OFFICE OF INSPECTOR GENERAL

Catalyst for Improving the Environment

Evaluation Report

EPA Can Better Implement Its Strategy for Managing Contaminated Sediments

Report No. 2006-P-00016

March 15, 2006

Report Contributors: Carolyn Copper
Patrick Milligan
Alicia Mariscal
Madeline Mullen
Michael Owen

Abbreviations

EPA	Environmental Protection Agency
NSQS	*National Sediment Quality Survey*
OIG	Office of Inspector General
OPPTS	Office of Prevention, Pesticides, and Toxic Substances
ORD	Office of Research and Development
OSWER	Office of Solid Waste and Emergency Response
OW	Office of Water
PCBs	Polychlorinated Biphenyls

Cover photo: Fish advisory posted next to Duwamish River where tribal salmon fishermen are in a boat, Seattle, Washington (EPA OIG photo)

U.S. Environmental Protection Agency
Office of Inspector General

2006-P-00016
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At a Glance

Catalyst for Improving the Environment

Why We Did This Review

We sought to determine the effectiveness and outcomes achieved from the Environmental Protection Agency's (EPA's) *Contaminated Sediment Management Strategy*. In particular, we evaluated whether Federal authorities and resources provided effective solutions, and how well EPA measured Strategy effectiveness and assessed contamination.

Background

Although the extent of sediment contamination remains uncertain, EPA estimates that approximately 10 percent of the sediment underlying the Nation's surface water poses potential risks to fish, as well as to humans and wildlife that eat fish. As of 2004, there were 3,221 fish consumption advisories in place in the United States covering 24 percent of the Nation's river miles and 35 percent of its lake acres.

For further information, contact our Office of Congressional and Public Liaison at (202) 566-2391.

To view the full report, click on the following link:
www.epa.gov/oig/reports/2006/20060315-2006-P-00016.pdf

EPA Can Better Implement Its Strategy for Managing Contaminated Sediments

What We Found

EPA needs to better manage its efforts to clean up contaminated sediments on a nationwide basis. Contaminated sediments are the soils, sands, organic matter, and other minerals that accumulate at the bottom of a water body and contain toxic or hazardous materials that may adversely affect human health and the environment. EPA made some progress with its *Contaminated Sediment Management Strategy*. However, the Agency cannot assure that resources devoted to addressing contaminated sediments provide the most effective and efficient solutions for reducing the environmental and human health risks posed by this national problem.

Program offices generally did not use National Sediment Inventory data for decision making, even though the inventory represents the most comprehensive source of data on contaminated sediments in the United States. EPA did not sufficiently coordinate contaminated sediment activities performed by various EPA program offices. The Agency did not develop sediment quality criteria to ensure the comparability of data gathered to assess sediment contamination and its effects. EPA contaminated sediment research efforts did not fully meet the Agency's needs, and EPA can improve coordination of its research efforts with those of other Federal agencies. The Agency also did not establish cross-program performance measures that fully evaluate the effectiveness of its Strategy and enable EPA to determine its progress. Many of these issues occurred because no program office within EPA has responsibility for overseeing contaminated sediments.

EPA's 2004 *National Sediment Quality Survey* report did not provide a complete assessment of the extent and severity of sediment contamination across the Nation, nor fully meet the requirements of the Water Resources Development Act.

What We Recommend

We recommend that EPA assign responsibility for the oversight and evaluation of the Agency's *Contaminated Sediment Management Strategy* to a committee or an office. We also recommend that EPA: develop and implement comprehensive performance measures; evaluate the need to develop sediment quality criteria; continue to improve research coordination; develop and implement a plan for using *National Sediment Quality Survey* reports; and develop and implement a plan to provide a comprehensive national assessment of contaminated sediments. EPA generally agreed with the recommendations in the draft report. The Agency will need to provide further details on its plans to address Office of Inspector General recommendations within 90 days.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
INSPECTOR GENERAL

March 15, 2006

MEMORANDUM

SUBJECT: EPA Can Better Implement Its Strategy for Managing Contaminated Sediments
Report No. 2006-P-00016

TO: Marcus Peacock
Deputy Administrator

Susan Bodine
Assistant Administrator for Solid Waste and Emergency Response

Benjamin Grumbles
Assistant Administrator for Water

George Gray, Ph.D.
Assistant Administrator for Research and Development

This is the final report on our evaluation of the Environmental Protection Agency's (EPA's) *Contaminated Sediment Management Strategy*. This report contains findings that describe the problems the Office of Inspector General (OIG) identified and corrective actions the OIG recommends. This report represents the opinion of the OIG and the findings in this report do not necessarily represent the final EPA position. Final determination on matters in the report will be made by EPA managers in accordance with established resolution procedures. We received EPA's written comments on our draft report on January 9, 2006, and a revised response to one recommendation on February 10, 2006.

Action Required

In accordance with EPA Manual 2750, you are required to provide a written response to this report within 90 days of the date of this report. You should include a corrective action plan for agreed upon actions, including milestone dates. We have no objections to the further release of this report to the public. If you or your staff have questions regarding this report, please contact me at (202) 566-0847 or Carolyn Copper, Acting Assistant Inspector General for Program Evaluation, at (202) 566-0829.

Sincerely,

Bill A. Roderick
Acting Inspector General

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Chapter 1
Introduction

Purpose

This report focuses on the U.S. Environmental Protection Agency's (EPA's) efforts to manage and address contaminated sediments. Overall, we sought to determine the effectiveness and outcomes achieved from EPA's *Contaminated Sediment Management Strategy*. We addressed three specific questions:

- Do available Federal authorities and resources provide effective solutions to the challenges of contaminated sediments?
- How does EPA measure the effectiveness of its management strategy for contaminated sediments and what outcomes have been achieved?
- Has EPA completely assessed the extent and severity of sediment contamination in the United States?

Background

Contaminated sediments are a national problem with serious implications for human health and the environment. EPA defines contaminated sediments as the soils, sand, organic matter, or minerals that accumulate on the bottom of a water body and contain toxic or hazardous materials that may adversely affect human health or the environment. EPA has studied data from 1,372 of the 2,111 watersheds in the continental United States, and has identified 96 watersheds that contain "areas of probable concern." These represent areas where probable adverse effects of sediment contamination are more likely to be found.

EPA has not fully assessed the extent and severity of sediment contamination in the United States. Although the extent of sediment contamination remains uncertain, the Agency has estimated that approximately 10 percent of the sediment underlying our Nation's surface water is sufficiently contaminated with toxic pollutants to pose potential risks to fish through the aquatic food chain, as well as humans and wildlife that eat fish. Fish consumption represents the most significant route of human exposure to many metals and organic compounds. Many surface waters have fish consumption advisories or fishing bans in place because of high concentrations of polychlorinated biphenyls (PCBs), mercury, dioxin, and other contaminants in sediments. As of 2004, there were 3,221 fish consumption advisories in place in the United States covering 24 percent of the Nation's river miles and 35 percent of its lake acres.

In 1998, EPA established the *Contaminated Sediment Management Strategy* to promote and ensure consistent consideration of risks posed by contaminated

sediments. The Strategy summarizes EPA's understanding of the extent and severity of sediment contamination in the Nation's watersheds and establishes four strategic goals:

Table 1.1: Goals for *Contaminated Sediment Management Strategy*
• Prevent the volume of contaminated sediment from increasing. • Reduce the volume of existing contaminated sediment. • Ensure that sediment dredging and dredged material disposal are managed in an environmentally sound manner. • Develop scientifically sound sediment management tools for use in pollution prevention, source control, remediation, and dredged material management.

In addition, the Strategy establishes a cross-program policy framework. The Strategy emphasizes the importance of coordination among EPA program offices and with other agencies for successful implementation.

EPA has authority under several statutes to address contaminated sediment issues. The primary statutes include:

Table 1.2: Statutes and Authorities	
Comprehensive Environmental Response, Compensation, and Liability Act	The "Superfund" Act provides EPA authority to conduct or compel remedial actions for contaminated sediments.
Clean Water Act	Provides EPA authority to address sources of contaminated sediments through regulation of water pollutant discharges.
Water Resources Development Act	Requires EPA to conduct a comprehensive and continuing program to assess aquatic sediment quality in the United States.
Great Lakes Legacy Act	Provides EPA specific authority to remediate contaminated sediment in the Great Lakes.

EPA does not have sufficient information to provide accurate national estimates on the volume of contaminated sediments and their remediation costs. However, where data exist for specific sites, the cost to address the contamination will be in the billions of dollars. For example:

- Superfund Records of Decision for 55 Tier 1 contaminated sediment sites indicate that approximately $2.9 billion will be required to remediate the sites. These sites have a minimum of 10,000 cubic yards, or 5 acres, of contamination. The estimate does not include sites with contaminated sediments on the National Priorities List where cleanup decisions have not yet

been made. As of 2005, there were approximately 60 additional sites without Records of Decision that may be classified as Tier 1 sites in the future. Although Superfund money is (or will be) required to pay for the remediation of some of these sites, responsible parties are (or will be) required to pay for remediation for the majority of these sites.

- EPA's Great Lakes National Program Office estimates that a total volume of 76,505,439 cubic yards of contaminated sediments in the Great Lakes require remediation at an approximate cost of $1.6 to $4.4 billion. The Great Lakes Legacy Act provides EPA $270 million over 5 years, beginning in Fiscal Year 2004, to address contaminated sediments in the Great Lakes.

The *Contaminated Sediment Management Strategy* established roles for several EPA offices involved with contaminated sediments, including:

Table 1.3: Primary EPA Program Offices Involved with Contaminated Sediments and Their Roles	
Office of Water (OW)	Coordinate implementation of the Strategy and prevent and control sediment contamination through the Clean Water Act.
Office of Solid Waste and Emergency Response (OSWER)	Remediate contaminated sediments that adversely affect the Nation's waterbodies in order to limit serious risks to human health and the environment.
Office of Prevention, Pesticides, and Toxic Substances (OPPTS)	Use new and existing chemical registration programs to reduce the potential of sediment contamination from pesticides and toxic substances.
Office of Research and Development (ORD)	Conduct comprehensive and coordinated research on contaminated sediment, and support EPA program offices.

