

A. PROJECT DESCRIPTION

PROJECT BACKGROUND

The City of New York, with the New York City Department of Parks & Recreation (DPR) as lead agency, is proposing the East Park Road system with the East Park area of Fresh Kills Park. East Park is approximately 482 acres in size and is City-owned property under the jurisdiction of the New York City Department of Sanitation (DSNY). The boundaries of the East Park are defined to the east by Richmond Avenue and across Richmond Avenue is parkland (LaTourette Park) and commercial uses (e.g., the Staten Island Mall). Main and Richmond Creeks form the boundary to the west and south. Fresh Kills Park was the subject of a comprehensive environmental review that was completed with the Final Generic Environmental Impact Statement (FGEIS) released on March 13, 2009. This Supplemental Environmental Impact Statement (SEIS) is being prepared to analyze in greater detail the potential impacts of the Proposed East Park road system, which totals approximately 2 miles of roads across East Park. The project site is located in the southwest portion of Staten Island, within Staten Island Community Board 2.

For many decades over the latter half of the 20th Century, Fresh Kills Landfill operated as the City's principal municipal solid waste landfill, receiving household and municipal solid waste between 1948 and 2001. A state law enacted in 1996 mandated that solid waste landfill operations cease at Fresh Kills Landfill by December 31, 2001; landfilling subsequently ended on March 22, 2001. After that date, Fresh Kills Landfill was temporarily used only for the disposal of materials from the attacks of September 11, 2001. During this time, no other materials were brought to the Fresh Kills. Large portions of Fresh Kills are comprised of four solid waste landfill sections—3/4, 2/8, 6/7, and 1/9. East Park and the East Park roads traverse Landfill Section 6/7. These landfill sections are regulated as Solid Waste Management Units (SWMUs) by the New York State Department of Environmental Conservation (DEC). With the cessation of solid waste disposal operations at Fresh Kills Landfill, final closure and post-closure activities are underway. Final closure design has been approved by DEC and closure construction is underway at Landfill Section 6/7.

Fresh Kills includes not just the landfill sections, but also the lands around the landfill sections, which have facilities once used by DSNY when the site was still receiving solid waste as well as buffer areas from the local community. This land also includes DSNY stormwater management, environmental control, maintenance and monitoring infrastructure, and systems that will remain active for up to 30 years after closure construction is complete. This infrastructure was installed by DSNY in accordance with a design approved by DEC. DEC also regulates activities in these environmental compliance buffer areas around the SWMUs. The portions of East Park that are outside the delineated landfill section include lands to the west between the base of the landfill and the shorelines of Main and Richmond Creeks. These areas are occupied by DSNY haul roads and tidal wetlands along the creeks. To the east, these lands include lands between the

Fresh Kills East Park Roads SEIS

base of the landfill and Richmond Avenue. Those lands include DSNY landfill drainage basins and wetlands, as well as a berm and buffer land fronting Richmond Avenue.

The proposed Fresh Kills Park is an extensive park and development project, one of the largest in the history of the City of New York. It is comprised of five key planning areas: North Park, South Park, West Park, the Confluence, and East Park. Upon completion, Fresh Kills Park will be the City's second-largest park (after Pelham Bay Park in the Bronx, which covers 2,765 acres), three times the size of Central Park, will more than double the size of the Staten Island Greenbelt, and will provide seven miles of roads. Park development will occur in multiple phases through 2036 with designs that are expected to evolve over time.

This Supplemental Environmental Impact Statement (SEIS) has been prepared to describe and analyze the proposed East Park Roads component of the Fresh Kills Park project, which is described in greater detail below.

DESCRIPTION OF THE PROPOSED PROJECT

PROJECT SUMMARY

The proposed East Park Roads that are the subject of this SEIS are all located within the East Park planning area of Fresh Kills Park.

The proposed project is comprised of three components:

- A modified grading plan for the final landfill cover at Landfill Section 6/7 that would be completed by 2011;
- Completion and operation by 2016 of the Yukon Avenue connection as a two-lane road, crossing Landfill Section 6/7 and connecting on the east with a new intersection at Richmond Avenue; and
- Completion of various options for the longer-term completion of the East Park Road system, which could be implemented as one of a number of options under consideration, including four-lane-wide or two-lane-wide roads across East Park with new connections at Richmond Hill Road, Yukon Avenue, and Forest Hill Road, or a two-lane loop road around the base of the landfill with connections at Richmond Hill Road, Yukon Avenue, and Forest Hill Road.

PROJECT CONSTRUCTION PHASING

Within the context of the larger Fresh Kills Park project, development of the East Park road system will proceed in three phases, including: 1) construction of final cover at Landfill Section 6/7 for the purposes of creating a potential embankment across the landfill section (this modified phasing plan reflects the completion sequencing of the work and is subject to adjustment because of field conditions)—this phase is assumed to be completed by 2011; 2) construction and opening of the Yukon Avenue Connection across the landfill by 2016; and 3) completion of the East Park Road network by 2036. The analysis years presented in this SEIS correspond to the analysis years presented in the FGEIS. These years are not the completion years for road construction (i.e., road construction could be completed earlier), but they are analysis years by which selected components of the project have been projected to have been completed and are therefore appropriate for analyzing traffic, air quality, and noise conditions (for example).

COORDINATION WITH DSNY LANDFILL INFRASTRUCTURE

Fresh Kills Park is a large, multi-phased project. In accordance with agreements between the City and State of New York and the permits and approvals issued to the City, DSNY is expected to complete final closure at Landfill Section 6/7 and then continue to operate and maintain the landfill environmental control systems, and perform the required monitoring and maintenance in accordance with the Fresh Kills Landfill Post-Closure Monitoring and Maintenance Operations Manual (see the description below) for a period of at least 30 years.

PERMITS AND APPROVALS

There are many City, State, and Federal land use and environmental approvals that are necessary to construct the proposed East Park roads. With respect to local (City) regulations, these approvals include amending the City Map to map a public place that would serve as the right-of-way for proposed roads and a zoning map amendment to assign a zoning district (M1-1) to the areas being mapped as public place. These mapping and zoning actions are part of a larger ULURP action for Fresh Kills Park.

At the State level, approvals necessary for the proposed project include modifications to the approved Fresh Kills Landfill Final Closure Plan; Part 360 landfill closure approvals for end use; permits for activities in wetlands and protection of waters. Federal approvals would apply to constructing structures over or in navigable waterways or activities in wetlands as delineated in accordance with U.S. Army Corps of Engineers (ACOE) procedures.

A State legislative action was previously approved for the alienation of parkland along these segments of proposed road corridors passing through mapped parkland (Chapter 659 of the 2007 Laws of the State of New York).

ENVIRONMENTAL REVIEW PROCESS

This SEIS has been prepared in conformance with applicable laws and regulations, including Executive Order No. 91 of 1977 and the Rules of Procedure for City Environmental Quality Review (CEQR). It has also been prepared in conformance with Article 8 of the Environmental Conservation Law (the State Environmental Quality Review Act [SEQRA]) and its implementing regulations found in Part 617 of Title 6 of the New York Codes, Rules, and Regulations (6 NYCRR Part 617) and follows the guidance of the *CEQR Technical Manual* (October 2001) and the National Environmental Policy Act (NEPA). DPR is the lead agency in preparing this SEIS with the assistance of other City agencies. The SEIS contains a description of the proposed project and its related actions including the project site and its environmental setting. It examines the short- and long-term environmental impacts of the proposed project for the two analysis years, and identifies and discloses any significant adverse environmental impacts. This SEIS also presents and analyzes alternatives to the proposed project, identifies the irreversible and irretrievable commitments of resources, and describes the mitigation measures necessary to minimize, eliminate, or avoid significant adverse environmental impacts that could occur with the proposed project. As described below, implementation of the proposed project requires multiple discretionary actions. This SEIS has been prepared to address the environmental issues and impacts related to decision-making regarding these actions.

FRESH KILLS SITE AND REGULATORY HISTORY

SITE HISTORY

Before solid waste landfilling operations began, natural conditions at the project site were almost entirely coastal marsh and creeks. In 1948, to address its increasing solid waste disposal needs, the City of New York opened the Fresh Kills Landfill as part of a network of municipal solid waste landfills that were developed to serve the dual purposes of municipal solid waste disposal and land reclamation. In the decades that followed, Fresh Kills became the City's principal landfill facility for the disposal of collected household and commercial and municipal solid waste and construction and demolition debris. It eventually grew into the largest landfill in the world by the mid-1990s. While the City had a number of operating landfills through the latter half of the 20th century, many were closed as new environmental regulations came into effect. By 1991, Fresh Kills was the City's only operating landfill. At its peak, Fresh Kills received as many as 29,000 tons of solid waste per day.

Landfill operations at Fresh Kills predated the existence of Federal and State regulations pertaining to the design and operation of solid waste landfills. With the promulgation of new federal statutes, such as the Resource Conservation and Recovery Act (RCRA) in the 1970s, federal guidelines were established for the siting, design, operation, closure, and monitoring of landfill. In addition, it required states to perform an inventory of their landfills to determine the level of compliance with the new regulations. Following the passage of the Environmental Conservation Law (ECL) of New York State in 1973, stringent new regulations were adopted governing the state's solid waste landfills. These new regulations included 6 NYCRR Part 360, Solid Waste Management Facilities, signed in 1977. To ensure that landfills throughout the state were in compliance with these new regulations, municipalities were required to apply for permits from DEC for their landfills.

DEC recognized that bringing existing landfills into compliance with new regulations would not occur immediately. To enable the Fresh Kills Landfill to come into compliance with the Part 360 regulations for solid waste management facilities, DEC entered into a consent order that allowed DSNY to continue operating the Fresh Kills Landfill while the City made environmental and operational improvements at the landfill. A review of a Part 360 permit application for Fresh Kills Landfill was subsequently terminated when a state law was passed in 1996 requiring the landfill to cease accepting solid waste by December 31, 2001. As a result, Fresh Kills Landfill continues to be governed by the consent order between DEC and the City of New York (April 24, 1990, as modified DEC Case #022-9001-89-03), which governs landfill closure at the site.

Fresh Kills Landfill received its last barge of solid waste on March 22, 2001. Subsequently, landfill closure construction has proceeded in accordance with a DEC-approved closure plan under the Consent Order. After the World Trade Center attacks of September 11, 2001, the Consent Order was amended by the Governor of New York to temporarily allow placement of materials from the World Trade Center site. No other materials were brought to Fresh Kills during this temporary suspension of the closure.

REGULATORY HISTORY

Consent Orders

Fresh Kills Landfill operates under a series of Consent Orders and amendments that began in 1980 between DEC and the City of New York (acting through DSNY). As described above, Fresh Kills Landfill operated as a major municipal landfill for several decades prior to the enactment of Federal and State laws regulating the management, handling, and disposal of solid waste materials.

After these laws took effect, Fresh Kills, as an existing municipal solid waste facility, was in non-conformance with the standards of the new regime, particularly with respect to managing the impacts of the landfill on local groundwater and surface waters, air quality, and wetlands. At the same time, however, Fresh Kills was an essential solid waste disposal facility for the City of New York, and one of the largest municipal landfills in the country. In accordance with those Consent Orders, in January 2001, DSNY submitted to DEC a Landfill Section 6/7 Final Cover Design Report and in January 2002, DSNY submitted a Landfill Section 1/9 Final Cover Design Report. (DSNY had submitted multiple Closure Construction Certification Reports for Landfill Sections 2/8 and 3/4 between November 1995 and March 1997, and the reports for Section 3/4 were submitted between February 1996 and May 1997.) In accordance with the modified Consent Order, DSNY also submitted to DEC a Post-Closure Monitoring and Maintenance Operations Manual for the landfill on December 13, 2002. Finally, DSNY submitted a Final Closure Plan on June 5, 2003. With the exception of the Closure Construction Certification Reports for Landfill Sections 1/9 and 6/7 and Annual Landfill Closure Progress Reports, all activities required under Appendix A-15 of the Consent Order have been completed and approved by DEC.

Fresh Kills Landfill Permits

The current Fresh Kills Tidal Wetlands permit (DEC ID: 2-6499-00029/000248) was issued May 26, 2004, and expires May 26, 2014. The current SPDES permit, which regulates discharges from the Leachate Treatment Plant to the Arthur Kill (DEC ID: 2-6499-00029/00037, SPDES ID: NY 020 0867) was issued July 25, 2007, and expires February 28, 2013; however, DEC is currently pursuing a Department-Initiated Modification (DIM) of the SPDES permit. The proposed DEC modifications to the SPDES include the alteration of the types of water quality samples.

At the landfill, DSNY operates three flare stations (six flares) in conjunction with the landfill gas management and processing at Fresh Kills. DSNY has a Title V Air permit to cover all sources of air emissions at the landfill including these activities. The current Title V Air permit (DEC ID: 2-6499-00029/00151) was issued August 16, 2006, and expires August 15, 2011.

FRESH KILLS PARK COMPREHENSIVE VEHICULAR CIRCULATION PLAN

OVERVIEW

The Fresh Kills Park vehicular circulation plan addresses a number of unusual challenges for traffic planning and roadway design, not the least of which includes the presence of extensive landfill infrastructure along with freshwater and tidal wetlands in the off-landfill low-lying areas. The intent of the vehicular circulation plan at Fresh Kills Park is to integrate the roads into the natural setting while providing local traffic relief, access to the park, and limiting environmental impacts to the extent possible.

The Fresh Kills Park vehicular circulation plan is designed to provide new east–west connections between Richmond Avenue on the east and the West Shore Expressway on the west, and a high level of interconnectivity among park elements, while taking advantage of the existing topography, within wide landscaped corridors, and distinctive paving materials.

The design guidelines for the proposed Fresh Kills road system take into account not only engineering criteria, but ecological, sustainability and aesthetic standards, Park functionality, and landfill protection principles. The design process includes use of the City's *High*

Performance Infrastructure Guidelines (New York City Department of Design and Construction and the Design Trust for Public Space, October 2005).

DESIGN GUIDELINES FOR THE FRESH KILLS PARK ROAD SYSTEM

OVERVIEW

Fresh Kills park roads are designed to meet the following goals:

- Provide access to the park.
- Site roads above flood level and the wetland buffer wherever possible and avoid negative impact on wetlands, mature trees, and other ecological resources.
- Provide scenic views of park natural features while limiting the visual and physical intrusion of the road in the landscape.
- Design the roads in conjunction with a landscape corridor that could serve as a robust habitat and stormwater treatment system.
- Buffer pedestrian paths and bikeways with native plantings integrated with the stormwater management design.
- Create a consistent system—in terms of geometries, widths, materials, edging, lighting, signage and markings—that identifies the road as a park feature.
- Improve traffic flow and reduce potential for pollution from start-stop activity.
- Use sustainable and durable materials.

ENGINEERING DESIGN GUIDELINES

Project specific road standards reflect the particular context in which the project would operate and in keeping with established safety standards. Consequently, separate design criteria are to be applied to the West Shore Expressway Service Roads and Ramps.

The typical four-lane park road section is comprised of four 11-foot-wide travel lanes, a flush, four-foot, textured median, and 6-foot outside shoulders, which may also be textured. The shoulders contribute to improved sight distance along the inside of curved roadway segments and help keep the roadside clear of hazards. The two-lane-wide park road option would have only two 11-foot-wide travel lanes.

The pavement structure has not been designed, but is expected to be a flexible asphalt surface, binder and base courses supported by a granular embankment course founded on a suitably prepared embankment. Special attention would be needed to prepare the embankment across the landfill and to integrate sustainable materials and principles.

Side slopes of 1 on 4 or flatter are to be provided wherever possible; however, site conditions necessitate fairly extensive use of 1 on 3 (and 1 or 2) slopes to minimize intrusion into wetlands and landfill impacts. Swales and ditches will be incorporated to prevent landfill and other site runoff from encroaching on the roadway pavement.

Roadway Crossings

The proposed park roads would pass through a variety of park uses, including passive and active recreation areas, and waterfront development. Pedestrian/bicycle crossings would be required at a number of locations in order to ensure safe passage over roadways. The safety of pedestrians,

cyclists, DPR and DSNY maintenance workers, and motorists is a paramount concern in the design of crossings.

Lighting

Appropriate lighting for the roads would be determined as part of the design process in coordination with NYCDOT and NYSDOT.

Roadway Management and Maintenance

Road management and maintenance at Fresh Kills Park will require a special maintenance program that is expected to be far different from typical City street maintenance programs. For example, at Fresh Kills Park, road maintenance is expected to involve monitoring landfill settlement to ensure that the critical landfill infrastructure is not compromised. The geotechnical properties of the site itself require special road design and special maintenance practices. While it is not yet established which city agency will have maintenance responsibility of the roadways, as DPR, NYCDOT, the Department of Design and Construction (DDC) and DSNY collaborate on the design the roadways, maintenance practices and programs will be determined.

LANDFILL CROSSING DESIGN GUIDELINES

With respect to roadway design over the landfill sections, the objective is to not compromise the function or integrity of the existing landfill cover, infrastructure, and environmental systems. The design, however, must provide protection consistent with that provided with the current landfill closure cover design, meeting both DEC and DSNY requirements. Thus, any element of roadway infrastructure needs to be designed to the satisfaction of DSNY and DEC. Both agencies need to approve all designs through final detail and construction.

Fresh Kills Landfill infrastructure must also remain accessible to DSNY until the landfill post-closure process is complete. Thus, access for landfill monitoring maintenance and repair activities will continue for many decades to come.

PROPOSED FRESH KILLS PARK ROAD SYSTEM¹

INTRODUCTION

The proposed Fresh Kills Park primary road system is comprised of the West Shore Expressway (Route 440) Corridor, the Confluence Loop Park Road, and three new connections to Richmond Avenue, as Yukon Avenue, Forest Hill Road and Richmond Hill Road.

PROPOSED WEST SHORE EXPRESSWAY ACCESS IMPROVEMENTS

The West Shore Expressway is part of the regional highway network. It runs north/south through the Fresh Kills Park site within a 400-foot-wide right-of-way under NYSDOT jurisdiction. The proposed project would include modifications within the West Shore Expressway corridor

¹ Sources: Sources used in this description include the *Conceptual Roads Report*, Fresh Kills Park, Phase 3A, Task 8.3, prepared by Arup et al., for DPR (September 6, 2007); the *100 Percent Schematic Report* and the *Fresh Kills Park Road Alternatives Report*, prepared by Arup et al., for DPR (January 2008); the *Fresh Kills Park Bridge Alternatives Report*, Phase 3A Tasks 8.4.3 and 8.4.5, prepared by Arup for DPR (November 2007); and “Contract Drawings for the Construction of the NB/SB West Shore Expressway Service Roads and Vicinity” (40 percent submission), HDR/Daniel Frankfurt for DPR, (September 11, 2008).

Fresh Kills East Park Roads SEIS

between Arthur Kill Road on the south and Victory Boulevard on the north to provide regional access to and across the park. These improvements would include new and extended service roads, additional ramps, and ramp relocations. The West Shore Expressway mainline would not be affected beyond the adjustments needed to accommodate new or modified ramp termini.

PROPOSED CONFLUENCE LOOP PARK ROAD

The proposed internal loop around the park's central area is the Confluence Loop Park Road. It is the primary hub and vehicular circulation element within the proposed park. It links the entire system, providing the means to access all areas of the park and the West Shore Expressway.

The Confluence Loop Park Road alignment is the result of both natural and manmade conditions. It is defined primarily by existing DSNY roads and bridges—including two existing bridges across Main and Richmond Creeks, referred to herein as the Main Creek and Richmond Creek Bridges. Currently these bridges provide access for DSNY haul and maintenance operations to the north, east, and south and west landfill sections. Under the proposed project they would be modified to become part of the park road system.

EAST PARK ROAD SYSTEM

OVERVIEW

The proposed East Park Road System would provide the opportunity for connections to Richmond Avenue at three locations: Yukon Avenue, Forest Hill Road, and Richmond Hill Road. These connections would provide new gateways into the park and link Richmond Avenue on the east with the West Shore Expressway on the west. A discussion of the proposed connections is presented below.

YUKON AVENUE CONNECTION

By 2016, the proposed project would extend Yukon Avenue west into the park from its existing intersection with Richmond Avenue. From this intersection, the park road would extend across East Park to connect with the Confluence Loop Park Road near the Richmond Creek Bridge. This proposed park road would cross Landfill Section 6/7. For the purposes of this SEIS, this connection is referred to as the Yukon Avenue Connection. Total length of the Yukon Avenue Connection Park Road is about 2,600 linear feet.

FOREST HILL ROAD CONNECTION

By 2036, the proposed project would extend Forest Hill Road west into the park from its existing intersection with Richmond Avenue. From Richmond Avenue, this park road would extend west across East Park to connect with the Confluence Loop Park Road. This proposed park road would traverse wetlands, Landfill Section 6/7, and DSNY service roads. It is anticipated that a viaduct/culvert structure would provide a space for the proposed park road over the wetlands. For the purposes of this SEIS, this connection is referred to as the Forest Hill Road Connection. Total length of this road segment is about 4,420 linear feet.

RICHMOND HILL ROAD CONNECTION

By 2036, the Richmond Hill Road Connection would extend from the intersection of Richmond Avenue/Richmond Hill Road west into the park where, under one option, it would connect at its

southern terminus with the Yukon Avenue Connection. Once in the park, the Richmond Hill Road connection quickly turns south, passing through an existing DSNY retention pond and stormwater Basin B1. The alignment crosses the basins twice, as it shifts to the east and then runs adjacent to the existing berm along Richmond Avenue, and again across Basin B1 where it meets the Yukon Avenue Connection. Total length of this road segment is about 4,990 linear feet.

DESCRIPTION OF PARK VEHICULAR CIRCULATION: 2011, 2016 AND 2036

With the above described proposed road improvements in place, the proposed project would improve local vehicular circulation patterns as well as providing access to the park. The goal of the overall Fresh Kills Park circulation system is to bring drivers to the center of the site, where they connect with the Confluence Loop Park Drive, from which the West Shore Expressway and all five park areas are accessible. An overall description of the park vehicular circulation for the three analysis years is provided below.

2011

In 2011, certain road segments west of Landfill Section 6/7 are assumed to be under construction (e.g., across from the West Shore Expressway).

2016

- By 2016, a new park road entrance would be operating at the Yukon Avenue/Richmond Avenue intersection. From there, this Yukon Avenue Connection would provide access to the Confluence Loop Park Road, Creek Landing, and the West Shore Expressway. This segment of road would extend over Landfill Section 6/7.
- From the West Shore Expressway, northbound drivers would reach the park or Richmond Avenue/Yukon Avenue by exiting the highway via a proposed ramp just north of Arden Avenue. This ramp connects with the proposed West Shore Expressway northbound Service Road. In turn, the service road intersects with the Loop Park Road, providing access to other parts of the park. In addition, a new entrance ramp from northbound Service Road into the mainline is proposed approximately 1,800 feet north of the off ramp to better serve departing park patrons and neighboring traffic.
- From the West Shore Expressway, southbound drivers would reach the park and Richmond Avenue/Yukon Avenue by exiting from the highway at the existing ramp just north of Victory Boulevard. Drivers would continue south across Victory Boulevard and onto a segment of road that is currently only open to DSNY and authorized vehicles accessing the Staten Island Waste Transfer Station. Under the proposed project, this service road would allow public access and would connect with the Confluence Loop Park Road. Drivers seeking to reach the Richmond Avenue/Forest Hill Road intersection would turn east, pass under the West Shore Expressway bridges, travel across the Main Creek Bridge, follow the east leg of Loop Park Road, and continue east to Richmond Avenue.
- The Fresh Kills Park project would also construct a ramp from the southbound service road to the Expressway beginning at a location just south of Arden Avenue and connecting with the West Shore Expressway southbound main line. Construction of this access ramp would require that the existing exit ramp to Arthur Kill Road be relocated to north of Arden Avenue.

2036

- The Forest Hill Road Connection would provide access to the Confluence Loop Park Road at the center of Fresh Kills Park via either the Richmond Creek or Main Creek Bridges. (Alternatively, rather than crossing Landfill Section 6/7, this park road segment would connect to a two-lane East Park Loop Road to be constructed around the base of Landfill Section 6/7.) To reach the southbound West Shore Expressway, drivers would continue west to the Confluence Loop Park Road south leg, across the Richmond Creek Bridge, under the West Shore Expressway, and turn left onto the West Shore Expressway southbound service road. Drivers would continue south on the Service Road past Arden Avenue to a proposed ramp entrance into the West Shore Expressway mainline, or stay on the Service Road to reach local destinations (e.g., Arthur Kill Road). Within the park, there would be a 30-space parking lot located in the Marsh that would be accessible from the south leg of Loop Park Road.
- By 2036, a new park road entrance would be operating at the Richmond Hill Road/Richmond Avenue intersection. Under another road option, the Richmond Hill Road Connection intersects immediately to the west with the East Park Loop Road around the base of Landfill Section 6/7. This proposed connection would also provide access to the Confluence Loop Park Road at the center of Fresh Kills Park via either the Richmond Creek or Main Creek Bridges. This proposed Richmond Hill Road Connection would also reach the southbound West Shore Expressway, drivers would continue west across the Yukon Avenue Connection to the Confluence Loop Park Road south leg, across the Richmond Creek Bridge, under the West Shore Expressway, and turn left onto the West Shore Expressway southbound service road. Drivers would continue south on the Service Road past Arden Avenue to a proposed ramp entrance into the West Shore Expressway mainline, or stay on the Service Road to reach local destinations (e.g., Arthur Kill Road). To reach the northbound Expressway, drivers would make a right turn at the Confluence Loop Park Road to access the service road on the east side of the Expressway that crosses Victory Boulevard to the northbound main line.

PARK ROAD STORMWATER MANAGEMENT PLAN

There are a number of proposed park features that, if constructed, would convert existing pervious surfaces to impervious surfaces. These include the proposed park roads, park structures and parking. Because impervious surfaces do not allow precipitation to infiltrate to the soil, precipitation first runs down a slope, and then infiltrates into soil, or is conveyed via a drainage swale or storm sewer system, to a receiving waterbody.

