

# **Proceedings**

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## **Great Lakes Contaminated Sediment Strategy Workshop**



**June 13-14, 1995  
Chicago, Illinois**

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## **LIST OF ACRONYMS**

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AOC - area of concern  
ARAR - applicable or relevant and appropriate standards, limitations, criteria, and requirements  
ARCS - Assessment and Remediation of Contaminated Sediments  
ARP - Ashtabula River Partnership  
BMP - best management practice  
CAA - Clean Air Act  
CAD - confined aquatic disposal  
CAG - citizen advisory group  
CDF - confined disposal facility  
CEO - chief executive officer  
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act  
CLEAR - Citizens of Lake County for Environmental Action and Reform  
CRP - Conservation Reserve Program  
CWA - Clean Water Act  
DMMP - dredged material management plan  
EA - environmental assessment  
EIS - environmental impact statement  
FEIS - final environmental impact statement  
FONSI - finding of no significant impact  
FRC - Fox River Coalition  
GLNPO - Great Lakes National Program Office  
GLTRE - Great Lakes Toxics Reduction Effort  
HCB - hexachlorobenzene  
IEPA - Illinois Environmental Protection Agency  
IJC - International Joint Commission  
MPRSA - Marine Protection, Research and Sanctuaries Act  
NCD - North Central Division  
NEPA - National Environmental Policy Act  
NPDES - National Pollutant Discharge Elimination System  
NRDA - natural resource damage assessment  
NWRI - National Water Research Institute  
O&M - operations and maintenance  
OPA - Oil Pollution Act of 1990  
PAH - polycyclic aromatic hydrocarbon  
PCB - polychlorinated biphenyl  
PRP - potentially responsible party  
QAPP - quality assurance project plan  
RAP - remedial action plan  
RCRA - Resource Conservation and Recovery Act  
REMAP - Regional Environmental Monitoring and Assessment Program  
RHA - Rivers and Harbors Act  
RIM - Reinvest in Minnesota  
ROD - record of decision  
SACM - Superfund accelerated cleanup model  
SDWA - Safe Drinking Water Act  
SEIS - supplemental environmental impact statement  
SMART - Sediment Management and Remedial Techniques Program

SOF - statement of findings  
SQC - sediment quality criteria  
T O W N. - Taskforce on Waukegan Neighborhoods  
TIF - tax increment financing  
TSCA - Toxic Substances Control Act  
USACE - United States Army Corps of Engineers  
USEPA - United States Environmental Protection Agency  
WDNR - Wisconsin Department of Natural Resources

# PROCEEDINGS

## GREAT LAKES CONTAMINATED SEDIMENT STRATEGY WORKSHOP

June 13-14, 1995  
Chicago, Illinois

### **SUMMARY AND ACTION ITEMS**

A two-day Great Lakes Contaminated Sediment Strategy workshop was held in Chicago to bring together various stakeholders in the Great Lakes Basin and develop recommendations to expedite the process for remediating contaminated sediments in the Great Lakes. The workshop was sponsored by USEPA Region 5 and the Great Lakes National Program Office.

More than 75 participants representing federal, state, industry, municipal, environmental, port authority, and local government interests attended the workshop. Each attendee participated in two of eight total breakout sessions to address specific questions on contaminated sediments. The breakout sessions included Garnering Local Support, CDFs and Dredged Material Management, Economics, Regulatory Approaches and Barriers, Public/Private Partnerships, Remediation Technologies, Clean-up Goals and Objectives, and What's Missing (a "catch-all" category).

The proceedings document includes a summary of presentations on various stakeholder perspectives in the Great Lakes Basin, highlights of the breakout sessions and their recommendations, and group discussion remarks. The appendices contain background papers for the breakout sessions, a list of attendees, and the workshop agenda. The proceedings document is not a transcript of the workshop, but rather a summary of the events and discussions that took place. Significant effort was made to identify the major areas of consensus or disagreement. However, every comment or opinion expressed at the workshop is not included in the document. Therefore, attendance at the workshop should not be construed as endorsement of every action item, recommendation, or opinion included in the proceedings.

## Action Items

- EPA will expand the EPA/State Cleanup Goals Workgroup to include other stakeholders and will accelerate the Workgroup's efforts to develop consistent methodologies for deriving sediment clean-up goals.
- EPA will assemble a group of stakeholders to further define opportunities for regulatory flexibility within applicable standards, including the staging of remedies, the use of negotiated settlements, the application of permit and ARAR waivers, etc
- EPA, in conjunction with nongovernmental organizations, will develop a brochure focusing on the development of public participation programs
- EPA will finalize a white paper on CDFs to increase technology transfer activities related to CDFs.
- EPA/Corps will participate in the CDF session at the International Joint Commission conference to be held in Duluth, Minnesota, in September of 1995
- The Corps will actively disseminate information on the process and schedule of DMMPs to a broad-based audience
- The Corps will work with local stakeholders to incorporate DMMPs into RAPs and watershed management plans
- EPA will convene a stakeholder workgroup to identify situations where "grim" brown fields may be appropriate for use as disposal sites for contaminated sediment.
- EPA/States will evaluate or identify other sites around the Great Lakes where public/private partnerships could be successful in addressing contaminated sediments
- EPA/Corps will increase dialogue with stakeholders to refine and publicize a "road map" for making both broad remediation decisions and technology selections for contaminated sediment sites.
- EPA will convene a capping workshop.
- EPA/Corps will implement a pilot sediment reclamation project at an existing CDF in the Great Lakes Basin.
- EPA will continue working on applying low-tech pretreatment technologies (e.g., sediment washing) to sediment situations
- EPA will reconvene a workshop to discuss progress made on the items listed above, discuss emerging sediment issues, and continue the productive dialogue begun at the June 1995 workshop.



## **WELCOME**

### ***Opening Remarks***

**Jim Giattina, USEPA, Great Lakes National Program Office**

This is the first of many dialogues on how to address the contaminated sediments problem in the Great Lakes Basin. As far as toxics are concerned, contaminated sediment remains one of the most significant Great Lakes problems. That and atmospheric deposition are the two major source categories we need to address in order to continue to make improvements in the Great Lakes System. Contaminated sediment technologies are on the cutting edge. We hope to address the entire range of issues to understand significant barriers preventing us from making more rapid progress. We are beginning to understand more and more the potential of contaminated sediments to cause human health effects—transgenerational effects. I agree with the quote, "To overreact would be dangerous. To fail to act would be irresponsible."

Government acting alone is not going to solve this problem. It will take a full complement of stakeholders. We need to decide on a consensus course of action on how to move forward. This is why we are working together today at this workshop. We are all frustrated over the inability to address the contaminated sediments problems speedily. We need to move forward, and we need your help to do so. We hope to learn from the discussions over the next two days. We would like to see a coalescing of those specific steps we can begin to take to move more quickly to address this problem. We would like to have a strategic view. Let's identify what you believe is the best path forward, a collective path.

I wish you luck. We need your help. If we don't tackle this problem, frustration at all levels will only grow.

## **STAKEHOLDER PERSPECTIVES ON MAJOR SEDIMENT ISSUES**

### ***USEPA Perspective***

**Howard Zar, EPA Region 5**

Contaminated sediments have been a high priority for EPA over the past several years. We've had both successes and frustrations. We've learned, first, that it's very hard work—time-consuming and energy- and resource-intensive. Second, the only way we can get these things done is with the involvement of all stakeholders, those who are in this room.

I'll use my time to summarize the approaches EPA has been using. Please reflect on the approaches and feel free to comment.

At a national level EPA has developed a National Contaminated Sediment Management Strategy. At the Regional and Great Lakes levels we've been trying to implement these approaches through a number of programs, including Regional efforts to remediate

sediments, the ARCS program for Assessment and Remediation of Contaminated Sediments, the Great Lakes Toxics Reduction Effort, and more.

The Contaminated Sediments Management Strategy includes the following

- (1) *Sediment criteria* - Five organics have been proposed, a metals methodology and user's manual are coming.
- (2) *Inventories* - National site and source inventories are nearing completion.
- (3) *Prevention and source control* - Critical, both short- and long-term.
- (4) *Remediation and enforcement* - Willingness to use available authorities and to form partnerships
- (5) *Dredged material management* - EPA and Corps collaborative efforts RCRA needs resolution
- (6) *Research* - A broad effort, more emphasis on ecological work.

Great Lakes Remediation efforts include the following

- (1) Enforcement efforts (e.g., Northwest Indiana, Lorain, Ohio)
- (2) Superfund (e.g., Waukegan, Sheboygan, Manistique, Fields Brook)
- (3) Corps cooperation (e.g., Indiana Harbor Canal)
- (4) Public-private partnerships (e.g., Ashtabula, Fox River)

ARCS was completed in October of 1994. It has included five pilot demonstrations, as well as the development of guidance documents on sediment assessment and technology. Sediment assessment remains active with EPA assisting states through funding and field assistance using the sampling vessel *R/V Mudpuppy*. A Remediation Demonstration Proposal has recently been made, offering matching funds for remediation projects.

The Great Lakes Toxics Reduction Effort began working on sediment in February 1994, establishing a multi-media EPA/State sediment task force. One workgroup developed a report, *Barriers to Managing Great Lakes Contaminated Sediments*. Other groups have been working on clean-up goals methodology, sediment criteria, and information exchange. It is intended to expand these efforts to include other agencies and to increase outreach to industry and the public. Additional efforts of the Agency and states include the development of Lakewide Management Plans and Remedial Action Plans, involving stakeholders working together to define ecosystem problems and solutions. The Agency has been working with the Corps on the development of a dredged material testing manual for the Great Lakes, and has various efforts in progress to develop documents to assist with future remediation efforts.

Many of these efforts will come up in further discussions. Please let us know what you think of their usefulness.

### ***State Perspective***

#### **Dan Helwig, Minnesota Pollution Control Agency**

My perspective is based on experience with the St. Louis River Remedial Action Plan Area of Concern. We've been able to raise awareness about sediment issues. The states are getting more comfortable with assessment technologies. People are getting a better handle on which sediments are good versus bad. There are some draft criteria currently out for public comment by EPA. We've done two sediment assessment projects in the St. Louis River using *R/V Mudpuppy* and will be doing a project supported by the Office of Research and Development (REMAP Sediments Assessment Project). Region 5 has supported states and helped us get our databases in order. Progress is being made. Through ARCS, states have a better sense of the pros and cons of various remediation activities. In Wisconsin there is a small dedicated program, the SMART Program. There has been progress made with regard to understanding who is in the field, who the contacts are. Are we getting the job done? The general consensus is "No." Contaminated sediment is still a prime source of toxics.

From Minnesota's perspective on the sediment issue, we need a higher priority in government programs. In the mid-1980s dioxins were found at a paper mill in Minnesota. In 3-4 years we moved very swiftly and successfully to resolve the dioxin issues. We have not made the sediment issue a high enough priority. We need to involve the citizens.

We need to invoke a cooperative model and stop fighting science with science. We're tired of doing study after study at our Superfund sites. Responsible parties must be more cooperative with one another. Let's minimize the use of attorneys. Use attorneys as a last resort, rather than first.

We need to focus on isolating and stabilizing known hotspots until a long-term solution can be found. The general public has the notion that we're going to move the material, but in fact that alternative is generally too expensive.

We need more innovative technologies. The ARCS program and some other projects have resulted in many innovations, but we need a lot more. In particular, we need more innovation with "screening" analytical techniques.

### ***Corps of Engineers Perspective***

#### **Jan Miller, North Central Division**

The Corps of Engineers has four offices within the Great Lakes Basin that share responsibilities for central missions. The offices are located in Buffalo, New York, Detroit, Michigan, St. Paul, Minnesota; and Chicago, Illinois.

Corps authorities related to contaminated sediment management are as follows.

- (1) River and Harbor Acts (various)
- (2) Regulatory mission is the Clean Water Act, section 404.

- (3) Environmental remediation mission is the Water Resources Development Act of 1990, section 312 (clean-up dredging) and section 401 (providing technical support to Remedial Action Plans)

Regarding contaminated sediments' impacts on Corps projects and missions, the bottom line is that contaminated sediments are causing delays in projects and 404 permitting, and this means increased costs to the Corps and the regulated community. Therefore, the Corps has a strong self-interest in resolving and helping the process.

In terms of lessons learned, the volumes of sediment and costs of remediation can appear overwhelming. It's hard to get people mobilized and interested when it appears unachievable.

The practical solutions are to identify the problem you want to solve and the scope of remediation you want to accomplish, then divide the remediation into bite-sized pieces. The rationale is that you won't get enough money all at one time to accomplish the mission. Since funding may be somewhat opportunistic, it is best to have plans for individual pieces of a remediation project ready to go as funding becomes available.

Innovative partnerships are critical. You may have different interests/environmental objectives, but your overall mission is the same.

This whole process requires partnerships at all levels of government, private industry, and the public.

***Nongovernmental Organization Perspective***  
**Patricia King, Sierra Club**

The Sierra Club has been happy to work closely with EPA to bring this workshop about and is grateful to them for hosting and funding it.

I am pleased to present the perspective of citizens and environmental organizations regarding contaminated sediments issues in the Great Lakes. We are fortunate to have representatives of many diverse groups from around the region present today, including Steve Skavroncek and Dan Burke of the Lake Michigan Federation, Chicago, Illinois, and Sturgeon Bay, Wisconsin; Becky Katers of the Clean Water Action Council, Green Bay; Doreen Carey of the Grand Cal Task Force in Northwest Indiana; Wayne Schmidt of the National Wildlife Federation, Ann Arbor, Michigan; Dr. Alden Lind of the Conservation Legacy Alliance, Duluth, Minnesota; John Peck and Marty Visnosky of the Sierra Club, Madison, Wisconsin, and Erie, Pennsylvania, and Paul Geiselhart, Citizens of Lake County for Environmental Action and Reform.

In addition, there are representatives of funding organizations who support the Great Lakes efforts of many of the groups—including John Sherman and Russ Van Herik of the Great Lakes Protection Fund; and of research organizations such as Allegra Cangelosi of NE/MW Institute, DC; and Steve Thorpe of the Great Lakes Commission, Ann Arbor.

As you will note from the listing of environmental organizations present, we are a diverse group—no one group speaks for all and I do not attempt to do so here. However,

in talking to many of the representatives before the workshop, some general themes emerged upon which most of us agree:

- First is our major concern for the *long-term* health of the Great Lakes environment. Though we are fully aware of the benefits of cleaning up the sediments as quickly as possible, we are equally aware of the dangers associated with acting out of expediency with an eye to short-term considerations only.

It was, in fact, with an eye to short-term economic gains, and no consideration of the long-term health of the environment, that most of the sediments became polluted in the first place. And it is the communities that are bearing the brunt of the costs of such pollution in being unable to drink the water, eat the fish, or swim at the beaches and, further, by having to bear the majority of the costs of cleanup.

We recognize the need to remove the contaminated sediments to clean up our rivers and harbors in most cases—but this must be done in such a way that the dredging process does not itself increase the risk to human health and wildlife by, e.g., resuspending contaminants into the water bodies. Such risks must be identified and mitigated as well as possible before the cleanup proceeds.

It may seem easiest to use public funds to pay for large proportions of each cleanup, but while some public funds may be necessary, the responsible parties must pay for their fair share. Without such accountability by culpable parties, we, as a society, lack the necessary disincentives to ensure the good behavior of our corporate citizens in the future.

Transferring contaminated sediments from our rivers and lakes to landfills only shifts the problem from one place to another and creates new toxic problems. Decontaminating such sediments must be the ideal we strive for.

While it may be necessary, because of the currently high costs of many decontamination technologies, to instead store contaminated sediments in landfills, we must plan now for the eventual treatment of those deposits. All landfills break down eventually, so projects must be funded to commercialize the decontamination technologies to be cost-effective as soon as possible. The responsible parties should provide such funding in order to ensure long-term solutions to the problems they have created.

- Our organizations represent various segments of the public and serve to facilitate their right to be heard. In efforts to "streamline" various regulatory processes we must not do so at the expense of public involvement and oversight. It is through such public oversight that many of these environmental problems have come to light and our governments moved to act on behalf of the public.
- Lastly, though "regulatory" approaches seem to be less popular these days and so-called "voluntary" ones are gaining in popularity, the verdict is still out on which, if either, is better. If voluntary measures had worked, we would not have this problem. Results of a recent Sierra Club poll indicate that Americans favor strengthening the Clean Water Act's "restrictions and regulations" by more than a six to one margin.

We need to see some real progress and answers from such voluntary groups before we can fully support them.

We look forward to contributing to the process of making this workshop a success and moving the process of cleaning up the Great Lakes forward. Our representatives have decades of experience in Great Lakes issues and represent a font of information that other groups are encouraged to tap.

Long-term considerations such as those outlined above are not new—we have several of the answers already. The expertise at this conference, together with the research done to date, is more than adequate to craft real solutions to such problems, rapidly incorporating the long-term concerns listed above. So let's move beyond mere discussion and actually do something! That's what we're here for!

### ***Industry Perspective***

**Rick Brewer, RMI Corporation**

I'd like to give my Ohio perspective. I'd like to relate the Ashtabula Partnership. I've boated for years. I have a personal interest and a professional interest. Industry is dealing with the results of unregulated effluent discharges. Fields Brook was placed on the National Priorities List (NPL) in 1983. Millions and millions of dollars have been spent on Fields Brook under Superfund, and there has still been no remediation. Through the existing Remedial Action Plan, we formed a partnership to remediate the river and continuous progress has been made. The partnership was formed in July 1994 and currently has 39 partners. The partnership is unique because it encompasses a variety of organizations. Our mission is four-pronged.

- (1) Define the contaminated sediment to be addressed.
- (2) Develop a detailed plan for sediment remediation.
- (3) Identify resource needs for implementation.
- (4) Generate a time line of milestones and activities.

Industry is well aware of the significance of addressing contaminated sediment. They learned the hard and expensive way. Industry can bring technical expertise to the table. We recognize the need to find an alternative to Superfund for harbor dredging. Many inroads have been made since 1985. There is a lot of recreational business in the harbor, which brings a lot of money to the community.

Our organization consists of a coordinating committee, siting committee, project committee, outreach committee, and resource committee. The coordinating committee is the management committee. Its role is to provide leadership, day-to-day decisions, and reports to the partnership. The siting committee develops criteria for disposal sites, recommends disposal sites, and feeds information. The project committee develops the scope and schedule and designs the CDF. The outreach committee educates and informs communities and recruits new partners. The resource committee is responsible for implementation, financial resources, and other resources.

### ***Port Authority Perspective***

#### **John Loftus, Toledo-Lucas County Port Authority**

I've been involved with dredged disposal and sediment issues for 10 years. I'm involved in cooperation, partnerships, etc. It's not easy, and it's not fun. From the Toledo Port Authority's perspective, a minor problem poses major problems. With regard to the disposal issue, specifically the Corps's policy for open lake disposal, the Port Authority joined Ohio to try to eliminate that program. The result of years of work is minor progress. My advice for EPA is to develop some "backbone." We need you to stand up and be counted at the appropriate time. You can't waffle as you have in the past. My advice to the Corps is to try to remain consistent in your policies. For those of you who will get involved in this, don't have a "slight" pollution problem. Either have no pollution problem or a major pollution problem. Science fighting science is a chronic problem. One of the ramifications we will experience as a result of science versus science is that Congress will come in and change the rules to become either too stringent or not stringent enough. The result will be to push us backward. If we're going to work as a partnership, put differences behind you. Work toward a common goal. If we come up with a clear solution or set of goals and objectives, the public and Congress will be there.

### ***Municipality Perspective***

#### **Steve Hiniker, City of Milwaukee**

I am the City of Milwaukee's Environmental Policy Coordinator. Among my friends in the environmental community, there is sometimes suspicion that I am simply there to try to weaken environmental standards to make it easier for industry to develop. Meanwhile, my friends in industry are wary that I may just be an environmental zealot with taxpayer funding.

We have a policy of trying to maintain a strong city with plenty of space for economic development, as well as maintaining a healthy environment. We keep water clean through an aggressive storm water management program. We've spent hundreds of millions of dollars to keep the environment clean. We've made tremendous progress. We're focusing more public attention on natural resources. If we don't clean up problems like sediments in the estuary, we haven't fulfilled our mission in the city.

I recommend that we develop a larger constituency. The Republicans in Congress are weakening environmental standards—certainly not the solution to protecting the public health. If those of us who know about the real health risks associated with Republican plans don't speak out, we have ourselves to blame for putting the public at risk. Some people in EPA are fearful that if they speak out, they may lose their jobs. I am saying that if you don't speak out the Republicans will abolish your jobs anyway. Take a look at the so-called Clean Water Act that emerged from the GOP-controlled House of Representatives. If that doesn't send a message, nothing will.

As state and local governments look at budget cuts they have to be fair. Significant cuts can hurt. At the same time, the state is proposing to raise gas taxes to pay for even more highways. This misguided set of priorities needs to be challenged. Less money for environmental protection but more money for sprawl. This is out of the mainstream. All of us with a stake in environmental protection need to speak up.

Regarding technology, we need to work closely with the private sector. Technological advances are happening, and regulations need to keep up with those advances

The costs of cleanup are great and they must be allocated fairly. Those who created the pollution need to be assessed for the damages they caused. All too often it is the ports and the cities that end up footing the bill because they are targets of convenience. Funding is a serious problem, and all of the stakeholders need to be at the table during negotiations.



***SUMMARY OF QUESTIONS AND  
ANSWERS ON STAKEHOLDER PERSPECTIVE  
PRESENTATIONS***

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Issues and topics that were raised during the question-and-answer session included the Great Lakes Water Quality Initiative Guidance, the Corps's interest in environmental dredging, the Corps's opposition to EPA's sediment quality criteria, the status of EPA's Sediment Quality Criteria User's Guide, isolation and stabilization of sediments, remediating sites to meet only "industrial use" standards, mixing zones for disposal of dredged materials, source control, long-term funding mechanisms, and the relationship of public/private partnerships to RAPs. Detailed questions and answers for this section are included in Appendix A.

## **BREAKOUT SESSIONS 1-4**

Provided below are summaries from the first four breakout sessions. The key questions that the participants were asked to address are listed for each breakout session, along with a summary of comments, a list of recommendations made by the group, and a list of participants. In some cases the groups added questions or selected different questions to address. The background papers for the breakout sessions are included in Appendix B.

### ***Breakout Session 1: Garnering Local Support***

The purpose of this breakout session was to discuss the most and least effective ways of garnering public support for the remediation of sites with contaminated sediments. Both questions were addressed simultaneously.

