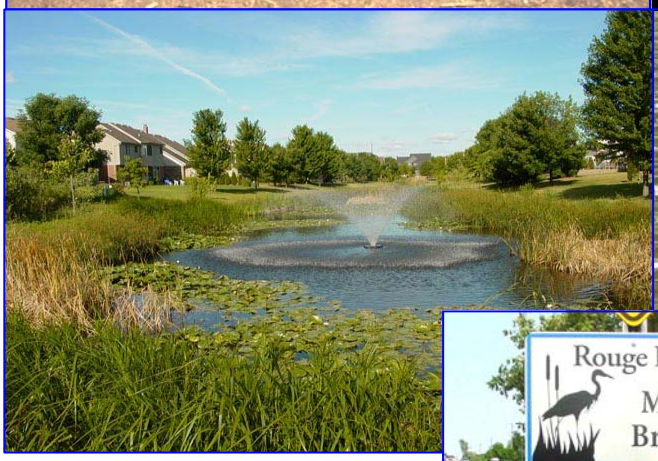
Rouge River Restoration Summary

Wayne County Rouge River National Wet Weather Demonstration Project
1992 - 2014



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Alliance of Rouge Communities
OURS TO PROTECT
Working together, restoring the river

For more information about the Rouge Project, please visit www.rougeriver.com or www.allianceofrougecommunities.com

Rouge River National Wet Weather Demonstration Project

MISSION STATEMENT

The mission of the Rouge River National Wet Weather Demonstration Project is to demonstrate effective solutions to water quality problems facing an urban watershed highly impacted by wet weather and develop potential solutions and implement projects which will lead to the restoration of water quality in the Rouge River. The project addresses both conventional and toxic pollutants to:

- provide a safe and healthy recreational river resource for present and future generations;
- re-establish a healthy and diverse ecosystem within the Rouge River Watershed;
- protect downstream water resources such as the Detroit River and Lake Erie; and
- help ensure compliance with federal, state and local environmental laws which protect human health and the environment.

This will be accomplished through the development, implementation and financial integration of technical, social and institutional frameworks leading to cost-efficient and innovative watershed-based solutions to wet weather problems. This watershed-based national demonstration project will provide other municipalities across the nation facing similar problems with guidance and potentially effective solutions.

Alliance Members:
Auburn Hills
Beverly Hills
Bingham Farms
Birmingham
Bloomfield Hills
Bloomfield Township
Canton Township
Commerce Township
Dearborn
Dearborn Heights
Farmington
Farmington Hills
Franklin
Garden City
Lathrup Village
Livonia
Melvindale
Northville
Northville Township
Novi
Oak Park
Oakland County
Water Resources
Commissioner
Orchard Lake Village
Plymouth
Plymouth Township
Pontiac
Redford Township
Rochester Hills
Romulus
Southfield
Troy
Van Buren Township
Walled Lake
Washtenaw County
Wayne
Wayne County
Wayne County
Airport Authority
Westland
Wixom

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Assoiciate Members:
Henry Ford
Community College
University of Michigan
Dearborn

Cooperating Partners:
Cranbrook Institute
of Science
Friends of the Rouge
Southeastern Oakland
County Water Authority

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WAYNE COUNTY ROUGE RIVER NATIONAL WET WEATHER DEMONSTRATION PROJECT

The Rouge River National Wet Weather Demonstration Project (Rouge Project) is a working example of how a systematic watershed approach to pollution management can result in cost-effective and ultimately greater and faster achievement of designated uses in a water body. The Rouge Project was initiated in 1992 by Wayne County, Michigan. This cooperative effort between federal, state and local agencies was supported through June 2014 by over $350,000,000 in multi-year federal grants from the United States Environmental Protection Agency with additional funding from local communities and other stakeholders.

Congressman John Dingell and EPA Director Carol Browner during early days of Rouge Project

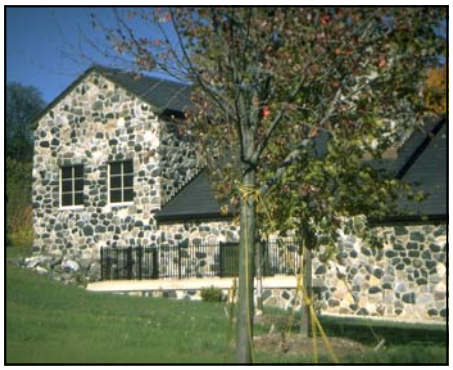
Pollution Control and River Restoration Activities

Dearborn Heights Combined Sewer Overflow Retention Treatment Basin

The early focus of the Rouge Project was on the control of combined sewer overflows (CSOs) to the river. The work quickly expanded to address other pollution sources such as sanitary sewer overflows (SSOs), storm water runoff, and discharges from illicit connections and failed onsite septic systems, necessary to achieve water quality goals. Streambank stabilization, riparian corridor management, low impact development and other green infrastructure and habitat restoration projects were also accomplished. Highlights of pollution control and river restoration activities are summarized below.

Construction of Detroit's Hubbell-Southfield Combined Sewer Overflow Retention Treatment Basin

- 75 communities, nonprofit groups, other entities received 383 subgrants totaling $446,688,000 ($255,580,000 Rouge grant funding) to implement projects benefiting the Rouge River
  - 88 CSO/SSO control projects totaling $379,263,600
  - 47 storm water control projects totaling $12,178,200
  - 48 riparian corridor management projects (including streambank stabilization, lake restoration, and dam removal) totaling $25,904,500
  - 71 public education and involvement projects totaling $11,621,400
  - 23 projects to enhance recreation along the river totaling $7,483,100
  - 106 watershed management/analysis projects (including geographic information system development, illicit discharge elimination projects and water quality monitoring) totaling $10,238,200



Birmingham Combined Sewer Overflow Retention Treatment Basin

Leavenworth Regional Storm Water Basin Improvement, Novi

Sewer Lining for SSO Control

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- Over 2,008 illicit discharges of wastewater to the Rouge River have been identified and have been/are being corrected
  - Over 1.6 million pounds of polluting materials and 466 million gallons of polluted water are estimated to have been removed from the Rouge River as of 2013 through illicit discharge elimination efforts in the watershed

Illicit Connection: Broken sanitary sewer line within a storm sewer manhole

- To reduce discharges from failing onsite sewage disposal systems (OSDS), two counties adopted ordinances requiring OSDS inspections at time of property sale
  - 898 failed OSDS systems have been found and corrected in the Rouge River areas of Wayne, Washtenaw and Oakland Counties
  - In Wayne County alone, correction of 255 failing OSDS will prevent an estimated 1.1 million pounds of polluting material and 87 million gallons of polluted water from reaching the Rouge River

Once water quality began to improve, watershed stakeholders undertook additional activities necessary to fully restore beneficial uses in the Rouge River. Projects to reduce instream flow variability and streambank erosion, improve recreational access, and other efforts were implemented.

