater Discharges**				
D-1	C-4	Ensure that regulated stormwater discharges comply with permit requirements	Not estimated	Not estimated	Ongoing	MDNR-SWQD
E	**F**	**Stream Flow**				
E-1e E-1f	F-1	Develop a log jam and debris master plan	$150,000	Not revised	Not developed; will be included in E-1e	MDNR-Fisheries, Wayne Co./ RRNWWDP, local governments
E-1b	F-2	Flow augmentation to mitigate flow conditions	Not estimated	Not estimated	Ongoing. YCUA discharge to augment low flows in Lower Rouge structurally complete	MDNR-SWQD, MDNR-LWMD, local governments
E-1b	F-2	Creation of wetlands to mitigate high flow stormwater discharges	Not estimated	Not estimated	Ongoing	Wayne Co./ RRNWWDP, MDNR-SWQD, MDNR-LWMD

New, Ongoing and Incompleted Rouge RAP Projects, continued

RAP Reference 1994	1989	Recommended Project	1989 Estimate	1994 Estimate	Status	Agency
E-1c	G-2	Fixed station monitoring	$30,000/year	Not revised	Ongoing	MDNR, Wayne Co., DWSD, Detroit Edison
E-1e	—	*River Corridor & Stream Channel Stabilization demonstration and implementation*	*Not applicable*	*Not estimated*	*Demonstration expected to be complete by 1996*	*Wayne Co./ RRNWWDP*
F	**E**	**Sediments**				
F-1 CD-1 CD-2	E-1	Clean-up sites of environmental contamination, Act 307 sites, including river sediments	Not estimated	Not estimated	Ongoing	MDNR-ERD, MDNR-SWQD
F-1a	G-6 E-1	Intensive survey of the Middle and Lower Rouge for PCBs	$70,000	$481,000 to date	MDNR completed 1989; RRNWWDP ongoing	MDNR-SWQD, Wayne Co./ RRNWWDP
F-1b	G-6 E-1	Impoundment sediment control and removal demonstration	Not applicable	$2,010,000	Expected completion by 1996	Wayne Co./ RRNWWDP
G	**C**	**Illegal Dumping/Discharges**				
G-1b	C-1	Eliminate improper connections to storm drains	$12,600,000	$302,400 to date	Ongoing	Wayne Co. Health Dept., RRNWWDP
G-1b	G-4	Survey storm drains for NPS problems from suspected improper connections	$150,000	Not revised	Ongoing	Wayne and Oakland County Health Departments
G-1c	—	*Evaluation of illicit connection program*	*Not applicable*	*$51,000*	*Expected completion by 1996*	*Wayne Co./ RRNWWDP*
H	**D**	**Municipal and industrial Discharges**				
H-1a	D-1	Reissue NPDES permits on a five year schedule	Not estimated	Not estimated	Permits reissued on basin year schedule; may not be every 5 years	MDNR-SWQD
J	**I**	**Institutions and Financing**				
J-1a	I-7	Secure state and federal funding support	Not estimated	Not estimated	Ongoing; $205,100,000 in federal funds, $34,550,000 in SRF funds	MDNR, USEPA, local governments, SEMCOG

New, Ongoing and Incompleted Rouge RAP Projects, continued

RAP Reference 1994	1989	Recommended Project	1989 Estimate	1994 Estimate	Status	Agency
J-1a J-1b	I-1	Pursue multiple sources of funding	Not estimated	Not estimated	Federal, state, and local funds received; more funding needed	MDNR, local governments, SEMCOG
J-1b	I-5	Consider establishing special drainage districts	Not estimated	Not estimated	Under consideration; discussed in F/I study[1]	Drain Commissions , MDNR, Oakland Co., local governments, Wayne Co./ RRNWWDP
J-1b	I-6	Examine cost allocation methods	Not estimated	Not estimated	Examined in F/I report[1]	Drain Commissions, MDNR, Oakland Co., local governments, Wayne Co./RRNWWDP
J-1d	—	*Financial and institutional arrangements to fund a watershed management system*	*Not applicable*	*Not estimated*	*Expected completion by 1997*	*Wayne Co./ RRNWWDP , MDNR-SWQD, RISC, RRAC*
K	**H**	**Public Participation**				
K-1	H-4	Public education to homeowners about their impact on the Rouge River	Not estimated	Not estimated	Ongoing	MDNR, RRAC-Public Education, FOTR, RRWC, SEMCOG, Wayne Co./ RRNWWDP, local governments
K-1 K-2	H-1	Support public education throughout implementation of the RAP	Not estimated	Not estimated	Ongoing	MDNR, RRAC-Public Education, FOTR, RRWC, SEMCOG, Wayne Co./ RRNWWDP, local governments
K-1a	G-1	Maintain Rouge River Archive	Not estimated	Not estimated	Maintained at WSU	WSU
K-1b	H-2	Rouge River Interactive Water Quality Project	$30,000	$150,000/year	66 schools now participating	FOTR, Wayne Co./ RRNWWDP, U of M

New, Ongoing and Incompleted Rouge RAP Projects, continued

RAP Reference 1994	1989	Recommended Project	1989 Estimate	1994 Estimate	Status	Agency
K-2	H-3	Communication with local governmental officials	Not estimated	Not estimated	Ongoing	MDNR, RRWC, SEMCOG, RRAC, Wayne Co./ RRNWWDP
K-3b	G-8	Coordination with Detroit River RAP	Not estimated	Not estimated	Coordination meetings for the Southeast Michigan RAP Coordinators began in 9/94	MDNR-SWQD, SEMCOG, OMOE

Notes:

* Local governments with sewage flows tributary to combined sewers:
Allen Park, Beverly Hills, Birmingham, Bloomfield Hills, Bloomfield Township, Canton Township, Dearborn, Dearborn Heights, Detroit, Farmington, Garden City, Inkster, Livonia, Melvindale, Northville, Northville Township, Novi, Plymouth Township, Redford Township, River Rouge, Romulus, Southfield, Van Buren Township, Wayne, Westland

Local Governments:
All of the above municipalities and Bingham Farms, Farmington Hills, Franklin, Lathrup Village, Lyon Township, Novi Township, Orchard Lake Village, Plymouth, Superior Township, Troy, and Walled Lake

Those projects listed in italics are new projects (not included in the 1989 Rouge River RAP)

Those projects designated by roman numerals address impaired uses. Those designated by letters refer to sources of impairments.

[1]F/I Study: *Study of Institutional and Financing Options*, July 1994, Apogee Research, Inc.

CHAPTER 1
ROUGE RIVER USE IMPAIRMENTS

"The water quality impacts that have resulted in the impairment of beneficial uses of the Rouge River are directly related to the extensive human activity that takes place in the watershed. Inadequate sewer capacity, while a significant cause of pollution, is only part of the overall problem. Improvements in the ways we manage our stormwater must be an integral part of any thorough water quality improvement plan. The Rouge Remedial Action Plan recognizes this and continues to serve as an important vehicle in advocating for comprehensive stormwater management throughout the Rouge River Watershed."

Flora McCormack, Administrator
Wayne County Department of Environment

INTRODUCTION

The Great Lakes Water Quality Agreement (GLWQA), a water quality preservation agreement between the United States and Canada, laid out a format for the development of remedial action plans (RAPs) for specified waterways within the Great Lakes Watershed. In order for the Rouge River RAP to comply with this format, the document is required to define the environmental problems that affect the health of the river and its uses. The GLWQA defines "use impairments" as any change in the chemical, physical or biological integrity of the Great Lakes System that causes any of the following:

- Restrictions on fish and wildlife consumption
- Tainting of fish and wildlife flavor
- Degradation of fish and wildlife populations
- Fish tumors or other deformities
- Bird or animal deformities or reproduction problems
- Degradation of benthos (aquatic animals and insects)
- Restrictions on dredging activities
- Eutrophication or growth of undesirable algae
- Restrictions on drinking water consumption or taste and odor problems
- Restrictions on swimming and other water-related activities
- Degradation of aesthetics
- Added costs to agriculture or industry
- Degradation of phytoplankton and zooplankton populations
- Loss of fish habitat
- Loss of wildlife habitat
- Restrictions to navigation (a Rouge River specific impairment)

These use impairments have become the template for determining the extent to which a river is degraded and for measuring progress toward its ultimate cleanup. For the Rouge River Watershed, the Rouge RAP Team determined that ten of these 16 uses are impaired throughout most of the watershed. Additional studies are needed to determine if the following uses are impaired: *tainting of fish and wildlife flavor, degradation of wildlife populations,* and *bird or animal deformities or reproduction problems.* The Rouge RAP Team determined that *degradation of phytoplankton and zooplankton populations* and *increased costs to agriculture and industry* are not impaired for the Rouge River. The impairment *restrictions on drinking water consumption or taste and odor problems* is not discussed in this document because the Rouge River is not used as a source of drinking water. Refer to Table 3 for a detailed listing of uses that are impaired in the Rouge River Watershed.

The RAP Team ranked these 13 use impairments in their order of importance with regards to the successful remediation of the Rouge River Watershed. The impairment *restrictions to swimming and other water related activities* is thought to be the highest priority for remediation, with *loss of fish and wildlife habitat* ranking second in priority. Table 3 and the discussion which follows address these impairments in their rank order of importance.

Once a beneficial use has been restored, it can be "delisted" using IJC's criteria. A table detailing IJC's criteria for listing and delisting beneficial uses in Areas of Concern (AOCs) can be found in Appendix B. Once all uses have been restored and delisted, the entire AOC can then be delisted.

The remainder of this chapter describes in detail the impaired uses of the Rouge River, goals and recommendations needed to restore these uses, and progress made toward restoration.

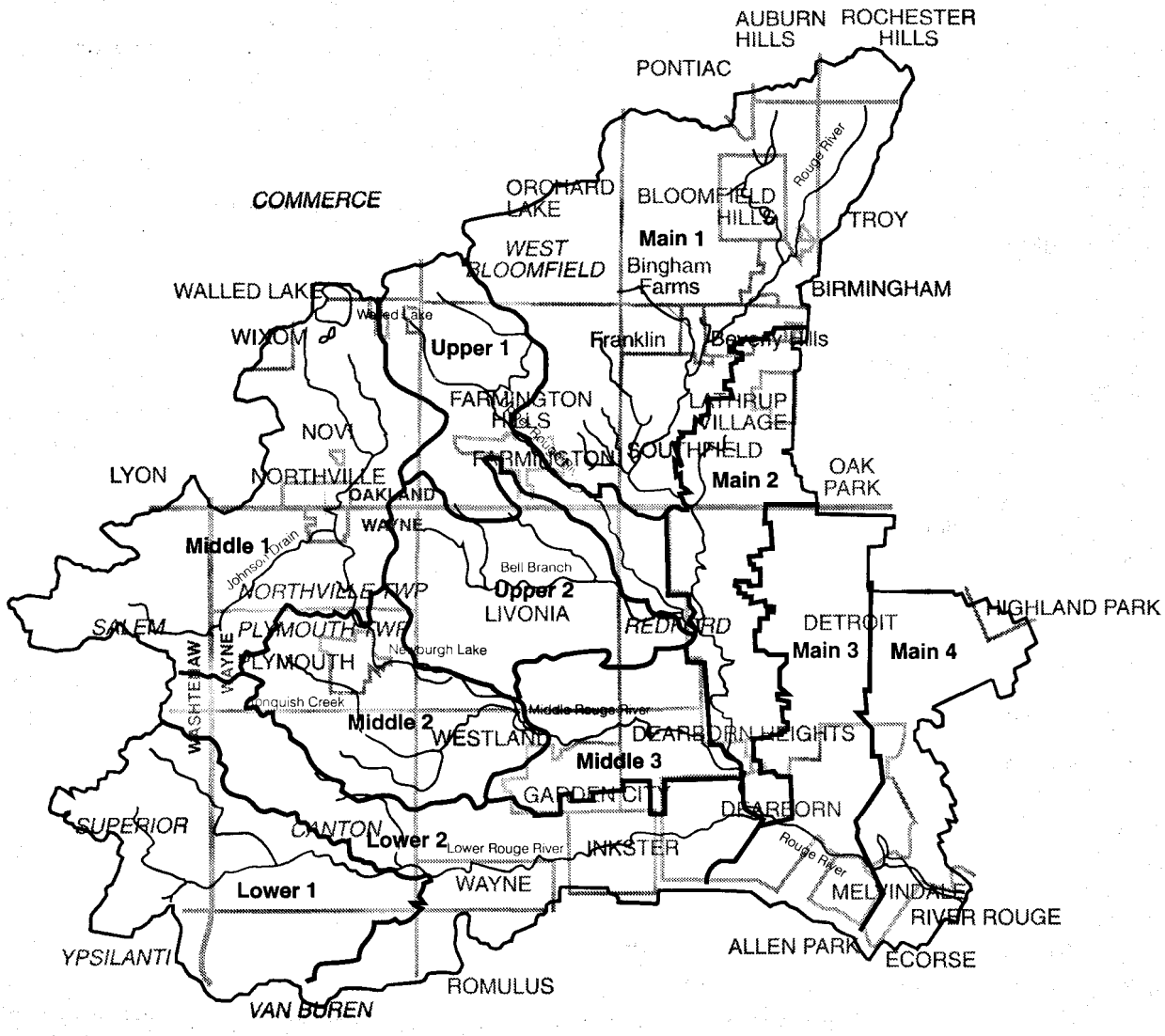
Table 3
Summary of Impaired Uses, Rouge River Watershed, 1994

Impairment (In Rank Order)	Degree of Impairment and Geographic Extent*	Probable Contaminants or Causes	Known or Potential Sources
Restrictions on swimming and other water-related activities Rank 1	Severely impaired: all branches	Bacteria (elevated E. Coli/ fecal coliform levels)	Combined/separate sewer overflows, nonpoint source pollution, industrial, municipal and point source stormwater discharges, illegal discharges, stream flow
Loss of fish and wildlife habitat Rank 2	Moderately to severely impaired: all branches and tributaries. Excellent habitat in two headwater areas	Channelization, enclosure or relocation of the streambed, elimination of trees/shrubs on the streambank and woody debris in the stream channel, soil particles from erosion, nutrients, organic and inorganic chemicals, low flow and flood conditions	Physical alteration of habitats, nonpoint source pollution, industrial, municipal, and point source stormwater discharges, combined/separate sewer overflows, contaminated sediments, stream flow, illegal discharges
Degradation of fish populations Rank 3	Severely impaired: further study needed to determine the entire extent of the impairment. Main- 1, Main-2, Tarabusi, Johnson, and Tonquish Creeks not impaired	Soil particles from erosion, nutrients, hazardous subtances, low flows and flooding, increased water temperature, low dissolved oxygen	Nonpoint source pollution, point source stormwater discharges, combined/ separate sewer overflows, contaminated sediments, stream flow, illegal discharges municipal and industrial discharges
Degradation of benthos Rank 3	Impaired: Fair to poor rating (per GLEAS 51) in all branches and tributaries studied	Soil particles from erosion, hazardous substances, low flows and flooding, increased water temperature, low dissolved oxygen, loss of habitat	Nonpoint source pollution, municipal, industrial, and point source stormwater discharges, combined/ separate sewer overflows, contaminated sediments, stream flow, illegal discharges
Degradation of wildlife populations Rank 3	Impairment unknown: additional studies necessary	Loss of habitat	Unknown
Eutrophication or growth of undesirable algae Rank 4	Severely impaired: all branches except most headwaters areas	Phosphorus, nitrogen, and other nutrients	Nonpoint source pollution, industrial, municipal and point source stormwater discharges, combined/ separate sewer overflows
Degradation of aesthetics Rank 4	Moderately to severely impaired: all branches except most headwater areas; insufficient data for Upper-2 subbasin	Nutrients, raw sewage, large log jams, garbage, oils, excessive algae, suspended soils	Nonpoint source pollution, industrial, municipal and point source stormwater discharges, combined/separate sewer overflows, contaminated sediments, stream flow, illegal discharges

Impairment (In Rank Order)	Degree of Impairment and Geographic Extent*	Probable Contaminants or Causes	Known or Potential Sources
Restrictions on fish consumption Rank 5	Severely impaired in Middle Branch downstream of Phoenix Lake and Main Stem downstream of Ford Road and the Lower Branch in Wayne County. Other areas not impaired	PCBs and mercury	Contaminated sediments, municipal, industrial and point source stormwater discharges, nonpoint source pollution, combined/separate sewer overflows
Bird or animal deformities or reproductive problems Rank 6	Impairment unknown: further study needed to determine the degree and extent of impairment	Unknown	Unknown
Restrictions on dredging activities Rank 7	Severely impaired at mouth and Middle Rouge impoundments. Further study needed to determine impairment status in other areas	Hazardous substances, including PCBs and heavy metals	Contaminated sediments, combined/separate sewer overflows, industrial and municipal point source discharges
Fish tumors or other deformities Rank 8	Moderately impaired: further study needed to determine the degree and extent of impairment	Organic and inorganic chemicals, viruses	Nonpoint source pollution, point source stormwater discharges, combined/separate sewer overflows, contaminated sediments, illegal discharges
Tainting of fish and wildlife flavor Rank 9	Impairment unknown: additional studies are needed to determine the degree and extent of impairment	Unknown	Unknown
Restrictions to navigation Rank 10	Moderately to severely impaired: all subbasins except Main-4, Upper-1, and Middle-1; need data for Upper-2	Large log jams, garbage, sedimentation, algae growth, low flows	Erratic stream flows, bank erosion, sediment loadings from off-land and streambank erosion
Added costs to industry or agriculture	Not impaired	——	——
Degradation of phytoplankton and zooplankton populations	Not impaired	——	——
Restrictions on drinking water consumption, taste and odor problems	Not applicable since the river is not used as a drinking water supply	——	——

*See Figure 4 for map of subbasin locations

Figure 4
Subbasins of the Rouge River Watershed



Restrictions on Swimming and Other Water-related Activities

Rank 1

Recreational use is restricted in all branches of the Rouge River due to bacterial levels that are not safe for full- or partial-body contact activities. There has been a standing health advisory for the entire watershed for total body contact for several years. Levels of fecal coliform bacteria, an indicator that disease-causing organisms may be present, exceed the standards established for safe recreational activities throughout the entire watershed. Bacterial levels exceed safe levels due to combined sewer overflows, separate sewer overflows, nonpoint source pollution (especially leaking septic systems), industrial, municipal and point source stormwater discharges, stream flow, and illegal dumping or discharges. The original RAP document contained the overall water quality goal of making the river safe for total body contact recreation.

Testing for failing septic systems

Goals and Recommendations

Short-term Goal:

I-1: Reduce the bacterial levels in problem areas in order to make the river safe for full body contact recreation.[1]

Short-term Recommendation:

I-1a: Monitor bacteria levels to determine if bacteria have been reduced to levels safe for full body contact recreation. *Primary responsibility: County health departments*

Long-term Recommendation:

I-1b: Ensure that safe levels are maintained for future recreational uses. *Primary responsibility: County health departments, MDNR-SWQD*

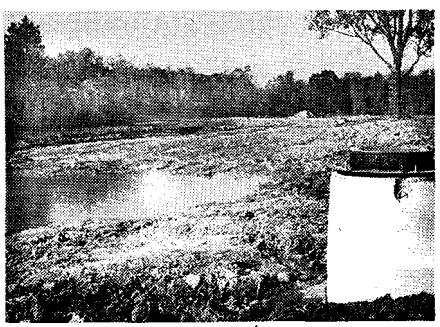
Further recommendations to meet this goal can be found in Chapter 3 under the sections covering combined sewer overflows, separate sewer overflows, nonpoint source pollution, point source storm sewer discharges, and illegal dumping and discharges.

Progress to Date

➲ See activities listed in Chapter 3 under the sections for combined sewer overflows, separate sewer overflows, nonpoint source pollution, point source storm sewer discharge, and illegal dumping or discharges.

Loss of Fish and Wildlife Habitat

Rank 2



Development destroys habitat

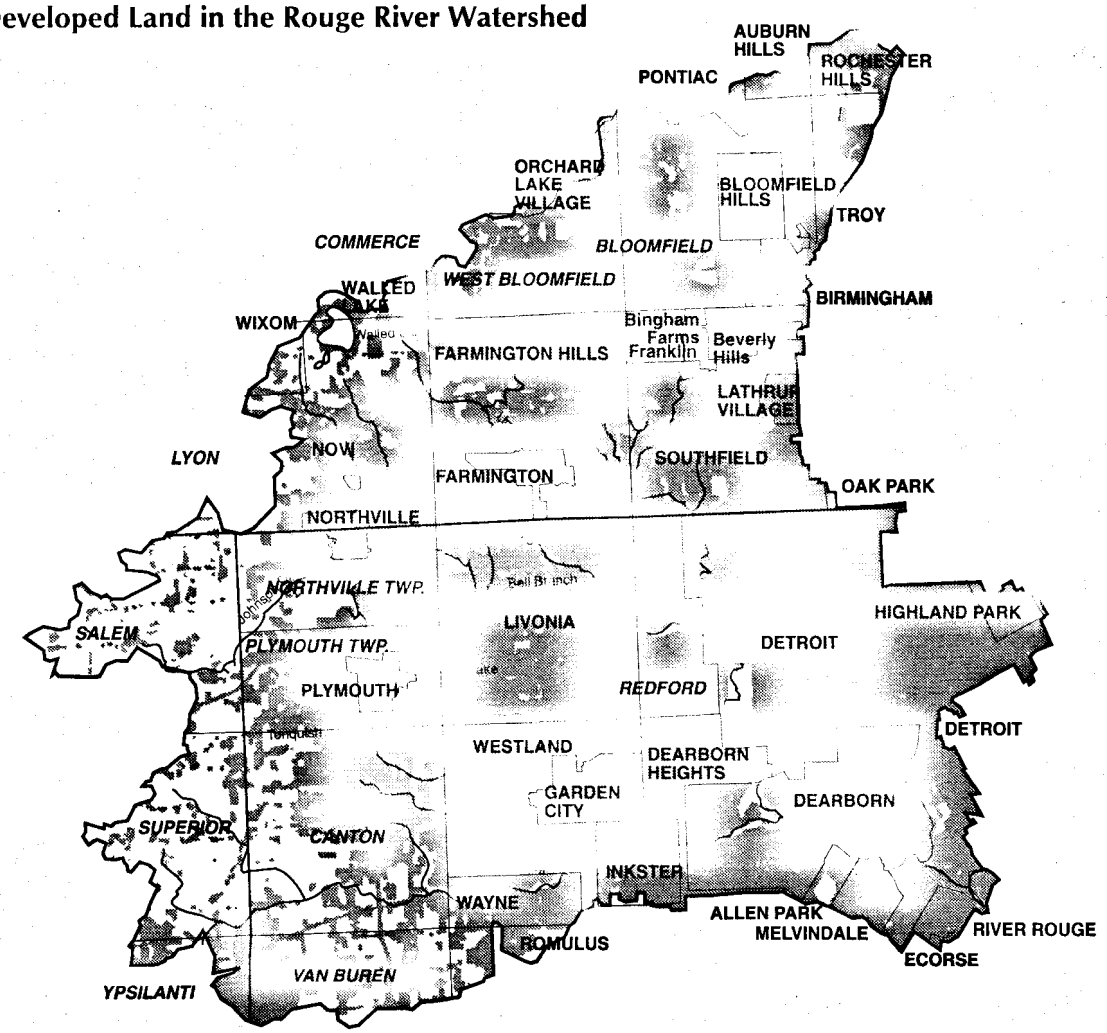
Loss of fish and wildlife habitat is considered to be an impairment in all branches and tributaries of the Rouge River. Fish and wildlife habitat is lost when pollutants degrade habitats; when streams are enclosed, channelized, or moved; when alterations are made to the streambank (such as vegetation being removed); and when all woody material is removed from the banks of the stream channel. Pressures from ever-increasing urbanization can destroy critical fish and wildlife habitats. As shown in Figure 5, much of the land area in the Rouge River

Watershed has been developed for human use. Land areas and streams are often altered to conform to the design of each new development. When this occurs, fish and wildlife are forced to move into new areas in order to find adequate habitat. As populations of fish and wildlife must live in smaller and smaller areas, their populations dwindle.

Loss of habitat can be attributed to urbanization and the following sources of impairment: nonpoint source pollution, storm sewer discharges, combined sewer overflows, separate sewer overflows, contaminated sediments, erratic stream flows, permitted municipal and industrial discharges, physical alteration of habitats and illegal dumping or discharges. The original RAP document recommended that streambank owners and municipalities improve stream habitat and discourage stream enclosures.[2]

Implementation of the recommendations below should emphasize the following: (1) the use of natural materials in construction of wing dams, bank stabilization structures, and floodplain protection; (2) greater use of native species of vegetation along streambanks; and (3) the evaluation of project effectiveness from fishery and fish and wildlife habitat perspectives.

Figure 5
Developed Land in the Rouge River Watershed



Developed Land
includes residential, commercial, service, institutional, industrial, transportation, communication, utility and cemetery land uses.

Goals and Recommendations

Short-term Goal:

II-1: Minimize the negative human effects on existing fish and wildlife habitats.[2]

Short-term Recommendations:

II-1a: Establish environmentally sound practices for dredging operations for use by communities, drain commissioners, developers, etc. so that habitats are not destroyed in this maintenance activity. *Primary responsibility: MDNR-LWMD, RRAC-NPS*

II-1b: Create guidelines for developers and contractors dealing with the development of regulated and non-regulated parcels containing wetlands. *Primary responsibility: MDNR-LWMD, RRAC-Habitat*

II-1c: Provide for and/or participate in educational activities to enhance the knowledge of developers, contractors, communities, etc. about the importance of preserving valuable fish and wildlife habitats. *Primary responsibility: MDNR-LWMD, RRAC-Public Education, RRAC-Headwaters, local governments*

II-1d: Develop and implement a comprehensive enforcement program to help minimize damage to existing wetland habitats and keep all developments in compliance with local and state regulations. *Primary responsibility: MDNR-LWMD, local governments*

Long-term Recommendation:

II-1e: Require developers to preserve and enhance habitat on those development proposals that would otherwise adversely impact existing habitat. *Primary responsibility: MDNR- LWMD, local governments*

Short-term Goal:

II-2: Identify and protect the remaining relatively healthy headwaters, biotic refuges (such as areas with relatively undisturbed, healthy habitat that serve as refuges for biodiversity), riparian areas, floodplains, and smaller, intact river habitats throughout the watershed. After protection of these healthy habitats is complete, begin to rehabilitate the areas between them to link these healthy portions together.[3]

Short-term Recommendations:

II-2a: Petition drain commissioners to establish site-specific conservation easements on Johnson, Sump, and Seeley Creeks/Drains, consistent with Section 541 of the Drain Code, in order to protect their unique fisheries. Similar efforts should be taken with other riparian owners on Fowler, Johnson, Sump, and Seeley Creeks/Drains and the Lower Branch of the Rouge River in Superior Township. In addition, all other alternatives for habitat protection should be investigated. *Primary responsibility: Citizens, riverside landowners, local governments, RRAC-Habitat*

II-2b: Secure commitments from 12 local groups (e.g. school groups, churches, community organizations, condominium associations, etc.) at or near the headwaters to adopt portions of the river for monitoring and protection, including habitat. *Primary responsibility: FOTR*

II-2c: Inventory all plant and animal species in the Rouge River Watershed and develop strategies for protection of habitat for endangered and threatened species. *Primary responsibility: Detroit Audubon Society, MDNR-Wildlife, RRAC-Habitat, universities*

II-2d: Ensure steps are taken to enhance habitat as part of all projects to rehabilitate existing physical structures or in the creation of new physical structures such as

retention basins, seawalls, and bulkheads. *Primary responsibility: MDNR-SWQD, MDNR-Fisheries, MDNR-LWMD, RRAC-Habitat*

II-2e: Assess and map Johnson, Sump, and Seeley Creeks for nonpoint sources causing sedimentation problems which impact fisheries. Develop management plans for these priority areas. *Primary responsibility: Oakland, Wayne, and Washtenaw counties, MDNR-SWQD, MDNR-LWMD, NRCS, local enforcing agencies, RRAC-NPS*

II-2f: Inventory and assess wetlands by 1997. Use this information to update and map critical recharge areas and wetlands. *Primary responsibility: MDNR-LWMD*

II-2g: Map the unnamed tributaries, drains, and intermittent streams of the headwaters to assist state and local governments in protecting these areas. *Primary responsibility: RRAC-Headwaters, FOTR, Wayne Co./RRNWWDP*

II-2h: Promote the FOTR "RiverWatch" program, a neighborhood-level citizen watch with an educational component. The program should include a reporting and follow up mechanism for violations and problems such as erosion from construction sites. *Primary responsibility: FOTR, local governments, Wayne Co./ RRNWWDP, SEMCOG, MDNR*

II-2i: Establish standards for environmentally sensitive land use practices in the developing headwater areas. *Primary responsibility: MDNR-SWQD, MDNR-LWMD, RRAC-Headwaters*

II-2j: Provide recommendations and information to local decision makers and encourage local initiatives regarding appropriate land use practices in environmentally sensitive areas (especially in the developing headwater areas), including land use restrictions, stormwater management, density of development, minimization of paved areas, and preservation of green corridors by holding a series of seminars/ workshops and by preparing a guidebook on proper practices for distribution. *Primary responsibility: RRAC-Habitat, RRAC-Headwaters, MDNR-SWQD, MDNR-LWMD*

II-2k: Educate the public regarding the protection of water quality and habitat in the headwater areas. *Primary responsibility: MDNR-SWQD, RRAC-Public Education*

II-2l: Hold a workshop of land-use planners, developers, and other stakeholders to address linking land-use, development, and river protection. *Primary responsibility: RRAC-Habitat, RRAC-Headwaters*

Long-term Recommendations:

II-2m: Develop alternative remedial options for stormwater control that may enhance or create new habitats (such as created wetlands for treatment of stormwater). *Primary responsibility: MDNR-SWQD , MDNR-LWMD*

II-2n: Encourage the planting of native species through local nurseries with a "Plant American" campaign to promote low impact landscaping. *Primary responsibility: RRAC-NPS, RRAC-Habitat*

II-2o: Evaluate what habitat improvements are needed and encourage/support local habitat improvement projects. *Primary responsibility: MDNR-Fisheries, MDNR-Wildlife*

II-2p: Develop a policy statement and operating procedures to guide stewardship of parklands adjacent to the river (such as maintaining natural corridors, limiting direct discharges, preserving and enhancing habitat, and managing for sustainable development). *Primary responsibility: Counties, local governments, RRAC-Habitat*

II-2q: Survey existing habitat, including habitat types and existing plant species, and create a habitat map. *Primary responsibility: MDNR-Wildlife, MDNR-LWMD, RRAC-Habitat*

Short-term Goal:

II-3: MDNR divisions should coordinate with other divisions/agencies in reviewing proposed developments.[4]

Short-term Recommendations:

II-3a: Develop standard policies and procedures for dealing with habitat issues for typical projects such as seawalls, and filling wetlands for development. *Primary responsibility: MDNR-LWMD, MDNR-Wildlife, MDNR-Fisheries*

II-3b: Develop a working relationship with the drain commissioners to be more involved in the decision-making process when drain alterations are proposed. This may include obtaining copies of draft proposals for review and comment. *Primary responsibility: MDNR-LWMD, MDNR-SWQD*

Long-term Recommendation:

II-3c: Provide input on applications for construction permits that directly impact the river and/or associated habitat. *Primary responsibility: MDNR-SWQD, MDNR-LWMD, MDNR-Wildlife, MDNR-Fisheries, RRAC-Habitat*

Long-term Goal:

II-4: Encourage the enhancement of existing wetlands and other critical habitats and the creation of new wetland habitats.[3]

Short-term Recommendations:

II-4a: Provide wetland determinations at the local government level. *Primary responsibility: Local governments, RRWC*

II-4b: Establish wetland ordinances at the local government level. *Primary responsibility: Local governments*

II-4c: Encourage local communities to implement in-stream restoration demonstration projects. These projects should focus on removal of excess logs and debris, bank stabilization, and improved fisheries habitat. Cost: $700,000 *Primary responsibility: Wayne Co./RRNWWDP, local governments*

II-4d: Encourage local governments to provide for a buffer zone along all water courses through local ordinances. *Primary responsibility: MDNR-LWMD, local governments*

Progress to Date

The following activities have been carried out to address the loss of fish and wildlife habitat:

- The City of Southfield received a 1989 Clean Waters Award from the Michigan Outdoor Writers Association for their 0.5 km aquatic habitat rehabilitation project in the Rouge River. During 1987 and 1988, six triangular wing dams were constructed of broken concrete and stone to create a sequence of deep pools and shallow riffles ideal for fish habitat. The project was expanded by 0.8 km in 1993.
- MDNR Fisheries Division is working in partnership with the Western Wayne County Conservation Association to preserve and enhance the cool water fishery habitat in Johnson Creek/Drain. Johnson Creek currently supports populations of brown trout and a "threatened" species called the redside dace. During 1994, efforts to stop bank erosion and enhance habitat were initiated in six locations along the creek.
- Commerce Township is developing a Seeley Drain Fishery Management Plan to maintain and restore Seeley Drain and the Upper Rouge River from its origin at the confluence of Seeley Drain and Minnow Pond Drain downstream to Eight Mile Road. The intent is to protect it as a high quality headwater stream and maintain a healthy population of the threatened fish, the redside dace. Components of this plan include protection of flow stability, control of nonpoint source pollution, preservation of floodplain wetlands, and maintenance of good water quality.

- The FOTR RiverWatch project is bringing year-round stewardship to the Rouge River for the first time by community and school groups taking responsibility for sections of the river. The project was officially launched in June 1994, with 17 groups that have either adopted a section of the river or one of its tributaries or have expressed interest in doing so. A training workshop was conducted on June 18, 1994. Groups will conduct quarterly cleanups and surveys of their section of the river beginning in September. Groups may also monitor water quality and conduct pollution prevention and habitat enhancement projects.
- The City of Novi, along with the Michigan Department of Transportation, is developing several artificial wetlands to compensate for those destroyed during construction of Highway M-5.
- The Village of Franklin adopted a zoning ordinance in June of 1994 that requires minimum setbacks from wetlands and watercourses for construction and other intrusive actions, such as removal of soils and vegetation.
- West Bloomfield Township is enforcing a strong floodplain and wetlands ordinance with a detailed permit system. The township utilizes a geographical information system (GIS) computer map, which delineates wetlands and floodplains, to aid in their permitting process.

Friends of the ROUGE

Rouge RiverWatch

Year-round stewardship of the Rouge River

- Two tree-planting projects were included in Rouge Rescue '94 to enhance habitat and stabilize stream banks. In the City of Detroit's Rouge Park, Friends of the Rouge cooperated with The Greening of Detroit, Global Releaf, and the Detroit Parks and Recreation Department's Forestry Division to purchase and plant 15 sycamore trees. The trees were placed in a picnic grove near the river with assistance from students from Hartland, Michigan. The City of Novi and Rouge Rescue '94 volunteers planted a variety of trees and shrubs in order to stabilize banks near the headwaters of the Upper Rouge close to Walled Lake.
- Citizens in the City of Northville formed the non-profit corporation called the "Friends of the Mill Pond" to enhance and maintain the Mill Pond and the surrounding area as a wildlife refuge. They would like to make the pond more accessible to the general public, and enhance the recreational, educational, ecological and historical value of the pond.
- Approximately five years ago, the City of Rochester Hills acquired lands through the Michigan Land Trust Fund with the intent of preserving significant wetlands in the watershed. The uplands were developed into the Pine Trees Golf Course and the wetlands were preserved.
- Wayne County Parks notified a number of homeowners regarding illegal tree removal and encroachment upon the river.

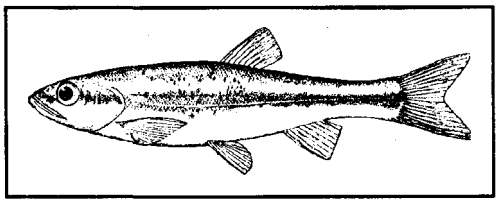
Volunteers made wildlife nesting boxes

- The Friends of the Rouge is sponsoring a project to build and place nesting boxes for wood ducks, bluebirds, tree swallows, and brown bats. The project began in 1992 at the University of Michigan-Dearborn where volunteers built and placed nearly a dozen wood duck nesting boxes in the University's outdoor education center. Frank Walker and his Monroe Elementary Nature Club have placed nearly a dozen wood duck nesting boxes in the City of Wayne's natural area. An Eagle

Scout troop has built dozens of bluebird boxes and bat nesting boxes. Boy scouts, cub scouts, and school groups in Canton Township and the cities of Birmingham, Bloomfield, Plymouth, Livonia, Dearborn, and Detroit have contributed to the project. The Riverdale Park neighborhood of Detroit is reducing its annual insecticide spraying and encouraging bat populations to control mosquitos by building bat nesting boxes.

Degradation of Fish Populations

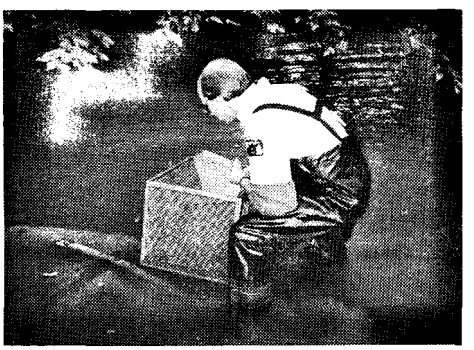
Rank 3



Redside Dace (threatened species)

Fish populations are degraded in all branches of the Rouge River, although there are some healthy populations in some headwater areas. Fish populations are considered degraded when their numbers are below that which are expected for a given habitat. Fish are harmed by degradation of their environment. For example, soil particles eroded from upstream construction can (1) increase water temperature, (2) deposit on the stream bottom covering habitat and (3) clog fish gills. The breakdown of organic nutrients from combined sewer overflows and illegal discharges can reduce the amount of oxygen in the water, suffocating fish. In addition, toxic chemicals sometimes released with CSO discharges can cause fish kills. Alteration of natural water flow patterns can create extremes in water temperature and flow conditions (such as droughts and floods), as well as artificially increase the rate of streambank erosion. These rapid changes in stream flow can negatively affect aquatic species. Minimizing flow fluctuations is critical to the survival of fish populations.

Nonpoint source pollution, including uncontrolled runoff from construction sites, storm sewer discharges, separate and combined sewer overflows, fluctuating stream flow caused by a greater percentage of impervious surfaces (such as concrete and asphalt), unpermitted discharges and illegal spills, and contaminated sediments all contribute to the degradation of habitat and therefore fish populations. The original RAP document recommended that the MDNR prepare a fisheries management plan for the Rouge River to determine the health of fish species and make recommendations for improving fish populations.



MDNR Caged fish study

Goals and Recommendations

Long-term Goal:

III-1: Protect and enhance fish populations.

Short-term Recommendations:

III-1a: Perform a fisheries watershed assessment.[5] Cost: $270,000 *Primary responsibility: MDNR-Fisheries, Wayne Co./RRNWWDP*

III-1b: Stabilize fluctuating flow rates to the maximum extent practicable. This can be done by requiring stormwater retention facilities adequate to minimize high flow discharges during rainstorms and by requiring the use of best management practices to minimize the effects of stormwater runoff. *Primary responsibility: MDNR-LWMD, local governments*

III-1c: Monitor and protect threatened, rare and endangered aquatic species from the effects of development and pollution. *Primary responsibility: MDNR-Wildlife, MDNR-Fisheries*

III-1d: Conduct field-validated fish and wildlife bioassays to confirm significant toxicity from water column or sediment contaminants. *Primary responsibility: MDNR-SWQD*

Long-term Recommendations:

III-1e: Implement the recommendations of the fisheries watershed assessment. *Primary responsibility: MDNR-Fisheries*

III-1f: Continue efforts to develop angling opportunities in higher quality portions of the river such as Johnson Creek. *Primary responsibility: MDNR-Fisheries*

III-1g: Perform follow up studies to determine if remedial actions have restored fish populations to formerly degraded areas. *Primary responsibility: MDNR-Fisheries*

III-1h: Ensure that new sources of impairment are prevented. *Primary responsibility: MDNR-SWQD*

Progress to Date

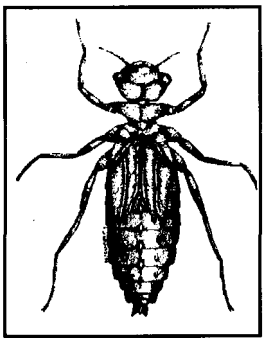
The following activities have been carried out to monitor or improve the viability of fish populations:

- The MDNR conducted exploratory fish surveys in 1993-1994 along portions of the Rouge River. Nineteen different fish species were found, including three species of bass, salmon, sunfish, northern pike, steelhead, and many other warmwater species. (See Chapter 6 for further detail.)
- The MDNR continues to study Johnson Creek/Drain to evaluate the Creek/Drain's ability to support cold water fish. Since 1990, the MDNR has monitored water temperatures. The MDNR has stocked the creek with brown trout since 1992 and stocking will continue through 1997. Each fall, MDNR Fisheries Division assesses the brown trout and redside dace populations and their habitat.
- Efforts have been made to protect and enhance fish habitat in the headwaters including the Johnson and Seeley Creeks/Drains. These activities include bank stabilization and increased monitoring of construction activities for control of runoff.

Degradation of Benthos

Rank 3

Benthos are considered to be impaired in the Rouge River Watershed, but the geographical extent of this impairment is not known at this time. Benthos are bottom-dwelling organisms, such as aquatic insects, that live in the river for at least part of their lives. Because they are sensitive to physical and chemical changes in their habitat (including decreased oxygen levels) and cannot easily escape pollution as some fish can, they are useful indicators of a river's water quality. Benthic macroinvertebrates are those benthos that can be seen with the human eye, such as the dragonfly nymph.



Dragonfly nymph

In the Rouge River, benthos populations are degraded by nonpoint source pollution, stormwater discharges, combined sewer overflows, separate sewer overflows, contaminated sediments, erratic stream flow, illegal spills and discharges, and municipal and industrial discharges. The original Rouge RAP document did not directly address the degradation of benthos populations.

Goals and Recommendations

Long-term Goal:

IV-1: Benthic macroinvertebrate communities throughout the Rouge River Watershed should routinely achieve a rating of at least "good" (or slightly impaired) as defined in the MDNR's Great Lakes and Environmental Assessment Section Procedure 51.

