
Name of Organization: Wisconsin Department of Natural Resources

Type of Organization: State

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Project Title: Expanded Hydrocarbon Assessment-Newton Creek, Superior, WI

Project Category: Contaminated Sediments

Rank by Organization (if applicable): 8

Total Funding Requested (\$): 162,500 **Project Duration:** 1.5 Years

Abstract:

The Wisconsin Department of Natural Resources proposes to conduct further assessment of hydrocarbon contamination identified in Newton Creek and Hog Island Inlet sediments, and to conduct continuous hydrocarbon monitoring of the Newton Creek water column. This information is needed in order to identify responsible parties, and to insure that the site does not become recontaminated from suspected sources. Contamination may have resulted from coal dust, refinery wastewater, urban stormwater runoff, and refined and crude petroleum spills from various suspected sources. Sediment and surface water contaminants of concern include diesel range organics, polynuclear aromatic hydrocarbons, lead, and mercury.

During normal flow conditions, Newton Creek serves as a conduit for transport of treated wastewater effluent from a petroleum refinery to the Hog Island Inlet in Lake Superior Bay. During infrequent high flow periods of snow melt and stormwater runoff, Newton Creek may scour the creek channel, banks, and floodplain. This scouring action can erode contaminated sediments causing them to move down stream away from their source. This causes difficulty in identifying responsible parties. The WDNR proposes to conduct an expanded hydrocarbon analysis in an attempt to identify the unique components and characteristics of the sources of contamination. These "fingerprints" could be used identify potentially responsible parties for funding of further remedial activities.

Furthermore, the WDNR proposes to install a continuous dissolved aromatic hydrocarbon monitoring and sampling system to evaluate variations in dissolved hydrocarbon concentrations and potentially ongoing contaminant sources to the creek. This information will assist in the WDNR's efforts to improve the effluent from the refinery, and evaluate whether the creek will become recontaminated by discharges to the creek.

Geographic Areas Affected by the Project

States:

- | | | |
|------------------------------------|-------------------------------------|--------------|
| <input type="checkbox"/> Illinois | <input type="checkbox"/> | New York |
| <input type="checkbox"/> Indiana | <input type="checkbox"/> | Pennsylvania |
| <input type="checkbox"/> Michigan | <input checked="" type="checkbox"/> | Wisconsin |
| <input type="checkbox"/> Minnesota | <input type="checkbox"/> | Ohio |

Lakes:

- | | | |
|--|--------------------------|-----------|
| <input checked="" type="checkbox"/> Superior | <input type="checkbox"/> | Erie |
| <input type="checkbox"/> Huron | <input type="checkbox"/> | Ontario |
| <input type="checkbox"/> Michigan | <input type="checkbox"/> | All Lakes |

Geographic Initiatives:

- | | | | | |
|--|----------------------------------|-------------------------------------|--------------------------------------|---|
| <input type="checkbox"/> Greater Chicago | <input type="checkbox"/> NE Ohio | <input type="checkbox"/> NW Indiana | <input type="checkbox"/> SE Michigan | <input type="checkbox"/> Lake St. Clair |
|--|----------------------------------|-------------------------------------|--------------------------------------|---|

Primary Affected Area of Concern: St. Louis River, MN

Other Affected Areas of Concern:

For Habitat Projects Only:

Primary Affected Biodiversity Investment Area:

Other Affected Biodiversity Investment Areas:

Problem Statement:

Newton Creek is located in the City of Superior and flows from its headwaters, a petroleum refinery wastewater treatment impoundment, towards the northeast approximately 1.5 miles where it discharges to the Hog Island Inlet, located in Superior Bay. Newton Creek and Hog Island Inlet are within the St. Louis River System Area of Concern and are considered to be a potential source of contaminants to Superior Bay and Lake Superior. Without the treated wastewater effluent from the refinery, Newton Creek's flow would be limited to runoff from its watershed during and following precipitation events and spring thaw.

Sediments in the Newton Creek system and Hog Island Inlet are contaminated with oil and grease, diesel range organics, PAHs, and a variety of metals (including lead and mercury). A significant portion of the diesel range organics have not yet been identified. Widespread shallow subsurface soil contamination appears to exist in the floodplain adjacent to the creek. Ecological impacts appear to be severe in some portions of the creek and Hog Island Inlet.

In 1997, approximately 1600 cubic feet of visibly contaminated sediment was excavated by the refinery from the Newton Creek impoundment and 500 feet of the creek channel sediments(although not floodplain soils). At least 18,000 cubic yards of visibly contaminated sediment and floodplain soils remain downstream in Newton Creek and Hog Island Inlet.

