OCEAN DISPOSAL OF CONTAMINATED DREDGE MATERIAL

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SUBCOMMITTEE ON OCEANOGRAPHY, GULF OF MEXICO, AND THE OUTER CONTINENTAL SHELF

OF THE

COMMITTEE ON MERCHANT MARINE AND FISHERIES HOUSE OF REPRESENTATIVES

ONE HUNDRED THIRD CONGRESS

FIRST SESSION

ON

THE EFFECTS OF OCEAN DISPOSAL OF CONTAMINATED MATERIALS ON OUR MARINE ENVIRONMENT AND POTENTIAL ALTERNATIVES TO OCEAN DISPOSAL OF CONTAMINATED MATERIAL

MARCH 30, 1993

Serial No. 103-16

Printed for the use of the Committee on Merchant Marine and Fisheries

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OCEAN DISPOSAL OF CONTAMINATED DREDGE MATERIAL

TUESDAY, MARCH 30, 1993

HOUSE OF REPRESENTATIVES, SUBCOMMITTEE ON OCEANOGRAPHY, GULF OF MEXICO, AND THE OUTER CONTINENTAL SHELF, COMMITTEE ON MERCHANT MARINE AND FISHERIES,

Washington, DC.

The subcommittee met, pursuant to call, at 2:19 p.m., in room 1334, Longworth House Office Building, Hon. Solomon P. Ortiz [chairman of the subcommittee] presiding.

Present: Representatives Ortiz, Green, Weldon, Saxton, Hughes, and Pallone.

Staff Present: Tom Kitsos, Mary Kitsos, Sue Waldron, Dan Ashe, Robert Wharton, Dino Esparza, Sheila McCready, Chris Mann, Greg Lambert, Ed Welch, Lisa Pittman, Dave Whaley, Eunice Groark.

STATEMENT OF HON. SOLOMON P. ORTIZ, A U.S. REPRESENTATIVE FROM TEXAS

Mr. ORTIZ. The hearing will come to order. Good afternoon. I am sorry I am a little late. We had a series of votes. We might have more later on. It might be an afternoon that will be very interrupted. I would like to take this opportunity to welcome all of you to this hearing of the Subcommittee on Oceanography, Gulf of Mexico, and the Outer Continental Shelf.

Today, our focus will be on the current ocean disposal program for contaminated dredge material. We are expecting a number of votes this afternoon so if there is no objection, I would like to submit my statement for the record and open the floor to any other members that might have an opening statement. Before we do that, I would like to yield to my good friend, the ranking member, Mr. Weldon.

[Statement of Mr. Ortiz follows:]

STATEMENT OF HON. SOLOMON P. ORTIZ, A U.S. REPRESENTATIVE FROM TEXAS, AND CHAIRMAN, SUBCOMMITTEE ON OCEANOGRAPHY, GULF OF MEXICO, AND THE OUTER CONTINENTAL SHELF

Good afternoon, I would like to welcome you all to this hearing of the Subcommittee on Oceanography, Gulf of Mexico, and the Outer Continental Shelf.

Today, our focus will be on the current ocean disposal program for contaminated dredge material. Specifically, it will examine the Army Corps of Engineers and the EPA's roles in the permitting process under the Ocean Dumping Act; an update on Federal efforts to address the issues of contaminated sediment assessment, remedi-

ation, and disposal; and alternatives to the ocean disposal of contaminated sediment, including remediation and treatment measures.

We have invited the Port Authority of New York and New Jersey, and the New Jersey Department of Environmental Protection and Energy, to come before us to talk specifically about the Port Authority's application for a permit to dispose dredge material from Newark Bay at a site off Sandy Hook, New Jersey.

As most of you know, this permit application, which has been pending for over three years, and whose approval is currently being withheld by the Corps and EPA pending further contamination testing, has become a focal point in this debate over the disposal. The policies and standards that are developed out of this particular permit, and the discussions that surround it, may substantially affect future permit applications from across the Nation.

On the one hand, we must ensure that our Nation's ports continue to operate and compete successfully for interstate and foreign commerce. Ports must be allowed to conduct channel and berth improvements and maintenance as needed, in a timely and cost-effective manner.

However, especially as our abilities to detect contaminated sediment increases, we must also focus our efforts on ways to deal with this material in a manner that will not degrade our environment or cause health concerns for humans or marine life. The Federal Government, and all the parties with a stake in this matter, must work together to properly assess the character and extent of contaminated material, how it should be handled, and where it should be disposed of.

This hearing today is an attempt to bring the various parties together to provide some oversight and focus on this matter. I have a feeling that the issue of contaminated sediment disposal will only become more prominent with time, and that we must present the public with a true picture of the problem and develop management practices that successfully deal with the issue.

I thank our witnesses for coming before us here today and I look forward to their testimony..

STATEMENT OF HON. CURT WELDON, A U.S. REPRESENTATIVE FROM PENNSYLVANIA

Mr. WELDON. Thank you, Mr. Chairman, for yielding. I would like to ask unanimous consent both to submit my statement into the record as well as the statement of Jack Fields, our ranking Republican member on the full committee, and say that I would congratulate you for holding this very important hearing. There are a number of issues that we need to discuss as it relates to the disposal of contaminated dredged material. This hearing today will help us better crystallize the issue for the Congress.

As someone who represents an area adjacent to the ports of Philadelphia, I have extreme concerns about this issue and am looking forward to both the discussion of the regulatory process, the issue as it relates to New York and New Jersey, specifically, as well as other methods that may, in fact, be employed to deal with contaminated materials. I think that is going to be a very important part of this hearing. So I congratulate you.

I apologize to our witnesses in advance. The Chairman and I are both, as well as Mr. Saxton, on the Armed Services Committee. We have been in all-day hearings that just ended a short while ago with Chairman Les Aspin and the Chairman of the Joint Chiefs, Colin Powell. We will be reconvening at 3:00 and so if you see us leave, it is not because we don't want to hear or be involved with your testimony, but we have dual responsibilities. And, unfortunately, this will be the only chance that we have to get both Secretary Aspin and Chairman Powell before our committee to discuss the Defense budget in this session. So, I apologize in advance for having to leave, Mr. Chairman. Thank you.

[Statement of Mr. Weldon follows:]

STATEMENT OF HON. CURT WELDON, A U.S. REPRESENTATIVE FROM PENNSYLVANIA

Mr. Chairman, thank you for holding this important hearing today on the ocean disposal of contaminated dredge material. Without a doubt, this is a matter of great significance for myself as well as other Members who represent ports that are, for the first time, addressing this growing problem.

As you know, the unfortunate circumstances leading to the denial of the permit for the disposal of contaminated dredge material from Newark Bay at the Mud Dump site has raised a number of important questions. Today, we will not only focus on the regulatory process of disposing dredged material in our oceans, but also, we will discuss alternatives to this disposal. This hearing, Mr. Chairman, is long overdue and I applaud you for taking the lead on this significant matter.

As you know, my district is adjacent to the Delaware River, which serves the Port of Philadelphia. Although still in its preliminary stages, the Army Corps of Engineers has selected a plan to enlarge the main channel of the Delaware River to 45 feet with widths ranging from 400 to 1000 feet. The plan also includes widening and deepening a portion of the Marcus Hook Anchorage Area. By deepening the river, there will be greater access to the Delaware River Port Area which will provide a local economic benefit.

While it is my understanding that contaminated sediments do not exist within the proposed channel enlargement area, little information exists outside of this area. If in fact, such sediments are found, I would hope that the Port of Philadelphia would not have to wait three years before obtaining a permit for disposal of these sediments.

Also of significance at today's hearing are not only the problems associated with ocean disposal of contaminated materials, but also the various alternative solutions that are being developed. In particular, I look forward to hearing from Dr. Robert Engler of the Army Corps of Engineers and Fred Grassle of the Institute of Marine Sciences on the various alternative methods of ocean disposal of contaminated sediments. I am very interested in technologies that are being developed which use contaminated sediments to create wetland areas under the combined COE-EPA Field Verification Program.

Again, Mr. Chairman, I applaud your leadership on holding this very important hearing. I look forward to working with you on this important matter.

[Statement of Mr. Fields follows:]

STATEMENT OF HON. JACK FIELDS, A U.S. REPRESENTATIVE FROM TEXAS, AND RANKING MINORITY MEMBER, COMMITTEE ON MERCHANT MARINE AND FISHERIES

Chairman Ortiz, thank you for scheduling this hearing on a topic of much interest to Members on my side of the aisle. We must remember, though, that the vast majority of dredge material poses no disposal problems and can be used beneficially to restore beaches and create wetlands. This is certainly the case in the Gulf of Mexico, which has more dredge material than any other region in the country. Most of the dredge material is dumped in open water, and disposal has not been a problem despite a number of contaminated sediment sites ringing Gulf shores. I would hate to think that it would take the Port of Houston three years to obtain an ocean dumping permit to dispose of dredge material from its waters, as the Port Authority of New York and New Jersey has faced since 1990.

I am also interested in technology that is being developed to help decontaminate those sediments that do pose a disposal problem. The Army Corps of Engineers laboratory in Vicksburg, Mississippi, is a leader in this area, and we must also consider EPA's operations in the Great Lakes under the Assessment and Remediation of Contaminated Sediments Program. I understand that most of these treatment processes are extremely expensive and thus work only on a small scale. Perhaps additional research may be necessary to expand the application of these technologies to the larger amounts of dredge material involved in our most heavily contaminated sites.

Finally, I will be very interested to hear about the Environmental Protection Agency's (EPA) survey of the extent of contaminated sediments in U.S. waters and its development of appropriate monitoring programs for these sediment sites. I hope that EPA will take into consideration the substantial work conducted by the National Oceanic and Atmospheric Administration (NOAA) in this area, and labor to avoid duplication of effort with NOAA and private entities.

Mr. ORTIZ. Mr. Saxton.

STATEMENT OF HON. H. JAMES SAXTON, A U.S. REPRESENTATIVE FROM NEW JERSEY

Mr. SAXTON. Mr. Chairman, I appreciate very much the dispatch with which you have called this hearing subsequent to my request. It is a very important subject, and this hearing turns out to be more timely than anyone could imagine. I say that because apparently just yesterday the EPA issued a conditional permit to the Corps of Engineers signifying the go-ahead conditioned upon some approvals from the National Marine Fisheries Service.

And to that extent, Mr. Chairman, I would like to ask unanimous consent at this point that following my opening statement a letter dated 29 March from EPA to the Corps be entered into the record to be followed by a letter dated March 23 written to the Corps from NMFS outlining NMFS's concerns relative to the Endangered Species Act as it relates to this permit.

[The abovementioned letters can be found at the end of the hearing.]

Mr. ORTIZ. Hearing no objection, so ordered. You still have another statement? I am sorry. Go right ahead.

Mr. SAXTON. Mr. Chairman, thank you very much, and, Mr. Chairman, as Congressman Hughes and Congressman Pallone and I will say clearly, "Here we are yet again to discuss the merits of ocean disposal as the most economic alternative for getting rid of unwanted waste." In this case, it is 460,000 cubic yards of dredged material much of which is contaminated with dioxin.

Once again, one sector of our society is being pitted against another due to the scientific ignorance as to the risks and our lack of commitment for aggressively developing alternative disposal methods, something which is only now getting the attention it deserves. Again, no one knows the effects of the dioxin, nor what the accumulative effects will be on marine life and seafood as time goes on. And, once again, it seems the burden of proof has fallen squarely on the shoulders of citizens and businesses who depend on the ocean for their livelihoods to prove that this activity may be harmful to marine life rather than requiring the applicants to prove that it is not.

It is important for my colleagues to understand that this is a precedent-setting case. There are 20 to 30 additional permit applications in the New York/New Jersey Harbor lined up behind the Port Elizabeth application. At least 20 of those projects are anticipated to contain dioxin. Whatever happens in this case will set the standards in dealing with similar situations elsewhere around the country.

It is important to note that this is the very first time that we have tested for dioxin. It is my understanding that the Six-Mile Mud Dump Site is already contaminated with dioxin from previous disposal activities which were not subjected to dioxin testing. A big concern is over whether or not introducing more dioxin to the Mud Dump will increase the bioaccumulated levels of dioxin already observed in marine life in and around this site. No one wants to see levels of dioxin equal to those found in Newark Bay where crabbing and fishing are already prohibited due to high concentrations of dioxin.

We are woefully ignorant about the effects of many contaminants which permeate the sediments of harbors and bays around the country. A legacy of past industrial indiscretions and the need to dredge and keep our ports open to seafaring commerce will involve future battles over a potpourri of poisons. This is merely a trial balloon of what is to come.

The amount of contaminated dredge spoils requiring specific disposal is small in comparison to total volume of dredged material—3 to 12 million cubic yards out of a total of approximately 400 million cubic yards to be more exact. Nevertheless, the process for managing contaminated dredge spoils is ad hoc and inefficient. Although the environmental community, the Port Authority, the New Jersey DEPE, and the academic community have all tried very hard to work together, the process has clearly failed.

After three years of expending a great deal of resources and time, the Port Authority is embattled in controversy. Ships are scraping bottom. Insurance companies are threatening to cancel insurance. And the port's second largest customer has now named Halifax, Canada, as its new deep-water port on the East Coast, and still our questions go unanswered.

On the other side, the environmental community and businesses who depend on the availability and health of marine life resources have been left out of the public debate. Critical decisions regarding acceptability standards for dioxin have been made without the benefit of scientific peer review. And important documents for public comment have required a Freedom of Information Act request—not necessarily friendly to concerned citizens wanting to participate in the process.

For a number of years, the Environmental Protection Agency has had the responsibility of promulgating national standards for contaminated sediments. Due to lack of funding and resources or for other reasons, this has not been given the priority attention it deserves. In addition, the Corps has been involved with researching alternative disposal methods—another area lacking the priority attention demanded by 3 to 12 million cubic yards of contaminated dredge material per year.

As the issue of contaminated sediments and their disposal looms on the horizon, it is incumbent upon the committee to ensure that adequate funding as well as deadlines and an effective process are provided. It is imperative that we stop the cycle from merely shifting our unwanted pollution from one environment to another, particularly the out-of-sight, out-of-mind option offered by ocean disposal. It may be cheap at the onset, but the economies dependent on commercial, recreation, fishing, and tourism comprise one of the largest growing economic sectors of our country, particularly along the New Jersey coast. Trust me, this is not a cheap alternative.

I look forward to hearing from all of our witnesses today. I would like to extend a special welcome to Richard Sinding of the New Jersey Department of Environmental Protection and Energy and particularly to Dr. Fred Grassle of the Institute of Marine and Coastal Services. I thank you both for being here.

Mr. Chairman, I look forward to hearing the testimony this morning, and, again, I want to express my appreciation to you for the timely fashion in which you have called this hearing.

Mr. ORTIZ. Thank you and I am sorry. I did not mean to interrupt your statement, Mr. Saxton.

Mr. SAXTON. That is all right.

Mr. ORTIZ. As I stated before, we are very happy to have with us two members of the full committee, Mr. Hughes of New Jersey, and Mr. Pallone. Mr. Hughes, do you have an opening statement?

STATEMENT OF HON. WILLIAM HUGHES, A U.S. REPRESENTATIVE FROM NEW JERSEY

Mr. HUGHES. Mr. Chairman, I do have an opening statement which I would like to submit for the record if I might. I would like to congratulate you in convening this hearing. And I thank my colleague from New Jersey, Mr. Saxton, for requesting the hearing. It is very timely as Mr. Saxton has indicated. Additionally, I would like to associate myself with his remarks.

Mr. Chairman, over the years, we have done a very good job of cleaning up the oceans, and our water quality has not been better. This hearing, though, is deja vu in many respects. I don't think anybody would seriously propose that we close down the New York/New Jersey Harbor. Nobody suggests that. But by the same token, it doesn't make sense to continue the same policies that have gotten us into trouble for so many years.

Frankly, there are a lot of unanswered questions. My colleague from New Jersey, Mr. Saxton, and certainly Mr. Pallone, has raised many of them. For example, there is an uncertainty about what level of dioxin is acceptable for ocean disposal. We don't know what the impacts of dioxin and other contaminants are on our marine environment. We don't know whether capping really is foolproof or what damage can be done by future storms. And yet we keep talking about interim solutions and the promise of long-term solutions, and I have yet to see them.

I hope that the witnesses today will begin to address what I think is probably one of the most important central questions to be resolved at this and future hearings and that is what are our long-term options? Do we have some long-term plans? Are we going to have this type of a battle every time we have new areas—new regions that have to be dredged? That wouldn't make sense. I think we can spend our time a lot more prudently if we begin to focus in on long-term options instead of the short-term fixes that keep getting us into trouble time and time again.

I want to welcome our witnesses. I see an old friend, Tudor Davies from EPA, is with us today and Mr. Rees and others from the Army Corps but particularly Mr. Sinding from the DEPE and Fred Grassle who is at Rutgers University, and we are delighted to have them. I look forward to the testimony.

[Statement of Mr. Hughes follows:]

STATEMENT OF HON. WILLIAM J. HUGHES, A U.S. REPRESENTATIVE FROM NEW JERSEY

Good afternoon, Mr. Chairman. Thank you for convening this hearing today to discuss ocean disposal of contaminated sediments. I appreciate the opportunity to join you and would also like to thank my colleague from New Jersey, Mr. Saxton, for requesting the consideration of this timely and important issue.

The disposal of contaminated sediments poses a very serious problem—one that has no easy solution. The hearing today is the result of the controversial application currently pending before the Army Corps of Engineers to dispose of dioxin-contami-

nated dredge material from the Port of New York/New Jersey at the six-mile mud dump off the New Jersey coast.

This case not only represents a return to the debates on the merits of ocean dumping, but serves as a test case that will set a precedent for the disposal of millions of cubic yards of contaminated sediments. It's a repeat performance: one economic sector against another, stewards of our environment versus industry.

On the one hand, our ports must continue to be dredged to allow the uninterrupted flow of commerce. Indeed, we must not set up a situation which precipitates the diversion of cargo to other ports and the concomitant loss of thousands of jobs.

On the other hand, we have worked long and hard to address the issue of ocean dumping and now have the best water quality in years off our shores. The hard work to reach this point should not be comprised by short-sighted and convenient policies.

This situation merely illustrates once again that our waste management policies continue to border on bankruptcy. We continue to select the easy, cheap way out of our waste disposal dilemma. The ocean continues to be perceived as the cheapest and, of course, the most comfortable way of disposing of contaminated substances—the old out-of-sight, out-of-mind syndrome is alive and well.

But it is not a cheap alternative—little is known about the long term effects that dumping will have on marine ecology. Even less is known about the impact and fate of dioxin in this environment—what levels, if any, are acceptable? Does dioxin bioaccumulate? Is there a threat to human consumers? The lack of answers to these and many other questions emphasizes the fact that we can't afford to ignore the potential impact of dioxin, metals and organic compounds on marine life in the ocean and throughout the ecosystem.

The impacts of ocean disposal of contaminated substances on our coastal communities is indisputable—direct and adverse impacts on tourism and the fishing industry have been clearly demonstrated. Dioxin-laden crabs have shut down crabbing and fishing in Newark Bay, diseased lobsters and fish with fin rot have brought economic hardship to local fishermen. Dirty beaches have sent tourists elsewhere.

In addition to the unknown and potential impacts of dioxin and other contaminants on our marine environment, there is great uncertainty as to whether capping offers sufficient protection from these contaminants.

Can the integrity of the cap withstand the forces of severe storms such as the ones we have experienced over the past two winters? Does EPA or the Army Corps of Engineers have a program to monitor changes in the character of the mud dump, particularly after these storms? Is there any monitoring to ensure that contaminants from the mud dump site are not spreading and being taken up by marine organisms?

Has the ACOE or EPA considered, proposed, or explored the availability of interim measures to handle these contaminated sediments until a final solution is found? What measures has the Army Corps of Engineers taken to develop a long-term plan to address the problem of contaminated sediments in general?

Clearly, we need to develop long-range options for the disposal of contaminated substances and not go through this symbolic train wreck every time the public interest in protecting ourselves and our resources from the threats of dioxin and other harmful substances conflicts with our economic interests.

We have a tremendous opportunity, and indeed, the responsibility, to use a 21st century approach to solve a 20th century problem. We must meet this challenge head on, move forward and avoid repeating the mistakes of the past.

Mr. Chairman, I will close my opening remarks by welcoming the panel. I look forward to their testimony today in hopes that it will address the concerns I have raised. I would also like to extend a special welcome to Dr. Fred Grassle from Rutgers University and Richard Sinding from the New Jersey Department of Environmental Protection and Energy. Thank you both for testifying today.

Mr. ORTIZ. Mr. Pallone.

STATEMENT OF HON. FRANK PALLONE, A U.S. REPRESENTATIVE FROM NEW JERSEY

Mr. PALLONE. Thank you, Mr. Chairman, and I also have a written statement I would like to have submitted in full for the record and urge unanimous consent for that. But I have to comment—I would like to summarize my remarks, if I could. I want to thank Mr. Hughes and Mr. Saxton, of course, the Chairman, for setting

this hearing up today and my colleagues who have done so much on the ocean dumping issue to prevent ocean dumping.

I have to say though that I think this is really one of the darkest days that I have seen in this Congress with the fact that the EPA has very cynically, in my opinion, given its consent for the dredging and ocean disposal of these dioxin-laded sediments from the berths at Newark Bay. I have to tell you I have no intention of giving up the battle. Those who agreed to allow this permit today should know that we continue to fight, and we will continue to fight against them. I see that one of the witnesses today is Sarah Clark from the Environmental Defense Fund. I would urge the Environmental Defense Fund to quickly bring suit to overturn this decision. I would certainly support their efforts in every way.

This site is six miles off the coast of my district. I can see it from my home, and I have to tell you that when they say that the effects of the dioxin are something that is unknown or, you know, we are not sure about, I have no doubt what the effects of the dioxin are. I have seen Vietnam vets come into my office who have dioxin-laded injuries to their arms and have had children who because of the dioxin and the effect of Agent Orange on them that those children have been born deformed—the same kinds of problems that they have. So don't tell me what the effects of the dioxin are. We know what they are. We have seen them from the Vietnam War. We have seen them from the Agent Orange and the plant where this material comes from. Don't tell me what the effect of the dioxin is on the fisheries. We have seen the rot. We have seen the fish and when they come back to the shore and they are rotten from the diseases from the Mud Dump Site.

This whole thing is such a farce—the committee is not a farce because we are trying to get to the bottom of it—but to suggest that somehow the capping is going to make a difference, what a joke that is! They have in a provision in the letter that Senator Saxton makes where they say that they are going to assure the capping of the material will render it absolutely safe for ocean disposal. The say that the dioxin will not affect the food chain and that our fishing industry can rest secure. They would have you believe that capping the material from the Mud Dump Site is an absolutely safe alternative.

We know that the Army Corps commissioned a report by the Science Applications International Corporation to explore the materials at the Mud Dump Site after the December nor'easter that we had, and much of the material has been lost at sea. The cap did not contain over 250,000 cubic yards of dredged material. This is a significant finding because the Corps and the EPA have maintained that dredge materials do not move off-site once it lands on the ocean floor.

Here is what we know about the capping in the past. In the area of the two mounds created by dredged materials from the Federal Kill Van Kull deepening project, 227,000 cubic yards were lost due to erosion and transport. The SAIC, the authors of the study, estimate that 1.5 feet of material were lost from broad areas where the depths range from 58 to 75 feet, and they hypothesize that the existing mounds focus storm-induced wave energy to cause bottom currents and sediment erosion at the mounds' flanks. The report

also indicates that the material was not redeposited within the Mud Dump Site. How can anybody after they receive that report suggest that capping is going to make the difference? Capping is a joke.

This morning I received a call from the EPA informing me that they are basing their decision to allow the ocean dumping on the proven stability of capping. They claim the losses of material appear not to affect past mounds but rather areas between them. And let me emphasize that they are basing their decisions on appearances. They don't know for certain if the cap will hold up in the event of significant storm action. They have basically ignored their own report. They have ignored information from the National Weather Service about how we are entering into a 25-year storm cycle.

What this says to me basically is that the EPA will not take the time to really do its job. I have a reminder for them. Gang, you are in the business of environmental protection. That is what you are supposed to be doing. You are supposed to take as much time as possible to assure the full protection of our resources. You are supposed to fully investigate any potential danger to the environment. You are not supposed to base decisions on appearances. You are not entitled to make decisions based on economic considerations. It is the environment that we are talking about here, and I intend every lack of respect for the Federal agencies here today and to the region which has signed off on this permit.

I demand that you go to the site and come back with proof that the marine life there has not been adversely affected by the contaminants. I demand that you prove to me that capping will stay in place. Each of the Federal agencies, the Corps, the EPA, the National Marine Fisheries Service, have made successive capping a contingency of its approval of ocean dumping, and summary thinking needs to be done in light of this latest report. It is not too late to prevent ocean disposal. What the EPA has erroneously asserted is that capping is OK if you ocean dump.

Now, I don't have much more to say, Mr. Chairman, but I don't consider myself an unreasonable person, and I think that now is our opportunity to stop ocean dumping. They haven't told me why. Nobody's responded to my request and that of other environmental agencies about in-vessel storage. We put together a proposal, and we have asked that you consider it. Nobody has considered it.

We know that ocean dumping is the cheapest disposal method known, and that is the reason that this is being done. You don't have to make choices between the economy and the environment. This would have been a case where you could have saved the port and the health of the ocean as well and not sanction the disposal and capping. But instead of looking to new ways of dealing with old problems, they have resorted to the same old maxim—Mr. Saxton said it—out-of-sight, out-of-mind.

I had a number of people in my office, and it is in my testimony, some from my own district—Max Kline of Matcom Incorporated in Shrewsbury—who came to my office and gave us examples of alternatives that could have been used, but nobody has been considering them. You know, I see Mr. Davis. I see a lot of people. When I was on Public Works for the last four years, we came up with propos-

als. We put authorizations in the Water Resources bill for alternatives to ocean disposal.

We appropriated money for alternative methods, but, even so, everybody is here today saying it is OK to continue to dump. Well, it is not OK. I don't find it acceptable. I don't know what to say other than to say that I am extremely disappointed in what has happened here, and I hope that there is some way to turn it around. Thank you, Mr. Chairman.

Mr. ORTIZ. We have Mr. Green, a good friend and colleague from Texas. Do you have an opening statement?

STATEMENT OF HON. GENE GREEN, A U.S. REPRESENTATIVE FROM TEXAS

Mr. GREEN. Mr. Chairman, I don't have a prepared opening statement. I just appreciate the opportunity to be here and representing the Port of Houston and the communities surrounding Houston. I appreciate the chance to participate.

Mr. ORTIZ. And I can assure the members that your opening statements in their entirety will appear in the record, and hopefully as we proceed this afternoon, we will begin to chart a course for the long-term solution to the problem of contaminated dredge disposal. Our first panel consists of the Federal and State agencies involved in the permitting process as set out in the Ocean Dumping Act.

The first witness is Mr. Morgan Rees, Deputy Assistant Secretary for Planning Policy and Legislation for the United States Army Corps of Engineers. Mr. Rees will be accompanied by Mr. Michael Davis, Assistant for Regulatory Affairs, Office of the Assistant Secretary of the U.S. Army Corps of Engineers. Representing the Environmental Protection Agency is Mr. Tudor Davies, the Acting Deputy Assistant Administrator for Water.

Lastly, but not least, representing the New Jersey Department of Environmental Protection and Energy, which has its own regulatory responsibilities with regards to the Newark Bay permit, is Mr. Richard Sinding, Director of Policy and Planning for New Jersey DEPE.

At this time, I would like to remind each of the witnesses to limit your oral statements to five minutes. Your written testimony will be placed in the hearing record. We can proceed with Mr. Rees. Thank you and welcome.

STATEMENT OF MORGAN REES, DEPUTY ASSISTANT SECRETARY FOR PLANNING POLICY AND LEGISLATION, U.S. ARMY CORPS OF ENGINEERS; ACCOMPANIED BY MICHAEL DAVIS, ASSISTANT FOR REGULATORY AFFAIRS, OFFICE OF THE ASSISTANT SECRETARY, U.S. ARMY CORPS OF ENGINEERS

STATEMENT OF MORGAN REES

Mr. REES. Thank you, Mr. Chairman, members of the committee and subcommittee. I am Morgan Rees, Deputy Assistant Secretary of the Army in the Office of the Assistant Secretary for Civil Works. We oversee the Army Corps of Engineers.

Mr. ORTIZ. If you can get your mike a little bit closer to you.

Mr. REES. OK. Is that better? OK. We oversee the Army Corps of Engineers civil works activities. With me today is Mr. Michael Davis, Assistant for Regulatory Affairs in our office. Representing the Corps to discuss the technical research issues in a later panel is Dr. Robert Engler, Director of the Center for Contaminated Sediments at the Corps' Waterways Experimental Station in Mississippi.

We are pleased to be here to discuss the general issue of disposal of dredged material in ocean waters, the procedures that we use for reaching decisions on disposal actions, treatment technologies, alternatives, research activities, and assessment and remediation in the Great Lakes and particularly the circumstances surrounding the ongoing permit action in the Port of New York and New Jersey.

My testimony will address the programs and process generally and the recent and ongoing permit situation. Dr. Engler later will discuss the technical aspects of treatment technologies, alternatives, and remediation.

We understand that the permit situation in New York prompted the hearing, but we are pleased that you decided to address the issue of disposal of dredged material in a broader fashion. Difficulties of disposal of dredged material affect not only permit actions but also affect the entire dredging program of the Army Corps of Engineers to maintain and improve the nation's waterways. This has significant economic implications to the country and particularly the maritime industry.

Both the Army Civil Works Navigation Dredging Program and the Army's program to regulate dredging and disposal activities of others operate under essentially the same rules. The three principal laws are Section 10 of the Rivers and Harbors Act of 1899; Section 404 of the Clean Water Act; and Sections 102 and 103 of the Ocean Dumping Act. In addition, there are more than 20 other laws, most of them addressing environmental objectives with which each decision in these programs must comply.

My full statement includes a lot of data on the amounts of material and generally where it comes from and the percentage of pollutants and so forth. Suffice it to say that the annual amount of dredging done is about 400 million cubic yards between both the Corps dredging program and permits issued, and something less than five percent of that material is considered contaminated and requires special handling.

Unfortunately for the coastal ports and the Great Lakes ports, most of those areas are located in areas of contamination. And so we find the kinds of problems that we have currently in New York. There is a threshold requirement for disposal under both the Clean Water Act and the Ocean Dumping Act. Under the Clean Water Act, it is compliance with the 404[b][1] guidelines, and under the Ocean Dumping Act it is compliance with the ocean dumping criteria. The Corps goes through a great deal of testing and analysis to determine compliance with those requirements.

In addition, the Corps goes through a great deal of public involvement, and I am troubled, frankly, to hear concerns raised about people having to submit Freedom of Information Act requests to get information from the Corps. It is certainly our intent

to make this an open and cooperative process with all interested parties.

In addition to the ocean dumping criteria, all the dredging and disposal actions, whether they are for Corps dredging activities or for permits, are subject to essentially a veto by the Environmental Protection Agency if EPA believes that the disposal would not meet ocean dumping criteria. And if the disposal is proposed to be in inland waters or within the territorial sea, it is also subject to a veto by the states under the states authority given in Section 401 of the Clean Water Act. So there are extensive controls and checks and balances in the system that go well beyond the authority of the Secretary of the Army and the Corps to decide on these permits.

I am sure everybody is aware that the reason we are here is that this issue is one of the most difficult and controversial ones to resolve. We are making a little bit of progress; frankly, not as much as we would like. We continue to work very hard to try to resolve these very difficult issues. We think the problem goes well beyond dredging and disposal of dredged material. It extends to upland sources that are in the first instance the cause of the pollution. We don't believe that we are going to solve the dredging and disposal problem without tackling the larger problem of introduction of pollutants into the aquatic system.

With respect to the New York permit situation, a lot of work was done there. The problems that arose got caught in the middle, if you will, of some evolving understandings of concerns about dioxin and some evolving improvements in technology to assess the constituents in material to the extent where we have increased by an order of magnitude our ability to detect contaminants in material.

I see my time has expired, and I will complete my oral statement there. Thank you.

[The prepared statement of Mr. Rees can be found at the end of the hearing.]

Mr. ORTIZ. Thank you. Mr. Davies please.

STATEMENT OF TUDOR DAVIES, ACTING DEPUTY ASSISTANT ADMINISTRATOR FOR WATER, U.S. ENVIRONMENTAL PROTECTION AGENCY; ACCOMPANIED BY RICHARD CASPE, DIVISION DIRECTOR, REGION II OFFICE, NEW YORK

STATEMENT OF TUDOR DAVIES

Mr. DAVIES. Thank you, Mr. Chairman. Let me introduce Mr. Richard Caspe who is here with me today. He is the Water Management Division Director from our Region II Office in New York, and I would like to ask your permission to have him join us at the table. He has been intimately involved in the decisionmaking there, and I think he can bring some firsthand experience to help us if that meets with your approval.

Mr. ORTIZ. Yes. That would be fine. Sure.

Mr. DAVIES. Thank you. EPA and the Corps together manage the ocean dumping program with two processes, a permitting process and a site designation, monitoring, and management process. We have made significant progress in developing testing procedures for material to be ocean disposed, and we published a manual that ev-

eryone refers to as the Green Book, and we hope that we will have out for public comment a new manual for looking at 404 disposal activities in the near future.

Let me perhaps jump in right away to that discussion of the Port Elizabeth/Port Newark permit which I think is what is on everyone's mind here even though your letter of invitation asked for a number of other areas to be covered. The Port Authority requested a permit from the Corps to dredge Ports Elizabeth and Newark and dispose of sediment at the Mud Dump Site. The Corps issued a public notice for ocean disposal of 200 cubic yards which is the subject of EPA review under its MPRSA responsibilities. And because sediments in the Newark area are contaminated with low levels of dioxin, this project has been subject to very, very careful review.

The agency itself has found the issue of dioxin to be very, controversial and has been involved in a reassessment broadly across the agency of research information that we have on dioxin, and we have used most of the information that we had available. The mention that Mr. Saxton made of a document that was derived under Freedom of Information will be put behind us. We hope to have that document published for public review. It will be published as a draft document for peer review, and there will be a public meeting in June on that information. The ongoing review of dioxin, of human health, exposure, and ecologic effects will continue through the year with EPA having public meetings and making as much available as they can on this issue. But based on this relevant scientific information, EPA determined that sediments which resulted in dioxin 28-day bioaccumulation worm tissue above 10 parts per trillion were unacceptable for ocean dumping. The agency agreed that sediments which upon biological testing resulted in bioaccumulation of less than 10 parts per trillion could be dumped at the Mud Dump Site provided that these sediments were covered with a layer of clean sediments at least one meter thick and that that capping should take place closely after disposal.

As you know, there has been some controversy about the amount of material to be disposed, and, consequently, EPA asked the port and the Corps to retest some of the material. The results of these tests show the dioxin levels in sediments to be at or below the tests conducted on the initial project, which were generally below the 10-parts-per-trillion criteria. Disposal may be allowed if the material is capped within five to ten days of such dumping, and as you mentioned, a decision was made on this yesterday.

These issues have been very controversial, and they have generated much public interest. And in light of this interest, our Region II office is seeking to facilitate a consensus on disposal alternatives among interested parties particularly as we deal with this and other issues relative to this site. In addition, EPA has been working on a whole range of other issues under the contaminated sediment heading. We have been developing sediment criteria, as someone mentioned, and we expect after having been through a series of Scientific Advisory Board reviews to publish a methodology for nonionic organic criteria for five chemicals for public comment this spring. We expect that those criteria would then be used in prevention and remediation activities.

As you know, the agency has authorities under a broad range of statutes to deal with contaminated sediments particularly to protect sediments, and what we have been trying to do is develop consistent testing methodologies between statutes and have a strategy that the agency could use. Some of these items were defined under the Water Resources Development Act last fall. What we have done is try to modify ongoing agency activities to support these mandates which include things like a contaminated sediment inventory across the nation. There is, in fact, a meeting going on here today between Federal agencies and State agencies on that inventory.

Let me jump quickly then to issues about sediment decontamination technology. We have done significant research in this area together with the U.S. Army Corps of Engineers particularly in sites within the Great Lakes area. But since the applications of the technologies that we have been investigating of full scale sediment remediation have been limited to only one site in the United States, the cost for future applications can only be estimated for complete sediment remediation scenarios. And estimates exist that it would cost something like $50 to over $400 per cubic yard of sediment to completely decontaminate sediment, particularly things like dioxin-contaminated sediments, though we do not feel that at this point in time there are available technologies that can help us resolve this decontamination issue. With that point I will stop. Thank you, Mr. Chairman.

[The prepared statement of Mr. Davies can be found at the end of the hearing.]

Mr. ORTIZ. Thank you. Mr. Sinding.

STATEMENT OF RICHARD SINDING, ASSISTANT COMMISSIONER FOR POLICY AND PLANNING, NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND ENERGY

Mr. SINDING. Thank you very much, Mr. Chairman and members of the committee and subcommittee. My name is Richard Sinding. I am the Assistant Commissioner for Policy and Planning for the New Jersey Department of Environmental Protection and Energy.

First of all, let me thank you for the opportunity to appear before you today on behalf of Governor Florio and Commissioner Scott Weiner of the DEPE and to share a couple of remarks about some of the opening statements made by the three New Jersey Congressmen. I think it is instructive that all of them made statements which I think comport very closely with positions that the New Jersey DEPE has taken.

In particular, Congressman Pallone, I want to assure you not only that the New Jersey DEPE shares your concern about the effects of dioxin but that I personally as a Vietnam veteran do. As someone who returned to Vietnam last year and visited firsthand a museum in Ho Chi Minh City that demonstrates very clearly the traumatic and tremendous effects of not only potential but real harmful effects of dioxin as a byproduct of Agent Orange, I share deeply your concern and so does the Department.

Congressman Hughes mentioned long-term options as an area which is important to assess and study, and I can assure you, Con-

gressman, that this is the area in which our department is placing its greatest hopes for an expedited resolution of the problem that is before us today. One of the activities which our department has been actively involved in collaboration with the Corps and EPA and other governmental and nongovernmental agencies for the last several weeks has been an attempt to identify those areas in which there is a common concern and a common interest in trying to seek resolutions to this problem rather than exacerbating some of the hype and hysteria and differences that are so often attendant to these kinds of activities.

And we have clearly identified that establishing not only long-term options but intermediate-term options to ocean disposal is an area with which everyone agrees as a matter of policy, and it is now simply a matter, to turn to a statement that Congressman Saxton made, of finding not only adequate funding but especially establishing deadlines for the creation of alternatives to ocean disposal. I think it should be made clear that the New Jersey DEPE has forcefully come out in favor of State legislation that would prohibit any New Jersey State agency after December 31, 1995, from permitting the dredging or disposal of any material contaminated with dioxin at any level unless an official science-based standard has been adopted by the U.S. EPA by that date.

These are activities which the New Jersey DEPE has attempted to undertake largely for the purposes of trying to prevent this whole activity from becoming a pitched jobs versus the environment battle, because it is very much our belief that it is not, that the New York Harbor should not be the area in which we refight the East Coast version of the spotted owl versus the timber workers or the snail darter versus the construction workers. Our goal in the Port of New York and New Jersey should be nothing less than the creation of a state-of-the-art port that serves as a model not only of robust economic vitality but also of the highest standards of environmental protection. There is absolutely no reason through a collaborative, informative process that we ought not to be able to achieve both.

New Jersey's role in this process, in addition to trying to serve as a catalyst for this collaboration, has been to permit the dredging activity specifically in Port Newark and Port Elizabeth with a number of very stringent but, we believe, fair conditions attached. The dredging activity would be conducted by the Port Authority, presuming that the EPA and the Corps of Engineers go ahead and issue the permit, on what we call a one-third, one-third, one-third operation. One-third of the dredging activity will be done with no barge overflow so that no amount of water is allowed to overflow the sides of the barges as the contaminated material is being put into the barges for ultimate disposal out at the Mud Dump. A third of the material would be allowed to overflow the sides of the barges, and a final third would be part of a research and monitoring protocol designed to determine just exactly what the properties and activities of the dioxin-laden contaminants or the dioxin-laden sediment being put into the barges would be so that rather than continuing to deal with the uncertainties of whether the dioxin does adhere to the finest sediments, whether it does or does not enter the water column during the dredging operation, we will

have actual empirical evidence based upon the actual dredging operation that occurs.

The disposal activity that would take place out at the Mud Dump is appropriately the responsibility of the EPA and the Corps of Engineers, but I assure you that we are watching that activity very closely to determine and to ascertain that there would be no adverse effects on New Jersey's economic or environmental health as a consequence of those actions.

I too, like my predecessors here, have a written statement which we have entered into the record, and, again, I thank you for the opportunity to present this testimony.

[The prepared statement of Mr. Sinding can be found at the end of the hearing.]

Mr. ORTIZ. Thank you all for your testimony. I would like to open the floor for members to see if they have any questions or comments. Additionally, the members of the committee and I will submit questions for the record, and I would appreciate it very much if you could respond to these questions in writing. I would like to yield to Mr. Weldon.

Mr. WELDON. Thank you, Mr. Chairman. I was just checking on the status of our Armed Services hearing, and it is temporarily on hold. Thank you for your testimony, and there are a number of issues that I think we want to raise. I would like to ask unanimous consent to submit a list of questions for the record. There are a few things that I would like to focus on verbally during my allotted time here.

First of all, for Morgan Rees of the Army Corps, in testimony that we are going to hear later on today from Sarah Clark of EDF, it is stated that the Corps does not have to respond to public comment. If that is true, I would like to know why this is the case? Specifically referring to her testimony, she states that the permit process pays lip service to public comment in one section, and then goes on to say the ACOE is not required to respond to public comments. She discusses very specific incidents where there were 15 separate comments submitted on 15 different private and Federal projects in the New York/New Jersey Harbor region. Only three responded in writing directly to EDF. It then goes on to say that an internal memoranda had to be requested through the Freedom of Information Act.

Mr. REES. Well, as I said in my oral remarks, and I am not sure of the extent to which we went into detail in the written testimony, but the intent of the program is for full and complete public involvement and certainly not to require people to have to submit Freedom of Information Act requests for information related to any activities of the Corps including disposal of dredged material.

Now, it is true that there is not an absolute requirement for the Corps to respond to all comments, and the background of that is that on many permit applications for Corps dredging projects they get literally hundreds and hundreds of comment letters. It is a matter of program efficiency where you have to make a judgment about when you respond individually or when you respond en mass by some statement. Perhaps there are some judgmental differences about when things should be responded to individually or not. But certainly the philosophy behind the program is to err on the side of

involving the public and to err on the side of full disclosure to anybody who asks.

Mr. WELDON. Do you have a set criteria for which public comments you respond to and which ones you don't?

Mr. REES. There is not a set criterion because it varies widely from case to case, but, as I say, the philosophy behind the Corps public involvement program, if you will, is maximize the involvement.

Mr. WELDON. But are you saying that in the instance of the New York/New Jersey Harbor region that this was, in fact, acceptable to the Corps?

Mr. REES. I am not aware of the details of this particular incident, and I would be pleased to look into it because I am troubled if there is perception that the Corps is trying to hide anything. Personally knowing and, in fact, having run that kind of program in the field for many years before I came to Washington, I sense that there is more than meets the eye because we really don't like to do business that way.

Mr. WELDON. Thank you. I would appreciate that for the record.

[The information submitted by Mr. Rees follows]:

The purpose of the Public Notice in the Corps' Regulatory Program is to solicit public opinion and comments on proposals that require Department of Army permits. In some instances, such as the application by the Port Authority of New York/New Jersey to dredge several of its berthing areas, hundreds of comments are received. The New York District evaluated all comments they received. However, the District determined that it was not necessary or in the public interest to prepare an individual response to each comment. Further, because comments are received before all information is evaluated and a permit decision is made, it would be premature to provide a substantive response to all comments. The District does ensure that the receipt of comments is acknowledged to each submitter.

As it pertains to this permit request, all comments received from the Environmental Defense Fund (EDF) were addressed in the permit decision, though not all were specifically identified in the decision document. In fact, several EDF recommendations were incorporated into the special conditions for the permit. Examples of the special requirements that were placed in the special conditions as a result of EDF comments include: maximum distance from the disposal buoy at which discharge operations can occur; maximum vessel speed at time of disposal; reduction of the timeframe during which dredging operations involving contaminated sediment can occur; and the requirement for a contingency capping plan if a long enough break occurs in the dredging operation.

The New York District does not require use of Freedom of Information Act procedures in responding to the majority of requests for documents related to permit applications. Requests generally involve a limited number of documents, such as the application form, public notice and final permit document, which are public information and freely releasable. However, the administrative record for some permit applications, such as the Ports of Elizabeth and Newark, are voluminous, containing many documents, some of which are quite lengthy. Such documents could include comments on a proposal, information provided by the applicant in response to the comments, and information on alleged violations. These lengthy documents may contain proprietary information or information that is subject to Privacy Act restrictions. Where requests are for numerous documents or the entire record, which may contain proprietary or Privacy Act restricted information, or there is an expressed intent to litigate a decision, the New York District's policy to require requests under the Freedom of Information Act is appropriate.

Mr. WELDON. Mr. Sinding, in your testimony you talk about the state's role. I have particular concern because, as you know, your region will be the agency that will be directly involved in what happens in the Delaware River port dredging project. As you know, my district is adjacent to the river. Do you feel that states should

have a greater role in the permitting process, and, if so, what recommendation would you make to us?

Mr. SINDING. I believe, Congressman, that the State has a very important and appropriate role to play and that is to look at activities which are taking place in the waters of the State of New Jersey and in the immediate environs of those waters. And I can assure you that we would apply the same rigorous analysis to any activity which would occur in the Delaware River ports that we did in the case of the Port Newark and Port Elizabeth area, and that is to look very closely at the dredging activity, at the levels of contamination not only of dioxin but of other substances of concern, and then make appropriately stringent but fair conditions upon any dredging activities which could take place therein.

Mr. WELDON. In the 1992 Water Resource Development Act, there is money allocated for a demonstration project of decontamination technologies in New Jersey. What is the status of that project, and what types of technologies will that project focus on?

Mr. SINDING. Is that directed to me?

Mr. WELDON. Yes.

Mr. SINDING. Because I would defer to Rich Caspe from EPA because that is their money, and they have a very clear program and plan for the expenditure of that money so——

Mr. CASPE. Yes. There is $2.7 million appropriated. We are right now trying to put together a study plan. We are attempting, as Mr. Davies spoke of earlier, to bring a forum together of all the concerned parties, all of the stakeholders on all ends of this issue here to try to come up with a long-term solution to the problems on how we are going to deal with this in the future and not just on this one permit. We are hoping that we will use that to help form the basis for exactly how that money will be spent.

Mr. WELDON. Finally, as my time expires initially here in the first round, Mr. Davies, you may have mentioned this, but for the record, how many ocean dump sites are there for the disposal of dredged material? Did you mention that in your testimony? I don't recall hearing that.

Mr. DAVIES. No, I did not and let me just check. There are 108 dump sites.

Mr. WELDON. 108?

Mr. DAVIES. Yes.

Mr. WELDON. And during the current——

Mr. DAVIES. And those are marine dump sites designated under MPRSA.

Mr. WELDON. Are you currently in the process of designating other sites besides those 108?

Mr. DAVIES. Yes.

Mr. WELDON. How many are currently in that process? Do you know?

Mr. DAVIES. I can get that for you for the record. There are sites being designated.

Mr. WELDON. Thank you. Thank you, Mr. Chairman.

Mr. GREEN. [presiding] Mr. Saxton.

Mr. SAXTON. Mr. Chairman, thank you. Tudor Davies, you are testifying on behalf of the EPA today. Correct?

Mr. DAVIES. That is correct.

Mr. SAXTON. Is it also true that you were not part of the process of issuing the permit in question off New Jersey or consideration of it?

Mr. DAVIES. We were consulted on developments with the permit, but the responsibility for review of the permit is delegated to our regional office in New York.

Mr. SAXTON. And are you familiar with the process that they used to investigate the advisability of issuing the permit and subsequent issuance of the permit?

Mr. DAVIES. Yes, sir.

Mr. SAXTON. I find it unusual, and I wonder if you do, that this permit apparently has been conditionally issued or objection has been conditionally withdrawn or withheld subsequent to further information and further study specifically with the National Marine Fisheries Service?

Mr. DAVIES. No. I think that condition is very appropriate. The National Marine Fisheries wrote to EPA and asked that we enter into consultation with them because there was concern about marine mammals at the dump site, and in most cases, we have had some consultation with National Marine Fisheries on-site-designation issues and also on permit issuance.

Usually we find that we come to a scientific conclusion that there is a no-effect determination, and we go through informal consultation with them under the Endangered Species Act, and they concur with our determination. There have been cases where they haven't, and I think it is very appropriate in this circumstance that since they have asked for consultation that we go through full consultation with the National Marine Fisheries, and I believe that they are preparing a biological opinion based upon the Corps of Engineers' finding of no-effect at this point.

Mr. SAXTON. Has the approval been made pursuant to the process and contingent upon approval by NMFS?

Mr. DAVIES. I think the process is partly concurrence with the no-effect opinion, and if they have an opinion that there are some mitigating measures that should be taken, then those would be appropriately discussed in a final permit. But I think we have to go through this consultation process before the permit can be fully defined.

Mr. SAXTON. So the permit has not been issued, has not been issued contingent upon anything. We are still in the permitting process, and final disposition of the permit, whether or not it is even going to be issued, is still off somewhere in the future?

Mr. DAVIES. The permit is issued by the Corps of Engineers. We have been in consultation with them. We have reviewed the technical data, and the letter that you saw or you quoted from, the Regional Administrator, sets specific conditions that should be inserted into the permit. And I think close to the end of that letter is a paragraph that required or requested that the—I am not sure precisely what the word is—but I think it requires the Corps to go through consultation as appropriate under the Endangered Species Act, Section 7, with the National Marine Fisheries.

Mr. SAXTON. So you have a significant enough concern about the Endangered Species Act and whales and turtles and other types of creatures that might be affected to still have concerns about that?

Mr. DAVIES. We are responding to the concern that was expressed by the National Marine Fisheries who have the Federal responsibility for Endangered Species Act.

Mr. SAXTON. Thank you.

Mr. DAVIES. We——

Mr. SAXTON. I am sorry. Do you want to continue?

Mr. DAVIES. We have done a very thorough technical review of the bioavailability of the dioxin, the concentration levels in the material, and our conclusion, as expressed in the letter, is that sediments that do not bioaccumulate the dioxin into the food chain is appropriate for ocean disposal with the appropriate management measures that are specified.

Mr. SAXTON. Thank you. Mr. Rees, a great deal of caution seems to have been taken by the designers of this process in terms of trying to be sure that the contamination that exists—that we all admit exists be contained by a cap. In December of 1992, I am told there was a survey done of the capping material or the material in this site that is currently in place. I am not clear whether it is capping material or just material that has previously been placed at the Mud Dump Site. Then a large storm occurred during December of 1992, and a subsequent survey was done in January of 1993 which showed significant movement of the material at the site. Can you comment on that?

Mr. REES. Yes, sir. There were comparative surveys done that were initiated by the Corps to determine what is happening, if anything, to the dredged material piles at the disposal site. The preliminary results indicate some change, and that change was characterized by the contractor as significant. The Corps is reviewing the contractor's report to see the nature of that characterization within the context of the accuracy of the measurements that are taken. By that, I mean they are in anywhere from 60 to 90 feet of water, and ocean surveys at that depth and given the wave action and tidal range and so forth, the accuracy of the surveys is plus or minus about a foot or so.

Mr. SAXTON. If we can just conclude for the record, I think you said there appears to have been significant movement of material.

Mr. REES. No. I said the contractor characterized the movement as significant. The Corps is checking to see whether they can support that view or not.

Mr. SAXTON. I have one more question, Mr. Chairman. Do I have time or is it——

Mr. GREEN. We will come back.

Mr. SAXTON. OK. Thank you. Thank you very much.

Mr. GREEN. Mr. Pallone.

Mr. PALLONE. Yes. Mr. Rees, are you suggesting that this capping study that I made reference to in my opening statement hasn't even been reviewed yet fully by you or by your staff?

Mr. REES. I am not sure I understand the question.

Mr. PALLONE. Well, in other words, I made mention in my opening statement of the study which I think Mr. Saxton is making reference to. Science Application International Corporation did this survey of the shifting of materials at the Mud Dump Site as a result of the December storm which is, in my opinion, a very good indication of the fact that capping is ineffective and this material

moves around, and, therefore, the granting of the permit and the whole basis for it is totally false. I understood your statement—and correct me if I am false—to say that you haven't reviewed this yet?

Mr. REES. No. I said the review is not complete. It is under review. The district has looked at it. They have asked the Waterways Experiment Station in Vicksburg to review it, and that is in progress.

Mr. PALLONE. Well, if the review hasn't been finalized yet, how could the Corps approve or go out and allow this permit for the dioxin to take place? In other words, you don't have to finish your review and analyze that before you issue the permit to let the dredging begin?

Mr. REES. The permit hasn't been reissued at this point.

Mr. PALLONE. So, in other words, there will be some time before you allow the permit to go forward, and one thing that would have to be completed first is this study and your analysis of it? That will go into the process?

Mr. REES. I don't know at this point whether the information in the SAIC report is of a nature that would preclude the permit action or not, but that is certainly a matter of obvious concern. We would certainly take that into consideration in reaching any decision on the permit.

Mr. PALLONE. Well, I would ask, you know, through the Chairman that it would be taken into consideration and that before the permit is granted or the dredging is allowed to take place that we would have some analysis of how that might affect the actual dredging. Let me ask you another thing. I mean, I have to say that as far as the Port Authority is concerned and their testing and their information that they give out or have given out about this permit over the last year, I don't believe any of it. You know, they initially said there was a certain amount of dredge material that was going to be dredged. Then the Corps or the EPA or myself found out that that was not accurate, and they went back again and disputed that.

Now, I understand that the whole EPA action, Mr. Davies, is based on the fact that the Port Authority did some sort of resampling and reported to you that now the dioxin levels are less. Is there any independent analysis done—in other words, let me explain it to you more clearly. The port, obviously, has an interest in having this dredging done—a major financial interest. Yet, we seem to rely on them and the consultant they hire to do the testing to tell us what the levels of dioxin are. Is there any independent check of their report, or do you just go based on the facts that are presented to you by whatever they do or whatever their consultant does? Do you believe their consultant, or do you do something independently is what I am saying?

Mr. CASPE. We did not take any independent testing. We did go behind the Port Authority's information. We checked the laboratory. We pulled the laboratory's actual worksheets, the lab reports out. Actually, we had found that we had a little bit of a controversy in the middle. A problem where there was a question of whether they were wet results or dry results and exactly how the lab tests were run. So we have looked behind the report into the lab data, but we have not done independent lab tests.

Mr. PALLONE. OK. Well, maybe if I can put it a different way. What if someone within the Port Authority was interested in having the test results come out a certain way for their own reasons? Could they fabricate that without your knowledge, or does the fact that you go back and look at those reports pretty much preclude that kind of fabrication?

Mr. CASPE. If someone wants to do something to try to break the law, there are always ways of fabricating something. I presume they could do that. We went back and we checked the records all the way back into the actual lab and the actual bench tests themselves and came back with that information.

Mr. PALLONE. OK. Thank you. Let me ask another thing. The in-vessel storage option that was proposed by Clean Ocean Action and some of the other environmental groups, my understanding is that pursuant to the Ocean Dumping Act—and I may not have the name right, but the one that Mr. Saxton and Mr. Hughes sponsored—that alternatives to ocean dumping have to be fully explored before a permit is approved. Now, once we put forward this in-vessel storage alternative, isn't there a requirement under the law to look at that and to rule it out before a decision is made because I haven't even got a response from any of the agencies about the in-vessel alternative? I have no response. Isn't there a legal requirement to look at it and analyze it and rule it out before any action is taken? I thought that was a requirement of the law.

Mr. DAVIES. I think we do look at alternatives. Our concern, frankly, if I can speak frankly, is that if we store this material, we as yet have no remedial technology that is cost effective that can deal with this volume of material. And if we store this material in tankers or something of that sort, all we have is a future problem that we do not see a solution for at this point in time. If——

Mr. PALLONE. Well, I understand what you are saying. You said that previously. What I want to know is isn't there a requirement that you get back to us? In other words, we send a letter asking that this be considered. We don't have a response. Isn't there a requirement that it be considered and that there be a response before we go ahead? That was my understanding, that every alternative to ocean dumping had to be looked at and ruled out, so to speak. You know, I don't know if you can answer it, but that was my understanding. I would like somebody who can——

Mr. DAVIES. Well, why don't we do a response to you on this very specifically, that we will work through our regulations and our lawyers with on this so that we can give you a response? I guess my preliminary feeling is that we look at the normal, feasible alternatives when we make a decision on disposal, and those were taken into account in terms of alternatives that we have in this case. The issue then of storage in a vessel leads us to say, "Well, what do we do with it in the long-term? Are we basically creating a long-term problem which we don't have a solution to so is it a practicable alternative?" But we will give you a written response to this.

Mr. PALLONE. Thank you. Thank you, Mr. Chairman.

Mr. CASPE. Can I just add something to that for a second? Again, EPA is not the permitting agency in this regard so the alternatives analysis that was done in sludge, for example, when we were deal-

ing with sludge permitting where EPA was the permitting agency, are not done by EPA in this case. It would be done by the Corps of Engineers who is the permitting agency.

Mr. PALLONE. Well, I believe we actually did send the letter to the Corps, and I did not get a response from the Corps. But, you know, either way, I think we sent a copy to you too so I would certainly like to have a response. Thank you.

Mr. GREEN. Mr. Saxton.

Mr. SAXTON. Thank you, Mr. Chairman. I just have, I think, one more question. Mr. Sinding, in your verbal testimony nor in your written testimony can I find any mention of the Coastal Zone Management Act provisions. Here in this room sometime ago there was a long discussion about giving states the right to make a determination as to whether or not a Federal-permitted activity is consistent with the state's Coastal Zone Management Act. I heard you say that apparently you are supporting legislation, or a decision has been made that will stop the disposal of dioxin-contaminated material after 1995. I guess the first question is does our New Jersey Coastal Zone Management Act speak to this issue currently? And if it does, then do you intend to use your State authority to address this question under the Federal opportunity to do so?

Mr. SINDING. The answer to both questions, Congressman, is yes.

Mr. SAXTON. The answer to both questions is yes, and does that yes mean that you are currently deciding whether or not you are in accordance with the issuance of the permit?

Mr. SINDING. Yes. Our initial decision for coastal zone consistency based upon the information available at the time that the EPA recommended and the Corps subsequently granted the permit to the Port Authority was that the permit for use of the Mud Dump Site was consistent with the state's Coastal Zone Management. The permit, of course, has since been pulled back. There is now another level of analysis that is ongoing. We continue to be supportive of the research and analysis efforts being undertaken by both the EPA and the Corps of Engineers, but we certainly do have the right at anytime to invoke the consistency review provision of the Coastal Zone Management Act and wouldn't hesitate to do so if we felt that the material that was being disposed of was in some way or was not in compliance with our consistency review provisions.

The statement about the 1995 deadline was as much to indicate our impatience with the inability of anyone to establish up to this point a national or regional standard for dioxin, and our rather forceful statement came out of the fact that we believe that if no such standard has been adopted by the end of 1995, that we would not hesitate not only to invoke the consistency review provision but to use any of the other permitting arrows in our quiver to prevent any disposal of any dioxin-contaminated material in the absence of the establishment of such a standard.

Mr. SAXTON. Now, you are then taking the position that this is consistent. Does that mean from your position that this is not harmful?

Mr. SINDING. On the basis——

Mr. SAXTON. This is not going to be harmful to either endangered species, other fish in the area, the general habitat, the ocean habitat that this Mud Dump Site is located in?

Mr. SINDING. On the basis of the information provided by the applicant as well as the analysis by EPA and the Corps of Engineers, our position has been that this material—that the dredging of this material in the waters of the State of New Jersey and the disposal six miles off the coast of New Jersey is not inconsistent with the Coastal Zone Management Act.

Mr. SAXTON. I heard you say it is not inconsistent with the Coastal Zone Management Act, but that wasn't my question. My question was whether or not you consider the disposal of dioxin-contaminated material at this Mud Dump Site harmful to the marine habitat?

Mr. SINDING. I guess the best way to answer that is that at this point we have not seen any definitive information and until the Corps of Engineers has made a final decision on the updated information having to do with this permit, it would probably be premature of us to indicate a final decision to that effect. But on the basis of the information that has been made available to us at each step of the process, our feeling was that it did not constitute a deleterious effect that would require us to invoke or suggest that we should invoke that consistency review process.

Mr. SAXTON. Mr. Rees, do you consider this permit subject to the consistency requirements of CZMA?

Mr. REES. Yes, sir.

Mr. SAXTON. Thank you. Thank you, Mr. Chairman.

Mr. GREEN. Mr. Pallone.

Mr. PALLONE. Thank you, Mr. Chairman. I also wanted to request that we be allowed to submit questions for the record after this hearing if that is OK with the Chairman. I don't know if that was established previously, that we be allowed to submit written questions after the hearing.

Mr. GREEN. Yes.

Mr. PALLONE. OK. Thank you. I wanted to ask a few things. First of all, I am not sure I understand about this NMFS, National Marine Fisheries Service, and what they can do at this point. Mr. Davies, maybe you can answer to me. I thought that the only thing left for them at this point is to simply make some recommendations. Is there actually anything to prevent the Corps from going ahead and allowing this dredging to take place because of any action that remains to be taken by NMFS? In other words, what is to stop them from allowing the dredging tomorrow at this point? Is there anything that has to be referred to NMFS legally at this point?

Mr. DAVIES. Yes.

Mr. PALLONE. Anybody can answer it.

Mr. DAVIES. In my mind, under the Endangered Species Act, there is consultation ongoing with National Marine Fisheries between the Corps and National Marine Fisheries and their biological opinion may concur completely with the finding of the Corps of Engineers which then would say go ahead. There could also be conditions in that biological opinion——

Mr. PALLONE. Yes, but I guess what I am asking is, and maybe I should address it to the Army Corps—Mr. Rees, do you feel that you have to wait for some action or some OK from NMFS at this point?

Mr. REES. Well, I will defer to Mike Davis, our assistant for Regulatory Affairs.

Mr. DAVIS. I think it is important to perhaps step back a little bit if we are going to talk about the endangered species issue. When the New York District of the Corps first advertised this project with the public notice, they solicited the comments of all the Federal and State resource agencies. At that time, the National Marine Fisheries Service wrote a letter and basically said they believe that this project would not have an impact on endangered species. This was during the normal review process. After the Corps decided to issue the permit and in light of the increased quantities of sediment to be dredged, the National Marine Fisheries Service wrote a subsequent letter and said that, "Perhaps we need to take another look at this. There may be some issues we need to address."

As Mr. Davies indicated, we are now in the process of discussions with the National Marine Fisheries Service. I would not characterize this as a formal consultation process. We are in discussions with the service now to determine if our action may affect an endangered species. If we have a major effect, then we would enter into a formal consultation process. The district is certainly very interested in what NMFS has to say, and, at this time, they are having discussions on what the issues really are.

Mr. PALLONE. At what point will we know whether they are going to essentially require you to do something anytime?

Mr. DAVIS. Perhaps within a week or so.

Mr. PALLONE. OK.

Mr. SAXTON. Will the gentleman yield on this?

Mr. PALLONE. Certainly.

Mr. SAXTON. I am curious. When you indicated that NMFS initially expressed no interest or had no objection, can you specify what permits that was relevant to? The reason I am asking this question is that my understanding is that at the point that they made their expression of lack of interest for lack of a better way of putting it, my understanding is that under consideration were dredging permits, not dumping permits.

Mr. DAVIS. Actually, I wouldn't characterize it as a lack of interest on the part of the NMFS. They commented on a project that they believed consisted of dredging and disposing of approximately 200,000 cubic yards. Based on that particular project, they informed the Corps that consultation on endangered species was not necessary. After the quantity increased, perhaps up to 500,000 cubic yards, NMFS asked to reevaluate that issue and take another look at it. That is what we are doing now.

Mr. PALLONE. So, in other words, they could still take action and say you are not allowed to go ahead without certain conditions being met, but you don't know if they are going to do that, essentially?

Mr. DAVIS. It is ultimately up to the Federal action agency to make the decision as to whether the project may affect a species.

Mr. PALLONE. All right. Let me ask one other thing about this standard that was used. My understanding is that the Environmental Defense Fund came up with a standard of four parts per trillion as opposed to the standard that you are using. I don't understand the difference and why a more lenient standard was used in this

case if that is the way I understand it to be—a more lenient standard?

Mr. CASPE. The 10-part-per-trillion standard that was used, that EPA is deeming is acceptable, was based upon New York State Department of Health criteria for fish flesh—for fish fillets. It assumed a variety of very conservative assumptions because really the 10 parts per trillion is a 28-day concentration of dioxin in worms that are allowed to grow in this area. It assumes that the worm is then eaten, and it goes directly into a fish to some degree on a one-for-one basis. So the 10 parts per trillion would equate into a 10 parts per trillion in the fish itself. That is very conservative because all the numbers, in fact, are actually around zero point seven—point eight at maximum. We used one point zero just to be conservative in that regard.

Then once you get into the fish, the 10 part per trillion would be whole fish weight which includes a lot of the fatty and non-edible tissue. We used the 10-part-per-trillion number that New York State used for the fish fillet. The fillets are always much lower actually in dioxin, and then we capped on it. We suggested capping on top of that so it was a very, very conservative number.

The four part per trillion, I believe, was actually three parts per trillion if I am correct, and that number really comes from, again, another standard that has been taken from Great Lakes work, and it is based upon protection of mammals. And actually that is based upon protection of a mink. There are fish in the Great Lakes that would, again, concentrate the dioxin, and then mink have a strange eating habit. They only eat these fish. So that is what the elevation is. So the three parts per trillion was based upon protecting mink in the Great Lakes which is very different, obviously, than the environment that we are dealing with in the ocean.

The 10 part per trillion we felt was more than effective in protecting against fish and against human health. As far as mammals in the ocean, we don't have the data at this stage of the game to give those.

Mr. PALLONE. I hope I am hearing you wrong, but it seemed like you are suggesting to me that the mink had a better standard than humans.

Mr. CASPE. What I am saying is that mink only eat—this is their sole food supply. So as it is their sole food supply, they, obviously, eat an awful lot of it, and so their intake is much greater than what any other mammal or any other species would be taking in. Therefore, that standard would be based upon that particular species, and that is the mink, and that was the three-part-per-trillion number. That is correct.

Mr. PALLONE. OK. Thank you, Mr. Chairman.

Mr. GREEN. Any more questions?

Mr. PALLONE. I did want to ask one other thing if that is OK. I know you have another panel, but I guess we will probably vote in between.

Mr. GREEN. Mr. Saxton wanted to submit some for the record and then come back.

Mr. PALLONE. Sure.

Mr. SAXTON. Mr. Chairman, I ask unanimous consent that a chronology of events regarding the proposed ocean disposal dioxin-

contaminated sediments at the Mud Dump compiled by Susan Kennedy be entered into the record at a point between annals—perhaps following this question.

Mr. GREEN. If there are no objections——

Mr. PALLONE. No. In fact, I don't know, Mr. Saxton, but if we haven't admitted this SAIC report, the Science Applications International Corporation report on the capping that both of us have made reference to, I would like unanimous consent to put that in the record as well of the hearing.

Mr. GREEN. Anything that is in the packet will be in the record.

Mr. PALLONE. OK. That wasn't in the packet because I think that just came out, if I am not mistaken.

Mr. GREEN. OK.

Mr. PALLONE. If it is in the packet, fine. If it is not, if we could put it in the record? I would ask unanimous consent.

Mr. GREEN. OK. It is in the packet, but without objection it will be submitted just in case it is not.

Mr. PALLONE. OK. Thank you. And I just wanted to ask one more thing. I know reference was made to an amendment that I sponsored in the '92 Water Resources Act providing authorizing a demonstration program for alternatives to ocean disposal of dredged material. And I, obviously, am very disappointed with the fact that this has moved so slowly even though money has been appropriated. Again, we are talking now I guess it is at least—I don't know—I think it is at least a year or so since that was authorized and the money was appropriated. Did I understand, Mr. Davies, there hasn't been any progress on that at all? We haven't done anything yet on it in terms of spending the money and actually doing a demonstration program?

Mr. DAVIES. This is the New Jersey demonstration—the $2.7 million?

Mr. PALLONE. Right. Right.

Mr. DAVIES. Yes. I think there has been progress. I am not sure what has been spent at this point, but there have been planning sessions on specifically how the money would be spent. It is a follow-up to other activities that we have had over the last couple of years on technology and demonstration so I don't think no progress has been made, and we are six months approximately into the fiscal year now.

Mr. PALLONE. Well, again, with the permission of the Chair, if we could have a progress report from you on that, I would appreciate it. OK. Thank you very much.

Mr. GREEN. Any other questions? If not, I would like to thank each of you for coming today, and several of the subcommittee members and I have further questions for you we will be submitting in writing for your response, and thank you for your testimony. We have a vote, and if I could while the first panel is leaving and the second panel will come have a seat, we will go vote, and we will back shortly.

[Recess.]

Mr. GREEN. The committee will come back to order. Our second panel today consists of representatives of the port and the environmental communities. First is Ms. Lillian Liburdi, Director of the Port Department for the Port Authority of New York and New

Jersey. Ms. Liburdi will address the permit application process with specific regard to the pending permit for the disposal of dredged material from the Port Authority's terminal area in Newark Bay.

Next is Ms. Sarah Clark, Staff Scientist for the Environmental Defense Fund who will discuss some of the environmental communities' concerns over the current permitting process and the current options for ocean disposal. Finally, our third witness for this panel is Mr. Dwayne Lee, Deputy Executive Director of Development of the Port of Los Angeles representing the American Association of Port Authorities. Mr. Lee will address the permitting process from a national port perspective. As with our first panel, I would like to remind each of the witnesses to try and limit your oral statements to five minutes, and your written testimony will be placed in the hearing record. Before we start with Ms. Liburdi, Mr. Pallone, would you like to submit that for the record?

Mr. PALLONE. If I could, I would like to ask unanimous consent to submit a letter from Richard B. Roe, Regional Director of the National Marine Fisheries Service, to Colonel York of the New York District for the Corps of Engineers which I believe—well, of course, it speaks for itself but indicates that formal consultation by NMFS is warranted. If I could, Mr. Chairman?

Mr. GREEN. If there is no objection, if you will provide that to the staff, we will include it in the record.

Mr. PALLONE. Thank you.

Mr. GREEN. Ms. Liburdi.

STATEMENT OF LILLIAN LIBURDI, DIRECTOR OF PORT DEPARTMENT, PORT AUTHORITY OF NEW YORK AND NEW JERSEY

Ms. LIBURDI. Thank you, Mr. Chairman. I am Lillian Liburdi, the Director of the Port Department of the Port Authority of New York and New Jersey, and I appreciate the opportunity to testify before this distinguished committee on dredging and ocean disposal of dredge material. My full statement will be submitted for the record, and it will address the length of time it takes for decisionmaking within the regulatory process, discuss the high cost of testing, and demonstrate the need for a proactive Federal policy initiative on dredging and disposal necessary to solve what I see as a national dredging crisis.

But we are also the applicant of the Port Authority Newark and Elizabeth Marine Terminal Dredging Permit, and in that regard, I would like to set forth a few important points. First of all, in that permit, we are not talking about toxic or hazardous materials according to Federal definition, for such materials are not dredged and disposed of in the ocean. What we are talking about disposing in the ocean are sediments that have low levels of contamination. We are not appearing before you as the offending industrial polluter but as the agency contending with the consequence of the polluter's actions.

It is our responsibility as a public port agency to both maintain marine terminal facilities for commerce and to do so with the utmost respect for the environment. We cannot adopt an indifferent attitude regarding the real costs and consequences of govern-

ment regulation. Indeed, we have to operate as a business does with a practical concern for costs in time, people, and financial resources.

Our port employs 180,000 people directly and indirectly. Most of the port's shipping activities occur at the Port Newark/Elizabeth complex, one of the largest in the world. Our port is suffering today. Due to doubts about adequate depths, some shipping lines, as Mr. Saxton indicated, have shifted cargo to competing ports including Halifax, Canada. At the same time, unnecessary controversy over the existence of trace levels of dioxin in our sediments and the disposal of these sediments with capping at the Mud Dump has harmed the commercial and recreational fishing industries in our region and has the potential to harm our spring/summer tourism business as well.

You can imagine our frustration that we are still not at a point of decision in a three-year process. Why? Because we proposed to dredge and dispose of the dredged material at the Mud Dump. The question being dealt with in the permit process is how clean is clean? The Federal regulatory system, when dealing with sediments proposed for ocean disposal uses criteria and standards which are orders of magnitude more stringent than that for land-based criteria. These interest groups insist scientific knowledge is not adequate to justify ocean disposal.

The committee should know that with regard to dioxin [2,3,7,8 tetrachlorodibenzo-p-dioxin] the land-based criteria viewed as clean is one part per billion while we are required by the Corps and EPA procedure for a maintenance dredging permit to test to one part in a trillion. That is 1,000 parts less.

We must recognize with rapid advances in technology our ability to detect things to lower and lower levels far exceeds our overall understanding of what it all means. It is unreasonable for society to expect to have a complete understanding of all risks of every action taken at every point in time. If we don't establish a reasonable risk level for environmental protection, economic development will come to a screeching halt, and we will not adequately protect our environment either.

In the case of our permit, I believe the risk of not acting is far worse than removing those trace levels by dredging the berths in Port Newark/Elizabeth and subsequently disposing of them in the ocean with a cap applied.

On the process side, the issues are clear. Responsibility, time, costs, and management between the responsible Federal agencies are all a problem. The regulatory process is a due process approach. A permit applicant should be able to have rules, requirements, and standards explained, provide information based on those requirements for Federal agency decisionmaking, expect prompt attention and decision within a reasonable timeframe. That hasn't happened in this case. Instead, because trace levels of a substance the Federal agencies did not have standards for were found, we became a national process and scientific test lab and a national cause for environmental advocates. In my full testimony, I have attached a chronology of the three-year process we have been through.

As a responsible public agency sensitive to environmental as well as commercial issues, we would have gladly considered using another option than disposal at the Mud Dump if there were any available to us. There are none, certainly not because we haven't tried to stimulate alternative development and certainly not because the Congress hasn't asked. Various legislative directives can be found, as Mr. Pallone indicated, in the Water Resource Development Acts of '86, '88, '90, and '92. I have included a listing of these in my formal statement.

