Chapter 14: Solid Waste and Sanitation Services

A. INTRODUCTION

OVERVIEW

Based on the *City Environmental Quality Review (CEQR) Technical Manual*, actions involving construction of housing or modest developments generally do not require an evaluation of impacts on solid waste and sanitation services, unless they are unusually large (i.e., solid waste generation rate of less than 10,000 pounds per week, for example, is not considered large). The proposed project would create a large new park along with cultural, recreational and commercial facilities, and services that would generate solid waste and recyclables. In addition, the proposed park would be sited on a closed landfill that would have post-closure environmental control systems, monitoring, and maintenance obligations while the park is being developed and opened to the public. These include landfill gas and leachate collection systems and monitoring with key centralized facilities (e.g., leachate treatment plant, landfill gas management), that would be operated by the New York City Department of Sanitation (DSNY). Furthermore, the park and landfill closure activities would have a long-term need for organic-rich topsoil. As compost made from leaves, grass, and other yard waste provides a valuable soil amendment, the park is intended to be able to accommodate one or more leaf and yard waste composting sites within its boundary, which would be a potential addition to the City's recycling/solid waste management infrastructure. There are also DSNY facilities that have no functional connection to the landfill in close proximity to the park, including the Staten Island Waste Transfer Station and the District 2 and 3 garages and repair shop. Given the size of the proposed park and the potential solid waste generation, and the on-site and adjacent DSNY facilities, this chapter provides a detailed analysis of the potential impacts of the proposed park on the City's solid waste and sanitation services and the City's Comprehensive Solid Waste Management Plan (SWMP). This analysis entails the calculation of existing solid waste generated within the proposed park as well as an assessment of the potential impacts on adjacent facilities for the two analysis years, 2016 and 2036.

B. EXISTING CONDITIONS

DESCRIPTION OF CURRENT SOLID WASTE SANITATION SERVICES

DSNY is the City agency responsible for the collection and disposal of municipal solid waste, refuse, and designated recyclable materials generated by residences, some nonprofit institutions, tax exempt properties, and City agencies. DSNY also collects waste from City litter baskets, street-sweeping operations, and lot cleaning activities. Fresh Kills officially closed in March 2001. It is estimated DSNY collects over 14,000 tons of residential and institutional refuse and recyclables per day.[1] Currently, about 85 percent of the City's municipal solid waste refuse is delivered to

[1] DSNY website: http://www.nyc.gov/html/dos/html/dosfact.html

transfer stations for transfer to larger "hopper" trucks or rail and then transported to landfills out of the City. The remaining DSNY-managed refuse is collected and trucked directly to out-of-State landfills and waste-to-energy facilities. DSNY collects designated recyclables, metal, glass, and plastic, and designated paper recyclables and delivers these materials to recycling and processing facilities in the City and in New Jersey. DSNY collects residential yard waste on certain spring and fall weekends and delivers it to the City's yard waste and composting facilities. Private carters also consolidate commercial solid waste at waste transfer facilities both inside and outside the City, where it is then transported to out-of-City disposal facilities.

The City's solid waste management services are undertaken in accordance with a SWMP, which is implemented under the jurisdiction of DSNY. The SWMP establishes a hierarchy of preferred solid waste management methods to reduce and process solid waste generated within the City. The objectives of the SWMP are, in order of importance: waste minimization; reuse, recycling, or composting; and export for out-of-the-City disposal. The SWMP provides that DSNY-managed refuse be delivered to certain solid waste management facilities located in each borough, including four City marine transfer stations, certain private transfer stations, and the Staten Island Transfer Station (a truck-to-rail facility). Certain types of household hazardous waste are accepted at Special Waste Sites, one in each borough. Local Law requires residents, institutions, and the private sector to separate certain recyclables for the waste stream for separate collection and delivery to material recovery facilities. New York City residents are required to separate aluminum foil, glass, plastic and metal containers, and newspapers and other paper wastes from household waste for separate collection. Businesses must source-separate certain types of paper wastes, cardboard, metal items, and construction wastes. Food and beverage establishments must recycle metal, glass, and plastic containers, and aluminum foil, in addition to meeting the commercial recycling requirements.

The project site is located within the DSNY service area covering Staten Island Community Districts 2 and 3. Solid waste currently generated at the site is handled by DSNY.

PROJECT SITE SOLID WASTE GENERATION

It is estimated that there are approximately 115 employees currently at the Fresh Kills site. It is assumed that they generate about 1,000 pounds of solid waste per week. Refuse is collected by DSNY and delivered to the State Island Waste Transfer Station, where it is loaded into sealed containers and sent by rail to a private landfill in South Carolina. Recyclable paper is delivered to the Pratt Industries paper recycling plant in Staten Island, while MGP is delivered to a private recycling processor in Jersey City, NJ.

DSNY FACILITIES

PROJECT SITE

The project site is all City-owned land, the majority of which is under the jurisdiction of DSNY, although portions of the project site are also under the jurisdiction of DPR, including lands that are currently open space or parkland/natural areas (e.g., the William T. Davis Wildlife Refuge at the headwaters of Main Creek), the Isle of Meadows, and the Owl Hollow soccer fields.