#### **Questions**

- 1. What are the most effective ways for keeping the public involved and informed throughout the assessment, design, and remediation phases for a contaminated sediment site?**
- 2. What approaches have worked for getting the public's support for remediation projects?**

The facilitator opened the session by asking the group to take a moment to review the questions to see if the group thought additional questions should be addressed. A participant wanted the first question revised to include the following: ". . . keeping the public involved and *effectively* and *honestly* informed . . ."

The group agreed that in order to get or continue to have public support, the public needs to be involved from the beginning. Citizen action groups want to be involved in day-to-day decisions. The group suggested also involving congressional and private interests to gain support/resources.

A participant involved with the Ashtabula Partnership gave an example of an approach that seems to be working as far as getting public support. The Ashtabula Partnership was formed to remediate the Ashtabula River. After millions of dollars had been spent on an adjacent site, Fields Brook (which was placed on the NPL list in 1983), and no remediation had occurred, the partnership, which includes a variety of organizations, was formed through the existing Remedial Action Plan in July 1994.

The first step the Ashtabula Partnership took was to develop a plan that could be followed by everyone. From there, they developed a committee to keep the public informed. They focused on the plan's desired image, the vulnerabilities of the image, and the target audience, including their attitudes and beliefs. Focus groups were established to research the public's beliefs. Committees were formed to address any questions the public might have. They discussed communication objectives, developed a master time line, and developed a budget for activities such as public meetings and marketing.

The Ashtabula Partnership believes in putting professionals in leadership roles to run the program. It takes a lot of dedication and time. Their group believes in treating their plan like a business. The plan is not yet in effect, but at this point there seems to be considerable support (from the "higher-ups" and the public) and they are continuing to sell the idea.

A participant expressed a concern about the possible manipulation of public opinion to agree with predetermined decisions. In order to have open, honest, and meaningful public participation, the public must be involved at the outset of projects, be given accurate information, be allowed to make and provide their own opinions, and have a vital role in the decision-making process.

One participant felt that there are two levels of involvement to take into consideration: there are the state coordinators (30-40 people at the table/monthly meeting), who are involved in the day-to-day process, and there is the general public, which wants to be more involved. The participant posed a question regarding how to work with the state level at these meetings and how to effectively involve the general public from the beginning.

Many participants felt that the "higher-ups" (e.g., EPA or local government) are not involved. Without their involvement the public does not recognize the urgency to participate and get involved. EPA needs to show the public that "this is the problem and it can be resolved." The "higher-ups" need to set some goals and deadlines to get the public's attention and involvement.

Many participants felt that, although government representatives and regulators need to be involved in development of the remediation projects, they should not usurp the process or supplant the public and local community representatives. The process for developing and implementing the remedial plan should be community-driven. The committees involved in designing and implementing the remediation plan should strive for a common goal and have diverse, well-balanced, and inclusive representation. Furthermore, the public representatives involved in the stakeholder groups and committees need to actively involve and consult the general public.

There was discussion regarding who should be responsible for garnering local support. The participants agreed that a leader is needed, as well as early involvement from citizen action groups. The participants discussed the possibility of the development of bylaws that would outline the responsibilities of the individuals involved, thereby giving them power to make decisions.

The group discussed the need for leadership, political support, and something threatening the area (e.g., designating an area a Superfund site) to get action. There needs to be a hammer and then flexibility in how the plan is implemented. Reasonableness between those who are involved in the process is also needed. There is no room for personal agendas or misinformation.

A group member also mentioned that the Waukegan Harbor project is a rather successful program. She stated, however, that more public and political support is needed.

It was suggested that in order to get public involvement, an action plan for remediation is needed. The group members discussed the contents of the plan and recommended the following

- Identify what (e.g., remedial options) you want the general public to consider and support. (Note This does *not* mean that government agencies should make remedial decisions without public involvement and then try to get public support for the decision after the fact. Rather, members of the public and other stakeholder groups, representing diverse interests, should be involved throughout the process. Thorough attempts should be made to address the concerns and goals expressed by the public.)
- Plan on how you are going to make the remediation plan happen (who, what, where, when, and how).
- Develop a strategy to implement the plan
- Define the benefits to those involved and affected by the remediation plan (e.g., industry, public, regulator, etc.)
- Show the consequences if there is no action

A group member stated that EPA should withdraw support if the plan is not working. EPA needs to recognize when a plan is not working and possibly consider an alternative plan.

## **Recommendations**

- Advise the public to beware of misinformation. Whatever is done to get public involvement needs to be honest, fair, and effective.
- Develop a public participation plan and then sell your plan to get the necessary parties involved. Treat the plan like a business. Look for leadership. If the partnership is going to work, regulatory agencies cannot lead it (you want the community to take control.) Don't give up. If it doesn't work one way, try something else.
- Promise action; make a commitment and follow through. Discuss the consequences of inaction.
- Where appropriate, balance regulatory and voluntary interests. It is important to keep the size of the committee manageable. Membership should be balanced and diverse and should not exclude strongly interested parties.
- A commitment is needed from the "higher-ups." Without a "hammer" (e.g., threat of designating a Superfund site) or political leadership, citizenry is virtually powerless.
- The group leader recommended the book *Doing Good Better*.

## **List of Participants**

Rick Brewer, RMI Environmental Services  
Lee Bridges, Indiana Department of Environmental Management  
Dan Burke, Lake Michigan Federation  
Jean Chruscicki, USEPA Region 5  
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## ***Breakout Session 2: CDFs and Dredged Material Management***

The purpose of this breakout session was to confirm what is known about existing confined disposal facilities (CDFs), including their successes and/or failures and how they are managed, as well as to discuss the future of CDFs.

The group leader began the session by asking if any questions needed to be addressed in addition to those which had been identified in the background papers. Several members of the group proposed additional questions:

- What is the environmental track record of CDFs?
- What is the status of current public outreach efforts?
- What are some of the future uses of CDFs, especially land-based CDFs?
- When should the decision of whether or not to treat the sediments in a CDF be made?
- How do we put CDFs out of business, i.e., reduce pollution?
- What are appropriate performance goals for CDFs and how do these goals compare to their design objectives?

The group then combined these concerns and came up with three basic questions they intended to address.

### **Questions**

#### **1. What do we know about existing CDFs?**

##### ***Saginaw Case Study***

A representative from EPA explained that an interagency workgroup had been formed in the late 1980s to evaluate the environmental significance of contaminant releases from in-water CDFs on the Great Lakes. The workgroup initiated a number of investigations, including the development of contaminant loss models for CDFs and field studies at the Saginaw Bay CDF to predict and measure the amount of contamination leaking through permeable CDF dikes. The workgroup concluded that the magnitude of losses through CDF dikes was very small, especially in comparison to other sources of contamination to area rivers and harbors. Discussion that followed indicated that while the federal agencies that participated in this interagency workgroup had reached a level of understanding about CDFs and contaminant losses from them, most of this information was buried in the "gray literature" and has not been widely distributed.

The group discussed a variety of other issues and perceptions about CDFs, and agreed that the issues for land-based CDFs were often different from those for in-water CDFs. The group decided that one of the largest problems associated with

CDFs is the lack of effective communication with the public, as well as state and federal agencies, on the following issues:

- Performance goals for permeable versus impermeable CDFs
- CDF design, construction, monitoring, and maintenance
- Regulatory requirements
- Reasons for needing CDFs
- Siting and decision-making processes

The group recommended the following actions to enhance the communication of information pertaining to CDFs.

- EPA GLNPO, with input from the Corps, would prepare a written summary of information about CDFs, including the conclusions of the interagency workgroup
- Corps would use public and agency involvement during formulation of Dredged Material Management Plans (DMMPs) to provide information about CDFs
- EPA and Corps would seek other forums and media for technology transfer and general education regarding CDFs

## **2. What should be included in the Corps's long-term management strategies for Great Lakes harbors, i.e., what needs to be added to the Corps's plan? What is the future of CDFs?**

The group leader began discussion of this question by listing existing requirements (which are limited by the Corps's jurisdiction) under the Corps's guidance as:

- Evaluation of all disposal alternatives.
- Estimation of future dredging needs
- Establishment of recommended alternatives.

One participant stated/felt that there is much confusion regarding the performance goals of CDFs. Commonly, a CDF incorporates aspects of both a wastewater treatment operation and a landfill. The nature of the sediments under consideration and the characteristics of the proposed disposal site should be used to establish the performance goals for a particular facility.

At present the Corps is generally held responsible for development of DMMPs, but all of the group participants agreed that they should not be solely responsible. Many components of the plan such as watershed-focused upland management do not fall under the Corps's jurisdiction and thus need to be developed by localities.

The group then identified the following additional requirements that should be included in DMMPs.

- Require a cost/benefit analysis
- Explain purposes of DMMP, which include:

- To explain how to spend O&M money in an appropriate manner to maintain harbors within given resources, budget, and schedule.
- To provide a uniform analysis (that will ensure that all CDFs are following the same guidelines) in order to allocate resources
- Encompass a broader "watershed approach," which would require bringing in state and local agencies as well as industry and citizen groups to develop a partnership for plan development and improvement
- Design plan to be dynamic, flexible, and ever-changing (adapting to new technologies) This involves using smaller CDFs that are more manageable and operate on a shorter time frame so that even the oldest CDFs can adapt easily to changes in technology If CDFs are too large, it is difficult to change their purpose as technology changes.
- Integrate with RAPs, watershed plans, etc.
- Reconsider researching new technologies (not focusing on building up dikes only to fill them up again).
- Increase early public involvement in order to reflect local issues and concerns.
- Compare risk analyses of a large regional CDF as opposed to several small CDFs.
- Consider future land use
- Consider sediment trends (volume, economics, "if-then" scenarios)
- Explain schedule, cost, and roles of participants in the plan and their responsibilities.
- Develop a *process* for plan development
- Encourage a commitment to follow the plan.

One participant stated that it is true that some CDFs leak and cause environmental problems but that is not true in all cases. An area in southeastern Michigan, called Woodtick Peninsula, is being eroded away at a dramatic pace. Plans are in place to protect the area with a beneficial CDF. There is a large wildlife area behind it that will be negatively affected if this CDF is not built. Michigan citizens are very supportive of this plan because it means the development of a new wildlife refuge. We need to inform the public that CDFs can be beneficial.

Overall, the discussion amongst this group was very spirited and highlighted the point that CDFs are a very complex and controversial subject. The fact that the group could address only a few of the many questions raised supported the need for further dialog and information exchange.



## **Recommendations**

- The Corps should provide greater transfer of information about CDFs to the general public (e g , RAP groups, CAGs) and state and local agencies through a variety of media.
- EPA and the Corps should prepare a report for the general public that summarizes the experiences with CDFs on the Great Lakes.
- The Corps's Dredged Material Management Plans should become integrated into RAPs and watershed plans, and allow for local input. Additionally, the Corps should incorporate the recommendations from the breakout session into the DMMPs

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### **Breakout Session 3: Economics**

The purpose of this breakout session was to weigh the costs of various contaminated sediment clean-up options, including "no action," and to provide recommendations that would improve the economics of cleanup. The group added an additional topic for discussion—Hidden Costs of No Action.

#### **Questions**

##### **1. What are the hidden costs of no action?**

The group chose to discuss first the hidden costs of no action (deferring clean-up efforts). The costs and benefits of any clean-up effort should take into account both short- and long-term factors, and both primary and secondary effects. For instance, opting for no action entails not only higher shipping costs in the short term, but also the long-term impacts of even worse pollution levels caused by congestion as a result of resorting to other transportation methods (i.e., truck, rail, or pipeline). It was noted by several group members that road transportation leads to air pollution, traffic accidents, road maintenance, etc. A participant added that according to the Port Authority, one ship not coming into New York results in the need for 250 rail cars.

The group agreed that, given limited resources, decision makers need to prioritize remediation efforts on significant risks and should try to get the most "bang for the buck" (the greatest benefits gained in exchange for the least amount of resources expended). It was concluded that the bottom line is return on investment. This process will depend on the relative danger posed by the toxic hotspot in question, the degree of local pressure for cleanup, and the ability of the stakeholders involved to leverage the necessary financing. In many cases, the remediation may only occur slowly over time, in step with these driving factors.

Members of the group acknowledged that there could be benefits gained from splitting the costs among the transportation stakeholders (to dredge and haul/load) and an environmental fund (for costs of disposal).

General consensus was that the no action problem is a severe one. The worst-case scenario is that the shipping industry suffers to the point where they cannot afford to operate because the Corps cannot dredge contaminant sediments. . . fish advisories put the fishing industry out of business. . . companies move out of the city. . . the city goes downhill very quickly, etc.

##### **2. Are there ways to improve the economics of cleanup, while ensuring environmental standards are met, via incentives for viable development of brown field sites?**

The discussion on brown field sites began with the distribution of an article from the *Milwaukee Journal Sentinel* (May 8, 1995) entitled "The Greening of Brown Fields" for individual review. The group came to consensus that for purposes of the discussion, a brown field is defined as "a parcel of land underutilized because of potential contamination problems."

The use of brown fields for disposal sites for contaminated sediments should be considered in accordance with broader land use priorities and development goals. An effort must be made to redevelop brown field sites, rather than automatically using them for disposal of dredged materials. It was of great concern to some group members that new development be built where the infrastructure already exists and where the jobs are needed. There was group consensus that brown fields are not a panacea for disposal of contaminated sediments.

Continually raised was the issue of long-term generation of funds to reinvest in the property. Specifically, it was suggested that a program be established to encourage the beneficiary to whatever value is achieved from remediation of contaminated sediments to put the money into a fund for environmental remediation, thereby increasing the value of that land. Money would be generated every time the property is sold, thereby providing funds for future remediation. Tax increment financing (TIF) was discussed. TIF is a program in which a portion of property tax revenue is set aside to finance continuous site improvement through gradual clean-up efforts.

**3. Are there ways to improve the economics of cleanup, while ensuring environmental standards are met, via mechanisms to make the technology more accessible and affordable?**

The group did not address this question.

**4. Are there ways to improve the economics of cleanup, while ensuring environmental standards are met, via strategies that pool resources to help defray clean-up costs and liabilities?**

One group member stressed that pooling resources and partnering to help defray costs and liabilities is often faster and cheaper than the litigious route. The group came to consensus that decision makers should pursue more holistic "upstream" strategies to prevent further generation and accumulation of contaminated sediments in conjunction with "downstream" remediation efforts. This approach was referred to as a multimedia watershed approach. If the goal is to reduce the mass balance of persistent toxins within a given ecosystem, there might be room for flexibility in terms of trade-offs in regulation of point and nonpoint sources.

Incentive programs already exist to encourage landowners to adopt more sustainable and responsible practices:

- Conservation Reserve Program (CRP) for farmers
- Reinvest in Minnesota (RIM) and other such state conservation programs
- RECLAIM, the California pollutant trading program
- Conservation easements through private land trusts
- Tax increment financing (TIF).

- Urban Renewal/Cleanup Bonding Authority, which raises revolving funds to provide would-be developers with seed grants, cost-share packages, low-interest loans, etc.
- Stakeholder resource base, which could be expanded to involve other jurisdictions with taxation authority (i.e., watershed districts, sewage districts) and interested industrial sectors.
- Legislative measures to limit liability, such as Wisconsin's Land Recycling Act, which protects responsible parties from future lawsuits once they acquire and clean up contaminated sites.

When considering economic incentives to bring value to the site, one group member urged that focus be placed not only on the disposal end, but also on incentives to keep that topsoil on the ground in the first place (i.e., think prevention versus remediation).

Group members were in agreement that cost-cutting strategies should involve assessment, prioritizing sites, and prioritizing within a site. It was noted that assessment needs to be timed with the community's ability to respond.

## **Recommendations**

- The costs and benefits of any clean-up effort should take into account both short- and long-term factors, and both primary and secondary effects. For instance, opting for no action entails not only higher shipping costs on the immediate horizon, but also worse pollution, congestion, etc. in the future as industries are forced to shift to other modes of transport (i.e., truck, rail, pipeline).
- Given resource constraints, decision makers need to prioritize remediation efforts and should try to get the most "bang for the buck."
- The use of brown fields as disposal sites for contaminated sediments should be considered in accordance with broader land use priorities and development goals. For instance, municipalities are not interested in "writing off" prime downtown property as permanent dumpsites or turning poor urban neighborhoods into "toxic sacrifice zones." It is necessary to fight the perception that brown fields are a disposal panacea. However, brown fields may be appropriate for sediment disposal in certain sites.
- A multi-media watershed approach should be taken to address contaminated sediments.
- Local, state, and federal authorities should pursue creative strategies to provide incentives for remediation and reclamation of contaminated sediment sites. Consider the viability of programs involving trade-offs, such as pollutant trading, when the result is a net benefit to the environment.

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## **Breakout Session 4: Regulatory Approaches and Barriers**

The purpose of this breakout session was to identify the regulatory mechanisms that are the most and least effective in remediating contaminated sediments, and to provide recommendations that would lead to improved methods for effective and expeditious cleanup of contaminated sediments.

### **Questions**

#### **1. What regulatory approaches have been most effective in getting sites cleaned up or well on their way to being remediated? Are there other regulatory approaches that could be used?**

The group leader began by listing various uses of regulatory approaches, such as the following to compel parties to clean up, to recover costs for EPA cleanups; to coordinate with natural resource trustees to seek restitution for injuries to natural resources, to negotiate supplementary environmental projects undertaken in lieu of civil penalties; and for prevention and source control. The primary regulatory tools used in sediment remediation are Superfund (CERCLA), RCRA, Clean Water Act, TSCA, the Rivers and Harbors Act, and Natural Resource Damage Assessments. He referred to the discussion of applications of these regulatory authorities in the background paper and asked the group whether there are any additional regulatory tools that are particularly effective in remediating contaminated sediments.

#### *Additional Effective Regulatory Tools Identified by the Group*

- SACM (Superfund Accelerated Cleanup Model) - Using SACM enabled the clean-up process to be triggered sooner than through the normal Superfund process, providing a presumptive remedy.
- Negotiated Consent Decrees - This approach brought all parties together up front. One participant said it was easier to deal with the states because they seem to have more local interests in mind and discussed a successful state consent decree. He felt state involvement was crucial because remediation will ultimately be determined by state processes. Further discussion of this item led to a conclusion that negotiated federal consent decrees, as in Northwest Indiana, had similar benefits.
- A group member suggested using market-based mechanisms as an avenue to achieve a regulatory end - This suggestion was made in the context of developing a program to prevent the perpetual industrialization of brown field areas and other contaminated property. The group did not reach consensus on this item and suggested that it might be a topic for the Economics session.

#### **2. What are the major regulatory obstacles to achieving remediation?**

The group leader listed the following barriers that had been identified in the EPA report *Barriers to Managing Great Lakes Contaminated Sediments* (and are summarized in the background paper): regulatory actions can be contentious and resource-intensive and may not produce the right result; overlap and conflicting goals

exist among applicable authorities; disagreements exist between EPA and the Corps on RCRA applicability; permits can be burdensome to obtain; RCRA regulations are not derived with dredged or remediated sediments in mind, cross-media coordination can be lacking; the EIS development process is slow; and the Corps is concerned about liability in CDF construction. He opened the discussion for the group to list other barriers.

### *Regulatory Obstacles to Achieving Remediation*

- Often federal and state authorities are not involved in an action at the same time. A group member felt PRPs should be able to deal with the states and federal authorities at the same time. Often he has found the states are brought in too late. There was follow-up discussion as to whether EPA adequately informs the states of the action or whether state resources are a problem that prevents them from taking an active role early in the process.
- The above comment was eventually expanded to include early involvement of all of the stakeholders involved at the site—PRPs, federal (specifically EPA, the Corps, and NRDA trustees), state, local government, and public interest groups. A group member commented that in the past NRDA trustees have come in late in the process and have caused problems, bringing activities to a halt perhaps providing an example of the lack of early involvement.
- There is a general lack of consistency in regulatory approaches among states and EPA Regions. A group member felt this is where EPA can play a strong federal role in developing consistent approaches for sampling and for deriving clean-up goals. It was made very clear that the approaches would not emphasize specific numbers, but rather the methodology for deriving the numbers. Another group member suggested that in the current political climate more programs are being turned over to the states and this might further increase inconsistencies. EPA advised that a workgroup exists that includes EPA and the eight states in the Great Lakes region to address clean-up goals and objectives across the Great Lakes Basin.
- There is a lack of flexibility/consistency in the regulations themselves. A group member stated that there is a lack of consistency among EPA Regions. He used the QAPP (Quality Assurance Project Plan) approval process as an example of a process that can vary from Region to Region. He encouraged Region 5 to be more product-driven and less process-driven. EPA responded to the comment by agreeing that the QAPP approval process is a concern. The Superfund program gives the Project Manager the ability to force a QAPP approval. The Region is decentralizing its QAPP approach in an effort to resolve these concerns.

A participant felt that waiver authorities could be applied in site-specific (not issue-specific) cases. Stakeholder input for specific applications would make more sense and would be achievable.

While greater flexibility in the regulations was suggested, comments were made that the standards still have to be met to protect the environment and human health. There is no "truth by majority," and the standards should not be subject

to consensus building. The application of the regulations should involve flexibility and consensus building within the framework of the standards and goals that have been set

- When several PRPs and multiple pollutants are involved (no "smoking gun"), regulatory approaches are more difficult to apply. However, enough people and agencies have to be involved to ensure the goals are met, responsible parties pay, and problems do not arise after the fact
- RCRA regulations are not really suited to sediments. A participant stated that a question at issue is whether sediments are even a solid waste. He believes that this question is dogging the application of RCRA. EPA should be decisive as to whether and when RCRA is applicable. Another group member suggested pursuing a sediment-specific statute or regulation that could address how to determine hotspots and disposal requirements.

### **3. What case studies exist to show how regulatory approaches have failed or succeeded?**

The group leader presented several Region 5 case studies from the *Barriers* report (summarized in background paper) as examples and asked the group for further examples.

#### *Case Studies*

- Coeur D'Alene, Idaho - A group member reported that there was no early involvement of EPA. The State of Idaho made a deal with the PRP that was very lax and will likely lead to legal challenges. The participant felt if EPA had been involved early in the process, the settlement would have been more legally defensible.
- Annie Creek, South Dakota - All parties (federal, state, tribal, public) agreed to remediate the site under the CWA instead of Superfund (although Superfund requirements were met), which caused the site to be cleaned up twice as fast and at half the cost that would have been realized if it had gone through Superfund. It was observed that this approach may be similar in effect to the SACM approach mentioned in item 1.