Short-term Recommendations:

IV-1a: Reduce the input of substances that adversely affect levels of dissolved oxygen such as fertilizers, human and animal feces, and chemicals. *Primary responsibility: MDNR-SWQD*

IV-1b: Lower stream temperature wherever possible by increasing streambank vegetation and require low flow, cool water discharges from stormwater retention basins.[3] *Primary responsibility: MDNR-SWQD, MDNR-LWMD, local governments, RRAC-Habitat*

IV-1c: Stabilize stream banks to reduce erosion and decrease streambed siltation.[3] *Primary responsibility: Local governments, FOTR, RRAC-Habitat*

Long-term Recommendations:

IV-1d: Augment aeration by increasing the number of riffles through in-stream habitat improvements.[3] *Primary responsibility: Local governments, RRAC-Habitat, environmental organizations*

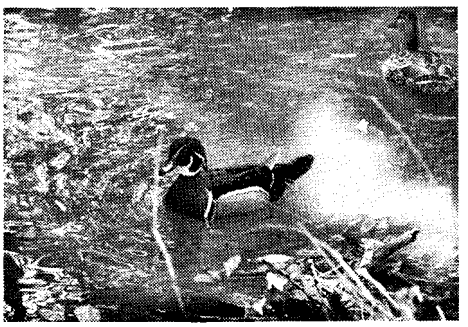
IV-1e: Conduct monitoring to determine if remedial actions have eliminated the degradation of benthos. *Primary responsibility: MDNR-SWQD*

IV-1f: Ensure that benthic habitat is protected for future populations. *Primary responsibility: MDNR-SWQD*

Degradation of Wildlife Populations

Rank 3

At the present time, no studies have been conducted to determine if wildlife populations have been degraded, therefore the status of this impairment is considered to be unknown. Widespread degradation is suspected, however, largely due to the loss of fish and wildlife habitat and generally poor water quality. Contaminants can be transferred to animal populations when they drink river water or eat fish or plants from the river. Contaminants can become concentrated (or bioaccumulate) in animal tissues and cause disease as well as genetic mutations in wildlife offspring. Degradation of wildlife populations can significantly change the balance of the entire ecosystem. Destruction of wildlife habitat also has a significant impact on wildlife populations and is discussed in further detail under the section entitled "Loss of Fish and Wildlife Habitat." The original RAP document did not address the degradation of wildlife populations.



Wood duck, Northville

Goals and Recommendations

Long-term Goal

V-1: Protect and enhance wildlife populations within the Rouge River Watershed with special emphasis on protection of rare, threatened or endangered species.

Short-term Recommendations:

V-1a: Perform studies necessary to determine wildlife species diversity and total number present. Once this information is known, degradation of wildlife populations should be evaluated. *Primary responsibility: MDNR-Wildlife, MDNR-SWQD, environmental organizations*

V-1b: Develop a wildlife management plan to encourage/enhance desired wildlife species and protect existing species. *Primary responsibility: MDNR-Wildlife*

V-1c: Monitor and protect any identified endangered, threatened, rare or wildlife species of concern. *Primary responsibility: MDNR-Wildlife*

V-1d: Provide technical input on proposed development that may have a negative impact on wildlife. *Primary responsibility: MDNR-Wildlife, MDNR-LWMD, RRAC-Habitat*

Long-term Recommendations:

V-1e: Monitor contaminants in wildlife food sources (fish, plants, insects) and habitats (including sediments) as an indicator that wildlife may be negatively impacted. In contaminated areas, monitor contaminants in wildlife also. *Primary responsibility: MDNR-Wildlife, MDNR-SWQD*

V-1f: Implement work items as identified by the management plan which may include habitat protection, development of new habitats, restoration and/or modification of existing habitat. *Primary responsibility: MDNR-Wildlife, MDNR-SWQD, RRAC-Habitat*

V-1g: Perform monitoring to determine if wildlife populations are restored. *Primary responsibility: MDNR-Wildlife, environmental organizations, universities*

Eutrophication or Growth of Undesirable Algae

Rank 4

Eutrophication or undesirable algae can be found in all branches of the Rouge River, although it is less evident in the headwaters areas. Eutrophication is a natural process that all water bodies experience over geologic periods of time (hundreds of years). Symptoms of eutrophication include an increase in plant growth, low dissolved oxygen concentrations and stagnant water. Eutrophication occurs as the water body ages and matures into the next stage, a wetland.

Although eutrophication is a natural process, human activities can significantly accelerate it by adding excessive nutrients to a water body. This type of eutrophication is called "cultural eutrophication." Examples of nutrient sources of human origin include lawn fertilizers and wastes from leaking septic systems such as those shown in Figure 6. Phosphorus used to make lawns and gardens green can also cause heavy plant growth and nuisance algal blooms when it runs off with rainwater into a river. Excessive algae can, in turn, deplete oxygen levels during the night. Many fish kills occur due to this type of oxygen depletion.

In the Rouge River Watershed, probable sources of excessive nutrients include nonpoint source pollution, storm sewer discharges, combined sewer overflows, separate sewer overflows, permitted municipal and industrial discharges, contaminated sediments, stream flow, and illegal discharges. The original RAP document did not directly address the eutrophication issue.

Goals and Recommendations

Long-term Goal

VI-1: Eliminate cultural eutrophication or undesirable algae.

Short-term Recommendations:

VI-1a: Determine what concentration of phosphorus is appropriate for the Rouge River. *Primary responsibility: MDNR-SWQD, Wayne Co./RRNWWDP*

VI-1b: Monitor phosphorus and other nutrient levels to identify problem areas. *Primary responsibility: MDNR-SWQD, Wayne Co./RRNWWDP*

Long-term Recommendation:

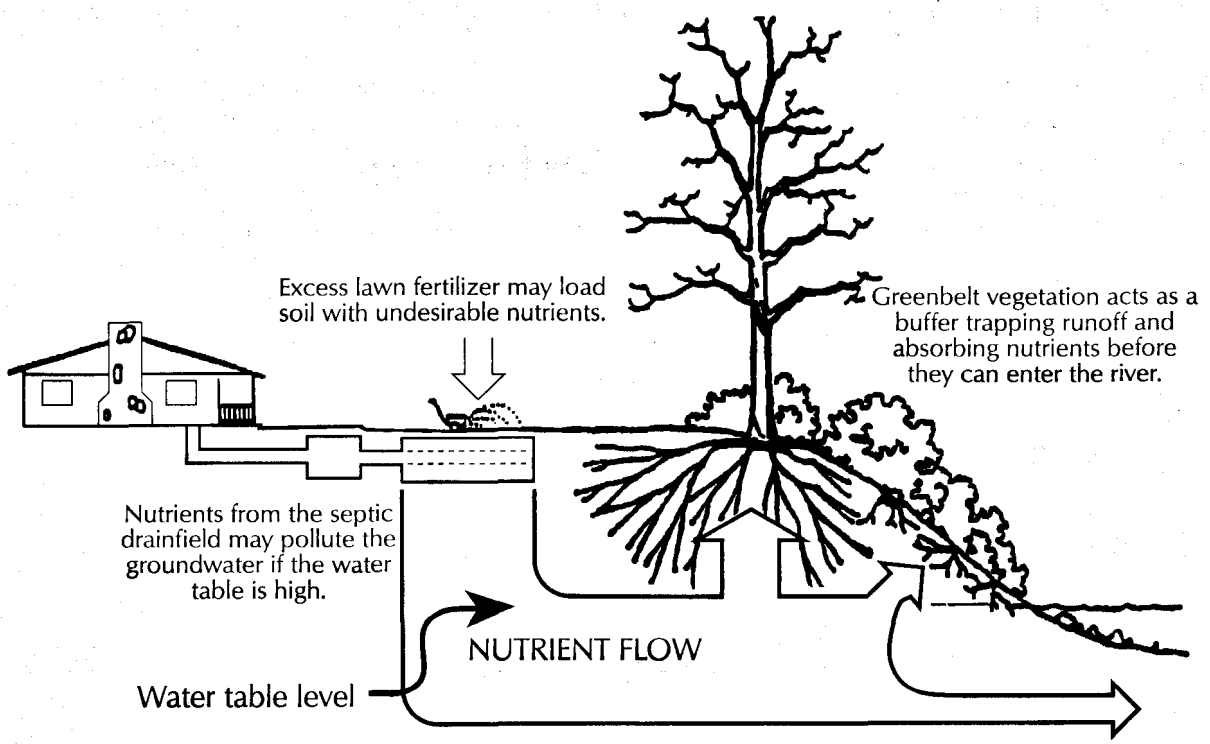
VI-1c: Reduce phosphorus and other nutrient inputs to appropriate levels. *Primary responsibility: MDNR-SWQD, Wayne Co./RRNWWDP, local governments*

Progress to Date

The following activities have been carried out to address eutrophication issues:

- West Bloomfield Township collected water quality data from their lakes in 1992 and 1993. The township's goal was to establish baseline information for each body of water to make inferences about water quality, detect any changes that may impair use of the resource and make recommendations to lake user groups regarding management of the lakes. The studies found that many of the lakes are in a critical stage of redevelopment, with large homes replacing small cottages. The studies made recommendations specific to each lake and encouraged all lake residents to re-establish greenbelts at the shoreline, eliminate fertilization near the lake, stop the feeding of geese and other waterfowl, and preserve remaining wetlands.

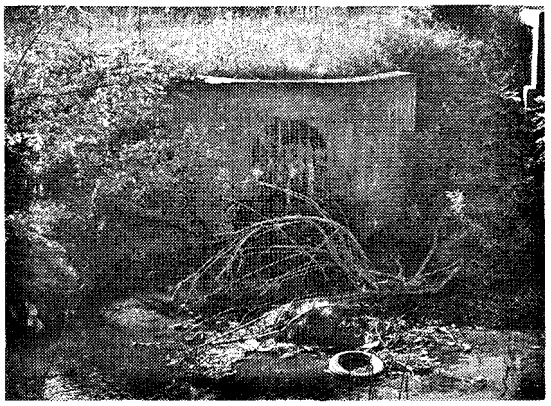
Figure 6
Sources of Eutrophication



- The MDA, NRCS and local Soil Conservation Districts were involved in a $11,000 project to develop and implement methods for reducing phosphorus pollution entering Lake Erie from the River Raisin and Lower Rouge River. The purpose of the project was to reduce nutrient loading from sediment, fertilizers and animal wastes, as well as reduce erosion and sediment deposition. Pollution control methods focused on both agricultural and urban land use practices and included 15,000 acres of conservation tillage, 500 acres of permanent vegetative cover, four sediment basins, and 100 acres of filter strips. Technical assistance was also provided by the Soil Conservation Service to the participating farmers. The project was successful, with phosphorus loading reductions exceeding the project's target levels.

Degradation of Aesthetics

Rank 4



Trash and debris degrade aesthetics

The aesthetic value or appearance of the Rouge River is degraded by large log jams, unnatural color from wastewater discharges, turbidity or cloudiness, solid waste or garbage, oil, and unnatural odors. The river is considered to be impaired in all branches, except the headwaters areas. Sources that contribute to degradation include nonpoint source pollution, storm sewer discharges, combined sewer overflows, separate sewer overflows, contaminated sediments, erratic stream flows, permitted municipal and industrial discharges, and illegal dumping or discharges. The original RAP document contained the goal of eliminating nuisance odors, debris, and log jams and recommended the development of a log jam and debris master plan that was never completed.

Goals and Recommendations

Long-term Goal

VII-1: Eliminate objectionable deposits, unnatural color or turbidity, and unnatural odors that interfere with river aesthetics.[6] It should be noted that the removal of all woody debris is not recommended, because in some cases it provides important habitat for aquatic organisms.

Short-term Recommendations:

VII-1a: Continue the annual Rouge Rescue that removes excessive log jams, garbage, and other solid waste from the Rouge River and its tributaries. The number of cleanup sites should be continually increased until the entire watershed is covered by the annual cleanup.[7] *Primary responsibility: Local governments, FOTR*

VII-1b: Eliminate/control nonpoint sources that contribute objectionable deposits, colors and odors. *Primary responsibility: MDNR-SWQD, local governments, RRAC-NPS*

Long-term Recommendations:

VII-1c: Support citizen stewardship programs such as the RiverWatch, an adopt-a-stream program through the Friends of the Rouge, that will encourage year-round cleanup and stewardship activities.[7] *Primary responsibility: FOTR, local governments, RRAC-Public Education*

Progress to Date

The following activities have been carried out to address the degradation of aesthetics:

- The Friends of the Rouge conduct a yearly cleanup of the Rouge River to remove trash and large log jams.
- Many municipalities, such as the City of Detroit, remove large log jams and debris on a regular basis.

Restrictions on Fish Consumption

Rank 5

Restrictions on fish consumption have been issued by the Michigan Department of Public Health for several species of fish within the Rouge River Watershed including carp, catfish, suckers, bass, and northern pike. Elevated levels of polychlorinated biphenyls (PCBs) and mercury in these fish have required fish consumption to be restricted in the Main, Middle, and Lower branches of the river. Figure 8 shows which portions of the Rouge River are presently under these fish consumption advisories and which fish species are restricted.

Mercury is considered to be a highly toxic heavy metal that, along with other metals, is found in air pollution in Michigan. These metals can be deposited directly into rivers as they fall out of the air or carried by rainfall and snow. These same metals may also be contained in discharges from combined or separate sewers. PCBs are a class of toxic substances that are resistant to the high temperatures used in cooking and do not readily break down in the environment. PCB contamination of the fish in the Rouge River is believed to have originated from sediments that became contaminated from previous industrial discharges.

PCBs and heavy metals such as mercury can concentrate in the fat of fish and be passed to humans when those fish are eaten. Figure 7 describes the proper way to clean fish caught in the Rouge River in order to reduce the contaminants consumed. Bottom-feeding fish such as carp and suckers ingest higher concentrations of these contaminants because they continually come in contact with PCBs and mercury as they forage for food in the sediments. Contaminant levels also tend to be higher in larger predatory fish, such as northern pike and bass, because they eat many smaller contaminated fish. If people eat contaminated fish in excess of amounts recom-

Figure 7
Proper Fish Preparation

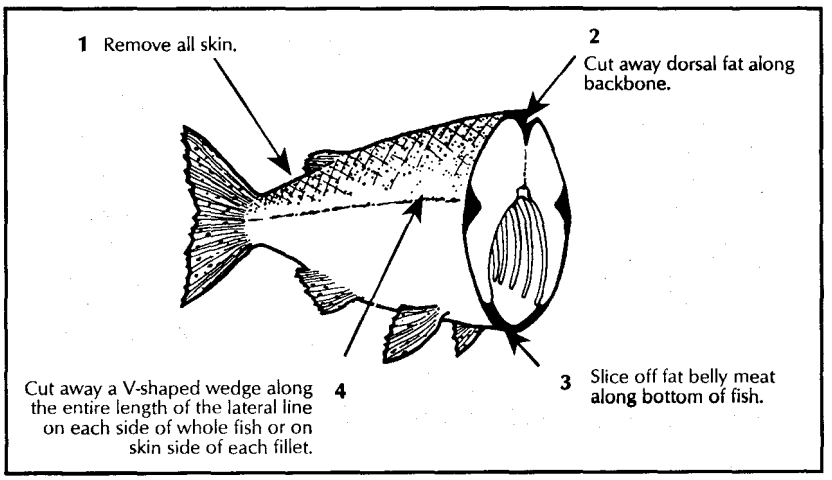
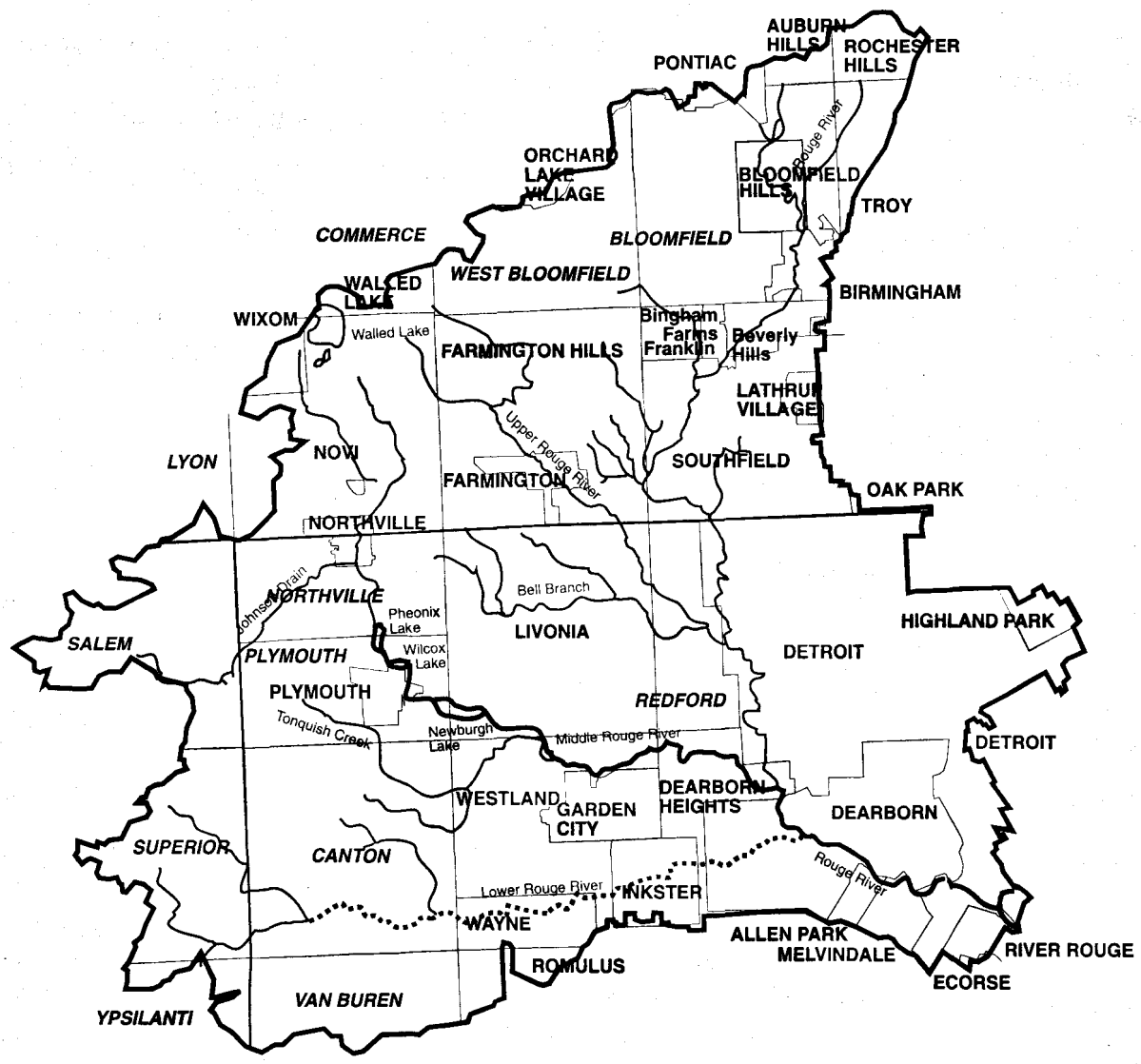


Figure 8
Rouge River Watershed Fish Consumption Advisories



For this portion of the River:

No Consumption of the following fish:

- Northern Pike
- Largemouth Bass
- Catfish
- White Suckers
- Carp
- Smallmouth Bass

Restrict Consumption of the following fish:
All other species except those listed under "No Consumption", no more than one meal per week. Nursing mothers, pregnant women, women who intend to have children, and children under age 15 should not eat **any** fish in this area.

For this portion of the River:

No Consumption of the following fish:

- White Suckers
- Carp

For all inland lakes and reservoirs in Michigan:
No one should eat more than one meal a week of the following kinds and sizes of fish; rock bass, perch or crappie over 9 inches in length; largemouth bass, smallmouth bass, walleye, northern pike, or muskie of any size.

mended, they, in turn, may store PCBs and mercury in their tissues where it may cause negative health effects. This magnification of contaminant levels is known as "bioaccumulation" (See Figure 9) and is the basis for the restrictions to fish consumption in the Rouge River. Smaller fish that do not feed on the bottom or on other fish tend to have lower concentrations of pollutants, therefore consumption of these fish is less severely restricted.

The original RAP document called for studies to determine the source and extent of PCB contamination responsible for the fish consumption advisories. PCB studies completed to date can be found in Chapter 6, "Updated Rouge River Studies and Reports."

Goals and Recommendations

Long-term Goal

VIII-1: Work toward the elimination of fish consumption advisories in resident fish.

Short-term Recommendation:

VIII-1a: Determine the sources of elevated PCB and mercury levels in fish in the lower parts of the Main, the Middle, and the Lower branches by performing outfall and sediment surveys. Once the sources have been identified, eliminate these sources.[8] *Primary responsibility: MDNR-SWQD, Wayne Co./RRNWWDP, DWSD*

Long-term Recommendations:

VIII-1b: Remediate sediment contamination in Newburgh Lake and in the Lower and Middle branches. Actions may include removal and proper disposal of contaminated sediments.[8] *Primary responsibility: MDNR-SWQD, Wayne Co./RRNWWDP*

VIII-1c: Monitor fish tissue to determine if remedial actions have eliminated contaminants causing fish advisories. *Primary responsibility: MDNR-SWQD, MDPH*

VIII-1d: Ensure that future discharges that may contain contaminants that contribute to fish advisories are controlled. This can be accomplished by establishing an ongoing water quality monitoring program throughout the watershed with follow-up enforcement of any violations. *Primary responsibility: MDNR-SWQD, industrial dischargers*

Progress to Date

The following activities have been carried out to address restrictions on fish consumption:

- The Wayne County/RRNWWDP sampled sediments at various locations throughout the watershed and conducted a more detailed survey of Newburgh Lake to better define the extent and concentration of PCB and metals contamination. Results of this monitoring have not yet been released.
- MDNR conducts periodic sampling of Rouge River fish to measure contaminant levels in their flesh to determine the need for fish consumption advisories. The most recent sampling was conducted in 1988. The MDNR-SWQD District Office has requested sampling for the 1995 season to update these records and find out if more areas should be under fish consumption advisories or if some existing restrictions can be eliminated.
- In 1989, the MDNR-SWQD conducted an intensive survey of the Middle and Lower Rouge to determine the source of PCB and metals contamination and the geographical extent of the contamination. PCB contamination was highest in the Newburgh and Nankin Lake impoundments with an average fish tissue concentration of 8.9 mg/kg, which is well above the MDPH trigger level of 2mg/kg. A more detailed description of the results of this survey can be found in Chapter 6.

Bird or Animal Deformities or Reproductive Problems

Rank 6

At present, no studies have been conducted to determine if bird and wildlife populations within the Rouge River Watershed have been affected by contaminants. The status of this impairment is therefore considered to be unknown. Deformities can occur in bird and wildlife populations due to environmental pollutants. Contamination of aquatic plants and animals with heavy metals and organic chemicals can accumulate in animal tissues (called bioaccumulation) and cause deformities or genetic changes in future generations (see Figure 9). The original RAP document did not directly address bird and animal deformities or reproductive problems.

Goals and Recommendations

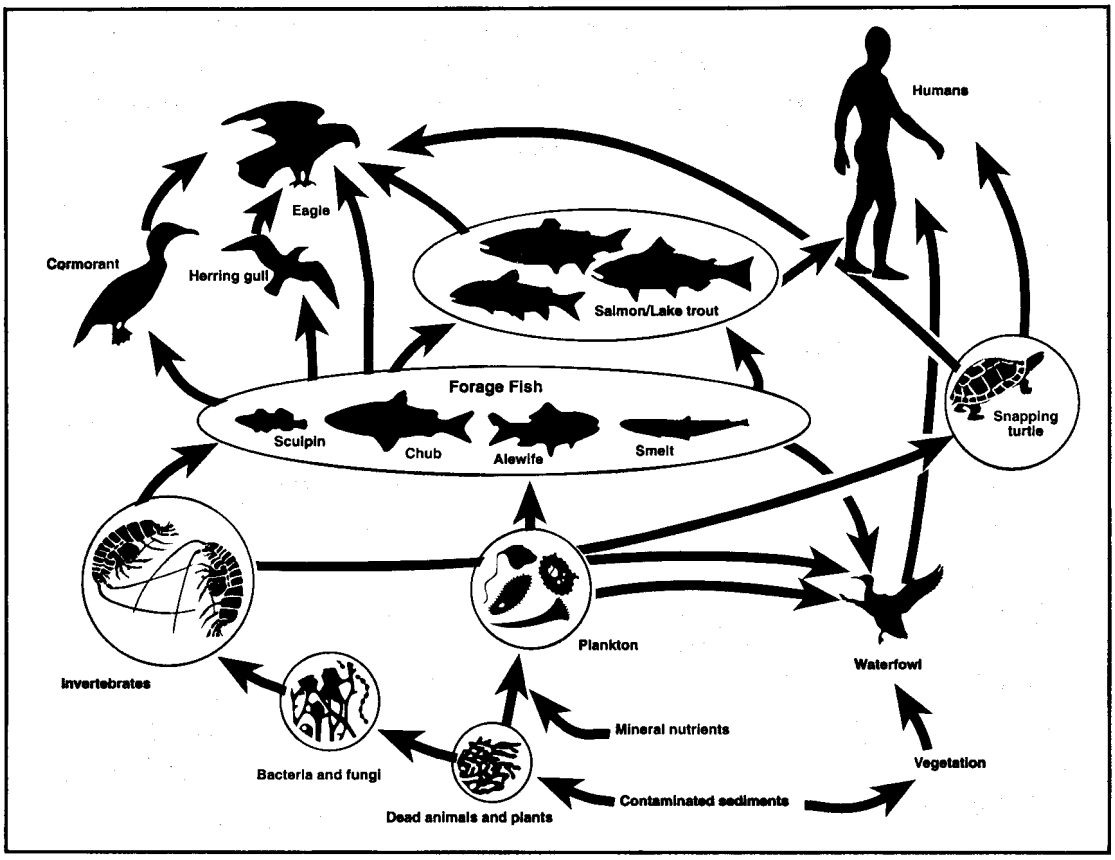
Long-term Goal

IX-1: Determine if deformities or reproductive problems exist in bird and animal populations and reduce their occurrence if present.

Short-term Recommendation:

IX-1a: Conduct surveys necessary to determine whether or not deformities (such as cross-bill syndrome) or other reproductive problems (such as egg-shell thinning) exist in resident wildlife species. *Primary responsibility: MDNR-Wildlife, environmental organizations, universities*

Figure 9
Great Lakes Food Chain and Bioaccumulation



Long-term Recommendations:

IX-1b: If a problem is identified, develop and implement a workplan to eliminate pollutant sources that are causing deformities and reproductive problems. *Primary responsibility: MDNR-SWQD, MDNR-Wildlife*

IX-1c: Perform monitoring to determine if remedial activities have eliminated animal deformities or reproduction problems. *Primary responsibility: MDNR-Wildlife*

IX-1d: Ensure that future populations of birds and wildlife do not develop contaminant caused deformities or reproduction problems. *Primary responsibility: MDNR-SWQD*

Restrictions on Dredging Activities

Rank 7

Maintenance dredging at the mouth of the Rouge River is done annually by the Army Corps of Engineers to allow for shipping traffic. Dredging activities are restricted due to contamination of sediments that limits where the dredged materials may be disposed. Rivers are dredged to remove sediments and debris that can slow the river's flow and impede navigation. Solids build up on the river's bottom from erosion and other inputs upstream. A confined disposal facility has been established at Pointe Mouillee for the disposal and required containment of contaminated dredgings from the Rouge and Detroit Rivers.

Local maintenance dredging in other areas of the watershed has not been well regulated. Dredged materials from drain cleaning projects are normally deposited on the adjacent streambanks. These exposed sediments, which may be contaminated, pose a potential threat to human health and may reintroduce contaminants to the water column. Monitoring or restriction of these types of activities is necessary to prevent further degradation of water quality and reduce human health risks.

Dredging restrictions are caused by contaminated sediments, combined and separate sewer overflows, and permitted municipal and industrial discharges. Dredging activities are restricted in the Middle Branch, impoundments, and the mouth of the Rouge River. Further study is needed to determine the extent of this impairment within the watershed. The original RAP document recommended that cleanup of river sediments should be pursued. For further discussion of this topic, see the "Contaminated Sediments" section of Chapter 2.

Goals and Recommendations

Short-term Goal

X-1: Ensure that local governments are made aware of areas with contaminated sediments in order to reduce environmental and human health risks from exposure to these sediments.

Short-term Recommendations:

X-1a: Survey and identify areas where dredging, cleaning, or construction activities may disturb contaminated bottom sediments. *Primary responsibility: MDNR-SWQD, county health departments*

X-1b: Compile data on locations of sediment contamination into a reference manual to be used by local DPW directors and drain commissioners in order to prevent their activities from releasing sediment contamination back into the river and to assure proper disposal of dredge spoils. *Primary responsibility: MDNR-SWQD, local governments*

Long-term Goal

X-2: Eliminate restrictions on dredging activities.

Short-term Recommendation:

X-2a: Reduce contaminants in sediments below present standards so that restrictions on dredging or disposal activities can be removed. This may include removal and proper disposal of contaminated sediments. *Primary responsibility: MDNR-SWQD*

Long-term Recommendations:

X-2b: Conduct sampling to determine if remedial activities have reduced sediment contaminants below dredge spoil criteria. *Primary responsibility: USACE, MDNR-SWQD*

X-2c: Once sediments are remediated, ensure that future contamination of sediments does not occur. *Primary responsibility: MDNR-SWQD*

Progress to Date

The following activities have been carried out to address restrictions on dredging activities:

- Wayne County/RRNWWDP conducted a watershed-wide sediment survey in which sediment samples were taken at various locations throughout the Rouge River Watershed. They also carried out a more detailed sediment survey of Newburgh Lake, one of the impoundments along the Middle Rouge River.[8]
- The Army Corps of Engineers has collected most of the sediment sampling data for the Rouge River, as well as other rivers in Southeast Michigan, and consolidated the information into a single database.

Fish Tumors or Other Deformities

Rank 8

Fish tumors occur due to natural causes, such as viruses or hereditary weaknesses, in approximately one percent of fish populations. Contaminants in the Rouge River are believed to cause fish tumors or other deformities in more than one percent of the total fish community. More studies are needed to determine the geographical extent of this impairment. Probable sources of contaminants that can cause deformities include nonpoint source pollution, stormwater discharges, combined sewer overflows, separate sewer overflows, contaminated sediments, and illegal spills and discharges. The issue of fish tumors and other deformities was not directly addressed in the original RAP document.

Goals and Recommendations

Long-term Goal

XI-1: Reduce contaminant-caused tumors to less than two percent of the fish population.

Short-term Recommendation:

XI-1a: Perform studies to determine the percentage of fish that have contaminant-related tumors. Determine which specific contaminants are causing tumors. *Primary responsibility: MDNR-SWQD*

Long-term Recommendations:

XI-1b: Perform monitoring necessary to determine the source of pollutants that cause fish tumors. *Primary responsibility: MDNR-SWQD*

XI-1c: Develop and implement a workplan to eliminate sources of contamination in the water column and sediments that are responsible for tumors in fish populations. *Primary responsibility: MDNR-SWQD*

XI-1d: Perform follow-up studies to determine if remedial activities have decreased the incidence of contaminant-caused fish tumors to below two percent in the populations surveyed. *Primary responsibility: MDNR-SWQD*

XI-1e: Ensure that the incidence of contaminant-caused tumors in future fish populations does not exceed two percent of the populations surveyed. *Primary responsibility: MDNR-SWQD*

Tainting of Fish and Wildlife Flavor

Rank 9

At the present time, no studies or surveys have been conducted to determine if the flavor of fish within the Rouge River Watershed is tainted by waterborne contamination. Contaminants that fish and wildlife consume, however, may be affecting the taste of fish and wildlife flesh. The original RAP document did not address tainting of fish and wildlife flavor.

Fishing on the Middle Branch

Goals and Recommendations

Long-term Goal

XII-1: Determine if tainting of game fish and wildlife flavor exists and, if present, eliminate any sources of contamination that may cause an undesirable taste.

Short-term Recommendations:

XII-1a: Conduct surveys of individuals who hunt and fish to determine if tainting of fish and wildlife flavor exists. *Primary responsibility: MDNR-SWQD, MDNR-Wildlife*

XII-1b: If fish and wildlife flavor is tainted, determine if water quality standards for substance(s) that can cause tainting are being exceeded. *Primary responsibility: MDNR-SWQD*

Long-term Recommendations:

XII-1c: Take actions necessary to eliminate sources contributing to violations of those water quality standards being violated. *Primary responsibility: MDNR-SWQD*

XII-1d: Conduct a follow up survey to determine if remedial actions taken have eliminated the tainted taste. *Primary responsibility: MDNR-SWQD*

XII-1e: Control contamination sources to ensure that future tainting does not occur. *Primary responsibility: MDNR-SWQD*

Restrictions to Navigation

Rank 10

Although not included as one of the original use impairments defined by the International Joint Commission, restrictions on commercial and recreational navigation were cited in the original RAP document as one of the impaired uses. Erosion of soil from streambanks, construction sites, and other sources significantly increases the amount of particles in the streambed and impoundments which, if allowed to accumulate, can impair navigation. Shipping traffic at the mouth of the river would become severely restricted if annual dredging of the channel did not occur. The Army Corps of Engineers maintains the channel so that industries along the Rouge River can receive goods and raw materials that are transported by ship.

Farther inland, however, maintenance dredging is done only to remove flow obstructions that cause flooding. Large log jams and other debris make the river impassable in many places. The annual "Rouge Rescue," sponsored by the Friends of the Rouge, helps to remove some of these obstructions only to have others occur the next year. Smaller boats are able to maneuver adequately in the larger impoundments on the Middle Rouge and the channelized portion of the Main Branch. Restriction to navigation can be caused by erratic stream flows that accelerate the erosion of streambanks, creating natural obstructions from downed trees and sediment buildup.

Large log jams impede navigation

Goals and Recommendations

Long-term Goal

XIII-1: Identify and eliminate sources that are contributing to the obstruction of stream channels.

Short-term Recommendations:

XIII-1a: Support the annual Rouge Rescue to remove excessive log jams, garbage, and other solid waste from the Rouge River and its tributaries. The number of cleanup sites should be continually increased until the entire watershed is covered by the annual cleanup.[7] *Primary responsibility: Local governments, FOTR and participants*

XIII-1b: Encourage bank stabilization activities to reduce the number of trees that are washed into the river as banks are eroded away.[7] *Primary responsibility: MDNR-SWQD, RRAC-Habitat, FOTR, local governments*

See "Degradation of Aesthetics" and "Stream Flow" (Chapter 2) sections for other goals, recommendations, and progress related to navigation issues.

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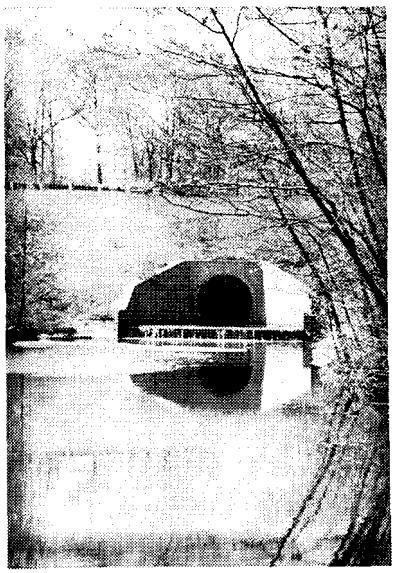
[1]Refers to Primary RAP Goal 13
[2]Refers to RAP Recommendations F-3 and F-4
[3]Refers to RAP Recommendation F-3
[4]Refers to RAP Recommendation F-4
[5]Refers to RAP Recommendation F-5
[6]Refers to Primary RAP Goal 20
[7]Refers to Primary RAP Recommendation H-1
[8]Refers to RAP Recommendation G-6

CHAPTER 2
SOURCES OF IMPAIRMENT

"It was the Rouge River Remedial Action Plan that first drew attention to the problem of combined sewer overflows in the Rouge River Watershed and prompted the initiation of the Rouge River National Wet Weather Demonstration Project. This update will help those working to protect the river better understand the pollutant sources that must be controlled. EPA will continue to work closely with state and local agencies to restore the Rouge so that it may once again be an asset to Southeast Michigan."

Valdas V. Adamkus,
EPA Region V Administrator



INTRODUCTION

Many pollutant sources cause use impairments in the Rouge River. Most of these sources of pollution cause impairments to one or more designated uses. For example, discharges from combined sewer overflows (CSOs) can restrict swimming and other water-related recreation, degrade aesthetics, contaminate sediments, and negatively affect fish, wildlife, and benthos populations.

The original Rouge River RAP focused almost exclusively on pollutant sources that were degrading the river, as opposed to the use impairments. Those pollutants which posed the greatest immediate risk to human health were addressed first. These included CSOs, industrial and municipal discharges, and separate sewer bypasses.

Figure 10 shows total loadings of selected parameters (suspended solids, biochemical oxygen demand, and phosphorus) from nonpoint source pollution (NPS), CSOs, and point sources as estimated in the 1989 RAP document. Wayne County's RRNWWDP is also estimating loadings, but these estimates are still under review. General preliminary observations from the RRNWWDP are included, however, for information purposes. It is important to realize that the proportion of loadings from a particular source varies throughout the watershed as well as over time. In general, most of the point sources in the watershed, particularly the Ford Rouge Plant, are concentrated near the mouth of the river and therefore do not affect the watershed as a whole. Conversely, NPS pollution loadings are more important upstream and affect nearly the entire watershed. CSO loadings are concentrated, of course, within and downstream of areas with combined sewers (see Figure 13 for locations of CSOs). Loadings generally increase during wet weather events and decrease during dry weather as stormwater and CSO pollutants decrease.

Suspended solids can include particles such as soil, heavy metals, and organic materials. High levels of suspended solids degrade water quality and directly affect aquatic life by clogging fish gills, smothering eggs of aquatic insects and fish, and destroying the microhabitats of mayfly nymphs and other aquatic insects. Preliminary observations from the RRNWWDP are that levels of total suspended solids (TSS) are generally low during dry weather, with some exceptions in the Lower and Main branches of the river. TSS concentrations are generally high during wet weather conditions. The 1989 RAP estimated that 174,465,858 pounds of TSS were discharged into the Rouge River each year: 88 percent NPS pollution, 8 percent from CSOs and 4 percent from point sources.

Figure 10
Rouge River Watershed Selected Loading Estimates, 1989

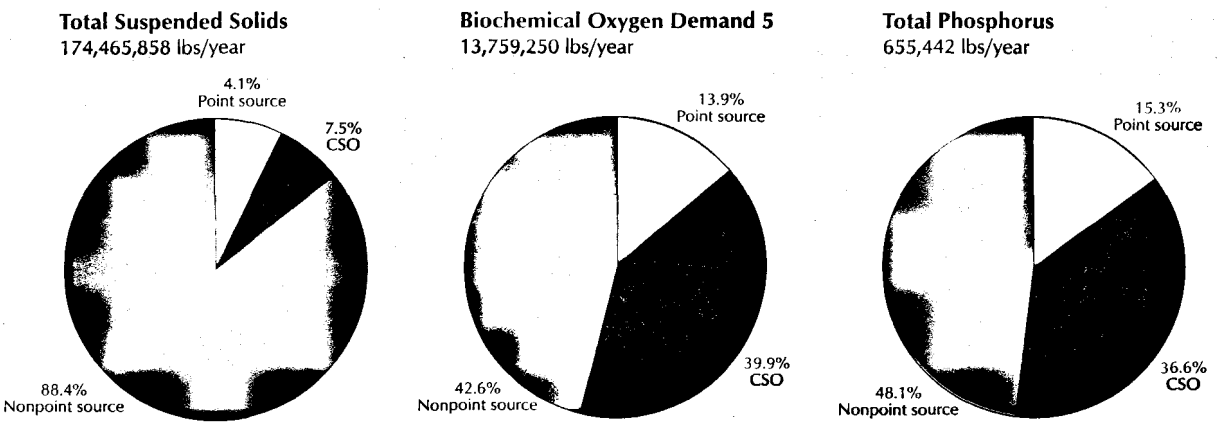
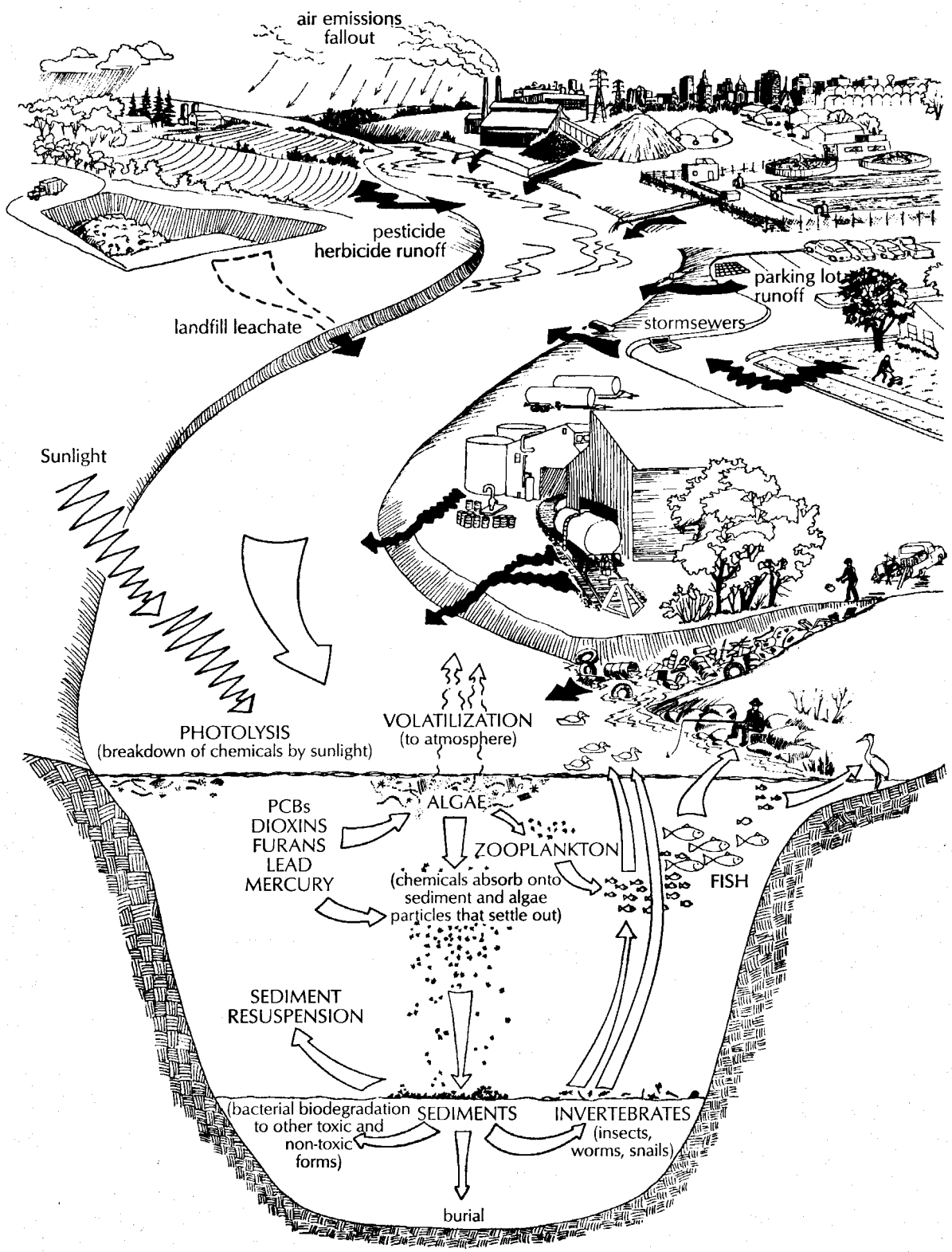


Figure 11
Sources of Pollution



Biochemical oxygen demand (BOD) is another indicator of water quality. When high levels of BOD are present, much of the available dissolved oxygen is consumed by aerobic (oxygen loving) bacteria. Dissolved oxygen is therefore not available to other aquatic organisms that need oxygen to live. Preliminary observations from the RRNWWDP are that BOD concentrations are generally low during dry weather and high during wet weather conditions in the downstream portions of the river. The 1989 RAP estimated that 46 percent of BOD was NPS pollution, 39 percent originated from CSOs and 14 percent from point sources.