A large portion of the project site (about 45 percent, or 987 acres) is occupied by Landfill Sections 3/4, 6/7, 2/8 and 1/9. These landfill sections are listed in Table 14-1 below and shown on Figure 14-1.

Table 14-1
Status of Landfill Sections (Closure Construction)
at Fresh Kills Landfill

Landfill Section	Area (acres)[1]	Closure Status[2]
3/4	142	Construction Complete
2/8	139	Construction Complete
6/7	305	Approved Design and Construction Underway
1/9	401	Approved Design and Construction Underway
Total	**987**	

Sources:
[1] Fresh Kills Landfill Post-Closure Monitoring and Maintenance Operations Manual, DSNY, December 2002.
[2] DSNY, October 2007.

These four landfill sections were once used by DSNY for the disposal of solid waste. They are regulated by DEC as SWMUs. In addition to the SWMUs, there are the Plant 1 and 2 facilities that were used during the decades of landfill operations, as well as the leachate treatment plant and landfill gas recovery facility. There are also landfill gas and groundwater monitoring wells that are part of the Fresh Kills environmental control system and post-closure maintenance and monitoring program (see also the discussion below under "Post-Closure Monitoring and Maintenance"). The systems and the monitoring and maintenance program were implemented by DSNY in accordance with a design approved by DEC. Under the monitoring and maintenance obligations, monitoring data is collected by DSNY and submitted on a regular basis to DEC for review. Lands that contain the environmental monitoring facilities are within the Fresh Kills environmental compliance boundary. (i.e., the lands outside the SWMUs that serve as a buffer between the SWMUs and surrounding sensitive uses).

Fresh Kills Landfill is currently undergoing final closure construction and post-closure maintenance, management and monitoring. Final closure construction is completed at Landfill Sections 3/4 and 2/8. Final closure design has been approved by DEC at Landfill Section 6/7 and closure construction is underway. Final closure design has also been approved by DEC for Landill Section 1/9 and subbase grading has begun. Final closure construction includes a final cover designed to minimize water infiltration with a vegetation soil and geomembrane layer that also minimizes erosion; completion of all drainage facilities for surface water runoff. It is expected that the final closure construction of both Landfill Sections 6/7 and 1/9 will be completed by 2016 (see the discussion below under the Future Without the Proposed Project"). To support the landfill's final closure, the project site has extensive infrastructure managed and maintained by DSNY. As described below, this includes piping to collect landfill gas and leachate, landfill gas recovery systems, accessory buildings and parking, detention ponds, bridges and landfill access roads. In addition, final closure construction is being completed at Landfill Sections 6/7 and 1/9. There are also the Plant 1 and Plant 2 facilities (see a more detailed description below) and a significant stretch of bulkheaded waterfront, where the solid waste once arrived by barge when the landfill was operating (see Figures 14-1 and 14-2).

Currently there are about 113 DSNY employees at the site. This includes about 87 employees from the Bureau of Waste Disposal, 4 from enforcement, and 22 in support services.

A description of the more critical components of the DSNY infrastructure systems at Fresh Kills is provided below. A more detailed description of these systems is provided in Chapter 1, "Project Description."

FINAL COVER

As discussed above, a final cover is placed over the four landfill sections to minimize surface water infiltration, thereby limiting leachate generation, reduce erosion, promote surface water drainage, and separate solid waste from the above-ground environment. Final cover is the regulatory name for the system of layers which are generally composed of an impermeable plastic hydraulic liner, 2 to 2.5 feet of barrier protection material (a compacted, largely inorganic soil layer that creates a barrier above the liner), and roughly 6 inches of growing medium. The five layers of the final cover working down from the surface include:

- Vegetation. The range of final cover vegetation can include crop grasses such as canada wild rye, oats, and annual rye grass.
- Surface Soil Layer. Composed of minimum, 6 inches of top soil.
- Soil Barrier Protection. This layer is composed of roughly 2 feet of soil. Its purpose is to protect the hydraulic liner from weather extremes that could cause cracking or heaving and to store excess water until plants uptake water or the water drains off.
- Drainage layer. Made of either soil or a geosynthetic, this layer is required in some areas, especially on the steeper slopes, to facilitate drainage.
- Hydraulic Barrier Layer. This layer is composed of a geomembrane or a compacted clay liner that prevents water from entering the waste below. It also prevents the upward movement of gas except in designated areas. A Gas Venting Layer may be used below the Hydraulic Barrier Layer to allow landfill gas generated within the landfill to move toward landfill gas vents or extraction wells.

A more detailed description of the types of landfill cover on each of the landfill sections at Fresh Kills is provided in Chapter 1 “Project Description.”