### **Recommendations**

- Establish a dialogue among stakeholders to improve consistency among states and regions for remedial activities (consistent approaches for assessment (i.e., clean-up goals), sampling methodology, and disposal requirements once the sediment is characterized)
- Continue the EPA/state clean-up goals workgroup. Expand this workgroup to include other stakeholders.
- Encourage greater involvement of all stakeholders up front (federal, states, NRDA trustees, industry, public)



- Allow greater flexibility in regulations on a site-specific basis within the confines of standards and goals that have been defined. For example, provide a mechanism that would allow federal authorities to manage private contributions; broaden the application for permit waivers and "ARAR" waivers, and clarify definitions of liability (USEPA/NRDA) and cost share (USACE)
- Solve the RCRA applicability problem. Maybe eliminate RCRA from sediments and allow sediments to be dealt with more strongly under CWA section 404 so RCRA would not have to be invoked.
- Encourage market-based mechanisms to move the process faster.
- Establish a broad-based stakeholder advisory group for regulatory issues to advise on site-specific applications as well as to deal with flexibility issues, variances, etc.\*

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\* In lieu of this recommendation, a stakeholders group has been proposed to further define opportunities for regulatory flexibility within applicable standards, including the staging of remedies, the use of negotiated settlements, the application of permit and ARAR waivers, etc

***SUMMARY OF OPEN DISCUSSION  
FROM BREAKOUT SESSIONS 1-4***

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Issues and topics that were raised during the open discussion included the need for EPA to be flexible yet decisive, the public's misunderstandings of CDFs, factoring environmental benefits of dredging into cost/benefit analyses, and use of the Workshop proceedings and recommendations by EPA and other participants. Detailed questions and answers for this section are included in Appendix A.

## ***BREAKOUT SESSIONS 5-8***

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### ***Breakout Session 5: Public/Private Partnerships***

The purpose of this breakout session was to share successful and unsuccessful experiences gained from various cooperative approaches to remediate contaminated sediments.

#### **Questions**

##### **1. How can cooperative approaches improve the chances of getting sites cleaned up?**

There was overwhelming agreement in the group that cooperative approaches can alleviate the gridlock of costly litigation. Many members of the group agreed that a partnership has the unique ability to stir passion to reach cleanup by exhibiting a sense of leadership. It was recommended that in order to get results, a partnership should be treated as a community project, rather than an industry cleanup or government initiative.

##### **2. How are successful public/private partnerships developed? How do you build up trust from all sides?**

Most group members were in agreement that some type of structured management is needed to maintain momentum within the partnership. A full-time facilitator/manager has become necessary for some partnerships. It was the general consensus that a common objective must be set forth from the beginning of the partnership to avoid subsequent confusion. Partnerships must recognize and learn from failures of past cooperative agreements and move forward.

It was decided that critical to a public/private partnership is the need to establish community ownership early on. According to some group members, this step is often ignored. The community must have a legitimate role in decision making and must be included at every stage of the process. Also to be considered are the stakeholders of the larger community—the Great Lakes areas, for example. Community-based decisions in one partnership may have ramifications on other sites around the Great Lakes.

Group members acknowledged the importance of a successful outreach program. Although there was no consensus on the method, aggressiveness in recruitment was conceded. One group member emphasized the need to define the economic benefits to individuals who will benefit indirectly as a result of cleanup. No group or individual is too small for inclusion.

One participant raised concerns about the Fox River Coalition's public participation process. According to the participant, the public was excluded from early meetings of the Coalition. Failure to include the public early on has diminished the trust of several parties involved. Another participant (and Fox River Coalition member) strongly opposed the statement that the public was excluded from the Coalition.

meetings. The participant stated that the Coalition's meetings have always been open to the public. The Fox River Coalition participant also responded that the Coalition was trying to improve its public participation process through public information meetings and other activities being planned by the Coalition's Public Outreach Workgroup

One participant said that in order to build trust in a partnership, the partnership has to begin at the outset with honesty, a clear set of goals that include true cleanup and fair funding, and an open process where the public plays a meaningful role in the decision-making process. Another participant responded that honesty needs to work both ways, i.e., environmental groups need to be up-front and honest, too, in their involvement in partnerships.

It is important to consider who will benefit from a cleanup and then get those benefactors on board, they are needed for credibility. Reference was made to the Ashtabula River Partnership, which invited all property owners along the river to join the effort. Not everyone who joined the partnership could afford to contribute financially, but at least they were supporting the cause, and that spirit can be infectious.

One group member stressed the influence of a hammer from regulatory agencies to keep the voluntary process moving. Regulators have the ability to provide needed input, and they have the responsibility to demonstrate a solid commitment.

A question was raised. "Who gave the members of various partnerships the authority to act?" It was suggested that community authority was self-proclaimed.

All group members learned from past experience that an agreed-upon schedule must be established from the beginning. Also, a commitment from all parties must be made that funding will stay in place, even if one group pulls out.

Trust was a serious issue raised by several group members. Trust is built when clear goals are established from the start and the entire decision-making process is open to all parties. One group member commented that the government cannot expect to plan the entire process, then invite the public and environmental groups to ask for their consent.

Some group members agreed that a commitment to a certain degree of cleanup should be established by the partnership. One participant felt strongly that political pressures placed on certain members of a partnership could not allow an objective selection of clean-up goals by that partnership. In particular, the participant expressed concern about having voluntary partnerships set clean-up standards. The participant felt that involving local government officials or industry representatives in selecting clean-up goals created a conflict of interest since these parties might be most concerned about minimizing the ultimate cost of the cleanup. The participant stated that the authority for making clean-up decisions should remain with the regulatory agencies that are charged with protecting public health and the environment.

### **3. How do you ensure progress and get sufficient funding from all partners for remediation?**

There is always the awkward issue of "Who is going to commit their money and make the first step in good faith?" One group member recommended that federal authority be used to buy good will. It was noted that although not all partners are able to contribute money, many are able to donate in-kind services.

There was no doubt that a financial incentive is required to persuade potentially responsible parties (PRPs) to come to the negotiating table. Members from the Ashtabula partnership found that PRP attitude is essential. PRPs are prepared to come to the table and spend a lot of money, and in return they must have input into the decision-making part of the partnership.

There was considerable discussion about who should pay for cleanup. There was consensus that fairness in the distribution of clean-up costs was a worthwhile goal and important for gaining public support. However, opinions varied widely on the definition of "fairness." Most participants agreed that industries (or other parties) responsible for discharging pollutants into a waterway and contaminating the sediments should bear a substantial portion of the clean-up costs. Some felt that the taxpayer (state and federal) should contribute as well, since the community and public derived some benefit from the operation of these industries. At least one participant felt strongly that taxpayers should not bear the brunt of clean-up costs when the contamination can be attributed to one or more responsible parties. In areas with large agricultural watersheds contributing contaminants to a river from a variety of sources, one participant stated that it would be more equitable to have the taxpayers share in clean-up costs rather than holding ports and industries responsible for clean-up costs.

Questions were raised as to the degree of financial commitment directed at cleanup by the industries involved in the Ashtabula and Fox River partnerships. In both cases, these amounts are yet to be determined.

### **4. Are there examples of successful public/private partnerships? If yes, how can these success stories be applied elsewhere?**

The Fox River Coalition for cleanup of the Fox River Valley and Green Bay areas of Wisconsin and the Ashtabula River Partnership for the Ashtabula River and Harbor in Ohio are examples of public/private partnerships. These partnerships are in their infancy, and it's too early to tell if they will result in more timely and efficient sediment remediation than would regulatory approaches. Group discussion led to the conclusion that success stories can be applied to critical attributes of effective partnerships everywhere.

### **Recommendations**

- A public/private partnership is one tool to consider in cleaning up contaminated sediments.

- A successful public/private partnership must be inclusive and transparent and must include broad-based decision making. Trust is a very important component of successful partnerships.
- An effective public/private partnership requires broad-based funding, including public and private sources
- Partnerships must define clear goals from the beginning, have commitment from all partners, and develop and use measures of success (schedules, work plans, etc.)

## **List of Participants**

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## **Breakout Session 6: Remediation Technologies**

The purpose of this breakout session was to identify the most appropriate remediation technologies to be used in various situations and to determine the factors used to select technologies at a specific site. The participants identified questions 3, 4, and 5, which replaced questions 1 and 2 for discussion.

### **Questions**

**1. When are the remediation approaches listed below appropriate for Great Lakes contaminated sediments?**

Capping  
In situ bioremediation  
Dredging  
Treatment technologies  
Natural recovery

**2. How do you select among the alternatives listed above for a specific site?**

**3. Are universities doing research on these technologies and how is that research transferred for regulatory applications?**

It was agreed that universities are doing research related to remediation technologies, but it appears to be primarily based on conceptual theory rather than applied research. The workgroup discussion then focused on why this is true and how to bridge that gap between conceptual research and applied research.

Current research is being conducted at universities in the Great Lakes Basin. The University of Minnesota is doing work on landfills and is moving out into the aquatic environment; GLNPO funds studies through its sediment program; and outside the basin EPA Region 2 is currently involved with the Corps of Engineers, Brookhaven National Laboratory, and a team from Rensselaer Polytechnic Institute, New Jersey Institute of Technology, Steven's Institute, and Rutgers University to develop and field test decontamination technologies in New York/New Jersey Harbor.

University research follows long-term funding. There hasn't been a stream of dollars for sediment remediation technology. In addition, it was mentioned that academic institutions do not tend to support applied technology research so there is no incentive on the university's part to pursue applied research.

Universities tend to focus on bench-scale studies that may not be effective in field applications. A participant made the comment that there is no effective feedback loop for those experienced in field applications to communicate their needs and experiences to those in the research field who are responsible for conceptualizing solutions.

Someone mentioned the need to bring private interests into the equation to drive conceptual projects that have potential to the endpoint of full-scale technologies.

Part of the problem seems to be that private firms won't do research and development if the technology isn't proven, and the federal government is reluctant to fund projects that could be profitable for private companies. It was suggested that the government needs to become involved in private research to bridge the gap. Someone commented that governments in other countries provide support to private entities for technology development and it has worked quite well.

Existing research centers such as hazardous waste research centers or NIST should be studied, and their mission statements should be examined to determine whether they have been successful in bridging the gap between conceptual and applied research.

#### **4. How do we go from the conceptual design of a remediation technology to technical implementation?**

The discussion focused on how to educate all of the participants involved in a site remediation to implement an effective technology once it has been selected. It was felt that oftentimes the correct alternative is not selected or not implemented correctly because of a lack of understanding on how the technology should be implemented in the field.

A participant made the comment that often parties that are involved in remediating a site are not aware of limitations in a real-world setting. He felt that this leads to improper or incomplete remediation of a site.

The nature of sediments and sediment transport leads to conceptual alternatives that may be impractical in a field setting. For example, a comment was made that there was a proposal to excavate a "prism" of contaminated sediment from an aquatic site. The project manager did not take into account the fact that the sediment would slump into the open space that was created. The question put forth to the group became how to educate all the players in sediment remediation about practical solutions for remediation.

It was agreed that although GLNPO has prepared several reports on remedial technologies and has conducted technology transfer to groups throughout the Great Lakes region, more technology transfer is needed to reach the appropriate audiences on various technologies.

The group thought the target audience should include the Corps and Superfund managers, as well as other personnel involved in site remediation.

It was also suggested that "post mortems" on remedial projects would be helpful to show what worked and what didn't. The group leader stated that GLNPO is collecting that information from its demonstration projects.

There was discussion regarding the need to compile and "institutionalize" the tools that have been developed and applied at sites. These tools include modeling, capping guidance, and lessons learned from other sites. It was recommended that tools not be limited to the Great Lakes Basin. The group suggested increased technology transfer of these tools once they have been compiled.



## **5. Can we define a decision process for choosing remediation alternatives?**

The group focused on the questions and factors that drive the selection of remedial options at a site. The discussion was based on the assumption that it had already been determined that remediation is appropriate.

The group first addressed in situ versus ex situ remediation, but then broadened the factors to remediation in general. Various factors mentioned in the decision process for remediation included cost, implementability, effectiveness for eliminating future contamination, navigation considerations, and risks to human health and the ecosystem.

One participant felt it would be very helpful to have a decision process to which all the stakeholders at the site could refer up front before an option is selected. She envisioned a one- to two-page sheet with questions leading the reader through various options.

It was agreed that a "road map," not a decision tree, was envisioned. This "road map" would not guide the reader to one specific alternative, but rather would lay out all of the options available.

There was discussion as to how valuable this process would be since it would have to be so general that it might not be very effective in site-specific cases. The group overall, however, felt that there is still a need for a general, diagram-like illustration of the process for selecting a remedial option, particularly for citizen action groups.

The group leader stated that GLNPO and the Corps tried to develop a decision tree three years ago but were not successful because they could not reach consensus on the paths of remedial choices and what decisions would lead to various remedial options. He said that some of this has been covered in an ARCS guidance document, which can be used as a beginning point.

A final comment was made regarding the development of interim goals. The commenter felt in many situations 80 percent of the problem can be remediated with 20 percent of the funds. He stated that the Superfund program tends to be inflexible in demanding that 100 percent of the site be remediated, which delays the cleanup and isn't always feasible. He suggested interim goals wherein the PRP would be responsible for cleaning up the entire site, but the cleanup could be done in phases. There was concern that if a PRP took a "short cut" it would not complete the remediation. It was agreed that interim goals should be looked at as long as there is a long-term commitment.

## **Recommendations**

- Increase private participation in academic research to bridge the gap between conceptual and applied research. Examine existing research centers and their mission statements. Government should identify foundations to develop a Request for Proposal for a central coordination effort to better forge public relationships with private sectors.

- Increase technology transfer activities.
  - Institutionalize tools for use at sites (i.e., modeling, capping, lessons learned). Broaden applicability beyond the Great Lakes Basin.
  - Transfer the information collected on project evaluations from sites, highlighting what worked and what didn't.
  - Conduct more effective technology transfer of remedial technologies to individuals involved in the entire process (EPA, Corps of Engineers, Superfund program)
- Develop a "road map" of the decision process for selecting a remedial technology
- Research the concept of interim goals for remediation, or a phased approach, as long as there is a long-term commitment on the part of the PRP.

### **List of Participants**

Dan Banaszek, Woodward-Clyde  
 Mark Brown, Blasland Bouk and Lee  
 Mike Dawley, Great Lakes Protection Fund  
 Steve Garbaciak, USEPA Great Lakes National Program Office  
 Roger Jones, Michigan Department of Natural Resources  
 Bruce Kirschner, International Joint Commission  
 Charlie MacPherson, Tetra Tech, Inc.  
 Anna Miller, USEPA Region 5  
 Bruce Roberts, BASF Corporation  
 Paul Rodgers, Limno-Tech, Inc  
 Susie Schreiber, Waukegan CAG  
 Dick Schwer, Dupont Company  
 John Sherman, Great Lakes Protection Fund  
 Eric Stern, USEPA Region 2  
 Larry Studebaker, Indiana Department of Environmental Management  
 Larry Sullivan, Port of Milwaukee

## ***Breakout Session 7: Clean-up Goals and Objectives***

The purpose of this breakout session was to discuss the need for sediment quality criteria for cleanups and, if needed, to determine whether they should be site-specific or consistent throughout the Great Lakes.

### **Questions**

#### **1. Do we need sediment quality criteria for cleanups? Do sediment quality criteria play a useful role in remediation?**

The group leader began by stating that the two issues that definitely needed to be discussed were (1) the roles of sediment quality criteria (SQC) and (2) the issue of uniformity and consistency throughout the Great Lakes. The group leader reminded everyone that, at this point, there are no promulgated SQCs. EPA has proposed five SQCs (which include pesticides and PAHs). Because they are not for the major compounds causing impairments to the Great Lakes, they will not be a panacea in terms of "hard" numbers. He also said that if the Regions wait for promulgation of SQCs, the Regions will be waiting a long time to perform any kind of remedy. The group leader then focused on a group discussion.

The group concluded that a mechanism is needed to establish a starting point for contaminated sediment remediation. There is a need for a screening-level tool to assist in determining whether there is even a potential problem. Numerical levels may be useful as a screening tool at the outset of a project to determine levels of contamination and help guide a second phase of assessment. Some participants said that SQCs are needed because they can trigger a cleanup. However, other participants maintained that SQCs should not be used alone in remediation decisions. Another participant stated that SQCs are also needed to meet enforcement and regulatory objectives.

Participants suggested establishing interim standards (goals) that require, for example, a clean-up goal of 90 percent. It was suggested that the term "sediment assessment values" be used instead of calling them SQCs. A group member expressed concern that it might be more difficult to go forward with cleanup based on an interim number knowing that there is a possibility of later action against a site. People want to be able to walk away from a site after it's considered 100 percent cleaned up.

The group leader gave an example for developing an interim clean-up standard using PCBs. He stated that the current proposed standard for PCBs is 80 to 100 ppb for protection within the food chain. An interim sediment quality criterion that would allow for fish consumption once a month with 10 ppm in the tissue may result in a substantially different clean-up goal. At this level, fish could be kept off an advisory list.

The facilitator asked the group whether clean-up goals are a risk-driven issue—e.g., whether clean-up goals are based on the goals for a risk assessment. Participants commented that this is a very complex way to evaluate the situation. Because there are so many models and so many different endpoints, there will be several ranges of

numbers. One risk assessment will use one model and set of numbers, while another site could use a different model and a different set of numbers.

The group summed up the benefits of SQCs. SQCs are useful for the following purposes:

- As a screening tool to trigger a more detailed site assessment.
- To determine the scope of adverse effects.
- As part of a tiered assessment approach (which uses weight of evidence) to establish goals for cleanup to determine site assessment and clean-up objectives.

The group members cautioned against using SQCs to establish final clean-up goals.

**2. Do sites have to be prioritized prior to taking action (e.g., address the upstream and worst sites first)?**

Several participants felt that prioritization of sites based on the risks of contamination is needed prior to taking action. This approach is particularly helpful with limited resources. Prioritization helps to focus efforts on the most significant risks.

**3. Should there be uniform clean-up goals across the Great Lakes? Must we be consistent from site to site?**

A group member stressed the need to make clear that there is a distinction between overall goals and site-specific goals. Overall goals for the Great Lakes should be the same (e.g., eliminate fish advisories), however, how this will be accomplished will vary from site to site. Goals should be generalized, stating what you ultimately want to achieve. Our overall goal is the protection of the environment. When defining the goals, it is important to maintain communication and negotiations between all parties involved. The same terminology should be used between negotiators.

Several group members stated that there is a need to focus on a consistent methodology—not consistent numbers—to which all stakeholders can agree.

**4. Do we have to wait until we are convinced recontamination won't occur before remediating?**

(This question was not addressed.)

**5. How can we get acceptance of clean-up goals from the various stakeholders?**

The group recommended that in order to gain acceptance of clean-up goals, stakeholders must be involved early in the process. This is also true for getting acceptance for the methodologies.

There is a need to resolve the technical issues from risk assessments. Conclusions on remediation are very different by parties using the same data sets because of different methodologies and endpoints. Consistent methodologies are critical to the process.

**6. In what situations, if any, is natural recovery a viable alternative to remedial action?**

Natural recovery is part of any remediation scenario. Ideally, source controls should first be implemented at contaminated sites to prevent further contamination. Then remediation efforts are involved (removal, stabilization, treatment). Finally, the natural recovery process begins. In some cases, the best remediation option may be leaving the contaminated sediment in place and allowing natural recovery to occur. All situations need to be evaluated thoroughly prior to settling on a remedial option.

**Recommendations**

- Develop methodologies that all Great Lakes stakeholders could adopt—methodologies that could be used by all programs to develop clean-up goals. The existing sediment clean-up goals workgroup with the addition of other stakeholders should participate in the development of the methodology.
- Use sediment quality criteria in conjunction with other methods as screening tools to trigger future efforts.
- Sediment quality criteria should be expanded beyond the protection of benthic organisms.
- EPA should develop screening values for a wide variety of chemicals in an expedited manner.
- Form a stakeholder workgroup and use it as a vehicle to gain acceptance of a plan (goals). EPA and the local and state levels need to be involved in addressing environmental protection using a community-based approach. There must be stakeholder agreement on the issues and solutions formed by these groups, coupled with an honest outreach/education effort on their part.
- Prioritize sites to make the best use of limited resources and to focus remediation efforts on the most contaminated sites. When prioritizing sites, stakeholders need to consider other factors, such as the effects on the shipping and fishing industries. The issue of sites with multiple hotspots will also have to be addressed.

## **List of Participants**

Lee Bridges, Indiana Department of Environmental Management  
Dan Burke, Lake Michigan Federation  
Jeff Busch, Toledo-Lucas County Port Authority  
Bonnie Eleder, USEPA Region 5  
Liz Hiett, Tetra Tech, Inc  
Jim Henry, U.S. Army Corps of Engineers  
Tom Janisch, Wisconsin Department of Natural Resources  
Lee Liebenstein, Wisconsin Department of Natural Resources  
Rick Lark, Rust Environmental  
Rick Menozzi, U.S. Steel  
Floyd Miras, Maritime Administration - Department of Transportation  
Michael Raab, Erie County Division of Environmental Compliance  
Tony Wagner, Chemical Manufacturers Association  
Howard Zar, USEPA Region 5

## ***Breakout Session 8: What's Missing?***

The purpose of this breakout session was to discuss various approaches to decontamination of sediments in the long term, as well as to find effective methods for development and promotion of decontamination technologies. The group discussed which parties should be held liable for contaminated sediments and thus sponsor their removal and decontamination.

The group leader began by discussing pollution control programs at the federal and state levels and whether those programs include contaminated sediment issues. The group agreed that section 319 of the Clean Water Act addressed the problems somewhat through erosion and sediment control best management practices (BMPs), but that there was a gray area between the 319 programs and the various Natural Resource Conservation Commission programs that has not been addressed. They also concluded that the 319 program was more educational than regulatory.

### **Questions**

#### **1. How do we ensure decontamination of the sediments in the long term (source/pollution control; control of sediment movement)?**

The following comments and suggestions were made to address the issue of long-term sediment decontamination:

- Include NPS controls as a requirement for securing dredging permits.
- Develop additional authorities to address interstate sediment pollution problems.
- Include sources of sediment problems in Remedial Action Plans (RAPs) even if they do not fall within the jurisdiction of the RAP (i.e., consideration of the whole watershed).
- Develop a long-term partnership that includes state, federal, and local agencies, as well as industry representatives, citizen groups, and any other interested parties to expand RAPs to include watershed plans. It was suggested by one group member that the International Joint Commission take the lead in this partnership, as well as develop watershed plans for other areas outside the Area of Concern.

#### **2. How do we promote the economic viability and development of decontamination technologies?**

The group made the following suggestions to address this question:

- There needs to be a market for remediation technologies that industry can tap into as an incentive for sediment decontamination. This market will be hard to develop if the cost for new technologies remains unpredictable. Increase research by land grant institutions into new treatment technologies. [Note similar recommendation for help gearing up decontamination technology industries in "remediation technologies" section.]

