

**ATTACHMENT V**  
**BIOSOLIDS, MEDICAL WASTE AND DREDGE SPOILS MANAGEMENT**

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# **BIOSOLIDS, MEDICAL WASTE AND DREDGE SPOILS MANAGEMENT**

## **1.0 BIOSOLIDS**

Biosolids are defined as the solid organic matter recovered from the sewage treatment process. The City produces approximately 1,200 wet tons (300 dry tons) of biosolids every day. After ocean disposal of biosolids was banned in 1988, the City was required to find alternative land-based use for this material. All of the terms of the previous Consent Order entered into with the NYSDEC to comply with the requirements of 6 NYCRR Part 360 were satisfied in July 1998 with the implementation of the long-term program described herein. Recognizing the value of biosolids and that they are safe when used according to regulations, the New York City Department of Environmental Protection (NYCDEP), implemented a program to beneficially use biosolids. Today, 100% of the City's biosolids are processed for beneficial use and result in products that fertilize crops and improve soil conditions for plant growth.

### **1.1 City Biosolids Beneficial Use Program**

Biosolids and products derived from biosolids are valuable resources that contain nutrients essential to plant growth. The use of biosolids products reduces agricultural use of chemical fertilizers. Application of biosolids increases soil productivity by improving soil texture, stimulating root growth and increasing water-holding capacity. Further, plants grown in soils where biosolids have been applied are more resistant to disease and drought conditions.

The City's biosolids are managed through the use of short-term (3-year) contracts and long-term (15-year) contracts. This mix provides for a very efficient program which NYCDEP anticipates that it will continue to pursue over the planning period; the biosolids program provides for the stability of long-term contracts with well developed markets and the cost effectiveness of short-term contracts that can respond to emerging market opportunities.

NYCDEP's current biosolids contracts involve the land application of biosolids and/or biosolids conversion into products such as compost, liming agents or pellets. Through processes, discussed below, 100% of the City's biosolids are prepared for beneficial use. All of these processes meet

or exceed all federal, state and local regulations for the control of contaminants and the destruction of disease causing organisms. The results are products that are easy to handle and have characteristics similar to many agricultural processes.

### 1.1.1 Land Application

Approximately 8% of the City's biosolids are spread on land to return nutrients to the soil directly. Biosolids are spread less than one-quarter-inch thick and sometimes are plowed into the soil. When necessary, biosolids material undergoes a lime stabilization process prior to land applying the material. Pursuant to a 15 year contract expiring in 2013 with R. J. Longo Construction Co., Inc, - Environmental Protection and Improvement Control, Inc. (EPIC) A Synagro Company, the biosolids material is transported via railroad for direct land application to corn crops and grazing land in Virginia and to wheat crops and grazing land in Colorado. EPIC's contract also provides for the liming of biosolids materials at a Colorado facility prior to land application, as necessary (see Section 1.1.4 for further discussion of alkaline treatment). EPIC's contracted allocation is between 225 and 510 wet tons per day. NYCDEP allocates approximately 24% of the City's production to EPIC at a cost of \$14,000,000 annually, depending on production.

### 1.1.2 Thermal Drying

Approximately 51% of the City's biosolids are heated to dry the material and reduce pathogens. Fertilizer pellets are formed during the process. City biosolids are made into pellets at a facility through a 15-year contract with New York Organic Fertilizer Company (NYOFCO), A Synagro Company, in the Hunts Point section of the Bronx. NYOFCO's contracted biosolids allocation is between 510 and 825 wet tons per day and the contract cost is, on average, about \$32,000,000, annually. The NYOFCO contract expires in 2013.

These pellets can be used directly on the land or mixed with other materials to make special fertilizer blends. Pellets from the NYOFCO facility are sold nationwide. They are used primarily in Florida's citrus groves and, in the past, NYCDOT has used them in highway beautification projects around the City.