Leachate Containment, Collection, and Treatment

Leachate is the liquid by-product of waste decomposition in a landfill. A number of control measures and Fresh Kills, including impermeable landfill cover (see the discussion above), cut-off walls, the leachate collection system and treatment plant (see the discussion below) prevent the migration of leachate from the landfill sections to the local groundwater and surface water systems in and around Fresh Kills. As stated above, the final cover prevents rainwater from percolating into the landfill sections and reduces the volume of leachate. Cut-off walls augment geological barriers to prevent the migration of leachate to surrounding surface and groundwater and block the entry of water from outside into the landfill system. Leachate collection and recovery wells and pumping stations are also located around the perimeter of all four landfill sections. Groundwater monitoring wells around the perimeter of the mounds, and regular inspection, ensure the effectiveness of these systems.

Gravity conveys leachate to collection drains located along the boundary of each landfill section. A system of collection drains, wells, and pumps conveys leachate to the Leachate Treatment Plant located at the south end of Landfill Section 1/9. Leachate is treated at the plant prior to discharge in the Arthur Kill. In addition, landfill gas collection system condensate is treated at the leachate plant. The plant has a treatment capacity of 1,050,000 gpd. The treatment system removes the ammonia from the leachate in sequence batch reactors (SBRs) where naturally occurring bacteria feed on the ammonia and other organic matter present in the leachate. The treatment system also provides metals removal. The facility has a DEC-approved SPDES permit.

A more detailed description of the leachate management system at the landfill is provided in Chapter 1, "Project Description."

Landfill Gas Management

Landfill gas is generated by decomposing organic solid waste buried in the landfill. Landfill gas is comprised mainly of methane, an explosive gas, and carbon dioxide, along with traces of other gases. Landfill gas at the Freshkills Landfill is managed both to control emissions of methane and NMOC and to prevent off-site mitigation of landfill gas. The Fresh Kills landfill gas management system is comprised of a landfill gas emissions management system, a gas recovery and flaring system, a passive venting system, and the landfill gas migration management system. There are 62 gas migration monitoring wells distributed throughout the landfill complex. Eighty-nine methane sensors are also distributed throughout the site. The landfill gas recovery operation is highly efficient. A description of the various components of the landfill gas management system follows:

- Passive vents—Independent of the gas extraction network, these vents line the perimeter of the landfill, serving as a safety measure to ensure that no gas migrates off-site. Passive vents are marked by a channel of coarse stones, while beneath the surface, the vents are keyed into low-permeability soils or areas below the seasonal low groundwater table.
- Gas extraction wells—Part of the active gas recovery system, these wells, which are under vacuum pressure, collect landfill gas. Located on approximately every acre of the landfill mounds, these wells are bored down into the bottom of the refuse or the groundwater table.
- Landfill gas header pipes—A network of non-perforated, lateral pipes which lie atop the geomembrane or clay lining and transmit gas collected in the wells toward flare stations or the landfill gas recovery plant.
- Condensate tanks—Located on all four mounds, water in the landfill gas condenses, is collected in tanks and subsequently pumped out by trucks.
- Gas collection mains—A system of transmission pipes has been constructed to link the four landfill sections to the landfill gas recovery plant and the flare stations.
- Gas venting trenches—These subsurface trenches around the perimeters of the SWMUs contain the passive vents, which ensure that gas does not migrate off-site.
- Flare stations—Located on half-acre sites at the north, east and south mounds, each of the 3 flare stations serve as a back-up safety system for combusting landfill gas in the event that the gas recovery facility is not operating.
- Landfill gas recovery plant—This facility is located northeast and adjacent to West Mount. It is designed to handle landfill gas from all landfill sections, processing the gas for reuse.
- Gas migration monitoring wells—Monitors located along the landfill perimeter and placed outside the vent trenches.

Stormwater Management System

Stormwater management is an essential component of Fresh Kills Landfill. The system has been designed to detain all site-generated stormwater runoff on the site and to facilitate the removal of suspended sediments and any adhered pollutants prior to any discharges to local waterbodies. It was installed by DSNY in accordance with a DEC-approved stormwater management and pollution control plan and has a State Pollution Discharge Elimination (SPDES) permit. In addition to the stormwater management system, erosion and sediment control practices across

the site, but particularly on the landfill sections, greatly reduces the potential for water quality impacts from sediment runoff impacts on the tidal waterways that flow through Fresh Kills.

The grading of the landfill sections is carefully engineered to ensure positive drainage and to direct storm flow. With the Fresh Kills stormwater management system, runoff that develops on the landfill sections is intercepted by swales and bench storm drains. These systems convey the water to down chutes, pipes and rip-sap lined swales, which in turn convey the runoff to the stormwater basins. The stormwater basins reduce the rate of stormwater discharge from the site. Here, sediment can settle out before the stormwater is released to local waters.

Plants 1 and 2

Plants 1 and 2 were the central activity areas at Fresh Kills when municipal solid waste landfilling operations were performed at the site. Thus, these areas contain large structured surfaces (or pads) where the solid waste was unloaded from barges to trucks as well as extensive areas of bulkheaded shoreline since the majority of the solid waste came to Fresh Kills by barge. There are also the sheds, garages, maintenance facilities, trailers, and small offices that were necessary to support the landfilling construction, monitoring, and maintenance. With the cessation of landfilling and the transition of site activities to final closure operations, these Plant 1 and 2 areas are used for staging for the final closure construction activities as well as a post-closure care and operations facility by DSNY. However, many of the buildings are vacant.