During high flow periods, the creek channel, banks, and floodplain soils maybe be subject to scouring and resuspension of sediments. The scouring action may mobilize contaminated sediments away from their source towards Hog Island Inlet and Lake Superior. This makes responsible parties identification difficult because of multiple potential sources in the area. These sources may include petroleum tank farms and refineries, historical coal docks, and urban storm water runoff. In order to obtain adequate funding for remediation, the identification of responsible parties is necessary.

Additionally, while much improved, the refinery wastewater may serve as an ongoing source of contamination. Effluent still contains high levels of unidentified diesel range organic compounds. It is also possible that the refinery wastewater treatment plant process could fail from time to time and allow pass through of more concentrated contaminants. Current monitoring at the treatment plant does not provide adequate information on refinery stormwater runoff or effluent concentrations to assess potential impacts to Newton Creek, Hog Island Inlet, or Lake Superior. This information is necessary prior to any remedial efforts, to determine whether the Newton Creek- Hog Island system will become recontaminated following any remedial action.

Proposed Work Outcome:

The WDNR proposes to conduct expanded hydrocarbon analyses soil, sediment and surface water samples in an attempt

to identify characteristics and components unique to the source of contamination in creek sediments, floodplain soils, and the inlet sediments. The results will be used to identify and obtain funding from responsible parties for remedial efforts in Hog Island Inlet and Newton Creek. The remedial efforts are expected to clean up Newton Creek sediments and floodplain soils and restore the spawning habitat of sport fish at Hog Island Inlet.

The WDNR proposes to collect 24 sediment samples from Newton Creek and Hog Island Inlet and 8 soil samples from the Newton Creek floodplain. These samples will be analyzed for total extractable hydrocarbons and an expanded list of PAHs and alkyl substitutes to identify and evaluate if a consistent hydrocarbon "fingerprint" is evident in both the creek sediments, floodplain soils, and the inlet sediments.

Additionally, the WDNR proposes to purchase and install a continuous hydrocarbon monitor/sampling system to monitor water quality in Newton Creek for a one year period. A pump will be used to continuously deliver water from the creek to a fluorometer that can measure aromatic hydrocarbon concentrations. The hydrocarbon concentrations will be transmitted to a data logger for remote retrieval and analysis. A preset peak concentration will allow the monitor to send a signal to an automatic water sampler and notify the user that a sample has been collected.

It is assumed that approximately 6 water samples will be collected by the auto monitor/sampling system due to peak hydrocarbon concentration conditions during the study period. The samples will be analyzed for total extractable hydrocarbons and an expanded list of PAHs and alkyl substitutes to evaluate potential similarities in the hydrocarbon fingerprint.

The monitoring system will require monthly maintenance visits to check operation and calibration and perform maintenance on the system components. The hydrocarbon data will be evaluated to determine if contaminant sources can be better identified. A summary report will be prepared.

Project Milestones:	Dates:
Project Start	10/2000
QAPP	11/2000
Install Automated Hydrocarbon Monitor	12/2000
Field Sampling -Soils & Seds	01/2001
Analytical Chemistry Results	04/2001
Remove Hydrocarbon Monitor	12/2001
Data Evaluation & Draft Report	02/2002
Final Report	04/2002

Project Addresses Environmental Justice

If So, Description of How:

Project Addresses Education/Outreach

If So, Description of How:

The results of this project will be summarized in electronic report format (PDF), and will be made available to the public via the WDNR web page. In addition, a technical conference presentation will be used to disseminate the results of this project to interested professionals. Progress under this project will be shared with the St. Louis River RAP Citizens Action Committee and the Lake Superior Binational Program.

Project Budget:

	Federal Share Requested (\$)	Applicant's Share (\$)
Personnel:	0	8,000
Fringe:	0	1,200
Travel:	0	200
Equipment:	0	0
Supplies:	0	0
Contracts:	162,500	0
Construction:	0	0
Other:	0	0
Total Direct Costs:	162,500	9,400
Indirect Costs:	0	0
Total:	162,500	9,400
Projected Income:	0	0

Funding by Other Organizations (Names, Amounts, Description of Commitments):

The State of Wisconsin is currently funding continued assessment of sediment contamination and loading of the Newton Creek system and Hog Island Inlet. The WDNR is expected to expend 650,000 dollars in consulting fees for investigation and evaluation of remedial options of the Newton Creek and Hog Island Inlet System. The WDNR will provide additional staff time as needed, beyond the salary amount designated in the above budget for this scope.

Description of Collaboration/Community Based Support:

Community-based support will be available from the City of Superior, Douglas County, Murphy Oil, Lakehead Petroleum, Dome Petroleum, and other property owners with regards to site availability and access. This project helps to implement recommendations, of the St. Louis River RAP and action in the Lake Superior LAMP. Collaboration with the St Louis River RAP Sediment Committee and the Citizens Action Committee will be on-going.