### 1.1.3 Composting

Approximately 10% of the City's biosolids are composted. To compost the biosolids, they are mixed with a bulking agent, such as wood chips. The bulking agent allows more oxygen to penetrate the mixture, providing an ideal environment for decomposition. The resulting compost product is similar to peat moss and used as mulch or soil conditioner at golf courses, nurseries, home gardens, lawns, etc. NYCDEP has contracted with Tully Environmental Co., Inc. (Tully) for biosolids (dewatered sludge) composting at the truck-fed Natural Soils Products facility in Good Springs, Pennsylvania. Tully's contracted allocation is between 75 and 150 wet tons per day. The cost of this contract is approximately \$3,400,000 annually depending on production. Under the contract's terms, the City may use up to ten (10) percent of the Contractor's compost product for community outreach, public participation and public education efforts and projects within New York City, at no additional cost to the City. The product has been used at Port Richmond, Tallman Island and Ward's Island Wastewater Treatment Plants, as well as at the Queens Botanical Gardens and the Randall's Island Sports Complex. This is a 3 year contract that expires in 2007.

### 1.1.4 Alkaline Treatment

Approximately 31% of the City's biosolids are mixed with a highly alkaline material, such as lime or Portland cement, and is subjected to high temperature. This process results in a product which resembles soil and is used as an agricultural liming agent. The City's biosolids are alkaline treated at a facility in Colorado through a 3-year contract (with a one year renewal) entered into in 2005 with R. J. Longo Construction Co., Inc. - Environmental Protection and Improvement Control, Inc. (EPIC) A Synagro Company. EPIC's contracted allocation is between 150 and 300 wet tons per day. The cost of the EPIC contract is approximately \$7,900,000 annually, depending on production.

NYCDEP has also entered in a 15-year contract that expires in 2013 with a Tully and Hydropress Environmental Services, Inc. Joint Venture for regional alkaline stabilization and for backup composting facility services in Good Springs, Pennsylvania. The Tully/Hydropress Joint Venture

contracted allocation is between 100 and 200 wet tons per day, based on monthly averages. The cost of the Tully/Hydropress Joint Venture contract is approximately \$2,900,000, annually, depending on production. The Tully/Hydropress Joint Venture products are beneficially used for land application with a possibility for energy production.

## **2.0 MEDICAL WASTE MANAGEMENT**

Medical waste includes all waste generated by licensed health services providers, including, but not limited to, voluntary and proprietary hospitals, residential health care facilities, diagnostic and treatment centers, clinical laboratories, walk-in clinics, and physicians' and dentists' offices. This waste stream includes: (1) pathological and infectious waste defined in state and federal regulations as Regulated Medical Waste (RMW), also known as red-bag waste; and (2) other solid waste generated by health service providers, which is similar in composition to commercial and institutional waste, i.e., Non-Regulated Medical Waste, known as black-bag waste. In addition, certain materials generated within the New York City Health and Hospitals Corporation (HHC) are recycled, as discussed in Section 2.1.

RMW definitions are contained in 42 U.S.C. 6992 et seq., and 40 CFR part 259, New York State Environmental Conservation Law 27-1501 et seq., and Public Health Law 1389 and et seq., and regulations thereunder, and in the New York City Administrative Code Section 16-120.1 and DSNY Rules there under (Local Law 57 of 1985, as amended, banned the disposal of black-bag waste at City landfills and Local Law 75 of 1989 required medical waste generators to file disposal plans). In addition, federal, state and local laws, including those cited above, address unique medical waste management issues associated with red-bag and black-bag waste. This regulatory framework establishes requirements that are applicable to the containment, transport and disposal of both types of waste.

The City's red- and black-bag waste is managed and enforced pursuant to this regulatory framework, as follows:

