A COMPREHENSIVE STRATEGY FOR MANAGING CONTAMINATED DREDGED MATERIALS IN THE PORT OF NEW YORK AND NEW JERSEY

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ABSTRACT

The Port of New York and New Jersey is the third largest seaport in the United States, with an estimated regional economic input in excess of $29 billion annually. There are over 250 miles of engineered waterways in the Port District, allowing deepwater navigation in a harbor that is naturally only 19 feet deep. Historically, dredged materials were disposed in water, with relatively little attention paid to environmental consequences. Unfortunately, being in the oldest industrial watershed in the country, the harbor sediments are moderately to severely contaminated with a variety of industrial pollutants and the majority are no longer considered suitable for ocean disposal. Since 1995, considerable resources have been allocated to the identification, evaluation and implementation of alternative management strategies for dredged materials in the Port of New York and New Jersey. Successful strategies include brownfield and landfill remediation, sediment decontamination and environmental manufacturing, abandoned mine reclamation, and confined aquatic disposal. Contrary to disposal, beneficial uses have the added benefit of reducing landside contamination while providing much needed construction materials and real estate. While increasing experience among both public and private sector entities has reduced costs somewhat, economic considerations are still the primary long-term concern for the Port and the search for reduced cost alternatives and strategies continues. In addition, resources have also been mobilized to evaluate the nature, extent and sources of continuing contamination of harbor sediments, and to create a plan for remediation of these sources, with the goal of making as much of the navigational dredged material ocean-quality as possible.

BACKGROUND

The Port of New York and New Jersey is situated in the metropolitan center of the Hudson Raritan Estuary complex (Figure 1). The New York / New Jersey Harbor complex is naturally shallow, with an average depth of 19 feet at low tide. The Port of NY and NJ is the largest on the East coast, and the third largest in North America, providing the region with over $29 billion in annual direct and indirect benefits. It is also the largest petroleum distribution point in the United States. Due to the Port's strategic position in regional and international trade, the Corps

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Figure 1. The New York / New Jersey Harbor and Major Navigation Channels

of Engineers has provided some 250 miles of engineered waterways at depths ranging from 20 to 45 feet. While completion of the most recent round of deepening the main shipping channels to 45 feet is not yet complete, an ambitious project to deepen the main shipping channels to 50 feet is already underway. Maintenance and improvement of these waterways, so crucial to safe navigation, requires dredging 4-6 million yd^3 of sediment, or "dredged material", annually. Unfortunately, the proximity to heavily urbanized and industrial land, coupled with historical

mismanagement of waste, has resulted in a legacy of contaminated sediments. Currently, as much as 85% of all maintenance material (newly deposited) is too contaminated for management via ocean disposal.

Historically, dredged materials from the channels and berths in the Port were dumped in the ocean. Following the London Convention, the United States Environmental Protection Agency (USEPA) directed materials suitable for ocean disposal to be placed at a 2.2 square mile area off Sandy Hook, NJ, known locally as the "Mud Dump". In 1991, the USACE and USEPA published new protocols for the evaluation of dredged material for ocean disposal (USEPA, 1991). The NY District of the USACE and the Regional office of the USEPA tested sediment from throughout the Harbor, and realized that between half and three-quarters of the material scheduled for removal would not pass the new tests. While these agencies struggled with the inevitable implementation of the new guidelines, the public stepped into the picture. In 1993, environmental groups challenged the continued use of the Mud Dump in court, bringing ocean disposal and dredging in the Harbor to a standstill.

CRISIS MANAGEMENT

The inability to dredge threatened the maritime industry and the continued viability of the Port. In response the States of New Jersey and New York, the U.S. Army Corps of Engineers (Corps) and the Port Authority of New York and New Jersey (PANY/NJ) mobilized resources to the crisis. The State of New Jersey, under the direction of then Governor Christine Todd Whitman, formed a team of New Jersey stakeholders (the Governor's Task Force) to examine the problem and recommend a course of action. The Corps and USEPA formed the Dredged Materials Forum under the auspices of the NY/NJ Harbor Estuary Program to obtain input from a wider range of stakeholders. The Forum examined various technical aspects of the issue including the future management of the Mud Dump, evaluated alternative management strategies and techniques, and considered pollution reduction strategies for sediments. In the meantime, the Port was contending with channels and berths that had to either be dredged or closed, forcing managers into accepting whatever the market had available. Disposal costs of $5-10 per yard skyrocketed to over $100 per yard, practically overnight.