The Strategy also outlines the roles of several other Federal agencies in managing contaminated sediments, including:

Table 1.4: Other Federal Agencies Involved with Contaminated Sediments
• U.S. Army Corps of Engineers • National Oceanic and Atmospheric Administration • U.S. Fish and Wildlife Service • U.S. Geological Survey • Department of the Navy

The U.S. Army Corps of Engineers, National Oceanic and Atmospheric Administration, U.S. Geological Survey, and Department of the Navy provided estimated information indicating that they budgeted approximately $69 million for contaminated sediment activities during Fiscal Years 2002 through 2005. (Budget information was not available from the U.S. Fish and Wildlife Service.) Some of the funding occurred through interagency agreements with EPA. Most of the budget information provided by these agencies relates to research. In addition, the U.S. Army Corps of Engineers issues permits for and conducts dredging of navigable waters, which can involve contaminated sediment removal. Also, the Department of the Navy conducts remedial actions on contaminated sediments as a responsible party. Other Federal agencies, such as the Department of Energy and Department of the Army, also devote resources to contaminated sediments.

Scope and Methodology

We conducted our evaluation from September 2004 to August 2005. We performed our evaluation in accordance with *Government Auditing Standards*, issued by the Comptroller General of the United States. We considered the findings of prior Office of Inspector General (OIG) and Government Accountability Office reports related to contaminated sediment issues.

To evaluate the effectiveness and outcomes achieved from EPA's Strategy, we reviewed documents and records related to the management of contaminated sediments, including databases and Internet Web sites, and interviewed EPA officials from OSWER, OW, OPPTS, and ORD. We also interviewed EPA officials from the Great Lakes National Program Office and four regions. In addition, we interviewed officials from various other Federal agencies, from six States and from the Association of State and Territorial Solid Waste Management Officials.

Appendix A provides further details on our scope and methodology.

Chapter 2
EPA Has Not Fully Implemented Its Contaminated Sediment Strategy

Although EPA made some progress in managing contaminated sediments, it did not fully implement its *Contaminated Sediment Management Strategy*. Program offices involved with addressing contaminated sediments did not:

- Use National Sediment Inventory data for decision making;
- Fully coordinate their activities;
- Develop sediment quality criteria;
- Fully meet research needs or coordinate research with other Federal agencies; and/or
- Establish adequate performance measures.

Also, EPA could enhance remediation efforts by increasing the use of the watershed approach and the Water Resources Development Act. The conditions primarily occurred because no program office assumed responsibility for oversight and overall coordination of the Strategy, and EPA has not updated the Strategy since implementation. Due to incomplete Strategy implementation, EPA cannot assure that resources devoted to addressing contaminated sediments provide the most effective and efficient solutions for reducing the environmental and human health risks posed by this national problem.

EPA Has Made Progress in Managing Contaminated Sediments

Various EPA program offices made some progress regarding the Strategy's goals and the management of contaminated sediments. For example:

- OW published the 1997 and 2004 *National Sediment Quality Survey* (NSQS) reports for Congress and issued guidance documents regarding sediment assessments.

- OSWER established the Contaminated Sediments Technical Advisory Group to oversee work at complex Superfund sediment sites, and the Superfund Sediment Resource Center to assist EPA staff on technical issues regarding sediment site cleanup. OSWER provided two important guidance documents - the *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites* (2002), and the *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* (2005) - to help remedial project managers make scientifically sound and nationally consistent risk management decisions. OSWER also sponsored or co-sponsored several national meetings on

characterizing and managing contaminated sediment. In addition, OSWER provided Federal and State officials training on *Sediment Remediation: Technical Considerations for Evaluating and Implementing Dredging and Capping Remedies*.

- ORD conducted research on issues such as site characterization, ecological and human health risk, and remedy development and evaluation. ORD also held national meetings and workshops on the management and treatment of contaminated sediments.

- OPPTS created a Draft National Action Plan in 2000 with links to fish advisories for Level 1 Pesticides and a 1998 *Multimedia Strategy for Priority Persistent, Bioaccumulative, and Toxic Pollutants*. In addition, OPPTS developed technical guidance documents on pesticides to evaluate their potential to run off or leach into surface waters, or accumulate in sediment.

Management Strategy Not Fully Implemented

Although EPA made some progress in managing and addressing contaminated sediments, it did not fully implement its Strategy. Areas where EPA did not sufficiently implement the Strategy include: (1) using National Sediment Inventory data for decision making, (2) coordinating activities, (3) developing sediment quality criteria, (4) meeting research needs, and (5) measuring performance. Details follow.

National Sediment Inventory Generally Not Used for Decision Making

EPA program offices generally did not use National Sediment Inventory data as part of the decision process for assessment, pollution prevention, and remediation activities as outlined in the Strategy. Under the Strategy, the Agency intended to use the inventory for several purposes, including those noted in Table 2.1.

Table 2.1: Purposes for National Sediment Inventory
• Identify sediment sites for consideration for assessment under the Comprehensive Environmental Response, Compensation, and Liability Act.
• Identify problem pesticides and toxic substances that may require further regulation or evaluation for possible enforcement action.
• Identify impaired waters for National Water Quality Inventory reports or possible Total Maximum Daily Load development.
• Select industries for effluent guidelines development.
• Identify chemicals of concern for sediment criteria development and evaluate the effectiveness of technology-based effluent guidelines, water quality-based permit limits, and Total Maximum Daily Loads.

The National Sediment Inventory, most recently updated in 2004, is the most comprehensive source of information on the extent of contaminated sediments in

the United States. The inventory includes 4.6 million records of sediment chemistry, tissue residue, and toxicity data, for more than 50,000 monitoring stations across the country. EPA obtained this information from various data storage systems and monitoring programs of the Agency and other entities. In 1997 and again in 2004, OW identified 96 watersheds containing areas of probable concern through an analysis of data in the National Sediment Inventory. These areas represented watersheds where sampling data indicated contamination levels that may pose threats to organisms at the bottom of waterbodies and resident fish. EPA reported the results of these analyses in its 1997 and 2004 NSQS reports. Both NSQS reports disclosed that further analysis should be conducted to determine the extent of contamination and appropriate and cost-effective actions.

According to OW and OSWER officials, their offices generally have not used the National Sediment Inventory and NSQS reports as part of assessment, pollution prevention, and/or remediation activities and decisions for contaminated sediments. The Strategy indicates the inventory and NSQS reports should be used to assist EPA program offices with making regulatory decisions for contaminated sediment issues. However, OW and OSWER based their decisions primarily on data specific to their individual programs. As a result, most of the Agency's decisions for managing and addressing human health and ecological risks within these areas of probable concern may not have considered data available from other sources included in the National Sediment Inventory. In 2004, OW did consider using National Sediment Inventory data in its plan for determining the industrial categories for which to develop effluent guidelines.

The National Sediment Inventory and NSQS reports, as appropriate, should complement other sources of information used by EPA program offices for making decisions. For example, we overlaid the data for the 96 areas of probable concern identified in the 2004 NSQS report with the data in OW's 2004 National Listing of Fish Advisories, using Geographic Information System software. We provide the overlay of the two data sets in Appendix C. The overlay shows that most of the areas of probable concern either had fish advisories or were adjacent to waterbodies with them. Using the NSQS data in this way provides additional, although qualified, information on potential human health and ecological risks in surface waters across the country.

Activities Not Fully Coordinated Across Program Offices

The *Contaminated Sediment Management Strategy*, as well as EPA's *Contaminated Sediments Action Plan* that supplements the Strategy, established a framework and actions intended to enhance cross-program coordination and collaboration in addressing contaminated sediments. The Strategy notes that implementation of statutory requirements has created inconsistencies in addressing contaminated sediments. However, EPA's program offices did not

coordinate most of their contaminated sediment activities, and the Agency's primary focus has been limited to remediation activities.

Our interviews with OW, OSWER, and OPPTS officials disclosed that the offices generally did not collaborate and coordinate on the majority of their activities involving the assessment, prevention, control, and remediation of contaminated sediments. Since at least 2002, EPA has primarily focused on addressing contaminated sediment issues through Superfund remedial actions. EPA has placed little emphasis on the prevention and source control aspects of contaminated sediments. Further, EPA's activities have been fragmented and "stovepiped" within program offices. For example, OW has not coordinated source control programs, such as National Pollutant Discharge Elimination System permitting, with OSWER's remediation activities for sites with contaminated sediments at the national level.

Although EPA generally did not coordinate activities across programs, OW, OSWER, and ORD did collaborate and coordinate on some activities related to contaminated sediments. For example, these offices coordinated in the development and release of the *Contaminated Sediments Action Plan* in 2002. This plan reflected the goals of the *Contaminated Sediment Management Strategy* and served as a tool for EPA senior managers to clearly coordinate cross-program contaminated sediment activities. OW, OSWER, ORD, and the Great Lakes National Program Office also collaborated in 2004 on the development of the Agency's *Contaminated Sediment Science Priorities*, which establish Agency-wide science activities that affect contaminated sediments.

EPA's inability to complete the Contaminated Sediment Assessment Pilot as outlined by the *Contaminated Sediments Action Plan* further illustrates the need for improvements in coordination and collaboration between program offices. EPA planned to begin the Pilot in the fall of 2002 and facilitate cross-program coordination between remedial investigation/feasibility study evaluations and Total Maximum Daily Load modeling. However, EPA stopped the project after OW staff selected potential sites for the Pilot because OSWER and OW were not able to successfully coordinate and collaborate on the project design.

Officials from two States also said EPA could improve its coordination between its program offices as well as with States. For example, one State official said that some EPA Regional Superfund Program remedial project managers do not consider various Clean Water Act requirements when overlapping programs perform work at contaminated sediment sites.

National Sediment Quality Criteria Not Established

EPA did not develop and implement numerical sediment quality criteria as specified by the Strategy. EPA established this requirement to ensure the comparability of data gathered to assess sediment contamination and its effects.

Although not intended as mandatory standards, EPA expected the criteria to assist in the ranking of sites needing further assessment, target hot spots within an area for remediation, and serve as a partial basis for the development of State sediment quality standards.

The Strategy assigned OW the responsibility for developing the criteria. OW officials said that they did not develop criteria because of scientific and policy disagreements within and outside the Agency. Instead, the Agency produced equilibrium partitioning sediment benchmark documents – for dieldrin, endrin, metal mixtures, and polycyclic aromatic hydrocarbon mixtures – for voluntary use by its program offices. The Agency presented these benchmarks as complements to numerous existing sediment assessment tools developed by EPA and others. As a result, EPA has no assurance that regulatory decisions made within and outside the Agency are based on comparable criteria and are consistent.

Although EPA has not developed and implemented criteria, the Agency could develop standards or guidelines as one State and Canada have done. Washington represents the only State that has developed legally enforceable water and sediment quality marine standards. According to a Washington State official, the standards have helped in the Superfund process because they provide authority and consistency for remedy decisions. Likewise, Canada developed Sediment Quality Guidelines based on scientifically derived sediment quality targets, and EPA could also consider that approach. Canada's guidelines are not regarded as blanket values for national sediment quality and may be modified according to local conditions. Interviewed officials from OSWER, the Association of State and Territorial Solid Waste Management Officials, and three States said they believed that some form of national sediment standards or screening criteria could help to speed projects toward cleanup. Officials from OSWER and the Association of State and Territorial Solid Waste Management Officials said criteria would make assessment and cleanup easier, faster, and less expensive.