Plant 1 was formerly used as a barge unloading facility. Here, the solid waste was loaded onto pay loaders and on/off road trucks for delivery to the active areas of the landfill. There is a two-story equipment maintenance building at Plant 1 as well as a one-story equipment repair building, a boat maintenance building, a boom and bucket repair shop, a floating boat repair shop, a bureau of building maintenance building, a garage, a storage building, and a barge unloading area. Plant 2 was also used as a barge unloading facility when Fresh Kills was operational. It also has a one-story equipment maintenance building, a one-story wash building, a fire pump house, a barge unloading area, and parking. A facility for the temporary storage of sifted material from the World Trade Center site haul roads is located in the former Plant 2 maintenance building, while another such facility is located in the Plant 1 vicinity.

Additional details on these facilities is provided in Chapter 1 “Project Description.”

Landfill Access Roads

The project site has an extensive internal roadway system that allows vehicular operations to move throughout much of the site independent of the adjoining public roads. The two entrance roads providing vehicular access to and from the site are Muldoon Avenue and a section of roadway north of Wild Avenue in the Travis area on the east side of the West Shore Expressway. This section connects north to Victory Boulevard and there is a ramp north of Victory Boulevard that connects to the West Shore Expressway northbound. There is also a road connection on the west side of the West Shore Expressway south from Victory Boulevard. This connection provides access to the Staten Island Waste Transfer Station as well as gated access to the project site. This entrance is accessible via the southbound ramp from the West Shore Expressway to Victory Boulevard. The northbound exit to Victory Boulevard provides an exit for vehicles now performing final closure at Landfill Section 6/7. Chain-link fences (10 feet high) surround all the landfill sections, preventing access at other locations.

Vehicle speed within the site is controlled by signs posted along the DSNY landfill access roads. These roads are regularly inspected and maintained by DSNY.

POST-CLOSURE MONITORING AND MAINTENANCE

The Post-Closure Monitoring and Maintenance Operations Manual (the manual) for Fresh Kills Landfill is a detailed protocol for the management of the Fresh Kills Landfill during the post-closure period. The Manual (December 2002) was prepared in accordance with the regulatory requirements of 6 NYCRR § 360-2.15(r) 360 Section 2.15(k) and the Fresh Kills Order on Consent (Consent Order) and sets the performance standards and requirements under which the actual monitoring, maintenance, and reporting practices are to be carried out at Fresh Kills. For example, the manual covers the post-closure program for the Fresh Kills Landfill Leachate Treatment Plant, containment and collection system, an environmental monitoring plan, and an operations and maintenance plan for landfill gas collection. The Manual is described in greater detail in Chapter 1, "Project Description." Post closure core monitoring and maintenance has been initiated on Landfill Sections 3/4 and 2/8 and will be initiated on Landfill Sections 6/7 and 1/9 when closure construction is completed.

DSNY FACILITIES ADJACENT TO THE PROJECT SITE

District 2 and 3 Garages and Borough Repair Shop

There are two DSNY garages adjacent to the project site (see Figure 14-2). One, which is accessible from Muldoon Avenue, serves collection vehicles for Staten Island's District 3. This is also the location of the borough repair shop. The other garage is accessible from Richmond Avenue and serves Staten Island District 2.

Staten Island Waste Transfer Station

The site of the Staten Island Waste Transfer Station is north of the project site and separated from the proposed park by Fresh Kills Creek (see Figure 14-2). The Staten Island Waste Transfer is accessible to vehicles via the service road along the west side of the West Shore Expressway and south of Victory Boulevard. This facility serves Staten Island residents as part of DSNY's sanitation services for this borough. This truck-to-rail transfer station exports DSNY-managed putrescible solid waste from the City by rail. This operation commenced in May 2007.

Composting Facility

The Yard Waste Compost Facility handles leaves and other yard waste. Any trees or large, woody shrubs are brought to a giant wood chipper, where they are processed into fine chips. The material is then placed in long "windrows," where it is composted. Composted leaves are mixed with wood chips and utilized throughout the City. DSNY provides free compost material to City residents, community groups, and DPR. This facility is located on the north side of Fresh Kills near the waste transfer station and is accessible via the service road described above.

Crushing and Screening Facility

The crushing and screening facility is one of the largest municipally owned construction and debris (clean fill) recycling facilities in the region. Nearly 100,000 cubic yards of material from various construction sites around the City, have been processed here. Large pieces of cement, stone, brick, and concrete are crushed and reduced and sorted into three sizes: 4–6 inches, 1.5 inches, and sand. Material generated from this plant is used for building temporary roadways at the landfill and for final cover of the closed sections. This facility is located on the north side of Fresh Kills near the waste transfer station and is accessible via the service road described above.