Given the economic pressure and the inexorable sedimentation, the stakeholders did not debate long on a dredged material management strategy. The *Joint Dredging Plan for the Port of New York & New Jersey* was completed in 1996. The Plan recommended specific actions to be undertaken by the two States to resolve the crisis and provide stability for the maritime industry with regards to navigation in the Harbor. Suggested actions included: development of an upland beneficial use program, evaluation of decontamination technologies, development of confined disposal facilities, investigation of alternative technologies, development of a regional dredged material management plan, an increased role for the Harbor Estuary Program in the evaluation and management of contaminated sediments, and dredging of critical projects. The Port Authority of NY and NJ (PANY/NJ) pledged $130 million to the implementation of this plan and Governors Whitman and Pataki signed it on October 7, 1996. Also in 1996, the New Jersey Legislature signed into law the Harbor Revitalization and Dredging Bond Act of 1996 pledging another $205 million to implement aspects of the plan not covered by the Port Authority funds and to provide money to support increased dredging costs for critical projects.

In order to implement the Joint Plan and oversee Bond Act projects, then Governor Christine Todd Whitman created New Jersey Maritime Resources, (NJMR was originally an office of the Department of Commerce, but it was subsequently moved to the Department of Transportation). The NJ Dept. of Environmental Protection drafted and implemented a new dredging manual for State waters and set up a new office (the Office of Dredging and Sediment Technology) to centralize dredging permits and to regulate the new upland beneficial use program. New York appointed a special assistant to the commissioner for dredging issues, but left the administration of the Joint Plan to existing staff of the Empire State Development Corporation.

The innovative management of contaminated dredged materials required a regulatory paradigm that was both sensitive to the need to dredge, and at the same time ensured that one problem was not being traded for another. Under the leadership of the NJ Department of Environmental Protection, a new regulatory framework was developed to manage dredging projects statewide. A panel of internal experts with knowledge of various environmental media (e.g. biology, surface water quality, groundwater quality, site remediation, risk assessment etc.) was assembled to discuss how the new programs should be regulated. This effort resulted in a manual, the *Management and Regulation of Dredging Activities and Dredged Material in New Jersey's Tidal Waters* (NJDEP, 1997). Not only does the manual discuss the final placement of dredged material, but also how dredging projects are sampled, monitored, and conducted in various regions of the State (Figure 2). Perhaps the most innovative part of the program was how the beneficial use of dredged material would be permitted. Borrowing from the existing paradigm of a Beneficial Use Determination for solid waste, the State permits use of dredged material based on the nature of the material and the environmental controls and intended use of the placement site. Upon a finding that a proposed use for dredged material is protective of human health and the environment, an Acceptable Use Determination is issued for both the processing facility and the placement site. Each placement site also has its own restrictions for characteristics of acceptable material based on future use, existing conditions, and engineering/institutional controls (if any). All these aspects are regulated through the Office of Dredging and Sediment Technology in the Site Remediation Program.

SHORT TERM SOLUTIONS

In 1997 the first actions under the plan were initiated. First, the Mud Dump was de-authorized, and a 19 square mile area around the site was designated the Historic Area Remediation Site (HARS). The HARS would be capped using clean dredged material, meeting the strict criteria of "remediation material". Remediation material is defined as material that "does not cause significant undesirable effects including through bioaccumulation". These criteria essentially limited remediation material to dredged material meeting Category I standards (no measurable toxicity and no unacceptable bioaccumulation as per USACE, 1992). The re-designation of the HARS provided a management solution for an estimated 40 million yd^3 of "clean" dredged material. However, this restriction prevented nearly half of all dredged material (2-4 million yd^3 annually) and 85% of all maintenance material from the Harbor from being placed in the ocean.