Phosphorus is a nutrient necessary for a plant's growth. In most waters, including the Rouge River, phosphorus limits growth because it is usually present in very low concentrations. The RRNWWDP's preliminary data shows that phosphorus concentrations are high in the Lower Branch of the river during dry weather and high throughout the entire watershed during wet weather. Significant algal and plant growth in much of the river system supports this data. The 1989 Rouge RAP document estimated that 655,442 pounds of phosphorus were discharged into the Rouge River each year, with 48 percent ascribed to nonpoint source pollution, 37 percent to CSOs and 15 percent to point sources.

Much progress in cleaning up the Rouge River has been made since 1989. Industrial and municipal discharges, which are still often thought of as the most serious sources of pollution, are no longer the significant threat that they once were. A great amount of time, effort, and money has also been expended to resolve separate sewer bypasses and CSO discharges. Activities addressing stormwater and nonpoint sources have recently become a higher priority as other pollution problems are brought under control.

To highlight the pollution sources of greatest concern, they have been ranked by the Rouge RAP Team and are described in this chapter in order of priority. Note that some sources are of equal priority and therefore have the same numerical ranking. Separate sanitary bypasses and CSOs still rank as the highest priority because of the public health threat associated with them. These sources, however, are currently being addressed. Our focus must now shift toward implementation of activities to address nonpoint sources of pollution, ranked as the second highest priority. Other sources of impairment detailed in this chapter that have degraded the river include contaminated sediments, variable stream flows, permitted municipal and industrial point source discharges, storm sewer discharges, and illegal dumping and discharges. See Figure 11 for a diagram of potential pollution sources.

Table 3 references the sources of impairment that are responsible for impairing each of the uses listed in Chapter 2. All applicable use impairments are referenced in the introductory paragraph to each pollutant source description to help the reader correlate impairments with the sources that negatively affect them.

Separate Sanitary Sewer Overflows

Rank 1

Some areas of the Rouge River Watershed are served by sewers that carry stormwater and sanitary wastewater in separate sewer pipes. These types of sewer systems are referred to as "separate sewers." Although the pipes are separate, groundwater can still seep into separate sanitary systems through cracks in the sewer lines. Stormwater can also enter through direct connections to the sewers from residential downspout and footing drains, faulty manhole covers and improperly connected catchbasins or drains. As a result, certain wet weather conditions can overburden these systems.

In order to deal with this increased flow, and to prevent sewage from backing up into homes and businesses, sanitary sewage is discharged (or bypassed) directly into the river. These discharges carry disease-causing organisms that are a risk to public health and nutrients that decrease the amount of oxygen available to aquatic organisms. They are considered illegal discharges and are a violation of Act 245, the Michigan Water Resources Commission Act of 1929, as amended, and the Federal Clean Water Act of 1972.

The original Rouge RAP called for $198.7 million in separate sanitary sewer improvements (this estimate included the $190 million Detroit Flow Management Plan, which will help to reduce excess flows from both combined and separate sewer systems). Most of these improvements have been completed and nearly all separate sewer overflows eliminated at a cost of over $543 million. The few remaining separate sewer overflows can, however, degrade fish and aquatic insects or benthos populations, restrict fish consumption, reduce fish and wildlife habitat, restrict swimming and other water related activities, degrade the aesthetic value of the river, cause fish tumors, accelerate eutrophication or excessive aquatic plant growth, and restrict dredging activities.

Goals and Recommendations

Short-term Goal

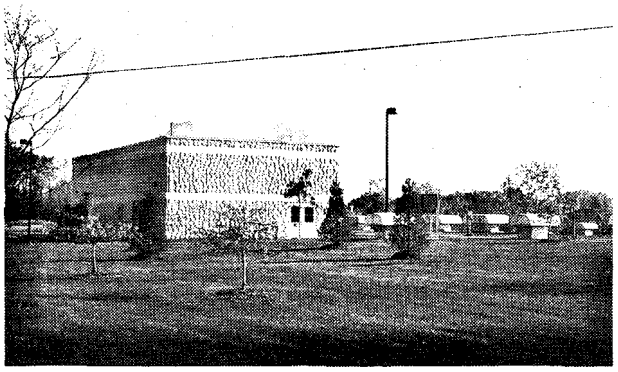
A-1: Eliminate all wet weather overflows from separate sanitary systems.

Short-Term Recommendations:

A-1a: Fully implement the Detroit Flow Management Plan by 1995.[1] Cost: $190,000,000 *Primary responsibility: DWSD*

A-1b: Complete local sewer improvements in the Evergreen-Farmington sewer service area.[2] *Primary responsibility: Local governments*

A-1c: Complete local sewer improvements in the North Huron Valley/ Rouge Valley sewer service area.[3] Cost: $21,400,000 *Primary Responsibility: Local governments*



Part of WTUA's sewer improvement project

Long-Term Recommendations:

A-1d: Encourage regular inspection and maintenance of separate sanitary sewer systems.[4] *Primary responsibility: Local governments*

A-1e: Conduct a survey to determine how many homes and businesses have downspouts connected to the sanitary sewer system and require elimination of these stormwater sources to the sewer systems.[4] *Primary responsibility: Local governments*

A-1f: Monitor sanitary sewer projects and local sewer improvements.[5] *Primary responsibility: MDNR-SWQD*

Progress to Date

The following improvements to separate sanitary sewer systems have been implemented to reduce bypasses of raw sewage into the river:

- The DWSD's $190 million Detroit Flow Management Plan, including Pump Station 2A, is nearly complete and testing is underway. The new pump station will increase the plant's treatment capacity from 1,200 million gallons per day to over 1,800 million gallons per day.[1]
- Oakland County's $55 million Evergreen/Farmington sewerage project is complete.[6]
- Local sewer improvement projects for the Evergreen-Farmington service area have been completed by the following communities: the cities of Auburn Hills, Birmingham, Bloomfield Hills, Farmington, Farmington Hills (Lathrup Village, Orchard Lake Village), Southfield, and Troy; the villages of Beverly Hills, Bingham Farms and Franklin; West Bloomfield and Bloomfield townships; and the Oakland County Drain Commissioner. The need for corrective action plans for these communities is still under review.[2]
- Construction of the $33 million First-Hamilton Relief Outlet Sewer is complete.[7]
- Wayne County's $160 million North Huron Valley/Rouge Valley Sewerage Project is complete.[8]
- The City of Livonia has completed construction of a 2.2 million gallon equalization basin at a cost of $7.7 million as part of the North Huron/Rouge Valley Sewerage Project.[3]
- Canton, Northville, and Plymouth Townships, which make up the Western Townships Utility Authority or WTUA, completed their $94 million sanitary sewer correction project in 1994. The discharge from the Ypsilanti Community Utilities Authority Plant to the Lower Rouge is scheduled to begin in early 1995.[9]
- Local sewer improvement projects for the North Huron Valley/Rouge Valley sewer service areas have been completed in the following communities: the cities of Dearborn Heights, Garden City, Inkster, Livonia, Northville, Novi, Plymouth, Romulus, Wayne, and Westland, and Redford and Van Buren townships. Six of these communities must still develop corrective plans to meet performance criteria.[3]
- Canton Township has a sump pump program to begin separating footing drains from the sanitary sewer system. This effort and a regular maintenance program have reduced the excess stormwater inputs to the sewer system from infiltration (leaking damaged sewer pipes) and inflow (stormwater flow into manholes).[10]
- The Village of Beverly Hills is implementing a phased project to disconnect residential sump pumps from their sanitary sewer system. In 1994, sump pumps in 477 homes were disconnected. Over 700 homes have been disconnected since the program began, reducing stormwater inputs to the sanitary sewer system and thereby increasing its capacity. With the help of Oakland County, the village will be conducting a study of the effects of this program in three different subdivisions and sewerage areas. Results should be available in 1996.
- The City of Melvindale plans to construct a new sanitary sewerage pump station to eliminate raw sewage bypasses.[4]
- The City of Walled Lake recently completed $6 million in improvements to their sanitary sewer system.[11]
- The City of Farmington Hills has completed a home inspection and downspout extension program to advise residents on how to reduce flooding in their basements and homes while helping to eliminate this stormwater source from their sewer system.[2]

Combined Sewer Overflows (CSOs)

Rank 1

In many of Michigan's older urban areas, stormwater, sanitary sewage and industrial wastewater are all transported to municipal wastewater treatment plants through a common sewer pipe. These "combined sewer systems" are designed to overflow directly into local rivers, through overflow discharge points, when they become overburdened by excessive stormwater during some storm events. Figure 12 depicts how a combined sewer system operates. The overflows are designed to prevent sewage from backing up into homes and businesses.

In 1989 the Rouge RAP estimated that 7.8 billion gallons of combined sewage was discharged into the river annually via combined sewer overflows or CSOs. Refer to Figure 13 for areas with combined sewers within the Rouge River Watershed and the approximate locations of CSO outfalls. These discharges create serious environmental and public health concerns. CSOs can degrade fish and aquatic insects (or benthos) populations, contribute to fish tumors and other deformities, and accelerate eutrophication or excessive aquatic plant growth, causing a decrease in oxygen concentrations. The discharges from CSOs can also restrict swimming and other water-related activities, degrade the aesthetic value of the river, impair fish and wildlife habitats, restrict fish consumption, and restrict dredging activities.

Figure 12
Combined Sewer System

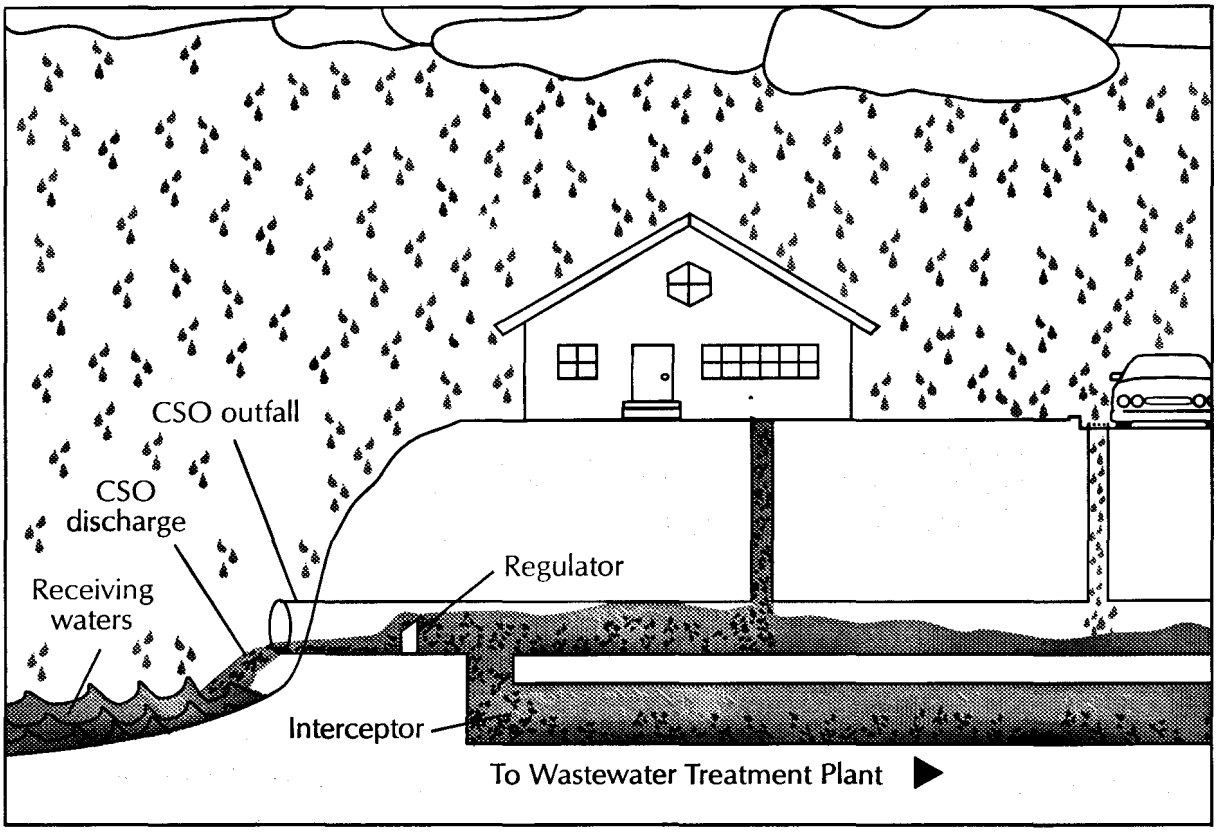
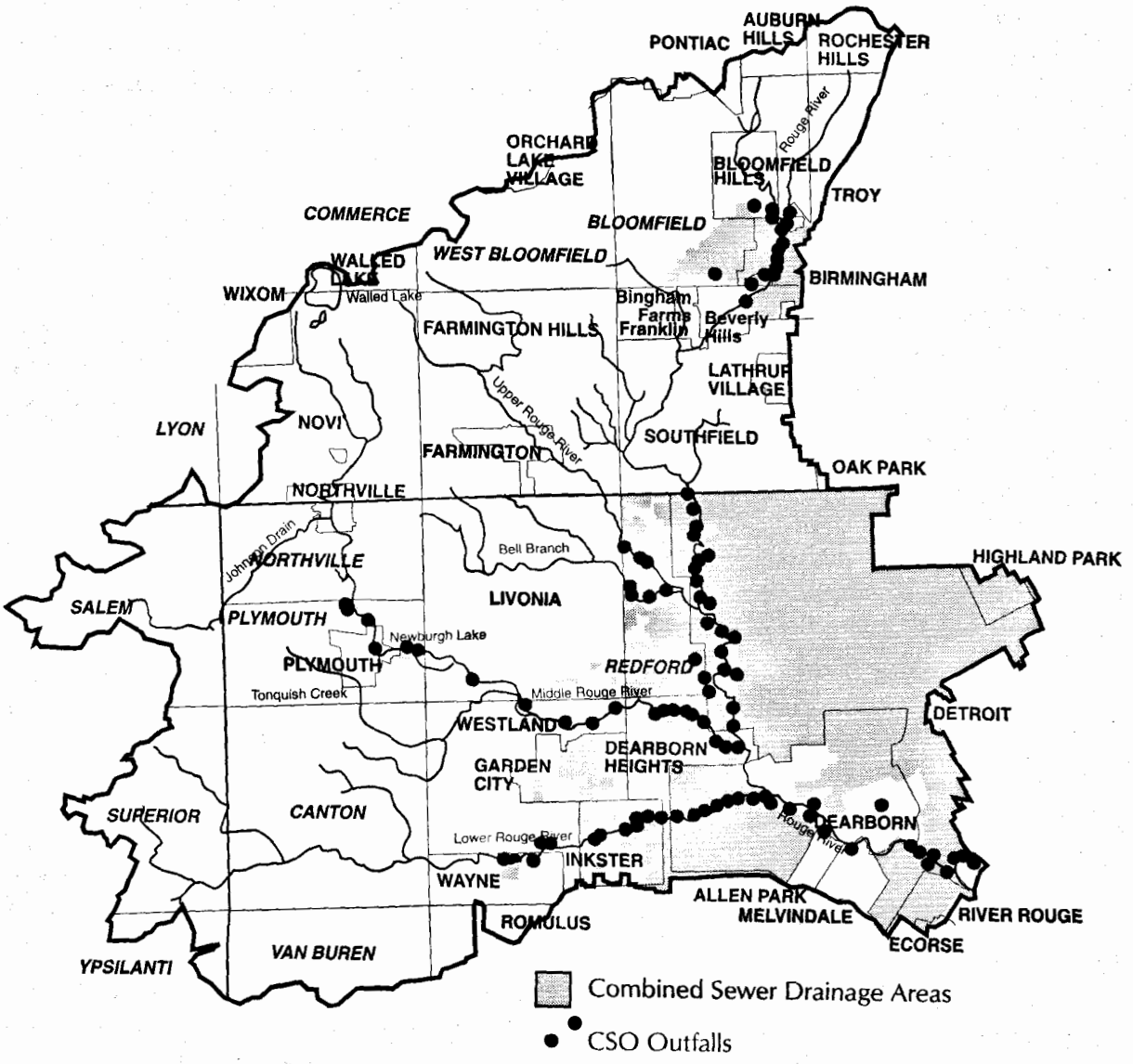


Figure 13
Rouge River Watershed
Combined Sewer Drainage Areas and Outfalls



As is the case with other discharges to a water body, CSO discharges are illegal without a National Pollutant Discharge Elimination System (NPDES) permit. The original RAP recommended that CSO permits be issued to CSO owners and contributing municipalities. It was stated that these permits should require that discharges of untreated sewage from CSOs be eliminated using a phased approach.

One alternative for controlling CSOs is separating combined sewers into two sewer systems. One sewer carries the stormwater directly to the river and the other transports sanitary sewage to the wastewater treatment plant (WWTP). Normally, separation is done by constructing a new sanitary sewer, leaving the existing sewer to handle the stormwater runoff. On occasion it is preferable to construct a new storm sewer and use the existing sewer to transport the sanitary flows.

The sewer separation alternative eliminates the introduction of human wastes to the river, but does not provide any treatment for the polluted stormwater runoff. Sewer separation is usually preferable in smaller, predominantly low-to-medium density residential areas. In industrial and larger, high-density residential areas, constructing new sewers and reconnecting sanitary sewers from every building is very costly. In some older areas, sewer construction activities often encounter significant conflicts with other utilities already in available rights of way.

Another alternative for CSO control is constructing a retention/treatment facility at the end of the CSO pipe just before it enters the river. This basin, depending on its volume, captures and stores overflows from storm events up to a specific size, which will eventually be discharged back into the main sewers when capacity is available. During larger rainfalls, the combined sanitary and stormwater flows will go into the treatment basin but may eventually overflow into the river when the capacity of the basin is exceeded. Before discharge, any floating materials are screened or skimmed out. Additionally, disinfectant (normally a chlorine product) is added as the water flows through the basin. While the wastewater is in the basin, some of the heavy materials settle out and are retained for future discharge to the WWTP. The amount of material captured is directly proportional to the size of the basin and the drainage area since the longer the water takes to flow through the basin the greater the amount of heavy materials can settle out. Although the treatment basin alternative allows some treated sanitary sewage to overflow into the river, a large portion of sanitary flow and polluted stormwater is directed to the WWTP for full treatment. Treatment basins are often less costly than sewer separation in larger drainage areas or those areas with high density populations.

CSO permits for the Rouge River Watershed were issued in 1989. Most communities who received these permits contested them through an administrative and/or judicial process. Issues involved the timetable for elimination of CSO discharges, the cost of treatment or elimination, and the size of the retention facilities required. With the assistance of the U.S. District Court, joint negotiations between all permittees and MDNR resulted in a two-phase approach to demonstrate alternative ways of controlling CSO pollution. This effort culminated in integrated and innovative permits that were approved by the Water Resources Commission in August, 1992.

The first phase, which has already begun, will demonstrate the effectiveness of various CSO control and sewer separation projects (see Table 4 for a summary of these projects and Figure 14 for their locations). Based on the results of the demonstration, MDNR will determine what additional work will be required. Figure 15 shows current estimates of the percent of CSO volume controlled by the Phase I projects. Most projects are expected to store over 60% of CSO volumes for later treatment at a WWTP and treat over 80% of CSO volumes before discharge to the river. Phase II requires completion of necessary treatment/control facilities or elimination of the remaining CSO

discharges to meet public health standards for full body contact. The requirement to meet water quality standards for parameters other than fecal coliform is covered in Phase III. Funding assistance for the construction effort has been received from four grants from the USEPA as part of the RRNWWDP. The remainder of the funding will be through State Revolving Fund loans and local funds.

Goals and Recommendations

Long-term Goal

B-1: Eliminate or provide adequate treatment and control for all CSOs.[12]

Short-term Recommendations:

B-1a: Complete implementation of the Detroit Flow Management Plan by 1995.[13] *Primary responsibility: DWSD*

B-1b: Complete Phase I interim controls, including monitoring of existing system performance, operation and maintenance programs, system optimization, use of available in-system storage capacity, and construction of sewer separation projects in localized areas not affected by the regional control program.[14] *Primary responsibility: Local governments, Wayne Co./RRNWWPP*

B-1c: Implement all CSO control projects listed in Table 4.[15] *Primary responsibility: Local governments, MDNR-SWQD, Wayne Co./RRNWWPP*

B-1d: Design and implement Phase II CSO control programs. The regional CSO control program should focus on those projects that will result in achievement of water quality improvement over the greatest area.[16] *Primary responsibility: Local governments, Oakland County, Wayne Co./RRNWWPP*

Long-term Recommendations:

B-1e: Phase III controls, based on the long-term goal of achieving water quality standards, should be designed and implemented after Phases I and II and the completion of an evaluation of system performance.[17] *Primary responsibility: Local governments, Wayne and Oakland counties*

B-1f: Conduct point source monitoring of representative combined sewer overflows and industrial and municipal dischargers, as necessary, to characterize all discharges. Monitor CSOs that have significant industrial sources that contribute to their discharges.[18] *Primary responsibility: Wayne Co./RRNWWDP, local governments, MDNR-SWQD*

B-1g: Control toxic pollutants from industrial sources that are discharged through CSOs at the source by the community having jurisdiction over the discharge. Address necessary discharge limitations on toxic pollutants through NPDES permits for CSO discharges.[19] *Primary responsibility: Local governments, industrial users*

B-1h: Eliminate improper discharges of toxic pollutants to the combined sewer system from material storage areas, floor drains, and other sources.[20] *Primary responsibility: Local governments, DWSD, industrial users*

B-1i: Identify the long-term maintenance and monitoring costs of constructed CSO control projects in order to highlight state and local commitment to cleaning up the river as well as to leverage additional state and federal assistance. *Primary responsibility: Local governments, Wayne Co./RRNWWDP*

B-1j: Continue implementation of the Industrial Pretreatment Program.[21] *Primary responsibility: DWSD, MDNR-SWQD, industrial users*

Table 4

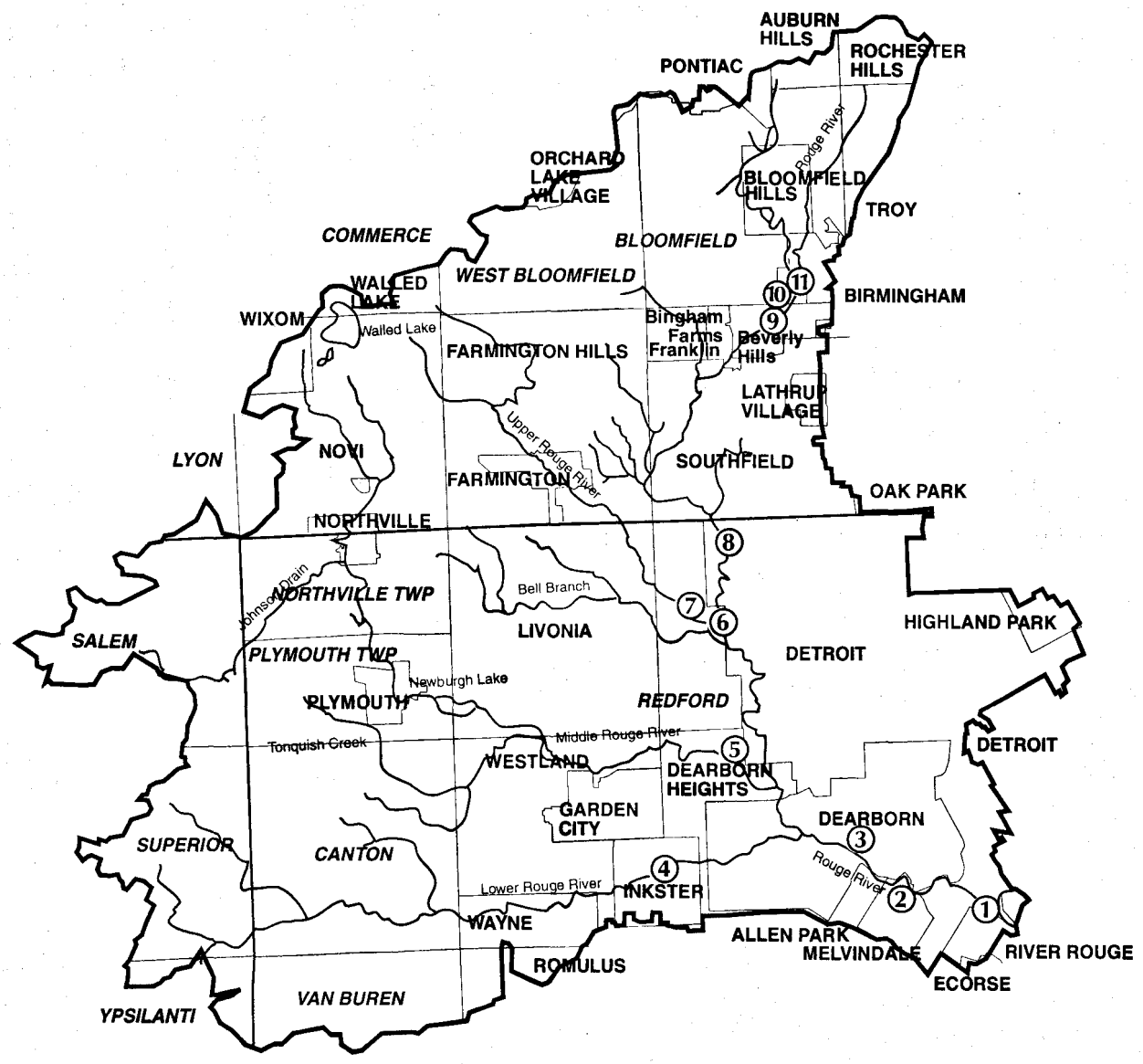
CSO Control Construction Projects Funding Budgets

Community/Project	Federal Grant	Local Match	SRF	*Total Projects Cost
Dearborn	$30,240,000	$24,380,000	$2,110,000	$56,730,000
Dearborn Heights	13,670,000	14,030,000	2,370,000	30,070,000
Detroit/Gates	2,320,000	2,180,000	0	4,500,000
Detroit/Hubbell-Southfield	34,020,000	28,980,000	0	63,000,000
Detroit/Outlet Control Devices	2,790,000	12,210,000	0	15,000,000
Detroit Puritan-Fenkell	11,680,000	10,320,000	0	22,000,000
Detroit/Regulator and Gates Rehab.	210,000	1,790,000	0	2,000,000
Detroit/Seven Mile	11,560,000	8,440,000	0	20,000,000
Garden City - Construction Contract No. 1	5,300,000	9,040,000	480,000	14,820,000
Garden City - Construction Contract No.2	6,870,000	9,430,0000	810,000	17,110,000
Inkster	10,680,000	12,640,000	2,600,000	25,920,000
Livonia	740,000	720,000	190,000	1,650,000
Oakland County/Acacia Park	6,950,000	5,510,000	1,250,000	13,750,000
Oakland County/Birmingham	16,550,000	15,840,000	3,270,000	35,660,000
Oakland County/Bloomfield Hills	630,000	1,570,000	240,000	2,440,000
Oakland County/Bloomfield Village	13,910,000	12,590,000	2,350,000	28,850,000
Plymouth Township - Construction Contract No. 1	410,000	370,000	0	780,000
Plymouth Township - Construction Contract No. 2	240,000	200,000	0	440,000
Redford Township	7,840,000	9,820,000	2,030,000	19,690,000
River Rouge	14,170,000	12,630,000	1,950,000	28,750,000
Wayne - Construction Contract No.1	250,000	210,000	70,000	530,000
Wayne - Construction Contract No. 2	9,290,000	7,860,000	1,240,000	18,390,000
Westland	4,780,000	5,130,000	800,000	10,710,000
Totals	**$205,100,000**	**$206,230,000**	**$21,460,000**	**$432,790,000**

Source: Wayne County Rouge River National Wet Weather Demonstration Project

*Costs are listed in this table as the bid price unless otherwise indicated.

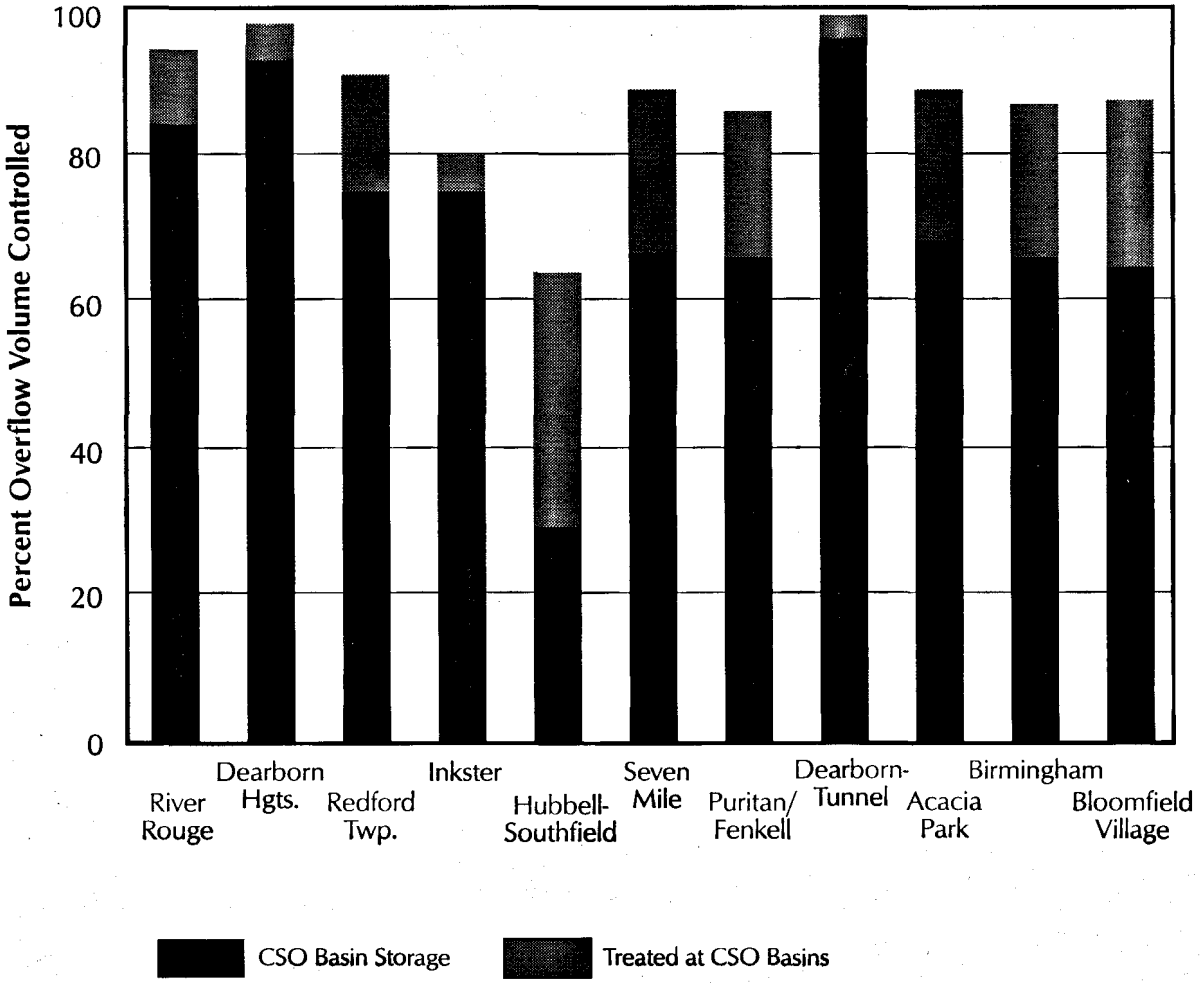
Figure 14
Rouge River Watershed
CSO Treatment Facility Locations



Key to Facilites

1 River Rouge retention basin
2 Dearborn Tunnel
3 Hubbell-Southfield retention basin
4 Inkster retention basin
5 Dearborn Heights retention basin
6 Puritan-Fenkall retention basin
7 Redford Township retention basin
8 Seven Mile retention basin
9 Acacia Park retention basin
10 Bloomfield Village retention basin
11 Birmingham retention basin

Figure 15
Percent Control of CSO Overflow Volume



Progress to Date

The following activities have been conducted to address pollution from CSOs:

- The Water Resources Commission (WRC) issued permits to CSO owners and contributing municipalities requiring the phased control of CSOs in August, 1992.[22]
- Table 4 lists communities implementing projects to control combined sewer overflows. These projects are being done in conjunction with Wayne County's RRNWWDP.[14]
- DWSD's $190 million Detroit Flow Management Plan, including Pump Station 2A, is nearly complete and testing is underway. The pump station will reduce the number and volume of CSO discharges.[23]
- Several communities, MDNR, and Oakland and Wayne counties have committed to implement the CSO controls listed in Table 4 with assistance from the RRNWWDP. Almost all of these projects have completed the design phase and construction contract bids have been received at the time of publication of this document.[24]

- DWSD continues to implement their Industrial Pretreatment Program, thereby limiting the quantities of industrial pollutants being discharged through CSOs from these sources.[21]
- The Wayne County/RRNWWDP will sample the influent and effluent of a CSO retention basin in another watershed to test its efficiency. This data will then be used to simulate the performance of the 10 CSO basins currently planned for construction.
- DWSD has started a PCB and mercury minimization program and has performed system-wide sampling to first determine point and then non-point sources of mercury and PCBs. Mercury from dental offices has been identified as a potential source to DWSD's collection system. DWSD has undertaken an initiative in conjunction with the Michigan Dental Association, the National Wildlife Federation, and others to develop control strategies for mercury use and disposal within the dental industry. Control of discharges of these contaminants from CSOs is also being studied.[19]
- The City of Farmington has eliminated all known CSOs (approximately 10) in the Farmington Sewage District by separation of their stormwater and sanitary sewers. As part of this project, the city built a $7 million, three million gallon sewage pump station and retention basin which was certified by the MDNR in October, 1994.[14]
- The City of Dearborn Heights cleans all its sewers every six years as part of a regular maintenance program.[14]
- The City of Troy has established a continuing program to inspect downspouts in combined sewer areas in the Evergreen Sanitary District to reduce the influx of stormwater into the system. Building inspectors and water and sewer department meter readers check to ensure that home downspouts drain into pervious areas away from house foundations. If a problem is found, the Water and Sewer Department gives homeowners notice via letter to correct the downspout and then follows up with a telephone call and visit if necessary.[14]
- DWSD is currently developing an education and outreach program to inform various stakeholders about its current CSO initiatives.
- The City of Dearborn, where feasible, is separating street stormwater sewers from the combined sewer system. These changes are taking place predominantly in west Dearborn.[25]
- Redford Township is conducting a seven-year cleaning and inspection program of their combined sewer system, including smoke testing and repair. Last year, they repaired 138 sewer covers that were allowing rainwater to enter the sewer collection system.[14]
- The City of Dearborn has also promoted a voluntary downspout disconnect policy to divert stormwater from roof gutters to lawn areas and installed storm drains that restrict stormwater inflow to the sewer system to preserve capacity in the combined sewer system.[14]

Nonpoint Source Pollution (NPS)

Rank 2

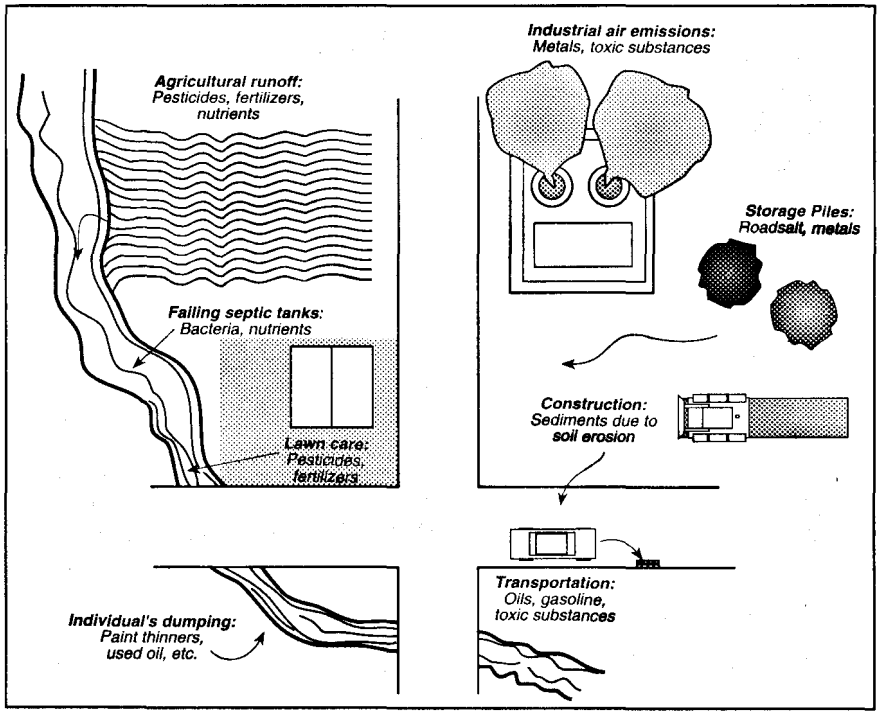
Nonpoint source (NPS) pollution is contaminated water discharged from a widespread area or from a number of smaller sources. Examples of this type of pollution include runoff from urban and agricultural areas, highways and roads, industrial stockpiles, old solid waste and hazardous waste landfills, and erosion from construction projects. Figure 16 (and Figure 11) depicts various forms of nonpoint source pollution. NPS pollution is a major cause of impairment in most areas of the Rouge River Watershed. The RAP Team ranked the various forms of nonpoint source pollution in their order of significance, with stormwater and erosion ranking as the two most important types of pollution within this category.

NPS discharges differ from most point sources in that they are not continuous, do not come from a designated pipe, and are highly variable in amount and type of pollutant. These discharges occur primarily during wet weather, when water moving over the surface picks up pollutants deposited from the atmosphere or derived from activities related to land use. This makes them difficult to assess and control. NPS pollution can contribute to the restriction of fish consumption, degradation of fish and aquatic insect populations, formation of fish tumors and other deformities, acceleration of eutrophication or undesirable algae, restriction of swimming and other water related activities, degradation of aesthetics, and loss of fish and wildlife habitats.

The original Rouge RAP document identified NPS pollution as an important contributor to use impairments in the Rouge River and called for control of stormwater runoff, soil erosion, household hazardous waste, and improper connections to storm sewers. The document focused primarily, however, on point source controls that were more readily assessed and regulated.

Many of the pollutants carried in stormwater runoff require oxygen in order for them to break down. These pollutants use up oxygen needed by fish and other aquatic species for survival. Increased algae from excessive nutrient loadings can create higher oxygen levels during the day (while algae is photosynthesizing) and depletion at night when algae use up oxygen. This process can deplete oxygen in the water, causing fish kills. This problem is accentuated during warm weather when the water is less capable of holding oxygen.

Figure 16
Examples of Nonpoint Source Pollution



Polluted Stormwater Runoff

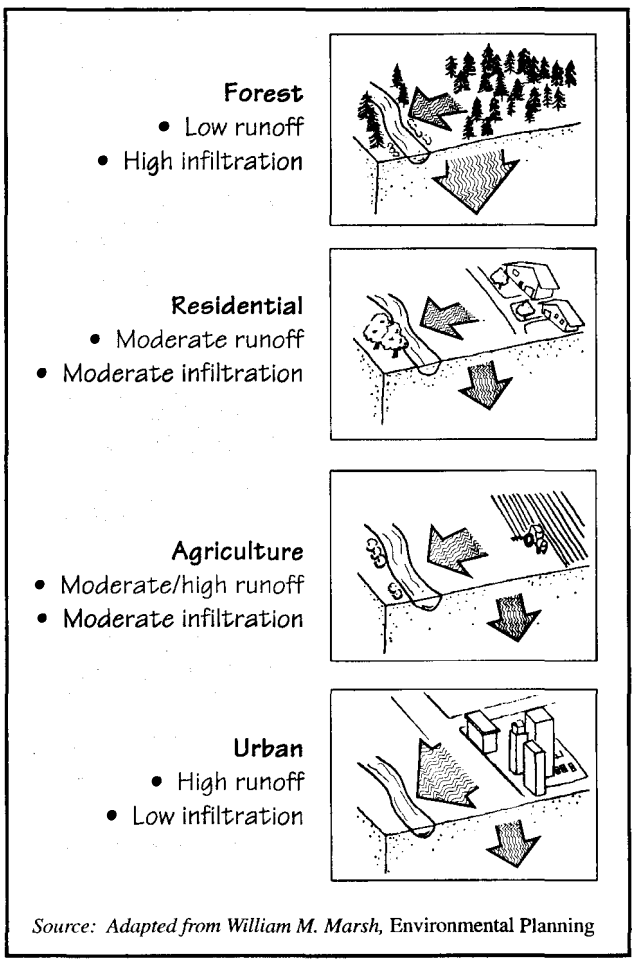
RANK 1 OF NPS POLLUTANTS

Stormwater runoff has become a major focus for pollution control. Considered a significant source of pollution, stormwater may carry many different pollutants such as bacteria, heavy metals, nutrients, oil and grease, pesticides, and soil particles. Figure 17 depicts stormwater runoff and the effects of urbanization. In the past, stormwater management efforts have generally been directed at controlling stormwater to prevent flooding and nuisance conditions. Stormwater detention basins served only to temporarily store water to prevent flooding of residences downstream. Control measures had only minor incidental water quality benefits. The technology exists, however, to construct stormwater retention or detention basins that treat stormwater before it is discharged.