ORD Has Not Completely Met Priority Research Needs and Could Enhance Coordination on Research Needs

ORD has not fully addressed OSWER's high priority research needs for contaminated sediments. OSWER officials said that one of their highest priorities for research on contaminated sediments is remediation alternatives for the top three remedies (dredging, capping, and monitored natural recovery). OSWER officials said this research is important to better understand where and how each type of approach can be most effective. However, for Fiscal Years 2002-2005, only about 10 percent of ORD's contaminated sediment publications focused on remediation alternatives; the majority of completed research addressed contaminant characteristics. According to OSWER officials, they could not determine whether ORD met its priorities prior to 2005 because OSWER and ORD had not established an effective communication process. In 2005, OSWER

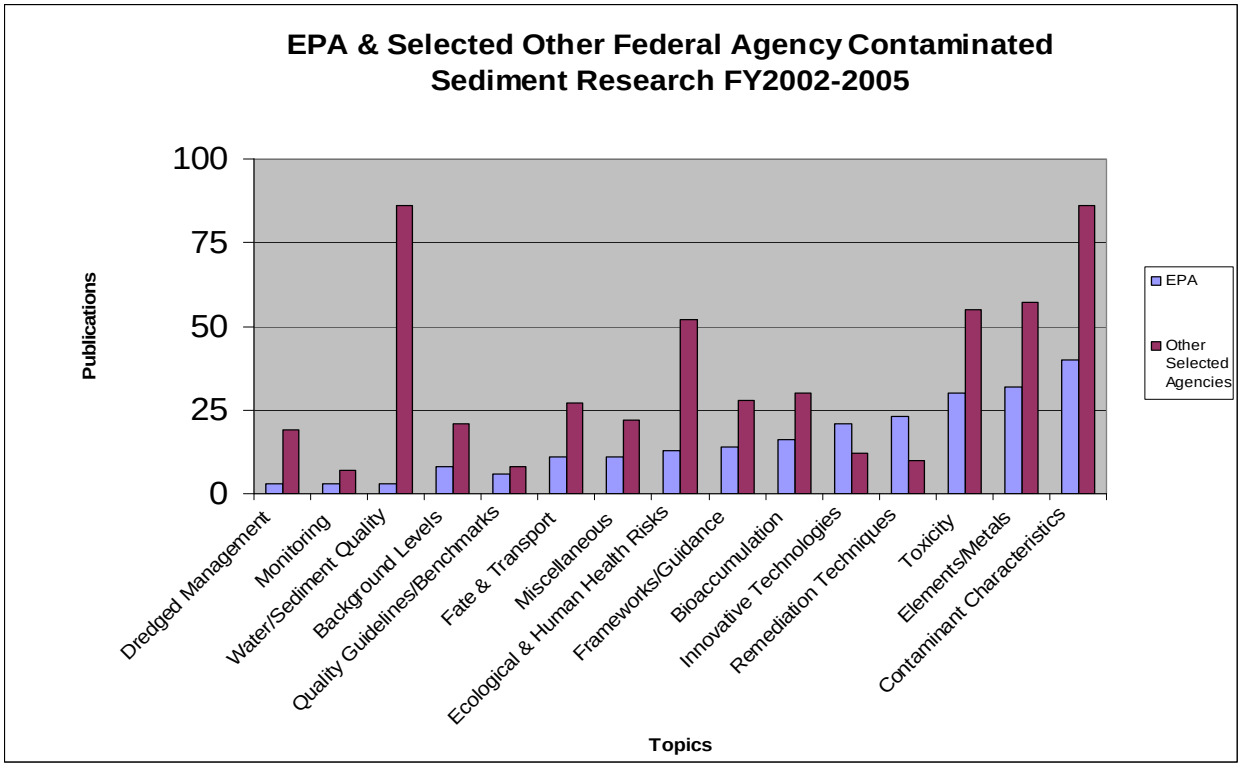
and ORD formed the Contaminated Sediment Regional Research Advisory Workgroup to enhance communication on research needs.

Opportunities also exist for ORD to make its completed research more readily accessible to OSWER and the regions. For example, until recently, OSWER officials could not obtain a monitored natural recovery document from ORD even though ORD completed the document a year earlier. ORD usually informs OSWER of completed research products through periodic distribution of research lists and e-mails, and ORD posts most of these research products in different formats on ORD's main Web page and three laboratory Web sites. This does not provide adequate visibility; OSWER officials said ORD could improve access by developing a set of easily accessible, media-specific Web sites. However, OSWER and ORD expect the recently formed Contaminated Sediment Regional Research Advisory Workgroup to improve communications about completed ORD research.

Further, opportunities exist for ORD to better coordinate its research activities with other Federal agencies that conduct research addressing contaminated sediment issues. EPA's Science Advisory Board, officials from other Federal agencies, and our own review disclosed that ORD needs to enhance such coordination. In its review of the 2002 *Draft Contaminated Sediments Science Plan* to establish research priorities, the Science Advisory Board cited the absence of information on research conducted on sediments outside of the Agency as a critical weakness. In 2004, EPA revised the plan and disclosed that it considered research by other Federal agencies as part of the plan's development. However, officials from the other agencies we interviewed said ORD did not routinely coordinate with their agencies on research and did not consider all their research addressing contaminated sediments.

Our review of research for contaminated sediments completed by ORD and selected other Federal agencies during Fiscal Years 2002 through 2005 showed that the other agencies conducted a substantial amount of the research (as shown in Figure 2.1 below). The other agencies included the U.S. Army Corps of Engineers, National Oceanic and Atmospheric Administration, U.S. Fish and Wildlife Service, U.S. Geological Survey, and Department of the Navy. The combined research products of the selected Federal agencies for most topics on contaminated sediments exceeded EPA's research on the topics. This clearly suggests that EPA and other agencies could enhance Federally-funded research through improved coordination and collaboration. For example, EPA and the other agencies may achieve cost efficiencies through specialization on research topics.

Figure 2.1: Contaminated sediment research publication totals by topic



According to EPA and other Federal agency officials, EPA recently made some progress collaborating with other Federal agencies on research. They cited as an example a research collaboration meeting that took place in September 2005 in Rhode Island with participation by EPA, Department of the Navy, and U.S. Army Corps of Engineers officials.

Performance Measures for Sediment Management Incomplete

EPA did not establish cross-program performance measures that fully evaluate the effectiveness of actions taken as part of the *Contaminated Sediment Management Strategy*.

The Government Performance and Results Act holds Federal agencies accountable for using resources wisely and achieving program results. The Act requires agencies to develop plans for what they intend to accomplish, measure how well they do, make appropriate decisions based on that information, and communicate performance information to Congress and the public.

As discussed in Chapters 1 through 3, EPA has devoted resources toward managing contaminated sediments. However, OW, OSWER, and other program offices with responsibilities for contaminated sediments have not adequately established performance measures for activities conducted under the Strategy's

four goals. EPA's 2003-2008 Strategic Plan includes measures related to contaminated sediments that partially cover two of the four goals:

- Subobjective 2.1.2, "Fish and Shellfish Safe to Eat," provides partial coverage of the Strategy's goals for preventing and reducing the volume of existing contaminated sediment by measuring reductions in the number of fish advisories.

- Subobjective 4.3.3, "Improve the Health of Great Lakes Ecosystems," provides some coverage of the Strategy's goals of preventing an increase and reducing the volume of existing contaminated sediment by measuring the reduction of PCBs in fish and the volume of contaminated sediments in the Great Lakes. This measure does not cover Agency activities outside the Great Lakes.

However, these measures do not address the Strategy's other two goals of (1) dredging and dredged material disposal and (2) scientifically sound sediment management.

OSWER has recognized the need for better measures for contaminated sediment remediation activities to help measure overall remedy effectiveness. As a result, OSWER has taken three important steps toward establishing performance measures for the remediation of contaminated sediments at Superfund sites.

- OSWER's *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites* (2002) specifies the use of post-remediation monitoring data to measure ecological outcomes from remediation activities. The principles state that although it is generally more practical to use measures such as contaminant concentrations in sediment to identify areas to be remediated, other measures should be used to assess whether human health and/or ecological risk reduction goals are being met. For example, using measured concentrations of PCBs in fish is suggested as the most relevant means of measuring exposure to PCBs in contaminated sediments.

- OSWER's *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* (2005) provides additional guidance to help remedial project managers develop meaningful measures based on outcomes. The guidance includes steps such as identifying monitoring objectives and designing the monitoring plan while considering a combination of physical, chemical, and biological methods to determine potential concerns.

- OSWER implemented the Contaminated Sediment Site Tracking Tool to evaluate the overall effectiveness of remedies for long-term risk reduction. OSWER developed the tool to facilitate evaluation of remedy effectiveness at Superfund contaminated sediment sites. Although OSWER implemented the tool in 2004, data is missing for many sites. OSWER is working to obtain

complete performance data, and OSWER officials said they plan to evaluate effectiveness of remedial actions at contaminated sediment sites after the tool includes the necessary data. The analysis should assist the Agency with measuring the effectiveness of its activities under the Strategy's remediation goal.

Primary Causes for Not Implementing Strategy

We noted two primary causes for EPA's program offices not implementing the *Contaminated Sediment Management Strategy*: (1) no program office has assumed responsibility for oversight and overall coordination of the Strategy; and (2) EPA has not updated the Strategy since implementation.

There has been no overall oversight of the Strategy since at least 2002. EPA's Strategy specifies that OW's Office of Science and Technology has responsibility for coordinating the implementation of the Strategy and that the Agency-wide Sediment Steering Committee provides oversight. However, as of 2002, the Office of Science and Technology and the Sediment Steering Committee stopped their coordination and oversight activities. OW officials said the Office of Science and Technology stopped its oversight because OW made a decision to focus on other higher priority issues. Although the Strategy required OW and OSWER to participate in the Sediment Steering Committee, officials from these offices could not explain why the Committee has not continued to perform its oversight role.

EPA has not updated the Strategy since implementing it in 1998. Although EPA has made some progress toward managing contaminated sediments, the Agency did not revise the Strategy to reflect these accomplishments or establish additional actions that may be necessary based on lessons learned since 1998. For example, the 1998 Strategy does not: (1) include the roles and responsibilities of the Contaminated Sediment Technical Advisory Group and Superfund Sediment Resource Center; (2) reflect the remediation approach outlined by OSWER's *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites* document, and (3) consider additional actions necessary to prevent and control contaminated sediments. In 2002, the Agency issued the *Contaminated Sediments Action Plan* that outlines additional actions consistent with the intent of the Strategy. However, the Action Plan does not completely update the Strategy because it primarily focuses on remediation activities and provides minimal coverage for contaminated sediment prevention and control activities.