1. Licensed private vendors are responsible to collect and dispose of all red-bag waste and the majority of black-bag waste from the City's health services providers. The DSNY collects black-bag waste from small-quantity generators only (medical/dental offices in residential buildings) pursuant to DSNY Rules.
2. The Department provides collection services for source separated recyclables generated by the (HHC and other not-for-profit health service providers).
3. Local Law 75 of 1989 requires that generators of RMW dispose of it separately from black-bag waste. To ensure the separation and proper disposal of RMW, medical waste generators are required to file medical waste removal plans on an annual basis with the DSNY's Environmental Police Unit (EPU). The EPU also conducts physical inspections of all facilities required to submit an RMW removal plan to ensure that the facilities are disposing of RMW in conformance with their filed removal plans. Notices of Violations (NOVs) are issued to medical waste generators that fail to file a removal plan, or that don't file in a timely manner. The EPU also issues NOVs to generators that fail to adequately separate their RMW or that fail to certify that the material was transported and disposed of by a licensed medical waste hauler. Most NOVs issued by the EPU are returnable to the City's Environmental Control Board. To bolster the effectiveness of its medical waste enforcement program, the DSNY is in the process of amending its Rules to increase the fines associated with certain NOVs. Currently, fines associated with violations of Local Law 75 range from \$2,500 to a maximum of \$10,000.
4. HHC continues to refine its waste management practices through improved procedures and the involvement of private vendors of medical waste collection and disposal services. As a consequence, the quantity of red-bag waste generated by HHC has declined as recycling rates have increased. Private vendors of medical waste management services have worked to provide more cost-effective collection and disposal services for both red- and black-bag waste and have reduced the amount of material erroneously set-out as red-bag waste at HHC facilities. These medical waste management vendors have also provided technical assistance on improving source separation of recyclables to medical facilities that generate solid waste.

## **2.1 Waste Reduction, Reuse and Recycling Measures**

The HHC is an integrated healthcare delivery system and the largest municipal health care provider in the country. HHC consists of 11 acute care hospitals, 5 long-term care facilities, 6 diagnostic and treatment centers and a myriad of community-based clinics located throughout the five boroughs of the City. As a leader in the provision of health care services to diverse communities, HHC has developed waste management programs that are regulatory compliant, environmentally sensitive and consistent with best practices followed in the health care industry.

HHC waste management efforts emphasize the control of inefficient supply chain management and its relationship to preventable operating costs. Within this emphasis, HHC efforts focus on three primary categories of waste management activities: improper storage of materials (e.g., departmental hoarding of supplies, unnecessary dispersion of inventory supplies in patient rooms); inefficient supply procurement practices (e.g., inappropriate inventory par levels for perishable supplies and clinically unnecessary replacement of unused supplies for new product introductions); and establishing supplier contract agreements that eliminate supply packaging before delivery (e.g., incorporating reusable containers to replace delivery boxes). HHC waste reduction and recycling activities are coordinated locally at the facility level by network administrators responsible for daily facility operations. In addition, HHC corporate offices facilitate the establishment of product and/or service contracts specifically structured to contribute HHC solid waste management objectives. HHC has instituted a number of successful initiatives that contribute to efficient waste management practices, promote waste reduction goals and encourage participation in recycling activities. Several of these programs are outlined as follows:

1. HHC has organized all acute care, long-term care, diagnostic and treatment centers and community-based clinics into seven vertically integrated health care networks. Within each HHC health care facility, departments (waste generation zones) coordinate and monitor waste management activities and compliance with proper recycling goals.
2. HHC staff are routinely provided in-service education on a myriad of regulatory compliance topics which include environmental health issues. Targeted environmental health training programs are specifically provided to HHC housekeeping and support staff to ensure awareness of HHC waste management requirements. These programs include departmental training initiatives and contract vendor-provided programs designed to maintain best practices in areas such as non-regulated waste management, recycling and proper disposal techniques.
3. HHC continues to evaluate products utilized, their acquisition cost and disposal, to identify best industry practices that will contribute to HHC's waste management objectives and allow for the continued provision of quality health care services. As an example, HHC approved a pharmaceutical prime vendor service contract that results in the elimination of product packaging (boxes) for all pharmaceutical products ordered by HHC facilities. The HHC prime vendor program requires that the service provider deliver all products in reusable secured containers. Pharmaceutical commodities represent the largest single product group at HHC totaling approximately \$120 million in annual expenses. This initiative demonstrates how HHC coordinates supply chain management contracting with prudent environmental health best practices (e.g., waste reduction).