SOLID WASTE MANAGEMENT PLAN

In October 2004, DSNY issued a draft SWMP that established the anticipated structure of New York City's solid waste management for the next 20 years, including certain recycling initiatives and a Long Term Export program for refuse. The City Council approved the plan in July 2006 and the DEC approved it in October 2006. The City's Long Term Export Program is anticipated to be implemented through the development of four converted marine transfer stations (MTS) and the award of up to five contracts with private transfer stations for barge or rail export of DSNY-managed waste for disposal. DSNY would continue to collect residential and institutional solid waste and take it to transfer stations for out-of-City disposal until the long-term plan is fully implemented. It is expected that by 2016 the implementation of that plan would be completed. It is also assumed that the Staten Island Waste Transfer Station would continue to be operating and handling the borough's DSNY-managed refuse as a major facility in the City's SWMP.

C. THE FUTURE WITHOUT THE PROPOSED PROJECT: 2016 AND 2036

2016

SITE CONDITIONS

In the future without the proposed project it is assumed that the final closure construction of all the landfill sections would be completed by 2016. DSNY would continue its phased completion of final closure at Landfill Sections 6/7 and 1/9 and would continue with the operation and implementation of post-closure environmental controls, monitoring and maintenance programs throughout the landfill, including the expansion of post-closure care at Landfill Sections 6/7 and 1/9 once final closure construction is completed. Certain post-closure care obligations will continue for a minimum of 30 years. Likewise, it is expected that the two facilities temporarily storing sifted materials from the World Trade Center site at Plants 1 and 2 would no longer be needed.

2036

SITE CONDITIONS

In the future without the proposed project, through the year 2036, all landfill sections would be closed and DSNY would continue to operate and manage the Fresh Kills Landfill environmental control systems, along with implementation of the monitoring and maintenance programs with certain post-closure care obligations continuing through at least 2036.

SOLID WASTE MANAGEMENT

By 2036 it is expected that the City's solid waste and recycling streams would increase with population and employment growth. It is expected that the City would continue to manage and transport its refuse and recyclables through the 2036 analysis year. It is also assumed that the Staten Island Waste Transfer Station would continue to operate and handle the borough's DSNY-managed refuse.

D. THE FUTURE WITH THE PROPOSED PROJECT: 2016 AND 2036

2016

SOLID WASTE GENERATION

In 2016, various components of the park would be operational, including North Park (the neighborhood park and landfill mound habitats), South Park (including the neighborhood park and the South Park recreation center), portions of Creek Landing, and the proposed roads.

As part of the implementation of Phase I of the park, solid waste and recycling receptacles would be installed throughout the 2016 park elements in accordance with DPR practices.

Estimated solid waste generation rates for the proposed project in 2016 are presented in Table 14-2. The estimated solid waste generation rates for the proposed park by 2016 would be limited primarily to park visitors and employees. Visitor solid waste generation rates are based on the *Brooklyn Bridge FEIS* (December 2005).

Table 14-2
Expected Average Daily Solid Waste Generation with the Proposed Project: 2016

Use	Units	Solid Waste Rate Per Unit (lb/day)	Total Solid Waste (lb/day)	DSNY (lb/day)	Private Carters (lb/day)
Restaurant	N/A	40.5 lbs. per employee (2)	N/A	N/A	N/A
Retail (includes Market Roof, Sports Barn, etc.)	209 employees (1)	11 lbs. per employee (2)	2,299 lbs.	N/A	2,299 lbs.
DPR employees*	150 employees (4)	1.4 lbs. per employee (3)	210 lbs.	210 lbs.	N/A
Visitors (general open space, recreation, and cultural facilities)	6,500 visitors (5)	1 lb. per visitor (3)	6,500 lbs.	6,500 lbs.	N/A
Total			9,009 lbs.	6,710 lbs.	2,299 lbs.

Notes: *It is assumed that 30% of the total number of park employees will be employed by 2016.
Sources: (1) Employees based on square footage of restaurant and retail space (see Chapter 1, "Project Description.")
(2) *CEQR Technical Manual,* (December, 2001)
(3) *Brooklyn Bridge Park FEIS,* (December, 2005)
(4) New York City Department of Parks and Recreation, August 2007.
(5) Average daily estimate.

The solid waste generated by the proposed project in 2016 would be equivalent to approximately 4.5 tons per day, of which approximately 3.4 tons would be handled by DPR and DPR collection trucks. DPR would provide adequate staffing and equipment to collect and convey all solid waste and recyclable materials. This solid waste would then be trucked to the Staten Island Waste Transfer Station. This increase in solid waste is a minimal increase in the City's solid waste stream and is not expected to overburden DPR or DSNY solid waste handling services. Thus, the proposed park would not have a significant adverse impact on the City's solid waste and sanitation services.

In addition, it is expected that the net increase in the commercial waste stream (approximately 1.1 tons per day from retail concessions) could be adequately handled by the private solid waste management industry; this is a small increase and it is expected to be met by private solid waste management services that already serve the area.