Residential Rain Garden, Farmington Hills

- Green Infrastructure
  - Over 60 acres of native plant grow zones were installed through out the watershed
  - Over 15,000 native herbaceous plants and 3,500 trees/shrubs were planted
  - Over 8,600 tree seedlings were distributed
  - Over 10,000 cubic yards of invasive plants removed

Grow Zone along Lower Rouge River

- Over 17,000 ft of streambank stabilization, including restoration of the 2,200 ft river oxbow restoration at Greenfield Village to provide natural riverine habitat along the channelized portion of the main Rouge River

Rouge Oxbow Restoration at Greenfield Village, Main Rouge River

Stream Restoration, Randolph Street Intercounty Drain, Middle Rouge River

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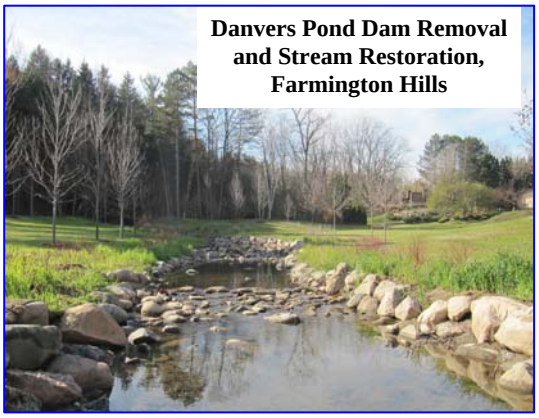
- Two dams were removed from the Rouge River: Danvers Pond Dam along Pebble Creek, a tributary to the Main Rouge River, and the Wayne Road Dam along the Lower Rouge River. Over 123 miles of river and tributary streams have been reconnected to the Great Lakes system for fish passage for the first time in over a century.



Danvers Pond Dam Removal and Stream Restoration, Farmington Hills

Carpenter Lake Restoration, City of Southfield

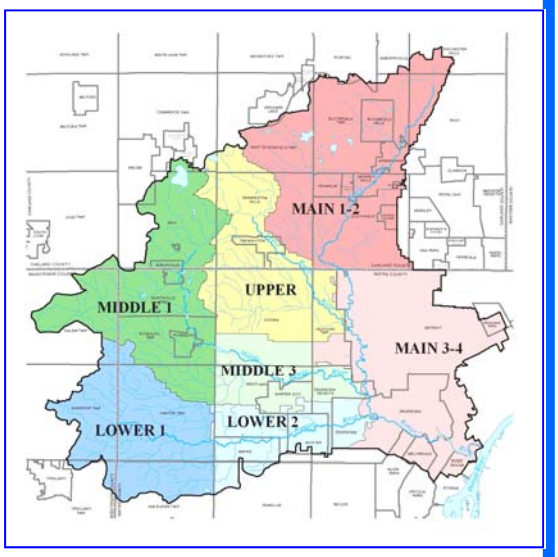
Contaminated Sediment Removal, Newburgh Lake, Middle Rouge River

- Over $14.3 million in projects were implemented at Newburgh Lake, Carpenter Lake, and Quarton Lake to improve water quality, aquatic habitat, aesthetics and recreational uses. For the Newburgh Lake restoration:
  - 28,000 lbs of PCB contaminated fish removed from Newburgh and Nankin Lakes
  - 558,000 tons of sediment removed; 350,000 tons contained PCBs
  - Seven acres of fish spawning habitat were constructed, along with ten acres of beneficial aquatic vegetation planted in constructed shoals
  - Over 30,000 fish of various species were restocked

Watershed Management Tools

Tools were developed to help analyze and prioritize the Rouge River restoration efforts.

Rouge River Watershed



- A comprehensive data management and a geographic information system was developed for the Rouge River watershed which includes over 100 different data layers. For example, 7,380 outfalls to the Rouge River were identified and mapped.

- The comprehensive sampling and monitoring program for the watershed included:
  - 10,023,000 continuous rainfall measurements at 49 locations
  - 5,801,000 continuous flow measurements at 94 locations
  - 2,126,000 measurements each of continuous dissolved oxygen and continuous water temperature at 127 locations
  - Over 475,000 continuous readings each of conductivity and pH at 24 locations
  - 125,700 water quality samples at 625 locations, including 8,500 *E. coli* samples collected at 336 locations and 7,600 chemical analyses conducted on 266 sediment samples
  - 1,400 macroinvertebrate samples collected at 220 locations

Public Education, Involvement, and Stewardship

An aggressive program was implemented to first educate watershed residents, businesses, governments about the importance of our water resources, and then to engage their active participation in river restoration and protection efforts. Numerous and varied activities were conducted in partnership with others, including:

- Rouge Rescue, Friends of the Rouge
  - More than 54,000 volunteers at 817 worksites
  - Items removed from Rouge River corridor and disposed of properly: 46,800 cubic yards of trash; 64 vehicles, 21 boats, 1,738 tires, 509 shopping carts and 241 appliances / items of furniture, and nearly 10,000 cubic yards of invasive plants
- Other Friends of the Rouge volunteer efforts:
  - Installed over 12,000 herbaceous plants and nearly 500 trees and shrubs for river corridor restoration
  - 1,015 volunteers at Winter Stonefly Searches, and 1,162 for Spring and 1,114 for Fall Bug Hunts
  - Over 2,400 Frog & Toad volunteer surveyors
- Over 3,800 rain barrels sold by Alliance of Rouge Communities staff and volunteers
- Over 2,100 workshops, demonstration or public awareness events were attended by over 125,000 people
- Over 1.4 million informational pieces were distributed, ranging from *Rouge River Activity Books* for children to *Our Actions Affect the River* handout for adults
- Over 410,000 advertisements were placed, including newspaper ads, restaurant placemats, sports arena dasher board ads, billboards, 30-second cable TV ads, and 30-second radio ads
- Rouge River/environmental educational displays were deployed at over 600 community events throughout the watershed
- The "Ours to Protect" river/watershed awareness signage was developed under the Rouge Project, and the artwork/logo has now been adopted by watersheds across Michigan. Over 1,000 stream road crossing signs and over 1,000 "grow zone" signs have been installed across southeast Michigan
- Under the Michigan Green Schools program, 695 schools have been recognized as Green Schools in Wayne County alone. Over 360 trees and over 4,380 tree seedlings were planted by Wayne County Green Schools in the Rouge River watershed.