The failure has been in the Executive Branch. First on the permitting issue, the Corps, the EPA, NMFS, and the Fish and Wildlife Service rely on a set of complex memoranda of agreements to address their concerns. They find it convenient to address the issues one at a time. This is a linear, drawn-out process. There is a need for parallel action to expedite the process. Also, decisions have to be made promptly. What is required is a policy guidance—a clear mandate that the law and regulations are to be implemented in an impartial manner with fast decisionmaking.

Second, with regard to disposal options, we have not as an authority sat idly by. While we have participated in the Federal long-term management strategy program, a 12-year effort which discussed a range of disposal options, the report which was issued in December of '89, to date the major Federal follow-up has been a draft EIS on borrow-pits. But we have taken other steps enumerated in my statement as well.

Now, I think it is important that the Federal Government acknowledge its role in these matters, not simply as a regulator but as a major stakeholder. It is responsible for the identification of polluters and assuring cleanup as well as for dredging of the Federal channels which constitute most of the volume of material dredged in our port and others. It is responsible for the U.S. economy that depends on ships carrying cargo to and from the rest of the world. It is responsible for the coastal environment that depends on creative and protective management of its natural resources. It must commit sufficient resources to assure adequate staffing and funding are available to the Federal agencies.

And, lastly, Mr. Chairman, it is time for all of us to move on to develop intermediate and longer-term solutions based on scientific research and assessed against environmental and economic criteria which the public must understand and support. We are prepared to participate fully. We need the Federal and State governments and the environmental community to commit to do the same. Thank you.

[The prepared statement of Ms. Liburdi can be found at the end of the hearing.]

Mr. GREEN. Ms. Clark.

STATEMENT OF SARAH CLARK, STAFF SCIENTIST, ENVIRONMENTAL DEFENSE FUND, INC.

Ms. CLARK. Good afternoon, Mr. Chairman, and members of the subcommittee. My name is Sarah Clark, and I am a staff scientist with the Environmental Defense Fund. I thank you for asking me to testify before you today. I am speaking on behalf of the Environ-

mental Defense Fund, Clean Ocean Action, Ocean Advocates, Coast Alliance, and the American Littoral Society, and for the record, I would like to say that the American Littoral Society has endorsed our written testimony as well.

The crisis being witnessed today in the New York/New Jersey Harbor should sound a warning. As tougher dredge material testing gets enacted within this year, more areas around the country are going to find themselves in the same position of the New York-New Jersey harbor in having an increased volume of contaminated dredge material and a need for new disposal alternatives. We must act if we are going to avert a major confrontation between the need to manage properly contaminated dredge material with the need to maintain navigation channels. This confrontation must be reconciled as soon as possible to protect the public health and to preserve the many jobs that depend upon safe and open harbors and the commercial and recreational fishing industries that depend upon clean waters. At the heart of the many issues that we are raising today and have raised throughout this entire permit process and in our recommendations is that good science should be driving permit monitoring and management decisions. Currently, ocean disposal of dredge material is supposed to be permitted only if unreasonable degradation doesn't occur. But a careful review of the ocean disposal program, as implemented in the New York District of the Army Corps of Engineers and in tandem with information about problems elsewhere in the country, shows that the federal ocean disposal program is not meeting its goals.

It suffers from a combination of little oversight, scattered monitoring that is never acted upon, and a cumbersome relationship between two agencies, the Corps and EPA, that are responsible for various portions of the same program. The ocean disposal regulatory program has not served the environment well up to now, and it is not prepared to meet the new challenges that face it. In our opinion, it really needs an overhaul.

A review of the Mud Dump Site in the New York Bight Apex is a good case study of the program's implementation. What little monitoring undertaken has revealed that sediments and worms in and around the Mud Dump Site are contaminated with a panoply of contaminants including dioxin. And although the vast majority of dredge material thus far dumped at the Mud Dump Site has passed ocean dumping criteria, monitoring has revealed that toxic contaminants have nevertheless accumulated in the sediments and biota to levels of concern.

Secondly, contaminated dredge material, those that do not pass ocean dumping criteria, have thus far been handled by the Corps and EPA by capping, at least in the New York District. And we disagree with the Corps and EPA's premise that contaminated dredge materials can be dumped safely in the ocean with capping. We disagree for a number of reasons, but one of which is the impact of storms that can have on capping. The impact of storms has been verified by a series of bathymetric surveys of the lower third of the Mud Dump Site conducted by the Corps to ascertain what impact the December Northeaster had on the Mud Dump Site in anticipation of placing dredge material from the Port Authority's facilities.

This report reveals several pieces of bad news. First, it found that a quarter of a million cubic yards of material dredged from the Kill Van Kull channel and recently deposited in two mounds at the Mud Dump Site had eroded away. In some places, up to four feet of material was found to be gone. Secondly, although over 300,000 cubic yards of material had been deposited in another portion of that site, over the course of the three months during which the survey was conducted only 25,000 cubic yards or 8 percent could be found.

Altogether, these findings have led us to conclude that, first, all testing of dredge materials fail to prevent ocean disposal of contaminated sediments. Secondly, that capping is not always an effective means of isolating contaminated dredge materials, and that the Mud Dump Site is not stable enough to withstand disruption by storms.

EDF has petitioned the EPA to evaluate the Mud Dump Site to determine if the effects of activities at the site can be considered to be impacting the marine environment and to set dumping limitations accordingly. This Petition may also be undertaken by other environmental and fishing groups.

The recent surveys must also be considered in the context of the Port Authority's pending permit, and we understand that EPA has already decided that only additional capping measures are needed to counteract any impact storms may have. We find this difficult to accept given that decisions about this permit have turned solely upon the ability of capping of dioxin contaminated dredge materials to prevent any adverse effects on the marine environment.

We look to the National Marine Fisheries Service, which now must decide how this project may affect endangered species, to consider this new information more carefully. We have raised numerous issues with respect to this permit and how it regulates dioxin. And as I have indicated, the most recent scientific surveys underscore our doubts about capping to work.

We believe that these issues are valid and should be resolved before any dumping of dredge material occurs. Unfortunately, most of the issues we have raised have fallen on deaf ears, and the public process largely ignored these issues until it became a crisis. The dioxin bioaccumulation criteria is an outdated fish consumption standard that did not go through a proper review process. No EIS was or is anticipated to be prepared. The record to date of dumping, monitoring, and capping at the site gives us no confidence that the proposed monitoring and management plan will be effectively carried out.

We believe that there are many problems that need resolution and assessment before any further dumping should go forward. A comprehensive environmental assessment that reviews conditions at the Mud Dump Site, reviews sediment conditions in the harbor, and identifies alternatives to ocean disposal for implementation in the near-term would ensure environmental protection and move forward this issue toward a long-term solution.

And, in closing, the present situation that we are faced with dictates that problems need to be resolved before they become elevated to a crisis, and we welcome this subcommittee's help and insight in heading off new crises from emerging around the country.

[The prepared statement of Ms. Clark can be found at the end of the hearing.]

Mr. GREEN. Thank you, Ms. Clark. Mr. Lee.

STATEMENT OF DWAYNE LEE, DEPUTY EXECUTIVE DIRECTOR OF DEVELOPMENT, PORT OF LOS ANGELES FOR THE AMERICAN ASSOCIATION OF PORT AUTHORITIES

Mr. LEE. Mr. Chairman, members of the committee, thank you very much. My name is Dwayne Lee. I am the Deputy Executive Director of Development for the Port of Los Angeles, but I am testifying today on behalf of the American Association of Port Authorities. I serve as a member of the AAPA Harbors, Navigation, and Environmental Committee and also as Chairman of the Dredging Task Force of the International Association of Ports and Harbors. And in that capacity, I represent IAPH as a nonvoting member of the London Convention of 1972 which is the international treaty governing the ocean disposal of dredge material of which the United States is a signatory.

We are on the verge of a national dredging crisis because we have not been able to dredge our nation's ports and harbors in a timely and a cost-effective manner. It is time for the Federal Government to develop a comprehensive national dredge material management and disposal policy that will enable us to break the gridlock that many of our nation's ports currently face when they attempt to dredge the harbor. Toward that end, AAPA will soon be finalizing a proposed policy, and we look forward to the opportunity of working with this committee, with Congress, and the Administration to address many of these very difficult issues.

In my oral testimony today, I want to make four points. First, the failure to dredge sediments from navigation channels and port areas not only impedes commerce but it also results in navigation safety and environmental hazards. Second, the vast majority of material dredged from navigation channels is not contaminated and can be safely disposed of in an ocean environment. Third, we do not need more laws. Current regulation of ocean dumping is adequate in our judgment to protect the environment. What we do need is Federal leadership and better and more coordinated implementation so that permits can be issued in a timely and in a responsible fashion. Fourth and finally, it is absolutely essential that the ocean dumping of dredge material remain a viable disposal option. All disposal options should be considered with the decision based on environmental, public health, and economic considerations.

In your invitation to today's hearing, you asked AAPA to comment on the ocean disposal of contaminated sediments. The extent of the problem of contaminated sediments depends ultimately on the definition of contaminated. In other words, what level of concentration triggers an environmental consequence? As some of the previous witnesses have indicated, EPA has the authority to establish criteria to ensure safe disposal of dredge material. Recent amendments to the Ocean Dumping Testing Manual, which is commonly referred to as the Green Book, have resulted in tougher testing and test results of dredge material.

While the current laws and regulations are adequate to manage contaminated sediments safely, too often ports are frustrated by the regulatory delay and lack of a strong leadership at the Federal level to make the permit decision. We believe our scientific ability to identify potential environmental problems has outpaced our institutional ability to make a decision.

Although the Corps is ultimately responsible for issuing the ocean disposal permit, complex requirements for coordination, consultation, and review by other Federal, state, and local agencies can often unnecessarily delay or even derail final consideration by the Corps. Too often reviews by regulatory agencies are sequential rather than concurrent or simultaneous, and there is no consensus on what ultimately will be required of the permit applicant.

Wherever possible, multiple agency reviews should be consolidated, objectives agreed to, and clear time lines established. Amendments to the Ocean Dumping Act in WRDA '92 did specify time lines for review of ocean dumping permits, and we hope that these changes will improve the permit review process.

Mr. Chairman, clearly the Federal Government's overall management of the dredging program, both the Corps and the EPA, can be improved. In addition to streamlining regulatory review, additional resources should be provided for long-term dredge material disposal planning, for disposal site designation, for more costly, beneficial use projects, and for site monitoring projects and disposal sites.

There are several disposal alternatives that are theoretically available for both clean and contaminated dredge sediments. You could go totally upland in a confined site or even in an unconfined area. You could go to confined disposal facilities that extend from the shore out into the water or could be totally surrounded by water. You could proceed with a thin layer disposed over a wide area. You could proceed with open-water placement in a bay, in a river or estuary, or in the ocean itself. But the underlying principle of dredge material management should be that all of these disposal options should be considered with the final decision being based on environmental as well as economic and public health considerations. We must recognize that land-based alternatives are not inherently better in terms of the environmental protection or the practical feasibility than open-water disposal.

In conclusion, Mr. Chairman, the public port community is aware that ocean disposal of sediments is an emotionally charged issue. This concern is caused in part by a philosophical objection to the use of the ocean and in part by concern over the impact of contaminants that exist in sediments. Sediments transported into the harbor by natural processes where they fall out into the water column sometimes and frequently do contain chemical constituents. These sediments must be dredged periodically if the ports are to continue to handle the transportation of our nation's cargo and keep us as a strong, internationally trading country in the international marketplace.

We strongly urge you to work with EPA and the Corps to reform the Federal regulatory process, to avoid permit delay, and to ensure that our nation's harbors can be dredged in both a timely,

cost-effective, and environmentally sound manner. Thank you very much.

[The prepared statement of Mr. Lee can be found at the end of the hearing.]

Mr. GREEN. Thank you, Mr. Lee. If I could ask the panel to stay for a few minutes, and we will go vote and come back and have questions.

[Recess.]

Mr. GREEN. The meeting will come to order, and if I could ask the witnesses to come back to the table. Mr. Pallone.

Mr. PALLONE. Thank you, Mr. Chairman. I wanted to start out my questions with Ms. Liburdi. Ms. Liburdi, during your oral testimony, you mentioned the word interest group and I think suggested, and correct me if I am wrong, that somehow the environmental groups were an interest group. Isn't it, in fact, the case though that the Port Authority is also an interest group?

Ms. LIBURDI. Absolutely.

Mr. PALLONE. What interest do you represent, essentially?

Ms. LIBURDI. I believe we represent the maritime and logistics and distribution interests who use the Port of New York and New Jersey as well as the overall region because of the development that the jobs and the commerce that flow through the port represent to it.

Mr. PALLONE. OK. Is the Port Authority allowed to lobby?

Ms. LIBURDI. We certainly are permitted to speak with Members of Congress about legislative matters as well as about activities which we undertake. Certainly.

Mr. PALLONE. Are they formally registered as lobbyists when they do that?

Ms. LIBURDI. I don't know the answer to that question, but I can ask our Washington representative of that.

Mr. PALLONE. OK. I would appreciate that. How much of your budget goes toward lobbying efforts of that nature either within Congress or the State legislature?

Ms. LIBURDI. I have no idea, Mr. Pallone. I would be happy to ask if we have an accounting available to provide it.

Mr. PALLONE. OK. I would appreciate that. Are there any limits in terms of who you lobby or anything of that nature as far as the port or its representatives are concerned?

Ms. LIBURDI. I don't think I understand your question.

Mr. PALLONE. Well, in other words, for example, I noticed that this year in February when there was a Chamber of Commerce trip down to Washington that there was a major effort during both the dinner meetings of the Chamber of Commerce as well as the train that a lot of the Members took down to the dinner—there was a concerted effort to basically push for the dredging permit and that it be granted. Is that something that you were—I don't mean you personally but that the Port Authority was involved with in some way?

Ms. LIBURDI. We certainly did participate, and I personally did attend the congressional dinner which I have every year for about a dozen years, and I certainly did attend the breakfast which was held the next morning to discuss issues pertaining to the region and the Port Authority not just the dredging permit.

Mr. PALLONE. Did the port in any way contribute to that effort in terms of—I know there was literature passed out. There was—I mean, a certain amount of expenditures that were being made to pass out materials and to promote the dredging permit. Was that——

Ms. LIBURDI. The Port Authority did participate in producing the materials that were distributed which I view as information that everybody on that train had available to them.

Mr. PALLONE. And could you give us some idea perhaps of what the cost of that might be? I mean, not today but in the future.

Ms. LIBURDI. Sure.

Mr. PALLONE. OK. Are Port Authority members, either commissioners or personnel, you know, staff, allowed to campaign or contribute to campaigns?

Ms. LIBURDI. We are as individuals permitted to contribute what would be common contributions. I don't think anything exceptional to local or congressional campaigns as any other citizen is, but we certainly are not permitted to hold public partisan office or to—I don't know about the commissioners. I don't know if there is a different standard for our commissioners than there is for staff.

Mr. PALLONE. Well, I guess what I am asking is that they are in no way HATCHED or under any kind of Federal or State law that prohibits their participation in campaigns or contributing to campaigns?

Ms. LIBURDI. Our commissioners? I don't——

Mr. PALLONE. Either the commissioners or the staff.

Ms. LIBURDI. We are permitted as individual citizens to contribute to individual campaigns, what would be a commonly accepted level of contribution.

Mr. PALLONE. OK.

Ms. LIBURDI. But beyond that, no.

Mr. PALLONE. You are not HATCHED in any way, in other words?

Ms. LIBURDI. No. It is not a Federal HATCH requirement, but we are not—I am trying to distinguish—we are not permitted to do something that is extraordinary in contribution or in working for someone that wouldn't be appropriate. We wouldn't work to lobby or campaign in someone's behalf.

Mr. PALLONE. OK. Are there any rules or any regulations in that regard?

Ms. LIBURDI. There are.

Mr. PALLONE. Could we also get some information on that too?

Ms. LIBURDI. Sure.

Mr. PALLONE. All right. I wanted to ask—you mentioned about the capping, and you said that the granting of the permit was very much dependent, I believe, on the capping. Have you looked at this SAIC report that we have made reference to today?

Ms. LIBURDI. Well, first of all, I think I indicated that our proposal is to dredge and dispose with a cap so, of course, if that is the condition that is proposed by the Corps of Engineers, that would be the solution that we would follow. We have only seen the summary of the SAIC report since that was what was provided to us. We have asked for the entire report so that we might examine it. As of

yesterday, we had not received it, but I don't know if we have received it today.

Mr. PALLONE. OK. But you do intend to review it?

Ms. LIBURDI. Absolutely.

Mr. PALLONE. And I would like to see some sort of response to that in view—I mean, the other people here from the other agencies have indicated that they would.

Ms. LIBURDI. It is our intent to review it, both within staff and using our consultant, EA Engineering, who has been doing the risk assessment work for us.

Mr. PALLONE. OK. And would you give us some sort of response to it?

Ms. LIBURDI. Certainly.

Mr. PALLONE. OK. One more thing. I notice that you were concerned about the length of this whole process——

Ms. LIBURDI. Yes.

Mr. PALLONE [continuing]. that it took for the permits, but certainly from my point of view, and I am expressing my own opinion here, that part of the reason for the delay was, in fact, assertions, which I put a lot of credence to both by the EPA initially and I think it was primarily by the EPA, that basically information given by the Port Authority in regard to the amount of material that was to be disposed of was inaccurate. And so my own view is that, essentially, the port was contributing to that delay because they were not providing accurate information about what was to be dumped. Did the port ever respond to the EPA's statements in that regard?

Ms. LIBURDI. We have responded with the information that was requested in terms of the surveys that would have provided the actual calculations of the depth, and we also provided a written summary of what has been alleged to be misstatements by us about data. And I would be happy to provide that to you as well.

Mr. PALLONE. I would be pleased to have that. Is your position then that, in fact, there was never any question about the amount of material that was to be dredged?

Ms. LIBURDI. No, that is not my position.

Mr. PALLONE. OK.

Ms. LIBURDI. My position is there are changes, but there are reasons why those changes occurred in terms of the process and the amount of time it has taken to get to a decision point.

Mr. PALLONE. OK. Just one other thing I wanted to ask you. We talked about alternatives, and one of the concerns that I have had is that alternatives really haven't been looked at sufficiently. Has the port ever expressed a willingness to subsidize or contribute in any way to any of these alternatives?

Ms. LIBURDI. Yes, we have. Since the first time I testified before this committee, we have done that. And, in fact, we have indicated as recently as last week that we are willing to contribute to the demonstration and development of alternatives, and that we have indicated to various groups who have participated with us in recent dialog sessions that we are willing to put our own resources up to update the upland disposal and containment island site studies if that will help move the Federal process forward. We have also indicated that we would be happy to contribute further to development

of other alternatives like the borrow-pits if that requires additional public information in order for a dialog and a decision to take place on that kind of solution.

Mr. PALLONE. Well, I certainly appreciate that because I do think that that is the most important thing perhaps that can come out of this hearing today—is if we can start looking and making progress on some of these alternatives. Mr. Chairman, I had some questions of Ms. Clark too, but I don't know what your procedure is.

Mr. GREEN. Well, let me ask some questions. Ms. Clark, Ms. Liburdi, both of you mentioned in your testimony that there are problems regarding the public's input and perception of the permit process. How can the Federal or State agencies better bring the permit process before the public in a manner that will allow the issues to be fairly and fully deliberated?

Ms. CLARK. From my experience, I think one of the first things they could do is make a better effort to educate the public about the testing that is being utilized at the particular region and district. What occurred with the Port Authority's project that was a real disservice to the public was that there was only a very scant mention of dioxin and how they were going to evaluate the levels of dioxin in the sediments. And it was impossible for the public to really understand what the evaluative procedure really consisted of.

The Corps and EPA need to make a more concerted effort to make their testing protocol well understood, have public input and review of that protocol. Right now it appears to be largely discretionary, and public input may be considered, but it doesn't really have to be necessarily responded to specifically. The corps' entire public notice process could be made much more friendly to the public. It is not a reader-friendly notice system at the present.

Additionally, in every region and district, there should be an idea of what kinds of projects are down the line. The present system is such that if you are on the mailing list, you get a public notice, and you may get one or three in a week. You have no idea of what is coming up, and there should be some kind of preparation by the Corps. The Corps should inform the public by saying, "We expect these many permits to be processed. Here is a warning about them, anticipate them, and you will be getting notices." Right now the public just responds on a case-by-case basis. Secondly, with respect to how sediments are managed, agencies could do a much, much better job in bringing the public in and having them participate in some of the decisions. Right now it is purely a process of reacting to environmental impact statements, reacting to public notices. There is no proactive garnering of public input before policy decisions are made.

Ms. LIBURDI. Mr. Chairman, I second many of the comments Sarah has offered. I think there are a few others that would be helpful as well. First of all, I would like to see the Federal agencies in each process on a permit convene and agree on what the issues are that they would like to look into and be clear about those issues both with the applicant as well as with the interest groups who are not the applicant so that everyone understands what is at issue in the review.

Secondly, I think that there should have been more information conveyed about the options if there were others than the Mud Dump that were going to be considered at the initiation of the process, and that we had information or scientific understanding of what the criteria were going to be. At the point where we realized that there were no criteria, I think we all should have had a convocation to explain what the steps of the process to develop the criteria were going to be and been able to participate in them whether through the dioxin steering committee or some other venue.

I also think that risk assessment needs to be better understood by the general public. I don't believe most laypeople understand what it means when we talk about bioaccumulation or bulk sediment tests and bioaccumulation, and we don't explain well enough what the real human risk is and whether people ought to be concerned or not concerned about the element that is being discussed.

And I think the Federal agencies, the states, and we need to do a better job—we meaning the general public—in conveying information about what is at risk and what the process for assessing risk is and make sure that there is ongoing information conveyed about the changes in science that are taking place and how they are going to be introduced to the review process.

I think that the Congress in legislative enactments has indicated that as science matures, as new technology is provided, it needs to be stably introduced so that we don't have a wholesale catastrophe in the sense that there is change that nobody knows how to deal with, that we work it through in some collective fashion. I don't think that has happened in this case, and I think those are some areas where had things been different we might have had a more reasonable dialog in way of concluding this permit decision.

Mr. GREEN. Mr. Chairman, if I could just ask one additional question of Mr. Lee and——

Mr. ORTIZ. Sure. Go right ahead.

Mr. GREEN. Mr. Lee, I understand the concern about the regulatory lag in our experience in the Port of Houston. We were notified two or three weeks ago that it is going to take a year to do a computer run on the heavy flow because they have already done the runs on the medium flow and a low flow, and if you could provide any information that would also meet the criteria but also I know that to respond as quickly as you can to lower the regulatory lag that we see?

Mr. LEE. Well, Congressman, you raise a good point. Frequently, when a port is an applicant for a project which ultimately will terminate in a permit to proceed, it is very difficult when you start down that path to know exactly what all of the concerns and the various regulatory agencies, local, state, and Federal, will be as you look at the project. There also is a tendency frequently in the regulatory community, whose primary concern as it should be is with the environment and environmental impacts, to expect that the engineering decisions on what the project really needs to look like in order to make commercial sense and engineering sense and to be technically feasible and doable.

You constantly find yourself in a situation where the designs aren't mature enough yet in what they think needs to be done to satisfy what the regulatory people would like to see in the way of

answers and applications. Somehow we need to come up with a system—to come up with a process where this concurrent progress of the project as a whole, both in terms of what needs to be there commercially, what needs to be there from the engineering standpoint so it makes engineering sense, solves the problem in an economical and cost-effective way, and how that needs to be assessed and evaluated from its environmental impact standpoint so that all those issues can be addressed concurrently and in a cooperative sort of fashion rather than in a sequential and, "OK. Now that I have seen that you have progressed this far, now I would like to see this additional analysis, to look at this particular problem," which becomes a whole new issue that had not been even contemplated before.

Mr. ORTIZ. Now, I think, Mr. Pallone, you have five minutes if you have any questions.

Mr. PALLONE. Thank you. Hopefully I won't take the five minutes, Mr. Chairman. I wanted to ask Sarah Clark—we mentioned before—I think you were here—in the first panel about this three or four point standard, and I guess it was Rich Caspe made reference to minks, and I was a little confused because it seemed to me that we were saying that there was a tougher standard for mink than there was for humans, and the way I understood it basically they were saying a mink eats more fish and people don't eat as much fish, but if an individual happens to eat as much fish, you know, it seems to me that they might be subject to the same problem as a mink. And I am just wondering, you know, if you wanted to comment on that because it was very confusing to me.

Ms. CLARK. Sure. Well, I think you have a very good point in that the criterion do depend upon the amount of a substance or a contaminant that is ingested and consumed, so consumption rates are very important to consider when designing a criteria. And it may be that minks consume largely so much more fish that the criteria set for their protection may be more protective than that for humans, but it depends upon what assumptions went into the criteria to begin with.

But another point is that when we originally found out about the dioxin bioaccumulation criteria that was being contemplated by the Corps of Engineers in the permit process, we very clearly stated, "Doesn't this kind of criteria have to account for impacts on wildlife? Isn't that the end point that really should be considered here since the law under which these permits are being granted is partly designed to address impacts on the marine environment and wildlife and fisheries, and shouldn't bioaccumulation criteria be set to protect the most sensitive wildlife species that may potentially be impacted by this activity?" And in our analysis, the most sensitive end point would be a bird that consumes only fish.

Mr. PALLONE. Right.

Ms. CLARK. When we went and looked to see what kind of criteria might be out there besides fish consumption criteria for human health protection, we did find a New York State wildlife criteria that was our understanding was set for protection of piscivirous birds, which are birds that only consume fish. And I will go back and look at that information and communicate that directly to the committee because it was our contention that the criteria should be

set or designed with that in mind of protecting the most sensitive wildlife, and that is one of the issues of debate here—is a fish consumption standard really appropriate in this kind of context.

Mr. PALLONE. All right. In that same regard, what actually has the National Marine Fisheries brought out and expressed concern about? Isn't it essentially the same thing?

Ms. CLARK. Well, they are looking at the endangered species that may be feeding upon fish that may reside near the Mud Dump Site or maybe fish that have been impacted by the Mud Dump Site, and some of those endangered species are mammals, so that it is something they have to be considering; is what kind of potential impact might be impacted on those particular species.

Mr. PALLONE. And then the third thing I was going to ask you is to what extent is this permit dependent upon capping? In other words, now we have this report that basically says that capping is in adequate, in my opinion—I suppose somebody might dispute the report, but there is no question about they are saying—and, you know, my impression is this whole permit is dependent upon capping being something that works. What is your opinion in that regard?

Ms. CLARK. From what I have read from the correspondence and memorandum of at least the EPA that their agreement to any criteria with respect to dioxin turns on the ability of capping to isolate the dioxin-contaminated sediments. And to that respect, capping then is extremely important in that EPA is holding that capping has to be respectively done in order for this kind of permit or any other kind of permit that might have dioxin-contaminated sediments to be allowed to go forward.

Mr. PALLONE. OK. Let me just ask one more thing because I know my time is up. You talked about an EIS, and I, of course, have asked the Corps and the EPA to do another EIS. How can it be that they have not had to do an EIS here? I don't understand. I thought under NEPA an EIS was required for anything like this that might have a major impact on the environment. How do they get away with not doing an EIS? I mean, either the Corps or the EPA or whatever.

Ms. CLARK. Well, it is the Corps' decision because it is an action that they are permitting, and their explanation as far as I can tell is that enough EIS's have been written with respect to impacts at the Mud Dump Site, and this project is really no different than any other projects that have been evaluated before except for dioxin.

Mr. PALLONE. But the dioxin—isn't that a sufficient reason to suggest that it is different?

Ms. CLARK. It is our belief that, yes, it is sufficient, and, in particular, in conjunction with the situation of the Mud Dump Site being contaminated to a degree now, to what degree will more sediments add to that problem? We feel that that question hasn't really been addressed and could have been addressed in an EIS process. I think a lot of these issues that we have raised and have been raising could have been addressed in the EIS process, and we may have resolved a lot of them and wouldn't be here today if one had been prepared. But that decision was made by the Corps, and in some respects was made almost before the public notice went out—not totally but it was a preliminary finding.

So it is very unfortunate. We think it could have been a constructive process to air a lot of these issues and have the public be informed of the information and data and sort of thinking behind the agencies' decisions about this permit.

Mr. PALLONE. Well, thank you very much, and thank you, Mr. Chairman, for having the hearing. I thought it was very productive, and I appreciate it.

Mr. ORTIZ. Thank you. Does any member of the panel have anything to add to your testimony before we move to the next panel? Let me thank each of you for coming here today, and I apologize for the interruptions that we have had during the day and delays. I will have some further questions for you, and I believe some members of the committee would also do the same and submit them to you, and at your convenience please respond to those questions. Thank you very much for being with us.

At this time, I would like to request that the third and final panel come forward and take your seats. Thank you very much for your patience. Our third panel today consists of Dr. Fred Grassle, the Director of the Institute of Marine and Coastal Sciences at Rutgers University, and Dr. Robert Engler, Director of the Center for Contaminated Sediments at the U.S. Army Engineer Waterways Experiment Station. Again, I would like to remind each of the witnesses to try and limit your oral statements. However, I know that it has been our fault today because of all the interruptions, and we will give you, hopefully, as much time as you would need. So, Dr. Grassle, please begin with your testimony.

STATEMENT OF FRED GRASSLE, DIRECTOR, INSTITUTE OF MARINE AND COASTAL SCIENCES

Mr. GRASSLE. Thank you. I thank you—both to you and members of the committee—for the opportunity to present information on the ocean disposal contaminated dredge material. Our remarks provide a brief overview of the effects of this activity on the marine environment, potential alternatives to ocean disposal of contaminated dredge material including the current state of technology for remediating sediments, and to comment on the proposal to use in-vessel storage for the dredging of contaminated sediments at the Port Newark/Port Elizabeth Marine Terminal.

It is necessary to be concerned about disposal of any contaminated materials in the ocean. Ocean disposal leads to changes in marine ecosystems in the immediate area of the disposal site. If the material from the disposal site is prevented from spreading, then the effects on either biota or human health are minimal. For example, at least in some instances, capping with clean sediments has proven to be successful in controlling the spread of contaminated sediments so that risks to marine life and human health have been acceptable.

However, major advances have been made in recent years in our understanding of processes associated with transport of sediment in the marine environment. Materials thought to have been contained may on some occasions be moved by storms and can be transported considerable distances. In these instances, material from ocean disposal contributes to the gradual buildup of pollutants in the ocean,

and despite the large extent of the deep ocean, pollutants have been measured in all deep-sea sediments sampled to date. The primary source of these pollutants are atmospheric, but we need to be concerned about any source that adds to the general level of contamination.

During the past year, the Institute of Marine and Coastal Sciences at Rutgers has received funding from the Port Authority of New York and New Jersey to assess sediment remediation technology. This assessment included the organization of two major international conferences with some of the world's leading scientists and engineers evaluating current research and demonstration programs in the U.S. and Europe. A broad range of remediation approaches were presented and evaluated, and a guidance document was produced by a steering committee for each conference, copies of which have been provided the committee staff for your information.

Considerable discussion at each conference centered on the lack of an adequate characterization of sediment pollutant loads, distribution and transport processes for New York Harbor. This is necessary to determine which sediments and what quantity of dredged material warrant remediation. Effective decisions concerning treatment technology cannot be made without this information. A detailed characterization of sediments is needed to focus treatment alternatives on sediment sources and depositional areas in the estuary. One useful technique for conducting this characterization is sidescan sonar in conjunction with fine-grained sampling and study of bottom boundary hydrodynamics.

Bioremediation or the use of marine organisms to reduce contamination was viewed by the participants as a viable strategy for some sediments where they are contained and where there is a restricted range of contaminants and the remediation processes have a long time to work.

Our second conference evaluated a range of technologies using physical and chemical processes to remediate sediments. A wide range of remediation projects are being conducted at the demonstration scale, and there is one full-scale separation treatment facility in Germany. Most of the U.S. remediation projects are being sponsored by the Environmental Protection Agency through the Assessment and Remediation of Contaminated Sediments or ARCS program. This program involves bench-scale tests of solvent extraction, thermal desorption, and wet-air oxidation techniques with contaminated sediments from Indiana Harbor, the Buffalo River, and Saginaw Bay. These projects focus primarily on PAH's or polynuclear aromatic hydrocarbons and PCB's, polychlorinated biphenyls.

Principal methods for remediation involve mechanical separation to separate sand from silt. Other physical separation techniques such as flotation may be effective and, along with heap-leaching techniques, should be investigated further. One particularly innovative program is being pursued in Great Britain where microorganisms are used to immobilize and localize metal ions from solution which are then separated with a high gradient magnetic separation technique. This approach may also be effective with polar organic compounds and is worthy of further exploration.

Undersea borrow-pits have been used on an experimental basis in Long Island Sound and the New England area as an alternative for the disposal of contaminated sediments. This approach presumes that contaminated sediments will be isolated and contained by a clean sand cap and the pit walls and bottom. Proper pit design and construction is important to the effectiveness of this approach. The cap must prevent biological and physical disturbance of the underlying dredged material to ensure that contaminants are not mobilized.

Despite the apparent success associated with this technique, the siting of these pits remains a contentious issue that has to be addressed when this alternative is proposed. Another concern is sediment dispersal during dredging and disposal operations. An initial loss of three to five percent of the volume occurs in the water column during pit disposal. Improvements in dredging procedures need to be considered, and a more comprehensive long-term monitoring program is needed to ensure that pit stability is maintained and any long-term diffusion of contaminants is detected.

Under recommendations, I add to my written testimony that first and foremost support needs to be provided to the U.S. Geological Survey to do sediment transport studies in the harbor and at the Mud Dump Site. The Mud Dump Site is reaching the end of its useful life, and, however, I don't think this means that we have to hastily adopt an unproven alternative if risk to marine life and human health continue to be within acceptable limits.

New proposals to use untested disposal or storage technology are inappropriate without the necessary time to study these methods properly. One proposal offered by the public interest groups is in vessel storage. This proposal suggests that specially designed barges be used to store and isolate the contaminated sediment until further development of treatment technology. The history of accidents from ships or barges makes me uneasy about this solution. However, I don't claim any special knowledge of this approach.

I am skipping some of what I was going to say because we are reaching the end of my time. Remediation technology will require some years of development, demonstration, and pilot-scale testing to become practical and successful. This means we must begin now to support those techniques with the most promise. The bench-scale studies need to start immediately; for example, the bacteria in conjunction with magnetic separation.

Given the urgency of the situation at Port Newark/Port Elizabeth, we should continue to manage contaminated sediments with known techniques even if they are not ideal. Intermediate range steps must be pursued to isolate and contain contaminated sediments until such time when remediation becomes possible. Finally, public participation must be a vital part of the decisionmaking process as we seek intermediate and long-term solutions.

Mr. Chairman and members of the committee, thank you for your time. I will be happy to answer any questions you may have.

[The prepared statement of Mr. Grassle can be found at the end of the hearing.]

Mr. ORTIZ. Mr. Grassle, you do have very interesting and very important testimony. I can assure you that the entire testimony will be inserted for the record. Mr. Engler, you may begin.

STATEMENT OF ROBERT ENGLER, DIRECTOR, CENTER FOR CONTAMINATED SEDIMENTS, U.S. ARMY ENGINEER WATERWAYS EXPERIMENT STATION, U.S. ARMY CORPS OF ENGINEERS

Dr. ENGLER. Thank you, Mr. Chairman, and members of the subcommittee. I am pleased to be here on behalf of the Corps Waterways Experiment Station where I am senior scientist in the environmental laboratory. I will summarize my statement which has been submitted for the full record.

The Corps has been applying considerable scientific engineering and management expertise to solving problems associated with contaminated sediments both in our projects and through work for others. Research over the past two decades emphasizes the identification, assessment, and management of contaminated sediments and encompasses endangerment assessments, risk analyses, restoration, remediation.

Sediment research in the '70's was broad and included a basic understanding of ecological impacts of management of clean as well as contaminated sediment. Research, in cooperation with EPA in the '80's, focused on contaminated sediments and emphasized field-verified, second generation tests and further procedures for identification assessment and management. Research in the '90's, also in full cooperation with the EPA, focuses on highly contaminated sediments emphasizing chronic/sublethal effects as well as the other treatment technologies.

The determination that a sediment is contaminated and unsuitable for unrestricted aquatic disposal is made by application of what we call effects-based testing and a preponderance of evidence leading to a determination. Effects-based testing is a holistic approach using a combination of biological, geochemical, and physical analyses.

As requested, the following contaminated sediment treatment technologies are summarized and noted in the full testimony. Subaqueous capping has been demonstrated in Long Island Sound, New York Bight, Duwamish Waterway, and Puget Sound, and sediment remediation projects in Puget Sound. Costs for normal maintenance dredging are around $4 to $8 a cubic yard or ton, and capping would double or triple these costs.

Confined disposal facilities are engineered structures on the land, partially in water, or completely in water resulting in an island. They are designed to retain fine-grained sediment particles and the contaminants, and costs range from about $10 to $30 per cubic yard.

After considerable testing and evaluation, wetlands may be constructed or created with marginally contaminated sediment such that the contaminants do not pose an unacceptable risk. Sediments unsuitable for aquatic disposal, however, would have to be effectively kept within the constructed wetland to minimize risk. Costs may range widely from hundreds to thousands of dollars per acre. Capping would increase these costs.

In situ vitrification electrically melts a waste media creating a glasslike solid and has been field demonstrated for soils with 99 percent reduction in PCB's. Application to in-water treatment of

contaminated sediments is not feasible. Costs are estimated at $300 to $400 per cubic yard or ton.

In line particle separation processes such as gravity settling, classifiers, and hydrocyclones have demonstrated and costs less than $100 per cubic yard.

Bioremediation processes have been evaluated only on a bench and very limited field pilot scale. Implementation is difficult because of their developmental nature. Long time periods in large systems will likely be required, and costs could well range from $100 to $600 per cubic yard.

Incineration is a proven technology for decontamination of soils contaminated with dioxins, PCB's, and other organic contaminants with a reduction greater than 99 percent. Costs, however, are over $1,000 per cubic yard or ton.

Extraction technologies remove contaminants from sediment by separating the contaminant from the sediment particles at greater than 95 percent removal, costs ranging from $100 to $500 per yard or ton.

Thermal desorption somewhat similar to extraction can remove contaminants greater than 90 percent and have been demonstrated at all levels. The process is useful for hot spots, and costs again may range up to $350 per ton. Two other treatment technologies, deep well injection and ocean disposal in the deep abyssal plains, do not appear feasible.

Mr. Chairman, in summary, there will be large amounts of sediments requiring cleanup. Innovative solutions will need to be developed or costs will escalate and inhibit any real progress. Sediment remediation will be a complex and expensive task and useful only for those sediments that pose an unacceptable risk if left unmanaged. Otherwise, huge quantities of marginal material may be remediated at a high cost without a commensurate benefit.

The only long-term solution to the contaminated sediments issue is the reduction of pollutants at their source and the cleanup of high risk hot spots on the land as well as in the water.

Mr. Chairman, that completes my oral statement. I would be happy to answer any questions you may have.

[The prepared statement of Dr. Engler can be found at the end of the hearing.]

Mr. ORTIZ. Thank you very much. Mr. Pallone, do you have a question?

Mr. PALLONE. No.

Mr. ORTIZ. Mr. Green?

Mr. GREEN. I have no questions, Mr. Chairman. Thank you.

Mr. ORTIZ. I just have one question. Dr. Grassle, you mentioned other countries' efforts to remediate contaminated sediments. Is the United States behind in its efforts to reduce contamination? What efforts can be made by the United States to improve the range of technology used in the process of remediation?

Mr. GRASSLE. I think that we have been slow to adopt the phased process to look at intermediate containment solutions, long-term remediation solutions in parallel with the immediate needs that we have to solve the urgent problems of a particular port.

Mr. ORTIZ. Anybody else? Mr. Engler, would you like to——

Dr. ENGLER. I certainly would like to add to that. As far as our technology, we are equal to what is being done in Japan and Europe and in some cases exceed their technology significantly and they are seeking our advice. But we pay careful attention to their management techniques as they are doing a very good job of bringing all sectors in line and on an information basis in selecting the array of alternatives that should be used in managing this highly contaminated materials.

However, in most of their ports, they dredge quite a bit less than we do. They dredge quite a bit less than we do nationally.

Mr. ORTIZ. I have another question for you. Dr. Engler, the cost of alternative technologies for the remediation of contaminated sediments is an important issue that you discussed in your testimony. What is the most practical and cost-effective method of managing contaminated sediments? And should additional Federal resources be spent in this area?

Dr. ENGLER. The immediate and most effective approach is isolation of the material because we are talking about huge quantities. 300,000 cubic yards, say, in the Port Elizabeth project, is equal to 100,000 standard dump trucks, just to place things in perspective. It is a huge quantity. We dredge 300 million cubic yards in Federal projects each year so we are talking large amounts. Isolation in confined disposal facilities such as we have constructed in a number of locations around the country—in fact, half of what we dredge today is placed out of the water in either a confined or an unconfined facility depending on the material. The confinement could occur on land, as an island construction, or in water in borrow-pits, or capped.

The only long-range solution is to better manage point and nonpoint source discharges especially on-land Super Fund sites. An example is one dioxin site is being cleaned to a level a thousand times the level acceptable in reviewing aquatic disposal. So the sediment would be cleaned up at that site to a level that will continue to contaminate the nearby water body. So these areas must be cleaned for the long-term. We must continue research in innovative remediation and treatment technologies for the hot spots, for the very highly contaminated materials.

Mr. ORTIZ. Thank you. I just have one more question. This is on behalf of Mr. Saxton who happens to be tied up at another meeting and it is for Dr. Grassle. What is the most important thing we need to focus on to develop management alternatives?

Mr. GRASSLE. I think that the—and this reflects on the comments that were just made—I think that management of our estuaries and coastal areas need to be considered in terms of the entire system, in terms of all of the sources of contamination. And as I said before, we need an adequate understanding of sediment composition and sediment transport for the entire system. We need to get accurate topography. We need to know sediment composition and what the sediment movements are.

As was already said, we need to be concerned about the hot spots. We need to be concerned about the deposition areas. We need to find out where the erosional sites are, and this isn't simply a problem of dredging and dredge material. It is a problem of management of the various sources of pollution that come into the

system and managing the system as a whole. And I think the greatest steps can be made if we do consider these systems as a whole.

I think that in the short-term we need to remove a lot of the uncertainty over dioxin, not only the toxicity issue but also the bioavailability of dioxin, the bioaccumulation of dioxin that has been frequently mentioned, but also where this material is being transported. There are routes for transport in the deeper ocean which also need to be determined. We need budgets of the sediments that these contaminants are bound to. And as I said in my testimony, we need to get on with the remediation process—the remediation process not just for the contaminated sediments but as was just said the remediation process for the hot spots in the system.

Mr. ORTIZ. Thank you, Dr. Grassle. I would like to thank both of you for coming here today to testify before this committee, and, again, I apologize for all the inconveniences and interruptions that we had during this hearing. And I know that several of the subcommittee members will have questions that they will submit to you in writing, and then you can respond to them.

This concludes our last panel. It is clear that this is a serious issue with no easy answers and few definitive long-term solutions. I hope that the testimony and discussions we have had today will provide the impetus for moving forward on this issue. We will continue to work with you. You can be assured of that. And I know that the members of the Subcommittee and I want to work with you, and we hope that we can find a solution. Again, thank you very much for being with us. At this time, the meeting is adjourned.

[Whereupon, at 5:24 p.m., the subcommittee was adjourned, and the following was submitted for the record:]

U.S. House of Representatives
Committee on
Merchant Marine and Fisheries
Room 1334, Longworth House Office Building
Washington, DC 20515-6230

March 25, 1993

BACKGROUND MEMORANDUM SUMMARY

TO: MEMBERS, SUBCOMMITTEE ON OCEANOGRAPHY, GULF OF MEXICO, AND THE OUTER CONTINENTAL SHELF

FROM: SUBCOMMITTEE AND COMMITTEE STAFF

RE: OCEAN DISPOSAL OF CONTAMINATED DREDGE MATERIAL

Attached is a copy of a detailed background memorandum relating to the upcoming March 30, 1993, hearing on ocean disposal of contaminated dredge material. What follows is a short summary of the memorandum.

Sparked by the recent denial of a permit to the New York/New Jersey Port Authority to dispose of dioxin-laced sediment dredged from Newark Bay into the Atlantic Ocean, the hearing will focus on the current ocean dumping program for contaminated dredge material. Specifically, it will examine the existing Army Corps of Engineers permitting process under the Ocean Dumping Act and alternatives to ocean disposal of contaminated sediment. In addition, the new National Contaminated Sediment Task Force will be discussed, as well as Environmental Protection Agency directives to inventory and monitor contaminated sediments in U.S. waters contained in the Water Resources Development Act of 1992.

The memo includes sections describing the extent and nature of contaminated sediments in coastal waters, the Federal regulatory scheme for ocean disposal of this material under the Ocean Dumping Act, the role of States in regulating the ocean disposal of contaminated sediments, and the contaminated sediment provisions of the Water Resources Development Act of 1992. The memo also outlines the circumstances surrounding the denial of a Corps permit to ocean dispose of contaminated sediments from Newark Bay, New Jersey. Finally, the memo provides a detailed summary of various methods of avoiding the ocean disposal of contaminated sediments, including land-based disposal, isolation of the dredge material, and treatment of sediment contaminants.

Attachment

March 25, 1993

BACKGROUND MEMORANDUM

TO: Members, Subcommittee on Oceanography, Gulf of Mexico, and the Outer Continental Shelf

FROM: Subcommittee and Committee Staff

RE: Ocean Disposal of Contaminated Sediments Under the Ocean Dumping Act

On March 30, 1993, at 2 p.m., the Subcommittee on Oceanography, Gulf of Mexico, and the Outer Continental Shelf will convene to hear testimony on the implementation of the Ocean Dumping Act, the recent denial of a permit for disposal of contaminated dredge material from Newark Bay at the Mud Dump Site, and the general issue of disposal of contaminated sediments and alternatives to ocean disposal of this material.

Witnesses invited include representatives of the U.S. Army Corps of Engineers (COE), the Environmental Protection Agency (EPA), the American Association of Port Authorities, the Port Authority of New York and New Jersey, the New Jersey Department of Environmental Protection and Energy, the Environmental Defense Fund, and the Institute of Marine and Coastal Sciences at Rutgers University.

BACKGROUND

Ocean dumping refers to the willful, direct disposal of material at sea. Since the passage of the Ocean Dumping Ban Act in 1988 (Public Law 100-688), the vast majority of waste dumped in U.S. ocean waters is dredge material,[1] a term used to describe sediment removed from waterways to improve navigation. Dredge material is comprised of varying amounts of sand, gravel, silt, clay, organic matter (such as decomposed fish), and chemical

[1]The COE estimates that 60 million cubic yards of dredge material is ocean dumped annually.

compounds such as sulfides. Dredge material can also be contaminated with various metals and organic chemicals and thus require special treatment or management practices to ensure there is no degradation of the marine environment. However, only three to five percent of dredge material can be considered seriously contaminated.

Contaminated Sediments: Facts and Figures

No quantitative Federal criteria exist to determine when sediments are contaminated enough by pollutants to require special handling. However, EPA has criteria for five organic pollutants under review and will soon be issuing these regulations for public comment under the Federal Water Pollution Control Act. Promulgation of sediment criteria has been a controversial issue with environmental groups calling for strict, number-based standards to help control permitting decisions, not only for ocean dumping, but also, for example, industrial discharge permits and to provide clean-up standards for Superfund sites.

However, under even the most stringent views, the vast majority of dredge material is not contaminated and poses few disposal problems. Of the 400 million cubic yards of sediment dredged each year from U.S. waterways, the COE estimates three to 12 million cubic yards is contaminated enough to require special handling or treatment.

Most contaminated material comes from dredging ports and harbors, or from areas where municipal and industrial discharges have polluted estuaries and coastal waters. Riverborne clays that have settled in estuaries and navigation channels also may have been contaminated as they traveled down river systems. Both point (direct discharge) and non-point (such as agricultural and storm runoff, air emissions) pollution contribute to contaminated sediments.

Pollutants commonly found in dredge material include metals, chlorinated hydrocarbons (PCBs, and DDT), polycyclic aromatic hydrocarbons, and other petroleum products. Most pollutants are absorbed or tightly bound to the organic material or smaller clay particles in dredge material. Sand or gravel, which often makes up a significant portion of dredge material, does not readily absorb pollutants. However, the most abundant component of dredge material, water, can be contaminated.

The mere presence of contaminated sediment may pose a problem to underwater organisms. Bottom-dwelling (benthic) creatures may absorb toxic substances from the sediment itself, or pass them along the food chain where they may accumulate in larger predator organisms, including humans through seafood consumption. In addition, when these contaminated sediments are dredged and ocean dumped, they may release pollutants directly into the water during both dredging and disposal operations. Dredging itself may unearth "dirtier" sediments which accumulated in coastal areas before water pollution controls were imposed. Finally, movement of the contaminated sediments to an unexposed site may

subject new life forms to pollutants.

Although very little dredge material is heavily contaminated, contaminated sediments have been linked with lesions and other growths on fish and other aquatic life forms. Decreases in benthic species number and diversity have been documented as a result of sediment contamination in the Gulf of Mexico, leading to inferences of reproductive inhibition and greater susceptibility to disease.

The effects of ocean dumping on humans have not been well documented. Some research has suggested that exposure through eating contaminated seafood may result in increased risk of cancer, or harmful reproductive, developmental, or neurological effects. Little research has been conducted on the health risk associated with physical contact or accidental ingestion of actual contaminated sediments.

The Federal Regulatory Scheme: The Ocean Dumping Act

Although Federal laws restricting dumping in harbor areas were enacted as early as 1886, the current major Federal statute governing ocean dumping of dredge material is the Ocean Dumping Act (ODA, title I of the Marine Protection, Research, and Sanctuaries Act, 33 U.S.C. 1401 et seq.). Under ODA section 103, the COE issues permits for the transportation of dredge material for disposal into U.S. ocean waters.

1. Ocean Dumping Criteria

In general, the COE may issue an ocean dumping permit if the dumping will not "unreasonably degrade or endanger human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities". The permit must also meet specific EPA criteria[2] which include a consideration of:

* the need for the dumping;
* the effect of the dumping on humans, fish and wildlife, shorelines, and marine ecosystems;
* persistence and permanence of the effects;
* effect of dumping particular volumes and concentrations; and
* effect on alternative uses of the ocean such as fishing and scientific research.

In addition to these criteria, the COE makes an independent determination of the need for the dumping, based on an evaluation

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[2]EPA decides whether its criteria are met and can effectively veto a COE permit. Alternatively, EPA may impose additional conditions on the permit, which must be adopted if the permit is issued. Recent amendments to the ODA by the Water Resources Development Act of 1992 have imposed a 45-day timeline on these determinations, and failure by EPA to respond allows the COE to issue the permit.

of the potential effect of a permit denial on navigation, economic and industrial development, and foreign and domestic commerce. The COE must also consider alternatives to ocean dumping and, if none exist, appropriate locations for the dumping. The COE is to use "to the maximum extent feasible" existing ocean dumping sites designated by EPA. Permits under the Ocean Dumping Act must also comply with State water quality standards and be consistent with State coastal zone management plans.

If the COE finds that there is no economically feasible method or site available, it may request an EPA waiver from the ODA criteria. At this point, EPA examines the proposed activity to see if it will "result in an unacceptably adverse impact on municipal water supplies, shellfish beds, wildlife, fisheries (including spawning and breeding areas), or recreational areas". If not, the permit may be granted. However, to date, the COE has not requested any waivers, preferring instead to resolve conflicts more informally.

2. Ocean Dumping Sites

As mentioned briefly before, EPA designates ocean dumping sites under the ODA. Approximately 119 ocean and coastal dumping sites have been designated by EPA, although many sites are operating under interim designations pending issuance of an Environmental Impact Statement under the National Environmental Policy Act. (See attached map for site locations)

Amendments to the ODA contained in Water Resources Development Act of 1992 (WRDA) clarified EPA's authority to prohibit dumping at a site, as well as required site management plans at dredge disposal sites, including a schedule for review and revision of the plan at least every ten years. WRDA also prohibits final designation of a site without a site management plan after 1994, and generally bans dumping at a site without final designation after 1996.[3]

States Role In Regulating Ocean Dumping

Until WRDA, States were prohibited from adopting or enforcing any rule or regulation relating to any activity regulated under the ODA. However, States were allowed to suggest criteria to EPA if the dumping affected State waters and could review ocean dumping activities for violations of State water quality standards under section 401 of the Federal Water Pollution Control Act. The application of State authority under the Federal Coastal Zone Management Act (CZMA) to review the proposed

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[3]There is an exception to this rule when the COE selects an alternative site for dumping with the concurrence of EPA. These alternative sites may be utilized for up to five years, with possible extensions.

dumping activity[4] for consistency with the State coastal zone management plan was unclear, as well as the application of State permitting requirements and environmental review.

WRDA repealed the earlier limitation and greatly strengthened States' review of ocean disposal activities. First, explicit language preserving State rights to "adopt or enforce any requirements regarding dumping of material" in State waters was added, as long as States do not discriminate against out-of-State generated material.[5] This will mean that ocean dumping of dredge material in State waters will be subject to both State and Federal requirements. For ocean dumping activities taking place in Federal waters, presumably the elimination of the earlier restriction would allow States to exercise their CZMA consistency review authority.

Additional WRDA Requirements: Task Force and Sediment Survey

WRDA established a National Contaminated Sediment Task Force to review, discuss, and report on the nature and extent of sediment contamination, the development of contaminated sediment remediation measures, the selection and promulgation of criteria for pollutants contained in contaminated sediments, prevention of contaminated sediments and control of sources of contamination.

The Task Force consists of representatives of EPA, the COE, the National Oceanic and Atmospheric Administration, the U.S. Fish and Wildlife Service, the U.S. Geological Survey, and the Department of Agriculture, and additionally, representatives of State governments, the port community, and the public.

The Task Force is to produce a report and recommendations by October 31, 1994. However, to date, no meetings have occurred.

WRDA also directed EPA to conduct a comprehensive national survey of the quality of aquatic sediments. The survey is to include information on the amounts, composition, and location of pollutants in sediments; the sources of sediment pollution; and the locations of contaminated sediments. The survey, along with recommendations for prevention and control of contaminated sediments, is also due October 31, 1994. EPA regions IV (Southeastern U.S.) and V (Midwestern U.S.) have completed inventories of sediment contaminant sources and now are working to create an inventory of contaminated sediment sites.

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[4]This would include the issuance of an ocean dumping permit to a private party, as well as instances where the COE conducts the dredging and disposal for Federal navigation channels.

[5]This authority is circumscribed for Federal projects, such as those involving COE disposal of dredge materials excavating from Federal navigational channels. WRDA also granted the President the right to exempt Federal projects from any State requirement if "it is in the paramount interest of the United States to do so".

EPA is also charged with overseeing a comprehensive and continuing program of sediment monitoring, including the establishment of a clearinghouse of information on technology, methods, and practices available for the remediation, decontamination, and control of sediment pollution. Biennial reports are due on this work.

Newark Bay Ocean Dumping Permit

One example of the problems associated with ocean disposal of contaminated dredge material is the recent denial of a permit to the New York-New Jersey Port Authority. In 1990, the Port Authority applied for a permit to dump dredge material from Port Newark/Elizabeth at the Mud Dump, an EPA-designated site located six miles east of Sandy Hook, New Jersey.

The Mud Dump Site has been an historic depository of clean and contaminated dredge material from the New York area since 1914. However, with the advent of the Ocean Dumping Act, only materials meeting ODA standards are disposed of at the Mud Dump. The material has created a mound approximately 45 feet high and two miles across that ironically has attracted fish to the area. The Site is also a mile from an area known as 17 Fathoms, a fertile ground for bluefish, bonita, fluke, and blackfish.

Sediments in Newark Bay have been found to be contaminated to some degree with dioxin, a by-product of herbicide manufacture. Initial testing of the sediments at the Terminal site found dioxin contamination, but at levels which were acceptable for ocean dumping under the EPA criteria (approximately 10 parts per trillion).

Even if the sediments meet EPA criteria, fishermen and environmental groups are still concerned that the dioxin-laced sediments will harm valuable clam, scallop, and crab fishing grounds and threaten 17 Fathoms. They are not convinced that the sediments will stay in place at the Mud Dump Site, especially after strong winter storms. Although the Port Authority permit would require capping the sediments with three feet of clean material after ocean dumping operations ceased at the Mud Dump Site, these citizens groups argue this might not be sufficient, that the capping could come too late after marine organisms have been exposed to the dioxin, and that turbulent storms could jeopardize the integrity of the cap, further exposing marine organisms.

The original permit application indicated that the Port Authority proposed to dredge the entire 39-berth Terminal complex, resulting in approximately 200,000 cubic yards of dredge material. The berths require annual dredging and permits issued in the past have covered three-year periods. After public notice was issued, the Port Authority modified its application so that it covered only the 29 berths in the lower portion of the Terminal area, known as Reaches B, C and D.

On January 6, 1993, the COE tentatively issued a permit for the $6.65 million dredging project, granting disposal authority

for 500,000 cubic yards of material.[6] On January 13, EPA objected to the permit, noting that the permit was for significantly more dredge material than had been previously discussed, and expressing concern that the additional sediment might exceed EPA criteria. In addition, the National Marine Fisheries Service (NMFS) asked that consultations be undertaken under the Endangered Species Act due to the possible seasonal presence of endangered whales, sea turtles, and perhaps shortnosed sturgeon in the area.

On February 12, 1993, the EPA issued new guidelines, approving the ocean disposal of dredged material from Reach D, but requiring the COE to perform additional tests on dioxin contamination in Reach B and C before reinstating the permit. By letter to the Port Authority dated February 18, the COE suspended the permit and ordered the Port Authority to perform additional tests on all three reaches (B, C, and D) to ascertain whether there had been changes in the quantity or quality of the sediment since the time that the berths were originally tested. The Port Authority has since conducted additional sediment testing and determined that the new sediment has an even lower degree of dioxin contamination. The Port Authority is also waiting for the COE to begin consultation with NMFS under the Endangered Species Act. If the permit is ultimately denied, the Port Authority has few options for disposing of its contaminated dredge material.

Environmental and fishing groups have been promoting the option of storing the contaminated dredge material on empty barges and docking them in unused berths owned by the Port Authority until the sediment can be decontaminated. Critics argue that the heavy sediments cannot be safety contained on a floating barge for extended periods of time, that the dioxin is at concentrations too small and in too large of volume of sediments to be addressed by current decontamination technologies, and that storing the sediments may require hazard waste permitting under the Federal Resource Conservation and Recovery Act.

This problem of contaminated dredge material disposal is not isolated, although this appears to be the first test case for ocean dumping of dioxin-contaminated sediment. The National Research Council concluded in a 1989 study that contaminated sediments are widespread in coastal waters, having been documented in at least 63 marine or estuarine waterways. In addition, most urban marine harbors suffer polluted sediments, especially in places like the Hudson-Raritan Estuary, Boston Harbor, and Oakland Estuary.

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[6] This number apparently reflects a misunderstanding of the number of berths the Port Authority proposes to dredge during the three-year limit of the permit, as well as possible overestimates to compensate for the amount of increased sedimentation expected to have occurred since the permit application was submitted three years ago.

Alternatives to Ocean Disposal of Contaminated Dredge Materials

As stated above, only a small percentage of dredge material are contaminated enough to require special handling. However, given the presence of contaminated sediments in harbors and navigation channels which must continue to be cleared to allow safe vessel access, the growing number of coastal Superfund sites which involve sediments, public opposition to marine pollution, and scientific advances which allow us to detect smaller and smaller quantities of pollutants, there has been considerable research on ways to isolate or decontaminate contaminated sediments.

Generally, if ocean dumping of contaminated dredge material is not environmentally acceptable, there are three options: 1) dispose of the material on land; 2) dump but minimize the environmental impact of the contaminates by capping or otherwise isolating the material; and 3) decontamination to allow conventional disposal or beneficial use of the dredge material.

As follows is a discussion of some of the technologies being used or tested.

Land-Based Disposal

1. Hazardous Waste Landfills - In several cases, contaminated dredge material has been buried in dumps designed to receive hazardous waste. This can be a very expensive option given the large amounts of material which need to be disposed of, the cost of using scarce hazardous waste landfills, and the distance that the sediment must travel from the water's edge to the landfill. In addition, there is a danger of exposure from the pollutants if the dump leaks or the surface erodes. Removing the water from the sediment can reduce the volume, but may create another disposal problem if the water is contaminated.

2. Confined Disposal Facilities - Very common in the Great Lakes region is the use of Confined Disposal Facilities (CDFs). Materials are mounded in these huge structures, often located on shorelines, and the materials are monitored for leaching or run-off of contaminates. With appropriate capping, the structures can be used for waterside parks. On the other hand, local residents frequently oppose CDFs, and CDF capacities are limited (most usually fill within five years). In addition, exposing sediments to oxygen in the air may cause certain pollutants to react, creating even more toxic substances.

3. Wetland/Beach Creation - Contaminated sediments have been used to create wetland areas under a combined COE-EPA Field Verification Program, and mildly contaminated sediment can be used for erosion control along beaches. Some contaminated sediments have been used to reclaim subsiding marshlands. Coarse contaminated sediments could also be used to provide fill for airports or other industrial uses which abut waterways, with proper safeguards for the environment. The Japanese are pursuing this use.

Isolation of Dredge Material

1. Capping - One of the most common remediation solutions now used (especially in New England) is capping, where clean dredge material or other material is deposited in a thick layer over the contaminated sediments to keep them in place. Dredge material contaminated with heavy metals can be capped with lime or calcium carbonate which binds the metals so they are not available to the marine environment. Capping can work for sediments left in place or for materials which have been dredged and deposited elsewhere.

Capping is most effective where little sediment erosion occurs such as on flat or depressed areas of the ocean floor. Monitoring of the cap is needed to ensure its integrity, and recapping may be necessary. Capping may not be effective in deeper waters and costs may be prohibitive if much clean material will need to be imported for the cap. On the whole, though, capping is relatively inexpensive to use and is estimated to cost approximately $9/cubic yard to use. This was the solution recommended as part of the Newark Bay ocean dumping permit.

2. Abyssal Plain Disposal - Not yet tested is the idea of depositing contaminated sediments on the deep ocean floor on geologically stable and ecologically barren areas known as abyssal plains. Proponents of this technique argue that the tremendous pressures at these depths may compact and immobilize the sediments. In addition, they believe that sealife at this depth is relatively scarce, and therefore contamination through the food chain would be minimal.

3. Borrow Pits - Often as a result of construction activities, subaqueous borrow pits are created in harbor areas and on land. They can also naturally occur. These trenches can be filled with contaminated sediments and then capped, if necessary.[7] Considerations involved in this method used in Lake Ontario are accuracy of the placement and whether the sediments can bear the weight of a cap. This is one alternative being reviewed for the future management of contaminated dredge material in the New York-New Jersey Harbor.

4. Hardening - This treatment, which has been applied in Japanese harbors, involves injecting a hardening agent (such as Portland cement) into the sediments and stirring them up. The sediment then solidifies and its contaminates pose a lesser threat to the environment. This technique has been used with dredge material, but can also be applied to sediments left in place. Disadvantages of this technique are the resuspension of contaminates after the stirring of the dredge material and the very precise placement of the hardening agent required. In addition, hardening works well with metals, but is less effective with organic contaminates. The ultimate use of the hardened material is a factor which must be considered, as the hardened sediment can be sturdy enough for construction but continued exposure to acidic conditions can cause contaminates to escape.

[7]The COE terms this method "contained aquatic disposal".

Decontamination/Isolation of Contaminates

1. Bioremediation - Sediments are first analyzed to determine if there are nutrient or oxygen deficiencies which inhibit the growth of naturally occurring organisms that break down pollutants into harmless constituents. "Fertilizers" can be applied to encourage the growth of these microbes, or the sediment can be inoculated with a new strain. Whether to dredge the sediments first is an issue, as is the long-term effectiveness of this expensive treatment. Bioremediation has been successful in treating complex organic compounds (except PCBs), as well as metals, on a small-scale basis.

2. Incineration - Once contaminated sediments have been dredged and the water removed, the resulting material can be incinerated to destroy the pollutants. This practice is growing more common, and EPA has issued standards for incinerators which require limits on emissions, and combustion efficiencies of 99.9 percent. PCBs must be destroyed 99.9999 percent of the time. Continuous monitoring is needed to ensure these standards. Incineration works best on organic contaminates, as it may oxidize metals in sediments and make them more available to living organisms.

Another incineration-like process, the Taciuk process, uses heat to separate organic contaminants from sediments. Pyrolysis applies high temperatures without combustion to degrade PCBs and other organics. Costs for this method of decontamination, including dredging, transport, treatment, and disposal, amount to $900 per cubic meter.

3. Vitrification - A combination of hardening and incineration, vitrification involves the channeling of an electric current through sediment to bind it into glass-like material. The intense heat also destroys PCBs and other organic contaminates. This has been used on a small scale with highly contaminated sediments at Superfund sites. The sediment must be dredged first, and poisonous gases from the vitrification process collected. Cost estimates are $60 per cubic meter.

4. In-Line Treatment - As used by the Japanese, in-line treatment involves the in-take of contaminated sediments in large pipes. Pollutant binders are then injected into the pipe and the resulting "clumps" of contaminates removed and treated.

5. Centrifuging - Because pollutants adhere to the finer portions of sediment, contaminated material can be loaded into large cyclones or centrifuges, and the coarser, cleaner materials extracted. The much smaller portion of polluted particles can then be decanted and treated. Costs for this technology (now in use on a small scale) is estimated to be $100-200 per cubic yard.

6. Propane Extraction System - This method uses propane gas converted to a liquid by pressure to dissolve organic pollutants. The propane and its load of contaminates are separated from the inert solids. Releasing the pressure converts the propane back into gas which is recaptured and used again. The isolated

contaminates must be dealt with by further treatment. Propane extraction has been used on a pilot scale in new Bedford Harbor on PCB-contaminated sediments. Cost estimates range from $155 to $266 a cubic meter.

7. Other Chemical Processes - If the actual chemical makeup of the contaminates in the sediment are know, there are various processes to render the contaminates less harmful or inert, after the sediment is dredged, and in some cases, dewatered. These include the modar supercritical process, which uses a combination of supercritical water, oxygen and pressure to degrade organics into harmless substances; the KPEG Terraclean Cl process, which uses potassium hydroxide and polyethylene glycol to initiate a complex chemical reaction that removes chlorine from PCB molecules, producing less toxic biphenyls which do not bioaccumulate; Light Activated Reduction of Chemicals, where chemicals are injected into sediments, the liquid decanted and placed into a reactor where it is treated with ultraviolet light; and various solvent extraction processes, which involve the treatment of sediments with organic solvents to remove PCBs and other organics (but not metals).

It must be noted that most of these methods generally require a single contaminant at high concentrations in the sediment to be successful.

Other Options

1. No Action Alternative - Allowing the sediments to remain, or to reduce dredging depth or location so as not to disturb contaminated sediments are also alternatives to managing contaminated dredge material. However, this is rarely acceptable since it would preclude the channel and berth improvements and maintenance that enable ports to accommodate virtually all the vessels that conduct interstate and foreign commerce.

2. Pollution Prevention - A favorite of environmental groups is preventing the creation of contaminated sediments in the first place. EPA is pursuing a pollution prevention strategy which is not specially targeted to sediments, but that medium can benefit from contact with cleaner water and fewer chances of pollution from air sources. EPA sediment criteria, when completed, can also help prevent pollution from reaching sediments in the first place.

ISSUES

Some issues that the Members of the Subcommittee might be interested in exploring are:

1) How big is the problem of disposal of contaminated sediments? What are the primary contaminants? Are the volumes of contaminant sediment increasing?

2) Will the changes in the Ocean Dumping Act improve the permitting process for the dredge material permits process (It took over three years to have a permit issued for the New York/New Jersey Port Authority dredging project for Newark Bay)? If not, what changes should be made to improve the process?

3) What alternatives are being developed to ocean dumping of contaminated dredge materials? Should additional Federal resources be spent in this area?

4) What role should States play in regulating ocean dumping?

5) What is the status of EPA sediment criteria? How will these affect ocean disposal as an option for contaminated dredge material?

6) How feasible is the idea of source control of point and non-point pollution to prevent the creation of contaminated sediments in the first place?

7) How often are contaminated dredge material disposal sites monitored? What is examined as part of the monitoring process? Have we learned any lessons from older contaminated dredge material disposal sites regarding improved isolation or treatment techniques?

8) Does the Federal Government have adequate resources to implement its ocean dumping responsibilities as they relate to the disposal of dredge material?

9) Is the process surrounding the Newark Bay ocean dumping permit typical for contaminated dredge material disposal? How can the process be improved, both on a Federal and State level?

10) How clean is clean, with regards to dredge material?

11) Are sediments for ocean disposal required to meet a higher standard than land-based counterparts? Are the testing and standards for land-based disposal comparable to that required for ocean disposal?

12) Is there universal application of EPA criteria and standards for the disposal of dredged material in coastal and ocean waters in all regions of the U.S.?

Attachment

69-996 O - 93 - 3

EPA DREDGE MATERIAL
DISPOSAL SITES
(As of 1990)

DEPARTMENT OF THE ARMY

OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY

(CIVIL WORKS)

COMPLETE STATEMENT

OF

MORGAN R. REES

DEPUTY ASSISTANT SECRETARY

PLANNING POLICY AND LEGISLATION

BEFORE THE SUBCOMMITTEE

ON

OCEANOGRAPHY, GULF OF MEXICO AND OUTER CONTINENTAL SHELF

COMMITTEE ON MERCHANT MARINE AND FISHERIES

U. S. HOUSE OF REPRESENTATIVES

OCEAN DISPOSAL OF CONTAMINATED DREDGED MATERIAL

MARCH 30, 1993

INTRODUCTION

Mr. Chairman and members of the Subcommittee, I am pleased to be here today on behalf of the Department of the Army to discuss the ocean disposal of contaminated dredged material and the Department of the Army regulatory process as it relates to dredging activities. Accompanying me today is Mr. Michael Davis, the Assistant for Regulatory Affairs in our office. In a later panel, Dr. Robert Engler, Senior Scientist and Director of the Center for Contaminated Sediments, at the Army Corps of Engineers Waterways Experiment Station in Vicksburg, Mississippi, will discuss our research activities and some specific technologies related to the management of contaminated sediments.

We particularly appreciate the detail and clarity of your letter of invitation. It has helped us greatly in preparing testimony which we trust will be directly relevant to your concerns. As requested, I will discuss the Department of the Army regulatory processes, particularly actions related to the Marine Protection, Research and Sanctuaries Act, commonly known as the Ocean Dumping Act. I will also address Department of the Army programs related to the overall management and regulation of dredged materials within our Nation's navigable waterways. Dr. Engler will discuss our contaminated sediment research activities and a number of specific processes and technologies related to the management of contaminated sediments.

ARMY RESPONSIBILITIES RELATED TO DREDGED MATERIALS

The Army administers a wide range of activities under its civil works program which play a critical role in the protection, management, and development of our Nation's water resources. Two major activities directly involved in the management of dredged materials are the national regulatory program and our national dredging program for constructing and maintaining the federal portion of the Nation's extensive navigation system of commercial channels, harbors and ports. Although we discuss the regulatory program and the federal navigation program as two distinct activities, it is important to understand that the environmental quality criteria apply equally to each program. It is just the internal agency process which differs slightly between the two. The two processes cover essentially all federal and non-federal actions related to dredging material from, or the discharge of dredged material into, the aquatic environment. Because the Nation's navigation system is essential to the economic well-being and defense capability of the United States, a major portion is federally constructed and maintained. The federal portion of the system includes over 25,000 miles of congressionally authorized navigation channels and related harbors.

Because of the scope of these programs and their impact on the economy and the environment, the Army has maintained a commitment to environmental research and development in support of these programs since 1973. This research provides the scientific base for our work with the Environmental Protection Agency (EPA) to classify sediments according to contamination potential and to regulate dredged material disposal in both a cost-effective and environmentally responsible manner. We view our R&D activities as a critical part of making informed decisions affecting both the regulatory and the navigation programs and will continue this strong commitment to R&D.

Although not a panacea to the navigation dredging problem, improved sediment management practices in upstream locations will provide some relief. Agricultural runoff, combined sewer overflows, and storm water runoff, coupled with the occasional lack of compliance with existing provisions of the Clean Water Act (CWA) exacerbate existing water quality problems. Contaminants found in sediments that must be dredged to maintain navigation most often come from the upstream industrial sources or from upstream agricultural runoff.

THE REGULATORY PROGRAM

The Army regulatory program responsibility includes authority to regulate most activities affecting the Nation's waters. Dredging, the construction of structures, and other types of work in navigable waters of the United States are regulated pursuant to section 10 of the Rivers and Harbors Act (R&HA) of 1899. Navigable waters of the United States are all tidal waters, plus all other waters previously, currently, or potentially capable of providing for transportation of interstate commerce. The Army regulatory program also includes the authority to regulate the discharge of dredged or fill material into waters of the United States pursuant to section 404 of the Clean Water Act (CWA), and the transportation of dredged material for the purpose of ocean disposal pursuant to section 103 of the Ocean Dumping Act. My discussion of the regulatory process will focus on the last two responsibilities, especially the ocean disposal of dredged material.

The objective of the federal navigation program is to provide for the construction and maintenance of a safe, reliable, and economically efficient navigation system within the United States. Ensuring the continued viability of the federal navigation system and the related non-federal facilities it supports usually requires maintenance dredging and associated disposal of sediments. Though the Corps dredging and disposal activities on the federal system are not specifically permitted under the Army's regulatory program, the same requirements to protect the Nation's environment and our natural resources apply.

Implementation of both programs requires compliance with over 20 other federal environmental protection and conservation statutes, including for example the National Environmental Policy Act, the Endangered Species Act, the Coastal Zone Management Act, the National Marine Sanctuaries Program Amendments Act of 1992 and the National Historic Preservation Act. In addition, implementation almost always requires approvals under various state programs and regulations.

The execution of both programs requires that we work closely with the EPA, the U.S. Fish and Wildlife Service and various elements of the National Oceanic and Atmospheric Administration, such as the National Marine Fisheries Service and the National Marine Sanctuaries Program. The process is designed to provide full involvement of state and local agencies and the public at large. Attached to my testimony is a flow chart and supporting information paper that describes the regulatory process by which public involvement is ensured. Joint federal responsibilities are most significant with EPA, who, in conjunction with Army, is responsible for the development of guidelines under which Army evaluates its own dredged material disposal activities and permit applications of others. Pursuant to section 404 of the CWA and section 102 of the Ocean Dumping Act, depending on whether disposal is proposed for inland waters or ocean waters, respectively, EPA, in consultation with Army, establishes criteria for the disposal of dredged material which are applied to Army dredged material disposal activities and permit applications of others. EPA has the authority to prohibit or restrict the use of any aquatic site for the disposal of dredged material. Further, EPA is also responsible for designating ocean disposal sites and, in conjunction with the Army, is responsible for the development of site management plans under the Ocean Dumping Act.