- To reduce the cost for use of these new technologies, we must reduce the volume of sediment to be decontaminated
- Emphasize low-cost, low-tech pretreatment technologies to reduce volume such as those used in mining operations (e g., sorting sediments, dewatering, and soil washing).
- Consider mining technologies for guidance on contaminated sediment pretreatment technologies

### 3. How do we ensure that landfills, when used, are "sediment recycling centers" versus permanent repositories for contaminated sediments?

The group leader started discussion of this question by asking whether group members thought that regional CDFs were a viable alternative to several smaller CDFs. Following is a list of pros and cons discussed by the group.

#### Pros and Cons of Large Regional CDFs

Pros	Cons
Cost of construction and disposal would decrease	Cost could increase due to transportation distances
One-stop shop (CDF and sediment recycling center)	Safety hazard because of long-distance transport
	Siting issues - Who wants it?
	Hard to drum up political support due to siting issues

One participant asked whether sediment recycling is currently included in Dredged Material Management Plans. Jan Miller of the U.S. Army Corps of Engineers explained that so far, only soil washing is included.

The group leader then discussed the following limiting factors surrounding sediment decontamination.

- ***Future Land Use*** - Local citizens might not want to disturb a CDF years after it has been filled. The decision then becomes a local land management decision.
- ***Design*** - CDF design is contingent upon current regulations. If there are changes in regulations due to new technologies, old CDF designs might become obsolete.



#### **4. Who (PRPs, municipalities, others?) should assume the liability for sediment pollutants while stored in landfills?**

The group leader explained the role the Corps plays in terms of liability for contaminated sediments disposed of in CDFs. Currently there is a "hold harmless" clause that limits Corps liability to faults in design or construction, but if environmental problems do arise in the future, the consensus was the clause would be ineffectual.

One group member suggested that "environmentally grim Superfund-like sites" be considered for use as future locations for CDFs. An environmentally grim Superfund-like site would be defined as a larger nonoperational facility with especially challenging contaminant types. Examples would include a closed refinery or coking operation associated with an aquifer contaminated with significant volumes of free-phase hydrocarbons. Given the technical limitations associated with the currently available remedial technologies, corrective action at such sites is commonly predicated upon containment. The components needed for containment would be incorporated into the design of the CDF. The resulting remedial hybrid CDF can be simpler in design. This would reduce the cost of construction and would lessen the overall liability. In addition, this reduced liability would be shared among the PRPs, the entity constructing the CDF, and the users of the facility. The PRPs under this scenario become the local sponsors of the CDF, contributing the property and potentially funds for the remedial components included in the hybrid CDF design.

#### **Recommendations**

- Recommendation for source control upstream
  - Develop DMMPs that include watershed management plans
  - Implement statutes with enforcement provisions (e.g., every negative impact on water quality in Pennsylvania results in a \$1000/day fine)
  - Include performance-based economic incentives in DMMPs.
- Incorporate DMMPs in RAPs
- Promote low-tech sediment remediation technologies, such as pretreatment technologies like soil washing, froth flotation, and particle size separation
- Increase cooperation among EPA, the Corps, and the Bureau of Mines to further examine pretreatment technologies
- Implement a pilot sediment reclamation project at an existing CDF to be spearheaded by EPA and the Corps
- Reduce the number of new CDFs needed by lengthening the life of existing CDFs through sediment reclamation
- Examine the feasibility of using "grim" brown fields for CDFs.

- Attach user fees for use of CDF permits in order to fund long-term liability concerns.

### **List of Participants**

Melissa Bowen, Tetra Tech, Inc  
Jean Chruscicki, USEPA Region 5  
Marcia Damato, USEPA Region 5  
Patricia King, Sierra Club  
Alden Lind, Conservation Legacy Alliance  
Jan Miller, U.S. Army Corps of Engineers  
John Peck, Sierra Club  
Dave Petrovski, USEPA Region 5  
Charlotte Read, Save the Dunes Council  
Ray Schreckengost, Erie-Western Pennsylvania Port Authority  
Marc Tuchman, USEPA - Great Lakes National Program Office

## ***SUMMARY OF OPEN DISCUSSION FROM BREAKOUT SESSIONS 5-8***

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Issues and topics that were raised during the open discussion included the need to address long-term accumulation and air deposition, long-term funding for sediment management, the Great Waters Program, using water quality criteria to generate sediment clean-up goals, the Enhanced Mass Balance Project, the Lake Michigan Mass Balance, the impact of political pressure on clean-up goals, setting reasonable clean-up standards, an approach for establishing a stakeholder advisory committee to address regulatory barriers, the slow pace of the RAP process, the marginal cost argument, Superfund litigation, the need for stakeholder information exchange meetings on sediments, future legislation, and expansion of stakeholder representation at future sediment meetings. Detailed questions/answers and open discussion topics for this section are included in Appendix A.

## **APPENDIX A**

### **QUESTIONS AND ANSWERS FROM STAKEHOLDER PRESENTATIONS**

*Question:* The Great Lakes water quality initiative never came up during EPA's perspective presentation.

*Response:* The ultimate system of standards developed by states will reflect the Great Lakes Water Quality Initiative and the sediments criteria work already done. I'm not aware of the Great Lakes Water Quality Initiative having affected a remediation effort.

*Question:* As a new Corps mission, is there a lot of interest in the Corps trying to support environmental remediation?

*Response:* The Corps has two forces moving in opposite directions. On the one hand, we have increasing involvement in environmental remediation, primarily in support to the military and other agencies. On the other side, a shrinking budget has caused us to be very selective on how we spend our navigation dollars. This means less funds for dredging contaminated sediments at some navigation projects.

*Question:* Will legislative proposals currently under consideration in Congress be addressed during the workshop?

*Response:* Yes [EPA]

*Response:* They're still a moving target. We [Corps] don't know what public policy we'll inherit.

*Question:* The Corps has a long-standing opposition to sediment quality criteria. How will they be applied in the regulatory context?

*Response:* We're [EPA] currently in the process of wrapping up public comments.

*Comment:* With regard to the evaluation of dredged material, how all of this will fit together will depend on how states develop their standards.

*Comment:* In Montana, there is a user's manual being developed.

*Question:* What is the schedule on the user's manual and a national workgroup of Great Lakes and regional folks?

*Response:* We're [EPA] just starting to grapple with how individual programs will use sediment criteria. A Sediment Quality Criteria User's Guide workgroup has been formed and has members from EPA Headquarters and Regions. A draft user's guide should be available by the end of the calendar year.

*Comment:* Regarding isolation and stabilization, the concern about the waterways being continually contaminated, the water quality division is lobbying hard to focus on the stabilization aspects of cleanup. Site response people are in agreement with it. It seems to be gaining momentum. Other state agencies seem to have a similar view.

*Comment:* I am troubled by the logic that if states plan to clean up industrial sites, the weight will always be toward treating a site only to the standards of industrial use. This means we will have a great deal of pressure to expand the use of waterfront areas for industrial use. There ought to be an off-setting commitment by the agencies that those areas which have not been contaminated will be designated for recreational use.

*Response:* We [state speaker] do have a tendency to go for the least restrictive use of the waterway given the cost of cleaning up a site. Regarding the St. Louis Remedial Action Plan, locals need to take the opportunity to voice their opinion of what they want done with the water. This has traditionally been a government decision, but should be a local decision.

*Question:* How common is the mixing zone concept for dredged material disposal?

*Response:* I [Corps] don't know how common it is. Section 404 indicates that you consider the mixing zone when determining water quality compliance. When you go to the state for a section 401 certificate, they may have a different opinion. It's hard not to consider the mixing zone regarding material disposal. The State of Indiana is currently grappling with that issue. Different states use different processes. There is no uniformity.

*Question:* What about the importance of the source of the sediments, rather than remediating once the sediments are there?

*Response:* The source feeding the river has been halted. One concern is that we don't get the river [Ashtabula Partnership] dredged, then stir things up again. Another source is the sediments in the river, which are serving as a source to the harbor.

*Response:* We've [Port Authority] been working with the Soil Conservation Service to eliminate the means of the contamination problem. They have demonstrated a way, through the use of modified tillage/no tillage, to remove significant portions of contaminants moving into the river. We cannot wait to address the problem once it's there. We have to look at the beginning of the process. However, each approach must be unique to individual operations.

*Response:* Wisconsin is placing greater emphasis on watershed management, a system-wide approach.

*Question:* As you move toward assessment, what type of long-term funding structure has been set up, as far as the private sector is concerned?

*Response* We're [Ashtabula Partnership] developing a base for local match programs. You need to have all organizations running as a partnership. If we win, we win together. If we lose, we lose together. You have to have a team effort, bring everybody on board.

*Question:* Why has RAP not achieved such partnership?

*Response* Many organizations in the partnership are also active in the RAP. Alone, it just didn't have the cohesiveness. People have now signed a charter. This gave us [Ashtabula Partnership] momentum. Everyone wanted to be a partner. Note that we don't want to see RAP disappear. RAP is a partner.

### **OPEN DISCUSSION FROM BREAKOUT SESSIONS 1-4**

*Comment:* Please elaborate on the request for government to be more decisive. Flexibility would enable one to tailor the remedy and the approach to the site.

*Response* It is often tough to get a decision from EPA. This factor is driven by the science versus science problem.

*Response:* Flexibility and decisiveness are part of the decision-making process. You really need to come together to agree about what it is you agree about. At that point you're in the position to come to grips with what is flexibility and what is confusion.

*Question* Regarding public misunderstandings of CDF, what is the misunderstanding?

*Response:* People misunderstand what it means when someone says they are leaking, what the environmental effects are, why a CDF was built, how it was built, etc. There has been communication breakdown. We [Corps] want people to see that a CDF can actually be a benefit in terms of a clean-up strategy.

*Question.* Does the Corps factor in environmental benefits from the dredged equation in economic cost/benefit?

*Response:* There is an authority set aside for someone with a use for dredged materials to do some kind of environmental improvements—wetlands for example. You can't always just look at the Corps. You need cooperation from many agencies. We need to take a broader perspective.

*Comment:* In our community, the Corps has been misleading with respect to CDFs. This creates a lot of mistrust. There were four CDFs in Lake Michigan. The Corps insisted that there was no leakage while, in fact, they were designed to leak. Wisconsin is now in court. Citizen groups can't afford to hire expert witnesses. There is concern that our representation mechanism could be taken away by the Corps. The island was placed in a very bad spot. The Corps is plodding along despite evidence from experts that it's a bad idea.

There is evidence that these will eventually fall apart. Does it make sense to build these in a water environment?

*Question:* What are the proceedings from this 2-day meeting going to be used for?

*Response:* This meeting is the initial step toward ongoing dialogue with interested stakeholders. Our plans are to hold meetings like this in the future. We need your opinions on specific issues. We will incorporate this information into the Great Lakes Five-Year Strategy. The Sierra Club came up with the idea for this workshop to get consensus on a common strategy on how to proceed. We want to move the ball forward in the Great Lakes to address contaminated sediments. Regarding CDFs, knowledge has not been made readily available or put into a form so local agencies can digest it.

*Response:* EPA might have several potential uses for the information gathered today. We want to find areas of conflict versus areas of consensus. We would like to know about unresolved issues that require follow-up. EPA has worked with other stakeholders and has tried to prepare a Great Lakes strategy. We want a meeting of the minds to figure out where we should be spending our time and energy. Are there legislative needs that come out of this that need to be addressed? We need to find out "What's the next step?" EPA is looking for reaction to what we've been doing.

*Comment:* Note that a steering committee meeting is open to all, here, tomorrow.

*Question:* How will the process be accelerated as a result of this workshop? What will EPA be doing differently?

*Response:* We [EPA] didn't want this to just be a show and tell, hence the breakout sessions. Focusing this on "What should EPA do?" would be too narrow. We want to look at everybody's contribution.

*Comment:* The goal of the [Sierra Club] guidebook is a good one, in part because there are stakeholders that need to be involved that are not here today. Sierra Club intends for experts to review and comment on each section of the guidebook.

*Comment:* Note that the landfill issue mirrors the contaminated sediments issue, except that there is no money-making activity involved. I see threads of progress (i.e., needing to make CDF issues clear to the public).

## **OPEN DISCUSSION FROM BREAKOUT SESSIONS 5-8**

*Comment:* To eliminate new problems with development, we need to address water and air quality rules. Long-term sediment accumulation is part of what should be considered. Long-term accumulation must be factored in. Right now a river is treated as a Teflon tube, but we all know it builds up over time.

*Response:* We [Ashtabula Partnership] did talk about keeping track of NPDES outfall permits, although we thought we had essentially a pretty good program in

place. We thought we would focus more on nonpoint sources, which are frequently more upstream.

*Comment* Air is very unregulated. It is an issue in Green Bay.

*Comment* Research in Minnesota on a reservoir full of mercury reveals that most mercury out there is airborne deposition. The reservoir operation exacerbates the mercury problem.

*Question* In the context of liability, how can we get people to pay for contaminated sediment management in the long term? All people who discharge in any way along the stream should help pay for the long term.

*Response* A fee system could be put in place. Navigation shouldn't pay for the whole thing.

*Comment* A problem with the Great Lakes Initiative is that it needs to deal with airborne toxics. We need to pay more attention to this issue.

*Comment* The Great Waters Program looks at the effects of air toxics on the Great Waters systems. Impairments are identified. There is a regulatory option for providing greater stringency. I think that is germane to the mercury question. The intent is to get at the prevention of bioaccumulative air toxics that cause impairment in aquatic systems.

*Response.* But it's not working.

*Response* That amendment set up a monitoring system. It authorized a source and fate study for mercury in Lake Superior and asked EPA to come up with recommendations annually to reduce toxics. There is another amendment for accelerated action on critical pollutants. (This is in a report on Great Waters.)

*Question* On sediment clean-up goals and objectives, have you looked at the opportunity for water quality criteria to create a setting?

*Response* Yes, water quality criteria for human health and wildlife exist and we are looking at factors. Yes, you would come up with contaminated sediment standards using water quality criteria. But water quality standards are very stringent. We can do that, but we won't come up with a better answer. The desired level of contaminated sediment will still be near zero. A near zero goal is the goal. Can we afford to reach near zero? No. Consider risk management. Ask yourself, "What's second best? What's third best?" We've gone through this exercise for many compounds and have come up with numbers we'd like to see, but they're unreachable.

*Comment* Be aware of a study entitled "Enhanced Mass Balance Project." This project looks at Lake Michigan. Sampling is being conducted. The project was designed to address critical pollutants. It will answer the question "Where are the PCBs coming from?"



*Comment* A bill has been introduced in Minnesota four years running, but killed in the Senate each time. The bill uses a hydrologic cycle as a model for accumulated toxicities. Fallback criteria had to do with material damage to the ecosystem. Anywhere you had a source you could track, you had a legal basis for going out and regulating that source. We need to craft such legislation.

*Comment.* I'm hoping the Lake Michigan Mass Balance Study will provide us with many answers. Ninety percent of the bioaccumulation problem in fish is an atmospheric problem, for example.

*Response:* We wrestled with this issue in the public/private partnership breakout discussion. You have to recommend the pragmatic side of things. There has to be an incentive for people to step up to the bar. The regulatory scheme is good. It's a fallback. But, it can't be the first step. Our group was more generic in setting objectives. Let the individual cleanup take it on. Guidelines are good.

*Comment:* The bottom line is that we need one method that all stakeholders can agree on.

*Comment.* Some of us are concerned with having local politicians heavily involved in deciding what the clean-up goal will be. We fear the political pressure will lead to weaker standards. I don't think the Department of Natural Resources should advocate its response to the public at large and then defer to a small, elite group for decision making.

*Response:* We could consider the criteria issue for years to come. Meanwhile pollution continues. We have to be cooperative and reach consensus.

*Comment* You have to have an administrative hearing to decide what is a reasonable set of clean-up standards. Without the background provided by the formal regulatory process (rule making, standards, etc.), you don't know where you're starting from and what the limits are.

*Comment.* The Clean Water Act provides us with the background. The Department of Natural Resources' job is to make Wisconsin water fishable and swimmable. It's how to get there that's the problem. The Department of Natural Resources does not stop at human health. We look at the food chain.

*Comment* We've talked about early stakeholder and public involvement. There is a general theme of having a clean-up goal forum.

***Presentation made by workshop participant:***

We've discussed the development of an approach for establishing a stakeholder advisory committee to address regulatory barriers. I've developed a "strawperson" for consideration on this issue. The purpose is to provide broad-based review by a group of knowledgeable people representing an array of stakeholders to suggest areas of flexibility.

and variances in regulatory implementation procedures in order to accomplish already-accepted sediment quality goals

The process requires each EPA Region/state to select a core group of stakeholders representing a wide range of interests (i.e., port authorities, municipalities, etc.) This group would be semi-permanent, with three- to five-year terms. This is to provide some consistency.

The next step would be to have the lead agencies and directly involved parties invite the stakeholder advisory committee to come in and review the specifics of that particular situation and render some advice—try to be more flexible with the common sense approach. They would have to submit a charge to the advisory committee stating just what the basis of agreement has been so far. The advisory committee has to know that there has to be assurance that their recommendations will be considered seriously.

You've got this core group. Now add local stakeholders. Focus on balance. This ensures greater credibility of this process. This would be done by the core group itself. It would add to itself, looking at the charge and other circumstances it's aware of.

The stakeholder advisory committee would be given limited but reasonable time to provide recommendations to the regulatory agency. There is a question regarding the work processes. Further definition of this approach is needed.

This core group could also be a sounding board to the region or state of more generic sediment quality issues. Hopefully, the group would have developed a level of trust.

This advisory committee could be used to develop a broad consensus in other technical areas. This initial group of stakeholders could move further along the path toward a more permanent public-private partnership.

*Comment:* This [presentation] sounds like another layer of bureaucracy that will slow the process down.

*Comment:* You handed them the keys, and what do they come up with? Committees and bureaucracy.

*Comment:* But, on the flip side, it's driving the process. It's moving toward progress. It just might not be as lean as you'd like.

*Comment:* I heard people saying it's got to be driven by the local community, not picked by the state or by regional EPA folks.

*Comment:* You need a group to make suggestions to the bureaucracy to streamline itself. If you have a broad-based consensus for the government to venture off the beaten path, it creates a skeleton. The bureaucracy would be more likely to agree to grant things.

*Comment:* There is concern with the slow pace at which the process moves. The RAPs move very slowly. There have been similar workshops to share information within RAPs, both successes and failures. I haven't seen the ability to take

work that's been done over here and move it over there. My sense is that there is no shorter path. We have to go through the entire slow process.

*Comment:* Yes, but every participant is frustrated with the slow, agonizing process.

*Response:* So, who said that it would be a painless process? It is essentially a learning process.

*Comment:* Not all contaminated sediment comes along in the RAP program. In northwest Indiana, people who are interested in beneficial uses of sand are wondering if this is contaminated. We're looking for good criteria. "If it's got x, y, z, you can or cannot put it on a lake or beach." Where are those standards? It is frustrating to determine what is clean. It's an issue beyond the RAPs.

*Comment:* On the stakeholder idea, is there any community or problem or facility with an interest in that sort of thing?

*Response:* Hey, it was just a strawperson.

*Comment:* You need a blending of navigation interests with the regulatory interests [Corps and EPA], with the states' interests.

*Comment:* You draw expertise from various groups. This strawperson bureaucracy may not have such expertise.

*Comment:* We need to find people in our agency [EPA] to get groups going. An EPA representative could come in and advise a responsible party on the way to proceed.

*Comment:* Keep in mind that local stakeholders must be a predominant voice on this advisory committee.

*Comment:* If you're a local citizen, you're going to have to make more than 10 phone calls. A citizen might not be able to overcome the typical brick wall of frustration. Maybe we need a core idea, but we need to implement it in a site-specific way.

*Comment:* I know how to get good advice, but I don't know how to put it together. An EPA group that could provide a base would be a good thing.

*Comment:* The way I look at it, there are two dead cats here. First, the drive to have a permanent solution (RCRA and Superfund). You have one solution, and then it's fought and litigated to the end. Second, mistrust. It is difficult to motivate people to finally ante up. Having one solution to be argued about causes gridlock. We need to look at phased solutions. Change the mind-set so the goal is not a cure-all solution, but the goal is to make progress. There is currently a spirit to fight about things to the point of gridlock. It's counterproductive to try to reach the endpoint, like the Superfund issue.

- Comment:* Nothing will progress until you have a funding mechanism up-front to pay for improvements down the line
- Comment:* It is clear that the Superfund 15-year litigation process is an enormous loss of resources.
- Comment:* We need constant progress. We can't expect to be perfect.
- Comment:* The problem is that corporate representatives want a permanent solution. They won't sign on the dotted line for an 80 percent solution
- Response:* Some of us disagree. There have, in fact, been instances where corporate representatives have signed on the dotted line without a perfect solution
- Comment:* You need an iron-clad guarantee that we're going to clean up to a certain point, otherwise, you have to deal with the marginal cost argument
- Comment:* We accept less than perfect with regard to our own health care. We certainly don't expect doctors to stand by our bedside 24 hours a day while we're in the hospital, but you won't accept anything less than 100 percent of resources put toward cleanup. You're saying, "I want perfection as an endpoint, and I'm willing to accept gridlock." There's the trade-off. I heard government respond that the 80 percent idea sounds good. It's an issue of flexibility
- Comment:* I see industries saying, "This is not a Superfund site. There is not joint liability."
- Comment:* Everyone focuses in on CERCLA sites or Superfund sites because those are easy. We dragged EPA into the Toledo process kicking and screaming, but they only wanted to run away because they have to take a position. Toledo is not a Superfund site, and you guys are not there. EPA focuses all attention on the high-risk areas because that's where your resources are. We need you to take a position and support open water disposal, for example. EPA waffled with state and Corps sides
- Comment:* Local groups need to be empowered more. We need more EPA expertise, but not EPA power. If we're going to use local groups for decisions, we have to empower them.
- Comment:* Spending our time talking about what government can't do is not moving us forward. Clearly there are learning opportunities, at a minimum, to come out of such workshops sharing information between EPA and the states. Great Lakes regional discussion will at least make it clear what's going on and what the Corps's plans are
- Comment:* There are several meetings conducted. The model I'm thinking of is simpler. State and EPA have periodic meetings—show-and-tell meetings—sometimes for information exchange, and sometimes advice is given. Rather than a grand bureaucracy, maybe we should try the meetings. I would be willing to help make that happen.

