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**Name of Organization:** USACE

**Type of Organization:** Federal Agency

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**Project Title:** Evaluation of Remedial Alternatives at the Milwaukee CDF

**Project Category:** Contaminated Sediments

**Rank by Organization (if applicable):** 2

**Total Funding Requested (\$):** 170,000 **Project Duration:** 2 Years

**Abstract:**

The U.S. Army CoE has been pursuing options for treating dredged material at the Milwaukee CDF for several years. During 2000 the Corps will host the EPA's SITE program in a project to evaluate plant-based remediation of dredged material on the Milwaukee CDF. The Corps has also encouraged the study of remedial alternatives for the heavily contaminated sediments outside the Federal Navigation Channel. In 1998 the Corps collected ten drums of sediment from a hot spot on the Kinnickinnic River. Those sediments were transferred to the EPA's National Risk Management Laboratory (NRML) in Cincinnati for evaluation of several bioremediation techniques. Studies have included bioreactor studies under varying environmental conditions.

The hot spot proposed for evaluation is heavily contaminated with Polycyclic Aromatic Hydrocarbons (PAHs) believed to be associated with the former Milwaukee Coke and Solvay Company. Sediments in this area contain up to 500 parts per million of PAHs - 10-50 times higher than the concentrations seen in the Channel sediments. The adjacent Milwaukee Coke and Solvay property is a brownfield and the contaminated sediment within the property would probably be a critical factor in its redevelopment. The proposed effort would involve placing a small volume of heavily contaminated sediments from outside the Navigation Channel in an upland location on the Milwaukee CDF and testing several remediation alternatives. Studying the fate of this material in the CDF environment would be a critical factor in helping the Corps and regulatory agencies assess the impacts of an environmental dredging project within the harbor.

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**Geographic Areas Affected by the Project**

**States:**

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|------------------------------------|-------------------------------------|--------------|
| <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 type="checkbox"/> Superior            | <input type="checkbox"/> | Erie      |
| <input type="checkbox"/> Huron               | <input type="checkbox"/> | Ontario   |
| <input checked="" 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:** Milwaukee Estuary, WI

**Other Affected Areas of Concern:**

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***For Habitat Projects Only:***

**Primary Affected Biodiversity Investment Area:** Not Applicable

**Other Affected Biodiversity Investment Areas:**

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**Problem Statement:**

In-place pollutants are a problem at all of the AOCs. Generally the costs to dredge and dispose of the large volumes of contaminated sediments are prohibitive. The Corps of Engineers has been pursuing options for treating dredged material at the Milwaukee CDF for several years. The Corps has also encouraged the study of remedial alternatives for the heavily contaminated sediments in the harbor but outside the Federal Navigation Channel. In 1998 the Corps collected ten drums of sediment from a hot spot on the Kinnickinnic River. Those sediments were transferred to the EPA's National Risk Management Laboratory (NRML) in Cincinnati for evaluation of several bioremediation techniques. Studies have included bioreactor studies under varying environmental conditions.

Remedial dredging is an option in this area and the Corps has authorities to assist with dredging of heavily contaminated sediments however the cost of disposal is still prohibitive. A potential alternative would be placing the material on the CDF with some treatment to reduce contaminant concentrations. Studying the efficacy of simple remediation techniques such as composting and phytoremediation would be a critical factor in helping the Corps and regulatory agencies assess the impacts of an environmental dredging project within the harbor.

**Proposed Work Outcome:**

The first phase of this study would be to conduct a brainstorming session bringing together those who have studied the Kinnickinnic River and the dredged material in the CDF. Participants would likely include UW - Milwaukee (2-3 faculty members), WES (2-5 researchers), Stanford University (Dr. Richard Luthy), NRML, Purdue University, ARCADIS (Contractor to the SITE program), the Pt. Authority, the RAP Coordinator, GLNPO, and several regulators. Each researcher would describe their efforts to date and present the results of their studies. Based on those findings 2-3 techniques would be selected by the Corps and GLNPO for evaluation with the hot spot material.