SCOPE OF THE PROBLEM

The total volume of dredged materials disposed of annually under Army programs is about 400 million cubic yards (mcy). This total is made up of approximately 300 mcy dredged under the Army Corps of Engineers national dredging program and about 100 mcy of material dredged under permits issued by the Corps. Of the total, about 60 mcy of dredged sediments are placed at ocean sites annually and regulated under the Ocean Dumping Act. The remaining volume, about 340 mcy annually, is discharged into open inland and near coastal waters or in confined disposal facilities located in aquatic sites or uplands. Those discharges are regulated under section 10 of the R&HA of 1899 and section 404 of the CWA.

Over 95 percent of the material within the Army's dredging program and the material from the vast majority of permitted dredging, is classified as uncontaminated. As such, it is often

suitable for both unconfined disposal in open water and beneficial use applications, such as beach nourishment and wetlands restoration. Where appropriate and authorized, dredged sediments generated under the Army dredging program are presently used for a variety of beneficial purposes. Based on a 1990 study, about 15 mcy of suitable material are used annually for beach nourishment. Section 204 of the Water Resources Development Act (WRDA) of 1992 included a provision recommended by Army authorizing the Corps, in partnership with non-federal cost sharing sponsors, to expand significantly its ability to utilize dredged sediments beneficially. Consequently, we expect to increase the amount of dredged material applied to beneficial uses substantially in future years. Despite these additional authorities, there will continue to be very large volumes of uncontaminated sediments that cannot be effectively or economically applied to beneficial uses. The prominent concern in managing this material will be the minimization of any physical environmental impacts from placement of the material.

Of the approximately 300 mcy of sediments that are dredged each year under the Army program, only a small percentage, one to four percent, is currently classified as contaminated and requires special handling or treatment. The total volume of this type of material ranges from 3 to 12 mcy each year. These contaminated materials are placed into appropriately confined areas and fully managed to protect the environment.

The small percentage of contaminated material associated with our Federal dredging program is not surprising. Most Federal channels have been periodically dredged for many years, which tends to minimize contaminant buildup in channel shoals. Moreover, recently deposited sediments tend to be cleaner due to increased regulation of point source discharges. Another factor which minimizes contaminant buildup is that federal channels are often located in higher energy areas of our waterways or are subjected to frequent turbulence. Highly contaminated sediment is usually found in heavily industrialized inner harbor areas and channel reaches which have not been dredged for many years, and which have been subject to contamination from point and non-point source discharges.

While it constitutes only 25% of the total volume (100 mcy), the percentage of dredged material from non-federal permitted activities that is contaminated to the extent that it requires special handling is roughly estimated to be higher than that for federal dredging over the last five years. The actual amount of contaminated sediment depends upon the specific proposed project for which a permit application is submitted.

THE REGULATORY PROCESS

The two primary authorities under which the disposal of dredged material is regulated for both programs are section 404 of the CWA and section 103 of the Ocean Dumping Act. Section 404 of the CWA permits apply to the discharge of dredged or fill material into "waters of the United States." Such waters are generally defined to include all inland waters, coastal waters, including the territorial seas, and most wetlands. The limit of jurisdiction under section 404 of the CWA in the territorial seas is three nautical miles seaward of the baseline. The baseline is generally defined as the line on the shore reached by the ordinary low tide. Permits under section 103 of the Ocean Dumping Act apply to the transportation of dredged material for the purpose of ocean disposal, seaward of the baseline of the territorial sea. Thus, there is geographic jurisdictional overlap between section 404 of the CWA and section 103 of the Ocean Dumping Act in the territorial seas. EPA's 404(b)(1) Guidelines contain a provision, which the Army agreed to, that establishes the rule that the disposal of dredged material in the territorial seas will be regulated under the Ocean Dumping Act. In other words, disposal of dredged material landward of the baseline is regulated under section 404 and disposal seaward of the baseline under section 103. Additionally, proposed discharges of dredged material regulated by the Corps under the CWA or the Ocean Dumping Act must be certified by the state as complying with the applicable provisions of section 401 of the CWA for all inland and coastal waters. Most coastal states also administer coastal zone management programs under the federal Coastal Zone Management Act. Discharges of dredged material that may affect a coastal zone must also be determined to be consistent, to the maximum extent practicable, with enforceable policies of the state's coastal zone management program prior to authorization of the federal project or regulated activity.

The Corps' evaluation of a proposed dredged material disposal activity involves determining whether the project complies with Corps' regulations, the section 404(b)(1) Guidelines for disposal in inland and near coastal waters, and ocean dumping criteria for disposal in oceans. The process generally begins with a pre-application consultation to ensure regulatory requirements are understood, including any necessary testing. The application phase includes the evaluation of all necessary documentation, including test results, to determine whether the dredged material may be contaminated and requires special handling. The testing procedures required under the Ocean Dumping Act utilize a manual developed by the Corps and EPA, entitled, "Evaluation of Dredged Material Proposed for Ocean Disposal - Testing Manual," commonly called the "Green Book". The Green Book provides for a progressive effects-based testing procedure.

After completion of the application, the public notice and public input phase begins. This process requires a minimum of 30 days for public input, but can take longer for complex and controversial proposals. It allows input from all interested and affected entities, federal, state and local agencies and the public.

Consistent with the environmental objectives and requirements of the regulatory program, the Army attempts to reduce delays that impact the regulated public. While we have shared responsibilities with EPA in regulating the disposal of dredged material, we continue to work with EPA and other agencies to minimize duplicative evaluations. In addition, Title V of WRDA 1992 somewhat modified the regulatory process under the Ocean Dumping Act by establishing specific timeframes for certain actions by the Army and EPA. Notwithstanding such statutory timing requirements, which apply to certain elements of the process, other required elements in the process can unavoidably take significant amounts of time.

EVALUATION PROCEDURES

Our ongoing initiatives with EPA to revise and update the Federal environmental guidance for testing and evaluating proposed discharges of dredged sediment are of high priority. The aforementioned Green Book was originally published in July 1977 and most recently revised jointly by the Corps and EPA in the Spring of 1991. It contains important technical implementation guidance for testing sediments proposed for ocean disposal. The Green Book utilizes biological testing, with chemical analysis as necessary, to provide effects-based conclusions with a tiered framework. Under a tiered framework, more sophisticated testing is used only when necessary for decision making. Several regional Green Book implementation manuals, which are an important component of this national process, have been completed.

There are many similarities in the procedures for dredged material testing between inland and near coastal waters and the oceans; however, differences do exist. This is due to the slightly different regulatory approaches under the implementing regulations of the CWA and the Ocean Dumping Act. To further enhance the consistency in testing procedures, the Corps and EPA have formed a working group that is completing a draft "Inland Testing Manual" that is patterned after the Green Book. We believe that implementation of the Inland Testing Manual will provide even more consistency for dredged material testing.

The Corps and EPA recently issued a comprehensive technical management strategy, entitled, "Evaluating Environmental Effects of Dredged Material Management Alternatives - A Technical Framework," designed to identify environmentally acceptable

disposal options for all dredged sediments. This document serves as the overall umbrella guidance in managing contaminated sediments. Our approach is to develop and apply a consistent evaluation framework, not only for sediment contamination testing, but also to provide effective controls of contaminated sediments for the full array of management options. We believe that this document, in conjunction with the testing guidance noted, will be particularly helpful in any future federal initiatives involving management of contaminated sediments.

PORT OF ELIZABETH/PORT OF NEWARK PERMIT

The Port of Elizabeth/Port of Newark permit request was processed through the established procedures for ocean disposal of dredged materials. However, due to the complex and controversial issues involved, the process required significant effort and an extended time for accomplishment. It took about 18 months from the pre-application coordination to development of a complete application. This effort included testing in accordance with the Green Book guidelines.

The extensive comments on the Port of Elizabeth/Port of Newark application required an extension of the public comment period and a public hearing. The controversy surrounding the dioxin issue was the primary basis for the Corps granting the extension to the comment period of the original public notice and holding the public hearing. A result of this public input was extended discussions in establishing criteria for the disposal of the dioxin contaminated sediments dredged from the port. We also participated in other public forums in conjunction with the general dioxin issue and with the Port of Elizabeth/Port of Newark project, in particular.

During the evaluation of the Port of Elizabeth/Port of Newark permit, extensive discussions occurred between the Corps and EPA concerning the appropriate criteria for the dioxin contaminated sediments to be disposed of in the EPA designated site, commonly known as the Mud Dump Site. We were working with EPA since the summer of 1992 to establish dioxin concentration criteria, as well as the site management plans to apply to the Port of Elizabeth/Port of Newark project and other dredged material discharge situations in the area. The criteria initially established were subsequently revised to be consistent with State of New York criteria. Subsequent to issuance of the permit, EPA properly questioned whether the ultimately established criteria for the site would be met in light of the increase in volume of material for disposal (i.e., from about 200,000 cyd in the permit request to about 500,000 cyd in the issued permit). Due to the time since sampling had been done and the change in volume, additional sampling was needed to ensure permit requirements could be met.

CONCLUSIONS

The Army continues to execute its responsibilities to protect the environment, recognizing the need for, and the benefits associated with, federal and non-federal dredging and dredged material disposal operations. We will continue to strive for as timely an administration of both programs as the degree of complexity or controversy allows. While complying with the established guidelines and the requirements of other statutes, we are continually coordinating with and ensuring the involvement of other federal agencies, state and local interests and the public at large.

The programs being managed encompass 400 mcy of dredged material annually. We work to make beneficial use of as much as possible of the uncontaminated material, while at the same time dealing with the small percentage but significant volume of contaminated sediments that require special handling.

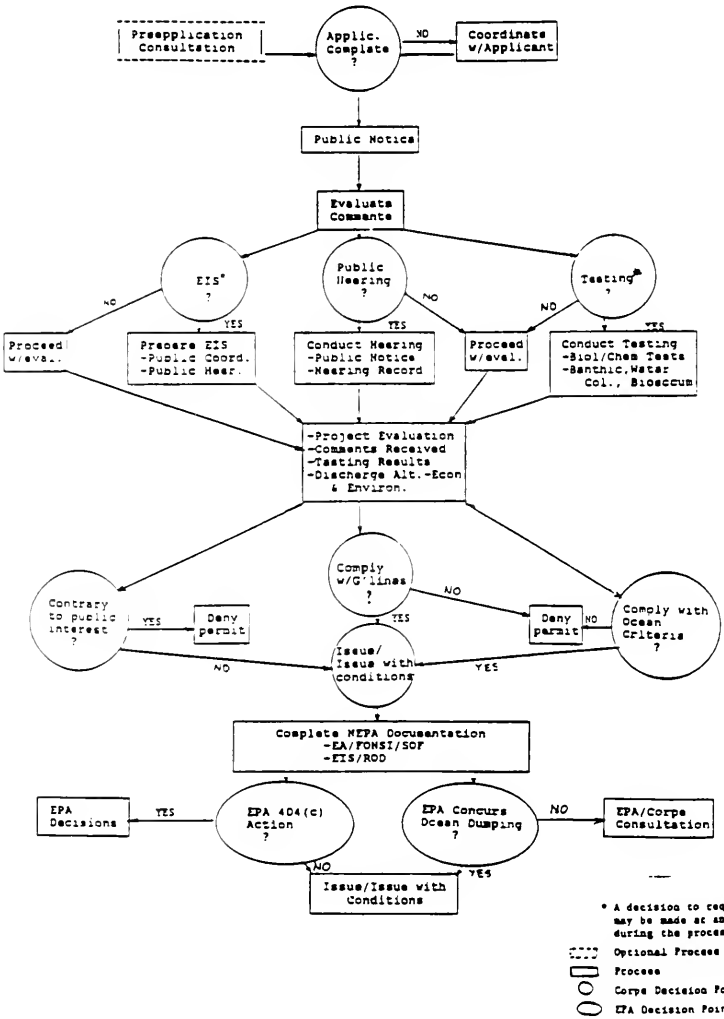
We have established processes for regulating disposal of dredged material in inland, coastal and ocean waters. We are continually working with others agencies, especially EPA, in enhancing the process, ensuring full public involvement and protecting the environment and the public at large. In our efforts to expedite the process, we are working with other agencies to minimize duplicative evaluations and enhance the consistency of testing procedures and management approaches, such as the Green Book, the Inland Testing Manual and the overall umbrella management guidance.

Even with all these efforts, complex and controversial projects, such as the Port of Elizabeth/Port of Newark, will require significant time to process to ensure full public involvement in meeting environmental as well as economic objectives.

As the Nation's environmental agenda for testing, regulating, and managing contaminated sediments unfolds, the Army will make use of all its capabilities to aid in accomplishing that agenda.

Mr. Chairman, that completes my statement, I would be happy to answer any questions.

DIAGRAM OF THE REGULATORY PROCESS
IN PREPARATION FOR TESTIMONY BEFORE
THE SUBCOMMITTEE ON OCEANOGRAPHY, GULF OF MEXICO
AND OUTER CONTINENTAL SHELF
MARCH 30, 1993



INFORMATION PAPER: THE REGULATORY PROCESS

IN PREPARATION FOR TESTIMONY BEFORE

THE SUBCOMMITTEE ON OCEANOGRAPHY, GULF OF MEXICO AND

OUTER CONTINENTAL SHELF

MARCH 30, 1993

The Department of the Army administers its regulatory program through the Corps of Engineers. This responsibility includes authority to regulate: (1) dredging, the construction of structures, and other types of work in navigable waters of the United States (tidal waters and waters previously, currently, or potentially capable of providing for the transportation of interstate commerce) pursuant to Section 10 of the Rivers and Harbors Act of 1899; (2) the discharge of dredged or fill material into waters of the United States (the territorial sea, all inland and near coastal waters located landward of the baseline of the territorial sea, wetlands adjacent to them, and isolated waters) pursuant to Section 404 of the Clean Water Act (CWA); and, (3) the transportation of dredged material for the purpose of ocean dumping, seaward of the baseline of the territorial sea, pursuant to Section 103 of the Marine Protection, Research and Sanctuaries Act (MPRSA), commonly known as the Ocean Dumping Act. The baseline of the territorial sea may generally be defined as the line on the shore reached by the oceans' ordinary low tides. Although both Section 404 of the CWA and Section 103 of the MPRSA apply to the discharge of dredged material in the territorial sea, the Corps and EPA have agreed that application of the MPRSA provides at least the same degree of environmental protection without necessitating duplication of CWA regulatory procedures. Inclusive in these regulatory responsibilities is the requirement to comply with the National Environmental Policy Act (NEPA), as well as a host of other federal environmental protection statutes.

The Environmental Protection Agency (EPA) has the responsibility to develop guidelines, in conjunction with the Department of the Army, under which the Army evaluates permit applications pursuant to Section 404 of the CWA. It is also EPA's responsibility to establish criteria for ocean disposal pursuant to Section 103 of the MPRSA. EPA may prohibit or restrict the use of inland and near coastal aquatic sites, as well as ocean sites, for fill and/or dredged material discharge purposes. EPA also has the authority, pursuant to Section 102 of the MPRSA, to designate ocean disposal sites.

The Corps evaluation of a permit application proposing dredging and dredged material disposal activities involves determining whether the project complies with: (1) the Corps permit regulations; and, (2) with the ocean dumping criteria, for disposal in the oceans; or, (3) with the Section 404(b)(1)

Guidelines, for disposal in inland and near coastal waters.

To comply with its permit regulations, the Corps must conclude that the project is not contrary to the public interest. Public interest factors considered with respect to dredged material contaminant-related impacts include wetlands, water quality, water supply and conservation, safety, and fish and wildlife impacts, and economics.

To comply with the ocean dumping criteria, it must be determined that disposal of dredged material will not unreasonably degrade or endanger human health, welfare, amenities, or the marine environment, ecological systems or economic potentialities. The MPRSA requires testing in conjunction with dredged material discharge activities in the oceans, which includes testing when it is suspected that material is contaminated. To satisfy the MPRSA requirements, the Corps and EPA have developed a manual which provides testing guidance entitled, "Evaluation of Dredged Material Proposed for Ocean Disposal - Testing Manual", short title, "Green Book". The Green Book utilizes biological testing, with chemical analysis as necessary, to provide effects-based conclusions within a tiered framework (more sophisticated testing, as necessary, for decision making) regarding the potential for contaminant - related water column, benthic toxicity and benthic bioaccumulation impacts.

To comply with the Section 404(b)(1) Guidelines, it must be determined that disposal of dredged material at the proposed site: (1) is the least environmentally damaging, practicable alternative; (2) complies with state and federally established water quality and toxics standards; (3) will not result in significant degradation of the aquatic environment; and, (4) will be conducted and conditioned so as to minimize potential adverse impacts to the aquatic ecosystem. The Section 404(b)(1) Guidelines also require chemical and biological testing when there is a reason to believe that material proposed for dredging and disposal in inland and near coastal waters is contaminated. In recognition of the need for greater consistency in testing procedures between inland and near coastal waters and the oceans, as well as between regions of the country, the Corps and EPA have formed a working group that is completing the draft of a manual, entitled, "Evaluation of Dredged Material For Discharge in Inland and Near Coastal Waters - Testing Manual", short title, "Inland Testing Manual", patterned after the Green Book. This draft will be submitted to Corps and EPA field offices, as well as the EPA's Science Advisory Board, for comment. The Corps and EPA intend to publish the manual in the Federal Register for comment by the fall or winter of 1993.

Additionally, any proposed discharge of dredged material regulated by the Corps under the CWA must be certified by the state as complying with the applicable provisions of Section 401 of the CWA for all inland waters and near coastal waters. Most coastal states also administer coastal zone management programs

under the federal Coastal Zone Management Act. Federally regulated discharges of dredged material that may directly effect a federally approved coastal zone must also be determined by the state to be consistent to the maximum extent practicable with those programs prior to authorization of the regulated activity.

The Corps regulatory process includes pre-application consultation, to discuss the project and regulatory requirements with the intent of avoiding application evaluation delays, and preparation of a public notice to describe the project and solicit comments from Federal, state and local agencies and groups and the public. The Corps may also conduct a public hearing if the Corps requires additional information to evaluate the project at issue. After information is collected, the project is evaluated (letters, meetings, coordination with the applicant and Federal, state and local agencies) to render public interest, ocean dumping criteria compliance, or Section 404(b)(1) Guidelines compliance determinations. Testing of dredged material is conducted if the presence of contaminants is suspected, and the results are considered, in conjunction with other case-specific information, to effect decisions with regard to managing the dredged material. This may include alternative disposal sites (upland, inland and near coastal aquatic sites and the oceans) and methods (capping or treatment of the dredged material). The Corps subsequently makes a decision to issue, issue with conditions, or deny the subject application and prepares the required NEPA documentation (environmental assessment or environmental impact statement (EIS), statements of compliance with the Section 404(b)(1) Guidelines or the ocean dumping criteria, and a statement of findings).

In recognition of EPA's MPRSA oversight authority, the Corps is required to notify EPA of its intent to authorize dredged material discharges in the oceans. The process, which has been somewhat modified by Title V of the Water Resources Development Act of 1992, requires EPA to make a determination to concur, concur with conditions, or decline to concur with the Corps decision to permit the discharge of dredged material within 45 days. EPA's determinations prevail under these circumstances. If EPA declines to respond, or makes a determination to concur or concur with conditions, the Corps may authorize the activity (with EPA's conditions, if recommended). However, if EPA maintains its determination to decline to concur and the Corps determines if there are no economically feasible alternative dredged material disposal sites or methods available, the matter may be forwarded to Corps Chief of Engineers. If the Chief of Engineers determines that there are no alternatives and that the project is not otherwise contrary to the public interest, he may request the Secretary of the Army to seek a waiver of the ocean dumping criteria from the Administrator of EPA. Again, EPA's determination to grant a waiver, grant a waiver with conditions, or not to grant the waiver, prevails in these circumstances. It is also important to realize that at any point, the Corps may determine that the environmental impacts of disposal at the

requested ocean site are such that the permit should be denied or conditioned to minimize or eliminate the potential for impacts.

In Section 404 CWA situations, the Corps will not issue a permit to discharge dredged material into inland and near coastal aquatic sites if EPA has advised, under its Section 404(c) CWA authority, of its intention to prohibit or restrict the designation of the site.

TESTIMONY OF
TUDOR T. DAVIES
ACTING DEPUTY ASSISTANT ADMINISTRATOR
OFFICE OF WATER
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
SUBCOMMITTEE ON OCEANOGRAPHY, GULF OF MEXICO,
AND THE OUTER CONTINENTAL SHELF
OF THE
COMMITTEE ON MERCHANT MARINE AND FISHERIES
U.S. HOUSE OF REPRESENTATIVES

March 30, 1993

My name is Tudor T. Davies, and I am the Acting Deputy Assistant Administrator for Water at the U.S. Environmental Protection Agency (EPA). The Office of Water has responsibility for implementing the EPA Ocean Dumping Program under Title I of the Marine Protection, Research, and Sanctuaries Act (MPRSA).

I appreciate the opportunity to discuss with the Subcommittee EPA's ocean dumping program, our development of sediment quality criteria, and implementation of Title V of the Water Resources Development Act (WRDA) of 1992. I will also address the other issues you raised in your letter of invitation concerning EPA's general role in reviewing Corps-issued dredged material permits, our research on sediment decontamination technologies and alternatives to ocean disposal, as well as recent events surrounding the permitting of dredged material from the New York Harbor area.

EPA'S OCEAN DUMPING PROGRAM AND ROLE IN REVIEWING CORPS PERMITS

The MPRSA was enacted in 1972 and generally prohibits the transportation of material from the U.S. for the purpose of ocean dumping without a permit. The MPRSA utilizes two primary mechanisms to control the impacts of ocean dumping: permitting and site designation, monitoring, and management, each of which I will discuss below.

Permitting

The Act divides permitting authority between the EPA and the U. S. Army Corps of Engineers (the Corps), with EPA being responsible for permitting the dumping of all material other than dredged material, and the Corps being responsible for permitting ocean dumping of dredged material. Although EPA is not the permit-issuing authority for dredged material, the MPRSA does establish a substantial role for EPA with regard to evaluation of the environmental impacts of dredged material ocean disposal.

Under the Act, when the Corps determines to issue a permit for ocean disposal, this determination is subject to EPA review and concurrence. In addition, the Act directs EPA to establish criteria for use in reviewing permit applications, and directs the Corps to utilize EPA's environmental impact criteria in evaluating ocean dumping permit applications. If the Corps determines to issue a permit, the Act provides that it must notify EPA of its intent to do so. EPA then evaluates the proposed permit issuance, and either concurs (either entirely or with conditions) or nonconcurs in

writing with the Corps determination that the EPA environmental impact criteria have been met. If EPA declines to concur in the Corps determination, no permit may be issued. If EPA concurs with conditions, the permit must include such conditions. In the event that EPA nonconcurs on a dredged material permit, the MPRSA allows the Secretary of the Army to seek a waiver of the criteria or conditions from EPA. In the history of the program, no waivers have been formally requested.

The environmental impact criteria developed by EPA for use in the ocean dumping permitting program primarily utilize biological effects tests (bioassays) as well as chemical and physical tests to determine the suitability of material for ocean disposal. These tests allow an assessment of the potential for the material to adversely impact marine life which might be exposed to the material at the dumpsite.

The biological tests are performed by exposing sensitive marine organisms in the laboratory to the material proposed for dumping in order to evaluate the toxicity of the material and also to evaluate the propensity of contaminants in the material to bioaccumulate. The results of these tests are then compared to test results on a reference sediment to determine the acceptability of the material for ocean disposal. The reference sediment reflects the ambient conditions that would exist in the vicinity of the disposal site had no dredged material disposal ever occurred, but had all other influences on sediment conditions taken place (e.g., pollutant inputs from point sources). In effect, the reference sediment provides the point of comparison for determining the acceptability of the material and reflects ambient conditions in the vicinity of the disposal site.

EPA and the Corps have jointly issued a testing manual "Evaluation of Dredged Material Proposed for Ocean Disposal" (commonly known as the Green Book), which provides technical guidance on how to perform the necessary biological tests and interpret the results. This manual was updated in 1991 to incorporate improvements in testing methods. We are well along in preparing a manual with similar testing methodologies for use in evaluating dredged material disposal in waters of the United States subject to regulation under §404 of the Clean Water Act (CWA). Drafts of this manual have been prepared and are undergoing Agency review. We anticipate providing this manual in draft form for public comment in the Fall or Winter of this year.

Site designation, management, and monitoring

The second key mechanism used to control the environmental impacts of dumping is site designation, management, and monitoring. Under the Act, EPA is charged with designating recommended sites for ocean dumping for all materials, and the MPRSA directs the Corps to use such EPA-designated sites to the maximum extent feasible.

EPA's ocean dumping regulations set out criteria for use by EPA in designating ocean disposal sites. These criteria are designed to select sites so as to minimize the potential for impacts on beaches, shorelines, and other important environmental resources. In order to ensure careful analysis of potential disposal sites, under its voluntary Environmental Impact Statement (EIS) policy the Agency prepares EISs as

part of the site designation process. Under the federal consistency provisions of the Coastal Zone Management Act, EPA also provides a consistency determination to states with federally approved coastal management programs. In addition, further opportunities for public involvement are provided through the notice and comment rulemaking used to designate sites.

Once a site has been designated, the placement of material at the site must be properly managed and monitored in order to protect the marine environment. The 1992 WRDA amendments to the MPRSA placed increased emphasis on the importance of site management and monitoring. WRDA requires that EPA and the Corps develop long-term site management plans, with opportunity for public comment. The statute provides that these management plans must be revised and updated at periodic intervals. EPA already has developed site management and monitoring plans for some of the sites it designated prior to the October 1992 enactment of WRDA, and will continue to develop such plans within its available resources. In addition, EPA and the Corps have been developing new guidance for the ocean dumping program to address technical and procedural aspects of site designation, management, and monitoring. That document also will provide guidance on the new site designation, management, and monitoring provisions contained in WRDA.

With this general overview of the ocean dumping regulatory regime, I would now like to turn to the Subcommittee's request that I briefly address the current

situation with regard to dredging and ocean disposal of dioxin-contaminated sediments in the Port Elizabeth/Port Newark area.

PORT ELIZABETH/PORT NEWARK PERMIT

The Port Authority of New York and New Jersey has requested a permit from the Corps to dredge Ports Elizabeth and Newark and dispose of the sediments at the EPA-designated Mud Dump site 5.3 nautical miles east of Sandy Hook, New Jersey. The Corps issued a public notice for ocean disposal of approximately 200,000 cubic yards (cy) of material, which was the subject of EPA review under its MPRSA responsibilities. Because sediments in the Newark area are contaminated with low levels of dioxin, this project has been subject to careful review by the Corps, EPA, and the public.

Based on its review of the proposed project and relevant scientific information, EPA determined that sediments which resulted in dioxin 28-day bioaccumulation in worm tissue above 10 pptr were unacceptable for ocean dumping. The Agency agreed that sediments which, upon biological testing, resulted in bioaccumulation levels of 10 pptr or less of dioxin could be dumped at the Mud Dump site, provided these sediments were then covered with a layer of clean sediments at least 1 meter deep (i.e. "capped") so that the dioxin would not become bioavailable.

On January 6, 1993 the Corps issued a permit which authorized the dredging of a greater quantity of material than the 200,000 cy originally advertised in the public notice. The revised number of 500,000 cy caused EPA concern as to whether the

characteristics of the material to be disposed had changed from the initial testing. EPA indicated to the Corps that it had not reviewed or concurred on the 500,000 cy proposal and requested that, if it could not be shown that the sediment profile had remained the same in the project site since the initial testing, then further sediment chemistry testing for dioxin be undertaken to ensure that the additional volume of material complied with the EPA ocean dumping criteria. Thereafter, the Corps directed the Port to conduct sediment chemistry tests for all the project area, and the results from these tests are being analyzed.

If the results of these tests show the dioxin levels in the sediment to be at or below those from tests conducted on the 200,000 cy project, which were generally below the 10 pptr criteria, disposal may be allowable if the material is capped within 5-10 days of such dumping. If these new sediment tests show increased levels of dioxin, then additional bioaccumulation testing of the material will be necessary before a disposal decision can be reached.

The issues of dredging and disposal of material from the New York/New Jersey Harbor have been controversial and generated much public interest and concern. In light of this widespread interest, our Region II office is seeking to facilitate a consensus on disposal alternatives among interested parties and is planning a forum sponsored by the EPA, the Corps, and the States. This forum would seek to bring together representatives of all interested parties including shipping, dredging, governmental, environmental, fishing, boating and marine research interests.

On March 18, 1993, representatives from EPA, Occidental Chemical Corporation, and the State of New Jersey met to discuss response actions to address contamination of the Passaic Estuary, including the Port Elizabeth/Port Newark site, caused by the release of dioxin and other hazardous substances from the Diamond Alkali Site. That meeting was convened at the request of the State of New Jersey which had been the lead agency charged with responsibility for negotiating with Occidental Chemical on this matter. The State of New Jersey and Occidental Chemical have been unable to reach an agreement to address the Passaic Estuary contamination, and EPA thus has assumed the lead. On March 22, 1993, EPA informed Occidental Chemical of the company's potential liability for response costs which the federal government incurs relating to the release of hazardous substances from the Diamond Alkali Site into the estuary.

In addition to its ocean dumping program under Title I of the MPRSA, the Agency has several other activities underway which bear on our management of contaminated sediment and dredged material. These activities include EPA efforts to develop sediment quality criteria under §304(a)(1) of the CWA. In addition, I will address implementation of Title V of the Water Resources Development Act of 1992 provisions regarding the National Contaminated Sediment Task Force and sediment monitoring, and research on sediment decontamination and alternative disposal methods.

MANAGEMENT OF CONTAMINATED SEDIMENT AND DREDGED MATERIAL

Sediment Criteria

Our efforts to develop sediment criteria have focused on gaining a better understanding of the extent of sediment contamination, and then selecting the best methodology for determining site specific sediment quality criteria (SQC). There are different criteria development methodologies for different classes of compounds (non-ionic organic, ionic organic, and metals).

EPA's initial efforts have focused on non-ionic organic contaminants, including review by the EPA Science Advisory Board (SAB). That review supported the methodology and recommended that implementation guidance be developed, that the criteria be periodically updated to keep pace with advancing science, and that uncertainty analyses be clearly documented and incorporated when applying the criteria in a regulatory context. EPA also has conducted extensive laboratory and field studies of a methodology for metal contaminants. An SAB review of that methodology is planned for 1993.

We plan to publish a Notice of Availability in the Federal Register in the Spring of this year for the first five criteria for non-ionic organics, with a 60 day public comment period. The first five criteria will address: Endrin, Dieldrin, Acenapthene, Fluoranthene, and Phenanthrene. After incorporating public comments into the criteria documents, they would then be issued. As a result, we anticipate that the 5 criteria would be final by December 1993, with two to three new criteria for other non-ionic organics being issued each year.

Over the past two years, the Agency, through its sediment management strategy has been working to define the specifics of SQC implementation in various Agency programs, including remediation, point source controls, and dredged material disposal. Before determining precisely how sediment quality criteria will be integrated into the ocean dumping regulatory regime, the Agency will provide an opportunity for public comment on the options being considered. EPA also is conducting an economic analysis to estimate what potential economic impacts use of SQC might have on dredged material disposal, and a final report is expected this summer. Using the 5 draft criteria and 10 interim criteria, a preliminary analysis suggests that the vast majority of dredged material will not exceed these sediment criteria. This is because most dredged material comes from operation and maintenance dredging (clean material being carried by currents into the harbors and canals) and only a small amount of dredged material comes from locations near urban and industrialized centers that have not been regularly dredged and that consequently may contain an accumulation of contaminated sediments.

Contaminated Sediment Task Force, Survey, Monitoring Program

I now would like to briefly describe EPA's current activities and future plans to implement Title V of the Water Resources Development Act (WRDA) of 1992 . Among other things, Title V of WRDA of 1992 directs EPA, in consultation with the National Oceanic and Atmospheric Administration (NOAA) and the Corps, to conduct a comprehensive national survey of all existing information on the quantity, physical

and chemical composition, and geographic location of pollutants in aquatic sediment. Title V further provides that EPA is to undertake a new comprehensive and continuous national program to monitor the extent and severity of sediment contamination. In addition, under WRDA of 1992 EPA is to establish and co-chair, with a designee of the Secretary of the Army, a National Contaminated Sediment Task Force which is charged with advising the Agency and the Corps on a range of issues related to contaminated sediment management.

EPA is using existing data and modifying ongoing programs to respond to WRDA's provisions. With regard to data on sediment contamination, we are currently focussing our efforts on collecting available information in order to develop a national inventory of contaminated sediment sites. We are developing that inventory to obtain a near term assessment of the extent and severity of the problem, delineate areas which may be contaminated and need further assessment, and identify areas which we know are contaminated and potentially have an impact on ecosystems.

EPA is also gathering existing information on sources of sediment contaminants. Agency data bases such as the Toxics Release Inventory and the Permit Compliance System are being used to link contaminated sediment sites with known point source discharges. EPA will use the site inventory to target geographic areas for assessment, pollution prevention, remediation, and dredged material management activities. EPA will prepare a report to Congress on the site inventory as required by WRDA Title V.

EPA has not been able to initiate a new program to collect and analyze sediment samples across the country. The Agency's Environmental Monitoring and Assessment

program (EMAP) continues to provide data describing the concentration of contaminants in sediment, as well as their biological effects, within a defined grid of sites located in coastal waters. However, the EMAP sampling program is designed to provide estimates of environmental quality on a regional or national scale, not to locate specific sites where sediments are contaminated. In addition, although NOAA's Status and Trends monitoring program has gathered data on coastal sediment contamination, it is designed to describe national, rather than local, distributions of contamination. These activities thus will not provide a national inventory of contaminated sediment sites or substitute for the need to collect additional new data.

EPA and the U.S. Army Corps of Engineers have not yet convened the National Contaminated Sediment Task Force. WRDA provides for Task Force participation by representatives from numerous other federal agencies, the States, port authorities, agriculture and manufacturing interests, and public interest organizations, and funding is necessary to sponsor non-federal participants.

The Agency has been developing a Contaminated Sediment Strategy and has held public meetings with State and federal agencies, industry, and public interest groups to help define appropriate activities to address contaminated sediment issues. A meeting of many of the federal agencies to be represented on the national Task Force also has been scheduled to discuss design of the contaminated sediment site inventory. Preliminary discussions related to Task Force projects have already been held with a number of other federal agencies. We shortly will be initiating discussions with the Corps to determine Task Force participation.

Sediment Decontamination Technologies and Disposal Alternatives

Although a sound regulatory and scientific regime to control ocean disposal as well as an understanding of the scope and severity of sediment contamination are important to protecting our coastal waters, it also is vital that we continue to develop methods to decontaminate sediments and find alternative disposal methods.

EPA's research on sediment decontamination is highly complex and new technologies are still evolving. The Agency's Assessment and Remediation of Contaminated Sediments (ARCS) Program is our principal effort to develop and pilot decontamination methodologies both at bench scale (laboratory) and pilot scale (field) for eventual use on a large scale. ARCS has focussed primarily on decontamination of Great Lakes sediments.

ARCS, which is administered by the Great Lakes National Program Office, was initiated in response to the 1987 amendments to the Water Quality Act, and examined several sediment decontamination technologies. The five study sites that were given priority in the authorizing legislation for the ARCS program were primarily contaminated with PCBs, PAHs, and heavy metals.

Tests have been conducted both in the laboratory and in the field examining the most promising decontamination technologies, although application of these technologies to sediments contaminated with much lower levels of contaminants such as dioxin has yet to be conducted on a meaningful scale. In a broad sense, however, the technologies tested under ARCS that deal with organic contaminants may be

relevant for dioxin-contaminated sediments because PCBs and dioxins are structurally similar.

The ARCS technologies that have been successful in the treatment of PCB-contaminated sediments are thermal desorption, solvent extraction, chemical transformation, and sediment washing. Of these four treatment types, only chemical transformation results in a net destruction of the contaminant of concern. The other three technologies extract or separate the contaminants from the bulk of the sediments, concentrating them in a much smaller volume that can be more easily treated to complete destruction.

In addition to these technologies, there is also the potential for biodegradation, or the use of natural or cultured microorganisms to destroy persistent organic contaminants. The ARCS Program was able to successfully demonstrate laboratory destruction of PCBs in sediments from three Great Lakes rivers. Research in this area has been limited, however.

The technologies demonstrated at the pilot scale by the ARCS Program are all well-developed and are at a point where scale up is possible. Thermal desorption units have been used to remediate a PCB-contaminated sediment Superfund site in Waukegan Harbor, Illinois. The sediment washing process, successfully demonstrated on low-level (i.e., 2ppm) PCB contaminated sediments in the Saginaw River and Bay, has been used on a full-scale basis in several European sediment remediation projects, and on several upland contaminated soil projects in the U.S.

Several of the technologies tested in the laboratory under the ARCS Program are ready for scale up, with the chemical transformation technologies holding promise for the destruction of dioxin in contaminated solids, such as soils and sediments. However, it must be noted that the levels of dioxin that cause concern are several orders of magnitude below those of PCBs and other contaminants, and such low levels make the analysis of treatment technology efficiencies, and the overall effectiveness of these technologies, difficult to accomplish.

Since the applications of these technologies to full-scale sediment remediation projects has been limited to only one site in the United States, the costs for future applications can only be estimated for complete sediment remediation scenarios. At this point, it is only possible to say that the unit costs of the technologies will range from $50 to over $400 per cubic yard of sediment treated, with the treatment of dioxin-contaminated sediments likely falling into the higher end of the range. It should also be pointed out that application of bioremediation technologies to dioxin-contaminated sediments will require much more highly engineered systems than have been demonstrated on other contaminants, and estimating the costs of such conceptual systems is speculative at best. Finally, the application of decontamination technologies, even when technically feasible, is most appropriate where the economics of the situation justify the subsequent reduction in the risk posed by the sediment contaminants. We are not yet at a point where an inexpensive panacea technology has been developed for application to all contaminated sediments.

In the specific context of the New York/New Jersey Harbor, various provisions of the Water Resource Development Act (WRDA) bills over the years have addressed alternatives to ocean dumping. §412(a) of the WRDA of 1990 directed EPA to submit a report to Congress on the feasibility of designating an alternative to the Mud Dump Site, and that report has been completed and is in the final stages of Agency review prior to transmittal to Congress. The WRDA of 1990 §412(b) also directed the Corps and EPA to prepare a plan for the long-term management of dredged material from the New York/New Jersey Harbor, and EPA Region II has been cooperating with the Corps New York District in its preparation. §412(c) of the WRDA of 1990 further directed the Corps in consultation with EPA to implement a decontamination technology demonstration project. The Corps Waterways Experiment Station and a private consultant have been performing the work. Finally, §405 of the WRDA of 1992 requires EPA and the Corps to conduct a decontamination project for the New York/New Jersey Harbor based on a review of the technologies identified under §412(c). Congress has appropriated to EPA $2.7 million, and once the information gathered by the Corps under §412(c) is available, we will be able to proceed.

In addition to decontamination of sediments, EPA considers alternatives to ocean disposal an important regulatory option. Accordingly, EPA and the Corps developed and published a guidance document last year addressing dredged material management alternatives. This guidance, known as the "Framework Document", emphasizes the importance of evaluating alternative methods to manage dredged material and provides technical guidance on evaluating the environmental

acceptability of dredged material disposal alternatives. It is intended to provide a consistent framework for use in evaluating alternatives under the Ocean Dumping program, the CWA §404 program, and the National Environmental Policy Act (NEPA). Alternatives addressed in that framework include confined aquatic disposal, land disposal, aquatic disposal, and, for clean material, beneficial uses.

This concludes my testimony, and I would be pleased to respond to any questions you might have.

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TESTIMONY OF
RICHARD V. SINDING, ASSISTANT COMMISSIONER FOR POLICY AND PLANNING
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND ENERGY
BEFORE THE
HOUSE COMMITTEE ON MERCHANT MARINE AND FISHERIES
OCEANOGRAPHY, GULF OF MEXICO AND CONTINENTAL SHELF SUBCOMMITTEE

Thank you for allowing me the opportunity to appear before you today to discuss a subject that is of great concern to the New Jersey Department of Environmental Protection and Energy. I believe that I can state unequivocally, not just on behalf of my department but of all the citizens of New Jersey, that protection of our waterways, our ports and our oceans is a matter of the highest priority, and we will not allow the superior quality of our marine and coastal resources to be compromised in any way.

I can also state, on behalf of Governor Jim Florio and DEPE Commissioner Scott Weiner, that the issue before us today -- the dredging and disposal of dioxin-contaminated materials in the New York/New Jersey Harbor region -- is not, and should not be considered, a conflict between jobs and the environment. Rather, it represents a formidable but surmountable challenge to provide for a vibrant, sustainable regional economy and a healthy, protected environment. Our goal in the Port of New York and New Jersey should be nothing less than the achievement of a state-of-the-art port that serves as a model of robust economic vitality and the highest standard of environmental protection.

To that end, we in New Jersey have worked long and hard in collaboration with our counterparts in New York State, appropriate federal agencies, environmental groups, labor unions, fishing interests, and other interested parties to seek a framework for a comprehensive policy of sound harbor-wide management practices. Our own state permitting conditions impose stringent but fair limitations on the dredging activities which the Port Authority of New York and New Jersey proposes to undertake in Port Newark and Port Elizabeth, including a no-barge overflow provision designed to keep potentially harmful levels of dioxin out of the water column.

I think it is important to recognize that there are some distinctions between the Port Authority's pending permit application and many of the broader, long-term issues involving proper harbor management. We have spent the last several weeks engaged in sometimes heated but generally fruitful discussion about the details of the current permit application, including the no-barge overflow and other conditions of the dredging operations, as well as the management practices, monitoring and capping protocols at the "Mud Dump" disposal site. Some of these issues are unique to this particular permit application, and must be addressed by our department, the U.S. Environmental Protection Agency, the Army Corps of Engineers, and other regulatory agencies in a manner consistent with current laws, rules, regulations and policies.

One of the benefits of this process is a clearer understanding of the limitations imposed by present policy. For example, the only disposal site under active consideration for the current application is the "Mud Dump," yet virtually everyone agrees that alternative disposal sites, including an artificial island, subaqueous borrow pits, and upland disposal, must be considered for future dredging operations, and there is general agreement that research and development of bioremediation and other decontamination technologies should be expedited. It may not be appropriate, however, to apply these intermediate and longer-term solutions to the current permit application, and, in our judgment, the USEPA and the Corps of Engineers have diligently and effectively sought to balance our mutual short-term objectives in the harbor with a realistic assessment of our ability to meet our intermediate and longer-term goals.

Clearly, alternatives to the current practice of ocean disposal of contaminated dredge materials must be found, and found quickly. The advantages and disadvantages of various disposal alternatives, including those just mentioned, must be examined and analyzed in a timely fashion. Sediments contaminated beyond accepted, scientific-based standards, whether polluted by dioxin or by other contaminants, should not be disposed of in ocean waters, and we should spare no effort to ensure that this policy continues to be implemented.

As I mentioned earlier, we have been engaged for the past several weeks in a collaborative process seeking to identify areas of common concern shared by public agencies, private enterprise, labor unions, commercial and recreational fishing organizations, environmental groups and others interested in a safe, secure and sustainable harbor. Through this process, we have successfully identified seven key initiatives around which a comprehensive policy of sound harbor-wide management practices can be formulated to achieve our stated objectives of a vibrant economy and a healthy environment.

The first step is to attack dioxin at the source. A significant amount of the dioxin in the Passaic Estuary, which discharges into the New York/New Jersey Harbor, may have originated at the former Diamond Shamrock plant in Newark. The successor company to Diamond Shamrock, Occidental Chemical Corporation, has expressed a willingness to discuss with the USEPA and the NJDEPE undertaking further investigation of dioxin in the Passaic Estuary which may have been the responsibility of Diamond Shamrock. We anticipate that these discussions will lead within 90 days to an administrative consent order with USEPA for addressing this contamination. At the same time, the NJDEPE has commenced surveys to identify any other present and/or past sources of dioxin in the estuary, and we anticipate that these surveys will likewise be completed within 90 days.

A second step is to reduce non-point sources of harbor pollution. Whether our efforts are targeted toward stormwater permitting, or eliminating combined sewer overflows, or ending other practices which have an adverse impact on water quality, we must invest in the environmental infrastructure necessary to remove the threat of non-point sources of pollution which threaten the integrity and quality of our harbor region. Special emphasis must be given to identifying sources of toxic substances so that they may be reduced and/or eliminated as quickly as possible.

Third, we need to do a better job of providing meaningful information to the public regarding science-based risk associated with dioxin and other contaminants, dredging and disposal practices and procedures, short-term and long-term disposal options, human health and environmental impacts of contaminated sediments, and steps all of us can take to reduce pollution. Instead of hype and hysteria, we should be providing the public with the information needed to make informed, rational decisions.

Fourth, we must move ahead promptly with research and development of decontamination technologies. The USEPA has announced plans to allocate $2.7 million from the Water Resources Development Act for a demonstration of decontamination technologies, such as bioremediation, thermal decomposition, chemical dechlorination, solvent extraction, mechanical separation, vitrification, and other promising technologies, in the New York/New Jersey harbor region. This work should supplement research and development activities already underway in the Great Lakes and other regions. In New Jersey, we have an exciting new public-private partnership -- the New Jersey Corporation for Advanced Technology, or NJ CAT -- which is being created for the express purpose of bringing together government, the business community and the state's leading academic and research institutions to develop advanced technologies that will help us solve some of our most pressing environmental problems. Certainly, research and development of

decontamination technologies to reduce the threat of dioxin and other pollutants of concern in our harbors and waterways will be a high priority for NJ CAT.

Fifth, we need to take steps to protect the livelihood, and enhance the recreational opportunities, of fishermen. The initiation of several projects in the New York/New Jersey harbor area would greatly enhance the economic viability of the commercial and recreational fishing industries in the region. Restoration of the Caven Point Pier in Jersey City would make the Port of New York and New Jersey more accessible to boaters from the heavily populated areas of northern New Jersey. The development of a comprehensive management plan for striped bass would help answer some longstanding questions about the spawning grounds and migration patterns of one of the region's most important marine species. A research program and education campaign to verify and demonstrate the hygienic, sanitary and nutritious qualities of fish caught in the Atlantic Ocean off the coast of New York and New Jersey would reassure the public and provide an important service to commercial fishing interests.

Sixth, we must seek long-term solutions in a short-term timeframe. As stated earlier, our policy is that sediments contaminated beyond accepted, scientific-based standards, whether polluted by dioxin or other contaminants, should not be disposed of in ocean waters. Moreover, realistic alternatives to ocean disposal of dredged materials must be aggressively pursued and implemented, and a final closure plan for the "Mud Dump" when it reaches capacity must be formulated. To achieve these policy objectives, the USEPA has committed to convene a Harbor/Bight Dredged Material Management Forum to identify the broad range of critical issues needing resolution and to seek consensus on them. As part of this forum, the U.S. Army Corps of Engineers will reconvene the Dioxin Steering Committee to continue its important scientific and technical analysis of the human health, environmental and aquatic effects of 2,3,7,8-TCDD. The establishment of national and state standards for dioxin is essential, and these standards should be set swiftly and stringently. The NJDEPE has already gone on record in support of legislation that would prohibit any state agency, after December 31, 1995, from permitting the dredging or disposal of any material contaminated with dioxin <u>at any level</u> unless an official, scientific-based standard has been adopted by the USEPA by that date.

Finally, we need to develop a comprehensive toxics management plan. Moving beyond the immediate, pressing issues associated with dredged material management, a more fundamental need exists related to the broader problem of contamination of water, sediment and biota within the New York/New Jersey harbor system. We need to develop and implement a comprehensive toxics management plan aimed at identifying the full range of problems and their causes, and charting paths toward short-term and long-term solutions.

Much work remains to be done, but we in New Jersey believe that we can solve even our most complex and contentious problems if we work together in an atmosphere of collaboration and mutual respect. In these past few weeks, we have demonstrated once again that when people stop yelling at each other and start talking to each other, good things happen -- like taking a highly charged issue that threatens to tear us apart and hammering out the framework for a reasoned, and reasonable, solution. Working within this framework, we are confident that we can build upon the foundation of a long-term harbor management strategy that achieves our mutual goal of making the New York/New Jersey Harbor a showplace for economic and environmental vitality.

TESTIMONY
BEFORE
THE SUBCOMMITTEE ON OCEANOGRAPHY, GULF OF MEXICO,
AND THE OUTER CONTINENTAL SHELF

LILLIAN C. LIBURDI
DIRECTOR, PORT DEPARTMENT
THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

WASHINGTON, DC
MARCH 30, 1993

My name is Lillian Liburdi. I am the Director of the Port Department of the Port Authority of New York and New Jersey. Mr. Chairman, I appreciate the opportunity to testify before this distinguished committee on dredging and ocean disposal of dredged material. I appreciate even more that you are giving your attention to this generic and very frustrating matter of dredging our ports. My statement will address the length of time it takes for decision making within the regulatory process, discuss the high cost of testing and demonstrate the need for a proactive federal policy initiative on dredging and disposal necessary to solve what I see as a national dredging crisis.

First, I would like to set forth a few important points.

- We are not talking about toxic or hazardous materials, for such materials are not dredged and disposed of in the ocean. We are talking about sediments that have low levels of contaminants that are pervasive throughout many if not all coastal systems and not just the New York/New Jersey harbor.

- We are not appearing before you as the offending industrial polluter but as the agency contending with the consequences of the polluter's actions. It is our responsibility as a public port agency to both maintain marine terminal facilities for commerce and to do so with the utmost respect for the environment.

- Not withstanding the fact that the Port Authority is a public agency and my colleagues and I are public employees we cannot adopt an indifferent attitude regarding the real costs and consequences of government regulation. Indeed we must operate as a business does with a practical concern for costs in time, people and financial resources.

- Our port employs 180,000 people. Most of the port's shipping activities occur at the Port Newark/Elizabeth complex, one of the largest in the world. While I

cannot point to actual job losses yet, we have clearly seen signs that our fears are being realized. Due to doubts about adequate depths, some shipping lines have shifted cargo to competing ports including Halifax, Canada. At the same time unnecessary controversy over the existence of trace levels of dioxin in our sediments and the disposal of these sediments with capping at the Mud Dump has harmed the commercial and recreational fishing industries in our region and has the potential to harm our spring/summer tourism business as well.

Why? Because the community at large has been prodded by interest groups who want nothing, even clean material dumped into the ocean. The question has become "how clean is clean?" The federal regulatory system when dealing with sediments proposed for ocean disposal uses criteria and standards which are order of magnitudes more stringent that land-based level criteria. These interest groups insist scientific knowledge is not adequate to justify ocean disposal. The committee should know that with regard to dioxin (2,3,7,8 tetrachorodibenzo-p-dioxin) the land-based criteria viewed as clean is one part per billion, while we are required by the Corps/EPA for a maintenance dredging permit to test to one part in a trillion. That is one thousand parts less.

We need to recognize that with rapid advances in technology our ability to detect things to lower and lower levels far exceeds our understanding of what it all means. It is unreasonable for society to expect to have a complete understanding of all risks of every action taken. If we do not establish reasonable risk levels for environmental protection, economic development will come to a screeching halt. I feel strongly that the risk of not acting is far worse than most proposed activities, such as removing these trace levels by dredging the berths in Port Newark/Elizabeth and subsequently disposing of them in the ocean.

The Port Authority retained a world renowned expert and commissioned a risk assessment of ocean placement of dredged material containing dioxin. The findings concluded that the material we propose to dredge doesn't need to be capped. The risk associated with the dioxin is well below EPA current cancer risk guidelines. However, a special condition of the Port Authority's suspended permit requires a two to one cap by volume, roughly three feet thick. This cap in effect is the suspenders going along with the belt. It will cost approximately $3 million and will exceed the cost of dredging.

Now I'd like to turn to the actual permit process. In the recent past the process of seeking and receiving a dredging and ocean disposal permit for berth maintenance dredging took approximately six months--about three months for sampling and testing of the sediments and marine organisms, about three weeks for Corps/EPA review and publication of a public notice on the permit, one month for public comment and another month for findings and a decision. As a matter of public policy, if the material to be dredged

doesn't meet federal criteria the application would never reach the public notice stage of the process. Our request filed three years ago on April 11 (1990) did. Yet it still isn't resolved even though we are moving slowly toward a regulatory conclusion perhaps this coming month.

There are process issues and executive leadership issues which arise in our story.

On the process side the issues are clearly: responsibility, time, costs, and process management between the responsible federal agencies.

Process Time

The regulatory process is a due process approach. A permit applicant should be able to have rules, requirements and standards explained, provide information based on those requirements for federal agency decision making, expect prompt attention within a reasonable time period and receive a judgment based on scientific and operations factors within a specific and reasonable time frame. That expectation is what the Congress conveyed in its approval of the procedures to be used.

That has not happened in this case. Instead, because trace levels of a substance the federal agencies did not have standards for were found, we became a national process and scientific test lab and a national cause for the environmental advocates. I've attached a chronology of the three-year process we've been through for the committee's review.

Costs

Because of new requirements we were asked to perform four bioassay/bioaccumulation test sets when in the past we had been required to do just one. The Corps and EPA required the facility to be split into four reaches. This quadrupled the costs of testing. We estimate that once this process is concluded we will have spent approximately $1.5 million on this on permit application. However, this is only one component of cost. Added to it must be rising payments to outside contractors (sample collection and analysis), the cost of monitoring of the dredging site, our expenditure for the risk assessment, and Port Authority staff time. The $1.5 million exceeds the $1.0 million cost for the normal annual maintenance dredging of the facility. We estimate the cost associated with this permit is more than 50 percent of the actual construction cost for the full three-year permit. I have attached a table of the Port Authority's expected costs for a one-year dredging cycle should the permit which was issued and then suspended in January be reinstated.

Mr. Chairman, some people believe that as a large agency the Port Authority can easily afford whatever it may cost to obtain the permit and accomplish the dredging. Although this is not true, we

do have more resources than most small public and private terminal operators in the port. Indeed, the tragedy of this is that applicants with small maintenance dredging projects for facilities that need to be dredged once in a three-year permit cycle find that the cost associated with the permit process exceeds the cost of construction. The cost of sampling and testing including consultant fees is hundreds of thousands of dollars, while the actual construction price to dredge 20,000 cubic yards of material may be a little more than $100,000. There are forty other maintenance dredging projects pending in the harbor, many are for small companies that cannot afford a costly and drawn out process, and are unfortunately still waiting for their permits to be acted upon.

Executive Branch Leadership Problems

As a responsible public agency sensitive to environmental, as well as commercial issues, we would have gladly considered another option other than disposal at the Mud Dump if there were any available to us. THERE ARE NONE. Certainly not because we haven't tried to stimulate alternative development and certainly not because the Congress hasn't asked. You have in various legislative directives.

The failure has been in the Executive Branch. The Congress in various legislative enactments has described certain steps to be taken.

1986 Water Resources Development Act -- The EPA Administrator was to study and monitor the extent and adverse effects of dioxin in the Passaic River Newark Bay system and report to Congress one year later. To the best of our knowledge this has not been done.

1988 Water Resources Development Act -- Within 180 days of enactment the EPA Administrator was directed to submit a plan to Congress to designate one or more sites as an alternative to the Mud Dump. To the best of our knowledge this has not occurred.

1990 Water Resources Development Act -- Within 180 days of the legislation the EPA Administrator was required to submit to Congress a long-term management plan for dredged material for our port. While a draft has been prepared to the best of our knowledge it has not been submitted.

1992 Water Resources Development Act -- Authorized the demonstration of decontamination technologies. The last administration did not implement this requirement. The current EPA administrator has indicated she is moving on the plan to initiate a demonstration program. Tomorrow we will be testifying before both houses of Congress to seek FY 94 funding for this project.

The Port Authority has not sat idly by. We have participated in the federal long-term management strategy program that lasted about twelve years and which discussed a range of disposal options. The report was issued in December, 1989, and to date the major federal follow-up has been the draft EIS on the borrow-pit option.

- We funded the Institute of Marine and Coastal Sciences at Rutgers University to assess remediation technology through the conduct of two seminars involving world renowned scientists and engineers to help us identify those approaches which should be tested through the WRDA demonstration program.

- We funded a program co-chaired by Rutgers and the State University of New York to discuss strategies to deal with non-point source pollution.

- We retained EA Engineering to perform the only known risk assessment of the effects of ocean disposal of sediments having trace levels of dioxin--which has been prepared.

- We have indicated our intent to undertake studies this year which will update both the upland and containment island siting studies of the early- to mid-1980s.

- We have pledged Port Authority support to the regional programs on informations sharing, seafood promotion and research. We agreed to contribute to and participate actively in the alternative development demonstration program.

Despite our past and planned efforts Mr. Chairman, immediately after issuing the permit on January 6, 1993, the Corps suspended it on January 14, 1993. After nearly three years of deliberation and having written letters of concurrence with criteria and permit conditions, the EPA in a matter of days reversed its position and withdrew its concurrence with the permit. This action forced the Corps to suspend the permit. In addition the National Marine Fisheries Service (NMFS), subsequent to the permit suspension, decided to raise Endangered Species Act issues. Where was NMFS during the three-year federal permit review process?

The Corps, EPA, NMFS and the Fish and Wildlife Service rely on a set of complex memorandums of agreement to address their concerns. They find it convenient to address the issues one at a time. This linear process is drawn out. There is a need for parallel action to expedite the process. Decisions have to be made promptly now. What is required is a policy guidance, a clear mandate that the law and regulations are to be implemented in an impartial manner, and fast rule making.

Finally, I will state unequivocally that the Port Authority has answered all questions posed to us regarding the federal

maintenance dredging application. The material after the most recent dioxin sediment concentration tests was found to be cleaner than the original testing. Therefore there is no basis for the Corps and EPA not to reinstate the maintenance dredging permit with ocean disposal for Port Newark/Elizabeth Marine Terminal Reaches B, C and D.

The seriousness of this issue cannot be overstated. The region is hurting. The 180,000 port jobs as well as regional fishing and tourism-related jobs are at stake. The economic costs are mounting and environmental costs of ocean disposal of dredged material is negligible. We must recognize that the environmental costs of not dredging decreases safety and may lead to spills. In addition, the sediment is in the waterway and is churned up by tidal action and ship passage. It is absurd not to dredge and ocean dispose of the material. It is also supremely ironic that those who express the greatest concern on environmental grounds do not favor capping at the ocean site which is the most expeditious and secure means available for handling contaminated sediments. Meanwhile, the Port of New York and New Jersey is losing cargo. Port interests have pursued a dredging permit fully mindful of and sensitive to the need to ensure that any dredging activity undertaken incorporates the soundest environmental practices.

A clear federal policy is needed now to enable dredging and material management to be conducted without sacrificing the safeguards that are intended by our nation's environmental laws. Part and parcel to that is need for a major adjustment to the federal regulations and the manner in which they are implemented. No longer can we afford to have agencies of the singular federal government act as if they are distinct feudal estates whose primary goal is to protect one's ground against intruders and not work in concert with each other. Time limits must be set and observed, the rules and standards must not be changed midstream, and regulators should be sensitive to the consequences of inaction and indecision.

Perhaps as important, the federal government must acknowledge that its role in tese matters is not simply as a regulator but as a major stakeholder. It is responsible for the dredging of the federal channels which constitute most of the volume of material dredged in our port and others. It is responsible for the US economy that depends on ships carrying cargo to and from the rest of the world. It is responsible for a coastal environment that depends on creative and protective management of its natural resources.

Ultimately, this is not a story of a terminal operator that cannot dredge some berths. It is a question of whether the infrastructure of our and other American ports will be maintained for commerce. And ultimately, I am optimistic that Congress will address these matters and that the executive branch will learn from this unfortunate experience. Thank you for your consideration. I greatly appreciate the opportunity to express my concerns. Mr. Chairman, I offer to work with you and the committee to resolve these issues.

TABLE I
Port Newark/Elizabeth Port Authority Marine Terminal
Maintenance Dredging Cost Comparison
Past Annual vs. Probable 1993

	Past Dredging	Expected 1993 Dredging
NJDEPE Dredge Site Monitoring	N/A	$250,000
Ocean Disposal Sampling, Testing, Risk Assessment & Staff Costs	$50,000 to $100,000	$1,500,000
Dredging Construction	$600,000	$1,500,000
Capping (mining of sand)	N/A	$3,000,000
Equipment Mobilization	$38,000	$60,000
TOTAL	$638,000	$6,310,000
ROUNDED TO	$1,000,000	$6,500,000

OR 6.5 TIMES MORE

CHRONOLOGY OF PORT NEWARK/ELIZABETH (PN/E) PERMIT

1990	
February 15	Meeting with Corps on PN/E
March 9	Sampling Plan meeting with Corps
April 5	Sampling Plan obtained from Corps
11	PA submits formal application to Corps
May 6	Original Corps permit expires
June 19	Corps letter to ENSECO Lab requesting QA data prior to initiation of 28-day request
25	Meeting with NJDEPE to confirm testing protocol
26	First bulk sediment test results available for Corps (Reaches B & D)
July 3	Bulk sediment analyses formally submitted to Corps; PA requests go-ahead to start 28-day test
11	PA submits bulk sediment data to NJDEPE
12	PA inspects labs (S. Solomon)
23	PA submits additional information (boring logs) which Corps requested as a result of the 7/3/90 submission
August 17	PA compiles data summary sheets of data supplied on 7/23/90, which Corps requested
September 6	Corps provides PA with approved sampling schemes & concurrence to start-up 28-day testing
7	PA requests EPA's concurrence with Corps' 28-day sampling plan; PA meets with EPA, gets verbal okay
11	EPA forwards written concurrence
20	PA (Port/Engineering Depts) gives PA (Materials Division) formal authorization to proceed with 28-day testing
20	PA submits EPA/Corps concurrence to NJDEPE
October 1	PA staff meet at ENSECO facility to discuss discrepancies in the report
November 21	PA notifies ENSECO to repeat 28-day test
1991	
January 4	PA submits bioassay data (except for 28-day tests) to Corps
February 15	Corps sends comments to PA regarding 1/4/91 submittal

March 14	ENSECO verbally reports results of 28-day re-test (see 11/21/90) to PA
19	PA submits response to Corps comments of 2/15/90 and submits 28-day data
27	PA submits formal application, with all test results, to NJDEPE
April 4	NJDEPE permit expires
29	Corps requests additional information (re: PA 3/19/91 submittal) on the data
May 9	PA responds to Corps' 4/29/91 comments
22	Corps requests additional "clarification" of data
30	Corps requests additional "clarification" of data
June 13	PA responds to Corps' 5/22 and 5/30 comments
19	PA submits draft Risk Assessment (EA) report to Corps
July 1	NJDEPE issues permit with no barge overflow
25	PA responds to NJDEPE barge overflow restriction
August 6	Corps' WES provides comments on EA report
September 11	Interagency DIOXIN Steering Committee meets
November 15	Corps provides new sampling plan for re-testing of Reach A
25	Corps issues 30-day public notice for Reaches B, C & D and states that Interim Guidelines for Dioxin have been established (25 ppt. w/capping)

1992

January 24	Corps issues public notice announcing a public hearing (to be closed 3/6/92)
February 21	Corps issues public notice to extend comment period to 3/16/92
24	Public hearing held
March 11	Corps/EPA agree on interim guidelines for dioxin disposal
16	End of comment period
June 18-26	PA responds to public notice/hearing comments
24	PA responds to EDF June 1992 Critique of EA Report and EDF 3/16/92 comments on public notice
July 13	EPA letter to PA stating further criticism of Risk Assessment
29	EDF letter to Corps/EPA questioning interim criteria and suggesting the need for EIS (dioxin), baseline data at Mud Dump, more public notice

August 10 EDF letter to PA continuing to question interim criteria and Risk Assessment

September 11 PA memo indicating Corps wants a dioxin pre-tested material or sand cap
25 EPA letter to PA requesting further coordination on Risk Assessment information

October 6 PA letter to Corps formally requesting modification of PN/E application to use Ambrose as second source cap
8 NJDEPE letter to PA modifying NJDEPE permit to include overflow monitoring
9 PA letter to NJDEPE to accept the 10/8/92 NJDEPE permit modification
14 PA submits Reach A re-test data to Corps
19 Corps issues supplemental public notice for Ambrose cap

November 4 EDF letter to Corps/EPA/NJDEPE/NYSDEC/PA requesting EIS related to dioxin, PHCs and the cumulative effect of sand mining
18 F&WS letter to Corps requesting extension of comment period on cap to 12/9/92
19 PA submits formal application for Reach A
20 PA memo announcing meeting to be held between PA/Corps/EPA/NJDEPE/EDF
24 Corps letter to PA transmitting comment letters from cap supplemental public notice
25 PA/Corps/EPA/NJDEPE/EDF meeting discussing possible permit details and Mud Dump monitoring plan

December 4 EPA letter to Corps approving Management & Monitoring Plan at Mud Dump
9 F&WS letter to Corps stating objection to permit and referring to elevation procedures in event of Corps' issuance of the permit
9 PA responds to cap public notice comments (other than 12/9/92 F&WS letter)
31 EPA letter to Corps changing the previously set 25 ppt. criteria

1993

January 4 EDF letter to Corps/EPA echoing 12/31/92 EPA letter
6 Corps issues permit for 500,000 cubic yards
11 EDF letter to Corps/EPA/DEP raising volume/testing issue
13 EPA letter to Corps echoing EDF letter of 1/11/93 and shifting on ocean disposal
13 EDF letter to Corps objecting to volume of material and seeking re-testing of dredged material
13 PA letter to EPA defending volume/testing issue
14 Corps letter to PA suspending permit
15 PA letter to Corps requesting meeting on 1/19/93 to discuss permit issues

	15	Corps letter to PA notifying PA that Corps and EPA are available to meet on 1/27/93
	26	PA letter to EPA affirming volumes to be dredged
January	27	PA meets with Corps/EPA
	27-28	EPA 2-day conference on Dredging and Disposal of NY/NJ Harbor Sediments
	29	EDF letter to EPA raising bioaccumulation issue throughout harbor and criticizes criteria level of 10 ppt
February	2	NMFS letter to EPA raising Endangered Species Act issue
	4	Corps and PA meet to clarify outstanding issues raised during suspension and 1/27/93 meeting
	5	Congressional Forum on dredging
	9	PA letter to Coast Guard requesting review of safe berth depth for facility
	12	EPA letter to Corps specifying conditions to be met for re-issuance of permit for Reaches B and C, while Reach D is acceptable without further testing
	17	EDF letter to Corps requesting a meeting and opposing EPA's decision not requiring additional testing for Reach D

PPLICANT	WATERWAY	LOCN.	VOL. CY.	DATE APPLICATION R CD.
Amerada Hess	Newark Bay	Newark NJ	39,000	16 Oct 92
Atlantic Salt Co., Inc.	Arthur Kill	Staten Island NY	20,000	14 May 92
Borough of Belmar	Shark River	Belmar NJ	50,000	24 Mar 92
British Petroleum	Arthur Kill	Linden NJ	50,000	Pre-application
Celanese Chem. Co.	Passaic River	Newark NJ	25,000	16 Jul 90
Chevron, U.S.A., Inc.	Arthur Kill	Perth Amboy NJ	63,000	4 Feb 91
CITGO Petroleum	Arthur Kill	Linden NJ	4,200	16 Jan 92
City of Perth Amboy	Arthur Kill	Perth Amboy NJ	30,635	1 Feb 91
Con Edison of NY	Arthur Kill	Staten Island NY	87,000	
Con Edison of NY (59th Street)	Hudson River	NY NY	44,000	9 Mar 92
Con Edison of NY	East River (Brooklyn side)	Brooklyn NY	16,000	Pre-application
Con Edison of NY	East River (Manhattan side)	NY NY	9,000	Pre-application
Con Edison of NY	The Narrows (Brooklyn side)	Brooklyn NY	24,000	11 May 92
Department of the Army, Bayonne (MOTBY)	NY Harbor	Bayonne NJ	183,000	2 Mar 92
Department of the Navy, EARLE	Sandy Hook Bay	Middletown NJ	2,300,000 700,000 1,000,000	23 Dec 92 16 Sep 92 Pre-application
Dupont	Arthur Kill	Linden NJ	no information	Pre-application
EXXON USA, Inc.	Arthur Kill	Linden NJ	11,318 25,000	26 May 92 Pre-application
EXXON Company, USA, Inc.	Kill Van Kull	Bayonne NJ	100,000	13 Mar 91

May Ship Yard & Repair Co.	Arthur Kill	Staten Island NY	67,500	Pre-application
Mobil Oil Corporation	Arthur Kill	Staten Island NY	80,000	19 June 92
NJDEPE-Liberty State Pk	Hudson River Morris Canal Basin	Jersey City NJ	110,000	Pre-application
NYC DEP North R. Wtr Pollution Control Plant	Hudson River	NY NY	15,000	17 Apr 89
Northville Linden	Arthur Kil	Linden NJ	18,000	22 Apr 92
Port Authority of NY & NJ (Howland Hook)	Arthur Kill	Staten Island NY	50,000	8 May 91
Port Authority of NY & NJ Pt. Nwk./Pt. Elizabeth (Reaches B, C, D)	Newark Bay	Newark/E'beth NJ	500,000	9 Apr 90
Port Authority of NY & NJ Pt Nwk./Pt. Elizabeth (Reach A)	Newark Bay	Newark/E'beth NJ	50,000	22 Oct [illegible]
Port Authority of NY & NJ Bklyn. Marine Terminal	East River	Brooklyn NY	150,000	15 Oct 92
Port Authority of NY & NJ Bergen Basin	Jamaica Bay	Queens NY	38,000	22 Jul 89
Refined Sugars, Inc.	Hudson River	Yonkers NY	60,000	10 Mar 92
Shell Oil Company	Arthur Kill	Woodbridge NY	10,500	11 Dec 90
Stratus (nee Tenneco)	Passaic River	Newark NJ	100,000	9 June 86
Texaco	Newark Bay	Newark NJ	15,500	Pre-application
Tower Ridge YC	Hudson River	Yonkers NY	15,000	16 Jan 92

US Gyspsum Company	Hudson River	Stony Pt. NY	95,000	21 Aug 92
Vinco Marine Management, Inc. (d/b/a World's Fair Mar)	Flushing Bay	Queens NY	25,000	15 Apr 92
Yonker's YC	Hudson River	Yonkers NY	8,575	24 Sep 92

REGIONAL FINE-GRAINED DREDGED MATERIAL MANAGEMENT PLAN NEXT STEPS

Underlying any dredged material management plan is the need for regulatory organizations to work through the various state and federal governments in an expeditious and non-redundant manner. As technological detection of contaminants becomes more and more sophisticated, the appropriate toxicity standards oftentimes have not been determined. The lag of standards to detection needs to be shortened and definitive policy must be established. Federal/state agencies need to coordinate the appropriate standards, policies and regulations, e.g. if fish standards are determined by NMFS or the FDA, this needs to be established at the outset.

Broad categories for a dredged material management plan and handling program are as follows:

- Dredged material - the physical constraints of the material, remediation, and the mechanics of handling; and source control.
- Disposal sites - or siting.

I. **DREDGED MATERIAL** - Clean-up, source control and handling.

A. Harbor Estuary Program (HEP)

1. **Ongoing participation in HEP.** The comprehensive conservation management plan (CCMP) is being developed. The CCMP will be the NY/NJ Harbor's long term management plan covering future use and clean-up.
   Time: 2 years

2. **Establish HEP finance committee.** The finance committee will develop long range plans and policies for funding the CCMP and prioritize the recommendations.
   Time: 6 months

B. Keep current on latest dredging and disposal technologies, and source control - Sponsorship of studies/research, such as the Conference on the Bio-Remediation of Sediments, the Conference on the Remediation of Sediments and the Workshop on Non-Point Source Pollution and Dredging (all of which were held in 1992).

1. Sediment remediation technologies (USEPA/USACE)

2. Non-point source pollution controls and/or remediation (PA/USEPA/USACE)

3. Determine most effective dredging technology, i.e. the mechanics of dredging (PA/USACE)

4. Siltation prevention (PA/USACE)

   Time: 1 year

C. Determine and pursue sources of pollution

1. Clean-up, seek expedited resolution of superfund river contamination. (PA/STATE/FED)
   Time: 1 year

2. Pursue polluters to compensate for additional expenses, expedite cleanup and contribute to alternate research. (PA/STATE/FED)
   Time: 1 year

D. Determine and implement demonstration projects of leading edge technologies

1. Implementation of WRDA 1992, Section 405 decontamination demonstration project. (USEPA/USACE)
   Time: Annual appropriation

   a. Need to convene regional interest groups (Great Lakes model) for input prior to actual initiation of demonstrations
      Time: 2 months

      1) Suggested demonstration technologies

         a) bio-remediation - such as magnetic anaerobic sulphur bacteria
         b) thermal decomposition
         c) chemical dechlorination
         d) solvent extraction
         e) mechanical separation - such as hydrocyclone
         f) pyrolysis
         g) vitrification
         h) chemical fixing, binding or stabilization
         i) incineration

b. Develop program
Time: 3 months

2. Development of new demonstration projects
Time: 2 to 3 years

II. **DISPOSAL SITES -**

A. New ocean site designation

1. PA RFP to review and make recommendations on required studies, federal budget requirements and schedule.
Time: 12 months (final report)

2. Federal process for designation. (USEPA/USACE)
Time: 5 years

B. Implementation of the use of subaqueous borrow pits

1. USACE to release findings.
Time: Immediate

2. Corps to apply for New York State generic 401 Water Quality Certification
Time: 3 months to 2 years (if NYSDEC requires public hearings, implementation will probably take 2 years)

C. Containment Island

1. PA Engineering to review and make recommendations for supplemental studies needed beyond existing work done to date to site and build a containment island, including an environmental gameplan
Time: 6 months (final report)

2. Public process - siting
Time: 10 years
3. Construction
Time: 2 years for a usable element

D. Upland disposal/remediation sites

1. 295 sites were identified by USACE, all of which were ultimately considered inappropriate. We are recommending that all sites be re-examined under

new criteria to be developed by port stakeholders to determine current availability.
Time: 1 year

2. PA to prepare RFP - regarding upland dredged material handling and environmental gameplan, includes advertisement to final report.
Time: 1 year

E. Federal role in funding disposal sites

1. Work with the AAPA and ports in establishing a federal role in funding disposal sites.
Time: 1 year

2. Develop coastal states (trust) fund proposal for clean-up of sediments.
Time: 1 year

AAPA = American Association of Port Authorities
PA = Port Authority of New York and New Jersey
USEPA = U.S. Environmental Protection Agency
USACE = U.S. Army Corps of Engineers

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I

New View Calls Environmental Policy Misguided

By KEITH SCHNEIDER
Special to The New York Times

WASHINGTON, March 20 — A generation after the United States responded to poisoned streams and filthy air with the world's first comprehensive strategy to protect the environment, many scientists, economists and Government officials have reached the dismaying conclusion that much of America's environmental program has gone seriously awry.