4. HHC facilities have instituted recycling programs and established designated disposal and collection points for recycling materials. In the area of recycled paper products which include white bond paper, computer printouts, corrugated and other high-grade office paper, HHC recovered 1,899 tons of paper during FY 2004 (July 3, 2003 to June 30, 2004). HHC will continue to develop and implement paperless electronic communication systems to encourage the reduction of overall paper use at HHC facilities.
5. HHC is embarking on a 10-year major capital improvement plan involving the renovation and/or building of new HHC hospitals and health care facilities. A component of this capital improvement initiative is the installation of electric hand dryers in public restrooms and staff locker rooms. The intent is to significantly reduce the use of paper towels at HHC facilities and a resultant reduction of material in the HHC waste stream. While appropriate infection control practices do not allow for the absolute removal of paper towels in a health care facility, the installation of hand dryers is anticipated to materially impact on an area responsible for approximately 60% of paper towel waste.
6. HHC facilities with operating kitchens work with reusable cookware and have installed dishwashers to ensure appropriate cleaning. As a result, disposable food service cookware is not being placed into the HHC waste stream.
7. HHC utilizes linen sheets throughout all acute and long-term care facilities. HHC also operates a central laundry facility and a contract vendor service to clean and process upwards of 16 million pounds of laundry annually. Consequently, the use of disposable sheets has been phased out at HHC facilities. Minor exceptions to the use of disposable linen exists in acute care settings where clinical practice necessitates (i.e., operating rooms).
8. HHC has established several sharps collection contracts with vendors responsible for the collection, removal, sterilization of sharps used at HHC facilities. Other than HHC clinical staff using the sharps, no other HHC personnel are involved in the handling of sharps. This sharps management model prevents needle sticks among housekeeping personnel and the inadvertent introduction of sharps into HHC's waste stream.

### **3.0 DREDGE SPOILS MANAGEMENT**

#### **3.1 Introduction**

The dredging of navigation channels, berthing piers, anchorage areas and other facilities within the New York Harbor complex is necessary to maintain the harbor and its water-dependent facilities. The harbor routinely requires dredging because fine-grained sediments, transported by

rivers and within the estuaries, settle and accumulate on the sea floor, causing shoaling which interferes with safe navigation. The success of ocean commerce within the Port of New York and New Jersey depends on regular and predictable maintenance dredging, as well as new work dredging. Existing channel depths must be maintained to allow safe clearance, and deeper navigation channels must be excavated for modern cargo ships if the viability of the Port is to continue.

Due to concerns about contaminants associated with some dredged materials, many environmental and citizens groups sought an end to the ocean dumping of dredged material. To address these concerns, a July 24, 1996 letter ("The 3 Party Letter"), signed by former United States Environmental Protection Agency (USEPA) Administrator Carol Browner, former Secretary of Transportation Frederico Pena, and former Secretary of the Army Togo D. West, Jr. to several U.S. Congressional Representatives from New Jersey, called for the closing of the Mud Dump Site (MDS) and the establishment of a "remediation area." The closure of the Mud Dump to contaminated materials subsequently occurred in late 1997 with the establishment of the Historic Area Remediation Site (HARS) at a portion of the former MDS.

With the closure of the MDS and due to past and present pollution, the management of dredged material from many areas of the harbor has become increasingly difficult. This is primarily due to either a lack of dredge management options or the high cost of the limited number of options currently available. Likewise, it has become very difficult to obtain the necessary permits from the United States Army Corps of Engineers (USACE) for offshore disposal, except for the cleanest of materials.

As a direct result of this, the management of dredged materials within the New York Harbor complex has largely been focused on upland management alternatives. Water-based disposal or reuse of dredged material has been limited to the remediation of the HARS site, placement in confined disposal facilities, and the beneficial use of dredged material for habitat enhancement and/or development.

## **3.2 Dredged Materials Management Plan (DMMP)**

To allow for continued operation of the harbor complex, a DMMP was prepared for the Port of New York and New Jersey. The DMMP required identification of successful management alternatives for dredged materials. Developed with the input of federal, state and local agencies, as well as concerned private entities, the DMMP identified options to manage material generated from both federal and non-federal maintenance and deepening of the Port through the year 2040.

