

**EXHIBIT A**

**SCOPE**

**ROUGE RIVER MAIN 1-2 SUBWATERSHED  
INVENTORY STUDIES PROJECT**

**OAKLAND COUNTY, MICHIGAN**

**PREPARED BY:**

**THE OFFICE OF THE OAKLAND COUNTY DRAIN COMMISSIONER  
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## **Background**

### **Stormwater Detention Pond Study**

Oakland County communities have required that most new developments retain stormwater on-site. This requirement spawned the building of detention ponds throughout the Rouge River Watershed. These basins effectively reduce peak flooding and reduce pollutant loads from stormwater runoff. However, opportunities exist to improve the performance of constructed stormwater detention basins by improving pollutant removal efficiencies and reducing the initial downstream flow.

A well-designed detention pond provides three main functions:

1. Prevention of downstream flooding by detaining and slowly releasing captured runoff,
2. Recharge ground water, and
3. Physical, chemical and biological interactions, which improve the quality of water of detained water before it is discharged into streams, rivers and lakes.

The purpose of this project is to identify, prioritize, and make recommendations for detention pond maintenance and design improvements of existing detention facilities in the Main 1-2 Subwatershed. The goal of these improvements is to minimize flow variability and to increase detention pond pollutant removal efficiency.

The total project cost for all communities is estimated at \$145,920. This includes \$121,600 for consulting services, \$12,160 for OCDC project administration, and \$12,160 project contingency. A USEPA grant of \$54,350 has been received as part of the Rouge River National Wet Weather Demonstration Project. The communities project cost will be determined based on the number of streambank miles and detention ponds evaluated. The Oakland County Drain Commissioner's Office, in cooperation with the following communities, will implement this project: the Cities of Southfield, Rochester Hills, and Troy; the Townships of West Bloomfield and Bloomfield; the Villages of Bingham Farms and Beverly Hills, and the County of Oakland.

### **Main 1-2 Streambank Inventory Study**

The Rouge River Watershed is under pressure from urbanization, making it vulnerable to heavy loading of non-point source pollutants. One such pollutant is excessive sediment. Although sediment loading is a natural part of a river system, excessive loading can degrade fish and wildlife habitat, destroy wetlands, and reduce the recreational and aesthetic appeal of the river system. In addition, substances such as oils, salts, and nutrients can enter the system attached to sediment particles causing eutrophication and a general decrease in water quality in hydraulically connected lakes and ponds.

The purpose of this project is to identify and prioritize stream bank erosion sites in the Rouge Main 1-2 Subwatershed (excluding the Franklin Branch) and to make recommendations that will incorporate best management practices to decrease sediment loading to the river. See attached map

The total project cost is estimated at \$120,00. This includes \$100,000 for consulting services, \$10,000 for OCDC project administration, and \$10,000 project contingency. A USEPA grant of \$49,645 has been received as part of the Rouge River National Wet Weather Demonstration Project. The Oakland County Drain Commissioner's Office in cooperation with the Cities of Southfield, Farmington Hills, Troy, Birmingham, Bloomfield Hills, and the Townships of West Bloomfield and Bloomfield, and the Villages of Bingham Farms and Beverly Hills will implement this project.

## **Scope of Services**

### **Oakland County Drain Commissioner's (OCDC) Office**

OCDC will provide overall grant administration services including project billing, project meeting attendance, coordination with consultant and communities, financial accounting, coordination with Wayne County and Interagency Agreement administration.

### **Municipality**

Each municipality will participate and coordinate with the consultant and OCDC to allow the consultant to complete the project as outlined in the following sections. This includes providing verbal and written information, as requested by the consultant.

### **Consultant**

The consultant will complete the following items as outlined in the OCDC Standard Professional Services Agreement.

### **Stormwater Detention Pond Study**

The consultant will communicate with the communities to determine the existing detention facilities in the Subwatershed. The estimated number of ponds in all participating communities is about 381. The inventory will consist of the following, or related items as agreed-upon between the community and consultant that meet the objectives of the grant.

- Compile existing data including location maps, copies of original design drawings, drainage area,
- Verification of owner/responsible party for maintenance,
- Verify location and obtain GPS coordinates for each facility,
- The local unit of government's records relative to drainage, facility construction and maintenance and any other records available for the facility will be collected.