These experts say that in the last 15 years environmental policy has too often evolved largely in reaction to popular panics, not in response to sound scientific analyses of which environmental hazards present the greatest risks.

As a result, many scientists and public health specialists say, billions of dollars are wasted each year in battling problems that are no longer considered especially dangerous, leaving little money for others that cause far more harm.

At First, Clear Benefits

In the first wave of the modern environmental movement, starting about 20 years ago, the focus was on broad efforts to eliminate the most visible pollution pouring from smokestacks and sewer pipes — programs with clear goals that had obvious benefits.

But a second wave began in the late 1970's, with a new strategy intended to limit visible pollution further — and to begin attacking invisible threats from toxic substances.

To that end, state and Federal governments began writing sweeping environmental laws, some of which included strict regulations to insure that certain toxic compounds were not present in air, water or the ground at levels that did not exceed a few parts per billion, concentrations that could be measured with only the most sophisticated equipment.

The result was a tangle of regulations that the Environmental Protection Agency estimates cost more than $140 billion a year, roughly $100 billion spent by industry and $40 billion by Government.

But what is now becoming apparent, some scientists and public health specialists say, is that some of these laws — written in reaction to popular concerns about toxic waste dumps or asbestos in the schools, as examples — were based on little if any sound research about the true nature of the threat. Since 1980 for instance, thousands of regulations were written to restrict compounds that had caused cancer in rats or mice, even though these animal studies often fail to predict how the compounds might affect humans.

And with rare exceptions Congress approved new laws without subjecting them to even rudimentary cost-benefit analyses. One reason was that during the 1980's, when the economy seemed healthier, there was far less pressure on Congress to consider the cost of environmental policy.

Overpriced and Misguided?

Now a new Administration intent on strengthening environmental policy is settling into office when competition for scarce financial resources is keen. At the same time, a wealth of new research shows that some of the nation's environmental protection efforts are excessively costly — though no one knows how much of this money is misspent — and devoted to the wrong problems.

This view is the vanguard of a new, third wave of environmentalism that is sweeping across America. It began in the late 1980's among farmers, homeowners and others who were upset largely by the growing cost of regulations that didn't appear to bring any measurable benefits. Corporate executives had long been making similar arguments but had gone unheeded, even during 12 years of Republican rule, because often they were seen as interested only in saving money.

Richard J. Mahoney, chairman and chief executive of Monsanto, the chemical company, said the nation may start listening to industry now.

"People want to know, even with the environment, what we are getting for our money," he said. "The most positive thing since the election is that we are beginning to recognize that we do have finite resources, and one must make choices."

But leaders of the nation's conservation organizations believe the new view is misguided.

"We don't need a new paradigm," said David D. Doniger, a senior lawyer with the Natural Resources Defense Council. "For 35 years, the policy of the Government has been that when there is uncertainty about a threat it is better to be safe than sorry. When you are operating at the limits of what science knows, the big mistake would be to underestimate the real danger and leave people unprotected."

Still in the last few years the wave has moved into universities, city halls, state capitols and even to the highest levels of the E.P.A., whose Science Advisory Board in 1990 concluded that environmental laws "are more reflective of public perceptions of risk than of scientific understanding of risk."

Law Follows Panic

William K. Reilly, the E.P.A. Administrator at the time, agreed. And in a recent interview in his office at the World Wildlife Fund, he argued: "People have a right to expect that public officials are making the right choices for the right reasons. We need to develop a new system for taking action on the environment that isn't based on responding to the nightly news. What we have had in the United States is environmental agenda-setting by episodic panic."

Richard D. Morgenstern, the acting administrator for policy planning and evaluation at the E.P.A., explains the problem this way: "Our society is very reactive, and when concerns are raised people want action. The problem in a democracy is you can't easily sit idly back and tell people it would be better to learn more."

The result, he added, is that "we're now in the position of saying in quite a few of our programs, 'Oops, we made a mistake.'"

President Clinton is clearly aware of this view. As Governor of Arkansas, he continually complained as a Federal toxic waste cleanup project in Jacksonville devoured $25 million in state, Federal and private money. State officials said nearly a decade of work has produced little more than piles of technical documents, exorbitant legal bills and public discord.

To be sure, some of the $140 billion the nation is spending this year pays for environmental programs that are indisputably useful. As an example, few experts question the value of spending roughly $3 billion each year on new sewage treatment plants. Many experts, however, question the wisdom of spending billions of dollars to protect people from traces of toxic compounds.

The new school of thought has blossomed as policy makers confront planetary threats like global warming, ozone depletion and deforestation in which the consequences of wrong action are much greater. Unless the nation rethinks its approach to environmental protection, some experts say, the United States could repeat its mistakes.

"The President is aware of this dilemma, and there is leadership in this Administration for trying to change the way we do business in every aspect of governing, including environmental protection," said Carol M. Browner, the Administrator of the Environmental Protection Agency. "We have to allow for change to occur as new information becomes available. This is not an area where a solution will fit forever."

Policy Now

Costly Solutions Seeking Problems

Almost everyone involved, including communities and local environmental groups, agrees that the toxic waste program stands as the most wasteful effort of all. It began 15 years ago, when the nation rose in revulsion over the discovery of seeping chemicals at Love Canal in New York. Hundreds of people were evacuated from their homes.

In response, Congress passed two laws, the Superfund law of 1980 and amendments to the Resource Conservation and Recovery Act in 1984. A decade later, those laws have driven the Government to spend almost $2 billion a year for the Superfund, which cleans up toxic waste sites, and more than $8 billion more a year on similar programs in other agencies, even though many of the sites pose little if any danger.

"Does it make sense to spend millions of dollars cleaning up a site that only has a tenth of an ounce of contamination?" asked Dr. Richard Goodwin, a private environmental engineer in Upper Saddle River, N.J., who has overseen more than 20 toxic waste cleanups. "I say, no. All we're doing in most cases is throwing money at a problem without improving public health or the environment."

Hugh B. Kaufman, a hazardous waste specialist at the E.P.A. who helped uncover the problem at Love Canal, said that in the few cases in which a site is near populated areas, "the best thing we can do is evacuate people if they want, then put up a fence and a flag that says stay away."

Mr. Kaufman said he knows that his idea represents a marked change in the traditional view of how the nation should care for its land. But he and other experts says it does not make sense to clean up these wastes at costs that frequently exceed $10 million an acre.

Even a principal author of the Superfund law, Gov. Jim Florio of New Jersey, who was chairman of a House environmental subcommittee in the 1970's, now argues that the "flexible rules mean that Superfund resources are too often devoted to making sites pristine."

"It doesn't make any sense to clean up a rail yard in downtown Newark so it can be a drinking water reservoir," he said, speaking rhetorically.

Toxic waste cleanups are one example of a program gone awry. Here are others:

■Early in the 1980's, Government scientists argued that exposure to asbestos could cause thousands of cancer deaths. Since asbestos was used as insulation in schools and public buildings, parents reacted with alarm. So in 1985 Congress approved a sweeping law that led cities and states to spend between $15 billion and $20 billion to remove asbestos from public buildings. But three years ago, the E.P.A. completed research that prompted officials to admit that ripping out the asbestos had been an expensive mistake, the removal often sent tiny asbestos fibers into the air. Now, except in cases when the asbestos is damaged or crumbling, the Government's official advice is: Don't touch it.

■In 1982, high concentrations of dioxin were discovered in the dirt roads of Times Beach, Mo., near St. Louis. Residents were alarmed, the Government had designated dioxin as one of the most toxic substances known. The furor came in the middle of a scandal at the E.P.A., the agency's chief, Anne Gorsuch Burford, was accused of not enforcing environmental law and being too close to industry. And as that scandal dominated the news, the Reagan Administration decided to evacuate all 2,240 residents of Times Beach, a project that cost the Government $37 million. But new research indicates that dioxin may not be so dangerous after all.

None of the former residents of Times Beach have been found to be harmed by dioxin, and two years ago, Dr. Vernon N. Houk, the Federal official who urged the evacuation, declared that he had made a mistake.

Yet even as enormous sums of money were being spent on these problems, Washington was doing little about others. Here are two:

■Mercury, a highly toxic metal, has contaminated thousands of lakes across the nation, poisoning wildlife and threatening human health; state environmental officials say. Twenty states, including New York, have posted warnings at lakes urging people not to eat the fish because they are tainted by mercury, which can cause nervous system disorders. But during debate on the Clean Air Act in 1990, Congress considered limiting mercury emissions from coal-burning electric plants. The lawmakers decided not to act because they believed utilities had already been asked to spend enough to control acid rain, Senate and House leaders said.

■In the last two years, several Federal agencies have called exposure to lead the largest environmental threat to the nation's children. Although some scientists dispute that, several studies have shown that lead poisoning in children leads to reduced intelligence, learning disabilities and hyperactivity. The problem is that most houses built before the 1970's could have some lead-based paint, and the fear is that children are eating paint chips or inhaling lead-laden dust. Some experts have said removing the lead paint will cost at least $200 billion. This year, the Government will spend $234 million on the problem, far less than it spends on cleaning up toxic wastes.

The Path to Policy

When Politics Mixes With Fear

Even the advocates of change acknowledge that as science evolves, experts may change their views again on the dangers posed by these and other substances. But at the least, "sound science should be our compass," as Mr. Reilly put it two years ago.

After all, it was politics, misinterpreted or inaccurate scientific findings and a newly influential national environmental movement that combined to set America down its present path.

During the 1970's, the United States had successfully dealt with many obvious environmental problems. When the Cuyahoga River in Cleveland caught fire in 1969, as an example, Congress passed the Clean Water Act. About the same time came the Clean Air Act, the Endangered Species Act and other landmark environmental statutes — laws that are now widely acclaimed.

By the late 1970's, many Democrats in Congress believed the public wanted even stricter environmental law. But when Ronald Reagan was elected in 1980, he promised to reduce regulation. While the White House and Congress battled over this, the national environmental movement, with help from the news media, took on the job of warning the public about new threats and creating campaigns to enlist popular support for new regulations. They were spectacularly effective at this, and Congress passed two dozen bills that laid down a welter of mandates.

In the 1970's, environmental statutes ran by an average of more than 50 pages. In the 1980's, these bills seldom numbered fewer than 500 pages. The reason was that Congress wanted to mandate safety limits so specific that the Administration could not ignore or evade them. Mr. Reilly, the former E.P.A. chief, said he was largely unable to change the Government's thinking, despite his strong opinion that environmental policy was on the wrong course, because "this represented a pretty significant change of direction."

Legitimizing Pollution?

At the leading environmental groups, staff members dispute the developing view that environmental policy is off track.

"It's an effort to legitimize pollution," said Daniel F. Becker, director of the Global Warming and Energy Program at the Sierra Club. "There are powerful forces who have an economic stake in de-emphasizing environmental damage."

But others who analyze environmental issues said these groups are in danger of becoming the green equivalent of the military lobby, more interested in sowing fear and protecting wasteful programs than in devising a new course.

"We are in danger of losing credibility and thus losing public support if we don't modify the whole way we go about protecting public health and the environment," said Dr. Devra Lee Davis, a senior research fellow at the National Research Council of the National Academy of Sciences.

A Case Study

Making Dirt Safe to Eat

Perhaps no environmental program has come under more criticism than the Superfund and its progeny. The Federal programs to clear toxic or radioactive wastes will consume more than one-quarter of the roughly $38 billion that the Federal Government spends for environmental protection this year. Experts in and out of the Government assert, though, that the justification for these expenditures is often questionable.

Consider the case of Columbia, Miss. The E.P.A. is overseeing the last phases of a $20 million Superfund cleanup project there. Like many others around the country, this one was guided by the Government's assumption that children will eat dirt. Lots of it. And from that dirt, the Government then fixed that they could develop cancer.

Some evidence suggested that this was an exaggerated concern. In 1981, a study for the Congressional Office of Technology Assessment, which has been endorsed by the National Cancer Institute, found that only 1 to 3 percent of all cancers in people are caused by exposure to toxic chemicals in the environment. This finding, however, has had little influence on Federal policy.

The problem in Columbia was an 81-acre site that over its long life had been home to a lumber mill, a naval turpentine and pine tar plant and a chemical manufacturer.

Soil tests taken in 1986 showed traces of compounds the Government defines as hazardous. The concentrations rarely exceeded 50 parts per million, or about two ounces of chemicals mixed in a ton of soil. But that level exceeded the Federal limit, and the E.P.A. placed the land on its list of dangerous toxic waste sites.

Some experts told the E.P.A. that such tiny amounts of contamination were harmless. They said the safest and most economical way to solve the problem would be to spread a layer of cleaner soil and call it a day. The cost: about $1 million.

But six years ago the E.P.A. settled on the most expensive possible solution. The Government ordered Reichhold Chemical, the plant's former owner, to dig up more than 12,500 tons of soil and haul most of it to a commercial dump in Louisiana — 450 dump truck loads, each one costing $7,500.

E.P.A. officials said they wanted to make the site safe enough to be used for any purpose, including houses — though no one was proposing to build anything there. With that as the goal, the agency wanted to make sure children could play in the dirt, even eat it, without risk. And since a chemical in the dirt had been shown to cause cancer in rats, the agency set a limit low enough that a child could eat half a teaspoon of dirt every month for 70 years and not get cancer.

Last month, the E.P.A. officials acknowledged that at least half of the $14 billion the nation has spent on Superfund cleanups was used to comply with similar "dirt-eating rules," as they call them.

"I don't think any way you look at this it could be seen as a practical solution," said W. Scott Phillips, an engineer with Malcolm Pirnie, an environmental planning company that manages the cleanup. "It's a lot of money to spend moving dirt."

Sea-Dumping Ban: Good Politics, But Not Necessarily Good Policy

By MICHAEL SPECTER

For millions of people from Montauk to Maryland, the troubling summer of 1988 will be hard to forget. It was the hottest year ever recorded. Repulsive trash slicks covered the Eastern shore line. And borne upon a tide of public outrage, garbage emerged as a potent political issue.

In New York and New Jersey, where most of the waste appeared, health officials closed beaches by the score depriving sweltering people of relief. Pictures of used syringes, dead dolphins and human excrement scattered across the sand became a staple of the news.

Anger required action. So that fall without registering a single vote of opposition, Congress banned the dumping of sewage into the ocean. The law prohibited New York City from dropping its processed waste into the sea and forced officials to find costly new ways to get rid of it.

The Rush to Ban

"This is a turning point in human history," said a euphoric Representative William J. Hughes, Democrat of New Jersey after the vote. Other officials agreed, rushing to embrace the law as one of the most important environmental measures ever enacted.

There was just one problem.

Ocean dumping had absolutely nothing to do with the garbage that washed up on the sand that year. In fact, the problems that caused the mess on the beaches in 1988 — overtaxed sewage systems — were largely ignored, and the health risks they present are as serious as they have ever been.

Most scientists agree that using the sea as a garbage can was unpleasant and are pleased that it is no longer legal. Still, some argue that dumping sewage in the Atlantic Ocean 106 miles from the shore — which saved New York and other cities billions of dollars over the years — is less hazardous than most of the disposal methods that have replaced it.

But Congressional leaders, relying almost solely on the summer's vivid images of filth, pushed through a ban on ocean dumping. As Senator John H. Chafee, Republican of Rhode Island, put it immediately after the vote: "It is unfortunate that it takes a situation like we have today with medical waste washing up on our beaches, to capture the attention of the American public and of Congress. But perhaps it is a blessing in disguise, since it has resulted in our action today to put a halt to the ocean dumping of sludge."

Representative Thomas J. Manton, Democrat of Queens, opposed the act at first, saying it would simply shift waste from sea to land, including land in his own district. But looking back to that time, he recalled: "If you opposed the bill you were treated like a leper or an environmental terrorist. Nobody wanted to discuss the relative risks or the merits. It had been a bad summer, and we all wanted to be able to say we did something. So we passed a law. I tried to have a debate. And it was like I was trying to destroy the planet."

Because of the Ocean Dumping Act, New York City spent $2 billion on giant plants that turn sludge into fertilizer. The city plans to spend at least $300 million a year over the next decade to dispose of its sludge in this way and in others — many times more than it would cost to dump it in the ocean.

Better Ways to Spend

Even some of the ban's most enthusiastic proponents at major environmental organizations, none of whom would be quoted by name, concede that the money might have been better spent on other problems, like fixing the extensive system of storm sewers that caused the waste to wash up on the beaches in the first place.

Indeed, the ocean dumping ban is a striking triumph of environmental politics over science, a clear demonstration of how environmental policy can often be directed by symbols and fears than by reasoned discussion of benefit and risk.

In 1988, and still today, the real problem came from New York's aged, 6,200-mile network of sewer pipes that mix household waste with rainwater. Normally, it is all treated together. But during storms, sewage treatment plants are quickly overwhelmed, and sewer pipes carry millions of gallons of raw waste directly to the rivers and harbors surrounding the city.

In fact, officials have closed beaches in the summers since 1988 more often than they did before the ban went into effect.

There is no question that the New York City sewer system is the greatest cause of water pollution in the region, a fact that has almost always been true," said Howard Golub, acting director and chief engineer of the Interstate Sanitary Commission, a regional regulatory agency that for 20 years has been trying in vain to convince people to pay attention to the problem.

"But a sewer system isn't sexy," he added. "It's expensive to fix, and nobody wants to hear about it. So people focused on what they understand — and they understand that sewage and the sea don't seem nice together."

The Real Problem

Wallflower At a Political Dance

Modern sewerage usually consists of two systems: storm sewers that carry off excess rainwater, and sanitary sewers that handle sewage that needs treatment.

But older, combined systems, like New York City's, serve almost 20 percent of the nation's population, about 50 million people living in the America's oldest cities. For decades they have been the major cause of beach closings and dangerous levels of bacteria in coastal waters. They generally work well enough in normal times, sewage and rainwater are treated together and then discharged.

During a heavy storm, however, so much water washes into the combined system that it is overwhelmed. The treatment centers cannot handle the load and everything — storm water and sewage — floods untreated out the pipe.

To solve the sewer problem, New York would have to build enormous subterranean tanks to hold waste water during heavy downpours, and the city Department of Environmental Protection says that could cost several billion dollars. Without them, many beaches in the area will continue to be closed after particularly heavy storms. Every time more than three-quarters of an inch of rain falls, 500 million gallons of mixed sewage pours into area rivers and harbors, the city says.

A report by the State University of New York estimated that sewage overflows cost New York and New Jersey $3 billion to $7 billion in lost jobs, lost fishing days and forfeited economic opportunities in the previous decade.

That report was published in 1988, just as the sewers were flushing syringes and other trash from streets and gutters onto the beaches. Still, almost nobody seriously questioned the need for an immediate ocean dumping ban.

'Congress Acted on Emotion'

As Alan Robin, a senior Environmental Protection Agency official in charge of determining the risks of disposing of sludge, put it in a recent interview: "By 1988 ocean dumping had become taboo, about as politically incorrect as any disposal of waste can be. Maybe it was a good thing that happened. Maybe not. But it was not decided on the merits. Congress acted on emotion, not on data."

Those who supported the ban now argue that two rights cannot make a wrong. They say that ocean dumping needed to stop and that bills get passed when they can, not always when they make the most sense.

"You take care of emergencies first in life and in politics," said Senator Frank R. Lautenberg, the New Jersey Democrat who was a leader in the fight to end ocean dumping.

Senator Lautenberg agreed that sewage overflows pose a serious health risk, but he added: "Sludge dumping was the equivalent of a fire we could put out. Just because you have earthquakes on the horizon doesn't mean you should let the fire rage."

Mr. Lautenberg asserted that it was not as clear in 1988 as it is today that storm sewers, not ocean dumping, were to blame for most of the trash that appeared on the beaches. But he did agree that the barges heading out to sea provided an image that was too useful to ignore.

"There is simply a point when you have to look at the broader picture," he said. "When we passed the law, it was at the height of a couple of ugly seasons. The waste may not have been a direct result of the ocean dumping, but it did alert people to the fact that we need to stop pouring garbage into the ocean."

Unsavory Practice

Where to Put A City's Sludge

Few people are genuinely unhappy about the demise of a practice in which 15 billion gallons of distilled sewage sludge was dumped each day 106 miles off the coast of New Jersey. Even those who say it makes sense to consider using the deep sea to store dangerous wastes acknowledge that the sludge was beginning to find its way into the food chain on the ocean floor.

And while most industrial waste, heavy metals and dangerous contaminants were removed from the sludge before it was dumped in the ocean, it was never possible to extract all the poisons found in a huge sewage system.

For decades, New York dropped its sludge only 12 miles off the coast — turning vast aquatic reaches into home to nothing but slime. Environmentalists fought for years to end ocean dumping. As a compromise, the Federal Government decided to permit New York and several neighboring cities to shift its dumping to the edge of the continental shelf, where E.P.A. officials said it would do no harm.

But even at 106 miles, where there is no scientific proof that waste disposal causes illness in humans, ocean dumping of waste has proven to be less than ideal. Although researchers first thought sludge dumped there would never reach the bottom of the ocean, scientists now know that some of it does. And after it gets there, it is eaten by animals that are eventually eaten by man.

But scientists argue that it may be just as troublesome to dump the sludge anywhere else. Sludge in landfills can seep into ground water. Even beneficial uses, like turning sewage to fertilizer, costs millions in processing and shipping.

Whatever the ancillary benefits, the ocean dumping ban may have offered it also cost New York a great deal of money. And many officials now say that money could have been put to far better use by trying to resolve the more complicated — and pressing — dilemma caused by combined sewer overflows.

"Am I sad that we no longer dump sludge in the Atlantic Ocean? Absolutely not," said Albert F. Appleton, commissioner of New York City's Department of Environmental Protection. He has made clean water a major focus of his tenure. "In a perfect world we simply wouldn't dump our waste at sea. But is that how I would have spent our next $2 billion? Never in a million years."

Other Solutions

A Victory Draws Questions

Tough new laws passed since the mess of 1988 govern the disposal of medical waste. So syringes and intravenous bags no longer show up on beaches with much frequency. And Coast Guard boats now skim coastal waters for other visible debris. But the levels of microscopic organisms that the E.P.A. considers harmful to humans and fish — the real problem — are no less serious than they have ever been.

"When environmentalists see a problem they tend to say, 'Let's have a total solution,'" Mr. Appleton said. "They don't say, 'How much bang can we get for our buck?' They don't say, 'Where is the garbage going to go if it isn't in the ocean?'"

Mr. Appleton certainly considers himself an environmentalist. But he and many others like him say the movement risks its credibility by placing so much emphasis on crowd-pleasing maneuvers like the ban on ocean dumping.

Nina Sankovitch, a senior project lawyer at the Natural Resources Defense Council who worked for the ocean dumping ban, countered: "Environmentalists have a huge agenda. We can't sit around and calculate what percentage of a problem will any particular law solve. Priorities matter, but they aren't always easy to fit into neat little flow charts. Is dumping sludge worse than burning garbage? Is money spent on recycling better than money spent on clean water? There aren't answers to those questions. So when we have the opportunity to improve the environment we go for it. And the Ocean Dumping Ban Act was a great opportunity."

Ms. Sankovitch says she now focuses much of her attention on the problem of combined sewers. But she said she sees nothing wrong with using the images of 1988 to help ban dumping — even though the two problems were not connected.

"A victory for the environment is a victory for the environment," she said.

But it is not completely clear that a ban on dumping was such an environmental triumph. The negative effects of burying sludge close to the shores have been documented with precision. But the dangers of dumping it in deeper water are less clear.

Studies have shown that sludge deposited 106 miles out does reach the ocean floor and, in the words of Dr. Frederick Grassle, director of the Rutgers Institute of Marine and Coastal Sciences, "it has a minimal measurable impact on the deep-sea ecosystem." However, Dr. Grassle also said that health risks from the dumping appeared to be minimal — primarily because the ocean rapidly diluted the waste below dangerous concentrations.

Some researchers have proposed the nearly lifeless plains at the bottom of the oceans as a relatively inexpensive, and safe, disposal site for sludge. They argue that at the deepest levels of the sea — several hundred miles away from any coastline and under nearly 16,000 feet of water — the sludge will rest undisturbed and harmless.

Short-Sighted Proposal?

However, many environmentalists and some scientists view the research proposals for deep-sea burial of sludge as short-sighted.

"It will take 10 seconds of logic and $10 million to prove that this too will have adverse effects on the environment," said Dr. Elliott A. Norse, a marine ecologist who is chief scientist for the Center for Marine Conservation.

But John Edmond, professor of chemical oceanography at the Massachusetts Institute of Technology, said: "There are going to be impacts on our society of anything we throw away. That includes ocean dumping. But there is a real crisis in land disposal of our waste, and we have acted to ban even the consideration of ocean dumping.

"Even if we don't use the upper ocean — and perhaps we should not — we should think about the sea floor. But people are so emotional about these issues that they can hardly see or think straight."

THE NEW YORK TIMES NATIONAL TUESDAY, MARCH 23, 1993

Many Say Lab-Animal Tests Fail to Measure Human Risk

By JOEL BRINKLEY
Special to The New York Times

GAITHERSBURG, Md., March 20 — Dozens of caged rats and mice spend their days here in a laboratory chewing on Purina rodent chow laced with as much boric acid as they can tolerate without risk of death from poisoning.

These rodents and more than 1,000 others are being used to study seven common environmental and household chemicals to see if any cause reproductive problems. The rats and mice are allowed to breed at will. Then scientists here at R.O.W. Sciences, a research laboratory that works under Federal contract, examine several generations of offspring for abnormalities or defects.

This project is just one of roughly 65 rodent studies under way at 15 laboratories across the country at an average cost of about $2 million each. For much of the last two decades, these studies have been the Government's most important diagnostic tool for identifying environmental problems that are health hazards and setting priorities for Federal regulation.

Billions Down the Drain?

But now the animal-studies program is being hobbled by doubts about its worth. So much evidence has accumulated that chemicals frequently have wholly different effects in animals and humans that officials throughout Government and industry often do not act on the studies' findings.

And with that growing skepticism, the rationale behind a large portion of the nation's environmental regulation is thrown into question.

As a result, even Dr. Kenneth Olden, director of the National Institute of Environmental Health Sciences, the branch of the National Institutes of Health that directs the animal studies, asks whether the nation is wasting billions of dollars regulating substances that might pose little risk.

The findings from about 450 animal studies over the last several decades, Dr. Olden said, have led Federal and state governments to write thousands of regulations forcing government and industry to spend tens of billions of dollars a year regulating the use and disposal of several dozen chemicals, or finding alternatives for chemicals that have been restricted or banned.

For instance, it was data from rodent studies that led the Government to ban or restrict the use of two kinds of artificial sweeteners, cyclamates and saccharin, as well as the pesticide DDT and the industrial byproduct dioxin.

In Dr. Olden's view, "That's an awful lot of money to be spending to be regulating substances we might not have to be regulating at all if we had more information."

After spending many billions of dollars to clean up dioxin, the Government is midway through a reassessment because new studies of people exposed to dioxin — once considered one of the most poisonous substances in the world — show it is not nearly as harmful as originally believed.

Similarly, John A. Moore, a former assistant administrator for the Environmental Protection Agency who now heads the private institute for Evaluating Health Risks, noted that DDT was banned because it was believed to be a carcinogen.

But new data show that it poses "a relatively modest cancer risk," Dr. Moore said, though DDT does present other environmental hazards. And as for some of the other chemicals that have caused cancer in rodents, Dr. Richard A. Griesemer, deputy director of Dr. Olden's institute, offered some additional revisionist ideas.

"Saccharin doesn't have much risk," he said, "and I don't think cyclamates have any risk at all."

Scott Green understands the weaknesses of his research. He is R.O.W.'s laboratory manager, and he did note that the reproductive studies "are already finding some effects." Some rats and mice are producing fewer litters that are smaller than average. "But is that relevant to what's happening out there in the environment?" he asked. "I can't tell you."

Origins

Rodents Are Used In War on Cancer

The Government first began experimenting with rodent studies in the early 1960's, and the program grew exponentially after the Nixon Administration announced the Government's "war on cancer" in 1971. Even with some known weaknesses, scientists enthusiastically embraced the animal studies as clear indicators of cancer risks.

Though there was no legal requirement to act on the studies' results, a welter of laws did require Government agencies to protect the public from foods, drugs, household products, industrial chemicals and other substances that caused cancer. So Government officials responsible for protecting the public health accepted the data as justification for many new regulations in the 1970's.

Then in the 1980's, new data from the rodent studies helped fuel another wave of modern environmentalism — the push to insure that certain compounds believed to be toxic were not present in air, water or the ground even at minute levels.

With each new piece of environmental legislation — the Superfund law, revisions to the Safe Drinking Water Act and others — Congress required the E.P.A. and other agencies to set safe exposure limits for hundreds of specific pesticides, industrial chemicals and other substances. Those new limits were derived from rodent-study data, thousands of new regulations were written as a result.

By the mid-1980's, however, new research findings began to cast new doubts on the validity of the animal research. Government was no longer so quick to accept the results automatically in every case. But by then, dozens of substances had been ruled safe or dangerous based on the animal studies alone.

By the time Dr. Olden took over as director of the Health Sciences Institute in 1991, the animal studies were increasingly being called into question. Almost immediately, he empaneled a group of the nation's leading experts to study his agency's toxicology-research program to help him decide whether to look for a new approach.

Last summer, the group's report said many of the assumptions driving the rat and mouse research "do not appear to be valid." The experts particularly questioned the practice of feeding rodents the "maximum tolerated dose" of the chemical being tested, the M.T.D., as it is called.

Finding the Poison Level

With that technique, used in almost every animal study, scientists feed a test group of mice larger and larger quantities of a substance until they find the level that actually poisons the animals. Then during the actual test, they feed new animals what they have determined is the maximum dose the animal can tolerate without death from poisoning.

The reasoning is that high doses will more reliably produce tumors or other effects in statistically significant numbers. Scientists might have to use thousands of animals to get a meaningful result at doses close to normal human exposure — 85,000 mice for the saccharin study, Dr. Griesemer said.

So using the high-dose reactions, scientists devised scales helping them to speculate on how people might react at lower levels. But Dr. Olden's review committee said it did not believe that this reasoning was valid. The review committee wrote, "Approximately two-thirds of the carcinogens would not be positive, i.e., not considered as carcinogens, if the M.T.D. was not used."

In other words, two-thirds of the substances that proved to be cancerous in the animal tests would present no cancer danger to humans at normal doses.

Dr. Griesemer and others disagreed with that particular finding. They said that probably only one-third, not two-thirds, of the chemicals shown to be carcinogens in animals would likely be benign at lower levels. Still, Dr. Griesemer acknowledged, a possible error rate of even 33 percent is worrisome.

He and others at the institute's headquarters in Research Triangle Park, N.C., agree that animal research, by itself, should no longer be accepted as a reliable means of judging risks for humans.

"The problem is we don't know what the findings really mean," Dr. Robert Maronpot, chief of the institute's experimental-pathology laboratory, said of the animal studies.

As illustration, Dr. Allen J. Wilcox, chief of the institute's epidemiology branch, cited a recent institute study showing that rodents consuming cola beverages "showed an association between the cola beverages and renal failure," or loss of kidney function.

"But the results are murky," he went on, and so the institute is choosing not to draw conclusions until more research is done.

Another study, completed about a year ago, found that rats and mice develop cancer when fed high doses of oxazepam, a direct chemical relative of Valium. Valium is among the nation's most-often prescribed drugs, and the rodents taking the maximum tolerated dose of oxazepam "had a 100 percent incidence of tumors, all over the body — very quick," Dr. Maronpot said.

And so the institute began a rare, crash study, devoting all available resources to see what more could be learned.

Examining frozen DNA sections from the affected animals, "we found this was an M.T.D. result," Dr. Maronpot said. "Oxazepam would not be a problem even for a mouse at normal human dosage levels."

But this kind of research is costly and time-consuming, and the technology has existed for only a few years.

Dr. Maronpot swept his hand toward a long row of blue books stretching more than 10 feet along an upper shelf, reports on all 450 animal studies the Government has conducted over the last 30 years.

"It's an impressive product, not produced by anyone else in the world," he said. Still, Dr. Maronpot acknowledged, neither he nor anyone else at the institute knows how many of the tested substances that produced tumors or other harmful effects in animals — about half the total — might now be shown to be benign at normal levels.

A More Vexing Question

Even more worrisome, perhaps, is the opposite question. How many substances that caused no harm to rodents might be dangerous to humans? One chance finding demonstrated this problem.

"Arsenic is not a carcinogen in animal studies," said Dr. Joseph F. Fraumeni, director of epidemiology and biostatistics at the National Cancer Institute. But several years ago, he recalled, a study of smelter workers exposed to high levels of arsenic in the air showed a high level of lung cancer.

From that, Dr. Olden's review committee concluded that the Government should no longer rely only on animal studies. They should be simply one part of a program of research also involving studies of population groups found to have been exposed to the substances without knowing of the possible risk, and laboratory analyses showing how the chemicals interact with cells.

That is easy to say, institute officials agree, but difficult and costly to do.

Progress

Studies of Cells At Cutting Edge

Since the review committee's report, more and more attention has been directed toward Dr. Maronpot's little shop, the institute's pathology laboratory. It is here that the crash oxazepam study was carried out. And it is in laboratories like these that the future of toxicology research is believed to lie.

Here, scientists try to figure out how substances interact with human cells, whether they cause mutations that can lead to cancer. And when research like this works, scientists believe they have the most credible findings now achievable.

"That's what we're focusing on now, understanding the responses at the most basic level," Dr. Maronpot said. "We're making progress." But he is at the cutting edge of science, and he acknowledged that "there's still so much we do not know."

As it is, if a substance that produces a carcinogenic effect in mice is referred to Dr. Maronpot's lab, "typically it can take two, three, maybe even five, seven, eight years" to carry out one of these studies. So Dr. Maronpot's laboratory can offer a second opinion on fewer than 10 percent of the substances subjected to animal studies.

Nearby, Dr. Wilcox heads the department that offers the second-best hope for validating findings from the animal studies. He and seven other epidemiologists try to find specific groups of people who have been exposed to the substances to see if they have suffered ill effects. The smelter workers exposed to arsenic are an example. But unfortunately, Dr. Wilcox said, similar examples of epidemiological studies are rare.

"The whole area of environmental epidemiology is a frustrating one," he said. The principal problems are that people are generally exposed to low levels of the suspect substances. And even if they suffer unusual health problems, it is hard to know whether the illnesses were caused by the substance or something else — smoking, poor diet, etc.

"Epidemiology is a real crude tool for looking for associations," Dr. Wilcox acknowledged. It is also time-consuming. As a result, his department, like the pathology laboratory, is able to examine only a tiny percentage of the substances subjected to animal studies.

That means the institute and the rest of the Government can seldom offer much more than the animal studies as warnings of a substance's possible danger to humans.

"We're looking for alternative approaches," Dr. Griesemer said. "But right now, that's what we've got."

Quite often, that means no one takes the institute's warnings seriously any longer.

Problems

Frustrations Grow With Knowledge

Almost two years ago, the results came in from rat and mouse studies of 1,2,3-trichloropropane, an industrial solvent used as a paint and varnish remover or a degreasing agent.

Almost every animal exposed to the substance was riddled with tumors "in several organs," said Dr. Richard D. Irwin, the institute toxicologist who wrote the report. "This is the type of chemical that shows the greatest potential for human effect."

"Our understanding is that workers wash themselves in this," Dr. Griesemer said. And since the chemical is absorbed in the skin, he and others said, the finding was particularly troubling.

In Dr. Irwin's view, "It would be real good to get some human data because I'm sure there were people who were exposed to it in the past, maybe even now."

So did the epidemiologists look for people who had been exposed to the substance?

"This isn't one we're looking at," Dr. Wilcox said. But maybe, he added, the National Cancer Institute's epidemiologists did look at it. The cancer institute has what is probably the world's largest cancer epidemiology department — 100 scientists and support staff — and they get the animal-study reports automatically. But they seldom choose to begin a study based on the animal research, and they did not initiate one in this case.

In 1990, when a rodent study suggested that fluoride might be a carcinogen, "we took that one on," said Dr. Fraumeni, head of epidemiology for the cancer institute. "We found nothing, and that was the last time."

As for trichloropropane, he said, "I haven't heard of it."

Dr. Irwin wondered if the Occupational Safety and Health Administration might have done a survey or found a way to check on workers exposed to the chemical.

But Dr. Edward Stein, a health scientist for O.S.H.A., said the agency had done no surveys and had not changed its standards for trichloropropane since January 1989, when it issued a regulation limiting airborne emissions of the substance.

As for telling people of the dangers, Dr. Stein added, "The primary manufacturers of the product would be responsible."

"I presume when updating training programs at companies that use this, say annually, whoever is doing that would be aware of the new information," Dr. Stein said. "They would make the employees aware of it, but I'm not sure if that is actually being done."

"We always have a battle on the issue of what to do with the animal data," Dr. Stein added. "I'm not trying to downplay it, but I do believe other things ought to have priority."

So back in North Carolina, Dr. Irwin said: "I really haven't heard of anything happening. It's almost as if our work just goes into a black box."

Acknowledging that problem, Dr. Olden said: "I have to say we don't serve the American people very well right now. But that's where we are."

Rebellion Over Environmental Rules

By KEITH SCHNEIDER
Special to The New York Times

COLUMBUS, Ohio — This city didn't want to pave paradise for a parking lot. It just wanted to cover a patch of weeds and mud behind the Short Street garage, where the city maintains its fleet of police cruisers and garbage trucks.

But two years ago, city engineers here in Ohio's capital discovered traces of chemicals in the dirt and learned that the Federal hazardous waste law might require a $2 million cleanup before the first ounce of pavement could be laid. Right then, a forgettable little stretch of urban America became the focus of anger and exasperation so profound that it started a national campaign among cities and states.

After the city issued a report on its problems, all of a sudden Columbus's leaders were joined by hundreds of city officials, state leaders and many private homeowners across the country as they advocate a cause that until now big business has been arguing most forcefully that many of the nation's environmental rules bring enormous expense for little gain.

Although independent safety specialists said the chemical concentrations were too small to cause any harm, Federal law defined several of the compounds as hazardous and required that they be removed, if detectable in the soil at all.

What the Law Demanded

In effect, the law required the city to take these expensive steps.

¶Dig up 2.4 million pounds of dirt containing no more than a few pounds of toxic chemicals from a patch of ground no larger than a baseball diamond.

¶Ship that dirt 1,500 miles south to Texas to be burned in an incinerator.

¶Install detection equipment to monitor the air for up to 25 years for traces of any contaminants that might remain.

All this, the engineers asked, to expand a parking lot?

They called a meeting at City Hall, and that led to the first major study to identify the cost of complying with Federal environmental regulations. It showed that environmental costs were about to swamp Columbus in red ink — or generate a revolt.

Now nearly 1,000 other cities have asked to see the report. And prompted by the Columbus study, the National League of Cities has made updating the nation's environmental laws — and through that reducing costs — one of its top five political priorities in Washington.

In January, mayors from 114 cities in 49 states opened the campaign by sending President Clinton a letter urging the White House to focus on how environmental policy-making had in their view gone awry.

"Not only do we sometimes pay too much to solve environmental problems, we've been known to confront the wrong problems for the wrong reasons with the wrong technology," the mayors said.

During the Bush Administration, William K. Reilly, the Administrator of the Environmental Protection Agency, offered public support for this campaign and even began offering grants to states that wanted to reevaluate their priorities.

With that money, Michigan and Vermont were among the first to appoint panels of citizens and scientists to examine environmental policy. In published reports, both state's panels concluded that the largest sums of money were being spent on the least threatening environmental problems, like exposure to toxic and radioactive wastes. In the view of these state panels, more important issues, like damage to farmland and forests, were being largely ignored.

"We're really just about at the end of the reductions in risk that you can achieve by the conventional approach, which is to crank down on the pollution coming out of the end of the pipe," said Dr. William Cooper, an ecologist at Michigan State University who helped lead his state's study. "Now we're into more subtle issues. How clean do we really want our environment? How much are we really willing to pay for it?"

The Seeds

Benefits Are Vague As Policy Shifts

The seeds of this grass-roots push lay in the Federal Government's shift in focus over the last 15 years from promoting "broad environmental" goals (purifying the air, cleansing the water) to regulating specific toxic substances: dioxin, asbestos and dozens of other compounds found at trace levels in drinking water, chemical-waste sites and the like.

Controlling the kind of pollution that poured out of automobile tailpipes or factory smokestacks, and stopping waste discharges into rivers and streams, showed clear social benefits. And so public acceptance usually came easily.

But the improvements in health or environmental safety from the more recent efforts have been less obvious. Scientists continue to debate how dangerous dioxin may really be. An industrial byproduct, dioxin was once considered the most toxic substance known to man. Reducing dioxin levels to the Federal standard — less than 13 parts per quintillion in drinking water, the equivalent of a single drop in Lake Michigan — is difficult and terribly expensive, even though no one really knows what, if any, benefits result.

More than 10 years ago, the Federal Government adopted the view that when there is any doubt, it is better to take the prudent approach than do nothing. But a decade later, the economic costs of this policy are painfully clear, while the benefits remain largely unmeasurable.

Last year, home owners, farmers, miners and timber industry workers roared into Washington and brought to a standstill Congressional efforts to reauthorize the Endangered Species Act and the Clean Water Act, two of the laws that form the foundation of American environmental policy. President Bush focused on this theme during his re-election campaign, largely siding with these protesters.

This year, city and state leaders have joined in a campaign to write into statutes a provision requiring the Federal Government to evaluate scientific evidence and the cost to communities before issuing new environmental directives.

Leaders of the major environmental groups are fighting this idea. They argue that it would set a level of proof so difficult to meet that the Government could not write new regulations until people started dying.

But backers of the provision assert that unless changes are made, public support for environmental protections will crumble as costs rise.

The Anger

Counting the Costs In a City Hall

It was precisely this issue of cost that prompted the Columbus engineers to call a meeting in January 1991. One participant, Michael J. Pompili, who was in charge of the Columbus Health Department's environmental-health division, had on his own been quietly studying how much the city would have to pay to comply with a new wave of rules coming out of Washington. These were intended to prevent public exposure to minute levels of chemicals in air and water.

"The guys were talking about spending all that money for nothing at the Short Street garage," he said in an interview. "They were complaining about the $2 million. And I said, the issue isn't $2 million. It's a lot more than that. I told them my guys had identified millions more in costs citywide to meet Federal environmental requirements, and where were we going to get the money to meet those mandates?"

Columbus's Mayor at the time, Dana Buck Rinehart, a Republican, promptly named Mr. Pompili chairman of the city team that published the environmental study in May 1991.

The report said that to meet dozens of Federal environmental requirements, Columbus faced $1.3 billion to $1.6 billion in new expenses from 1991 through the end of the decade, depending on the inflation rate. Virtually all of the money was to come from the Columbus city treasury.

Of the $241 million 1991 city budget, $62 million, or 11 percent, was devoted to environmental protections. That year, the average Columbus household paid $160 for that purpose.

The study said that by the end of the decade, if every Federal requirement were met, Columbus's environmental budget would more than triple to $215 million, or roughly 27 percent of the city's $810 million budget projected for the year 2000. The cost to a household for environmental protection would be $856 that year — more than the cost of fire or police protection.

"When we came up with these kinds of costs, we also looked for the justification and just couldn't find much there," Mr. Pompili said. "I had to wonder, Am I out of touch? I have worked all my life to protect people from environmental harm. Am I fooling at these issues in the wrong way?"

Now, he said, "I no longer ask those questions because I'm convinced that we are doing the right thing."

Mr. Pompili said he wants clean air and water as much as anyone else ("This city will not survive without a clean environment"), but he added: "What bothers me is that the new rules coming out of Washington are taking money from decent programs and making me waste them on less important problems. It kills you as a city official to see this kind of money being spent for nothing."

The Revolt

Battling Radon: Changing Targets

Officials in many other cities feel the same way. Late last year, Hastings, Neb., began its own review of environmental costs and concluded that the single biggest drain on its treasury was the $65 million it would take to build a treatment plant to meet a proposed E.P.A. rule for removing radon from the city's water.

Radon is a radioactive gas formed naturally when radium decays in rocks and soil. It is frequently found at trace levels in water pumped from the ground. Before the E.P.A. proposal, made under authority of the Safe Drinking Water Act, almost no public-health specialist had considered radon in drinking water to be any sort of threat. And for years Hastings had been boasting that its water supply was so clean that it could be pumped from an underground aquifer directly into the homes of 23,000 residents.

Last year, however, the E.P.A. said Hastings did have a problem with water: Radon levels exceeded the proposed safety limit. But critics of the proposal, including some agency officials, said the E.P.A.'s decision to tackle the issue was a lesson in the dangers of using weak scientific assumptions to write an expensive new regulation, even while many experts found the idea absurd.

Many studies of radon have shown that it is harmful only if inhaled at high levels over a long period. Almost 30 years ago, the Government did confirm that uranium miners in the West contracted lung cancer after years of working in the mines, where they were exposed to some of the highest levels of radon ever recorded. Among those who died, though, many were heavy smokers.

Then, during the 1980's, the E.P.A. found significant levels of radon in 10 percent of the homes they surveyed across the country. That led the E.P.A. to call radon the most serious environmental public health threat the nation faced. It was a menace so great, the agency said, that radon was probably causing up to 20,000 cases of lung cancer a year.

That estimate has come under intense criticism from many radiation-health specialists, who have called it unscientific and wildly exaggerated.

Going After the Water

But the E.P.A. ignored the criticism and set an unofficial guideline for the amount of radon it considered safe in homes. The agency has been reluctant to make the limit legally enforceable because of the backlash that some E.P.A. officials feared from homeowners. Hundreds of thousands would have had to spend thousands of dollars on ventilation equipment to clear radon from basements.

Since the agency was unwilling to regulate the air in private homes, E.P.A. scientists and technical experts chose to defend their assessment that radon was a menace by taking action against the only other source in homes: tap water. So the E.P.A. proposed a legally enforceable limit on radon in water.

Scientists who have looked at the issue said the threat to health from radon in water, if there is one at all, can come only from inhaling radon that evaporates, particularly during showering. In other words, the Government was trying to prevent someone from getting lung cancer from their morning showers.

Independent radiation-health experts said that in virtually every area of the United States, the amount of radon that evaporates from water is only one-thirtieth to one one-hundredth of what is already naturally in the air. These experts said the regulation does nothing to protect health. "It's a silly thing that E.P.A. is proposing because radon in water is an insignificant public health hazard," said Dr. Ralph E. Lapp, a radiation physicist in Alexandria, Va., and author of 22 books on radiation and public health.

If the regulation becomes final, the cost to install filtering equipment in public water systems in the United States would be $10 billion to $20 billion, according to estimates made by several states. The Association of California Water Agencies recently estimated that the cost in California would approach $4 billion.

"How do we explain to our residents the need for a regulation that costs as much as this one will and doesn't provide any public-health benefits?" asked Dr. Adi Pour, the toxicologist for the Nebraska Department of Health. "If this kind of rule-making continues, it's going to hurt public confidence in environmental protection."

The protests prompted Congress last year to pass legislation sponsored by Senator John H. Chafee, Republican of Rhode Island, that prevented the E.P.A. from making the radon rule final until the agency looked at the benefits and costs again. When asked about the rule, Martha G. Prothro, the acting Assistant Administrator for Water at the E.P.A., acknowledged: "We may have gone further than we need to in human health concerns. It's appropriate to go back and look at this proposal."

So for now, Hastings, Neb., has been given a reprieve.

Back in Columbus

As for that parking lot in Columbus, City engineers are still working on the problem. One idea they proposed was to dig up the dirt, turn it over and allow the chemicals to evaporate.

But the state said Federal law forbade that. The engineers then proposed inserting pipes beneath the ground, pumping air to the surface and trapping and filtering chemicals that are released. The state environmental agency is considering that idea. The estimated cost: $250,000 to $500,000.

Regulation and the Price per Life

Two years ago, the Office of Mangement and Budget tried to estimate the cost of certain environmental and safety regulations by dividing the cost of enforcing each rule by the number of lives it appeared to save.

The estimate is highly subjective since it is virtually impossible to know how many lives might have been lost without a certain rule. In addition, the analysis did not account for non-fatal injuries. But this cost-benefit analysis did demonstrate the Bush Administration's attitudes toward the laws it was enforcing.

Now, state and local governments are distributing this analysis widely to support their criticism of national environmental policy. Here is a partial list of regulations.

Regulation	Cost per premature death averted (in millions of dollars)
Ban on unvented space heaters	$ 0.1
Aircraft cabin fire protection standards	0.1
Auto passive restraint/seat belt standards	0.1
Trihalomethane drinking water standards	0.2
Aircraft floor emergency lighting standard	0.6
Concrete and masonry construction standards	0.6
Ban on flammable children's sleepwear	0.8
Grain dust explosion-prevention standards	2.8
Rear seat auto lap/shoulder belts	3.2
Ethylene debromide drinking water standard	5.7
Asbestos exposure limit for workers	8.3
Benzene exposure limit for workers	8.9
Standards for electrical equipment in coal mines	9.2
Arsenic emission standards for glass plants	13.5
Ethylene oxide exposure limit for workers	20.5
Hazardous waste listing for petroleum refining sludge	27.6
Acrylonitrile exposure limit for workers	51.5
Asbestos exposure limit for workers	74.9
Arsenic exposure limit for workers	106.9
Asbestos ban	110.7
1,2-Dichloropropane limits in drinking water	653.0
Hazardous waste land disposal ban	4,190.4
Formaldehyde exposure limit for workers	82,201.8
Standard for atrazine/alachlor in drinking water	92,069.7
Hazardous waste listing for wood-preserving chemicals	5,700,000.0

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TESTIMONY OF THE
ENVIRONMENTAL DEFENSE FUND
BEFORE THE
SUBCOMMITTEE ON OCEANOGRAPHY, GULF OF MEXICO AND
THE OUTER CONTINENTAL SHELF
OF THE MERCHANT MARINE AND FISHERIES COMMITTEE
HOUSE OF REPRESENTATIVES
March 30, 1993

SARAH L. CLARK
STAFF SCIENTIST
ENVIRONMENTAL DEFENSE FUND

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I. Effectiveness of the EPA/Corps Ocean Disposal Program

It is a pertinent time to be considering how effective the nation's ocean disposal program has been at protecting our nation's coastal resources. In order to determine how effective the ocean disposal program has been, one must first review the standards of effectiveness to ascertain if they have been met.

The disposal of dredged materials into the ocean is regulated by the Marine Protection Research and Sanctuaries Act (33 USC 1401-1445) (MPRSA) and its regulations and implemented by U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency.

The Army Corps of Engineers (ACOE) issues permits for dumping dredged materials into the ocean after determining that the dumping "will not unreasonably degrade or endanger human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities." In issuing such permits, the ACOE applies criteria developed by the U.S. Environmental Protection Agency (EPA). The EPA is responsible for designating ocean dump sites that receive dredged materials.

First, as described above, the MPRSA only allows ocean disposal of dredged material as long as it will not unreasonably degrade or endanger a variety of factors, including the marine environment. The EPA regulations that implement the MPRSA[1] delineate how the impact of dredged material disposal sites must be evaluated to determine to what extent the marine environment has been impacted by materials disposed of at the ocean disposal site. Therefore, reviewing scientific information about the dump sites to determine how they have impacted the marine environment is a valid way of assessing how effective the ocean disposal program is in meeting the standards set by the MPRSA of preventing "unreasonable degradation".

A second way is to review how the Army Corps of Engineers permit process is implemented to determine if the process satisfies the regulations and appropriate guidance documents that are designed to implement the MPRSA. Again, EPA regulations define what conditions must be met for dredged materials to be considered acceptable for ocean disposal. A guidance manual[2], developed jointly by the ACOE and the EPA specifies which tests must be carried out to

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[1] 40 CFR 220-228

[2] USEPA/USACOE. February 1991. Evaluation of Dredged Material Proposed for Ocean Disposal Testing Manual, EPA-503/9/91/001.

determine whether those conditions are satisfied.

A. Are Dump Sites managed to prevent unreasonable degradation?

According to the ACOE, contaminated dredged materials are presently managed in three general regions. The Puget Sound, the New England region and the New York Bight and Long Island Sound. These are the areas that must be focused upon to gain an understanding of how effective the ocean disposal program has been in preventing unreasonable degradation.

The Mud Dump Site, located six miles off the New Jersey coast within the New York Bight Apex, is a good case study of whether or not the ocean disposal program has been successfully implemented to allow for management of contaminated dredged materials in the ocean environment so as to prevent unreasonable degradation.

Dredged materials from the naturally shallow New York Harbor have been deposited within the Harbor and the New York Bight Apex for over a hundred years. In 1977, EPA designated the Mud Dump Site to receive dredged materials that met ocean dumping criteria and that received ACOE permits. Currently, about 55% of the Site has been "filled" and the site is expected to fill up by the late 1990s, upon which time a new site must be designated by the U.S. EPA.

1. The Mud Dump Site as a case study of contaminated dredged material management.

a. Biological monitoring at The Mud Dump Site is lacking

EPA is responsible for managing ocean disposal sites[3]. The ocean dumping regulations require that management includes "developing and maintaining effective ambient monitoring programs for the site[4]." Impacts at the disposal sites must be evaluated periodically and reports submitted as necessary with Annual Reports to Congress[5]. The regulations[6] also detail how baseline and

[3] 40 CFR 228.3 (b) -- Disposal site management responsibilities

[4] 40 CFR 228.3(a) -- Disposal site management responsibilities

[5] 40 CFR 228.10 -- Evaluating disposal impact

[6] 40 CFR 228.13 -- Guidelines for ocean disposal site baseline or trend assessment surveys under Section 102 of the MPRSA.

trend surveys should be planned to be "part of a continual monitoring program through which changes in conditions at a disposal site can be documented and assessed."

The NYD has conducted various physical monitoring efforts. However, a chemical and biological monitoring program was never conducted at the Mud Dump Site prior to, or since its designation until 1990.

i. First monitoring survey of Mud Dump Site conducted in 1990

In 1990, EPA Region II sponsored a monitoring survey of the Mud Dump Site and its environs[7]. Heavy metals, PCBs, pesticides, polycyclic aromatic hydrocarbons and dioxin were measured in surficial sediments and in benthic worms at 39 different stations. The monitoring survey revealed several notable findings.

o Body burden levels of metals in the tissue of worms were on par with levels found at other disposal sites in Massachusetts Bay, Central and Long Island Sound and the Cape Arundel Disposal Sites. However, chromium, iron and lead levels were higher at the Mud Dump Site than these other disposal sites[8]. No other studies have been conducted to assess levels of contaminants in benthic worms throughout the NY Bight Apex against which to compare these values.

o Heavy metal concentrations in the sediments of the Mud Dump Site were higher than outside the Mud Dump Site. Stations along the eastern and southern margins of the Mud Dump Site were found to have the highest enrichment factors, meaning the concentrations of sediments at the Mud Dump Site were much greater than the concentrations in naturally-occurring uncontaminated sediments. Several metals (silver, chromium, mercury and lead) were found at several stations to have levels above values considered by NOAA to represent average concentrations that have a potential for causing adverse effects on biological life.

o High concentrations of dioxin (2,3,7,8-TCDD) were found at stations along the eastern, southern and southwestern sides of the Mud Dump Site and dioxin was strongly correlated to silt content. The maximum concentrations

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[7] Judith B. Charles and JoAnn Muramoto. October 11, 1990. Assessment of Contaminants in Sediment and Biota at the Mud Dump Site. New York.

[8] ibid at 35

were 180 and 229 pptr and the average concentration was 24.1 (dry weight). The animals feeding at the Mud Dump Site can be expected to take up and concentrate dioxin in their tissues by as much as many thousands of times.

o Dioxin was measured in worms at all stations sampled. The average level was 27 pptr (dry weight). This corresponds to about 5 pptr wet weight. Higher concentrations were found along the eastern boundary, the northern boundary and the southern boundary. Outside the Mud Dump Site, at stations north and west, tissue concentrations were also above average. Of all compounds measured, dioxin was found to have greatest tendency to bioaccumulate, after silver.

o High concentrations of total PCB aroclors were found to the south and west of the Mud Dump Site (1538, 1081 and 879 ppb, dry weight). Total PCB congeners ranged from 3.9 to 769.9 ppb at stations throughout the Mud Dump Site. The average total PCB congener concentration was 59.6 ppb, not counting the maximum concentration measured. A previous survey of contaminants in the New York Bight Apex found PCBs to be less than 1 ppb beyond the Mud Dump Site and the old sewage sludge disposal site[9], whereas at those sites, concentrations ranged from 10 to 150 ppb.

o Again, eastern and southern margins of the Mud Dump Site had the highest concentrations of polycyclic aromatic hydrocarbons (PAHs); maximum concentrations of individual compounds were 1000-6000 ppb.

ii. Additional monitoring is scant

The only additional monitoring, that we are aware of.that has occurred in the vicinity of the Mud Dump Site has been a contaminant survey of sediments and several marine species throughout the New York Bight and Long Island Sound[10], a study of dioxin in aquatic animals and sediments conducted in 1983[11] and a study of PCBs, chlordane and DDTs in fish and shellfish from New Jersey

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[9] Robert N. Reid et al. September 1982. Contaminants in New York Bight and Long Island sound Sediments and Demersal Species, and Contaminant Effects on Benthos, Summer 1980. Woods Hole, MA.

[10] Ibid

[11] NJDEPE. October 1985. A Study of Dioxin in Aquatic Animals and Sediments. Trenton, NJ.

waters that included the region where the Mud Dump Site is located[12]. The 1983 study found elevated level of dioxin in two out of nineteen Bluefish. Composite samples of the hepatopancreas of lobsters caught from the Mud Hole, deep nearshore waters to the south of the Mud Dump Site, were found to be contaminated with dioxin at 72 and 82 pptr. The 1986-87 study found levels of PCBs in stripped bass in estuarine and ocean waters between Sandy Hook and Seaside Park to be above the FDA action level for PCBs of 2 ppm. The New York Bight Restoration Plan, a Congressionally mandated[13] program that was to ivestigate pollution problems affecting human health and the marine environment and to propose remedies to those problems, reported three toxicants to have been identified from historical data sets to have exceeded enforceable limits from fish tissue concentrations: mercury; PCBs; and dioxin[14].

iii. Biological monitoring at other sites

The EPA is routinely lax on monitoring at ocean dumping sites. In the designation of the ocean dumping site for dredged materials off Los Angeles and Long Beach, the proposed monitoring plan emphasizes the location of dredged material mounds rather than the environmental effects of dumping. Effects monitoring is prescribed by EPA only if the dumping misses or is carried outside the dump site. The effects of proper dumping is apparently of no concern to EPA Region IX.

Similarly, the monitoring of the Mud Dump Site off new York and New Jersey has been very limited. Furthermore, in recent considerations of the Port Authority's permit EPA Region II has not expressed any interest in monitoring beyond observing the physical integrity of capping sediments and a very limited sampling for animals and contaminated sediments. They have demonstrated a lack of knowledge of the effects of materials already dumped at the site, and they have not asked for monitoring that would assess the biological effects of dumping

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[12]NJDEP. 1990. PCBs, Chlordane and DDTs in Selected Fish and Shellfish from New Jersey Waters, 1986-1987: Results from New Jersey's Toxics in Biota Monitoring Program.

[13]by the Marine Plastic Pollution, Research, and Control Act of 1987 (MPPRCA)

[14]New York Bight Restoration Plan Toxics Inputs, Fate and Effects Work Group. 1990. Phase II Report: Preliminary New York Bight Toxics Categorization. U.S. EPA--Region II.

in the future.

On the other hand, the monitoring concerns that have been suggested for the proposed San Francisco Bay Deep Water Dredged Material Disposal Site do include biological effects of approved dumping. This would be a welcome change, if EPA Region IX does actually implement a monitoring plan that assesses the effects upon the biological community of dumping dredged materials that may be contaminated at whatever site is ultimately designated. However, while we feel that monitoring is essential wherever sediments of questionable quality or known contamination are dumped, we do not view the disposal of contaminated materials at an open water dump site as consistent with the intent of the MPRSA.

b. Past capping of contaminated sediments has revealed flaws and limits in being an effective mitigative measure.

In 1980, an "experiment" was initiated by the New York District of the Corps (NYD) to evaluate how effective a cap would be at reducing possible environmental impact by covering and isolating contaminated dredge material. This was decided upon because the NYD determined that sediments from several dredging projects had the potential to cause contaminant bioaccumulation in test organisms, suggesting that the material did not comply with ocean dumping criteria. Consequently, a decision was made to deposit the sediments into the most unimpacted quadrant of the Mud Dump Site, the southeast quadrant, and cap the material with silty material from the Bronx River and Westchester Creek and sand from the Ambrose Channel. Also, the NYD decided to study the effect of capping at the MDS because "the overall efficacy of capping as a mitigating measure had not been proven."[15] Approximately 500,000 cubic yards of contaminated sediments were dumped in the southeast quadrant of the Mud Dump Site and covered with over 1 million cubic yards of fine-grained and sandy material. This mound became referred to as the Experimental Mud Dump (EMD).

By 1982, several studies had been conducted to determine "the potential for placing a cap at the experimental Mud Dump Site and to determine reductions in environmental impacts related to capping." The reports submitted to the Corps

[15]Joseph M. O'Connor and Susan G. O'Connor. October 1983. Evaluation of the 1980 Capping Operations at the Experimental Mud Dump Site, New York Bight Apex., (p.35)

regarding this experiment were summarized into one final report[16]. Later, in 1987, an updated report was submitted to the NYD[17].

i. Capping may work only under certain conditions

The cap appeared to be successfully placed at the EMD and it was still intact within 16 months. Cap erosion was considered minor, although the researchers did document an increase of muds on the cap. They attributed this to a combination of erosion of fine sand plus deposition of fines transported onto the cap from peripheral locations. The cap was determined to have a lifetime of 20 years under "normal meteorological conditions."

However, the researchers were careful to caution that unusual events, such as hurricanes, could generate energies more than an order of magnitude greater than the combined wave/current maxima. Such conditions could cause the cap to breach and expose contaminated muds to the water column. The researchers also warned that the EMD cap was composed of the most easily erodible material, fine sand. They recommended that "for a margin of safety...additional cap material be placed over the present cap. This should be...sand, silt and clay consisting of mostly mineral grains, with little or no organic matter and....relatively low water content."[18] As far as we know, this recommendation was never followed.

In 1986, a survey was conducted of the entire Mud Dump Site, including the EMD[19]. This survey concluded that the capped mound within the EMD had not substantially changed in height. However, it did find approximately 130,000 cubic yards of material to have accumulated to the north and east of the mound, presumably from disposal operations in the northeast quadrant.

It also discovered that the sand cap was not made up of over 1 million cubic yards of material as presumed, but that the volume of material calculated to have been deposited on at the EMD was only approximately 800,000 cubic

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[16] ibid

[17] SAIC. June 17, 1987. Long-Term Sand Cap Stability: New York Dredged Material Disposal Site (Draft). Newport, Rhode Island.

[18] George L. Freeland et al February 1983. Sediment Cap Stability Study New York Dredged Material Dump Site. Miami, Florida.

[19] See footnote 5

yards[20]. Somehow, although scow logs showed 1.2 million cubic yards having been deposited at the site to serve as a cap, 400,000 cubic yards were not to be found. The authors attributed this finding to a loss due to poor disposal operations.

ii. Capping does not necessarily prevent bioaccumulation

A mussel bioaccumulation study was performed at the Mud Dump Site[21] to determine if mussels exposed to disposed dredged materials accumulated any of the known contaminants greater than those accumulated at "control" sites. The study claimed that the accumulation of mercury and cadmium by mussels exposed to uncapped dregded materials was greater than those exposed to capped dredged materials. Differences in PCB accumulations were not statistically significant. Unfortunately, the experiment's results are limited by the design of the experiments. Mussels exposed to the capped site were exposed during the winter months, a period in which mussels are inactive metabolically and feed at low rates. In addition, the platform at the capped site was lost after only several months. Mussels were deployed to other sites during the summer, when mussels are more actively filter feeding. Also, water, sediment and mussel food data were not collected to help correlate mussel bioaccumulation to dredged material disposal.

iii. PCBs were found to be have moved into the sand cap

Cores were taken from the EMD to determine the effectiveness of the cap in isolating contaminants from the dredged material[22]. The cores revealed that metals were an order of magnitude lower in the cap than below the cap and that no vertical gradient of concentrations existed between the upper portion of the cap and the interface region with the dredged materials. However, the same could not be said for PCBs. In the case of PCBs, the vertical gradient from the cap down through to the dredged material was gradual and the PCB concentrations in the cap were only a factor of 2 lower than the dredged material

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[20] Ibid at 13

[21]Stephen J. Koepp et al. March 1982. Bioaccumulation Monitoring in the New York Bight Using the Blue Mussel. Final Report to Corps of Engineers, New York District. New Jersey Marine Sciences Consortium.

[22]J.M. O'Connor and M. Moese. March 1984. Distribution of Contaminants in Experimentally Capped Dredged Material Deposits. New York, New York.

PCB concentrations in the sand cap were found to be as much as 60% of the concentration detected below the sand-mud interface and all PCB concentrations measured in the sand cap were greater than the mean PCB value calculated for the original capping material. Consequently, the authors concluded that the PCBs in the sand cap were derived from the contaminated material. In other words, PCBs had moved from the dredged material into the cap material within three and one-half years. The authors final conclusion was that PCBs were being forced out of the muddy sediments during mound compaction and residing in solution in the pore water of the cap.

iv. Edges of sand caps are vulnerable to bioturbation

Benthic organisms that live in the top layers of sediments become exposed to contaminants as they feed and burrow through the sediments. This activity is called bioturbation and is the major route of exposure for contaminants to marine organisms that capping of dredged material is supposed to prevent. The 1987 study of the Mud Dump Site did find bioturbation on the sand cap itself. But bioturbational mixing of the thin sand layer with underlying muds on the flanks of the EMD, resulting in a "fairly healthy benthic community..established in the peripheral areas" was documented[23]. The authors predicted that as bioturbational mixing continues, the sand cap would continue to shrink.

c. There is substantial evidence of material moving outside the Mud Dump Site boundaries

An ACOE sponsored field study was conducted in 1986 to "continue research into the effectiveness of capping[24]." It found significant accumulation of sediment to the south and east of the present disposal point in the northeast quadrant, which the authors attributed to a "lack of tight controls on disposal operations and/or hydrographic energy regime." More work was considered necessary to discover which reason was the cause of the movement off site. The authors predicted that high energy storms could develop waves of sufficient height to resuspend bottom sediment at least at the shallower depths of disposal mounds. Obviously, once suspended, dredged material can be transported by prevailing currents.

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[23] See footnote 17, pg. 24.

[24] See footnote 17

The report definitively concluded that dredged material "is not confined to the limits of the designated boundaries." It recommended shifting the disposal buoy to prevent individual mounds from extending too far up the water column and that a focused, tiered monitoring program be developed to test whether or not dredged material stays within the Mud Dump Site boundaries, whether transport is occurring and whether or not excessive bioaccumulation of contaminants is occurring.

d. Recent surveys confirm that storms can move material and that substantial amounts of dredged material are not accumulating at the designated disposal site.

The December Northeaster has proven to be a remarkable test for providing proof that the concerns and warnings expressed by researchers responsible for past field studies were valid. As part of a "monitoring and management plan" designed by the ACOE and EPA for purposes of studying the disposal and capping of dioxin contaminated sediments, surveys were conducted in early November 1992 of the lower third of the Mud Dump Site. Upon the December storm, surveys were conducted in January and February to determine to what extent any conditions had changed[25].

The results, although not surprising given past findings and warnings, were disturbing. The first major finding was that in the area of two mounds created by dredged materials from the Kill Van Kull (KVK) deepening project, 227,000 cubic yards were "lost" due to erosion and transport. More than 1.5 feet of material were lost from broad areas where the depths ranged from 58-75 feet. Over 4 feet was also calculated to have been lost along the northern boundary of the survey area. Considering this finding, it is likely that the two subsequent storms, albeit less powerful than the December Northeaster, may have had an additional effect.

The second major finding is that of the 329,100 cubic yards dumped in the eastern side of the survey area (near the EMD), only 25,300 (8%) could be determined to have accumulated. The researchers concluded that poor disposal operations are the cause of such a loss, although it is not conclusive that high energy currents did not play some role in transporting dredged materials off-site.

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[25]SAIC. 1993. Comparison of Baseline Bathymetric Surveys: New York Mud Dump Site Dioxin Capping Monitoring Project. Data Report #4 submitted to U.S. Army Corps of Engineers, New York District.

It is not known what the ultimate fate is of the lost 300,000 cubic yards.

This finding confirms that of the 1987 field study[26], that a combination of poor disposal practices and transport off-site caused by high energy currents results in substantial amounts of dredged material not being deposited within the boundaries of the Mud Dump Site.

e. Summary

The results of limited monitoring efforts indicate that the Mud Dump Site is more contaminated compared to the rest of the New York Bight Apex. Although biomonitoring of higher trophic species is extremely limited, it does signal that the Mud Dump Site needs to be carefully studied to understand the extent to which it is responsible for contributing towards elevated levels of contaminants in fish and shellfish species. Additionally, biomonitoring needs to be stepped up to help evaluate and understand the degree to which toxic pollutants are impairing marine species and potentially causing a threat to public health.

It seems apparent that the management of the Mud Dump Site has not been successful. The combination of poor disposal practices and transport of dredged material appear to have resulted in rendering the Mud Dump Site boundaries meaningless. Capping cannot withstand storm events that can easily breach the cap or carry cap material away. This is especially true as the United States is entering into a new 25-year cycle of super-hurricanes and emerging from a "quiet" 25-year hurricane cycle. The impact of storms needs to be reevaluted in light of their potential to disturb sites and spread contaminated sediments, thus rendering caps ineffective in isolating material. Capping appears to be less effective in isolating PCBs than metals; what does this say about its ability to contain dioxin?. And, the physical monitoring of the EMD cap, and the Mud Dump Site altogether, do not appear to have directly affected management decisions.

The combination of all of these factors and pieces of information has led the Environmental Defense Fund, and possibly others, to petition the EPA to re-evaluate the impact of disposal of dredged material at the Mud Dump Site and to place the site in Impact Category I. This would require EPA to place certain limitations on dumping activities to reduce the impacts to acceptable levels. These factors also confirm skepticism that this permit should be reinstated.

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[26] See footnote 17

2. Issuance of ACOE permits and EPA review

In our experience, the Section 103 permit process is frustrating and generally an exercise in futility. At least as it is implemented by the New York District of the Corps, there is substantial room for improvement.

First, the permit process pays lip service to public comment. Public notices (PNs) are issued when the application for an dredge and ocean disposal permit is completed. They contain a description of the project, test results and a determination by the Corps as to whether the material meets criteria for ocean disposal. The test results are presented in a fashion that only a reader with considerable experience and expertise and an understanding of numerous other documents, including dilution models, can fully understand the discussion and analysis of test results.

Sampling plans, locations of sampling stations and rationale behind deciding upon the number and location of stations are not part of the public notice. Consequently, a large project involving hundreds of thousands of cubic yards in an impacted area can be based upon 4-6 samples. Although bulk sediment chemistry is required to be performed for three metals, the results are not reported in the PN. In the case of the NYD, that information can only be obtained through a FOIA request.

Exactly thirty days from date of issuing the PN are allowed for submitting public comments. Should the PN take a few days or a week to be received by a member of the public, that time is effectively lost. Extensions are granted, if requests are submitted in writing. Although hearings on the application can be requested by the public, it is the District's discretion to grant them. Unless the project is highly controversial, they are not regularly granted.

The ACOE is not required to respond to public comments. Out of a set of fifteen comments submitted on fifteen different private and federal projects in the New York-New Jersey Harbor region, only three were responded to in writing directly to EDF. Frequently, the comments were never acknowledged as having been received. The NYD's responses to EDF, Clean Ocean Action and the American Littoral Society's comments submitted on the Port Authority project were contained in the permit decision and an internal memorandum, both of which had to be requested by EDF through FOIA. Additionally, one never learns if or when a project that was commented upon was ever granted a permit or record of decision (if the project is federal).

EPA's role in the Section 103 permit process is only different from a public reviewer in two manners. EPA must sign off on sampling plans for prospective applications and it has the right to object to a permit should it determine that ocean dumping criteria are not complied with. EPA staff receive the PNs along with the public and submits its comments within the same time frame. The public never knows what EPA's position is on the application, unless it requests a copy of its comments.

The bifurcated nature of the Section 103 permit process has not been successful, at least in the New York District. The different philosophies and missions of both the ACOE and EPA have resulted in gridlock over many important issues, which serves neither the maritime community nor the public. This is a serious administrative problem in need of fixing.

3. Ocean Dumping Criteria

The ocean dumping criteria biological testing requirements are mostly described in 40 CFR 227. The biological testing requirements were first detailed in a national guidance manual issued in 1977[27], also known as the Green Book. These testing requirements must be used to determine the suitability of dredged material for ocean disposal. Generally, ACOE Districts and EPA Regional offices that work jointly on ocean disposal matters developed "regional guidance," tailoring the national guidance to region-specific situations. For example, relevant species that were either suitable to the region, or readily available from labs had to be chosen from among the suite of species listed in the Green Book.

The 1977 Green Book has always been recognized as seriously flawed and in need of revision. A final revised draft was released in April of 1991[28].

a. Problems with 1977 Green Book and its implementation

Based on the EPA/Corps effects-based testing approach and utilizing the 1977 Green Book tests, the ACOE estimates that only 3% of all dredged materials dumped into the ocean were contaminated enough to warrant special management. In other words, most dredged material passed the required tests and were considered safe for ocean disposal and would not unreasonably degrade the environment. Mention was rarely made of the amount of dredged material that

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[27] EPA/Corps of Engineers. 1977. Ecological Evaluation of Proposed Discharge of Dredged Material into Ocean Waters.

[28] see note #2

could not be dredged because of failure to meet the criteria.

This circumstance was particularly perplexing, considering that almost every harbor and different type of waterbody in the United States had contaminated sediments[29], that NOAA had found toxic sediment, fish and shellfish contamination to be of national proportions[30] and that NOAA's National Status and Trends Program had found the highest concentrations of organic chemicals, heavy metals and pesticide residues in those areas closest in proximity to cities and ports.[31] How was it that dredged materials from around the country consistently appeared to be considered clean enough for ocean disposal at the same time that contaminated sediments appeared to be widespread in the same waterways that were being dredged. Obviously, how sediments were tested played a major role in their characterization.