The stormwater management system proposed for the proposed East Park Roads would complement and enhance the aesthetic of the park while avoiding impacts to landfill infrastructure. The approach would include a mix of traditional conveyance and storage measures that would include Low Impact Development practices throughout each subcatchment. These stormwater management approaches would both reduce runoff and pollutant loadings by managing the runoff at the source, and promoting the use of natural systems to achieve stormwater quality requirements, and achieve volume control through both infiltration and evapotranspiration. Implementation of these measures would minimize the potential for significant adverse impacts to aquatic resources resulting from the discharge of stormwater from Fresh Kills Park. Implementation of the runoff control and drainage system proposed for the park would require coordination and review between DPR and DSNY through both design and construction.

Generally, stormwater management design for the park road is designed to retain the flow patterns developed for the landfill stormwater design. Where road embankments interfere with drainage swales along the perimeter of the landfill or at downchutes, culverts would be installed beneath proposed roads to retain existing drainage patterns to sediment basins. Road runoff would be directed to existing swales, or new swales installed adjacent to proposed roads.

In park road segments crossing wetlands (e.g., the Forest Hill Road Connection), either viaducts or culverts are proposed to convey stormwater and maintain connectivity on each side of the roadway.

The stormwater management plan for the East Park roads would utilize the existing stormwater management systems presently in place and retrofit the existing system with new BMPs to meet the needs of the new roadways.

EAST PARK ROADS: PROJECT PURPOSE AND NEED

ADDRESSING THE TRAFFIC NEEDS

Increasing Regional Connectivity

There is an undeniable need to address traffic congestion on Staten Island. Traffic in this part of Staten Island is particularly heavy; moreover, congestion is only expected to increase as western Staten Island continues to develop. In response to growing community concerns regarding local traffic, the City of New York created the Staten Island Transportation Task Force which is multi-agency task force led by representatives from NYCDOT and DCP (also represented are local community boards, NYSDOT, the MTA and Port Authority). Formed in 2006, the Task Force is charged with exploring multiple short-term and long term opportunities and solutions for improving transportation and circulation across Staten Island. The Staten Island Transportation Task Force has identified the construction of the Fresh Kills Park roads as one of its key recommendations for relieving local traffic congestion in addition to transit, alternative transportation modes, and other road improvement projects that are being implemented and considered for the area.

Minimizing Local Traffic Impacts

Given the lack of operational capacity along Richmond Avenue, it is recognized that alternative travel routes that reduce congestion along Richmond Avenue are needed. During the course of the preparation of the Fresh Kills Park FGEIS (March, 2009) and this SEIS (including the SEIS scoping hearing), numerous comments were put forth by local representatives and the general public with respect to the need for not only including new east/west public roads as part of the Fresh Kills Park project, but expediting construction of these roads. With no public through road across Fresh Kills, there is a major local need for a shorter travel distance across (rather than around) the approximately 4-square-mile, 2,200 acre Fresh Kills site. Fresh Kills currently presents a significant void in the local street grid, and a significant obstacle to local drivers seeking to reach the West Shore Expressway and the regional highway system. While the proposed park would be served by publicly accessible roads for automobile and transit access into the park, the connections to the West Shore Expressway would simultaneously provide a through road across the site, thereby providing some measure of local traffic relief.

By way of background, in 2001, with the official closing of Fresh Kills Landfill, the office of the Staten Island Borough President, through the New York City Economic Development

Fresh Kills East Park Roads SEIS

Corporation commissioned a study of alternatives for providing vehicular access across Fresh Kills. Among the findings of that study were that roads through the park could provide traffic relief on local streets. In implementing new east/west connections that would provide access to the West Shore Expressway and a bypass to the congested Richmond Avenue corridor, it was the conclusion of those studies that intersections along Richmond Avenue would experience reductions in vehicular congestion if new roads were to be constructed across Fresh Kills. These improved traffic flows were determined to be directly linked to a shift in traffic patterns from the Richmond Avenue corridor (currently via Arthur Kill Road and Victory Boulevard) to roads across Fresh Kills. Thus, with park roads, not only would congestion be reduced at local intersections, but vehicle miles traveled would be reduced with the potential for accompanying air quality benefits.

Based on that report, it is concluded that proposed roads can reduce overall trip time in the network with both more direct (shorter) travel paths and reduced travel times between points of origin and destination. Overall, the 2001 report concluded that these benefits would occur at multiple locations in the local travel network, but particularly along Arthur Kill Road, Drumgoole Road West, Richmond Avenue, Richmond Hills Road, and Forest Hill Road.

The proposed park roads would also eliminate the need for vehicles to travel through the quiet residential neighborhoods adjacent to the Fresh Kills Park site.

Lastly, by reducing travel time from the congested Richmond Avenue corridor to the West Shore Expressway, the proposed roads would also provide the benefit of emergency access to and across the site as well as economic and community benefits with improved circulation.

Providing Park Access

Another goal of the proposed park roads is to provide access into the park and to the various uses distributed through the park. The primary roads are designed to provide vehicular access to those uses which will generate the greatest demand, such as the recreational center proposed for the Confluence.

EAST PARK ROADS: DESCRIPTION OF THE PROJECT SITE, CURRENT AND FUTURE CONDITIONS

BLOCKS AND LOTS

The project site is all City-owned land comprising Block 2520, Lot 1. The property is under the jurisdiction of DSNY.

CURRENT ZONING AND MAPPED PARKLANDS

The proposed East Park has one underlying zoning district, R3-2. This zoning district covers all of Landfill Section 6/7. Open space and recreational facilities are allowed in the R3-2 districts. Where the site is mapped parkland, the zoning designations do not apply.

There is also a City special zoning district mapped over a portion of the project site (the waterfront), the City's Natural Area District (NA-1). The NA-1 District connects with the William T. Davis Wildlife Refuge to the north and LaTourette Park to the east. This Special Zoning district was created in the 1970's to preserve the unique natural landscapes and topography of Staten Island.

Portions of the project site are currently mapped as parkland. Although mapped as parkland, the areas are not developed with recreational facilities and are not publicly accessible.

Because the proposed roads would, in part, pass through existing mapped parkland on the project site, a State legislative action was approved for the alienation of parkland along proposed road corridors (Chapter 659 of the 2007 Law, State of New York).

CURRENT LAND USES, STRUCTURES AND OPERATIONS

LAND USES

The project site is all City-owned land, all of which is under the jurisdiction of DSNY. In addition to the landfill and its associated infrastructure (e.g. drainage basins), there is undeveloped land, including landfill buffer lands and a constructed berm fronting on Richmond Avenue. Richmond Creek and Main Creek form the west boundary of the site.

FRESH KILLS LANDFILL SYSTEMS

There are four landfill sections at Fresh Kills, Landfill Sections 3/4, 6/7, 2/8 and 1/9. The project site is within Landfill Section 6/7.

The landfill sections, or Solid Waste Management Unit areas (SWMUs), at Fresh Kills were once used by DSNY for the landfilling of municipal and household solid waste. These landfill sections are regulated by DEC as SWMUs because they contain solid waste. In accordance with the Resource Conservation and Recovery Act (RCRA), the SWMUs are defined by areas where waste was placed after 1980. In addition to the SWMUs, the project site contains accessory DSNY facilities, such as drainage basins, and landfill gas migration and groundwater monitoring wells that are part of the Fresh Kills environmental control system and post-closure monitoring program (see the discussion below under the “Post-Closure Monitoring and Maintenance”). These environmental control systems and the monitoring and maintenance program for Fresh Kills Landfill are being implemented by DSNY under supervision 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 properties).

Final closure construction is underway at Landfill Section 6/7 in accordance with a DEC-approved design. Final closure construction includes a final cover designed to minimize water infiltration and gas releases with a soil/geomembrane layer and vegetative cover that minimizes erosion. There is also a comprehensive network of drainage structures to collect surface water runoff.

POST-CLOSURE MONITORING AND MAINTENANCE OPERATIONS MANUAL¹

In accordance with the requirements of the State of New York including 6 NYCRR Part 360 and the Order on Consent between DEC and DSNY, a Post-Closure Monitoring and Maintenance Operations Manual (the Manual) was prepared for Fresh Kills Landfill to provide all information

¹ The source for the information provided below is the *Fresh Kills Landfill Post Closure Monitoring and Maintenance Operations Manual*, prepared by Roy F. Weston of New York, Inc. for DSNY, December 3, 2002. This is a summary description. A more detailed description of the Manual is provided in the Fresh Kills Park FGEIS.

Fresh Kills East Park Roads SEIS

necessary to effectively monitor and maintain Fresh Kills for the entire post-closure period. Under the requirements of the Post-Closure Manual, the City is required to perform a variety of measures to ensure that closure and post-closure monitoring and maintenance of the landfill occurs in compliance with 6 NYCRR Part 360.

DSNY FACILITIES ADJACENT TO THE PROJECT SITE

DSNY operates a number of essential solid waste and sanitation management facilities at Fresh Kills that support ongoing solid waste management services and operations for the Borough of Staten Island. These include the Staten Island Waste Transfer Station as well as two local Sanitation Districts 2 and 3 facilities that are located adjacent to, but outside, the boundaries of the proposed park. The DSNY District 2 garage is adjacent to the project site, off Richmond Avenue near Richmond Hill Road, and serves DSNY's Staten Island Sanitation District 2.

FUTURE CONDITIONS AT THE PROJECT SITE WITHOUT THE PROPOSED PROJECT

Closure of Landfill Section 6/7 is underway in accordance with a DEC-approved design and will continue in the future with or without construction of the proposed East Park roads. The phasing plan for the final closure of Landfill Section 6/7 includes four sequences of closure construction covering about 60-80 acres, each phase being implemented in a counterclockwise direction around Landfill Section 6/7. Final landfill closure construction is intended to be completed by 2010 at Landfill Section 6/7. As part of that final cover construction, the vegetation and drainage systems are also installed. As of September 2008, Phase 1 closure construction activities have been completed and Phase 2 closure construction activities are continuing according to the approved sequence.

While the closure construction would be completed and the monitoring and maintenance program for Fresh Kills Landfill underway, in the future without the proposed East Park Roads project, there would be no public roads provided in East Park. In the future without the proposed park, it is also assumed that DSNY would continue use of all needed facilities currently on site for at least 30 years.

SEIS: FRAMEWORK FOR ENVIRONMENTAL IMPACT ANALYSIS

The proposed East Park Roads project and its related discretionary actions are the subject of this SEIS. Under CEQR/SEQRA, environmental impacts of a proposed project (or action) are measured against a background of "No Build" conditions, which is referred to in this document as the "Future Without the Proposed Project." No Build conditions are the conditions that are expected to exist at the time in the future when project construction would be complete and/or when the project would be in operation, assuming, however, that the proposed project does not occur.

For this project there are three major phases to the project and, therefore, three analysis years when each phase is expected to be complete. The three years are 2011, 2016 and 2036 for both the No Build and Build conditions. These three year analysis years reflect the endpoints for each of the following project phases:

- By 2011, completion of the modified final cover plan at Landfill Section 6/7;
- By 2016, completion of construction and operation of the Yukon Avenue Connection park road; and

- By 2036, completion of construction and operation of the Forest Hill and Richmond Hill Road Connection park roads.

With respect to the future No Build conditions assumed in this SEIS, in the absence of an approved modification, it is assumed that DSNY would move forward with construction of its approved final cover design at Landfill Sections 6/7. In addition, DSNY would also have all environmental monitoring facilities in place and would continue to implement its Fresh Kills Landfill environmental maintenance and monitoring program through the 2016 and 2036 analysis years. Additional No Build assumptions include:

- Build out of Fresh Kills Park through the 2016 and 2036 analysis years as described in the Fresh Kills FGEIS (March 2009); and
- Build out of Fresh Kills Park park roads west of East Park through the 2016 and 2036 analysis years as described in the FGEIS including the connections and ramps associated with the West Shore Expressway.

The essential purpose of CEQR/SEQR is to provide decision makers at the City, State, and Federal levels (as appropriate) with an examination of the full range of environmental issues and impacts at the earliest time possible to inform their decisionmaking during the development of a project, in this case the Fresh Kills Park East Park Roads project. The project concept, however, just be sufficiently defined to be capable of undergoing a meaningful examination.

DPR issued an FGEIS in March 2009 that comprehensively examined the impacts of the Fresh Kills Park project in its entirety, including the proposed East Park and its park road/circulation system. That FGEIS serves as the backdrop to this SEIS.

The proposed East Park Roads project involves the construction of approximately two miles of new public roads and is a long-term project with several decades of build-out, involving multiple actions and approvals. Segments of the Yukon Avenue and Forest Hill Road Connections to Richmond Avenue must cross Landfill Section 6/7 which is currently in the process of final closure construction under an approved closure plan design. However, there are significant fiscal and environmental benefits to modifying the southern phases of the landfill closure program at this time, as opposed to retrofitting the closed landfill to accommodate the proposed roads at a future date (see also Chapter 22 “Alternatives” under “Alternative Phasing [Reconstructed Final Cover]”). This SEIS has been prepared to examine the impacts of this action (modification of the landfill closure design to incorporate a roadbed) and its related secondary (or subsequent) actions of constructing the proposed park roads. It has been prepared for the purposes of informing decision makers as to the potential environmental impacts of the modified final cover plan, and the East Park Roads project, to the extent that a number of park road designs and options are under consideration at this time, particularly for the longer term phase (after 2016). Thus, this SEIS comprehensively examines the full range of impacts with the proposed East Park roads including a completed road network, some segments of which may not commence construction for 10-20 years.

The analysis of the park roads presented in this SEIS presents the reasonably expected and comprehensive environmental impacts of the proposed project while recognizing that final decisions on the long term designs are yet to be reached; thus, a range of options have been analyzed which also allows flexibility in future road designs

For the short-term actions (e.g., modification of the landfill cover and the Yukon Avenue Connection), environmental impacts have been minimized and there are no significant

Fresh Kills East Park Roads SEIS

differences in the environmental impacts of preparing a road embankment across Landfill Section 6/7 for either a four-lane park road or a two-lane park road. For long-term phases, such as the Forest Hill Road and Richmond Hill Road connections, this SEIS provides full disclosure of the range of impacts for a number of options (including alternative road alignments and widths) and their associated actions, recognizing that decisions on these segments of the road are many years, if not a decade away. However, defining for analysis purposes a road option that is 60 feet wide for this SEIS presents the maximum impact and allows for specific design decisions that could be made at a later date based on future more advanced road designs coupled with a review of permits and other approvals and decisions regarding each future park road segments. These future decisions will be based on balancing the environmental impact against the project's purpose and need as well as the range of available alternatives and the mitigation.

EAST PARK ROADS: DESIGN ASSUMPTIONS

OVERVIEW

The proposed roads that are the subject of this analysis would extend across the 482-acre East Park. East Park is proposed to be a large, landscaped open space with spectacular views and, since it fronts on Richmond Avenue, would also serve as the point of vehicular access to Fresh Kills Park from the east.

As described in the FGEIS, East Park is a mix of "Active Recreation-Field Sports" on the upper elevations of the mound and "Habitat with People" in the lower elevations. The stormwater basins at the base (east of) the landfill sections are proposed for a mix of "Habitat with People." This includes a hilltop field and recreational fields, with landscaped successional meadow (130 acres) and mixed woodland (187 acres) communities. Footpaths would be provided throughout East Park with a 12-mile multi-purpose path around the base of the landfill.

Ecological enhancements and facilities (e.g., outdoor classroom education center) for public access are proposed for DSNY stormwater basins east of Landfill Section (B1 and B2) and the associated wetlands. Total acreage of the wetland restoration/enhancement is estimated at 13 acres. About 28 acres of the existing wetlands (in the area south of basins B1 and B2) would be restored as tidal marsh.

PUBLIC TRANSIT PLAN

It is expected that with the three proposed connections to Richmond Avenue, described above, NYCT could modify its existing bus routes to take advantage of new road connections into the park. In addition, to accommodate the park-generated transit demand, NYCT could amend the existing bus service and expand bus routes to include new stops within the park, extending service into the site from Richmond Avenue via the Yukon Avenue, Forest Hill Road and Richmond Hill Road connections. In order to extend bus service into the park, the proposed park roads would need to satisfy the design requirements of NYCT for bus operations (e.g., bus stops, lane widths, turnarounds).

PLAN TO AVOID IMPACTS TO LANDFILL INFRASTRUCTURE AND TO PROTECT PUBLIC HEALTH

A key objective for the Fresh Kills Park project is to provide public access in a way that does not conflict with the health and safety of the park users, DPR staff, or the community as a whole. To that end, it is important to avoid and minimize impacts to landfill infrastructure and to properly

design and implement any modifications that may be necessary to construct the proposed park roads. As described above, segments of the proposed East Park roads traverse Landfill Sections 6/7 or the associated landfill infrastructure including stormwater management basins and monitoring wells. DPR, DSNY, and DEC would therefore collaborate in the park road design and approval process, utilizing the extensive monitoring network and data collection systems with respect to landfill gas, groundwater, and surface water that is in place at Fresh Kills Landfill to protect the health of park users, visitors, and DPR personnel.

With these measures in place, and the environmental and public health protections of the current landfill controls and the added systems of the park, the potential for human exposure to contaminants would be significantly minimized. In addition, with continual and ongoing monitoring, the potential pathways for human exposure to pollutants are regularly monitored and tested to ensure that public health and the environment are not at risk.

SOIL MANAGEMENT PLAN

Development of the East Park roads is expected to require substantial volumes of soil and gravel to provide a road embankment as well as the landscaping along the road corridors. In developing the Fresh Kills Park soils strategy (Fresh Kills Park FGEIS, March 2009), the following guidelines were established:

- Protect public health and safety;
- Enhance ecology utilizing native Staten Island soil types;
- Comply with landfill closure and post-closure needs;
- Ensure cost effectiveness and feasibility; and
- Provide for environmentally sustainable soil sources and processing.

Soil decisions for the proposed project would be made on a case-by-case capital project basis as to the types of soil that may be used at each Fresh Kills Park project. Such a “project by project” approach is also recommended by the New York City Department of Health and Mental Hygiene (NYCDOHMH).¹

EAST PARK ROADS PROJECT PHASING FOR THE 2011, 2016 AND 2036 ANALYSIS YEARS

PROPOSED PROJECT: MODIFIED LANDFILL 6/7 CLOSURE PLAN (2011 ANALYSIS YEAR)

By 2011 it is assumed that the grading and infrastructure improvements for the proposed roads would be installed on Landfill Section 6/7 in accordance with a modified final closure design. Interim uses in the embankment corridors would include a meadow cover and walking trails.

PROPOSED PROJECT: YUKON AVENUE CONNECTION (2016 ANALYSIS YEAR)

As described in greater detail above, under “Vehicular Circulation,” the Fresh Kills project would develop the Yukon Avenue Connection by 2016 in addition to the park road system to the

¹ Additional details on the Fresh Kills Park Soil Management Plan are provided in the Fresh Kills Park FGEIS (March 2009).

Fresh Kills East Park Roads SEIS

west. The proposed project would extend Yukon Avenue west into the park from its existing intersection with Richmond Avenue. From this intersection, the park road would extend across East Park to connect with the Confluence Loop Park Road near the Richmond Creek Bridge. This proposed park road would cross Landfill Section 6/7 and the DSNY service road. The overall length of the Yukon Avenue Connection is about 2,600 linear feet. Under existing conditions, the intersection of Yukon Avenue and Richmond Avenue is a T-intersection, with a southbound approach consisting of an exclusive left turn lane and four through lanes, a northbound approach consisting of four through lanes (with the curbside land operating as two moving lanes with a through lane and right turn lane), and a westbound approach consisting of one left-turn and one shared left- and right-turn lane. In 2016, with the proposed project, this intersection is proposed to be reconfigured to accommodate the park road entrance/exit at Yukon Avenue and Richmond Avenue.

PROPOSED PROJECT: EAST PARK ROAD SYSTEM (2036 ANALYSIS YEAR)

By 2036, it is assumed that the East Park road system would be completed. At this time a number of options are under consideration for the completion of the East Park road system. These options include:

- Four-lane-wide road connections at Richmond Hill Road, Yukon Avenue, and Forest Hill Road. These four-lane roads would extend into the site and across Landfill Section 6/7 to reach the Confluence Loop Park Road and, in turn, access to the West Shore Expressway.
- Two-lane road connections, at Richmond Hill Road, Yukon Avenue, and Forest Hill Road, with the same alignment as described above. However, under this option the park roads are two-lane-wide only, widening only at the Richmond Avenue intersection to provide adequate turning lanes (intersection design is similar to the option described above).
- Yukon Avenue only as a two-lane road and carrying the 2036 projected traffic.
- A two-lane, two-direction East Park Loop Road around the base of Landfill Section 6/7, providing access to the Confluence Loop Road as well as linking two-lane road connections at Forest Hill Road and Richmond Hill Road with a four-lane-wide road at Yukon Avenue that also provides a connection to Richmond Avenue and crosses Landfill Section 6/7.

A description of each of the options is provided below.

Background conditions common to each of these park road options is that East Park is completed by 2036, as described in the March 2009 Fresh Kills Park FGEIS.

EAST PARK ROAD SYSTEM—FOUR-LANE ROAD OPTION

Forest Hill Road Connection (4-lane Road)

This proposed project option would extend Forest Hill Road west into the park from its existing intersection with Richmond Avenue. From Richmond Avenue, this park road would extend west across East Park to connect with the Confluence Loop Park Road in the vicinity of the Richmond Creek Bridge. This segment of the proposed park road would traverse wetlands, Landfill Section 6/7, and cross DSNY service roads. It is anticipated that a viaduct/culvert structure would carry the proposed park road over the wetlands. For the purposes of this SEIS, this connection is referred to as the Forest Hill Road Connection. The overall length of the Forest Hill Road Connection is about 4,420 linear feet. Use of this park road would be limited to vehicles.

Under existing conditions, the intersection of Forest Hill Road and Richmond Avenue is a T-intersection, with a southbound approach consisting of an exclusive left-turn lane and four through lanes, a northbound approach consisting of four through lanes, (with the curbside lane operating as two moving lanes with a through lane and a right-turn lane), and a westbound approach consisting of one left-turn and one shared left- and right-turn lane. With the proposed project, this intersection is proposed to be reconfigured to accommodate the park entrance/exit at Forest Hill Road and Richmond Avenue.

Richmond Hill Road Connection (4-lane Road)

Under the proposed project option, the Richmond Hill Road Connection would extend west into the park from the intersection of Richmond Avenue/Richmond Hill Road and would then turn south to connect at its southern terminus with the Yukon Avenue Connection. There already exists a short extension of Richmond Hill Road west of Richmond Avenue in the form of a 200-foot stub that currently operates as the driveway into a Duane Reade parking lot. The proposed project would modify this road segment to fit the proposed park road design. With the proposed extension, the overall length of this segment of the park road is about 4,990 linear feet .

This segment of park road would pass through existing DSNY stormwater basins and freshwater wetlands situated east of Landfill Section 6/7 and part of the landfill drainage system. The alignment crosses the basins twice, once as it shifts to the east and extend along the existing berm parallel to Richmond Avenue, and again at Basin B1 where it meets the Yukon Connection. At the basin crossings, it is anticipated that the proposed park road would be comprised of an embankment traversed by culverts designed to maintain hydraulic continuity. The segment of the road adjacent to the berm along Richmond Avenue would occupy the embankment of an existing DSNY dead-end service road that provides access to landfill monitoring facilities. As a four-lane road, the park road would require filling of certain wetlands and basins along its length as well as modifications of the DSNY drainage system.

Under existing conditions, the intersection of Richmond Hill Road and Richmond Avenue is a four-legged intersection, with a southbound approach consisting of an exclusive left-turn lane, three through lanes, and one shared through-right lane, a northbound approach consisting of an exclusive left-turn lane and four through lanes (with the curbside lane operating as two moving lanes with a through lane and a right-turn lane). With the proposed project, this intersection would be reconfigured to accommodate the park entrance/exit to Richmond Hill Road at Richmond Avenue (eastbound approach).

EAST PARK ROAD SYSTEM—TWO-LANE ROAD OPTION

Introduction

The purpose of this option is to provide a narrower footprint two lane road (i.e., approximately 38 feet wide as compared to the four lane road option which is 60 feet wide). The principal areas of comparison between these options are the physical geometric differences between a two-lane and four-lane park road design, and the resulting potential for landfill conflicts, environmental impacts, and park design conflicts.

With respect to the Forest Hill Road and Richmond Hill Road Connections, the road coverage associated with this two-lane option would differ from that under the four-lane option in terms of magnitude and extent. This provides certain advantages. For example, the smaller footprint of the two-lane alternative would provide a significant advantage in the segment along the berm along Richmond Avenue. While the base of the roadway embankment would be approximately

Fresh Kills East Park Roads SEIS

80 percent as wide as the four-lane at the basin crossings, along the berm the narrower two-lane width would require 50 percent less width into the Basin B1 and the associated wetlands.

The two-lane park road option would require a modified closure plan for Landfill Section 6/7 just like the four-lane option described above. Like the four lane option, there would also a need to avoid, minimize or mitigate impacts from the proposed roads with respect to the landfill infrastructure and wetlands. It is expected these measures could eliminate project impacts, although this option would occupy less area and therefore the impacts on landfill infrastructure, for example, would be reduced. This option would also achieve the project's goals and objective with respect to improving local traffic circulation, providing connectivity across Fresh Kills Landfill, and minimizing the impacts of the proposed Fresh Kills Park project on local streets.

Both the proposed four-lane road and this two-lane park road design provide a connection with a short and direct route to the Confluence Loop Fresh Kill Park program areas. Views from the road on the viaduct and on the section across the landfill would be of significant park features. A viaduct along the Forest Hill Road Connection provides expanded views while reducing impacts on wetland.

Under both the four-lane and two-lane options, the Richmond Hill Road connection would serve as the northeastern gateway into the park from the local neighborhoods.

Forest Hill Road Connection

Under this option, the two-lane park road for the Forest Hill Road connection follows a similar horizontal alignment and profile as for the Four-Lane proposal. It would also have a similar intersection design.