The DMMP identified a wide variety of preferred and contingency management options for dredged material. These options included:

- Contaminant Reduction – With the states’ lead and USACE’s support, a multi-million dollar, multi-year data collection and analysis program was initiated to identify and track down the sources of pollution that are contaminating dredged material.
- Remediation of the HARS – Use of dredged material to beneficially remediate the HARS.
- Habitat Creation/Restoration – The DMMP included several different habitat applications (e.g., restoring habitat by filling existing degraded pits, creating fish reefs, and creating shellfish & bird habitats).
- Land Remediation – Using amended or processed dredged material for the remediation of landfills and brownfields in the region.
- Decontamination Technologies – The USEPA, the USACE, and New Jersey have investigated several innovative dredged material treatment methods. The products of these treatments have several potential uses (e.g., construction material, or clean fill).
- Containment Options – Several in-shore pit options are either in use or have been considered as contingency to meet the region’s short- and mid-term management needs. The pits are sited in existing impacted areas and in close proximity to the dredged material sources to avoid adverse environmental impact.

## **3.3 Dredged Material Management Alternatives**

### **3.3.1 Water-Based Management of Dredged Materials**

Even with the increased restrictions placed upon the in-water disposal of dredged materials from the harbor complex, some materials are clean enough to allow continued disposal at the HARS site. In addition, other in-water management alternatives also continue to be used for managing some dredged materials. These include the use of confined disposal facilities for the disposal of

dredged materials and the use of selected dredged material for habitat enhancement and restoration opportunities in the region. The primary, current in-water management alternatives for dredged material are discussed below.

#### *3.3.1.1 Ocean Disposal*

Since the 1996 agreement to limit ocean disposal of dredged material, the only materials that have been transported to the HARS site are clean materials, suitable for capping the previous materials disposed at the site. The designation of the HARS in September 1997 allowed the beginning of the remediation of contaminated dredged materials dumped prior to modern environmental regulations. Only sediments classified as Category I (clean, uncontaminated sediments that cause no adverse biological effects) are permitted for placement at the HARS.

Using dredged material from the harbor to cover existing sediments at the HARS represents an environmentally beneficial use of this resource. Bottom sediments at the HARS, which may have the potential to cause adverse effects, can be capped with cleaner sediments dredged from the harbor complex, which meet the criteria of the Ocean Dumping Act, and will not cause adverse effects. Placement of this material at the HARS serves to remediate the site by reducing impacts to acceptable levels and improving habitat conditions for bottom dwelling organisms. Dredged materials from the harbor complex are currently being taken to the HARS site from several dredging projects within the region, including the harbor deepening efforts being jointly undertaken by the USACE and the Port Authority of New York and New Jersey. Materials taken to the HARS site include virgin materials removed as part of the harbor deepening project consisting primarily of clay, till and rock. Substantial remaining capacity is available at the HARS for the placement of additional clean materials.

#### *3.3.1.2 Confined Disposal Facilities*

In the mid to late-1990s, the Port Authority permitted a confined disposal facility within Newark Bay for the management of dredged material, primarily for Port Newark and Port Elizabeth. The Newark Bay Confined Disposal Facility (NBCDF) has accepted materials for disposal over the

past 10 years and is currently being utilized on a contingency basis by the Port Authority if upland restoration alternatives are not available for the use of dredged material. Additional capacity remains within the NBCDF.

### *3.3.1.3 Habitat Enhancement and Development*

Primarily rock materials that have been dredged as part of the harbor deepening project in the Port of New York and New Jersey have been utilized in the development of additional marine habitats. Rock materials have been placed at various in-water locations for the development of new reef areas to enhance fish habitat. Materials for the deepening of portions of the Kill Van Kull, which has involved the removal of significant amounts of rock, have been utilized for the development and/or enhancement of fishing reefs.