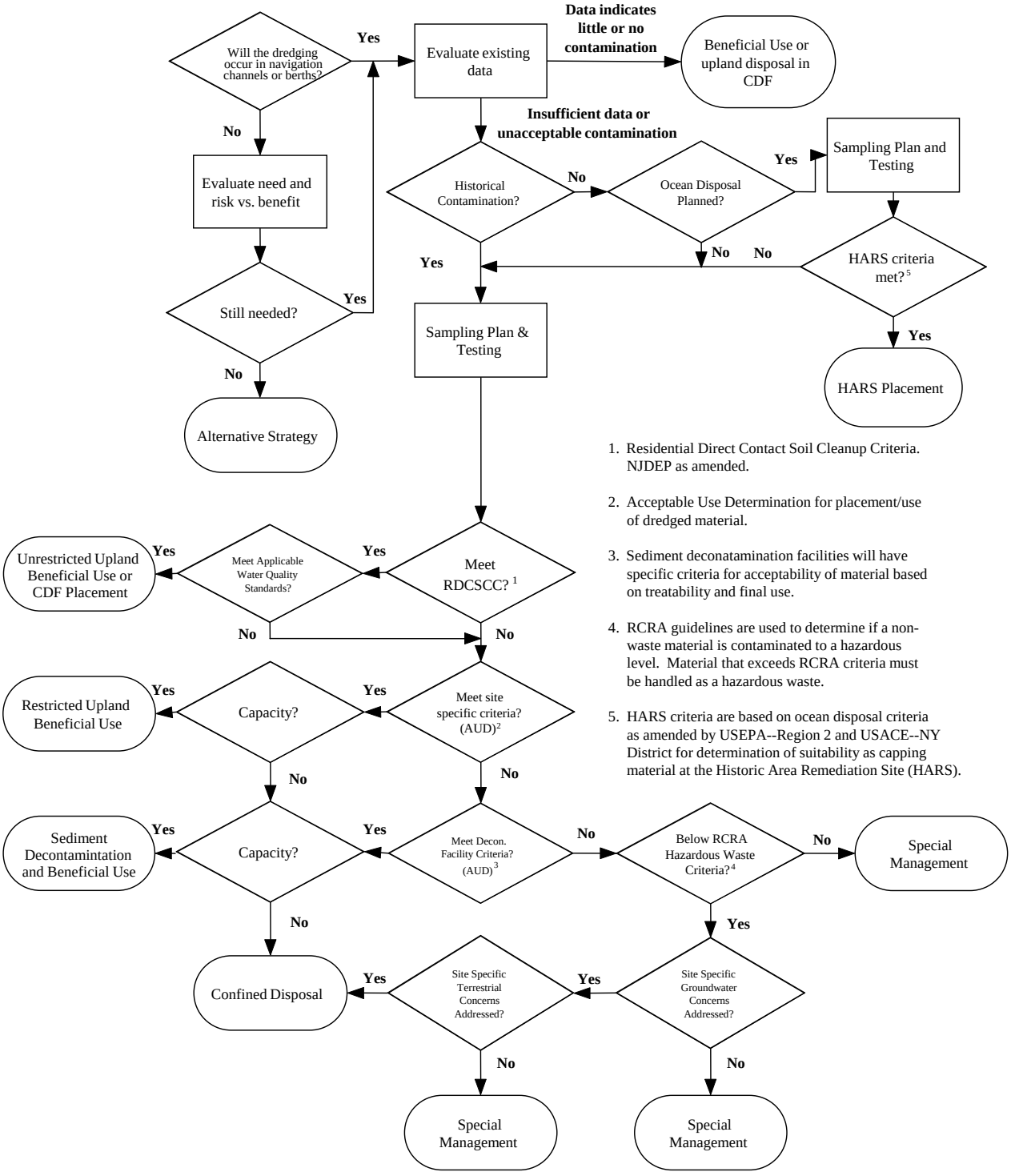

Figure 2. Flowchart for managing dredging projects in New Jersey.

The material of concern, unfortunately, was concentrated in the approach channels to the main shipping berths and petroleum terminals. The Port Authority was able to move dredged material upland and cross-country to a landfill in Utah, but at a cost of over $118 per yard. Economically viable alternatives were needed immediately.

The first project of the program to manage dredged material determined to be unsuitable for placement at the HARS was to build a confined aquatic disposal facility in Newark Bay. Extensive surveys of the Bay were performed to find a site that would be cost effective and environmentally acceptable. With speed that belied what would normally be a highly controversial project, a site was selected, permit applications filed and approved, and the facility constructed all in little more than a year. Over 1.4 million yd^3 of material were excavated from a 17-acre area in about five feet of water in Newark Bay. The moderately contaminated surface sediments excavated from the pit were some of the last approved for ocean disposal prior to the closure of the Mud Dump and the designation of the Historic Area Remediation Site (HARS). The clean clay excavated from the 70-foot deep pit was used to cap the moderately contaminated surface sediments at the Mud Dump. A detailed management plan for the Newark Bay Confined Disposal Facility (NBCDF) was developed and implemented by the PANY/NJ. The facility was available for use in October of 1997.