Richmond Hill Road Connection

Like the four-lane proposal, the two-lane park road option follows a similar alignment in the Richmond Hill Road Connection. The two-lane park road option exceeds the design criteria, except at the horizontal curve approaching the Richmond Avenue intersection, where a curve of a 300 foot radius is provided. Here, justification for retention of the non-standard horizontal curve is the same as for the four-lane proposal. Intersection design is the same as the four-lane option.

The two lane alignment differs in the northern segment of the road from the four-lane proposal in that it allows for minimal impacts to the stream outlet from Basin B1. The alignment passes between the garage and the stream. Since the desired profile is approximately ± 10 feet below the elevation of the parking lot and ± 10 feet above the elevation of the stream, a retaining wall is required on each side of the road along that segment of park road, which allows the stream to be retained (see also the discussion under "Environmental" below).

YUKON AVENUE CONNECTION (FOUR-LANE ROAD OPTION)

This option is essentially a four-lane, two-way road across Landfill Section 6/7 along the Yukon Avenue Connections (widening the two lane road proposed in 2016). With this option, neither of the connecting roads to Richmond Hill Road or Forest Hill Road are provided.

EAST PARK LOOP ROAD AND RICHMOND AVENUE CONNECTIONS

Introduction¹

This option (referred to as the “SIBPO Alternative in the FGEIS, March 2009), essentially calls for a two-lane, one-way road that loops around Landfill Section 6/7 and utilizes the alignment of the existing DSNY haul roads. In addition to being a one-way road in a counterclockwise direction around the landfill, this option also proposes a four-lane road across Landfill Section 6/7 that would connect directly to Richmond Avenue at Yukon Avenue. Thus, under this option, the loop around Landfill Section 6/7 (referred to as the East Park Loop Road in this option) would have two-way connections at three intersections along Richmond Avenue, Richmond Hill Road, Yukon Avenue and Forest Hill Road (from north to south).

This option has been put forth for the purposes of determining if such an alignment could potentially have less of an impact on the landfill systems and on-site wetlands, and therefore could possibly be implemented sooner and for less cost than other options.

As described in greater detail below, this option would have impacts similar to the above options in many respects, although in some cases the impacts may be of a lesser magnitude. There are also specific design differences with respect to road geometry, landfill conflicts, environmental impacts, and park conflicts that are described in greater detail below.

Road Design Objectives

The roads proposed under this option do not entirely meet the functional classification system described by AASHTO Policy on Geometric Design of Highways and Streets (2004). For the purpose of determining required supplementary design criteria, the system evaluated was classified as an “Urban Collector Road.”

Design Speed

Under this option, at locations where the minimum radius for 35 mph could not be accommodated, a lower design speed would be necessary with the appropriate signage (26 of the 71 curves proposed in this alternative are substandard for the proposed design speed in order to more closely follow the alignment of the existing haul roads).

Physical Constraints

In general there are certain areas where minimal impacts to Landfill Section 6/7 including the existing and proposed gabion walls would occur under this option; therefore, minor realignments along with other design modifications would need to be identified and recommended to avoid these impacts.

Horizontal Stopping Sight Distance

Stopping sight distance is affected by various factors including cut slopes and object heights. In the evaluation of the proposed this park road option, the location and slope of Landfill Section 6/7 was considered first, including the introduction of a three-foot-wide drainage buffer strip of the two-foot

¹ The description below is based on the report “Fresh Kills Landfill Staten Island Borough President’s Office Evaluation of Roadway Alternative in East Park (Draft Report),” URS for the New York City Department of Transportation and the New York City Department of Design and Construction, February 2009.

shoulder with a proposed slope of 1 vertical to 3 horizontal. The road segments where the slope represents an obstruction is when the curve is to the left (i.e., towards the landfill mound).

As a result of this analysis, any gabion walls located on a horizontal curve to the left would impact the horizontal stopping sight distance. The smallest gabion wall height is two feet, six inches tall. AASHTO's requirement when an object would obstruct sight is two feet, therefore all gabion walls obstruct the driver's line of sight. Also the gabion wall locations (except for one) do not meet the required horizontal sightline offset.

Radius of Horizontal Curve

The minimum required horizontal radius is determined by the road's functional classification, its design speed and the superelevation rate. Based on the AASHTO Policy on Geometric Design of Highways and Streets, the minimum required horizontal curve for a two percent superelevation rate (away from the landfill mound) at a 35 mph design speed is 408 feet when the curve is to the right and 510 feet when the curve is to the left (adverse cross slope).

Based on the two percent superelevation rate and 35 mph design speed as described above, there are a number of locations where the horizontal curves do not comply with the minimum radius required.

Vertical Geometry

The maximum allowable grade for a roadway is determined by its functional classification, the design speed, and the terrain and the maximum allowable grade is seven percent. The minimum desirable grade is 0.5 percent, but is ultimately controlled by the design of the drainage system.

This park road option does not exceed the maximum allowable grade; however, it does not meet the minimum desirable grade in many locations. In order to produce cross sections and determine possible impacts to the landfill facilities and due to the fact that existing ground did not follow a "smooth line," a proposed vertical alignment (following the existing grades) was developed. However, this drainage consideration could be addressed by providing a cross-slope of two percent along the entire roadway.

Proposed Pavement

To avoid impacts to the existing Landfill Section 6/7 liner which is located approximately three feet below existing grade under the existing DSNY haul roads, a proposed pavement section for this option was developed assuming the existing (haul road) pavement structure remains in place. The proposed top of the new pavement would be typically located approximately four inches above the existing pavement surface. The following is recommended for these areas (and subject to DEC approval):

A flexible pavement system over the haul roads, rather than rigid (concrete) or composite (asphalt overlay over unreinforced concrete base) could avoid any potential differential settlement over landfill haul roads.

A field investigation confirmed that some vents fall within the limits of pavement of this alternative roadway.

B. PROBABLE IMPACTS OF THE PROPOSED PROJECT

As stated above, this SEIS has been prepared to provide additional technical analyses related to the proposed East Park road elements of the Fresh Kills Park project. Therefore, many analyses

presented in the Fresh Kills Park FGEIS (March 13, 2009) would cover the proposed East Park Roads project with respect to the following environmental analyses:

- Land Use, Zoning, and Public Policy
- Socioeconomic Relations
- Community Facilities
- Open Space
- Shadows
- Historic Resources
- Neighborhood Character
- Hazardous Materials
- Waterfront Revitalization Program
- Solid Waste and Sanitation Services
- Energy
- Transit and Pedestrians
- Growth Inducing Aspects
- Environmental Justice
- Irreversible and Irrecoverable Commitment of Resources

For these analyses, it is concluded, like the FGEIS, that the proposed project would not have any significant adverse impacts.

A summary of the remaining technical analyses follows.

NATURAL RESOURCES

OVERVIEW

The proposed East Park roads would be a significant road system through the East Park covering a total distance of about two miles.

Certain elements of the proposed roads have the potential to result in significant adverse impacts to natural resources. For example, construction and operation of the proposed park roads to provide a new east-west connection between Richmond Avenue and the West Shore Expressway as well as to provide visitor access to major park facilities would result in significant adverse impacts to wetlands and aquatic habitats due to filling and shading from park roads. Operation of the proposed park roads also has the potential to result in indirect impacts to wildlife due to road operation impacts such as noise and light pollution, as well as impairment of life-cycle requirements, habitat fragmentation and wildlife avoidance response, and the loss of wildlife individuals due to wildlife/vehicle collisions. To minimize and avoid these impacts, measures would be integrated into park road design and management that minimize the potential for adverse impacts to aquatic and terrestrial biota (e.g., monitoring of wildlife/vehicle collisions, providing safe wildlife passages, and modifying roadside landscaping and maintenance.

2011 Modified Cover Plan

Implementation of the modified landfill cover would not result in significant adverse impacts to natural resources. The modified cover design incorporates appropriate engineering design performance standards and approaches that are consistent with New York Part 360 landfill final closure design requirements and previous final closure designs implemented at Fresh Kills Landfill and other locations. Construction of these two corridors under this proposed modification could increase the impervious area of Landfill Section 6/7 by approximately 3 percent above the No Build condition (or from 29 to 38 acres). This additional 9 acres assumes widening the landfill access roads along the Yukon and Forest Hill corridors from 30 feet wide to 65 feet wide, as well as the application of embankment material that would increase imperviousness.

This proposed modification of the landfill cover is not expected to result in impacts with respect to any of the following natural resources conditions:

- Terrestrial Resources (the site would be disturbed in the future under the approved final cover plan)
- Floodplains (there are no flood hazards areas on Landfill Section 6/7)
- Threatened or Endangered Species (there are no threatened or endangered species on the landfill section)
- Significant Coastal Fish and Wildlife Habitat

Landfill leachate is generated by percolation of precipitation through the landfill surface and into the waste. The percolation volume is minimized throughout the landfill life-cycle through the conformance with minimum operating standards, as prescribed in the solid waste regulations, during waste placement operations and through the application of engineered cover systems following cessation of waste placement. Typical minimum operating standards include: (i) performing waste operations within a limited area that can be easily managed; (ii) diverting stormwater run-on into the open waste areas; (iii) maintaining positive drainage on surfaces to prevent ponding of water; (iv) application of temporary cover materials over waste overnight and during other periods of inactivity.

Considering that a significant reduction in leachate percolation would occur with approximately 50 percent of Landfill Section 6/7 having an engineered final cover system in place during the 2011 build-out mass grading and waste relocation activities, it is concluded that the project construction activities, performed using appropriate landfill operating standards, would not increase the volume of leachate associated with closure construction under this modified plan. Once the closure construction is completed, it would be as effective as the approved system. Thus, the modified landfill cover would not have any impacts on groundwater or surface water during construction or during the operational period of the proposed road embankment.

The modified cover plan requires additional material for grading and contouring the landfill cover to provide the proposed road corridor embankment. This includes an estimated 77,000 cubic yards of materials for the Yukon Avenue Connection and 92,000 cubic yards for the Forest Hill Road connection. These additional materials would not have any natural resources impacts as they would be deposited and graded on the already disturbed landfill. The addition of this fill would require the continuation of sedimentation and erosion protection measures under a SPDES permit for the duration of the modified grading project; however, since these measures are in place and already permitted, and serve to minimize and avoid environmental impacts, continuation of these measures

for the added construction period under the modified closure plan (given that an estimated 1,000,000 cubic yards of material is already required for constructing the final cover) would not be expected to result in any indirect impacts to local water quality, wetlands or habitats.

With respect to stormwater and water quality conditions, an assessment of the water and sediment quality for the proposed modified cover was conducted to determine the annual loading changes when compared to the “future without the proposed project” conditions discussed above.

The annual water quality and sediment loadings were calculated at the inflow to Richmond and Main Creeks, which includes the output from the existing storm water management basins at the Landfill. Annual loadings for the 1-year and 2-year, 24-hour design storms, equivalent to a 2.50 inches and 3.30 inches, respectively, were calculated. The water quality loading estimates for the 2011 final closure condition account for an increase in impervious area of 30 percent above the No Build condition (from 29 acres to 38 acres). This increase is due to widening of the landfill access roads along the Yukon and Forest Hill corridors from 30 feet width to 65 foot width and the application of the road embankment material. Comparison of the 2011 modified closure condition without modification of the stormwater basins for water quality function to the No Build condition reveals the following impacts to stormwater and sediment quality for the 2-year design storm:

- Richmond Creek: 31 to 56 percent increase in all water quality constituents; and
- Main Creek: 35 to 106 percent increase in water quality constituents.

The above projected increases in pollutant loading under the modified closure design are a worst case condition in that it assumes the installation of full width road embankment material (i.e. 60 feet wide) across Landfill Section 6/7. In fact, measures could be taken reduce the width of the embankment materials and to provide appropriate sedimentation and erosion control measures, including stabilizing the corridors with vegetation. Between this DSEIS and the FSEIS, DPR and DSNY will examine potential measures to reduce this level of interim pollutant loading which is primarily due to sedimentation and erosion. These measures will be presented in the FSEIS.

With the proposed park roads, there are changes in hydrology due to road runoff and changes in the DSNY stormwater management basins; however the volume of runoff generated could be handled on-site, and stormwater management issues could be addressed without any adverse impacts. There would also be the filling of wetlands and the need for a comprehensive mitigation plan. Lastly, there would be impacts related to habitat fragmentation.

Floodplains may increase the amount of roadway within the 100-year floodplain compared to the proposed project. However, neither has a significant adverse impact on the floodplain.

TWO-LANE PARK ROAD

Under the two-lane park road option, there are changes in hydrology due to road runoff and changes in the DSNY stormwater management basins; however the volume of runoff generated under this option would be less that under the proposed project given that there would be less impervious surface area. In addition, given the reduced volume of stormwater, it is expected that under this option, like the proposed project, stormwater management issues could be addressed without any adverse impacts. There would also be the filling of wetlands under this option and the need for a comprehensive mitigation plan like the four-lane option (total impacted wetlands in this option are 1.2 acres with the Forest Hill Road Connection and 2.15 acres with the Richmond Hill Road Connection). However, the filling of wetlands would be about half the

Fresh Kills East Park Roads SEIS

impact of the proposed project given that the roads crossing through wetlands would be about half the width. Lastly, it is expected that there would be similar impacts related to habitat fragmentation with the proposed two lane road since there would be new structures and traffic across habitats, albeit narrower structures.

YUKON AVENUE CONNECTION—TWO-LANE ROAD OPTION

This option would have only a minimal potential impact on wetlands due to runoff as well as habitat fragmentation. No direct impacts on wetlands or natural resources (i.e., filling) would occur.

EAST PARK LOOP ROAD AND RICHMOND AVENUE CONNECTION

Wetlands

Freshwater Wetlands

In this option, impacts to the freshwater wetlands occur in multiple locations, including the three connections between the park roads and Richmond Avenue and along the westernmost perimeter road. Under this option, about 1.92 acres of wetlands are impacted.

While this option results in less acreage impact than the two-lane or four-lane options, it is noted that the wetlands impacted by this option could be considered higher-value resources than those disturbed by the option analyzed in this FGEIS.

Tidal Wetlands

In this option, impacts to the tidal wetlands occur in the northeast corner of the site where a connection would be constructed between the park roads and Richmond Avenue at Richmond Hill Road. These impacts include filling impacts to the wetland areas in multiple locations and the addition of impervious surface within the wetland area at the Richmond Hill Road and Forest Hill road crossings.

Floodplains

This option may increase the amount of roadway within the 100-year floodplain compared to the proposed project. However, neither has a significant adverse impact on the floodplain.

Roadway Pollutants

The roadway option includes provisions for collecting stormwater through a system of structures and detention basins and treating the runoff through Low Impact Design and best management practices. This option also proposes to collect stormwater from the perimeter roadways and direct it to the nearest water body, but would not provide the pre-treatment.

Hydrology

Road pavement increases the imperviousness of a site, thereby increasing the quantity of runoff. Since a large portion of the roadways proposed in this option would be constructed in the same location as existing haul roads, they represent a smaller increase in total impervious area in East Park (and by extension stormwater runoff quantities) compared to the proposed project.

Habitat Impacts

Most of the segments of roads proposed under this option would be constructed in the same location as the existing landfill haul roads, thereby limiting habitat impacts. While the new roads under this option would be wider than the existing haul roads, disturbances would mostly be

limited to previously disturbed areas. However, the location of these roads near major wetlands on the north, west, and south edges of East Park, as well as the increased traffic that will be carried along these corridors, could result in habitat fragmentation impacts. Additionally, placement of traffic closer to water bodies and wetlands under this option, as compared to the proposed project, is likely to have a greater degradation impact to aquatic habitat at the perimeter of the site. This option also crosses habitats on the eastern edge of the park, including the connection at Yukon Avenue and Forest Hill Road. Thus, like the two-lane and four-lane road options, mitigation and impact avoidance measures would be necessary.

HAZARDOUS MATERIALS

It was the conclusion of the FGEIS analysis that nearly the entire project site has the potential to have been impacted by hazardous materials as defined under CEQR. Therefore, for site-specific capital project areas where soil and/or groundwater disturbance is proposed (e.g., excavation), significant adverse impacts could occur due to hazardous materials. The proposed project would be built in multiple phases over a number of decades. Therefore, recommendations for individual project-specific subsurface investigation and, if necessary, remediation, are proposed to avoid this impact. This conclusion is also presented in Chapter 20, “Construction Impacts,” and Chapter 23, “Impact Avoidance and Environmental Protection Measures” (Chapter 21, “Public Health,” also addresses hazardous materials issues). With this individual project site investigation and testing program, any impacts due to hazardous materials would therefore be avoided during project implementation. In addition, in accordance with local, state, and federal laws, the demolition or reuse of any buildings would need to comply with environmental regulations relative to the handling and disposal of asbestos and lead paint.

INFRASTRUCTURE

INTRODUCTION

As described in the Fresh Kills Park FGEIS, neither the Fresh Kills Park or the East Park Roads would have a significant impact on water supply or wastewater treatment. Therefore, the focus of this SEIS is the potential for impacts on landfill infrastructure. The summary of this analysis is provided below.

LANDFILL INFRASTRUCTURE IMPACT AVOIDANCE MEASURES

Introduction

It is recognized by DPR that the Fresh Kills Park project is a multi-year, multi-phase project with an obligation to avoid and minimize impacts to landfill infrastructure. Such an approach would protect the functionality of these systems, as well as minimize regulatory review and costs. DPR is committed to minimizing impacts of the project and to that end has developed an extensive assessment of conceptual impact avoidance and mitigation measures. These are presented in detail in Chapter 23 of this SEIS, “Impact Avoidance and Mitigation Measures.” Given that Fresh Kills Landfill is subject to post-closure care monitoring and maintenance requirements; and the proposed project would provide the public with access to the Fresh Kills site, and potential access to the landfill management systems, and park development (particularly the proposed roads) may introduce new loading conditions on the subsurface landfill infrastructure, the following measures are presented as conceptual measures that are

Fresh Kills East Park Roads SEIS

expected be taken to avoid impacts to landfill systems and thereby avoid conflicts with post-closure care and maintenance or impacts to public health and the environment.

Leachate Management System

- Install locks at leachate collection well vaults, leachate collection well valve chambers, and associated electronic control panels. These measures are intended to protect the public against entry into confined spaces, where potentially unsafe atmospheric conditions may occur, and to protect the public from potential electrical hazards.
- Install security fences, locked gates (as necessary) and appropriate warning signs around leachate collection well vaults, valve chambers, and associated electronic control panels. These measures are intended to act as a deterrent against public interference with leachate management system features. The design of additional fencing and locks, if appropriate, at the leachate management system features will require that they do not conflict with ongoing post-closure care maintenance and operation program procedures.
- Install locking manhole covers at manholes located along the leachate transmission forcemain route.
- Install perimeter security fencing around the Landfill Section 6/7 leachate transmission forcemain pump stations (for example). The design of fencing around these leachate management system features will require that it does not conflict with ongoing post-closure care maintenance and operation program procedures.
- Prevent malicious activities or vandalism to leachate management system infrastructure.
- Deploy park grounds keepers and security personnel to deter malicious acts or vandalism. The grounds keepers and security personnel would receive training regarding identification of landfill infrastructure and would be provided with emergency contact information for responsible landfill personnel.

Landfill Gas Management

- Develop project designs with DSNY and DPR coordination to avoid conflicts with the landfill gas management system features. Measures include selection of road alignments that avoid flare locations, or use of living fences (i.e., thorn bushes), or landscaping that discourages activity on or along the landfill gas interceptor venting trench. The design would take into consideration any added post-closure care maintenance and monitoring activities that occur at the various landfill gas management system features.
- Install permeable gas venting layers (i.e., gravel layers) across interceptor venting trenches where park development features would cover the interceptor venting trenches.
- Post signage to inform the public regarding hazards associated with landfill gas.
- Maintain seals on landfill gas vents to prevent escape of landfill gas into the atmosphere. Unsealing of the gas vents would not be allowed without modification to the existing Title V and Part 360 landfill gas permits, which would involve review and approval by DEC.
- Install security fencing and locking gates around landfill gas flare pads.
- Install locking manhole covers on manholes associated with the landfill gas transmission main.
- Provide DPR staff and security personnel with the authority to deter malicious acts of vandalism of landfill gas management system features. The grounds keepers and security

personnel would receive training to identify landfill infrastructure and would be provided with emergency contact information for responsible landfill personnel.

Stormwater Management Systems

Park road elements would alter runoff patterns and increase impervious surface cover. Like the current and future land cover at Fresh Kills, the vegetative cover that is proposed with the project would both control erosion and allow for substantial evapotranspiration. The greatest change in the proposed hydrology at the site would be the introduction of impervious surfaces with the proposed park roads.

To avoid stormwater impacts from increases in impervious surfaces and to protect receiving waters, individual stormwater best management practices (BMPs) would be used to enhance proposed park features and provide water quality treatment and quantity management, particularly for the road runoff. The general objectives of the proposed stormwater management system are to:

- Continue to collect and handle all on-site runoff without off-site or downstream impacts.
- Maximize pervious surfaces and minimize the introduction of new impervious surfaces, reusing existing structured surfaces where feasible;
- Provide natural systems for stormwater management to the extent possible, but consistent with landfill design regulations (e.g., created runoff swales, pocket wetlands, vegetated treatment swales, planter boxes) and minimize the use of hard infrastructure (e.g., inlets and pipes), particularly for handling runoff from roads and parking areas;
- Minimize impacts to natural stormwater management features at the site such as freshwater and tidal wetlands to minimize any potential impacts to local water quality; and
- Utilize the existing DSNY stormwater basins, to the extent feasible, without adversely impacting the DSNY stormwater management system—if modifications are necessary, they would be designed in accordance with DSNY and DEC specifications.

The stormwater management projects proposed as part of the park would be designed to complement and enhance the aesthetic and ecological aspects of the proposed park, meet the above-described stormwater management objectives, and improve upon the current hydrologic and water quality management provided by the existing stormwater infrastructure. To achieve these goals, the approach would utilize a mix of traditional conveyance and storage measures (including the existing downchutes and large-scale detention basins) and smaller controls selectively located throughout each sub drainage area. By utilizing stormwater controls, runoff flows would also be routed through multiple levels of treatment prior to discharge off the site thereby protecting local water quality. In addition, any modification or reuse of stormwater basins for park-generated stormwater runoff would be subject to the reviews of DSNY and the approval of DEC. Measures related to protecting stormwater management systems include the following:

- Develop landscape features to discourage park users from entering drainage channels.
- Post signage that informs park users that the stormwater management basins are not publicly accessible (until so designed) and that entry into stormwater culverts is prohibited.
- Provide DPR personnel with the authority to deter malicious acts or vandalism of final cover and stormwater management features. The grounds keepers and security personnel would

receive training to identify landfill infrastructure and would be provided with emergency contact information for responsible landfill personnel.

MODIFIED LANDFILL SECTION 6/7 FINAL CLOSURE PLAN (2011)

Landfill Infrastructure

The Modified Landfill Section 6/7 final closure design (Alternative Cover) is consistent with Part 360 design requirements and will meet all performance standards associated with the final closure designs previously used at the Fresh Kills Landfill. The alternative final cover design modifies the landfill final closure grades such that the finished grade of the final cover system is lower than any of the proposed roadway alignments evaluated as part of this project. Because the breadth of final closure regrading and relocation of landfill infrastructure is consistent with any of the potential future roadway designs prepared for the project, the 2011 construction will create two corridors across Landfill Section 6/7 that provide sufficient separation between the project roadways and infrastructure, such that no further relocation of the infrastructure will be necessary to accommodate construction of the 2016 or 2036 project roadway designs.

To accommodate the revised grading presented for modified cover, and in order to ensure that there would be no impacts to landfill infrastructure as a result of this design, measures are described below that would preserve the integrity of final cover grading, landfill gas system, stormwater management system and landfill services roads, recognizing that the modified closure design does require relocation of some landfill gas extraction wells and headers, and relocation of stormwater channels and culverts (see the discussed below).

Landfill Gas Infrastructure Modifications

Three general sections of the landfill gas extraction system are required to be relocated or modified to accommodate the modified closure plan. These areas include: (i) the east side Yukon Avenue corridor; (ii) the west side of the Yukon Avenue corridor; and (iii) the central portion of the Forest Hill corridor.

Post-Closure Care - Service Road Modifications

The Final Closure Report includes the establishment of multiple gravel service roads across the landfill surface that connect to the existing paved service road that currently encircles landfill Section 6/7.

The Modified Landfill Section 6/7 final closure design would encroach upon the proposed access roads located at the east end of the corridor. To mitigate this encroachment, the service road would need to be relocated to the north and outside of the Yukon Avenue corridor. Prior to the 2016 project road construction, the Yukon corridor will be a new and usable gravel access road for DSNY use.

The Forest Hill Road corridor bisects the proposed service road that is to provide access to the southernmost tip of the Landfill Section 6/7. To mitigate this encroachment the proposed Alternate Cover Design includes a new DSNY access road to this location. The Forest Hill corridor also bisects a landfill service road that enters the landfill from the south-central area of the site. The bisection of the service road by the Forest Hill Corridor would not alienate any portion of the landfill or landfill infrastructure and therefore no mitigation is required for this encroachment. Prior to the actual road construction, the Forest Hill Road corridor would, in fact, provide a new and usable gravel access road for DSNY use.

Grading

Grading under the Modified Landfill Section 6/7 final closure design is comprised of two separate surfaces; a embankment plan, which is the grade where the geomembrane barrier (i.e., bottom of the cap section) is established; and a final grade plan, which is the finished surface elevation. The embankment plan incorporates a minimum 4 percent grade and maximum 33 percent grade as required by New York Part 360 landfill regulation design criteria. In the areas of the Yukon Avenue and Forest Hill Road corridor that are coincident with the future build year project roadway alignments, the cap system will consist of the following components from bottom to top. The proposed modifications to the final cover include:

- 40 mil thick LDPE Geomembrane hydraulic barrier;
- 300-mil thick double sided drainage net layer;
- 48-inch thick layer of barrier protection soil (i.e., sand);
- Woven geotextile separator layer; and
- 6-inch thick layer of crushed stone (driving surface).