Students assisting with Spring 2013 Bug Hunt

Tabletop Educational Display

Amerman Elementary School, Green School Rain Garden Installation Project

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Rouge River Water Festival at University of Michigan–Dearborn

Since the first one was held in 1998 at University of Michigan - Dearborn, over 57,000 students have participated in annual Rouge River Water Festivals held to educate fifth grade students about the importance of clean water.

Rouge River Water Festival at Cranbrook Institute of Science

Technology Transfer

A key Rouge Project objective was to transfer information and "lessons learned" from using a watershed approach to wet weather pollution control in an urban area to other river restoration efforts.

- Over 25.9 million hits recorded at Rouge Project website www.rougeriver.com
- Tours of Rouge Project facilities were given to hundreds of visitors from around the world
- Hundreds of presentations on various Rouge Project initiatives were made at regional, national and international conferences, and dozens of technical papers were included in various publications
- Over 2,200 people from across the country participated one or more of the 44 training sessions on Illicit Discharge Elimination offered by Wayne County

Rouge River Improvements

Water quality and ecosystem health in the Rouge River system has steadily improved during the 22 year Rouge Project effort, as summarized below.

- Johnson Creek was recognized/designated a cold water stream by the State of Michigan and the Michigan Department of Natural Resources began stocking brown trout.
- Trout are being caught in both the Middle Rouge River and the Lower Rouge River, and salmon have been spotted as far upstream as Canton Township along the Lower Rouge River.

Rainbow Trout, Lower Rouge in Canton

- For the first time in decades, fish consumption advisories have been lifted for part of the Rouge River. In Newburgh Lake advisories for general population relaxed to unlimited consumption for carp, channel catfish, largemouth bass.
- Aquatic insects whose presence indicates good water quality were identified in the Rouge River during the Rouge Project, including Slender winter stonefly (family Capniidae), Perlodid stonefly (family Perlodidae), Freeliving caddisflies (family Rhyacophilidae), Dobsonfly (family Corydalidae), and many more.
- A species of water quality sensitive Freeliving caddisfly, *Rhyacophila lobifera,* first discovered in the Rouge in 2008, appear to be expanding their range in the watershed. These caddisflies have been genetically identified and are the first of its genus ever reported in Michigan.
- Dissolved Oxygen (DO) levels met the State standard of >5mg/L for a warm water fishery 98% of the time in 2013 at the lower end of the Lower Rouge and Main Branch as compared to 43% in 1994.
- 79% of the dry weather samples for *E. coli* collected along the Middle 3 SWMA area were less than 300 CFU/100 mLs of water for the years 2007-2009 as compared to 51% for the years 1994-97.

Spiny Soft-shell Turtle and Damsel Fly in the Middle Rouge River

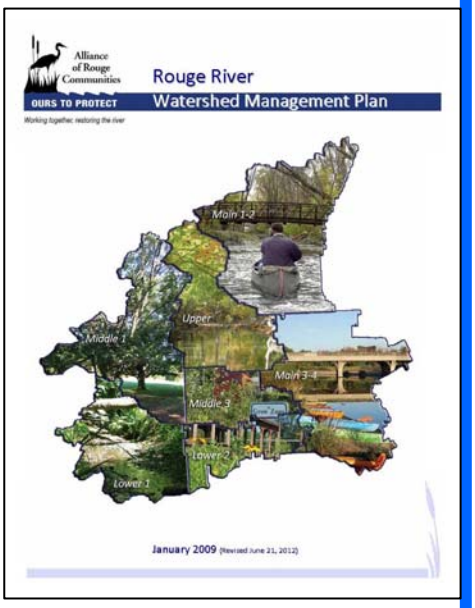
- Use of the Rouge River as a recreational amenity continues to increase
  - Friends of the Rouge are hosting annual Rouge River canoe trips, boat tours and monthly "Explore the Rouge" events across the watershed
  - Canoes and kayaks are available to rent from the Newburgh Pointe Comfort Station for use on Newburgh Lake and for use along the Lower Branch of the Rouge River
  - The City of Wayne and Friends of the Rouge host an annual celebration of the river, *Rouge-A-Palooza*, which features a canoe race, a canoe trip, paper boat races, live entertainment, food and beverages along the banks of the Lower Rouge River

Friends of the Rouge
Lower Rouge Canoe Trip

Cooperative, Locally Based Watershed Management Approach

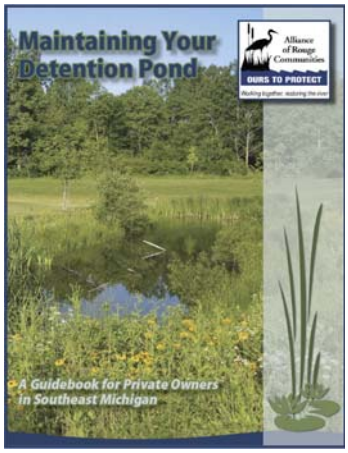
ARC Meeting

The holistic, watershed-based strategy to restore the Rouge River has been implemented through a unique partnership of local agencies and communities, state agencies, non-profit organizations, businesses and citizens. A key indicator of the success of the Rouge Project is given by the fact that communities, counties, and other partners in the Rouge River watershed formed a new voluntary, watershed-wide institutional arrangement to continue the Rouge watershed restoration efforts into the future.



On August 5, 2003, after nearly two years of discussion, 38 Rouge watershed communities and 3 counties formed the *Rouge River Watershed Local Management Assembly (Assembly).* The Assembly successfully operated for 2.5 years, with annual budgets of $600,000 per year used to fund watershed-wide monitoring, sampling data analyses and reports, and public education and involvement activities, as required under the Michigan watershed-based storm water permit.