Use of the Newark Bay Confined Disposal Facility is necessarily restricted. First, dredging projects are required to show that the material is unacceptable for use in capping the HARS (i.e. that they are contaminated), but that they do not possess hazardous characteristics prior to being permitted for placement at the NBCDF. In addition, only those projects in New Jersey and shared waters from Liberty State Park south to the Kill van Kull, the entire Kill van Kull and Arthur Kill, and Newark Bay north to the mouth of the Passaic and Hackensack Rivers (the draw area), were considered eligible to use the facility. Third, only dredged material with no alternative placement site are eligible for placement in the NBCDF.

The cost for disposal at the NBCDF was set at $29 per yd^3 to recover costs of construction, monitoring and closure (up front costs were shared by the New Jersey and PANY/NJ). Monitoring during disposal events has demonstrated that material does not escape the confines of the facility, due to the bottom dumping scows discharging material below the rim of the pit. To date, over 1 million yards have been successfully placed in the NBCDF, including emergency dredging projects required to facilitate the removal of debris from the collapse of the World Trade Center (outside of the draw area).

INTERMEDIATE TERM SOLUTIONS

The private sector also had a significant role to play. A Danish development company was working to redevelop a brownfield site just south of the Port Newark/Elizabeth complex on Newark Bay. The site is about 185 acres in size and was an old municipal landfill for the City of Elizabeth that had never been properly closed and had been used as a dumping ground for years. The Dutch firm, OENJ Corporation, proposed to utilize dredged material amended with Portland cement for the grading, filling and capping required for the remediation of the landfill. Amending dredged material with Portland cement yields three benefits: it binds contaminants to the sediment particles, it removes excess water and it improves the structural characteristics of

the silt and clay particles. In keeping with the Joint Plan, a demonstration of the amendment technology was approved. Between 1997 and 1998 over 800,000 yd^3 of dredged materials were placed on the site, and eventually covered with Macadam (a high load bearing capacity pavement) for a parking lot. The site is now the home of the Jersey Gardens Mall, and the redevelopment was awarded the Phoenix award at the annual Brownfields conference in 2001. As the first upland beneficial use project in the State, many lessons were learned. One of the most important lessons learned at Elizabeth was that it is exceedingly difficult to slurry dredged material and pump it to a pug mill because of excessive amounts of debris in the sediments dredged from some parts of the Harbor.

Similar projects have since been undertaken in Kearny and Bayonne and are now in various stages of completion. To date over 3,000,000 yd^3 of dredged materials have been placed on brownfield sites in the harbor complex, with an additional 9 million yd^3 either permitted or soon to be permitted. Long-range projections indicate that at least another 10-15 million yd^3 of capacity could be permitted as needed. Project costs for amending and placing dredged material have ranged from $38 to $56 per yd^3, including dredging. Assuming a dredging cost of $8-12 per yd^3 brings the cost of upland placement to $30-$48 per yd^3. Prices continue to drop with each new bid.

As with the Elizabeth Landfill project, the learning curve continues to be steep. To process and place material efficiently in upland beneficial use applications dredged material must be de-watered and screened to remove debris. In-barge processing appears to offer production advantages over pug mill processing. Pug mill operations are able to process about 5,000 yd^3 in a ten hour shift. In-barge processing can generally handle 8,000 - 9,000 yd^3 in a ten-hour shift. In-barge processing involves the use of a mixing head on a long reach excavator with Portland cement injected pneumatically at the head. This process avoids difficulties associated with dredged material sticking to the elevator buckets on a pug mill, and is generally more tolerant of debris that would clog the mixing augers in a pug mill. On the other hand the mixing head is extremely vulnerable to chains, cables and rope in the dredged material. Once wrapped around the mixing head these items tend to burn out the mixing heads at a cost of $120,000 each. So screening of material remains important with in-barge processing although the level of precision required is reduced. In either case redundancy in processing equipment is essential to keep material moving in the event of a mechanical failure. If material is processed at a site other than the placement site, in-barge processing can also reduce handling and transportation costs provided the placement site also has water access. Lastly, the placement site must be large enough to accommodate drying of material for three to seven days until it dries enough to be worked. In order to allow efficient lay-down of material (5,000 yd^3 per day) a minimum of 40 acres is required.