The 48-inch thick layer of barrier protection material is two-times the thickness of barrier protection material as required by the current Final Cover Report. The increased thickness is would ensure that the minimum NYSDOT recommended separation distance of 4 feet between pavement structures and waste is maintained under the proposed Alternate Final Cover Design.

In other areas of the corridors what require grading, but are outside of the proposed road alignment, the cap design would conform to the approved Final Cover Report. The Alternate Final Cover Design grading results in Cap Type I and Cap Type II slope lengths that are equal to or less than the maximum slope, as established for the Final Cover Report design.

Stormwater System Modifications, 2011

Minor modifications to the approved final cover stormwater management system would be necessary under this modified plan. These include modified cover types, drainage pipe outlets, channel modifications, relocation of swales, construction of new swales and culverts, and conveyance to the existing stormwater drainage basins. Details of these modifications are provided in the report “Landfill Section 6/7 Alternative Final Cover Design Report, Fresh Kills Landfill” (Geosyntec for DSNY, May 2009). That report also includes an analysis and discussion of the hydrologic conditions under this modified cover plan. An assessment of the proposed modifications with respect to potential impacts on water quality is provided in Chapter 10 “Natural Resources.”

As described in greater detail in that Alternative Cover Report, the proposed modified stormwater management plan for Fresh Kills Landfill Section 6/7 maintains the primary functions of the existing stormwater drainage system which include: minimizing infiltration into the final cover; collecting all landfill generated stormwater runoff; and removing pollutants and sediment prior to discharge into adjacent waterways. As part of the modified closure design, the Forest Hill Road and Yukon Avenue Connection embankments would direct several of the existing drainage areas to existing stormwater control basins. After completion (2011), it is assumed that the Forest Hill Road and Yukon Avenue Connections would be gravel roads built on suitable fill material.

No modifications to the existing stormwater control basins are necessary to accommodate the 2011 modified closure plan. The existing basins will continue to manage the quantity and quality of stormwater discharged into existing adjacent waterways.

Firewater and Overhead Electric Lines

There are water supply/revised grading conflicts with the existing 8-inch diameter firewater main and overhead electric supply that service the site. To mitigate the firewater main conflict a portion of the existing firewater main will be relocated to a lower elevation, below the modified final cover membrane elevation. To mitigate the overhead electric supply conflict, the electric line will be relocated to the north and east.

YUKON AVENUE CONNECTION: 2016

Landfill Infrastructure

As described above, the modifications to landfill infrastructure to accommodate the proposed Yukon Avenue Connection across Landfill Section 6/7 would be addressed under the modified cover plan. Thus, no further modification is needed for the 2016 condition where the proposed road segment across the landfill would be developed on top of the previously prepared embankment. In addition, no additional measures would be necessary relative to the fire and electrical service modifications discussed above for 2011.

For the segment of road between the base of the landfill and Richmond Avenue, work would encroach upon the existing service road that provides access to environmental monitoring points located to the north of the alignment. No monitoring points are located within the proposed alignment and therefore no further modifications to the landfill infrastructure would be required.

In the area of the leachate management system slurry cutoff wall a reinforced concrete slab would be installed to distribute the traffic loads and prevent excessive deformation of the top of the cutoff wall. It is expected that the proposed project could be constructed without any impacts to the slurry wall.¹

Stormwater Management

As part of the roads construction, the existing sediment basins (B1, B2) that receive runoff from the Yukon Avenue roadway would be modified to perform a water quality improvement function. According to the *New York State Stormwater Management Design Manual* (Design Manual), dated April 2008, the existing storm water sediment basins would need to follow the design criteria described below to be converted into a storm water management feature sized to treat the water quality volume.

Post Closure Care/Service Roads

The proposed project would include the necessary turn lanes and gated access points from public roads onto landfill service roads. The gates and turn lanes would allow DSNY personnel access to the site to perform post-closure care, maintenance, and monitoring.

The landfill service roads provide access to various components of the landfill environmental protection systems, which are located throughout Fresh Kills Landfill. Although each of the each of the individual landfill environmental protection systems may only be accessed on a regularly scheduled periodic interval, the combination all the activities associated with multiple system results in a requirement for nearly continuous access throughout the site. Consequently, it is

¹ Calculations regarding the road loadings on the slurry wall are provided in the Appendices under "Finite Element Analysis for Slurry Wall," (Geosyntec, May 2009).

essential to establish dedicated landfill service roads that are separate from the Fresh Kills Park East Park roads system. It is recognized, however, that multi-use paths within the park circulation system are compatible with landfill service road. For instance, service vehicles would travel at low speeds on shared paths, partial blockage of multi-use paths for landfill operational requirements could be done while still accommodating foot or bicycle traffic.

EAST PARK ROAD SYSTEM: 2036

The post-2017 build out for the East Park road system includes consideration of various options for completion of the system. Still under consideration are two- or four-lane roads across East Park with new connections at Richmond Hill Road, Yukon Avenue, and Forest Hill Road, or a two-lane loop road around the base of the landfill with connections at Richmond Hill Road, Yukon Avenue, and Forest Hill Road. This construction would not occur in the near future but the options are presented to better understand the potential benefits and tradeoffs.

Forest Hill and Richmond Hill Road Connections (Four-Lane Road Option)

Forest Hill Road

Landfill Infrastructure. As described above, the modifications to landfill infrastructure in order to accommodate the proposed Forest Hill Road Connection across Landfill Section 6/7 would already be addressed under the modified cover plan. Thus, no further modification is needed for the 2036 condition where the proposed road segment across the landfill would be developed on top of the previously prepared embankment. In addition, no additional measures would be necessary relative to the fire and electrical service modifications discussed above for 2011.

For the segment of the Forest Hill Road between the base of the landfill and Richmond Avenue the alignment would encroach upon the landfill gas vent trench. To mitigate these encroachments, a gravel venting layer would be placed above the landfill gas vent trench to ensure a permeable conduit to the surface. Placement of fill soil or pavement over a limited section of the gas vent trench is consistent with as-built conditions along the vent trench. Therefore, the fill placement, along with the permeable layer would not compromise the vent trench's ability to function.

Stormwater. As part of the roads construction, the existing sediment basins (R, C1, and C2) which receive runoff from the Forest Hill Road alignment would be modified to perform a water quality improvement function in the same manner as described for the 2016 basin modifications.

Richmond Hill Road Connection

Landfill Infrastructure. As it negotiates the narrow passage between the DSNY District 2 Garage and the landfill, the proposed road would cover the outlet stream from Basin B1, which requires that a closed drainage system adjacent to Basin A be extended to a location south of the existing DSNY garage. The proposed road would also overlap the landfill cut-off wall at two separate points, for which protective slabs are proposed to shield the cut-off wall from the effects of roadway loads.

In addition, the proposed embankments across Basin B1 would divide the basin. Preliminary analyses indicate that the remaining landfill stormwater basin would be sufficient to meet its functional purpose. Culverts will be added to maintain hydraulic continuity and balance water levels.

For the segment of the Richmond Hill Road Connection between the base of the landfill and Richmond Avenue the alignment would pass near groundwater monitoring wells 154D, 174S,

and 153D. The alignment would also pass by gas migration monitoring wells G-44, G-17, G-18, G-46, and G-19. Each of these features would also be protected during construction, but not disturbed.

Stormwater. As described above, the details of the proposed stormwater management system would be developed as each park capital project and segment of road design is further developed. Since the proposed project would be located directly along the coastal waterways of Richmond and Main Creeks, it is not expected that the project would result in any impacts on downstream flooding. Moreover, runoff is expected to be controlled on-site and would not adversely impact surrounding neighborhoods or open spaces. In addition, to avoid stormwater impacts from increases in impervious surface to the receiving waters, individual stormwater BMPs would be used to enhance proposed park features, and provide water quality treatment and runoff volume control, particularly for the road elements. In sum, by 2036, the proposed project could be expected to manage all increases in site-generated runoff while contributing positively to the local wetlands.

As part of the roads construction, the existing sediment basins (R, C1, and C2) which receive runoff from the Forest Fill Road alignment would be modified to perform a water quality improvement function in the same manner as described for the 2016 basin modifications.

Moreover, runoff is expected to be controlled on-site and would discharge controlled runoff into the coastal waterways of Richmond and Main Creeks; it is therefore not expected that the project would result in any impacts on downstream flooding.

FOREST HILL AND RICHMOND HILL ROAD CONNECTIONS (TWO LANE ROAD OPTION)

Overview

Like the four-lane proposal, the Two-Lane Park Road option constructed a road over the modified Section Landfill 6/7 final cover and the road segments east of Landfill Section 6/7. Therefore, the proposed two-lane-road must also account for these landfill infrastructure conditions and potential conflicts in the same manner as the Four-Lane option. The specific features and systems that may be influenced by the road alignment include: final cover protections and the foundation support properties of the solid waste in the landfill, and protection of the landfill gas, stormwater, and leachate management system.

With regard to the landfill closure cover system, the horizontal extent of the road embankments under this alternative would be greater under the Four-Lane design than this Two-Lane option, and the wider embankments would result in settlement over a larger area. The wider embankments would also apply more weight to the landfill cover system, waste, and underlying soils, which could result in a lower degree of stability and increased stress on the closure system's geomembrane layer. However, it is expected these design issues would be addressed with the proposed modified final cover which is being designed to accommodate the proposed road and would not arise during the actual road construction.

Due to the narrower road width of road in the Two-Lane Park Road Option, this is expected to apply a lesser load to the landfill than the four-lane option. Nonetheless, like the four-lane option, this option would need to be evaluated for potential impacts on Landfill Section 6/7. Like the four lane option, this alignment crosses the southern landfill gas collection header ring at two locations, eight lateral landfill gas collection pipes and passes over one landfill gas extraction well. Like the four-lane option, this alignment requires that landfill gas lines be rerouted through a protective carrier pipe that would protect the pipes from crushing, and allow access to flush the pipes, remove condensate, or if needed remove and replace the pipes. With this alignment, the

landfill gas wells are to be either decommissioned or reinstalled outside of the alignment or be provided with a lateral header connection from outside of the roadway.

The two-lane road option would also include placement of lateral vent channels perpendicular to the road alignment at a one vent per 200-foot spacing for sampling the soil vapor beneath the road.

As with the four-lane option, swales and ditches would be introduced to intercept runoff that would otherwise flow onto the road. Swales would be placed along much of the north edge of the road to intercept mound runoff on the uphill side. A culvert would also be added under the roadway on the west side to convey flows westward toward Basin C2. The length of this culvert under this option is less than that required for the Four-Lane option.

Similar to the Four-Lane option, as the park road descends from the landfill section onto the Forest Hill Road viaduct, the alignment spans over the leachate collection trench and cut-off wall, requiring that one end of the span be placed within the landfill. For the Two-Lane Park Road option, the width of the end pier and mechanically stabilized earth wall is narrower than that under the Four-Lane option.

Likewise, with the appropriate construction-period protection measures, there would not be any impacts on the production of leachate nor would there be hazards for landfill slope stability. With both the proposed four-lane and two-lane park roads, there would be changes in hydrology due to road runoff and changes in the DSNY stormwater management basins; however the volume of runoff generated under this option would be less than that under the four-lane option given that there would be less impervious surface area (an analysis of potential water quality impacts is presented in Chapter 10 “Natural Resources.” In addition, given the reduced volume of stormwater, it is expected that under this option, like the four-lane proposal, stormwater management issues could be addressed without any adverse impacts. There are no significant differences between the 2-lane and 4-lane options in terms of impacts or conflicts with the environmental monitoring system.

Additional details with respect to landfill infrastructure impacts are presented below by road segment.

Forest Hill Road

Overview

As with the Four-Lane option, the alignment under the proposed Two-Lane option for the Forest Hill Road segment passes over the landfill. Some of the specific differences between the two-lane park road and the four proposals with respect to landfill infrastructure are described below.

In both the Four-Lane option and this Two-Lane option the design must account for the unusual embankment conditions, as well as the road’s influence on continuing landfill post-closure operations. In general, the park road foundation design and analysis of landfill related impacts are similar to those described above.

Landfill Infrastructure

As described above, the modifications to landfill infrastructure in order to accommodate the proposed Forest Hill Road Connection across Landfill Section 6/7 would already be addressed as part of the 2011 Modified Landfill 6/7 Final Cover Plan. Thus, no further modification is needed for the 2036 condition where the proposed road segment across the landfill would be developed on top of the previously prepared embankment. In addition, no additional measures would be necessary relative to the fire and electrical service modifications discussed above for 2011.

Impacts on landfill infrastructure would be somewhat less with this option since the road itself would be narrower. This would result in less road overage and also opens the option to allowing minor changes in road alignment that can further avoid or reduce the

As described above, for the four-lane road option, for the segment of the Forest Hill Road between the base of the landfill and Richmond Avenue the alignment would encroach upon a landfill gas vent trench. Landfill gas migration monitoring point GX-40 is located in the vicinity of the alignment. Therefore, to avoid impacts GX-40 would be flagged and protected from disturbance during construction. To mitigate these encroachments, a gravel venting layer would also be placed above the landfill gas vent trench to ensure a permeable conduit to the surface. Placement of fill soil or pavement over a limited section of the gas vent trench is consistent with as-built conditions along the vent trench. Therefore, the fill placement, along with the permeable layer would not compromise the vent trench's function.

Stormwater

As part of the park road construction, the existing stormwater management basins (R, C1, and C2) which receive runoff from the Forest Hill Road alignment would be modified to perform a water quality improvement function in the same manner as described for the 2016 basin modifications.

Both options cross the leachate management system; however, the Four-Lane design affects an additional length of cutoff wall and leachate collection trench; however, this Two-Lane Park Road option requires less extensive protective measures due to its narrower footprint. Impacts on the landfill gas management system are on the whole relatively minor, but are slightly less for the Two-Lane option.

Richmond Hill Road Connection

Landfill Infrastructure

As it negotiates the narrow passage between the DSNY District 2 Garage and the landfill, the proposed park road would impact the outlet stream from Basin B1. This impact requires that a closed drainage system adjacent to Basin A be extended to a location south of the existing DSNY garage. The proposed road would also overlap the landfill cut-off wall at two separate points, for which protective slabs are proposed to shield the cut-off wall from the effects of roadway loads.

This crossing requires a culvert to maintain its hydraulic function between the basins. Similarly, a pair of multi-barrel culverts is proposed to maintain the hydraulic connection at the north end of Basin B1. In between, the alignment takes up the space of an existing gravel access road leading to groundwater and landfill gas monitoring wells. Protected pullouts are to be provided at each monitoring well. The landfill gas interceptor venting system is also affected along this segment of roadway.

For the segment of the Richmond Hill Road Connection between the base of the landfill and Richmond Avenue, as with the four-lane-road option, the two-lane-road option would pass near groundwater monitoring wells 154D, 174S, and 153D. The alignment would also pass by gas migration monitoring wells G-44, G-17, G-18, G-46, and G-19. Each of these features would be protected during construction, but not disturbed.

In addition, the proposed embankments across Basin B1 would divide the basin. However, preliminary hydrology analyses indicate that the remaining landfill stormwater basin would be

sufficient to meet its functional purpose. Culverts would also be added to maintain hydraulic continuity and balance water levels.

Stormwater

As described above, the details of the proposed stormwater management system would be developed as each park capital project and segment of road design is further developed. In addition, to avoid stormwater impacts from increases in impervious surface to the receiving waters, individual stormwater BMPs would be used along the park roads to enhance existing wetlands and basins and to provide water quality treatment and runoff volume control. With these measures in place, by 2036, the proposed project would be expected to manage all increases in site-generated runoff while contributing positively to the local wetlands.

As part of the roads construction, the existing sediment basins (R, C1, and C2) which receive runoff from the Forest Hill Road alignment would be modified to perform a water quality improvement function in the same manner as described for the 2016 basin modifications.

All runoff is expected to be controlled on site and not impact any downstream uses. Since the proposed project would discharge runoff to the coastal waterways of Richmond and Main Creeks, it is not expected that the project would result in any impacts on downstream flooding.

YUKON AVENUE CONNECTION (FOUR-LANE ROAD)

As with the Two Lane proposal described above (2016) , the Yukon Avenue Connection under the Four Lane option passes over the landfill. Some of the specific differences between the two-lane and the four-lane park road options with respect to landfill infrastructure are described below.

In both the Four-Lane option and this Two-Lane option the park road design must account for the unusual embankment conditions, as well as the road's influence on continuing landfill post-closure operations. In general, the park road foundation design and analysis of landfill-related impacts are similar to those described above and are expected to be addressed as part of the modified final closure design. Among the affected elements along the Yukon saddle are two landfill gas collection laterals, crossing of landfill gas collection headers, covering of a leachate stone trench and a water line. Culverts would also be introduced to maintain drainage conveyance patterns.

As it descends from Landfill Section 6/7, the alignment spans over the leachate collection trench and cutoff wall. This requires that one end of the span be placed within the landfill.

In both the Four-Lane and the Two-Lane park road options, the Yukon Connection traverses the elevated land between Basins B1 and B2.

Both the Four-Lane option and this Two-Lane Park Road option require filling a portion of Basin B1. However, the estimated encroachments into Basin B1 and the wetlands are greater under this four-lane road than that of the 2016 two-lane option, as a result of the narrower width.

LOOP PARK ROAD OPTION

Introduction

As described in greater detail below, with this option, like the above options, there would be some delay in the closure of Landfill Section 6/7; however this delay would be limited to accommodating the Yukon Avenue Connection and not both the Yukon Avenue and Forest Hill

Road connections. Like the above option, there would also a need to avoid, minimize, or mitigate landfill impacts from the proposed roads. As with the above options, it is expected these measures could eliminate project impacts.

Under this option, with the appropriate construction period protection measures, there would not be any impacts on the production of leachate nor would there be hazards for landfill slope stability. However, it is recognized that with this option there is a greater need to modify landfill infrastructure at the base of Landfill Section 6/7, including the leachate collection and pumping systems. With the option there are changes in hydrology due to road runoff and changes in the DSNY stormwater management basins; however, unlike the above options, it is expected that the Loop Park Road Option would be expected to use the DSNY basins, as well as the Main Creek and Richmond Creek wetlands for runoff control given the alignment around the entire base of the landfill. Unlike the above options, this option would avoid the filling and associated hydrology impacts on Basins B1 and A as occurs with the Richmond Hill Road segment described above.

Where the proposed above options and this option differ is primarily in the areas of road design and engineering, conflicts with landfill systems, natural resources, and park design. These differences are described in greater detail below.

Pump Stations

As part of the leachate conveyance system there are 14 existing pump stations located on the outboard side of the existing haul road (around Landfill Section 6/7), 13 of which are located in the proximity of this alignment. Due to the lack of adequate space for the proposed roadway section, this roadway alignment alternative does not allow for a shoulder in the proximity of the existing pump stations. The following are potential impacts the roadway proposals may have on the pump stations:

- Roofs of pump stations located adjacent to the traveled-way could carry loading in excess of H-20 from an errant vehicle.
- Maintenance procedures would have to be altered in order for maintenance workers to safely perform their duties at any station located within the traveled-way.
- Gas vents and electrical cabinets could be struck by an errant vehicle, endangering operation of the pump station.

Gas Management System

Active Landfill Gas Collection System

Extraction wells and gas header pipes are unaffected by this option, as they are all located in the interior of the mound and outside of the roadway grading limits.

However, eight condensate tanks for the north would be impacted by this option because they are currently located underneath the existing and proposed roadway. At these locations, equipment, loading, and excavation constraints would be implemented to avoid any damage to the existing gas collection system. In addition, six drip leg vaults lie within the proposed roadway.

Passive Landfill Gas Venting System

In Landfill Section 6/7, a geocomposite gas venting layer with passive vents along the landfill section perimeter is proposed for the southern portion of Landfill Section 6/7. Several of the

passive gas vents in this area fall within the southern portion of the landfill section and within the grading limits of this alternative alignment.

On the northern section of Landfill Section 6/7, several gas vents fall within the roadway grading limits. In this case, minor realignment along with other design solutions would need to be addressed to avoid these impacts.

Grading and Drainage

The landfill stormwater management system consists of a series of swales, gabion downchutes, culverts, inlet pipes and control basins. The design intent of this option is to direct the runoff of the last tier/terrace of Landfill Section 6/7 across the roadway pavement by providing a two percent roadway cross-slope. This design conflicts with standard design practice and has the potential to contribute to hydroplaning and icing conditions, because this option would continue to allow some of the surface runoff from the landfill mound to be carried across the roadway surface. However, there are techniques to avoid this impact. Since the drainage area contributing to runoff that crosses the roadway varies through the site, it is recommended that further studies be performed during the design stage.

Final capping of the southern portion of Landfill Section 6/7 (i.e., areas south of Yukon Avenue) has not yet been completed. This may allow for the modification of stormwater management plans to accommodate this option that would reduce the quantity of stormwater runoff flowing across the proposed roadway.

Final capping of the northern portion of the site (approximately defined as those areas to the north of Yukon Avenue) is complete. As a result, impact avoidance on these road segments above could require excavation and backfilling a portion of the landfill cap. These activities could threaten the integrity of the landfill liner, and therefore are not recommended in the northern segment of the road design.

DSNY Maintenance

It is important to note that under this option, maintenance of the Fresh Kills Park leachate pump system would require periodic closure of traffic lanes. The leachate pumps are all located along the outer lane of the Loop Road. This would require periodic capacity reductions from two lanes to one. There are no pumps located along the bidirectional link between the Main Creek and Richmond Creek Bridges. There are also no pumps along the extension of Yukon Avenue.

TRAFFIC AND PARKING

PROPOSED PROJECT TRAVEL DEMAND ESTIMATES: TRIP GENERATION

As described in greater detail in the FGEIS, the proposed park includes active and passive recreational uses, cultural facilities, event space and restaurants, educational programming, and ecological enhancement.

The proposed Fresh Kills Park is expected to be a major attraction for residents of the City and the region. The park elements considered for trip generation purposes were organized into six categories: city destination park, regional park, active recreation (including constructed surface/field and indoor sports), commercial restaurants, commercial retail, and cultural facilities. In addition, many acres of the park are natural areas and would not have facilities or be programmed for access. These categories included, City Destination Park; Regional Park; Active

Fresh Kills East Park Roads SEIS

Recreation—Constructed Surface/Field Sports and Indoor Sports; Commercial/Retail; Cultural; Event Space.

It is expected that large areas of the park would be natural areas and not active trip generators. These park elements, including tidal and freshwater wetlands, the waterways of Fresh Kill, Main and Richmond Creeks, the Isle of Meadows, and the large areas of landscape enhancement on the landfill mounds, are considered natural areas of the park and would not generate trips. All travel demand and trip generation assumptions used in this SEIS were based on the Fresh Kills Park FGEIS (March, 2009).

PROPOSED ROAD CONNECTIONS AND TRAFFIC DIVERSIONS

As described in greater detail in Chapter 1, “Project Description,” the proposed park would create a pattern of park roads, improvements to the Northbound and Southbound Service Roads of the West Shore Expressway, and new ramp connections to the map line of the Expressway, that, in addition to providing park access, would provide a direct connection between Richmond Avenue on the east and the West Shore Expressway (northbound and southbound lanes) on the west. Since there is currently no such direct connection, the new park roads would result in traffic diversions. It is expected that with the new park roads, traffic traveling north- and southbound along Richmond Avenue would use these roads to access the West Shore Expressway, and the reverse travel pattern is also assumed. This diverted traffic would be in addition to the park-destined traffic. All assumptions used in this SEIS with respect to road diversions are based on the Fresh Kills Park FGEIS (March, 2009).

MODIFIED LANDFILL COVER (2011)

While it is assumed that by 2011 the landfill cover in East Park would be modified to create a new embankment, the roads would not be improved as publicly accessible roads. Therefore, this condition does not generate any new traffic pattern or diversions.

YUKON AVENUE CONNECTION (2016)

Road Description and Study Area

As discussed above, the Yukon Avenue Connection calls for a two-lane, two-way road public road that would cross Landfill Section 6/7 with a connection to Yukon Avenue. The new intersection of Yukon Avenue at Richmond Avenue created as part of the proposed connection would therefore capture all of the diverted traffic across Fresh Kills Park in 2016 as well as a certain number of park destined trips. Since the use of East Park Road would not affect traffic patterns at other intersections already analyzed in the March 2009 FGEIS, the traffic impact analysis was limited to the five intersections east of East Park.

Traffic Diversions

As discussed above, the Yukon Avenue Connection assumes one park connection to Richmond Avenue for vehicular traffic at the intersection of Yukon Avenue and Richmond Avenue. To generate traffic volumes for the 2016 project condition, traffic diversion patterns developed for the Fresh Kills Park FGEIS were modified to account for the single connection at this location in 2016.

Park Trip Generation and Assignments

The 2016 park development program as presented in the March 2009 FGEIS is unchanged for this SEIS. Therefore, the total number of project-generated vehicular trips for the 2016 analysis year is unchanged. Park trip Assignments along Richmond Avenue are then all channeled to the Yukon Avenue/Richmond Avenue intersection.

Traffic Impacts

In 2016 with the Yukon Avenue Connection in place, four (4) out of the five (5) analyzed intersections would experience significant adverse traffic impacts with the proposed project.

Overall, traffic conditions at the Yukon Avenue/Richmond Avenue park entrance would be congested and/or impacted during all five analyzed peak hours in 2016; traffic operating conditions at the intersection of Forest Hill Road and Richmond Avenue would be similar to the No Build conditions; the Richmond Hill Road and Forest Hill Road intersection would have impacts in a number of approaches for all analyzed peak hours. At the Yukon and Richmond Avenue intersection, the newly proposed northbound left-turn movement would operate under congested (mid-LOS D or worse) conditions during all five analyzed peak hours; the proposed eastbound left-turn movement would operate under congested conditions during all peak hours except for the weekday AM peak hour. The southbound shared through and right-turn movement would be impacted during the weekday PM peak hour. Richmond Hill Road and Richmond Avenue intersection would also have impacts in all five analyzed peak hours.

Mitigation for these potential impacts is presented in summarized below under “Impact Avoidance Measures and Mitigation.”