Partial Implementation of Strategy May Limit Agency's Effectiveness

EPA's current focus on addressing contaminated sediments through the Superfund Program and the lack of coordination among program offices will not enable it to sufficiently address the contaminated sediments problem. Contaminated sediments are multi-media, cross-program, issues. EPA cannot

assure that resources it expends on contaminated sediments provide the most effective and efficient solutions for reducing the environmental and human health risks posed by this national problem. Currently, EPA cannot assure that it bases decisions for managing and remediating contaminated sediments on all available information because program offices have not used the National Sediment Inventory and NSQS reports. Without cross-program coordination and prescribed national sediment criteria, the Agency has limited assurance that it consistently and effectively assesses risks posed by contaminated sediments. EPA's primary focus on addressing contaminated sediments through the Superfund Program, rather than a more comprehensive and integrated approach, limits the Agency's ability to prevent future sites and to ensure the application of consistent assessment standards. EPA also needs to improve its internal research efforts and better coordinate research efforts with other Federal agencies to avoid duplication and gain the maximum benefit from research dollars.

Other Opportunities Exist to Improve Contaminated Sediment Efforts

EPA could enhance its contaminated sediments efforts through the watershed approach, which the Agency has already used at selected sites. The premise of the watershed approach is that EPA can best solve many water quality and ecosystem problems at the watershed level rather than the individual waterbody or discharger level. This approach requires cross-program coordination, targeting priority problems, promoting stakeholder involvement, integrating multiple agencies' expertise and authority, and measuring success.

OSWER's Urban Rivers Restoration Initiative uses the watershed approach to address contaminated sediments at eight pilot sites, including two on the National Priorities List. The initiative intends to bring about increased coordination and cooperation within EPA and with the U.S. Army Corps of Engineers to restore degraded urban rivers. OSWER expects the eight pilot projects to result in less duplication of effort; faster and cheaper assessment and cleanup; leveraging and more effective use of funds; and better targeted, holistic remedies. However, although EPA has used the watershed approach for selected sites involving contaminated sediments, it has not yet pursued the approach to deal with contaminated sediment issues on a national scale.

EPA can also enhance contaminated sediment efforts by increasing the use of the U.S. Army Corps of Engineers' Water Resources Development Act authority. The Act authorizes the U.S. Army Corps of Engineers to remove contaminated sediments adjacent to navigation channels, but these removal actions require specific appropriations from Congress and funding matches by State or local sponsors. The Act authorizes additional funding and added a mechanism for more comprehensive evaluation and resolution of sediment issues. The Act has been used to remove contaminated sediments adjacent to two sites on the National Priorities List. According to OSWER officials, a number of other sediment sites could potentially benefit from the Act's funding, but liability and funding issues

have prevented further use of the authority. OSWER recently held a meeting with the U.S. Army Corps of Engineers and formed a workgroup to resolve those issues and consider increased use of the Water Resources Development Act authority at more contaminated sediment sites.

Recommendations

We recommend that the Deputy Administrator:

2-1 Establish a committee or designate an office to assume responsibility for the oversight and evaluation of the Agency's *Contaminated Sediment Management Strategy*. The designated office or committee should:

a. Ensure program offices with responsibilities for managing and addressing contaminated sediment issues use the National Sediment Inventory as part of their decision making processes.

b. Ensure contaminated sediment issues are managed and addressed through a cross-program approach, as intended by the Strategy, that places emphasis on prevention and control of contaminated sediments.

c. Update the Strategy to reflect accomplishments made on managing and addressing contaminated sediments and incorporate additional actions that Agency program offices should take.

We recommend that the Assistant Administrator for Water and the Assistant Administrator for Solid Waste and Emergency Response:

2-2 Collaborate with other program offices with responsibilities under the *Contaminated Sediment Management Strategy* to develop and implement comprehensive and coordinated performance measures for preventing, assessing, and remediating contaminated sediment issues.

We recommend that the Assistant Administrator for Water:

2-3 Evaluate and report on the need to develop numerical sediment quality criteria to assist in the ranking of sites needing further assessment, target hot spots within an area for remediation, and serve as a partial basis for the development of State sediment quality standards.

We recommend that the Acting Assistant Administrator for Solid Waste and Emergency Response:

2-4 Use the watershed approach, including concepts from the Urban Rivers Restoration Initiative, at contaminated sediment National Priorities List sites in high priority watersheds.

2-5 Continue working with the U.S. Army Corps of Engineers to expand the use of Water Resources Development Act funding for additional contaminated sediments adjacent to National Priorities List sites to provide more comprehensive evaluations and resolutions of contaminated sediment issues.

We recommend that the Assistant Administrator for Research and Development:

2-6 Work with the Assistant Administrator for OSWER to continue improving communication between the offices on contaminated sediment research priorities and status of research products. In addition, develop a system that provides OSWER and other potential users with easy access to all completed contaminated sediment research projects.

2-7 Continue to enhance collaboration and coordination between EPA and other Federal agencies on research activities. At a minimum, the coordinated activities should ensure that research is not duplicated by the agencies and that Federal resources are leveraged through coordinated research efforts that meet the needs of multiple agencies.

Agency Comments and OIG Evaluation

EPA generally agreed with the recommendations in the draft report. The Agency will need to provide further details on its plans to address OIG recommendations within 90 days. The Agency also provided suggested revisions to some details in the report and the recommendations, and we made revisions as appropriate.

Regarding Recommendation 2-1, the Agency agreed to establish an OW-led intra-agency committee by March 17, 2006 to determine the next steps and develop an initial workplan. Also, the Agency said it would revisit the 1998 Strategy to assess the degree to which EPA's actions achieved the Strategy's goals. The Agency also believes that it should focus attention on emerging contaminants due to their potential to adversely affect human health and the environment. The Agency did not comment on whether it agreed with the cross-program approach or whether it would use the National Sediment Inventory as part of its decision making processes, as suggested by the recommendation.

The Agency's planned action appears to generally meet the intent of Recommendation 2-1. In the Agency's response to our final report, it will need to specify the office or committee that will assume responsibility for oversight and evaluation of the Strategy. The Agency will also need to describe the actions taken or planned to ensure that the Agency uses the National Sediment Inventory as part of EPA's decision-making, contaminated sediment issues are managed and addressed through a cross-program approach, and the Strategy is updated. In addition, the Agency needs to provide milestones for completing each of these actions.

Regarding Recommendation 2-2, the Agency agreed to look at performance measures as part of developing a new Strategic Plan, but stated that it already has indicators reflecting the integration of all stressors, including sediments. The Agency cited Subobjective 2.2.1 from EPA's current Strategic Plan as an example of an indicator meeting the overall goal of preventing ecological and human health impairment by increasing the number of watersheds where water quality standards are met. We acknowledge that EPA has some indicators that partially cover contaminated sediment activities. However, Subobjective 2.2.1 and the other measures evaluated do not provide comprehensive measures that assess the effectiveness of all Agency program activities under the *Contaminated Sediment Management Strategy*, and such comprehensive measures are needed. In its response to the final report, the Agency must describe actions taken or planned to develop and implement comprehensive performance measures for managing and addressing contaminated sediments. Also, the Agency will need to provide milestones for completing these actions.

In responding to Recommendation 2-3 the Agency provided formal written comments followed up by clarifying remarks that generally meet the intent of our recommendation. Specifically, we were told that the Agency published several chemical-specific sediment benchmarks to provide guidance to regions, States and the regulated community in assessing risk to aquatic organisms from sediment contamination. We were told EPA supports the use of these benchmarks by the States and Tribes and will continue to evaluate the need for additional sediment management tools such as these within the context of its review of the achievements of the 1998 *Contaminated Sediment Management Strategy*. In its 90-day response, the Agency will need to describe specific actions taken or planned to evaluate and report on the need for numerical sediment quality criteria. Also, the Agency needs to provide milestones for completing these actions.

The Agency suggested that we make Recommendation 2-4 more specific and address National Priorities List sites with contaminated sediments in priority watersheds. The Agency said it endorses the cross-programmatic watershed approach at selected high priority sites. The Agency also said it has drafted the guidance, *Integrating Water and Waste Programs to Restore Watersheds* and intends to train regional staff on using the guidance. We agree that the watershed approach should focus on priority watersheds and, as a result, revised Recommendation 2-4 to reflect this focus. While EPA agreed to provide guidance and training on watershed approaches, the Agency will need to describe in its response to the final report the specific actions taken or planned to apply the watershed approach at contaminated sediment National Priorities List sites in priority watersheds. Also, the Agency must provide milestones for completing these actions.

The Agency generally agreed with Recommendation 2-5 and said it convened a workgroup to resolve some of the issues associated with the use of the Water Resources Development Act at contaminated sediment sites. However, the

response did not disclose whether the workgroup intended to resolve all major issues associated with use of the Act. The Agency will need to describe in its response to the final report how it plans to resolve all the major issues to increase the use of the Water Resources Development Act funding for contaminated sediments adjacent to National Priorities List sites. Also, the Agency needs to provide a milestone for completing this action.

EPA partially agreed with Recommendation 2-6, and asserted that ORD has an effective process in place for OSWER to communicate research priorities. The Agency indicated ORD has created avenues for OSWER to communicate its research needs through teams, progress reviews, and meetings. The Agency agreed that communicating on research products specific to contaminated sediments and providing access to those products is important, and will attempt to improve communications and access. We modified Recommendation 2-6 to reflect recent communication enhancements. We are pleased that the Agency plans to enhance communication on the status of research projects and access to completed research projects. In the Agency's response to the final report, it will need to describe specific actions it plans to take to improve communication between ORD and OSWER regarding contaminated sediment research priorities and status of research products. Also, the Agency will need to describe specific actions taken or planned to improve access to research products. The Agency will also need to provide milestones for completing these actions.

The Agency requested that we revise Recommendation 2-7 to recognize ongoing collaboration activities with other Federal agencies. The Agency also described recent actions taken and planned that meet the intent of the recommendation. These actions include working with OSWER on a Memorandum of Understanding with the U.S. Army Corps of Engineers and the Department of the Navy, and workgroup and task force activities with various Federal agencies. We revised Recommendation 2-7 to reflect ORD's ongoing coordination activities. The Agency's taken and planned actions meet the intent of our recommendation. However, in its response to the final report, the Agency will need to provide milestones for completing these actions.