In addition, the park would be able to accommodate one or more composting sites for leaves and other yard waste to create a top soil amendment for the park. In the event the City decides to undertake such composting within the park, an appropriate environmental review would be conducted at that time.

ANALYSIS OF POTENTIAL IMPACTS ON DSNY SERVICES, FACILTIES AND FRESH KILLS LANDFILL POST-CLOSURE MANAGEMENT

By 2016, the proposed park would not compromise the City's ability to complete final closure at Fresh Kills, nor would it conflict with the post-closure environmental control systems, maintenance, and monitoring that is necessary for Fresh Kills landfill.

As described in Chapter 1, "Project Description," the proposed park would integrate the major elements of the Fresh Kills Landfill environment control systems including the landfill gas recovery plant, the leachate treatment plant, and the associated collection systems and infrastructure. Protection of these systems is a critical objective for the proposed park since these systems would be protective of future park uses and the environment of the park. In cases where elements of the existing infrastructure need to be modified or replaced, the City would do so as they are identified during the final design process for the proposed park and all of its elements including the park open spaces, roads, and landscape enhancement. In addition, DEC must approve any modifications to these systems as well as any changes in the final closure plans and the post-closure maintenance and monitoring programs that are currently in effect at Fresh Kills. Certain post-closure care obligations will continue for a minimum of 30 years. In this way, it can be concluded that the City will continue to meet its obligations regarding the closure and post-closure care at Fresh Kills and the necessary protections to the local environment including air quality, surface and groundwater conditions. On-site facilities that would be displaced by 2016 include most of the facilities at Plant 2. However, by 2016 DSNY would no longer have any need for these facilities. Thus, their removal would not adversely impact either landfill closure construction, environmental control, monitoring or maintenance obligations of the City with respect to Fresh Kills Landfill. Likewise, it is expected that the two facilities temporarily storing sifted materials from the World Trade Center site at Plant 1 and Plant 2 would no longer be needed. The proposed park roads would also be accessible to DSNY vehicles for the purposes of providing local vehicular circulation and access to the DSNY waste transfer station.

Regarding the off-site facilities, the proposed park would not conflict with DSNY operations at the Staten Island Waste Transfer Station, the composting or crushing and screening facilities, or the District 2 and 3 garages or the borough repair shop. Moreover, the park would be able to accommodate one or more composting sites for leaves and other yard waste to create a topsoil amendment for the park. In the event the City decides to undertake such composting within the park, an appropriate environmental review would be conducted at that time.

The added refuse and recyclables from the proposed project would be collected by DPR/DSNY and transported to the Staten Island Waste Transfer Station and to DSNY's recyclables processing contractors for paper and MGP, respectively. The waste transfer station and the private recyclables processing contractors have more than adequate capacity to handle the added volume of solid waste from the proposed park and no impacts on the solid waste transfer station's waste handling operations or on the Borough's recycling operations would be expected with the proposed project.

CONSISTENCY WITH THE CITY'S SWMP

Implementation of the proposed park would require extensive coordination between DPR and DSNY. However, design at the proposed park can move forward in such a way that the project would not adversely impact the landfill infrastructure, would properly repair and replace any landfill infrastructure that needs to be modified, and would not adversely impact neighboring DSNY facilities, including the District 2 and 3 Garages or the Staten Island Waste Transfer Station such that amendments to the City's SWMP would be necessary. To this end, DPR would coordinate with DSNY to ensure that:

- DSNY facilities operating adjacent to the proposed park would not be adversely impacted by park operations, would have adequate security and buffers, and access for trucks and personnel; and
- Final closure will be completed with the maintenance programs at Fresh Kills Landfill proceeding for as long as required by DEC in conjunction with the proposed park.

Chapter 1, "Project Description," outlines a range of preliminary measures to ensure the protection of landfill infrastructure and environmental monitoring systems at the landfill. These are also presented in Chapter 23, "Impact Avoidance and Mitigation Measures." With these measures in place, it is expected that the proposed project could move forward without compromising the City's objectives under the SWMP.

2036

SOLID WASTE GENERATION

By 2036, all of the park components are expected to be operational. Solid waste and recycling receptacles would be installed throughout the entire park in accordance with DPR practices.

Estimated solid waste generation rates for the proposed project in 2036 are presented in Table 14-3. By 2036, the total solid waste generated by the proposed project would be equivalent to approximately 14.6 tons per day, of which 8.85 tons would be handled by DPR. DPR would provide the necessary equipment and personnel to collect and transport all solid waste and recyclables generated by the park. This solid waste would then be trucked to the Staten Island Waste Transfer Station. This increase in solid waste is a minimal increase in the City's solid waste stream and is not expected to overburden DPR or DSNY solid waste handling services. Thus, the proposed park would not have a significant adverse impact on the City's solid waste and sanitation services.

In addition, it is expected that the net increase in the commercial waste stream (5.7 tons per day) could be adequately handled by the private solid waste management industry; this is a small increase and it is expected to be met by private solid waste management services that already serve the area.