The 1977 tests were problematic for a number of reasons. They include: 1) the use of species in acute bioassays that were particularly hardy and tolerant of pollutants; 2) the absence of important sensitive species used in tests; 3) the unrepresentativeness of sediments to be dredged due to the small number of samples taken; 4) the need to show statistical significant differences in mortality and bioaccumulation between proposed dredged material sediments and "reference sediments" with small number of data; 5) the short duration time for bioaccumulation test, and 6) the lack of assessment for long-term sublethal, or community effects.

Other examples specific to the New York Bight region include the following. Up until recently, the only contaminant for which a "bioaccumulation criteria" existed was for total PCBs. Therefore, if there was bioaccumulation of any contaminant other than PCBs in test organisms over a 10-day period of time and the bioaccumulation levels was statistically significantly higher than the bioaccumulation level in organisms exposed to reference sediments, no decision

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[29]A.D. Little. 1987. Overview of Sediment Quality in the United States. Prepared for the U.S. Environmental Protection Agency. NTIS # PB88-251384.

[30]Ehler, Charles N. 1989. Prepared Statement of Charles N. Ehler, Director, Office of Oceanography and Marine Assessment, NOAA before the Subcommittee on Superfund, Ocean and Water Protection and the Subcommittee on Environmental Protection, Committee on Environment and Public Works.

[31]National Ocean Service. 1987. National Status and Trends Program for Marine Environmental Quality Progress Report. NOAA Technical Memorandum NOS OMA 38.

could be made on that result because no "bioaccumulation criteria" had been developed.

Petroleum hydrocarbons would bioaccumulate in test organisms and occasionally at concentrations statistically significantly higher than "reference" organisms. In both cases, the test result would be ignored because the Corps would explain that the test for petroleum hydrocarbons bioaccumulation did not distinguish between bioaccumulated hydrocarbons and natural body lipids. Plus, no petroleum hydrocarbon bioaccumulation criteria had ever been developed. Consequently, a portion of the test value would be attributed to naturally-occurring substances. In EDF's review of fifteen Public Notices, eight had bioaccumulation results of petroleum hydrocarbons and those results played no role in determining how to manage the sediments.

Another major problem was the reference material used to compare against sediments proposed for dredging. The "reference" sediments were supposed to reflect conditions that had not been affected by the Mud Dump Site. The rationale was that if the organisms exposed to proposed dredged material sediments did not fail the tests any more than organisms exposed to reference material, then the dredged material would not have any more of an impact than those caused by ambient conditions. But the "reference" area has always been 2.6 nautical miles southwest of the Mud Dump Site. EDF and Clean Ocean Action have consistently maintained that the site was too close to not be influenced by the Mud Dump Site. One reason for this position was that based on a sediment survey conducted by NOAA[12], the reference site fell within the area of sediments contaminated with metals, PCBs, PAHs and bacteria. Another was that whenever % survival results were low for proposed dredge sediments or bioaccumulation results were above detection limits, so were the results from the reference sediments. Consequently, statistically significant differences were almost never able to be found.

b. Problems with the 1991 Green Book and its implementation

The 1991 Green Book offered an opportunity to remedy the outstanding problems with the 1977 version. However, some problems remain and new ones have emerged.

i. A critique of the 1991 Green Book criteria

[12] see footnote 9

The testing manual for the "Evaluation of Dredged materials Proposed for Ocean Disposal" (also known as the Green Book) has recently (1991) been revised and issued by the Corps of Engineers. Nevertheless it is flawed in several respects and will therefore not always lead to the decisions regarding the disposal of dredged materials in the marine environment that are consistent with the word and intent of the Ocean Dumping Act. The most significant flaws are summarized below:

(1) In laboratory testing of the effects of dredged material samples, the results are compared to a reference site sample. The referenced sediment is chosen such that, in environments which are already stressed by contamination -- such as the New York Bight, it is not possible to predict what will be the effects of yet another dose on contamination upon animals which may be near the limit of their tolerance to stress. The tests seem to assume that all organisms in the ecosystem are healthy and the sediments, except for the dump site, are clean.

(2) The bioassay procedures contain numerous flaws, including: the use of highly tolerant species rather that the most sensitive species, the use of species that may not be typical of the dump site area, the use of specimens that may be healthier and more tolerant than those found in the dump site area, and the testing of each species in isolation.

(3) The bioaccumulation bioassays are inadequate because they are conducted for a relatively short time (while bioaccumulation occurs over very long periods of time) and they do not include bioaccumulation through the food chain. Despite claims to the contrary, 28 days is not sufficient to assess bioaccumulation in many animals and certainly does not give the accumulation end-pint, which is what we are interested in. The lack of food chain considerations is the most glaring flaw.

(4) The tiered approach is flawed. It could work, if it were applied correctly -- such that failing tests in one tier would suggest that the material is unsuitable for dumping. However, the way EPA and the Corps apply it, passing one tier, any tier, suggests that the material is suitable for dumping. This greatly increases the chances that the sediments will be determined suitable for dumping.

(5) Sublethal chronic effects are not adequately addressed. The Corps claims to be working on this, but any decisions based on the Green

Book tests should take into account this major missing piece.

(6) Finally, this manual is based upon antiquated mixing modes. It is time for EPA and the COWE to acknowledge the flaws in the four-hour initial mixing model and base their analyses on a more environmentally realistic model for potential effects. This model allows most of the contamination into the water due to the dumping activity to escape (swept away by currents) before samples are taken to determine the effects of the dumping upon the water column and its biota.

ii. Implementation of the 1991 Green Book

The implementation of the Green Book has not been as straightforward as one might be led to believe. When the Green Book was released in final form in April of 1991, the transmittal letter signed by both EPA and the Corps explicitly stated that the revised testing manual would be phased in between the announcement in the Federal Register and October 1, 1991. However, projects that had sampling plans approved were grandfathered and didn't have to conform to the new Green Book requirements, plus the new requirements were not going to be imposed until the regional guidance documents were developed. As of today, regional guidance have been approved by EPA Regions IV and VI. Regions IX and X have letters of agreement to use the newer test methods. Regions I and II are close to getting final approval, subject to public review and agreement among state agencies.

In the case of Region II, the document was not released to the public until December 1992. Public review was solicited in the letter delivered with the document, but no final deadline was set for accepting comments. Neither State nor other Federal Agencies were consulted on the document before it went out for public review. Consequently, new testing requirements are being imposed in Region II one year after anticipated by headquarters EPA and ACOE, only on new permit applications and effectively without public comment. However, the NYD makes assurances that public comments will be reviewed and the document revised if warranted. But that assurance is of little comfort considering how Public Notices are handled.

The regional documents do not necessarily contain criteria or threshold levels against which bioaccumulation test results must be compared against. These are the critical decision-making tools that will decide whether or not bioaccumulation levels are considered acceptable or not. One frustrating aspect of the method recommended by the Green Book is to use FDA fish consumption

action levels to assess bioaccumulation of a limited number of compounds in the tissue of worms or other benthic species. Without accounting for trophic transfer levels, it eludes us how the use of fish consumption action levels is protective enough of the marine environment. This is a serious flaw in the Green Book guidance.

4. Use of capping as a mitigation measure

The Corps considers capping "an appropriate contaminant control measure for benthic effects"[33]. However, there is no provision in the MPRSA or its implementing regulations that allow for mitigating measures such as capping to be used as a means for meeting ocean dumping criteria that otherwise would not be suitable for unrestricted open ocean disposal. The Corps maintains that capping is recognized by the London Dumping Convention (LDC) as a management technique to "rapidly render harmless" otherwise unsuitable materials. However, it should be understood that the LDC addresses capping as a management technique for rendering materials "harmless" only in a guidance document.

Even if capping was expressly allowed as a mitigative measure, there is doubt that it truly works. The ACOE claims it has a body of evidence that demonstrates the effectiveness of capping, however, as described above, that claim is extremely questionable. In large measure, the ACOE's claims about capping are based on limited use in certain areas of the country. It should not necessarily be viewed as a uniform mitigative measure that can work under any condition. In fact, we understand Region I rejected the ACOE's request to utilize capping as a means of managing contaminated dredged material at a deep ocean site in Massachusetts Bay. And, as described above, the experience of capping at the Mud Dump Site has provided substantial pieces of evidence that capping is not a completely effective mitigative measure.

5. Regulating dioxin in absense of the national reassessment

It is of great concern that Region II EPA undertook to regulate dioxin in dredged material as EPA concurrently is reassessing dioxin's potential to harm humans and the environment. Without the benefit of the reassessment, decisions are being made in absense of good science. This is of concern considering what has been said by EPA regarding dioxin presently. The preliminary results of the dioxin reassessment show that dioxin's cancerous and non-cancerous effects are

[33] ACOE-WES. 1992. "Monitoring Considerations for Capping". Dredging Research Technical Notes. DRP-5-07.

still a threat to humans and the environment. Scientists have reported non-carcinogenic effects from dioxin at low doses and an ability to cause cancer in humans at high doses[34].

6. Problems to come

The management of contaminated dredged materials are by no means limited to the New York-New Jersey area. Similar situations are developing or have developed in other parts of the country, particularly around urban harbors. These are a few examples.

i. Boston and New Bedford Harbors

These two harbors contain sediments contaminated with a variety of pollutants, but most highly contaminated with heavy metals and PCB's respectively. The massachusetts Bay Disposal Site off the coast in 300 feet of water near Stellwagen Bank has been designated for the disposal of clean sediments only. EPA Region I has been admirably consistent in opposing the disposal of any contaminated sediments at that site. Therefore, there will have to be special areas for disposing of contaminated materials dredged from these two harbors. it will also be essential to minimize the dredging at least until decontamination technologies are available.

ii. Oakland harbor and other San Francisco Bay Dredging

The disposal of polluted dredged materials from projects in San Francisco Bay presents serious problems that have been recognized since the 1980's. Deep ocean disposal is being viewed as the solution to the problem, and the EPA is moving to designate a deep ocean disposal site, which it appears is intended to receive contaminated sediments. We do not believe that the disposal of contaminated sediments would be appropriate within the context of the ocean Dumping Act. Such a designation should follow the model of the Massachusetts Bay Disposal Site which excludes contaminated materials.

The disposal of dredged materials from Oakland Harbor has been a contentious issue since 1988 and has still not been resolved. The opening project for Oakland harbor contains contaminated sediments, some of which have been proposed for ocean disposal. Part of the dredging project has been delayed

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[34]Interview of William Farland, Director of EPA's Office of Health and Environmental Assessment in Daily Environment Reporter, October 1, 1992. Bureau of National Affairs.

because of the lack of a suitable dumping site. After one failed attempt to designate a site first in the Bay and then a few miles off shore, the process of selecting a site has now focused upon open ocean waters just outside the newly designated Monterey Bay Sanctuary. In the meantime, another dredging project at two navy sites near Oakland has been proposed and an application to use an old military dump site within the boundaries of the proposed new dump site is being considered. Despite the fact that the Navy bases in question are proposed for closure, the project is being portrayed as urgently needed as a matter of national security, and as a basis to justify dumping at the site before the formal designation is approved.

iii. Thames River and Long Island Sound

The Navy plans to dredge 2.7 million cubic yards of sediment from an 8-mile stretch of the Thames River in order to accomodate the needs of the SEAWOLF submarine. The material is proposed to be dumped 2.5 miles due south of the mouth of the Thames River in Long Island Sound. The project is adjacent to several hazardous waste sites of the Groton Naval Base, all of which are Superfund sites. This project is still in the evaluative stages as a Supplemental EIS is being prepared by the Navy.

2. Port Authority of New York-New Jersey permit

There are a host of problems with the Port Authority's permit to dredge and ocean dispose sediments from Newark Bay that are of grave concern. First, it is a precedent-setting permit because it will be the first time that 2,3,7,8-TCDD (dioxin) will be expressly regulated in dredged materials. Secondly, serious procedural mistakes were made in processing the permit through public review. Thirdly, the existing dioxin contamination condition of the Mud Dump Site and the New York-New Jersey Harbor were never factored into the decision about the appropriateness of dumping additional dioxin-contaminated sediments at the Mud Dump Site. Fourth, we disagree with a variety of decisions made by the Corps and EPA that impact this permit. Fifth, the entire decision-making process was made in a void left by the U.S. EPA's failure to establish yet a national dioxin policy. Lastly, the recent bathymetric surveys show that a substantial amount of dredged material was lost due to the December Northeaster, indicating that the Mud Dump Site should be evaluated by EPA to determine if it fits "Category 1" criteria for impacted site and that "containing" dioxin-contaminated sediments at an open ocean site has a good chance of not being successful and cannot be guaranteed. For these reasons and reasons stated below, we have objected to this permit as presently issued.

As described above, dioxin has been found to be spread throughout the sediments and benthic worms in and around the Mud Dump Site. While this is new information, dioxin has been known to be present in Newark Bay sediments for ten years. In 1985, New Jersey Department of Environmental Protection published a study on dioxin in aquatic animals and sediments. It detailed findings of levels of dioxin in fish and shellfish tissue greater than the Food and Drug Administration's "levels of concern[15]." Subsequently, in 1984, New Jersey established a prohibition on the sale and consumption of all fish and shellfish taken from the Newark Bay complex. Recently, a soon to be published report conducted by Dr. Angela Cristini of Ramapo College for the New Jersey Department of Environmental Protection and Energy has revealed that dioxin levels in the tissue of Newark Bay blue crabs has not appreciably declined since the early 1980s. Also, her research documented the dioxin levels are close to and above the "FDA level of concern" in the hepatopancreas of blue crabs taken from three locations outside of the Newark Bay; the furthest location being Raritan Bay. These findings show that dioxin has spread beyond the confines of Newark Bay and is present in areas, until now, that have been considered "clean."

A. The Public Notice was flawed and undermined public comment

The Public Notice (PN) for the Port Authority's project was issued in late November 1991. A hearing was held in late February and comments were due in mid-March of 1992[16].

The PN's only discussion of dioxin was a brief paragraph at the end of the notice saying that effectively, the results of the bioassay/bioaccumulation testing indicated that the proposed dredging did meet "the current ocean disposal interim guidelines for dioxin.[17]" The notice never described what the current ocean disposal interim guidelines for dioxin were. The only way to find out was to obtain a copy through contacts at agencies. The interim guidelines never went through any form of public review, whether formal or informal. The Corps developed the guidelines and kept other agencies informed of the process through an "Interagency Dioxin Steering Committee", made up of state and federal

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[15] see footnote #11

[16] Many of the following issues were discussed in detail in EDF's comments on the Public Notice dated March 16, 1992, and subsequent correspondence, which are part of the permit's administrative record.

[17] Public Notice No. 14515-91-1028-OD

resource agencies, including EPA Region II. The PN also stated that this Interagency Committee had agreed that ocean disposal of sediments producing dioxin bioaccumulation of greater than 4 pptr would require de facto capping. De facto capping is simply the action of periodic burial of contaminated sediments with contaminated sediments from the same project area.

Upon investigation, several issues surfaced. First, all members of the Steering Committee had never agreed to 4 pptr as being a trigger for de facto capping. Most believed that if dioxin was detected in any level, it should be capped. Second, the Steering Committee had never agreed to the interim guidelines period. EPA, the Fish and Wildlife Service and the New Jersey Department of Environmental Protection had all objected to the guidelines according to meeting minutes obtained through FOIA requests. In particular, EPA Region II had been on record with correspondence that the guidelines as promoted by the NYD were not protective enough. It turned out that the guidelines consisted of allowing sediments that caused bioaccumulation in worms upon a 28 day test of up to 25 pptr before ocean disposal would be prohibited. EPA had been advocating for either 10 pptr, or even arguing that something lower might be appropriate.

The EPA objection is crucial, because according to the 1991 Green Book, EPA and the Corps are supposed "to develop and agree upon case-specific evaluative criteria, based upon technical evaluations made with local input" when tissue concentrations in organisms exposed to dredged material statistically exceed those of organisms exposed to the reference material[38]. The Corps action to issue the PN stating that interim guidelines had been complied with, when in fact interim guidelines agreed to by both the Corps and EPA did not even exist, was misleading to the public and shows that the NYD acted in direct contradiction to its own guidance.

b. The dioxin bioaccumulation criteria is flawed

The NYD pressed the use of 25 pptr as the trigger for prohibiting ocean disposal because of its claim that it was recommended by the 1991 Green Book as an FDA "action level." Upon some quick investigation, it was soon discovered that FDA did not in fact have an "action level" for dioxin. It had made a regional advisory opinion for the Great Lakes that 25 pptr was appropriate, based on assumptions about consumption in the Great Lakes region and that people would not regularly consume fish contaminated with dioxin.

[38]1991 Green Book, Section 6.3

Surprisingly, Region II capitulated to the NYD's insistence that 25 pptr be the upper limit that triggered prohibition of ocean disposal in March of 1992, after the public comment period had ended. It was understood that the EPA agreed to the number of 25 pptr as long as a monitoring and management plan was developed. Despite raising the issue personally with EPA and citing the problem in comments on the public notice, it wasn't until December 31st, 1992 that EPA reconsidered its position on 25 pptr and found it to be insufficiently protective. It chose to rely upon an upper limit of 10 pptr instead, which is New York State's fish consumption standard.

This action, while welcome on one level, did not go far enough. The most important reason is that a fish consumption standard does not protect sensitive species or wildlife, which should be accorded protection given that the MPRSA requires prevention of unreasonable degradation to the marine environment. Protecting sensitive endpoints is paramount in the development of any bioaccumulation criteria, but in the case of dioxin, it is particularly important. In addition, there is a critical need to have bioaccumulation criteria undergo scientific scrutiny and public review. EDF recommended several existing dioxin criteria designed to protect wildlife to EPA for there consideration. We have yet to hear a cogent explanation as to why they are not appropriate. Secondly, whatever the criterion number is, the presumption is that capping will occur and will work in isolating the dioxin from marine life. This very premise is now in dispute.

There are many reasons why fish consumption standards are not appropriate to use in assessing worm bioaccumulation potential after a 28 day test. First, the harm resulting from contamination caused by dredged material disposal is via the exposure to the contaminants of the marine food web (the trophic system) and eventually humans. Marine animals in the immediate vicinity of the Mud Dump Site, migratory fish, wildlife (including endangered bird species) feeding on contaminated fish and shellfish, and humans, via the same exposure pathway, are currently exposed to contaminants at the Mud Dump Site. Contaminants can be taken up from the sediments by invertebrates (clams, worms, crabs, and dozens of soft-bodied animals) living within or on the sediments. These animals are consumed by other animals, especially crabs, lobsters and bottom feeding fish where the tissue concentration of dioxin increases above that in the prey animals. Also, any contaminated organism in dredged material that is dumped will become prey for scavenging fish or shellfish as it floats through the water column or lands on the bottom and is left exposed.

Second, there are many routes of exposure that have to be taken into account including, 1) water column exposure when dredged materials are dumped into the Dump Site or released into the water column once dredged material reaches the ocean floor; 2) the dredged materials may well be unstable and thus dispersed over a wider area; 3) if materials are "capped", contaminants can escape via breaches or thin layers, such as at the peripheral edges of capped area; 4) benthic organisms can bioturbate the flanks of mounds or the edges of capped areas and accumulate contaminants, then becoming preyed upon by higher trophic species, 5) fish are attracted to feed at vertical surfaces such as a dredged material mound, increasing the exposure route; and 6) animals that feed on bottom dwelling invertebrates are attracted to disturbed areas to feed on the exposed animals in the sediments.

Third, fish consumption standards should be looked at carefully to understand the assumptions used to develop the standard. In the case of New York State's 10 pptr dioxin standard, it was developed when 10 pptr was the detection limit. It also is viewed by the New York State Department of Health as a standard that should be applied to total TCDD toxic equivalents, not only 2,3,7,8-TCDD. There is reason to believe that many dioxin isomers exist in Newark Bay that can accumulate in organisms, consequently, the criteria should not be used to assess the bioaccumulation of one isomer only.

c. This project was decided upon without the benefit of an EIS

Under NEPA, an Environmental Impact Statement (EIS) is to be included in every recommendation or report on proposals for legislation and "other major Federal actions" significantly affecting the quality of the human environment. What constitutes "significantly" varies with the circumstances of each case. The following issues have yet to addressed and were not considered in the Environmental Assessment (EA) issued by the Corps.

Existing levels of dioxin contamination at the Mud Dump Site have never been determined to be acceptable. The prospect of further impact due to disposal of hundreds of thousands of cubic yards of material contaminated with dioxin from the Port Authority's project and approximately 800,000 cubic yards per year from nearly twenty additional projects in the Newark Bay complex awaiting permits was never considered. The dioxin bioaccumulation criteria was objected to by the Fish and Wildlife Service and the National Marine Fisheries Service has questioned its suitability given EPA's recent recantation of the 25 pptr number. No EIS has been prepared for either the Mud Dump Site or a private or federal project in the New York-New Jersey Harbor area that has ever assessed the

potential impacts of ocean dumping dioxin-contaminated sediments. The EA did not review all alternatives available to the Port Authority, including in-storage vessels. Finally, the economic impact on the fishing industry was not fully considered.

The PN for this project declared that public "comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act (NEPA)". Upon review of the permit's record before the public comment period ended. EDF discovered a memorandum that the Chief of Western Permits Section had made a preliminary determination that the decision on this application would not require preparation of an environmental impact statement. It wasn't until the permit was issued on January 6, 1993 that the Environmental Assessment was issued in the permit's "Statement of Findings". Within that Statement of Findings, a Finding of No Significant Impact (FONSI) was announced and an EIS was declared not be necessary. This appears to be in contradiction to the Corps' own regulations, which requires that a FONSI shall be prepared for a proposed action...for which an EIS will not be prepared and that the Public Notice is supposed to indicate the availability of the EA/FONSI[39]. This sequence of events did not take place and the public did not have opportunity to know exactly what the Corps' decision was until after the permit had been issued. More importantly, the public did not have the benefit of the Environmental Assessment discussion of potential environmental impacts in the context of the public review process.

Additionally, the Council on Environmental Quality requires public review of FONSIs under four circumstances. They include (a) if a proposal is a borderline case, i.e. when there is a reasonable argument for preparation of an EIS; (b) if it is an unusual case, a new kind of action, or a precedent setting case such as a first intrusion or even a minor development into a pristine area; (c) when there is scientific controversy over the proposal; or (d) when it involves a proposal which is or closely similar to one which normally requires preparation of an EIS.

Although the request had been made in public comments and oral testimony for an EIS or SEIS to be conducted, the Corps rejected that request and issued the FONSI. Currently, the National Marine Fisheries Service is on the record as wanting an EIS conducted[40]. In summary, it is apparent that an EIS

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[39]33 CFR 230.11 -- Finding of No Significant Impact

[40]NMFS February 2 letter to Mr. Sidamon-Eristoff, Administrator of Region II EPA

should have been conducted to ascertain the all potential environmental impacts of continuing to dispose of dioxin-contaminated sediments at the Mud Dump Site.

d. The Monitoring and Management Plan

A "Monitoring and Management Plan" (MMP) was developed by the NYD and Region II EPA to be effectively test whether or not the dioxin bioaccumulation criteria was acceptable. The MMP was negotiated between Region II and NYD between March and late November 1992, when it was released to other agencies for comment. The MMP did not go through a true review process and did not undergo any scientific scrutiny. Although comments were considered welcome, an eight page set of comments submitted by EDF[41] has yet to be responded to. Some features of the MMP have changed since it was originally issued, but it is still flawed.

The MMP does not answer the right questions. If any disposal of dioxin-contaminated material was to occur and if that material was subject to a rigorous, scientifically credible bioaccumulation criteria that protected wildlife, a MMP should answer the following questions. 1) Has capping been successful in covering the entire amount of deposited sediments? 2) Have all routes of exposure and risk posed by dioxins and furans in dredged materials been assessed? 3) how will monitoring be conducted to determine if any threats are posed to the environment by the exceedance of preset thresholds? The MMP, even in its current incarnation will not answer these questions. It is lacking in breadth of data that is to be collected; the capping regime is insufficient to guarantee any measure of protection; too many factors are uncontrolled and there is no scheme for defining how data will be used to change management practices or to amend the criteria. Lastly, long-term monitoring is not provided for.

In addition to the problems outlined by EDF's letter, it appears that the MMP does not even comport with the ACOE's own recommendations about monitoring. In a technical guidance document[42], monitoring components are detailed that go further than the MMP developed by the NYD/Region II.

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[41] EDF letter to Mr. Sidamon-Eristoff, Administrator of Region II EPA and Colonel Thomas York, District Engineer, New York District, on January 4, 1993.

[42] U.S. Army Engineer Waterways Experiment Station. "Monitoring Considerations for Capping" in Dredging Research and Technical Notes DRP-5-07

Although the ACOE's recommendations may not be considered complete as far as we are concerned, it does at least suggest thresholds and what should be done if those thresholds are exceeded. The MMP does not appear to comport to ACOE's own guidance.

Lastly, the MMP is very similar in nature to the effort undertaken in the early 1980s around the EMD, described above. There is no indication that any lessons have been learned from the last time the Corps experimented with capping and that those lessons have been incorporated into this current endeavor.

e. New Jersey's Coastal Zone Management Act decision was flawed.

Section 307(C)(3)(A) of the Coastal Zone Management Act does allow states to determine whether Federally permitted activities "in or outside of the coastal zone, affecting any land or water use or natural resource of the coastal zone of the State" is consistent with the State's Coastal Zone Management Plan. In early November, Clean Ocean Action prevailed upon the State of New Jersey to review its consistency decision and granting of a water quality certificate given that the potential for the disposal of sediments at the Mud Dump Site to attract fish that want to consume any organic matter or marine organisms present in the dredged materials[43]. A Supplemental Public Notice issued in late October for the Port Authority's project was seen as an opportunity for the State to review all information available about the potential impact at the Mud Dump Site. NJDEPE had set conditions to its water quality certificate restricting barge overflow when the material was being dredged in Newark Bay, but no review of dumping impacts were considered. Although NJDEPE agreed that the issues raised were important, it declined to reopen its consistency determination.

f. Endangered Species Act consultation

At the request of NOAA, the COE has initiated a consultation under the Endangered Species Act. Under the law, NOAA has the authority to review a proposed dumping project to determine whether it will threaten any endangered species in the area. The Corps is obliged to supply all pertinent information

[43] Cindy Zipf of Clean Ocean Action letter to Scott Weiner, Commissioner of NJDEPE dated November 3, 1992 and Clean Ocean Action and American Littoral Society letter to Bob Tudor, Administrator, Land Use REgulation Program for NJDEPE dated November 12, 1992.

needed to make such a determination. Once all the information has been received by NOAA they have 30-90 days, depending upon whether it is an informal or formal consultation, in which to review the material and make their determination. In the case of this permit, there is a great deal of information that needs to be considered. In order to determine if the health of endangered species swimming and/or feeding in the area is compromised by the activity, it is essential that NOAA have information on the endangered species that frequent the area (marine mammals and sea turtles), when they are in the area, their feeding behavior, their state of health, their sensitivity to the contaminants in the sediments (especially dioxin in this case), the extent of contamination in the sediments to be dumped and how that will add to the contaminants already at the dump site and in the vicinity, and the movement and accumulation of contaminants through the food chain. We believe a NEPA document would be helpful in providing this information, though it could be provided in other forms. The information should also be helpful to EPA in determining potential effects of the materials on other marine species in the area.

g. EPA and Corps need to determine that the permit complies with 40 CFR 227.5(b).

There is a possibility that the dredged material constitutes a "prohibited material" under the MPRSA regulations. 40 CFR 227.5(b) requires that "the ocean dumping of the following materials will not be approved by EPA or the Corps of Engineers under any circumstances:..[m]aterials in whatever form (including without limitation, solids, liquids, semi-solids, gases or organisms) produced or used for radiological, chemical or biological warfare."

It is well understood that dioxin is a by-product of the manufacture of Agent Orange, an herbicide used for warfare. This issue has been raised to both the Corps and EPA for a response to the possibility that dioxin caused by the manufacture of Agent Orange in dredged materials may fall under the rubric of prohibited materials.

III. The Water Resources Development Act of 1992 -- Title V

Title V of the Water Resources Development Act of 1992 was an important environmental achievement. For the first time, a national policy was crafted on the problem of contaminated marine and freshwater sediments. Plus, important changes were made to the ocean dredged material disposal program.

First, a National Contaminated Sediments Task Force with representation from federal agencies, states, ports and environmental interests was mandated.

Secondly, a comprehensive national sediment survey was mandated to be conducted using all available data and information regarding sediment quality.

The Title does change how the ocean disposal program is currently operated. It provides for EPA to have a concurrence role with respect to ACOE issued permits. EPA has 45 days to review all information and the permit application and concur, reject or concur with conditions. States are allowed to promulgate regulations for ocean disposal that are stricter than federal regulations, as long as they are scientifically defensible. The new language also revises the site designation requirements by requiring that all dump sites be designated by 1997, requires that EPA develop site monitoring plans and site management plans be developed by 1995. It also clarifies the policy of non-designated sites. The maximum length of permits are restricted to seven years, placing an upper limit on the amount of time a permit can exist before renewal. However, it is important to note that the intent of this last requirement was to set an upper limit on permit lengths and not preclude the typical permit term length of three years, which is appropriate for most permits.

IV. Alternatives to Ocean Disposal

Alternatives to ocean disposal include upland disposal, upland storage, use as sanitary landfill cover, disposal on beaches, wetland restoration projects, containment structures, such as islands, subaqueous borrow pits, or near-shore diked areas, and decontamination technologies.

Alternatives generally are utilized according to the quality of the sediment and its structure. To be sure, any clean, sandy dredged material should be taken advantage of and reused in a beneficial manner.

Alternatives to ocean disposal of contaminated dredged materials do exist and can be implemented. A full set of alternatives needs to be considered and assessed to determine which ones best meet environmental protection and meet the needs of the specific locality.

Decontamination technologies do offer an advantage over containment options due to their ability to render dredged materials less contaminated and perhaps even suitable for ocean disposal. The Superfund program has helped develop numerous technologies that lend themselves to being utilized to decontaminate sediments. Decontamination also offers the possibility of spurring economic growth and can be considered among the new environmental technologies promoted by the present Administration.

A unique decontamination program in the Great Lakes. EPA's Assessment and Remediation of Contaminated Sediments (ARCS) has successfully shown that decontamination technologies hold promise in reducing contaminant levels. A similar program, although on a smaller scale, should begin in the New York-New Jersey Harbor, thanks to an amendment to the Water Resources Development Act of 1992 (Section 405), which had the support of the New Jersey and New York delegation. This section requires that EPA and the ACOE work together to develop a sediment decontamination program in the New York-New Jersey region that builds upon information generated by Section 412 (c) of the WRDA of 1990. Section 412(c) required the ACOE to review alternatives to ocean disposal, including decontamination technologies. Thus far, the NYD has had four vendors treat sediments from Newark Bay to ascertain their technology's ability to decontaminate the sediments. By and large, these technologies were found to be successful. Increasing the scale of demonstration, which Section 405 should accomplish, is key to understanding the feasibility of decontamination.

Public participation in the process of developing alternatives to ocean disposal have not been terribly successful. At least in the New York-New Jersey region, there is immense frustration with how the public has been included in the decision-making process. Although the NYD did undertake an effort to evaluate alternatives to ocean disposal during the 1980s, the end result is a choice of using existing subaqueous borrow pits in the most popular recreational fishing area of the New York Harbor. It is difficult to understand how any alternative will ever be successfully implemented with large public opposition. The ACOE needs to work effectively with the public in an open and flexible manner that generates proposals that have an opportunity for some public support. Thus far, the ACOE has not been able to do that.

V. Recommendations

1. Good science should be the prevailing factor that determines how well the ocean disposal program has worked to protect coastal resources. The effectiveness of the ocean disposal program on a national level should be investigated more thoroughly. Other major disposal sites that have received contaminated sediments should be investigated to determine their condition and impact on the marine environment. A review of the uniformity with which the six different EPA regions and ACOE districts implement ocean dumping criteria would shed light on the degree to which the program is working cohesively. Congress would benefit from learning more about EPA's revision of the ocean dumping regulations and its rewriting of the "Gold Book", which is comparable to the Green Book and applies to Clean Water Act waters. These issues could be investigated by the Office of Technology Assessment or the General Accounting

Office.

2. EPA should review ongoing monitoring efforts and develop both a research plan for determining environmental impacts from dredge disposal sites and guidance for their regional offices on how to monitor for environmental impacts.

3. One legislative proposal considered during the last Congress was to give EPA permitting authority over ocean disposal permits. We believe this proposal has merit and should be reconsidered. The bifurcation of permitting now between EPA and the ACOE is not serving either the maritime interests or those concerned about the protection the marine environment or the recreational and commercial fishing economy. Also, the current practice of having the Corps permit federal projects amounts to a federal agency permitting itself with little, if any, oversight.

4. EPA needs a Congressional mandate to develop sediment quality criteria and to develop rational means of applying the criteria to regulate dredged material and prevent continued contamination. Sediment quality criteria offer a means of helping to characterize the potential for sediments to have adverse effects on marine organisms and if applied as water quality standards are applied in developing water-quality based NPDES permits, to offer a stronger means of promoting pollution prevention and the prevention of future contamination.

5. Substantive public participation needs to be garnered by both the EPA and ACOE to help develop long-term management options that integrate public and private interests. Contaminated dredged material management is going to move into an increasingly heightened stage of crisis management if a redoubling of effort isn't made to find solutions that are environmentally protective and meet the needs of various constituents.

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STATEMENT OF THE

AMERICAN ASSOCIATION OF PORT AUTHORITIES

BY

DWAYNE LEE

DEPUTY EXECUTIVE DIRECTOR OF DEVELOPMENT

PORT OF LOS ANGELES

BEFORE THE

SUBCOMMITTEE ON

OCEANOGRAPHY, GULF OF MEXICO AND THE OUTER CONTINENTAL SHELF

OF THE

COMMITTEE ON MERCHANT MARINE AND FISHERIES

UNITED STATES HOUSE OF REPRESENTATIVES

1334 LONGWORTH HOUSE OFFICE BUILDING

MARCH 30, 1993

ON

CONTAMINATED SEDIMENT AND DREDGED MATERIAL MANAGEMENT

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Testimony Of

The American Association Of Port Authorities

By

Dwayne Lee

Deputy Executive Director Of Development
Port Of Los Angeles

Good morning. My name is Dwayne Lee. I am the Deputy Executive Director of Development for the Port of Los Angeles. I am testifying today on behalf of the American Association of Port Authorities (AAPA). In addition to serving as a member of AAPA's Harbors, Navigation and Environment Committee, I am Chairman of the Dredging Task Force of the International Association of Ports and Harbors (IAPH). In that capacity, I represent IAPH as a non-voting member of the London Convention of 1972, the international treaty governing the ocean disposal of dredged material, of which the United States is a signatory.

Founded in 1912, AAPA represents virtually all public seaport authorities and agencies in the United States, Canada, Latin, South America and the Caribbean. AAPA members are mandated by law to serve public purposes, to facilitate waterborne commerce and to generate local and regional economic growth. My testimony today only reflects the views of our U.S. members. As public agencies, AAPA members share the public's concern for preserving a clean environment while furthering our country's economic, international trade, and national security objectives. The public port community is particularly concerned about the need to accommodate both our environmental goals and the economic necessity to dredge our nation's harbors to ensure that ports continue to serve as our nation's gateways to the international marketplace.

Mr. Chairman, the public port industry commends you for holding this hearing today. AAPA greatly appreciates the opportunity to testify and to share our perspective on ocean disposal of dredged material. The reality is we are on the verge of a national dredging crisis because we have not been able to dredge our nation's harbors in a timely and cost-effective fashion. It is time for the federal government to develop a comprehensive, national dredged material management and disposal policy that will enable us to break the gridlock that many of our nation's ports face when they need to dredge our harbors. AAPA will soon be finalizing a proposed policy and looks forward to working with this Committee, Congress and the Administration to address these difficult but very important issues.

In my testimony today, I want to highlight five principal points:

1. Of the 300 million cubic yards of sediment dredged by the Corps from federal navigational channels only about 5 percent

do not meet EPA's ocean disposal criteria and require special management or confined disposal.

2. Current regulation of ocean dumping is adequate to protect the environment. We do not need more laws. What we need is better and more coordinated implementation.

3. There is a lack of strong federal leadership to resolve interagency conflicts and to issue dredging permits in a timely manner.

4. It is absolutely essential that the ocean dumping of dredged material remain a viable disposal option. All disposal options should be considered, with the decision based on environmental, public health and economic considerations.

5. The failure to dredge sediments from navigational channels and port areas not only impedes commerce, but also results in navigational safety and environmental hazards.

Background

The importance of ports to local, state and regional economies cannot be overstated. Over 95 percent by volume and 75 percent of the world's traded goods by value are transported in oceangoing vessels which require navigational access to and from U.S. markets. Public ports serve as a vital conduit linking the United States to the world marketplace. Port activities create an economic benefit for the nation, as well as for the local port community. A recent report by the U.S. Department of Transportation found that in 1991 cargo activities port activities generated 1.5 million jobs, contributed $70 billion to the gross national product, provided personal income of $52 billion, generated federal taxes of $14 billion and state and local taxes of $5.3 billion, and over $11 billion in Customs receipts.

Due to natural siltation processes of rivers and estuaries, federal navigation channels must be dredged if port operations are to continue and if harbors are to be improved to handle the increased trade volumes expected in the coming decades. As the Operation Desert Shield deployment demonstrated, modern port infrastructure, adequate channel depth and maintenance dredging are indispensable not only to commercial waterborne transportation, but also to national security interests.

The Extent of Contamination

I would like to put the problem of the dredging of contaminated sediments into perspective. Approximately 400 million cubic yards of sediment are dredged annually in the

United States. The Corps dredges approximately 300 million cubic yards from federal navigation channels. There are approximately 10 to 15 million cubic yards of sediments dredged annually for navigational purposes which require special care and handling because they do not meet unrestricted open water disposal criteria.

Sediments act as records reflecting a chemical chronology of past activities, including agricultural and forestry runoff, and industrial and municipal pollutant discharges. Navigation channels and harbors are often located in, or near, highly industrial urban centers and are subject to runoff and discharges from roads, freeways, residential development, as well as commercial and industrial sources. Contaminated sediments, therefore, is sometimes found near shipping berths where port authorities must dredge in order to operate the port. As a result, public port authorities find themselves confronting an historical problem which, quite literally, has been dumped into our harbors.

In your invitation to today's hearing you asked AAPA to comment on "the ocean disposal of contaminated sediments." The extent of the problem of contaminated sediments depends ultimately on the definition of "contaminated." In other words, what level of contamination concentration triggers environmental consequences. Under current law, the most highly contaminated dredged material cannot be disposed of in the ocean. As I will explain in more detail later in my testimony, the Ocean Dumping Act prohibits the ocean disposal of dredged material that fails to meet criteria established by EPA, as well as applicable state water quality criteria. Therefore, when we talk about the "ocean disposal of contaminated sediments" we are talking only about low levels of contaminants and only when it can be demonstrated that they can be rapidly rendered harmless through appropriate management practices.

The monitoring and management of ocean disposal sites should improve further as the result of contaminated sediment provisions adopted last year by Congress, with the support of the port community, in the Water Resources Development Act of 1992, that amend the Ocean Dumping Act. Enormous resources are already expended by public port authorities and the federal government to characterize dredged sediments and to develop environmentally sound disposal solutions. In fact, the cost of regulatory compliance has skyrocketed -- in some instances, testing and analytical work has become more expensive than the dredging itself. These costs are reflective of the complicated testing involved.

Much of the current concern over sediment contamination is driven by site specific "hot spots" of in-place contaminants and fish advisories unrelated to harbor dredging operations. Unfortunately, these legitimate concerns over the potential impacts caused by a fraction of contaminated sediments has created a climate in which dredged material uniformly is assumed to be "contaminated." The combination of these real and imagined problems makes the removal and disposal of sediments a very serious management and public perception problem for the public port community.

If the sources of sediment contamination are not abated, however, it will do little good to clean up an area which continues to receive contaminated sediments through natural siltation processes. Congress has a spotty record in funding vital aspects of the Clean Water Act, such as Section 115 (sediment remediation) or Section 319 (nonpoint source control provisions) and the result is to exacerbate the sediment problem. There are still too many partially controlled sources of pollution into U.S. waters, including approved point discharges. Although nonpoint sources are much harder to control and normally do not result in "hot spots," controlling them is essential to restoring and maintaining the overall health of our coastal and marine waters.

In any urban or industrial harbor, there are likely to be some sediment constituents found in concentrations in excess of naturally occurring "background" levels. These levels will differ greatly from region to region, and harbor to harbor. In addition, the environmental effects of contaminate vary according to factors such as salinity levels, type and density of sediment (e.g. clay or sand) and temperature.

Our overall national understanding of the scope of the contaminated sediment problem is still incomplete. Because the vast majority of highly contaminated sediments are not found in navigation channels where the Corps or the ports routinely dredge, a larger effort is needed to better define the problem, as well as to prioritize the areas obviously in need of remedial action because they pose a serious threat to human health or the environment. The public port community supported provisions included in the Water Resources Development Act of 1992 (WRDA '92) that require a survey of contaminated sediment sites nationwide, as well as the establishment of a National Contaminated Sediment Task Force to work with EPA and the Corps. Our understanding is that while the survey is well underway, EPA and the Corps have not yet taken any steps to establish the Task Force.

Current Regulation of Dredged Material Adequately Protects the Environment

In order for the sediments to be dredged and moved to another site in the water, they must meet national criteria established by the EPA and the Corps, as well as more specific regionally based federal criteria, coastal zone consistency requirements, and state water quality standards. Sediments not meeting the requirements, if they are to be dredged at all, are isolated from the biota using capping, borrow pits or placement behind dikes along a waterway.

For the navigational dredging program, EPA and the Corps currently have adequate authority to control and manage contaminated sediments. This assessment is confirmed by the EPA's ongoing development of a contaminated sediments strategy, which will rely on existing statutory authority. These two agencies have moved forward with initiatives to better manage both clean and contaminated dredged material, including developing long term disposal management strategies and beneficial uses for dredged material.

EPA, in consultation with the Corps, last year completed the "Evaluation of Dredged Material Proposed for Ocean Disposal--Testing Manual," better known as the "Green Book". The Green Book is structured for easy interpretation and representative marine organism for exposure to potential contaminants in dredged material. The Green Book uses a "loose-leaf" approach which will allow new procedures and methods to be added as they are developed. The revised protocols will result in more stringent analysis of dredged material. Congress needs to give the Green Book's long-awaited guidelines a chance to work and avoid uprooting an effort that has taken years of study and millions of dollars to develop.

The development of numerical sediment quality criteria continues to be a controversial issue. EPA is in the process of working to develop numerical criteria for about a half dozen pollutants. AAPA encourages EPA to convene the National Contaminated Sediment Task Force mandated by WRDA '92, as soon as possible so that it can assist the federal government to determine the need and a schedule for the development of numeric sediment standards. AAPA will work with EPA and the Corps as they continue their work on developing suitable criteria. For dredged material disposal decision-making purposes it would be inappropriate at this juncture to use numeric criteria as "pass-fail" numbers, replacing detailed site-specific analysis currently in use. Reliance on strict pollutant specific numerical standards may lead to categorical elimination of the aquatic disposal option even when it is the most environmentally preferable and cost effective option.

A list of constituents in the sediment does not give an accurate picture of their environmental significance, which is a function of a variety of complex factors. There are natural variations in "background" levels of the various chemical constituents which appear in sediments. The existence of the constituent is not alone enough to reach a conclusion that it is causing a problem in the environment. Chemical and physical properties such as temperature and sediment grain size interact to vary the bioavailability of a contaminant and the impact that a specific constituent concentration may have on the environment.

The manner in which sediment criteria are implemented is of critical importance to the port industry. In their revision of the Green Book, EPA and the Corps deliberately created a niche in the process for incorporation of numerical criteria as they are adopted. The Green Book would use numerical criteria as a "screen," or a flashing yellow light, which would indicate the need for biological testing, rather than as a "pass-fail" standard. AAPA believes that this structure represents responsible use of criteria, and provides for verification of the criteria validity through supplementary effects-based, biological testing.

The Effectiveness of the Federal Ocean Disposal Program

While the current laws and regulations are adequate to manage contaminated sediments safely, implementation is lacking in two principal areas. The first, and the most frustrating, is the regulatory delay and lack of strong leadership at the federal level to make permit decisions. Our scientific ability to identify potential environmental problems has

outpaced our institutional ability to make decisions. The second is the lack of adequate federal funding for the implementation of existing program mandates such as the designation of disposal sites and development of disposal site management, the development of cost-effective remediation technologies, and the construction of confined disposal areas for contaminated material when ocean disposal is not feasible. In making management decisions about contaminated dredged material, regulatory agencies should consider whether the relative risk posed by open water placement justifies the expense of hugh capital investment in landside disposal facilities decontamination.

Although the Corps is ultimately responsible for issuing ocean disposal permits, complex requirements for coordination, consultation and review by other federal, state and local agencies can often unnecessarily delay or derail final consideration by the Corps. Too often reviews by regulatory agencies are sequential rather than simultaneous, and there is no consensus on what is required of the permit applicant. Wherever possible multiple agency reviews should be consolidated objectives agreed to and clear timelines established. Amendments to the Ocean Dumping Act in the WRDA '92 did set out specific timelines for review of ocean dumping permits. We hope that these changes will help improve the permit review process.

Regulatory agencies must understand that leaving sediments in navigational channels both impedes commercial opportunities, and presents navigational, safety and environmental hazards. It is common sense to realize that is environmentally and economically preferable to move sediments out of the path of oncoming vessels and relocate it to designated, monitored and managed disposal sites. Too often regulatory agencies become embroiled in endless process forgetting that time is of the essence for the permit applicant. Ports welcome any improved working relationship among federal and state agencies as a positive step toward achieving more programmatic consistency and building public confidence in the soundness of their dredged material disposal program.

The public port industry supports the current regulatory structure, in which the Corps has authority to permit ocean disposal while the EPA has the authority under both the Clean Water Act and the Ocean Dumping Act to prevent unwise disposal actions and to designate appropriate disposal sites. The technical and biological concerns are well balanced in a division of labor with the Corps conducting assessment, permit review and sediment remediation functions, and the EPA reviewing ocean disposal permits and making disposal site designations. The Corps' has considerable experience, resources and expertise in dredging and dredged material management and disposal. Indeed, EPA currently relies on the expertise of the Corps in designing sediment remediation under the Superfund program for aquatic sites like New Bedford Harbor, MA.

Unfortunately, even if regulatory improvements can be made it will not address the fact that there is inadequate funding. The public port community is very concerned that proposed cuts in funds for EPA's ocean dumping program will limit their ability to comply with WRDA '92 mandates to designate ocean disposal sites, upgrade monitoring programs,

and develop site management plans.

Last year, AAPA worked with the environmental community to support a national sediment remediation program in WRDA '92. However, because of Administration objections to the cost of the program, it was scaled back to one project in the New York/New Jersey area. While the public port community is hopeful that decontamination technology will be developed, research is only in the very early stages and large scale application is not a viable alternative to the management and confined disposal of contaminated materials.

The 1990 Water Resources Development Act authorized $10 million annually for the Corps to conduct remediation dredging outside navigation channels. However, the local project sponsor would be required to pay 50 percent of the cost, and 100 percent of the disposal costs. Certainly the remediation outside navigation channels is a national concern and should not be the responsibility of local government or port authority, nor should it be the component of our navigation project cost sharing obligations under the Water Resources Development Act. Public ports should not be forced to assume responsibility, either to bear the cost of securing the disposal capacity or to support a wider remediation program. The polluter or discharger that caused the contamination should, wherever possible, pay for the cost of clean up.

Mr. Chairman, clearly the federal government's overall management of the dredging program -- both the Corps of Engineers' and EPA's -- can be improved. For example, regulatory reviews should be streamlined and resources provided for long-term dredged material disposal planning, for disposal site designation, for more costly beneficial use projects, and for site monitoring projects and disposal sites. These functions will become even more important in the context of any expanded sediment remediation program. AAPA welcomes the opportunity to work with you in these and other areas to help improve the program.

Ocean Water Disposal Should be Preserved

Of the approximately 400 million cubic yards of sediments dredged annually, about 60 million cubic yards are disposed of at ocean sites regulated under the Marine Protection, Sanctuaries and Research Act; and the remaining 340 million cubic yards are regulated under Section 404 of the Clean Water Act.

There are several disposal alternatives theoretically available for both clean and contaminated sediments: totally upland confined sites or unconfined areas; confined disposal facilities extending from shore into the water or totally surrounded by water; thin layer disposal over wide areas; open water placement in bays, rivers and estuaries; or, in the ocean. All disposal alternatives can potentially have some adverse environmental impacts, but these impacts can be limited or eliminated with good management practices. Some alternatives obviously should not be used for highly contaminated sediments. On the other

hand, opportunities to use dredged material beneficially should be employed to the maximum extent possible, especially for the construction of coastal wetlands.

There are many factors that come into play when selecting disposal sites. For ports in major urban centers, upland alternatives are usually unavailable, especially if there are large annual volumes being removed. Building confined sites nearshore in any location may threaten wetlands, and building containment structures in estuaries threatens productive shallow bay bottom (although it creates good waterfowl habitat). Open water disposal in relatively nonproductive, nondispersive deepwater sites is often found to be the best solution. If the material contains low levels of contamination, subaqueous "capping" is often used.

The underlying principle of dredged material management should be that all disposal options should be considered, with the decision based on environmental, as well as economic and public health considerations. We must recognize that land-based alternatives are not inherently better, in terms of the environment protection or practical feasibility, than open water disposal. This principle has been recognized by the London Convention of 1972 which is the international treaty governing the ocean disposal of dredged material. In addition, the Corps and EPA recently jointly issued guidance proving a technical framework for evaluating environmental effects of dredged material management alternatives. This guidance recognizes the need to evaluate the environmental impacts of the full range of disposal alternatives.

Conclusion

Mr. Chairman, the public port industry is aware that ocean disposal of sediments is an emotionally charged issue. This concern is caused in part by philosophical objection to the use of the ocean; and in part by concern over the impact of pollutants in sediments. By working with the Corps and EPA to improve ocean disposal management practices and participating in the development of long term management strategies and beneficial use projects, the public port industry is attempting to build greater public confidence in the program and to reduce reliance on open water disposal where feasible.

Nonetheless, as front line parties to the dilemma posed by the widespread concern regarding contaminated sediments, ports believe that ocean disposal is an important option in the effort to dispose of sediments in environmentally sound ways. This is especially true if we begin to examine sediments causing water quality problems in our estuaries under a nationwide sediment remediation program. Removing bioavailable contaminated sediments from our estuaries and disposing of them in well managed ocean disposal sites may represent a "net environmental benefit" which society cannot afford to ignore.

Sediments transported into the harbor by natural processes, where they fall out of the water column, sometimes contain chemical constituents. These sediments must be dredged periodically if ports are to continue to handle the transportation of our nation's cargo. As

the entities that must dredge in order to do business, public port authorities are left with the job of properly disposing of these dredged materials. We strongly urge you to work with EPA and the Corps to reform the federal regulatory process, to avoid permit delay and to ensure that our nation's harbors can be dredged in a timely and cost effective manner.

This morning, I have attempted to outline the components which we believe a successful sediments approach would feature, including the critical point that all disposal methods ought to be considered in determining which option poses the least risk to the environment. We believe that these initiatives would form the basis for addressing the scope and extent of our contaminated sediments problems. We look forward to working with the Congress on such a program.

Testimony

Delivered by Frederick Grassle, Director
Institute of Marine and Coastal Sciences
Rutgers University

Hearing on Ocean Disposal of Contaminated Dredge Material
Subcommittee on Oceanography, Gulf of Mexico and
the Outer Continental Shelf
Tuesday, March 30, 1993

I'd like to thank Chairman Ortiz and members of the Subcommittee for the opportunity to present information on the ocean disposal of contaminated dredge material. Per your request, my remarks provide a brief overview of the effects of this activity on the marine environment, potential alternatives to ocean disposal of contaminated dredged material including the current state of technology for remediating sediments, and comments on the proposal to use in-vessel storage for the dredging of contaminated sediments at the Port Newark Port Elizabeth Marine Terminal.

Overview of Effects of Ocean Disposal of Contaminated Sediments on the Marine Environment

It is necessary to be concerned about disposal of any contaminated materials in the ocean. Ocean disposal leads to changes in marine ecosystems in the immediate area of the disposal site. If the material from the disposal site is prevented from spreading, then the effects on either biota or human health are minimal. For example, capping of contaminated sediments with clean sediments has proven to be successful in controlling the spread of contaminated sediments so that risks to marine life and human health have been acceptable. Major advances have been made in recent years in our understanding of processes associated with transport of sediment in the marine environment. Materials thought to have been contained may in some occasions be moved by storms and can be transported considerable distances. In these instances, material from ocean disposal contributes to the gradual buildup of pollutants in the ocean. Despite the large extent of the deep ocean, it covers 60% of the earth's surface, pollutants have been measured in all deep-sea sediments sampled to date. The primary source of these pollutants are atmospheric, but we need to be concerned about any source that adds to the general level of contaminants.

Assessment of Ocean Disposal Alternatives Including Sediment Remediation

During the past year, the Institute of Marine and Coastal Sciences at Rutgers University received funding from the Port Authority of

New York/New Jersey to assess sediment remediation technology. This assessment included the organization of two major, international conferences with some of the world's leading scientists and engineers evaluating current research and demonstration programs in the U.S. and Europe. Speakers represented a variety of U.S. research institutions and agencies as well as organizations in the United Kingdom, Germany, Belgium, and the Netherlands. A broad range of remediation approaches were presented and evaluated along with the use of undersea pits for sediment disposal in the ocean. A guidance document was produced by a steering committee for each conference, copies of which have been provided to the committee staff for your information.

Sediment Transport

The New York/New Jersey Harbor Estuary is a complex series of large embayments, tidal straits and rivers with many diverse hydrodynamic environments. Most of the approximately one million metric tons of fine-grained sediments that enter the harbor annually are brought there by tributaries (i.e. Hudson, Passaic and Raritan Rivers) and easily account for more than 90% of the harbor's annual sedimentation rate.

Considerable discussion at each conference centered on the lack of an adequate characterization of sediment pollutant loads, distribution and transport processes for New York harbor. This is necessary to determine which sediments and what quantity of dredged material warrant remediation. Effective decisions concerning treatment technology cannot be made without this information. A detailed characterization of sediments could be used to focus treatment alternatives on sediment sources and depositional areas in the estuary. One useful technique for conducting this characterization is sidescan sonar. This technology, in conjunction with some sampling and direct characterization of sediments, provides information on seafloor characteristics such as bottom roughness and sediment texture at meter scales. Sidescan sonar has been used successfully at other port areas to provide essential information for the design of research and monitoring programs.

Continuous measurements of current flow at several heights off the bottom at selected sites will also be needed to determine patterns of erosion and deposition inside and outside the harbor.

Bioremediation

The use of microorganisms to reduce contamination is commonly referred to as bioremediation. In some cases, bioremediation techniques have been used to clean up oil spills.

Bioremediation was viewed by the participants as a viable strategy for some sediments where they are contained, and where there is a restricted range of contaminants and the remediation processes have a long time to work.

Current bioremediation research programs target individual contaminants. Where particular or individual contaminants are of concern, bioremediation is an appropriate decontamination method. In many cases, however, pollutants in sediments around New York harbor constitute a complex mixture of contaminants, including heavy metals. This raises many questions on how to handle biotransformation of mixed contaminants.

One consideration with bioremediation is cost-effectiveness. To achieve a significant reduction in sediment decontamination with present bioremediation technology would involve considerable expense including the cost of a treatment facility. No one disputes that for certain compounds, under a specific set of circumstances, bioremediation can provide environmental benefits. However, for some compounds, natural processes can be just as effective as bioremediation. We need to develop a demonstration-scale project to investigate biological methods to remediate New York harbor sediments.

In general, bioremediation should not be viewed as a panacea for the management of dredged material. Rather, it should be viewed as one technique suitable for specific contaminants which can be contained for long periods of time.

Chemical and Physical Remediation

The second conference evaluated a range of technologies using physical and chemical processes to remediate sediments. A wide range of remediation projects are being conducted at the demonstration scale and there is one full-scale separation treatment facility. Most of the U.S. remediation projects are being sponsored by the Environmental Protection Agency through the Assessment and Remediation of Contaminated Sediments (ARCS) program. This program involves bench-scale tests of solvent extraction, thermal desorption and wet-air oxidation techniques with contaminated sediments from Indiana harbor, the Buffalo River and Saginaw Bay. These projects focus primarily on polynuclear aromatic hydrocarbons and polychlorinated biphenyls.

In Europe, a number of institutions have been developing methods to remediate contaminated sediments over the past ten years. These have led to several small-scale pilot facilities and one full-scale separation facility. Principal methods for remediation involve mechanical separation to separate sand from silt. Other physical separation techniques such as flotation may be effective and, along with heap-leaching techniques, should be investigated further.

One particularly innovative program is being pursued in Great Britain where microorganisms are used to immobilize and localize metal ions from solution which are then separated with a high gradient magnetic separation (HGMS) technique. This approach may also be effective with polar organic compounds and is worthy of further exploration.

Although many of the sediment remediation strategies in Europe parallel those being pursued in the U.S., differences in political systems and the relationships between private industry, government and public/environmental groups have enabled some European nations to produce a long-range strategy with short-term tradeoffs. This strategy uses specially-designed undersea disposal pits as near-term solutions to manage dredged material while other relocation/remediation alternatives are vigorously pursued in the long-term. The common practice in the Netherlands is to reduce the amount of contaminated material to a minimum by physical separation of particles and to confine the most contaminated dredged materials to double-lined land-containment areas or undersea pits, with the more contaminated materials receiving greater levels of protection. The same is essentially true for Belgium and Germany, with greater emphasis on heavy metals in Belgium. Unlike Germany, Belgium and the Netherlands do not treat large quantities of dredged material regularly. Similarly, treatment projects in the U.S. have only been conducted at the demonstration scale.

Undersea Pit Disposal

Undersea borrow pits have been used on an experimental basis in Long Island Sound and the New England area as an alternative for the disposal of contaminated sediments. This approach presumes that contaminated sediments will be isolated and contained by a clean sand cap and the pit walls and bottom.

Data collected from capped disposal mounds as part of the Dredge Area Monitoring System (DAMOS) project indicate that no detectable mobilization of trace metals has occurred over a 7-11 year period. Although some mixing of contaminated and cap material was observed, cores showed a distinct boundary between the two materials. Even with consolidation, the two sediments remained geochemically distinct.

Proper pit design and construction is important to the effectiveness of this approach. Knowledge of the characteristics and strengths of base materials used in pit construction, along with depth and the impact of material disposed on the seafloor is necessary to account for settlement of the disposed material and compression of the base material. Regardless of the type of pit construction, the cap must prevent biological and physical disturbance of the underlying dredged material to ensure that contaminants are not remobilized.

Based upon roughly a decade of experience using undersea pits, it appears that the distinction between sand caps and dredged material can be maintained physically and chemically. Despite the apparent success associated with this technique, the siting of these pits remains a contentious issue that has to be addressed when this alternative is proposed. Another concern is sediment dispersal during dredging and disposal operations. An initial loss of 3-5% of the volume occurs in the water column during pit disposal. Improvements in dredging procedures need to be considered. A more comprehensive long-term monitoring program is needed to ensure that pit stability is maintained and any long-term diffusion of contaminants is detected.

Beneficial Use

In Glasgow, dredged material is applied to beneficial uses on land. The areas where this might be applied are those places where a heavy contaminant loading already exists in the soil. Several sites exist in New Jersey where even a fairly significant contaminant loading would be an improvement in the soils. It is quite clear from the beneficial use in Glasgow that attractive gardens can be developed on dredged material despite contaminant loadings. Potential effects on groundwater need to be considered however. This land application and soil development process needs to be considered in the context of other approaches to bioremediation. It has the advantage that port lands might be used and the goals of the project could be very well defined.

Recommendations

The main impetus to clean up dredged material remains the dioxin contamination in the Passaic River. This contaminant has stimulated public interest in dredging activities and disposal practices. One approach would be to combine a short-range strategy to clean up the dioxin "hot spot" with intermediate and long-range strategies that addresses the vast bulk of dredged material.

Short-Range Strategy

The Mud Dump site off Sandy Hook is reaching the end of its useful life as a place to dispose of contaminated sediments. This does not mean we hastily have to adopt an unproven alternative if risks to marine life and human health continue to be within acceptable limits.

An orderly phase-out of current practice can be conducted as alternate solutions are pursued and set in place. Several European nations have adopted this approach to manage disposal of contaminated sediments. In view of the current need to dredge Port

Newark/Port Elizabeth and the lack of adequate and affordable treatment techniques, existing disposal alternatives should be considered as a short-term solution. None of the existing alternatives (capping, upland containment, existing borrow pits) are ideally suited to resolve the current dredging issue. I believe the agencies responsible for protecting the public interest should be given some latitute in the short-term to reach a compromise within the regulatory framework.

New proposals to use untested disposal or storage technology are inappropriate without the necessary time to study these methods properly. One proposal offered by the public interest groups is in-vessel storage. This proposal suggests that specially-designed barges be used to store and isolate the contaminated sediment until further development of treatment technology. The history of accidents from ships or barges makes me uneasy about this solution, however I do not claim any special knowledge of this approach.

Intermediate Strategy

The intermediate strategy would be to construct specially-designed undersea pits to store contaminated sediments (Class II and III dredged material) as we pursue a long-range effort to treat and dispose of this material. As I mentioned earlier, this approach has been successfully used by other nations. When properly constructed, undersea pits can provide an effective storage facility for dredged material. When sediments are isolated by this technique, metal constituents of the sediments may be immobilized in an anaerobic environment. Consequently, some of the advantages of biological processing may be realized from the placement of sediments in undersea pits. Since bioremediation might be occurring within pits, conceivably some research could be conducted to accelerate or facilitate remediation. Obviously, the occurrence of any bioremedial processes in pits must be documented.

One concern with this technique is associated with the material lost to the water column during dredging and pit deposition operations. New technology is emerging to address this concern (such as digital dredging which aims to conduct dredging operations much like the mining of ore on land) and we expect to evaluate these techniques in the near future.

Long-Range Strategy

As we focus initially on one or several contaminants, we must develop a long-term strategy for the treatment and/or disposal of all dredged material. Ultimately, the goal should be to dispose only Class I material into the ocean. Considerable emphasis should be placed on reduction of contamination at the source and to pretreatments as mitigation techniques. In addition, precise

determination of the distribution of contaminants should be part of our long-term efforts to reduce the volume of sediments which have to be treated prior to disposal. Without a fine-scale characterization of sediment content and distribution, we cannot accurately locate "hot spot" areas for remediation.

Remediation technology requires years of further development, demonstration and pilot-scale testing to become practical and successful. This means we must begin now to support those techniques with the most promise. Last year, the Environmental Protection Agency received $2.7 million to support a sediment remediation program based on innovative approaches to decontaminating dredged material. At this moment, we are prepared to submit a proposal to test one of the most promising approaches to remediation which resulted from the conferences--immobilization of heavy metals (and possibly organics) by colonies of bacteria which occur in anaerobic muds coupled with the use of a High Gradient Magnetic Separation technique.

Now is the time to commence a long-term effort to remediate sediments and to begin efforts to reduce contaminants at their source. Only with a long-term commitment to remediation and source reduction can we attain what should be our long-term goal: to dispose only Class I material in the ocean.

Summary

Given the urgency of the situation at Port Newark/Port Elizabeth, we should continue to manage contaminated sediments with known techniques even if they are not ideal. Intermediate range steps must be pursued to isolate and contain contaminated sediments until such time when remediation becomes possible. Finally, public participation must be a vital part of the decision-making process as we seek intermediate and long-term solutions.

Mr. Chairman and members of the committee, thank you for your time. I will be happy to answer any questions you may have.

COMPLETE STATEMENT

OF

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BEFORE THE SUBCOMMITTEE
ON
OCEANOGRAPHY, GULF OF MEXICO AND OUTER CONTINENTAL SHELF
COMMITTEE ON MERCHANT MARINE AND FISHERIES
U.S. HOUSE OF REPRESENTATIVES

ON

REGULATORY PROCESS AND MANAGEMENT OF CONTAMINATED SEDIMENTS

MARCH 30, 1993

INTRODUCTION

Mr. Chairman and members of the Subcommittee. I am pleased to be here on behalf of the Department of the Army to discuss our research activities and processes related to management of contaminated sediments. I am Senior Scientist in the Environmental Laboratory and Director of the Center for Contaminated Sediments at the Waterways Experiment Station. My discussion will address the issue of contaminated sediments research activities and I will include a discussion of specific technologies related to managing contaminated sediments.

BACKGROUND

The Army Corps of Engineers has considerable scientific, engineering, and management expertise and experience that is being applied to solving problems associated with dredged material, including contaminated sediments. Our research efforts have focused on needs generated by our projects and programs as well as in support of others, such as the Environmental Protection Agency (EPA), the National Oceanic and Atmospheric Administration (NOAA) (a Natural Resources Trustee), the U.S. Coast Guard and Department of Defense agencies. We have developed a research base over the last two decades that emphasizes the identification, assessment, and management of contaminated sediments. Because of this research and our active participation in the London Convention and other international efforts, we are recognized experts in dealing with contaminated sediments. Due to the widespread distribution of contaminated sediments and the need to ensure focused efforts in managing contaminated sediments, the Waterways Experiment Station recently established the Center for Contaminated Sediments, which I direct. The Center focuses existing Corps R&D expertise on identification, evaluation, endangerment assessments, risk analysis, restoration, remediation and management activities for contaminated sediments. Functions of the Center include; research and development activities, technical assistance, training, technology transfer, workshops, seminars, and response to general information requests.

RESEARCH

Environmental research on dredged materials in the 1970's was broad in scope, including the basic understanding of ecological impacts associated with management of clean and contaminated dredged material. The applied research emphasized beneficial uses, field monitoring, first generation testing procedures for contaminated material, input to development of the Clean Water Act and Ocean Dumping Act regulations, guidelines and criteria, and documentation of knowledge gained for management and disposal of dredged material on land and in open water. Research in the 1980's focused on contaminated sediments and

emphasized field verified second generation tests and procedures. This work was done jointly with EPA to enhance the identification, assessment and management of contaminated materials. Existing regulations and implementing manuals were revised to reflect this knowledge. Related research for others was conducted during this period and continues today. Research efforts in the 1990's focuses on highly contaminated materials, emphasizing chronic/sublethal effects and genotoxicity evaluations. It continues efforts to enhance capability for cleanup and remediation of hot spots, risk analysis, endangerment assessments, treatment technology, revision of guidance documents and manuals, and training. Research in this decade is being actively conducted in partnership with EPA, NOAA and DOD to combine technical expertise and to leverage R&D funding, to ensure that critical areas of concern are addressed to the best advantage.

CONTAMINATED SEDIMENTS

Even though only a small percentage of sediments dredged each year from our federal channels is currently classified as contaminated such that they require special handling or treatment, as noted by Mr. Rees, the actual volume is still quite large. Contaminated sediments are defined in relation to our navigation program as those that demonstrate an unacceptable adverse impact on human health or the environment.

Effects Based Testing. The determination that a sediment is contaminated and unsuitable for unrestricted aquatic disposal is made by application of effects-based testing and a preponderance of evidence leading to a determination of actions to be taken. The effects-based approach is implemented through regulatory and testing manuals, such as the Green Book, developed by the Corps and EPA over the past 2 decades. Effects-based testing is a holistic approach which uses a combination of biological, geochemical, and physical analyses in conjunction with water quality standards and other appropriate criteria. The effects-based approach is tiered; that is, lower tiers use existing information and screening techniques to reach a decision on disposal management or to determine that additional testing is needed at higher tiers in order to reach a decision on the appropriate form of disposal. This determination will impact the need and methods necessary for cleanup and remediation. This approach, jointly developed by the Corps and EPA, has been refined over the years to represent the state-of-the-science for testing and evaluation of dredged material proposed for aquatic, nearshore, and upland disposal. We believe that our definition and this process for identifying contaminated sediments is fully consistent with the spirit and intent of the Clean Water Act and the Ocean Dumping Act.

TREATMENT TECHNOLOGIES

Now I would like to discuss briefly the validity, engineering aspects and costs associated with the management, treatment and remediation technologies that were identified in discussions with the Subcommittee staff. Many of these technologies are being conducted as part of EPA's Great Lakes Assessment and Remediation of Contaminated Sediments (ARCS) program and are described in more detail in the document published in support of EPA's ARCS program entitled, "Review of Removal, Containment and Treatment Technologies for Remediation of Contaminated Sediments in the Great Lakes." As requested in your letter of invitation, I am describing these technologies below along with a description of a few other technologies used elsewhere.

Decontamination Technologies. Many processes and technologies are potentially available for dealing with contaminated sediments, but few have been actually applied on a field scale. Most testing of treatment technologies has been done on a bench scale with limited pilot scale applications. The database for design of contaminated sediment management operations is primarily limited to navigation dredging and limited sediment remediation projects. Further testing and pilot demonstrations are needed that incorporate complete sediment remediation strategies, not just individual pieces of the remedial alternative. Costs for managing contaminated sediments in large and possibly even small volumes will be significantly more than the costs of normal dredging operations, perhaps greater in cost by orders of magnitude.

Subaqueous Capping and Borrow Pits for Contaminated Sediments. In the last decade, capping techniques that limit the mobility of contaminants in sediments disposed of by open water methods have been demonstrated on the east and west coasts. Capping has been demonstrated as a technology for disposal of contaminated dredged material in near coastal waters in Long Island Sound, New York Bight, Duwamish Waterway, and sediment remediation projects in Puget Sound. The costs of normal maintenance dredging projects ranges from $4 to $8 per cubic yard (cyd) of dredged material moved. Capping could double or triple those costs, depending on the availability of cap material.

Contained aquatic disposal is an engineered method of capping for shallow sites, where the disposal site is first excavated to construct a pit for placement, followed by capping of the contaminated material with clean material. This option has been demonstrated to be feasible for contaminated sediment in Rotterdam Harbor, Netherlands, and was used for a pilot project for the New Bedford Harbor, Massachusetts Superfund project. Pit construction costs significantly increase the total costs of this

technique. Capping of contaminated dredged material in pre-existing deep, subaqueous borrow pits is a potentially viable but untried management option.

Depending upon the physical and chemical nature of the contaminated material, control of material during placement of caps may be needed. Other potentially significant factors, such as the location of placement sites and engineering design and monitoring costs have to be considered and may be significant.

Construction of Confined Disposal Facilities. Confined disposal facilities are engineered structures that may be located entirely upland above the water table, partially in-water adjacent to the shore, or completely surrounded by water. The principal design criterion of confined disposal facilities has been to retain as high a percentage of the fine-grained sediment particles as practical. It has been demonstrated that most chemical contaminants associated with sediments can be effectively retained through efficient solids containment. Current costs for confinement of moderately contaminated dredged material ranges from $10 to $30 per cubic yard of site capacity. Significant quantities of sediment have been disposed of in this manner.

Building Wetlands with Marginally Contaminated Dredged Material. Wetlands have been and continue to be created with relatively uncontaminated dredged material. Sediments unsuitable for aquatic disposal because of toxicity and contaminant bioavailability would have to be effectively capped within the constructed wetland to minimize risk. However, wetlands may be created with marginally contaminated dredged material such that contaminants do not pose an unacceptable risk. This technique has not been field evaluated with marginally contaminated dredged material. However, extensive testing of two San Francisco projects has been completed for aquatic, wetland and upland environments. The data from investigations of these projects are currently being evaluated to develop guidance on the suitability of dredged material for wetland creation. Costs of creating wetlands with marginally contaminated sediments may range widely. Capping or containing contaminated sediment in a wetland would also increase costs.

In Situ Vitrification. In situ vitrification can be used to treat contaminated soils and sludges where the process electrically melts the waste media, creating an extremely stable glass-like solid. In situ vitrification has been demonstrated on a field scale for a number of contaminated soil sites. In situ vitrification has not been demonstrated for high water content contaminated sediments. A laboratory evaluation of vitrification performed on dewatered New Bedford Harbor sediment demonstrated 99.94 percent reduction in PCB concentration. Application of in situ vitrification to in-water treatment of contaminated

sediments is not feasible due to the presence of water in the sediment and the effects on the overlying water column. Cost for in situ vitrification treatment of New Bedford sediment was estimated at $290 to $350 per ton in 1988, not counting dewatering and dredging costs.

In Line Particle Separation and Pipeline Injection. Particle separation and pipeline slurry injection have been evaluated primarily for hydraulically dredged sediment. Physical separation processes such as gravity settling, spiral classifiers, and hydrocyclones have been demonstrated in The Netherlands and in the ARCS Program. The cost of the physical separation in the ARCS Saginaw River, Michigan demonstration was less than $100 per cubic yard. Injection of chemicals, such as oxygen, hydrogen peroxide, and organic polymers, into the discharge pipe of the dredging operation has been evaluated in this country and the Netherlands with little success. Cost data are not available.

Bioremediation. Bioremediation technologies use bacteria, fungi, or enzymes to break down petroleum hydrocarbons, PCBs, pesticides, and other organic constituents into innocuous or less toxic compounds. Metals are generally not treated by biological processes. Biodegradation processes have been evaluated only on a bench and limited field pilot scale. Implementation is difficult because of the developmental nature of these processes. Long time periods and large systems will likely be required for treatment of contaminated sediments. The cost could range from $100 to $300 per cubic yard. If biodegradation could be conducted in a confined disposal facility, the cost could decrease.

Incineration. Incineration is the process of heating contaminated materials to temperatures generally in excess 1200°F in the presence of air to convert organic contaminants to inorganic ash, carbon dioxide and water. Most metals remain with the ash. Incineration is a proven technology for decontamination of soils contaminated with dioxins, PCBs, and other organic contaminants. It has been selected for remediation of hot spot sediments at New Bedford Harbor, Massachusetts, and Bayou Bonfouca, Louisiana, Superfund Sites. The EPA has conducted incineration tests on a bench or pilot scale for New Bedford sediment and for New York/New Jersey sediment. Incineration has demonstrated destruction and removal efficiencies greater than 99.9999 percent. Incineration of New York/New Jersey Harbor sediment reduced total dioxin levels in the sediment from approximately 200 parts per trillion to less than 2 parts per trillion. Preliminary cost estimates for removal and incineration of contaminated sediments from New York/New Jersey Harbors are approximately $1300 per cubic yard.