The Agency's complete response is in Appendix B.

Chapter 3
EPA Has Not Completely Assessed Extent and Severity of Nation's Sediment Contamination

EPA's 2004 NSQS report did not provide a complete assessment of the extent and severity of sediment contamination across the Nation, nor did it fully meet the requirements of the Water Resources Development Act. This reporting issue occurred because OW relied on known data sources and did not design a method to acquire and compile data and address data limitation issues. As a result, EPA cannot accurately estimate the volume and risks posed by contaminated sediments on a national scale. Such a national assessment would better enable EPA to ensure that it devotes resources to contaminated sediment issues that pose the greatest risks to human health and the environment.

National Assessment Not Complete

EPA spent over $600,000 to acquire, compile, and assess the data in the 2004 NSQS report. OW issued the NSQS report primarily to address requirements under Section 503 of the Water Resources Development Act and assist EPA program offices, States, and tribes with decision making. The report identified locations where available sampling data indicated a high probability that direct or indirect exposure to sediments could be associated with adverse effects to aquatic and/or human health. OW based the report on contaminated sediment sampling data obtained from OW's National Sediment Inventory, which was comprised of readily available sampling data principally obtained from other Federal agencies and States covering the 10-year period from 1990 through 1999.

Despite EPA's efforts, the 2004 report did not provide a complete assessment of the extent and severity of sediment contamination across the Nation. Also, it did not fully meet the requirements of Section 503 of the Water Resources Development Act, which requires EPA to: (1) work with the National Oceanic and Atmospheric Administration and U.S. Army Corps of Engineers to conduct a comprehensive national survey of existing sediment data; (2) biennially report to Congress on findings, conclusions, and recommendations; and (3) conduct a comprehensive and continuing program to assess sediment quality.

Although the Water Resources Development Act required a comprehensive national survey of existing contaminated sediment data and a comprehensive monitoring program, the 2004 NSQS report did not include all available sampling data nor provide national coverage of contaminated sediments. For example, the report did not include contaminated sediment data from the Great Lakes and from Superfund sites. In addition, approximately 68 percent of the data in the NSQS report only covered 10 States (Washington, Virginia, California, Illinois, Florida,

Wisconsin, New York, Texas, Oregon, and South Carolina), or 20 percent, of the 50 States. Further, the NSQS did not cover approximately 91 percent of river reaches (the length between two major tributaries ranging from 1 to 10 miles) in the contiguous United States and about 46 percent of watersheds nationally. EPA recognized these data limitations and designated the NSQS report as a screening-level assessment of contaminated sediments.

The 2004 NSQS report also did not meet the biennial reporting requirement specified by the Water Resources Development Act. The 2004 report represents an update to the NSQS report EPA issued in 1997. EPA issued the 2004 NSQS report approximately 5 years overdue, since the Water Resources Development Act required EPA to update the 1997 report in 2 years time.

Assessment Incomplete Because Adequate Design Not Developed

After interviewing OW officials and reviewing a development document supporting the National Sediment Inventory and 2004 NSQS report, we found the report incomplete because OW had not developed and implemented a methodology and plan for acquiring and compiling data necessary for a national assessment. Instead, OW acquired most of the data from databases previously known to OW. OW did not establish a formal coordination process for acquiring data from all major sources within and outside EPA. In addition, the lack of a methodology and plan led to the continued existence of the following key limitations from the 1997 NSQS report:

- **Non-random design.** OW collected a majority of the data based on a biased sampling design. OW collected the data through monitoring programs targeting contaminated or potentially contaminated areas. Without the use of a statistical sampling methodology, there is no assurance that both contaminated and uncontaminated sediments are accurately represented in a national assessment of the extent and severity of the contamination. A statistical sampling methodology such as EPA's Environmental Monitoring and Assessment Program would provide OW with an unbiased national assessment of sediment contamination that would help provide identifiable trends. OW could use this program to develop the tools necessary to monitor and assess the status and trends of national ecological resources. OW may also integrate random sampling results with existing data, thus reducing the cost. For example, existing sediment data generated by statistical approaches, such as the recent *Environmental Monitoring and Assessment Program National Coastal Assessment*, would reduce the amount of additional statistically valid data necessary for the national assessment. The 2005 version of this report includes results from over 50,000 samples taken from over 1,500 randomly selected sites.

- **Critical Data Lacking.** Data lacked sample location information (metadata), quality assurance/quality control information, and key assessment parameters.

Although sample location data is critical, some of this data was not included in the NSQS report because the data was missing or incomplete. Also, key assessment parameters, such as Total Organic Carbon and Acid-Volatile Sulfide data, were not always available; these parameters are critical to predict bioavailability of sediment contaminants. The NSQS report also excluded quality assurance/quality control data because information was limited; this information is critical because it provides detection limits and other parameters necessary for determining the quality of the data.

- **Hard Copy Data Excluded.** Large amounts of data were maintained in paper format and thus excluded from the National Sediment Inventory. OW officials said this data was not readily available in computerized format and it would have been labor-intensive to input manually.

According to OW, it is working on revisions for the next NSQS report. OW plans to perform a data gap analysis between statistically-needed sampling locations and existing data as part of the methodology. In addition, OW plans to broadly advertise its data needs by conducting national meetings, workshops, and outreach to improve national coverage and data quality. However, at the time we completed our field work, OW did not have a written plan for the next NSQS report, and we could not assess whether OW preliminary planning will provide a more complete national assessment.

OW officials also said that they do not plan on issuing the NSQS report every 2 years as required by the Water Resources Development Act. They cited two primary reasons: (1) sediment contamination does not change that frequently; and (2) the public comment and Agency review processes for the report make it impossible to meet the timeframe. Even if OW's position has merit, the reporting requirement is mandatory, so the Agency should disclose to Congress that the reporting frequency cannot be met and is too frequent to evaluate trends if that is the case. EPA has not made such a disclosure. Further, if EPA believes a change in reporting frequency is needed, it should indicate the reporting frequency it believes is appropriate.

Recommendations

We recommend that the Assistant Administrator for Water:

3-1 Develop and implement a plan for future NSQS reports that, consistent with the Water Resources Development Act, provides a comprehensive national assessment of the extent and severity of contaminated sediments. At a minimum the design should:

a. Use a statistical sampling approach as the basis for collecting data from EPA and other sources and assessing the national extent and severity of contaminated sediments. As a cost savings alternative,

consider using statistical sampling in conjunction with existing data for the national assessment. Improve the completeness and availability of sample location information (metadata), quality assurance/quality control information, and assessment parameters for future NSQS reports.

b. Ensure that the National Sediment Inventory and future NSQS reports include contaminated sediment data from all major sources, including the Great Lakes National Program Office and Superfund program. At a minimum, establish a formal coordination process for acquiring contaminated sediment data from EPA program offices and applicable agencies and organizations outside EPA. Also, consider cost-effective options for acquiring and compiling contaminated sediment data maintained in paper format.

3-2 Determine a reporting frequency for the NSQS report that is both useful for decision makers and achievable for EPA, disclose to Congress that EPA cannot meet the current biennial reporting requirement specified by Section 503 of the Water Resources Development Act, and provide Congress an alternative reporting schedule for consideration.

Agency Comments and OIG Evaluation

EPA generally agreed with the recommendations. The Agency also provided suggested revisions to some details in the chapter and one of the recommendations, and we made revisions as appropriate.

The Agency generally agreed with Recommendation 3-1 and described three projects in OW's 2006 workplan intended to improve the next NSQS report. OW plans to hold two workshops to get stakeholder input, have an outreach program encouraging other entities to provide data, and work with OSWER on a formal process to convert Superfund data to an electronic format. The Agency also suggested that we revise Recommendation 3-1 to reflect data collection rather than sampling because OW does not interpret Section 503(b) of the Water Resources Development Act of 1992 to require EPA to sample sediments. The Agency does see the merit in developing a statistically-based study design and has agreed to work with ORD to determine if it can develop such a design.

The Agency's actions under OW's 2006 workplan partially address Recommendation 3-1, but the actions will not provide a comprehensive national assessment of the extent and severity of contaminated sediments. We acknowledge that Section 503(b) does not specifically require EPA to conduct sampling. However, Section 503(b) does require the Agency to conduct a comprehensive and continuing program to assess sediment quality and establish minimum requirements for the program. The minimum requirements outlined by Section 503(b) do not restrict EPA from establishing a comprehensive program

based on a statistical sampling approach. EPA cannot meet these minimum requirements unless it bases its continuing program to assess sediment quality on a statistical sampling design coordinated with EPA program offices, other Federal agencies, and States. Our recommendation does not specifically require that EPA conduct the sampling (although EPA programs such as Superfund do conduct sediment sampling). Instead, the recommendation requires that EPA develop and implement a plan that uses a statistical sampling approach for acquiring the data necessary to assess the Nation's sediment quality. We revised the recommendation to clarify that EPA is not required to sample sediments, but should develop and implement a plan consistent with the Water Resources Development Act.

In the Agency's response to the final report, it will need to describe specific actions it has taken or plans to take to develop a statistical sampling approach as the basis for collecting data from EPA and other sources, to resolve data quality issues, and to ensure that contaminated sediment data from all major sources are included. The Agency's description should include the results of the three projects in OW's 2006 workplan intended to improve the next NSQS report. If the Agency cannot complete a comprehensive national assessment that is based on a statistical sampling methodology, it should disclose to Congress that the national assessment is not possible and that the funds used to generate this report should be reprogrammed to fund other program activities. The Agency also will need to provide in its response milestones for completing these actions.

The Agency agreed with Recommendation 3-2. The Agency said that OW plans to discuss the factors that affect how fast sediment contaminants change, consult with ORD fate and transport experts, and develop a reporting frequency that is more consistent with anticipated changes in sediment contaminant levels. The Agency's planned actions meet the intent of our recommendation. In the Agency's response to the final report, the Agency will need to specify milestones for completing these actions and provide an alternative reporting schedule to Congress for consideration.

The Agency's complete response is in Appendix B.

Appendix A

Details on Scope and Methodology

We conducted our evaluation from September 2004 to August 2005 in accordance with *Government Auditing Standards*, issued by the Comptroller General of the United States.

Our scope included contaminated sediment activities performed by EPA, other Federal agencies, and selected States. Early in our review, we determined the EPA offices and Federal agencies involved in the universe of contaminated sediments. We determined the universe of contaminated sediment sites through a review of the Comprehensive Environmental Response, Compensation, and Liability Information System and listings provided by OSWER. We did not independently verify the accuracy of data obtained from Agency sources, but obtained input on the accuracy from Agency officials.