Table 14-3
Expected Average Daily Solid Waste Generation with the Proposed Project: 2036

Use	Units	Solid Waste Rate Per Unit (lb/day)	Total Solid Waste (lb/day)	DPR/DSNY (lb/day)	Private Carters (lb/day)
Restaurant (includes restaurant and banquet facilities)	198 employees [1]	40.5 lbs per employee [2]	8,019 lbs.	N/A	8,019 lbs.
Retail (includes Market Roof, Sports Barn, etc.)	308 employees [1]	11 lbs. per employee [2]	3,388 lbs.	N/A	3,388 lbs.
DPR employees	500 employees [4]	1.4 lbs. per employee [3]	700 lbs.	700 lbs.	N/A
Visitors (general open space, recreation, educational and cultural facilities)	17,000 [5]	1 lb. per visitor [3]	17,000	17,000	N/A
Total	N/A	N/A	29,107 lbs.	17,700	11,407

Sources: (1) Employees based on square footage of restaurant and retail space. (See Chapter 1, "Project Description.")
(2) *CEQR Technical Manual,* (December 2001).
(3) *Brooklyn Bridge Park FEIS,* (December 2005).
(4) New York City Department of Parks and Recreation, August 2007.
(5) Average daily estimate.

ANALYSIS OF POTENTIAL IMPACTS ON DSNY SERVICES, FACILITIES, AND FRESH KILLS POST-CLOSURE MANAGEMENT

By 2036, the proposed park would be completed along with all the associated recreational facilities, roads, and landscape enhancement projects. As described in Chapter 1, "Project Description," the proposed park would continue to include the elements of the Fresh Kills Landfill environment control systems including the landfill gas recovery plant, the leachate treatment plant, and the associated collection systems and infrastructure. Protection of these systems is an important objective for the proposed park since these systems would be protective of future park uses and the environment of the park. In cases where elements of the existing infrastructure need to be modified or replaced, the City would do so for the locations and facilities that are identified as part of the final design process for the proposed park and all of its elements including the park open spaces, roads, and landscape enhancement. In addition, DEC must approve any modifications to these systems as well as any changes in the final closure plans and the post-closure maintenance and monitoring programs that are in effect at Fresh Kills. In this way, it can be concluded that the City would continue to meet its obligations regarding the closure of Fresh Kills and the necessary protections to the local environment including air surface and groundwater quality. On-site facilities that would be displaced by 2036 include all of the facilities at Plant 2. However, by 2036 DSNY would no longer have a need for these facilities. Thus, their removal would not adversely impact either landfill closure construction, environmental control, monitoring, or maintenance obligations of the City with respect to Fresh Kills Landfill. The proposed park roads would also be accessible to DSNY vehicles for the purposes of providing local vehicular circulation and access to the DSNY waste transfer station.

Regarding the off-site facilities, the proposed park would not conflict with DSNY operations at the Staten Island Waste Transfer Station, the composting or crushing and screening facilities, or the District 2 and 3 garages or the borough repair shop. Adequate buffers, security, and access for DSNY vehicles and personnel would be provided.

The added refuse and recyclables from the proposed project would be collected by DPR/DSNY and transported to the Staten Island Waste Transfer Station and to DSNY's recyclables processing

contractors for paper and MGP, respectively. The waste transfer station and the private recyclables processing contractors have more than adequate capacity to handle the added volume of solid waste from the proposed park and no impacts on the solid waste transfer station's waste handling operations or on the Borough's recycling operations would be expected with the proposed project.