COMPLETED EAST PARK ROAD SYSTEM: 2036

Park Road Description and Study area

By 2036 the project could have two additional road connections to Richmond Avenue components, one at Forest Hill Road and the other at Richmond Avenue. Under one option there is only one connection, at Yukon Avenue. Under the Yukon Avenue option, the intersection design is similar to 2016, but the road segments to the west are widened to four lanes. As with the 2016 condition, since the use of East Park Road would not affect traffic patterns at other intersections already analyzed in the March 2009 FGEIS, the traffic impact analysis was limited to the five intersections east of East Park.

Traffic Diversions

With up to three connections at Richmond Avenue, traffic diversion patterns developed for the FGEIS 2036 analysis year were modified to account for the additional connection at the Yukon Avenue/Richmond Avenue intersection.

Park Trip Generation and Assignments

For the 2036 analysis year the park trip generation is the same as analyzed in the FGEIS. However, with the additional connection at the intersection of Yukon Avenue and Richmond Avenue, the assignments are different in that both the in-and outbound project generated vehicular trip assignments were modified. Specifically, the proposed project inbound vehicular trip assignments along Richmond Avenue were modified to by assigning approximately 17, 16 and 26 percent of project-generated (park and diversion related) vehicular trips to the intersections of Richmond Hill Road, Yukon Avenue and Forest Hill Road at Richmond

Fresh Kills East Park Roads SEIS

Avenue, respectively. For the 2036 option with just the Yukon Avenue Connection, all park destined Richmond Avenue traffic would use this connection.

Traffic Impacts

Three Richmond Avenue Connections

Based on the above, the park road options that have three connections along Richmond Avenue would have the following impacts.

For 2036 future traffic conditions, all five (5) analyzed intersections would be impacted. At the intersection of Yukon Avenue and Richmond Avenue, the westbound approach would be impacted during the weekend midday peak hour. The proposed northbound left-turn movement would operate under congested conditions during all peak hours under this alternative. Also, the southbound shared through and right-turn movement would be impacted during the weekday PM and weekend midday peak hours. At the intersection of Forest Hill Road and Richmond Avenue, the southbound shared through and right-turn movement would also be impacted. At the intersection of Yukon Avenue and Forest Hill Road, the northbound approach would also be impacted.

Mitigation for these potential impacts is presented in summarized below under “Impact Avoidance Measures and Mitigation.”

Yukon Avenue Connection

With this option, neither the Richmond Hill Road or Forest Hill Road connections to Richmond Avenue are provided. Thus, the only 2036 connection to Richmond Avenue for vehicular access to the through-connection to the West Shore Expressway is via the Yukon Avenue intersection.

Under this option, the intersection of Richmond Hill Road at Forest Hill Road would be impacted during all analyzed peak hours. For the intersection of Richmond Hill Road at Richmond Avenue, four out of the five peak hours would be impacted. For the intersection of Forest Hill Road at Richmond Avenue, one peak hour impacted. The newly created intersection of Yukon Avenue at Richmond Avenue under this option would also be impacted.

Mitigation for these potential impacts is presented in summarized below under “Impact Avoidance Measures and Mitigation.”

Parking

Under all the build options, as described in the Fresh Kills Park FGEIS (March, 2009), there would no changes with respect to future parking conditions. Thus, neither this alternative nor the proposed project would have a parking impact.

TRANSIT AND PEDESTRIANS

Currently, the proposed Fresh Kills Park site is not directly served by NYCT existing bus routes; however, there are several existing NYCT bus routes that serve its periphery, as well as regional service along the West Shore Expressway (weekday service) and access to local park and rides (both existing and proposed). In the future with the proposed park, and the proposed East Park Roads, NYCT could either expand bus services and routes to accommodate the park generated transit demand (especially during the weekend summer months) or would amend the existing bus routes to include new stops within the park and along its exterior boundaries. It is anticipated by park planners that expanding the availability of bus transit in the future conditions could potentially reduce the number of project generated auto trips by shifting the patrons to mass

transit. This could, over time, reduce vehicle trips and improve transit use at the local (boroughwide), citywide, and regional levels. Reduced traffic would also reduce demands on parking and enhance the overall park experience while potentially increasing park use through transit arrivals. Therefore, DPR would continue to coordinate with MTA/NYCT for the purposes of providing transit service to the park.

AIR QUALITY

MOBILE SOURCES ANALYSIS

Modified Closure Plan (2011)

Since no changes in vehicular travel would occur under the 2011 modified closure, it is assumed that no significant changes in background air quality would occur through that analysis year. As discussed in greater detail in Chapter 20 “Construction” the proposed project would not result in any odor impacts to future park users as a result of the modified closure program.

Yukon Connection (2016)

With the proposed Yukon Connection, CO concentrations would not result in any violations of the 8-hour CO standard. In addition, the incremental increases in 8-hour average CO concentrations would be very small and, consequently, would not result in a violation of the CEQR *de minimis* CO criteria. Therefore, the proposed project would not result in any significant adverse CO air quality impacts.

2036 Build Analysis

In 2036, CO concentrations with the proposed project would not result in any violations of the 8-hour CO standard. In addition, the incremental increases in 8-hour average CO concentrations would be very small and, consequently, would not result in a violation of the CEQR *de minimis* CO criteria. Therefore, the proposed project would not result in any significant adverse CO air quality impacts.

MESOSCALE ANALYSIS

As described in the FGEIS, the proposed project would create new connections to the West Shore Expressway, including the extension of service roads. An analysis is required to quantify the net change in regional emissions of NO_x, CO and VOCs. Initial pollutant burdens were based on the expected emissions from the vehicle miles traveled (VMT) that would occur in the absence of the new interchanges along the West Shore Expressway within the proposed park. These were compared to the build pollutant burdens predicted from the traffic study. The results of the analysis indicated a slight increase in emissions (less than 5 percent) for each of the analyzed pollutants as compared to the no build condition. According to the NYSDOT *EPM*, projects with a VMT difference of 10 percent or more are considered to have a potential significant impact on regional emissions. The mesoscale analysis is conservative since it does not take into account vehicle emissions due to idling. The proposed new connections to the West Shore Expressway are expected to reduce traffic burdens on existing signalized local roads, which will reduce idling at intersections. Nevertheless, the slight increase in emissions from the proposed project is not considered to be regionally significant.

NOISE

The proposed project would not result in significant noise impacts from increased traffic or stationary noise sources. Although noise levels at certain areas within Fresh Kills Park that are immediately adjacent to roadways would be above the CEQR Technical Manual noise exposure guideline of 55 dBA L10(1) for outdoor areas requiring serenity and quiet, they would be comparable to noise levels in several other New York City parks, including South Shore Golf Course Park, Arden Heights Woods Park, LaTourette Park, and Willowbrook Park, and would not result in a significant adverse noise impact.

MODIFIED CLOSURE PLAN (2011)

The proposed project assumes that by 2011 a modified closure plan would be constructed at Landfill Section 6/7. The potential for noise impacts associated with this modified closure plan are presented in Chapter 20 “Construction Impacts.” There would be no operational noise impacts from the modified closure plan.

YUKON CONNECTION (2016 AND 2036)

Future noise levels with the proposed action were calculated for the 2016 analysis year under for the full Fresh Kills Park program including all park and traffic elements.

Based on that analysis, the increase in $L_{eq(1)}$ noise levels would be less than 1.0 dBA at receptor sites from 1 through 13. At receptor sites 3, 7, 9, 10, 11, and 12 a decrease in noise levels was predicted to occur for Build conditions due to a decrease of 2016 traffic volume at Arthur Kill Road, Richmond Hill Road, Victory Boulevard, and Travis Avenue. The Build traffic would be expected to decrease at these locations due to the reverse travel pattern caused by the new park roads. At those locations where the proposed project would result in an increase in noise levels, the changes would not be perceptible, would be insignificant, and they would be below the CEQR threshold for a significant adverse impact. In terms of CEQR Noise Exposure Guidelines, noise levels at receptors from 1 through 12 would remain in the “marginally unacceptable” category, and noise levels at receptor 13 would remain in the “acceptable” category.

At receptor A (i.e., the closest residence adjacent to the proposed softball field) the maximum increase in $L_{eq(1)}$ noise levels would be 3.1 dBA. Changes of this magnitude would be perceptible, but they would be below the CEQR threshold for a significant adverse impact. Because of low No Build noise levels (less than 60 dBA) at this location, the CEQR threshold for a significant adverse noise impact would be 5 dBA. In terms of CEQR Noise Exposure Guidelines, noise levels at receptor A would remain in the “acceptable” category. These conclusions would also apply to the proposed project with respect to the Yukon Avenue Connection.

FOREST HILL ROAD/RICHMOND HILL ROAD CONNECTIONS (2036)

Based on the 2036 noise analysis for the FGEIS, the increase in $L_{eq(1)}$ noise levels would be less than 1.0 dBA at receptor sites from 1 through 13. At receptor sites 3, 7, 9, 10, 11, and 12 a decrease in noise levels was predicted to occur for Build conditions due to a decrease in traffic volumes at Arthur Kill Road, Richmond Hill Road, Victory Boulevard, and Travis Avenue. The Build traffic would be expected to decrease at these locations due to the reverse travel pattern caused by the new park roads. At those locations where the proposed project would result in an increase in noise levels, the changes would not be perceptible, would be insignificant, and they would be below the CEQR threshold for a significant adverse impact. In terms of CEQR Noise

Exposure Guidelines, noise levels at receptors from 1 through 12 would remain in the “marginally unacceptable” category, and noise levels at receptor 13 would remain in the “acceptable” category.

At receptor A (i.e., the closest residence adjacent to the proposed parking lot and softball field) the maximum increase in $L_{eq(1)}$ noise levels would be 4.2 dBA. The major contributor for these increases in noise levels would be noise from the project-generated traffic. Changes of this magnitude are noticeable, but they would not exceed the CEQR threshold for a significant adverse impact. In terms of CEQR Noise Exposure Guidelines, noise levels at receptor A would remain in the “acceptable” category.

ACCEPTABILITY OF AMBIENT NOISE LEVELS IN THE PROPOSED PARK

Noise Levels in the Park

Noise levels within Fresh Kills Park would be above the 55 dBA $L_{10(1)}$. This exceeds the noise level for outdoor areas requiring serenity and quiet contained in the *CEQR Technical Manual* noise exposure guidelines (see Table 19-5). Maximum $L_{10(1)}$ noise levels would be the high 80s dBA at locations near the outdoor amphitheater (when events are taking place in the amphitheatre), maximum $L_{10(1)}$ noise levels would be the high 70s dBA at locations near the West Shore Expressway, and average $L_{10(1)}$ noise levels would be the mid 60s dBA at the center area of proposed park. These predicted noise levels would result from the noise generated by traffic on the nearby West Shore Expressway and new park roadways, as well as activities in the new park. There are no practical and feasible mitigation measures that could be implemented to reduce noise levels to below the 55 dBA $L_{10(1)}$ guideline. However, the noise levels in the new park would be comparable to noise levels in portions of other parks that are also located adjacent to trafficked roadways, including South Shore Golf Course Park, Arden Heights Woods Park, LaTourette Park, and Willowbrook Park. Although the 55 dBA $L_{10(1)}$ guideline is a worthwhile goal for outdoor areas requiring serenity and quiet, this relatively low noise level is typically not achieved in parks and open space areas in New York City. Consequently, noise levels in the Fresh Kills Park, while exceeding the 55 dBA $L_{10(1)}$ CEQR guideline value, would not result in a significant adverse noise impact.

CONSTRUCTION

INTRODUCTION

The construction analysis presents the potential impacts of the proposed project with respect to the three phases of analysis: 1) Modified Landfill Section 6/7 Final Cover; 2) Yukon Avenue Connection; and 3) Forest Hill Road and Richmond Hill Road Connections. Where separate analyses are necessary for each scenario, they are presented below.

Overall Description of Activities

Activities Common to Approved and Modified Closure Plans

Construction activities associated with the modified closure plan will include the same general construction activities that are required to complete approved final closure design, plus two new utility modifications. In general the landfill closure construction activities that are necessary under both the proposed and existing plans include:

- Cutting and waste relocation to achieve the embankment elevations;

Fresh Kills East Park Roads SEIS

- Filling to achieve the embankment elevations;
- Installation of geosynthetic landfill final cover system;
- Installation of landfill gas system components;
- Construction of stormwater management swales and culvert;
- Installation of vegetation; and
- Construction of DSNY landfill service roads.

In addition the modified closure construction activities will require partial relocation of a fire fighting water main that services a fire hydrant located at the Landfill Section 6/7 ground flare and relocation of an overhead electric utility line that also services the Landfill Section 6/7 ground flare and other on-site equipment.

Activities Specific to Modified Closure Plan

Although cut, fill, and waste relocation is currently required to accomplish Landfill Section 6/7 closure construction under the approved final closure plan, the mass grading necessary to achieve the objectives of this modified closure plan would require additional excavation and on-site waste relocation to prepare the embankment surface. In order to maintain the integrity of all landfill infrastructure; allow for ongoing monitoring and maintenance operations; and to provide an embankment upon which a future road could potentially be placed, this modified closure plan includes the following construction activities:

- Place surcharge along the Forest Hill Corridor to consolidate and strengthen the underlying waste material and reduce long term settlement along the future road corridor for a period of about 6 months;
- Increasing the barrier protection layer component of the cover system from two feet to four feet thick along the proposed road corridors;
- Modify the location of several stormwater conveyance swales;
- Some modification of landfill service road alignments;
- Relocate approximately 1,000 feet of landfill gas pipe and three gas wells; and
- Relocate a portion of the existing fire water main to a lower elevation.

Details of the specifics of these measures are provided in the report “Draft Alternative Final Cover Design Report, Fresh Kills Landfill Section 6/7” (Geosyntec Consultants for DSNY, May 2009). Measures to avoid or mitigate impacts due to the above activities would be achieved by extending established best management practices through the period of construction, as are in place under the approved closure plan. These measures are also explained Chapter 23, “Impact Avoidance and Mitigation.”

On-Site Waste Staging for Off-Site Disposal

In the event that waste is encountered that requires off-site disposal, the contractor would be required to take appropriate steps to segregate and contain the waste materials in accordance with prevailing state and federal regulations until the proper disposal requirements can be determined. On-site waste staging is likely to include constructing temporary containment areas such as placing materials in lined roll off containers or on plastic sheeting. In the event that on-site staging is necessary, applicable storage or accumulation time limits will be determined in consultation NYSDEC.

LAND USE, NEIGHBORHOOD CHARACTER AND OPEN SPACE

Fresh Kill Park and East Park as well as the East Park and the associated road corridors are large and currently bounded by industrial uses to the west, other park properties to the north, east, and south, commercial uses to the east, and residential neighborhoods such as Travis to the north and Arden Heights to the south. The majority of Fresh Kills is not bordered by residential uses. As it relates to East Park and the project site, sensitive receptors in the vicinity of the project site include parks users (e.g., LaTourette Park), public uses in the local commercial areas (e.g., the Staten Island Mall), and natural habitats along Main and Richmond Creek. There are no sensitive residential receptors or community facilities in the immediate area.

In order to minimize impacts on sensitive receptors, construction activities (e.g., staging, storage, operations) would be concentrated in the central portion of Fresh Kills Park. These areas allow for centralized access and re-use of areas previously disturbed that are located away from local communities and existing open spaces and natural areas. Construction staging would not need any off-site locations and construction activities near these neighborhoods and would therefore be limited to constructing the local parks and would be short in duration.

Certain types of construction activities at the periphery of the park (e.g., the road connections at Richmond Avenue) would be potentially noisy for local residents and current parks users at places such as LaTourette Park and some short-term construction activities would also be audible and visible from the local community and park. There are likely to be temporary and localized construction impacts due to construction noise, operation of heavy equipment, construction workers traveling to and from the site, and trucks delivering materials to and removing construction waste from the site. However, the intensity of the off-site impact decreases with the distance from the site and construction access and traffic corridors would primarily use the West Shore Expressway and internal project site roads to avoid impacts to neighborhoods.

In addition, as discussed below (see “Noise”), pursuant to the New York City Noise Control Code, as amended December 2005 and effective July 1, 2007, the adoption and implementation of noise mitigation plans would be required for project construction. Construction activities typically occur between the periods of 7 AM to 4 PM on weekdays, and not on weekends when the local parks would likely be more fully utilized. As described below under “Traffic and Parking,” during construction of the proposed project, no off-site queuing of trucks is expected, and all construction staging would take place within the project site.

Worker vehicles would also use local roads only to access the project area, while construction trucks would use local truck routes and the designated truck entrances to reach the site.

In sum, the local neighborhoods would be sufficiently buffered from construction activity. For these reasons, it is concluded that no potential significant adverse construction period impacts on land use or community character would occur with the proposed project.

HISTORIC RESOURCES

Archaeology

Construction excavation may potentially impact subsurface archaeological resources that have been identified at particular locations as part of the Phase 1A Archaeology Study of the site (see the Fresh Kills Park FGEIS, Appendix B). Mitigation for these potential impacts is summarized below. These mitigation measures are to be instituted prior to construction, but can also be

Fresh Kills East Park Roads SEIS

incorporated into the construction bid documents, as long as the work is undertaken before construction proceeds.

Historic Resources

There are no historic resources in the vicinity of the proposed modified cover or roads; thus, the proposed project would not impact any historic resources during construction.

NATURAL RESOURCES

Introduction

The analysis below examines the potential for impact on natural resources due to the proposed project. No direct impacts to natural resources are expected with the proposed modified landfill cover as this work would occur entirely within the corridor of existing disturbed areas on the landfill. There is the potential for indirect impacts during this construction due to soil erosion and sedimentation. Measures to avoid these impacts are addressed below. The analysis below therefore largely pertains to the potential for construction period impacts on the segments of road east of Landfill Section 6/7.

Natural Resources Protections

Land Disturbing Activities

Construction would result in the following land disturbance activities:

- Land clearing—removal of existing vegetation or other existing cover material;
- Temporary stockpiling of fill to be used as final cover material;
- Grading and construction of surface drainage systems;
- Installation of infrastructure.

These activities have the potential to impact terrestrial and aquatic resources through:

- Discharge of stormwater to tidal and freshwater wetlands present within the project site;
- Deposition of fugitive dust resulting from grading activities into terrestrial and aquatic landscapes;
- Physical damage to vegetation outside a project area (i.e., above ground portion of the plants and the below ground portion of the tree protection zone for trees identified for retention);
- Direct (i.e., physical removal of plant community or grading of soil, loss of individual wildlife due to collision with or as a result of operation of construction equipment) and indirect (avoidance of landscape due to noise, vehicle traffic, or other human disturbance) loss of landscape; and
- Potential impacts to natural resources as a result of these activities would be minimized through the implementation of measures and guidelines discussed in the following sections.

Measures to Reduce Potential Wildlife Impacts During Construction

Wildlife use of a particular area would be expected to return upon completion of construction and enhancement activities. Moreover, in the long term, the restored and enhanced landscapes proposed for Fresh Kills Park would be expected to benefit wildlife through the introduction of vegetative cover of higher quality and diversity than currently present within much of the project site.

Strategies to limit wildlife impacts as a result of the above construction activities would depend on the duration and extent of the disturbance. Physical barriers at construction and staging areas, such as drift fencing, would be used to restrict movement of ground-dwelling wildlife (i.e., small mammals, reptiles and amphibians). Direct impacts to wildlife would also be reduced by limiting the speed of construction vehicles, and avoiding nighttime construction operations. Additionally, the phasing of the park road development activities over a 30 year period would limit the extent of land disturbance and area of in-water construction activities at a given time, increasing the potential that suitable habitats may be available in other areas of Fresh Kills Park.

Habitat Protection Plan

In addition to the above, a natural resources protection plan would be prepared for each capital construction project. This plan would identify landscapes, trees, sensitive plant communities such as wetlands, and any other communities that have been identified for protection under the proposed project and establishes the necessary protection zones around these resources so as to minimize the potential for adverse direct or indirect impacts.

Clearing of staging areas for roadway construction would also be conducted in a manner consistent with minimizing impacts to large trees (e.g., trees greater than 12 inches in diameter at breast height) that are outside or adjacent to areas proposed for construction disturbance.

Geology, Soils, and Groundwater

Modified Closure Plan

Development of the proposed park road embankment across Landfill Section 6/7 is not expected to result in significant impacts with respect to geology, soils and groundwater. These project elements would be built over the man-made waste mound, Landfill Section 6/7, and would not affect any natural geologic, soils or groundwater conditions.

Landfill leachate is generated by percolation of precipitation through the landfill surface and into the waste material. The percolation volume is minimized throughout the landfill life-cycle through conformance with minimum operating standards, as prescribed in the solid waste regulations, during waste placement operations and through the application of engineered cover systems following cessation of waste placement. Considering that approximately 50 percent of the engineered final closure system has already been completed over Landfill Section 6/7, a significant reduction in percolation is expected. Consequently, excavation and relocation of existing waste to accomplish mass grading along the Yukon Avenue and Forest Hill Road corridors, performed using appropriate minimum landfill operating standards, will not increase the volume of leachate required to be managed above the volume previously managed by the system prior to closure construction.

Proposed Park Roads

Development of the proposed park roads is not expected to result in significant impacts with respect to geology, soils and groundwater. The embankment across the landfill for the project would be developed as part of the modified cover plan. Thus, these road segments would be built at or above grade and therefore would not significantly affect local geology soils, or groundwater.

In addition, cutting and filling would be necessary for the proposed roads segments off the landfills sections. In addition, cutting and filling would be necessary for the proposed road segments off Landfill Section 6/7.

Fresh Kills East Park Roads SEIS

As discussed above, a construction monitoring plan would be implemented to ensure that the construction of the road elements would protect the existing environmental control and monitoring systems at Fresh Kills (i.e., landfill gas and groundwater monitoring systems, stormwater basins). This construction monitoring plan would also ensure that the integrity of the landfill cover remains and that all systems are functioning during road construction, thereby minimizing the potential for adverse impacts to the environment.

Floodplains

Neither the development of the modified closure plan or the park roads would impact floodplains. The area of the modified closure is above the floodplain and the road alignments are generally outside the 100-year floodplain with limited exceptions (e.g., the connection at Richmond Hill Road).

Wetlands

Implementation of erosion and sediment control measures described above for each park road element would minimize the potential for significant adverse impacts to both water quality and aquatic resources during construction.

In addition, it is expected that all activities in wetlands (both tidal and freshwater) would require permits for activities in wetlands. This would include permits for tidal wetlands and protection of water, as well as permits from the ACOE for activities in waterways and wetlands. For all build years, construction erosion and sedimentation measures, established in accordance with the site SWPPP will be used to control impacts to stormwater runoff during construction. A description of construction period impacts follows.

Modified Landfill Closure (2011). Road base construction activities across Landfill Section 6/7 would not have any direct impacts on wetlands. Any indirect impacts would be related to changes in water quality.

Yukon Connection (2016). Construction of the proposed two-lane Yukon Avenue Connection would not result in any direct adverse impacts to wetlands.

Completed East Park Road System (2036)

Forest Hill Road Connection (Four-Lane Road)

The Forest Hill Road Connection under this option crosses over a portion of the freshwater/estuarine wetland system on the east side of Section 6/7. This road segment would impact about 1.3 acres of wetlands. It is anticipated that the crossing of this wetland would be accomplished with a viaduct or box culvert structure. As currently contemplated, this structure would be approximately 665 feet long and about 60 feet wide in its crossing of the wetland. These emergent wetlands are predominantly dominated by *Phragmites*. Construction of the viaduct has the potential to result in impacts to wetlands within the viaduct alignment due to activities of construction vehicles and the direct impact of structures within the wetlands. Construction techniques to minimize damage to wetlands would be implemented as part of the construction management plan and in coordination with the DEC and the ACOE requirements, which would be expected during the permitting process (structures in this segment of construction would require wetland permits). (An analysis of potential shading impacts is also presented in Chapter 10 “Natural Resources.”) For all of these wetlands areas, the loss of wetland acreage would be mitigated by the creation of wetland acreage elsewhere in Fresh Kills Park. A description of this wetland mitigation is provided in Chapter 23 “Impact Avoidance Measures and Mitigation.”

Richmond Hill Road Connection (Four-Lane Road)

This road segment under this option would directly disturb about 4.25 acres of freshwater wetlands. In addition to this direct construction impact, there would be the potential for additional impact due to construction activities within the wetlands and DSNY basins. Mitigation for this impact is summarized below under “Impact Avoidance Measures and Mitigation.”

Forest Hill Road Connection (Two-Lane Road)

This road segment under this option would directly disturb about 1.2 acres of wetlands. In addition to this direct construction impact, there would be the potential for additional impact due to construction activities within the wetlands themselves. Mitigation for this impact is summarized below under “Impact Avoidance Measures and Mitigation.”

Richmond Hill Road Connection (Two-Lane Road)

This road segment under this option would directly disturb about 2.15 acres of wetlands. In addition to this direct construction impact, there would be the potential for additional impact due to construction activities within the wetlands and DSNY basins. Mitigation for this impact is summarized below under “Impact Avoidance Measures and Mitigation.”

Yukon Avenue Connection (Four-Lane Road)

This road segment under this option would directly disturb about 0.25 acres of wetlands in the DSNY Basins B1 and B2. In addition to this direct construction impact, there would be the potential for additional impact due to construction activities within the wetlands and DSNY basins. Mitigation for this impact is summarized below under “Impact Avoidance Measures and Mitigation.”

East Park Loop Road and Richmond Avenue Connections

This park road option would directly disturb about 1.92 acres of wetlands. In addition to this direct construction impact, there would be the potential for additional impact due to construction activities within the wetlands. Mitigation for this impact is summarized below under “Impact Avoidance Measures and Mitigation.”