Perhaps most important to the success of upland beneficial use of dredged material is the ability and willingness of the dredger and the processor to work together. The inability of dredging companies and upland purveyors to work together has resulted in unrealistically high bids, contentious bid disputes, and contract damage claims by dredging firms. Disagreements over production rates, the volume of material delivered, damage to scows during off loading, screening and dewatering all lead to increasing difficulty and costs. If these entities work together they could match equipment to achieve the greatest economy of operation. For

example, the dredge production capacity must mirror the processing capacity or one end of the operation cannot operate efficiently. Operating days and maintenance schedules need to be comparable or storage of scows needs to be provided. Access channels to placement sites need to be sized adequately to receive the scows. Scow sizes need to be large enough to minimize marshalling and the amount of material left in the scow relative to the removed volume, but not so large that they exceed the reach of the off-loading equipment.

The largest potential capacity for amended dredged materials exists outside of the Port district, in abandoned coalmines in Pennsylvania. The State of Pennsylvania has reported that over 2,400 miles of freshwater streams and rivers are impacted by acid mine runoff and drainage from abandoned strip and deep-hole mines. The USEPA has mandated that Pennsylvania remediate the mines. It is a daunting task, made more difficult by lack of funds. While those mines opened after 1972 have closure funds, the remaining mines do not. It is these "orphaned" mines that require innovative funding and technologies to close. Some of these mines are so large that a single mine could easily hold over 30 million yd^3 of amended dredged material (ADM). Since 1998, New Jersey has funded the processing and placement of over 300,000 yd^3 of ADM at a research facility in central Pennsylvania designed to evaluate the use of ADM in mine closure. While the project has been an unmitigated success, garnering praise from state and local officials, the rail transport of ADM to central Pennsylvania has been very costly, bringing project costs up to as high as \$85 per yd^3. However, these costs are typical for a demonstration level project. As of the printing of this paper, the PADEP has completed a small pilot project in eastern Pennsylvania, opening the door to sites within an hour or two of the Port District. It has been claimed by local dredged material handlers that opening these sites to dredged materials will be in a cost range competitive with more local alternatives. These abandoned anthracite surface mines are typically capable of containing tens of millions of cubic yards of processed dredged material. Additional information on the PA Mines program is available at www.dep.state.pa.us/dep/deputate/minres/bamr/bark_camp/barkhomepage.htm.

Other projects have been conducted to examine the use of ADM in transportation projects, unique amending agents for ADM, and the use of ADM as landfill daily cover. All of these contain potential to augment or improve the efficiency of the existing programs but have not progressed to the point of demonstration level projects. Additional information on these projects is available at www.state.nj.us/transportation/maritime.

LONG RANGE PLANNING

Sustainable commercial use of the NY Harbor requires that dredged material management be cost effective and predictable. The State of New Jersey is looking for long term capacity solutions for the future. The State is also seeking ways to lower dredged material management costs through improving the efficiency of beneficial use, environmental manufacturing, and by increasing our understanding of the nature of dredged materials in the Harbor. Given the economic potential of the Port and the desire on the part of the PANY/NJ to expand, identifying and implementing long term solutions for dredged materials management is one of the region's highest priorities.

The first step in long range planning is to craft a plan. The NY District of the Army Corps of Engineers is responsible for developing a regional dredged materials management plan. In a cooperative atmosphere, representatives from various agencies of both States, the USEPA, the Port Authority and the NY District began developing a regional dredged material management plan (DMMP) in 1997. The projected amounts of material to be dredged on a yearly basis were identified for the next 4 decades and specific sites and options for management, as well as their costs were identified. Along with each potential option, the status and desirability is ranked, allowing the reader to understand which options are to be implemented and when. The DMMP had to plan for the removal and management of over 240 million yd^3 over the next 40 years . Due to the uncertainty in the out years of the planning horizon, a Programmatic Environmental Impact Statement was prepared on the concepts of beneficial use, near-shore disposal and sediment decontamination. Overall, the DMMP can be summarized as providing a roadmap to: reduce the need to dredge (sediment reduction), reduce contamination (source control), maximize beneficial use, and dispose of only what cannot be used (USACE, 1999).