### 3.3.2 Upland Disposal Management Alternatives

Due to the restrictions placed upon the disposal of dredged materials within the HARS or former MDS, the vast majority of dredged material, removed from within the harbor complex, is currently managed through upland disposal alternatives. Primary upland alternatives include, but are not limited to, landfill disposal, land reclamation, and landfill closures in New York and New Jersey. Additional upland alternatives that have been or continue to be used within the harbor complex include on-site or near-site dewatering and management; research and development applications for the decontamination and reuse of dredged materials; and the use of processed dredged material for the remediation of abandoned mines, such as the recent Bark Camp demonstration project in Pennsylvania, which was concluded in the past few years. A discussion of the more significant upland dredge material management alternatives that have primarily been used for non-HARS materials within the Port of New York and New Jersey are provided in the next sections.

#### *3.3.2.1 Landfill Disposal*

Disposal of dredged material within existing landfills continues to be utilized as a management alternative for dredged material within the region. Many of the smaller dredging projects that occur within the New York Harbor complex are transported to landfills for disposal after the

dewatering or processing of these materials. Although DSNY has not conducted any dredging recently, materials removed from most of their marine-based facilities in the past were routinely transported to out-of-state landfills for disposal.

### 3.3.2.2 *Land Reclamation*

Several projects, primarily within New Jersey, have been utilizing processed dredged materials in the reclamation of existing sites, and the capping and/or remediation of brownfield sites and former landfills. Dredged material is stabilized through a process that involves the addition of Portland cement, fly ash and/or other admixtures for use in these applications. Sites have been reclaimed for future development as commercial/industrial uses, golf courses and other uses. Several sites that have been utilized, that are currently accepting processed dredge materials, or are pursuing approval for the acceptance of these materials are discussed below:

- OENJ Orion-Elizabeth Site – This former garbage landfill site was remediated, capped and redeveloped through the use of processed dredged materials.
- OENJ Bayonne Site – This site has been using processed dredge materials for the past several years and is near completion. Present plans are that the site will be redeveloped as a golf course.
- OENJ Port Reading Site (Jersey City) – The Port Reading site has been proposed as a potential land reclamation site for the use of processed dredged material; however, it is not currently accepting material.
- Seaboard Koppers Site (Kearney) – The remediation of this site will involve the use of approximately 1.0 million cubic yards of dredged material that will be stabilized through the addition of Portland cement and other admixtures.
- ENCAP Site – This site in the Hackensack Meadowlands is fully permitted and has an estimated capacity of 2.5 million cubic yards. The project will involve the capping of four landfills in Lyndhurst, Rutherford and North Arlington, New Jersey and the potential redevelopment of the site for mixed commercial and residential uses and a golf course.
- FDP Enterprises (Jersey City) – This site is fully permitted and has an estimated capacity of 1.0 million cubic yards of processed dredged material, which will be used to complete a proposed wetland fill of approximately 53 acres along Pen Horn Creek.

### 3.3.2.2 *Landfill Closures*

Several landfills have used or are currently approved for the use of processed dredged material as an alternative grading material. In addition to several landfills within the New York and New Jersey area that have or are currently utilizing dredged material, additional “orphan” landfills with the Hackensack Meadowlands complex are also being evaluated for the potential use of dredged material. Major landfill closure projects that have or will utilize processed dredged material as components of their closure include the following:

- Pennsylvania and Fountain Avenue Landfills (Brooklyn) – Processed dredged material was used as an alternative grading material at these closed landfills as part of the overall closure process. This phase of the closure effort is largely completed.
- Fresh Kills Landfill – The Fresh Kills Landfill has recently received a Beneficial Use Determination (BUD) from the New York State Department of Environmental Conservation (NYSDEC) for the use of processed dredged material as an alternative grading material to assist in the closure of the landfill. An estimated three to four million cubic yards of material may potentially be used as part of this effort. Initial materials for use at the landfill may come from access dredging within Fresh Kills Creek and approximately 680,000 cubic yards from Phase 1 of the Harbor Deepening Project.
- Landfill 1E (Hackensack Meadowlands) – This landfill located in the Hackensack Meadowlands is fully permitted for the acceptance of processed dredged material. Dredged materials are currently processed off-site before being transported to the landfill for use. Capacity is approximately 1.5 million cubic yards.

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