Aquatic Resources

The project site contains wetlands including ponds, stormwater basins and emergent wetlands. It is a critical component of the project construction practices to avoid impacts to these natural systems, not only for the purposes of avoiding impacts to natural resources and water quality, but also for the purposes of avoiding siltation impacts to the existing DSNY stormwater basins. In order to avoid these impacts, the proposed project includes a “Conceptual Site-Wide Erosion and Sediment Control Plan.” This plan establishes the guidelines by which each phase of project construction, though implementation of the proposed techniques, would avoid impacts to natural features and in-place stormwater management systems. Implementation of these techniques would be ensured not only by DPR, but through the SPDES Permit requirement which is expected to include:

- No increase in turbidity that would cause a substantial visible contrast to natural conditions;
- No increase in suspended colloidal and settleable solids that would cause “deposition or impair waters for their designated best use”; and
- No residue from oil and floating substances.

Each proposed stormwater management plan would be designed to meet the requirements of a SPDES Individual Permit as well as Article 17 of the New York State Environmental

Fresh Kills East Park Roads SEIS

Conservation Law and the Federal Clean Water Act. The Plan has also been designed to meet the standards of the *New York State Stormwater Design Manual* (DEC, 2003) and the New York State Standards and Specifications for Erosion and Sediment Control (DEC, 2005). DEC would need to review and approve State Pollutant Discharge Elimination (SPDES) permits for stormwater discharges associated with road construction activities.

A conceptual site-wide ESCP was developed to present conceptual erosion and sediment controls that may be used during construction (see FGEIS, March 2009).

Certain elements of park construction would require activities in the water. This construction activity is expected to include:

- Construction of stormwater outfalls and aprons.
- Placement of fill material, culverts, and other structural elements within the existing surface waters or wetlands as required for the construction of the proposed park roads and viaducts.
- Removal of sediment and grading of shoreline required as part of the proposed wetland enhancement/mitigation activities.

These activities have the potential to impact aquatic resources and wetlands through:

- Temporary increases in suspended sediment and resuspension and redeposition of sediment contaminants during sediment disturbing activities such as piling installation, bulkhead repair/replacement, and removal of sediment and grading as a result of wetlands enhancement efforts.
- Direct loss of wetlands within the footprint of viaduct and culverts as well as fill material or other structural elements associated with the proposed park roads.

Given the high degree of mixing in the Fresh Kills waterways, any temporary increase in suspended sediment resulting from in-water construction activities is expected to be localized and dissipate within a short distance of the project activity. In the majority of cases these activities are also quite limited in duration (1-2 weeks) and impacts would cease upon completion of the in-water (sediment disturbing) activity. Therefore, although temporary short-term disturbances to aquatic habitats and suspended materials in the water column may occur, in-water construction activities would not be expected to result in significant adverse impacts on water quality or aquatic biota during construction. Similarly, any contaminants released to the water column as a result of sediment disturbance would not be expected to result in significant short-term or long-term impacts on water quality in Main or Richmond Creeks.

Life stages of estuarine-dependent and anadromous fish species, bivalves and other macroinvertebrates are fairly tolerant of elevated suspended sediment concentrations and have developed behavioral and physiological mechanisms for dealing with variable concentrations of suspended sediment (Birtwell et al. 1987, Dunford 1975, Levy and Northcote 1982 and Gregory 1990 in Nightingale and Simenstad 2001a, LaSalle et al. 1991). Fish are mobile and generally avoid unsuitable conditions in the vicinity such as increases in suspended sediment and noise (Clarke and Wilber 2000). While localized increase in suspended sediment may cause fish to temporarily avoid the area around where piles or other in-water structures are being installed, the affected area would be expected to be small. Similar suitable landscapes would be available for use by fish to avoid the area of in-water construction. Fish also have the ability to expel materials that may clog their gills when they return to cleaner, less sediment laden waters. Most shellfish are adapted to naturally turbid estuarine conditions and can tolerate short-term exposures by closing valves or reducing pumping activity. More mobile benthic invertebrates

that occur in estuaries have been found to be tolerant of elevated suspended sediment concentrations. In studies of the tolerance of crustaceans to suspended sediments that lasted up to two weeks, nearly all mortality was caused by extremely high suspended sediment concentrations (greater than 10,000 mg/L) (Clarke and Wilber 2000) which would not occur from the in-water work associated with the proposed project.

Potential impacts to natural resources as a result of construction activities could be minimized through implementation of the following:

- Measures to minimize increases in turbidity and suspended sediment in the water column, and to capture floating debris during sediment removal and grading activities, and installation of in-water structures. Examples of measures to be considered include silt curtains and coffer dams. Measures would be selected on the basis of on-site conditions and consultation with DEC and the USACE.
- Implementation of measures to stabilize the wetlands enhancement areas as necessary during planting, such as the use of biodegradable/geosynthetic erosion control mats or revegetation mats.
- If necessary, implementation of measures that may restrict or limit the construction activities in water or sensitive landscapes during certain seasons.

In addition, it is recognized that all construction activities within open waters or other wetlands are subject to the review and approval of DEC and ACOE and federal natural resource agencies through the permitting process that would further identify and implement these and other protection measures necessary to protect water quality and sensitive landscapes.

Significant Coastal Fish and Wildlife Habitat

Construction of the proposed modified closure plan and park roads would not be expected to conflict with the Fresh Kills Significant Coastal Fish and Wildlife Habitat. During construction, with the proposed construction protection measures in place, the tidal creeks of this designated landscape would continue to provide spawning and nursery opportunities for anadromous, estuarine, and resident fish, and would continue to be used by wading birds, waterfowl, shorebirds, raptors and passerines. In addition, all proposed in-water activities would be subject to permitting by the DEC and USCOE for the purposes of protecting wetlands and water quality and would require the input of the DOS with respect to coastal policies and protection of significant coastal fish and wildlife landscape. Each capital park project would be reviewed on an individual basis as part of its permit review. For these reasons, it is concluded that the proposed project would not conflict with this designation during construction.

During construction, the tidal creek systems of Main and Richmond Creeks would continue to provide spawning and nursery landscape for anadromous, estuarine, and resident fish, and would continue to be used by wading birds, waterfowl, shorebirds, raptors, and passerines. In addition, no indirect impacts to water quality and the Significant Coastal Fish and Wildlife Habitat are anticipated during construction.

Terrestrial Resources

Modified Closure Plan (2011)

The modified cover closure construction would essentially occur on top of the landfill in areas currently disturbed by an interim cover and proposed to be disturbed under the approved cover

Fresh Kills East Park Roads SEIS

plan in the No Build condition. Thus, it is concluded that construction of the modified cover closure would not have any impacts on terrestrial resources.

Yukon Avenue Connection (2016)

Construction of the Yukon Avenue Connection across Landfill Section 6/7 would occur on a developed embankment. It would not have any direct impacts on terrestrial resources.

For the segment between the based on the landfill and Richmond Avenue, there would be limited direct impacts (i.e., clearing and physical removal of plant community or grading of soil within the roadway alignments, loss of individual wildlife due to collision with or as a result of operation of construction equipment) and the potential for indirect impacts (avoidance of habitats due to noise, vehicle traffic, or other human disturbance) to wildlife. The proposed project has been designed to minimize direct clearing impacts to the extent possible by utilizing existing disturbed corridors, such as the Yukon Connection, thereby limiting impacts to terrestrial resources. Thus, clearing of resources in this road segment would be minimize and not significant.

While certain wildlife individuals may avoid undisturbed landscapes in the vicinity of road construction due to noise, vehicle traffic or increased human activity, this is also not expected to be a significant impact in this area.

Completed East Park Roads (2036)

Construction of the Forest Hill Road Connection across Landfill Section 6/7 would be on an interim trail and meadow cover maintained as part of the modified final closure. This segment of road would therefore not have any direct impacts on terrestrial resources.

The segment of the Forest Hill Road Connection between the base of the landfill and east to Richmond Avenue would occur with in an area of wetlands (see the discussion above) and terrestrial habitats including the Richmond Avenue berm and wetlands. This berm includes a linear wooded area along Richmond Avenue that contains planted white pine, Douglas fir, and Norway spruce. The proposed Forest Hill Road Connection would span an area of mixed upland and wetlands that contain a mix of habitats including native and non-native scrub-shrub and *Phragmites*. The proposed park road segment would be directed through woodlands along the berm and in the southern end of the 0.5 acre forested area, resulting in removal of few large trees (i.e., greater than 12 inches diameter at breast height) in this vicinity. The small loss of landscaped habitat associated with the roadway construction would not result in significant adverse impacts to wildlife resources.

Construction of the Richmond Hill Road Connection also has the potential to result in direct impacts (i.e., clearing and physical removal of plant community and soil grading) as well as potential loss of individual wildlife due to collision with or as a result of operation of construction equipment as well as indirect impacts (avoidance of habitat due to noise, vehicle traffic, or other human disturbance). However, construction of the Richmond Hill Road Connection would require minimal impacts on terrestrial resources in its alignment along the Richmond Avenue berm. This small loss of habitat associated with the road construction would not result in significant adverse impacts to wildlife resources.

Completion of the East Park Loop Road would also not be expected to have any impacts on terrestrial resources since it largely would follow an alignment of built DSNY haul road surfaces. Thus, it would not impact any terrestrial resources.

Threatened or Endangered Species

Construction under the modified closure plan, the Yukon Avenue Connections, or the Completed East Park Roads would not result in significant adverse impacts to colonial water bird nesting activity on Isle of Meadows, or inhibit the re-establishment of such activity in the future. Barn owls have nested on bridges in the vicinity of Richmond Creek in recent years. None of the analysis scenarios would impact these species. Thus, it is concluded that construction of the East Park Roads would not have any impacts on threatened or endangered species.

HAZARDOUS MATERIALS

Development of the modified closure plan and the proposed park roads would involve excavation and disturbance of the existing on-site soils as part of construction activities. This could result in temporary increases in exposure pathways for workers and nearby residents. To avoid this impact, preventative measures would be undertaken to protect the safety of the workers and local residents as well as the larger environment for areas where construction activity has the potential to encounter areas of contamination. To this end, the environmental issues with respect to hazardous materials conditions as identified at the project site during the current and previous environmental studies (see also the Fresh Kills Park FGEIS) would be remediated prior as part of the road construction.

To that end, prior to construction, site investigations for hazardous materials would be performed (as necessary) and a site-specific Construction Health and Safety Plan would be prepared. It would include health and safety procedures to minimize exposure to workers and the public, including possible dust monitoring and/or volatile organic compound (VOC) monitoring, if applicable, and provisions for the identification and management of known and unexpected buried tanks or contaminated materials that might be encountered during the soil disturbance activities associated with construction. Such a plan would ensure that the construction workers, the surrounding community, and the environment are not adversely affected by environmental conditions exposed by or encountered during the construction activities. In addition, existing fill remaining on-site would be either covered with 2 feet of certified clean fill (e.g., road landscaped edges) or covered by structures such as road pavement. With these proposed measures in place, the health and safety of construction workers and the visiting public would be protected from adverse environmental conditions during construction (see also Chapter 23 “Impact Avoidance and Mitigation Measures”).

INFRASTRUCTURE

Modified Closure Construction (2011)

Overview

As part of the 2011 build-out, grading of the Landfill Section 6/7 surface prior to closure construction would be required. Grading would disturb: (i) existing landfill cover soils; (ii) stormwater diversion berms, which are constructed with clean soil fill; and (iii) existing waste material. To avoid impacts from these activities, a series of operational procedures and protection measures would be implemented which are similar to those being used for the ongoing Section 6/7 landfill final closure construction. These procedures, which are described below, would also be used during the Modified Landfill Section 6/7 Closure construction including those that pertain to waste disruption (cut) activities associated with the 2011 modified closure plan. These measures are as follows:

- The work would be monitored by the construction quality assurance Quality Assurance Site Manager who would have the authority to stop the work should unsatisfactory conditions be observed. Work shall not progress until the unsatisfactory conditions are corrected.
- Prevent surface and subsurface water from flowing into excavation areas with exposed waste, remove water from excavation as fast as it collects.
- Dispose of all water that has contacted exposed solid waste into the on-site leachate conveyance system. Convey water from the construction site in a closed conduit; do not use trench excavations as temporary drainage ditches.
- The location for placement of relocated of solid waste would be at the direction of the quality assurance construction manager.
- Solid waste would not be placed if any water is on the surface of area to receive solid waste.
- Solid waste would be placed in horizontal loose lifts of up to 24 inches each.
- Using suitable equipment, compact each lift of relocated waste before placing the next lift of waste.
- Apply odor suppressant per manufacturer recommendation at end of each shift of waste excavation or after each shift of waste placement.
- Apply a temporary cover material (i.e., minimum 6-inch deep soil cover, plastic sheeting, or proprietary foam cover) at the end of shift of waste excavation or waste placement.
- A project-specific plan for waste disruption (i.e., excavation and relocation) associated with the 2011 modified closure plan will be prepared by the contractor performing the work.
- Excavated waste material will be transported between the excavation and placement location using standard construction equipment and vehicles.

It is assumed during this phase of construction that runoff from the landfill would continue to be directed towards the existing stormwater management basins. To the extent possible, construction runoff outside of the landfill footprint would also be directed towards the existing basins.

The relocation of landfill gas header and lateral collection pipes would be accomplished by the contractor in coordination with the DSNY landfill gas system operator. In general, temporary connections that span the work area between ends of the pipes, or between laterals and the wells would be constructed prior to making any system modifications. The landfill gas system performance would be monitored and checked by the system operator following temporary connections and following completion of the work to ensure appropriate operation.

Landfill Settlement

As waste degrades during the post-closure period, Landfill Section 6/7 will settle. This settlement will create the need for planned and unplanned maintenance of environmental protection systems. The anticipated settlements are not expected to necessitate future disturbance of landfill material.

During 2011 and 2016 construction periods, the public would not be permitted within the landfill area or project area. Therefore, no increased public exposure is anticipated during these construction periods.

Nuisance and Vector Management

It is recognized that grading, which is necessary to achieve the alternate design embankment elevations, will encounter waste. The associated excavations and onsite waste relocation activities have the potential to create odor nuisances and, attract vectors. However, these issues also exists as part of the work necessary to construct the final cover as described in the Final Cover Report. Consequently, specifications to establish acceptable construction procedures and mitigation techniques are also provided in the current technical specifications; specifically, Specification 02224, Solid Waste Relocation.

Inclement Weather

Inclement weather such as heavy rains, snow, ice conditions, high winds, or extreme temperatures may impact on the construction operations. Additional procedures would be implemented to ensure that inclement weather would not have adverse construction impacts.

Litter and Debris Control

During waste relocation activities a litter and debris control program will be implemented at the site to collect and prevent windblown litter and debris.

Dust Control

A dust control program will be implemented during construction (see also Air Quality, below).

Vector Control

Vectors such as birds, rodents, and insects can be attracted to putrescible wastes exposed during the relocation activities. Measures such as the application of soil cover over waste to reduce the access to putrescibles; implementation of good housekeeping measures during waste relocation activities to eliminate conditions that could attract vectors; making sure that waste transporting vehicles at the site are covered; and limiting the working area to minimize the area of exposed waste will be taken.

During the waste relocation operations, the work areas will be inspected for infestation by insects and rodents once per week. Should vectors become a problem during waste relocation activities, control measures specific to the identified problem will be proposed to NYSDEC. Approved control measure will be implemented.

Odor Control

Odors from the waste relocation activities will be controlled primarily through continual operation of the Landfill Gas Management System and by applying soil cover, as previously described. Chemical odor suppressants, as described in current Technical Specification 02224 may be used to control odors. Odor control materials will be used in accordance with manufacturer recommended procedures.

Noise Control

Noise from waste relocation operations could be a nuisance under certain circumstances, such as during off-hour operations. Routine measures would be implemented to limit noise problems.

Fresh Kills East Park Roads SEIS

Yukon Avenue Connection (2016)

With the 2011 modified landfill closure in place, the proposed Yukon Avenue Connection would not require any additional modifications to landfill infrastructure for the segment of road crossing the landfill.

For the segment of road between the base of the landfill and Richmond Avenue work would encroach upon the existing service road that provides access to environmental monitoring points located to the north of the alignment. No monitoring points are located within the proposed alignment and therefore no further modifications to the landfill infrastructure would be required.

Completed East Park Road System (2036)

With the 2011 Modified Closure Construction in place, the proposed Forest Hill Road Connection would not require any additional modifications to landfill infrastructure for the segment of road crossing the landfill.

For the segment of the Forest Hill Road between the base of the landfill and Richmond Avenue the alignment would encroach upon the landfill gas vent trench. To mitigate these encroachments, a gravel venting layer would be placed above the landfill gas vent trench to ensure a permeable conduit to the surface. Placement of fill soil or pavement over a limited section of the gas vent trench is consistent with as-built conditions along the vent trench. Therefore, the fill placement, concoction with the permeable layer would not compromise the vent trenches ability to function.

For the segment of the Richmond Hill Road Connection between the base of the landfill and Richmond Avenue the alignment would pass near groundwater monitoring wells 154D, 174S, and 153D. The alignment would also pass by gas migration monitoring wells G-44, G-17, G-18, G-46, and G-19. Each of these features would be protected during construction, but not disturbed.

SOLID WASTE

The proposed project would require new construction across generally unbuilt land. It is not expected that significant demolition debris would be generated by any of the construction phases. It is expected that solid waste from construction would consist primarily of construction debris and packaging from new construction materials brought onto the site. All construction waste would be handled by private carters who would haul the materials and dispose of the materials in full accordance with the applicable regulatory requirements. In addition, there would be the recycling of cut trees and vegetation for use as park mulch. The City has an active program to reduce solid waste generated by construction sites.

ENERGY

Energy impacts due to construction are primarily a result of the energy required to manufacture, deliver, and install the materials at the construction site. This type of energy is known as the embodied energy of the material. Embodied energy is expended extracting the raw materials, manufacturing and fabricating the product, handling and transporting them to the site, and placing the materials in the roadway. Approximately 70 percent of the energy embodied in new construction is attributable to the manufacture of the basic construction materials and components. The remaining embodied energy is divided among direct fuel purchases, wholesale

and retail trade, business and professional services, transportation of materials furnishings, and construction machinery and equipment. Almost all (approximately 99.5 percent) of the embodied energy is consumed before the material reaches the construction site. Construction of the proposed project over the course of 30 years is not expected to have a significant impact on energy demands for the City or region.

TRAFFIC AND PARKING

Introduction

This section of the construction impacts analysis evaluates whether construction-related traffic from the proposed project would significantly impact local traffic and parking conditions. Construction of the proposed park roads would generate traffic in the study area, including construction workers commuting by car and construction trucks making deliveries to and from the project site and the delivery and removal of soil with the greatest volumes of delivery occurring with the enhancement importation of base soils and road building materials.

Project-generated construction trips would occur due to construction trucks delivering soils and equipment, delivery of materials, and construction workers commuting to the job site. The truck activities are expected to be distributed evenly throughout the day, while the construction worker trips would likely be concentrated in two peak time periods—the early morning arrival period between 6:00 and 7:00 AM and the early afternoon departure period between 3:00 and 4:00 PM. During the work day, some discretionary travel may also take place (e.g., lunch), but the number of trips is likely to be substantially lower than the peak hour levels. The principal means of access to the site are expected to be the West Shore Expressway (regional), including the mainline and service roads which would be used to then access the project's internal service roadways.

Projected Travel Patterns of Construction-Related Traffic

Construction workers are expected to access the site primarily from the West Shore Expressway although some may reach the site by local roads. However, it is noted that for the 2016 program, other than the park projects at the site periphery, the site would not be accessible to vehicles from the local roads (i.e., there would not be any access from Richmond Avenue).

Given the site's access and egress opportunities to the regional highway network, most construction-related traffic would not be expected to use local streets. Arriving and departing autos would primarily reach and exit the site via the West Shore Expressway connections to the project site and then use landfill service roads within the site. For any off-site locations where service conditions might be affected by project-generated construction traffic, the impact would be temporary and short-term. Details of site access would be coordinated between DPR and the contractors with the assistance of NYSDOT and NYCDOT.

Worker and Truck Trips

Construction activities would generate a modest amount of traffic during the peak hours during both the construction of the proposed park elements and the proposed roads. In addition, construction workers generally arrive before the peak morning commuter peak traffic period and depart before the peak afternoon commuter peak traffic period, with limited weekend work. Therefore, these vehicle trips generally do not affect the local traffic network. In addition to the worker commutes, there would also be trucking activity associated with the delivery and removal of soils (particularly the delivery of soils), and there would also be the delivery and removal of materials during the demolition of buildings, the construction of buildings, and the construction of

the proposed bridges and viaducts. As also described above, given the size of the project site, it is expected that the delivery of all soils and materials that are expected to be necessary for the proposed project could reach the site via the West Shore Expressway and once on site could reach the work location for that particular phase of construction via the internal roadways, thus minimizing impacts on the surrounding neighborhood.

These truck movements would be spread throughout the day and would vary depending upon the period of construction. However, as described above, it is expected 70 to 100 trucks per day, or about 10 per hour, would be providing deliveries to the site during the more intense periods of construction, particularly with respect to the importation of soil. Truck deliveries would be dispersed over the day with few occurring in the peak hours.

Regarding worker vehicles, conservatively assuming that all workers would travel to the site via automobile as single occupants, the daily trip generation would be about 50 to 100 vehicles during the more intensive periods of construction. With the proposed direct access to the West Shore Expressway that would provide access to central parking facilities, these trips would require limited use of local roads during peak periods. It is therefore expected that construction vehicle traffic from the proposed park would not significantly impact local roads. As stated above, most of the trips associated with construction would not coincide with the traditional commuter peak travel hours. Construction workers typically arrive between 6:00 and 7:00 AM and leave between 3:00 and 4:00 PM. This minimizes the likelihood of any significant increase in peak period traffic congestion due to construction.

Traffic Maintenance During Construction

With the proposed construction program, access to the project site would be gate-controlled and some streets may be temporarily closed or have lane closures at the periphery of the site for the construction of new intersections (e.g., the re-construction at the intersections along Richmond Avenue), as well as the installation of utility connections (e.g., water, sewer, gas, electric) at the periphery of the site. During these limited periods of construction impact, major roads, such as Richmond Avenue, would have at least one lane open to traffic at all times. The temporary and limited closure of travel lanes is an unavoidable temporary impact on the local traffic network.

In addition, nighttime construction may be considered at high traffic locations along Richmond Avenue in order to minimize disruption to traffic. This would be a consideration at final design and proposed (if appropriate) as part of the construction approval process with NYCDOT and NYSDOT.

Parking

The surrounding area contains primarily open spaces and low-density residential uses that generate little on-street parking demand traffic throughout the day. However, it is expected that parking would be provided on the project site in order to avoid any impacts on local on-street parking conditions. Thus, during the proposed construction period, parking demand in the vicinity of the project site would be similar to existing levels. As discussed above, with limited exceptions such as the construction of the small neighborhood parks, all construction worker vehicle parking is expected to be accommodated in the central staging areas.

AIR QUALITY

Introduction

Construction activities have the potential to impact local air quality as a consequence of emissions from stationary on-site equipment, emissions from construction vehicles on site and traveling to and from the site, as well as emissions from worker vehicles. For example, most construction engines are diesel powered, and produce relatively high levels of particulate matter. As a result, air quality impacts could occur on the surrounding area due to on-site sources as well as traffic that could also increase mobile source-related emissions. In addition, construction activities also emit fugitive dust.

The construction of the proposed project would be subject to Local Law 77 of 2003; thus the potential for particulate emissions would be controlled by required emission controls and ultra-low sulfur diesel (ULSD). In addition, it is acknowledged that as a longer-term construction project there will continue to be advances in air pollution control for construction equipment, as well as turnover and replacement with newer vehicles and equipment that would further reduce emissions from construction vehicles.

City regulations would require all project contractors to reduce particulate matter emissions to the extent practicable by employing relatively new equipment including diesel oxidation catalysts (DOCs). As stated above, the construction activities would all be subject to New York City Local Law 77, which requires the use of Best Available Technology (BAT) for equipment at the time of construction.¹

Fugitive Emission Sources

Fugitive emissions can result from land clearing operations, such as excavation, hauling, dumping, spreading, grading, compaction or wind erosion and traffic over unpaved areas. The EPA suggests a general overall emission rate of about 1.2 tons of particulate matter per month per acre for construction sites with significant land clearing operations and no fugitive dust control measures. However, this is a national estimate and actual emissions vary widely depending on many factors. In addition, the proposed project would include techniques to reduce fugitive emissions during construction.

The proposed project would require soil importation and filling, excavation, site grading, and repaving. With the exception of truck traffic, no construction activities would occur adjacent to residential areas. At the project site, there are substantial buffers between the project site and local sensitive receptors (even the commercial receptors are separated by a wide heavily traveled road, Richmond Avenue), and recognizing that fugitive dust generated by construction activities consists of relatively large-size particles that settle on the ground within a short distance from the construction activity, fugitive dust emission impacts on the surrounding community should not be significant.

¹ New York City Administrative Code § 24-163.3, adopted December 22, 2003, also known as Local Law 77, requires that any diesel-powered non-road engine with a power output of 50 hp or greater that is owned by, operated by or on behalf of, or leased by a city agency shall be powered by ultra low sulfur diesel fuel (ULSD), and utilize the best available technology (BAT) for reducing the emission of pollutants, primarily particulate matter and secondarily nitrogen oxides. NYCDEP is charged with defining and periodically updating the definition of BAT.

Moreover, because fugitive dust is a common impact of construction, it is also regulated under New York City's code. During construction, all appropriate fugitive dust control measures—including watering exposed areas and using dust covers for trucks—must be used to satisfy Section 1402.2-9.11 of the New York City Air Pollution Code.

Increases in concentrations of particulate matter are difficult to quantify accurately because of the difficulty in determining total emissions and the wide range of size of the particles emitted. However, since much of the fugitive dust generated by construction activities consists of relatively large-size particles, that dust would settle to the ground within a short distance of the construction site and would not adversely affect nearby residential areas or community facilities. In addition, dust-control procedures, including stabilization of exposed areas, the frequent watering of affected areas, and the use of dust covers for trucks, would be required as part of the construction contract documents so that only minimal increases in ambient concentrations of particulate matter would occur.

Because contaminated materials exist in some project areas, more extensive dust control measures and perhaps monitoring would be employed when contaminants in soils are identified. When construction occurs in these areas, it is expected that a health and safety plan would be developed specifically designed to reduce the risk to the public and construction workers at particular sites where contaminated materials may be present and may also include a monitoring plan, where necessary.