In 2004, Michigan signed into law the *Watershed Alliance Act* authorizing local governments to form watershed alliances. The Alliance of Rouge Communities (ARC) officially formed in January of 2006 under the Act.



Today, the ARC successfully fosters watershed-wide cooperation to meet water quality permit requirements and to restore beneficial uses of the river. ARC activities include watershed-wide efforts such as public education / involvement and river monitoring and assessment, and have expanded to include planning, design and construction of projects to benefit the Rouge River such as the Wayne Road dam removal and stream restoration. Day-to-day activities are completed through committees including the Technical Committee, Public Involvement and Education Committee, Organization Committee, Finance Committee and Executive Committee, with support from cooperating partners. Most importantly, the ARC continues to demonstrate that while water quality challenges do not stop for political boundaries, pooling resources saves money and yields better results. For more information about the ARC, please visit their website at www.allianceofrougecommunities.com.

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Salmon Caught in Lower Rouge River, City of Wayne, 2008 *Photo credit: Kurt Kuban*

Lower Rouge at Wayne Road after Dam Removal and Stream Restoration

Rouge River Restoration Continues into the Future

The Rouge River National Wet Weather Demonstration Project has been an unqualified success, using any measure of achievement. Major progress has been made in the control of pollution being discharged to the Rouge River. For example, CSO pollutant loads to the river have been reduced by 90 to 100 percent during most events. In previous years, certain water quality standards were violated most of the time at many places in the watershed. Today, the majority of the waters in the Rouge River watershed meet many standards.

Coupled with the water quality improvements, the ecosystem health also continues to improve, and there are increased sightings of fish and wildlife along the river. Improvements in the water quality coupled with removal of contaminated sediment in Newburgh Lake resulted in the lifting of the fish consumption advisory for some species of fish in the lake. This is the first time fish caught in the Rouge River system have been safe for consumption in decades. The article "Salmon, Trout Prove Rouge No Longer on Brink of Death" by Kurt Kuban appeared in the November 16, 2008 edition of the *Canton Observer* newspaper and included the following excerpt:

> "*As we examined the dead salmon, he noticed that it didn't have a clipped fin, meaning it was a naturally reproduced fish and not the product of a DNR fish hatchery. He's convinced these fish have been successfully reproducing in the Rouge. You read that right - the Rouge River. It kind of contradicts the old image of the Rouge, doesn't it?*"

Perhaps the best indicator of Rouge Project success is that people are returning to the river, and it is once again an amenity for those who live, work, and play in the watershed. The residents, businesses and other stakeholders in the watershed have stepped up to become active participants to restore and protect the Rouge River for future generations. Flow and pollution controls continue to be implemented by watershed communities. Watershed communities, businesses and residents are involved in ways large and small, and have formed innovative partnerships, such as the Alliance of Rouge Communities, to leverage ideas and resources to achieve common environmental goals into the future. For more information about the Rouge Project, please visit www.rougeriver.com.

Fishing in the Middle Rouge, Northville Township
Photo credit: FOTR

Kayaks along the Main Rouge River, Dearborn
Photo credit: FOTR

COMMUNITY/AGENCY ROUGE RIVER RESTORATION ACTIVITIES SUPPORTED BY ROUGE PROJECT GRANT FUNDING

City of Allen Park
Implementing the Storm Water General Permit (GP)
Sewer Evaluations (IIB-11)
Allen Park SSO Outfall Closure and Wet Weather Pump Station (RVIA-11)

Alliance of Rouge Communities
Watershed-wide Activities, 2006 - 2014
Rouge Green Corridor Urban Habitat Implementation Plan (RXB-16)
Wayne Road Dam Removal Project: Design Phase (RXB-20)

City of Auburn Hills
Implementing the Storm Water General Permit (GP)
Bloomfield Orchards Subdivision Flow Metering Analysis (RVIA-16)

Village of Beverly Hills
Pilot Swale with Underdrain Project (III-09)
Strafford Street Swale with Underdrain Project (RV-06)
Implementing the Storm Water General Permit (GP)
Sanitary Sewer Improvement to Reduce SSOs to Evergreen Farmington System (RVIA-05)

Village of Bingham Farms
Implementing the Storm Water General Permit (GP)

City of Birmingham
Building GIS Capacity to Protect the Main 1 (GIS-39)
Implementing the Storm Water General Permit (GP)
Quarton Lake and Springdale Park Restoration (SW-17)
Quarton Lake Restoration Project (IIB-25)
Rouge River Streambank Stabilization at Booth Park (RIXB-02)
Main Rouge River Restoration and Hill Slope Stabilization (RXB-08)

Bloomfield Hills Schools
E. L. Johnson Nature Visitor Center Improvements (RIII-07)

Bloomfield Township
Public Education Initiative (RV-05)
Meadow Lake Bioretention /Bioswale Project (RVIB-08)
Bloomfield Wetland Inventory (RVIIB-18)
Investigate & Rehabilitate Sewers in Hickory Heights Separated Sanitary Sewer District (RXA-03)
Wing Lake Sanitary Sewer Rehabilitation Project (RXIA-02)

Bloomfield Hills
Whitehall & Bloomfield Sites Subdivisions Sanitary Sewer Investigation and Rehabilitation (RXIA-01)

Canton Township
Utility Coverages (GIS-02)
Implementing the Storm Water General Permit (GP)
Fellows Creek Regional Detention Basin & Public Education Program (SP02, Pilot)
Lower 1 Wetland Resource Protection Plan (WET-01)
Canton Community Detention Basin Enhancements (IIA-05)
Recreational Trails in the Lower Rouge River Watershed (IIB-05)
Fellows Creek Naturalization and Flow Reduction (RIII-23)
Canton Community Detention Basin Enhancements − Phase II (RVIB-11)
Lower Rouge River Recreational Trail Head and Associated Trails Project (RVIIB-02)
Canton Storm Water Detention Basins Enhancements (RVIIIB-19)
Workman Elementary Schoolyard Habitat (RVIIIB-20)
Lower Rouge Recreational Trail and Bridges (RIXB-03)
Pheasant Run Golf Club Detention Basins Enhancements (RIXB-04)
Lower Rouge River Log Jam Inventory and Maintenance Project (RXB-04)
Michigan Avenue Bio-Swale and Native Planting Project (RXB-03)