*Comment* The Corps and EPA have had a staff-level working group. A manual is about to go out in final. There are more sediment issues to deal with. What should be addressed next? There are problems regarding state 401 requirements. We're trying to draw states into dialogue with EPA. They could meet once or twice a year to try to resolve legal problems. It could be a technical exchange.

*Comment* One suggestion is that a proactive effort should be made by the agencies to make sure everyone is included in the discussions at these meetings. We need more opportunity to exchange ideas and reach solutions.

*Comment* A citizen activist's observation is that we need an opportunity to have dialogue with the state, Corps, and EPA—four people sitting in a room with the citizens for a few hours. I haven't seen any such small-scale cooperative efforts. Also, there are places where there are CDFs that had not been addressed in the RAP.

*Comment* I'm getting a lot of mixed signals. On the one hand, local citizens don't want us [EPA] to tell them what to do. On the other hand, they want our advice, too.

*Comment* Regarding remediation techniques and practices, Dupont and other private sector companies have been doing sediment cleanup on their own land. They should share their successes with government.

*Comment* I'm hearing both global issues and very site-specific issues. Maybe we need two workgroups to discuss these separately. Was this a worthwhile workshop?

*Response* I benefited from hearing other non-agency viewpoints. I think "Who's going to get the proceedings?" is an important question. All federal managers and Great Lakes Directors, among others, should get copies, not just the attendees. And tell us in a letter who will receive the document. It's important to talk about success stories.

*Response* I came hoping to get those kinds of ideas. There's lots of legislation on the horizon. I'm not sure that I can answer the question "What changes in Superfund and Clean Water Act and public-private partnerships need to be made?"

*Comment:* We need to confront our differences. We need these exercises which involve trying to reconcile the differences that manifest themselves in this sort of workshop situation. We need to smoke out the problem areas, get them on the table, and fight them out. I think the open discussion is helpful.

*Comment* I would like to address the reality of what is coming up in Congress. We're in a rear-guard position to defend any environmental cleanup at this point.

*Comment* I heard in my public-private partnership breakout discussion group that we're trying to avoid that sort of confrontation.

- Comment* There is a trickle-down effect within the states. Employees of the Department of Natural Resources are afraid of losing their jobs. Are all these projects going to fall apart because the Corps runs out of funds?
- Comment* Our goal is to achieve consensus, then hand everyone a document. We're more likely to gain support that way.
- Comment* Regarding getting information by way of bills, the vehicle is moving. You can argue about the Clean Water Act, but we've got some good bills. It's an important time to remain strong.
- Comment* It might be interesting if there were *one* recommendation of what EPA could be doing, that the Corps could be doing, that Congress could be doing, or the ports or business community.
- Response* Sediments pose a significant problem to many sites in the Great Lakes Basin. Stakeholders have a problem with the bureaucratic process necessary to obtain the remediation process. There's a problem with funding mechanisms to clean up these sites. My one recommendation to everyone is that we need the development of broad-based sediment criteria that people don't have to argue about. We need very general criteria.
- Response* I take a different approach. We can't afford to wait for new criteria or new legislation. We need a lot of flexibility. We must reach consensus. We're moving in the right direction. We could go the litigation route and wait for legislation, but we'll end up 10 years down the road and no better off. I got a lot out of this workshop.
- Comment* I think we [EPA] should continue such dialogue among stakeholders in the future.
- Comment* We'll make our proceedings available to everyone via Internet. Please comment on the draft form of the proceedings.
- Question* Any chance of follow-up meetings to address more contentious issues?
- Comment* Instead of two hours on a topic, maybe we could spend two days.
- Comment* It would be nice to know if there were stakeholders we left out of this meeting. Some stakeholders were invited but were unable to attend.
- Response* Yes. Developers and farm groups/rural groups should be represented here.

**BACKGROUND PAPER SUMMARIES FOR BREAKOUT SESSION TOPICS**

**BACKGROUND PAPERS FOR  
GREAT LAKES CONTAMINATED SEDIMENT  
STRATEGY WORKSHOP  
CHICAGO, IL, 13-14 JUNE 1995**

**Topic 1: Garnering Local Support.**

**Topic 2: CDFs and Dredged Material Management.**

**Topic 3: Economics.**

**Topic 4: Regulatory Approaches and Barriers.**

**Topic 5: Public/Private Partnerships.**

**Topic 6: Remediation Technologies.**

**Topic 7: Cleanup Goals and Objectives.**

**Topic 8: What's Missing?**

Sponsored by United States Environmental Protection Agency Region 5 and Great Lakes National Program Office.

## **BACKGROUND PAPER: GARNERING LOCAL SUPPORT**

Written by Paul Geiselhart, Citizens of Lake County for Environmental Action Reform (CLEAR). Compiled and edited by Patricia Smith King, Sierra Club - Great Lakes Program.

Session Leader:  
Paul Geiselhart, CLEAR.

### **QUESTIONS FOR DISCUSSION:**

**1. WHAT ARE THE MOST EFFECTIVE WAYS FOR KEEPING THE PUBLIC INVOLVED AND INFORMED THROUGHOUT THE ASSESSMENT, DESIGN AND REMEDIATION PHASES FOR A CONTAMINATED SEDIMENT SITE?**

**2. WHAT APPROACHES HAVE WORKED FOR GETTING THE PUBLIC'S SUPPORT FOR REMEDIATION PROJECTS?**

This particular workshop, unlike most of the others, needs less background information to prepare the participant for a fruitful discussion. The outline will be used by the workshop leader to prompt the discussion among participants. The accompanying pieces are meant to exemplify some of the steps listed in the outline and to give the participant some ideas about the kind of things which can be done.

The participants are encouraged to bring their own experiences to the discussion -- in particular, any evidence of actual responses to local efforts would be helpful. For example, how have groups gotten decision-makers to listen; how have they gotten their political representatives to become involved -- perhaps to intercede on behalf of the groups with the regulatory agencies or others?



## **OUTLINE OF BASIC STEPS TO GARNERING LOCAL SUPPORT.**

- I. TAKE AN INVENTORY. [see "Waukegan Citizen Advisory Group"].
  - A. review Citizen Advisory Group (CAG) membership components.
  - B. establish a "persons and influence" database.
- II. BUILD CONSENSUS -- MISSION AND GOALS.
  - A. define what needs to be accomplished.
  - B. redefine short and long term goals.
- III. ORGANIZING FOR IMPLEMENTATION.
- IV. IMPLEMENTATION COMMITTEES.
  - A. committee action steps quarterly objectives.
  - B. get elected officials involved.
  - C. build committees -- to meet needs/gain objectives.
- V. CLEANUP -- LOCAL LAWS. [see T.O.W.N. brochure].
  - A. check local laws that may help meet goals.
  - B. work with other organizations that have mutual objectives.
- VI. REMEDIATION ACTION/IMPLEMENTATION. [see "Public Notice" and "CLEAR" response letter; also see, "EPA approves rules..." article].
  - A. quality of life
  - B. business, government and citizens.
  - C. finance -- the big issue.
  - D. developing funding programs
  - E. funding resources

## "WAUKEGAN CITIZEN ADVISORY GROUP"

The Waukegan Citizen Advisory Group (CAG) was organized in August 1990 to help citizens and business leaders concerned about the harbor environment develop plans to identify and clean up contaminated industrial harbor properties.

Citizens and business leaders working together have helped identify former factory locations that are contaminated. In some areas, factory wastes from our industrial past are buried in the soil making many of these harbor properties unusable for any purpose until the hazardous wastes are cleaned up.

When will the harbor area be clean? The CAG is working with the Illinois Environmental Protection (IEPA) Agency and the Federal EPA to develop a Remedial Action Plan. the Plan follows International Joint Commission (IJC) guidelines for improvement of the water quality of the Great Lakes. the Plan is scheduled to be complete within the next few months. The CAG hopes to accelerate the clean-up program through this coordinated Plan. There have already been improvements to lakefront properties over the last years such as the removal of PCB's from the harbor, removal of a tar pit, and cleanup of the former U.S. Steel property.

The goal of the CAG is to help start the clean-up of each designated property by applying for funds and grants in addition to asking government agencies, political leaders, and businesses for funds to complete Waukegan Harbor restoration. It is hoped that the cleanup of the area will be effective enough to return Waukegan's lakefront to a healthy, usable natural resources for everyone to enjoy.

The CAG sponsors community environmental programs such as the annual Beach Sweep, tire recycling collection and household hazardous waste collection.

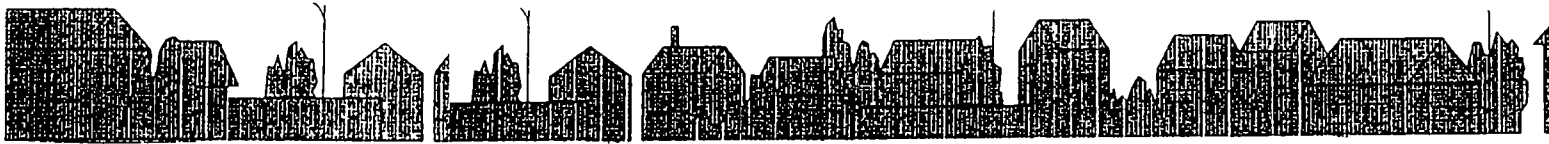
Interested citizens can join the CAG by attending monthly meetings which are held at the Waukegan Yacht Club, the second Thursday of each month at 7:00 pm.

More information is available by calling the following members:

Charles C. Isley (708) 249-3800

Mary S. Walker (708) 422-3133

The Citizens Advisory Group  
PO Box 91, Waukegan, IL 60079  
4/95.



## T.O.W.N.

You have an investment in Waukegan  
a nice comfortable home,  
attractive rental property,  
a growing business,  
a place you are proud of

Then you begin to sense problems in  
the neighborhood

You realize not everyone shares your  
sense of pride or your regard for the  
rights of others

You realize there are those who disre-  
gard community standards and values  
for personal profit or simply because  
they don't care

Whatever the reason,  
you are at risk

Your quality of life  
Your peace of mind  
Your investment

What can you do?

**WE SHARE  
YOUR VALUES  
YOUR CONCERNS  
YOUR FRUSTRATIONS.**

**TOGETHER  
WE CAN  
MAKE A DIFFERENCE.**

**FOR OURSELVES.  
FOR OUR CITY.**

We are T O W N Taskforce On  
Waukegan Neighborhoods We are a  
group of Waukegan residents, property  
owners, and business owners who have  
organized to protect and improve our  
city's neighborhoods

Our goals are

- To cause the repair or demolition  
of abandoned or unsafe buildings
- The elimination of illegal occu-  
pancy and slum housing
- The eradication of blight and pub-  
lic nuisances
- The correction of serious viola-  
tions of building and zoning codes

We can show you how to deal with  
problems like these, and put you in touch  
with key city officials and public-spirited  
attorneys willing to tackle these problems  
without cost to you

**T.O.W.N. BROCHURE**

## **BACKGROUND PAPER: CONFINED DISPOSAL FACILITIES (CDFs) AND DREDGED MATERIAL MANAGEMENT**

Written by Jan Miller, US Army Corps of Engineers, North Central District.  
Compiled and edited by Patricia Smith King, Ph.D., Sierra Club - Great Lakes  
Program.

Session Leader:  
Jan Miller, US Army Corps of Engineers, North Central District.

### **QUESTIONS FOR DISCUSSION:**

- 1. IN WHAT SITUATIONS ARE CDFS APPROPRIATE IN THE GREAT LAKES?**
- 2. HOW CAN SITING AND CAPACITY PROBLEMS BE RESOLVED?**
- 3. WHAT SHOULD BE INCLUDED IN THE CORPS' LONG-TERM MANAGEMENT STRATEGIES FOR GREAT LAKES HARBORS?**

### **Why Dredge ?**

Bottom sediments are routinely dredged from sites around the Great Lakes for a number of purposes, such as maintenance of navigation channels, bridge construction and repair, waterfront development, keeping water supply intakes clear, utility crossings at rivers, and environmental remediation. Between 4-6 million cubic yards of sediments are dredged in the Great Lakes and tributaries each year. A cubic yard is equal to about 200 gallons, and a typical dump truck holds about 10-15 cubic yards.

The vast majority of this volume of sediments is dredged to maintain navigation projects (harbor and ports) for commercial and recreational users. Most of this is

conducted by the U.S. Army Corps of Engineers (USACE). Most of the other dredging is conducted by private industries, harbor and marina operators, utility companies, and municipalities.

## **Disposal Options.**

There are two general classes of options for disposing of dredged material: unrestricted and restricted. About half of the sediments dredged in the Great Lakes basin is disposed unrestricted, and half is restricted. The selection of the appropriate disposal options involves testing and evaluation, compliance with regulations, and design and economic considerations, discussed below.

Unrestricted disposal options include open water disposal, upland disposal, and beneficial use. Open water disposal typically involves the placement of dredged material at a designated nearshore site, usually a few miles from the dredging site. Sediments can be dumped from a barge or pumped in a pipeline to the site, where they settle to the bottom. Upland disposal is similar, except that the sediments are either trucked or pumped to the disposal site. Beneficial use turns the dredged material into a useful product for a specific purpose (USACE 1987a). Examples of uses that have been applied on the Great Lakes include beach nourishment, construction fill, landscaping, and incorporating into agricultural soils

Restricted disposal options include capping, confined disposal, and treatment. Capping and confined aquatic disposal (CAD) involve the placement of dredged material at an aquatic site and covering it with clean material to isolate any contamination. Confined disposal facilities (CDFs) are structures with dikes (walls) to contain the sediments (Miller 1993). A variety of treatment processes have been developed that might be applied to contaminated sediments (Averett et al. 1990; USEPA 1994).

## **Regulation**

The discharge of dredged or fill materials into the U.S. waters of the Great Lakes is regulated under Section 404 of the Clean Water Act. The USACE has the lead in administering this regulation, and issuing permits. The USEPA is responsible for developing guidance on the testing and evaluation of dredged material for Section 404, in cooperation with the USACE, and the USEPA also reviews proposed permits and environmental assessments or impact statements prepared by the USACE.

The State also plays a key role in dredged material disposal regulation. Before the

USACE issues a Section 404 permit, the State must first certify that the proposed discharge will not violate applicable State water quality standards.

Not all aspects of dredged material disposal regulation are as clear-cut as those covered by Section 404. There are no Federal regulations that explicitly apply to the disposal of dredged material at upland sites, and few States have specific regulations for dredged material management. As a result, there is often confusion about how some disposal options are regulated, and occasionally there are disagreements about the applicability of some regulations.

## **Testing & Evaluation**

The USEPA and USACE have developed a "Technical Framework" for guiding decisions about dredged material disposal (USACE/USEPA 1992). This Framework utilizes a series of laboratory tests to evaluate the potential impacts of dredged material contaminants in order to determine the acceptability of disposal options. Specific tests are available for each disposal option, and the Framework identifies other documents which contain detailed instructions on these tests.

If, for example, the open water disposal option is being considered, tests which mimic the conditions of open water disposal are applied. The USEPA and USACE have recently developed two testing manuals for the evaluation of potential contaminant impacts from open water disposal. The "Inland Testing Manual" (USEPA/USACE 1994) is a national testing manual for dredged material that is proposed for discharge into inland and near-coastal waters. In addition, the offices of the USEPA and USACE around the Great Lakes have recently published the "Great Lakes Dredged Material Testing & Evaluation Manual" (USEPA/NCD 1994), which follows the procedures of the national manual, but provides more detailed instructions about tests recommended for Great Lakes dredgings.

The USEPA and USACE are working together on technical guidance for the evaluation of other dredged material disposal options. However, for many disposal options, the interpretation of test results will require a subjective judgement. There are no universal pass/fail numbers for many of these tests, and key stakeholders need to agree on interpretation rules in advance.

## **CDF Issues**

The USACE has constructed 43 CDFs for the disposal of contaminated dredged material from Great Lakes ports (Miller 1993). These facilities range in size from a few acres to several hundred. About two-third of these CDFs were constructed in-water, typically using dikes of stone, ranging from sand and gravel to large boulders. The upland CDFs were often constructed in existing pits or involved earthen dikes.

The need for, and type of environmental controls utilized at a CDF is site specific.

The environmental performance and impacts of CDFs in the Great Lakes have been the subject of considerable controversy and debate. Concerns about "leaking" CDFs and adverse impacts on the fish and wildlife inhabiting these facilities have been raised (see, e.g., FEIS-CDF Green Bay 1985). Numerous studies performed at CDFs in the Great Lakes have addressed some of these concerns. Monitoring has demonstrated that CDFs are as effective as municipal wastewater treatment facilities in treating water that enters with the dredged material, with removal efficiencies typically above 99%. Studies of the long-term release of contaminants through CDF stone dikes have shown losses that are below measurement capability, and can only be calculated (Velleux et al. 1993; Myers 1991). Studies of plant and animal uptake of contaminants at one CDF in Buffalo have shown some pathways to be significant (Stafford et al. 1991). Methods to control these impacts and manage the wildlife that inhabits CDFs are a significant concern at some facilities.

Twenty-seven of the CDFs were constructed under the authority of Section 123 of the River and Harbor Act of 1970. This Act authorized the USACE to build CDFs in cooperation with a local sponsor, who provided all lands, easement and rights-of-way. All of the CDF construction was at 100% Federal cost. This authority has been discontinued, and any future CDFs for Federal navigation projects will have new requirements for local sponsorship. The existing USACE guidance on CDF cost sharing does not provide a definitive answer, but it is clear that a non-Federal sponsor will have to pay some portion of the construction cost. In addition, it is also likely that the USACE maintenance of harbors lacking significant commercial navigation will be curtailed or eliminated.

The most immediate problem at CDFs in the Great Lakes is the lack of capacity. Many facilities constructed in the 1970's are nearly full. A limited amount of space can be gained by raising the dikes, but this only postpones the problem for a few years. The selection of a site for a CDF has been a controversial and time-consuming effort. With the increase in cost sharing for future facilities, the availability of local sponsors may further limit the development of future CDFs.

The USACE recently initiated a program to develop long-term dredged material management plans for each Federal navigation project on the Great Lakes (USACE 1994). These plans represent an opportunity for stakeholders to participate in the evaluation of all management options and, where necessary, the siting of future CDFs.

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## **BACKGROUND PAPER: ECONOMICS.**

Written by John Peck, Sierra Club - Great Lakes Program,  
Compiled and edited by Patricia Smith King, Ph.D., Sierra Club - Great Lakes  
Program.

Session Leaders:  
John Peck, Sierra Club - Great Lakes Program, and  
David Allardice, Federal Reserve Bank of Chicago.

### **QUESTIONS FOR DISCUSSION:**

**1. ARE THERE WAYS TO IMPROVE THE ECONOMICS OF  
CLEANUP WHILE ENSURING THAT IT MEETS  
ENVIRONMENTAL STANDARDS?**

**\*VIA INCENTIVES FOR VIABLE DEVELOPMENT OF  
BROWN FIELD SITES?**

**\*VIA MECHANISMS TO MAKE TECHNOLOGY MORE  
ACCESSIBLE AND AFFORDABLE?**

**\*VIA STRATEGIES THAT POOL RESOURCES TO HELP  
DEFRAY CLEANUP COSTS AND LIABILITIES?**

Failure to address the issue of contaminated sediment continues to undermine the Great Lakes economy. These often "hidden" costs of continued inaction must be weighed against upfront cleanup expenses. A recent Sierra Club Great Lakes Program report estimates that close to 2.9 million jobs and nearly \$95 billion in economic activity are in jeopardy due to the persistence of contaminated sediments (see chart below).<sup>1</sup> While the toxic toll on public health, tourism, and sport fishing in the Great Lakes basin has been widely addressed elsewhere, this background paper will focus on less well known adverse economic effects.

### **Transportation Difficulty.**

Water shipment remains far and away the cheapest mode of bulk transport. The 145 U.S. and Canadian port facilities in the Great Lakes-St. Lawrence Seaway move an

estimated 200 million tons in bulk commodities annually<sup>2</sup>. A 1992 study calculated that Great Lakes shipping accounts for 44,628 direct jobs in the eight Great Lakes states, generating \$1.9 billion in personal income, \$1.7 billion in corporate income, as well as \$90.7 million in state and local taxes.<sup>3</sup>

<b>JOBS AREA</b>	<b>JOBS**</b>	<b>ESTIMATED VALUE</b>
HEALTH	*	\$18.47 Billion
FISHING	89,000	4.0 Billion
SHIPPING	44,000	3.5 Billion
TOURISM	2.76 Million	69 Billion
<b>TOTAL</b>	<b>2.893 Million</b>	<b>\$94.97 Billion</b>

[\* - complete data unavailable; \*\* - based on \$25,000/direct job]

Unfortunately, since the 1970s the Great Lakes shipping industry has experienced a serious decline in part due to contaminated sediments. Clogged harbors and channels are forcing shipping companies to offload as much as 240 tons per vessel to clear each inch left undredged.<sup>4</sup> The Army Corps, which normally dredges about 4 million yd<sup>3</sup> per year in the Great Lakes to maintain a navigable depth of 18-27 feet,<sup>5</sup> now finds that over half of these sediments are contaminated and hence can no longer be cheaply dredged and dumped. Total remediation costs for these accumulated contaminated sediments in the Great Lakes Basin could well exceed \$10 billion.<sup>6</sup>

Meanwhile, shipping companies and their customers are forced to bear the direct costs of public inaction. For instance, Inland Steel officials report that their ships using Indiana Harbor, IN must offload 500 tons per vessel and dock up to 20 feet from the piers, due to undredged contaminated sediments.<sup>7</sup> In Waukegan, IL ships could only carry two thirds of their normal cargo and had to take turns offloading since the slip was too shallow. The owner of Gold Bond Building Products noted that cleanup delays were costing his firm an extra \$250,000 per year in transport fees.<sup>8</sup> Clearly, timely cleanup is a prerequisite for recovery of the Great Lakes shipping industry.

### **Financial Liability.**

Recent Superfund rulings have expanded the definition of "ownership" such that financial institutions can now be held liable for cleanup costs, even after the actual polluter may have declared bankruptcy. Private citizens injured by toxic threats are also beginning to target banks in lawsuits seeking damages. As a result, many banks are "greenlining" certain industries and properties which they deem to present unacceptable environmental liabilities. Bank America Corp. recently hired nine full

time staff simply to assess environmental risks with real estate loans.