We evaluated management controls covering Fiscal Year 2002 through 2005 (second quarter). We generally considered whether the organization, policies, and procedures ensure that (1) intended results were achieved; (2) resources were used consistent with the Agency mission; (3) programs and resources were protected from waste, fraud, and mismanagement; (4) laws and regulations were followed; and (5) reliable and timely information was obtained, maintained, reported, and used for decision making. We focused on the effectiveness of EPA's program offices regarding implementation of the *Contaminated Sediment Management Strategy*. We found that EPA has not put sufficient effort into implementing the Strategy and had insufficient measures to evaluate the Strategy's success.

We took into account the findings of a prior EPA OIG report, *Water: EPA's Great Lakes Program* (Report No. 99P00212, dated September 1, 1999), and the following Government Accountability Office reports that addressed sediment issues:

Report Title	Report No.	Date
Water Resources - *Future Needs for Confining Contaminated Sediment in the Great Lakes Region*	GAO/RCED-92-89	July 1992
Superfund - *Information Regarding EPA's Cleanup Decision Process on the Hudson River Site*	GAO/RCED-00-193	September 2000
Great Lakes - *EPA Needs to Define Organizational Responsibilities Better for Effective Oversight and Cleanup of Contaminated Areas*	GAO-02-563	May 2002
Great Lakes - *An Overall Strategy and Indicators for Measuring Progress Are Needed to Better Achieve Restoration Goals*	GAO-03-515	April 2003
Great Lakes - *Organizational Leadership and Restoration Goals Need to Be Better Defined for Monitoring Restoration Progress*	GAO-04-1024	September 2004

We interviewed officials from various EPA offices, other Federal agencies, and six States. We judgmentally selected the six States based on recommendations from OSWER and the

Association of State and Territorial Solid Waste Management Officials. The following table lists the EPA offices and other entities from which we interviewed officials.

Offices/Agencies/Organizations From Which Officials Were Interviewed During Evaluation
EPA
• Office of Solid Waste and Emergency Response • Office of Water • Office of Research and Development • Office of Prevention, Pesticides, and Toxic Substances • Great Lakes National Program Office • Region 2 • Region 5 • Region 9 • Region 10
Other Federal Agencies
• U.S. Army Corps of Engineers • U.S. Geological Survey • U.S. Fish and Wildlife Service • National Oceanic and Atmospheric Administration • Department of the Navy
States
• California • Kansas • New Jersey • Ohio • Virginia • Washington
Other
• Association of State and Territorial Solid Waste Management Officials

To evaluate whether available Federal authorities and resources provide effective solutions to the challenges of contaminated sediments, we:

- Interviewed EPA officials to gain an understanding of national and regional office activities regarding contaminated sediments; and contacted other Federal agencies, the Association of State and Territorial Solid Waste Management Officials, and State officials to gain an understanding of their activities and coordination with EPA.
- Obtained and reviewed the *Contaminated Sediment Management Strategy* (1998), *Contaminated Sediments Action Plan* (2002), OSWER's *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* (2005), OSWER's *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites* (2002), and ORD's *Contaminated Sites Multi-Year Research Plan*.
- Reviewed interagency agreements, research lists, budget spreadsheets, EPA's National Listing of Fish Advisory database, and Geographic Information System shapefiles.
- Requested and received lists of research project titles completed during Fiscal Years 2002-2005 from EPA and the other Federal agencies included in our review. We also

conducted an online Web site search for research projects by the same agencies. We then compiled and categorized a list of contaminated sediment research titles completed by EPA and other Federal agencies during Fiscal Years 2002-2005.

- Judgmentally selected 13 Superfund and Superfund Alternative Sites from the contaminated sediment sites in Regions 2, 5, and 9, and 1 Water Resources Development Act site from each of the 3 regions. For each site, we reviewed site files and interviewed remedial project managers regarding contaminated sediment activities to determine their knowledge of the Strategy and their application of Agency guidance.
- Overlaid Geographic Information System shapefiles created from the National Sediment Inventory and National Listing of Fish Advisory databases and analyzed the information to determine any visual connections between the data. We did not independently verify the data we obtained from the two databases, and thus did not draw definitive conclusions from the data.

To evaluate how EPA measures the effectiveness of the Strategy and what outcomes EPA has achieved, we:

- Interviewed EPA officials to gain an understanding of measures used to evaluate the effectiveness of contaminated sediment work.
- Reviewed EPA's Strategic Plan and Performance Reports.
- Obtained EPA's Contaminated Sediment Site Tracking Tool database and spreadsheets and evaluated the information for completeness and potential to evaluate remedy effectiveness.

To evaluate whether EPA has completely assessed the extent and severity of sediment contamination in the United States, we:

- Interviewed OW staff to gain an understanding of processes and procedures used for the National Sediment Inventory and the NSQS reports.
- Reviewed the 1997 and 2004 NSQS reports and the 1994 *Framework for the Development of the National Sediment Inventory*.
- Identified major data gaps and the causes for gaps in the 2004 NSQS report.
- Evaluated the data acquisition process used for the 2004 NSQS report, but did not verify the accuracy of the data used for the National Sediment Inventory and NSQS reports. Our focus was to determine causes for reported coverage and quality issues with the data.
- Discussed EPA's plans to obtain an accurate assessment of the extent and severity of contamination in the United States.

Agency Response to Draft Report

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 10 2006

DEPUTY ADMINISTRATOR

MEMORANDUM

SUBJECT: Draft Evaluation Report: EPA Can Better Implement Its Strategy for Managing Contaminated Sediments

FROM: Marcus Peacock

TO: Carolyn Copper
Acting Assistant Inspector General
Office of Program Evaluation
Office of Inspector General

We appreciate the opportunity to further respond to the draft report on the subject evaluation, No. 2004-01322. Specifically, we have added to our response to Recommendation 1 of the draft report.

Recommendation 1 (Report Recommendation 2-1): *The Deputy Administrator establishes a committee or designates an office to assume responsibility for the oversight and evaluation of the Agency's contaminated sediment management strategy. The designated office or committee should ensure program offices with responsibilities for managing and addressing contaminated sediment issues use the National Sediment Inventory as part of their decision making processes, and ensure contaminated sediment issues are managed and addressed through a cross-program approach, as intended by the Strategy, that places emphasis on prevention and control of contaminated sediments. The designated office or committee should update the Strategy to reflect accomplishments made on managing and addressing contaminated sediments and incorporate additional actions that Agency program offices should take.*

EPA intends to establish an intra-agency committee, by March 17, 2006, with the Office of Water in the lead, to determine next steps on preventing and managing contaminated sediments, and to develop an initial workplan within two months after the committee's establishment. Further, we agree that it is time to revisit the 1998 Contaminated Sediment Management Strategy. The Contaminated Sediment Management Strategy laid out a process for preventing ecological and human health impairment by abating and controlling sources of sediment contamination and remediating currently contaminated sediments. Since the time when the Strategy was published, EPA has undertaken a number of actions to measure, control and reduce discharges and emissions of contaminants to the environment. One measure of our success in addressing this issue is with state-issued fish advisories. The great majority of these advisories are due to either mercury, which we are now regulating both the direct discharge into

water and the deposition from air sources, or chemicals that we have banned. Another measure is in the tons of toxic pollutants that have been removed from the environment through both technological and water quality-based controls instituted through the NPDES permit program. As a result, we believe we should first assess the degree to which EPA's actions have achieved the goal of the Strategy before restarting activities that were covered under the Strategy. In addition, we believe we should focus attention on emerging contaminants which are now becoming of concern due to their potential to adversely affect human health and the environment. In this way, EPA can work more effectively to prevent new contamination of the environment, including sediments.

If your staff would like to discuss these additions, please have them contact Doreen Vetter (202-564-1509) in the Office of the Administrator.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEPUTY ADMINISTRATOR

JAN 09 2006

MEMORANDUM

SUBJECT: Draft Evaluation Report: EPA Can Better Implement Its Strategy for Managing Contaminated Sediments

FROM: Marcus Peacock MP

TO: Carolyn Copper
Acting Assistant Inspector General
Office of Program Evaluation
Office of Inspector General

Thank you for your memo dated November 17, 2005, transmitting the draft report on the subject evaluation, No. 2004-01322. We appreciate your careful and thoughtful study of EPA's actions regarding contaminated sediments, specifically with respect to implementing the 1998 Contaminated Sediments Strategy, and we appreciate the opportunity to respond to the draft report's specific recommendations. In addition, we suggest some additional clarifications to the draft report in an attachment to this memo.

Recommendation 1 (Report Recommendation 2-1): *The Deputy Administrator establishes a committee or designates an office to assume responsibility for the oversight and evaluation of the Agency's contaminated sediment management strategy. The designated office or committee should ensure program offices with responsibilities for managing and addressing contaminated sediment issues use the National Sediment Inventory as part of their decision making processes, and ensure contaminated sediment issues are managed and addressed through a cross-program approach, as intended by the Strategy, that places emphasis on prevention and control of contaminated sediments.*

We believe that it is time to revisit the1998 Contaminated Sediment Management Strategy. The Contaminated Sediment Management Strategy laid out a process for preventing ecological and human health impairment by abating and controlling sources of sediment contamination and remediating currently contaminated sediments. Since the time when the Strategy was published, EPA has undertaken a number of actions to measure, control and reduce discharges and emissions of contaminants to the environment. One measure of our success in addressing this issue is with state-issued fish advisories. The great majority of these advisories are due to either mercury, which we are now regulating both the direct discharge into water and the deposition from air sources, or chemicals that we have banned. Another measure is in the tons of toxic pollutants that have been removed from the environment through both technological and water quality-based controls instituted through the NPDES permit program. As a result, we

believe we should first assess the degree to which EPA's actions have achieved the goal of the Strategy before restarting activities that were covered under the Strategy. In addition, we believe we should focus attention on emerging contaminants which are now becoming of concern due to their potential to adversely affect human health and the environment. In this way, EPA can work more effectively to prevent new contamination of the environment, including sediments.

Recommendation 2 (Report Recommendation 2-2): *The Assistant Administrator for Water and the Assistant Administrator for Solid Waste and Emergency Response collaborate with other program offices with responsibilities under the Contaminated Sediment Management Strategy to develop and implement comprehensive and coordinated performance measures for preventing, assessing, and remediating contaminated sediment issues.*

We agree to look at our performance measures with respect to contaminated sediments as part of developing a new Agency Strategic Plan. The overall goal of EPA's current strategic plan is to prevent ecological and human health impairment. We do have indicators for meeting this overall goal that reflect the integration of all stressors, including sediments. For example, the current strategic plan includes sub-objective 2.2.1 which aligns pollution prevention and restoration approaches to increase the number of watersheds where water quality standards are met in at least 80% of the assessed water segments. To the extent that contaminated sediments impair water quality standards, this sub-objective provides an integrated measure of achieving the overall objective for addressing contaminated sediments, which is preventing ecological and human health impairments.