Commerce Township
Implementing the Storm Water General Permit (GP)

Cranbrook Educational Community
Sustainable Water Resources Management and Public Education Plan (SW)
2004 Rouge River Water Festival at Cranbrook (RV-10)
Rouge River Water Festival at Cranbrook 2005 (RVIB-17)
2006 Rouge River Water Festival at Cranbrook Institute of Science (RVIIB-12A)
Rouge River Water Festival at Cranbrook 2007 (RVIIB-12B)
Rouge River Water Festival at Cranbrook 2008 (RVIIIB-16)
2009 Rouge River Water Festival at Cranbrook Institute of Science (RIXB-09)
2010 Rouge River Water Festival at Cranbrook (RXB-02)

City of Dearborn
Phase II CSO Study (CSO)
Storm Sewer Data Development (GIS-13)
Implementing the Storm Water General Permit (GP)
Ford Bridge Retrofit, Implementation of Illicit Discharges and Public Education Plans (SW-02, Pilot)
Downspout Disconnection Program-Main ¾ (IIA-20)
Instream Dissolved Oxygen Augmentation (IIB-22)
Phase II: Evergreen Road to Greenfield Village (RV-23)
Dearborn CSO Control Project Phase A (IV-14)
CSO Outfall 13 Storage and Treatment Facility (West Dearborn/Phase A) (RVIA-19)
CSO Outfall 17 Storage and Treatment Facility (East Dearborn) (RVIA-20)
Dearborn Dept of Public Works Yard Storm Water Management (RVIIB-14)
Sewer Separation of Outfall 012 (RVIIIA- 02)
CSO 009 Sewer Separation Project, Morley Avenue from Military Street to Monroe Street (RIXA-03)
West Village Restoration Project-Sewer Separation on West Village Drive from Mason (RXA-01)
Sewer Separation Analysis for CSO Reduction at Outfalls 13 and 14 (RXA-07)
Sewer Separation Project (CSO-03), North of Michigan Avenue & West of Telegraph (RXIA-04)

City of Dearborn Heights
CSO Retention Treatment Basin and Sewer (CSO)
Septic System and Storm Sewer Data Development (GIS-37)
Phase II CSO Study (CSO)
Implementing the Storm Water General Permit (GP)
Catch Basin Cleaning and Street Sweeping (M3-01, Pilot)
River Oaks (Old Orchard) Storm Water Detention Basin Retrofit/Restoration (SN2-08, Pilot)
Public Education, Pilot Commercial IDEP and IDEP Training (IIB-15)
Dearborn Heights Phase II CSO Design and Construction (IV-11)

City of Detroit
CSO Regulation and Remote Structure Rehabilitation (CSO)
Frisbee Sewer (CSO)
Hubbell-Southfield CSO Retention Treatment Basin (CSO)
In-System Storage Dams (CSO)
Puritan-Fenkell CSO Retention Treatment Basin (CSO)
CSO Regulator and Remote Structure Rehabilitation (CSO)
Seven Mile CSO Retention Treatment Basin (CSO)
Phase II CSO Source Control (CSO)
Phase II CSO Study (CSO)
Parkland Improvements (SP-88, Pilot)

City of Farmington
Fundamental GIS (GIS-43)
Implementing the Storm Water General Permit (GP)
Footing Drain Disconnect Program in Chatham Hills Subdivision (RVIA-13)

City of Farmington Hills
Implementing the Storm Water General Permit (GP)
Pebble Creek Erosion and Sedimentation Control Study (SP-10, Pilot)
Storm Water System Evaluation and Maintenance (U2-08F, Pilot)
Pebble Creek Subwatershed Storm water Drainage Master Plan (SW-11)
Swale Evaluation (SW BMP)
East Lincolnshire Subdivision SSO Elimination −Phase 1 (IIA-08)
Assessment of Alternative Funding Mechanisms for Maintenance of Privately Owned Storm Water Detention Facilities (RV-20)
Costick Activities Center Storm Water Retrofit Project (RV-13)
Relief of East Lincolnshire SSO (RVIA-03)
Danvers Pond Removal and Stream Restoration Design (RVIIIB-15)
Longwood Basin Retrofit Project (RXIB-04)

Village of Franklin
Implementing the Storm Water General Permit (GP)
Jones Building Rain Garden Construction (RXIB-01)

Franklin Watershed Drainage District
Franklin Branch Watershed Study (IIB-14)

Friends of the Rouge
Continuation of Public Education (IIA-23)
Habitat Evaluation (M1-12, Pilot)
River Watch Program (SP-11, Pilot)
Rouge Education Project (SW-03)
Wildlife Habitat Survey 1998-99 and RiverWatch 1999-00 (RH-14, Pilot)
2002-03 Public Education and Private Involvement (RIII-19)
Schoolyard Habitat Project (RIII-24)
Public Involvement Wetland Stewards (Watchfrogs) Program (RVIB-02)
Rouge Public Education and Involvement Project 2005-06 (RVIB-04)
Rouge Public Education and Involvement Project 2003-05 (RV-27)
Rouge Public Education and Involvement Projects 2006-07 (RVIIB-04)
Rouge Education and Involvement Projects (RVIIIB-02)
Public Education and Involvement Projects (RIXB-07)
Public Education and Involvement 2010-2012 (RXB-12)
Public Education and Involvement 2012-2014 (RXIB-10)

Garden City
Perrin and Middlebelt Sewers (CSO)
Implementing the Storm Water General Permit (GP)
Storm Water Ordinance, Implementation of Illicit Discharge and Public Education Plans and Catch Basin Stenciling (SW-05)
Water Quality Based Determination of SSO Design (IIA-02)
Public Participation, Illicit Discharge and PE Continuation Programs (IIB-20 and -21)
Reduction of Excess Peak Flows Through Evaluation and Modification of In-line Storage (IV-08)

Garden City Public Schools
Wetlands Education (RH-02, Pilot)

Henry Ford Museum and Greenfield Village
Preliminary Design for the Oxbow Restoration Project (SW-16)

Henry Ford Community College
Kingfisher Fisher Bluff Parking Lot and Storm Water (RIII-11)
Green Roof and Rain Garden, Science Building Addition (RXB-19)