This section describes stormwater that is considered nonpoint source pollution that is not regulated under the MDNR's NPDES permit program. Control of stormwater discharged from a designated pipe (see *Point Source Stormwater Discharges* section) has become much more stringent, with new stormwater regulations developed by the USEPA and adopted by the State of Michigan. Point source stormwater discharges regulated though the NPDES permit program include those from industrial sites, construction sites more than five acres in size, and municipalities with a population of 100,000 or more that are served by separate sewers. Prior to these regulations, few stormwater discharges were directly regulated. There is, however, a considerable amount of stormwater not regulated through this permitting process. This type of stormwater runoff is considered nonpoint source pollution because it is not discharged to the river through a pipe.

The Coastal Zone Management Act is another federal regulation that will be implemented in Michigan. According to this act, the entire land area of Michigan will be required to comply with coastal zone regulations. This act is also directed at the control of stormwater runoff and nonpoint sources of pollution.

Figure 17
Land Use Impact on Runoff



Source: Adapted from William M. Marsh, Environmental Planning

Goals and Recommendations

Short-term Goal

CA-1: Reduce negative impacts of stormwater discharges by controlling these sources using a watershed-wide approach.[26]

Short-term Recommendations:

CA-1a: Conduct a wet weather water quality survey throughout the watershed.[27] Cost: Over $9,000,000 *Primary responsibility: Wayne Co./ RRNWWDP, MDNR-SWQD*

CA-1b: Develop a watershed-wide stormwater management plan to ensure that (1) water quality impacts from both small and large storm dis-

charges are addressed, (2) applicable best management practices (BMPs) are incorporated into existing state and local regulations, (3) increased fines for non-compliance are put into place and (4) state-wide legislation is drafted to require the use of BMPs. *Primary responsibility: MDNR-SWQD, MDNR-LWMD, county drain commissions, local governments, legislature*

CA-1c: By 1997, implement an enforceable watershed-wide stormwater management system. This system could be in the form of a watershed-wide NPDES permit, a "permit by rule" arrangement or a voluntary watershed-wide control program. Communities within the watershed, particularly those with separated sewers, should join with representatives of the USEPA and the MDNR under the RRNWWDP to develop institutional and regulatory options for managing stormwater pollution control on a watershed-wide basis. These communities should (1) identify state and federal incentives that could be adopted to encourage a watershed approach to stormwater regulations, (2) create model stormwater management ordinances for individual communities as part of a watershed-wide stormwater management plan, and (3) recommend specific pilot stormwater pollution control and monitoring projects that can be funded under the RRNWWDP that demonstrate the cost effectiveness and feasibility of watershed-wide approaches. *Primary responsibility: Wayne Co./RRNWWDP, MDNR-SWQD, USEPA, local governments, RRAC-NPS*

CA-1d: Evaluate traditional polluted stormwater runoff control measures as to their effectiveness and costs. Cost: $1,030,000 *Primary responsibility: Wayne Co./RRNWWDP*

CA-1e: Evaluate wetland improvements for polluted stormwater runoff control for their effectiveness and cost/benefit of their application. Cost: $700,000 *Primary responsibility: Wayne Co./RRNWWDP*

CA-1f: Reduce negative impacts of stormwater runoff from parking lots by encouraging local governments to implement control measures. Encourage measures such as taxing parking lot space, crediting preservation of trees/green spaces, using on-site storm water basins to control and treat parking lot runoff, and retrofitting existing parking lots with devices that will filter out oils/heavy metals. *Primary responsibility: Local governments, MDNR-LWMD, RRAC-NPS*

CA-1g: Preserve and create vegetative buffer strips along the river that can filter runoff as well as provide valuable wildlife habitats.[28] *Primary responsibility: Local governments, MDNR-LWMD*

CA-1h: MDNR should continue planning and begin implementation of their prototype stormwater management program. *Primary responsibility: MDNR-SWQD*

CA-1i: Develop a model local ordinance for stormwater control. Cost: $80,000. *Primary responsibility: Wayne Co./RRNWWDP*

Short-term Goal

CA-2: Educate builders, developers, contractors and local officials about (1) the importance of protecting the river and (2) what they can do to minimize the negative impacts associated with development.[29]

Short-term Recommendation:

CA-2a: Inform builders, developers and contractors about the planning and implementation of BMPs for the control of polluted stormwater runoff (such as suspended solids) and the economic advantages of doing so. *Primary responsibility: MDNR-SWQD, MDNR-LWMD, county and local enforcing agencies, RRAC-NPS, RRAC-Headwaters*

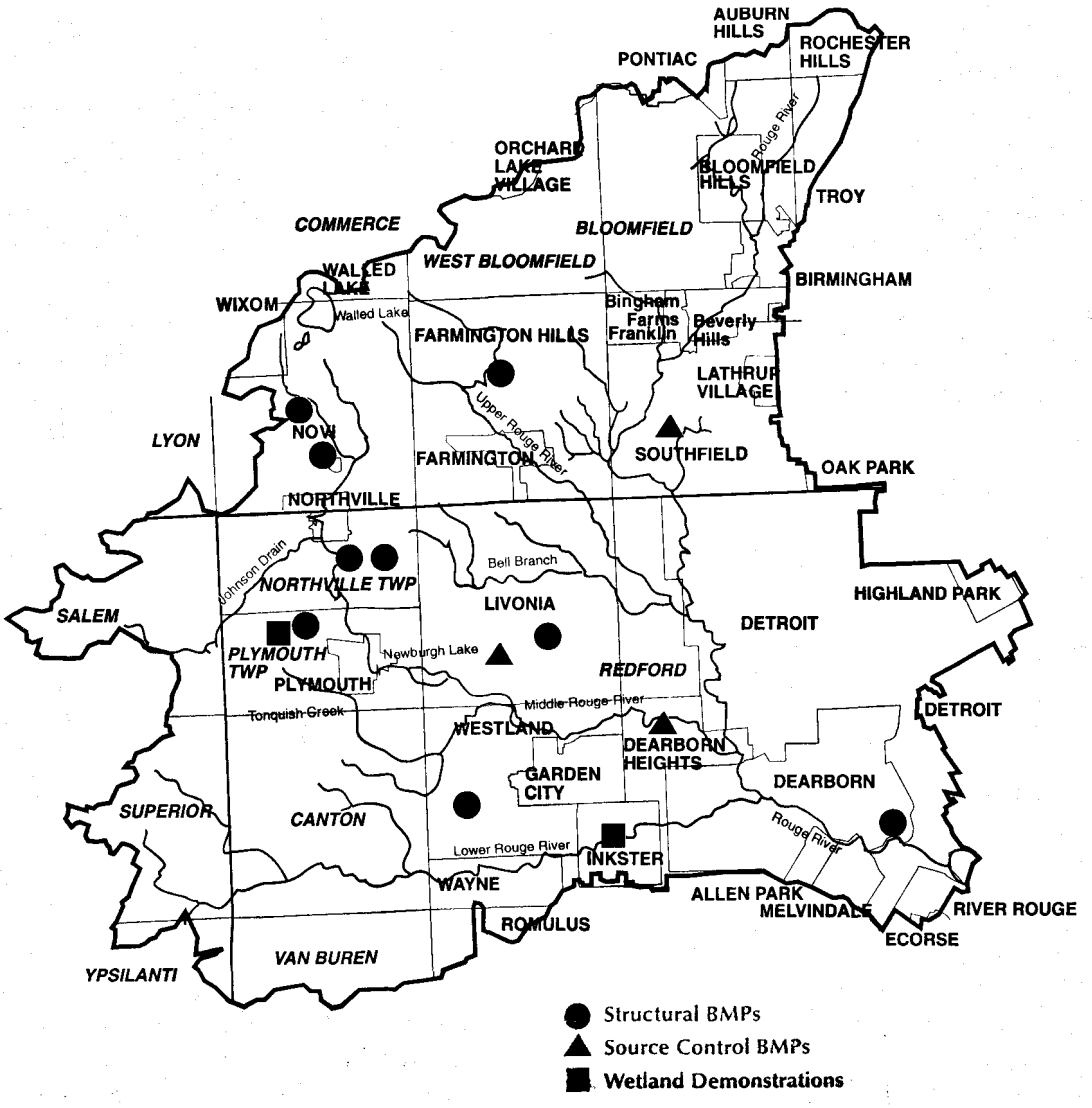
Long-term Recommendations:

CA-2b: Inform builders, developers and communities of services and assistance available from the NRCS for the control of stormwater runoff. *Primary responsibility: MDNR-SWQD, MDNR-LWMD, county and local enforcing agencies, NRCS*

CA-2c: Encourage road commissions to further study the impacts of road de-icing and provide other possible alternatives to local communities via fact sheets. *Primary responsibility: County road commissions, RRAC-NPS*

CA-2d: Continue to hold a series of seminars on polluted stormwater runoff for local governmental staff. *Primary responsibility: MDNR-SWQD, RRAC-NPS, Wayne Co./ RRNWWDP*

Figure 18
Proposed Nonpoint Source Pollution
Best Management Practices Pilot Project Locations

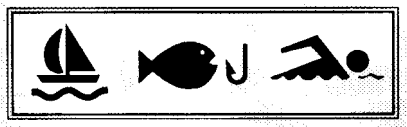


Progress to Date

The following activities have been conducted to address polluted stormwater:

- Wayne County/RRNWWDP has established a $3.3 million watershed-wide baseline water quality and quantity sampling and monitoring network to document existing conditions, measure the effectiveness of control measures and measure the progress of Rouge River restoration efforts.[27]
- Wayne County/RRNWWDP is establishing a $1.35 million environmental database specific to the Rouge River. This data will be incorporated into a $1.865 million geographical information system (GIS) used by the RRNWWDP to assure that spatially related information being gathered and generated by the RRNWWDP is efficiently maintained and readily available to decision-makers. In addition, the GIS system will be able to map the results of the modeling process described below.[27]
- Wayne County/RRNWWDP is developing a $2.6 million computer modeling system of the water quantity and quality in the watershed. The models will be a primary tool to analyze water management alternatives and evaluate their impacts on the water quality of the Rouge River.
- Wayne County/RRNWWDP will be demonstrating a number of structural (built) BMPs and evaluating them at up to nine different locations throughout the watershed (see Figure 18 for a map of the BMP demonstration locations). Each BMP will be evaluated for its ability to control polluted stormwater runoff. Information about the cost effectiveness and pollutant removal efficiencies of each BMP will be gathered and used to establish the pollutant loadings in the modelling system.[29]

THE **ROUGE RIVER** PROJECT
A WORLD CLASS EFFORT



BRINGING OUR RIVER BACK TO LIFE

- In addition to structural controls, Wayne County/RRNWWDP will be demonstrating source control (non-structural) BMPs in three locations in the watershed. Two residential areas and one commercial/industrial area will undergo an aggressive education campaign to change residents' daily activities that may negatively impact the river. Water quality will be tested before and after this project in these three areas to measure any corresponding improvement in water quality. Residents will receive informational materials and be encouraged to establish clean neighborhood, adopt-a-stream and storm drain stencilling programs. Businesses will receive a variety of informational materials and a clean business program will be launched. Street sweeping and catch basin cleaning will be intensified in all three target areas.[30]
- Wayne County/RRNWWDP will be evaluating a variety of wetland systems for their ability to control polluted stormwater runoff in a $700,000 project. A variety of wetland areas will be assessed for their pollutant removal efficiencies and cost effectiveness.[31]
- MDNR-SWQD administers the stormwater control portions of the NPDES program and is reviewing the requirements of the Coastal Zone Management Act.
- The City of Northville is enforcing stormwater discharge limits through construction of detention basins.[29]
- In the City of Westland, the Meijer and vacant Source Club buildings use a 21-acre wetland/detention pond to treat stormwater runoff to Tonquish Creek.[29]
- Canton Township is developing a stormwater management program to include regional sediment/detention basins, BMPs, and construction details. The city plans on applying for a nonpoint source grant to study and determine the location of problem areas and implement a program to improve water quality.[29]

- Washtenaw County has revised its stormwater management regulations to incorporate requirements for management of water quality as well as quantity.[32]
- The City of Walled Lake recently completed a stormwater management study to assist in planning for adequate drainage as the city grows and develops.[29]
- The City of Westland is restricting stormwater runoff to agricultural runoff rates through detention ponds, retention ponds and a combination of both. The piping used by detention and retention ponds will aid in treating water to remove solids before it is released.[29]
- West Bloomfield Township has adopted a fertilizer and pesticide regulation ordinance to eliminate the overuse of fertilizers which can eventually run off to the nearest stream and create algal blooms and excessive weed growth.[29]
- The City of Dearborn Heights requires new developments to include on-site storm water retention that limits flow discharge rates.[29]
- The City of Dearborn Heights sweeps and cleans its streets on a regular basis to reduce solids loadings to the storm sewer system.
- The MDNR and the RRWC conducted a half-day seminar entitled "Protecting the Rouge, Action Plan for Nonpoint Source Pollution Control" on March 23, 1993, for local governmental officials to help them understand the causes and effects of nonpoint source pollution. The seminar also outlined some of the actions that can be taken to reduce their communities' impacts on the river and an informative handbook entitled *Guidebook of Best Management Practices for Michigan Watershed* was given to all attendees.
- The MDNR-SWQD is considering the implementation of a prototype program for controlling pollution from stormwater and nonpoint sources. This program will be an integrated watershed approach to address remaining pollution control needs, including encouraging voluntary action, providing educational opportunities, and requiring pollution abatement. Currently in the planning stages, this program would be closely coordinated with Wayne County's RRNWWDP. The program would require that all storm sewers and nonpoint sources in certain demonstration sub-watersheds of the river be covered by a NPDES discharge permit or similar regulatory device. This "permit" would specify certain date-specific tasks to be accomplished by the discharger which would improve and protect water quality. The requirements would be based on protecting or restoring beneficial uses. This program would include a significant effort to educate professionals, elected officials and the public on the need for comprehensive stormwater management. Stakeholder groups will be included to assist in making decisions on program implementation.

Stormwater retention basin, W. Bloomfield

Erosion

RANK 2 OF NPS POLLUTANTS

Erosion from streambanks, construction sites, and farms destroys the valuable and ever-shrinking habitat for aquatic life through loss of trees and streambank vegetation and deposit of mud and silts on stream bottoms. Suspended soil particles absorb the heat from sunlight, causing the water temperature to increase, decreasing the water's ability to hold oxygen. Low concentrations of oxygen make it nearly impossible for many forms of aquatic life to survive. In addition, suspended solids directly affect aquatic life by clogging fish gills, smothering eggs of aquatic insects and fish, and destroying the microhabitats of mayfly nymphs and other aquatic insects.

Erosion is caused by a variety of activities including construction, dredging, removal of vegetation within the watershed and along streambanks, and erratic stream flow. Erosion can degrade fish, wildlife, and benthos populations and habitats, degrade the river's aesthetics, and interfere with navigation.

Goals and Recommendations

Long-term Goal

CB-1: Reduce erosion and its effects.

Erosion at a construction site

Short-term Recommendations:

CB-1a: Work with all local and county enforcement agencies to obtain agreement about developing a uniform soil erosion and sedimentation control program throughout the watershed to maintain better compliance with the regulations. This program should include: (1) limiting the maximum area exposed at one time for construction activities (such as 20 to 40 acres); (2) requiring stormwater basins that treat runoff for removal of sediments as well as to control of the rate of discharge in projects larger than 10 acres in total size; (3) establishing minimum standards for erosion control practices to be used during construction activities; and (4) establishing a minimum standard for how often inspection will be performed by the responsible regulatory agency.[33] *Primary responsibility: MDNR-LWMD, local enforcing agencies, MDNR-SWQD, counties*

CB-1b: Require staging and scheduling of construction activities and critical area seeding to reduce discharges of suspended solids to watercourses by decreasing soil and wind erosion from construction sites.[33] *Primary responsibility: MDNR-LWMD, local enforcing agencies, MDNR-SWQD, counties*

CB-1c: Require participation in the soil erosion courses sponsored by the MDNR, especially by soil erosion enforcing agency field personnel.[33] *Primary responsibility: MDNR-LWMD, MDNR-SWQD, local enforcing agencies, counties*

Long-term Recommendation:

CB-1d: Map critical slope areas and work to prevent erosion in these areas. Prevention activities may include restricting construction in these areas and bank stabilization projects.[33] *Primary responsibility: MDNR-LWMD, MDNR-SWQD, local enforcing agencies, counties*

Progress to Date

The following activities have been conducted to address erosion:

- In the City of Westland, detention basins with soil erosion controls have been used near Hix Road and all sites in the Middle Rouge area.
- The City of Farmington Hills has initiated an erosion control project on Caddell Drain.
- The City of Novi has planted a variety of trees and shrubs in order to stabilize banks near the headwaters of the Upper Rouge near Walled Lake.[28]
- The City of Birmingham is seeking assistance from the county to develop a stream bank stabilization program. The city also attempts to prevent erosion by requiring a permit for any construction activities within 500 feet of the river.[28]
- Plymouth Township constructed a detention facility with a sediment trap at the township's recreational park. The facility now serves as a focal point for the recreational area.[29]
- The City of Novi has stabilized 700 feet of streambank on Munro Creek.[28]
- The City of Dearborn has stabilized the riverbank west of the new Brady Street bridge in Ford Field.[28]
- The City of Troy removed large trees from the Rouge and made efforts to stabilize eroding stream banks near Beach Road.[28]
- The City of Rochester Hills stabilized the eroding streambank of Borden Drain and constructed weirs and steps to reduce flow rates.[28]

On-Site Sewage Disposal Systems

RANK 3 OF NPS POLLUTANTS

On-site sewage disposal systems, commonly called septic systems, can provide effective wastewater treatment for many years, offering an alternative to sewers and municipal wastewater treatment plants in rural and semi-rural areas. In most cases, however, septic systems are considered temporary and eventually fail. They fail for a variety of reasons, including being located in inadequate soils (such as clays) that prevent wastewater from percolating through the system, and improper maintenance. Leaking septic systems can allow untreated human waste to be discharged directly to the river, causing a significant threat to the environment and public health. Because of this potential public health problem, county health departments regulate the installation and repair of septic systems.

Students sampling for failing septic systems

A number of communities in the Rouge River Watershed use septic systems to dispose of their wastewater. A few of these areas are presently rural while others were once rural and are now urban. In the latter case, sewers were not installed in certain areas for a variety of reasons (such as difficult terrain, no available funding, etc.). The original Rouge RAP document noted that septic system failures were of concern in the Village of Franklin, Northville Township, and Salem Township. Leaking septic systems can impair fish, wildlife, and benthos populations and habitats, accelerate aquatic plant growth or eutrophication which can cause a decrease in oxygen levels, restrict swimming and other water-related recreation, and degrade aesthetic values.

Goals and Recommendations

Long-term Goal

CC-1: Eliminate contamination from failing on-site sewage disposal systems.

Short-term Recommendations:

CC-1a: Identify and survey all on-site sewage disposal systems. Institute corrective action for non-functional systems. *Primary responsibility: County health departments, RRAC-On-Site Sewage Disposal*

CC-1b: Encourage the development of programs for the regular inspection of on-site sewage disposal systems. Mandatory ordinances for the proper maintenance, monitoring, and inspection of these systems should be made a part of the total watershed management plan. *Primary responsibility: County health departments, RRAC-On-Site Sewage Disposal*

Long-term Recommendation:

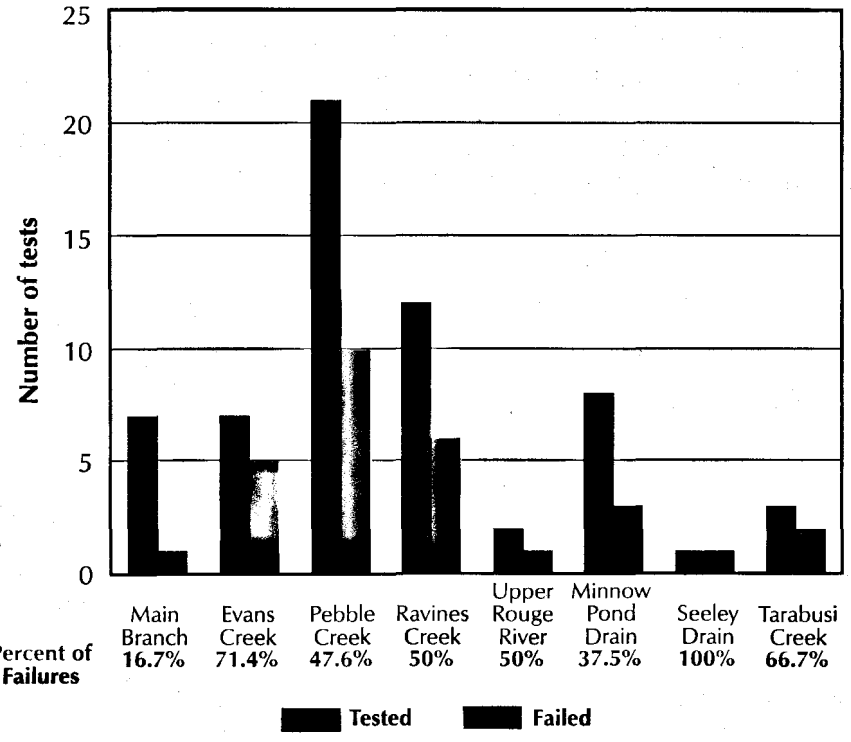
CC-1c: Require the connection of every home in the watershed to municipal sewers when municipal sewers become available. This is especially critical in the headwater areas which are presently being developed. RRAC should work with local governments to that end. *Primary responsibility: Local governments, county health departments, RRAC-On-Site Sewage Disposal*

CC-1d: Connect residences in the Village of Franklin to the sanitary sewer system.[34] Cost: $9,100,000 *Primary responsibility: Village of Franklin, Oakland Co.*

Figure 19

Dye Tests Showing Failures

On-Site Sewage Disposal System Survey, Farmington Hills and Southfield



Progress to Date

The following activities have been conducted to address pollution from failing septic systems:

- The Wayne County Health Department and Oakland County Health Division conduct programs to inspect septic systems, find failures and require repairs. Homeowners and potential home buyers (often at the request of mortgage companies) may ask the county to inspect a septic system for a fee to find out if repairs are needed. Both public health agencies respond to complaints about suspected failing septic systems.
- In 1994, acting upon the recommendation of the On-Site Sewage Disposal Subcommittee of the Rouge RAP Advisory Council, the Oakland County Health Division, through the Southeast Michigan Health Association, conducted a survey to identify the rate of failure of septic systems in the cities of Farmington Hills and Southfield. The study included in-stream water quality testing for dissolved oxygen, pH, turbidity, and fecal coliform in an attempt to target the areas of poorest water quality in the two cities. Subsequent dye testing was performed at homes along the river and its tributaries serviced by on-site septic systems. In-stream macroinvertebrate studies were also completed to assess overall stream health. A total of sixty-five homes were dye tested using an innovative method first developed in Thurston County, Washington. The dye testing results indicated 52% of the homes tested were leaching sewage effluent into the river. Figure 19 summarizes these survey results. The $37,000 study was funded by the RRNWWDP. It is hoped the study will be funded again for the summer of 1995 to expand the number of homes dye tested in order to gain a more accurate rate of failure for those areas targeted by the 1994 study.
- The Village of Franklin, which now uses on-site systems for sewage disposal, began installing a pressure sanitary sewer system in 1992. By the spring of 1995, approximately 250 (out of a total of 1026 residences) will be connected to this pressure sewer system. The entire village will have accessibility to the pressure sewer by the fall of 1995.
- The DWSD has undertaken an aggressive approach to monitoring permitted septage haulers and their specified dumpsites. This program includes strict enforcement actions against violators as well as a monitoring program. To help determine the contribution of pollutants of concern from this particular source, the DWSD periodically samples septage haulers as well as their dumpsites.

Contaminated Sites

Rank 3 of NPS Pollutants

The Michigan Avenue dump site clean-up

River banks and floodplains have been used historically as dumpsites for all types of waste from construction debris to hazardous waste. People often "filled in" wetlands and other low areas within the river's floodplain with waste because it was easy to fill and was, in their view, unuseable because it flooded. They often believed that they were improving the land so it could be used for a building site. Factories were often located along the river's banks so they could use its water to readily dispose of wastes. The river is now eroding into some of these old "dump" sites as it meanders and changes its course, and previously dumped waste is being discharged into the river.

These contaminants can adversely impact the river in several ways. Liquid contaminants can degrade fish, wildlife, and benthos populations and habitats, cause tumors and other deformities in

fish, cause restrictions on fish consumption, restrict dredging activities, impair swimming and other water related activities, and negatively impact the aesthetic appeal of the river. These sites can also present a risk to human health due to direct exposure to these wastes. Several of these contaminated sites are located near homes, schools or businesses or in parks and recreation areas. Citizens may be exposed to these contaminants without being aware of it. More studies are needed within the watershed to determine the impacts to human health from these contaminated sites and other pollutant discharges.

Contaminated sites are regulated through Michigan's Environmental Response Act (P. A. 307 of 1982, as amended), which provides for the identification of contamination and any potentially responsible parties (PRPs), a risk assessment, evaluation, and cleanup of these sites. These sites are regulated by the MDNR's Environmental Response Division (ERD), Waste Management Division (WMD), Surface Water Quality Division (SWQD), and the Underground Storage Tank (UST) Division.

There are currently 100 known Act 307 sites of environmental contamination in the watershed. This does not include sites not presently on the 307 list. Figure 20 shows the approximate locations of these sites. A corresponding list of sites, including site name and cleanup status, is located in Appendix D. Sixty-five sites have a cleanup plan approved by the MDNR with interim response activities funded by PRPs or other funds. Twenty-four sites either have no cleanup plan approved by the MDNR or no actions have been taken. Eight sites do not have cleanup plans yet approved by the MDNR but interim response activities has been provided by state funds. Three sites are in final cleanup phase funded by a PRP or other funds.

There were 27 known sites of environmental contamination listed in the original Rouge RAP document. Five of these sites were listed as having a direct negative impact on the river. Interim response activities have been conducted at two of these sites, the Rouge River (Main Branch) and Salem Landfill. No actions were taken at the Dial Trucking and Trilex sites. The K & J Landfill site will be excavated and the contaminated contents placed in a lined landfill cell. The current status of these sites is included in Appendix D. In addition, a number of sites that have undergone remediation since the RAP was completed in 1989 are described in more detail later in this section.

Goals and Recommendations

Short-term Goal

CD-1: Identify sites of environmental contamination that are contributing, or have the potential to contribute, contaminants to the river.[35]

Short-term Recommendations:

CD-1a: As part of the RRNWWDP, MDNR should assist Rouge Program Office staff in identifying sites of environmental contamination. *Primary responsibility: MDNR-ERD, Wayne Co./RRNWWDP, USEPA*

CD-1b: Assist in mapping all identified sites of contamination in the watershed. List all addresses and owner's names for each site located on the map. *Primary responsibility: MDNR-ERD, Wayne Co./RRNWWDP*

CD-1c: Where data exists, sites of environmental contamination should be scored for listing under the Michigan Environmental Response Act (MERA-1982 P.A. 307, as amended). *Primary responsibility: MDNR-ERD*

CD-1d: Provide maps with MERA site locations to local governments. *Primary responsibility: MDNR-ERD, Wayne Co./RRNWWDP*

Long-term Recommendations:

CD-1e: Map the extent of contamination for each site where the extent of contamination is defined. *Primary responsibility: MDNR-ERD, MDNR-LWMD, Wayne Co./ RRNWWDP*

CD-1f: List all sites of environmental contamination which directly impact wetlands, parks, playgrounds, public access sites, athletic fields and schools and make this information available to the public. *Primary responsibility: MDNR-ERD, Wayne Co./ RRNWWDP*

CD-1g: List contributing water courses and the sites of contamination within their subwatersheds. *Primary responsibility: MDNR-SWQD, MDNR-ERD*

Short-term Goal

CD-2: Work to eliminate contaminant loading to the Rouge River from sites of environmental contamination as described under the Michigan Environmental Response Act (MERA).[35]

Short-term Recommendations:

CD-2a: Provide technical expertise to the RRNWWDP staff in the area of workplan formulation and data interpretation. Identify potentially responsible party(ies) (PRPs). *Primary responsibility: MDNR-ERD, Wayne Co./RRNWWDP*

CD-2b: Notify any identified PRPs of their liability and responsibility for investigation and cleanup. *Primary responsibility: MDNR-ERD*

CD-2c: Evaluate sites for possible state funding and nominate those that qualify. *Primary responsibility: MDNR-ERD*

CD-2d: Work with PRPs to effect cleanups and/or to reduce immediate hazards. *Primary responsibility: MDNR-ERD, Wayne Co./RRNWWDP, USEPA*

CD-2e: Prioritize sites in the watershed for potential remediation. If funding exists, work on high priority sites for cleanup. *Primary responsibility: MDNR-ERD*

Long-term Goal

CD-3: Determine the amount and effects of nonpoint source contaminant loadings on groundwater and/or surface water quality from these sites.

Short-term Recommendation:

CD-3a: Evaluate existing groundwater data or gather additional information regarding leachate from abandoned dumps and determine the contaminant loading to the groundwater and/or surface water. *Primary responsibility: MDNR-SWQD, MDNR-ERD, Wayne Co./RRNWWDP, U of M-Dearborn*

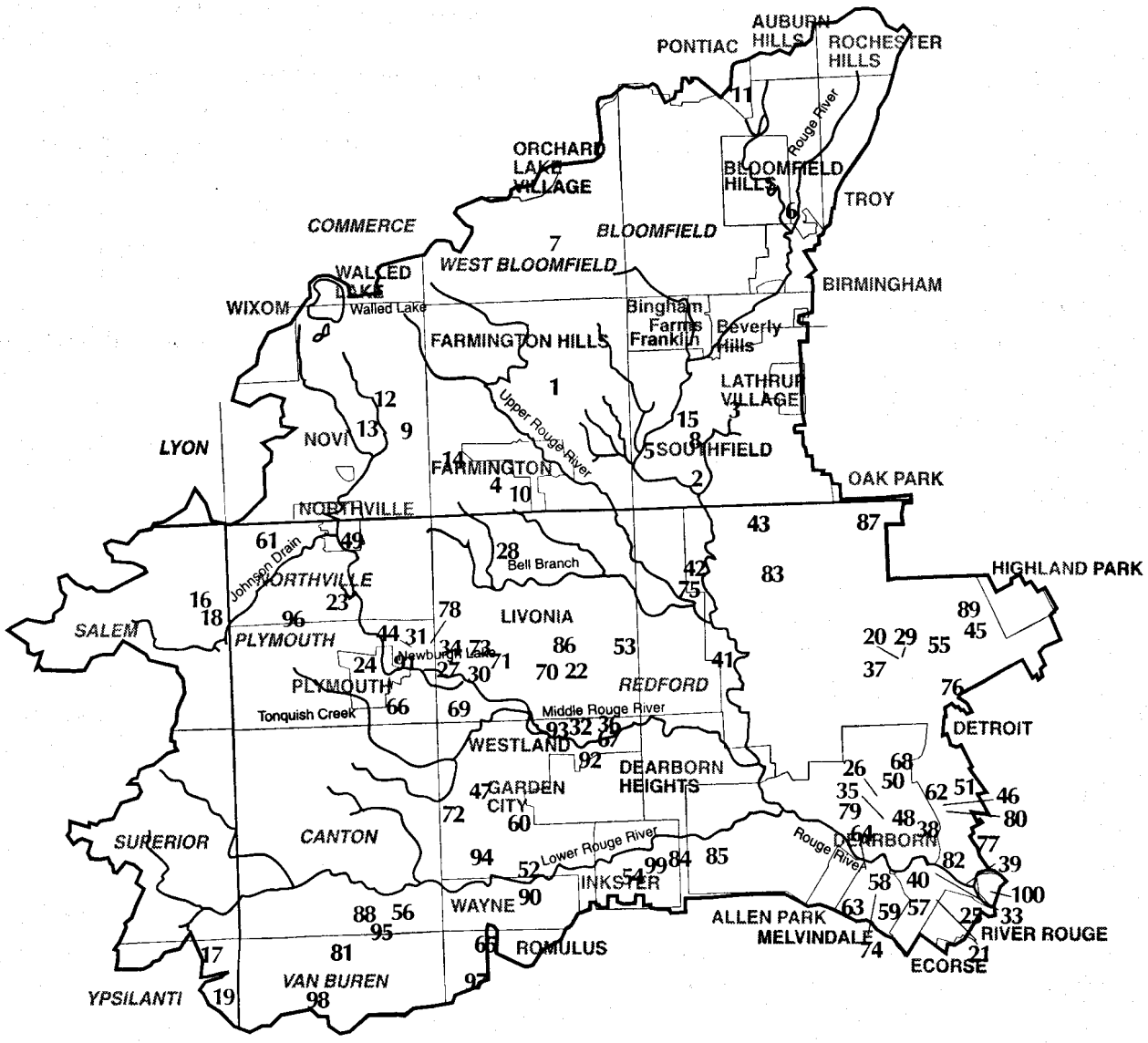
Long-term Recommendations:

CD-3b: Study the effect of old unregulated landfills on groundwater and any subsequent impacts on surface water. *Primary responsibility: MDNR-SWQD, MDNR-ERD, U of M-Dearborn, Wayne Co./RRNWWDP*

CD-3c: Develop an ongoing, comprehensive groundwater monitoring program for all old Act 87 or unregulated landfill sites located in the floodplain to determine their effect on the river. *Primary responsibility: Wayne Co./RRNWWDP, MDNR-WMD, MDNR-ERD, U of M-Dearborn*

CD-3d: Sample soils in parks and public areas accessed by the public to determine if soils are contaminated, especially from old floodplain dumps. Primary responsibility: MDNR-ERD, Wayne Co./RRNWWDP

Figure 20
Rouge River Watershed
Known Sites of Environmental Contamination



Note: See Appendix D for site names, identification numbers, ranking, and status

Long-term Goal

CD-4: Encourage legislation to secure funds to assist private party cleanups.

Long-term Recommendations:

CD-4a: Work with legislature to enact legislation to provide necessary funding for cleanups through either direct funding or an orphan share fund. *Primary responsibility: MDNR-ERD, Wayne Co./RRNWWDP*

CD-4b: Using these funds, work on high priority sites for cleanup. *Primary responsibility: MDNR-ERD*

Short-term Goal

CD-5: Improve communication and coordination of activities among all agencies involved in management of contaminated sites, such as the Rouge Program Office, Wayne County Department of the Environment, and MDNR.

Short-term Recommendation:

CD-5a: Create a list of all regulatory agencies involved in remediation activities and a contact person for each agency. *Primary responsibility: MDNR-ERD, RRAC-Contaminated Sites*

Long-term Recommendations:

CD-5b: Maintain a mailing list of agencies and individuals to whom copies of pertinent information will be sent. *Primary responsibility: RRAC-Contaminated Sites*

CD-5c: Periodically meet with interested agency personnel to determine role or involvement, activities in which that agency is involved, and keep abreast of any pertinent rules or regulations. *Primary responsibility: RRAC-Contaminated Sites*

Long-term Goal

CD-6: Promote dissemination of information on contaminated sites to the public.

Short-term Recommendation:

CD-6a: Provide the Act 307 list of sites of environmental contamination to all public libraries. *Primary responsibility: MDNR-ERD*

Long-term Recommendations:

CD-6b: Develop a procedure to allow citizens concerned about exposure to toxic and hazardous substances better access to information on a particular contaminated site as well as a mechanism for reporting specific human health effects related to these sites. *Primary responsibility: MDPH, MDNR-ERD*

CD-6c: Encourage local governments to publish, in a local newspaper, a list of contaminated sites within their jurisdiction. This list should be published yearly. *Primary responsibility: RRAC-Contaminated Sites, residents*

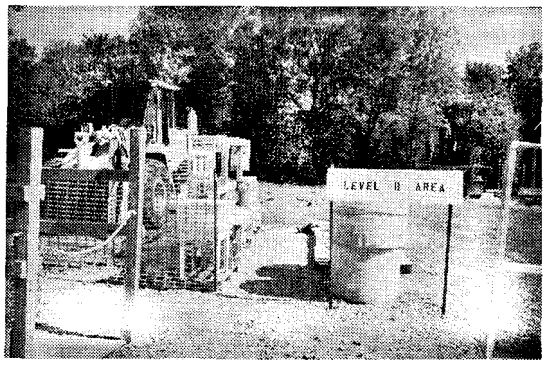
CD-6d: Participate in studies to determine human health risks from sites of environmental contamination. *Primary responsibility: MDNR-SWQD, MDNR-ERD*

Progress to Date

The following activities are being conducted to address pollution from contaminated sites:

- The University of Michigan-Dearborn will begin an independent study of groundwater contamination from old dump sites and their potential impact on water quality in the watershed.
- Wayne County/RRNWWDP is investigating abandoned dump sites within the watershed to determine the impact of these sites on water quality through a $1,350,000 project. A public records search, field reconnaissance, and sampling and analysis of leachate are currently underway. Leachate samples will be collected at up to 11 abandoned dump sites to pro-

vide current and consistent data for comparison of pollutant sources. Sampling parameters include volatile and semi-volatile organics, PAHs, metals, PCBs, dissolved oxygen, total and dissolved solids, oxygen demand, nutrients, temperature, pH, and conductivity.



Site cleanup in progress

- The Contaminated Sites Subcommittee of the RRAC was formed to address the concerns that citizens and other watershed stakeholders had with regards to old dump sites. Many of the previously mentioned recommendations were presented by this subcommittee. This committee has several watershed residents as members.
- The Rouge River Watershed has been chosen as one of five areas to participate in a workshop and research project entitled, "Human Health Indicators in Areas of Concern," in which experts in the field of human health will exchange information with AOCs. This project will foster a better understanding of the human health effects associated with toxins within the Rouge River Watershed and other AOCs. Members of both the RRAC and MDNR will participate in this workshop.
- The City of Detroit has undertaken a cooperative effort with the MDNR-ERD to assess, remediate and ultimately delist a number of designated 307 sites within the city's boundaries. The city has organized a "Land Use Task Force" and a "Reuse Task Force" to begin cleanup of several of these sites.[35]
- The DWSD, as part of its PCB/Mercury Minimization Program, has initiated a program to assess, characterize and develop control strategies for the contributions of PCB and Mercury from leaking 307 sites.

Contaminated Sites Summary

The following summary is meant to be a general overview of contaminated sites that have undergone substantial remediation since the RAP was completed in 1989. This list does not include sites which are not on the state's Act 307 list or USEPA's Superfund list. Contaminated sites from the original RAP are discussed only if they have had substantial activity.

Contaminated Fill near Bietz Creek (Marshall School) (Site ID #820227)

The contaminated fill near Bietz Creek in Livonia is an old landfill used in the 1950s and 1960s for municipal waste disposal. It is located next to Bietz Creek and behind Marshall Elementary School. The landfill was operated by the City of Livonia, which has volunteered to investigate and remediate the site. The creek has eroded its banks and waste is exposed. There are also several leachate seeps flowing into the creek, which were sampled in 1992 and resampled in 1994. Benzene was detected at levels below state standards. A MDNR-ERD toxicologist determined that there was no significant health risk at this low level. Further sampling was conducted in July/August, with both water and soil sampling. A full review of the data has not been conducted at this time, but a preliminary review indicates that benzene levels remain below state standards.

Cooper Elementary School (Site ID #820010)

This site is located at 28611 Ann Arbor Trail in Westland and encompasses approximately 40 acres. Originally, the site was an active municipal landfill until the early 1950s. After its closure, the Cooper Elementary School was constructed on the site. The contaminants of concern are lead, cadmium, chromium, mercury and DDT. Lead was detected at nine times above the standard

for human contact. Groundwater seepage from the site entering the Barnes Drain (tributary to the Middle Rouge River) had lead concentrations in excess of the water quality standards for protection of aquatic life. The school has been closed due to overwhelming public concern for the safety of the students. The site has been permanently fenced off to restrict access. Other remedial actions proposed include capping the fill area. The site needs further groundwater investigation to determine if a leachate collection system is needed. The MDNR is working with the PRP to complete an investigation and remediation of the site.

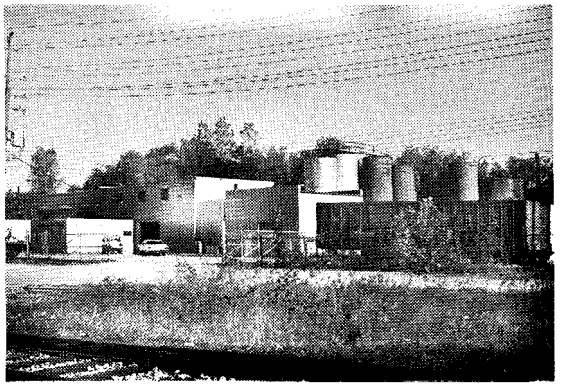
Dial Trucking (Site ID #820013)

The Dial Trucking site is a 26 acre municipal landfill and solid waste transfer facility located in Plymouth Township at 14015 Haggerty Road. The site is fenced on three sides with the west border being Sly Creek, a tributary of the Middle Rouge River. The site was licensed under Act 87 as a landfill and transfer facility to accept municipal and industrial waste. It operated from the early 1960s until its closure in 1971.

In June 1984, the Wayne County Health Department visually inspected the site and found leachate draining into Sly Creek. No soil or groundwater samples were taken.