Recommendation 3 (Report Recommendation 2-3): *The Assistant Administrator for Water evaluates and reports on the need to develop numerical sediment quality criteria to assist in the ranking of sites needing further assessment, target hot spots within an area for remediation, and serve as a partial basis for the development of State sediment quality standards.*

In response to EPA's previous Contaminated Sediments Management Strategy developed in 1994, EPA published several chemical-specific sediment benchmarks to provide guidance to Regions, States and the regulated community in assessing risk to aquatic organisms from sediment contamination. These are called the Equilibrium-partitioning Sediment Benchmarks (ESBs) and are available for the following chemicals or chemical mixtures: 1) Non-ionic organics; 2) Dieldrin; 3) Endrin; 4) Metal mixtures (Cadmium, copper, lead, nickel, silver, and zinc); and 5) Polycyclic aromatic hydrocarbon (PAH) mixtures.

EPA supports the use of these ESBs to characterize the extent of sediment contamination in a particular area. The 1998 Strategy included the development of sediment criteria and EPA will continue to evaluate the need for additional sediment assessment measurements, such as ESBs and criteria, within the context of competing priorities and available resources.

Recommendation 4 (Report Recommendation 2-4): *The Assistant Administrator for Solid Waste and Emergency Response uses the watershed approach, including concepts from the*

Urban Rivers Restoration Initiative, at National Priorities List sites with contaminated sediments where appropriate.

We recommend that the recommendation be revised to say "consider using" rather that "use." We endorse the cross-programmatic watershed approach as an effective means to evaluate, remediate and restore impacted watersheds at some selected sites that are of high priority. This approach has not been widely used at NPL sites to date but does show merit at some locations. However, due to the resources needed to implement this approach, it cannot be adopted readily at most NPL sites at this time. The Office of Solid Waste and Emergency Response (OSWER) has worked with the Office of Water (OW) and Region 8 to draft a new guidance: Integrating Water and Waste Programs to Restore Watersheds. This manual provides guidance on how to integrate assessment and cleanup activities across programs in order to optimize available tools and resources that can be used to restore and/or remediate contaminated waterbodies efficiently and effectively. OSWER and OW are also working together to develop training for Regional staff that may be involved in watershed cleanups. This training should facilitate the development and use of many of the approaches and tools described in the manual such as Watershed Cleanup Project Manager and the Comprehensive Preliminary Watershed Assessment. The use of this approach in priority watersheds should result in significant opportunities for streamlining and reducing the final cost of cleanup, restoration, and redevelopment, resulting in cleaner watersheds for beneficial use.

Recommendation 5 (Report Recommendation 2-5): *The Assistant Administrator for Solid Waste and Emergency Response continues working with the U.S. Army Corps of Engineers to expand the use of Water Resources Development Act funding for additional contaminated sediment National Priorities List sites to provide more comprehensive evaluations and resolutions of contaminated sediment issues.*

The Office of Solid Waste and Emergency Response, the Office of Enforcement and Compliance Assurance, and Region 5 have set up a workgroup to resolve some of the issues concerning the use of Water Resources Development Act funding to facilitate the evaluation and remediation of contaminated sediments. Workgroup members have met with U. S. Army Corps of Engineers staff several times and will continue to do so until the key issues are resolved.

Recommendation 6 (Report Recommendation 2-6): *The Assistant Administrator for Research and Development works with the Assistant Administrator for Solid Waste and Emergency Response to develop and implement a process that ensures effective communication between the offices on contaminated sediment research priorities and status of research products. In addition, develop a system that provides the Office of Solid Waste and Emergency Response and other potential users with easy access to all completed contaminated sediment research projects.*

We believe that the Office of Research and Development (ORD) has an effective process in place for OSWER to communicate research priorities. Through the Land Research Coordination Team activities, annual progress reviews with OSWER, meetings with OSWER staff on specific

research activities, and meetings between ORD and OSWER Deputy Assistant Administrators, ORD has created avenues for OSWER to communicate its research needs. A recent example of ORD responsiveness to OSWER's highest priority research needs occurred during 2005. ORD received OSWER's research priorities at the March 2005 progress review, and input from the regional workgroup was received in September 2005. Five regional workgroups were formed to review research needs and the current ORD research program. The regional workgroup for sediments, which included an OSWER representative, concluded that ORD is addressing the highest priority research needs identified by the regional workgroup.

The recommendation concerning the communication of research products specific to contaminated sediments is an important point, and we will discuss ways to address this need. The issue of easy access to completed projects is also an important one, for contaminated sediments and other research projects, that is currently being discussed with the ORD communication team.

Recommendation 7 (Report Recommendation 2-7): *The Assistant Administrator for Research and Development, in coordination with other affected Federal agencies, develops and implements a plan that ensures collaboration and coordination between EPA and other Federal agencies on research activities. At a minimum, the plan should ensure that research is not duplicated by the agencies and that Federal resources are leveraged through coordinated research efforts that meet the needs of multiple agencies.*

We request this recommendation be changed as follows: "Continue collaboration and communication efforts with other federal agencies to ensure: (1) coordination of research activities; (2) research is not duplicated by other agencies; and (3) federal resources are leveraged through coordinated research efforts that meet the needs of multiple agencies."

These voluntary activities will be accomplished through the following:

- Collaborate with the Strategic Environmental Research and Development Program (SERDP) Council, Executive Working Group, and various technical panels to identify research needs and evaluate proposals;
- Finalize the Memorandum of Understanding with the U.S. Army Corps of Engineers (USACE) and the U.S. Navy (USN);
- Work with the U.S. Geological Survey (USGS), the National Oceanic and Atmospheric Administration (NOAA), and the Technical Advisory Committee for National Sediment Inventory on planning and review of inventory-led activities;
- Collaborate with USACE, NOAA, U.S. Fish and Wildlife Service (USFW), states, and the Contaminated Aquatic Sediment Remedial Guidance Workgroup to develop EPA guidance;
- Partner with states, USN, USACE, and the Industry on Interstate Technology and Research Council (ITRC) to develop state guidance; and
- Collaborate with USACE, NOAA, the State of South Carolina, private firms, the Southern California Coastal Water Research Project, and the State of California Sediment

Quality Objective Scientific Steering Committee to advise the state in the development of sediment guidelines."

ORD is working with OSWER on a Memorandum of Understanding with the US Army Corps of Engineers and US Navy to address issues in this recommendation. ORD has more than ten workgroup and task force level activities with various Federal agencies on aspects of contaminated sediments. ORD would be interested in further discussions with the Office of Inspector General on their search of federal agency publications on sediments to evaluate agencies involved in research on sediments in addition to those performing biological surveys.

Recommendation 8 (Report Recommendation 3-1): *The Assistant Administrator for Water develops and implements a plan for future NSQS reports that, consistent with the Water Resources Development Act, provides a comprehensive national assessment of the extent and severity of contaminated sediments. At a minimum the design should:*

a. *Use a statistical sampling approach as the basis for assessing the national extent and severity of contaminated sediments. Statistical sampling may be used in conjunction with existing data for the national assessment as a cost savings alternative.*
b. *Improve the completeness and availability of sample location information (metadata), quality assurance/quality control information, and assessment parameters for future NSQS reports.*
c. *Ensure that contaminated sediment data from all major sources, including the Great Lakes National Program Office and Superfund program, are included in the National Sediment Inventory and used for future NSQS reports. At a minimum, establish a formal coordination process for acquiring contaminated sediment data from EPA program offices and applicable agencies and organizations outside EPA. Also, consider cost-effective options for acquiring and compiling contaminated sediment data that is maintained in paper format.*

We appreciate this recommendation. The Office of Water had conducted its own post-report assessment of the 2004 National Sediment Quality Survey, and came to similar findings. OW has included three projects in its 2006 work plan that addresses in part these findings. The first is two workshops to be held to obtain input from stakeholders regarding the 2004 National Sediment Quality Survey. These sessions are designed to gather ideas on how to improve the next National Sediment Inventory data collection and analysis. The second is an outreach program to encourage other entities with contaminated sediment data to enter that information into STORET, which is OW's repository for water quality and sediment information. STORET is also designed to store the metadata supporting contaminant measurements. By making better use of STORET, OW will be able to improve the completeness of quality assurance metadata. In addition, the outreach program is designed to obtain more information for the next National Sediment Inventory. The third is to convert data from Superfund paper files into an electronic format for inclusion in the next National Sediment Inventory. Under this project, we will be developing with OSWER a formal process for acquiring Superfund contaminated sediment data.

We suggest, however, that the first sub-bullet in this recommendation be revised to reflect data collection rather than sampling. OW does not interpret section 503(b) of the Water Resources Development Act of 1992 (WRDA) to require EPA to sample sediments. The WRDA requires EPA to conduct a comprehensive and continuing program to assess aquatic sediment quality with specific minimum elements, but does not require sampling. We do see the merit in developing a statistically-based study design to identify the waters where EPA should look for available data, and if such data are available, EPA would be able to develop a statistically-based national assessment of sediment contamination. OW will work with ORD to determine if such a design can be developed.

Recommendation 9 (Report Recommendation 3-2): *The Assistant Administrator for Water determines a reporting frequency for the NSQS report that is both useful for decision makers and achievable for EPA, discloses to Congress that EPA cannot meet the current biennial reporting requirement specified by Section 503 of the Water Resources Development Act, and provides Congress an alternative reporting schedule for consideration.*

We appreciate this recommendation. As part of the workshops described above, OW plans to discuss the factors that affect how fast one might expect sediment contaminants to change given historical pollution abatement controls and natural chemical and physical processes. From this information and consultation with ORD fate and transport experts, OW expects to be able to develop a reporting frequency that is more in line with anticipated changes in sediment contaminant levels. With this information, OW will be able to develop an alternative schedule for publishing the next report to Congress on sediment contamination.

Clarifications

The draft report covered a range of subjects related to implementation of programs to address contaminated sediments. We identified and attached some clarifications that we ask you to consider before issuing the report in final form. If your staff would like to review or discuss these clarifications, please ask them to contact Jim Pendergast (202/566-0398) in the Office of Science and Technology, Randy Wentsel (202/564-3214) in the Office of Research and Development, or Steven Els (703-603-8822) in the Office of Solid Waste and Emergency Response.