Extraction. Extraction technologies remove contaminants from sediment by separating the contaminant from the sediment particles and/or dissolving and concentrating the contaminant in a solvent with subsequent treatment. The B.E.S.T.® process has been demonstrated on a full scale, 70 tons per day, at the General Refining Superfund site in Garden City, Georgia, on a pilot scale for the ARCS and SITE programs for Grand Calumet River, Indiana sediments, and on a bench scale for three Great Lakes ARCS sediments. The CF System process was demonstrated on a pilot scale for PCB removal at the New Bedford Harbor Superfund Site. The BEST[R] process has been laboratory tested for dioxin removal from New York/New Jersey sediment. Laboratory evaluations of the B.E.S.T.® process have shown removals of PCBs from sediments between 96 and 99.9 percent. The CF System process achieved 90 to 98 percent removal efficiencies for PCBs at the New Bedford pilot demonstration. Extraction processes could be implemented for relatively small volume sediment remediation projects. Costs for extraction processes range from $100 to $500 per ton based on vendor estimates.

Thermal Desorption. Thermal desorption is similar to solvent extraction processes in that the contaminants in the sediment are removed, but not destroyed. Separation of contaminants is effected by heating the sediment to temperatures ranging from 200 to 1,000 °F to remove volatile and some semi-volatile organic contaminants. This process has been demonstrated for contaminated sediments on a bench, pilot, and full scale. The ARCS program evaluated ReTec's heated auger system for two sediments. Soil Tech's Anaerobic Thermal Processor was evaluated by the ARCS program on a bench and, by the Superfund program, a full scale treatment of sediment from Waukegan Harbor. The Soil Tech unit had a processing rate of approximately 10 tons per hour, but may reach 25 tons per hour. Removal efficiencies for most organic contaminants have been greater than 90 percent, reducing PCB concentrations from an average of 10,000 parts per million to less than 2 parts per million. Thermal desorption processes can be implemented for remediation of hot spot sediments, but high moisture content in the sediment increases the costs. Reported costs for these technologies range from $80 to $350 per ton. The cost of treatment of 12,700 tons of Waukegan sediment was approximately $240 per ton.

Well Injection and Ocean Disposal in Abyssal Plains. Two other treatment approaches, identified by subcommittee staff, deep well injection and ocean disposal in the abyssal plains, are not discussed because they appear technically infeasible or uneconomic. Deep well injection of a high solids material is not physically achievable. Ocean disposal of sediment that has been unacceptably contaminated with London Convention Annex I compounds, such as mercury, cadmium, organohalogens and petroleum

hydrocarbons, is prohibited by international treaty. Capping or burial in the abyssal plains, which may be allowed, offers no advantage over capping in near coastal waters, as it presents additional engineering difficulties and greater expense.

SUMMARY

Though the specific amount of contaminated sediments that may require cleanup or remediation in the foreseeable future is not known, indications are that it could be in the millions or tens of millions of cubic yards. Innovative solutions will need to be developed, or costs will escalate and inhibit any real progress.

The Corps, undoubtedly, will have a role in many decisions regarding contaminated sediments. Significant cost savings can result from the close coordination of navigation and cleanup dredging among federal, state and local agencies. Reduced costs associated with mobilization and demobilization of dredging equipment is one such example. In other cases, close coordination of the two activities may significantly increase the array of cost effective, environmentally acceptable disposal options for highly contaminated sediments. Sediment remediation will not be a simple or an inexpensive task and should be considered only for those sediments that pose an unacceptable risk if left unmanaged. Otherwise huge quantities of marginal material may be remediated at a high cost without a commensurate return in environmental benefits.

The only long-term solution to the contaminated sediments issue is the reduction or cessation of pollutants at their source and the clean up of high risk hot spots on land as well as in water. If these actions are not taken, we will be facing significant problems indefinitely.

Finally, I would like to note that the Corps, EPA and others must continue to conduct intensive basic and applied research on contaminated sediments. This should include risk assessment/management techniques, and full-scale demonstration projects to verify and refine the basic research products. Future research and development expenditures will produce direct benefits in many areas, including reduced testing costs and more cost-effective project selection and implementation.

Mr. Chairman, that completes my statement. I would be happy to answer any questions.

PORT OF HOUSTON AUTHORITY

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TESTIMONY SUBMITTED

TO THE

OCEANOGRAPHY, GULF OF MEXICO

AND THE OUTER CONTINENTAL SHELF SUBCOMMITTEE

OF THE

HOUSE MERCHANT MARINE AND FISHERIES COMMITTEE

BY

H. THOMAS KORNEGAY

EXECUTIVE DIRECTOR AND CEO

PORT OF HOUSTON AUTHORITY

Chairman Ortiz and members of the subcommittee, on behalf of the Port of Houston Authority, thank you for permitting us to submit testimony regarding a unique and unprecedented approach to address environmental interests and concerns regarding dredge material disposal anticipated from the proposed Houston Ship Channel widening and deepening project.

THE HOUSTON SHIP CHANNEL AND THE PORT OF HOUSTON

It is no exaggeration to say that the Houston Ship Channel is one of the most important economic lifelines between our nation and the world. Houston's favorable geographic location provides easy access to the entire world business community through key ocean, land and air routes. Nearly 100 shipping lines connect Houston with more than 250 world ports. Four major railroads provide cargo distribution throughout the United States and more than 160 trucking lines service the rest of the nation via the Texas and interstate highway system.

These factors have made the Port of Houston a preferred gathering and distribution point for shippers transporting goods to and from the Midwestern and Western United States.

We are proud to report that last year a total of 5,280 ships flying the flags of 77 different nations called on the Port of Houston. In addition, approximately 35,000 barges navigated the waterway. The combined cargo of these vessels exceeded 125 million tons.

All of this has made the Port of Houston the number one U.S. port in foreign tonnage and the third busiest port in total tonnage. It is the eighth busiest port in the world and generates nearly $3 billion a year in revenues. An estimated 29,000 people work in jobs that are directly related to Port of Houston activity and another 110,000

jobs are indirectly related to the port's activity. There is no doubt that the port has become a vital force in the commerce of the United States and the world.

While Houston is one of our nation's busiest ports, we are also one of the narrowest deep draft channels. The channel was last improved in 1966 when it was deepened to 40 feet and widened to 400 feet.

As you can imagine, ships and shipping patterns have dramatically changed to meet the demands of world trade over the last 30 years. Likewise, for reasons of safety, environment, and economics, we believe that the Houston Ship Channel is long overdue to be improved.

The voters of Harris County agree and have committed significant local funding to support these improvements. In 1989, Harris County voters approved by a two-to-one vote a measure that will provide the local funding ($130,000,000) to deepen the channel to 45 feet and widen it to 530 feet.

BACKGROUND

Publication in 1987 of a Final Environmental Impact Statement regarding the Houston Ship Channel project prompted a request for a Supplemental Environmental Impact Statement. It was agreed that Congressional authorization would be deferred until 1994 while several environmental issues would be explored.

The Port of Houston Authority has been working with federal and state agencies for almost two years as part of an Interagency Coordination Team cooperative effort to address environmental interests. The port's role includes active participation and direct financial support of this environmental initiative.

The Interagency Coordination Team represents a broad and diverse range of environmental interests including: Environmental Protection Agency (EPA); U.S. Fish

and Wildlife Service (USFWS); National Marine and Fisheries Service (NMFS); Texas Parks and Wildlife Department (TPWD); Texas Water Commission (TWC); Texas General Land Office (GLO); Galveston Bay National Estuary Program; Texas Water Development Board; U.S. Corps of Engineers (USACE); U.S. Coast Guard; Soil Conservation Service; PHA; and Port of Galveston.

One of the prime concerns of the Interagency Coordination Team focused on the proposed dredged material disposal plan, which essentially called for confined upland disposal in the inland reaches of the channel and continuation of open bay unconfined disposal for the Galveston Bay reach. The willingness of the Port Authority to bear up to $37 million in additional costs for development of beneficial uses of dredged material further reinforced the Interagency Coordination Team's ability to consider reducing adverse environmental impacts.

THE BENEFICIAL USES GROUP (BUG)

The Beneficial Uses Group was created as a subcommittee of the Interagency Coordination Team. Included as part of the Beneficial Uses Group are: U.S. Army Corps of Engineers; U.S. Fish and Wildlife Service; Environmental Protection Agency; National Marine and Fisheries Service; U.S. Soil Conservation Service (SCS); Texas Parks and Wildlife Department; Texas General Land Office; and Port of Houston Authority (Chair of the Beneficial Uses Group).

The formally adopted purpose of the Beneficial Uses Group was "to develop a disposal plan that utilizes dredged material in an environmentally sound and economically acceptable manner that incorporates, to the extent possible, other public benefits into its design". Most important was the committed objective that the final plan would have a net positive environmental effect over the life of the project.

APPROACH

The approach utilized by the Beneficial Uses Group for Galveston Bay makes this effort unique and precedent setting. What was being attempted, in its totality, had never been done before.

The Beneficial Uses Group's efforts are unique in that:

1. The Beneficial Uses Group is an interagency group developing a preferred disposal plan - rather than reviewing a proposal in a regulatory setting.
2. The Beneficial Uses Group addressed one of the largest navigation projects in recent years (approximately 120 Million Cubic Yards (MCY) of new work material and an estimated 190 MCY of maintenance material over the next 50 years.
3. The Beneficial Uses Group committed to the objective that the final plan would have a net positive environmental effect over the 50 year life of the project.
4. The Beneficial Uses Group actively solicited beneficial use suggestions from Bay interests and user groups - whose collective ideas were given full consideration during the development of the recommended plan.

DEVELOPMENT OF CANDIDATE SITES

Public Participation

This element was approached carefully, and was an effort to solicit input from a wide range of Bay users. Briefly, the process was:

1. An information packet was developed by the Beneficial Uses Group, supplemented by graphics and slides for meetings;

2. A list of Bay interests, user groups and local government entities was developed, and the packets were mailed to them; and

3. Those groups expressing an interest were contacted. Numerous letters were received, and approximately 14 meetings, scheduled at the convenience of interested groups, were held over a six month period.

RESULTS

In October 1992, the Interagency Coordination Team overwhelmingly approved the beneficial use plan for disposal of dredged material from the Houston Ship Channel project. The approval of the plan represents a significant step forward for this important project and a commendation of the diligent work performed by the Beneficial Uses Group that developed the disposal plan. Ultimately, the beneficial use plan approved by the Interagency Coordination Team will provide for the creation of almost 6,000 acres of marsh, together with bird islands, boater destination islands and shoreline erosion protection.

The efforts of the Interagency Coordination Team have been guided from the outset by three basic principles:

1. Dredged material is a potentially valuable resource and should be considered and treated as such;

2. Development of an environmentally acceptable disposal plan is intrinsic to the eventual approval of this project; and,

3. Any disposal plan adopted must have long-term environmental benefits for the Galveston Bay system.

These principals are reflected in the disposal plan adopted by the Interagency Coordination Team.

In addition, the approach utilized by the Interagency Coordination Team in developing the plan is particularly noteworthy on four accounts:

1. Suggestions for beneficial uses were actively solicited from the community and particularly from Galveston Bay user groups. These collective ideas were given full consideration in developing the plan. In point of fact, the community identified more beneficial uses than the material expected over the 50 year life of the project.

2. Sound scientific methods have been used to examine alternative beneficial use plans, including:

   a. hydrodynamic and salinity models;

   b. analysis of physical data;

   c. sediment contaminant studies; and,

   d. National Marine and Fisheries Service productivity studies to determine the most environmentally appropriate locations for marshes.

3. Additionally, the Port Authority itself has funded several studies, including:

   a. Probes of the bay bottom to asses the best bottom conditions for siting beneficial uses (relative to other environmental constraints);

   b. Construction of a 250 acre demonstration marsh (in process) to determine how to achieve the desired result out of the typical new work and maintenance material using typical dredge equipment;

c. Funding of National Marine and Fisheries Service to assist the Beneficial Uses Group in the development of design criteria and parameters for constructing ecological functioning marshes; and

d. Construction of a five acre oyster reef with Houston Lighting and Power under an Environmental Protection Agency grant in order to determine large-scale feasibility using non-native material for clutch. (This is also a Coastal America Project and a Galveston Bay National Estuary Program Action Plan Demonstration Project.)

4. The plan addresses on the priority concerns identified by the Galveston Bay National Estuary Program -- loss of wetland habitat.

It is most noteworthy that the Interagency Coordination Team has determined that its disposal plan, if properly implemented and managed, can actually achieve a net positive environmental effect for Galveston Bay.

CONCLUSION

Dredged material disposal is a serious concern for public ports whose task it is to create jobs and facilitate international trade and thus augment the economy, while remaining environmentally sensitive. What has been done in the planning phases for the Houston Ship Channel project is a bright ray of hope. The Beneficial Uses Group plan will have to undergo formal public and agency scrutiny through the NEPA process. In its current form, however, the Beneficial Uses Group's recommended plan has taken into consideration all of the public's ideas for beneficial uses in a unique and unprecedented approach.

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DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON D.C. 20310-0103

MAY 1993

Honorable Solomon P. Ortiz
Chairman
Subcommittee on Oceanography, Gulf of Mexico,
and the Outer Continental Shelf
Committee on Merchant Marine
and Fisheries
House of Representatives
Washington, D. C. 20515-6230

Dear Mr. Chairman:

This is in response to your letters of April 1, 1993 to Mr. Morgan R. Rees, Deputy Assistant Secretary of the Army (Civil Works) for Planning Policy and Legislation, and Dr. Robert M. Engler, Director, Center for Contaminated Sediments, U.S. Army Engineers Waterways Experiment Station, providing additional questions for the record for the hearing on March 30, 1993 on "Ocean Disposal of Contaminated Sediments."

Thank you for the opportunity to testify on this important subject. As requested in your letters, I have enclosed the responses for the record to the questions for Dr. Engler, Mr. Michael L. Davis and myself.

Sincerely,

G. Edward Dickey
Acting Assistant Secretary of the Army
(Civil Works)

Enclosure

Questions and Answers for the Record
Hearing Before House MM&F-OGM&OCS on 30 March 1993
Ocean Disposal of Contaminated Dredge Material

Question from Chairman Ortiz - How big is the problem of the disposal of contaminated sediments?

ANSWER Mr. Rees: According to the Office of Technology Assessment report, less than 5 percent of the approximately 300 million cubic yards of material dredged annually, on the average, under the Corps dredging program is contaminated to the extent it requires special handling. As I noted in my testimony, the percentage is indicated to be higher for permitted activities but is still relatively small. However, the small percentage of contaminated sediment presents serious problems with maintaining and improving many important ports in all parts of the country. As an example, of those deep water ports that handled over a million tons of waterborne commerce in 1990, about 80 ports, the ports where contaminated sediments exist in at least a portion of the project handled over 40 percent of the total volume of 1.56 billion tons. We believe that a broad approach to problem solving is critical for the future of our ports and maritime industry. Agencies responsible for source contamination must be a part of the solution and those responsible for the pollution must contribute to the premium costs when special handling is required. Currently, the maritime industry is expected to bear all the costs for remediating pollution problems caused by others and by lack of historic vigorous enforcement of water quality laws.

- Is the volume of contaminated sediment increasing?

ANSWER Mr. Rees: As point and non-point sources of contamination are controlled, we may see a decrease in the level of contamination in sediments. However, with the ability to identify and detect harmful contaminants at lower and lower concentrations and a general trend toward lowering state criteria/standards for levels of contamination considered harmful, we expect that the volume of sediments that could be classified as contaminated would increase. We believe it is critical to continue looking at impacts of other disposal options and measuring them against impacts of open water disposal. Setting an absolute threshold for open water disposal can well lead to upland or groundwater impacts which are even less acceptable than some potential minor water quality impacts. We believe we should be in a position to select the least environmentally damaging practical alternative considering all options together.

Questions and Answers for the Record
Hearing Before House MM&F-OGM&OCS on 30 March 1993
Ocean Disposal of Contaminated Dredge Material

Question from Chairman Ortiz - Does the Federal government have adequate resources to implement its ocean dumping responsibilities as they relate to the disposal of dredged material?

ANSWER Mr. Rees: Currently, the Harbor Maintenance Trust Fund established by the Congress is adequately funding dredged material disposal for coastal projects. However, as more stringent requirements are placed on disposal of sediments for coastal dredging projects, we can expect a greater burden on the Harbor Maintenance Trust Fund's ability to keep pace. Ever increasing sophistication of testing procedures and equipment are pushing testing costs ever higher. Some ports report that the majority of their costs to keep berthing areas dredged is taken up by testing rather than by the dredging itself.

Questions and Answers for the Record
Hearing Before House MM&F-OGM&OCS on 30 March 1993
Ocean Disposal of Contaminated Dredge Material

Question from Chairman Ortiz - Should additional Federal resources be spent in the development of alternatives to existing contaminated sediment disposal methods?

ANSWER Mr. Rees: The Corps of Engineers has spent in excess of $120 million through Congressional appropriations over the past 20 years in pure and applied research investigating nearly every facet of dredging and disposal. We are continuing to conduct research to investigate and develop innovative new alternatives. If the Congress appropriates additional funds, the Corps has the capability to expand its contaminated sediments research. However, the reality is that none of the research has produced any magic solution to disposal needs. Any hypothesized alternatives are either too costly, technically infeasible, or simply not available. This is a very complex situation which is difficult to convey in formal testimony. We would be pleased to provide a full briefing on the issue for the committee staff, should you wish.

Questions and Answers for the Record
Hearing Before House MM&F-OGM&OCS on 30 March 1993
Ocean Disposal of Contaminated Dredge Material

Question from Chairman Ortiz - There are a number of parties that have expressed concern over the lack of public comment and input provided by the existing permitting process. Could you explain the various steps in the process that your agency provides for public input?

ANSWER Mr. Rees: The basic philosophy of the program is to provide full and open public involvement. To achieve that, the following process has been developed. Upon receipt of a complete permit application, the Corps prepares a public notice to solicit input from the general public, as well as from federal, state and local agencies, environmental groups, and other interested parties. Public notices are mailed to those who have expressed a desire to be informed of proposed projects and have requested to be placed on mailing lists pertaining to certain areas, watersheds, or projects within the district boundaries. The public may also telephone or meet with Corps representatives concerning permit applications.

The Corps may also determine that there is a need to conduct a public hearing to provide additional information to assist in its decision on a particular permit application. The general public is advised of the hearing in a public notice, and may provide oral comments during the hearing, which are recorded verbatim. Written comments may also be submitted either during the hearing or prior to the close of the hearing record.

In addition, the Corps determination to prepare an environmental impact statement (EIS) in conjunction with a permit application carries with it requirements to provide for public comment at various stages of the National Environmental Policy Act process that are separate and distinct from the aforementioned public comment opportunities. The public may provide comments on draft and final EIS, as well as oral and/or written comments in conjunction with public hearings held in conjunction with the EIS preparation process.

There are situations where the degree of public interest is so great that we simply do not have the logistical capability to deal with or respond to each person or comment individually. In those cases, we provide generic responses and make the analysis and decision documents available to anyone who asks for them. We approach Corps dredging projects in the same open manner as we do the regulatory program.

- Do you feel that there are ways that the process could be improved in this regard?

ANSWER Mr. Rees: Honestly no. We believe the Corps project and regulatory permit processes provide extensive opportunity for the public to comment on permit applications or proposed project activities.

Questions and Answers for the Record
Hearing Before House MM&F-OGM&OCS on 30 March 1993
Ocean Disposal of Contaminated Dredge Material

Question from Chairman Ortiz - Regarding the Port Elizabeth/Port Newark permit, what were the standards that you used to measure dioxin contamination? How were these standards decided upon?

ANSWER Mr. Rees: The procedures developed by the Corps and EPA for the evaluation of the ocean disposal of dredged material require that, in the absence of an otherwise defined standard, U.S. Food and Drug Administration (FDA) standards should be used. In the case of dioxin, the FDA recommends that fish tissue containing between 25 and 50 parts per trillion be suitable for restricted human consumption. Based on this information, the standard for dioxin contamination for evaluation of the Port Elizabeth/Port Newark permit request was set at 25 parts per trillion. EPA subsequently revised the standard to 10 parts per trillion to be consistent with the State of New York standards.

Questions and Answers for the Record
Hearing Before House MM&F-OGM&OCS on 30 March 1993
Ocean Disposal of Contaminated Dredge Material

Question from Chairman Ortiz - It is my understanding that new tests on the sediment show dioxin levels below the 10 parts per trillion standard EPA imposed. If the sediment ends up exceeding that threshold level, what options would have remained for the Port to dredge its facilities?

ANSWER Mr. Rees: We are not aware of an acceptable option that is economically feasible for disposal of large amounts of such contaminated dredged material. In the case of the Port Elizabeth/Port Newark facility, this would mean that no dredging would occur in the areas where the sediment exceeded the ocean disposal criteria. Port facilities would have to be reconfigured, as appropriate, to shift deep draft berths to areas where the sediment to be dredged meets the ocean disposal criteria. Use of the berths where sediment exceeded the criteria would be limited to ships with shallow drafts that could use the facility without dredging until such time as an acceptable disposal alternative were found.

Questions and Answers for the Record
Hearing Before House MM&F-OGM&OCS on 30 March 1993
Ocean Disposal of Contaminated Dredge Material

Question from Chairman Ortiz - The Mud Dump Site has been used as a repository for clean and contaminated dredge material since 1914. Is the dredge material proposed for disposal from Newark Bay any more contaminated or environmentally harmful than what has been disposed of at the site in the past?

ANSWER Mr. Rees: Generally no. As point and non-point sources are regulated, we may see a diminution in the amount of contaminated material at the Newark Bay site. Maintenance dredging and capping the material at the Mud Dump site essentially represents a piecemeal clean-up of the Newark Bay site.

However, it is difficult to make a full and direct comparison because the historic information is based on less sophisticated and less precise measurements. For example, without recent improvements in sensitivity of testing procedures and equipment, we would not have been able to detect any dioxin in the Port Elizabeth sediment. How long it has been there and in what quantities is unknown.

Questions and Answers for the Record
Hearing Before House MM&F-OGM&OCS on 30 March 1993
Ocean Disposal of Contaminated Dredge Material

Question From Chairman Ortiz - Is the process surrounding the Newark Bay ocean dumping permit typical for contaminated dredge material disposal?

ANSWER Mr. Rees: The permit process used is typical. However, for this project, an atypical amount of time was spent developing the criteria for allowing ocean disposal of the sediment that contained trace amounts of dioxin. The extended time resulted in a significant change in the volume of material to be dredged, which required additional verification testing. This case could occur again whenever a new "contaminant of concern" is found in the sediment for which disposal criteria are not established.

- How can the process be improved on a Federal and State level?

ANSWER Mr. Rees: The major problems in the process are continually changing or undefined standards and the lack of uniformity among the various regulatory agencies at both the federal and state level as to the standards to be applied. Efforts must focus on establishing standards that are changed only as public health and environmental risks justifying such change are scientifically documented. The second focus must be on interagency coordination to define acceptable standards that will be applied by all. In situations where such agreement cannot be reached, a specific agency should be responsible for final determination of the criteria that will be applied.

- How can we avoid situations where permits are approved and then denied and then approved again with conditions?

ANSWER Mr. Rees: As I noted, the process required for this permit application is somewhat atypical. It generally occurs when new contaminants are identified for which no disposal criteria have been established. Other than the recommendations described above, there is little that can be done short of a much more detailed, cumbersome and costly regulatory process to eliminate the potential for recurrence of this problem. A more costly and complex process would have serious adverse effects on the majority of routine, non-controversial permit applications.

Questions and Answers for the Record
Hearing Before House MM&F-OGM&OCS on 30 March 1993
Ocean Disposal of Contaminated Dredge Material

Question from Chairman Ortiz - Why did the Corps of Engineers require further testing of Reach D of the Port Terminal at Newark Bay when EPA approved that part of the Permit application?

ANSWER Mr. Rees: The original permit was conditioned to require sequential dredging of the berths to insure that the material with the highest levels of dioxin was deposited first, and capped by the "cleaner" sediments within the project area. The New York District required the testing of Reach D to insure that the sequencing of the dredging remained appropriate. The decision was made after evaluating the cost of the additional testing and considering the fact that the testing would not further delay the final decision on the application.

Questions and Answers for the Record
Hearing Before House MM&F-OGM&OCS on 30 March 1993
Ocean Disposal of Contaminated Dredge Material

Question from Mr. Weldon - In your written testimony, you state that over 95 percent of the material from the vast majority of permitted dredging, is classified as uncontaminated. If this is the case, how much of a problem does the other 5 percent pose to our harbors? Do you feel that this is a growing problem?

ANSWER Mr. Rees: The degree of impact depends upon the state or region of the country. Each state has a different set of water quality standards that must be met. If the state should arbitrarily change those standards, the Corps would be compelled to comply for both Federal projects and regulated activities. You should be aware that we reserve the prerogative of whether to budget for disposal activities where we find that the costs of complying with State imposed criteria are not justified. Additionally, as our analytical procedures improve, we are able to measure smaller quantities of substances. Knowing that very small quantities of a chemical compound exists in a sediment does not necessarily mean that the substance will be harmful to the aquatic environment or humans. It also does not mean that the substance will be harmless if either left alone or dredged. We are often faced with having to make regulatory decisions with analytical data that has not had the benefit of the appropriate and often necessary research and development that provides a foundation for interpretation into the project decision process.

As we continue to make advances in identification and quantification of contaminants in sediments, we can expect more

occasions where known contaminants will be identified. The Corps and EPA are now forming a national dioxin strategy team to address, among other things, analytical procedures and how data will be used to fulfill our regulatory responsibilities with respect to dioxin concentrations.

Questions and Answers for the Record
Hearing Before House MM&F-OGM&OCS on 30 March 1993
Ocean Disposal of Contaminated Dredge Material

Question from Mr. Weldon - You also mention in your testimony that research has been conducted to classify sediments according to contamination potential and also used to regulate dredged material disposal in both a cost-effective and environmentally responsive manner. Could you expand on this research?

ANSWER Mr. Rees: Corps sponsored research in the 1970's emphasized basic understanding of the physical, chemical and biological characteristics of dredged material, both contaminated and uncontaminated. The tests developed were the first generation approaches used by the Corps and EPA in classifying and regulating sediments according to contamination potential.

Research in the 1980's focused on contaminated sediments and produced field verified second generation sediment classification procedures jointly with the EPA. It also dealt with improving procedures for the design and management of confined disposal areas, particularly for controlling contaminated sediments. The key to the 1980's research was the effects based approach jointly developed with EPA for sediment classification for pollution potential. The effects based approach can be used to identify those sediments that require special handling or treatment, level of special handling or treatment required, and assist in determining the best possible disposal alternative. The process allows for both cost-effective and environmentally responsible assessment of dredged material and disposal needs.

Research in the 1990's focuses on highly contaminated dredged material emphasizing chronic-sublethal effects, genotoxicity evaluations and risk assessment techniques. The research, in conjunction with others, includes efforts to improve endangerment assessments and risk assessment/management, as well as clean-up techniques. Dr. Engler's testimony discussed several of the specific clean-up alternatives being researched, to include the costs and a viability assessment. These efforts are being conducted jointly with or in support of programs of EPA, DOD and NOAA.

We are continuing our research into the most productive and beneficial uses of both uncontaminated and marginally contaminated sediments. These efforts are aimed at ensuring economical and environmentally sound use of this massive volume of material each year, nearly 400 million cubic yards.

- Also, could you discuss in greater detail what factors are considered when you determine what is cost effective and environmentally responsive when addressing contaminated sediments?

ANSWER Mr. Rees: First, there are environmental quality thresholds which all open water disposal must meet. These include compliance with all Clean Water Act criteria, both Federal and State, as well as compliance with many other environmental and preservation statutes. A list of 20 such statutes follows:

National Environmental Policy Act of 1969

The Rivers and Harbors Act of 1899 - Sections 9 and 10

The Clean Water Act - Sections 401, 402 and 404

The Marine Protection, Research, and Sanctuaries Act of 1972 - Sections 103 and 302

The Fish and Wildlife Coordination Act

The Coastal Zone Management Act of 1972 - Section 307

The Fish and Wildlife Act of 1956

The Migratory Marine Game Fish Act

The National Historic Preservation Act of 1966

The Preservation of Historical and Archeological Data Act of 1974

The Historical and Archeological Preservation Act

The Archeological Resources Act

The Endangered Species Act

The Deepwater Port Act of 1974

The Marine Mammal Protection Act of 1972

The Wild and Scenic Rivers Act - Section 7

The Ocean Thermal Energy Conversion Act of 1980

The National Fishing Enhancement Act of 1984

The Estuary Protection Act

The Submerged Lands Act

The goal in decision making is to seek the alternative disposal method which complies with all necessary environmental requirements. Section 404 of the Clean Water Act requires consideration of the environment, navigation and anchorage (section 404(b)(1)). Similar, but not identical, language is

contained in the Marine Protection, Research, and Sanctuaries Act. For Corps dredging projects in order to determine whether a disposal option is "cost effective," the Corps analyses costs and benefits of all options, both monetary and non-monetary, to include environmental quality improvements, and compares them. Where there are incremental costs between alternatives, the incremental benefits are compared with the incremental costs and a judgment reached on whether the additional expenditure is justified. For dredging activities regulated by the Corps, a determination must be made that the disposal option represents the least environmentally practicable alternative. In making a determination of practicability, the Corps must consider the cost of disposal options.

- How strongly were these factors considered in the New York/New Jersey permitting process?

ANSWER Mr. Rees: The New York District evaluated all of the relevant issues and public interest factors which were raised during the public comment period for the application. This included comments received in response to the five public notices issued for the project and those received at the public hearing. Costs were considered insofar as they would affect the opportunity for implementation of alternatives to ocean disposal. Potential environmental impacts were evaluated for the project both at the dredging site and at the ocean disposal site. The District's decision documentation for the project contains

extensive and detailed discussions of each of these issues. It must be remembered that an alternative which fails any of the many required threshold environmental criteria would not be selected.

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Question from Mr. Weldon - Furthermore, it is my understanding that the objective of the federal navigation program is to provide for the construction and maintenance of a safe, reliable and economically efficient navigation system. However, how strongly were these elements factored into the New York/New Jersey permit process?

ANSWER Mr. Rees: During the review of the Port Authority permit application, the New York District was clearly aware of the fact that the proposed dredging project was being performed to provide the deep water berthing facilities that would be adjacent to the deepened channels that are part of the Kill Van Kull project. This situation was a factor of major consideration in the permit review process. The District's decision memoranda on the project address both the navigational issues surrounding the proposed project, and the interrelationship of the Port Newark/Port Elizabeth project with the deepening of the Kill Van Kull Federal Navigation Project. However, if a proposal fails the threshold ocean disposal or section 404(b)(1) criteria, it can be disposed of in open water only after a full analysis of the economic effect on navigation is done. While this provision may sound reasonable, we have never pursued it and do not plan to use it. To make such an analysis is extremely costly and time consuming, and in our judgment would not serve to resolve the issue because there are no standards against which to measure the severity of the economic impacts.

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Questions from Mr. Weldon - You also mention in your testimony that dredged material from non-federal permitted activities constitutes 25 percent of the total volume of contaminated sediment. You also state that this percentage is estimated to be higher than that for federal dredging over the last five years. Why is this the case?

ANSWER Mr. Rees: Our intent was to state that 25 percent of the total 400 million cubic yards (MCY) of dredged material generated in the U.S. each year is from permitted activities, both federal and non-federal. The remaining 75 percent, or 300 MCY, is derived from the Army's Civil Works projects constructed or maintained by the Corps of Engineers.

Of the 300 MCY Corps of Engineers annual dredging requirement, one to four percent of this average annual volume is contaminated to the extent that some level of special handling is required. Limited review of permitted activities provides a strong indication that a higher percentage of the dredged material is contaminated to the extent it requires special handling.

- Is it because non-federal waters are not dredged as often as federal waters?

ANSWER Mr. Rees: A number of factors could be involved in this apparent higher level of contamination. In addition to the fact that the non-federal sites may not be dredged as often, they are generally in closer proximity to industrial activities and a

greater percentage of this workload is in off-channel, inner harbor areas with more limited water exchange, which generally translates to a correspondingly higher percentage of fine-grained sediments with which contaminants are most likely to be associated.

- What types of future problems may be associated with this?

ANSWER Mr. Rees: Many of these areas are integral to the economic vitality of our national navigation system. The immediate problem is the ability of the project sponsors to find suitable disposal sites for contaminated material. In addition, the regulatory requirements which would likely be imposed on disposal of contaminated material could entail extreme costs. If the project sponsors either cannot find or cannot afford acceptable disposal sites, then the continued need for the related Federal project may come into question.

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Questions from Mr. Weldon - In your testimony, you state that Title V of the Water Resources Development Act somewhat modified the regulatory process under the Ocean Dumping Act by establishing specific time frames for actions by the Army and EPA. Is this a potential problem or a positive step in improving the regulatory process? Why is this the case?

ANSWER Mr. Rees: The time frames imposed on the regulatory process are an extension of what previously existed in EPA's implementing regulation for the Ocean Dumping Act (40 CFR 220-228). The effect was to provide a more reasonable timeframe for regulatory reviews of proposed Army permits/projects, based on program experience since the regulation was last revised in 1977.

It was clear in our discussions with committee staff leading up to the final language in Title V that we did not support many of the provisions believing instead that administrative solutions were in place and should be allowed to operate. Nevertheless, we reached the compromise position expressed in Title V and stand by it. Whether the provisions will lead to an improved situation or not is speculative, but we believe they will. What is certain, however, is we have lost administrative flexibility to modify the procedures that are now locked in legislatively, should they turn out to be unsatisfactory.

- What other recommendations would you make to improve the regulatory process?

ANSWER Mr. Rees: We anticipate that the Corps and EPA will very shortly begin a joint effort to revise the EPA implementing regulation for the Ocean Dumping Act (40 CFR 220-228). At this time, we do not anticipate that additional changes in the Ocean Dumping Act would be necessary and that required programmatic changes which we have identified can be made through the rulemaking process.

- Do you think that Title V adequately addresses the problems associated with the regulatory process? If not, why?

ANSWER Mr. Rees: Title V may only serve to exacerbate rather than improve the regulatory process. Implementing a regulatory process for which two Federal agencies essentially have been assigned joint and equal responsibility will be extremely difficult at best. As noted in a previous response, the procedural detail in Title V is now codified and reduces administrative flexibility, should we find implementation difficulties.

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Question from Mr. Weldon - How often is the "green book" revised and updated to meet the changing needs of testing and evaluating proposed discharges of dredged sediment?

ANSWER Mr. Rees: There is no regular schedule for revising and updating the green book. Rather, the green book has been designed in loose leaf fashion and the expectation of the Corps and EPA is that changes will be incorporated as they become necessary and as they are developed to a reasonable degree of scientific credibility. For example, the Corps and EPA are currently conducting research to develop chronic, sublethal testing methodologies which are intended to be incorporated into the green book.

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Question from Mr. Weldon - What types of testing of dredged material is the Corps involved with?

ANSWER Mr. Rees: The Corps, in close consultation with EPA, has developed a wide array of dredged material testing protocols which are applied on a case-by-case basis, depending on the characteristics of the sediment to be dredged, its source and other factors. Effects-based testing with bioassays and sediment chemical analysis are the predominant environmental measures that we use to evaluate potential impact. The type(s) of bioassay organisms used depend on whether the material is proposed for disposal in marine waters, in freshwater, in upland sites or as a beneficial use application, such as marsh development. We also employ a wide range of additional tests to determine the effectiveness of proposed management options where initial testing indicates such would be required for acceptable disposal. These tests include, as example, lab analyses of the required thickness of a clean sediment cap to prevent bottom organisms from burrowing down into the contaminated sediments and lab tests to evaluate the effectiveness of management actions to prevent leachate from migrating into groundwater aquifers.

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Questions from Mr. Weldon - Does your recently released manual "Evaluating Environmental Effects of Dredged Material Management Alternatives - A Technical Framework" address the disposal of contaminated sediments? What recommendations does it make?

ANSWER Mr. Rees: The manual is a joint technical guidance document published by EPA and the Corps, as was the "Green Book". It applies to all dredged sediments, both contaminated and not, regulated by either the Ocean Dumping Act or Section 404 of the Clean Water Act and the National Environmental Policy Act.

While it offers no specific recommendations, it encourages a balanced overall management perspective for dredged material disposal, particularly for contaminated sediments. It stresses that no management options should be summarily dismissed or given preferential treatment for other than sound technical reasons. The manual also encourages maximum beneficial use of dredged sediments.

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Question from Mr. Weldon - Is the Corps involved in any efforts to develop a long term management plan for the disposal of contaminated sediment?

ANSWER Mr. Rees: Yes. We have specific efforts underway in San Francisco Bay, Toledo Harbor, Baltimore Harbor and Houston-Galveston Ship Channel, with plans being developed for long term management strategies in all dredging areas where disposal options are at issue. Solutions to long term dredging needs will require cooperative efforts of Army Civil Works, the port and maritime interests, and Federal and state agencies responsible for pollution control at its source, and other environmental and economic interests. We cannot expect the ports or the maritime industry to pay for all the pollution sins of the past and we must be creative in finding ways to see that those responsible for causing or allowing the pollution contribute a fair share of the remediation costs. As briefly discussed in their testimony, EPA does have an ongoing effort to develop a national strategy for contaminated sediment management. The Corps efforts may often have to be closely coordinated with these efforts on a regional basis to ensure, for example, that available disposal capacity suitable for disposal of highly contaminated sediments is not used instead for sediments that do not require that level

of environmental management. States also need to do more to control point and non-point sources of contaminants entering the aquatic system.

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Question from Chairman Ortiz - A coordinated relationship between the EPA and the Corps could be considered an asset for the management of contaminated sediments. Would you consider their present relationship as smooth or is there static involved when it comes time for a decision to be made?

ANSWER Dr. Engler: Given our respective statutory responsibilities with regard to the dredging and ocean disposal, as well as the potential for controversy from any number of factors, including contaminated sediments, we believe the Corps and EPA, by and large, have a professional and productive relationship. Over a number of years the Corps and EPA have been working very closely at the headquarters level on a number of technical issues, including the ocean dredged material testing manual published in February 1991 and the soon to be published manual for inland and near-coastal waters. We jointly sponsor dredged material training exercises and frequently consult on policy and administrative matters. Our joint responsibilities, under the statutes, have placed each agency in a role of greater understanding for the respective roles and responsibilities of the other agency. However, our agencies are charged with different responsibilities which lead to inconsistent priorities between the agencies and occasional disagreements, especially where science is inconclusive and judgment is required to reach a decision. We continue to work with EPA to minimize such situations.

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Question from Chairman Ortiz - The cost of alternative technologies for remediation of contaminated sediments is an important issue that you discussed in your testimony. What is the most practical and cost effective method of managing contaminated sediments?

ANSWER Dr. Engler: The most practical and cost effective approach for managing contaminated sediments encompasses a two-phase process, short and long-term. The short-term solution should consist of isolation of the unsuitably contaminated dredged material through use of confined or contained disposal facilities (CDF's) similar to those in use in a large number of locations. The principal behind CDF containment is that the contaminants are largely attached to the particulate sediment material and that CDF's are engineered to contain and isolate sediment particles. CDF's can also confine the liquid fraction, if necessary. CDF's can be constructed on land, near shore or as an in water facility (island). Each of these approaches has been demonstrated at numerous locations. Underwater capping on level bottoms or in borrow pits or pits excavated for the contaminated materials has also been shown to be effective, practical and cost effective. The only long-term solution is to aggressively control contaminants at their source, that includes point and non-point sources, and clean-up of in-water and on-land hot spots

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that act as chronic sources to the aquatic environment. If this is not done, recontamination will occur and the short-term solution will have to remain in effect.

- Should additional federal resources be spent in this area?

ANSWER Dr. Engler: In the near-term, probably the most cost-effective return on any federal investment in this area would be in developing efficient and innovative treatment technologies for isolated source "hot spots" of contaminated sediments. Extensive treatment of the typically large volumes of marginally contaminated sediment would probably not be cost-effective for the foreseeable future.

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Question from Chairman Ortiz - You mention significant long term problems if action is not taken. With research being conducted to detect and reduce pollutants at their source, what further actions must be taken to prevent further problems?

ANSWER Dr. Engler: Research on source detection, control, and management is an EPA mission. As such, the Corps has no research in this area. The Corps does conduct research in the identification, assessment and management of contaminants once they are in the sediments that we manage in our dredging program. We are detecting low levels of a wide range of contaminants that originate from land based sources, atmospheric deposition or in-water hot spots. These sources must be aggressively controlled before we can pursue any long-term clean-up solutions.

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Question from Chairman Ortiz - If contaminated sediments remaining in our bays and estuaries close to shore have harmful biological effects, would it make sense to employ deep ocean isolation as a technology for moving these contaminants to more remote locations?

ANSWER Dr. Engler: In order to manage the contaminated sediment problem in the most efficient and environmentally responsible manner, it is essential that all potentially feasible management options be available to the resource manager and equally so from a regulatory context. However, deep ocean isolation most probably would not represent a cost-effective option at this point in time, even for managing highly contaminated bottom sediments. Further, it is questionable if this option could be seriously considered at present for highly contaminated sediments due to regulatory constraints of the London Dumping Convention.

- Would isolating and removing contaminated dredged material from current near-shore bays or estuaries aid in remediation of the marine ecosystems and coastal water quality of these areas?

ANSWER Dr. Engler: Isolating and/or removing contaminated sediment has been shown to be an effective remediation measure under certain conditions. For example, isolation or removal of "contaminant hot spots" with natural remediation of the remaining problem may often be the preferred option for resolving this problem, both from an environmental as well as an economical

perspective. This has to be a case-by-case assessment based on a number of site-specific factors, including the type of contamination, its areal extent and the physical characteristics of the waterbody involved. No solution will be fully effective unless or until the original source of the contamination is first cleaned up.

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Question from Mr. Weldon - In your testimony you describe an effects-based testing as a tiered approach with lower tiers using existing information and higher tiers requiring that a decision be made on an appropriate form of disposal. Can this approach be used in the future to determine what is the best possible disposal method for contaminated sediments?

ANSWER Dr. Engler: The effects-based approach at identifying and assessing potential contamination of sediments proposed for dredging can be used and is designed specifically for identifying environmentally acceptable disposal alternatives. The procedures summarized in my testimony can be applied to aquatic, wetland, and upland disposal alternatives. It is used in combination with the jointly developed Corps of Engineers/EPA manual, "Evaluating Environmental Effects of Dredged Material Management Alternatives - A Technical Framework" cited in Mr. Rees' testimony to select the best possible disposal method for contaminated sediments. These procedures are not designed specifically for remediation concerns involving in-place sediments, but would be applicable if a decision was made to remediate by removing those sediments and placing them elsewhere.

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Questions from Mr. Weldon - How much of your research is currently focusing on alternatives to ocean disposal of contaminated material? Are there technologies being developed to address both the most contaminated and least contaminated sediments?

ANSWER Dr. Engler: Significant research has been conducted over the past 20 years on alternatives to ocean disposal for clean and contaminated dredged material. Specific research on contaminated material has dealt with design and management of confined disposal facilities on land, nearshore, and in water, subaqueous capping, and procedures to identify and assess contaminated sediments for selection of the proper controls for confined disposal. These techniques are now standard practices. Current Corps research focuses on improved predictive techniques for leachate, run-off, and volatiles associated with confined disposal of contaminated sediments. Other work conducted by the Corps and funded by the Corps and others (e.g., EPA, DOD, NOAA) includes endangerment assessments, risk assessment/management, and clean-up techniques for aquatic and wetland sites. Current identification and assessment research emphasizes chronic/sublethal effects, genotoxic consideration, and risk assessment techniques. Significant research is being conducted by the Corps on sediment treatment technologies through EPA's Great Lakes Assessment and Remediation of Contaminated Sediments (ARCS) programs. These programs were outlined in my complete

testimony and include the general areas of: 1) physical stabilization/separation, 2) extraction procedures, and 3) thermal processes to remediate severely contaminated sediments. Research on the least contaminated or clean sediments continues under the Corps of Engineers Wetlands Research and Dredging Research programs. Their focus is to further enhance our ability to productively and beneficially use such dredged materials in near shore and aquatic sites, respectively.

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Questions from Mr. Weldon - Do you feel that more federal resources are needed to develop effective technologies to address this problem?

ANSWER Mr. Rees: At the direction of the Congress, the Corps has had a lead responsibility for conducting research and development on dredging and dredged material disposal, including technology development for managing contaminated sediments. We believe current funding levels are appropriate, particularly in light of the budget situation and other funding priorities.

- What alternatives are being developed to ocean dumping of contaminated dredged materials?

ANSWER Dr. Engler: There are several alternatives to ocean disposal currently in use that include confined disposal facilities on land, near shore and on islands and capping on level bottoms or in excavated pits. All of these alternatives may not currently be available in all locations that we dredge. As cited in my complete testimony, numerous treatment and remediation alternatives are being investigated. In some cases, the no-dredge or no-action alternative may be appropriate. Developing wetlands with contaminated material is also being investigated but must be done with great care and with an environmental concern equal to that of aquatic placement.

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Questions from Mr. Weldon - In your written testimony you discuss wetlands creation using dredged material. How effective is this?

ANSWER Dr. Engler: Numerous wetlands have been created successfully with dredged material. Engineering and design information for wetland creation using dredged material is contained in Engineer Manual EM 1110-2-5026. This document lists over 120 sites and locations of wetland creation projects using dredged material. These sites have been from as small as 1 acre to as large as 1,200 acres (Louisiana) and 4,000 acres (Minnesota). These have been effective beneficial uses of dredged material.

- Are there cases in which contaminated material was used for wetland creation? If so, what is the success rate of this?

ANSWER Dr. Engler: There are at least two locations were wetlands have been established on contaminated dredged material, Times Beach Confined Disposal Facility (CDF) at Buffalo, NY and at the Corps/EPA Field Verification Program (FVP) site at Bridgeport, CT. The flora in both wetlands are growing and appear to be thriving on dredged material containing PCBs, PAHs and metals. Both sites are currently being evaluated to document migration of contaminants into the biota on each site. While wetland plants do not appear to be contaminated on these sites,

wetland animals appear to contain contaminants. The level of contamination of animals is being evaluated and will be interpreted for the need for controls and restrictions as deemed necessary.

- Is this a viable technology? What types of constraints exist for this technology?

ANSWER Dr. Engler: The use of marginally contaminated dredged material for wetland creation appears to be a viable technology. However, the level and type of contamination that can be considered marginally contaminated needs to be defined. Depending upon results of the studies noted above, creation of wetlands on contaminated dredged material similar to that referenced for Times Beach CDF at Buffalo, NY or the FVP site at Bridgeport, CT may or may not be a viable technology, if contaminant uptake is found to be a problem. If this is the case, some control or restrictions such as capping the contaminated material with cleaner material may be necessary. This should isolate the contaminated material from wetland animal contact and exposure. While this may be a viable technology, it should be demonstrated further prior to widespread application.

- What potential problems exist?

ANSWER Dr. Engler: Potential problems include: contamination of food chain organisms associated with wetland animals colonizing contaminated or marginally contaminated dredged material; erosion of the cap of clean material, exposing the contaminated material

for exposure to wetland animals; migration of contaminants into the groundwater; and, migration of contaminants into tidal waters that might come in contact with contaminated material placed in a wetland environment.

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Question from Mr. Weldon - How effective have past technologies been in addressing ocean disposal of contaminated sediments?

ANSWER Dr. Engler: As noted in an earlier response, the Corps does not ocean dump material that violates EPA's ocean dumping criteria. Past technologies to identify, assess, and manage material proposed for ocean disposal have used state-of-the-practice physical, chemical, and biological procedures to determine whether or not a material was contaminated and unacceptable for unrestricted ocean disposal. These technologies were jointly developed by the Corps and EPA and are in the Ocean Disposal Manual, first published in 1977 with subsequent revisions to reflect changing technical knowledge and environmental concerns. This interagency process has been very effective in ensuring that only acceptable dredged material, that which meets EPA's environmental impact criteria, is ocean disposed. Contaminated material may be disposed in the ocean if proper restrictions, such as capping, are part of the project that ensures isolation of the contaminated material from the marine environment. This process has recently been augmented by the Corps and EPA's joint Technical Framework manual cited in Mr. Rees' testimony.

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Question from Mr. Weldon - Is there a need to develop a long term strategy for the development of alternative technologies to ocean disposal of contaminated sediments?

ANSWER Dr. Engler: There is a need to build on ongoing and previous efforts in this area to provide an array of alternatives that are both cost-effective and environmentally sound. These efforts should not preclude any potentially viable management options, including ocean disposal related options.

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Question from Mr. Green - The Corps of Engineers is doing a study at the Waterways Experiment Station to predict the inflows of low, medium, and high rates of fresh water into Galveston Bay. The Corps is studying what will happen under these various scenarios. The low and most of the medium inflows have been completed, however it has been said that the high inflow will take a year to a year and a half. I would like to know why it will take such a long period of time to do the high inflows and what can be done to expedite this study?

ANSWER Mr. Rees: Studies to assess the environmental impacts of dredged material disposal from the Houston-Galveston Ship Channel were developed in the Fall of 1988. The clear intent of all agencies participating was that all necessary studies would be completed in 1992. When we learned recently that the studies are not complete and some interests involved are asking for an additional one and one-half years of further study, we called for a full Washington level review of what has been done in the past four years and why an additional year and a half of study is needed. That review has been underway for a few weeks and a conference is scheduled between Washington level technical reviewers and managers and the field people involved in the study to determine the need for additional studies. We expect it will take a month or two after the conference to sort through all the information and perspectives and reach a decision on whether to proceed with additional studies. We will report back to you as soon as we have done so.

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Question from Mr. Green - Has there been any research on the health risk associated with physical contact or accidental ingestion of contaminated sediments?

ANSWER Dr. Engler: The Corps has not conducted direct research on the human health risks associated with physical contact or accidental ingestion of contaminated sediments. We rely on research conducted by other agencies and programs responsible for assessing such risks and establishing criteria and protection requirements from potential exposure of humans, such as EPA and the Food and Drug Administration. Our research does address the processes for identifying sediments containing contaminants and the procedures necessary for handling, control and potential remediation of such materials. These efforts would include analyzing mechanisms to minimize the health risk to humans involved in the process. It also addresses the assessment of risk to humans and the environment in determining actions be taken with contaminated dredged material.

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Question from Mr. Green - What is considered "clean" dredge material?

ANSWER Dr. Engler: "Clean" dredged material refers to those sediments that do not demonstrate an unacceptable adverse impact on human health or the environment due to the presence of contaminants when the material is dredged and disposed. "Clean" dredged material may contain trace amounts of chemicals and other materials that do not violate EPA and other federal and state criteria for human and environmental impact for open water disposal.

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Question from Mr. Green - Has there been a contaminant subcommittee in the Inter-agency Coordination Team declare dredge material in Galveston Bay suitable for beneficial use?

ANSWER Mr. Davis: The Galveston District is conducting studies to determine whether deepening the existing navigation channels in Galveston Bay will have any adverse environmental impacts. The Interagency Coordination Team is participating in these studies and includes a subcommittee to evaluate the contaminant potential of dredged materials. Based on results of testing done on materials dredged as part of past maintenance of the existing channels, the subcommittee found the material to be acceptable for ocean disposal or beneficial use in at least one location. Though testing of previously dredged material was positive and indicated that beneficial use of future dredged material was possible, the subcommittee recommended that material to be dredged in the future, either for construction or maintenance, be tested and evaluated to determine its suitability for a particular beneficial use or method of disposal.

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Scott A. Weiner
Commissioner

Richard V. Sinding
Assistant Commissioner

May 3, 1993

Honorable Solomon P. Ortiz, Chairman
Subcommittee on Oceanography,
Gulf of Mexico, and the Outer
Continental Shelf
U.S. House of Repreaentatives
Merchant Marine and Fisheriea
Room 1334, Longworth House Office Building
Washington, D.C. 20515-6230

Dear Congressman Ortiz:

Thank you very much for allowing me the opportunity to appear before your Subcommittee on Oceanography, Gulf of Mexico, and the Outer Continental Shelf on Tuesday, March 30, 1993. I believe the inquiry which your subcommittee is conducting is both timely and significant, and I appreciated the reception afforded me and representatives of other public agencies involved in the issue of ocean disposal of contaminated dredged material.

I have reviewed the list of questions which you and aubcommittee members were kind enough to forward to me following the March 30 hearing, and am pleased to enclose my responses to these questions. If there is any additional information which you or subcommittee members uay require with regard to any of these questions, or if there are additional questions which you would like to pose, I will be more than happy to answer them.

Thank you again for allowing the New Jersey Department of Environmental Protection and Energy to participate in this important process.

Sincerely,

Richard V. Sinding
Assistant Commissioner

enclosure

Responses to Subcommittee Questions

(1a) **There are a number of parties that have expressed concern over the lack of public comment and input provided by the existing permitting process. Could you explain the various steps in the process that your agency provides for public input?**

At the state level, the New Jersey Department of Environmental Protection and Energy (DEPE) reviewed the Port Newark-Port Elizabeth maintenance dredging project pursuant to the state Waterfront Development Act, Section 401 (Water Quality Certification provisions) of the Federal Clean Water Act (as amended), and for consistency with the state Coastal Zone Management Program. Notice of these pending regulatory actions was published in the "NJDEPE Bulletin." The Department did not receive any significant public comment prior to the issuance of these permits/approvals. In addition, the Department maintained regular contact and discussion with the applicant, federal regulatory agencies, and other interested parties throughout the permitting process, so that the stringent conditions placed on New Jersey's permits for dredging operations received ample public attention and discussion.

At the federal level, the permitting process also provided opportunities for public input. A public hearing was held by the U.S. Army Corps of Engineers-New York District (USACE) and the U.S. Environmental Protection Agency-Region II (USEPA) for the Port Newark-Port Elizabeth permit. In recent weeks, the federal and state agencies have had ongoing discussions regarding the project with interested parties. One problem that did arise during the course of the permit application review by the USACE was an increase in the quantity of sediments to be dredged. The public was not made aware of this change, which subsequently led to the flurry of activity in which we all remain presently engaged.

The main concern about public involvement, which is justified, is the lack of public input into the establishment, by the federal agencies, of the ocean disposal criteria for the dioxin-contaminated sediments. The State of New Jersey also had very little input into the development of these criteria.

(1b) Do you feel that there are ways that the process could be improved in this regard?

The USACE and USEPA should initiate a formal process, involving the states of New Jersey and New York, representatives of the scientific, environmental, and business communities, and other interested parties to develop scientifically based standards for the ocean disposal of dioxin-contaminated dredged material.

(2a) Is the process surrounding the Newark Bay ocean dumping permit typical for contaminated dredged material disposal?

No, this was not a "typical" permit application or review. The Port Newark-Port Elizabeth project was the first permit application which identified the presence of sediments contaminated with dioxin at levels which could result in adverse environmental impacts. As such, various environmental organizations viewed this project as a significant precedent, not only because it was the first such application, but also because of the large quantity of sediment to be dredged.

Given the current lack of knowledge and conflicting data concerning the effects of dioxin, it was difficult (both procedurally and scientifically) to evaluate the permit application. Thus, the application has taken an extended period of time to review, additional testing has been required, and multiple public interests have become involved appropriately in the decision-making process.

(2b) How can the process be improved on a Federal and State level?

See response to Question (1a). In addition, the federal agencies, in cooperation with the state agencies and other interested parties, should continue to study, develop, and eventually implement alternative methods to the ocean disposal of contaminated dredged material. In particular, the development of decontamination technologies must be expedited.

(3) What roles should States play in the regulation of ocean dumping? Is New Jersey's role adequate or should changes be made to enhance States' role in the dredge permit process?

The states should be an equal partner with the federal agencies in the development, evaluation and designation of proposed ocean disposal sites and the preparation of associated Environmental Impact Statements (EIS). Under the National Environmental Policy Act (NEPA), the DEPE could serve as a cooperating agency in the preparation of EISs. In addition, the federal agencies should work with the states to develop standards for the ocean disposal of dioxin-contaminated sediments.

New Jersey has ample authority, under the 1990 amendments to Section 307 of the Federal Coastal Zone Management Act, to involve itself in all aspects of the dredging permit process. The state has chosen to employ the issuance of a DEPE coastal permit as a demonstration of consistency with its Coastal Zone Management Program, and has generally deferred to the expertise of federal regulatory agencies in the evaluation of potential impacts of ocean disposal activities. The state stands fully prepared to assert its independent authority, however, should it be determined that any proposed dredging or disposal activities outside the waters of the State of New Jersey are inconsistent with our Coastal Zone Management Program.

(4) **For the State of New Jersey, how feasible is the idea of source control of point and non-point pollution to prevent the creation of contaminated sediments?**

Control of point sources of pollution is very feasible and effective. The continued application of water quality standards for toxic substances and the strengthening and enforcement of the industrial pretreatment program will result in continued water quality improvements. The New Jersey Pollutant Discharge Elimination System, in coordination with the state Clean Water Enforcement Act, will continue to result in improvements in water quality.

Control of non-point sources of pollution is more problematic. The overriding problem is that the sources of such pollution are numerous, small, and diverse, and thus are difficult to manage. Although they are individually small and dispersed, the cumulative impacts of these activities have been shown to be quite large. Increased public education and lifestyle changes will be needed to address this problem. Non-point source pollution control measures, such as stormwater permitting, along with pollution prevention in general, are currently being studied and, increasingly, put into practice by the DEPE.

In the particular case of dioxin contamination in Port Newark-Port Elizabeth, it should be noted that the apparent source is not a present discharger. Thus, neither point nor non-point source controls would be effective in preventing the creation or reducing the incidence of contaminated sediments. Rather, the removal of dioxin from the Passaic River and Newark Bay will be accomplished only through remediation, as opposed to regulation and enforcement.

5) Under your Coastal Zone Management Program consistency review authority, what actions have you taken, and what actions have you proposed to take with regards to the Newark Bay permit?

The proposed Port Newark-Port Elizabeth maintenance dredging project, with ocean disposal of the dredged material, was found to be consistent with the New Jersey Coastal Zone Management Program. The DEPE concurred with the conclusion of the federal agencies that disposal of the dredged material, with proper capping and the implementation of other management practices, would not result in adverse impacts to the environment.

The DEPE recognizes, however, that there is a need for additional scientific knowledge concerning the possible impacts of dioxin and the development of scientifically based standards for the ocean disposal of dioxin-contaminated dredged material. Thus, the state has established a deadline of December 31, 1995 for the development of such criteria. If the standards are not in place by this deadline, the state will use whatever authorities it has to prevent the dredging and ocean disposal of any sediments contaminated with dioxin at any level.

(6) How do you respond to the testimony of the Environmental Defense Fund that your Coastal Zone Management Act decisions were flawed?

We respectfully disagree with the assertions made by the EDF. The Department's review of the Port Newark-Port Elizabeth project was consistent with established Coastal Zone Management Program review procedures. As previously noted, the DEPE concurred with the federal agencies in the assessment of possible adverse environmental impacts at the Mud Dump site.

Responses to the Questions of the Honorable Curt Weldon

(A-1) **In your testimony you state that it is important to recognize that there are some distinctions between the Port Authority's pending permit application and many of the long-term issues involving proper harbor management. What are some examples of this?**

The biggest distinction is that most sediments in the estuary system are not contaminated with dioxin, and thus will not pose similar problems. The overall issue of the suitability of ocean disposal at the Mud Dump site has been raised, however, and should be evaluated and addressed. Feasible disposal alternatives should continue to be evaluated and, if shown to be economically viable, implemented. Other long-term issues, many of which are currently being addressed by the New York-New Jersey Harbor Estuary Program (HEP), include the loss of habitat, the control of floatables in the harbor, the development of a toxics management program, and water quality concerns.

(A-2) **What do you feel are some of the crucial issues facing proper harbor management? Do you feel that these issues are being addressed or has the New York/New Jersey permit process served as a catalyst to address problems associated with harbor management?**

As noted above, many of these issues are being addressed in the forum of the HEP and as part of the recently announced seven-point interagency cooperative initiative (see Response B below). In addition, these issues are now considered on a routine basis during policy and permit reviews. The Port Authority's permit application did serve as a catalyst in that it transformed what had previously been policy issues into practical and regulatory problems demanding action. The problem of dioxin-contaminated sediments, though long recognized as a potential issue, became a "real" problem demanding immediate attention. It has also resulted in an ongoing series of meetings bringing together all of the stakeholders in the New York-New Jersey Harbor Region for frank and extended discussion of pressing issues and concerns.

(B) What recommendations would you make to better address the long-term issues involving proper harbor management?

As noted above, many of these issues are being evaluated by the New York-New Jersey Harbor Estuary Program. In addition, the DEPE, in cooperation with the N.J. Department of Labor, the USEPA, and the New York Department of Environmental Conservation, has developed a seven-point initiative to address a multitude of management issues in the harbor. These initiatives include cleaning up the sources of dioxin in the Passaic River, reducing non-point pollution inputs, promotion and development of possible decontamination technologies, development of a comprehensive toxics management plan, and implementation of a public information and education program.

(C-1) Secondly, you also mention in your written remarks that one of the benefits of the permitting process is that there is a clearer understanding of the limitation imposed by the present policy. Would you expand on this? What changes need to be made to improve the current policy?

Present policy is guided by too little scientific data and too few disposal options. Additional scientific investigations are needed to gather the data required to fully assess the possible impacts of dioxin on the environment. As previously noted, this must lead to development of standards for the ocean disposal of dioxin-contaminated sediments. The federal agencies should also implement a monitoring and management program at the Mud Dump site. This program would include an assessment of impacts to marine biota, as well as an evaluation of various ocean disposal and management practices (capping, etc.).

In addition, alternatives to the current use of the Mud Dump site for the ocean disposal of dredged material should continue to be evaluated and implemented promptly. Finally, the impacts of past and current disposal activities at the Mud Dump site (positive and negative) should be evaluated.

(C-2) Does it require more support from the federal or local level?

Yes. At the federal level, additional funding support for scientific research into the possible impacts of dioxin in the environment is needed. In addition, the development and implementation of decontamination technologies must be supported and encouraged. Additional funds are also needed to ensure the proper monitoring and management of dredged material disposal sites. At the state and local levels, increased resources are needed to address issues and problems specific to the region. Depending on the type and magnitude of the problem, federal support may also be needed to address the local concerns.

(C-3) Do you think other states are also faced with this same issue?

If not at the present time, many states will be faced with similar problems and issues. This could potentially occur in any state in which the disposal of dredged materials is practiced and in which the sediments are contaminated by toxic substances. Give our industrialized and urbanized society, the problem will doubtless arise in other areas of the country. Dioxin contamination of river, estuarine, or marine sediment is not limited to New York Harbor.

(D) You also mention that there is a need to reduce non-point sources of harbor pollution because it is considered to be a substantial source of contaminated sediments. Are there currently any efforts underway in New Jersey to address this? If so, what are they? If not, are there any management plans currently being developed to address runoff pollution?

The previously noted seven-point initiative, as well as actions being evaluated under the HEP, will address non-point source pollution issues. The state has begun to implement a comprehensive Stormwater Management Program, and has been evaluating the impacts of Combined Sewer Overflows. The New Jersey Sewerage Infrastructure Improvement Act, which provides funds to municipalities for the mapping and improvement of stormwater systems, is currently in operation.

(E) Do you feel that states should have a greater role in the permitting process? If so, what recommendations would you make?

At the present time, the states have adequate authority to involve themselves fully in the federal permitting process. As noted above, however, there is a need to develop scientifically based ocean disposal standards.

(F-1) How actively did the public participate in the permitting process for the Port Newark-Port Elizabeth permit?

The public has been actively involved in the permitting process. Concern centers around lack of public involvement in the development and establishment of the ocean disposal criteria for dioxin. This concern is justified.

(F-2) In your testimony you mention that there is a need to provide meaningful information to the public regarding science-based risk associated with dioxin and other contaminants. Are there any efforts along this line currently underway? If so, could you give me an example? If not, are there any efforts being developed that would provide necessary information to the public so that they have a greater understanding of the potential health threats associated with contaminated sediments?

Given the wide variance of opinion among scientists and other experts involved in the dioxin issue, and considering the air of contentiousness that has surrounded this issue, it is not at all clear what information, if any, would provide the public with a greater understanding of the potential health threats associated with contaminated sediments.

We understand, however, that a national-level study of the impacts of dioxin is currently being finalized by USEPA. This study will evaluate the existing information available on the health effects and environmental impacts of dioxin contamination. The previously noted cooperative interagency seven-point initiative includes a public information component to address this very issue. In addition, other programs can be developed and implemented under the auspices of the HEP and the USACE Public Involvement Coordination Group for the Dredged Material Disposal Management Plan for the Port of New York and New Jersey (this group has not been active for approximately two years).

(G-1) Finally, in your testimony, you state that we must find long-term solutions in a short-term time frame. How would you suggest accomplishing this? What recommendations can you make to the Subcommittee?

It is imperative that ocean disposal of contaminated dredged material be terminated as quickly as possible. The USACE should reconvene the Dioxin Steering Committee and the USACE Public Involvement Coordination Group. The federal agencies should make these issues a high priority and devote the resources needed to resolve these issues in a timely manner. Alternatives to ocean disposal should be evaluated and implemented promptly.

(G-2) You also mention that we need to develop a comprehensive toxics management plan. Are there any efforts on the local level to develop such a plan?

Yes. As previously noted, the development of such a plan, in cooperation with the New York-New Jersey Harbor Estuary Program, is one component of the seven-point interagency initiative recently announced.

Questions of Hon. Solomon P. Ortiz and Hon. Curt Weldon and responses from Lillian Liburdi, Director of Port Department, Port Authority of New Jersey

Responses to Written Questions

1. What has been the economic impact to both the Port Authority and the companies you serve as a result of the permit denial? Have the shipping companies diverted their cargo to other ports? If so, which ports?

It is very difficult to precisely quantify the losses at this time. The International Longshoremen's Association (ILA) reported in early May of this year that there has been a reduction in labor hours for the past six months when compared to a similar period the previous year. The ILA reported a loss of over 100,000 hours. We estimate a loss of 2 to 3 percent of cargo tonnage in the last quarter of 1992 due to diversions to other ports. We expect the first quarter of 1993 to show a much greater loss.

We believe that Maersk Lines is diverting cargo because we can no longer accommodate their deeper draft vessels fully loaded. They have recently announced that Halifax, Canada, has been chosen over Port Newark and Elizabeth Marine Terminal as the Lines' East Coast deep water port.

Hapag-Lloyd, due to inadequate berth depths at our Port Newark and Elizabeth Port Authority Marine Terminal, no longer has the port as a first-in, last-out, port-of-call. Norfolk has become the last port-of-call on the eastbound route to Europe.

There have been at least 14 ship groundings since January 1992 at the facility.

If these trends continue, we can expect a major reduction in tonnage passing through the Port of New York and New Jersey. We are performing an economic impact analysis to determine what losses we have sustained at this time and what we can expect in the future, if we are not able to dredge.

2. What has been the total cost to the New York and New Jersey Port Authority as a result of the permit denial?

The total cost is indeterminate. We have spent nearly a million and a half dollars on testing and analyses for the Port Newark and Elizabeth Port Authority Marine Terminal ocean disposal dredging permit. If we were to receive the permit, additional costs for capping, alone, could exceed $3 million. In addition extra costs will be incurred because of the extraordinary management procedures the Port Authority is required to implement. The total estimated cost of dredging the berths under the three year permit is $6.5.

The inability for the Port Authority and others to dredge material and ocean dispose of it because of the traces of dioxin in the sediments will increase unemployment in a region which is already suffering from a high unemployment rate of 9.1 percent as of January 1993. We have heard from a number of private firms that will, most

likely, relocate and close their operations within the Newark Bay system if they are not able to dredge. Many are concerned with the high cost of permit process and the additional costs that could result with requirements to cap sediments they would dredge from their facilities.

In order to understand the seriousness created by the uncertainty of our permit, one must understand how the marine industry operates. Shipping lines must plan in advance, usually six months, regarding shipping routes. In order to provide a truly intermodal transportation system, steamship lines must make arrangements for terminals, warehousing, trucking and railroads. Once these agreements are reached with other ports such as Halifax, Philadelphia, Norfolk, Baltimore, and Boston, it will be difficult for the Port of New York & New Jersey to recapture the tonnage loss.

3. In the past, how often was the port dredged?

The Port Newark and Elizabeth facility is dredged annually, at least once and possibly, two times each year. The entire facility is not dredged each year but selected berths are dredged on an as-needed basis. The entire Port of New York and New Jersey's annual maintenance dredging volume ranges from 6 to 10 million cubic yards.

4. Have there been any previous problems with contaminated sediments? If so, when?

With regards to dredging, under the previous ocean dumping guidelines the Port Authority of New York and New Jersey did not have any problems with sediment quality at the Port Newark and Elizabeth Port Authority Marine Terminal.

5. Have any safety problems arisen due to the fact that the Newark Bay port has not been dredged in three years?

At the present time, the Port Authority has not yet experienced any significant safety problems because of increased siltation at our berths. However, there have been operational constraints placed on terminal operators that may reduce the level of safety margin for both vessel and workforce. In order to unload and load a vessel rapidly because of berth depth limitations, terminal operators have increased the number of cranes working on a ship, thus creating a more difficult working environment. In addition, there have been at least 14 ship groundings since January 1992 at the facility because of shoaling of the berths due to lack of dredging.

6. In your testimony, you raise a very important question, "how clean is clean?" Do you feel that the EPA criteria adequately assess this or does the criteria go too far? What changes, if any, would you recommend to better assess what is considered clean sediment, or sediment that does not pose a threat to the environment of public health?

EPA criteria fail to consider the question of how clean is

clean, especially with regard to dioxin and the managed ocean disposal of sediments containing traces of dioxin. EPA fails to evaluate the proposed action and uses generic or global impacts to evaluate dioxin-contaminated sediments for ocean disposal. The use of the New York State Department of Health's parts per trillion regulatory level for fish consumption is not appropriate for a capping level limit.

The Port Authority retained an independent, nationally recognized consultant--Dr. Richard Peddicord of EA Engineering, Science & Technology--to evaluate risks associated with the permit action, the management and ocean disposal of dioxin-contaminated dredged material. Dr. Peddicord's recommendations, as far as we know, is the only study of its kind that deals specifically with this issue. The criteria values generated by our consultant are greater, i.e. less stringent, than EPA's interim guidance values.

There is obviously a need to segregate policy making from scientific understanding. For example, when speed limits are set for highways, it is implicit that there is an "acceptable risk" of certain numbers of fatalities (approximately 45,000 per year) and many more injuries. Yet, with ocean disposal of dredged material, it appears that society will only accept zero risk. Such a requirement is onerous and places the United States at a competitive disadvantage with other nations. Within the scientific community there is a doubt, justifiably so, regarding cancer risk. This doubt is over whether EPA's use of a linear risk model based on radiation is appropriate, versus the consideration that there are threshold limits to exposure. Nevertheless, although there is some uncertainty, there is a need for policy makers to set reasonable and supportable risk levels for dioxin and other chemicals.

7. **Do you feel that standards for ocean disposal of sediments exceed the requirements for land-based disposal of similar materials? Do you feel that the testing and standards for land-based disposal are comparable to that required for ocean disposal?**

Definitely so, ocean disposal requirements are much more stringent than land-based requirements. In particular, for dioxin, the standard for land-based actions is one part per billion (ppb), while for an ocean disposal permit, we are required to test for dioxin in sediments to a detection limit of one part per trillion (ppt). That is a thousand times greater.

The EPA set interim criteria of one ppt through ten ppt and requiring capping. Material showing a dioxin bioaccumulation of greater than 10 ppt cannot be ocean disposed. Ten ppt is one hundredth of a ppb. Under Superfund, cleanups are site specific and risk levels selected may be in the order of 1 in 10,000, and up to 1 in 1 million risk of cancer in a lifetime. Our consultant, using EPA's risk assessment guidance, was able to develop criteria numbers for dredged material containing dioxin for ocean disposal at the Mud Dump site. There were two criteria values; (1) for unrestricted ocean disposal, the value is up to 11 ppt, and (2) for material that requires capping, the values are greater than 11 and up to 128 ppt. The above values are

for a 28-day bioaccumulation test results using the sandworm, Nires Virens. In contrast, EPA's interim guidance does not allow disposal without capping of material that shows any bioaccumulation of dioxin and prohibits disposal of material that exceeds 10 ppt bioaccumulation.

The testing and standards for land-based disposal are not comparable to that required for ocean disposal. We believe that is justifiable, because the conditions for disposal alternatives are different. Dredged material behaves differently when on land. In a land-based environment, dredged material may be oxidized and is also exposed to acid rain, thus creating a potential for heavy metal leaching. In the chemically buffered marine environment, heavy metal contaminants tend to be less mobile in fine grain sediments and anoxic conditions.

8. You also state that with the rapid advances in technology, our ability to detect things to lower and lower levels far exceed our understanding of what it all means. Do you feel that these advances in technology could potentially pose a greater problem to the permitting process in the future as potentially harmful contaminants are found in other harbors? What recommendations would you make to improve this process so that this is not the case?

Yes. Advances in technology enabling measurements of pollutants to smaller and smaller detection limits will exacerbate the permitting process throughout the nation. There is a need for a public policy which calls for criteria and standards based on actual risk to health and the environment. Included in this policy should be a clear statement of what is an acceptable risk.

9. What recommendations would you make to improve the federal permitting process? Do you feel that there is a need to streamline this process? If so, what would you suggest as the best approach to simplifying the permitting process? Will changes in the Ocean Dumping Act improve the dredge permitting process? What further suggestions do you have for eliminating the number of regulatory delays and creating better coordination of efforts by the Corps, EPA, and State agencies in order to provide a more stable, streamlined permit process?

The difficulties we find with the federal permitting process is the inability of regulators to make decisions in a timely manner and the potential for changing requirements. The formal process allows for public comment and review within specified time frames. However, regulators have historically proven themselves incapable of bringing this process to a close. Both EPA and the Corps of Engineers act on issues in a linear manner and have demonstrated an inability to deal with more than one aspect of the permit application at a time. It is the standard practice for regulators, both in federal and state agencies, to piecemeal information gathering to run the process over a greater length of time. This prolongs decision-making and favors those who would seek to slow or indefinitely delay the process and defeat the bid for the permit. The environmental community, which has no stake in a positive determination, acts to delay and extend the process as long

as it can possibly do so. By doing so, environmental advocacy groups hope to defeat the application and make the permit disappear. Lastly, environmental advocacy groups usually prefer the no action alternative to permit issuance with mitigation, because they have no faith in engineering solutions.

To simplify the permit process, the federal regulator must adhere to the schedules specified in their regulations and must be able to cut off comments without fear of losing in a court of law because of an administrative error. This fear of loss provides the impetus for regulators not to close the record.