General Oil Site (Site ID #820208)

This site is located in an industrially-zoned area in the City of Northville surrounded by a mixture of commercial and residential developments. The facility has been utilized historically for waste oil recycling operations by a series of companies, some of which are now defunct. Unlined lagoons were utilized from 1950 until the mid-1970s to dewater waste oils contaminated with chlorinated solvents, PCBs and heavy metals. The lagoons were generally closed by filling them with soil with no prior cleanup activities.



The General Oil site

Waste oil from one of the old lagoons was discovered seeping into the Rouge River in 1983. The source of the oil was eventually traced back to the former north lagoon which was utilized most during operations. Groundwater throughout the site is contaminated with chlorinated solvents at concentrations well in excess of the human health drinking water standards. An artesian drinking water well located near this site is monitored periodically for contamination due to its proximity to the contamination. No contamination has yet been detected in this well.

A boom has been in operation since approximately 1991 to contain the oil seeping into the river. In addition, a skimmer trench was installed along the shoreline in 1994 to intercept oil before it reaches the river. The trench does not, however, collect contaminated groundwater, which is still discharging into the river. An investigation has determined the extent of the contamination. Additional remedial activities are needed to stop the further spread of contamination. If unabated, the plume of contaminated groundwater may pose a threat to residential wells.

K & J Landfill (Site ID #820023)

K & J Landfill was in operation from 1966 through 1977 in Canton Township. The Wayne County Health Department filed many complaints against the landfill operators for noncompliance of their permit. There were also allegations that the facility accepted liquid industrial wastes. Ecology & Environment, Inc. prepared a site inspection report that stated that groundwater in the area was

reported to be contaminated but the source was unknown. Additional groundwater monitoring has not been conducted to confirm contamination.

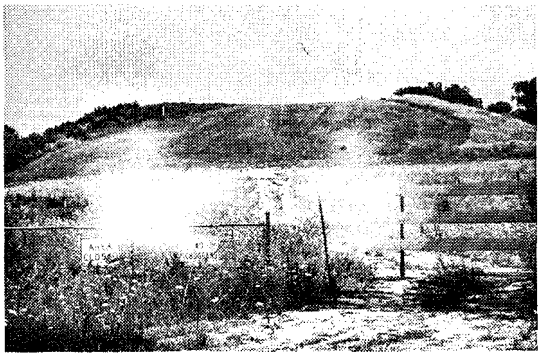
Wayne Disposal, Inc. has purchased the property containing the K & J Landfill to create a new landfill. MDNR has approved a plan to dig out the old landfill and place its contents in a lined landfill cell. The excavated area will be developed into a new licensed Type II landfill.

Michigan Avenue Dump Site (US EPA CERCLIS #312-886-0900)

The 3M Company, under the supervision of the USEPA, has completed Phase I waste removal activities at the Michigan Avenue Dump Superfund Site, located in Canton Township on Michigan Avenue just east of Lilley Road. The site is bordered on the north by the Lower Rouge River. This site was used for the disposal of liquid and solid wastes including paints, resins, and adhesives. Contaminants of concern at this site include lead, zinc, PCBs, chromium, toluene, and xylene. This site posed several potential threats including dangers to public health and the Rouge River. During the last 20 months, 3M has removed almost 18,000 cubic yards of waste and contaminated soil from the site. In addition, 3M restored the river's eroding streambank. Protective stone rip-rap is now firmly in place to prevent erosion at the excavation site. Phase II of the cleanup involved a series of follow-up tests of the soil, groundwater, and surface water to determine the effectiveness of the removal. These tests will ascertain whether additional cleanup is needed. Phase II testing has been completed and is under evaluation.

Middlebelt Hill (Site ID #820207)

This site is located on Hines Drive between Middlebelt and Inkster roads in Westland. The area of contamination is in a recreational area previously used as a toboggan hill. In the past, the Wayne County Road Commission agreed to allow Detroit's Sanitation Department to dump municipal waste on the hill to increase its slope. The contaminant of concern at this site is lead. Woodchucks burrowing into the hillside allow contamination from within the fill to reach the surface. A groundwater investigation has been conducted, with only one well containing groundwater. The Barnes Drain, a tributary of the Middle Rouge River, does not appear to be impacted by contamination from this site. Vegetation has been removed and animal burrows filled with soil to discourage further burrowing. Wayne County has submitted a plan, which is presently under review, to cap the hill.



Middlebelt Hill site

Nankin Township Dump Superfund Site (Site ID #821535)

EPA conducted a preliminary site assessment of the Nankin Township Dump Site, a 12 acre site located near the intersection of Cowan and Warren Roads in Westland. This site is on the south bank of the Tonquish Creek and was used as a dump site for industrial and municipal wastes from the 1950s to the 1970s. On April 14, 1993, USEPA found partially buried drums, scrap metal, and exposed solid waste while performing a more extensive survey. Later sampling detected a number of hazardous substances including chromium, lead, zinc, toluene, and ethylbenzene. In 1993, the USEPA conducted negotiations with three potentially responsible parties (PRPs), 3M, Wayne County, and Crestwood Development, without reaching any agreement. In 1994, the USEPA determined that the site posed a threat to human health and the environment and issued an administrative order requiring the PRPs to conduct cleanup activities. The PRPs have performed an investigation. The USEPA has removed all buried drums and contaminated soil at this site.

National Airport (Site ID #820034)

The National Airport Site in Westland contains a former 30-acre landfill, the "Old American Landfill," that accepted industrial waste and city trash from the early 1960s until the early 1980s. A parcel adjacent to the landfill was developed into the National Airport, which operated during the 1970s. During the late 1980s, drum were discovered on the site. Some were from the old landfill operation and some appeared to have been dumped more recently.

The MDNR conducted a surface cleanup in the winter of 1990 and 1991, and the site owner filed for bankruptcy. In early 1992, the subsequent owner conducted a hydrogeologic study of the landfill and the surrounding land. Data showed that there was neither soil nor groundwater contamination on the perimeter parcels. However, soil borings from the heart of the landfill revealed the presence of lead, cadmium, and zinc above natural background levels. The organic analyses confirmed the presence of benzene at 19 parts per billion. However, due to matrix interference base neutral, phenol and polynuclear aromatic (PNA) compounds were found at detection limit of 3.0 ppm, which is above Type B levels. In August of 1994, the four primary PRPs agreed to pay for previous study costs and undertake future response activities. The next remediation priority is to remove exposed drums.

Old Munn Contractors Landfill (Farmington Township Landfill) (Site ID #630040)

The site is located at the corner of Haggerty and 10 Mile Roads in a highly developed industrial and business area. The landfill, now closed, accepted incinerator ash and municipal refuse. There are no soil or groundwater data from the site, but there are allegations of wet and stained soil areas. In 1984, the property owner moved some waste to a licensed landfill in order to build a car dealership. It is not known whether landfill waste still exists on the site.

Salem Landfill (Site ID #810033)

This closed, unlined municipal landfill was cited in the original RAP as impacting the surface water of the Rouge River. Through funding from the State Quality of Life Bond Grant Program, the landfill was capped under the supervision of the MDNR-WMD to help prevent further buildup of water within the landfill. This site has visible leachate outbreaks which are likely impacting surface water and nearby wetlands. A culvert that originally protected a stream that ran underneath the landfill was dislodged, allowing more leachate to leave the landfill. The drain will be rerouted around the landfill to stop this impact. Further sampling is proposed to determine if there is a surface water impact from this site.

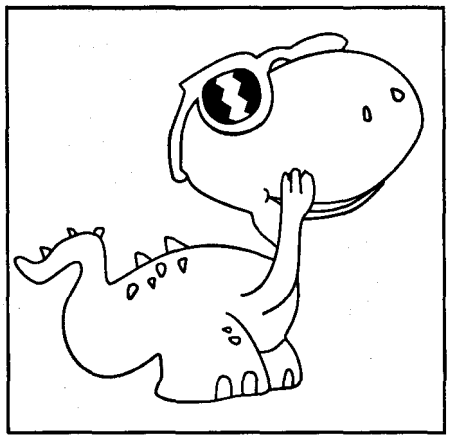
Warrendale Site (Warrendale Rouge Dump) (Site ID #821537)

The Warrendale site is located near the intersection of Telegraph Road and Hines Drive in the City of Dearborn Heights and consists of approximately eight acres. The City of Detroit used this site for the disposal of municipal waste from 1936 to sometime prior to 1944. The area is presently being used as a county park. Contaminants that have been detected at levels above the MDNR's Type B cleanup criteria include polynuclear aromatic hydrocarbons, arsenic, and lead. This area is of particular concern because the area was chosen as one of the 10 sites to host a CSO treatment basin. There have been special concerns about how the existing waste will impact the construction activities and the surrounding environment. A workplan has been developed for this site and for the construction activities. Waste will be excavated from the basin area and stored on site under a geosynthetic liner. When the basin is completed, the waste will be placed back over the basin and a clay cap will be constructed over this area to prevent water penetration of the fill and subsequent production of leachate.

Household Hazardous Waste

RANK 4 OF NPS POLLUTANTS

Household hazardous waste includes many commonly used chemicals such as paint thinners, car battery acid, various cleaners, furniture polishes, insecticides, and glues. If a product can catch fire, react or explode under certain conditions or when mixed with other substances, corrode other material or is toxic, it is usually considered hazardous. Many watershed residents dump these wastes down the storm sewers or in the ditches near their homes, not realizing they are hazardous. Many of these sewers and ditches discharge directly to the Rouge River or one of its tributaries.



DWSD's Snoopasaurus educates about household hazardous waste

If not disposed of properly, household hazardous waste can cause impairments to fish and aquatic insect populations and habitats, contribute to formation of fish tumors and deformities, and degrade the aesthetic value of the river. The original Rouge RAP cited household hazardous waste as a potentially significant source of pollution and called for public education and periodic collection programs.[36]

Goals and Recommendations

Long-term Goal

CE-1: Take actions necessary to eliminate pollutant inputs from the improper disposal of household hazardous wastes.[36]

Short-term Recommendations:

CE-1a: Initiate ongoing workshops to educate residents about what they can do to reduce pollution to the river (such as low impact yard care, proper disposal of household hazardous waste and alternatives). *Primary responsibility: NRCS, county health departments, local governments, RRAC, Wayne Co./RRNWWDP*

CE-1b: Encourage communities to initiate periodic household hazardous waste collection days for residents. This effort can then be incorporated into a watershed-wide program. *Primary responsibility: Local governments, MDNR-WMD, environmental organizations*

Long-term Recommendations:

CE-1c: Continue the storm drain stenciling program sponsored by the Friends of the Rouge to help eliminate dumping of residential hazardous wastes down storm sewers. *Primary responsibility: FOTR and participants*

CE-1d: Encourage schools to incorporate environmentally sound practices for the home into their curriculum (such as safe pesticide use or alternatives, hazardous waste disposal and alternatives). *Primary responsibility: FOTR, Michigan Department of Education, Regional Educational Service Agency*

CE-1e: Establish a watershed-wide household hazardous waste collection program. *Primary responsibility: Wayne Co./RRNWWDP, MDNR-WMD, local governments*

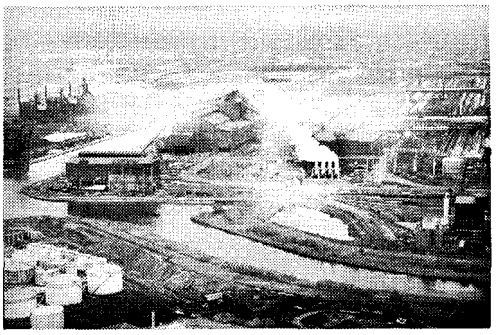
Progress to Date

The following activities have been conducted to address improper disposal of household hazardous waste:[36]

- The DWSD has initiated a household hazardous waste (HHW) program within its service region. The program includes multimedia public education and outreach activities, including customer billing inserts to over two million DWSD customers, public speakers, presentations to community groups, and advertisements in the *Detroit News* and *Free Press*. The program also promotes participation in proper disposal of HHW through the use of an on-site collection mobile and encourages the use of alternative products. This program will help educate the public on the hazardous substances contained in the products used for chores in their homes, which often are poured down the drain and into Detroit's sewers.
- The following communities conduct household hazardous waste collection programs twice each year: Bloomfield and West Bloomfield townships and the cities of Farmington, Farmington Hills, Southfield, and Wixom.
- The cities of Livonia and Dearborn provide an annual household hazardous waste collection day for residents.
- The cities of Grosse Pointe and Harper Woods and the Central Wayne County Sanitation Authority (the cities of Dearborn Heights, Garden City, Inkster, Wayne, and Westland) applied for and received state grants to implement household hazardous waste collection programs.
- The Friends of the Rouge continues its storm drain stencilling project to help eliminate dumping of household hazardous waste into storm sewers. Volunteers from service clubs and scout troops have stencilled "DUMP NO WASTE, DRAINS TO ROUGE RIVER" next to storm drains in Redford Township and the cities of Detroit, Dearborn, Farmington Hills, Livonia, Novi, Southfield, and Wayne to warn residents of the final destination of materials poured down the sewer.
- Downriver Recycling Center has a public education program to promote stenciling drains among its membership organizations and to encourage oil recycling.
- Canton Township plans to establish a program to stencil storm drains to discourage people from dumping hazardous materials into storm drains.
- The City of Birmingham, in cooperation with a local cable company, utilizes public service programs to promote its storm drain stencilling program.
- The City of Birmingham's Department of Public Services give presentations promoting their household hazardous waste programs.
- The City of Livonia has maintained a used oil drop-off center for the last 15 years.

Air Deposition

RANK 5 OF NPS POLLUTANTS



Airborne pollution affects the river

Pollutants such as mercury, discharged into the air by industries and automobiles, can enter the Rouge River when, as particles in rain and snow, they are carried back down to the earth. Precipitation can also be acidic. These pollutants can acidify the receiving stream in some areas or can accumulate in the sediments. Acid precipitation does not pose an immediate threat to the Rouge River because limestone soils neutralize these acids. One obstacle in eliminating pollution from airborne sources is that it can be carried from hundreds or even thousands of miles away. For practical purposes, the controls discussed in this document are limited to readily identifiable, local sources of air deposition. Airborne pollutants can impair fish and benthic populations and habitats, restrict fish consumption, contribute to fish and animal deformities, and create restrictions to dredging operations. Air deposition was not directly discussed in the original Rouge RAP document.

Goals and Recommendations

Long-term Goal

CF-1: Reduce the input of airborne deposition of contaminants to the Rouge River, as feasible.

Short-term Recommendations:

CF-1a: Determine the air pollutant sources which may contribute to use impairments by encouraging and supporting studies performed to identify sources of atmospheric deposition. *Primary responsibility: MDNR-AQD, DWSD, Wayne Co./RRNWWDP*

CF-1b: Quantify the atmospheric deposition of pollutants of concern. Cost: Over $838,000 *Primary responsibility: MDNR-AQD, DWSD, U of M, Wayne Co./ RRNWWDP*

Long-term Recommendations:

CF-1c: Quantify the air emissions generated exclusively within the watershed. Cost: Less than $600,000 *Primary responsibility: MDNR-AQD, DWSD, Wayne Co./ RRNWWDP, U of M*

CF-1d: Determine if stricter controls and/or emission limits are needed for industries in Southeast Michigan to protect the watershed. *Primary responsibility: MDNR-AQD*

CF-1e: Strengthen, where necessary, regulations affecting atmospheric deposition. *Primary responsibility: MDNR-AQD*

Progress to Date

The following activities have been conducted to address air deposition:

- The RRNWWDP is conducting a study to estimate the amount of pollutants contained in stormwater runoff that can be attributed to both wet- and dry-fall air deposition. Two monitoring sites have been identified: one in an urban industrial area and the other in a suburban residential and commercial area. The project will evaluate pollutants such as nutrients, metals (including mercury), PCBs, and polynuclear aromatic hydrocarbons (PAHs).

- DWSD is conducting an atmospheric deposition study of wet weather runoff to determine the quantity of contaminants contributed to their collection system by air deposition. It is suspected that certain constituents of the incoming wastewater may be coming from air deposited contaminants brought into the collection system with rainfall. The estimated completion date for this study is 1997.
- West Bloomfield Township and the City of Detroit utilize a leaf burning ordinance to control airborne contaminants from this source of air pollution.

Waste Management Division Regulated Facilities

RANK 6 OF NPS POLLUTANTS

MDNR's Waste Management Division (WMD) regulates active and inactive landfills, waste transfer stations, waste processing plants and hazardous waste treatment, storage and disposal (TSD) facilities. Landfills that are considered "active" are either operating presently or undergoing their 30-year post-closure monitoring. "Inactive" landfills are those that are closed and their monitoring period is complete. Potential impacts from these landfill facilities include the illegal discharge of leachate to the surface water or groundwater from leaking waste disposal cells, stormwater runoff from the perimeter of the landfill site which may be contaminated if not properly managed and refuse that blows away from the active fill area.

These potential sources of pollution were not directly addressed in the original Rouge RAP document. If these sites are leaking or are not properly controlled, however, they can cause impairments to fish and aquatic insect or benthos habitats and populations, cause fish tumors or other deformities, cause restrictions on dredging, increase eutrophication or plant growth which can decrease oxygen levels, restrict swimming or other water-related activities, and degrade aesthetics. In the State of Michigan, these landfill facilities are regulated under Act 64, the Hazardous Waste Management Act of 1979, as amended, and Act 641, the Solid Waste Management Act of 1978, as amended.

Goals and Recommendations

Short-term Goal

CG-1: Eliminate contamination from facilities regulated by the MDNR-WMD.

Short-term Recommendations:

CG-1a: Ensure that any surface water or groundwater discharges are sampled for any WMD-regulated facility suspected of having a negative effect on the watershed. *Primary responsibility: MDNR-WMD, MDNR-SWQD*

CG-1b: Ensure that appropriate MDNR divisions are notified and consulted regarding any environmental impact from the above facilities that will adversely affect the watershed. *Primary responsibility: MDNR-WMD*

Long-term Recommendations:

CG-1c: Identify and report any potential impacts to the river during WMD inspections of hazardous waste generators, hazardous waste transporters, nonhazardous liquid industrial waste transporters, and TSD facilities to the MDNR-ERD, MDNR-SWQD or other agencies as appropriate, for corrective action. *Primary responsibility: MDNR-WMD*

CG-1d: Develop a process for adequate communication between the WMD and the Rouge RAP Coordinator whenever a construction permit is submitted for landfills and TSD facilities located within the watershed. *Primary responsibility: MDNR-WMD*

Long-term Goal

CG-2: Ensure that inactive landfills regulated by WMD are being monitored and maintained by the owners or operators.

Short-term Recommendation:

CG-2a: Inspect existing conditions at inactive landfills that are regulated by WMD. *Primary responsibility: MDNR-WMD*

Long-term Recommendation:

CG-2b: Correct any environmental or operational problems at the WMD-regulated facilities to eliminate contamination. *Primary responsibility: MDNR-WMD*

Long-term Goal

CG-3: Eliminate impacts to the river from junkyard operations.

Short-term Recommendation:

CG-3a: Educate owners and operators of junkyards about pollution prevention and pursue enhanced regulatory control over these facilities. *Primary responsibility: MDNR-ERD, MDNR-SWQD, MDNR-WMD, RRAC-NPS*

Progress to Date

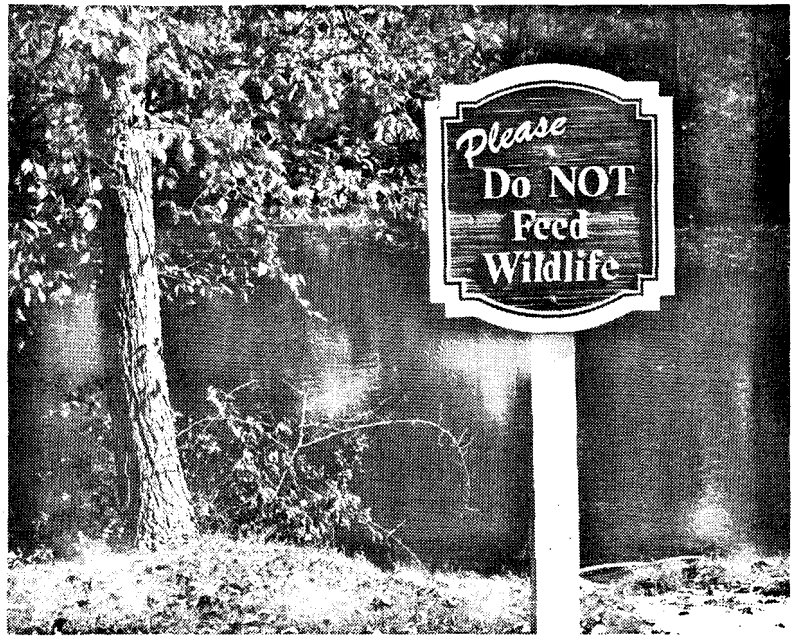
The following activities have been conducted to address pollution from WMD-regulated facilities:

- MDNR-WMD is coordinating with Wayne County to determine the status of closed, inactive landfills in the watershed and will work to contact potentially responsible parties (PRPs) if environmental problems are found.
- MDNR-WMD and Wayne County are investigating the impact of junkyards on the river. The enhanced regulatory control will be coordinated by the USEPA and MDNR Southeast Michigan Initiative (SEMI).

Animal Waste

RANK 7 OF NPS POLLUTANTS

Excessive amounts of animal waste from ducks, geese, horses, cows and other animals can cause many water quality problems. Unhealthy levels of bacteria and nutrients can be carried in stormwater from horse or cattle farms or pond areas where birds are fed. When wild geese and ducks are fed, they tend to congregate in large numbers. This, in turn, creates high bacteria levels, concentrated nutrients, reductions in available oxygen, and degraded streambank habitat. It



Educating residents to protect the river, Northville

also creates an unnatural dependency of these wild birds on humans for survival. Severe negative impacts can also result from cattle or horses being allowed to walk and defecate in streams. Excessive animal wastes can impair fish and aquatic insect habitats and populations, accelerate aquatic plant growth that can choke waterways, decrease oxygen levels, and severely degrade the aesthetics of a stream. Animal wastes were not specifically addressed in the original Rouge RAP document.

Goals and Recommendations

Long-term Goal

CH-1: Eliminate the negative impacts of excessive animal waste.

Short-term Recommendations:

CH-1a: Educate residents about the hazards to humans and wildlife from the unregulated feeding of animals. *Primary responsibility: MDNR-Wildlife, local governments*

CH-1b: Continue to inform farmers about the assistance provided by the NRCS in planning animal waste control systems. Encourage farmers within the watershed to install these systems. *Primary responsibility: MDA, NRCS, MDNR-SWQD*

Long-term Recommendations:

CH-1c: Enact local ordinances to ban the feeding of wildlife (such as ducks and geese) by residents. *Primary responsibility: Local governments*

CH-1d: Animal waste problems should continue to be monitored and corrected if necessary. *Primary responsibility: MDNR-SWQD, MDA, NRCS*

Progress to Date

The following activities have been conducted to address pollution from animal waste:

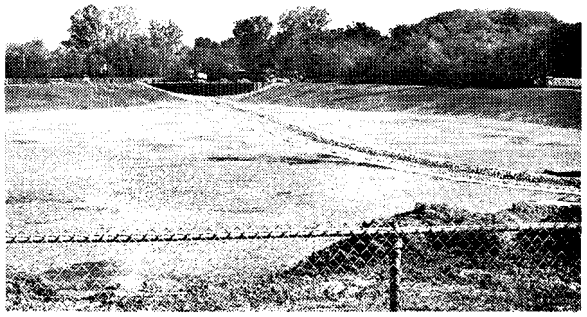
- The MDA, NRCS, and MDNR-SWQD initiated a program in 1994 to contact farmers for animal waste system planning assistance by NRCS staff.
- The City of Northville has posted a sign requesting that residents not feed the animals.
- In 1989, a memorandum of understanding between MDNR and MDA was agreed upon that dealt with environmental regulation of agricultural operations and the procedure for responding to agriculture-related complaints.
- NRCS staff continues to work with farmers on environmental issues and help them to follow the "Generally Accepted Agricultural and Management Practices for Manure Management and Utilization" to avoid future complaints.
- MDNR has produced an *Agricultural Best Management Practices Manual* that is available to any interested farmers.

Point Source Stormwater Discharge

Rank 3

Under the 1987 Clean Water Act Amendments, certain stormwater discharges are now regulated as point sources by National Pollutant Discharge Elimination System (NPDES) permits. These discharges differ from nonpoint sources because they are discharged from a specific pipe or point. Stormwater runoff, which carries pollutants such as heavy metals, nutrients, and oils is considered to be one of the most significant point sources of pollution. USEPA stormwater regulations, effective October 1, 1992, require that a discharge permit be obtained for stormwater discharges to the surface waters from construction sites five acres or more in size and from certain industrial activities that are specified in the regulations. Stormwater discharges within communities with a population over 100,000 served by separate sewers are also covered by this program. No communities within the Rouge River Watershed are covered by this program because the communities over 100,000 in population have combined sewers and are covered by other NPDES permits. As these regulations become more stringent, however, communities within the watershed will most likely be regulated under the state stormwater program.

Construction activities five acres and greater in size must have an Act 347 (Soil Erosion and Sedimentation Control Act) permit issued from the appropriate enforcing agency before they can obtain "Permit-by-Rule" coverage from the MDNR. These construction sites were required to have a certified operator, trained by the MDNR, to monitor stormwater discharges by November 14, 1994.



Regional stormwater basin, Farmington Hills

Stormwater discharges from industrial activities are also required to have stormwater discharges covered under an NPDES permit. The industries required to be permitted are identified by Standard Industrial Classification (SIC) code or narrative description in the USEPA stormwater regulations (40 CFR 122.26). A majority of these industries will be covered under a general permit that has been specifically developed for stormwater discharges from industrial activities. Under this permit, the permittee is required to develop a stormwater pollution prevention plan. They are also required to have their discharges monitored by a stormwater operator within one year of obtaining coverage under the general permit. Individual permits will be required for industrial activities where additional pollution controls are necessary to protect water quality. As of December 1994, there were more than 280 industrial stormwater permits issued in the Rouge River Watershed.

Point source stormwater discharges can restrict fish consumption, degrade fish and aquatic insects or benthos populations, lead to the loss of fish and wildlife habitat, contribute to fish tumors and other deformities, accelerate eutrophication or excessive aquatic plant growth (causing a decrease in oxygen concentrations), restrict swimming and other water-related activities and degrade aesthetic values. Since the USEPA rules for the Clean Water Act Amendments were not final until the fall of 1990, the original RAP document did not address point source stormwater discharges in detail. The RAP recommended that stormwater discharge permits be issued for all Rouge River Watershed municipalities with major stormwater-related use impairments.

Goals and Recommendations

Long-term Goal

D-1: Ensure, to the maximum extent practicable, that regulated stormwater discharges do not have a negative impact on the river and that permitted facilities comply with the requirements of their permit.[37]

Short-term Recommendations:

D-1a: Identify all facilities that are required to obtain a stormwater permit from the MDNR. Once identified, ensure all necessary permits are obtained.[37] *Primary responsibility: MDNR-SWQD*

D-1b: Catalogue large industrial storage sites and investigate containment provided for above-ground tanks, etc.[38] *Primary responsibility: MDNR-SWQD, MDNR-WMD, county governments*

D-1c: Encourage the use of detention basins for the control of stormwater runoff with an additional emphasis on designing them to treat for water quality not just water quantity. These basins should be designed so as to not add warm water to the stream.[29] *Primary responsibility: MDNR-SWQD, MDNR-LWMD, local governments*

D-1d: Investigate and address the potential negative impact (erratic flows and increased downstream flooding) of the numerous uncoordinated discharges from stormwater retention basins.[32] *Primary responsibility: MDNR-SWQD, MDNR-LWMD, local governments, county drain commissions*

Long-term Recommendation:

D-1e: Develop BMPs for composting sites that address the containment and/or reuse of contaminated water from these sites. *Primary responsibility: MDNR-SWQD*

Progress to Date

The following activities have been conducted to regulate point source stormwater discharges:

- A series of workshops were held by the MDNR-SWQD to train and certify stormwater operators to carry out the requirements for stormwater control at construction and industrial sites.
- Several communities are now looking at ways to better control stormwater runoff from residential developments. The concept of large regional stormwater control and treatment retention basins for all stormwater discharges is now being used by the cities of Novi and Farmington Hills. These basins accept stormwater from various developments within a geographic area which are all piped to a centrally located basin. These larger basins will replace smaller individual basins that are presently used in many developments. These communities believe that regional basins will be a more effective way to treat and control discharges of stormwater.

STREAM FLOW

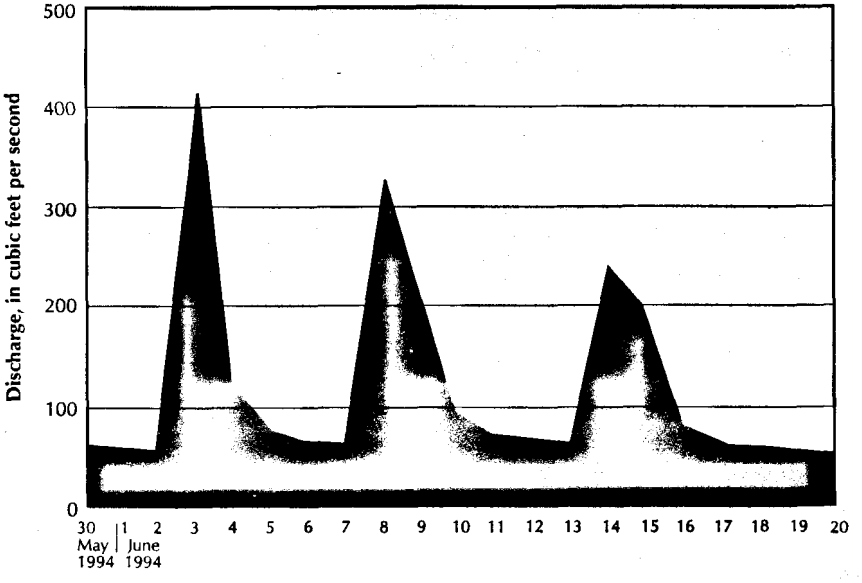
RANK 4

There are two factors that strongly affect stream flow in the Rouge River Watershed. The first, geology, establishes the physical grade of the river's stream channel and the permeability of the soils. The Rouge River headwater areas (where the river begins) are contained in the hilly glacial moraines left by glaciers. The streams in these areas have a steep grade, are swift moving, and have gravel in their sediments. Cool groundwater seeps through the porous soils to feed the river, making good habitat for many cool water fish species such as trout. The greater portion of the river, however, flows through relatively impermeable clay soils. Low grade, slow, meandering, clay-bottom streams characterize these areas. These red clays give the Rouge River its characteristic "cloudy" appearance, and its name "Rouge". Surface water runoff, generally warmer and potentially carrying more pollutants, is primarily what feeds the river in these downstream reaches.

The second factor, which has a more significant negative impact, is the ever increasing amount of impervious surfaces within the watershed. Urban amenities such as parking lots and concrete streets prevent rainwater from soaking into the soil. Instead, it runs into the river in greater volumes in a shorter period of time and does not recharge groundwater. This significant reduction in available groundwater input greatly reduces river flows during dry weather.

Due to the urbanization of the watershed, the Rouge River floods more frequently and at higher levels than it did historically. From the period of 1950 to 1990, average flood levels increased by 25 percent from what was experienced in the 1930s and 1940s. In addition, the number of times moderate floods occured has dramatically increased, from seven times from 1930 to 1940 to 36 times from 1970 to 1980. The Rouge River has also become very "flashy," meaning that rapid flow changes regularly occur. Figure 21 shows the vast fluctuations in river flows in the Middle Branch of the river during a 21-day period, from a high of 417 cubic feet per second to a low of 48 cubic feet per second.

Figure 21
Rouge River Mean Daily Discharge, Selected Area



Note: Discharge taken 500 feet upstream from the bridge on Plymouth Road.

These erratic stream flows can scour stream channels and banks, reduce populations of fish and benthos, cause loss of fish and wildlife habitat, restrict recreational use, degrade aesthetics, and restrict navigation. The original Rouge RAP document found that low flows were a source of impaired uses in all but the lower reaches of the Main Branch of the river where the stream has been channelized by concrete.

Goals and Recommendations

Long-term Goal

E-1: Reduce the impact of erratic stream flows that cause scouring, erosion, sedimentation, loss of habitat, degradation of aesthetics, and restricted navigation.

Short-term Recommendations:

E-1a: Determine an achievable base flow and flow variability. Use this determination as a target for control measures.[39] *Primary responsibility: MDNR-SWQD, MDNR-LWMD*

E-1b: Determine retention and detention measures that can be implemented to achieve the base flow and variability target for the river. Infiltration practices should be used where possible. Work should be targeted to upstream and headwater areas as much as possible.[39] *Primary responsibility: MDNR-SWQD, MDNR-LWMD, local governments*

E-1c: Continue fixed station monitoring including flow monitoring at 22 stations in the watershed.[40] Cost: $30,000/year *Primary responsibility: MDNR, Wayne Co., DWSD, Detroit Edison*

Long-term Recommendations:

E-1d: Draft a watershed plan that provides for implementation of stormwater control measures with both water quantity and quality benefits. The plan should allow sufficient time for communities to install management measures which will provide the maximum benefit to the river. *Primary responsibility: MDNR-SWQD, MDNR-LWMD*

E-1e: Establish a demonstration river corridor and stream channel stabilization program to address log jams, debris removal, and streambank erosion.[41] *Primary responsibility: Wayne Co./RRNWWDP, local governments, MDNR-Fisheries*

E-1f: Establish a mechanism for long-term implementation and funding of a river corridor and stream channel stabilization program.[41] *Primary responsibility: Wayne Co./RRNWWDP, local governments*

Progress to Date

The following efforts are underway to address stream flow issues:

- Many communities, including the cities of Detroit, Farmington and Farmington Hills and Canton Township actively monitor the river for large log jams and other debris problems which may restrict stream flow.
- Each year, the Friends of the Rouge organize the "Rouge Rescue." In 1994, the event drew nearly 2,500 volunteers to help clear debris and large log jams from 28 sites along the river.
- Ypsilanti Community Utilities Authority (YCUA) opened a new pumping station that will transfer discharges of YCUA Wastewater Treatment Plant effluent from Belleville Lake to Willow Creek, which feeds into the Lower Rouge River. It is projected that the effluent will augment low flow problems in the Lower Branch during dry weather.[39]

- Under the nonpoint source work element of Wayne County's RRNWWDP, a $700,000 artificial wetland will be created in a floodplain area in the City of Inkster to demonstrate that urban stormwater runoff can be effectively treated by this type of system. This project will also increase stormwater detention capacity in the Lower Rouge River, helping moderate stream flow during low and high flow conditions.[39]
- The City of Dearborn Heights now requires on-site stormwater retention for new developments to limit flow discharge rates.[29]
- The City of Farmington Hills is constructing flood control basins for Minnow Pond Drain and Pebble Creek. A large regional stormwater retention basin has been built to hold runoff stream flows from developments and to divert some of the stream's flow during wet weather which will help eliminate flooding of homes built in the floodplain downstream along the Minnow Pond Drain.[41]
- Redford Township requires all new commercial developments to retain their stormwater on site.[29]
- The City of Rochester Hills is developing a new Chapter 20 drain called the Chester Drain, which will drain to an existing retention basin to control flow rates during wet weather events.[39]

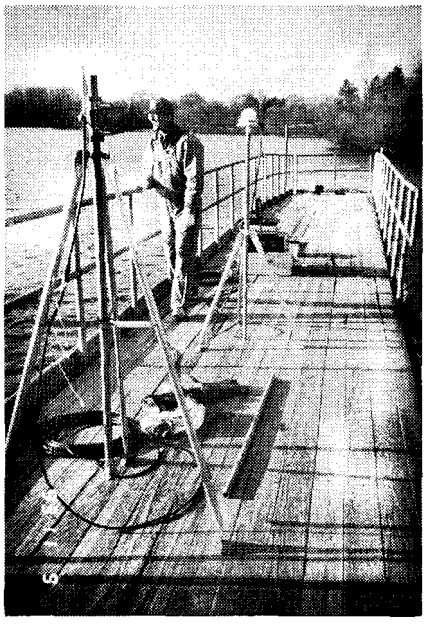
Contaminated Sediments

Rank 5

Sediments in many areas of the watershed are contaminated by historical and current industrial activity. Sediments become contaminated when certain pollutants, such as metals and organic chemicals, are released to the environment and easily adhere to soil particles in suspension in the water column or to those deposited on the river's bottom.

The last 5.5 miles of the Main Branch of the river has been designated as a site of environmental contamination (or an Act 307 site) because of pollutants such as lead, cyanide, barium, chromium, copper, zinc, and numerous organic chemicals contained in the sediments. Using the state's numerical risk assessment model, the MDNR scored this site 43 points out of a possible 48. PCBs are also of concern and are in highest concentrations in the Newburgh and Nankin Lake impoundments on the Middle Branch of the Rouge River. The PCB contamination can be traced to local industrial sources.

The original Rouge RAP document found contaminated sediments to be of concern throughout most of the Rouge River Watershed. Contaminated sediments impair the river by causing restrictions on fish consumption, depleting fish and aquatic insects or benthos populations, contributing to the formation of fish tumors, contaminating fish and wildlife habitats, degrading the aesthetics of the river, and restricting dredging activities.



RRNWWDP sampling contaminated sediments, Newburgh Lake

Goals and Recommendations

Long-term Goal

F-1: Reduce the impact of sediment contamination on fish and other aquatic life by remediating contaminated sediments and eliminating any new sources contributing to sediment contamination.[42]

Short-term Recommendations:

F-1a: Determine the extent of sediment contamination by collecting sediment samples throughout the watershed and take any actions necessary to reduce the impact of contamination on fish and other aquatic life.[42] *Primary responsibility: MDNR-SWQD, Wayne Co./RRNWWDP*

F-1b: Perform a sediment control and removal demonstration leading to the establishment of a lake restoration and sediments remediation program to remediate pollution from in-stream contaminated sediments.[42] Cost: $2,010,000 *Primary responsibility: Wayne Co./RRNWWDP*

Long-term Recommendation:

F-1c: Determine if sediment contamination can be traced back to a potentially responsible party and pursue remediation activities based on these findings.[43] *Primary responsibility: MDNR-SWQD, MDNR-ERD*

Progress to Date

The following activities have been conducted to address sediment contamination:

RRNWWDP core sampling, Newburgh Lake

- The MDNR and the RRNWWDP have conducted studies on contaminated sediments in Newburgh Lake. Special attention was focused on Newburgh Lake and the Middle Branch because PCBs and metals are entering the food chain in these areas and are being concentrated in fish flesh.[42]
- The RRNWWDP took sediment grab samples at over 180 points throughout the watershed to test for PCBs, PAHs, and metals. This $233,000 effort was conducted to evaluate the presence of toxic sediments and aid in planning for future sediment sampling, modeling, and remedial action projects.
- The RRNWWDP has targeted Newburgh Lake for a $2.01 million sediment remediation project. A $248,500 sediment survey to estimate pollutant concentrations and locations was performed for Newburgh Lake. Surveys to estimate the volume of sediment build up were performed on Newburgh, Wilcox, Nankin, and Phoenix Lakes. The project will recommend sediment collection, treatment, and disposal technologies.[43]
- The MDNR-SWQD conducted a records search to find potentially responsible parties (PRPs) for the PCB contamination in the sediments of Newburgh Lake. MDNR-SWQD identified PRPs and notified them of their liability for the contamination and responsibility to pay for remediation.[43]
- The Army Corps of Engineers dredges contaminated sediments in the shipping channel near the mouth of the River (where the Rouge River flows into the Detroit River) on an annual basis to assist in navigation.[43]

- The University of Michigan-Dearborn has initiated a multidisciplinary study of polluted stormwater runoff. One component of the study will be to analyze river bottom sediments for contaminants, which is a continuing source of problems for water quality and the living creatures in the river. Researchers will examine sediment samples for heavy metals, total organic carbon, and grain size distribution to find "hot spots" of contamination and evaluate the risk to biota. Future studies will evaluate potential treatment strategies.[43]
- The USEPA's Emergency Response Branch conducted sediment sampling in May of 1993 to determine if contamination warranted emergency actions along the lower section of the river. They collected samples just upstream of the turning basin to the mouth on the north side of Zug Island. Results showed some PCB and PAH contamination, but not at levels that would warrant emergency actions.[43]

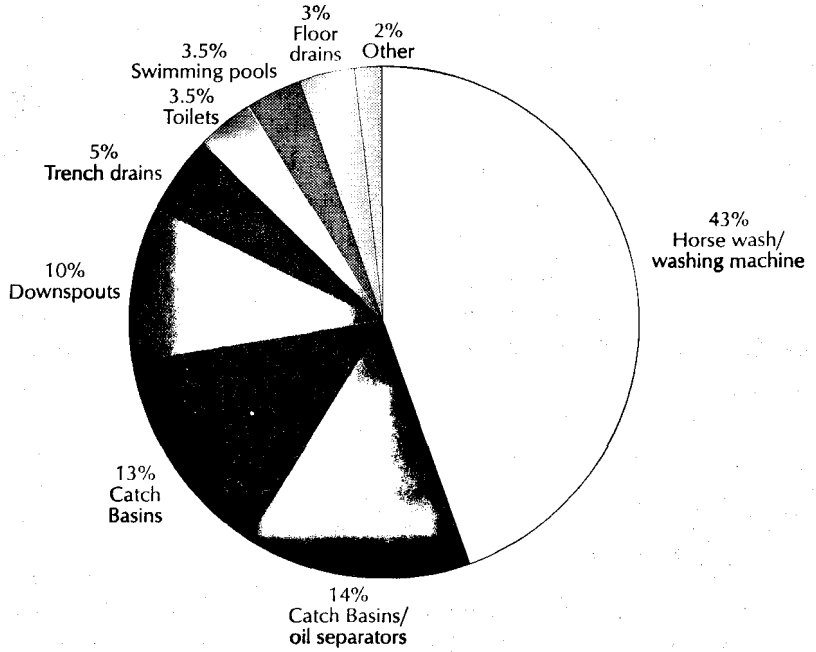
Illegal Dumping/Dischcarges

Rank 7

Sometimes individuals, industries, and businesses illegally dump or discharge pollutants into the Rouge River. A truck may dump wastes into a stream or a business may be improperly connected to a storm drain that discharges directly into the river. A variety of pollutants can reach the stream through these actions, including oil, gasoline, paints, and other waste chemicals.