The collected data will be compiled in an electronic database that includes a location map of all existing facilities and will be accessible using ArcView. The database will be provided for all partnering communities and the Oakland County Drain Office.

#### Assessment:

An assessment of each the existing detention facilities will be performed, consisting of the following:

- A field assessment to determine the physical and hydraulic characteristics of each facility including detention volume, outlet flow control, quantity and size of the inlet and outlet structures, permanent pool depth; and stormwater quality enhancement capabilities,
- A review of design plans, maintenance and other records for the facility to determine if it was built and is functioning as designed,
- Verification of the type of development in the drainage area,
- Characteristics relating to the existing condition of each facility including the presence of slope erosion, degree of sediment build-up, existing vegetation and condition of the infrastructure,
- Age and years in service.

All collected data will be added to the previously created database and distributed to the Oakland County Drain Office. Each community will receive only the data that pertains to facilities within their jurisdictional boundaries.

#### Evaluation & Ranking:

The data collected for each facility during the Inventory and Assessment will be evaluated. The evaluation will consider all of the collected data, and identify needed improvements and maintenance at each facility. In addition, recommendations will be made for retrofitting measures that would improve outlet water quality, function, and ground water recharge.

The findings and recommendations from the evaluation will be added to the previously created database and distributed to the Oakland County Drain Office and the communities. Each community will receive only the data that pertains to facilities within their jurisdictional boundaries.

#### Final Report:

A summary of field findings and the accompanying recommendations, including construction cost estimates, will be included in a comprehensive report. The report and database will be arranged so that each community can easily access the information that applies to the detention facilities within their jurisdictional boundaries.

## **Main 1-2 Streambank Inventory Study**

### **Streambank Inventory:**

An inventory of the streambanks will be performed for the Rouge Main 1-2 Subwatershed, including all tributaries and open county drains, but excluding the Franklin Branch and its tributaries (which are covered under another project). The consultant will communicate with the communities to determine which branches and tributaries of the approximately 100 miles (all communities) of river are sizable enough to be inventoried. The inventory will be performed using the existing Michigan Department of Environmental Quality (MDEQ) approved inventories for Mitchell Creek, Au Sable River and Clinton River Watersheds as models.

Physical data and photographs will be collected at each erosion site, including the following, or related items as agreed-upon between the community and consultant that meet the objectives of the grant:

- Location identified by global positioning system,
- Complete site photographs,
- Bank condition,
- Apparent cause of erosion,
- Amount of erosion, length & width, amount of sediment in river
- Slope ratio,
- River conditions,
- Soil type & texture

The collected data will be compiled in an electronic database that includes a location map of all inventory sites and will be accessible using ArcView. The database will be provided for all partnering communities and the Oakland County Drain Office.

### **Hydraulic/Hydrologic Study:**

An assessment of the hydraulic/hydrologic characteristics of the Rouge Main 1-2 drainage area will be performed using HEC-2, HEC-RAS or similar models taken from existing FEMA flood insurance studies. The study will include reviewing 2, 10, 50 and 100-year storm flow velocity and river stages. The cross-sections that are considered in the study will be located on a watershed map. The results of the study will be summarized for inclusion in the final report, and will be used to determine appropriate site stabilization techniques. For areas without FEMA studies, simple flow estimates and calculations will be used.

### **Site Prioritization:**

Erosion sites identified in the inventory will be scored and ranked into minor, moderate and severe categories. The severity index that will be used was developed for the Northwest Michigan Streambank Erosion Inventory and has been used extensively by river restoration committees elsewhere in Michigan as a basis to prioritize sites for restoration work. Based on the ranking, an overall prioritized list will be created. A prioritized list will also be created, specific to each community.

Conceptual Drawings & Cost Estimates:

Conceptual site drawings will be prepared for each severely ranked site. The site drawings will include site characteristics and the recommended Best Management Practices (BMP) necessary for site stabilization.

Accompanying cost estimates will be developed for each severely ranked site. These cost estimates will consider the types of BMPs to be implemented, the accessibility of the site, the size of the site, engineering design and construction oversight. A cost summary table will be developed for the entire subwatershed, as well as for each community.

Final report:

A summary of the field investigations, cost estimates, site drawings and the hydrologic study will then be included in one report. The report will be arranged so that information is easily accessible by each separate community.