When banks acquire property through foreclosure, they must increasingly purchase environmental liability insurance simply to sell off the real estate. With \$500 million in annual premiums, environmental coverage is one of the fastest growing insurance sectors.<sup>9</sup> Since 1992 Fleet Financial has required all of its commercial real estate loans in excess of \$1 million to carry at least \$2 million worth of environmental insurance. According to CEO Terence Murray, "If we ever thought somebody was deliberately end-running the rules for environmental protection, we would, by definition, consider him irresponsible, and we would not want to deal with him."<sup>10</sup>

Of course, these rising liability costs are ultimately passed along by banks to their customers. Some borrowers have been charged up to \$20,000 for an environmental audit when using real estate as loan collateral. Until cleanup of contaminated sediments in the Great Lakes occurs, one of the hidden expenses will remain inflated capital charges on the part of skittish financial institutions.

### **Brown Field Development.**

There is growing interest on the part of both public officials and private developers to reclaim urban "brown field" sites, rather than foster sprawl in rural "green field" areas.<sup>11</sup> Given that 43% of the U.S. shoreline along Lake Michigan, Lake Erie and Lake Ontario is already urbanized,<sup>12</sup> much prime lake front property has already been devalued and abandoned due to contaminated sediments. The infilling of brown fields makes sound economic sense when one considers the capital sunk in already existing infrastructure and the need to revitalize depressed urban communities. While cleanup of these sites for "low intensity" "soft uses" such as public parks and green space may be less expensive and problematic, it is often the "high intensity" "hard uses" of urban land such as for office complexes, housing and contaminated sediment disposal that are most in demand.

Investors are unlikely to consider brown fields, though, until yield differentials (minus cleanup and liability costs) are at least comparable with those of green fields. It has been reported that some land buyers are even demanding a 40% discount from the going market price simply to cover the toxic risks with derelict property.<sup>13</sup> While *in situ* remediation and/or isolation of toxics may well satisfy engineering goals, financial concerns about long term liabilities could well require more costly *ex situ* removal and treatment of contaminated material. Stronger zoning laws and land use restrictions may also be required, since it is hardly worth the expense to reclaim one brown field site if irresponsible dumping elsewhere continues to undermine property values.

Given these constraints, successful brown field reclamation will largely depend upon

cooperative arrangements between public agencies and private investors. One proposed strategy is to create a revolving loan fund financed through court fines against liable polluters to assist interested brown field developers. Such a program could also indemnify investors and banks against future liabilities through a joint insurance pool. In the end, a reformulated federal/state cleanup initiative could well provide its own financing mechanism for remediation of contaminated sediments. The use of brown fields for contaminated sediment disposal may prove useful in solving the brown field development and sediment disposal problems simultaneously.

The problems associated with choosing acceptable contaminated sediment disposal sites have delayed several of the US Army Corps of Engineers (USACE) dredging projects. For example, at Indiana Harbor the dredging has been delayed some 20 years. The disposal of contaminated sediments by the USACE is in practice restricted to upland sites because the alternative disposal in in-lake confined disposal facilities (CDFs) tends to be highly controversial. In choosing a site the USACE typically identifies a "local sponsor" for the proposed dredging project. The responsibility of the local sponsor rests upon the provision of a proximal piece of property to the USACE for CDF construction and subsequent sediment disposal. After completion of the project and closure of the CDF, control of the site generally reverts back to the original sponsor.

The use of brown fields as contaminated sediment disposal sites could potentially cost less and minimize the liability concerns of both the USACE and sponsors. Unused contaminated former industrial sites proximal to the Federal dredging projects are probably more common than adequately sized clean sites. Such brown fields are generally also closer to the dredge sites thereby reducing logistical costs.

One strategy for the use of brown fields as disposal sites is to design the upland CDF in such a way as to meet the engineering necessities of the USACE and fulfill the closure and corrective action needs of RCRA. In this way the disposal of large volumes of near shore contaminated sediments would be done while simultaneously remediating a previously contaminated brown field site. In contrast to the owners of clean upland sites, the owners or PRPs of a contaminated site may welcome local sponsor status and may prove more willing to help finance a CDF project which would also address their site's environmental/remedial needs. Should the future performance of the CDF prove inadequate, it is likely that the costs to upgrade the CDF and/or remediate any resultant environmental contamination would be shared by the local sponsor(s)/ PRP(s). The overlapping regulatory/remedial and USACE engineering requirements can result in simpler and therefore cheaper CDF designs.

## **Economic Relocation.**

Contaminated sediments also pose a serious "negative externality" in terms of future economic activities. When polluters are able to pass along the costs of their behavior to third parties without restriction, the situation is likely to deter other economic activity in the area. Press reports of toxic "hot spots" also discourage firm relocation when executives and employees are increasingly concerned about their "quality of life."

In fact, clean water and clean air, along with a low crime rate, have been the top three concerns of survey respondents in Money magazine's annual ranking of most desirable U.S. cities. Similarly, a 1989 survey of business leaders found that nearly a third rated the quality of life for their employees as "absolutely essential" in locating their operations.<sup>14</sup> As Barry Boyer, law professor at the Univ. of NY - Buffalo, has argued "areas that can't provide a clean attractive environment will be severely handicapped in the competition to attract and hold these growth industries."<sup>15</sup>

Clean water as a "marketable amenity" is now recognized as a major contributor to the value of lakeshore property throughout the Great Lakes region. A recent study noted that at least 20% of Chicago's economic activity "depends, one way or another, on the availability and attractiveness of the Lake Michigan shoreline."<sup>16</sup> Mark Wyckoff, editor of Michigan's Planning and Zoning News also observes that "land values have skyrocketed" in certain popular summer resort counties such as Grand Traverse and Leelanau, where annual population growth exceeds 20%.<sup>17</sup> If the Great Lake basin wishes to shake its dirty "rust belt" image once and for all, it will need to seriously tackle the issue of contaminated sediments.

## **Sediment Remediation.**

A final word is necessary on the relative costs of remediation technologies and the obvious preference for more cost-effective cleanup strategies. The storage, handling, and treatment of contaminated sediments can be extremely expensive - up to \$1500 per yd<sup>3</sup> depending upon site-specific toxicity levels and technological constraints.<sup>18</sup> Fortunately, a more typical cleanup cost range is between \$3 and \$250 per yd<sup>3</sup> for disposal and between \$90 and \$250 per yd<sup>3</sup> for treatment with only a few up in the \$700 range (see chart below).<sup>19</sup>

Many conventional cleanup technologies - such as incineration - are not only expensive but also controversial when they end up "displacing" toxics from one locale to another. It is important to realize that these high-tech "benchmark" technologies, while popular among commercial sellers of cleanup services, are steadily being displaced by more innovative and less costly alternatives as research expands and the industry matures. In fact, simple soil washing to reduce toxic volume remains one of

the most versatile and inexpensive remediation strategies available. Promising bioremediation techniques have also been employed elsewhere - mostly in Western Europe - and are just now starting to be considered in the U.S.<sup>20</sup> Both public agencies and private interests need to devise better ways to cooperatively finance and conduct research on more cost-effective cleanup alternatives.

Technology	Unit Cost (\$/yd <sup>3</sup> )
<b>Treatment Costs:</b>	
Immobilization	90
Extraction	71-251
Thermal Desorption	211
Thermal Destruction	720
<b>Disposal Costs:</b>	
Capping/contained aquatic disposal	3-20
<b>Commercial Landfill:</b>	
Solid Waste	20-25
RCRA - Hazardous Waste	150-200
TSCA - Toxic Waste	250
Confined Disposal Facility	5-50
Temporary Storage Facility	5-50

Lastly, the track record of cleanup in the U.S. has been plagued by excessive cost overruns - one study of eight Superfund remediation projects revealed an average 84% pricetag increase from start to finish.<sup>21</sup> Accurate initial characterization of contaminated sediments would drastically reduce final remediation costs. Better site surveys and mass balance studies not only insure that the worst toxic threats are addressed first, but they also ensure that scarce resources are not spent on unnecessary cleanup efforts. Once again, the overriding challenge in an era of fiscal austerity is to prioritize enough research dollars towards such efforts. The nearly 25 million U.S. citizens and the quarter of U.S. industry that presently resides in the Great Lakes basin can no longer afford to ignore the economic threat posed by contaminated sediments.

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See also, Keillor, J Philip "Obstacles to the Remediation of Contaminated Soils and Sediments in North America at Reasonable Cost " Sea Grant College Program, UW-Madison Madison, WI, 1993
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- 21 Keillor *supra* note 19 at pg 1

## **BACKGROUND PAPER: REGULATORY APPROACHES AND BARRIERS**

Written in part by Howard Zar, Senior Technical Advisor, Water Division, US Environmental Protection Agency, Region 5. Compiled and edited by Patricia Smith King, Ph.D., Sierra Club - Great Lakes Program.

Session Leader:  
Howard Zar, Senior Technical Advisor, Water Division,  
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### **QUESTIONS FOR DISCUSSION:**

- 1. WHAT REGULATORY APPROACHES HAVE BEEN MOST EFFECTIVE IN GETTING SITES CLEANED UP OR WELL ON THEIR WAY TO BEING REMEDIATED? ARE THERE OTHER REGULATORY APPROACHES THAT COULD BE USED?**
- 2. WHAT ARE THE MAJOR REGULATORY OBSTACLES TO ACHIEVING REMEDIATION?**
- 3. WHAT CASE STUDIES EXIST TO SHOW HOW REGULATORY APPROACHES HAVE FAILED OR SUCCEEDED?**

The reader should note that the following discussion emphasizes the experiences and authorities applicable to the USEPA - Region 5 and are meant only as general background to the workshop. Examples from States and other regions are also pertinent though not included here.

**REGULATORY APPROACHES AVAILABLE FOR OBTAINING SEDIMENT REMEDIATION.**<sup>1</sup> EPA may take actions directed at remediation of contaminated sediments through multiple statutes, either applied individually or in concert. Applicable authorities include the Comprehensive Emergency Response, Compensation, and Liability Act (CERCLA) or Superfund, the Resource Conservation and Recovery Act (RCRA), the Clean Water Act (CWA), the Rivers and Harbors Act (RHA), the Toxic Substances and Control Act (TSCA), and the Oil Pollution Act of 1990 (OPA).



EPA can use these authorities to (1) compel parties to clean up the sites that they have contaminated, (2) recover costs from responsible parties for EPA-performed cleanups; and (3) coordinate with natural resource trustees to seek restitution from responsible parties for natural resource damages. The Agency's ability to obtain sediment remediation within a reasonable time frame may be enhanced through the coordinated use of contractor listing authority, debarment and suspension, state or local laws and regulations, other federal laws and regulations, and EPA's criminal enforcement authority.

To date, EPA has successfully used only section 309(b) of CWA, RCRA Corrective Action Authority, and section 106 of CERCLA in conjunction with contractor listing authority to require sediment cleanups. Settlements of CWA unauthorized discharger enforcement cases have incorporated sediment cleanup as part of the injunctive relief. EPA will use all of its authorities, individually, or in combination to require sediment remediation by responsible parties, where justified. Assessment efforts and inventories, when available will assist in the targeting of actions for remediation.

CERCLA or Superfund: provides one of the most comprehensive authorities available to EPA to obtain sediment cleanup, reimbursement of EPA cleanup costs, and compensation to natural resource trustees for damages to natural resources affected by contaminated sediments. Once EPA determines that there is a release or substantial threat of release to the environment, EPA may undertake response action necessary to protect public health and the environment, and, if necessary to compel the potentially responsible parties (PRPs) to undertake the cleanup. Liability is strict, meaning responsible parties are liable without fault, and "joint and several," meaning that they are collectively responsible for the entire cost of the cleanup.

RCRA: Subtitle C of RCRA provides EPA with the authority to assess whether releases from a hazardous waste treatment, storage, or disposal facility have contaminated sediments and to require "corrective action," which could include sediment remediation. RCRA corrective action provisions address releases of hazardous waste or constituents to all environmental media, including sediment, they are implemented through either administrative orders or RCRA permits. The RCRA corrective action process is initiated by requiring the facility owner/operator to conduct extensive investigations on site as well as off-site. If solid waste management units at a RCRA facility are then shown to be the source of contamination, sediment remediation can be required. RCRA corrective action authorities for sediments are expected to get more use in the future.

CWA: Section 309 of CWA authorizes EPA to take civil action for discharges in violation of permit limits and seek appropriate relief, including environmental remediation. If environmental harm is demonstrated, EPA can seek sediment

remediation as part of the injunctive provisions of the administrative or judicial order. Enforcement actions for permit effluent violations can also encourage sediment cleanups in lieu of civil penalties. The facility may be willing to clean up the sediments even if the sediment contamination is the result of permitted discharges as an offset to civil penalties or to limit possible liability under other statutes. Region 5 has been leveraging penalties to require sediment cleanups.

TSCA: TSCA does not explicitly require cleanup of regulated substances other than PCBs. PCB spills that occurred after the effective date of the TSCA regulations (April 18, 1978) are subject to the TSCA disposal rules. PCB spills and discharges that occurred before the effective date of TSCA may also be subject to TSCA disposal rules. An Agency position is currently under development to determine how such authority will be applied.

RHA: The Rivers and Harbors Act includes provisions which may be used to address sediment contamination. the injunctive relief available under the Act includes the ability to order the removal of obstructions to navigation and the removal of refuse.

NRDA: Several federal statutes (i.e., CERCLA, CWA and OPA) and State laws authorize natural resource trustees to conduct Natural Resource Damage Assessments (NRDAs) and collect damages for injuries to natural resources. Natural resource trustees include Federal, State and Tribal organizations which manage or control natural resources (e.g. fish, wildlife, land, air, water and sediments). As co-trustees, Federal, State and Tribal representatives often work together to conduct an NRDA for a contaminated site.

**CASE EXAMPLES IN REGION 5 AND THE GREAT LAKES.**<sup>2</sup> The contaminated sediment problem has special importance in the Great Lakes system and in the Region 5 Office of USEPA, which covers the States of Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin, encompassing the US portions of most of the Great Lakes, as well as portions of the Mississippi and Ohio River Basins. Of the Areas of Concern (AOCs) identified by the International Joint Commission (IJC) on the Great Lakes, virtually all have significant sediment problems. In many of the AOCs, sediments have become the principal issue of focus. Considerable efforts are being made to clean up contaminated sediments, using available regulatory tools. Some highlights of Region 5 remediation efforts are given below with details on specific sites provided in Table 1. These efforts provide concrete evidence of the directions the EPA Strategy is heading in dealing with contaminated sediments.

Regulatory approaches to sediment cleanup once were very limited. When the PCB problem at Waukegan Harbor (IL) was discovered in 1976, the CWA was successful in stopping the active discharge of PCBs but turned out to be ineffective in dealing with

the sediment contamination problem. The Waukegan site was one of the first to make the National Priorities List after the passage of CERCLA in 1980 but it was only after CERCLA was amended in 1986 that USEPA was able to compel a sediment cleanup, completed in 1993.

Table 1: Examples of Remediation Actions Now Underway in Region 5.	
<u>Indiana Harbor Canal and Grand Calumet River</u>	
Corps Navigation Project - EPA and Corps working together, ECI bankruptcy settlement lodged Oct 93 may provide a disposal site	
LTV Steel - May 1992 CWA consent decree - Characterization and cleanup of an intake flume	
Inland Steel - March 1993 multi-media consent decree (CWA, RCRA, SDWA) - Includes sediment remediation	
USX Gary Works - Oct 1990 CWA consent decree - Characterization of 13 miles (21 km), remediation of 5 miles (8 km)	
Gary Sanitary District - Oct 1992 CWA/TSCA consent decree - Characterization and remediation of 4 miles (6.4 km)	
Hammond Sanitary District - Aug 1993 compliant under CWA and Rivers and Harbors Act Relief sought includes sediment remediation	
<u>Other Lake Michigan Basin</u>	
Sheboygan Harbor, WI NPL site (Tecumseh Motors) - CERCLA orders resulted in partial cleanup, storage, and studies	
Waukegan Harbor, IL (OMC) NPL Site - 1988 CERCLA consent decree resulted in dredging, treatment, and disposal Sediment remediation completed in 1993	
Manistique River/Harbor, MI (Manistique Paper, Edison Sault Elec) - CERCLA removal action placed temporary plastic cover on a hot spot Decision on a final response action for the remediation of the full site is now being made by EPA	
<u>Lake Erie Basin</u>	
River Raisin, MI (Ford Monroe) - The PRPs have agreed to complete remediation of the site under CERCLA authority -- cleanup is projected to occur in 1996	
Ashtabula River/Harbor and NPL site in Fields Brook - CERCLA remedial action at Fields Brook in design stage The Ashtabula River is in investigation phase while a private public partnership approach is being established, in combination with navigational dredging	
Black River, OH (USX Lorain) - A CWA consent decree resulted in dredging in Nov 1990	

As concerns about contaminated sediments grew, regulators looked for further approaches to obtain cleanup. An opportunity presented itself in 1985. Enforcement penalties assessed at the USX steel mill in Lorain, OH for CWA and Clean Air Act (CAA) violations were turned into a consent decree requiring dredging of sediments contaminated with heavy metals and PAHs from the Black River, which drains into Lakes Erie. This is the kind of supplemental environmental project or environmentally

beneficent expenditure conducted in lieu of civil penalties that will be discussed in more detail in EPA's Strategy.

CERCLA: Enforcement is only one of the available regulatory tools. As discussed above, Superfund legislation (CERCLA) provides comprehensive authority for obtaining cleanup, reimbursement for cleanup, and compensation for natural resources trustees. The implementation of the Superfund Accelerated Cleanup Model (SACM) in 1994, is bridging the remedial and removal approaches, in order to achieve more timely and efficient cleanups.

The Waukegan Harbor site and actions currently in progress at Sheboygan Harbor, WI (PCBs) and Fields Brook, Ashtabula, OH (PCBs, HCBs, PAHs) are examples of remedial actions being undertaken in Region 5. The Manistique River, MI (PCBs), a SACM site, and River Raisin, MI (PCBs) are examples of removal actions, now in progress. Some details on these sites are also in Table 1.

RCRA: RCRA authority was involved in obtaining the multi-media consent decree for contaminated sediment cleanup at Inland Steel in East Chicago, IL. There are also several RCRA corrective action sites within Region 5 where 3004(u) and (v) and 3008(h) authorities are being used to require characterization of contaminated sediments, among them the U.S.S. Lead plant in East Chicago. If these studies show that contamination emanated from the facility and poses an environmental risk, EPA will require remediation of contaminated sediments. It is anticipated that corrective action authority for sediment cleanup will be used further in both a permits and enforcement mode.

TSCA: To date, TSCA involvement in Region 5 sediment remediation activities has primarily been assistance to the CERCLA and CWA programs concerning PCB cleanup, storage, and disposal issues. TSCA authority has also been used on small scale PCB sediment cleanups as part of broader settlements of TSCA Civil Administrative Actions. Future use of TSCA authority for large scale sediment remediation projects will be through this same settlement process or by referral to the Department of Justice.

NRDA: Around the country, the pursuit of NRDA's has been successful in getting monetary damages to address contaminated sediments at several sites (e.g. St. Paul Waterway in Tacoma, WA; Duwamish River in Seattle, WA; and New Bedford Harbor in MA). In the Great Lakes, several NRDA's are underway for sites with contaminated sediments and include: Saginaw River and Bay in MI, Fox River and Green Bay in WI, and Northwest IN.

Cooperative Approach/Public Private Partnership: While the Enforcement and

Superfund approaches noted above have been effective in sediment cleanup, they can involve considerable resources and time expenditures by agencies and responsible parties. A number of entities, including the State of Wisconsin, have advocated working closely with responsible parties in a non-adversarial mode. The objective is to turn the potential costs of adversary proceedings into real cleanup and to avoid the delays involved in contentious lawsuits. [See Background Paper for Topic 5 Public/Private Partnerships for information on the Fox River Coalition and the Ashtabula River Partnership].

Site Prioritization: Sites in Region 5 with contaminated sediments have become the subject of regulatory attention by EPA and the States thus far because a combination of obvious environmental impact and the availability of clear cut regulatory tools made action cost effective. As the Agencies make progress in attacking this first group of sites, it is necessary to identify which sites come next. The experience with regulatory authorities that has been gained and the greater availability of information about sites, including the Region 5 and National Sediment Inventories is increasing our ability to prioritize further sites and to deal with them effectively.

**REGULATORY BARRIERS.**<sup>3</sup> This list, not necessarily all-inclusive, is reproduced to help focus the discussion of the workshop. The recommendations of the *ad hoc* group are not included so as to encourage workshop participants to develop their own recommendations.

1. Regulatory actions (e.g. enforcement) can be contentious, protracted, and resource intensive, and may not, in the end, result in the necessary levels of cleanup.
2. Although many State and Federal laws exist that can be used to remediate contaminated material, they are not specific to contaminated sediments and are often program-, agency- and/or media-specific. Implementation and interpretation of the laws and the associated regulations can result in overlap and conflicting cleanup goals. For example, a risk-based decision under CERCLA may be in conflict with a State's interpretation of its laws. CERCLA actions are based on the existence of or the potential for an unacceptable risk to human health or the environment. Without that risk, an action may not be taken, even when State standards are exceeded.

The regulatory overlap and program specificities can make it difficult to develop a coordinated plan of attack to address contaminated sediment sites. One consequence is that remediation efforts when taken can be piecemeal, leaving the problem partly unresolved and the PRPs without certainty whether liability still exists.

3. USEPA and the USACE disagree on the applicability of RCRA regulatory authorities to the disposal of sediments. This disagreement centers upon whether dredged

sediments can be considered solid waste or hazardous waste under RCRA. USACE believes that the regulatory mechanisms under the CWA are adequate for the disposal of sediments, while USEPA believes that sufficiently contaminated environmental media, such as sediments, meeting the definition of a hazardous waste should be subject to the RCRA hazardous waste disposal regulations.

Among the alternatives currently being considered are the following: (a) Exempting the disposal of dredged sediment from the RCRA hazardous waste disposal regulations regardless of their chemical or physical nature. This approach would include enhanced CWA rules for the disposal of heavily contaminated sediments. (b) Revising the RCRA disposal regulations for contaminated environmental media such as sediments. This would be coupled with an effort to revise the RCRA rules for hazardous determinations for environmental media, e.g., replacing the RCRA toxicity characteristic leaching procedure with a more adequate or appropriate test. Both of these steps would be needed, as improved RCRA entry criteria would very likely define additional volumes of media as hazardous. Economically feasible disposal scenarios would be needed to handle these augmented volumes.

A blanket RCRA exemption of dredged sediments from RCRA would need to distinguish upland soils and materials excavated from wetlands, from exempted dredged sediments. Without this, the parties funding future remedial activities would be motivated to label other generated contaminated environmental media as dredged sediments, thereby qualifying for the lesser expenditures associated with CWA disposal.