Mobile Source Emissions

Gaseous hydrocarbon and NO_x emissions from construction equipment, private vehicles on construction workers, and delivery vehicles at the construction sites would not be expected to impact local air quality. The small localized increases in hydrocarbon and NO_x emissions during the construction process caused by these sources would be insignificant when compared with total regional levels of these pollutants. Thus, these increases are expected to have a negligible effect on regionwide concentrations of photochemical oxidants.

Odors and Methane

Modified Final Cover

For the 2011 modified cover, it is assumed that there would be cut and fill activities across the two segments of the proposed embankment across the landfill (one at Yukon Avenue and the other at Forest Hill Road). Excavation is expected to require some relocation of waste materials as part of the 2011 build-out that could create the potential for increased waste and landfill gas odor. To manage and mitigate potential negative impacts from odors leaving the site the following mitigation measures will be employed: continuous observation of site conditions and odor at the work site; cessation of activities if unsatisfactory conditions exist; application of commercial odor suppressants; and placement of temporary cover material over exposed waste between work shifts.

These measures are similar to those employed with the current approved cover closure program. With these measures in place, it is not expected that this phase of the proposed project would result in local odor impacts, particularly given the distance between the proposed activities and local sensitive receptors and the intervening buffers.

The relocation of waste could also increase the potential for methane and other volatile organic emissions from the landfill. The landfill currently operates a landfill gas management system to collect methane and other gaseous compounds to generate electricity by applying a vacuum to

the landfill via vertical wells drilled into the waste. The cut and fill operations for embankment across the landfill will require modification of the landfill gas collection wells and piping. To manage and mitigate potential negative impacts for methane emissions leaving the site, the following mitigation measures will be employed: use of temporary piping within the construction zone to maximize the collection of landfill methane from existing wells within the cut and fill operation; daily adjustment of landfill gas collection wells adjacent to the cut and fill operation to maximize the application of vacuum to undisturbed portions of the landfill; placement of temporary cover material over exposed waste between work shifts.

Fugitive methane generated by construction activities would be widely disbursed within a short distance of the construction site and would not adversely affect nearby residential areas or community facilities. In addition, methane-control procedures cited above, including frequent adjustment of vacuum, the use of temporary piping to minimize the period when individual landfill gas collection wells are not connected to a vacuum, and the use of cover materials over the waste every day would be required as part of the construction contract documents so that only minimal increases in ambient concentrations of methane would occur.

Because methane, under certain circumstances, can cause a safety hazard in the immediate vicinity of the cut and fill operation, methane monitoring would be employed in the immediate vicinity when waste is exposed. When construction occurs in these areas, it is expected that a health and safety plan would be developed specifically designed to reduce the risk to construction workers at particular sites where methane may be present. The health and safety plan would include a monitoring plan, where necessary. This health and safety monitoring will provide verification that no impacts to nearby residential or community areas are occurring.

Park Road Connections: 2016 and 2036

With the embankment in place, no additional disturbance of the landfill cover would be necessary. Thus it is not expected that construction of the road final grade and finishes would result in any significant odor or methane impacts. Consequently, landfill gas and waste odors will be managed by the continuous operation of the landfill gas extraction and collection system.

NOISE

Impacts on community noise levels during construction can result due to noise from construction equipment operation and from construction vehicles and delivery vehicles traveling to and from the site. Construction activity generates noise from the construction equipment, construction vehicles, worker traffic, and deliveries of soils and materials to and from the construction site. Noise and vibration levels at a given location would depend on the number and types of construction equipment being operated, the acoustical utilization factor of the equipment (i.e., the percentage of time a piece of equipment is operating), the distance from the construction site, and any shielding effects (shielding due to structures, elevated topography, or natural barriers). Noise levels caused by construction activities would vary widely, depending on the phase of construction and the location of the construction relative to receptor locations. Typically, the most significant noise associated with construction is jackhammers and pile driving. The impact of noise would be based the result of individual project construction phases and sequences and the location of each phase of construction relative to the project site boundaries; the particular construction tasks with in each phase, including the types and number of construction equipment specific to each task, recognizing that the construction of the road would progress geographically. For example, the use of jackhammers is expected to be very limited, perhaps for the breaking of pavement to provide utility connections at select locations.

In addition, pile driving (or drilling) would occur, but also at select locations for the construction of the viaducts and crossings for the Yukon Avenue, Forest Hill Road and Richmond Hill Road connections; however, these activities are well removed from the local neighborhoods. Pile activity nearer local neighborhoods would be limited to lighter and shorter duration activity, such as the construction of a small dock in North Park.

Noise levels associated with the construction of the proposed project would be subject to the noise emission source controls of the recently revised New York City Noise Control Code. This code specifies maximum sound pressure levels at receiving properties (designated by octave band levels). The *CEQR Technical Manual* also provides guidance for examining the incremental noise impacts, and comparisons with NYCDEP's external Noise Exposure Guidelines. Finally, the City of New York's Zoning Resolution sets octave band limits for the lot line of a property. Construction equipment is also regulated by the Noise Control Act of 1972.

The New York City Noise Control Code, as amended December 2005 and effective July 1, 2007, requires the adoption and implementation of a noise mitigation plan for each construction site, limits construction (absent special circumstances as described below) to weekdays between the hours of 7 AM and 6 PM, and sets noise limits for certain specific pieces of construction equipment. Construction activities occurring after hours (weekdays between 6 PM and 7 AM and on weekends) may be authorized in the following circumstances: (i) emergency conditions; (ii) public safety; (iii) construction projects by or on behalf of city agencies; (iv) construction activities with minimal noise impacts; and (v) where there is a claim of undue hardship resulting from unique site characteristics, unforeseen conditions, scheduling conflicts and/or financial considerations. It is not anticipated that extended hours (7:00 AM through 6:00 PM) would be needed for construction of the proposed project on a regular basis.

Noise from construction activities and some construction equipment is regulated by not only the New York City Noise Control Code but also by the EPA. The EPA requirements mandate that certain classifications of construction equipment meet specified noise emissions standards. These federal requirements mandate that: 1) certain classifications of construction equipment and motor vehicles meet specified noise emission standards; and 2) construction material be handled and transported in a manner that does not create unnecessary noise.

Construction Noise Impact Assessment

Construction activities for the proposed project would be expected to result in increased noise levels as a result of: (1) the operation of construction equipment on-site; and (2) the movement of construction-related vehicles (i.e., worker trips, and material and equipment trips) on the surrounding roadways.

As discussed above, the City has recently updated its Noise Control Code (effective July 1, 2007). Thus, the construction associated with the proposed project would be subject to the requirements of the new City Noise Control Code. Outlined below is a list of source controls noise reduction measures that may be proposed to meet those noise reduction requirements.

While the level of construction noise associated with the type of construction activity depends on the numbers and type of equipment employed at any time, noise levels associated with construction may occasionally be noticeable to nearby residents, particularly during the times when jackhammers and/or other pavement-breaking equipment are used. Significant ambient noise level increases along streets where construction activities are taking place can reach up to 98 A-weighted decibels (dBA) under worst-case conditions (pavement breaking at 50 feet). However, given the type of construction that is expected with the proposed project, limited use of higher

noise generating equipment is expected since most activities would occur in areas not previously covered by paved surfaces. In most cases these types of impacts would be related to the installation of utility connections, or street connections at Richmond Avenue or Arthur Kill Road, for example.

Temporary noise increases from more significant noise generating equipment can be intrusive to nearby residents as distances of up to about 400 feet from the activity. However, there are no cost-effective measures that can be implemented to effectively eliminate temporary noise increases of this type which occur throughout the city as part of the construction process. In addition, construction of the road, for example, would largely take place on the interior of the site and would not require any substantial use of jackhammers or pavement breaking equipment.

Noise levels also increase/decrease exponentially over distance; thus, they drop off an estimated 2–4 dB with each doubling of distance from the source. Thus, sound pressure levels after peaking at the front of a residential unit or park would drop by 2–4 dB (it is likely to be 4 dB, given the relatively open nature of the physical environment in this area). Once the construction has moved to 200 feet away, the sound pressure levels would decrease by 4–8 dB. While this level would continue to affect the ambient noise levels of the generally quiet neighborhoods, the decreasing noise levels and distance from the receptors would limit impacts. Therefore, although elevated noise levels are considered a nuisance and would be intrusive at times to local residents, these impacts would be short-term and are not considered a significant adverse impact.

As described above, all construction equipment and vehicles must also meet the City, State, and Federal regulatory requirements regarding noise emissions, and construction activities would be limited to weekdays between the hours of 7:00 AM and 6:00 PM.

In terms of potential source controls (e.g., reducing noise levels at the source or during most sensitive time periods), the following types of measures could be implemented as part of a noise control plan:

- NYCDEP, in its review of the noise control plan, would require all contractors and subcontractors to properly maintain their equipment.
- DPR could require all contractors and subcontractors to properly maintain their equipment and have quality mufflers installed;
- Noisy equipment, such as generators, cranes, concrete pumps, concrete trucks, and dump trucks, should be located away from and shielded (as necessary) from local neighborhoods which are the only existing sensitive receptor immediately adjacent to the construction site and used to the least extent possible; and
- Noise curtains and equipment enclosures could be utilized to provide shielding to sensitive receptor locations as necessary.

Based on the above, it is concluded that construction period noise emissions would be limited to the extent practicable and performed in accordance with all local, State and Federal laws and practices. The proposed project would also make use of the project site to avoid impacts on the surrounding neighborhoods and sensitive receptors. Thus, it is concluded that although short-term noise impacts would be selected for certain capital projects, the overall construction noise impact of the proposed project should not be significant.

Vibration

Vibrations generated by construction activities, generally within one thousand feet of existing buildings, may be perceptible or potentially damaging to structures. No blasting would be

performed as part of the proposed project; however, pile driving, or drilling, may be performed. In general, vibratory levels at a receptor are a function of the source strength (which in turn is dependent upon the construction equipment and construction methods utilized), the distance between the equipment and the receiver, the characteristics of the transmitting medium, and the receiver building construction. Construction equipment operation causes ground vibrations which spread through the ground and decrease in strength with distance. Vehicle traffic, even in locations close to major roadways, typically does not result in perceptible vibration levels, unless there are irregular road surfaces. With the exception of the case of fragile, historically significant structures or buildings, generally construction activities do not reach the levels that can cause architectural or structural damage, but they can achieve levels that may be perceptible and annoying in building very close to a construction site. Since no blasting is proposed the greatest vibration activity is expected to travel a distance at no more than two hundred feet (pile driving). Thus, vibrations are not expected to affect local residences. As necessary, impact avoidance and pre-construction inspection would be made for the protection of landfill infrastructure and where necessary, alternative means of installing support piles, including drilling, may be preferred (see also the discussion above under "Landfill Protections During Construction).

PUBLIC HEALTH DURING CONSTRUCTION

Potential construction period public health impacts due to air and noise pollutant emissions can stem from construction equipment and construction vehicles. Of particular concern is the potential for diesel emissions with particulate matter from construction-related activities to impact public health (such as increasing asthma rates). In response to those concerns, as described above, the City has adopted Local Law 77, which would result in significant reductions in air pollution from construction equipment throughout New York City and including the proposed project.

Considering that a significant reduction in percolation would occur with approximately 50 percent of Landfill Section 6/7 having an engineered final cover system in place during the 2011 build-out, it is concluded that construction activities associated with the proposed Modified Landfill Section 6/7 Modified Closure, performed using appropriate minimum landfill operating standards, would not increase the volume of leachate required to be managed above the volume managed prior to closure construction. Likewise, the construction of the proposed roads would take place on prepared embankment and off the landfill and therefore would not increase the volume of leachate required to be managed above the volume managed prior to closure construction.

With the odor protection measures in-place during the construction of the modified Landfill Section 6/7 cover and embankment in place and no additional disturbance of the landfill cover for the proposed roads, it is not expected that construction of the proposed project would result in any significant odor or methane impacts.

Odor and methane emissions are closely related because odor causing compounds are emitted with methane from landfill gas. Therefore, odor protection measures in combination with measures designed to maintain collection of methane during the construction of the modified Landfill Section 6/7 cover and embankment will address potential methane emissions. As a result, it is not expected that any significant methane impacts will result from the proposed construction activities.

It is also expected that construction contracts would include provisions for a rodent (e.g., mouse and rat) control program as appropriate. Before the start of construction, the contractor would

survey and bait the appropriate areas and provide for proper site sanitation. During the construction phase, as necessary, the contractor would carry out a maintenance program. Coordination would be maintained with appropriate public agencies. Only EPA- and DEC-registered rodenticides would be permitted, and the contractor would be required to perform rodent control programs in a manner that avoids hazards to persons, domestic animals, and non-target wildlife. Public health issues related to hazardous materials are discussed above.

For all the above reasons, it is concluded that with proposed impact avoidance and protection measures in place, no public health impacts would occur during the three phases of project construction.

PUBLIC HEALTH

While municipal solid waste landfills are well documented as potential sources of pollution, environmental control and management and techniques, such as those practiced at Fresh Kills, including landfill leachate treatment and gas collection and treatment as well as stormwater management, coupled with regular groundwater and air monitoring significantly reduce environmental impacts, facilitate the timely identification of potential problems associated with the control management systems, and thus minimize the transmission of pollutants to humans along the known exposure pathways. The existing environmental protection infrastructure at Fresh Kills includes an active landfill gas collection system complete with underground piping to collect the gas and direct it to the landfill gas recovery plant or flares, as well as leachate and stormwater control systems and an extensive monitoring and maintenance program.

These in-place protections would continue to operate for at least 30 years, and will be protected and maintained during the park construction phases and as the park becomes accessible to the public, it is expected that it will be necessary to implement additional measures to both protect the landfill infrastructure (e.g., protections and replacement of infrastructure due to the construction of roads and park facilities, restricting public access, and increased monitoring of air and water conditions) and to ensure that as areas of the proposed park become publicly accessible, they do not present a public health risk or safety concern. Therefore, continued coordination between DPR and DSNY related to implementing these measures as well as the completion of closure construction and the post-closure landfill monitoring and maintenance activities is vital not only to the proposed project, but also to the successful completion of the City's post-closure monitoring and maintenance obligations with respect to Fresh Kills Landfill.

The environmental control infrastructure associated with the closed landfill mounds includes leachate management, landfill gas management, and final cover/drainage systems. The new measures presented below for the proposed park are intended to provide additional protections with respect to allowing public access onto the site. These measures include additional infrastructure protections, monitoring, training, and signage, for example. A detailed evaluation was performed as part of this the Fresh Kills Park FGEIS to evaluate the future conditions with respect to air quality, groundwater, surface water, and sediments/soils and the potential contaminant pathways and possible public health effects. The principal conclusions of that analysis are summarized below:

- Air emissions: air emissions from local stationary sources including the landfill environmental control infrastructure would not be expected to result in any significant adverse air quality impacts to the public.

Fresh Kills East Park Roads SEIS

- Groundwater: while contaminated groundwater is known to exist within the boundaries of the project area, the analysis performed as part of the Fresh Kills Park FGEIS found that it does not pose a significant public health risk to park users. This is based on the fact that groundwater is not currently, nor is it envisioned in the future, to be utilized as a supply of potable water. Leachate treatment systems for the closed landfill mounds will continue to be operational with the proposed park. Local groundwater is not expected to pose a risk to park users due to the lack of direct exposure pathways. Mitigation measures include the periodic sampling of monitoring wells associated with the closed landfill, in accordance with applicable permit requirements, as this data can facilitate the identification and correction of potential problems associated with the environmental control infrastructure associated with the landfill.
- Surface water: the proposed roads would entail limited possible uses and potential public health exposures associated with surface water use. As stated above, surface waters in the vicinity of the proposed project are neither designated for use as potable waters nor are they expected to be used in that way for the foreseeable future. In addition, no proposed use assumes use of the surface water for irrigation. The proposed project would not result in an exposure pathway related to surface water.
- Sediments: Sediments are another potential public health risk in that they serve as sinks for many environmentally persistent contaminants including PCBs, pesticides, toxic metals, and other anthropogenic pollutants. Measures to avoid public health impacts from sediments include design and management elements that would limit potential interactions between sediments and users with the proposed project. For example, no major dredging projects are proposed with the road projects.
- Site testing: Site testing is recommended as capital projects move forward and individual capital projects would develop a testing program based on areas where soil/ground water disturbance may be proposed. Based on site-specific project designs and individual testing protocols, remediation, if necessary, may be proposed to avoid impacts.
- Soils: The park development process envisions use of soils that meet the various criteria contained in 6 NYCRR Part 375 standards appropriate to the specific capital park project and program elements for the proposed project. Soils imported to the park and used for final soil cover would also be analyzed to verify that they meet the criteria for the park which could be developed on a case by case basis using Park 375 as a guide.

For the reasons stated above, it is not expected that the proposed project would result in any public health impacts.

C. ALTERNATIVES TO THE PROPOSED PROJECT

This EIS considers the following alternatives:

- The No Action Alternative, which assumes no park roads in East Park;
- Alternative Phasing (Reconstructed Final Cover)-Four Lane Road;
- Alternative Phasing (Reconstructed Final Cover)-Two Lane Road;
- Alternative Alignment: Richmond Hill Road Connection (west of Landfill Section 6/7);
- Alternative Alignment: East Park Loop Road Modified Proposal;
- A one lane East Park Loop Park Road;

- Limited Action Alternative.

A summary of the impacts under these alternatives follows.

NO ACTION ALTERNATIVE

The No Action Alternative assumes that the proposed East Park roads are not implemented. This alternative essentially reflects conditions discussed as the “Future Without the Proposed Project” in Chapters 2 through 21 through the analysis years 2011, 2016 and 2036. This analysis compares conditions under the No Action Alternative to conditions with the proposed project through 2036.

OVERVIEW OF IMPACTS

With the No Action Alternative, there would be no delay in the closure of Landfill Section 6/7. There would also be no need to avoid, minimize or mitigate impacts; however, with the proposed project these measures can eliminate project impacts. What the No Action Alternative would not achieve are the project’s goals and objective with respect to improving local traffic circulation, providing connectivity across Fresh Kills Landfill, and minimizing the impacts of the proposed Fresh Kills Park project on local streets.

Similar to the proposed project, the No Action Alternative would not result in significant adverse impacts on land use, zoning, and public policy; socioeconomic conditions; community facilities; open space; shadows; historic resources; urban design and visual resources; neighborhood character; natural resources; waterfront revitalization program; infrastructure; solid waste and sanitation services; energy; transit and pedestrians; air quality, noise; construction; and public health.

In addition, like the proposed project, this alternative would not have any impacts on odors or air emissions either during construction or operation. Likewise, there would not be any impacts on the production of leachate nor would there be hazards for landfill slope stability. Nor would there be any changes in runoff patterns at the site or the hydrology of the current DSNY systems. With the proposed project there are changes in landfill hydrology; however it is expected that the proposed project could address these stormwater management issues without any adverse impacts to the landfill or upstream or downstream locations and without any water quality impacts. There would also not be any filling of wetlands under this alternative; while these impacts occur with the proposed project they can be addressed through a comprehensive restoration and wetlands mitigation program. Lastly, under this alternative, there would not be any impacts related to habitat fragmentation. With the proposed project these impacts would need to be addressed through road design, particularly with the Forest Hill Road Connection.

Under this alternative, the benefits to local land use that are expected to result from the proposed action—including new road access across Fresh Kills including access to the West Shore Expressway and the proposed park—would not be realized. This alternative would also not attain the stated project or City goals (e.g., the Staten Island Transportation Task Force) to improve traffic conditions in western Staten Island. This alternative would also not implement the goals and plans of the City and the Office of the Staten Island Borough President to provide road access across Fresh Kills.

ALTERNATIVE PHASING (RECONSTRUCTED FINAL COVER)

This section analyzes the environmental impacts of an alternative phasing in which the currently approved closure design proceeds without the alternate closure design to construct the embankments for the future roads, and any work required for future East Park Road access and connections therefore need to be implemented following closure of Section 6/7.

The approved final cover system for Section 6/7 is described in the report entitled “*Fresh Kills Landfill, Section 6/7. Final Cover Design Report*” dated January 2001 by Malcolm Pirnie, Inc. (Final Cover Report). The City of New York has proposed an alternate closure design that would coordinate the current closure construction with the proposed development of the Fresh Kills Park and its road system, allowing for the possibility of connection to park programs and the West Shore Expressway. This alternate closure is described in Geosyntec’s draft report “*Landfill Section 6/7 Alternative Final Cover Design Report, Fresh Kills Landfill, Staten Island, New York,*” dated January 2009, (Alternative Final Cover Report).

The Alternate Final Cover Report describes the following required activities to implement an alternative final cover design:

- Surcharge fill placement and removal;
- Waste relocation as necessary to establish base grades within the road corridors;
- Modification to landfill gas (LFG) collection wells and header piping in the vicinity of the road corridors;
- Modification to stormwater management system to allow storm water to flow across the road corridors to existing basins B2, C1 (north and south) and R;
- Installation of final cover.

As stated above, the alternative phasing option involves the closure of Section 6/7 under the currently approved closure design without coordinating the work with the Alternate Final Cover Report. Therefore, portions of previously completed final closure work, including geosynthetic cap materials, cover soils, LFG piping, and stormwater management features, would be removed or modified in order to implement the alternative final cover design work. As a result, the alternative phasing will increase the consumption of nonrenewable resources (petroleum and construction materials), and create additional waste and air emissions associated with construction activities as compared to implementing the proposed development in conjunction with closure of Section 6/7. A description of the impacts associated with each identified activity is described below.

With this Alternative Phasing, there would be no delay in the closure of Landfill Section 6/7. However, it is assumed that at some future date given the local need for traffic solutions and the need for vehicular access into the propose park, the landfill cover would be redesigned and reconstructed. Like the proposed project, under this alternative there would also a need to avoid, minimize or mitigate impacts from the proposed roads. As with the proposed project, it is expected these measures could eliminate project impacts, although for the landfill crossing segment these mitigative measures would be more costly since they would have to be retrofitted into the cover system. This alternative would achieve the project’s goals and objective with respect to improving local traffic circulation, providing connectivity across Fresh Kills Landfill, and minimizing the impacts of the proposed Fresh Kills Park project on local streets; however it would expected with this alternative there would be a greater time delay for this remedy.

Like the proposed project this alternative would not likely impact odors or landfill air emissions either during construction or operation, although the techniques to implement such measures as a retrofit are expected to be more complicated and costly. Likewise, with the appropriate construction period protection measures, there would not be any impacts on the production of leachate nor would there be hazards for landfill slope stability. With the proposed project, as under this alternative, there are changes in hydrology due to road runoff and changes in the DSNY stormwater management basins; however it is expected that this alternative, like the proposed project, could address the stormwater management issues without any adverse impacts to landfill system hydrology or water quality. There would also be the filling of wetlands under this alternative and the need for a comprehensive mitigation plan like the proposed project. Lastly, there would be similar impacts related to habitat fragmentation with the proposed roads and the need for design measures to minimize these impacts as well.

Based on the analysis in this SEIS, using an alternative phasing will result in the generation of at least 900 tons of non-recyclable waste materials, add over 25,000 truck trips on Borough roads for delivery of equipment and materials, and result in the consumption of over 217,000 gallons of diesel fuel for transportation and construction. It can therefore be concluded that the alternative phasing option will result in avoidable impacts to air quality and road congestion to Staten Island Borough residents. This alternative, like the proposed project, would not have any impacts on air emissions, odor emissions, leachate generation, or landfill slope stability.

ALTERNATIVE PHASING (RECONSTRUCTED FINAL COVER-EXPANDED TWO LANE ROAD)¹

This alternative examines the environmental impacts of an alternative phasing in which the currently approved closure design proceeds with the alternate closure design but only to accommodate an embankment wide enough to accommodate a two lane road, and that any work required to widen the embankment to accommodate four-lane roads for future East Park Road access and connections therefore needs to be implemented following closure of Landfill Section 6/7. It is similar to the above presented alternative; however this alternative assumes that the landfill cover is modified at this time for an embankment wide enough to accommodate a two lane road only, but would need to be modified for a four lane road at a late date. This assumes that once the Yukon Avenue Connector (for example) is operating and demand exceeds capacity, the final cover would then be modified to widen the road.

The differences between modifying the landfill at this time to potentially accommodate a four-lane park road as compared to the modifications that would be necessary for a two lane road are quite limited. For example, the estimated volume of cut necessary to provide the road embankment is only 37,000 cubic yards less in creating a two-lane road embankment at this time (if the four-lane is necessary at a later date, the ultimate total is the same). This reduction is primarily due to reducing the limits of grading on the east-facing side of the landfill. In addition the gravel road surface area of the two lane road option would be only half of the surface area needed for the four-lane option.

The estimated volume of cut necessary to provide the road embankment for Forest Hill Road would be reduced by an estimated 17,000 cubic yards. The change is even less significant than at Yukon Avenue. The extent of the grading changes at Forest Hill are controlled by the vertical

¹ This analysis would apply to an alternative that would require modifying the landfill cover in order to widen the road embankment from 38 feet (two lanes) to a 60-foot-wide (four lanes wide).

road profile and extend past the road corridor to the south in order to maintain a minimum 4 percent cover system slope. Consequently, narrowing of this road corridor has less of an effect than along Yukon Avenue. The number of impacted gas wells would be reduced from four to three if the two-lane option is selected. The gravel road surface area of the two-lane road option would be only half of the surface area needed for the four-lane option.

Otherwise, the physical changes with respect to the landfill under either a modification for a four-lane road or a two-lane road are quite similar. On the Yukon Connector, the impacted gas wells, gas header line, and stormwater features, firewater line and overhead electric lines would be the same. Along the Forest Hill Road Connector, the impacted gas headers and lateral pipes, stormwater management features, would not change regardless of the option selected.