City of Inkster
Retention Treatment Basin and Sewer (CSO)
Phase II CSO Study (CSO)
Inkster Storm Sewer Data Development Project (GIS-05)
Implementing the Storm Water General Permit (GP)
Storm Water Ordinance, Implementation of Illicit Discharge and Public Education Plan and Catch Basin Stenciling (SW-06)
Illicit Connection and Public Education Activities (IIB-01, IIB-02)
2004 Illicit Discharge Elimination and Public Education Activities (RIII-12)
Outfalls, 11, 20, 25 Cross Connection Correction and Ongoing Public Education Program (RVIB-13)
Illicit Connection Elimination and Catch Basin Replacement, Mosquito Control Policies and Public Education (RV-04)
Modify Regulators Setting and Identification and Correction of Inflow Sources (RVIA-10)
CSO Outfall L49 Sewer Separation and Relief Sewer to Andover Pump Station (RVIIA-02)

Jacobs Drainage District
Pebble Creek Tributary Regional Detention and Enhancement Project (RV-15)

Jamian Drainage District
Pebble Creek Sediment Removal & Stream Improvement Project (RV-14)

Lathrup Village
Implementing the Storm Water General Permit (GP)
Section 624 Sewer Televising and Assessment (RXIA-08)

Lawrence Technological University
Rain Garden Educational and Demonstration Project (RVIIB-03)

City of Livonia
Sewer Separation (CSO)
GIS Public Storm Sewer Layer Enhancement (GIS-11)
GIS Support for Illicit Discharge Elimination Plan (GIS-42)
Implementing the Storm Water General Permit (GP)
Continuation of IDEP, Public Education Plan and Watershed Planning Activities (IIB-23)
Storm Water System Evaluation and Maintenance (U2-08L, Pilot)
Street Waste Transfer Facility (M3-10, Pilot)
Regional Storm Water Management Facility (U2-09, Pilot)
Construction of Idyl Wyld Regional Storm Water Treatment Facility (IIA-26)
Removal of Storm Water from Sanitary Sewer along Ann Arbor Trail (RV1A-12)
Cities of Livonia, Westland: Online Quality Devices Evaluation (SW BMP)
Demonstration Rain Garden Project (RVIB-15)
Bell Branch Streambank Stabilization (RXB-14)
Whispering Willows Storm Water Detention Basin (RXB-15)
Livonia Pilot Footing Drain Disconnection Program – City District 16 (RXIA-05)

Lyon Township
Implementing the Storm Water General Permit (GP)

City of Melvindale
Implementing the Storm Water General Permit (GP)
GIS Development (GIS-35)
Illicit Discharge Investigation and Elimination and Sanitary Sewer Evaluation Study (IIB-08)
Footing Drain Disconnect Pilot Program (RVIA-01)
Sanitary Pump Station with SSO Tank (RVIA-02)

City of Northville
Implementing the Storm Water General Permit (GP)
Ford Park Development Passive Recreation (M1-14, Pilot)
Mill Pond Restoration Design (M1-01, Pilot)

Northville Township
Storm Water Education and Erosion Control Projects (RV-17)
Implementing the Storm Water General Permit (GP)
Extended Detention Pond Evaluation (SW BMP)
Continue IDEP, Public Education, Subwatershed Planning and Johnson Creek Protection Group Support (IIB-28)
Quail Ridge Drain Improvements (IIA-09)
Continue IDEP 2003 & Storm Water Ordinance Modification Project (III-02)
Detention Pond Retrofit and Monitoring Project (RVIB-24)
Water Quality Monitoring and SWPPI Activities (RVIIIB-08)
Northville Bennett Arboretum Pathway Project (RXB-01)

City of Novi
Implementing the Storm Water General Permit (GP)
Septic System and Illicit Discharge Data Development (GIS-36)
GIS/Public Awareness (M1-10)
Soil Erosion Control Blanket Program (M1-09)
Wet Detention Pond Evaluation (SW BMP)
Streambank Stabilization (M1-11 SW BMP)
First Flush Sedimentation Pond Evaluation (SW BMP)
Dunbarton Regional Storm Water Detention Basin (SW-18.3)
Haggerty Regional Storm Water Detention Basin (SW-18.2)
Dunbarton Storm Water Detention Basin Improvements (RV-18)
Regional Storm Water Detention Basins Retrofit for Water Quality Improvements (RVIIIB-05)
Regional Basin Retrofits for Water Quality Improvements (RXB-13)

Oakland County Drain/Water Resources Commissioner
14 Mile Road Sewer and Relief (CSO)
Acacia Park CSO Retention Treatment Basin (CSO)
Birmingham CSO Retention Treatment Basin (CSO)
Bloomfield Hills Sewer Separation (CSO)
Bloomfield Village CSO Retention Treatment Basin and Sewer Separation (CSO)
Farmington Hills Storm Sewers and Septic System Data Development (GIS-01)

Construction of Septage Unloading Facility (OSS-01, OSDS)
Rouge Oakland Communities Public Education Efforts (RVIIB-05)
Rouge Oakland IDEP Activities (RVIIIB 06)
Implementing the Storm Water General Permit (GP)
Illicit Connection Detection Program and Down Spout Disconnection Program (SW-19)
Caddell Drain Detention Pond Retrofit (U2-04)
Rummell Drain Improvements (RIII-18)
Edwards Relief Drain-Streambank Stabilization (IIA-11)
Storm Water Detention Pond Inventory/Assessment (IIA-13)
Oakland County Rouge Water Festival and Rouge Watershed Display (III-04)
Rouge Oakland County Public Education Activities 02-04 (III-17)
Main 1-2 Stream Bank Inventory Project (IIA-12)
Farmington to Evergreen SSO Interceptor with CSO Regulator Adjustments (IV-04)
Edwards Relief Drain Streambank Stabilization Construction Project (RVIB-19)
Rouge Oakland County Public Education Activities No. 2 (RV-26)
Farmington to Evergreen SSO Interceptor and Walnut Pump Station #1 with CSO Regulator Adjustments-Part II (RVIA-18)
Jacobs Drain-Pebble Creek Tributary Regional Detention and Enhancement Project-Part II (RVIIB-10)
Rouge Oakland Public Service Announcements (RIXB-15)
Rouge Oakland Public Service Announcements – 2011 (RXB-07)
Upper Rouge River Stream Bank Erosion Inventory Project (RVIB-22)
Total Residual Chlorine Reduction for Acacia Park, Bloomfield Village and Birmingham Retention Treatment Basins (RIXA-06)
Illicit Discharge Elimination in the Upper Rouge River Watershed (RIXB-14)
Streambank Eroision Control Demonstration Project – Caddell Drain (RXIB-07)