In addition, all governmental and inter-agency reviews of permits should be coordinated and where possible, consolidated. The complex memo of agreements between the Corps of Engineers, Environmental Protection Agency, National Marine Fisheries Service and Fish and Wildlife Service provide the framework for endless review and study.

Another frustration for the applicant is when the federal agencies add to and change requirements and in doing so, at a minimum, protracts the process. In fairness to the permit applicant, the regulators should early in the process set forth clearly the information they require, the appropriate testing and other protocols, and not add to those requirements once the original requirements are complied with. As for criteria and standards, the applicant should be required to meet only those criteria and standards in effect at the time of the application. The rules should not change in midstream.

We believe that only minor changes in the Ocean Dumping Act are required to improve the permitting process for dredged material ocean disposal. Again, it is the lack of policy and guidance at the national level by the Corps of Engineers and EPA which allows for an endless process within Corps districts and EPA regions. We respectfully suggest the need for a national policy which provides for a level of acceptable risk, requires adherence to schedules as published in the regulation, oversight that ensures closure of public comments in a timely manner, and decision-making which recognizes and weighs the serious economic and environmental impacts of the no action alternative. That policy should also place with the federal government responsibility for dredged material disposal planning and costs.

10. If the Port Authority's permit is ultimately denied, what dredge and disposal options will you have, and are they feasible and practical alternatives? What will the cost be?

At the present time, the Port Authority has no feasible or practical alternative to dredging and ocean disposal of the maintenance material from Port Newark and Elizabeth. There is only one EPA designated ocean site and no other water or land-based sites. Whenever possible, dredged sand is used for beach replenishment or as construction aggregate. There are a number of alternatives for disposal of contaminated dredged material that while not readily implementable have merit. Subaqueous borrow pits in the New York Lower

Bay would be suitable for the disposal of contaminated dredged material. This option is the subject of a nearly complete EIS but is faced with a great deal of public opposition. The Dutch, in particular the Port of Rotterdam, have come to the realization that the use of subaqueous borrow pits for contaminated dredged material is the way to go. The Port of Rotterdam presently uses a containment facility called the Parrot Beak. The Dutch have found the economics of such a facility and possible future environmental consequences have demonstrated that this is not the best solution. Once the Parrot Beak reaches capacity, the Port of Rotterdam expects to implement the use of subaqueous borrow pits for contaminated dredged material. The cost of use of subaqueous borrow pits in the New York and New Jersey harbor may be less than the cost of ocean disposal with capping. A much longer-term solution (although The Netherlands would not agree) would be the construction of a containment island in the Lower New York Bay. The siting of such a facility is problematic and the cost of construction may be a billion dollars or more.

We are investigating, with the partial involvement of the federal government, other potential means of disposal. For example, pursuant to WRDA 1992 the EPA and Corps of Engineers are to demonstrate decontamination technology on materials from the port. We have requested that the Congress provide $5 million in FY 1994 to supplement the $2.7 million appropriated for the current year and we have urged the agencies to quickly produce the work plan for that project which has yet to get underway. However, EPA has yet to develop a plan of study. In order to facilitate action the project we are preparing to hire a consultant to identify potential upland areas in the port region where such a project might be located.

As for materials that are not contaminated the port will continue to need an ocean location especially because of the great volumes of material dredged annually.

11. The Mud Dump Site has been used as a repository for clean and contaminated dredged material since 1914. Is the dredged material proposed for disposal from Newark Bay any more contaminated or environmentally harmful than what has been disposed of at the site in the past?

The dredged material being proposed for ocean disposal from our Port Newark and Elizabeth Port Authority Marine Terminal probably has less contaminants than material that has been disposed of at the Mud Dump in the past. The testing requirements are just more stringent. Evidence of this is the fact that the most recent tests of sediment in Port Newark/Elizabeth revealed that the material was in fact less contaminated. We believe dredged material that is being generated in the Port of New York and New Jersey is cleaner today than it has been in the past. Since the advent of environmental laws in the 1970's, the pollution loadings to the waterway have been regulated and have decreased over time. In addition, the publicly-owned sewage treatment works in general have been upgraded to secondary treatment. During this century, there has been increased use of synthetic

chemicals, in particular, chlorinated hydrocarbons and pesticides. During the Vietnam era, there was a chemical manufacturing facility producing Agent Orange on the Passaic River which discharged dioxin into the river. We have reason to believe that during the period this facility was in operation, sediment dioxin levels were higher than what is presently found at the Port Newark and Elizabeth Port Authority Marine Terminals. Such material may have been dredged and subsequently been defacto capped at the Mud Dump.

12. You mention that misguided public perception has driven certain policy decisions in the permit process. What can the Federal and State agencies, and port communities like yourself, do to educate the public and thus provide for a more rational atmosphere for making policy decisions?

We believe misguided public perception drives policy decisions in the permit process. For example, the material that we propose to dredge is already in the ecosystem. The proposal, as per the permit that was rescinded, provides for capping of the dredged material. This action would remove the contaminated sediment from the system and render it harmless. We believe that most people would understand this and see the environmental benefit derived from the proposed dredging and disposal. The Port Authority is committed to working with both federal and state agencies and the environmental community to develop a better understanding of the issues and find publicly acceptable solutions which are economically viable for disposal of legally contaminated dredged material.

13. Can you comment on the Environmental Defense Fund's proposal to move the entire permitting process under the jurisdiction of the EPA?

In principle, we have no objection for the permit process to be under the EPA. In fact, abolishment of dual responsibility may expedite the process. However, if there is a detectable predisposition at the headquarters or regional level against the ocean disposal of dredged sediments that meet the requirements of the law then such a shift in responsibility would be ill-advised. In any event, eliminating the dual responsibility of the current process alone would not improve the process or get at the root of the problems we have experienced. Changes such as those described earlier in this paper should make a difference.

Having said that, the Port Authority of New York and New Jersey does have reservations of assigning this responsibility to EPA Region II. It is our belief that Region II's goal has been to ban <u>all ocean disposal</u> of any material regardless of its ability to meet federal criteria.

As an example of this, EPA Region II prepared a Final Environmental Impact Statement for the New York Harbor Collection and Removal of Drift Project regarding wood burning at-sea. The project removes wood debris within the harbor and provides great economic benefit and safety of navigation to commercial and private vessels. The Environmental Impact Statement was an outgrowth of public pressure

describing wood burning at-sea as a barbaric and dangerous process. For instance, there were accusations that some children playing in the water on the New Jersey Shore were struck with timbers that fell off a burn barge. This incident was later determined to be caused by wood debris that came from an adjacent pier that was damaged in a very severe fire. However, the Final Environmental Impact Statement found at-sea wood burning to be an acceptable practice, but recommended a phased out period of two years. Nevertheless, EPA Region II, then placed such onerous restrictions on the wood burning operation that it was no longer feasible. As a result of EPA's action, the costs for disposal of wood for this project have increased a minimum of two times and is probably more. This project is federally funded and cost-shared by local governments. In this case, EPA's action has caused a greater expenditure of public funds with little or no environmental benefit. During the time the Environmental Impact Statement was being prepared, material similar to what was generated by this project was allowed to be open and burned on land in the southeastern states.

Ultimately, the Port Authority would like to be confident that there is consistency in the application of federal rules and standards in our region relative to others. It also is our hope that in the future good science and the common good will be the basis for decision-making and not ill-founded public perception.

14. You comment that the permitting process is costing more than the cost of the dredging itself. To date, how much have you spent trying to obtain your pending permit, and how does this compare to the last permit obtained by the Port Authority? In real terms, how do the additional cost effect the Port and its ability to operate?

We estimate that we will have spent approximately a million and a half dollars, or possibly more, for testing and monitoring to obtain the Port Newark and Elizabeth Marine Terminal maintenance dredging permit. We believe the cost for the previous permit for the Port Newark and Elizabeth complex was around $100,000. This does not include staff time and other in-house costs.

In real terms, the high cost of testing for the Port of New York and New Jersey is tragic. The additional costs are making it prohibitive to operate in this region. Small terminal operators cannot afford such high costs. When the cost of a three-year permit exceeds the cost of construction for maintenance dredging, which for most terminal operators is only once within the three-year life cycle of the permit, then it should be obvious that there is no alternative to ocean disposal.

Some private terminal operators are finding the cost of obtaining a dredging permit in our harbor to be much too high. When the terminal operator passes on this cost, the operation becomes less competitive and may suffer losses or may even go out of business. In either case, the region suffers. This is a lose/lose situation for the New York and New Jersey region.

RESPONSES BY EPA'S OFFICE OF WATER AND

OFFICE OF RESEARCH AND DEVELOPMENT

TO ADDITIONAL QUESTIONS BY

SUBCOMMITTEE

QUESTION:

a. How big is the problem of the disposal of contaminated sediments?

b. Is the volume of contaminated sediment increasing?

ANSWER:

a. Waterways adjacent to urban, industrialized areas are most likely to contain contaminated sediment., Dredging in such areas is often a necessity to maintain and improve access for naval, commercial and recreational vessels. Contamination of these sediments most likely occurred before current pollution control measures were implemented, though, continued contamination of these sediments may be occurring from nonpoint sources (e.g., urban and agricultural runoff). For dredgers of such sediments, disposal can be a big problem. Even approximate estimates of the volume of such sediments is difficult to make. While from a national perspective a large amount of dredging is done in areas far removed from sources of contamination and disposal is not a problem, disposal of the relatively smaller volume of contaminated sediment presents a considerable challenge.

   Several problems can be associated with the disposal of contaminated sediment. Dredging contaminated sediment can result in resuspension of contaminated material, which may then become more available to aquatic organisms. Disposal of the contaminated dredged material requires locating a secure site, either on or off shore, where large amounts of aqueous material can be safely transported and contained. Specialized dredging techniques and disposal sites are sometimes required to handle the contaminated sediment. Confined disposal facilities are expensive to construct and are often not a feasible alternative. In addition, the contaminated material must often be dewatered or otherwise treated before disposal can occur. Sediment decontamination technologies have been demonstrated on a pilot scale, but are costly for use on a large scale. Capping contaminated dredged material with clean sediment in the aquatic environment is not effective at all depths and in all environments.

b. No data are available to monitor, on a national scale, changes or trends in the volume of contaminated sediment present in U.S. waters. EPA and State pollution abatement and control programs have reduced the volume of toxic chemicals entering our nation's surface waters. However, toxics continue to be discharged and accumulated in aquatic sediments. At many sites, particularly those subject to nonpoint source contamination and contaminated air deposition, the volume of contaminated sediment present could be increasing.

The past discharge of pollutants that persist for long periods of time in sediment is responsible for some of today's sediment quality problems. However, sediment contamination is not solely the legacy of past discharge of pollutants. Because of the lack of sediment chemical criteria and appropriate sediment bioassay methods, current procedures for writing water quality based point source discharge permits may not fully account for sediment contamination. EPA studies have documented cases of sediment contamination caused by ongoing stormwater discharges, combined sewer overflows, and discharges from metal finishing industries, pulp and paper mills, and oil storage terminals. Nonpoint sources of contaminants, including runoff from urban areas and agricultural fields and atmospherically deposited pollutants, aggravate sediment contamination concerns.

QUESTION:

a. What is the status of the EPA's new sediment criteria?

b. How will the criteria be used in EPA's regulatory regime for the disposal of contaminated sediments?

c. What do the economic analyses you are conducting indicate regarding the potential economic impact of using the new criteria for regulating dredged material disposal?

ANSWER:

a. Consistent with the recommendation of the November 1992 Science Advisory Board (SAB) review, EPA is moving forward with Sediment Quality Criteria (SQC) based on the Equilibrium Partitioning Approach (EQ-P) for five non-ionic organic chemicals: Endrin, Dieldrin, Acenapthene, Fluoranthene, and Phenanthrene. A Sediment Quality Criteria number for dioxin is not currently available. EPA is currently revaluating the Water Quality Criteria database for dioxin.

The proposed criteria, technical basis, and site specific modification documents completed Red Border Review on March 22, 1993. It is expected that the package will be noticed in the Federal Register for public comment this summer. Final revisions and publication of the criteria package is anticipated in fiscal year 1994. EPA expects to publish, on average, three additional criteria for non-ionic organic pollutants each year.

EPA is also proceeding with the development of a methodology for deriving SQC for divalent metals. The proposed methodology and first five criteria will be presented to the SAB in the first quarter of fiscal year 1994. Publication of five proposed SQC for divalent metals (Nickel, Copper, Lead, Cadmium, Zinc) is expected in approximately two years.

Field validation, verification, and uncertainty analyses for both criteria types are ongoing. EPA is also developing a "users guide" for the derivation and interpretation of the SQC.

b. As described above, the sediment quality criteria are not yet finalized, nor has their use for managing the disposal of contaminated sediment been fully established. However, while these criteria are being finalized, EPA will seek comment on their use in the ocean dumping program during the public

review of proposed revisions to the ocean dumping regulation, which we anticipate will occur in the fall of 1993.

c. EPA is currently completing a comprehensive study of available Corps of Engineers data on contaminants in dredged material. This study, to be completed by the end of July, 1993, will provide additional information on the regulatory impact of the criteria. Preliminary data indicate that less than one percent of the material could be expected to exceed criteria for the first five non-ionic organic contaminants.

QUESTION:

a. In your testimony, you stated that the Science Advisory Board is periodically updating its criteria to keep pace with advancing science. Does this mean that sediment formerly deemed "clean" is now designated as contaminated as our ability to detect contaminants grows?

b. Does EPA feel that the ability to manage or treat contaminated sediment has kept up with contaminant detection technology?

ANSWER:

a. The Administrator of EPA has established a Science Advisory Board (SAB), made up of individuals from the public and private sectors, to independently review scientific results which may form the basis of Agency policy. The SAB does not itself develop agency policy or procedures, such as the sediment quality criteria. The testimony referred to the Agency's process for developing sediment quality criteria, which has included, and will continue to include, review by the SAB.

Notwithstanding the above clarification of the role of the SAB, EPA will periodically review and update, as appropriate, the sediment quality criteria to keep pace with advancing science. This is consistent with our process for use of water quality criteria and biological-effects tests in the ocean dumping program. The result of such reviews may be that some sediments will be found to be contaminated which were previously thought to be clean; or, sediments once thought contaminated deemed clean. It is important to note that these consequences are not due merely to our improved ability to detect the presence of contaminants but also result from our improved ability to detect and understand the effects of contaminants.

b. Improved analytical chemical methods have significantly lowered the detection limits of many toxics present in sediment. This has allowed EPA and other regulatory agencies to detect the presence of many sediment contaminants at levels below human health or ecological effects thresholds. However, for some extremely potent sediment contaminants such as dioxin, effects may occur near or sometimes even below the limits of detection. Since the reliability of chemical measurement generally decreases near the limits of detection, it is often difficult to regulate contaminants measured at levels near the detection limit. This situation is further complicated because the application of new treatment technologies like bioremediation to dioxin contaminated sediments will require much more highly engineered systems

than have been demonstrated on other contaminants, and the costs of constructing and operating such systems are likely to be higher.

For many contaminants, however, the most difficult problems are encountered in determining contaminant effects thresholds. A range of methods have been developed for estimating the human health and ecological risks associated with varying levels of sediment contamination. However, more research must be completed to develop reliable methodologies for determination of ecological and human health effects thresholds.

QUESTION:

Does the federal government have adequate resources to implement its ocean dumping responsibilities as they relate to the disposal of dredged material?

ANSWER:

Proper management of dredged material disposal in the ocean is important for the protection of the environment and the continued viability of the ocean as a disposal alternative. The present focus of ocean disposal management is on site designation and dredged material evaluation. The Water Resources Development Act of 1992 amendments to the Marine Protection, Research and Sanctuaries Act established site management and monitoring as priorities. All of these elements are essential to proper ocean disposal management.

The ocean disposal of dredged material is regulated at the national level principally by the EPA and the US Army Corps of Engineers. As stated above, EPA has focused its resources on designating suitable sites and development of state-of-the-art dredged material evaluation procedures, with limited resources devoted to comprehensive site management reserved for high priority areas (e.g., ecologically sensitive areas, dredged material from urban, industrialized harbors). To realize the benefits of comprehensive ocean disposal management, as envisioned under WRDA '92, would require EPA to reprogram additional resources. However, ultimate Federal investment should be made with full consideration of other demands and the relative risk reduction achieved.

QUESTION:

Should additional Federal resources be spent in the development of alternatives to existing contaminated sediment disposal methods?

ANSWER:

Cost effective alternatives to existing contaminated sediment disposal methods must be developed if we are to reduce the risk of exposure to sediment contaminants. EPA presently has not budgeted resources for this problem and EPA would be required to redirect funds to accomplish this task. Title V of the Water Resources Development Act of 1992 requires EPA and the Corps of Engineers to convene a Task Force to make recommendations regarding actions needed to reduce the risk of exposure to sediment contaminants. The Task Force, consisting of representatives from a range of Federal agencies, the states, environmental groups, and the regulated community, will evaluate the costs and benefits associated with developing alternative disposal methods and make recommendations concerning the expenditure of Federal resources. Ultimate Federal investment decisions should be made with full consideration of other demands and the relative risk reductions achieved.

QUESTION:

a. There are a number of parties that have expressed concern over the lack of public comment and input provided by the existing permit process. Explain the various steps in the process that EPA provides for public input.

b. Does EPA feel that there are ways that the process could be improved in this regard?

ANSWER:

a. The Marine Protection, Research and Sanctuaries Act provides for EPA to promulgate criteria to be used in evaluating the effects of proposed dumping (MPRSA §102(a)) as well as designating times and locations where permitted ocean dumping may occur (MPRSA §102(c)) . The MPRSA assigns EPA responsibility for issuing permits for all materials to be ocean dumped, except dredged material. Under the Act, the US Army Corps of Engineers is assigned the responsibility for issuing dredged material ocean dumping permits, subject to EPA review for compliance with the ocean dumping criteria.

With regard to designation of ocean disposal sites, EPA has adopted a voluntary policy to prepare an environmental impact statement with the concomitant opportunity for public comment. In addition, sites are formally designated by promulgation of a rule in 40 CFR 228.13 and the public is afforded an opportunity to comment at this time under the normal rule-making process. Furthermore, in accordance with the Water Resources Development Act of 1992 (WRDA '92), the public will have the opportunity to review and comment on the development of site management plans.

With regard to permitting, for non-dredged material EPA is the permitting authority. For such EPA-issued permits, EPA makes available to the public a notice of the proposed dumping, a copy of the draft permit, and provides an opportunity to request a public hearing (See 40 CFR 222).

In the case of dredged material permitting, the Corps of Engineers is the permit issuing authority. The Corps has established public comment procedures as described in the Corps permitting regulations at 33 CFR 325 and in the Corps' operation and maintenance regulations at 33 CFR 337. These regulations provide for public notice, review and comment and the opportunity to request a public hearing. EPA's role in issuing dredged material permits is one of review and concurrence; under the statute, EPA has 45 days to reach a decision.

b. EPA believes that the public review and comment process is sufficient for EPA-issued permits and designation of ocean dumping sites. The adequacy of the public review and comment provisions for dredged material authorizations, would be better addressed by the Corps of Engineers as the responsible Agency.

QUESTION:

Are sediments for ocean dumping required to meet a higher standard than land-based counterparts? Are the testing and standards for land-based disposal comparable to that required for ocean disposal?

ANSWER:

Sediments proposed for ocean dumping are not required to meet a higher standard than land-based counterparts. Sediments proposed for ocean disposal are evaluated to determine potential effects on the ocean environment. This evaluation takes into account the unique characteristics of proposed dredged material and disposal site, and the pathways through which impacts could occur to human health and the environment. Experience with managing dredged material disposal both on land and in the ocean has shown that the relationship between the characteristics of the dredged material and the pathways for impacts at the disposal site is very different between the two types of disposal alternatives. While the standards applied to each type of alternative may be different to protect against different types of impacts, the guiding principle of preventing unacceptable adverse impacts is the same.

QUESTION:

What problems has EPA had in developing the contaminated sediment survey provided for by Title V of the Water Resources Development Act of 1992? How can these problems be overcome and when do you expect to get this survey to Congress?

ANSWER:

The Agency has already begun work on the WRDA Title V Contaminated Sediment survey, which we are calling the National Sediment Inventory. This inventory will be a compilation of available chemical, physical, and biological data describing sites of potential and probable sediment contamination. To develop this inventory, we are initially compiling information contained in the national data bases such as EPA's STORET and Ocean Data Evaluation Systems, and data in other systems developed by NOAA, the U.S. Geological Survey, the U.S. Fish and Wildlife Service, and the EPA Regional offices. An EPA report, "Framework for the Development of the National Sediment Inventory", describes the design of the National Sediment Inventory, and how the inventory will be used by Agency Program offices.

In fiscal year 1993, we will gather all of the available sediment data from the national data bases. In fiscal year 1994, a report to Congress on the inventory will be prepared and submitted. Also in fiscal year 1994, the inventory will be reviewed by all of the EPA Regional offices, and additional data will be added. Following fiscal year 1994, EPA will continue to maintain and update the National Sediment Inventory on a regular basis, and to report to Congress on a biannual schedule.

Funds would be required to be redirected at EPA to support development of the inventory. It will be very difficult to gather and analyze all of the available data that have been collected and archived by Federal agency field and regional offices, State and local agencies, universities, and other organizations. Problems encountered in compiling and analyzing the available data include: lack of existing data from many geographic areas, inconsistencies in the quality of data, lack of documentation concerning data quality, lack of information from many sites concerning the biological availability of contaminants (such as total organic carbon measurements), lack of biological effects data from many sites, inconsistent data formats, and difficulties associated with reviewing and analyzing data that are not stored in computer readable format. Given the limited resources available for compilation of the inventory, EPA will initially gather only those available

data that are currently electronically readable, and document known problems associated with the data.

QUESTION:

When do you expect to convene the National Contaminated Sediments Task Force?

ANSWER:

We would like to convene the Task Force next fall, shortly after the beginning of the new fiscal year. We plan to work with the Corps of Engineers during the remainder of this fiscal year to develop a list of individuals who will serve on the Task Force, and to prepare an agenda of issues that the Task Force may wish to address.

EPA has already organized and held a number of public forums and workshops addressing various aspects of EPA's Contaminated Sediment Management Strategy, and most of the groups to be represented on the Task Force have participated. We must now work with the Corps to extend formal task force membership invitations to the appropriate groups. Unless funds are redirected, it is unlikely that the Task Force report will be completed by October 31, 1994.

QUESTION:

a. How often are contaminated dredged material disposal sites monitored?

b. What is examined as part of the monitoring process?

ANSWER:

a. Monitoring to evaluate impacts in the marine environment is resource intensive and time-consuming. The frequency of monitoring at any ocean disposal site is based on a number of site specific factors, of which contamination is one. Other factors include, but are not limited to, the frequency, volume, and characteristics of disposed material, the sensitivity of the environment around the disposal site, and the availability of resources. For example, monitoring may be important at a site, even if the material is not contaminated, if the movement of the material could cause physical impacts to near-by sensitive resources. For the period from 1987 to 1990, EPA conducted surveys at 27 of the 110 ocean dump sites. This figure does not include monitoring which has been conducted by the Army Corps of Engineers.

b. Monitoring information is used to verify that permit conditions are met and to determine if the conditions set by the permit are sufficient to prevent adverse impacts. Monitoring disposal sites used by multiple dumpers is especially important in determining whether the cumulative impacts are acceptable. 40 CFR 228 contains considerable detail as to what may be required in a monitoring program.

In general, the primary purpose of monitoring is to evaluate the impact of disposal on the marine environment by referencing the monitoring results to a set of baseline conditions. The most common measurements collected during monitoring programs include water depths, water quality, distribution of disposed material in the water column and on the bottom, long-term resuspension and movement of deposited material from the disposal site, and movement of contaminants from the deposited material to aquatic organisms. Project specific monitoring programs are tailored to the predicted pathways and impacts of the dumping, based on the type of material and characteristics of the disposal site.

QUESTION:

a. How far are we from employing ARCS technologies on a meaningful basis?

b. How much of the existing contaminated dredged material can be rendered "clean" by ARCS technologies? At what cost?

ANSWER:

a. The technologies demonstrated at the pilot scale by the ARCS Program are all well developed and are at a point where scale up is possible. Thermal desorption units have already been used to remediate a PCB-contaminated sediment Superfund site in Waukegan Harbor, Illinois. The sediment washing process, successfully demonstrated on low level (2ppm) PCB contaminated sediments in the Saginaw River and Bay, has been used on a full scale basis in several European sediment remediation projects, and on several upland contaminated soil projects in the U.S. Application of decontamination technologies, even when technically feasible, is most appropriate where the economics of the situation justify the subsequent reduction in the risk posed by the sediment contaminants. We are not yet at a point where an inexpensive panacea technology has been developed for application to all contaminated sediments.

b. The effectiveness of decontamination technologies varies depending upon the particular contaminants and kind of sediment being treated. Thermal desorption can remove up to 99 percent of the volatile organic compounds and semivolatile organic compounds from contaminated sediment at a cost of $100-$450 per cubic yard. Solvent extraction has removed up to 90% of PCBs in harbor sediments at a cost of $200-$600 per cubic yard. Sediment washing can remove 90-99 percent of the volatile contaminants and 40-90 percent of the semivolatile contaminants at a cost of approximately $50 per cubic yard. Dechlorination has resulted in removal of more than 98 percent of PCBs in contaminated sediment at a cost of $200-$500 per cubic yard. The effectiveness of biological treatment varies depending upon characteristics of the sediment. Costs of $50-$80 per cubic yard have been documented for biological treatment. It is important to note that for sediments contaminated with much lower levels of contaminants, as is the case with most dredged material, the analysis of treatment technology efficiencies, and the overall effectiveness of these technologies, is difficult to assess.

QUESTION:

Regarding the Port Elizabeth/Port Newark permit, what standards were used to measure dioxin contamination? How were these standards decided upon?

ANSWER:

EPA chose 10 parts per trillion (pptr) of dioxin in the tissue of marine worms as the standard for allowing the dredged material to be ocean dumped. This is a level established by the New York State Department of Health.

EPA Region II considered risk pathways and possible risk levels associated with the disposal activities and the ocean environment at the disposal site. EPA's interim dioxin ecologic risk assessment report was also considered. For the pathways of risk associated with the disposal activity, 10 pptr bioaccumulation in organism tissue appears to provide an adequate level of safety.

QUESTION:

It is my understanding that new tests on the sediment show dioxin levels below 10 parts per trillion standard EPA imposed. If the sediment exceeds the threshold level, what options would remain for the Port to dredge its facilities?

ANSWER:

The acceptability of dredged material for ocean disposal is based, in part, on the potential of the material to cause accumulation of contaminants in marine organisms. This determination is made based on conducting biological tests. EPA's Region II set a limit on bioaccumulation of dioxin in marine organism of 10 part per trillion. This limit does not directly relate to contaminant concentration in sediment.

There are currently no approved disposal or treatment sites for dredged material available to the Port Authority in the NY/NJ area. There are a number of alternatives that have been discussed (e.g., containment islands, borrow pit confinement, treatment), but all such alternatives will take substantial time to develop and implement.

EPA and the Corps have entered into a consensus-building process with over 80 representatives of other agencies, elected officials, and interest groups to find alternatives to ocean dumping and other ways of managing dredged sediments from the harbor. EPA and the Corps will be the lead in this process, which includes seven working groups to deal with harbor dredging problems, and ways of managing dredged materials.

QUESTION:

The Mud Dump site has been used as a repository for clean and contaminated dredged material since 1914. Is the dredged material proposed for disposal from Newark Bay any more contaminated or environmentally harmful than what has been disposed of at the site in the past?

ANSWER:

The Mud Dump Site has been used as a repository for dredged material since 1914. Until the enactment of the Marine Protection, Research and Sanctuaries Act in 1972, there was very little environmental oversight of material disposed. After establishment of MPRSA and the Ocean Dumping Regulations, proposed material has been tested in accordance with the procedures in place at the time. EPA Region II has requested dioxin testing in certain areas since the mid 1980's. The detection level for dioxin was 1 part per billion (ppb) for the Newark Bay Deepening project, which was begun in 1987, as well as other previous projects disposed. Since then, our technical ability to measure dioxin has improved to allow detection limits in the part per trillion range. EPA believes that some of the material deposited in the past contained dioxin at levels below the 1 ppb detection level but above the current detection level of 1 part per trillion.

QUESTION:

Besides conducting biological tests on marine organisms to evaluate the toxicity of the material, what other test do you conduct? Overall, how effective is the biological testing?

ANSWER:

A range of physical, chemical and biological tests may be performed as part of a dredged material evaluation, as follows:

Physical tests, such as grain size, total organic carbon, settling rates, may be conducted to evaluate the possibility for physical effects at the disposal site. This information is also useful for determining the potential for transport of material away from the disposal site during disposal or resuspension and transport after deposition. Physical test results are also important in the interpretation of chemical and biological results.

Chemical tests are used to develop a list of contaminants of concern for the project. Bulk sediment chemistry can be used in a screening mode to predict release of contaminants to the water column (assumes all contaminant is release to water column during disposal) or uptake by marine organisms (using equilibrium partitioning theory). An elutriate may be evaluated as a more realistic prediction for release of contaminants to the water column. Prediction of release to the water column is done to determine if the project will violate water quality criteria. At the present time, except for determining compliance with water quality criteria, bulk sediment chemistry data alone cannot be used for determining the suitability of a project for ocean dumping.

Biological tests have been used in the ocean dumping program for decision making since 1977. These tests are used to determine the potential for the whole sediment to cause toxic impacts in the water column and on the seafloor, and the potential for individual contaminants to move from the sediment to living organisms. In biological tests, animals are exposed to the whole sediment (or an elutriate of the sediment in the case of water column bioassays) and observed to determine if the sediment has an effect on them. Biological tests have the advantage of integrating the effects of all contaminants, without having to conduct individual chemical analyses; this minimizes the risk of overlooking a particular chemical and addresses chemicals for which sediment criteria have not been developed. Monitoring results have demonstrated that biological tests are predictive of effects at the disposal site.

QUESTION:

It is my understanding that EPA is developing ocean disposal criteria for dioxin? What is its status?

ANSWER:

EPA and Corps of Engineers have established a task group to develop policy and technical guidance for use by field offices in making permit decisions. This effort is not to develop a criterion for dioxin, but rather to provide guidance to field offices on conducting dioxin evaluations and interpreting the risk associated with dioxin-containing dredged material disposal projects. This task group, which first met on April 28 and 29, 1993, is comprised of both agencies' headquarters, research and field office personnel. The task group is planning to develop early operational guidance by August 1993. Concurrently, issues which are not readily resolvable will be worked on, with the assistance of senior agency management, through the late summer and early fall of 1993.

QUESTION:

a. Once a site is designated for ocean disposal of dredged material, at what point is a monitoring plan developed?

b. Does the public comment on the monitoring plan?

c. How often is a site monitored?

d. In most cases, what does monitoring entail?

e. How effective would you say your monitoring efforts are?

ANSWER:

a. Prior to enactment of the Water Resources Development Act of 1992 amendments to the Marine Protection, Research and Sanctuaries Act regarding development of site management plans, monitoring plans were either developed as part of a site management plan or were developed separately for individual projects either before or after the site designation. With implementation of WRDA's new requirements, site monitoring plans will be developed as part of the site management plan required for all sites. As a practical matter, the monitoring plan contained in the site management plan will describe, in a general way, the goals of the monitoring, necessary equipment, and when certain types of monitoring will be appropriate; detailed monitoring survey plans will likely be developed on a project-by-project basis, though consistent with the monitoring plan contained in the site management plan.

b. Title V of the Water Resources Development Act of 1992, which requires development of site management plans, provides for public review and comment of site management plans (which includes the site monitoring plan). Specific monitoring requirements for an individual project would be available for review as part of the normal project public-review process provided by the statute and regulations and as described in a previous answer.

c. Monitoring to evaluate impacts in the marine environment is resource intensive and time-consuming. The frequency of monitoring at any ocean disposal site is based on a number of site specific factors, of which contamination is one. Other factors include, but are not limited to, the frequency, volume, and characteristics of disposed material, the sensitivity of the environment around the disposal site, and the availability of

resources. For example, monitoring may be important at a site, even if the material is not contaminated, if the movement of the material could cause physical impacts to near-by sensitive resources. For the period from 1987 to 1990, EPA conducted surveys at 27 of the 110 ocean dump sites. This figure does not include monitoring which may have been conducted by the Army Corps of Engineers.

d. Monitoring information is used to verify that permit conditions are met and to determine if the conditions set by the permit are sufficient to prevent adverse impacts. Monitoring disposal sites used by multiple dumpers is especially important in determining whether the cumulative impacts are acceptable. 40 CFR 228 contains considerable detail as to what may be required in a monitoring program.

In general, the primary purpose of monitoring is to evaluate the impact of disposal on the marine environment by referencing the monitoring results to a set of baseline conditions. The most common measurements collected during monitoring programs include water depths, water quality, distribution of disposed material in the water column and on the bottom, long-term resuspension and movement of deposited material from the disposal site, and movement of contaminants from the deposited material to aquatic organisms. Project specific monitoring programs are tailored to the predicted pathways and impacts of the dumping, based on the type of material and characteristics of the disposal site.

e. Probably the most notable result of monitoring is detecting violations of permit conditions, which can lead to enforcement actions. A number of permit violations have been detected and adjudicated in the last few years based on project monitoring data. In addition, the results of environmental monitoring can and have been used to modify disposal operations or trigger more comprehensive monitoring. Monitoring has also been conducted to verify predictions made from biological testing about the potential effects of the disposal. Monitoring resources are used where the greatest concerns for adverse effects exist; expanding monitoring operations to more projects will require reordering our funding priorities.

QUESTION:

As you know, the Mud Dump site is slated for closure in the late 1990's, what efforts are underway to designate another site in the area for ocean disposal? What, if any, problems is EPA encountering?

ANSWER:

The Mud Dump Site has been used for acceptable material (material that meets the ocean dumping criteria). This site is nearing its capacity, and EPA has been working with the Corps to designate a new ocean site for acceptable material. A notice for re-scoping the EIS to cover the entire new Zone of Site Feasibility for a replacement is being prepared for issuance. A number of oceanographic studies have been conducted. A status report to Congress has been developed on progress toward designating a new site in accordance with WRDA '90 Section 412(a) and is in final agency review.

The current schedule for designation is:

- a draft EIS: January 1994
- a final EIS: January 1995
- a final designation: June 1995

QUESTION:

a. As you know, many have stated informally that the New York/New Jersey permit process will be a test case for other ports around the country. Does EPA feel that the NY/NJ case is an indication of potential permitting problems in the future?

b. How wide spread do you feel the problem of contaminated sediments is and what problems are associated with the disposal of these sediment?

c. What efforts can be undertaken to improve the permitting process so that ports like NY/NJ do not have to wait three years to obtain a permit?

ANSWER:

a. EPA does not believe that the Port Authority of New York and New Jersey permit will be a test case in terms of setting a national precedent. However, we do believe that many of the types of problems encountered are likely to recur. These problems include:

- The use of more sensitive tests for evaluating potential impacts of dumping raises concern over more subtle, chronic effects of dumping.

- Increasing focus on dredged material as other materials are prohibited from ocean dumping (i.e., sewage sludge and industrial waste).

- As many dredged material ocean dumping projects are located in coastal metropolitan areas and as the population continues to migrate towards these locations, the availability of alternatives (e.g., confined land disposal) will be reduced. This will likely create increased pressure for ocean disposal.

b. In surveys conducted in 1985 and 1987, EPA's Office of Water began to document the extent and severity of sediment contamination. The 1987 EPA report indicated that wherever urban-industrial concentrations exist, sediments in rivers, estuaries and harbors serving these areas could be expected to contain elevated concentrations of metals, organic chemicals, and other toxics. Similarly, rivers draining agricultural land use areas are likely to contain elevated levels of pesticides in sediment. In 1992, three EPA Regions initiated inventories of contaminated sediment sites. The inventory of the Gulf of Mexico coastline indicated that approximately 7 percent of the estuarine drainage systems contain very high concentrations of contaminants in sediments; 42 percent contain moderate levels of in-

place pollutants; and 90 percent contain some level of sediment contamination above naturally occurring background. Approximately 50 percent of the sites evaluated in the EPA Region V (Great Lakes Region) inventory of contaminated sediment sites have some degree of sediment contamination. EPA has begun work to compile a national inventory of contaminated sediment sites. The inventory will further document those sites where sediment is contaminated at levels posing ecological or human health risks. A direct relationship between these data and dredged material projects is difficult to make. Areas where dredging is conducted routinely may not be as contaminated as near-by areas which received contamination before current pollution control measures were implemented. Also, a large amount of dredging is done in areas far removed from sources of contamination.

Several problems can be associated with the disposal of contaminated sediment. Dredging contaminated sediment can result in resuspension of contaminated material, which may then become more available to aquatic organisms. Disposal of the contaminated dredged material requires locating a secure site, either on or off shore, where large amounts of aqueous material can be safely transported and contained. Specialized dredging techniques and disposal sites are sometimes required to handle the contaminated sediment. Confined disposal facilities are expensive to construct and are often not a feasible alternative. In addition, the contaminated material must often be dewatered or otherwise treated before disposal can occur. Sediment decontamination technologies have been demonstrated on a pilot scale, but are costly for use on a large scale. Capping contaminated dredged material with clean sediment in the aquatic environment is not effective at all depths and in all environments.

c. EPA continues to work closely with the Army Corps of Engineers to make the permitting process for dredged material disposal predictable and more efficient. The most notable effort was completion of the Ocean Dumping Testing manual. Since the national manual was completed in April 1991, EPA and Corps of Engineers' field offices have developed regional implementation manuals to clarify the process and refine the testing procedures for local conditions (e.g., appropriate bioassay organism for particular region). The development of regional implementation manuals has facilitated increased coordination between the EPA and Corps of Engineers field offices which will lead to more efficient dredged material evaluation and project review.

In regard to the management of dredged material containing dioxin, the EPA and Corps of Engineers have established a task group to develop policy and

technical guidance for use by field offices in evaluating permit applications. This task group, which first met on April 28 and 29, 1993, is comprised of both agencies' headquarters, research and field office personnel. The task group is planning to develop early operational guidance by August 1993. Concurrently, issues which are not readily resolvable will be worked on, with the assistance of senior agency management, through the late summer and early fall of 1993. Coordination with, and review and comment by, the interested public will be sought during this process.

QUESTION:

a. When would EPA veto an ocean dumping permit?

b. Is there a process that needs to be developed in order to avoid another NY/NJ permit denial problem? If so, what would you recommend.

ANSWER:

a. Under Section 103(c) of the MPRSA as amended by WRDA '92, EPA must make an independent evaluation and concur or non-concur within 45 days of receiving all necessary information as to compliance of a proposed dredged material ocean dumping project with the ocean dumping criteria. If EPA determines that a proposed project is not in compliance with the ocean dumping criteria and non-concurs on such determination by the Corps of Engineers, then the permit can not be issued without a waiver of the criteria by the Administrator of EPA. The Secretary of Army may request a waiver of the criteria after certifying that there are no economically feasibly alternatives to ocean dumping. A waiver shall be issued within 30 days "unless the Administrator finds that the dumping of the material will result in an unacceptably adverse impact on municipal water supplies, shellfish beds, wildlife, fisheries (including spawning and breeding areas), or recreational areas" (see MPRSA §103(d)).

b. The NY/NJ permit was issued and subsequently suspended when the volume of material needing to be dredged had substantially increased since the time the proposed dredged material had been tested. Additional testing was requested by EPA to determine whether the additional material which had accumulated in the channel was also suitable for ocean dumping. The additional testing was conducted and EPA determined that it was suitable for ocean dumping. However, for other reasons, the Corps of Engineers did not lift the permit suspension after EPA withdrew its objection.

As described in the previous answer, EPA continues to work closely with the Corps of Engineers to ensure that the permit process is predictable, delays in permit decision-making are reduced, and the environment is adequately protected.

QUESTION:

As you know, Title V of the Water Resources Development Act of 1992 established a National Contaminated Sediment Task Force to review, discuss and report on the nature and extent of sediment contamination. It also required the task [sic] to develop contaminated sediment remediation measures, select and promulgate criteria for pollutants contained in sediment, address prevention of contaminated sediments and control of sources of contamination. At this time, has the Task Force met? If not, when do you expect to meet? Will the Task Force be able to produce a report and make recommendations on the contaminated sediments by October 31, 1994?

ANSWER:

We would like to convene the Task Force next fall, shortly after the beginning of the new fiscal year. We plan to work with the Corps of Engineers during the remainder of this fiscal year to develop a list of individuals who will serve on the Task Force, and to prepare an agenda of issues that the Task Force may wish to address.

EPA has already organized and held a number of public forums and workshops addressing various aspects of EPA's Contaminated Sediment Management Strategy, and most of the groups to be represented on the Task Force have participated. We must now work with the Corps to extend formal task force membership invitations to the appropriate groups. Unless EPA redirects funds, it is unlikely that the Task Force report will be completed by October 31, 1994.

69-996 O - 93 - 10

QUESTION:

a. Also, the Water Resources Development Act required EPA to conduct a national survey of the quality of aquatic sediments. What is the status of this?

b. Will this information be used in your site designation process as well as in the development of management plans for disposal sites?

ANSWER:

a. The Agency has already begun work on the WRDA Title V Contaminated Sediment survey, which we are calling the National Sediment Inventory. This inventory will be a compilation of available chemical, physical, and biological data describing sites of potential and probable sediment contamination. To develop this inventory, we are initially compiling information contained in the national data bases such as EPA's STORET and Ocean Data Evaluation Systems, and data in other systems developed by NOAA, the U.S. Geological Survey, the U.S. Fish and Wildlife Service, and the EPA Regional offices. An EPA report, "Framework for the Development of the National Sediment Inventory", describes the design of the National Sediment Inventory, and how the inventory will be used by Agency Program offices.

In fiscal year 1993, we will gather all of the available sediment data from the national data bases. In fiscal year 1994, a report to Congress on the inventory will be prepared and submitted. Also in fiscal year 1994, the inventory will be reviewed by all of the EPA Regional offices, and additional data will be added. Following fiscal year 1994, EPA will continue to maintain and update the National Sediment Inventory on a regular basis, and to report to Congress on a biannual schedule.

Funds would be required to be redirected at EPA to support development of the inventory. It will be very difficult to gather and analyze all of the available data that have been collected and archived by Federal agency field and regional offices, State and local agencies, universities, and other organizations. Problems encountered in compiling and analyzing the available data include: lack of existing data from many geographic areas, inconsistencies in the quality of data, lack of documentation concerning data quality, lack of information from many sites concerning the biological availability of contaminants (such as total organic carbon measurements), lack of biological effects data from many sites, inconsistent data formats, and difficulties associated with reviewing and analyzing data that are not

stored in computer readable format. Given the limited resources available for compilation of the inventory, EPA will initially gather only those available data that are currently electronically readable, and document known problems associated with the data.

b. Yes. The information gained by conducting the national survey of aquatic sediment quality will be useful in many aspects of the dredged material management program. In general, the information will be used as part of the evaluation of existing information to help direct site specific evaluations during site designation, project evaluation and monitoring.

QUESTION:

Do you think that these provisions included in Title V of the Water Resources Development Act will improve the permitting process; especially when there is a presence of contaminated sediments?

ANSWER:

EPA believes the provision in Title V for developing a site management plan may actually help make the ocean dumping permitting process more predicable, both for the applicant and the reviewing public. Site management plans will describe how the site may be used, what type of material may be dumped there, what type of management actions may be suitable for use, what resources are potentially at risk, and what monitoring will be required. Site management plans will be developed with input from the public and will be updated based on operational experience and monitoring results. In addition, Title V's clarification of EPA's review role may be helpful in effecting early consultation on projects which should result in fewer last-minute delays.

QUESTION:

Do you feel that the federal government have adequate resources to implement its ocean dumping responsibilities as they relate to the disposal of dredged material?

ANSWER:

Proper management of dredged material disposal in the ocean is important for the protection of the environment and the continued viability of the ocean as a disposal alternative. The focus of ocean disposal management has been on site designation and dredged material evaluation. The Water Resources Development Act of 1992 amendments to the Marine Protection, Research and Sanctuaries Act established site management and monitoring as priorities. All of these elements are essential to proper ocean disposal management.

The ocean disposal of dredged material is regulated at the national level principally by the EPA and the US Army Corps of Engineers. As stated above, EPA has focused its resources on designating suitable sites and state-of-the-art dredged material evaluation procedures, with limited resource devoted to comprehensive site management reserved for high priority (e.g., ecologically sensitive areas, chemically-challenged dredged material). To realize the benefits of comprehensive ocean disposal management, as envisioned under WRDA '92, would require EPA to reprogram additional resources. However, ultimate Federal investment should be made with full consideration of other demands and the relative risk reduction achieved.

QUESTION:

a. Is EPA developing a long-term strategy plan for the ocean disposal of both clean and contaminated sediment? If so, what are some of the major components of such a plan?

b. For contaminated sediments, is EPA developing a management and enforcement disposal strategy for these sediments? Will this criteria be applicable to all waters of the U.S.?

ANSWER:

a. EPA and the Corps of Engineers have provided policy direction and guidance to assist our field offices in developing long-term management plans for their specific dredging projects. A number of regions, most notably San Francisco Bay, are currently developing such site-specific plans. The goal of such plans is to predict the dredged material disposal needs (e.g., volumes, material characteristics, scheduling) and to assure appropriate disposal alternatives are available.

In November 1992, the EPA and Corps released guidance entitled "Evaluating the Environmental Effects of Dredged Material Management Alternatives - A Technical Framework," referred to as the Framework Document. The Framework Document provides a consistent approach for conducting suitability analyses of disposal alternatives under the Marine Protection, Research and Sanctuaries Act, the Clean Water Act, and the National Environmental Policy Act. This document addresses the evaluation of effects of confined land disposal, confined aquatic disposal, unconfined aquatic disposal, and beneficial uses, for both clean and contaminated sediment. This document will be very useful to our field offices in developing long-term management plans.

b. EPA is developing a Contaminated Sediment Management Strategy which is expected to be produced in final form this fiscal year. The strategy describes EPA's understanding of the extent and severity of sediment contamination, including uncertainties about the dimension of the problem, and provides a cross program policy framework for reduction of ecological and human health risks posed by sediment contamination. The strategy describes specific actions that EPA will take under all existing authorities to manage and dispose of contaminated sediment, and to generally reduce risks posed by contaminated sediment in all waters of the U.S. The strategy also describes various uses of chemical specific sediment quality criteria by all of the Agency's program offices. The proposed sediment quality criteria will be

used in different ways by each program office to implement a range of regulatory programs. However, sediment quality criteria will apply to all waters of the U.S.

QUESTION:

a. In your testimony you outlined the various activities of the Agency's Assessment and Remediation of Contaminated Sediments (ARCS) program. Are the efforts of the ARCS program applicable to the problems associated to Newark Bay?

b. Are there any currently any pilot projects underway to examine decontamination technologies in marine environments similar to Newark Bay? If so, could you describe them in detail?

ANSWER:

a. The results of the ARCS program are a good starting point for developing solutions to contaminated sediment problems in Newark Bay. However, these technologies have to be developed and demonstrated to remediate marine (salt water) sediments. In addition, it is important to note that the levels of dioxin that cause concern in Newark Harbor are several orders of magnitude below those of PCBs and other contaminants addressed under the ARCS program, and such low levels make the analysis of treatment technology efficiencies, and the overall effectiveness of these technologies, difficult to accomplish.

b. The New Bedford Harbor Superfund project included remediation of contaminated sediments by several different methods. There are other reports available that describe remediation methods and their results, which are being reviewed by EPA's Region II for their potential in remediating Newark Bay sediments.

Although at laboratory-scale and not at pilot-scale, the U.S. Army Corps of Engineers is investigating, under WRDA '90, Section 412(c), four technologies for decontaminating sediments from the NY/NJ Harbor region. The treatments being tested are: incineration; thermal reduction ("Ecological Process"); base-catalyzed decomposition; and, chemical solvent extraction ("BEST Process").

QUESTION:

What are some of the greatest challenges that exist in the development of alternative disposal methods for contaminated sediments? What are some of the costs associated with this program?

ANSWER:

No method can be used to contain or treat contaminated sediment without some disturbance and consequent release of contaminants, and a number of challenges exist in the development of each alternative disposal method. Development of alternative disposal methods will require research and testing to address these challenges and problems. The use of confined disposal facilities designed to retain dredged material is limited by problems in acquiring land and permits, expenses in transporting dredged material, the potential for contaminant migration into groundwater and surface runoff of contaminated water, and plant and animal uptake of contaminants. Subaqueous capping methods can be used only at sites where such factors as current, water depth, and bottom material will not affect the placement accuracy of the sediment as well as the integrity of the mound. Furthermore, the success of capping operations is dependent upon the development and availability of dredging equipment that can deposit material on the bottom without resuspension. In addition, monitoring programs must be undertaken to ensure that the integrity of the cap has not been compromised by water body and other effects.

Treatment options such as biodegradation, dechlorination methods, soil washing, solvent extraction, solidification/stabilization treatment, incineration, and thermal desorption are effective only on certain kinds of contaminants, and are costly to implement on a large scale. The effectiveness of each treatment method is also limited by the availability of technology. While some treatments actually decontaminate the sediment through chemical transformation, other treatments merely reduce the volume of contaminated material which must be disposed of safely. Disposal costs for reduced volumes of contaminated material, while lower, can still be significant. Biological treatment can decontaminate a range of organic contaminants but does not eliminate metals. Many factors, such as lack of nutrients and temperature, also impede the degradation process. The cost of excavating and constructing lined treatment beds required for biological treatment can be quite high. Typical costs for biological treatment range from $50-$80 per cubic yard of contaminated material. Processes associated with dechlorination include: achieving adequate screening to remove oversize debris, particle size separation, dewatering, and pH

adjustment. Dechlorination costs run from $200-$500 per cubic yard. Soil washing is not very effective on fine sediment particles which tend to bind contaminants. Costs associated with this technology include sediment removal and transport, sediment screening, disposal of treated sediment, and treatment of wastewater. Typical soil washing costs are approximately $50 per cubic yard. Solvent extraction is not effective for inorganic contaminants, and requires many of the same pretreatment steps listed for dechlorination. Costs of this technology range from $200-$600 per cubic yard. Use of solidification/stabilization methods is limited by problems associated with reagent placement, erosion, and long term monitoring requirements. Little is known about the costs of large scale solidification/stabilization treatment or its toxic byproducts. Incineration costs include air pollution. Another problem associated with incineration is that some contaminants can pass through the process or become more mobile in the ash than they were in the original sediment. Other costs associated with incineration include removal and transport of the contaminated material, sediment preparation (which can include dewatering and particle size separation), and landfill of treated solids. Costs are variable, but can range from $250-$350 per cubic yard. Thermal desorption can be used to remove volatile organic compounds from contaminated sediment at a cost of between $100-$450 per cubic yard. This process also requires removal and transport of contaminated sediment, and a series of preparation steps in which large debris is screened and particle size separation is effected. All of these processes must be refined to make them cost effective on a large scale.

QUESTION:

a. Finally, there has been considerable discussion on the overall effect of improved technology on our ability to detect specific levels of toxics in dredged material. Does EPA think that there is a need to develop a process that will determine an acceptable level of toxics in dredged material?

b. Are sediments for ocean dumping required to meet a higher standard than land-based counterparts? Are the testing and standards for land-based disposal comparable to that required for ocean disposal?

ANSWER:

a. EPA's ocean dumping criteria (40 CFR 227) describe the current process for determining the acceptability of dredged material for ocean dumping. This process relies heavily on the use of biological tests for determining acceptable levels of toxics in dredged material. Monitoring results have demonstrated that biological tests are predictive of effects at the disposal site. We continue to work to develop biological test with more sensitive species, more sensitive biological test (e.g., chronic end-points), and when fully developed, sediment quality criteria also will be used in the ocean dumping program to help assess the potential effect of toxics contained in dredged material.

b. Sediments proposed for ocean dumping are not required to meet a higher standard than land-based counterparts. Sediments proposed for ocean disposal are evaluated to determine potential effects on the ocean environment. This evaluation takes into account the unique characteristics of proposed dredged material and disposal site, and the pathways through which impacts could occur to human health and the environment. Experience with managing dredged material disposal both on land and in the ocean has shown that the relationship between the characteristics of the dredged material and the pathways for impacts at the disposal site is very different between the two types of disposal alternatives. While the standards applied to each type of alternative may be different to protect against different types of impacts, the guiding principle of preventing unacceptable adverse impacts is the same.

QUESTION:

Has there been a contaminate [sic] subcommittee in the Inter-agency Coordination Team to declare dredged material in Galveston Bay suitable for beneficial use?

ANSWER:

The Interagency Coordination Team (ICT) was formed to help determine the scope of studies necessary to evaluate the impacts of the proposed widening and deepening of the Houston-Galveston Navigation Channels (HGNC). One of several subcommittees of the ICT, the Contaminants Subcommittee was formed to address contaminants issues associated with the project. The Subcommittee is comprised of representatives from the U.S. Army Corps of Engineers, Environmental Protection Agency, U.S. Fish and Wildlife Service, Texas Parks and Wildlife Department, and the Texas Water Commission.

Based on the evaluations and results obtained from testing sediments in the HGNC, the Contaminant Subcommittee concluded (and the ICT concurred) that there are no contaminant concerns related to dredging and disposal of maintenance material from the HGNC project, and that the material is considered acceptable for beneficial uses in the ocean and bay.

MR. RALPH HICKS, PORT OF SAN DIEGO

CONGRESSIONAL TESTIMONY

HANDLING DREDGED MATERIALS

Millions of cubic yards of sediments are dredged annually in the United States due to large amount of siltation that occurs in its waters. Fortunately, San Diego Bay does not require annual maintenance dredging. Most areas in San Diego Bay are dredged approximately every ten to twenty years. Because dredging is so infrequent here, sediments, especially at stream and river outfalls, usually contain heavy metals, hydrocarbons, polynuclear aromatics, and other industrial contaminants. Industrial contaminants in the sediments vary in levels from low to very high. The constituents in the sediments determine how this dredge spoil material is disposed of. There are numerous options for dredge spoil disposal depending on the existence and level of contaminants.

Dredge disposal options for materials with no industrial contaminants, or with contaminant levels below those considered hazardous, are numerous and usually inexpensive. Beneficial uses for such sediments include a wide variety of options which utilize the material for some productive purpose. The following is a list of beneficial uses of dredge spoil material containing non-hazardous sediments.

1. Ocean disposal
2. Habitat development (wetland, upland, island, aquatic, including lands for migratory and nesting use by water birds, shore birds, water fowl, and other wildlife)
3. Beach enhancement
4. Aquaculture
5. Parks and recreation (commercial and non-commercial)
6. Agriculture, forestry, and horticulture
7. Strip mine reclamation and solid waste management
8. Shoreline stabilization and erosion control
9. Construction and industrial use (including port development, airports, urban, and residential)
10. Material transfer (fill, dikes, levees, parking lots, and roads)

Opportunities for beneficial uses of dredge material appear to be unlimited. The most economically efficient dredge disposal option is ocean disposal. Ocean disposal is regulated by the Environmental Protection Agency (EPA). EPA, wanting to prevent an ocean superfund site, highly regulates all material that is disposed of at an ocean disposal site. The EPA determines the suitability of dredged material for ocean disposal through chemical, physical, and biological evaluations. Sediment is tested for its persistence, toxicity, and bioaccumulation effects on marine and benthic organisms through bioassays and bioaccumulation testing. There will be no ocean disposal of dredge material that causes an unacceptable bioaccumulation of any potentially harmful constituent. An estimate of costs to perform these tests for proposed disposal of approximately 20,000 cubic yards is $100,000.

The ocean disposal testing evaluation process emphasizes potential biological effects, rather than chemical presence of possible contaminants. Bioassays are used to evaluate the effects of the sediment on appropriate sensitive organisms, to record any mortality, and to determine if dredge material is suitable for ocean disposal.

Bioaccumulation indicates the biological availability of contaminants in the dredge material to marine organisms. Bioaccumulation also assesses the potential for long-term accumulation of contaminants in aquatic food webs at levels that might be harmful to consumers. Bioaccumulation is used to determine a cause-and-effect relationship between a marine organisms' presence in the dredge material and any adverse elevation of contaminant levels in tissues greater than that in similar marine organisms not exposed to the dredge material.

Biological evaluations serve to integrate the chemical and biological interactions of the contaminants present in dredge materials by measuring their effects on test organisms. Biological evaluations are more direct and specific than are chemical evaluations, which have to infer interactions and effects based on sediment contaminant data alone.

Bioassays and bioaccumulation tests indicate a direct and specific biological effect under test conditions and, therefore, have the potential to detect any ecologically unacceptable impact. Thus, the results can be used to determine the acceptability of the material for ocean disposal. Because of the strict testing requirements for ocean disposal, it is very difficult to obtain permits. Dredge material may be considered unsuitable for ocean disposal because of bioassay and bioaccumulation results, but this material, once placed on land, could be considered non-hazardous. If material does not qualify for ocean disposal, other alternatives need to be found.

If dredged material is not hazardous and of suitable granularity, it is more beneficially used for beach replenishment than disposed of in the ocean. All beach replenishment activities are also regulated by the U.S. EPA, but under a different standard of suitability than exists for ocean disposal. There are a number of other beneficial uses of dredge material provided it is not hazardous. The difficulties of dredging occur when the material is deemed unsuitable for any of the beneficial uses listed previously.

More time, research, and money need to be spent investigating alternative dredge spoil remediation methods for contaminated sediments. Remediation options for dredged sediments containing hazardous materials are expensive and include, but are not limited to the following:

1. Confined disposal facilities
2. Capping
3. Chemical fixation/stabilization
4. Size screening/separation
5. Chemical extraction

Confined disposal facilities (CDF) are used frequently on the East Coast as a disposal option for contaminated dredge spoils. A CDF is an enclosed area

that prevents the dredge spoils from migrating or leaching back into the environment. They are usually bermed and are either lined with plastic or clay soils. A CDF can be located either on the shoreline or upland. A CDF requires long-term monitoring of the surrounding soil, surface water, and groundwater to ensure that contaminants are not leaching. Another problem with a CDF is placement on a shoreline, which takes away fish habitat and foraging grounds for shorebirds and waterfowl. The cost of building a CDF is approximately $1 million per acre.

Capping is an alternative for material that may be unsuitable for unconfined open-water disposal because of potential contaminant effects on benthic organisms. Capping is defined as the controlled, accurate placement of contaminated dredge material at an open-water disposal site, followed by a covering or cap of clean isolating material. Capping contaminated dredge material with a layer of clean soil is considered an appropriate containment control measure to prevent dredge spoils from coming into contact with marine organisms. Capping requires long-term monitoring because of potential effects on benthic toxicity or bioaccumulation if the material is disturbed. Long-term monitoring concerns include whether the cap remains in place or erodes and whether the contaminants remain within the clean cover material or are being transported to the sediment surface layer or water column. Capping is not usually a beneficial option because of long-term monitoring and the possible need to further remediate the dredge spoils at a later time. The cost of capping is usually $3.00 to $6.00 per cubic yard.

Chemical fixation/stabilization is a process performed in a designated processing unit by adding a pre-determined reagent formulation to the dredge material. Through a series of chemical reactions, the contaminated dredge material becomes encapsulated, rendering the dredge spoils safe, non-polluting, non-leaching, and chemically stable. Chemical fixation will chemically change the metal oxide compounds to metal meta-silicate compounds, which render the material non-soluble in water. Following fixation/stabilization, material may be placed into a municipal landfill. However, landfilling materials is not usually an option because of long-term future liability associated with landfill disposal. The cost of chemical fixation is $60.00 to $75.00 per cubic yard.

Screening/size separation of dredge material is a process utilizing standard equipment, most of which has been used for decades in the mining business. Gross oversize materials are separated from the dredged material using mechanical screening techniques, while the coarse and fine grain materials are separated by the use of hydrocyclones. Hydrocyclones are used to separate coarse grain sands from fine grain materials by using screens of different sizes which spin and shake the material while directing each size fraction to different flow paths. Gravity separators are also used to separate coarse grain from fine grain fractions. Coarse grain materials, usually sand, are separated from contaminants; thereby, allowing the resulting sand material to be used for ocean disposal or beach replenishment. The finer grained fractions contain the contaminants. Disposal options vary depending on the contaminants contained in the material. The cost for size screening/size separation is $35.00 to $50.00 per cubic yard.

Chemical extraction is currently being used by the San Diego Unified Port District to separate copper ore from bay sediments. During loading operations at the National City Marine Terminal, copper ore was discharged into the bay. Chemical extraction is used to break the surface tension binding a contaminant to a sand particle. Extraction uses nitric acid heated by steam to 100°C to break the surface tension, separating the sand and contaminants. The sand is rendered non-hazardous and can be used in many different beneficial ways. The copper ore will be sent to a metal smelter in Arizona for processing. The cost for chemical extraction is $75.00 to $100.00 per cubic yard. Processing the copper at a metal smelter will help to recover some of the costs of extraction.

When material to be dredged is non-hazardous, disposal options are numerous and inexpensive. If dredge material is hazardous, then the disposal costs increase exponentially and disposal options decrease. More research needs to be performed to discover disposal options for contaminated material that are affordable and acceptable by all regulatory agencies.

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Executive Director

May 10, 1993

The Honorable Solomon P. Ortiz
Chairman
Subcommittee on Oceanography,
Gulf of Mexico, and the Outer
Continental Shelf
U.S. House of Representatives
Committee on Merchant Marine and
Fisheries
Room 1334, Longworth House Office Building
Washington, D.C. 20515-6230

Dear Representative Ortiz:

Thank you for inviting me to testify on behalf of the Environmental Defense Fund and other environmental organizations on the subject of ocean disposal of contaminated dredge material on March 30, 1993. I have prepared the following responses to the questions your committee forwarded to me on April 1, 1993.

1. If the initial studies of contamination at the New Jersey/New York Port are correct or improving, how does this sediment compare to that already at the site? Additionally, how do you respond to other testimony that indicates that some think of this sediment safe for a sandbox?

In terms of dioxin levels, the sediments from the Port Authority's Port Elizabeth/Port Newark facilities are more contaminated than those documented at the Mud Dump Site.

Three different "reaches" are proposed to be dredged from the Port's facilities. The following chart outlines the average concentrations (pptr. in dry weight) of 2,3,7,8-TCDD in the sediments from these three reaches taken in 1990, when the sediments were initially tested, and in 1993, when they were tested a second time.

	1990	1993
Reach B	127.2	81.2
Reach C	154.3	94.2
Reach D	84.5	62

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In contrast, the average concentration of 2,3,7,8-TCDD at the Mud Dump site was documented in a 1990 EPA-sponsored survey to be 24.1 pptr (in dry weight), with concentrations ranging between 0.39 pptr to 229.2 pptr.

According to EPA's Interim Report on the Assessment of 2,3,7,8-TCDD Risk to Aquatic Life and Associated Wildlife (March 1993), sediment concentrations of 100 pptr in sediments pose a "high risk" to sensitive species of fish. High risk is defined by EPA to cause 50-100% mortality in embryos and young sensitive species. Sediment concentrations of 21 pptr and 60 pptr are considered to pose a "low risk" to avian wildlife and fish respectively. Low risk is defined as a no-effects threshold for reproductive effects (mortality in embryos and young) in sensitive species. Low risk is not meant to be defined as something that is acceptable, but defines a threshold above which effects will occur.

Therefore, the levels of 2,3,7,8-TCDD in sediments in the Port Authority's reaches are 1) close to levels that pose a high risk to fish (in two out of three reaches); 2) above levels considered a low risk to fish; and 3) three to four times as high as concentrations that pose a low risk to birds.

While the Mud Dump Site sediments are less contaminated, in terms of dioxin, than those from the Port Authority's facility, they are by no means clean. The average level of dioxin (from 38 stations) is above what EPA considers enough to pose a low risk to avian wildlife. Three stations had levels above the concentration that is considered a low risk to fish; two of those stations had levels higher than what is considered a high risk to fish.

The sediments found at the Port Authority's facility or at the Mud Dump Site could hardly be described as safe enough for a sandbox. First, the sediments proposed to be dredged are mostly silt and clay, hardly appropriate as sandbox material. In the 1991 Public Notice, the grain size characteristics of the three reaches were described in the following manner.

Reach B: 2.7% sand, 61.3% silt and 36.0% clay.
Reach C: 6.9% sand, 56% silt and 37.1% clay.
Reach D: 9.2% sand, 57.8% silt and 32.0 clay.

Much of the sediments inside the Mud Dump Site are also largely made up of silt and clay, although some sandy spots do exist. It is important to note that pollutants are most closely associated with silt content.

2. Are the levels of contaminants found at the Mud Dump Site at levels that would negatively impact the health of humans if the specimens were consumed either directly or indirectly through the food chain?

This is a difficult question to answer, because the Food and Drug Administration has only set Action Levels on methyl mercury, PCBs and fourteen pesticides. The pollutants of concern at the Mud Dump Site are several heavy metals, hydrocarbons and dioxin, for which FDA Action Levels do not exist. In other words, there may be problems associated with consuming fish or shellfish from the Mud Dump Site contaminated with certain pollutants, but there no standards against which current tissue levels can be compared.

Additionally there is very little data on the levels of contaminants in fish and shellfish. The only work conducted thus far on collecting and analyzing fish and shellfish from near the Mud Dump Site has been by the State of New Jersey (described in my testimony on page 4). Worms collected at the Mud Dump Site were found to have levels of mercury and DDE below the FDA action limits. PCBs were not analyzed in the worms. The average level of dioxin in worms at the Mud Dump Site (5 pptr, wet weight) is one-half of limit set by the State of New York as being appropriate for fish consumption (10 pptr). Other states have set much lower fish consumption numbers, such as Virginia (1 pptr) and North Carolina (3 pptr).

The hepatopancreas of blue crabs collected from within the New York Harbor by Dr. Angela Cristini of Ramapo College have been documented to have concentrations of 2,3,7,8-TCDD ranging from 40-80 pptr (in crabs collected from Sandy Hook Bay) to 450-960 pptr (in crabs collected from Newark Bay). The crabs collected from Sandy Hook Bay can be considered to be relatively unimpacted by dredge material disposal. Therefore, it can be hypothesized that even if crabs and other crustaceans collected from the Mud Dump Site are not being impacted by dredge material disposal, but only by ambient concentrations of dioxin, they could have similar levels of dioxin in their hepatopancreas. These concentrations in the hepatopancreas of crustaceans may potentially be a public health problem and are being reviewed by the State of New Jersey to ascertain if the current health advisories need to be revised.

3. What adjustments to this permit could be made to garner our support?

a) The preparation of an EIS to determine whether or not this activity meets applicable federal and state standards;

b) The use of a scientifically credible dioxin bioaccumulation criteria promulgated by Region II, with full public participation;

c) An acknowledgement of contamination at the Mud Dump Site by EPA and the

initiation of an accelerated process for mitigating the contamination.

d) The initiation of an immediate effort to implement alternative disposal options and a moratorium on ocean disposal permits.

4. How does the lack of monitoring at the Mud Dump Site impact on EDF's support or opposition to this permit in particular and the permitting process in general?

The paucity of monitoring at the Mud Dump Site indicates that EPA, the agency responsible for managing the site, is not in a good position to determine to what degree the criteria used to evaluate dredged material is appropriate. After nearly twenty years of dumping dredged material at a federally designated site, EPA still has no comprehensive effort to determine to what degree the standard of the MPRSA, "no unreasonable degradation", has been met or not.

Essentially, EPA has never defined what constitutes "unreasonable degradation," consequently, no upper limit exists that triggers a change in dredge material management. For comparison purposes, imagine if EPA claimed that air pollution in the United States met the goals of the Clean Air Act by basing that determination on the fact that mobile and stationary sources largely met their state air permits. This is essentially how EPA defends ocean disposal of dredged material; it claims that the program works because the dredged material meets ocean disposal criteria, not because ambient monitoring shows that disposal sites meet any sort of minimum criteria or standards. As described in our March 30th testimony, EDF has petitioned EPA based on existing information that enough degradation has occurred that EPA should categorize the Mud Dump Site as "Impact Category I." EDF has yet to hear from EPA regarding this petition.

EPA's approach to monitoring makes this permit troublesome. EPA claims that all dredged material contaminated with dioxin will be monitored for a period of 12 months to ascertain the appropriateness of the dioxin bioaccumulation criteria. However, there is no pre-set trigger to indicate how such a decision will be made.

For example, what if 600,000 tons of material is dumped, but only 450,000 can be located on the bottom? Such a "loss" could indicate a serious problem and justify adding more final cap material. But, EPA and the Corps could consider it not serious; they could consider only a "loss" of 250,000 tons to be serious enough to trigger the addition of more cap. Without defining the ground rules as to what conditions must be maintained and to what degree different parameters can allowed to be changed, it is impossible to know what EPA will consider acceptable and how it will conclude whether or not the permit conditions were successful. In fact, this example is close to what occurred recently when it was documented that 92% of approximately 300,000 cubic yards of material could not be located. EPA, without even hearing the full explanation of this event, determined that it was not important enough to warrant any additional controls on the Port Authority's permit.

Secondly, the monitoring plan devised by the Corps and EPA for this permit is still flawed and should be vastly improved. For example, the area that will be monitored is too small to provide a good picture of the entire area that could potentially be impacted by dredge material disposal.

In summary, the monitoring aspect of this permit plays a large role in EDF's position on this permit and ocean disposal permitting in general.

5. How should ports dispose of contaminated dredged material? Who should pay for it?

Ports should dispose of contaminated dredged material either in containment facilities identified as the safest method of disposal for contaminated dredged material or by decontaminating the dredge material prior to disposal. Decontamination technologies are typically viewed as being too expensive and not available to the ports as a feasible, short-term dredge material management option. Federal monies need to be made available to demonstrate decontamination technologies and to prove its effectiveness. Secondly, the ports are frequently reluctant to support the use of the safest containment facilities because they tend to be more expensive than less effective options. The payment for these disposal and treatment options should be borne by both the public and private sector. Because ports range from being completely private to completely public entities, it is difficult to define how the entire port community should share the burden. Nevertheless, it is a dialogue in need of occurring.

6. What percent of the time are requests for public comment extensions denied by the Corps of Engineers or EPA?

EPA has no jurisdiction to extend public comment deadlines for Section 103 permits; only the Corps can make such extensions. In my experience, the Corps only grants extensions when the requests come from numerous parties, and in particular, from other federal or state agencies. I would guess that requests are denied 25% of the time.

Questions from the Honorable Curt Weldon

7. How effective is the ocean disposal program?

To some degree, it may not be possible to answer that question because systematic, comprehensive monitoring has not yet been conducted by EPA at all dump sites around the country. Consequently, it is difficult to ascertain how effective the program has been in meeting the goals of the MPRSA. However, the fact that almost all dredge material has passed ocean dumping criteria, include those materials from polluted industrial harbors, indicates that the criteria are not stringent enough and there is a potential for dredged

material to have had adverse impacts at disposal sites.

8. How should EPA's monitoring be addressed? How should monitoring at Mud Dump Sites be improved?

EPA should demonstrate that the ocean disposal program is effective in preventing unreasonable degradation at ocean disposal sites. EPA has been directed by the 1992 WRDA bill to develop monitoring plans for all dump sites within the next several years, but it may still be necessary for EPA to establish minimum monitoring standards and guidance, which can undergo public review, to help set consistent monitoring efforts at different dump sites.

Any long term monitoring strategy should be designed that meets the needs of individual sites but is uniform enough to allow comparison between sites. Minimum funding requirements of monitoring efforts should identified and guaranteed to allow long term planning. Analytical techniques should be uniform to ensure comparison among data sets from different disposal sites. Adequate background data should be collected to establish baseline conditions. Minimum standards should be established to allow managers to know which conditions are no longer being met.

9. When is capping appropriate for containing dredge material?

The circumstances under which capping may be an effective means of containing dredge material are either 1) that it is not the only means by which dredge material is being contained, and 2) when it has been documented and proven to be an effective means of containing material under site-specific circumstances. As mentioned in my March 30 testimony, the legality of capping material deemed unsuitable for ocean disposal is disputable.

The fact that sediments and biota at the Mud Dump Site are more contaminated compared to sediments and biota in other parts of the New York Bight Apex indicates two things, 1) that ocean dumping criteria was not stringent enough to prevent the ocean disposal of material contaminated with pollutants and, 2) capping made little difference in containing that material. It may also be that capping was not utilized to a great degree, but if that is the case, the effectiveness of capping should be established before it is used as the method of choice for managing contaminated dredged materials.

10. Should the Corps' public response requirements be changed?

Most certainly, the Army Corps of Engineers public response requirements should be amended to make the agency more accountable to public comment. The only means by which the public has in the ocean disposal permitting process is through commenting on public notices and testifying before hearings. The Corps regulations should be amended in

the following ways:

1) to make the public notices provide more relevant information for the public to review;
2) to provide for more time to make comment (45 days instead of 30 days, due to the time lost to mail and delivery);
3) to outline the schedule of upcoming federal and private projects in order to warn the public of the work envisioned within the next fiscal year;
4) to require the Corps to respond to public comments in a timely fashion, and
5) to require the Corps to inform the public of final decisions within a timely fashion.

Additionally, each District and EPA region should work together to create a process by which the public has the opportunity to participate and advise the agencies on long term planning and decision making. This important step is frequently by-passed and allows the public to only make comment on either Public Notices or EISs, when most decisions have already been made.

11. What changes to the classification process should be made? Has the Green Book been an effective document?

As mentioned above, the old 1977 Green Book has not been an effective document in guiding the Corps and EPA to assess contaminated sediments. The new 1991 Green Book may be more successful, however it is too soon to tell. The implementation of the new Green Book is still underway, for each District and Region has approached it differently. The consistency with which each District and Region is implementing the new Green Book would be a worthy subject for some investigation.

The new Green Book should increase the percent of material that is classified as contaminated. When this occurs, within the next year or so, the debate as to how such material should be managed will intensify. The Corps may insist that ocean disposal with capping is appropriate, while the environmental community will likely advocate for other alternatives, such as decontamination.

12. What recommendations can be made to compensate ports that would be economically impacted due to reduced dredging?

First, it may not be necessary for reduced dredging to economically deprive ports, if dredging needs are prioritized. A common practice has been for applications to be submitted for entire areas to be dredged, but in fact, they are not dredged as extensively because the demand for it does not present itself. Frequently, the driving force behind ports and others in need of dredged channels is the flexibility to quickly dredge a particular channel or berth when it is needed. The permitting system needs to address itself more to the prioritized needs of ports.