The original RAP document did not discuss illegal dumping and discharges directly, but included them as nonpoint source pollution. The original RAP recommended that improper connections to storm drains be eliminated wherever polluted stormwater runoff was identified as a major cause of impairment. Illegal dumping and discharges of chemicals and other toxic materials can degrade populations of fish and aquatic insects, cause fish tumors and other deformities, restrict recreational use, degrade aesthetics and can lead to the loss of fish and wildlife habitat.

Figure 22
Wayne County's Illicit Connections Project
Type of Violations Found, 1992-94



Goals and Recommendations

Long-term Goal

G-1: Minimize any adverse impacts from spills and accidental discharges through effective containment, response, and remediation.

Short-term Recommendations:

G-1a: Identify illegal dumpers/dischargers and take actions necessary to discontinue these discharges. *Primary responsibility: MDNR-SWQD, Wayne Co./RRNWWDP*

G-1b: Continue the illicit connections program to detect illegal sewage connections to storm sewers.[44] *Primary responsibility: County health departments*

G-1c: Evaluate the effectiveness of the illicit connections program towards improving water quality. Cost: $51,000 *Primary responsibility: Wayne Co./RRNWWDP*

Long-term Recommendations:

G-1d: Identify NPDES and non-NPDES permitted facilities with toxic inventories. This effort should be coordinated with MDNR-WMD and the Industrial Pretreatment Program. *Primary responsibility: MDNR-SWQD, MDNR-WMD, DWSD, Wayne Co./RRNWWDP*

G-1e: Identify all facilities in the watershed required to have secondary containment and/or pollution incident prevention plans (PIPPs). *Primary responsibility: MDNR-WMD, MDNR-SWQD*

G-1f: Organize a workshop on illicit connections to educate local DPW and building officials on these issues.[45] *Primary responsibility: County health departments, local governments*

G-1g: Ensure that all communities have commercial/institutional building codes that require that floor-level drains be connected to sanitary sewers for automatic floor cleaners to discharge their wastewater.[45] *Primary responsibility: Local governments, Code Administrators International*

G-1h: Encourage the development of local plumbing codes to eliminate the discharge of chlorinated wastewater from private swimming pools to the river. *Primary responsibility: Local governments, MDNR-SWQD*

Progress to Date

The following progress has been made to address illegal dumping and discharges:

- The City of Westland tested for illicit connections to its storm sewers and required disconnection of the six illegal connections that were found.[45]
- Wayne County Department of the Environment continues its illicit connection elimination program. The county designed this program to seek out and eliminate improper discharges to storm sewers or the river itself. The program has been highly successful, diverting 8,564 pounds of pollutants per year from the river. Over the last two years, 729 facilities were inspected, and 13% of these were found to have illicit connections – many with more than one violation. See Figure 22 for a summary of the types of illicit connections found.[45] In addition, the Wayne County Rouge Program Office has significantly enhanced the efficiency, and therefore the effectiveness, of this program with the use of geographic information systems (GIS) technology. Providing a standardized method for prioritizing drainage areas and sites for inspection, this GIS application reduces preparation for field work from weeks to hours.
- Wayne County conducted an outfall survey on selected portions of the Rouge River to look for evidence of illegal discharges.[45]

- The MDNR-SWQD is on 24-hour call for pollution spills and emergencies, responding to several hundred calls about a variety of pollution problems within the watershed each year. These emergencies are monitored through a the Pollution Emergency Alerting System (PEAS). Citizens who witness a pollution **emergency** can call a toll free number 24 hours a day and report what they have observed. The PEAS number is 1-800-292-4706.

Permitted Municipal and Industrial Point Source Discharges

Rank 7

Under federal and state law, it is illegal to discharge treated or untreated wastewater to surface waters in Michigan without a National Pollutant Discharge Elimination System (NPDES) permit. The MDNR-SWQD administers the NPDES permit program in Michigan. Facilities whose waste is discharged to the river through a designated sewer pipe are considered "point source" dischargers. A list of permitted point source dischargers within the Rouge River Watershed can be found in Appendix C.

Many of the point source industrial facilities presently discharging to the river are permitted for non-contact cooling water discharges only. Non-contact cooling water is uncontaminated water used for cooling purposes. It does not come into contact with any pollutants unless there is a system malfunction. Significant pollutants can be released when an industrial facility has an illegal or unauthorized spill of chemicals used in their processing operations (see Illegal Dumping/ Discharges section).

Most industries physically located within the watershed do not discharge to the river directly. Rather, they discharge into the Detroit Water and Sewerage Department's (DWSD) collection system. DWSD, in turn, is required by their NPDES permit to administer an Industrial Pretreatment Program for these industrial dischargers. The program requires these industries to reduce their pollutant discharges to levels preset by DWSD. This ensures that pollutants discharged to the wastewater treatment plant are adequately treated before discharge and that they will not adversely impact the collection or wastewater plant treatment systems.

The original Rouge RAP document stated that the industrial and municipal point sources were being inspected and most permit conditions were being met. Although most discharges are being closely regulated, they can still, at times, degrade populations of fish and aquatic insects, accelerate eutrophication or excessive aquatic plant growth, degrade aesthetics, impair fish and wildlife habitats, restrict fish consumption, restrict dredging, and restrict swimming and other water-related recreation.

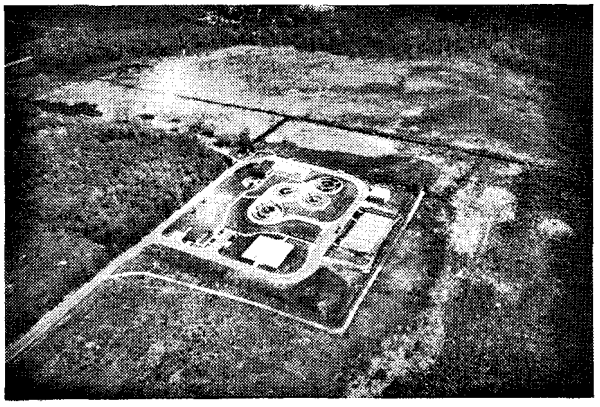
Goals and Recommendations

Long-term Goal

H-1: Minimize any negative impacts from point source discharges.

Short-term Recommendations:

H-1a: Continue administration of the NPDES program.[46] *Primary responsibility: MDNR-SWQD*



Walled Lake WWTP improvement project

H-1b: Continue regular monitoring of the permitted discharges from point sources for any unknown or unpermitted contaminants in the discharge. *Primary responsibility: MDNR-SWQD*

H-1c: Work toward virtual elimination of the discharge of any toxic/bioaccumulative materials to the river from point source discharges. *Primary responsibility: MDNR-SWQD*

H-1d: Minimize any adverse impacts from spills by performing inspections of spill control and containment facilities at industrial and commercial operations. *Primary responsibility: MDNR-SWQD, MDNR-WMD*

Progress to Date

The following activities have been conducted to address pollution from permitted municipal and industrial point source discharges:

- Currently, 34 NPDES permits are being administered by the MDNR-SWQD in the Rouge River Watershed, with each requiring specific types of controls and/or treatment for discharges to the river. Nearly half of these facilities discharge noncontact cooling water (non-contaminated water) and/or stormwater runoff exclusively.[46] A list of all permitted point source discharges can be found in Appendix C.
- MDNR determined that a NPDES permit was not necessary for Highland Superstores, previously permitted under Ameritech Services, because the firm has terminated its discharge.[47]
- MDNR ensured that BMC Manufacturing (Mid Continent Enterprises) met its NPDES permit requirements for discharge of compressor water.[48]
- Walled Lake WWTP now primarily land applies its sludge, discharging to the Detroit sewer interceptor only if the sludge is not suitable for land application.[49]
- DWSD is in the process of strengthening their Industrial Pretreatment Program to identify and eliminate sources of PCBs and mercury to the sewage collection system.[21]
- Redford Township requires new automotive work and storage areas to use oil/water separators in their floor drains to prevent the discharge of oil to the sanitary sewers as part of its industrial pretreatment program with the DWSD.[50]
- Considerable controversy and public concern has been expressed about the proposed increased discharge from the South Commerce WWTP to 8.5 MG/day. Concerns for the survival of the threatened redside dace living downstream and possible flooding caused by the increased flows have been voiced during the public comment period for this permit. Both a public meeting and hearing were held by MDNR staff to better understand the public's concerns. The permit for this increased discharge was issued in October 1994.

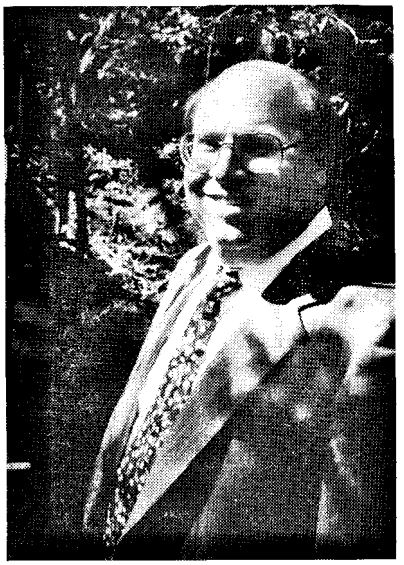
Endnotes

[1]Refers to RAP Recommendation A-1
[2]Refers to RAP Recommendation A-3
[3]Refers to RAP Recommendation A-6
[4]Refers to RAP Recommendation A-10
[5]Refers to RAP Recommendation A-11
[6]Refers to RAP Recommendation A-2
[7]Refers to RAP Recommendation A-4
[8]Refers to RAP Recommendation A-5
[9]Refers to RAP Recommendation A-7
[10]Refers to RAP Recommendation A-8
[11]Refers to RAP Recommendation A-9
[12]Refers to Primary RAP Goal 4
[13]Refers to RAP Recommendation B-4
[14]Refers to RAP Recommendation B-3
[15]Refers to RAP Recommendation B-1, B-2, and B-6
[16]Refers to RAP Recommendation B-7
[17]Refers to RAP Recommendation B-8
[18]Refers to RAP Recommendation G-7
[19]Refers to RAP Recommendation B-9
[20]Refers to RAP Recommendation B-11
[21]Refers to RAP Recommendation B-10
[22]Refers to RAP Recommendation B-1 and B-2
[23]Refers to RAP Recommendation B-4 and A-1
[24]Refers to RAP Recommendation B-5 and B-6
[25]Refers to RAP Recommendation B-6
[26]Refers to RAP Recommendation C-2, F-4
[27]Refers to RAP Recommendation G-3
[28]Refers to RAP Recommendation F-3
[29]Refers to RAP Recommendation C-3
[30]Refers to RAP Recommendation C-3, C-7, and C-2
[31]Refers to RAP Recommendation C-3 and F-2
[32]Refers to RAP Recommendation C-2
[33]Refers to RAP Recommendation C-5
[34]Refers to RAP Main-1 Subbasin Recommendation 5
[35]Refers to RAP Recommendation C-6, E-1
[36]Refers to RAP Recommendation C-7
[37]Refers to RAP Recommendation C-4
[38]Refers to RAP Recommendation C-6
[39]Refers to RAP Recommendation F-2
[40]Refers to RAP Recommendation G-2
[41]Refers to RAP Recommendation F-1, F-2
[42]Refers to RAP Recommendation E-1 and G-6
[43]Refers to RAP Recommendation E-1
[44]Refers to RAP Recommendation C-1, G-4
[45]Refers to RAP Recommendation C-1
[46]Refers to RAP Recommendation D-1
[47]Refers to Recommendation 12, Middle-2 Subbasin
[48]Refers to Recommendation 13, Middle-2 Subbasin
[49]Refers to Recommendation 9, Middle-1 Subbasin
[50]Refers to RAP Recommendation B-10 and B-11

CHAPTER 3
FINANCIAL AND INSTITUTIONAL ARRANGEMENTS

"As one of the largest communities located in the headwaters areas of the Rouge River, we understand and support the commitment that is needed to be successful in saving the river. Leadership in the restoration and preservation of the wetlands and smaller streams that feed into the main river is crucial. Environmentally responsible land use planning is the foundation of this important effort."

Thomas Yack, Supervisor
Canton Township



Tom Yack, first RRAC chairperson

The 1989 Rouge River RAP made a series of recommendations on funding initiatives and institutional arrangements required to implement the remedial measures to improve water quality. Many of the initial recommendations were addressed through the first of two U.S. Environmental Protection Agency grants to Wayne County for the Rouge River National Wet Weather Demonstration Project (RRNWWDP). The Steering Committee of the RRNWWDP, consisting of representatives of local government, state and federal regulators, SEMCOG, and observers from the U.S. District Court provides a forum to help address water quality issues on a watershed basis. One of the first proposals adopted by the Steering Committee and funded by Wayne County under the RRNWWDP was an independent study of institutional and financing options for implementing the Rouge River RAP.

RRAC discovering Johnson drain

The year-long study, directed by Apogee Research Inc. with legal support provided by Miller, Canfield, Paddock and Stone, was completed in July 1994. The final report documents the current financial situation of communities in the watershed; outlines the institutional arrangements available under current Michigan law to address sanitary, stormwater, and related water quality issues; presents case studies of six Michigan communities and 11 United States metropolitan areas that examine an array of institutional and funding arrangements for managing wastewater and stormwater; and reviews the benefits and disadvantages of specific alternatives for consideration by Rouge River Watershed communities. The report detailed several alternatives, but the Financial and Institutional Technical Advisory Group which participated in oversight of the study could not reach consensus on a final recommendation.

Results of the study were presented to the RRNWWDP along with the following four options for future action:

- Wait (at least until 1995) until more definitive information on costs and benefits is available from the RRNWWDP before pursuing the options identified in the study.
- Immediately explore incentives that could encourage communities to pursue a collective watershed approach. Establish a group under the Financial and Institutional Technical Advisory Group to examine the advantages of stormwater management on a watershed basis.
- Take some other interim step toward reaching a consensus on alternative approaches.
- Conclude that, absent forcing legal action through the courts or the legislature, significant changes in the current institutional or financial arrangements among the Rouge River Watershed communities are unlikely.

Of the four options presented, the Steering Committee agreed with the second option. This option stated that a specific work plan be developed and funded under the RRNWWDP that would explore both watershed-wide approaches to stormwater management and the specific steps required to create the legal authority and funding needed to address large log jams and other physical problems identified in the RAP. A special study of stormwater management options and related issues is now underway; several additional communities have been selected to participate in the institutional arrangements study. Specific recommendations are expected in August 1995.

Issues still remain on how to best plan, operate and fund the current sanitary wastewater system. A considerable portion of the analysis of the institutional and financial alternatives has focused on management and funding of the existing sanitary wastewater systems and combined sewer overflow control facilities required under a federal court order.

The current sanitary systems, except for CSOs, are not a major contributor to pollution problems in the Rouge River. In fact, the largest portion of the sanitary waste is transported outside the Rouge River Watershed for treatment and disposal. Thus, there is little incentive to change current institutional arrangements that would affect ownership and control of sanitary wastewater facilities.

There is strong interest in exploring alternative means of financing needed CSO facilities by some older urban communities, such as Detroit, who have a disproportionate share of CSO problems and a financial base which may be inadequate to finance needed pollution control facilities. Cost allocation concerns for required CSO facilities have been set aside during the first phase of the CSO design and construction program under NPDES permits; however, cost allocation for the second phase of CSO facilities will become a major issue when the full extent of the required CSO remediation is known. CSO cost allocation concerns are not limited to the Rouge River Watershed but also extend to other drainage areas including the Clinton and Detroit River watersheds.

Although stormwater runoff represents nearly 70 percent of the volume of treated and untreated water entering the Rouge River, there is only limited management, except for flood control, of this major pollution source. New stormwater regulations imposed under federal and state authority have not required the 48 communities within the watershed to apply for individual NPDES stormwater permits because the larger municipalities do not have separated sewers and the remainder of the communities are less than the 100,000 population currently required to have stormwater permits. A few watershed communities, like Livonia, may soon exceed the threshold size.

Both the regulatory agencies and the communities agree that the issuance and management of 48 or more separate stormwater NPDES permits in the watershed could be a very cumbersome and inefficient approach to addressing stormwater pollution control. A watershed-wide stormwater approach is needed that includes both an institutional arrangement for planning and management and a funding mechanism to provide for construction and operation of any needed facilities.

Goals and Recommendations

Short-term Goal

J-1: Establish long-term funding mechanisms for watershed management programs.

Short-term Recommendations:

J-1a: Continue to pursue multiple sources of funding for projects to implement the Rouge RAP.[1] *Primary responsibility: USEPA, MDNR, local governments, SEMCOG*

J-1b: Consider establishing special drainage districts to implement pollution control measures that have not been carried out due to lack of intergovernmental authority and funding.[2] *Primary responsibility: MDNR, local governments, Oakland Co., Wayne Co./RRNWWDP, drain commissioners*

J-1c: Research and promote model regulations for pollution control on a watershed-wide basis to provide comprehensive and cohesive enforcement. *Primary responsibility: Wayne Co./RRNWWDP, SEMCOG*

J-1d: By 1997, identify and implement financial and institutional arrangements necessary to sustain a watershed management system. This funding mechanism must be able to support various watershed management services such as a long-term water quality monitoring network, watershed modeling and geographical information system, a river corridor and stream channel stabilization program as well as a continuing public education and involvement program. *Primary responsibility: Wayne Co./RRNWWDP, MDNR-SWQD, RISC, RRAC*

J-1e: Establish a long-term river water quality monitoring network and program. This effort is necessary to support the watershed management support system, track RAP implementation, and identify future watershed management measures needed. The program should include both water chemistry and biological integrity, and bacti monitoring and evaluation. *Primary responsibility: Wayne Co./ RRNWWDP, MDNR-SWQD*

Long-term Recommendation:

J-1f: After the recommended institutional and financing mechanisms have been implemented, the Rouge RAP oversight committees must evaluate the effectiveness of these mechanisms. The evaluation must include: a) the degree to which communities have been able to separately and jointly respond to permit requirements, b) the usefulness of the recommended drainage district, and c) the adequacy of the state and federal response to funding needs.[3] *Primary responsibility: RRAC, RISC*

Progress to Date

The following activities have been conducted to develop an institutional framework for the funding and implementation of the Rouge RAP:

RRAC meeting, Birmingham

- Since the RAP was prepared, the State Revolving Fund has been established and the prioritization of projects has allowed a number of CSO and sewer separation projects in the watershed to receive funding (see Table 4).[4]
- Funding for a number of Rouge RAP projects has been obtained through special USEPA funding of the RRNWWDP. The first grant for the RRNWWDP totalled $48 million, which will expire at the end of 1994. A second grant totaling $80 million will begin in 1995, and a proposal for another $100 million has been submitted for 1996.[5]
- A number of sewage treatment works projects received State Construction Grant Funds including: Detroit Pump Station 2A, North Huron Valley-Rouge Valley Interceptor, Evergreen-Farmington Improvements, First Hamilton Relief Outlet.
- Communities have submitted timely application for State Revolving Fund monies to support the implementation of the RAP.[6]
- The RRNWWDP has a project underway to develop a special drainage district to raise revenues for log jam removal, identification and correction of improper sewer connections, and

other nonpoint source control measures. The model drainage district is expected to be available for implementation by the end of 1995.[2]

- A study funded by the RRNWWDP evaluated potential cost allocation methods by reviewing the current financial situation of communities in the watershed; outlined the institutional arrangements available under current Michigan law to address sanitary, stormwater, and related water quality issues; and presented case studies of six Michigan communities as well as 11 United States metropolitan areas, providing an array of institutional and funding arrangements for managing wastewater and stormwater. The benefits and disadvantages of specific alternatives for consideration by the Rouge River communities was analyzed. Some communities are interested in pursuing a further examination of funding allocation after the specific costs of CSO projects have been identified.[7]
- State funding for implementing specific pollution control facilities recommended in the RAP has been secured through the SRF, and federal funding has been provided through the RRNWWDP. In addition, communities have provided the matching funds for specific CSO basins, and sewer separation projects. See Table 4.[8]
- Draft CSO permits for communities in the watershed were issued in 1989. The MDNR and those watershed communities with CSOs took part in a unique, basin-wide approach to resolving the disputes over the permits. See the CSO section in Chapter 2 for a more complete description.
- The ability of communities to finance and operate additional wastewater treatment facilities has been evaluated in the study of financial alternatives conducted by the RRNWWDP (referenced above).[9]
- The Rouge RAP Advisory Council (RRAC), reorganized from the Rouge River Basin Committee, was created in 1993 to advise the MDNR regarding the update and implementation of the Rouge RAP. The RRAC has formed six subcommittees, each of which recommended updated goals for this update of the Rouge RAP.[10] SEMCOG, under a state grant, assists with public participation for the Rouge RAP, including RRAC meeting arrangements.
- The Steering Committee formed under the RRNWWDP meets on a regular basis to review progress towards achieving grant goals, which include many elements of the RAP.[10]

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[1]Refers to RAP Recommendation I-1, I-7
[2]Refers to RAP Recommendation I-1, I-5, I-6
[3]Refers to RAP Recommendation I-10
[4]Refers to RAP Recommendation I-3
[5]Refers to RAP Recommendation I-1, I-2
[6]Refers to RAP Recommendation I-4
[7]Refers to RAP Recommendation I-6
[8]Refers to RAP Recommendation I-7
[9]Refers to RAP Recommendation I-8, I-9
[10]Refers to RAP Recommendation I-11

CHAPTER 4
EDUCATION/COORDINATION

"We'd like to thank everyone who attended so many meetings and contributed so much creative thought to this RAP Update, especially the members of the RAP Advisory Council, all its subcommittees, and staff from MDNR and SEMCOG. It's great to know the Rouge has so many devoted friends."

Jim Graham, Executive Director
Friends of the Rouge.

Students monitoring water quality

Lack of education and coordination of activities plays an important role in the degradation of the Rouge River. Residents may unknowingly pollute the river by applying excessive amounts of fertilizers to their lawn or improperly disposing of household hazardous wastes down storm sewers. Government officials may add to the river's problems through lack of coordination or protective land use practices.

Extensive and long-term pollution of the Rouge River leads many residents within the watershed to believe it is merely an "open sewer" with no chance of ever being clean again. A change in attitudes is necessary to make remediation activities successful. Better informed public officials and citizens are more likely to support projects to cleanup the river. The original Rouge RAP document recognized that public education must be cultivated throughout the implementation of the Rouge RAP and supported the programs of the FOTR, RRWC, SEMCOG, and the MDNR.

Rouge RAP logo contest winner

Goals and Recommendations

Short-term Goal

K-1: Develop a strategy to educate the public about the positive and negative impacts that their actions have on the river.[1]

Short-term Recommendations:

K-1a: Continue to maintain and update a Rouge River archive for storage of all documents, data and reports.[2] *Primary responsibility: WSU*

K-1b: Continue the multifaceted student education and water quality monitoring project administered by the FOTR. *Primary responsibility: FOTR, Wayne Co./RRNWWDP, U of M*

K-1c: Make videos and public service announcements on pertinent issues to help educate the public on their role in cleaning up the river.[3] *Primary responsibility: RRWC, RRAC-Public Education*

K-1d: Encourage local newspapers to publish educational articles about the river. *Primary responsibility: RRAC-Public Education, all stakeholders*

K-1e: Create educational exhibits using old and new photographs and paintings to enhance the awareness of residents. *Primary responsibility: RRAC-Public Education, FOTR, Wayne Co./RRNWWDP, SEMCOG, MDNR*

K-1f: Exhibit the Rouge RAP display board at various public events including environmental activities. *Primary responsibility: MDNR, SEMCOG*

K-1g: Create a speakers bureau to better educate the public about the river. *Primary responsibility: Wayne Co./RRNWWDP, MDNR-SWQD*

K-1h: Encourage and support the pollution prevention ethic. An example of this would be to educate residents about using alternatives to lawn care chemical sprays and fertilizers. *Primary responsibility: MSU Cooperative Extension Service, Wayne Co./RRNWWDP, RRAC-NPS*

K-1i: Hold seminars on the use of the RRNWWDP's geographic information system for the public to access the complete river inventory database. *Primary responsibility: Wayne Co./RRNWWDP*

K-1j: Implement the RRNWWDP public involvement plan. *Primary responsibility: Wayne Co./RRNWWDP*

K-1k: Establish environmental education facilities (i.e. nature centers) throughout the watershed to assist in educating the public about the degradation and restoration of the river. *Primary responsibility: County and local government, universities*

Long-term Recommendations:

K-1l: Educate the public on recreational opportunities such as wildlife viewing and birdwatching locations. *Primary responsibility: FOTR, Detroit Audubon, RRAC-Public Education*

K-1m: Appeal to the appropriate drain commissioner to change the designation of "drain" to "creek" for county drains to help remove the assumption that these streams are waste ditches. *Primary responsibility: RRAC-Public Education, residents*

K-1n: Install a fish tank containing native species at nature centers including the Nankin Mills Nature Center to help educate residents. *Primary responsibility: County and city parks departments*

K-1o: Host recreational activities such as (1) artists doing watercolors of the river and (2) "everybody's favorite photo" contest with winners as backdrop to weather reports to help change negative attitudes. *Primary responsibility: County and city parks departments, FOTR, RRAC-Public Education*

K-1p: Host and/or promote educational nature walks by various groups along the Rouge River. *Primary responsibility: Detroit Audubon Society, FOTR, other stakeholders*

Short-term Goal

K-2: Educate local governments about the importance of protecting the river and their responsibility in its remediation.[4]

Short-term Recommendation:

K-2a: Develop traveling "road shows" to present to local governmental officials to help educate them on critical issues so that they may make more environmentally sound decisions. *Primary responsibility: MDNR-SWQD, RRAC-Public Education*

K-2b: Continue efforts of the MDNR, RRAC, RRWC, and Wayne Co./RRNWWDP to educate local governments.[4] *Primary responsibility: MDNR-SWQD, RRAC, RRWC, Wayne Co./RRNWWDP*

Long-term Recommendation:

K-2c: Educate local political leadership, public officials and staff about ways their community can reduce nonpoint source pollution through an interactive computer tutorial similar to that developed by Washtenaw County. *Primary responsibility: RRAC-Public Education*

Short-Term Goal

K-3: Coordinate efforts to cleanup and enhance the watershed.

Short-term Recommendation:

K-3a: Institute a review process regarding the impact of state and federal grant projects on the goals and recommendations of the Rouge RAP to determine if these projects are compatible with the RAP. *Primary responsibility: MDNR-SWQD*

K-3b: Coordinate with the Detroit River RAP and other RAP efforts.[5] *Primary responsibility: MDNR-SWQD, SEMCOG, OMOE*

Progress to Date

The following activities have been conducted to educate citizens and public officials about the Rouge River:

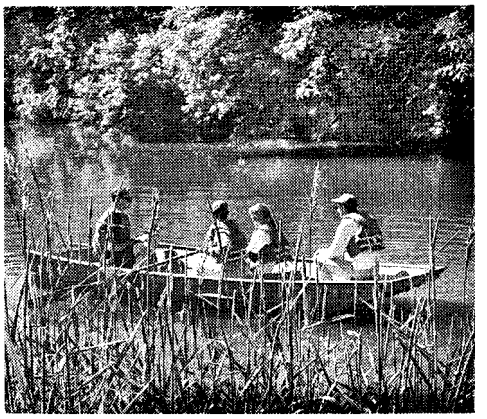
- The FOTR, with assistance from U of M students, teach elementary, middle- and high-school students from 66 local schools, as well as adult education classes, about water quality and steps they can take to help cleanup the river. Through a computer network, students compare their findings with other students in the watershed and with students and teachers from 125 countries on six continents. Participants are encouraged to take action in their communities based on what they have learned.[3]
- Wayne County/RRNWWDP, The Detroit News, MDNR and several other stakeholders published a poster for distribution to the general public which depicts plants, animals and fish found in the watershed as well as highlighting some of the river's pollution problems. Copies of this poster can be obtained from Wayne County's Rouge Program Office.
- The Observer newspaper has agreed to be the sponsoring paper for the RRAC-Public Education Subcommittee. The paper published an editorial about stewardship of the river and covered the RRAC On-Site Sewage Disposal Subcommittee's Survey Project.
- In the fall of 1993, the MDNR developed a Rouge River RAP display which has been shown at a number of events since that time, including the RRNWWDP breakfasts for local officials, the Rouge Riverfest, and an IJC RAP forum.
- The RRWC, FOTR, MDNR, SEMCOG, and the RRAC all provide information to the public about the river on an ongoing basis, including giving presentations, showing informational displays, distributing written materials, and answering questions.[1]
- DWSD hosts an annual celebrity basketball game to benefit the FOTR. Last year, DWSD raised $25,000. This money is used by the FOTR to continue their education efforts.
- The FOTR held the Rouge Pedalfest in 1993 and 1994 to raise funds to expand existing programs like the annual Rouge Rescue river cleanup, the school-based FOTR Education Project, and the new RiverWatch project.
- Many communities provide information to the public about the river on an ongoing basis through newsletters, brochures, and presentations.[1]
- Wayne County/RRNWWDP has developed a number of educational newsletters and brochures for distribution to various interest groups throughout the watershed as part of their public education program. These publications cover a variety of topics and copies can be obtained from Wayne County's Rouge Program Office (see Chapter 6).[1]
- Wayne County/RRNWWDP has updated local officials about issues of importance to the Rouge River through periodic breakfast briefings.[1]

[1]Refers to RAP Recommendation H-1, H-4
[2]Refers to RAP Recommendation G-1
[3]Refers to RAP Recommendation H-2
[4]Refers to RAP Recommendation H-1, H-3
[5]Refers to RAP Recommendation G-8

CHAPTER 5
ENHANCEMENT OF RECREATIONAL USE

"Figuratively speaking, people must take ownership of their own sections of the Rouge River. When something is yours, it is your responsibility to take care of it. We can't wait for 'somebody else' to do it."

Mike Anusbigian,
Friends of the Mill Pond



When people enjoy the Rouge River, they are more likely to support efforts to protect it. It is important to provide safe, recreational opportunities that also enhance and protect the river habitat. Recreational use of the river has been severely impaired for many years. As improvements are made, recreational opportunities will be increased. People of the watershed will then be able to visit a local stream and fish, canoe, or have a riverside picnic without encountering unpleasant odors or evidence of pollution. Watershed residents should not have to leave Southeast Michigan to find a clean, safe river for recreation. It will take the interest and the initiative of all watershed stakeholders to help the river reach its full recreational potential. See Figure 23 for a map showing park areas in the Rouge River Watershed.

Goals and Recommendations

Short-term Goal

L-1: Develop recreational opportunities within the watershed.

Short-term Recommendations:

L-1a: Encourage the City of Dearborn to go forward with its plans to create a nature trail from Outer Drive to Ford Field on the Lower Rouge.[1] *Primary responsibility: City of Dearborn, residents, MDNR, RRAC*

L-1b: Provide the public with increased wildlife viewing and recreational opportunities while ensuring healthy wildlife populations. *Primary responsibility: MDNR-Wildlife, environmental organizations*

Long-term Goal

L-2: Develop more fishing opportunities to encourage safe recreational activities. These fishing opportunities should be focused in areas without fish advisories. In other areas, catch and release fishing should be encouraged.

Long-term Recommendations:

L-2a: Work towards providing more fishing opportunities as water quality and habitat improves. This may include the addition of more fishing piers and fishing platforms along high quality portions of the river. *Primary responsibility: MDNR-Fisheries, fishing clubs*

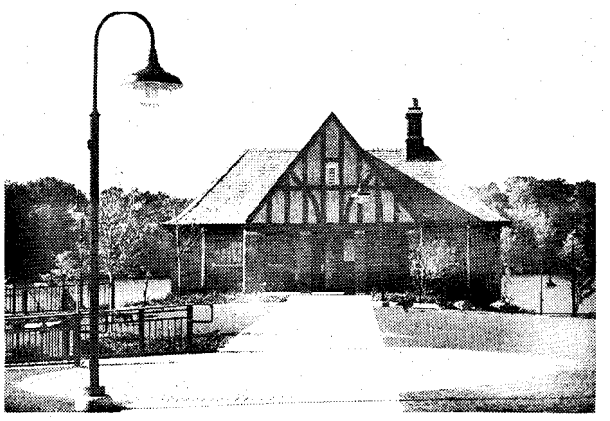
L-2b: Educate the public about recreational fishing opportunities within the watershed. *Primary responsibility: MDNR-Fisheries, RRAC-Public Education*

L-2c: Expand the Southfield fish habitat improvement project by 0.5 kilometers by creating a sequence of deep pools and shallow riffles using triangular wing dams. *Primary responsibility: City of Southfield, environmental organizations*

Progress to Date

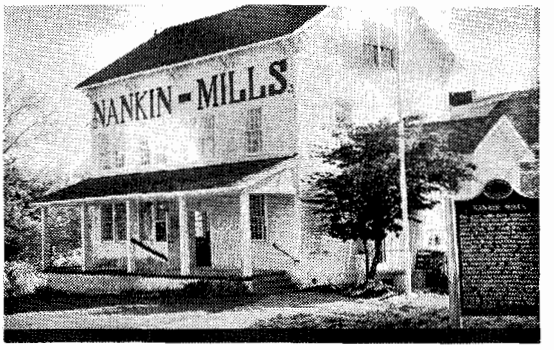
The following activities have been conducted to develop recreational opportunities in the Rouge River Watershed:

- Wayne County Parks Department has completed the $567,000 Middle Rouge Parkway Improvement Project for Newburgh Lake. The project included renovating a comfort station, creating a river walk, stabilizing the shoreline, building a boat launch for non-motorized boats, and re-opening of the paddle-boat concession.[2]



Comfort station, Middle Rouge Parkway Improvement Project

- Wayne County Parks Department renovated Sumac Fishing Point on Newburgh Lake by improving its parking lot, creating a split rail fence to keep people off the bank area, and planting trees to stabilize the bank.[1]
- In 1992, the City of Wayne constructed a mile-long, eight foot wide asphalt path along the river bank between Josephine and Elizabeth streets for walkers, joggers, and bikers to enjoy views of the river as they exercise.



Nankin Mills

- The FOTR holds an annual "pedalfest" along the Middle Branch of the river in western Wayne County to raise funds for its educational activities.[1]
- The Dearborn Historical Museum holds an Annual Heritage Festival on the banks of the river at Ford Field Park. The weekend's activities include demonstrations of life in the eighteenth century and re-enactments of revolutionary war battles.
- The City of Detroit and the MDNR completed a $1.3 million renovation project to reopen the Olympic-sized swimming pools in Detroit's River Rouge Park on June 18, 1994. The pools were closed four years ago when the city could not afford to operate and maintain the facility.
- The Wayne County Parks Department and the Holliday Nature Preserve groomed hiking trails along Tonquish Creek and removed illegally dumped tires.
- The City of Melvindale acquired an additional three acres of land for recreational purposes along the river next to their ice arena through the state's recreation bond fund.
- The Friends of the Mill Pond are helping to educate the residents of their community about the Mill Pond impoundment located in Northville. They have formed their own nonprofit organization and have sold T-shirts and coffee mugs in order to raise much needed funds to clean up the Mill Pond. They want the pond to become a better recreational and educational tool for the local schools and residents.[1]

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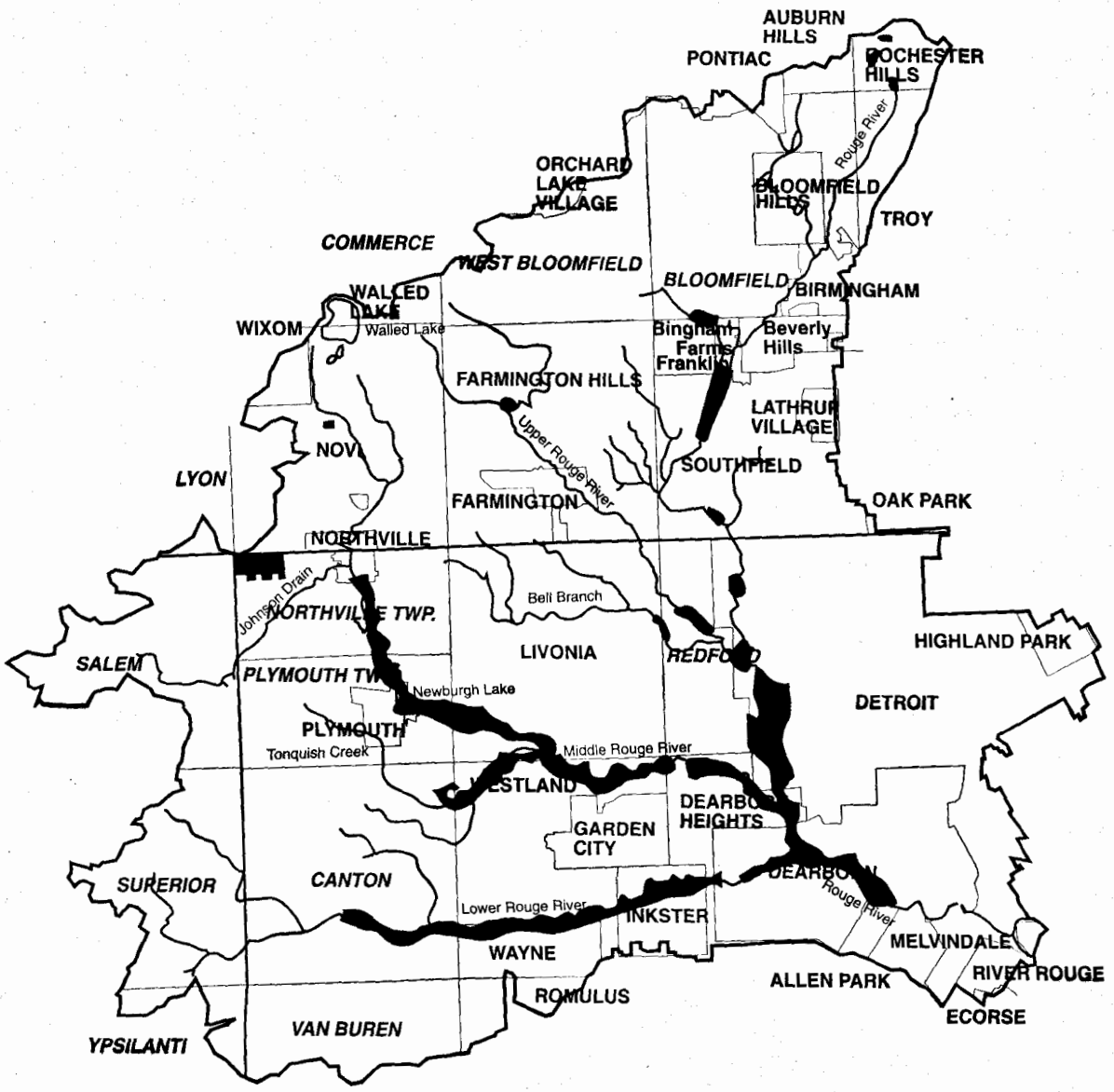
[1]Refers to RAP Recommendation H-1
[2]Refers to RAP Recommendation F-6

Figure 23
Major Parkland in the Rouge River Watershed



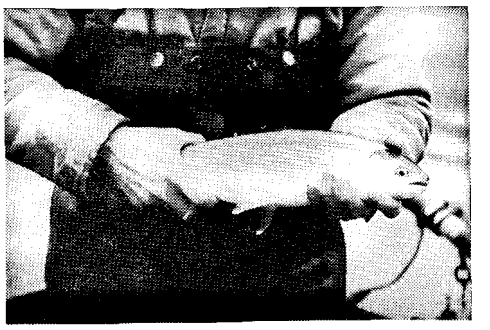
CHAPTER 6
UPDATED ROUGE RIVER STUDIES AND REPORTS

"The 1994 Rouge River Remedial Action Plan Update continues to present a major challenge to the citizens of southeast Michigan. The political will and persistence required to restore the Rouge River transcend the present generation and necessitate cooperation among the diversity of cultures in all our communities. The success of the RAP will be an indication of our ability to develop a sustainable society in the Detroit metro area.

As a testimony to the dynamic nature of the RAP process, the leaders in this project are to be complimented for recognizing the need for making modifications to the 1989 RAP. This, an important lesson of this 1994 Update, is that we must all be open and willing to consider future solutions that may not be evident or acceptable today."

Dr. Orin G. Gelderloos,
University of Michigan-Dearborn
Rouge RAP Advisory Council Chairperson

The following is a list of reports and studies that have been written about the Rouge River since the Rouge River RAP was completed in 1989. This listing includes the report title, and a brief report summary. If available, a report reference number has been included to provide ease in obtaining copies from the MDNR, Rouge Program Office, or other sources.



Fish from the Rouge River

MDNR Publications

MDNR Biological Surveys

Biological Survey of Johnson Drain, Washtenaw and Wayne Counties, March 1989
(MI/MDNR/SWQ-89/020)

This survey was performed on Johnson Drain on May 18, 1988 at the request of the MDNR Surface Water Quality Division because Browning Ferris Industries contested their permit for their discharge to Johnson Drain. The permittee contested the cadmium limit in their permit on the basis that the stream was intermittent and therefore could not support aquatic life. The survey found that even though there were documented fluctuations in stream flow, aquatic life was present in the stream.

Biological Survey of the Upper Section of Johnson Drain, Washtenaw County, September 1989
(MI/MDNR/SWQ-89/099)

This survey was performed on June 7, 1989 to evaluate if a negative impact was evident on the Johnson Drain from the discharges of sanitary wastewater from storm sewers in Salem Township and from the Salem Community Schools Wastewater Treatment Plant. This survey did not find a noticeable impact to the stream from these two sources. Stream flow was sighted as more of a limiting factor then the effluent.

Rouge River Ambient Toxicity Summary Report, Wayne and Oakland Counties, February 1990
(MI/MDNR/SWQ-90/014)

This report summarizes four ambient chronic toxicity evaluations conducted between January and August 1989. These tests were performed as part of the Rouge Act 307 project. Chronic toxicity was measured using two seven-day tests that exposed larval fish and small invertebrates to samples of river water. Each of the 20 selected river stations was evaluated two to four times. The results of the four separate sampling events is presented in a series of reports which is summarized in this document. Results generated suggest that chronic, ambient water column toxicity is not a widespread, continuous, or severe problem. The data did indicate that there are localized segments of the river that exhibit ambient toxicity. The toxicity appeared to be episodic and related to storm events. The worst locations appeared to be Evans Ditch and an area near Warren and Fenkel roads.