The Corps would then coordinate and contract the collection of approximately 200 cubic yards of dredged material from a hot spot on the Kinnickinnic River. If other Corps authorities, such as Section 312 of the Water Resources Development Act of 1990 (Environmental Dredging) could be invoked additional amounts of material would be dredged. Of course all dredging operations would be contingent on receiving approvals from the EPA and the Wisconsin Department of Natural Resources on the dredging and final disposition of the dredged material. The dredged sediments would be placed in an elevated area of the CDF and confined in approximately a 100 foot by 100 foot area using push-up berms. The hot-spot material would only be about one foot deep, which would enhance dewatering. The physical and chemical characteristics of the dredged material would be monitored for a 2-month period as it dewateres on the CDF. This monitoring would help to determine the importance of volatilization vs. other processes in understanding why the concentrations of PCBs and PAHs tend to be lower at the surface of the CDF than at depth. Depending on the research interests of those involved it would be

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possible to allow vegetation to develop on one portion of the plot while preventing vegetation on the other portion. After the de-watering period 2-4 remediation techniques would be attempted at each cell. Examples might include simple tilling, tilling with addition of biosolids, phytoremediation with native vegetation; and phytoremediation with specific plant species.

<b>Project Milestones:</b>	<b>Dates:</b>
Project Start	10/2000
Brainstorming Session	11/2000
Coordination with WDNR/EPA	03/2001
Dredge Hot Spot	06/2001
Monitor Dredged Material on CDF	09/2001
Remediation Techniques	05/2002
Monitor Remediation Techniques	06/2002
Project End	08/2002

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Project Addresses Environmental Justice

**If So, Description of How:**

This project does not have a specific environmental justice component.

Project Addresses Education/Outreach

**If So, Description of How:**

Web site links would be established from the Detroit District, EROC-WES, and the web page for the Milwaukee Estuary Area of Concern. A Visitor's Day conducted at the Milwaukee Port Authority's Office would include reports from the individual investigators on their research.

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**Project Budget:**

	<b>Federal Share Requested (\$)</b>	<b>Applicant's Share (\$)</b>
<b>Personnel:</b>	50,600	54,000
<b>Fringe:</b>	0	0
<b>Travel:</b>	6,000	8,600
<b>Equipment:</b>	10,000	0
<b>Supplies:</b>	4,400	18,000
<b>Contracts:</b>	99,000	250,000
<b>Construction:</b>	0	0
<b>Other:</b>	0	0
<b>Total Direct Costs:</b>	170,000	330,600
<b>Indirect Costs:</b>	0	0
<b>Total:</b>	170,000	330,600
<b>Projected Income:</b>	0	0

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

Researchers would be expected to provide some funding from their own programs to fund some or all of the fieldwork. Purdue University has applied for funding to conduct a phytoremediation study on the CDF. A proposal has also been submitted to the LEDO program to further study the bioavailability of PAHs on the Milwaukee CDF dredged material. The LEDO and DOER (Dredging Operations and Environmental Research) program have been partners with the Detroit District on previous projects and those partnerships would be expected to continue. A current DOER work unit is evaluating the role of plants in degrading dredged material contaminants and Richard Price from that program would partner on this project. Ms. Cynthia Price is evaluating volatilization from dredged material on CDFs and is partnering with the Detroit District and GLNPO on a topsoil creation project. She would also partner on the project. EPA's Superfund Innovative Technology Evaluation program is proposing to evaluate composting and phytoremediation on the Milwaukee CDF in a program scheduled to begin this summer. Marquette University has also expressed an interest in studying phytodegradation on the CDF. The Port Authority and Milwaukee Metropolitan Sewerage District and the Port Authority would be expected to provide assistance with technical issues and transport of materials, as has been done in the past. GLNPO's contribution would be approximately 33% of the total project cost and would cover mainly the dredging operation and the early monitoring of the dredged material.

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**Description of Collaboration/Community Based Support:**

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The Engineering Research and Development Center at the Waterways Experiment Station (ERDC-WES). Researchers: Mr. Richard Price; Ms. Cynthia Price, Dr. Tommy Myers; Dr. Jeffrey Talley;  
Environmental Protection Agency's National Risk Management Laboratory. Researchers: Dr. Richard Brenner and Dr. Gregory Sayles.  
Superfund Innovative Technology Evaluation program.  
Purdue University. Researchers: Dr. Kathy Banks and Dr. Paul Schwab.  
Milwaukee Seaway Port Authority (MSPA)  
Milwaukee Metropolitan Sewerage District (MMSD)