4. Obtaining necessary permits under TSCA, NPDES, RCRA, and CWA Section 404 is overly burdensome and time consuming (e.g. minimum of 4-5 months for NPDES permits, sometimes >1 year for TSCA permits, and usually >1 year for RCRA permits). The extensive nature of the RCRA permitting process, including requirements for ground water monitoring, liners, clay caps, etc., stems from a desire to prevent new CERCLA sites from being created by waste disposers. However, these protections and their long timelines can become undesirable when the permit under consideration is needed for remediation. This situation is undesirable and several efforts have been made to alleviate it, including the draft RCRA corrective action rule (Subpart S). However, due to the many complexities involved, Subpart S has not been finalized and this issue remains to be resolved.

5. The RCRA hazardous waste regulations were developed for industrial process wastes generated in relatively small quantities along with a salable product. These regulations were designed to discourage the unnecessary generation of hazardous waste and to ensure that those wastes created would pose no future threat to human health or the environment. In contrast, for dredging or remediation, no salable product

is produced to offset the costs of disposal, and the volumes of "waste" generated are correspondingly high. In addition, portions of the RCRA regulations are problematic for sediment disposal. These provisions include a prohibition on the placement of "wastes" associated with free liquids in a RCRA facility.

6. Cross-media coordination is often lacking in enforcement actions. If the sediment remediation is to be driven by an enforcement action, the office writing the enforcement order is primarily concerned about meeting the terms of their program first. The concerns of other offices are often not voiced or considered until after the order is issued and the facility tries to implement the terms of the order. The result is delay in activity until the concerns of the other offices are resolved, including revision of the order.

7. USACE's process for developing environmental impact statements (EISs) for navigational and environmental dredging projects can be slow. USACE has usually developed EISs on their own, without assistance from others and with limited use of information generated for other purposes (e.g. Superfund, RCRA or CWA testing).

8. USACE's liability for the construction of confined disposal facilities can be an issue, particularly if RCRA is involved at a "brownfield" site (see "Brownfield Development" section of Background Paper for Topic 3: Economics). The issue is less problematic if there is a local sponsor to share the liability.

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1 Excerpted from: Howard Zar, Draft Paper on *Regulatory Strategies for Remediation of Contaminated Sediments*, 1994 For copies contact Howard Zar, USEPA, Region 5 -WS-16J, 77 West Jackson St , Chicago, IL 60604, 312/886-1491, fax: 312/886-7804, e-mail. zar howard@epamail epa gov

See also, *Strategy for Remediation and Enforcement*, EPA's CONTAMINATED SEDIMENT MANAGEMENT STRATEGY 67, 1994. USEPA Office of Water, EPA 823-R-94-001

2. Howard Zar, *supra* note 1.

3 Excerpted from BARRIERS TO MANAGING GREAT LAKES CONTAMINATED SEDIMENTS, prepared by *Ad Hoc* Great Lakes Sediment Focus Group, April 10, 1995 The ad hoc group consisted of representatives of USEPA-Regions 2, 3, 5; USEPA-Gt. Lakes National Program Office, the 8 Gt. Lakes States; and a representative of Tribal Government. Copies are available by contacting either Linda Holst or Howard Zar at the address given for Zar above at note 1

## **BACKGROUND PAPER: PUBLIC/PRIVATE PARTNERSHIPS.**

Contributions submitted by Al Toma, Assistant to the President and Director of Environmental Affairs, Fort Howard Corporation, and Brett Kaull, Projects Director to Congressman Steven C. LaTourette, on the Fox River Coalition and Ashtabula River Partnership respectively. Compiled and edited by Patricia Smith King, Ph.D., Sierra Club - Great Lakes Program.

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Fort Howard Corporation.

### **QUESTIONS FOR DISCUSSION:**

- 1. HOW CAN COOPERATIVE APPROACHES IMPROVE THE CHANCES OF GETTING SITES CLEANED UP?**
- 2. HOW ARE SUCCESSFUL PUBLIC/PRIVATE PARTNERSHIPS DEVELOPED? HOW DO YOU BUILD UP TRUST FROM ALL SIDES?**
- 3. HOW DO YOU ENSURE PROGRESS AND GET SUFFICIENT FUNDING FROM ALL PARTNERS FOR REMEDIATION?**
- 4. ARE THERE EXAMPLES OF SUCCESSFUL PUBLIC/PRIVATE PARTNERSHIPS? IF YES, HOW CAN THESE SUCCESS STORIES BE APPLIED ELSEWHERE?**

The following background information is meant to give the workshop participant familiarity with two public/private partnerships that have formed around the Great Lakes: the Fox River Coalition for cleanup of the Fox River Valley and Green Bay areas of Wisconsin, and the Ashtabula River Partnership for the Ashtabula River and Harbor in Ohio.



## **FOX RIVER COALITION.<sup>1</sup>**

"In 1992, representatives from municipalities, industry, wastewater treatment facilities and state and local government joined forces to tackle the problem of PCB-contaminated sediment in the Lower Fox River. PCBs, or polychlorinated biphenyls, threaten both environmental and human health. In 1990, Lower Fox River sediments were estimated to contain between 20,000 and 40,000 kilograms of PCBs. Without any remedial action in the Lower Fox, scientists estimate it will take about 100 years for PCB concentrations in fish tissue to drop to levels that are no longer harmful to human consumers.

The Fox River Coalition (FRC) is forming a plan and timetable for contaminated sediment cleanup in the Lower Fox River. This effort is built upon the results of the 1986 Green Bay Mass Balance Study, the first in the world to determine the presence, transport and fate of bioaccumulating toxic substances in a river and bay environment. The USEPA selected the Lower Fox River and Green Bay over all other locations on the Great Lakes to conduct this research. Fifty-five national experts from the USEPA, US Geological Survey, National Oceanographic Atmospheric Administration, Wisconsin Department of Natural Resources and other top national academic institutions participated in the four-year effort. The resulting data, maps, interactive sediment and toxics transport models, and food chain models form the scientific basis for remedial decisions.

The State of Wisconsin is committed to reducing sources of bioaccumulating toxic chemicals to the Great Lakes region. Cleanup of the Lower Fox River is an important part of the statewide Sediment Management and Remedial Techniques Program (SMART), implementation of the Clean Water Act's mandated Remedial Action Plan (RAP) for lower Green Bay, and the Lakewide Management Plan for Lake Michigan. An informed public from throughout the Lower Fox River watershed is also participating in remedial efforts. FRC members and citizens participating in the lower Green Bay RAP are disseminating information on existing sediment contamination and ongoing contributions of new sediment, excess nutrients, heavy metals, and pesticides from polluted runoff.

More than 30 partners from local governments and wastewater treatment facilities, industry, the Green Bay RAP, the WDNR and the public have crossed geographical and political boundaries to cooperatively solve an environmental problem. The technical, financial and institutional needs of comprehensive sediment remediation are complex and time-consuming. This partnership is addressing these issues and serving as a national model for successful environmental restoration. The cooperative Lower Fox River remediation effort is Wisconsin's greatest hope for achieving

successful river restoration in the shortest time possible."

### **ASHTABULA RIVER PARTNERSHIP.**

The Ashtabula River Partnership (ARP), a public/private partnership formed in July, 1994, has made significant progress towards promoting a cooperative approach to remediate historically contaminated sediments in the Ashtabula River. Prior to the formation of the ARP, federal, state and private interests were proceeding independently to address Superfund and navigation issues without regard to common interest and ultimate fate of the resource.

Project History: Two federal decisions critical to the future of the river precipitated the formation of the ARP. Pollutants migrating from upstream sediments in the recreational channel exceeded federal criteria for open lake disposal of dredging spoils from the federal navigation channel necessitating the construction of a federal confined disposal facility (CDF). Secondly, USEPA Region 5 signaled its intention to extend the Fields Brook Superfund site to the lower river and harbor channel. The practical effect of these decisions could lead to the closure of the Port of Ashtabula and the legal entanglement associated with Superfund.

Additionally, the Army Corps of Engineers (ACE) informed the community of its responsibility to cost share construction of a \$12M CDF with the local share approaching \$3M. Navigation dredging was suspended in 1994 until construction of a CDF has been completed, placing the future of commercial shipping in the Port of Ashtabula at risk. Furthermore, extension of the Fields Brook Superfund site to the river and port would likely delay remediation of an estimated 750,000 cubic yards of contaminated sediment currently in the recreation channel endangering the recreational boating industry and the health of the river. Superfund Potentially Responsible Parties (PRPs) have spent over \$30M in transaction costs and environmental studies on Fields Brook and the river during the past 12 years without closure on the site.

Three principal elements must be addressed to return the Ashtabula River to environmental health and commercial viability: Superfund liability, maintenance of the federal navigation channel; and removal of historically polluted sediments in the recreational channel. The Ashtabula River RAP Committee recognized the explicit linkages among these elements and began advocating a new approach.

An Alternative Approach: It was suggested that remediation of the upstream pollution sources in the recreational channel would preclude the need to construct a CDF and therefore should attract federal navigation project interest. Additionally, USEPA

Superfund sought to assign liability for sediments in the recreation channel to Fields Brook PRPs thereby creating private financial interest in the remediation project. Finally, a longstanding commitment of \$7M by the State of Ohio could be used to leverage new federal environmental dredging and RAP assistance authorities. Taken together, these elements could provide the financial means to construct a common disposal facility and dredge the recreational channel while minimizing the financial costs to private and local entities.

In January, 1994, USEPA Region 5 Superfund staff held a public meeting in Ashtabula to announce its evidence and authority to extend the Fields Brook Superfund site to the lower river and harbor. At that time, the RAP presented the concept of an alternative, cooperative approach predicated on mixing federal, state and private resources to construct a disposal site and remediate the river sediments. A public/private partnership was suggested as the vehicle to accomplish the task and the RAP voted its unanimous support of the approach. Most dramatically, EPA announced it would "hold off" on the Superfund designation pending demonstrated progress that such a partnership would be advanced.

A Partnership in Progress: The Ashtabula River Partnership Charter, a non-legally binding document, was signed in July, 1994 by federal, state and local entities as well as many Fields Brook PRPs with all parties pledging their time and technical/human resources. A committee structure and monthly meeting schedule was formed to implement the goals of the agreement. to date, over \$2M in federal and state funding has been identified to implement Phase I of the project.

Phase I will comprise the development of a Comprehensive Management Plan (CMP) to provide critical products such as additional river testing, preliminary engineering and site selection for the disposal facility. The Environmental Impact Statement and ultimate cost-sharing responsibilities for construction and sediment removal will also be determined during this period, 401 (\$300,000 state/ \$300,000 ACE); \$250,000 USEPA, \$300,000 (Congressional add-on); and \$850,000 ACE Operation and Maintenance account funding. The ARP has requested the ACE Buffalo District to take a lead on the CMP development which is expected to take 22 months and cost \$1.8M.

Phase II will provide construction of the disposal facility and complete remediation of the Ashtabula River. The \$7M state commitment will be used to leverage \$14M in ACE funding under the Section 312 environmental dredging authority. Private financial interest is driven by Superfund avoidance intended to lower the ultimate cost to the Fields Brook PRPs. The private share of expense is anticipated to provide a significant contribution to complete funding requirements. Superfund designation remains a viable option throughout the process of negotiation on project cost-share to

ensure private interest.

The Ashtabula River Partnership demonstrates the resolve of a Great Lakes community to protect its future by focusing the resources of the federal and state governments on a common-sense approach to resolve a complex environmental problem. Most importantly, the ARP has created the political will among all parties to work cooperatively towards a mutual financial and social benefit.

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1. Joe Mercurio, *Summary*, THE FOX RIVER COALITION II, 1995, Publ-WR-382-95, Wisconsin Department of Natural Resources. For a copy contact: Jo Mercurio, Policy and Planning Section, WDNR, WR/2, Bureau of Water Resources Management, 101 S. Webster St., PO Box 7921, Madison, WI 53707, ph: 608/267-2452, fax: 608/267-2800.

## **BACKGROUND PAPER: REMEDICATION TECHNOLOGIES.**

Background information excerpted from ARCS Remediation Guidance Document, by USEPA-GLNPO. Compiled and edited by Patricia Smith King, Ph.D., Sierra Club - Great Lakes Program.

Session Leader:  
Steve Garbaciak, US Environmental Protection Agency, Great Lakes National Program Office.

### **QUESTIONS FOR DISCUSSION:**

#### **1. WHEN ARE THE REMEDIATION APPROACHES LISTED BELOW APPROPRIATE FOR GREAT LAKES CONTAMINATED SEDIMENTS?**

- \*CAPPING,**
- \*IN-SITU BIOREMEDIATION,**
- \*DREDGING,**
- \*TREATMENT TECHNOLOGIES,**
- \*NATURAL RECOVERY.**

#### **2. HOW DO YOU SELECT AMONG THE ALTERNATIVES LISTED ABOVE FOR A SPECIFIC SITE?**

- \*ECONOMICS,**
- \*LOCAL SUPPORT,**
- \*IMPACT ASSESSMENT.**

The following information is excerpted from the ARCS Remediation Guidance Document (Guidance) of the EPA.<sup>1</sup> The Guidance is a product of the Assessment and Remediation of Contaminated Sediments (ARCS) Program and reports the findings of that program regarding the remediation of contaminated sediments.

## REMEDIATION APPROACHES

**DREDGING.** [See Dredging Background Paper, Topic 2].

### NONREMOVAL TECHNOLOGIES.<sup>2</sup>

Nonremoval technologies are those that involve the remediation of contaminated sediments *in situ* (i.e., in place). Nonremoval technologies for contaminated sediments include *in situ* capping, *in situ* containment, and *in situ* treatment. Such technologies do not require sediment removal, transport, or pretreatment. As a result, nonremoval technologies are often less complex and have lower costs than multicomponent alternatives (e.g., combinations of removal, transport, treatment, and disposal). In some cases (e.g., *in situ* treatment), nonremoval technologies may be similar to the treatment and disposal technologies used with dredged sediments.

**TABLE 3-2. SELECTION FACTORS FOR NONREMOVAL TECHNOLOGIES**

Technology	Applications	Limitations
<b><i>In situ</i> Capping</b>	Most favorable conditions are in areas with low currents and no navigation traffic, cap may have to be armored to prevent erosion  Cap design must provide contaminant isolation and address bioturbation (Palermo and Reible, in prep.)  Special equipment for cap placement has been developed (Palermo 1991b)	Cap will decrease water depth and potentially limit future uses of the waterway  Potential impacts on flooding, stream-bank erosion, navigation, and recreation
<b><i>In situ</i> Containment</b>	Abandoned slips and turning basins are well suited  Enclosed area can be used for disposal of contaminated sediments from other areas of the waterway	Portion of waterway to be filled must be expendable  Potential impacts on flooding, stream-bank erosion, and navigation
<b><i>In situ</i> Treatment</b>	Oxidation and enhanced biodegradation of low molecular weight organic compounds appears promising. Other treatment technologies need substantial development both in process and application tools	Potential impacts of process, reagents/amendments, and sediment disturbance on water column and aquatic environment  Ability to control process <i>in situ</i> and effect a uniform level of treatment  Effectiveness of process under saturated, anaerobic conditions at ambient temperatures  Ability to treat deeper sediment deposits

**In situ Capping:** *In situ* capping is the placement of a covering or cap over an *in situ* deposit of contaminated sediment. The cap may be constructed of clean sediments, sand, or gravel, or may involve a more complex design using geotextiles, liners, and multiple layers. An annotated bibliography prepared for the Canadian Cleanup Fund<sup>3</sup> summarizes most of the capping projects and studies that have been completed to date.

In situ Biological Treatment: Effective *in situ* bioremediation of fine-grained, saturated soils and sediments (as opposed to more porous groundwater aquifers or soils within the vadose zone) poses a major challenge. While delivery and transport of nutrient and electron acceptor amendments to and through groundwater aquifers is a demonstrated technology, movement of these materials through fine-grained sediments is difficult.

## **TREATMENT TECHNOLOGIES.<sup>4</sup>**

There are numerous treatment technologies for sediments contaminated with hazardous substances. Many of these technologies have been developed for treating contaminated soils at hazardous waste sites, especially those designated under the Superfund Program. The following provides a brief introduction to some of the better-established technologies, particularly those that have been demonstrated on contaminated sediments.

Treatment technologies reduce contaminant concentrations, contaminant mobility, and/or toxicity of the sediments by one or more of four means: destroying the contaminants or converting the contaminants to less toxic forms; separating or extracting the contaminants from the sediment solids; reducing the volume of contaminated material by separation of cleaner sediment particles from particles with greater affinity for the contaminants; and, physically and/or chemically stabilizing the contaminants in the dredged material so that the contaminants are fixed to the solids and are resistant to losses by leaching, erosion, volatilization, or other environmental pathways.

Thermal Destruction Technologies. These technologies heat the sediment several hundreds or thousands of degrees above ambient temperature. These processes are generally the most effective options for destroying organic contaminants, but are also the most expensive. They include: incineration (basically involves heating the sediments in the presence of oxygen to burn or oxidize organic materials, including organic compounds), pyrolysis (involves the heating of solids in the absence of oxygen), high-pressure oxidation (uses the combination of high temperature and pressure to break down organic compounds), and vitrification (uses electricity to volatilize or destroy organic compounds and immobilize inert contaminants).

Most of the thermal technologies are highly effective in destroying a wide variety of organic compounds, including PCBs, PAHs, chlorinated dioxins and furans, petroleum hydrocarbons, and pesticides. They do not destroy metals, although some technologies (e.g., vitrification) immobilize metals in a glassy matrix. Volatile metals, particularly mercury, will tend to be released into the flue gas. Additional equipment for emission control may be needed to remove these contaminants.

Thermal Desorption Technologies. Thermal desorption physically separates volatile and semivolatile compounds from sediments by heating the sediment to temperatures ranging from 90 to 540 deg.C. Water, organic compounds, and some volatile metals are vaporized by the heating process and are subsequently condensed and collected as liquid, captured on activated carbon, and/or destroyed in an afterburner. An inert atmosphere is usually maintained in the heating step to minimize oxidation of organic compounds and to avoid the formation of compounds such as dioxins and furans. The temperature of the solids in the desorption unit and retention time are the primary variables affecting performance of the process. Heating may be accomplished by indirectly fired rotary kilns, heated screw conveyors, a series of externally heated distillation chambers, or fluidized beds.<sup>5</sup>

Thermal desorption processes offer several advantages over thermal destructive processes, including reduced energy requirements, less potential for formation of toxic emissions, and smaller volumes of gaseous emissions. Disadvantages include the need for a follow-on destruction process for the volatilized organic compounds and reduced effectiveness for less volatile organic compounds.

Immobilization Technologies. Immobilization alters the physical and/or chemical characteristics of the sediment to reduce the potential for contaminants to be released from the sediment when placed in a disposal site. The principal contaminant loss pathway reduced by immobilization is contaminant leaching from the disposal site to groundwater and/or surface water; however, contaminant losses at the sediment surface may also be reduced by immobilization processes.

Extraction Technologies. Solvent extraction processes are used to separate contaminated sediments into three fractions: particulate solids, water, and concentrated organic compounds. Contaminants are dissolved or physically separated from the particulate solids using a solvent that is mixed thoroughly with the contaminated sediment. Most extraction processes do not destroy or detoxify contaminants, but they reduce the volume of contaminated material that must be subsequently treated or disposed. Volume reductions of 20-fold or more are possible, depending on the initial concentration of extractable contaminants in the feed material and the efficiency of separation of the concentrated organic (oil) stream and the water removed by the process. Another advantage of the volume reduction is that most of the contaminants are transferred from the solid phase to a liquid phase, which is more easily managed in subsequent treatment or disposal processes. The primary application of solvent extraction is to remove organic contaminants such as PCBs, volatile organic compounds, halogenated solvents, and petroleum hydrocarbons. Extraction processes may also be used to extract metals and inorganic compounds, but these applications, which usually involve acid extraction, are potentially more costly than those used for removing organic contaminants. Solvents used for



extraction processes can represent a significant cost; therefore, a key component of an extraction process is to separate the solvents from the organic compounds and reuse them in subsequent extraction steps. Usually several extraction cycles are required to reduce contaminant concentrations in the sediments to target levels.

Sediment Washing. The term sediment washing is generally used to describe extraction processes that use a water-based fluid as the solvent.<sup>6</sup> Many sediment washing processes rely on particle-size separation to reduce the volume of contaminated material. Other water-based techniques involve dissolving or suspending the contaminants in the water-based fluid. Because most sediment contaminants are tightly bound to particulate matter, water alone is not a suitable extraction fluid. Surfactants, acids, or chelating agents may be used with water to effect separation of some contaminants. The particle size and type of contaminant are important factors in the effectiveness of sediment washing as an extraction process. Sediment washing for clays and silts is only marginally applicable. The U.S. Bureau of Mines evaluated acid extraction for heavy metals in Great Lakes sediments from three AOCs under the ARCS Program and found minor reductions in sediment metal concentrations. The use of surfactants may be successful for removing organic compounds from sandy sediments.

Bioremediation Technologies. Bioremediation, sometimes called biodegradation, is a managed or spontaneous process in which microbiological processes are used to degrade or transform contaminants to, hopefully, less toxic or nontoxic forms, thereby remedying or eliminating environmental contamination. Microorganisms depend on nutrients and carbon to provide the energy needed for their growth and survival. Degradation of natural substances in soils and sediments provides the necessary food for the development of microbial populations in these media. Bioremediation technologies harness these natural processes by promoting the enzymatic production and microbial growth necessary to convert the target contaminants to nontoxic end products.

Many of the more persistent contaminants in the environment, such as PCBs and PAHs, are resistant to microbial degradation because of 1) the compound's toxicity to the organisms, 2) preferential feeding of microorganisms on other substrates, 3) the microorganism's lack of genetic capability to use the compound as a source of carbon and energy, or 4) unfavorable environmental conditions in the sediment for propagating the appropriate strain of microorganisms. Alteration of the environmental conditions can often stimulate development of appropriate microbial populations that can degrade the organic compounds. Such changes may include adjusting the concentration of the compound, pH, oxygen concentration, or temperature, or adding nutrients or microbes that have been acclimated to the compound.

Factors to Consider. Selection factors for treatment technologies can be discussed in terms of three general categories: target contaminants, sediment characteristics, and implementation factors. The decision-maker can select a type of technology (e.g., thermal destruction, extraction, immobilization) for a particular project and a process option within a technology type. In addition, the evaluation of the overall remedial alternative must consider the effects of each step of the process on preceding and succeeding steps.