Attachment

ATTACHMENT
Clarifications to Draft Report

Chapter 1

At the bottom of page 2 and the top of page 3, the report should state that EPA has issued Records of Decisions (RODs) for 60 Tier 1 sites, and clarify that we have not estimated the cost for any of the ten Tier 2 sites, as no remedies have been proposed for these sites. There are approximately 50 additional sites without RODs that may be classified as Tier 1 sites in the future. We don't think the report needs to talk specifically about the Tier 2 CSTAG sites; they are a subset of the other potential 50 Tier 1 sites.

Chapter 2

The second bullet on page 5 implies that program offices did not coordinate any of their activities. There has been some coordination at the headquarters level and substantial coordination in the Regions at some Superfund sites. This statement should be modified to reflect this.

The last bullet on page 5 lists the *Draft* Contaminated Sediment Remediation Guidance for Hazardous Waste Sites. The guidance was finalized so the text should be changed to reflect the final guidance.

The following two bullets should be added to the bottom of page 5 to reflect additional efforts that OSWER has taken to make progress in managing contaminated sediments:

- OSWER sponsored or co-sponsored several national meetings on characterizing and managing contaminated sediment.
- OSWER developed and delivered the training course *Sediment Remediation: Technical Considerations for Evaluating and Implementing Dredging and Capping Remedies* to Federal and State personnel in four EPA Regional Offices.

Table 2.1, on page 6, implies that the Superfund program intended to use the National Sediment Inventory (NSI) to identify sediment sites for consideration for remedial action. The following is the actual language on page 26 of the Strategy:

> OERR [now OSRTI] intends to identify sites with contaminated sediments so that they can be added to the NSI, and to review high priority contamination sites identified in the inventory. These sites can become candidates for assessment under CERCLA. This assessment may include evaluation with the Hazardous Ranking System, which is used to identify sites that may warrant long-term clean-up under the Superfund program."

The OIG report should be revised to clarify that it was never the Superfund program's intent to use the NSI data as a stand alone tool to identify those sites that may need to be remediated.

Typically, our state partners identify potential Superfund sites to EPA for further evaluation. EPA then screens these sites using the Hazard Ranking System (HRS). The HRS is a National Contingency Plan (NCP) regulatory process specifically designed to evaluate the relative potential of uncontrolled hazardous substances to pose a threat. If the HSR evaluation indicates a site is eligible for listing, EPA must go through a rule-making to add the site to the NPL. All these steps in the process are required before a site can be remediated under CERCLA.

On page 7, first full paragraph, we suggest changing the sentence to state that at least one activity used the National Sediment Inventory. In the 2004 Clean Water Act section 304(m) plan for determining for which industrial categories to develop effluent guidelines, the Office of Water did consider the then draft National Sediment Quality Survey and final 1997 National Sediment Contaminant Point Source Inventory. See http://epa.gov/guide/304m/factor1.pdf. This is one use of the contaminated sediment information as envisioned by the Contaminated Sediment Management Strategy.

On page 8, second paragraph under the "Activities Not Coordinated" heading, first sentence, we suggest changing the sentence to state that some related activities were collaborated upon or coordinated. For example, OW, ORD and OSWER did coordinate in the development and release of the Contaminated Sediments Action Plan in June 2002. This plan reflected the goals of the 1998 Contaminated Sediments Management Strategy and the 2001 National Academy of Sciences recommendations, and laid out how EPA would report on our current activities and accomplishments regarding contaminated sediments, and to serve as a tool for EPA senior managers to closely coordinate our cross-program activities in the future. The actions by each office to carryout the Action Plan reflect collaboration and coordination, as did the actions each office took to carryout its part of the Management Strategy.

Also, OW, OSWER and ORD collaborated in 2004 on a draft Contaminated Sediments Science Plan to develop and coordinate Agency office- and region-wide science activities that affect contaminated sediments. This draft plan identifies a number of instances where the offices coordinated. This plan is another example of where the offices collaborated and coordinated on a range of contaminated sediments issues. We suggest that the language on page 8 reflect these activities.

On page 9, the heading states "ORD Has Not Met High Priority Research Needs or Effectively Coordinated Research." We request the heading be changed to: "Communication and Coordination Can Be Improved." ORD believes that it has been responsive to OSWER's highest priority research needs, as described the response to recommendation 2-6.

On page 9, paragraph 1, the first line, the draft report states that "ORD's research activities have not fully met OSWER's needs for contaminated sediments." We request this sentence be deleted. ORD believes that OSWER's needs have been met, as described the response to recommendation 2-6.

On page 9, paragraph 1, last line, the draft report states that "In addition, OSWER officials said they could not determine whether their priorities were being met by ORD [sic] because an effective communication process had not been established between the two offices." We request this sentence be deleted. While perhaps the opinion of some OSWER officials, ORD believes this statement is not supported by factual evidence. Throughout the year, OSWER has several opportunities to determine whether priorities are being met and to discuss changes in the research program. Progress on current research occurs through seminars, involvement in laboratory implementation plans, planning meetings at the laboratories, and the annual progress review. Additional opportunities for interaction occur through the Land Research Coordination Team and the meeting of the OSWER and ORD Deputy Assistant Administrators.

On page 9, paragraph 3, first line, the draft report states that "Also, ORD's completed research is not readily accessible to OSWER and the regions." We request the following change to this portion of the draft report: "Opportunities exist for ORD to make its completed research more readily accessible to OSWER and the regions." ORD agrees that improvement opportunities exist for developing a set of easily accessible, media-specific web sites. We are already beginning work to make our completed research more accessible.

On page 9, paragraph 4, first line, the draft report states that "Further, ORD has not fully coordinated its research activities with other Federal agencies that conduct research addressing contaminated sediment issues." We request the following change to this portion of the draft report: "Further, opportunities exist for ORD to better coordinate its research activities with other Federal agencies that conduct research addressing contaminated sediment issues." A previous comment describes ongoing coordination and collaboration with other Federal agencies. Development of the Memorandum of Understanding cited above will make coordination more formal and visible.

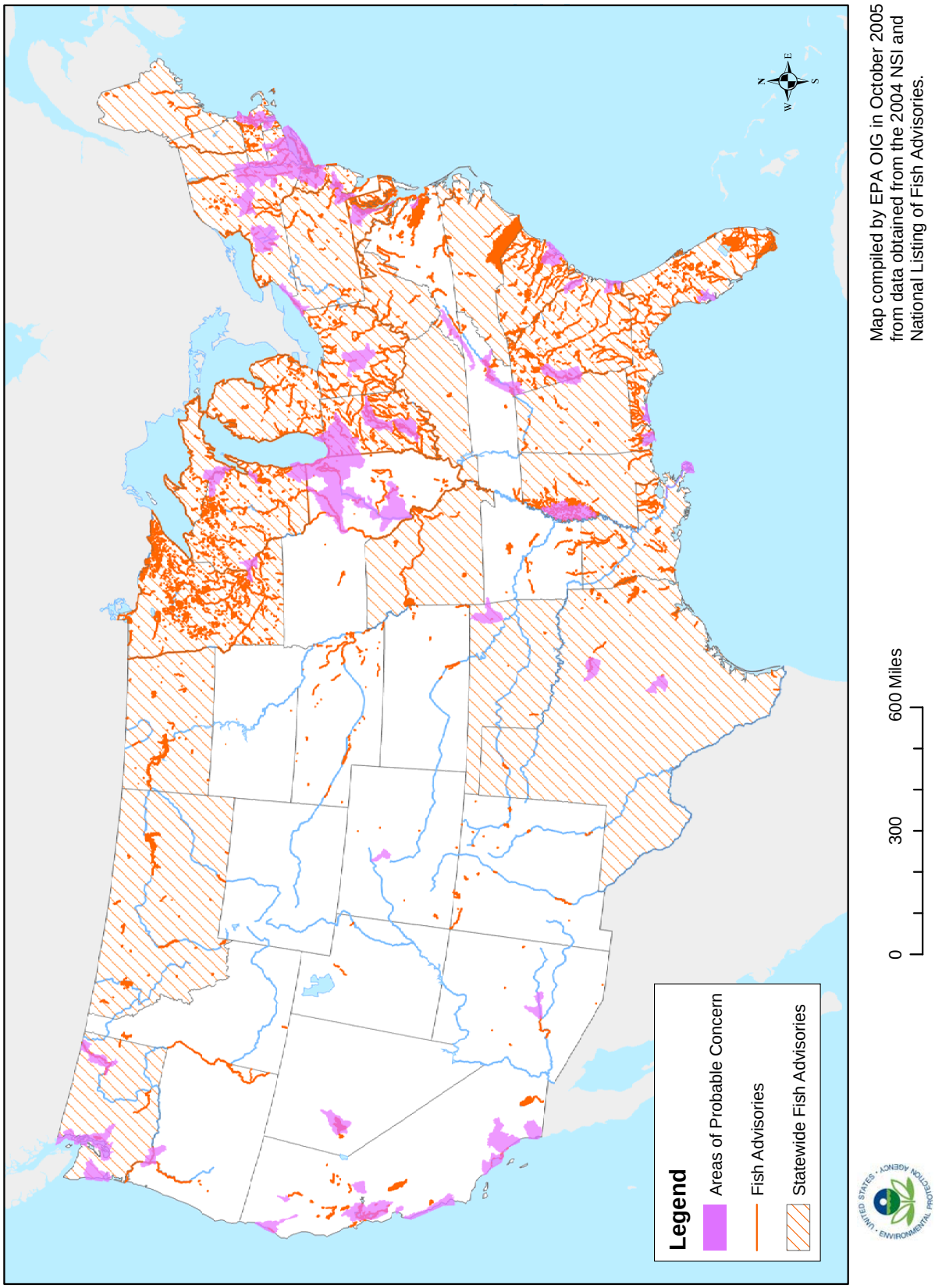
On page 12, second paragraph under the "Primary Causes" heading, third sentence, please change the 2001 date to 2002. The last meeting of the Steering Committee occurred in the fall of 2002.

Chapter 3

On page 17, first bullet, paragraph under the "Assessment Incomplete" heading, we suggest changing the characterization of the bullet to "non-random data collection." OW does not interpret section 503(b) of the Water Resources Development Act of 1992 (WRDA) to require EPA to sample sediments. The WRDA requires EPA to conduct a comprehensive and continuing program to assess aquatic sediment quality with specific minimum elements. As such, we suggest that the text of this bullet be revised to reflect collection of information rather than sampling.

On pages 17 and 18, we suggest changing the statements about excluding metadata to statements that say metadata was not included. OW did not decide to exclude metadata. Rather, OW did not include metadata because OW was not able to obtain all metadata from all sources.

Map Overlay of Areas of Probable Concern and Fish Advisories



Appendix D

Distribution

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