CONSISTENCY WITH THE SWMP

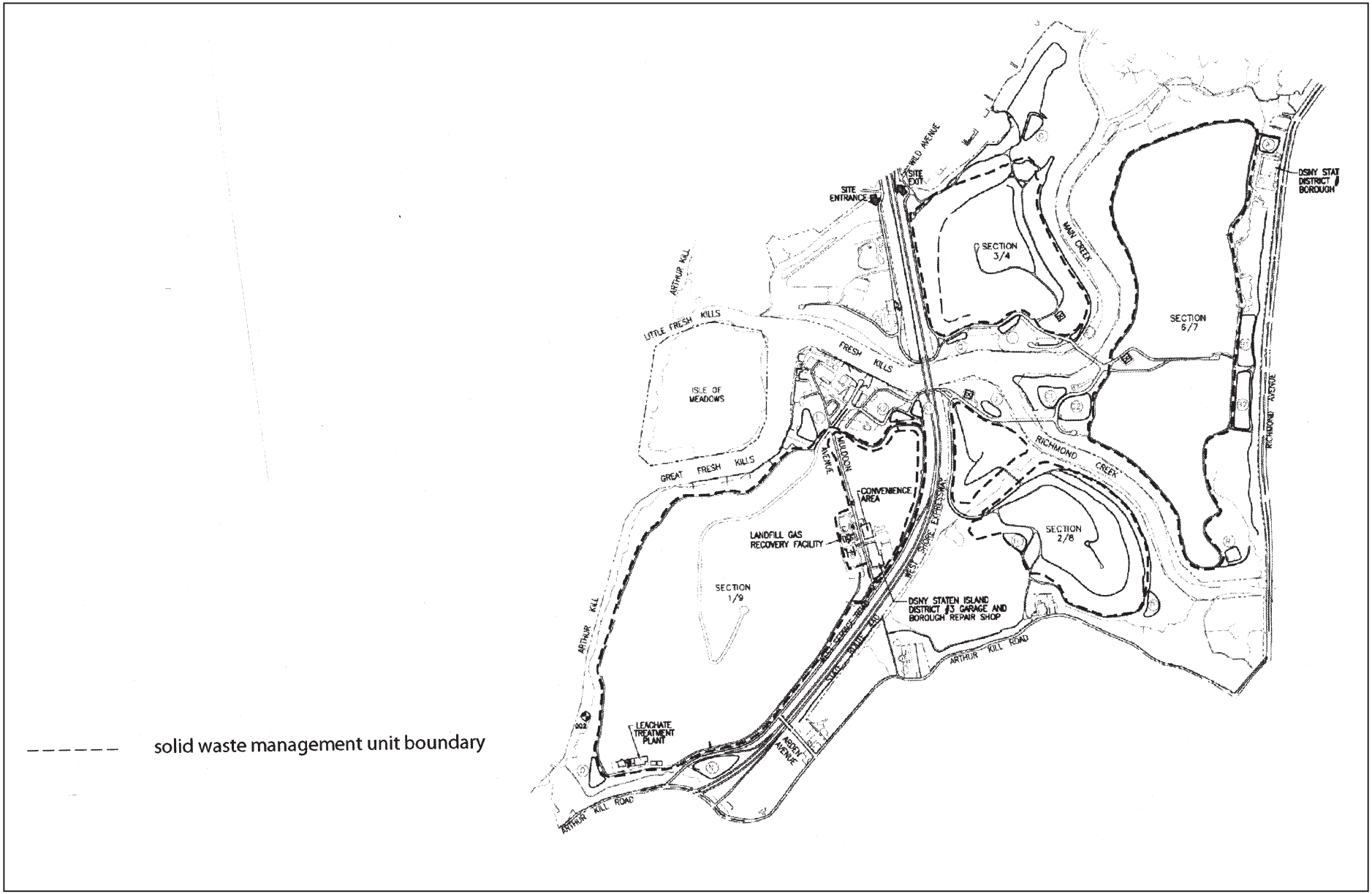
For the reasons described above, the proposed project would be consistent with the City's SWMP and is not expected to require any amendments to the SWMP relative to the operation of the DSNY facilities in District 2 or 3 or the Staten Island Waste Transfer Station. In addition, the proposed project would take the necessary measures to minimize conflicts between the proposed park and the existing landfill. In addition, the long-term design for the Point area would include space for a landfill post-closure operations center, possibly in the former Boat Maintenance Building.

CONCLUSIONS

Solid waste management and recycling services for the proposed project would be principally provided by DPR and DSNY. It is expected that a small amount of refuse and recyclables would be handled by private carters at the privately operated commercial facilities. The proposed project would not adversely affect the City's solid waste collection, recycling, and disposal services, or place a significant burden on the City's solid waste management system. The net increase in solid waste to be collected under the proposed project by 2036 is about 14.6 tons per day, which is a minimal increase when compared to the estimated 14,000 tons per day of residential and institutional refuse and recyclables collected by DSNY. While the commercial waste would also increase due to the proposed action, this waste would amount to about 5.7 tons per day. This would represent an increase of less than one percent in the commercial waste stream of the City (which amounts to approximately 10,000 tons per day) and is also a minimal increase in the commercial waste stream. It is expected that this volume of solid waste could be handled by the private commercial solid waste management industry.

In conclusion, given that there is an extensive system of solid waste collection and disposal services available to the proposed project and that the added net increments of solid waste under the project would be a minimal addition to the City's solid waste stream, the proposed project would not adversely impact solid waste and sanitation collection services.

With respect to the existing solid waste management facilities on the project site and adjacent areas, the City would ensure that all management and maintenance obligations relative to the closure and post-closure requirements that pertain to Fresh Kills Landfill would be met even with the construction of the proposed park. This would include any modifications to existing facilities or amendments to the post-closure monitoring and maintenance program for Fresh Kills Landfill. In addition, DPR would ensure the continued access to DSNY facilities at the Fresh Kills site as well as off-site, including the Staten Island Waste Transfer Station and the Borough 2 and 3 District garages and the repair shop, as well as use of the Fresh Kills Park roads, for the purposes of allowing DSNY to continue to provide sanitation collection and disposal services for Staten Island. The park mapping language will acknowledge that leaf and yard waste composting that produces compost for park use is a compatible park use. For the reasons stated above, it is concluded that the proposed project would not adversely impact solid waste and sanitation services, the obligations of the City under its SWMP, or the obligations of the City regarding long-term monitoring and post-closure maintenance of the former Fresh Kills Landfill. ✷



Landfill Solid Waste Management Unit Areas

Figure 14-1

DSNY Facilities on the Project Site and Adjacent Areas