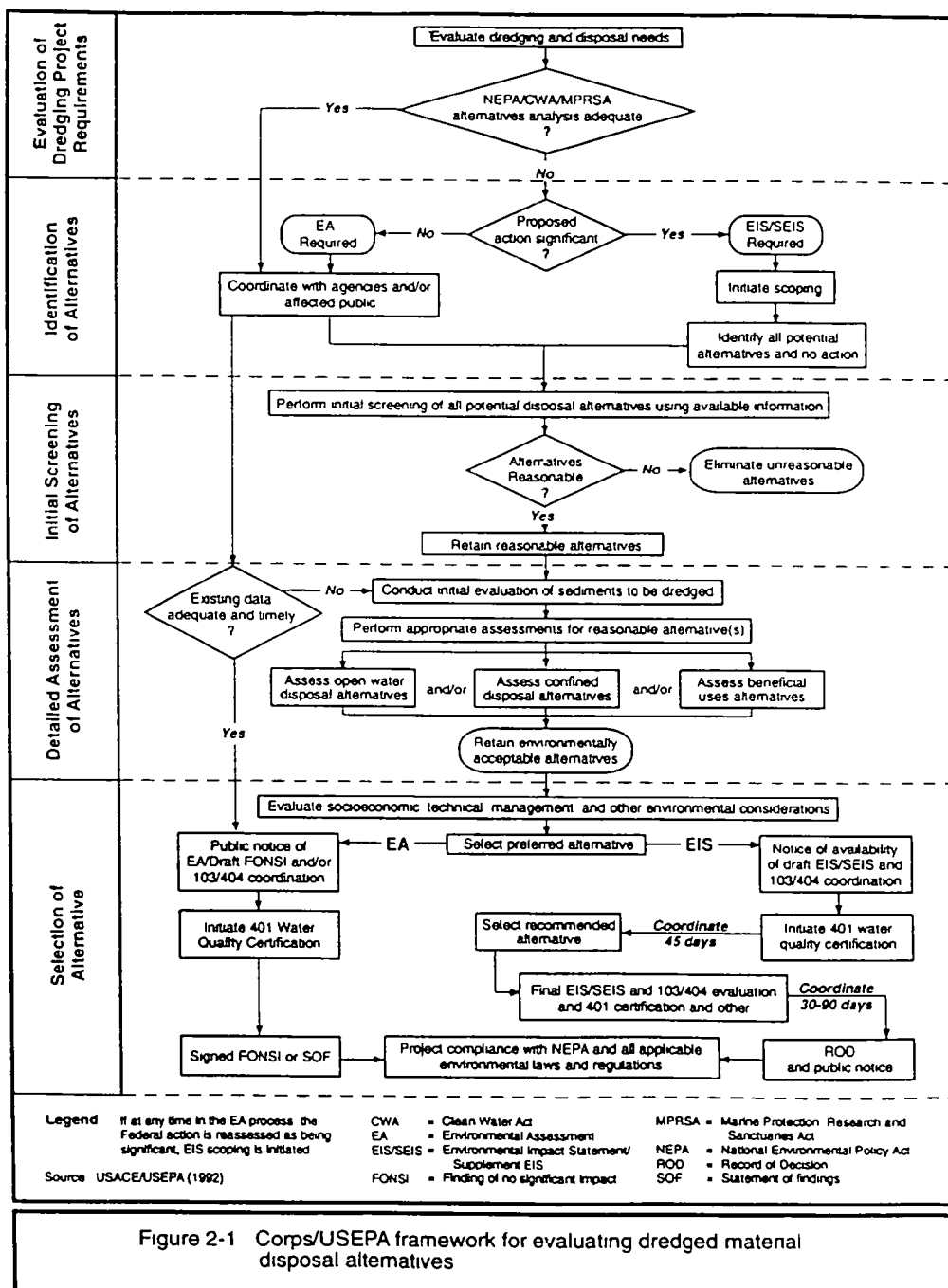
There may be several different types of technologies that have potential for successfully remediating a specific contaminated sediment site. A screening process, considering such factors as contaminant type and sediment physical characteristics, will typically narrow the range of applicable technology candidates, but will not reduce them to a single process option. To proceed from a site screening analysis or remedial investigation to the selection of an optimum technology for full-scale application in the remediation of a contaminated sediment site, there are several types of tests that can be used to further reduce the range of options.

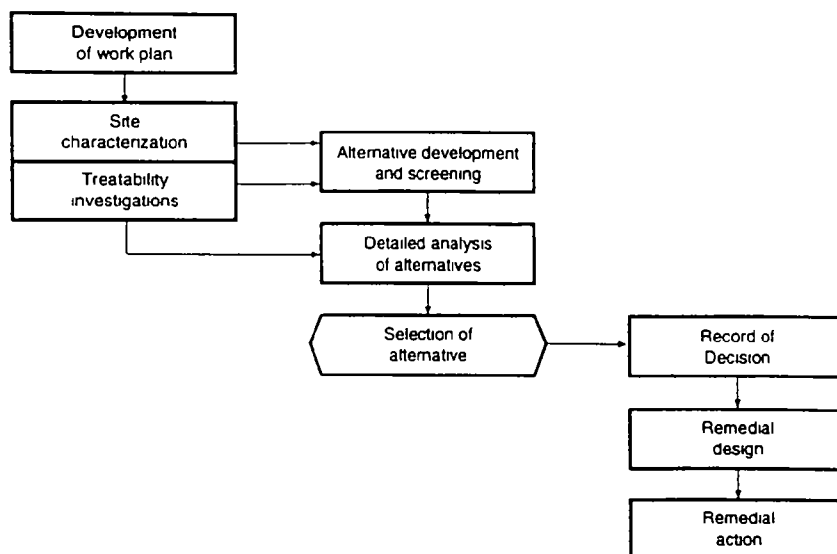
Treatment costs will in most cases be the step requiring the largest expenditure of funds. Unfortunately, costs for the treatment step are the most difficult to estimate accurately. Treatment technologies have not been widely applied to full-scale remediation projects for soils or sediments. Historical project construction data and data for relatively standard construction practices are available for other components, such as removal and disposal, but such data are not available for treatment technologies. Most treatment cost estimates are based on information provided by the vendor. Though vendors may act in good faith in providing cost information, comparability of the data from various vendors is often poor because of variability in the items included in the estimates, the effects of variable sediment characteristics on process operations, and other uncertainties in the process.

## **DECISION-MAKING STRATEGIES<sup>7</sup>**

Decision-making strategies are pathways for approaching a complex issue or problem in a logical order or sequence. A strategy can be represented as a flow chart or framework of activities and decisions to be made. Decision-making strategies are usually developed for very specific applications. The management of contaminated sediments occurs for a variety of purposes other than environmental remediation and restoration. Other purposes include the construction and maintenance of navigation channels, the clearing of sediment deposits from water supply intakes, construction within waterways, and the operation and maintenance of reservoirs and impoundments for flood control, water supply, recreation, or other purposes. There is no single decision-making strategy for the management of contaminated sediments that suits all

purposes. Two established strategies that have been applied to the management of contaminated sediments are 1) a technical management framework developed jointly by the U.S. Army Corps of Engineers (Corps) and USEPA and 2) the decision framework established for Superfund projects. These two strategies are described in the charts below.





Source USEPA (1988a)

**Figure 2-2. Superfund framework for evaluating contaminated sediments.**

1 Assessment and Remediation of Contaminated Sediments (ARCS) Program REMEDIATION GUIDANCE DOCUMENT USEPA-Great Lakes National Program Office EPA 905-R94-003, Oct 1994 [hereinafter REMEDIATION GUIDANCE]

2 *Id* , chapter 3.

3 Zeman, A.J , S Sills, J E Graham, And K A Klein, 1992 Subaqueous capping of contaminated sediments annotated bibliography NWRI Contribution No 92-65 National water Research Institute, Burlington, Ontario, Canada

4 REMEDIATION GUIDANCE, chapter 7

5 USEPA 1991 Engineering bulletin thermal desorption treatment EPA/540/2-91/008 USEPA, Office of Emergency and Remedial Response, Washington, DC, and Office of Research and Development, Cincinnati, OH

6. USEPA. 1990 CF systems organics extraction process-New Bedford Harbor, MA Superfund Innovative Technology Evaluation Applications Analysis Report EPA 540/A5-90/002 USEPA, Office of Research and Development, Washington, DC

7 REMEDIATION GUIDANCE, chapter 2

## **BACKGROUND PAPER: CLEANUP GOALS AND OBJECTIVES**

Compiled and edited by Patricia Smith King, Ph.D.,  
Sierra Club - Great Lakes Program.

Session Leader:  
Lee Liebenstein, Bureau of Water Resources, Wisconsin Department of  
Natural Resources.

### **QUESTIONS FOR DISCUSSION:**

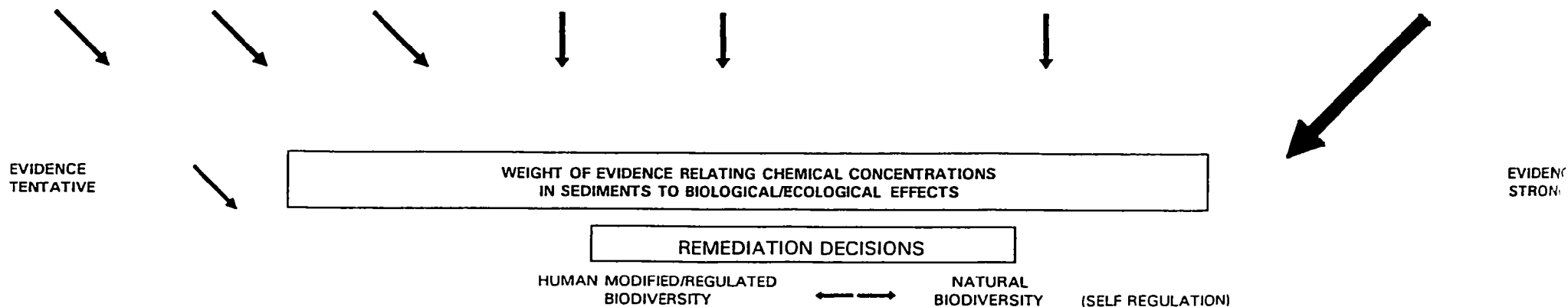
- 1. DO WE NEED SEDIMENT QUALITY CRITERIA FOR CLEANUPS? DO SEDIMENT QUALITY CRITERIA PLAY A USEFUL ROLE IN REMEDIATION?**
- 2. DO SITES HAVE TO BE PRIORITIZED PRIOR TO TAKING ACTION (E.G. ADDRESS THE UPSTREAM AND WORST SITES FIRST)?**
- 3. SHOULD THERE BE UNIFORM CLEANUP GOALS ACROSS THE GREAT LAKES? MUST WE BE CONSISTENT FROM SITE TO SITE?**
- 4. DO WE HAVE TO WAIT UNTIL WE ARE CONVINCED RECONTAMINATION WON'T OCCUR BEFORE REMEDIATING?**
- 5. HOW CAN WE GET ACCEPTANCE OF CLEANUP GOALS FROM THE VARIOUS STAKEHOLDERS?**
- 6. IN WHAT SITUATIONS, IF ANY, IS NATURAL RECOVERY A VIABLE ALTERNATIVE TO REMEDIAL ACTION?**

Although there are numerous methods and approaches for evaluating impacts to human health and the environment from contaminated sediments (e.g., comparison to background, comparison to sediment quality criteria/threshold values, evaluation of tissue residue concentrations, conducting sediment toxicity testing, etc.), there is no universally accepted approach to derive acceptable levels of cleanup. Cleanup goals for contaminated sites are often derived on a case-by-case basis with consideration given to ecological and human health risks, technological feasibility and cost, among other factors. Cleanup goals can, and usually do, differ from site-to-site for many reasons, including differences in species sensitivities and endpoints chosen for protection.

In order to stimulate discussion during the breakout session for this topic, listed below are some issues that often are raised when discussing cleanup goals for contaminated sediment sites in the Great Lakes.

- The role of numeric sediment criteria, thresholds and objectives vs. specific effects-based testing approaches.
- The role of risk assessment/risk management.
- The potential for broader use of Ontario Ministry of the Environment guidelines or dredged material testing manuals.
- The appropriateness of uniform cleanup goals for the Great Lakes vs. waterbody-specific and site-specific goals.
- The role of natural recovery and source control. If natural recovery is chosen, what timeframe should be set to see a result?
- Balancing the need for rapid action with the need for better defined objectives.
- Balancing the need for simple and inexpensive approaches to define cleanup goals with the complexity of current approaches. Possibility of a tiered approach to setting cleanup goals.
- The appropriate endpoints for protection (e.g. wildlife/fish consumption, benthic effects, and wildlife impacts).
- Difficulty in prioritizing sites with limited data.

SCREENING		CURRENT CAPABILITIES FOR ESTABLISHING SEDIMENT QUALITY OBJECTIVES							SITE SPECIFIC CHEMICAL CONCENTRATION/ BIOLOGICAL EFFECTS
-----LOWER TIERS-----			TIERED APPROACH FOR EVALUATING SEDIMENT QUALITY			-----UPPER TIERS-----			
1	2	3a	3b	3c	4	5	6	7	8
Other regulatory agency reference	Companion with background/ reference site concentrations	Calculated Methods (Non-Polar Organic Compounds)			Fate and transport modeling of contaminants of concern	Ecological Risk Assessment	Sediment Chemistry and Chemicals	Laboratory Toxicity/ Bioaccumulation Testing	Study of Various Field Biological Variables
Critera/ Guidelines/ Objectives		Equilibrium partitioning models use stated assumptions sediment quality objectives developed to be protective of water quality criteria based on human health and wildlife in NR 105 and proposed Great Lakes Water Quality Criteria under Great Lakes Initiative (G L Critical Programs Act) Total PCB congeners PAH's chlorn pesticide	Partitioning models that consider sediment TOC, bioconcentration factors (BCF), lipid content of organisms, preference factors. Sediment quality objectives developed to be protective of FDA and IJC tissue level objectives Total PCBs	Calculation of TCDD- equivalents for certain dioxins, furans and PCB-dioxin like congeners detected in sediments					
Approaches related sediment concentrations to biological effects • Ontario sed qual guidelines SLC • NOAA Status and trends • Washington sed stds - AET • Netherlands sed qual cnt EQP to protect benthic organ • Canadian manne sed qual guide • Literature	• Determine degree of enrichment • Similar site characteristics grain size TOC water depth • River system • Watershed • Drainage basin				• Potential for natural recovery • Far field transport and increase in extent of area of contamination • Circumstances that may lead to increased bioavailability	• Problem formulation • Exposure Assessment • Ecological effects assessments • Risk characterization • Remedial objectives	• AVS • Grain size • TOC • Ammonia • Metals • Organics	MATRIX • Whole sediment • Pore water • Overlying water • Test organisms  • Daphnia • Fathead minnow • Hyallela azteca • Chironomus tentans • Ceriodaphnia Dubia	• Benthic community structure/ dive • Tissue concentrations Bioaccumulation • Tumors/ abnormalities • Organism reproduction
						Risk Management Decisions	Sediment Evaluation Integrative assessments Interdependent Endpoints "Tnad Approach"		



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## **BACKGROUND PAPER: WHAT'S MISSING?**

Written by Patricia Smith King, Ph.D., Sierra Club - Great Lakes Program.

Session Leader:  
Patricia Smith King, Ph.D., Sierra Club - Great Lakes Program.

### **QUESTIONS FOR DISCUSSION:**

- 1. HOW DO WE ASSURE DECONTAMINATION OF THE SEDIMENTS IN THE LONG-TERM (SOURCE/POLLUTION CONTROL; CONTROL OF SEDIMENT MOVEMENT)?**
- 2. HOW DO WE PROMOTE THE ECONOMIC VIABILITY & DEVELOPMENT OF DECONTAMINATION TECHNOLOGIES?**
- 3. HOW DO WE ASSURE THAT LANDFILLS, WHEN USED, ARE "SEDIMENT RECYCLING CENTERS" VERSUS PERMANENT REPOSITORIES FOR CONTAMINATED SEDIMENTS?**
- 4. WHO (PRPs, MUNICIPALITIES, OTHERS?) SHOULD ASSUME THE LIABILITY FOR THESE POLLUTANTS WHILE STORED IN LANDFILLS?**
- 5. ARE THERE OTHER POSSIBLE APPROACHES OUTSIDE OF THE REGULATORY AND PARTNERSHIP ARENAS?**

This is the catch-all session of the Contaminated Sediments Workshop which may prove the most lively due to the controversial nature of some of the questions posed. There are few resources to which to refer the participants. Attendees are encouraged to bring whatever useful background information they may have. The following provides brief explanations of the questions presented.

#### **1. HOW DO WE ASSURE DECONTAMINATION OF THE SEDIMENTS IN THE LONG-TERM (SOURCE/POLLUTION CONTROL; CONTROL OF SEDIMENT MOVEMENT)?**

Once contaminated sediment sites are cleaned, they become vulnerable to recontamination from a number of sources: other contaminated sediments,

contaminated waters, point and non-point sources of pollutants, and others. Are there ways in which recontamination from any or all of these sources can be prevented?

## 2. HOW DO WE PROMOTE THE ECONOMIC VIABILITY & DEVELOPMENT OF DECONTAMINATION TECHNOLOGIES?

The current costs of decontaminating sediments are generally high (see chart in Background Paper for Economics). Yet, decontamination actually solves the problem of pollutants by destroying them unlike containment or storage of such sediments which leave us with the problem of dealing with large volumes of contaminated sediments in the future. What economic incentives/programs could be devised to promote the development of decontamination industries with the subsequent decrease in their costs? Are there other soil reduction techniques in addition to soil washing which could be devised to reduce the volume of contaminated sediments and in that way decrease the total costs of treatment? If storage must be used in the short-term, would the development of a central facility be wise -- or perhaps regional facilities? Could these storage facilities be developed in conjunction with soil reduction?

## 3. HOW DO WE ASSURE THAT LANDFILLS, WHEN USED, ARE "SEDIMENT RECYCLING CENTERS" VERSUS PERMANENT REPOSITORIES FOR CONTAMINATED SEDIMENTS?

Rather than leave contaminated sediments in landfills over the long-term, is there some way to ensure that they are used only as short-term storage? Is this even advisable? How will we as a society deal with these large volumes of highly contaminated waste in future?

## 4. WHO (PRPs, MUNICIPALITIES, OTHERS?) SHOULD ASSUME THE LIABILITY FOR THESE POLLUTANTS WHILE STORED IN LANDFILLS?

Liability issues are often the major stumbling blocks to remediation of contaminated sediments both by private entities and public ones alike (see Brown Fields section of Economics Background Paper). Yet, holding those who caused the pollution liable is at the core of our system of justice, creating the disincentive to harm others which works to protect the public. What to do about this? Is there some position that would lessen this block to remediation while adequately protecting the public?

## 5. ARE THERE OTHER POSSIBLE APPROACHES OUTSIDE OF THE REGULATORY AND PARTNERSHIP ARENAS?

The Workshop has focused on regulatory and public/private partnership approaches in dealing with contaminated sediments (see Background Papers for each of those sections). Is there some other way?

## ***APPENDIX C***

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### ***LIST OF PARTICIPANTS AND WORKSHOP AGENDA***

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Chicago, Illinois  
June 13-14, 1995

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## **AGENDA FOR GREAT LAKES CONTAMINATED SEDIMENT STRATEGY WORKSHOP**

### **DAY 1 - June 13, 1995**

- |                   |   |
|-------------------|---|
| 9 00am - 9 15am   | Welcome (Chris Grundler, USEPA, GLNPO)  |
| 9 15am - 9 20am   | Meeting Logistics   |
| 9 20am - 10 00am  | Stakeholder Perspectives on Major Sediment Issues (10 min. each) <ul style="list-style-type: none"><li>➤ USEPA (Howard Zar, Region 5)</li><li>➤ State (Dan Helwig, Minnesota Pollution Control Agency)</li><li>➤ Corps of Engineers (Jan Miller, North Central Division)</li></ul>  |
| 10 00am - 10 15am | BREAK   |
| 10 15am - 11 00am | Stakeholder Perspectives on Major Sediment Issues, cont'd (10 min each) <ul style="list-style-type: none"><li>➤ Non-governmental organization (Patricia King, Sierra Club)</li><li>➤ Industry (Rick Brewer, RMI Corporation)</li><li>➤ Port authority (John Loftus, Toledo-Lucas County Port Authority)</li><li>➤ Municipality (Steve Hiniker, City of Milwaukee)</li></ul> |
| 11 00am - 11 30am | Background Paper Summaries for Topics 1-4 (15 min on each issue) <ul style="list-style-type: none"><li>➤ Topic 1 - Garnering Local Support (Paul Geiselhart, Citizens of Lake County for Environmental Action and Reform)</li><li>➤ Topic 2 - CDFs and Dredged Material Management (Jan Miller, Corps, North Central District)</li></ul>                                    |
| 11 30am - 1 00pm  | LUNCH ON YOUR OWN   |
| 1 00pm - 1 30pm   | Background Paper Summaries for Topics 1-4, cont'd (15 min on each issue) <ul style="list-style-type: none"><li>➤ Topic 3 - Economics (John Peck, Sierra Club and David Allardice, Federal Reserve Bank of Chicago)</li><li>➤ Topic 4 - Regulatory Approaches and Barriers (Howard Zar, USEPA Region 5)</li></ul>  |

- 1 30pm - 3 30pm      Breakout Session on Topics 1-4  
(Each group will address specific questions addressed to them. Issues will be discussed to reach resolution, if possible, or note where conflicts exist.)
- 3 30pm - 3 45pm      BREAK
- 3 45pm - 5 45pm      Summaries from Breakout Session on Topics 1-4 (15 min each) and Open Discussion (1 hour)

**DAY 2 - June 14, 1995**

- 8 30am - 9 30am      Background Paper Summaries on Topics 5-8 (15 min on each issue)
- Topic 5 - Public/Private Partnerships (Al Toma, Fort Howard)
  - Topic 6 - Remediation Technologies (Steve Garbaciak, USEPA GLNPO)
  - Topic 7 - Clean-up Goals and Objectives (Lee Liebenstein, Wisconsin Department of Natural Resources)
  - Topic 8 - What's Missing? (Patricia King, Sierra Club)
- 9 30am - 9 45am      BREAK
- 9 45am - 11 45am      Breakout Session on Topics 5-8  
(Each group will address specific questions addressed to them. Issues will be discussed to reach resolution, if possible, or note where conflicts exist.)
- 11 45am - 1 00pm      LUNCH ON YOUR OWN
- 1 00pm - 3 00pm      Summaries from Breakout Session on Topics 5-8 (15 min each) and Open Discussion (1 hour)
- 3 00pm - 3 15pm      Wrap-up, Next Steps and Adjourn
- 
- 3 30pm - 4 30pm      Steering Committee Meets on Follow-up