Additionally, a hard look should be taken at the domestic port industry. It is possible that ports around the country are overbuilt, trying to make themselves accommodate too much in order to make themselves competitive. The need for all ports to maintain deeper and deeper channels to accommodate larger and larger ships is certainly questionable, in light of the enormous federal dollars spent to maintain deep channels.

I would argue that dredging does not necessarily need to be reduced, it is the disposal of dredged materials needs to change. Such changes will undoubtedly be more expensive, but costs can be more readily accommodated if addressed sooner rather than later. Additionally, such costs would also be avoided if the loadings of pollutants into Harbors and ports are reduced through pollution prevention and improved water pollution controls.

13. What recommendations can be made to more closely coordinate the six regions of EPA and the Corps in implementing the ocean disposal program?

The two most important recommendations would be for EPA to establish minimum monitoring standards that would apply to all dump sites and for EPA to document to consistency of the testing guidance and criteria used by all the six regions.

14. Why should EPA be the lead agency in permitting ocean disposal for dredged material?

Because EPA is charged with managing the dump sites, establishing ocean dumping criteria and addressing contaminated sediments generally, it would be more efficient if EPA managed the ocean disposal permit program. At the very least, EPA should be the lead agency when the sediments involved are contaminated. The Corps has historically been reluctant to readily admit that some sediments are contaminated and secondly, have an overwhelming interest in keeping navigation channels open. Their mission to protect the environment is secondary. For these reasons, it is time to place EPA in charge of those permits that involve contaminated materials.

15. Why should Congress mandate the development of sediment quality criteria?

EPA has been attempting to establish numeric sediment quality criteria for over five years. EPA has been repeatedly challenged for this effort, particularly by the Corps of Engineers, but also by industry. A congressional mandate would help establish EPA's role in establishing standards and internally would help drive EPA's agenda to make such standards a priority. A legislative mandate would clearly instruct EPA to establish criteria under a deadline and could prioritize the most important pollutants. Legislation would also clarify how such criteria would form the basis for decisions about NPDES permitting, ocean dumping permitting and Superfund cleanup. A position paper written on this

subject, Application of Sediment Quality Criteria and Standards, is attached.

Sincerely yours,

Sarah L. Clark

Sarah L. Clark
Staff Scientist

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May 11, 1993

Honorable Solomon Ortiz
Chairman, Subcommittee on Oceanography,
Gulf of Mexico and the Outer Continental Shelf
575 Ford House Office Building
Washington, D.C. 20515

Re: Hearing on Ocean Disposal of Contaminated Sediments

Dear Mr. Ortiz:

On behalf of Dwayne Lee, Deputy Executive Director of the Port of Los Angeles, and the American Association of Port Authorities, I have enclosed answers to written questions submitted by yourself and Subcommittee members as a follow up to the hearing on the Ocean Disposal of Contaminated Sediments held on March 30, 1993. Thank you again for providing AAPA an opportunity to testify on this very important issue. In addition, I would like to acknowledge the very capable assistance and cooperation of your staff, Sheila McCready and Bob Wharton, in helping to organize the hearing.

AAPA looks forward to working closely with you and the Subcommittee on issues affecting America's port community

Sincerely,

Anthony B. MacDonald
Director of Environmental Affairs

U.S. House of Representatives
Committee on Merchant Marine and Fisheries
Subcommittee on Oceanography, Gulf of Mexico, and the Outer Continental Shelf

Hearing on Ocean Disposal of Contaminated Sediments
March 30, 1993

Written Questions and Answers

Witness: **Dwayne Lee, Deputy Executive Director of the Port of Los Angeles, on behalf of the American Association of Port Authorities**

Questions of the Honorable Solomon Ortiz

1. **What impact do you foresee the particular situation regarding the Port of New York and New Jersey's permit application having on a national level? Do you see this situation becoming more prevalent in the future and why?**

Answer: The delay and indecision that the Port of New York and New Jersey are currently facing in their efforts to secure a maintenance dredging permit both reflects problems and challenges already faced by many ports on a national level and portends even stricter scrutiny of ocean disposal permits in the future. If it is true that we can learn from our mistakes, perhaps the impact will be a positive one and federal, state and local interest groups will finally recognize that nobody benefits from the convoluted, often contradictory, expensive and inefficient system that presently regulates the management and disposal of dredged material. It is more likely, however, that without adoption of a national dredging policy and a commitment by the federal government to dredge our nation's harbors in a timely and cost-effective fashion the entrenched regulatory bureaucracy will prevail.

Each dredging permit is unique, based on the characteristics of the project, quality of the dredged material, and the working relationship among the port, the state and federal regulatory agencies and the public. The particular circumstances of the New York/New Jersey situation are, therefore, not replicated elsewhere. Yet, as our scientific ability to identify potential contaminants to levels so low they are almost inconceivable to the average person, public concern over trace contaminants found in dredged material will continue to grow. Without more extensive public education about the relative risk (or lack of risk) posed by these contaminants, and clear direction and strong leadership from the federal government, the problems currently being experienced by the Port of New York and New Jersey will become more frequent around the country.

2. Will changes in the Ocean Dumping Act improve the dredge permitting process? What further suggestions do you have for eliminating the number of regulatory delays and creating better coordination of efforts by the Corps, EPA, and State agencies in order to provide a more stable, streamlined permit process?

Answer: Changes to section 103(c) the Ocean Dumping Act (ODA) mandated by the Water Resources Development Act of 1992 (WRDA '92) clarify the responsibilities of the EPA and the Corps regarding review of ocean dumping permits and provide specific timelines for review by EPA of permits under consideration by the Corps. While these changes are a small step toward providing consistent and timely review of ocean dumping permits, additional changes may be necessary.

Current permit regulations provide a reasonable and workable framework for reviewing ocean dumping permits. However, federal regulatory agencies too often ignore the time frames and fail to make difficult decisions in a timely fashion. Coordination of comments and consultation among the interested federal agencies should be required as early as possible in the process. Current Memoranda of Agreement between the Corps and EPA, National Marine Fisheries,and the Fish and Wildlife Service should be revised to require streamlined and concurrent review of all issues relevant to the permit. It is crucial that permit applicants know upfront what criteria will be applied to their project. All agency and public comments should be identified early in the permit process and should be handled concurrently rather than sequentially as is too often the current practice. It is impossible for permit applicants to satisfy regulatory agencies if applicants must respond to a moving target and a seemingly endless line of new issues. The law should also be amended to provide for regional, site specific permits for low volume, regular maintenance dredging.

3. Is there universal application of EPA criteria and standards for the disposal of dredged material in coastal and ocean waters in all regions of the U.S.?

Answer: Application of criteria and standards for disposal of dredged material varies between regions. In addition, slightly different criteria and standards are applied to coastal waters, regulated under guidelines pursuant to section 404(b)(1) of the Clean Water Act (CWA), and ocean waters regulated under the ODA. On one hand, the variability in the application of criteria is a result of the flexibility necessary to allow for consideration of site specific conditions and their effect on the impact of dredging activities on the marine environment. On the other hand, the variability is a function of the uneven application of the criteria as applied by the various EPA regions which have the responsibility for administering the ocean dumping program. In addition, before a dredging permit can be issued there must be a certification that it

complies with applicable state water quality standards, the enforcement of which, are in most cases, delegated from EPA to the state.

Last year, the EPA and the Corps released a new testing manual, commonly referred to as the "Green Book", that provides guidance and more stringent testing guidelines for to the regions to use to determine whether proposed ocean dumping meets EPA criteria. Uniform application of the Green Book testing protocols should result in more consistent application of ocean dumping criteria and standards around the country. The EPA and the Corps are currently at work updating the "Gold Book" testing manual for coastal waters which is also being designed to assure more consistency both among the various coastal regions and between coastal and ocean waters.

4. **In your opinion, are sediments for ocean disposal required to meet a higher standard than land-based counterparts? Are the testing and standards for land-based disposal comparable to that required for ocean disposal? Should the standards be higher for ocean disposal? Why or why not?**

Answer: It is very difficult to compare the standards for ocean and land based disposal of sediments for two principal reasons: first, the sediment contaminants will react differently depending on their disposal conditions (e.g. contaminants that will bind to sediments in a water environment, may be oxidized and released into the air when disposed on land); and, second because the governing statutes which regulate different disposal media (e.g. Superfund, RCRA, ODA and CWA) have different requirements, goals and objectives. It is clear, however, that toxicity testing protocols designed under RCRA and Superfund are not appropriate for dredged material.

EPA has developed an internal Contaminated Sediments Task Force which brings together representatives from the various program offices to develop, as much as possible, a consistent approach to handling contaminated sediments. AAPA strongly supports this EPA initiative. Legislative changes may be necessary to clarify that the handling and disposal of marine sediments should be regulated by EPA's Office of Water, in consultation with the Corps, to ensure consistency in the management of dredged material. In addition, EPA and the Corps should expand efforts to assess and compare the environmental risks posed by disposal of dredged material on land, in water, and in confined near-shore facilities. AAPA favors a regulatory regime which requires the consideration of <u>all</u> disposal alternatives with full consideration of the relative risk they pose to the environment, as well as their cost.

5. **If permitting standards are applied equally, how would the economic viability and competitiveness of the Ports be affected by increased costs associated with obtaining dredge disposal permits?**

Answer: Perhaps it would be more accurate to say that permitting standards should be applied "consistently and fairly", rather than "equally" because, as previously discussed, ocean disposal criteria are necessarily flexible enough to consider the relative environmental impact that disposal activities will have on the relevant environment. Although the EPA and Corps are working to improve the consistency of their permit programs, there is no indication that the current inequities impact directly on the viability or competitiveness of the U.S. public port community. While it is true that U.S. ports are very competitive, the costs of compliance with applicable environmental regulations is just one among many costs of doing business and among many competitiveness issues which impact a port's viability.

While ports are committed to pay the costs necessary to preserve a healthy environment, it is extremely important that the additional regulatory costs for the clean-up, management or remediation of contaminated sediments in federal navigational channels and harbors caused by years of industrial, agricultural and municipal activities not fall on the port community.

Questions of the Honorable Curt Weldon

1. **Mr. Lee, in your written testimony you state that as a nation, we are on the verge of a national dredging crisis because we have not been able to dredge our nation's harbors in a timely and cost-effective fashion. You go on to state that it is time to develop a comprehensive, national dredged material management and disposal policy that will break the gridlock. What do you think should be the major components of such a comprehensive strategy? Do you feel that they will address the growing problems facing our nation's harbors? If not, what needs to be done?**

Answer: As a nation we have become hypnotized by regulatory process. Our scientific ability to identify potential environmental threats has far outpaced our administrative ability to make decisions. Furthermore, we have passed law after law and adopted regulation after regulation to respond to the public perception of environmental risk (in many cases fanned by the political expediency of the moment - the "hot" environmental issue), while expending little time or money assessing relative environmental risks and determining if we are making progress toward meeting our environmental goals. The result

is, at best, costly and counterproductive regulatory delay and, in many cases, regulatory gridlock. It is time to take a step back and identify more precisely what we want to achieve; establish goals and reform the process in order to attain our objectives in the most cost-efficient manner possible. The simply fact is we have limited financial resources to meet seemingly limitless environmental needs.

A National Dredging Policy is necessary to cut across the current patch work quilt of environmental laws and regulations applicable to dredged sediments.

> First, there must be a federal commitment to the need to dredge our nation's navigation channels and harbors, and an understanding that a well maintained, efficient navigation system benefits the entire nation. Dredging our harbors in a timely and cost-effective manner is good economic and environmental policy. It is neither environmentally productive nor cost-effective to direct limited cleanup resources to the large volume, but low level, pollutants usually found in navigation channels. We should concentrate our efforts on safe management and disposal practices which minimize environmental impacts.
>
> Second, our nation needs to develop a long term plan to identify and disposal sites and to provide federal funds for the construction of those sites. Unless environmentally protective, dredged material disposal capacity is available, we will not be able to dredge out nation's harbors. This is particularly important in areas where sediments may be contaminated and, therefore, unsuitable for safe marine disposal.
>
> Finally, the regulatory process should be reformed to remove the roadblocks to decisions and to streamline permit reviews. Unbiased consideration should be given to all disposal options based on a relative assessment of environmental risk and overall cost.

The National Dredging Policy should also include to following components. If a federal or state resource agency opposes the preferred dredge disposal alternative selected by the Corps, they should be required to identify acceptable alternatives and to provide funding to cover any incremental costs above the preferred alternative. The Water Resources Development Act of 1986 should be amended to establish a lead federal responsibility to assure the availability and to pay the cost of providing adequate dredged material disposal capacity to meet the needs of dredging our nation's commercial harbors. Clean dredged material can, in many cases be a beneficial resource and should be encouraged where funds can be identified. Decontamination technology for contaminated sediments, although a desirable goal, has not been demonstrated to be feasible or affordable on a broad scale; however,

federal research and development of cost-effective, decontamination technology should be given a high priority.

2. We have heard today that contaminated sediments in dredged material make up only 3 to 5 percent of all material dredged. Do you feel that this is an adequate assessment? If not, what do you think represents a more accurate figure?

Answer: That assessment is based on estimates by the Corps of Engineers of the amount of dredged material from federal navigation channels that cannot be disposed of in the marine environment without special management practices under current regulations. It is likely that on a national scale, if you include access channels and port berthing areas the percentage would increase slightly. In addition, as the new Green and Gold Book testing manuals are implemented across the country some additional material may be identified as unsuitable for unrestricted marine disposal.

3. How widespread do you think the problem of polluted runoff is for our nation's harbors?

Answer: According to EPA, 50 percent of current coastal pollution is attributable to nonpoint runoff. Historically, the problem is even more significant given the build up of contaminated runoff in our nation's harbors.

4. In order to address the growing problems associated with polluted runoff, do you think that it is necessary to establish a nonpoint source management plan in order to contain some of the potential harmful material that could impact sediment? If so, what do you think some of the major components of such a strategy?

Answer: There is no doubt that pollution prevention and the management of polluted runoff are the keys to the future environmental health of our coastal waters, including bottom sediments. AAPA supports the nonpoint source control programs mandated by section 6217 of the Coastal Zone Management Act of 1990. However, additional funding should be provided for implementation of nonpoint pollution control programs under both the CZMA and the CWA. With specific regard to sediments, ports are concerned that costly cleanups will be required before continuing sources of pollution runoff are adequately controlled. In the development of nonpoint source management plans, upstream polluters should be required to consider sediment control measures, as well as the potential impacts of downstream deposition of sediments.

5. Do you think that there is a need to better define the word contaminated? Do you think that this will better address some of the problems associated with disposal of these sediments? Also, do you feel that there is a need to define what constitutes a clean sediment, and how clean is clean?

Answer: As discussed in the answers to some of the previous questions, the EPA and the Corps are working to ensure that there is a uniform and scientifically justifiable definition of what constitutes contaminated sediments. Under existing criteria and regulations, regulatory agencies have an adequate definition of what constitutes contamination. However, because the definition is not the same for all of EPA regulatory programs there is considerable public confusion about the definition. It is not so much that a new definition is required but, rather, more outreach by EPA and the Corps to educate the public and to build confidence in the reliability of the existing mechanisms for identifying contamination.

Regarding a definition of "clean sediment", clearly there is a need for EPA and the Corps to work together to determine appropriate cleanup levels for highly contaminated sediment sites. Again, the appropriate definition will depend to a large extent on what your regulatory objectives are. For example, are you trying to determine the appropriate level of clean up under Superfund, whether dredged material is suitable for beneficial use, or whether dredged material is suitable for ocean disposal? The answer to what is "clean" sediment for each of these examples may vary.

In each case, the definition of contaminated, as well as clean sediment should be effects based and flexible enough to reflect real world conditions.

6. How much is spent annually by Port Authorities to characterize dredged sediments? Based upon these costs, do you feel that there is a need to develop a long term management plan to better assess these sediments and ways to dispose of them?

Answer: We do not have any specific information on the annual cost to Port Authorities for characterization of dredged sediment, although in many cases it can be a significant component of undertaking a project. The Port Authority of New York and New Jersey estimates that they spent $1 million in connection with their pending permit application. The cost of testing is particularly problematic for smaller public port authorities which do not have the resources or expertise to undertake the tests.

Long term dredged material management plans and federal contribution to the construction of disposal areas could significantly limit the need for individualized project testing and project by project decisionmaking. AAPA strongly supported provisions of the Water Resources Development Act of

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1992 which establish a National Contaminated Sediments Task Force and require a survey of sediment contamination nationwide. These initiatives should help to get a more accurate picture of the extent and severity of sediment contamination in our nation's harbors, as well as other sites. In addition, WRDA '92 requires the Corps to undertake a long term study of dredged material disposal needs.

7. **In your testimony, you state that the vast majority of highly contaminated sediment are not found in navigation channels where the Corps or the ports routinely dredge, a larger effort is needed to define and prioritize the problem. While it is the intent of the National Contaminated Sediments Task Force to assess this problem, do you feel that the task force is sufficient enough to adequately address this problem? If not, what would you recommend?**

Answer: AAPA strongly supports the establishment of the National Contaminated Sediments Task Force, and worked hard last year with Congress and the regulatory agencies to define the appropriate roles and responsibilities of the Task Force. Despite the fact that seven months have passed since Congress mandated the establishment of the Task Force, nothing has been done! We ask your help in contacting the Administration and urging them to set up the Task Force as soon as possible.

8. **Does the Port Authority support the idea of developing a numerical sediment quality criteria? If so why? Do you feel that biological assessments are an adequate assessment?**

Answer: AAPA supports the development of numerical sediment criteria, as they become scientifically justifiable, to be used in conjunction with the biological effects tests currently utilized by EPA. EPA's Green Book testing manual anticipates the development of numeric criteria and the incorporation of those criteria into its tiered testing regime. Because of the scientific uncertainty inherent in national numeric criteria, the Green Book would permit the use of site specific biological testing to determine the actual environmental impact of the proposed disposal activity. Numeric criteria should not be used a pass-fail standards.

It is very important, that specific numeric criteria are not proposed by EPA without accompanying proposed guidance on how they will be implemented in the various regulatory programs. Will these criteria be used a cleanup standards under Superfund?...How will they be used to set point source discharged limits under the Clean Water Act?...How will they be incorporated into the Ocean Dumping Program?

9. What recommendations would you make to improve the current regulatory process? Is there a need to streamline or improve communication between the various agencies involved in the process? Is there a need to better define the roles of the various agencies involved in the permitting process?

Answer: See Answer to Question 2, Questions of the Honorable Solomon Ortiz.

10. Has the regulatory process had a negative impact on the economic potential of harbors? In other words, with delayed dredging due to problems associated with the permitting process, what has been the long-term economic impact of this; if any?

Answer: Regulatory permit delays result in immeasurable unrecoverable costs, as well as missed commercial opportunities for ports and their communities, as well as for the nation. Our nation's intermodal transportation system is only as efficient as its most constrained part. If harbors are not dredged to meet the needs of shipping, we are not making efficient use of commercial opportunities they provide. Too few people understand that a federal navigation project is approved by Congress only if it is determined that it is in the national interest. Therefore, every time a federal channel or its access channels are not dredged it is the national interest that suffers along with the direct local and regional impact on jobs and other economic benefits.

11. Do you feel that sediments for ocean disposal must meet higher standards than their land-based counterparts? Are the testing and standards for land-based disposal comparable to that required for ocean disposal?

Answer: See Answer to Question 4, Questions of the Honorable Solomon Ortiz.

12. Is the port authority involved in the development of alternative technologies for the disposal of contaminated dredge material? If so, could you expand on this?

Answer: This question appears specifically directed at the Port Authority of New York and New Jersey which also testified at the hearing. On a national level, the AAPA with the support of the environmental community supported language in WRDA '92 that would have established a national demonstration program for decontamination technology. Unfortunately, because of objections to the cost of the program by the previous Administration that program was scaled back to on a demonstration project in the New York/New Jersey area.

It is our understanding that the Port Authority of New York and New Jersey has strongly supported the development of a decontamination technology program. In addition, they have worked with Rutgers University to fund a series of decontamination technology workshops.

13. In your testimony, you discuss the New Jersey demonstration project included in the Water Resources Development Act. Do you think that there is a need for more demonstration projects?

Answer: Yes. See Answer to Question 12 above.

14. Is the port authority involved in the siting of mud dump sites as well as other disposal sites for dredged material?

Answer: This question relates directly to the activities Port Authority of New York and New Jersey. On a national level, it is the responsibility of the EPA to work with the Corps to identify and designate appropriate open water disposal sites. WRDA '92 required that EPA designate all ocean disposal sites and establish monitoring and management plans for those sites. However, AAPA is concerned that given the budget currently proposed for EPA adequate funding and personnel will not be provided to EPA's ocean dumping program to meet the deadlines required by WRDA '92.

15. It is my understanding that there have been success stories associated with the disposal of dredged material. For example, in Mobile, AL a island was created out of dredged spoil. This in turn has become a Wildlife Refuge. Can you highlight other similar instances? Is this unique?

Answer: Dredged material can, in many cases, be a valuable beneficial resource. It should be pointed out the Gaillard Island created in Mobile, AL for the disposal of dredged material has not only become the home of endangered Brown Pelicans but it continues to be used as a dredged disposal area. Dredged material has also been used as landfill to create additional expansion areas for port and other development. In Louisiana, dredged material is often used for bank stabilization and wetlands creation. Similarly, the San Francisco Bay area ports are exploring the use of dredged material to help create the Sonoma Bay Wetlands. In Tacoma, WA., an agreement has been reached with the resource agencies where the port will contribute $12 million dollars to remove contaminated sediments from the bay. Dredged material can also be utilized in some cases for beach nourishment, as well to create in water berms to discourage erosion of beach areas. Opportunities for the beneficial use of dredged material are, however, circumscribed by the lack of funding.

16. It is my understanding that the American Association of Port Authorities is currently finalizing a National Dredged Material Management and Proposed Disposal Policy. Can you discuss some of the recommendations of this proposal?

Answer: See Answer to Question 1 above.

Institute of Marine and
Coastal Sciences

May 10, 1993

Honorable Solomon P. Ortiz, Chairman
Subcommittee on Oceanography, Gulf of
Mexico and the Outer Continental Shelf
1334 Longworth House Office Building
Washington, D.C. 20515-6230

Dear Congressman Ortiz,

Thank you for the opportunity to testify at the recent hearing on ocean disposal of contaminated dredged material. Enclosed per your request are responses to questions posed by subcommittee members following the hearing. I will be happy to provide you with any additional information you may require.

Again, thank you for your kind invitation and your interest in identifying alternatives for the management of contaminated dredged material.

Sincerely,

J. Frederick Grassle
Director

Enclosure

P O Box 231, New Brunswick New Jersey 08903-0231
908/932 6555, FAX 908/932 8578

RUTGERS

**Responses to Questions Posed by the Subcommittee on Oceanography,
Gulf of Mexico and the Outer Continental Shelf
Following the March 30, 1993 Hearing on
Ocean Disposal of Contaminated Dredged Material**

Responses to questions by Rep. Gene Green

1. I do not know of any specific studies that estimate health risk associated with contact or accidental ingestion of contaminated sediments.

2. Dredge material is classified as clean (category 1) if it does not cause unacceptable toxicity or bioaccumulation in biological test systems.

Responses to questions by Rep. Curt Weldon

1. Extensive efforts at remediation of contaminated sediments are being made in a number of port areas including Holland, Belgium, Germany and in the EPA Assessment and Remediation of Contaminated Sediments (ARCS) Program in the Great Lakes. The greatest success has resulted from reduction in the amount of contaminated material by physical separation of particles. Hydrocyclones and other types of mechanical separators are useful for separation of sand from finer-grain fractions. Flotation followed by a heap leaching process may prove useful for sediments without much sand. Solvent extraction, chemical transformation, thermal desorption and wet-air oxidation are all promising approaches to remediation.

2 and 3. Most of the current bioremediation research programs target specific classes of compounds. None of the methods in present use appear to be successful for bioremediation of metal contamination. The most success has been with petroleum compounds in oil spills and PCBs in sediments. Biotechnology approaches are not yet ready to solve the problems associated with disposal of contaminated sediments from dredging. However, this is a very active area of research and break-throughs are likely. Bioremediation should not be ignored in any management strategy since natural biological processes have been shown to naturally reduce levels of contamination in sediments. In situ enhancement of these natural processes should be a management goal.

Biotechnology experts at the remediation conference held May 4-6, 1992 at Rutgers University concluded that successful bioremediation procedures need to focus on a specific class of compounds. However, new approaches to bioremediation are continually being proposed. For example, at a subsequent Conference held November 17-18, 1992, one particularly innovative approach was suggested by Professor James Watson of the University of Southampton in Great Britain. He suggested that microorganisms could be used to immobilize and localize metal ions from solution which are then separated with a high gradient magnetic separation technique. Polar organic compounds may also be concentrated on the metal sulfides attached to these bacteria and be removed in the magnetic separation.

4. Some of the chemical and physical treatments are likely to have immediate application and should be tested with sediments presently disposed of in the ocean. Category 1 sediments are, by definition, not harmful and the most cost-effective approaches to relocation or reuse of this material can continue.

5. Procedures used in Norway were not discussed at the two Rutgers conferences on remediation. We received useful discussion of efforts underway in Holland, Belgium, Germany and the United Kingdom. Each port is working on approaches to reduce contamination in sediments but these methods are specific to particular sediments. Most of the present approaches are regarded as interim procedures until better methods of decontamination can be developed. Most of the technologies have been or are being tried in the U.S. None are

presently adequate to the task of decontaminating large quantities of dredge material.

6. My testimony on undersea borrow pits should not have referred to experience in Long Island Sound. The use of borrow pits has been much discussed but there is very little practical experience with their use. It is thought that pits can be designed so that they would provide long-term containment, however none have been in use long enough to be sure there are no long-term problems. Where they have been suggested it has not been as a solution but rather as a method that may have the fewest drawbacks.

7. Greater emphasis needs to be placed on sources of sediment contamination. The management of contaminated sediments must be based on fine-grid sampling of sediment contamination and a fine-grid model of sediment transport for the harbor that considers both sources of contamination and sites of continuing contaminant input. Sources of contamination need to be eliminated or contained and methods of reducing volume or toxicity need to be fully considered before residual, contaminated material is placed at long-term containment sites.

Remediation technology requires years of further development, demonstration and pilot-scale testing to become practical and successful. Last year, $2.7 million was appropriated to the Environmental Protection Agency for this purpose. Now is the time to implement a research program designed to evaluate those remediation techniques with the most promise.

Responses to questions by Chairman Solomon Ortiz

1) At the May 4-6, 1992 Rutgers Conference on Remediation of Sediments several bioremediation processes were discussed including: reduction of the toxicity of PCBs through an anaerobic bacterial transformation that removes chlorine from the PCB molecule, enhancement of the rate of microbial breakdown of petroleum compounds through the application of nutrients, and transformation of chromium to a less available form using sulfate-reducing bacteria. In general, bioremediation uses enzymes, bacteria or other microorganisms to transform toxic compounds to either less toxic or less available compounds.

2) The use of these methods is not behind in the U.S., however developments in remediation technology are proceeding sufficiently rapidly that it is necessary to keep up with developments in other countries. Implementation of the provision in the 1992 Water Resource Development Act for a project to decontaminate New York/New Jersey Harbor sediments will be an important step. However, a better means for testing a broad range of promising bench-scale technologies with contaminated New York/New Jersey Harbor sediments would be valuable.

3) My testimony on this point is misleading. There are no tests underway in Long Island Sound and there is almost no direct experience with placement of contaminated sediments in borrow pits in the New England region. This statement should have referred to the use of capping techniques, not borrow pits. Borrow pits should only be used if there is a much greater prospect for complete containment of material even in the most severe storms than is the case for mud dumps that are not associated with pits.

4) The most promising other approaches include land containment and the construction of containment islands

5) Landfill of contaminated sediments require double lined containment facilities so that there is no danger of polluting groundwater, streams or adjacent coastal areas. Such a containment facility is being used presently by the Port of Rotterdam for contaminated sediments. A significant fraction of the sediment may be lost in the water column during dredging operations. Methods of dredging have been developed that considerably reduce this loss.

APPLICATION OF SEDIMENT QUALITY CRITERIA AND STANDARDS

The National Contaminated Sediments Working Group

March 1992

APPLICATION OF SEDIMENT QUALITY CRITERIA AND STANDARDS

The National Contaminated Sediments Working Group

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APPLICATION OF SEDIMENT QUALITY CRITERIA AND STANDARDS

I. Why be concerned about sediment contamination?

When pollutants are discharged into a waterway, a substantial portion accumulates in the sediments on the bottom. Sediments that have "collected" pollutants can, under particular chemical or physical conditions, release those pollutants back into the water column, affecting water quality. Additionally, there are numerous aquatic organisms that are continuously exposed to pollutants in sediments because they live in or on sediments, and/or they ingest sediments as a method of finding food. There is no longer any doubt that contaminated sediments are a critical and widespread problem:

- o Contaminated sediments are responsible for several Superfund sites, most notably Massachusetts' New Bedford Harbor, Waukegan Harbor on Lake Michigan, and Commencement Bay in Puget Sound.

- o A 1987 study conducted for the EPA found contaminated sediment sites throughout the country (see Appendix). Among the study's findings are that 43 "toxic hotspots" in the Great Lakes have contaminated sediments.

- o The National Oceanic and Atmospheric Administration (NOAA) has documented fish diseases caused by contaminated sediments in Washington State's Puget Sound.

- o A portion of sediments dredged for navigational purposes and dumped in open waters is contaminated, thus creating a potential hazard to our waters and coasts. In the Great Lakes, for example, approximately 50 percent of the sediment dredged for navigational purposes must be confined in storage facilities due to contamination.

Given this evidence, it is apparent that sediments in many areas must be cleaned up, still clean sediments need to be protected, and other sediments must be better managed to protect the environment. Our long-term goal is to restore contaminated areas to their original state or as close as possible. We must also prevent new contamination in these areas and in pristine

areas. The first step for any program is to develop federal numeric and other criteria that together will act as a trigger for restoration and preventative actions.

II. What are sediment quality criteria?

The purpose of sediment quality criteria should be to establish levels of contamination in sediment that, when exceeded, would serve as a critical component in triggering remedial and preventative actions. The levels of contamination established by the criteria must protect the most sensitive species in the environment, as well as other ecosystem characteristics such as community structure and function, and must include a margin of safety which accounts for the gaps in scientific understanding and uncertainty. For example, exposure routes such as sediment ingestion and direct dermal contact with sediments by bottom-dwelling organisms, differences between acute and chronic or reproductive effects, synergistic effects, dynamic changes in bioavailability, and exposures through the food chain must be taken into account by criteria.

Some people have expressed concern that it is scientifically impossible to develop one simple number (such as "1 ug/kg for cadmium"), that defines what is safe or "clean" in all locations or circumstances. This concern is based on an incomplete understanding of the criteria.

Sediment quality criteria need not consist of one simple number applicable in all waters. It is likely that criteria will vary depending on a number of factors that might affect toxicity or exposure such as salinity, sediment grain size, sediment carbon content, or content of acid volatile sulfide (AVS). A sediment quality criterion could consist of a matrix that includes these or other relevant factors, and that enables the decision maker to calculate a concentration appropriate for a given site. Figure 1 provides an hypothetical matrix where a property of the sediment such organic carbon content is compared to a property of the ambient water such as pH to find the appropriate numerical criterion for a particular pollutant. Many existing water quality criteria are written this way.

Sediment quality criteria need not be only a "number". Sediment quality criteria and standards may consist of an array of tests. The EPA may not be able to derive numbers that define the safe concentration of a chemical in sediments with a high degree of confidence for more than a small subset of chemicals. Therefore, tests should be adopted that directly measure the toxicity of sediments to compensate for the chemicals for which criteria with a high degree of certainty have not yet been developed,

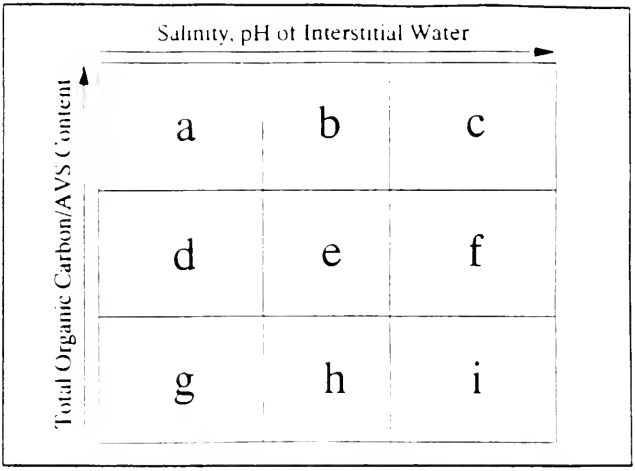

Figure 1. An hypothetical sediment criteria matrix. Lowercase letters represent the sediment criteria for a particular set of sediment and water quality conditions. Arrows indicate increasing trends.

and for the lack of knowledge regarding the effects of mixtures.

In summary, the concept of sediment quality criteria is broad enough to encompass a combination of single-chemical criteria (such as those developed by the Equilibrium Partitioning approach or the Apparent Effects Threshold), toxicity bioassays, and in-situ measurements of benthic health. Single-chemical numbers by themselves will not meet the "sensitive species" or "margin of safety" criteria. Toxicity bioassays should be able to define chronic effects and sublethal endpoints. Due to gaps in the understanding of sediment chemistry and bioavailablity, sediment quality criteria must incorporate this full suite of tests to be accurate and protective. Thus, a site could be declared clean only if it successfully passes all biological and chemical testing.

III. How do sediment quality criteria fit into the federal/state relationship?

Sediment quality criteria are fully compatible with the existing federal and state regulatory framework.

Under section 303(c) of the Clean Water Act (CWA), states are required to adopt water quality standards that "serve the purposes of the Act," as spelled out in Sec. 101(a). Such standards must include criteria that protect water body uses such as fishing and swimming.

Furthermore, federal regulations provide that state standards must be based on federal criteria (EPA's section 304(a) guidance), the EPA guidance modified to reflect site-specific conditions, or other scientifically-defensible methods.

Once EPA develops sediment quality criteria, this same principle applies to state adoption: federal 304(a) guidance will form the basis for state standards, unless the state develops site-specific standards or uses other scientifically defensible methods for deriving standards. The burden of demonstrating defensibility should rest with the state.

In the past decade the states have been extremely slow to adopt water column standards for toxic pollutants despite a specific requirement in the 1987 amendments to the CWA that they do so within three years. This inactivity has resulted in delay in protecting our waters. For this reason, a national sediment quality criteria program must be developed to give States an incentive to promptly adopt and implement standards. If sediment quality criteria are developed by the EPA, the states should be given two years to adopt their own standards. If states have not adopted standards at least as protective as EPA's within the deadline, then EPA's criteria should automatically become applicable state standards.

In waters where state criteria do not apply, such as the open ocean, federally adopted sediment quality criteria should be used. In interstate and shared waters (such as the Great Lakes and the Chesapeake Bay), consistent, protective standards are needed. If states wish to apply more stringent provisions, then they should be provided authority to do so.

IV. How will sediment quality criteria be applied?

There are a number of obvious applications for sediment quality criteria. More are sure to emerge once these criteria are established.

A. National Pollutant Discharge Elimination System (NPDES) permitting, limits derivation

Industries and sewage treatment plants that discharge effluent into US waters are required to have permits that establish limits on the quantity of pollutants they can release. Today, those limits are derived in order to protect water quality -- i.e., the chemical content in the water column. Permit writers use state standards, plus information on effluent concentration, flow (the "dilution" of the waste stream that will occur once it hits the water) and patterns of mixing to calculate the level of a pollutant that is permissible in the effluent.[1]

However, it is known that pollutants present in low concentrations in the water settle onto sediment and over time accumulate in high concentrations. Sediment quality criteria should insure that clean sediments stay clean.

Once sediment quality criteria are available, they can be used like water quality criteria to back-calculate the level of pollutant discharges that can safely be made without exceeding sediment quality criteria.[2] Permit limits then can be modified to protect both water and sediment quality.

For many waters, multiple dischargers of a toxic contaminant of concern pollute waterways. In such cases, single-facility discharges cannot be analyzed in isolation. A "Total Maximum Daily (sediment) Load" (TMDL) -- the maximum daily amount of a certain pollutant that the sediment bottom can safely receive -- must be calculated. Once the TMDL for sediment is determined, that load must be allocated among all dischargers and pollutant sources from both point sources and runoff sources.

Because TMDL and load allocation calculations can be time consuming, interim protection should be provided for areas whose sediments already exceed standards. In these cases, a staged cutback or freeze at current levels or discharges should be incorporated into NPDES permits until the more precise TMDL and load allocations are available.

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1 U.S. Environmental Protection Agency (1991), "Technical Support Document for Water Quality-based Toxics Control", Office of Water, EPA 505/2-90-001.

2 U.S. Environmental Protection Agency (1991), "Pre-Draft Guidance on the Application of Sediment Quality Criteria for the Protection of Aquatic Life", Office of Science and Technology, Draft Document, Washington, D.C.

The freeze or reduction would remain in effect until an acceptable wasteload allocation could be developed.

Once the "load allocation" is established, pollution prevention strategies are implemented in addition to existing pollution prevention strategies to reduce the discharge of pollutants to the water and sediment. Although individual strategies may vary depending on site-specific factors, a TMDL should typically include the reduction of pollutants from discrete industrial, commercial, and municipal discharges, and the prevention of more diffuse sources such as contaminated stormwater runoff from urban, agricultural, and silvicultural areas. Some pollution prevention strategies include the elimination of harmful chemicals from industrial and commercial processes, and the retention of naturally vegetated areas such as wetlands to reduce the magnitude and contamination of runoff flows during rainfall.

B. Protection of pristine areas

Clean sites that have no contaminated sediments must be protected. In order to effectively protect sites that are cleaner than the sediment standards would require, the antidegradation policy of the CWA, which requires that clean waters remain uncontaminated, should be amended to clarify that it applies to sediment quality as well as water quality.

C. Evaluation of materials for dredging and disposal, and better management of contaminated materials

Every year from 350 to 450 million cubic yards of materials -- enough to fill a football field-sized pit 378 miles deep -- are dredged and disposed to keep shipping channels and harbors open. A portion of these materials is contaminated by toxic substances. Sediment quality criteria and standards would enable testing of these materials, to see which ones are "clean" and which may cause adverse effects.

Once the distinction can be made between clean and contaminated dredged materials, the focus can turn to beneficially reusing the clean materials. Comprehensive pollution prevention strategies would help by halting continuing contamination of sediments. The open water disposal of contaminated materials must be eliminated. During the time that the nation moves toward achieving that elimination, more effective sediment control and management strategies are needed to minimize damage to the environment.

The Marine Protection, Research, and Sanctuaries Act (the "MPRSA" or the "Ocean Dumping Act") should incorporate sediment quality criteria as a screening tool to determine the quality of sediments (i.e. clean, partially contaminated, contaminated) at a site where dredging is planned. Since the MPRSA forbids the ocean dumping of dredged materials that would endanger human health, the aquatic ecosystem, or the economic potential of an area, sediments that fail the sediment quality criteria cannot undergo ocean disposal. In emergency situations where no economically feasible alternative to ocean disposal is available, the Corps of Engineers may submit a waiver request to the EPA for review. Under the current law, waivers are denied only if the Agency can prove that the dumping will result in "unacceptably adverse impacts" on a waterbody (33 USC Section 1413(d)). Due to the complexity of aquatic ecosystems, it is often difficult to prove, with great certainty, "adverse impacts". Therefore, the MPRSA should be amended to require denial of waiver requests unless the Agency can prove that the dumping of materials will not result in unacceptably adverse impact. Such waivers should be contingent on the implementation of waste prevention plans, and coordination with pollution reduction and prevention plans for other sources of degradation, such as upstream sources. To further clarify the waiver process, the EPA should, with public comment and review, define those situations where no economic alternatives to ocean dumping exist.

Site management plans should be developed for designated ocean sites that receive both clean and contaminated dredge materials. These plans should include periodic monitoring using sediment quality criteria and biological effects monitoring such as assessments of community structure and function, as measurement tools. The plans should also contain mechanisms for closing the site or modifying its use if impacts are discovered.

D. Consistent standards for monitoring and ecological evaluation

For many years people have been debating the scope and degree of sediment contamination. A number of efforts have been made to evaluate the problem on a national basis, by such institutions as the National Academy of Sciences.

Thus far all the evaluators have had to develop their own yardsticks for contamination, which has made it difficult to reach definitive answers. National sediment quality criteria (either EPA guidance adopted by the States or national criteria adopted by EPA for U.S. waters) would provide a yardstick that everyone could use. It will be far easier to set up monitoring programs -- both for still-uncontaminated sites, to protect them,

and for contaminated sites, to measure progress in cleaning them up -- once criteria are in place.

E. **Standards for site cleanup/restoration**

For sediments that are already contaminated and need to be cleaned up, a mechanism is needed to determine what triggers remediation. Sediment quality standards would serve as a critical component of a set of criteria that would be used to trigger the cleanup of a contaminated site. Currently there exists little agreement or understanding of the extent to which sediments must be cleaned up for purposes of achieving a remediated site. Of course, cleanup can mean many things. It can mean implementation of pollution prevention to halt further contamination and allow natural processes to take their course. In some cases, it will mean full-scale dredging and treatment of materials. Each site will need to be evaluated individually. Used in conjunction with other factors or criteria, sediment standards will serve to trigger remediation.

Once a decision has been made, people charged with remediation need to select a cleanup goal -- a level of de-contamination that will protect human health and the environment.

The debate about "how clean is clean" will occur in sediment remediation, just as it has in ground water, surface water, and soil remediation cases.

Just as water quality criteria and drinking water Maximum Contaminant Level Goals (MCLGs) serve as measures of cleanliness under Superfund, so too should sediment quality standards (whether they are set by states or by EPA).

Concerns that these national standards, which are used to establish "no adverse effects levels," will be too difficult to meet at Superfund and other contamination sites are unfounded. Existing law already provides mechanisms for establishing a cleanup goal when these standards are unattainable. For example, under the CWA EPA has established a carefully controlled set of variance provisions for water quality criteria under which a State can apply a less protective criterion if it is not possible or appropriate, for technical, scientific, or economic reasons, to meet the State's standard at a particular site (40 CFR 131.10(g)(1)-(6)).

Under Superfund, the President can select a cleanup action that will not achieve the otherwise primary "applicable, relevant, and appropriate requirements" (ARARs) of water quality criteria if, among other things,

"compliance with such requirements is technically impracticable from an engineering perspective" (Superfund section 121(d)(4), 42 USC Section 9621(d)(4)).

Thus, a decision maker can apply a lesser standard in appropriate circumstances and sediment quality criteria -- like water quality criteria and drinking water standards -- need not be scientifically compromised to account for these circumstances.

V. Does EPA have legal authority to develop sediment quality criteria?

Yes. EPA does have authority to develop and implement sediment quality criteria. Section 101(a) of the CWA establishes a national objective of restoring and maintaining the "chemical, physical and biological integrity" of the nation's waters. In addition, section 304(a)(1) directs the Administrator to develop and publish criteria for water quality reflecting the latest scientific knowledge on (1) the kind and extent of all identifiable effects on plankton, fish, shellfish, and wildlife that may be expected from the presence of pollutants in any body of water, including ground water, and (2) the effects of pollutants on biological community diversity, productivity, and stability.

Section 304(a)(2) directs the Administrator to develop and publish information on the factors necessary for the protection and propagation of shellfish, fish, and wildlife for classes and categories of receiving waters.

EPA has developed water column criteria pursuant to its authority under section 304(a). These numerical criteria are intended to protect the chemical integrity of the aquatic resource, but, standing alone, are not adequate to protect physical and biological integrity as required by section 304(a). The EPA has recognized this deficiency, and has been developing both biological criteria (criteria based on biological assessments of natural ecosystems) and sediment criteria to complement its water column criteria. Putting water column, sediment and biological criteria in place, will provide a better mechanism for restoring and protecting our waters as mandated under sections 101(a) and 304(a).

VI. Why do we need legislation?

Since EPA already has authority to set sediment quality criteria if it wants, why is legislation needed? There are two main reasons: timing and applicability.

A. Timing

While the law clearly allows -- and requires -- EPA to develop sediment quality criteria, the agency's job would get done more quickly if Congress provided more express authorization and clearer instructions. Despite its existing mandate, in twenty years EPA has yet to promulgate a single sediment quality criterion. The CWA should be amended to specify how quickly EPA must move in developing sediment quality criteria. The law should also specify which pollutants should be given the highest priority.

As mentioned above, the law also needs to be structured so that criteria are promptly adopted by the states. Federal sediment quality criteria should become state standards automatically if, within a defined time frame, the states have not adopted their own sediment quality standards.

B. Applicability

Sediment quality criteria will protect the environment only if they are used as a basis for making regulatory decisions. The CWA and MPRSA should be amended to clarify that, once developed, these criteria will form the basis for decisions about permitting the disposal of dredged materials (i.e., what may be dumped, and where) and the discharge of pollutants.

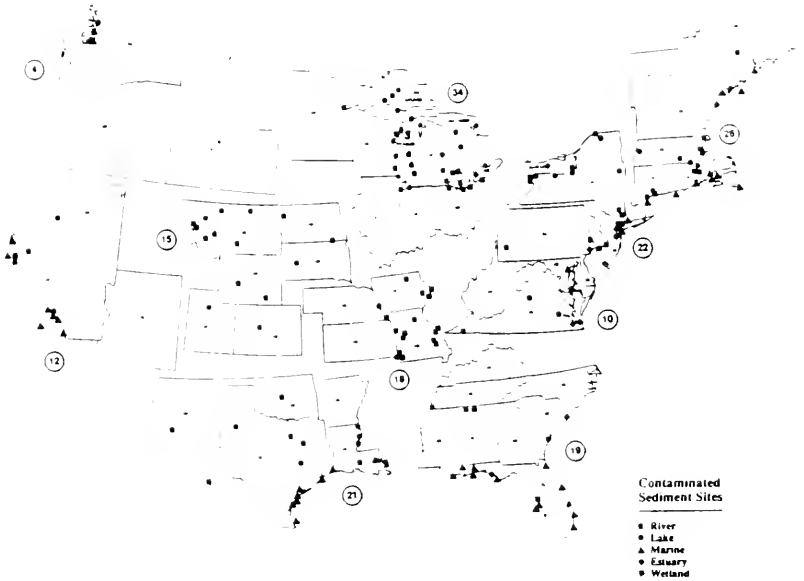
Furthermore, the law should be amended to ensure that EPA's sediment quality criteria are applicable in ocean and shared coastal waters. The CWA should be amended to establish national sediment quality criteria as well as national water quality criteria. These amendments would lay to rest once and for all the issue of "standard shopping," and would be a far more efficient and effective way to begin the national assessment and cleanup process. Of course, the law would continue to provide for the establishment of site-specific standards where scientific evidence demonstrates that such standards are appropriate.

Used with other tests such as biological assays, sediment quality criteria would play a vital role in the protection of sediment and water

quality, aquatic life, wildlife, and human health. Like water quality standards, sediment quality criteria should be used in the monitoring of ecologically sensitive areas, the protection of pristine areas, and as a basis for effluent discharge limits. Sediment criteria should also be used to trigger remediation of contaminated sites, although the nature of this remediation will be determined in part by site-specific factors. Nevertheless, it is clear that we need to distinguish between "clean" and "dirty" sediment in order to achieve the above objectives. Sediment quality criteria should enable us to make that distinction, and should ensure that sediment programs are implemented in a coherent and consistent manner.

APPENDIX

Contaminated Sediment Sites as Documented by EPA (1987).



THE CONFEDERATION OF ASSOCIATIONS
OF
ATLANTIC CHARTERBOATS & CAPTAINS
230 PARK AVENUE
SUITE 1221
NEW YORK, N.Y. 10169

TEL: (212) 867-3730
FAX: (212) 751-1384

MARCH 24,1993

THE SUB-COMMITTEE ON OCEANOGRAPHY
GULF OF MEXICO AND THE OUTER
CONTINENTAL SHELF
HOUSE ANNEX II
ROOM 575
WASHINGTON D.C. 20515

ATTENTION MR. ROBERT WHARTON:

GENTLEMEN:

I REPRESENT THE HARDWORKING MEN AND WOMEN OF THE ATLANTIC CHARTER BOAT INDUSTRY. WE HAVE 1500 VESSELS,10,000 JOBS,CONTRIBUTE OVER $300,000,000 TO THE EASTERN COSTAL STATES ECONOMIES,AND WE TAKE 5,000,000 AMERICANS FISHING A YEAR. WE ARE SORRY THAT YOU DID NOT HAVE ROOM FOR ME TO TESTIFY BEFORE THE COMMITTEE ON MARCH 30,1993 TO TAKE TESTIMONY ON THE ISSUE OF OCEAN DISPOSAL OF CONTAMINATED DREDGE MATERIALS. WE HAVE BEEN INVOLVED WITH THIS ISSUE FOR SOME TIME AND PROBABLY WILL BE THE MOST AFFECTED USER GROUP SHOULD THE DIOXIN DREDGE SPOILS BE ALLOWED TO ENTER THE FOOD CHAIN AT THE MUD DUMP SITE,SIX MILES OFF SANDY HOOK,NEW JERSEY;RIGHT IN THE MIDDLE OF ONE OF THE MOST PROLIFIC FISHING GROUNDS WE HAVE ON THE EASTERN COAST OF THE UNITED STATES.

I WOULD LIKE THE FOLLOWING TO APPEAR IN THE PUBLIC RECORD FOR THE HEARING.

PLEASE NOTE THAT I HAVE INCLUDED A NEW WAY TO DREDGE NEWARK BAY AND OTHER AREAS SO INFECTED WITH CONTAMINATED MATERIALS. WE BELIEVE THAT THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY IMMEDIATELY PUT OUT A RFP REGARDING THIS PROPOSAL SO THAT WORK TO DREDGE THE HARBOR CAN BEGIN AS QUICKLY AS POSSIBLE.

I AM ENCLOSING THE FOLLOWING:
1. MY LETTER OF MARCH 17,1993 TO ROBERT WHARTON SHOWING CREDENTIALS
2. OUR LETTER TO COLONEL YORK REGARDING OCEAN DUMPING OF CONTAMINATED DREDGE MATERIALS
3. DRAWINGS A1-A2-A3 SHOWING PROPOSED SUCTION DREDGING OF CONTAMINATED AREAS OF ANY HARBOR.

VERY TRULY YOURS,

THE CONFEDERATION OF THE ASSOCIATIONS
OF ATLANTIC CHARTER BOATS AND CAPTAINS.

THE CONFEDERATION OF ASSOCIATIONS
OF
ATLANTIC CHARTERBOATS & CAPTAINS
230 PARK AVENUE
SUITE 1221
NEW YORK, N.Y. 10169

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FAX: (212) 751-1384

MARCH 17,1993

MR. ROBERT WHARTON
SUBCOMMITTEE ON OCEANOGRAPHY
GULF OF MEXICO AND THE OUTER
CONTINENTAL SHELF
HOUSE ANNEX II
ROOM 575
WASHINGTON DC.20515

DEAR MR. WHARTON,

AS PER OUR CONVERSATION I WISH TO APPEAR BEFORE THE HEARING THE SUBCOMMITTEE WILL BE CONDUCTING ON MARCH 30,1993 IN ROOM 1334 OF THE LONGWORTH HOUSE OFFICE BUILDING AT 2:00 PM.

I AM CHAIRMAN OF THE CONFEDERATION OF THE ASSOCIATIONS OF ATLANTIC CHARTER BOATS AND CAPTAINS. WE HAVE 1500 VESSELS,10,000 JOBS,PRODUCE $300,000,000 IN AMERICAN COMMERCE,AND TAKE 5,000,000 PEOPLE FISHING A YEAR IN OUR INDUSTRY. I HAVE BEEN INVOLVED IN ALL THE RECENT MEETINGS WITH THE ARMY CORPS,THE DEC,AND THE PORT AUTHORITY. I HAVE INTERVIEWED MANY PUBLISHED SCIENTISTS ON MY RADIO PROGRAM CONCERNING THIS ISSUE. I ALSO REPRESENT THE RECREATIONAL FISHING COMMUNITY AND HAVE TWO MARINE BUSINESSES THAT ARE DIRECTLY AFFECTED BY THE PROPOSED DUMPING OFF THE SANDY HOOK SITE.

I ALSO AM VICE CHAIRMAN OF MAFAC(THE MARINE ADVISORY FISHERIES COMMITTEE) A SPECIAL ADVISOR TO THE NATIONAL MARINE FISHERY SERVICE AND AM A MEMBER OF THE ICCAT DELEGATION (THE INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNAS).THIS ISSUE DIRECTLY AFFECTS INTERNATIONAL; FISHERIES AS WELL AS DOMESTIC ONES.

I ALSO SERVE ON THE BOARDS OF THE FOLLOWING:
THE INTERNATIONAL GAMEFISH ASSOCIATION
THE BILLFISH FOUNDATION
THE NATIONAL COALITION FOR MARINE CONSERVATION
THE MARINE CONSERVATION NETWORK
I WOULD APPRECIATE THE OPPORTUNITY TO APPEAR BEFORE YOUR COMMITTEE ON THIS ISSUE.

VERY TRULY YOURS

THE CONFEDERATION OF THE ASSOCIATIONS OF ATLANTIC CHARTERBOATS AND CAPTAINS.

STEPHEN SLOAN,CHAIRMAN

FAXED 6/24/93

THE CONFEDERATION OF ASSOCIATIONS
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MARCH 23,1993

COLONEL THOMAS A YORK,
DISTRICT ENGINEER
U.S. ARMY CORPS OF ENGINEERS
JACOB JAVITS BUILDING
NEW YORK, NY. 10278-0090

RE: DEPT. OF THE ARMY PERMIT # 91-1023-OD

DEAR COLONEL YORK,

I READ WITH INTEREST YOUR LETTER OF MARCH 5,1993 TO RICHARD ROE,REGIONAL DIRECTOR,THE NATIONAL MARINE FISHERIES SERVICE (NMFS).

I RESPECTFULLY REQUEST THAT YOU CONSIDER THE FOLLOWING POINTS:

IT IS PRECISELY THE MIGRATORY NATURE OF WHALES,TURTLES AND FISHES THAT CONCERN THE FISHING COMMUNITIES OF THE EASTERN SEABOARD,AND IN FACT THE ENTIRE EASTERN AND WESTERN ATLANTIC COMMUNITY. THERE IS FULLY DOCUMENTED INFORMATION THAT OVER 30 SPECIES OF FISH DO FEED IN THE PROPOSED DUMP AREA,AND THAT MANY OF THE FISHES ARE CLASSIFIED AS HIGHLY MIGRATORY. FOR EXAMPLE:
SCHOOLS OF MACKEREL,BOTH BOSTON AND SPANISH,SCHOOLS OF WHITING IN THE WINTER,AND PODS OF JELLYFISH ACTIVELY FEED AT THE MUD DUMP SITE. THEY DEVOUR WORMS,BAY ANCHOVIES,SMALL SQUID AND SQUID SPAWN,CRABS BOTH GREEN AND BLUE,AND SAND LANCES WHICH PROLIFERATE THE AREA. SHOULD THESE SPECIES EAT AND DEVOUR INFECTED DIOXIN ANIMALS BOTH BENTHIC AND FREE SWIMMING THE ENTIRE OCEAN COULD BECOME INFECTED WITH DIOXIN LACED FISHES AND MAMMALS. A WORM OF CRAB CANNOT TELL A PREDATOR WITH A SIGN STATING "DO NOT EAT ME,I'M INFECTED WITH DIOXIN." PLEASE REMEMBER THAT FISHES EATING DAY IS 24 HOURS.

WE HAVE NOT SEEN ANY REPORT THAT THE 'DREDGED MATERIAL HAS UNDERGONE STRINGENT PHYSICAL,CHEMICAL,AND BIOLOGICAL TESTING,AND HAS BEEN DETERMINED ACCEPTABLE FOR RESTRICTED OCEAN DISPOSAL.'

WE HAVE NOT SEEN THE SPECIFICATIONS THAT WOULD 'RIGOROUSLY CONTROL THE SPECIAL CONDITIONS' OF THE PERMIT. IN FACT,ALL OF THE BRIEFINGS HAVE BEEN NOTORIOUSLY SILENT ABOUT JUST HOW LONG THE NOXIOUS MATERIAL WOULD REMAIN ON THE OCEAN FLOOR UNCAPPED.

WE DO NOT AGREE,NOR HAS THERE BEEN ANY SCIENTIFIC DATA PROVIDED TO US TO SHOW THAT A CLUMP(THE SIZE OF THE DREDGE BUCKET I

PAGE 2-

BELIEVE WAS THE PHASE) OF DIOXIN LACED DREDGE MATERIAL WOULD NOT BREAK UP UPON BEING DROPPED. NO P-RESENTATION WAS MADE OF THE FORCE OF THE IMPACT OF SUCH A CLUMP HITTING THE OCEAN FLOOR.

I HAVE CHECKED WITH THE NATIONAL MARINE FISHERIES SERVICE AND SPECIFICALLY WITH DR NANCY THOMPSON OF THE SOUTHEAST NMFS LAB,WHO IS AN ACKNOWLEDGED EXPERT ON TURTLES. DR.THOMPSON INFORMED ME THAT ALL THE MENTIONED SEA TURTLES EAT JELLYFISH AND THE RIDGLEY AND LOGGERHEADS ARE PARTICULARLY FOND OF BLUE CRABS.THE BLUE CRABS OF NEWARK BAY HAVE WELL DOCUMENTATED HIGH LEVELS OF DIOXIN. ALL THE TURTLES LIVE AND EAT IN DEPTHS OF 77 FEET OR MORE.LEATHERBACKS ARE KNOWN DEEP DIVERS. ANY OF THE THREE SPECIES CAN UTILIZE THE WATER DEPTH YOU STATED IN YOUR LETTER. TURTLES ARE SENSITIVE TO WATER TEMPERATURES AND THE FOOD AVAILABILITY. THEY ARE FOUND WHERE THERE ARE MARKED THERMOCLINES. "THEY LOVE TO FEED WHERE THE FOOD CHAIN IS STIRRED UP."

DR. TIM SMITH OF THE NMFS LAB AT WOODS HOLE INFORMED ME THAT THE RIGHT WHALES HAVE BEEN OBSERVED STANDING ON THEIR HEADS OFF NANTUCKET BURROWING IN THE MUD LOOKING FOR AMPHLIPODS,COMMONLY KNOWN AS," BUGS IN THE MUD". THE FIN AND HUMPBACK WHALES EAT HERRING,MACKERELS,AND SHRIMP. ALL FOUND IN ABUNDANCE AT THE MUD DUMP SITE.

I MUST REJECT THE SUGGESTION THAT THE ARE "NOT PRONE TO FEEDING IN THE AREA." JUST THE OPPOSITE IS TRUE AS THEY ARE IN THE AREA BECAUSE IT HAS A LOT OF FOOD. DR. SMITH STATED THAT THE WHALE HAS BEEN KNOWN TO TRAVEL INCREDIBLE DISTANCES JUST TO OBTAIN FOOD.

THE SUGGESTION THAT ANY OF THE PREY SPECIES WILL NOT SURVIVE OR RECOLONIZE AFTER THE DUMPING BEGINS IS WITHOUT SCIENTIFIC FACT OR STUDIES. MANY OF US BELIEVE THAT SUCH DUMPING WILL ONLY INCREASE THE COLONIZATION BECAUSE THE CAPPING WILL BE DELAYED UNTIL THE MOUND IS BUILT UP. NO SCIENCE HAS BEEN FORTHCOMING TO MITIGATE CIRCUMSTANCES OF WAVE ACTION AND STORMS.

COLONEL YORK,I HAVE OBSERVED YOU DURING THE MEETINGS AND FOUND THAT YOU LISTEN AND SEEM TO BE ABLE TO SIT THROUGH THE POUNDEROUS PRESENTATIONS TAKEING NOTES;AND I BELIEVE THAT YOU ARE HONESTLY TRYING TO WEIGH THE ISSUES. I ALSO REALIZE THAT THE CORPS IS UNDER FIERCE POLITICAL PRESSURES TO ISSUE THE PERMIT TO BEGIN THE DREDGING OF THE HARBOR TO MAKE ROOM FOR THE 42' DRAFT VESSELS. I SINCERELY BELIEVE THAT YOU ARE FACED WITH ONE OF THE MOST IMPORTANT CHALLENGES THAT EVER FACED A PUBLIC OFFICIAL.. I ONLY ASK THE QUESTION AND PLEAD THE CAUSE.

PAGE 3-

CAN YOU BE ABSOLUTELY CERTAIN THAT DIOXIN WILL NOT AFFECT THE TURTLES,WHALES,FISH, AND EVENTUALLY THE PUBLIC WHO MAY EAT THE INFECTED FISH? CAN YOU BE ABSOLUTELY CERTAIN,BEYOND A SHADOW OF A DOUBT,THAT WHAT IS PROPOSED IS THE BEST(NOT THE CHEAPEST OR MOST EXPEDIENT) WAY TO HANDLE THIS ISSUE? CAN YOU BE ABSOLUTELY CERTAIN THAT MURPHEY,AS IN MURPHEY'S LAW WILL NOT TAKE OVER AND BELAY THE BEST LAID PLANS OF WELL INTENDED MEN? CAN YOU BE ABSOLUTELY CERTAIN THAT NO MAN OR WOMAN WILL EVER HAVE A SLIVER OF A CHANCE TO CONTRACT CANCER OR SOME OTHER DEGENERATIVE DISEASE BECAUSE OF WHAT YOU MAY APPROVE? AND FINALLY CAN YOU BE ABSOLUTELY CERTAIN THAT WHAT IS BEING PROPOSED WILL HAVE NO EFFECT ON THE UNBORN?

I BELIEVE THERE IS A BETTER WAY. A WIN-WIN WAY. I ASK THAT I MAY BE ABLE TO PROPOSE IT TO YOU AND YOUR STAFF. I FEEL THAT MY PROPOSAL WILL PROVE THAT AMERICA IS THE VERY BEST AT WHAT SHE DOES BEST. INNOVATE,AND FACILITATE.

IT IS FOR ALL OF ABOVE AFOREMENTIONED REASONS THAT WE ASK YOU NOT TO REINSTATE,MODIFY OR GRANT THE PERMIT TO DUMP DIOXIN DREDGE MATERIALS ON ONE OF THE MOST PROLIFIC FISHING GROUNDS ON THE EASTERN SEABOARD.

IT WAS DR. ALBERT SCHWEITZER WHO SAID,"MAN CAN HARDLY EVEN RECOGNIZE THE DEVILS OF HIS OWN CREATION," BUT TO EQUALIZE SCHWEITZER,WE HAVE THE" OBLIGATION TO ENDURE GIVES US THE RIGHT TO KNOW."

IN THAT AMERICAN WAY,WE MUST KNOW,REALLY KNOW EVERYTHING BEFORE WE PERMIT THIS DEADLY MATERIAL TO BE DUMPED. LET'S FIND A BETTER WAY.

RESPECTFULLY SUBMITTED,

SINCERELY YOURS,

THE CONFEDERATION OF THE ASSOCIATIONS OF ATLANTIC CHARTERBOATS AND CAPTAINS AND THE FISHERIES DEFENSE FUND INC.

STEPHEN SLOAN,CHAIRMAN

FAX TO: RICHARD ROE/NMFS - FAX: 508/281-9371
WILLIAM W. FOX, JR.FAX: 301/713-2258
SARA CLARK/E.D.F. FAX: 212/505-2375
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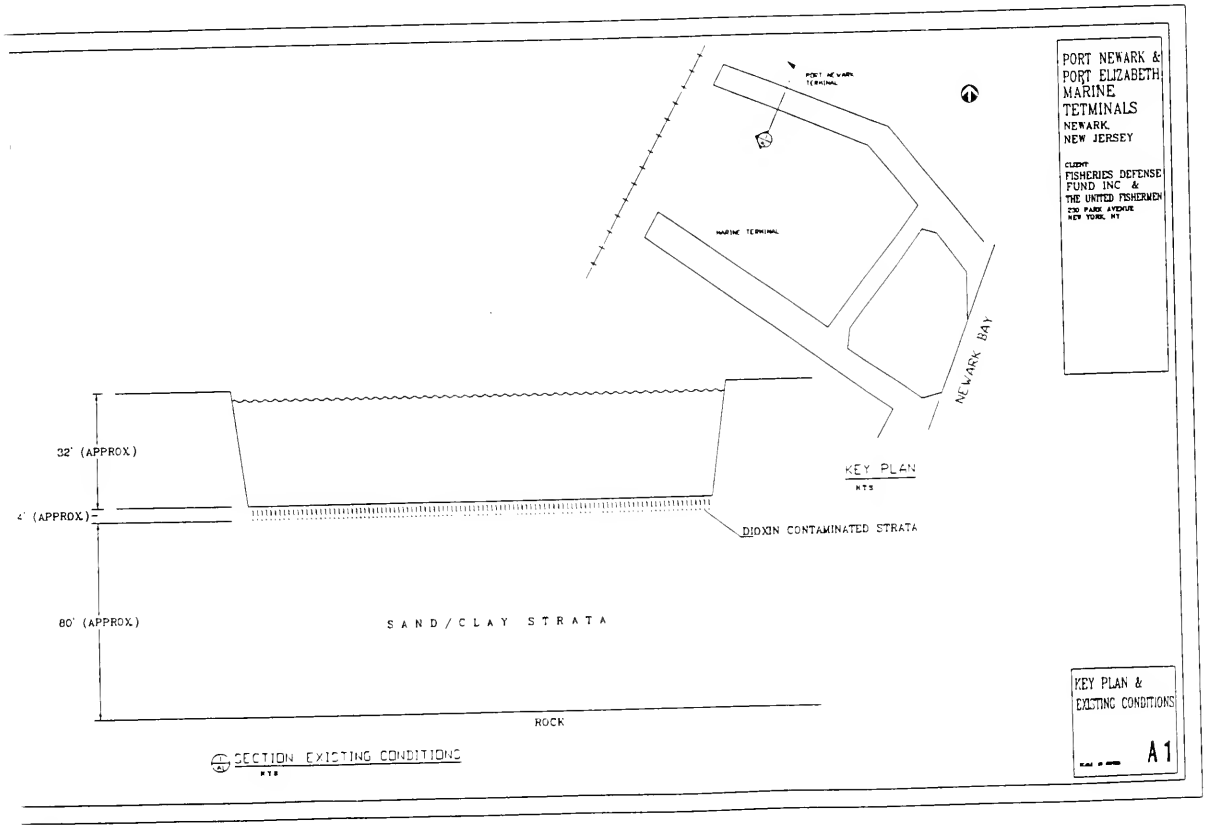
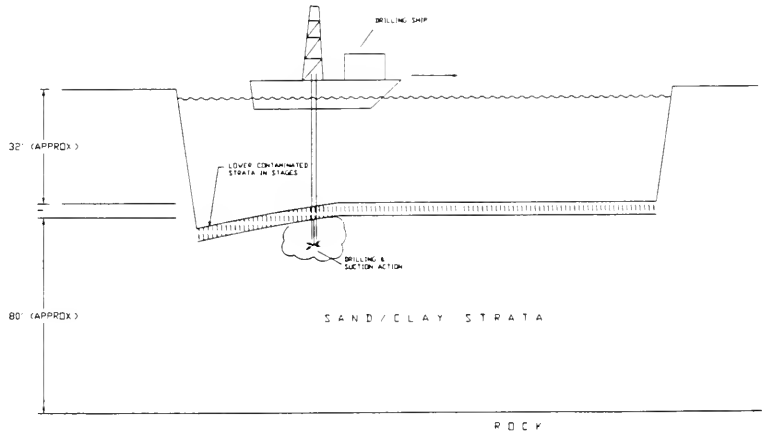
SALLY LENTZ/OCEAN ADVOCATES - FAX: 410-531-5237
SCOTT FURMAN, ESQ. 516-466-8904


PORT NEWARK & PORT ELIZABETH MARINE TETMINALS
NEWARK, NEW JERSEY
CLIENT
FISHERIES DEFENSE FUND INC &
THE UNITED FISHERMEN
230 PARK AVENUE
NEW YORK, NY
PORT NEWARK TERMINAL
MARINE TERMINAL
NEWARK BAY
KEY PLAN
NTS
32' (APPROX.)
4' (APPROX.)
80' (APPROX.)
DIOXIN CONTAMINATED STRATA
SAND / CLAY STRATA
ROCK
SECTION EXISTING CONDITIONS
NTS
KEY PLAN & EXISTING CONDITIONS
A1

PORT NEWARK &
PORT ELIZABETH
MARINE
TETMINALS
NEWARK
NEW JERSEY

CLIENT
FISHERIES DEFENSE
FUND INC &
THE UNITED FISHERMEN
220 PARK AVENUE
NEW YORK, NY



1 A1 MINING CLAY SAND LAYERS
N.T.S.

MINING OF UNDER
LAYING SAND/CLAY

A2

PORT NEWARK &
PORT ELIZABETH
MARINE
TETMINALS
NEWARK
NEW JERSEY

CLIENT
FISHERIES DEFENSE
FUND INC &
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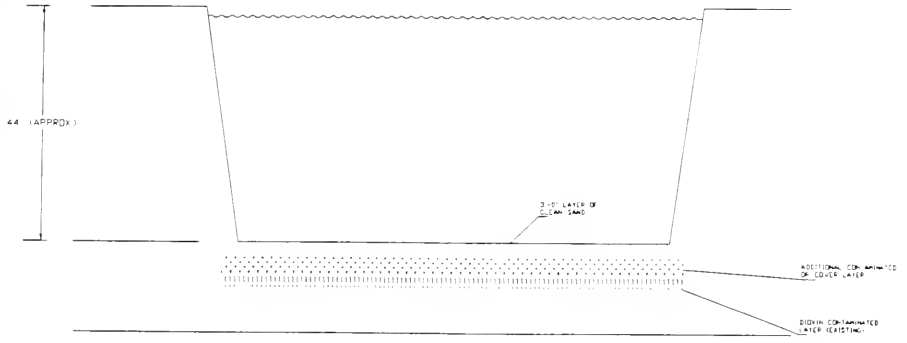
230 PARK AVENUE
NEW YORK, NY



A1 SECTION AFTER DREDGING
N.T.S.

PROFILE AFTER
DREDGING

A3

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northeast Region
One Blackburn Drive
Gloucester, MA 01930

MAR 23 1993

Colonel Thomas A. York
New York District, Corps of Engineers
Jacob. K. Javitz Federal Building
New York, N.Y. 10278-0090

Dear Colonel York:

This is in reference to your letter dated March 5, 1993, initiating Section 7 consultation concerning the dredging and disposal activities proposed by the New York/New Jersey Port Authority. Based on the information provided in your letter and other relevant data regarding potential project impacts to endangered species, we believe formal consultation is warranted. As the project is currently proposed, there is a potential for the disposal activities to directly and indirectly affect endangered whales and sea turtles that could occur at the Mud Dump Site. My staff is preparing a biological opinion that will determine whether or not these activities, taken together with cumulative effects, are likely to jeopardize the continued existence of any listed species. To complete our evaluation of the project, we require receipt of the information discussed below.

During initial discussions concerning this project, we understood that the Corps planned to include a special condition in the Department of the Army permit that required endangered species observer coverage aboard the disposal barge. We need verification that this condition is part of the proposed project. Observer coverage would eliminate potential direct affects to listed species from disposal activity. In addition, we did not receive any sediment chemistry data aside from the most recent test results of the bulk sediment analysis for the presence of dioxin. It is necessary for us to review all pertinent information concerning contaminant levels in the sediments. My staff will address indirect impacts of disposal activities on listed species, including the potential for dioxin, or any other contaminant found in the sediments, to bioaccumulate in the food chain and affect endangered species.

Please furnish additional materials to Nancy Haley of my staff as soon as possible so that we may expedite completion of our biological opinion.

Sincerely,

Richard B. Roe
Regional Director

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, NEW YORK 10278

29 MAR 1993

Colonel Thomas A. York
District Engineer
U.S. Army Corps of Engineers
New York District
26 Federal Plaza
New York, NY 10278

Dear Colonel York:

This letter is to follow up on my February 12, 1993 letter and the February 12, 1993 letter from Richard L. Caspe concerning the Corps' January 6 permit to the Port Authority of New York and New Jersey for dredging Ports Elizabeth and Newark and disposal of dredged material at the Mud Dump site. This letter also reflects the continuing discussions that have occurred between our two agencies including the Corps' North Atlantic Division (NAD).

In a March 12, 1993 letter, Ms. Lillian C. Liburdi from the Port Authority of New York and New Jersey submitted to you the results of the retesting of Reaches B, C and D. My staff and I have carefully reviewed these results and subsequent correspondence and find the results acceptable. I therefore am satisfied that the material to be dredged and disposed has been properly characterized and is suitable for ocean disposal.

Based on our conversations and our staff's conversations, I am assured that the Corps has accepted the suggested operational measures contained in the two February 12, 1993 letters and has incorporated those measures into permit conditions as appropriate. I would appreciate receiving a copy of the final permit conditions before the permit is reinstated.

As Mr. Caspe discussed with you, members of your staff, and Louis Pinata of NAD, the report, Comparison of Baseline Bathymetric Surveys: New York Mud Dump Site Dioxin Capping Monitoring Project by Science Applications International Corp. has shown significant erosion to have occurred in the time period surrounding the December 1992 nor'easter. While we note that losses of material appear not to affect past mounds, but rather areas between them, we believe the following additional controls are necessary in order to minimize the potential for adverse

affects occurring should a major coastal storm occur during the time of this dredging and disposal operation.

1. To ensure expedient capping, the final capping plan should identify all equipment needed and its availability. Extra equipment may be necessary to accomplish the task in an expedited time frame.

2. As suggested by Mr. Louis Pinata of NAD, the project should be divided into phases such that material is deposited for maximum periods of 30 days. After completion of each phase, the disposal mound would be covered by the final project cap. This would require additional bathymetric surveys.

3. To ensure that uncapped material is not subject to the dynamic force of a major coastal storm, the final capping plan should identify a source of sand material available for immediate placement in the event of the prediction of a major coastal storm and a methodology by which a protective cap could be quickly placed upon the exposed dredged material. The thickness of the cap should be maximized based upon time available and extent of exposed dredged material.

This approval is, as specified in my February 12, 1993 letter, contingent upon the Corps' completion of the necessary consultations with the National Marine Fisheries Service pursuant to the Endangered Species Act. Please advise me of how these requirements have been satisfied.

If there are any questions on these matters, please contact me at (212) 264-2525 or Mr. Richard L. Caspe, Director of the Water Management Division, at (212) 264-2513.

Sincerely,

William J. Muszynski, P.E.
Acting Regional Administrator

cc: Commissioner Thomas C. Jorling, NYSDEC
Commissioner Scott A. Weiner, NJDEPE
Lillian C. Liburdi, Port Authority of NY & NJ

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