Oakland County Planning and Economic Development Services
Rouge Green Corridor Identity Demonstration Project (RVIB-06)

Oakland PLUS
Otter Reintroduction and Watershed Education Project (RV-08)
Schools Program and Rouge River Calendar Contest (RV-09)

City of Plymouth
Implementing the Storm Water General Permit (GP)

Plymouth Township
Sewer Separation (CSO)
GIS Development (GIS-07)
Implementing the Storm Water General Permit (GP)
Interpretation and Educational System along Tonquish Creek (RH-03, Pilot)
Tonquish Creek and Stream Bank Improvement (SN2-04, Pilot)
Storm Water Detention Basin Conversion to Improve Treatment (WET-03)
Storm Water Basin Conversion, Stream Bank Protection and Flow Control (III-13)
Presentations to Associations and Tributary Signage (RIII-14)

City of Pontiac
Implementing the Storm Water General Permit (GP)

Randolph Street Inter-County Drain Drainage District
Randolph Street Drain Project (SW-08)
Randolph Street Drain Streambank Restoration (RIXB-13)

Redford Township
Consolidated Drain (CSO)
Implementing the Storm Water General Permit (GP)
CSO Retention Treatment Basin (CSO)
Phase II CSO Consolidated Drain (CSO)
Phase II CSO Study (CSO)
Data Management/GIS Inventory (U2-06, Pilot)
Roadway Source Controls (U2-03, Pilot)
Golf Course Maintenance Program (U2-02, Pilot)
Study and Concept Plan for Bell Creek Park Area (RH-01, Pilot)

Resource Recovery and Recycling Authority of Southwest Oakland County
Business Waste Audit Program (RV-16)

City of River Rouge
River Rouge CSO Retention Treatment Basin (CSO)
Source Controls (SP-15, Pilot)

City of Rochester Hills
Rouge District Sanitary Sewer Evaluation Study (RXA-02)
Rouge District Sanitary Sewer Rehabilitation Project (RXIA-07)

City of Romulus
Environmental Data Development (GIS-12)
Implementing the Storm Water General Permit (GP)
Minimize Clearwater Flow in Sanitary Sewer (RVIA-17)

Salem Township
Implementing the Storm Water General Permit (GP)
Public Awareness (M1-04, Pilot)

Salem/South Lyon
Outdoor Lab and Interactive Trail System for MBMP (M1-13)

Southeast Michigan Council of Governments (SEMCOG)
1999-2001 Public Involvement, Public Information and Subwatershed Support Project
2001-2002 SEMCOG/Rouge Project Support
2005-2006 Rouge Project Support

Southeastern Oakland County Resource Recovery Authority (SOCRRA) & Southeastern Oakland County Water Authority (SOCWA)
Demonstration Home Lawn Care (SP-04, Pilot)
Public Education for Health Lawns, Landscapes, Rain Gardens & Rainwater Harvesting (RIXB-01)
Healthy Lawn and Garden Education for Storm Water Pollutant Reduction (IIB-10)
Healthy Lawn and Garden Education 2002-2004 (III-20)
Rouge Green Corridor Public Involvement and Presentation and Rain Garden Community Sites and Public Education (RV-07)
Rouge Friendly Lawn and Landscape Public Education 05-06 (RVIB-01)
Earth Friendly Landscapes, Rain Gardens and Public Education for Rouge River Water Quality (RVIIB-01)
Rouge Friendly Lawns and Landscapes: Demonstration Projects: Public Education (RVIIIB-01)
Public Education for Health Lawns, Landscapes, Rain Gardens & Rainwater Harvesting (RIXB-01)
Rouge Friendly Lawns and Landscape 2010-2012 (RXB-09)
Rouge Friendly Lawns and Landscape 2012-2014 (RXIB-06)

City of Southfield
Storm System Data Development (GIS-34)
Implementing the Storm Water General Permit (GP)
Municipal Storm Water Planning and Renovation (SP-05, Pilot)
Carpenter Lake Restoration (RV- 28)
Rouge River Streamwood Stream Bank Erosion Mitigation Project (RVIIB-08)
Carpenter Lake Fisheries Management (RVIIB-13)
Beech Woods Naturalized Streambank and Soil Erosion Control Project (RVIIIB-09)
Beech Woods Park Greening Project, Phase I-North Parking Area (RIXB -11)
Valley Woods Trail Head & Storm Water Improvement (RIXB-12)
Beech Woods Greening Project II (RXB-17)
Southfield Sanitary Sewer Investigation (RXA-05)
Inglenook Park – Storm Water BMP Retrofit Project (RXIB-03)

Southfield Township
Implementing the Storm Water General Permit (GP)

Superior Township
Utility and Parcel Development (GIS-03)
Implementing the Storm Water General Permit (GP)
Site Conservation Easements (SP-12, Pilot)

City of Troy
Firefighter's Park Streambank Stabilization Project (IIB-04)
Local Sanitary Sewer Improvement to Reduce SSOs to Evergreen Farmington System (RVIA-22)
Detention Pond Retrofit and BMP Analysis (RVIB-21)

University of Michigan - Dearborn
Rouge River National Automotive Heritage Site (RH-12, Pilot)

Rouge River Water Festival 2004 (RV-21A)
Rouge River Water Festival 2005 (RV-21B)
Educational Exhibits on Storm Water Management at Environmental Interpretive Center (IIB-09)
Rouge River Gateway Partnership Master Plan Implementation 04-05 (RV-11)
Storm Water Education (RVIB-10)
Storm Water Education (RVIIIB-04)
U of M Dearborn 2009 Rouge River Water Festival & Real Time Monitoring Exhibit (RIXB-05)