Biological and Sediment Survey of Evans Ditch, Oakland County May 1990
(MI/MDNR/SWQ-91/006)

This survey was conducted on October 4, 1989 to determine the cause of degraded conditions in this channelized stream. Previous surveys did not sample the upper reaches of the stream nor the sediments for contaminants. The survey determined that the stream was highly degraded from its headwaters to its confluence with the Rouge River. The primary reason for this condition is extreme flow fluctuations created by land use practices. The contaminants of concern found in the sediments were lead and zinc.

Biological Survey of Seeley Drain, Oakland County, September 1990 (MI/MDNR/SWQ-90/106)

This survey was conducted on May 10, 1989 to document background conditions in the drain prior to onset of the discharge from the South Commerce Wastewater Treatment Plant and the distribution of the threatened fish, redside dace (*Clinostomus elongatus*). The survey found that the redside dace were present in sparse numbers because its habitat is being degraded by siltation and sand. The substrate of the drain was covered by loose gravel, sand, and silt.

Sediment Survey of the Rouge River Basin, Wayne and Oakland Counties, June 1992 (MI/MDNR/SWQ-92/215)

This survey was a follow up to the 1986-87 Rouge River Sediment Survey. A total of 43 samples were collected from areas throughout the watershed from February to November 1989. The purpose of the survey was to determine the degree, location, and possible sources of sediment contaminants and compare it to previously collected data. PCB contamination was found primarily in the Newburgh-Nankin Lake stretch of the Middle Branch with fish concentrations averaging 8.9 mg/Kg. Mercury concentrations were high at two stations on the Middle Rouge, with other heavy metal concentrations lowest in the headwaters and highest in Newburgh Lake. Overall in comparison to 1986-87 data, those areas which had lower concentrations decreased and those areas with higher concentrations tended to increase.

Acute Toxicity Assessment of Double Eagle Effluent, Wayne County, September 1989 (MI/MDNR/SWQ-89/116)

This study was conducted as part of a routine biomonitoring inspection to determine the acute toxicity of the effluent from the Double Eagle Steel's process effluent. Flathead minnows and *Daphnia magna* were exposed to this effluent from June 15-17, 1989. The results showed that the effluent was highly acutely toxic to flathead minnows and Daphnia. Mortality occurred for the minnows after 15 minutes of exposure to 100 percent effluent and within 30 minutes for Daphnia after exposure to 75 percent and 100 percent effluent.

Chemical Analysis and Aquatic Toxicity Tests of the Bell Branch, Fellows Creek, Johnson Drain, and the Tonquish Creek, Wayne and Oakland Counties, December 1993 (MI/MDNR/SWQ-93/065)

These tests were conducted as part of the Wayne County's Rouge River Nonpoint Source Pollution Demonstration Project and were conducted between August 1992 to June 1993. The objective of the study was to provide background biological integrity measurements of selected sites prior to implementation of nonpoint source controls. Results indicated that organic chemical and heavy metal concentrations were within acceptable levels except for zinc in Tonquish Creek, and DDT and DDT-related compounds detected in Fellows Creek. Sediments analysis indicated that organic chemicals and toxic metals were not detected or were below acceptable limits in all but 3 locations. Some samples of stream water were also toxic to *Ceriodaphnia dubis* and flathead minnows.

Investigation of Biological Communities Inhabiting Rouge River Tributaries, Wayne County, March 1994 (MI/MDNR/SWQ-93/066)

These surveys were conducted as part of Wayne County's Rouge River National Wet Weather Demonstration Project and were conducted from June to July 1992. A total of 22 stations were evaluated in the Bell Branch and Tarabusi, Johnson, Tonquish, Willow and Fellow Creeks to provide background information for this demonstration project. The overall biological quality of all stations was considered unacceptable or in the "Fair-Poor" category. Fish communities scored a rating of "Good" at eight stations in the farthest upstream reaches while downstream segments

rated "Fair-Poor". Johnson Creek had the greatest diversity of all tributaries sampled. Macroinvertebrate populations scored between "Fair-Poor" at all locations surveyed. A total of 23 species of fish were identified. Species diversity in any particular tributary for both fish and macroinvertebrates was low except in Johnson Creek. Impairment of these tributaries is due to poor water quality and habitat deterioration.

Acute Toxicity Assessment of Rouge River CSO MOZ Acacia, Wayne County, July 1994 (MI/MDNR/SWQ-94/056)

This assessment was done as part of the Rouge River Nonpoint Source Demonstration Project. Acute toxicity testing of Daphnia magna was conducted using a grab sample collected from the Acacia wastewater combined sewer overflow (CSO). The sample was collected on June 20, 1994 and testing was conducted at the MDNR's Aquatic Toxicity Laboratory. Results indicated that the effluent was not acutely toxic to Daphnia suggesting that the overflow met the aquatic toxicity-related requirements of Rule 82 of the Michigan Water Quality Standards.

Acute Toxicity Assessment of Rouge River CSO, Garden City Wastewater, August 1994 (MI/MDNR/SWQ-94/068)

This assessment was done as part of the Rouge River Nonpoint Source Demonstration Project. Acute toxicity testing of Daphnia magna was conducted using a grab sample of the Rouge River-Garden City combined sewer overflow (CSO). The sample was collected on July 20, 1994 and was taken to determine the toxicity of the CSO discharge. Analysis of the sample was done by the MDNR's Aquatic Toxicity Laboratory. Results indicated that the discharge was not acutely toxic to Daphnia magna. The results suggest that the discharge was meeting the aquatic toxicity-related requirements of Rule 82 of the Michigan Water Quality Standards.

Annual Fixed Station Monitoring Report, Wayne County

This monitoring is done on an ongoing basis from three fixed stations located on the Main Branch near Greenfield Rd., Jefferson Ave., and the Ford Rouge water intake. A total of 107 stations are sampled throughout the entire state. The report focuses on six parameters including total phosphorus, nitrite-nitrate nitrogen, total ammonia, suspended solids, chloride and lead. Forty-four other parameters are also analyzed but are not reported due to the volume of data generated.

MDNR Fish Surveys

Survey of Quarton Lake, Birmingham, Oakland Co., August 16, 1990

The purpose of the survey was to do a general inventory of the lake. Species found during this survey include largemouth bass, bluegill, pumpkinseed, and carp.

Survey of Sump Creek Drain, Wayne County, June 21 and July 2, 1991

The Sump Creek is a cool water stream and a major tributary to the Johnson Creek/Drain. Sump Creek has many cool water species such as the mottled sculpin, blacknose dace, five-spine stickleback, and the central stoneroller which are found only in high quality water. Currently the creek does not flow into the Johnson Creek because of unpermitted changes by the Seven Lakes of Northville development. Because of these flow changes, fish populations in Sump Creek are isolated, and Johnson Creek has lost a source of cool water and habitat refuges for the species in its system. These violations are presently under litigation.

Survey of Minnow Pond Creek/Drain, Oakland County, August 19, 1992

This general survey was conducted to see if redside dace were present and to determine if there would be any negative fisheries impacts from a LWMD permit application #90-14-929. The Min-

now Pond is one of two headwater tributary streams that comes together to form the Upper Rouge River. The upper reaches showed the presence of cool, clear water species which prefer moderate to rapid velocities such as dace and pumpkinseed. The central portions of the stream had more warm water species such as bluegills and green sunfish. Creek chub, common white suckers, central stonerollers, and blacknose dace were ubiquitous throughout the entire stream. The latter two species are indicative of good water quality. No redside dace were found at any of the sites which was expected because suitable habitat was not found in this stream. The presence of wetlands and undisturbed uplands was encouraging and helps mitigate the negative effects of urbanization. Preserving these areas and controlling nonpoint source pollution will help maintain the integrity of this stream and the Upper Rouge.

Survey of Johnson Drain, Wayne and Washtenaw Counties, September 14 and 15, 1992

This survey consisted of electroshocking five sites along the Johnson Drain to determine if the first trout planted survived. Brown trout were found at four of the five locations sampled and all fish observed were in good condition. Redside dace were found farther downstream than in any previous survey suggesting that the range of this population is expanding.

Survey of the Main branch of the Rouge River, Dearborn, Wayne County, March 28, 29 and April 13, 1993

These exploratory surveys were performed to determine the diversity of the fish populations in the lower reaches of the Rouge River. Fish were electroshocked from a boat in the area just below the waterfall at the University of Michigan-Dearborn. Gizzard shad was the most abundant fish present but there were up to 21 other species of fish observed including steelhead, northern pike, three species of bass, and white perch. All species present except the steelhead were representative of a warm water fish community.

The area upstream of the Dix Avenue bridge near the turning basin was also surveyed. Carp, gizzard shad, and goldfish were observed, with some having visible tumors. This area is still undesirable for fish species due to poor water quality and lack of habitat.

When the area at U of M-Dearborn was surveyed in 1979, only carp, sunfish, and minnows were observed. Therefore, in 14 years the number of species has increased by 19 indicating that there has been a water quality improvement. The report does state that desirable habitat is still sparse.

Other Reports

Protecting Wetlands at the Local Level: Options for Southeast Michigan Communities, Lillian Dean June, 1991 [SEMCOG Library]

This report was prepared to provide local governments in southeast Michigan with options for the protection of wetlands to complement state and federal programs. Although the emphasis is on mapping, the guidebook describes a variety of potential local government activities ranging from education to local wetlands ordinances.

RRNWWDP Publications

The following is a list of brochures, papers, and other publications produced through the Rouge River National Wet Weather Demonstration Project (RRNWWDP).

RRNWWDP Brochures

Making Your Yard, Car and Home "Rouge River Friendly" A Fall Primer! Rouge Project, Public Involvement Work Element. 1994 (RRNWWDP-RPO-PI-BROCH-02)

Fall is the time of year when many people fertilize and care for their lawns, take care of basic car maintenance, and do their semi-annual cleaning which often includes disposal of leftover paint and various chemicals. Do's and don'ts, a list of household hazardous wastes, and helpful hints are given for living responsibly in the delicate Rouge River Watershed.

Making Your Yard, Car and Home "Rouge River Friendly" A Spring Primer! Rouge Project Public Involvement Work Element. 1994 (RRNWWDP-RPO-PI-BROCH-01)

Spring is the time of year when many people fertilize and care for their lawns, take care of basic car maintenance, and do their semi-annual cleaning which often includes disposal of leftover paint and various chemicals. Do's and don'ts, a list of household hazardous wastes and helpful hints, are given for living responsibly in the delicate Rouge River Watershed.

RRNWWDP DemoBulletins

Rouge River DemoBulletins are multi-page fact sheets that describe the types of technology used to manage water quality in the Rouge River Watershed. This concise overview is written especially for public officials, watershed managers and the general public.

Stormwater Management. Rouge Project Public Involvement Work Element. 1994 (RRNWWDP-RPO-PI-BUL-01)

RRNWWDP DemoInfos

DemoInfos are one-page fact sheets that describe the water quality issues within the Rouge River watershed. This overview is written especially for the general public.

An Introduction to the Rouge Geographic Information System. Rouge Project Public Involvement Work Element. 1994 (RRNWWDP-RPO-PI-INFO-03)

Rouge Education Project. Rouge Project Public Involvement Work Element. 1994 (RRNWWDP-RPO-PI-INFO-04)

Rouge River National Wet Weather Demonstration Project. Rouge Project Public Involvement Work Element. 1994 (RRNWWDP-RPO-PI-INFO-02)

Stormwater Management: Best Management Practices (BMPs). Rouge Project Public Involvement Work Element. 1994 (RRNWWDP-RPO-PI-INFO-05)

The Watershed. Rouge Project Public Involvement Work Element. 1994 (RRNWWDP-RPO-PI-INFO-01)

RRNWWDP Field Reconnaissance Plans

Field Reconnaissance Plan. O'Brien, Joseph, and Dennis Prevo, November 1993, 5+ pgs. (RRNWWDP-RPO-NPS-FRP-01.02)

A detailed plan is presented for conducting field inspections of up to 20 landfills and/or dumps along the Rouge River. Fill areas suitable for leachate sampling and monitoring will be determined. Each fill area will be inspected for the following characteristics: type of hydraulic connection; slope, surface area, and other drainage features; depth of fill; waste types; surrounding land use and land cover; and potential pollutant source locations; visible signs of erosion; potential for future leachate sampling. Locations of fill areas will be mapped on United States Geological Survey (USGS) 7.5 minute quadrangle maps and entered into the Rouge River Geographic Information System database. Samples of field log sheets are included.

RRNWWDP Field Sampling Plans

Abandoned Dump Site Leachate Sampling. Bokovoy, Jennifer. August 1994, 16+ pgs. (RRNWWDP-RPO-NPS-FSP09.00)

This Field Sampling Plan (FSP) specifically addresses the quality assurance requirements of the abandoned dump site leachate sampling program. The leachate sampling program is part of an investigation of abandoned dump sites in the Rouge River Watershed. This overall investigation entails reconnaissance, sampling and analysis of leachate and stormwater runoff, and estimation of pollutant discharges to the Rouge River from abandoned dump sites. The purpose of the leachate sample component of the investigation is to identify pollutants and estimate their discharge to the Rouge River from the abandoned dump sites. Field sketches, maps, log sheets. Appendices contain 120 pages.

Field Sampling Plan for Bathymetric Surveys. Tomlinson, Michael. April 1994, 20 pgs. (RRNWWDP-RPO-NPS-FSP03.00)

A detailed plan is presented for conducting bathymetric surveys on four lakes within the Rouge River Watershed in order to define water depth. Phoenix, Wilcox, Newburgh and Nankin Lakes were surveyed for location. Survey methods are described. Data will be analyzed using ESRI's ArcCAD, a Geographic Information System (GIS), along with appropriate statistical software. Samples of data logs are included.

RRNWWDP Miscellaneous Memoranda

1994 Rouge River Headwaters On-Site Sewage Disposal System Survey. Krinn, Keith L, William T. Carlson, Eugene C. Cyranski, Paul D. Drescher, Brian J. Murphy, and Laura M. Stasiewicz. August 1994, 54 pgs. (RRNWWDP-RPO-NPS-SR04)

Oakland County Health Division identified approximately 160 sewage disposal system failures occurring since January of 1990 along the headwaters of the Rouge River system within the cities of Farmington Hills and Southfield. This problem was referred to the Rouge Remedial Action Plan Advisory Council's On-Site Sewage Disposal Subcommittee for further study. In order to determine if the non-point source pollution from failing septic systems degrades the water quality of the Rouge River, an innovative method of dye testing for on-site sewage disposal system failure was conducted. A total of 65 houses were dye tested, with 52.3% testing positive (34 houses). Fecal coliform sampling was carried out at forty-six sites. Over 90% of the sample sites exceeded the standard limits for surface water quality. The results of testing showed that water quality standards were met for dissolved oxygen, pH, and temperature. A macroinvertebrate study utilizing the kick screen method was also performed. Low ratings resulted for many of the testing sites. Data, charts, maps.

Abandoned Dump Sites Field Survey Summary. O'Meara, John, Jennifer Bokovoy, and Lynn Craig. August 1994, 11+ pgs. (RRNWWDP-RPO-NPS-MM02.00)

This report documents field inspections of eighteen abandoned dumps located along the Rouge River. The inspections were performed to identify sites suitable for leachate sampling and monitoring and to estimate the pollutant loadings on a watershed-wide basis. Sites were chosen based upon proximity to the Rouge River and its tributaries, amount of available information regarding the site and size information available, and discussions with Wayne County Environmental Health Division (WCEHD) officials. Leachate seeps were observed, some of which flowed into the river or its tributaries. Some seeps unearthed wastes and/or eroded portions of the concrete lining in the channelized segments of the river. Gas seeps, stressed vegetation and insufficient fill cover were observed at several sites. The report provides a summary on each site visited. Appendix contains 98 pages of summary tables, maps and field sketches, and field log sheets.

Combined Sewer Overflow Innovative Funding. Zabaneh, Fayek, and Jerry Neibert. April 1994, 5+ pgs. (RRNWWDP-RPO-VE-MM03.06)

At the onset of the RRNWWDP, representatives from Wayne County, Michigan Department of Natural Resources (MDNR), Federal Court, and Rouge River Watershed communities developed a plan to construct detention treatment facilities at ten locations and sewer separation projects in six municipalities. For the purpose of demonstration, the detention criteria for the storage and treatment facilities were varied in order to test a range of detention and treatment criteria and to identify effective combinations of design parameters for future CSO control facilities in the Rouge River Watershed. The municipalities and the engineering consultants for the ten retention facilities were invited to propose "demonstration processes" to be incorporated in their designs, with the understanding that some proposed demonstrative unit processes would be funded from a separate portion of the grant extended by the USEPA. This memorandum presents the unit processes that each community proposed as innovative. Also presented is a suggested funding priority list. Appendices include 42 pages of design and financial documentation.

RRNWWDP Newsletters

Rouge River News and Views is a quarterly newsletter that informs the general public and government officials of the activities of the Rouge River National Wet Weather Demonstration Project, Friends of the Rouge, Rouge River Action Council, and other Rouge River initiatives.

Rouge News and Views, July 1993 (RRNWWDP-RPO-PI-NEWS-01)

Rouge News and Views, September 1993 (RRNWWDP-RPO-PI-NEWS-02)

Rouge News and Views, January 1994 (RRNWWDP-RPO-PI-NEWS-03)

Rouge News and Views, April 1994 (RRNWWDP-RPO-PI-NEWS-04)

RRNWWDP Papers

CSOs: Two-Phased Permitting for the Watershed. Kaunelis, Vyto P., and Jerry S. Neibert. Presented at the 1994 Water Environment Federation Annual Conference, October 1994, 11pgs. (RRNWWDP-RPO-WEF94-02.00)

Wayne County, the local communities, Michigan Department of Natural Resources (MDNR), U.S. District Court, and USEPA have developed a plan to demonstrate and evaluate alternative combined sewer overflow (CSO) control strategies in the Rouge River Watershed. A two-phased National Pollution Discharge Elimination System (NPDES) permit was issued to facilitate the demonstration and evaluation (Phase 1) of alternatives. In 1997, MDNR will establish criteria for addressing CSOs throughout the Rouge River Watershed. Communities will be required to construct these improvements by 2005 (Phase 2). Wayne County received an USEPA grant to study the CSO treatment alternatives and provide the results to guide future CSO control in the Rouge River Watershed. The results are expected to provide valuable insight on CSO treatment alternatives throughout the nation. Figures and tables.

Financial/Institutional Issues: Bringing it all Together. Murray, James E., and Jack Bails. Presented at the 1994 Water Environment Federation Annual Conference, October 1994, 10 pgs. (RRNWWDP-RPO-WEF94-05.00)

Political institutions within the Rouge River Watershed each have differing needs, abilities to pay for environmental remediation, and priorities assigned to watershed pollution. To restore water quality in the Rouge River, each jurisdiction, under current institutional arrangements, must fund equal measures to eliminate pollution regardless of their need, ability to pay, or the priority the community assigns to the problem. There are many advantages to an integrated watershed-wide approach to dealing with watershed pollution problems, but new or modified financial and institutional arrangements will be necessary. The RRNWWDP established a working group to identify potential beneficial system modifications. The key unanswered question is whether an institutional

and financial arrangement can be constructed by mutual consent or solutions will have to be mandated through enforcement actions placed on local communities.

Project Technical Support GIS / Sampling / Modeling. Mullett, Jr., Noel, Charles R. Bristol, and Ken P. Koleda. Presented at the 1994 Water Environment Federation Annual Conference, October 1994, 11 pgs. (RRNWWDP-RPO-WEF94-04.00)

The RRNWWDP will evaluate sources of wet weather pollution; implement alternative remedial measures; investigate wet weather waste load allocations; establish pollutant load reductions; examine the financial and institutional impediments to wet weather pollution control; and recommend a plan for watershed-wide pollution control which is implementable in the Rouge River Watershed and can be transferred to urban watersheds throughout the country. To accomplish such an ambitious effort, several technical support functions have been established. These technical support functions include a GIS for analyzing spatial data and generative maps; a sampling program for determining the pollutant loadings; and a suite of modeling tools for predicting the improvements in river water quality. This paper will describe these technical support functions and how they are being used to support watershed-wide wet weather water quality management.

Rouge River National Wet Weather Demonstration Program. Murray, James E., and John M. Bona. January 1993, 6 pgs. (RRNWWDP-RPO-PI-PAPER-01.00)

The range of water quality problems which impact urban rivers is being studied utilizing a unique cooperative effort among governmental agencies at the federal, state, county and local levels. The RRNWWDP is a comprehensive analysis of an entire watershed and the pollutant sources which impact the river's water quality. It looks at sources of pollution without regard to the political jurisdiction in which they are located. The program is designed to provide for an analysis of these various sources of pollution and the technologies currently available for their remediation. At completion, it is expected to establish a method for determining the mix of control measures which provided greatest water quality improvement at most reasonable public expenditure.

Rouge River Watershed Management: Implementing a Remedial Action Plan. Murray, James E. Presented at the 1994 Water Environment Federation Annual Conference, October 1994, 12 pgs. (RRNWWDP-RPO-WEF94-01.00)

Water quality within the Great Lakes and their connecting waterways has historically been viewed as an issue by both local, state, and national officials, and by our Canadian neighbors. This paper provides the historical background for the MDNR's Rouge RAP and Wayne County's implementation of the RRNWWDP, a project funded in part by the Environmental Protection Agency.

Rouge River Watershed Nonpoint Source Management: Significant Components of Urban Pollutant Loads—Crossing the Final Hurdles for Achieving Water Quality Standards. McCormack, Flora M., and James W. Ridgway. Presented at the 1994 Water Environment Federation Annual Conference, October 1994, 12 pgs. (RRNWWDP-RPO-WEF94-03.00)

Nonpoint source pollution control has failed to realize the same reductions as point source pollution because a number of impediments remain in the implementation of an effective nonpoint source program. This paper provides a brief summary of past nonpoint studies in Southeast Michigan, the impediments which have prevented implementation, and some alternatives for overcoming these obstacles. The impediments identified by the RRNWWDP are not technical but rather institutional. The RRNWWDP recognizes that implementation of nonpoint source controls is best handled at the local level but the motivation to local governments, industries, and residents is not sufficient to initiate controls. The RRNWWDP will therefore attempt to forge a consensus between the regulators and the public in general to develop a holistic or consensus-based approach to nonpoint source control and pollution prevention.

RRNWWDP Posters

The Rouge. Rouge Project Public Involvement Work Element. September 1994. (RRNWWDP-RPO-PI-POSTER-01)

This four-color poster (14" x 22") illustration of a river bank scene depicts man and nature coexisting along the banks of the Rouge River. Twenty-one types of flora, fauna, wildlife, combined sewers, log jams, bank erosion and concrete channels are depicted. There is a key identifying each species of nature and man-made changes. A map of the Rouge Watershed showing sewer drains, industrial discharge, municipal discharge is also illustrated.

Preliminary Data Reports

The monthly Preliminary Data Report (PDR) presents the data collected under the Baseline Sampling Efforts in a rapid and timely manner in order to inform the technical audiences of what data have been collected and will soon be available in final form. Baseline sampling activities include water quality monitoring at 17 sites; instream sampling at 16 autosampling sites and additional grab sampling locations; and CSO outfall flow monitoring and sampling.

The PDR presents a summary of the activities and events that occurred by month, as well as the preliminary data resulting from these activities and events. Dates and descriptions of wet weather and dry weather sampling events are presented along with rainfall volumes and number of samples collected. A summary of equipment performance for the continuous water quality monitors, instream level/flow monitors and automatic sampling equipment is provided for each site. The appendices to each PDR present the results of the analyses performed on collected samples and measurement data collected by the level and water quality monitoring equipment as well as the rain gage network.

The preliminary data presented in the appendices have undergone the first level of quality control review and been assigned a "preliminary status". The graphical presentations of the data are annotated with flags identifying the quality of the data. Therefore, data presented in the PDR are only a preliminary presentation of what data will soon be available in "final" form. From this scan one can more easily request final data from the Rouge Program Office. There will be a total of eight monthly PDRs which present data from April 1994 through November 1994. Average length of each report is 200 pages including appendices.

Baseline Water Quality Sampling Program Preliminary Data Report, April 1994. (RRNWWDP-RPO-SAM-PDR-1)

Baseline Water Quality Sampling Program Preliminary Data Report, May 1994. (RRNWWDP-RPO-SAM-PDR02)

Baseline Water Quality Sampling Program Preliminary Data Report, June 1994. (RRNWWDP-RPO-SAM-PDR03)

Baseline Water Quality Sampling Program Preliminary Data Report, July 1994. (RRNWWDP-RPO-SAM-PDR04)

Baseline Water Quality Sampling Program Preliminary Data Report, August 1994. (RRNWWDP-RPO-SAM-PDR05)

RRNWWDP Preliminary Value Engineering Reports

Preliminary Value Engineering Report of 30 Percent Design Completion of CSO Basin Demonstration Projects for Inkster, Dearborn Heights and Redford Township. Rouge Project Value Engineering Work Element, July 1993, 26+ pgs. (RRNWWDP-RPO-VE-PVER3.00)

A value engineering (VE) review was conducted on combined sewer overflow designs at 30 percent design completion. The goal is to meet NPDES permit requirements and optimize investment. Included in this VE preliminary report are details of all VE recommendations and design options considered during the workshop process, documentation of the decision process, and details of cost/benefit process. Appendices include 150+ pages containing designs, charts, and workshop worksheets.

RRNWWDP Quarterly Memoranda

Quarterly Memorandum Q3-93 for the Coordination of CSO NPDES Permit Requirements for Period Ending October 1, 1993. Alsaigh, Razik, and Raymond Rammo. January 1994, 11 pgs. (RRNWWDP-RPO-CSO-QM01.02)

This report summarizes the progress that the twelve communities in the Rouge River Watershed have made in complying with the terms of their NPDES permits for controlling CSOs. For the third quarter 1993: several communities were working on their Interim CSO Report and Long-Term Monitoring Program. Table showing reports submittal status are included.

Quarterly Memorandum Q4-93 for the Coordination of CSO NPDES Permit Requirements for Period Ending December 31, 1993. Alsaigh, Razik. January 1994, 8 pgs. (RRNWWDP-RPO-CSO-QM02.01

This report summarizes the progress that the twelve communities in the Rouge River Watershed have made in complying with the terms of their NPDES permits for controlling CSOs. For the fourth quarter 1993: several communities were working on their design to fulfill their plans and specifications submittal. Recent Michigan legislation requires current notification and reporting for the discharge of untreated sewage from combined sewer systems. Communities receiving funds from the State Revolving Fund loan program for 1994 were identified. Modifications for five NPDES permits were requested. Two tables are included detailing the status of all NPDES milestones.

Quarterly Memorandum Q1-94 for the Coordination of CSO NPDES Permit Requirements for Period Ending March 31, 1994. Alsaigh, Razik. May 1994, 7 pgs. (RRNWWDP- RPO-CSO-QM03.00)

This report summarizes the progress that the twelve communities in the Rouge River Watershed have made in complying with the terms of their NPDES permits for controlling CSOs. For the first quarter 1994: several retention communities submitted their plans and specifications, several separation communities commenced construction. City of Wayne and Garden City submitted their flow monitoring reports and two communities advertised for bidding on their construction projects. Four NPDES permits were modified and a consent order was issued for the City of River Rouge. Detroit requested modification of their NPDES permit. Several tables are included detailing the status of all NPDES milestones.

Quarterly Memorandum Q2-94 for the Coordination of CSO NPDES Permit Requirements for Period Ending June 30, 1994. Alsaigh, Razik. August 1994, 4 pgs. (RRNWWDP- RPO-CSO-QM04.00)

This report summarizes the progress that the twelve communities in the Rouge River Watershed have made in complying with the terms of their NPDES permits for controlling CSOs. For the

second quarter 1994: the City of Wayne submitted their Basis of Design. One community, River Rouge, prepared their amended project plan. Wayne County, Redford, Inkster and Dearborn Heights submitted their financing plan, and three communities opened bids on their construction projects. Nine more bid openings are expected next quarter. Grant 2 funds distribution and fiscal year 1994 State Revolving Fund (SRF) proposed project priority list were presented. Several tables are included detailing the status of all NPDES milestones.

Quarterly Memorandum Q3-94 for the Coordination of CSO NPDES Permit Requirements for Period Ending September 30, 1994. Alsaigh, Razik. January 1994, 7+ pgs. (RRNWWDP-RPO-CS0-QM05.00)

This report summarizes the progress that the twelve communities in the Rouge River Watershed have made in complying with the terms of their NPDES permits for controlling CSOs. For the third quarter 1994: several communities commenced construction. One community, the City of River Rouge, prepared their project plan for the State Revolving Fund (SRF). Acacia Park's financing plan was submitted in July 1994. Seven communities opened bids on their construction projects. Several tables are included detailing the status of all NPDES milestones.

RRNWWDP Supplemental Reports

A Strategy for Public Involvement. Wayne County Department of Environment (Michigan). January 1994, 60 pgs. (RRNWWDP-RPO-PI-SR02)

Community interviews, focus groups and telephone queries were conducted to identify public opinion and perception of needs of the Rouge River Watershed communities. Four consistent themes emerged from the research: stakeholders and community leaders must be actively involved; the K-12 schools are critical to long-term success; there are very effective communication tools and organization entities already in place throughout the watershed; and most people obtain a significant amount of information from, and form opinions, based on what they read, hear, and see in the major media. Specific ideas and approaches are included.

Proposed Rouge River Public Involvement Action Plan. Wayne County Department of Environment (Michigan). September 1994, 16+ pgs. (RRNWWDP-RPO-PI-SR03)

This action plan is designed to seek public input from people within the Rouge River Watershed in order to design programs to meet community needs and allay concerns. The action plan identifies initial messages, key themes, and delivery mechanisms for each audience. Level of effort for each group is stated. An advisory group, the Pollution Prevention Committee, has also been established. Appended to this plan is the research report *A Strategy for Public Involvement*, January 1994, 60 pages which documents results from community interviews, focus groups and telephone queries that were conducted to identify the public involvement views and needs of the Rouge River Watershed communities.

Study of Institutional and Financing Options. Apogee Research, Inc. July 1994, 72+ pgs. (RRNWWDP-RPO-FI-SR01)

This report presents options for institutional and financial actions that may be taken to advance implementation of the Rouge River Remedial Action Plan. The approaches are presented in three categories: (1) approaches that address coordination and participation issues, without changing operating responsibilities; (2) approaches that address financing issues; and (3) approaches that incorporate some degree of change to the management and operation of water pollution control infrastructure and related water pollution control programs. Included is a detailed description of current institutional and financial arrangements, a summary of Michigan and U.S. case studies, and the legal framework and current arrangements for water pollution control in the Rouge River Watershed.

RRNWWDP Task Product Memoranda

Data Access/Privileges. Reed, Les, and Ellen Taylor. May 1994, 8 pgs. (RRNWWDP-RPO-DAT-TPM13.00)

This document specifies the access rules, rights and privileges for people using the Wayne County Rouge Program Office UNIX workstations. Access to the database is at the team level, rather than the individual user. Details on the team concept, accounts and rights, privileges, access rules and access tools are included.

Data Collection and Documentation. Ryder, Donna, and John Foley. April 1994, 4 pgs. (RRNWWDP-RPO-GIS-TPM11.00)

This memorandum uses an example of the GIS Digital Data Inventory Log to show what data elements are collected to describe the various maps, data, and information for use on the Rouge Project. A brief discussion is included on how the data were collected.

GIS Base Map Data Conversion. Ryder, Donna. August 1994, 9+ pgs. (RRNWWDP-RPO-GIS-TPM12.00)

This memorandum describes the general conversion procedures, issues and problems for converting and importing Michigan Department of Natural Resources (MDNR) Michigan Resource Information System (MIRIS) data and USEPA River Reach Files (RF3) data into the RRNWWDP GIS. The data was used to create a GIS base map, as well as denote current land use and soils type throughout the Rouge River Watershed.

GIS Base Map Data Evaluation. Ryder, Donna. August 1994, 19 pgs. (RRNWWDP-RPO-GIS-TPM16.00)

Evaluation of the quality of the RRNWWDP GIS base map is presented. Report includes evaluations of the MIRIS data (base map, land cover/land use, and soils) and discusses positional accuracy, attribution, digital storage requirements, compatibility, and annotation conversion. Issues such as inconsistent coding, incorrect topology, missing data, and graphic editing are identified. Also included is an evaluation of USEPA River Reach (RF3) data.

GIS Data Available Through October 1993. Ryder, Donna. November 1993, 10 pgs. (RRNWWDP-RPO-GIS-TPM10.03)

This document presents a non-technical overview of available GIS data from the Rouge River Watershed. Data layer, description, status, and attributes are given on the following data categories: administrative, control, engineering, environmental, hydrologic, and pollutants.

GIS Directory Structure. Ryder, Donna. April 1994, 7+ pgs. (RRNWWDP-RPO-GIS-TPM04.00)

The RRNWWDP GIS directory structure is specifically designed for a water quality, water environment assessment project. Two factors influenced the structure: (1) the need to be highly structured in order to allow access by external users to data subsets; and (2) the need to accommodate different file formats. A hierarchical directory structure was developed which organizes the files by theme, purpose and/or file format.

GIS Mapping Symbology Standards. Ryder, Donna. August 1994, 3+ pgs. (RRNWWDP- RPO-GIS-TPM09.00)

This document illustrates and discusses the customized symbol sets created for the RRNWWDP GIS. The four sets used by ARC/INFO GIS software include symbology for linear features and polygons, point features, text/labels, and fill/hatch symbols for aerial features. Standard map symbology for base map and thematic features is also included.

Oracle Database Graphical Layout. Capton, Victor, and Les Reed. May 1994, 11 pgs. (RRNWWDP-RPO-DAT-TPM15.00)

A graphical layout is presented documenting the relationships and dependencies of the Oracle database at the Wayne County Rouge Program Office. The database will be used to store and access all the data from the Rouge River sampling collection effort including sediment, analytical dry/wet, historical flow, time series flow, time series rain, and time series water quality data.

Software Evaluations. Rood, Steve, and Susan Field. October 1994, 26 pgs. (RRNWWDP-RPO-MOD-TPM21.00)

Several commercial, off-the-shelf software packages were evaluated as potential candidates for integration with a suite of software tools which would comprise a decision support system (DSS) for the RRNWWDP. Types of software evaluated include spatial data query and viewers; ARCVIEW1 and ARCVIEW2; GIS/CAD; and hypermedia programs.

RRNWWDP Technical Memoranda

Air Deposition Studies: A Review of Air Deposition Literature. Sidhu, Amarjit. September 1994, 22 pgs. (RRNWWDP-RPO-NPS-TM03.00)

This document presents a summary of the available literature on the topic of wet and dry air deposition and makes recommendations for the design and implementation of air deposition studies to study the water quality of the Rouge River. Detailed summaries of the literature are provided. The information collected will be used to design ambient air monitoring and sampling, analysis, and data reduction parameters for implementation in the next phase of the RRNWWDP.

Contaminated Sediments Characteristics and Collection/Removal. O'Meara, John, and Kelly Cave. August 1994, 24 pgs. (RRNWWDP-RPO-NPS-TM05.00)

This paper summarizes existing dredging technology and is the first in a series on the collection, treatment and disposal options for remediating the contaminated sediment in the Rouge River impoundments. The report discusses characteristics of the sediments found in the Rouge River and summarizes two published reports discussing the sources of the sediment contamination: the "Rouge River Basin Remedial Action Plan" and "Michigan Department of Natural Resources Surface Water Quality Division 1992 Sediment Survey". The collection and removal component of the remediation process is presented. Descriptions and anticipated results of conventional collection and removal technologies using cutterhead, clam shell, hopper, and matchbox dredges are presented. New and innovative options will be studied before a final selection of the dredging method will be made. Figures, maps, references.

Contributions to Surface Water Quality of Atmospheric Deposition in Rouge River Watershed. Pirrone, Nicola, Gerald Keeler, Thomas B. Brown, and Mark Mikesell. August 1994, 23 pgs. (RRNWWDP-RPO-NPS-TM20.00)

Atmospheric deposition of trace contaminants in urban areas is considered the major diffuse source of loading to urban stormwater. In this paper, historical trends in the dry deposition of trace metals in the Rouge River Watershed are evaluated using a dynamic model previously validated and calibrated by the authors. Ambient air concentration data collected at several sampling stations in Wayne County were used to assess these trends over the period from 1982 to 1992. Samples were collected at seven sampling stations situated in residential, commercial, and industrial areas of Wayne County to determine the ambient concentrations of iron, zinc, lead, nickel, chromium, cadmium, beryllium, and mercury. Analysis of the data shows that the overall variations in dry deposition flux of trace metals to the surface are controlled by the dry deposition velocity, a pa-

rameter computed by the authors' model. The variation of dry deposition velocity controls the overall variation of dry deposition flux of trace metals to the urban surface. The historical trends are downward for iron, lead, chromium, and beryllium, and upward for zinc, nickel, and mercury.

Geographic Information System and Mapping Plan. Ryder, Donna, and Ellen Taylor. May 1993, 21+ pgs. (RRNWWDP-RPO-GIS-TM01)

This status report describes the development of the RRNWWDP GIS between November 1992 and April 1993. Included is an overview of future GIS development, hardware and software alternatives, project needs assessment (systems and data inventory, data requirements, functional requirements), and details of short- and long-term GIS plans as they relate to internal project needs, Rouge River Watershed community needs and technology transfer.

GIS Data Dictionary. Ryder, Donna, and Ellen Taylor. November 1993, 39 pgs. (RRNWWDP-RPO-GIS-TM19.03)

This memorandum documents existing GIS coverages and data fields used in the RRNWWDP ARC/INFO GIS data structure. Administrative, control, engineering, hydrologic, pollutant, and environmental coverages are discussed. Two separate GIS database management systems are used in the project: HENCO INFO version 9.1.3 which contains all the support data; and ORACLE version 8.0 which contains all the relational GIS data.

Literature Review - Wetlands as a Nonpoint Source Pollution Control Measure. Denison, Doug, and Don Tilton. August 1993, 18+ pgs. (RRNWWDP-RPO-NPS-TM12.01)

This memorandum is a literature review of articles on wetlands systems for the treatment of stormwater runoff. Included is a review of general wetland ecology, wetland ecosystem processes, and the use of wetlands for the water quantity and water quality control of stormwater. Sections included are: stormwater and nonpoint source pollution; general wetland ecology; nutrient cycling, wetland systems for wastewater treatment and nonpoint source pollution; and natural versus created wetlands for nonpoint source pollution control. A discussion of the Rouge River water quality is included.

Middle Rouge Detention Basin Inventory. Prevo, Dennis. August 1994, 25+ pgs. (RRNWWDP-RPO-NPS-TM27.00)

Locations and specifications of the 259 detention basins in the Middle Rouge River Subwatershed are documented. Each detention basin was studied to determine specific characteristics: tributary drainage area, surface area of basin, total volume, inches of storage over the tributary area, permanent pool volume, permanent pool depth, inlet/outlet pipe diameter, and tributary land use. A short summary of urban watershed Best Management Practices (BMPs) for controlling stormwater pollution is included. Tables.

Model Review and Assessment. RRNWWDP Modeling Program Element. July 1994, 35+ pgs. (RRNWWDP-RPO-MOD-TM04.04)

Computer models are used to simulate and predict wet weather pollution control measures and management practices on water quality in the Rouge River. The report details a review of previous and ongoing studies conducted within the Rouge River Watershed, technical aspects of modeling the river, and critical reviews of state-of-the-art models. Storm Water Management Model (SWMM) (RUNOFF), SWMM (TRANSPORT), and Water Quality Analysis Simulation Program (WASP) are recommended by the project modeling team.

Percent Treated Analysis of Demonstration Combined Sewer Overflow Control Facilities. Kluitenberg, Edward, H, and Clinton Cantrell. October 1994, 27 pgs. (RRNWWDP- RPO-MOD-TM17.00)

A computer modeling analysis was conducted to determine how eleven proposed demonstration combined sewer overflow (CSO) control facilities in the Rouge River Watershed compares to the USEPA CSO Control Policy issued in April 1994. The eleven demonstration facilities comprise a variety of design features and different hydraulic design criteria for facility sizing. The analysis evaluates each facility individually rather than on a system-wide basis. Percent treated, as defined in the USEPA policy, and the number of overflow events per year were calculated on an annual average basis using the TRTSTORM hydrologic mass balance model. Model results are presented for each facility for each of three different operating scenarios. The results are also presented for a range of values (1/2 to 3 hours) of minimum hydraulic detention time, which is the criterion used by the model to define primary clarification. A sensitivity analysis of the model results is also presented.

Quarterly Memorandum No. 1 for the Coordination of CSO NPDES Permit Requirements for Period Ending June 30, 1993. Rammo, Raymond. July 1993, 2+ pgs. (RRNWWDP-RPO-CSO-TM08.04)

This report summarizes the progress that the twelve communities in the Rouge River Watershed have made in complying with the terms of their NPDES permits for controlling CSOs. For the second quarter 1993: several communities were working on their Operation and Maintenance Plan, Interim CSO Report and Long-Term Monitoring Program. Table showing reports submittal status are included.

Selection of Stormwater Pollutant Loading Factors. Cave, Kelly, Tom Quasebarth, and Eric Harold. October 1994, 25+ pgs. (RRNWWDP-RPO-MOD-TM34.00)

This technical memorandum summarizes and assesses the available data from previous local, regional, and national stormwater monitoring studies and presents land use-specific stormwater pollutant loading factors for use in the simulation of stormwater pollution loads to the Rouge River. The primary objectives are to: (1) identify stormwater related pollutants that may impact water quality in the watershed; (2) describe the methodology for determining appropriate stormwater pollutant loading factors, based on storm even mean concentrations (EMCs), for simulating the water quality in the Rouge River; and (3) present recommended stormwater EMC loading factors based on statistical analysis of local, regional, and national monitoring databases. Stormwater pollutant loading factors are presented for the following twelve constituents: biochemical oxygen demand (BOD), chemical oxygen demand dissolved phosphorus (DP), total Kjeldahl nitrogen (TKN), nitrate+nitrite-nitrogen, lead, copper, zinc, and cadmium. This Technical Memorandum presents recommended stormwater loading factors for ten (10) land use categories based on the statistical analysis. The loading factors will be applied in the Rouge River Watershed models to estimate stormwater pollution loads to the river under existing and future land use conditions and to determine the effect of Best Management Practices (BMPs) on pollution reduction. This analysis will be used in the simulation of water quality of the Rouge River in response to wet weather events.