Ultimately, the long-term solution to managing dredged material will rely on the concept of watershed management. The main initiatives under watershed management are to reduce the amount of sediment and contaminants entering the State's waterways. The States of NY and NJ have already committed some $25 million to the Contaminant Assessment and Reduction Project (CARP). This program was developed to encourage bi-state cooperation to develop a baseline of the condition of harbor sediments and water quality, to track down sources of contaminants and to recommend additional controls and remedial actions on the region's landfills, brownfields, and contaminated sites. Regional cooperation in this effort is ensured by its inclusion in both the Comprehensive Conservation and Management Plan for the NY/NJ Harbor Estuary Program (USEPA, 1996) and the DMMP. This, combined with the requirement to improve water quality through the Total Maximum Daily Loads (TMDL) program, will ultimately mean there will be less material that needs to be dredged and that the material that remains will become cleaner over time. The regional DMMP predicts that a realistic program of source control and sediment reduction will result in a significant reduction in the amount of dredged material requiring special management. If these goals are met, the potential savings in navigational dredging costs alone could easily exceed one billion dollars (USACE, 1999). For more information on CARP visit the Hudson River Foundation website at www.hudsonriver.org.

Perhaps the most intriguing problem encountered in the planning process was the issue of capacity. No matter how successful pollution and sediment control programs are, there will always be a need to maintain and improve the navigational network. Heavy reliance on near shore disposal and beneficial use for remediation will only be feasible for a finite amount of time. At some point, all the available sites will be used up. Of course, this is not true for the mine reclamation strategy discussed previously. Given the potential for over a billion yd^3 of capacity in Pennsylvania, this solution alone could solve the problem. However the region cannot rely on a single, as yet unproven, solution.

Historically, the region has viewed dredged material as a nuisance at best and as a liability at worst. Over the past eight years we have shown that dredged material, with its value augmented by the economic engine of the Port, can and should be viewed as a resource. We are taking this concept to the next step using the concept of environmental manufacturing. What began as

sediment decontamination technologies under the auspices of the USEPA, has begun to show potential as an innovative construction materials manufacturing industry. Sediment decontamination technologies like soil washing or thermal destruction, given the proper permanency and economy of scale, are potential users of large quantities of dredged material. The region has encouraged the development of technology that results in the production of a value-added product such as blended cement, lightweight aggregate, high quality building materials, or topsoil (Jones *et al*., 2001). While the costs for processing can be as high or higher than any of the other technologies currently used, economies of scale and economic value of the end products can make them economically viable for navigational dredged material. Because environmental manufacturing views the dredged material as raw feed material, the capacity is essentially endless. The region is convinced that this environmental manufacturing should be part of the region's long range plan and has committed over $40 million in State and Federal funds to evaluate and encourage environmental manufacturing featuring sediment decontamination in the region. Additional information, as well as project specific reports is available at www.wrdadcon.bnl.gov.

CHALLENGES TO IMPLEMENTATION

Despite the enormous efforts of both government and industry, implementation of these innovative programs has not always been smooth. Dredged material in the Port is mostly silt and clay with large amounts of organic matter. The resulting "black mayonnaise" is difficult and expensive to handle requiring a long learning curve for the processing plant personnel. In addition, the contaminant concentrations require the use of no-barge overflow and environmental bucket dredging techniques that further complicate the process by increasing water content. Dewatering the material prior to off-loading, as well as debris management (everything from scrap metal to shopping carts to cars), has resulted in significantly lower processing rates than are experienced for in-water disposal techniques. Other complicating factors are the reduced ability to process material in the winter months and dredging restrictions resulting from local interpretation of the Magnusen-Stevens Act (Essential Fish Habitat). The result has been higher costs for projects than planned, time delays for contract award and completion, as well as anxiety regarding responsibility for the costs associated with delays.