Van Buren Township
GIS Development (GIS-10)
Implementing the Storm Water General Permit (GP)
Van Buren Wet-Weather Sanitary Flow Metering & Analysis (RVIA-04)
Interpretive Wetland Recreational Trail at Visteon Village (RIII-21)
Lake Fringe Wetlands (RIII-22)
Storm Water BMP Tracking System (RV-29)

City of Walled Lake
Implementing the Storm Water General Permit (GP)

Washtenaw County Drain Commissioner
Implementing the Storm Water General Permit (GP)
OSDS Management Project (OSS-02, OSDS)
Streambank Stabilization (M1-05, Pilot)
Storm Water Conveyance and Wetland Treatment (M1-07, Pilot)
Headwater Protection and Storm Water Management (M1-06, Pilot)

City of Wayne
Sanitary System Equalization Basin and Sewer Separations (CSO)
General GIS Development (GIS-04)
Implementing the Storm Water General Permit (GP)
Storm Sewer Retrofit, Inventory and Maintenance, Public Education and Streambank Erosion Inventory (SW-14)
Continue IDEP, Public Education, Subwatershed Planning and Central Oil Collection Facility Planning (IIB-27)
Sand Filter Evaluation (SW BMP)

Wayne County
Newburgh Lake Restoration
Rouge Oxbow Restoration, Phase I
Multi-Chamber Treatment Train Evaluation (SW BMP)
Enviro-Friendly Mixed Use Development (M1-03, Pilot)
Wetland Revolving Fund (WET-07)
Geo-Spatial Metadata Application (GIS-38)
North Huron Valley/Rouge Valley Sanitary Sewer System Evaluation Project (RVIIIA-01)
Balancing Chamber to Improve the Efficiency of the Lower Rouge Interceptor (IV-10)
North Huron Valley/Rouge Valley Sewer System Short Term Corrective Action Plan (Regulators & Comfort Stations) (RIXA-08)
Middle Rouge Riparian Corridor Management Project
Middle Rouge Streambank Stabilization (2 projects)

Wayne County Parks
Riparian Corridor Master Plan for Bennett Arboretum (RV-03)
Rouge River Trail Design – Outer Drive to Evergreen Road (IIB-12)
Nankin Mills Interactive Display (M3-05, Pilot)
Interactive Kiosk (M3-06, Pilot)
Nankin Mills Bank Stabilization (M3-07, Pilot)

Wayne County Environmental Health
Development of OSDS Management (OSS-04, OSDS)
On-site Sewage Disposal Systems Homeowners Public Education Materials (OSS-05, OSDS)
Septic System Database and Evaluation (M3-08, Pilot)
Onsite Sewage Disposal Data Management System (GIS-31)

Wayne and Washtenaw County Conservation District
Abatement of Agricultural Runoff (M1-15, Pilot)

West Bloomfield Township
GIS Data for Water Quality Indices & Wetlands Assessment (GIS-41)
GIS to Supplement Storm Water Master Plans (GIS-40)
Implementing the Storm Water General Permit (GP)
Edwards Relief Drain Siphon Removal (IV-03)
Sanitary System Sewer Evaluation Survey Pilot Study (RVIA-21)

City of Westland
Sewer Separations (CSO)
GIS Data Development (GIS-06)
GIS for Septic Field Data and Soil Erosion (GIS-44)
Implementing the Storm Water General Permit (GP)
Illicit Connection Investigation (M3-12, Pilot)
Sedimentation Basin at Outlet Area 10 (M3-11, Pilot)
Storm Water Master Plan (IIA-04)
Implement Manhole Rehabilitation & Continue Public Education (IIB-13)
Rear Yard Catch Basin Disconnect Program (RVIA-14)
Documentation of Existing System Conditions and Pilot Footing Drain Removal Program (RVIA-15)
Flow Metering & I/I Evaluation in City of Westland (RVIIA-01)

United States Geological Survey
Rouge River flow monitoring, 1995-2008

City of Wixom: Commercial Lawn Maintenance (IIA-25)

Ypsilanti Township: GIS Conversion (GIS-08)

PROJECT TYPE LEGEND

KEY	PROJECT TYPE
CSO	Combined Sewer Overflow Control project
GIS	Geographic Information System project (Rounds 1 and 2)
GP	Project to implement the Storm Water General Permit
OSDS	On-Site Sewage Disposal System management project
Pilot/SW	Storm Water Management Project, implemented by local community
RIIA	Round II Rouge Project Subgrant Program: CSO and SSO control projects
RIIB	Round II Rouge Project Subgrant Program: storm water management projects
RIII	Round III Rouge Project Subgrant Program: Storm water management projects
RIV	Round IV Rouge Project Subgrant Program: CSO and SSO control projects
RV	Round V Rouge Project Subgrant Program: Storm water management projects
RH	Recreation and Habitat Improvement projects
RVIA	Round VI Phase A Rouge Project Subgrant Program: CSO and SSO control projects
RVIB	Round VI Phase B Rouge Project Subgrant Program: Storm water and watershed management projects
RVIIA	Round VII Phase A Rouge Project Subgrant Program: CSO and SSO control projects
RVIIB	Round VII Phase B Rouge Project Subgrant Program: Storm water and watershed management projects
RVIIIA	Round VII Phase A Rouge Project Subgrant Program: CSO and SSO control projects
RVIIIB	Round VII Phase B Rouge Project Subgrant Program: Storm water and watershed management projects
RIXA	Round IX Phase A Rouge Project Subgrant Program: CSO and SSO control projects
RIXB	Round IX Phase B Rouge Project Subgrant Program: Storm water and watershed management projects
RXA	Round X Phase A Rouge Project Subgrant Program: CSO and SSO control projects
RXB	Round X Phase B Rouge Project Subgrant Program: Storm water and watershed management projects
RXIA	Round XI Phase A Rouge Project Subgrant Program: CSO and SSO control projects
RXIB	Round XI Phase B Rouge Project Subgrant Program: Storm water and watershed management projects
SW BMP	Storm Water Management project, implemented by Rouge Project
WET	Wetlands improvement project

Other Acronyms:

BMP	Storm Water Best Management Practice
CSO	Combined Sewer Overflow
I/I	Infiltration and Inflow
IDEP	Illicit Discharge Elimination Plan
SSO	Sanitary Sewer Overflow

THE ROUGE RIVER PROJECT
A WORLD CLASS EFFORT

BRINGING OUR RIVER BACK TO LIFE