Summary of Waste Disposal Sites. O'Meara, John, and Dennis Prevo. July 1994, 8+ pgs. (RRNWWDP-RPO-NPS-TM11.00)

A summary of the initial efforts to collect existing data on waste disposal sites along the Rouge River is presented. Preliminary field investigations were conducted, and a literature and/or file

search was performed at Wayne County Environmental Health Division, Oakland County Environmental Health and Planning Divisions, and both the Waste Management and Environmental Response divisions at the Michigan Department of Natural Resources (MDNR). A total of 112 regulated active and inactive landfills or unregulated dumps were located in Wayne and Oakland counties. The field investigations revealed evidence of exposed waste along the river and its tributaries, leachate seepages, and cuts into the fills by meandering of the river bed. Literature and file searches focused on information for abandoned sites which might indicate potential sources of pollution to the Rouge River. The searches identified data relating ground water quality, monitoring results, flow direction, soil types, drilling activities, site maps, and photographs. It should be noted that information was not available for many of the abandoned sites. Individual site summaries and photographs are included.

RRNWWDP Technical Reports

CSO Demonstration Facilities Design Parameter Report. Alsaigh, Razik. August 1994, 50 pgs. (RRNWWDP-RPO-CSO-TR02.00)

This report summarizes the CSO abatement projects that the twelve communities in the Rouge River Watershed are constructing. Key design parameters for the retention treatment basins, retention treatment tunnel and sewer separation projects are identified. Estimates of costs; flows and other features of each system; and plans and diagrams showing facilities are included.

Newburgh Lake Sediment Core Sampling and Analysis. O'Meara, John M., V. Elliot Smith, Joseph E. Rathbun, Laura L. Huellmantel, and Dennis B. Prevo. September 1994, 33+ pgs. (RRNWWDP-RPO-NPS-TR04.00)

During the period of November 8, 1993 through November 12, 1993, the Wayne County Rouge Program Office (RPO), with the assistance of the USEPA, Office of Research and Development, completed a sediment survey of Newburgh Lake in Wayne County, Michigan. The sediment survey involved the collection, subsampling, and analysis of sediment from a total of 21 locations. A total of 101 samples were analyzed for metals using x-ray fluorescence spectroscopy and polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs) using modified enzyme immunoassay test kits. The core stratigraphy was generally simple: black, often oily silt in the upper 2 to 3 feet followed by non-oily gray/brown silt and usually ending in sand and/or gravel. In some cases stratigraphy appeared to derive from the terrestrial riparian soils present before the impoundment was created. The most contaminated region of Newburgh Lake for PCBs, PAHs, and the metals quantified is the West-Northwest part of the lake. Contaminants are most concentrated in the upper 0-30 inches of sediment, which are mainly black, oil silt. PCBs, lead, nickel, and zinc were the contaminants present in Newburgh Lake sediments that most often exceeded their respective Effects Range-Median (ERM) values, suggesting the potential for toxic effects in aquatic organisms. The sand and/or gravel that usually composed the lower end of the cores contained very low concentrations of all of the contaminants quantified. Field logs, data; 140 page appendices.

Nonpoint Source Data Assessment and Field Investigation. Quasebarth, Thomas F., Kelly A. Cave, Richard A. Wagner, Douglas Denison, Mark D. Mikesell, and Amarjit Sidhu. August 1994, 85+ pgs. (RRNWWDP-RPO-NPS-TR03.00)

This report provides the basis for the Rouge River Watershed nonpoint source field studies. It reviews available existing data developed under local and national nonpoint source programs and identifies data gaps that will be refined under the RRNWWDP. Available data sources include 208 Programs, the Rouge River Remedial Action Plan (RAP), the Nationwide Urban Runoff Program (NURP) and other ongoing nonpoint studies. Sections in the report include a literature review

of urban stormwater sources and controls; a literature review of air deposition sources; summaries of the methods and conclusions of significant local and national programs; summaries of contaminated sediments and abandoned dumps affecting the river; a plan for the pilot studies and field investigations; and a proposed approach for data analysis of nonpoint pollution monitoring data collected at the pilot BMP sites. Tables, figures; 80 page appendices.

Rouge River Reconnaissance Survey. Regenmorter, Louis C. October 1994, 40+ pgs. (RRNWWDP-RPO-MOD-TR01.00)

A reconnaissance survey was conducted along 90 miles of the Rouge River. Its purpose was to record the locations of sewer outfalls, characterize sediments, and provide a general description of the river's flow hydraulics, water quality, and environment. The findings of the survey conducted on the main Rouge River, Lower Rouge, Middle Rouge, and Upper Rouge are presented in the report. The report includes the locations and sources (combined, storm, sanitary, unknown) of the 630 outfalls found. The general makeup of the sediments (sand, silt, clay, cobblestones) are described, plus identified on the field maps. Locations where the sediments contain high organic contents are specifically identified for future sampling activities. Additional characteristics that are reported include: flow rates, hydraulics, and stream geometry at selected locations; visual observations of water clarity, impacted water quality, and aesthetic appearance; and general descriptions of land use and the flora and fauna.

APPENDICES

A. RAP UPDATE ENDORSEMENT/DISSENT LETTERS

B. GUIDELINES FOR RECOMMENDING THE LISTING AND DELISTING OF GREAT LAKES AREAS OF CONCERN

C. PERMITTED MUNICIPAL AND INDUSTRIAL DISCHARGES TO THE ROUGE RIVER

D. ACT 307 SITES OF CONTAMINATION IN THE ROUGE RIVER WATERSHED

E. AGENCIES AND ORGANIZATIONS TO CONTACT FOR MORE INFORMATION

F. ROUGE RAP COMMITTEES

APPENDIX A
GOAL UPDATE ENDORSEMENT/DISSENT LETTERS

Edward H. McNamara
County Executive

January 26, 1995

Ms. Cathy Bean
Rouge RAP Coordinator
DNR Southeast Michigan District Headquarters
38980 7 Mile Road
Livonia, MI 48152

Dear Ms. Bean:

I am writing this letter in support of the Rouge River Action Plan (RAP) Update. The Rouge RAP has provided the framework from which the 48 Watershed communities can collectively address the pollution problems causing the degradation of the River's water quality.

As those communities move forward in addressing these problems, it is important to assure that we all do our fair share. Through Wayne County's Rouge River National Wet Weather Demonstration Project, many of the communities will be able to take a comprehensive, watershed approach to achieving the goals of the Rouge RAP. This collaborative effort effectively and efficiently pursues water quality and other improvements to the Rouge River.

The older, urban areas have made a substantial commitment through their combined sewer overflow control program. Now, the other components of wet weather pollution must be addressed. The Rouge RAP Update will serve as a guide for our future efforts. Together, we can achieve the goal of improved water quality.

Sincerely,

James E. Murray
Director

zb/ball:work:raplet

DEPARTMENT OF ENVIRONMENT
415 CLIFFORD, DETROIT, MICHIGAN 48226 • 313-224-3620

Friends of the ROUGE
950 Michigan Building, 220 Bagley Avenue, Detroit, Michigan 48226-1412
Office (313) 961-4050 • Education Project (313) 961-4099 • FAX (313) 961-4018

Dr. Orin Gelderloos, Chairperson
Rouge Remedial Action Plan Advisory Council
660 Plaza Drive, Suite 1900
Detroit, MI 48226

January 27, 1995

Dear Dr. Gelderloos:

On behalf of the Board of Directors and members of Friends of the Rouge, congratulations on the completion of the 1994 Rouge River Remedial Action Plan Update.

Friends of the Rouge is proud to serve as a member of the Rouge RAP Advisory Council, and we have been very pleased to play a role in the development of the goals and recommendations included in the 1994 Update.

Be assured that Friends of the Rouge is anxious to participate however possible in the implementation of the Update's recommendations, and we urge all responsible parties to respond immediately to the Update's call to action. The future of the Rouge River depends on us all.

We want to applaud you, the members of the Advisory Council, and all the members of the Council's subcommittees who devoted so much of their time, talent, and energy to the Update.

It is this kind of dedication that will assure the restoration of the Rouge River to the valuable, and valued, natural resource it once was and will be again.

Special thanks to Cathy Bean, the Rouge RAP Coordinator for the Michigan Department of Natural Resources, and to Carla Davidson of SEMCOG, for their leadership in the development of this document.

We're glad that the Rouge River has so many good Friends.

Best regards,

Jim Graham
Executive Director

STATE OF MICHIGAN

JOHN ENGLER, Governor

DEPARTMENT OF NATURAL RESOURCES

Southeast Michigan District Headquarters, 38980 Seven Mile Road, Livonia, MI 48152-1006

ROLAND HARMES, Director

Ms. Catherine J. Bean
Rouge River RAP Coordinator
Michigan Department of Natural Resources
Surface Water Quality Division
38980 W. Seven Mile Rd.
Livonia, Michigan 48152

January 27, 1995

Dear Ms. Bean:

On behalf of the Michigan Department of Natural Resources Rouge Project Team, we support the 1994 Rouge River Remedial Action Plan Update.

As a group formed to assist with the implementation of the Rouge River National Wet Weather Demonstration Project, and to help coordinate these activities with the Rouge River RAP, we feel that this update to the original 1989 Rouge River RAP is critical to the successful remediation of the Rouge River.

Because many of the concerns for public health are being addressed, we now believe it is necessary to move into a new phase of planning and implementation. We believe that the 1994 Rouge River RAP Update begins to guide us in this important endeavor.

We look forward to realizing our vision of a healthy and diverse ecosystem in the Rouge River Watershed.

Sincerely,

R 1026-EF10
04/94

CITY OF WESTLAND

DEPARTMENT OF PUBLIC SERVICE

37137 Marquette • Westland, Michigan 48185 • (313) 728-1770

Robert J. Thomas
Mayor

Carl W. Clark
Director

October 25, 1994

Ms. Carla Davidson
SEMCOG
660 Plaza Drive, Suite 1900
Detroit, MI 48226

Dear Ms. Davidson:

We are in receipt of the "Draft of the 1994 Rouge River Remedial Action Plan Update."

After reviewing the aforementioned document, the City of Westland submits the following comment.

The City of Westland does not agree with the draft due to the fact that there is a large portion of items listed which show no cost amounts for the work that will be performed. This has the possibility of creating an undue burden upon this City, as a large portion of the work identified will be performed in Westland. Based on this, the City is requesting that figures be accessible to the City of Westland as soon as possible for those items shown in the draft. Until such time, the City must go on record as being opposed to the 1994 Draft, as we will be responsible to carry out the River Protection and Remediation activities.

Sincerely,

Robert J. Thomas, Mayor
City of Westland

RJT:az

APPENDIX B

GUIDELINES FOR RECOMMENDING THE LISTING AND DELISTING OF GREAT LAKES AREAS OF CONCERN

International Joint Commission Guidelines for Recommending the Listing and Delisting of Great Lakes Areas of Concern

Use Impairment	Listing Guideline	Delisting Guideline	Rationale	Reference
Degradation Of Aesthetics	When any substance in water produces a persistent objectionable deposit, unnatural color or turbidity, or unnatural odor (e.g. oil slick, surface scum).	When the waters are devoid of any substance which produces a persistent objectionable deposit, unnatural color or turbidity, or unnatural odor (e.g. oil slick, surface scum).	Emphasizes aesthetics in water; accounts for persistence.	Adapted from the Ontario Ministry of the Environment 1984
Added Costs To Agriculture Or Industry	When there are additional costs required to treat the water prior to use for agricultural purposes (i.e. including, but not limited to, livestock watering, irrigation and crop-spraying) or industrial purposes (i.e. intended for commercial or industrial applications and noncontact food processing).	When there are no additional costs required to treat the water prior to use for agricultural purposes (i.e. including, but not limited to, livestock watering, irrigation and crop-spraying) and industrial purposes (i.e. intended for commercial or industrial applications and noncontact food processing).	Sensitive to increased cost and a measure of impairment.	Adapted from Michigan DNR 1977
Degradation Of Phytoplankton And Zooplankton Populations	When phytoplankton or zooplankton community structure significantly diverges from unimpacted control sites of comparable physical and chemical characteristics. In addition, this use will be considered impaired when relevant, field-validated, phytoplankton or zooplankton bioassays (e.g. Ceriodaphnia; algal fractionation bioassays) with appropriate quality assurance/quality controls confirm toxicity in ambient waters.	When phytoplankton and zooplankton community structure does not significantly diverge from unimpacted control sites of comparable physical and chemical characteristics. Further, in the absence of community structure data, this use will be considered restored when phytoplankton and zooplankton bioassays confirm no significant toxicity in ambient waters.	Accounts for community structure and composition; recognizes water column toxicity; uses appropriate control sites.	Adapted from IJC 1987
Loss Of Fish And Wildlife Habitat	When fish and wildlife management goals have not been met as a result of loss of fish and wildlife habitat due to a perturbation in the physical, chemical, or biological integrity of the Boundary waters, including wetlands.	When the amount and quality of physical, chemical, and biological habitat required to meet fish and wildlife management goals have been achieved and protected.	Emphasizes fish and wildlife management program goals; emphasizes water component of Boundary Waters.	Adapted from Manny and Pacific, 1988

International Joint Commission Guidelines for Recommending the Listing and Delisting of Great Lakes Areas of Concern, cont.

Use Impairment	Listing Guideline	Delisting Guideline	Rationale	Reference
Degradation Of Benthos	When the benthic macro-invertebrate community structure significantly diverges from unimpacted control sites of comparable physical and chemical characteristics. In addition, this use will be considered impaired when toxicity (as defined by relevant, field-validated, bioassays with appropriate quality assurance/quality controls) of sediment-associated contaminants as a site is significantly higher than controls.	When the benthic macro-invertebrae community structure does not significantly diverge from unimpacted control sites of comparable physical and chemical characteristics. Further, in the absence of community structure data, this use will be considered restored when toxicity of sediment-associated contaminants is not significantly higher than controls.	Accounts for community structure and composition; recognizes sediment toxicity; uses appropriate control sites.	Adapted from Reynoldson 1988; Henry 1988; IJC 1988
Restrictions On Dredging Activities	When contaminants in sediments exceed standards, criteria, or guidelines such that there are restrictions on dredging or disposal activities.	When contaminants in sediments do not exceed standards, criteria, or guidelines such that there are restrictions on dredging or disposal activities.	Accounts for jurisdictional and federal standards; emphasizes dredging and disposal activities.	Adapted from IJC 1988
Eutrophication Or Undesirable Algae	When there are persistent water quality problems (e.g. dissolved oxygen depletion of bottom waters, nuisance algal blooms or accumulation, decreased water clarity, etc.) attributed to cultural eutrophication.	When there are no persistent water quality problems (e.g. dissolved oxygen depletion of bottom waters, nuisance algal blooms or accumulation decreased water clarity, etc.) attributed to cultural eutrophication.	Consistent with Annex 3 of the Agreement; accounts for persistence of problems.	United States and Canada, 1987
Restrictions On Drinking Water Consumption Or Taste And Odor Problems	When treated drinking water supplies are impacted to the extent that: 1) densities of disease-causing organisms or concentrations of hazardous or toxic chemicals or radioactive substances exceed human health standards, objectives or guidelines; 2) taste and odor problems are present; or 3) treatment needed to make raw water suitable for drinking is beyond the standard treatment used incomparable portions of the Great Lakes which are not degraded (i.e. settling, coagulation, disinfection).	For treated drinking water supplies: 1) when densities of disease-causing organisms or concentrations of hazardous or toxic chemicals or radioactive substances do not exceed human health objectives, standards or guidelines; 2) when taste and odor problems are absent; and 3) when treatment needed to make raw water suitable for drinking does not exceed the standard treatment used in comparable portions of the Great Lakes which are not degraded (i.e. settling, coagulation, disinfection).	Consistency with the Agreement; accounts for jurisdictional standards; practical; sensitive to increased cost as a measure of impairment.	Adapted from United States and Canada, 1987
Beach Closings	When waters, which are commonly used for total-body contact or partial-body contact recreation, exceed standards, objectives, or guidelines for such use.	When waters, which are commonly used for total-body contact or partial-body contact recreation, do not exceed standards, objectives, or guidelines for such use.	Accounts for use of waters; sensitive to jurisdictional standards; addresses water contact recreation; consistent with the Agreement.	Adapted from United States and Canada, 1987; Ontario Ministry of the Environment 1984

International Joint Commission Guidelines for Recommending the Listing and Delisting of Great Lakes Areas of Concern, cont.

Use Impairment	Listing Guideline	Delisting Guideline	Rationale	Reference
Restrictions On Fish And Wildlife Consumption	When contaminant levels in fish or wildlife populations exceed current standards, objectives or guidelines, or public health advisories are in effect for human consumption of fish or wildlife. Contaminant levels in fish and wildlife must be due to contaminant input from the watershed.	When contaminant levels in fish and wildlife populations do not exceed current standards, objectives or guidelines, and no public health advisories are in effect for human consumption of fish or wildlife. Contaminant levels in fish and wildlife must be due to contaminant input from the watershed.	Accounts for jurisdictional and federal standards; emphasizes local watershed sources.	Adapted from Mack 1988
Tainting Of Fish And Wildlife Flavor	When ambient water quality standards, objectives, or guidelines, for the anthropogenic substance(s) known to cause tainting, are being exceeded or survey results have identified tainting of fish or wildlife flavor.	When survey results confirm no tainting of fish or wildlife flavor.	Sensitive to ambient water quality standards for tainting substances; emphasizes survey results.	See American Public Health Association (1980) for survey methods
Degraded Fish And Wildlife Populations	When fish and wildlife management programs have identified degraded fish or wildlife populations due to a cause within the watershed. In addition, this use will be considered impaired when relevant, field-validated, fish or wildlife bioassays with appropriate quality assurance/ quality controls confirm significant toxicity from water column or sediment containments.	When environmental conditions support healthy, self-sustaining communities of desired fish and wildlife at predetermined levels of abundance that would be expected from the amount and quality of suitable physical, chemical and biological habitat present. An effort must be made to ensure that fish and wildlife objectives for Areas of Concern are consistent with Great Lakes ecosystem objectives and Great Lakes Fishery Commission fish community goals. Further, in the absence of community structure data, this use will be considered restored when fish and wildlife bioassays confirm no significant toxicity from water column or sediment contaminants.	Emphasizes fish and wildlife management program goals; consistent with Agreement and Great Lakes Fishery Commission goals; accounts for toxicity bioassays.	Adapted from Manny and Pacific, 1988; Wisconsin DNR 1987; United States and Canada, 1987; Great Lakes Fishery Commission 1980
Fish Tumors Or Other Deformities	When the incident rates of fish tumors or other deformities exceed rates at unimpacted control sites or when survey data confirm the presence of neoplastic or preneoplastic liver tumors in bullheads or suckers.	When the incidence rates of fish tumors or other deformities do not exceed rates at unimpacted control sites and when survey data confirm the absence of neoplastic or preneoplastic liver tumors in bullheads or suckers.	Consistent with expert opinion on tumors; acknowledges background incidence rates.	Adapted from Mac and Smith, 1988; Black 1983; Baumann et al. 1982
Bird Or Animal Deformities Or Reproductive Problems	When wildlife survey data confirm the presence of deformities (e.g. cross-bill syndrome) or other reproductive problems (e.g. egg-shell thinning) in sentinel wildlife species.	When the incidence rates of deformities (e.g. cross-bill syndrome) or reproductive problems (e.g. egg-shell thinning) in sentinel wildlife species do not exceed background levels in inland control populations.	Emphasizes confirmation through survey data; makes necessary control comparisons.	Adapted from Kubiak 1988; Miller 1988; Wiemeyer et al. 1984

APPENDIX C

PERMITTED MUNICIPAL AND INDUSTRIAL DISCHARGES TO THE ROUGE RIVER

Facility Name	Location	Status
Ameritech Services	Plymouth	Terminated
Amoco Oil Company	Plymouth	City Sewer
Amoco Oil Company	Livonia	Under Construction
Amoco Oil Company	River Rouge	Discharging
Amoco Oil Company	Rochester Hills	Discharging
Amoco Oil Company	Southfield	Under Construction
Amoco Oil Company	West Bloomfield	Discharging
Amoco Oil Company	Westland	Not Discharging
Browing Ferris Industry	Northville	Discharging
BMC Manufacturing	Plymouth	Discharging
BP Oil Company	Taylor	Discharging
Buckeye Pipeline	Plymouth	Discharging
Buckeye Pipeline	Wayne	Discharging
Detroit Coke Corporation	Detroit	Closed
Detroit Diesel Corporation	Detroit	Discharging
Dow Corning Auto-Dev. Center	Plymouth	Discharging
Eaton Corporation	Southfield	Terminated; City Sewer
Eppert Oil Company	Detroit	Discharging
Ford Michigan Truck Plant	Wayne	Discharging
Ford Motor Company	Northville	Closed
Ford Rouge Mfg. Complex	Dearborn	Discharging
Ford-Wayne Assembly Plant	Wayne	Discharging
GM-Power Train	Romulus	Discharging
GM-Delco Product Division	Livonia	Discharging
GM-Inland Div. - Trim Plant	Livonia	Discharging
Heublein Inc.	Allen Park	Terminated; City Sewer
Hygrade Food Products	Livonia	City Sewer
IMPC, Inc.	Detroit	Discharging
Marathon Oil Company	Detroit	Terminated
Marblehead Lime Company	River Rouge	Discharging
McLaren Engines	Livonia	Terminated; City Sewer
MICHCON	River Rouge	Terminated
Mobil Oil Corporation	Dearborn	No Discharge

Mobil Oil Corporation	Dearborn Hts.	No Discharge
Mobil Oil Corporation	Farmington Hills	Discharging
Mobil Oil Corporation	Farm.Hills/10 Mile	Withdrawn
Mobil Oil Corporation	Farm. Hills/11Mile	Withdrawn
Norfolk & Western RR	Melvindale	Discharging
Oak Co. Walled Lk/Novi WWTP	Novi	Discharging
PIC (a.k.a Evans Assets) Holding Company	Plymouth	Discharging
Polymeric Protective Linings	Livonia	Terminated
Robert Bosch Corporation	Farmington Hills	Discharging
Rouge-Power & Utility Oper.	Dearborn	Discharging
Rouge Steel Co.	Dearborn	Discharging
Rouge-USX-Corp-Double Eagle	Dearborn	Discharging
Shell Oil-Orchard Lake	West Bloomfield	No Discharge
Shell Oil-Detroit	Detroit	Discharging
Solder Craft, Inc.	Plymouth	Discharging
South Commerce Twp. WWTP	Walled Lake	Discharging
Steel Technologies, Inc.	Canton	No Discharge
St. Mary's Cement Company	Detroit	Discharging
Sun Petroleum	Westland	Withdrew
Total Petroleum	Westland	No Discharge
Uniflow Corporation	Novi	Terminated; City Sewer
VIP Car Wash	Dearborn Hts.	Closed

Source: MDNR, 1994

Key

City Sewers:	Discharge has been changed to city sewers
Closed:	Facility is no longer in operation-no discharge to rivers.
Discharging:	Presently discharging to the river.
Discharge Discontinued:	Facility still in operation but permitted discharge discontinued.
Under Construction:	Facility has permit but construction of treatment equipment has not been completed.
Terminated:	Entity requested a termination of their NPDES permit
No Discharge:	Facility is not discharging at the current time but its status may change (e.g. the facility could be awaiting final permit approval)

APPENDIX D

ACT 307 SITES OF ENVIRONMENTAL CONTAMINATION IN THE ROUGE RIVER WATERSHED

Rouge River Watershed
Act 307 Sites

The following sites are regulated through the Michigan Environmental Response Act, P. A. 307 of 1982, as amended, which provides for the identification of contamination and any potentially responsible parties (PRPs), risk assessment, evaluation, and cleanup of these sites. These sites are regulated by MDNR's Environmental Response Division (ERD), Waste Management Division (WMD) and the Underground Storage Tank (UST) Division.

Map #	Site Name	Site #	SAM Score/Status
Oakland County			
1	11 Mile & Orchard Lake	630001	24/B-3
2	AB Dick Company (Former)	630161	24/B-3
3	Allied Signal M.E.L.	630854	33/B-3
4	American Screw Products (Former)	630088	20/B-3
5	American Heating Spill	630144	18/A
6	Amoco-Hunter & Oak	630076	24/B-3
7	Amoco-Maple & Orchard Lake	630002	29/B-3
8	Anderson Heat Treat	630004	40/B-3
9	By Rite Oil Company	630012	22/B-3
10	Clark-9 Mile & Farmington	630120	24/B-3
11	GM Truck & Bus Pontiac Central	630048	24/A
12	Leemon Oil	630100	27/B-3
13	Munn Landfill Section 23	630040	26/B-2
14	Selastomer (Former)	630857	35/B-3
15	United Paint & Chemical	630086	22/B-3
Washtenaw County			
16	Arbor Hills - East	810004	24/B-3
17	Old Ypsilanti Twp. Sludge Disposal	810030	35/A
18	Salem Landfill	810033	38/B-3
19	Willow Run Creek Area	810048	39/A
Wayne County			
20	ABC Drum Barrel	820143	27/B-3
21	Accu Park	820148	17/A
22	Accurate Machine Services	821493	30/A
23	Adistra Corporation	820219	31/B-3
24	American Tube & Wire Fabricators	820161	29/A
25	Amoco River Rouge Terminal	820122	23/B-3
26	Amoco Service Station 7217	820106	23/B-5
27	Amsted Industries	820147	33/B-3

SAM Map #	Site Name	Site #	Score/Status
28	Bietz Creek Fill (Marshal Elem.)	820227	23/B-3
29	Beta Chemical - Detroit	820058	25/B-3
30	Bra Con Industries	820167	27/B-5
31	Buckeye Pipeline Company	821422	33/B-3
32	By Rite Station - Westland	820064	32/A
33	Chesapeake Properties	820151	24/A
34	Chevy Livonia Plant	820008	34/B-3
35	Commercial Auto Wrecking	820155	20/A
36	Cooper School Site	820010	37/B-2
37	Cyanokem	820035	32/B-3
38	Dearborn Refining Company	820011	39/A
39	Detroit River Paper	820197	36/B-3
40	Detroit Strip Cyclops Steel	820173	20/A
41	Detroit Diesel	820222	35/B-3
42	Dexco Corporation	820201	38/B-3
43	Dexter Chevrolet	821418	24/B-3
44	Dial Trucking	820013	23/A
45	Enterprise Oil	820200	22/B-3
46	Eumet Recycling	820184	28/B-3
47	Feister Oil Company	821427	31/B-3
48	Freedland Industries	820176	21/A
49	General Oil - Northville	820208	43/B-3
50	GTE Products - Ford Rd. Facility	820225	30/B-3
51	Heavy T's	821499	16/A
52	Henry's Service Center	820085	23/B-3
53	Inkster & Schoolcraft Contamination	820160	21/B-3
54	Inkster Rd. Oil Contamination	820021	33/B-3
55	Intervale Lyndon LC	820022	18/B-3
56	K and J Landfill	820023	22/A
57	Marathon Refinery Tank Farm	820149	23/A
58	Marathon Pipeline Crystal Mine	820076	33/B-3
59	Marathon Refinery Weathering Plant	820154	16/B-3
60	Marquette & Hanlon Road	821430	16/B-3
61	Maybury State Park	820230	16/B-2
62	MDES Dix Avenue	820163	37/A
63	Means Industries Corporation	821423	25/B-3
64	Mich Con Gas Co. - Melvindale	820028	40/B-3
65	Michigan Recovery Systems	820182	31/B-3
66	Michigan Bell Telephone Company	820126	24/B-3
67	Middlebelt Hill	820207	28/B-3
68	Mobil Oil Terminal	820226	30/B-3
69	Mobil Station - Livonia	820063	32/B-3
70	Munoz Machine Shop - Livonia	820070	27/B-3
71	Nagel Asphalt	820079	18/A
72	National Airport Site	820034	16/B-2
73	Newburgh Industrial Subdivision	820220	20/B-3
74	Norfolk & Western Railroad	820036	21/A
75	Payless Service Station	820071	26/B-3
76	Peerless District	820206	20/B-3
77	Penn Central Melville	820171	19/A
78	PIC Holding Company	820044	14/B-3

SAM Map #	Site Name	Site #	Score/Status
79	Prospect Street - Dearborn	820072	30/A
80	R E Leggette Company	820211	27/B-3
81	Republic Tool & Die Company	820046	20/B-3
82	Rouge River	820047	43/B-2
83	S and Mini Mart	820081	19/B-3
84	SERVCO	820217	26/B-3
85	Southland Corporation	821488	35/B-3
86	Total Gas Station	820078	19/B-3
87	Total Service Station 2513	820187	31/B-3
88	Trilex	820050	25/A
89	Tronex Chemical corporation	82005	21/B-3
90	Unistrut Corporation	820053	19/B-3
91	Unisys Burroughs Landfill	820172	31/B-3
92	United 6208	820193	32/B-3
93	Vacant Property - Ann Arbor Trail	820110	25/B-3
94	Van Dresser Corporation	821425	25/B-2
95	VanBorn & Lilley Rd. Site	820054	28/B-3
96	Western Wayne Correctional Facility	821486	33/B-2
97	Wick Elementary School Dump	820014	34/B-2
98	Willow Run Airport East	820125	23/B-3
99	Wolverine Gasket Company	820215	36/B-5
100	Zug Island Great Lakes Steel	820057	22/A

Table Key

Site Assessment Model (SAM) Score

These Act 307 sites are scored on a scale from 0 (lowest priority) to 48 (highest priority) based on risk factors including potential hazard to public health, safety, and welfare, or the environment. The scores listed above are the total points scored out of a possible 48 points. The Environmental Response Division of the Michigan Department of Natural Resources is responsible for investigating and scoring these sites of contamination.

Status

A - Inactive

Either the cleanup plan has not been approved by the MDNR or there have been no actions taken.

B - Cleanup Actions Taken or in Progress

2. Evaluation/Interim Response - Fund

   Cleanup plan not approved by MDNR and interim response activity has been, or is being, provided by state funds.

3. Evaluation/Interim Response - PRP/Other

   Cleanup plan approved by MDNR and interim response activity is being provided by the potentially responsible party or other funds.

4. Final Cleanup - Fund

   Cleanup plan approved by MDNR and remedial actions have been, or are being, provided by the state.

5. Final Cleanup - PRP/Other

   Cleanup plan approved by DNR and remedial actions have been, or are being, provided by the potentially responsible party or other funds.

Appendix E

Agencies and Organizations to Contact for More Information

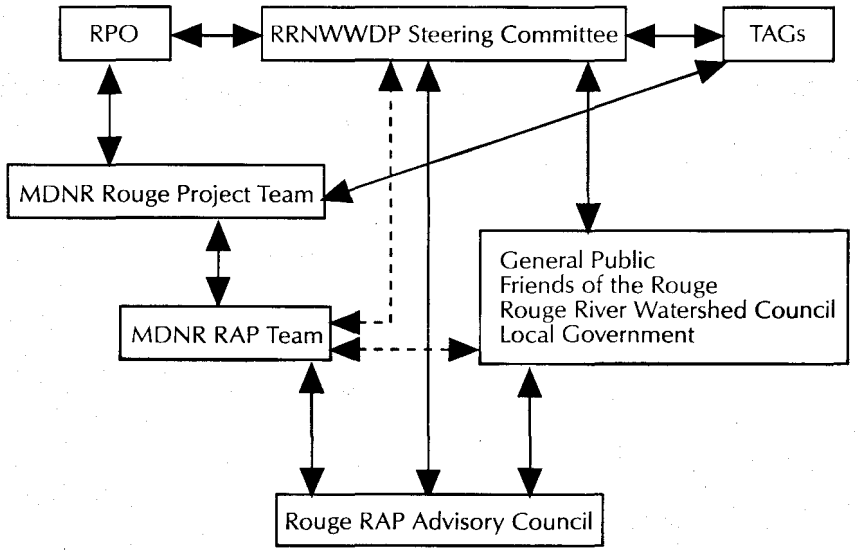
Department of Natural Resources Cathy Bean, Rouge RAP Coordinator	(313) 953-1441
Friends of the Rouge Jim Graham, Executive Director	(313) 961-4050
International Joint Commission John Hartig, Water Quality Specialist	(313) 226-2170
Rouge Program Office John Bona, Project Director	(313) 961-0700
Rouge River Archive Tom Heidke, Associate Professor	(313) 577-3854
Rouge River Watershed Council Mark Taormina, Chairperson	(313) 965-2526
SEMCOG Carla Davidson, Environmental Planner	(313) 961-4266
Wayne County Noel Mullett, Technical Coordinator	(313) 224-4657

APPENDIX F

ROUGE RIVER COMMITTEES AND ORGANIZATIONS

There are several different organizations that are involved in the update and implementation of the Rouge River RAP. Some of these groups were formed to deal specifically with RAP issues, while others are involved in more general Rouge River concerns. The brief description provided about these committees or organizations is provided to help the reader understand the role and mission of each group. Membership lists have been provided for those groups that were formed to specifically address RAP issues. For further information about this listing, contact either the Michigan Department of Natural Resources (MDNR) or SEMCOG.

Selected Rouge River Committees and Organizations



Key:

RAP: Remedial Action Plan

RPO: Rouge Program Office

TAGs: Technical Advisory Groups of the RRNWWDP

RRNWWDP: Rouge River National Wet Weather Demonstration Project

MDNR: Michigan Department of Natural Resources

Formal relationship
Either has formal interactions by membership or has direct influence on activities.

Informal relationship
Minor interaction or indirect influence on activities.

Rouge RAP Advisory Council Members

The Rouge RAP Advisory Council (RRAC) is a multistakeholder, public participation group within the Rouge River Watershed. The purpose of this council is to advise the Department of Natural Resources on issues relating to the update and implementation of the Rouge RAP. They also act as liaison with the public at large and with interest groups to ensure that there is adequate public participation in the RAP process. Meetings of this council are **open to the public** and participation is encouraged in order to get a broader perspective in remedial planning and activities. A list of members is detailed below.

Delegates	Alternates
Members	
Industrial Representatives	
Gary Trahey Rampart Industries	William Noade Rampart Industries
Mark McKinney Double Eagle Steel Coating Company	
Citizen Representatives	
Vacant position	
Joe Derek	
Joan Lintelman (Vice-chair)	
Developer	
Jeffrey Brown Lewiston-Smith Realty Corporation	
Engineering Consultant	
Dick Wolinski Applied Science & Technology	
Parks and Recreation Department	
Hurley Coleman Wayne County Parks and Recreation	Dan Navarre Wayne County Parks and Recreation
Ernest Burkeen Detroit Parks and Recreation	
Ralph Richard Oakland County Parks & Recreation	Steve Vandenbosch Oakland County Parks & Recreation
Health Departments	
Tom McNulty Wayne County Health	Dean Tuomari Wayne County Health
Doug Spencer Washtenaw County Health	

Delegates	Alternates
Keith Krinn Oakland County Health	Thomas Gordon, PhD Oakland County Health
Soil Conservation Service Steve Olds Natural Resources Conservation Service	Joe Luellen Natural Resources Conservation Service
Environmental Groups Jack Smiley Detroit Audubon Society	
Jim Graham Friends of the Rouge	Mark Mitchell Friends of the Rouge
Peter Bray East Michigan Environmental Action Council	
Students James McRae Renaissance High School	Ahmar Matthews Renaissance High School
Academic Representatives Dr. Orin Gelderloos (Chair) University of Michigan-Dearborn	Dr. Kent Murray University of Michigan-Dearborn
Dr. John Hartig Wayne State University	
Local Government Representatives William McFarlane Superior Township	Colleen O'Neal Superior Township
Tom Yack Canton Township	Tom Casari Canton Township
Coco Siewert City of Birmingham	Dennis Dembiec City of Birmingham
Ex-Officio Members	
Wayne County Flora McCormack Department of Environment and Energy	Noel Mullett Department of Environment and Energy
Oakland County William Klockow Drain Commission	
Detroit Water & Sewer Dept. Kathleen Leavey Detroit Water & Sewerage	

Delegates	Alternates
Rouge River Watershed Council	
Nancy Watkins Darga Wayne County Parks and Recreation	Chris Pargoff City of Novi
Michigan MDNR	
Cathy Bean, Rouge RAP Coordinator Surface Water Quality Division	Roy Schrameck, District Supervisor Surface Water Quality Division
USEPA	
Matt Didier USEPA - Region V	
Court Representatives	
Chuck Moon Dickinson, Wright, Moon, VanDusen & Freeman	Terry Donnelly Dickinson, Wright, Moon, VanDusen & Freeman
Jonathon Bulkley University of Michigan	

Rouge RAP Team

The Rouge RAP Team is a technical group whose function is to revise and update the existing RAP as necessary. They are also responsible to oversee public participation activities that may interface with the RAP. The RAP Team is ultimately responsible for approving and adopting the RAP update documents which will be published biannually. One member of the RRAC is a member of the RAP Team to act as liaison between the two groups. RAP Team activities are organized by the Department of Natural Resoures. The RAP Team is made up of individuals from various MDNR divisions whose activities impact the Rouge River. A detailed membership list of this Team can be found below. All members are from the MDNR Southeast Michigan District Headquarters unless otherwise listed.

Sharon Ferman
Surface Water Quality Division

Julie Parsons
Wildlife Division

Larry Bean
Waste Management Division

Cathy Bean
Rouge River RAP Coordinator
Surface Water Quality Division

Martin Hendges
Nonpoint Source Pollution
Surface Water Quality Division

Don Newsome
Point Source Pollution
Surface Water Quality Division

Roy Schrameck
District Supervisor
Surface Water Quality Division

Mary Vanderlaan
Environmental Response Divison

Sunny Krajcovic
Land and Water Management Division

Matt Didier
Environmental Protection Agency
Region V

Air Quality Division

Carla Davidson, staff to the Rouge RAP
SEMCOG Environmental Programs

Tom McNulty, RRAC Representative
Wayne County Health Department

Liz Hay
Fisheries Division
Institute for Fisheries Research

Rouge River National Wet Weather Demonstration Project Steering Committee/ RAP Implementation Steering Committee

The Rouge River National Wet Weather Demonstation Project (RRNWWDP) Steering Committee and the RAP Implementation Steering Committee are the same organization. The function of this committee is to oversee and coordinate the implementation of both the RRNWWDP and the Rouge River RAP. This committee was given double responsibility due to the need for their participation in both the RAP and the RRNWWDP, as well as to provide a stronger link between these two efforts. This committee consists of a cross section of representatives from the major entities affected by the RRNWWDP and the Rouge RAP. One member of the RRAC attends these Steering Committee meetings to act as liason between these two groups. A detailed membership list can be found on the following page.

Delegate	Alternate
Paul Zugger (Chair)	
John Bona Wayne County Rouge Program Office	
Jim Ridgway Wayne County Rouge Program Office	
Jim Murray Wayne County Department of Environment and Energy	Gwendolyn Reedus Wayne County
Paul Blakeslee, P.E. MDNR Surface Water Quality Division	Fred Cowles MDNR Surface Water Quality Division
Matt Didier EPA, Water Quality Division, Region V	Todd Cayer EPA, Water Compliance Branch
William Klockow, Deputy & Manager Oakland County Drain Commission	Phil Sanzcia Oakland County Drain Commission
Kathleen Leavey Detroit Water & Sewage Department	Beverly Ingram Detroit Water & Sewage Department
Kurt Gibson City of Dearborn	Godfrey Udoji City of Dearborn
Steve Marshall Rouge River Watershed Council	Mark Taormina Rouge River Watershed Council
Patrick Brunett SEMCOG Environmental Programs	Ted Starbuck SEMCOG Environmental Programs
Jack Bails Public Sector Consultants, Inc.	

Rouge River Watershed Council

The Rouge River Watershed Council is a water resource management agency formed by concerned government officials and citizens who work toward the preservation, enhancement, and appreciation of the Rouge River. The general function of the Council is to assist in the improvement of Rouge River water quality by providing information and educational materials to municipalities and citizens within the Watershed. The Council also provides a forum for the exchange of information among other organizations concerned about the Rouge River. One of the Councils goals is to support the Rouge River Remedial Action Plan. Membership is limited to representatives from local communities located within the watershed, but businesses and citizens can acquire associate memberships and can attend Council meetings.

Friends of the Rouge

The Friends of the Rouge is a nonprofit citizen-based organization whose mission is to promote restoration and stewardship of the Rouge River through education and citizen involvement. This advocacy group encourages community participation in the restoration of the Rouge River by sponsoring a variety of activities such as the the annual basinwide cleanup of the Rouge River known as the "Rouge Rescue". The Friends of the Rouge also sponsor a storm sewer stenciling program to eliminate the improper disposal of hazardous wastes down storm sewer and an interactive student education program which includes water quality monitoring of the river. Membership in the Friends of the Rouge is open to everyone and existing membership includes local governments, citizens, conservation groups, civic groups, and businesses.

Rouge Project Team

The Department of Natural Resources' (MDNR) Rouge Project Team's mission is to protect and enhance the water quality of the Rouge River watershed by developing useful techniques in watershed management. They accomplish this by assuring that there is adequate coordination between the RAP and the Rouge River National Wet Weather Demonstration Project (RRNWWDP), and by ensuring that the MDNR maintains an active role in the implementation this project. This team is also responsible for assuring adequate and appropriate inter and intra-agency communication with regards to the Rouge River. Membership of this Team includes several experts from the MDNR Surface Water Quality Division as well as the Fisheries Division.

Rouge Program Office (RPO) and Technical Advisory Groups (TAGs)

Both the Rouge Program Office and the Technical Advisory Groups were formed under the Rouge River National Wet Weather Demonstration Project (RRNWWDP). The Rouge Program Office is made up of a variety of consultants that were retained to assist Wayne County in the implementation of their RRNWWDP. Several experts in various fields are housed in this office to perform the work necessary to execute this important demonstration project. This office has an information "Hotline" (313-961-0730) for the public to obtain information about the RRNWWDP.

To ensure participation from the various stakeholders within the watershed in the implementation of the RRNWWDP, Wayne County has formed Technical Advisory Groups or TAGs. Specific TAGs exists to address each program area and include Combined Sewer Overflows, Financial and Institutional Arrangements, Public Involvement, Nonpoint Source Pollution, Geographic Information System, and Sampling and Modeling. Membership of the TAGs is diverse and includes experts from various agencies, organizations, and governments. These meetings are open, and can be attended by the public.

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