Perhaps most critical to the success of the program are efforts to reduce the risk assumed by our private partners. Often proposed placement sites (brownfields and landfills) require the installation of expensive engineering controls to remedy existing contamination. These types of cleanups are often voluntary, and as such the entity doing the work needs the assurance that dredged material will be available to facilitate the closure and the restoration of the site to economic use. Unfortunately, the contracting procedures utilized by the Corps of Engineers have not been easily adapted to improve the continuity of dredged material availability nor to be flexible during start up difficulties. As a result one of the upland placement sites went bankrupt, and a second was forced to accept alternative materials, thereby losing valuable capacity for dredged material. Consequently, when placement sites are needed few upland options have been available resulting in little competition and correspondingly high processing and placement prices. Modifications to the administrative process and procedures in the contracting of dredging are needed to reduce the risk and ensure a constant supply of dredged material.

Similarly, decontamination technologies relying on dredged material as a substitute raw material in a manufacturing process require huge infusions of capital. Before the private sector will invest the large sums of money needed to fund these technologies, a business model that will allow them to recover these expenditures over time is required. That risk associated with, and the success of, the business model will depend upon a reliable source of raw materials, in this case dredged material. Without reasonable assurances of raw material supply, investment in these technologies will not be forthcoming.

To avoid this "feast or famine" premium, the supply of dredged material needs to be made more constant and reliable. This will likely require a change in the contracting procedures of the Corps and PANY/NJ. One thought would be to let an on-call dredging contract with a minimum annual volume of non-HARS material to be removed, processed and placed. The contract would also establish daily maximums (*e.g.* 5,000 yd^3 per day for 200 operating days for a total annual volume of 1 million yd^3). The successful contract vendor could then be directed to remove maintenance material where needed, either to clean off an area in advance of a deepening or typical channel and berth maintenance. To reduce the cost further the contract could specify a minimum amount of material to be removed from any one location, thus reducing mobilization and demobilization uncertainty. This may also require changes in the appropriations language as necessary to provide the Corps and the PANY/NJ the flexibility to direct the dredger where the need is greatest. Present project specific appropriations do not afford this flexibility.

The reward for increasing certainty in dredged material availability is anticipated cost savings from increased competition and new "value added" technologies. However, despite these cost savings it is doubtful that the price of upland beneficial uses of dredged material will be competitive with the pre-1993 costs of ocean disposal. These increased costs must be balanced against the benefits derived from the beneficial use of the dredged material. The beneficial use of dredged material, as described, results in reduced environmental exposure to contaminants of concern, by remediating sites that currently impact water quality and biota and by the removal of contaminated sediments from the waterways themselves. Without the income incentive offered by using dredged material to offset associated costs of environmental controls (*e.g.* slurry walls, or leachate collection systems) these sites would not likely be remediated in the near future. Therefore, the beneficial use of dredged material for these applications has the added benefit of reducing environmental exposure to the contaminants existing on these sites. Once remediated, there is a further benefit associated with returning these sites to productive uses, particularly in the stressed urban areas where they frequently occur. This is fully consistent with the intent of New Jersey's coastal zone management and brownfield programs, which have major objectives of reducing pollution by cleaning up contaminated sites, concentrating development in appropriate areas and revitalizing urban waterfronts. Conceptually, the development accommodated on these sites will not need to be located on other sites containing productive habitats. At the State's request, the U.S. Army Corps of Engineers has recently agreed to undertake a study of these benefits under section 207 of the Water Resources Development Act. This study may result in a formal recognition of these benefits in real dollars and enable greater cost sharing with federal funds.

In a state as densely populated as New Jersey, competition for access to and preservation of our maritime resources will always be intense – the challenge is to craft a balance among interests.

One firm step forward toward this end is to manage dredged materials as a resource not a waste. All factors in the maritime equation benefit from such an approach. Beneficial uses for dredge material exist and need to be promoted. These beneficial uses not only ensure a renewable capacity for managing dredged material, but also result in other significant environmental and socio-economic benefits. These benefits have not been lost on either the commercial or environmental community. Over the last several years, the Corps, the PANY/NJ, the States, and various environmental groups have come to realize that they need each other in order to reverse the impacts of over 150 years of environmental mismanagement. In a recent rededication ceremony for the Harbor Estuary Program, the stakeholders unanimously agreed that the future of the Port of NY and NJ is tied to the environmental health of the Harbor and committed themselves to striving for fishable, swimmable and navigable waters resulting in a World Class Estuary. It is in these kinds of partnerships that the future of dredging lies for the NY/NJ Harbor.

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