In addition, assuming that at a later date the two-lane road needs to be widened, but that the final cover installed at this time cannot accommodate that widening, this alternative phasing would have similar impacts to that discussed above for the four-lane road alternative. These are significant adverse impacts that can be avoided. Added material that would need to be moved at a later date would also result in the generation of about 500 tons of non-recyclable waste materials, about 12,500 truck trips for delivery of equipment and materials, and the consumption of over 217,000 gallons of diesel fuel for transportation and construction at a later date. It would also cause major traffic disruptions on operational roads to the extent that such a retrofitting would be highly impractical at that time. It is therefore concluded that the alternative phasing option would also result in avoidable impacts to air quality and road congestion to Staten Island residents.

This alternative, like the proposed project, would not have any impacts on air emissions, odor emissions, leachate generation, or landfill slope stability.

ALTERNATIVE ALIGNMENT: RICHMOND HILL ROAD CONNECTION (WEST OF LANDFILL SECTION 6/7)

This alternative examines the potential impacts of a roadway alignment for the Richmond Hill Road Connection that extends around the west side of Landfill Section 6/7 rather than passing over the Landfill via the “Yukon Saddle” and heading north along Richmond Avenue berm and crossing the stormwater basins and wetlands to reach the intersection of Richmond Hill Road at Richmond Avenue. As described in greater detail below, three specific corridors were considered along this alignment: 1) a placement off the landfill (outside the solid waste management unit area boundary); 2) a placement on the existing landfill service road; and 3) a placement up the higher elevation of the landfill. This Alternative Road Alignment would have impacts similar to the proposed project in many respects, including traffic conditions at this intersection of Richmond Hill Road at Richmond Avenue, which is a long-term proposal for the project and is in the 2036 analysis year. However, there are specific differences with respect to road geometry, landfill conflicts, environmental impacts, and park conflicts that are described below.

With the Alternative Alignment Richmond Hill Road, there would be some delay in the closure of Landfill Section 6/7, similar to the proposed project. Like the proposed project there would also be a need to avoid, minimize or mitigate impacts from the proposed roads, although the need for mitigation would extend to the tidal wetlands northwest of Landfill Section 6/7 under this alternative (i.e., the wetlands along Main Creek). As with the proposed project, it is expected that these mitigation measures could eliminate wetland impacts. This alternative would similarly achieve the project’s goals and objectives with respect to improving local traffic circulation,

providing connectivity across Fresh Kills Landfill, and minimizing the impacts of the proposed Fresh Kills Park project on local streets.

Like the proposed project this alternative would not be expected to have any impacts on odors or air emissions either during construction or operation. Likewise, with the appropriate construction period protection measures, there would not be any impacts on the production of leachate nor would there be hazards for landfill slope stability.

ALTERNATIVE ALIGNMENT: EAST PARK LOOP ROAD MODIFIED PROPOSAL¹

Based on a design review of the East Park Loop Road option, a modified alignment was developed with a revised conceptual design that proposes an alternative alignment which reduces the number of nonstandard features for the 35 mph design speed, while still maintaining the design intent of that option, where feasible. This alternative also includes recommendations that minimize and/or mitigate impacts and conflicts with landfill features.

For instance, this modified alternative includes a revised horizontal alignment which accounts for the typical roadway sections and eliminates nonstandard curve radii and horizontal stopping sight distances identified in the analysis of this alternative. The maximum safe operating speed is reduced to less than 35 mph at approaches to intersections at multiple locations. The roadway alignment presented in this modified alternative does not conflict with any drip leg vaults as does the above-described alternative.

This modified alternative recommends a revised vertical alignment which coincides with the revised horizontal alignment. The vertical profile is improved, however there are nonstandard and undesirable features which remain in this alternative. There are 34 locations where longitudinal grades are less than the desirable minimum of 0.50%. Existing vertical grades breaks remain at many locations. While these break are in accordance with the 4.0% maximum per NYCDDC standards, they exceed the AASHTO maximum grade break criteria of 0.62% at 59 locations. Vertical curves are provided where possible to smooth out alignment transitions. There are four vertical curve locations which have nonstandard stopping sight distance or headlight sight distance.

This modified alternative proposes a number of solutions to eliminate adverse and nonstandard drainage conditions which exist in the East Park Loop Road option. In the northern section of the loop, riprap stormwater collection points or shallow inlets are provided every 50 feet behind gabion walls, with 8 inch HDEP outletting drains installed beneath the roadway. This alternative would have the capacity to completely drain surface runoff at all locations.

In the southern section of East Park Loop Park Roads, where landfill capping has not been completed, drainage options include installation of a perforated underdrain along the top of the landfill cap with 4-inch HDPE outlets to the roadway pavement at either a gabion wall or riprap ditch spaced every 150 feet. These alternatives do not have the capacity to drain the entire roadways, and does not direct runoff away from the roadway surface. However, another alternative involves installation of a 3-foot riprap strip adjacent to the shoulder and allowing it to percolate into a subsurface crushed-stone trench with 8 inch PVC outlet pipes spaced every 100

¹ This alternative was presented in the *Fresh Kills Landfill Evaluation of Roadway Alternative in East Park Draft Report*, prepared by URS Corporation for the New York City Department of Design and Construction (February 2009). It is a modification of the alternative submitted by the SIBPO as part of the DGEIS comments.

Fresh Kills East Park Roads SEIS

feet on center. Outlet pipes would discharge on the opposite side of the road. This alternative would provide adequate capacity to completely drain surface runoff in all parts of the southern section for the 10-year design storm, and is recommended for locations with relatively large drainage areas.

There are maintenance concerns regarding the underdrain systems. If underdrain systems were to become clogged, the roadway drainage would be compromised. These systems would have to be designed with maintenance of utmost importance to reduce the potential for icing and hydroplaning.

Impacts under this alternative with respect to landfill closure delays, minimizing, avoiding and mitigating environmental impacts, addressing the traffic need; odors and air emissions; production of leachate; hazards for landfill slope stability; generation of runoff; adverse impacts on wetlands and wildlife; and habitat fragmentation would be similar to the East Park Loop Road option analyzed in this SEIS. Based on the design, it would have less of a potential for impacts on landfill infrastructure.

This alternative would fill slightly more acres of wetlands than the East Park Loop Road option; however, it would fill fewer acres of wetlands than the 4-lane option. It is, however, noted that the wetlands impacted by this alternative might be considered higher-value resources than those impacted by the proposed project, since they are more naturally occurring wetlands both west of Landfill 6/7 and at the Forest Hill connection across the wetlands. This alternative may also increase the amount of roadway within the 100-year flood plain.

This alternative also recommends lighting on park roads to improve safety.

ONE LANE EAST PARK LOOP ROAD

This modified alternative alignment was developed with a revised conceptual design that is identical in alignment to the East Park Loop Road option, the except being that a single-lane loop roadway is proposed around Landfill 6/7, rather than the two-lane loop road. This alternative has been included to determine if there are lesser impacts to wetlands and effects on DSNY's maintenance of leachate pump stations.

This alternative alignment retains the nonstandard roadway features identified in the East Park Loop Road Alignment, which includes horizontal curvature, adverse superelevation rates, nonstandard sight distances, and retains the undesirable vertical profile. Stormwater runoff from the mound would be directed across the roadway surface, with no provisions for subsurface drainage. No roadway lighting or fire protection are provided for this alternative.

Impacts under this alternative with respect to landfill closure delays, minimizing, avoiding and mitigating environmental impacts, addressing the traffic need; odors and air emissions; production of leachate; hazards for landfill slope stability; generation of runoff; adverse impacts on wetlands and wildlife; and habitat fragmentation would be similar to the SIBPO Alternative Alignment presented above. Based on the design, it would have less of a potential for impacts on landfill infrastructure.

While the East Park Loop Road option would require the temporary closure of the right lane of the roadway during DSNY leachate pump station maintenance operations, this alternative would allow maintenance and access in a widened right shoulder of the roadway. Installation of a traffic signalization system for the right lane closure would not be required.

For this alternative, differential settlement between the pavement of the existing haul road and the widened portion outside of the haul road may be less of a concern, since the joint between existing and new pavement would be located in the right shoulder of the roadway rather than at moving travel lanes.

This alternative would directly impact somewhat less acres of wetlands than the East Park Loop Road option and fewer wetland acres than the 4-lane option. It is, however, noted that the wetlands impacted by this alternative might be considered higher-value resources than those impacted by the options, since they are more naturally occurring wetlands.

LIMITED ACTION ALTERNATIVE

This alternative examines the potential impacts of using the modified landfill cover proposed with project only for a recreational purpose and without the construction of the proposed East Park roads and is included in response to the comments received from the New York State Department of Environmental Conservation. In this alternative the modified closure plan would therefore allow for two informal trails across the landfill that would connect on the east and west with the proposed multi-purpose loop road around the base of the Landfill Section 6/7 which is proposed with East Park. There would also be parking proposed at the western trail heads, near the Confluence Loop Road. Impacts under this alternative with respect to landfill closure delays. Minimizing, avoiding and mitigating environmental impacts; addressing the traffic need; odors and air emissions; production of leachate; hazards for landfill slope stability; generation of runoff; adverse impacts on wetlands and wildlife; and habitat fragmentation would be similar to the No Action Alternative presented above.

As compared to the proposed project, this Limited Action Alternative would require a similar delay in the closure of Landfill Section 6/7 since the landfill closure would be modified, although it would not provide the proposed roads. Thus, unlike the proposed project, there would be no need to avoid, minimize or mitigate impacts; however, with the proposed project these measures can eliminate project impacts. What the Limited Action Alternative would not achieve are the project's goals and objective with respect to improving local traffic circulation, providing connectivity across Fresh Kills Landfill, and minimizing the impacts of the proposed Fresh Kills Park project on local streets. Rather, it would only provide more trail connections across the park.

Like the proposed project this alternative would not have any impacts on odors or air emissions either during construction or operation. Likewise, there would not be any impacts on the production of leachate nor would there be hazards for landfill slope stability. Unlike the proposed project, there would not be any changes in runoff patterns at the site or the hydrology of the current DSNY systems. With the proposed project there are changes in landfill hydrology due to the proposed roads; however it is expected that the proposed project could address these stormwater management issues without any adverse impacts to the landfill or upstream or downstream locations and without any water quality impacts. There would also not be any filling of wetlands under this alternative; while these impact occur with the proposed project they can be addressed through a comprehensive restoration and wetlands mitigation program. Lastly, under this alternative, there would not be more limited impacts related to habitat fragmentation. With the proposed project these impacts would need to be addressed through road design, particularly with the Forest Hill Road Connection.

D. IMPACT AVOIDANCE MEASURES AND MITIGATION

In keeping with the objectives of New York City Environmental Quality Review (CEQR)/New York State Environmental Quality Review (SEQR), the proposed project has been designed to minimize impacts on the environment. Thus, in many technical areas the proposed project has built into the project measures that avoid significant impacts. These measures are described in the various chapters of the EIS and are summarized below. Where significant impacts have been identified that go beyond these measures, or where mitigation requires the approval of other agencies, such as the New York City Landmarks Preservation Commission (LPC), tidal wetlands mitigation from the New York State Department of Environmental Conservation (DEC) or traffic mitigation measures that need to be coordinated with the New York City Department of Transportation (NYCDOT), in accordance with the *CEQR Technical Manual*, these mitigation measures are presented below. Technical areas that require no impact avoidance measures or mitigation include socioeconomic conditions, community facilities, open space, shadows, air quality and noise.

IMPACT AVOIDANCE MEASURES

- **Landfill Protections.** Considering that the proposed project would provide the public with the opportunity to more closely approach the surface features associated with the leachate management system and the landfill gas management system, and that park road development may induce new loading conditions on the subsurface features, a number of preliminary conceptual measures would be implemented to avoid impacts to public health and the environment. Measures to avoid impacts to public health and the environment with respect to the stormwater management systems would also be implemented.
- **Natural Resources.** There are a number of elements of the project that could be proposed to avoid impacts on natural resources. These include measures to minimize the impacts of nighttime lighting on wildlife activity, as well as measures to minimize habitat fragmentation such as ensuring a well-designed circulation network.
- **Infrastructure.** The proposed project does not require any impact avoidance measures for water supply and sanitary sewer systems, as no impacts are anticipated. However, it does include a sustainability strategy to reduce demands on water supply and sanitary wastewater treatment. Incorporating some of these measures could reduce, at certain locations, the need to extend utility connections for long distances into the site, particularly with respect to sanitary sewer connections. In addition, to avoid stormwater impacts from increases in impervious surfaces and to protect receiving waters, individual stormwater best management practices (BMPs) would be used to enhance proposed park features, and provide water quality treatment and quantity management, particularly for the road runoff. Multi-functional source control BMPs such as bioretention and pocket wetlands that not only provide water quality treatment of stormwater runoff, but also provide aesthetic and natural resource benefits would be used.
- **Traffic and Parking.** The proposed project is a long-term implementation project with multiple phases. It would have future capital projects that would require future/and or coordination with NYCDOT including curb cuts to provide access to parking facilities in North Park and South Park, as well as the proposed reconstruction of the intersections of Richmond Avenue with Forest Hill Road and Richmond Hill Road to allow for the proposed Forest Hill Road Connection (2016) and Richmond Hill Road Connection (2036). To avoid future impacts at all the locations that would provide access to the project site and to ensure

proper traffic patterns and intersection designs are implemented, DPR will continue to coordinate with NYCDOT as additional capital projects move forward.

In addition, since the proposed project includes a major road improvement project that would affect circulation patterns in this area of Staten Island, DPR (the Fresh Kills Project) would also actively participate in the Staten Island Task Force which has been created to address traffic issues on Staten Island.

Given the long term nature of the Fresh Kills Park project and the conceptual level of design for much of the Park, additional traffic analysis will be necessary over the course of the project as individual areas of the park and roadway system are advanced. As the project progresses and the Park is constructed, DPR will continue to monitor the traffic conditions and seek ways of improving traffic flow in and around the Fresh Kills site. DPR would continue to coordinate with NYSDOT and NYCDOT through the course of project implementation to ensure that the proposed project, both the proposed park elements and the park road elements, would minimize adverse traffic impacts on local roads.

- **Transit and Pedestrians.** The proposed project is seeking to provide alternative modes of travel to the project site for the purpose of reducing vehicle trips (now assumed to be the predominant mode) and to reduce traffic impacts and enhance the park experience. These alternative modes include bus, rail ferry, walk and bike. Since bus service is an important mode of travel to the project, DPR would continue its efforts to extend bus service into the park and to provide both express and local service and connections with the Eltingville Station of Staten Island Transit. In order to extend bus service into the park, the proposed park roads would need to satisfy the design requirements of NYCT for bus operations. In addition, recognizing that pedestrian and bicycle access into the park is an important design approach that would reduce vehicle trips and encourage walk and bike trips, DPR would work closely with NYCDOT (the agency with jurisdiction over the street system) to ensure that adequate sidewalk conditions are provided along the perimeter of the park (e.g., along Arthur Kill Road and Richmond Avenue where the joint DPR/NYCDOT Springville Greenway project is proposed) as well as to ensure that adequate street conditions exist along the roads that lead to the park, particularly the major park entrances and those specifically located along Arthur Kill Road.
- **Construction.** Measures to avoid impacts during construction would include:
 - Coordinate with DSNY Closure Activities at Landfill Sections 6/7 and 1/9;
 - Protection of landfill infrastructure from vibration impacts;
 - Pre-construction contractor education and training that addresses protecting and avoiding impacts to landfill infrastructures for contractors;
 - Flagging or marking of infrastructure;
 - Posting of signs, such as “Buried Utility” or “Overhead Lines;”
 - Review of construction procedures to identify whether alternative, less disruptive construction techniques, are applicable to a given activity;
 - Protection of landfill infrastructure from vibration impacts;
 - For critical landfill infrastructure, trained personnel would provide field monitoring of the construction activities and potentially affected infrastructure; and
 - Record Observations of the construction activities and any monitoring results.

Fresh Kills East Park Roads SEIS

- Prepare staging plans that place construction activities internal to the project site for the larger projects thereby minimizing impacts on local neighborhoods and roads at the periphery;
- Locate heavier construction operations, such as soil making (if proposed) in an area central to the project site and away from local residential uses;
- Site individual capital project staging areas in areas that were previously disturbed or that would be disturbed as part of project development and thereby avoiding impacts to wetlands and natural features;
- Locate road construction staging areas in the proposed road corridor, clear of wetlands and landfill infrastructure;
- Use existing truck access routes for construction since these allow for direct access to and from the regional highway while internalizing truck traffic and minimizing the use of neighborhood streets around the project site;
- Evaluate the potential for the use of barging, particularly for the delivery of soils;
- Prepare a noise control plan in accordance with City regulations;
- Reuse of existing maritime infrastructure, such as bulkheads in the Plant 1 area;
- Protect wetlands and natural resources through flagging and signage to protect areas adjacent to construction activities;
- Undertake landscape enhancement during periods that would not conflict with existing wildlife and avian species use of the site;
- Perform field inspections and provide barriers to protect rare and endangered species and their landscapes or nesting areas during the construction period;
- Use best management strategies to control soil erosion and sedimentation including implementing site specific stormwater pollution preventions plans for each capital project (see the discussion below);
- Avoid excavation activities that would compromise the existing landfill cover functions;
- Incorporate enhancement measures that would minimize disturbance and removal of desirable existing native vegetation where possible;
- Invasive species management as part of construction and use of appropriate, regulated herbicide compounds suitable for use in natural areas, including herbicides approved for aquatic/wetland uses, to be applied to targeted invasive species using the lowest effective concentrations and to be used in accordance with all permits and regulations;
- Minimize the closing of existing streets by performing nighttime work along major corridors (e.g., to implement modifications at the two intersections with Richmond Avenue, at Richmond Hill and Forest Hill Roads, and the connecting ramps to the West Shore Expressway);
- Control worker access to the site by stipulating entry and exit points within each contract; and
- Provide for all necessary construction worker parking on-site.
- Include a “Conceptual Site-Wide Erosion and Sediment Control Plan” to establish the guidelines by which each phase of project construction, through implementation of the proposed techniques, would avoid impacts to natural features and in-place stormwater management systems.

- Use strategies to limit wildlife impacts as a result of construction activities such as physical barriers at construction and staging areas, limiting the speed of construction vehicles, and avoiding nighttime construction operations.
- Prepare a natural resources protection plan for each construction project. This plan would have a pre-construction walkover identify sensitive landscapes, trees, sensitive plant communities such as wetlands, and any other communities that have been identified for preservation and protection under the proposed project and would establish the necessary protection zones around these resources to minimize the potential for adverse direct or indirect impacts to these resources.
- Implement a construction monitoring program during construction to document that construction is consistent with the design and intent of the projects construction management plan including protection of the environmental monitoring control systems at Fresh Kills Landfill (i.e., landfill final cover gas and leachate collection systems) and to ensure that those systems remain intact and functioning during and after construction activities.
- Implement measures to minimize impacts to natural resources from the construction of road viaducts and culverts.
- Secure all the regulatory approvals from DEC and NYCDEP and take all the steps for environmental control and protection in order to ensure that local waterways are not adversely impacted by dewatering activities.
- For site-specific capital project areas where soil and/or groundwater disturbance is proposed, individual project-specific subsurface investigations and, if necessary, remediation, would be undertaken in accordance with additional site research (e.g., aerial photos, database searches) that may be necessary at the time of construction in order to supplement the conclusions presented in this EIS, along with the necessary individual project site investigations and testing programs.
- Implement a Construction Health and Safety Plan during construction.
- Minimize solid waste during construction by recycling cut trees and vegetation for use as park mulch and by implementing the City's program to reduce solid waste generated by construction sites.
- Maximize the use of the regional highway access provided by the West Shore Expressway as well as to use the existing landfill service roads that are internal to the site for the purposes of delivering soils and construction equipment to minimize traffic impacts on the local neighborhood during construction. In addition, all construction worker parking would be provided on site.
- Reduce short-term impacts of the proposed project on air quality through diesel equipment reduction; the use of clean fuel; the use of newer equipment; locating large emissions sources and activities, such as concrete trucks and pumps, away from residential buildings, schools, and playgrounds; implementing measures to prevent fugitive dust from becoming airborne; and limiting on-site travel speeds to 5 miles per hour to control particulate emissions. In addition, idling of trucks or other equipment would not be permitted during periods when they are being unloaded or are not in use.
- Implement noise reduction measures that would ensure compliance with the new Noise Control Code (effective July 1, 2007). Thus, the construction associated with the proposed project would be subject to the requirements of the new City Noise Control Code.

Fresh Kills East Park Roads SEIS

- Implement nuisance, vector management, litter and debris, dust, odor, and noise controls, as well as inclement weather procedures and landfill fire prevention measures.

MITIGATION MEASURES

The measures below are presented as mitigation measures as they require additional regulatory approvals or are outside the jurisdiction of DPR to implement. Specific mitigation measures will be developed as individual capital projects progress.

EROSION AND SEDIMENTATION (2011 CONSTRUCTION PERIOD)

With the proposed modified cover plan, there are projected increases in pollutant loading that are a worst case condition in that it assumes the installation of full width road embankment material (i.e. 60 feet wide) across Landfill Section 6/7. In fact, measures could be taken reduce the width of the temporary gravel road and to provide appropriate sedimentation and erosion control measures, including stabilizing the corridors with vegetation. Between this DSEIS and the FSEIS, DPR and DSNY will examine potential measures to reduce this level of interim pollutant loading which is primarily due to sedimentation and erosion. These measures will be presented in the FSEIS.

ARCHAEOLOGICAL RESOURCES (2036)

A Phase 1A study prepared for this project concluded that portions of the project site are sensitive for pre-contact and historic period archaeological resources. As project design progresses, it is recommended that individual construction projects be reviewed by an archaeologist to determine if the project could impact any archaeologically sensitive areas identified in the Phase 1A. If it is determined that impacts are possible, further investigation such as Phase 1B archaeological testing would be necessary to identify the presence or absence of archaeological resources.

NATURAL RESOURCES (2016 AND 2036)

Introduction

The Fresh Kills Park Plan intends to protect and enhance the condition and value of the wetland systems currently present and proposed future conditions, while offsetting the adverse impacts to wetlands resulting from construction of park roads and bridges. The proposed East Park Roads project would have impacts on wetlands only in the later phase with the completion of the East Park Road system. (No direct impacts to wetlands would occur in the 2011 or 2016 phases.) This include activities that would impact wetlands as either direct impacts (e.g., filling a portion of the wetlands for the Richmond Hill Road Connection), or indirectly (e.g., shading from Forest Hill Road connections viaduct, changes in hydrology, habitat fragmentation).

Overall, the Fresh Kills Park project and the East Park elements are proposed to include substantial wetland and upland enhancement projects for the purposes of improving the overall ecological values of the project site. These include extensive wetland improvement projects that call for enhancement of tidal wetlands (i.e., *Spartina* and mixed-marsh enhancement along tidal creeks), freshwater wetland expansion and enhancement (i.e., palustrine scrub shrub and forested wetlands) and possible freshwater wetland creation (i.e., conversion of detention basins to wetland features).

There are numerous wetland mitigation opportunities at Fresh Kills Park. Therefore, as design moves forward, the selected long-term East Park Road options can include a number of mitigation strategies that are tailored to the impacts and mitigation opportunities specific to that option. In no case would there be any remaining unavoidable or unmitigated adverse wetland impacts from the proposed roads. Provided below is a discussion of potential mitigation strategies and opportunities.

IMPACT AVOIDANCE AND MITIGATION STRATEGIES

Overview

A number of potential habitat restoration and enhancement alternatives has been developed to demonstrate feasible and implementable mitigation for these impacts. Project impacts are related to shading or fill for park roads that need to cross wetlands. The proposed mitigation strategies, discussed below, seek to replace those wetland functions that would be lost due to the project impacts, and are sited in areas of the proposed project that are located near the impact zones.

Mitigation Options within East Park

- **Living Shoreline Creation:** In areas around the East Park DSNY drainage basins, and within other areas where steep slopes that transition to aquatic habitats prevent a sustainable shoreline habitat, the potential exists to create gentler slopes that not only provide erosion control benefits, but also enhance the natural shoreline habitat and buffer areas. As roads are improved to provide better connections through the Fresh Kills Park, these shoreline areas can be enhanced to allow for natural processes to evolve through the strategic placement of plants, stone, sand fill and other structural and organic materials. Such enhancements may increase overall fill of these areas slightly, but for the purposes of improving habitat functions substantially. In addition, the replacement of the existing marginal soils with sandier soils will aid in managing invasive species (which prefer more nutrient-enriched soils). This mitigation alternative can be used to mitigate for impacts related to the placement of additional roadside fill around the site in tidal, freshwater wetland and aquatic habitats.
- **Aquatic Habitat Enhancement:** It is assumed that the hydrology of the DSNY basins in East Park will change as Landfill Section experiences final closure and the park roads are developed. One likely long-term result is that the basins will be drier and subject to less frequent flooding. Therefore, to enhance the remaining aquatic zones, floating islands could be placed in areas around the basins to create diversified aquatic habitat, and to provide increased riparian edge. In addition, as water levels potentially decrease within the aquatic basins, excess capacity can be converted to wetland and riparian habitat (meadow and scrub-shrub) with natural vegetation through the strategic placement of sandy soils. Interior open water areas can be created and maintained to support waterfowl and wading bird use, and in some instances can be enhanced with the establishment of freshwater submerged or floating leaved aquatic vegetation. This mitigation alternative can be used to mitigate for impacts related to the filling of the basins.
- **Stream Enhancement:** Where stream connections will continue to exist, stream channel improvements can be undertaken to mitigate for those to be impacted by the proposed road system. Stream enhancements could include the management of invasive plants species and provision of additional buffer areas planted with natural vegetation. There is also the

potential to integrate stream enhancements with larger-scale regenerative stormwater conveyance projects.

- **Freshwater Wetland Restoration and Enhancement:** In the southeastern area of the Landfill Section 6/7, adjacent to Basin R, some of the flow currently directed to Basin R could be split off to create small freshwater wetland areas and natural buffer zones. The dimensions of the freshwater area would be dependent on the ultimate proposed roadway alignment as well as the results of water budget and hydrology analysis. This freshwater wetland creation could be appropriate as mitigation for some of the freshwater impacts that may occur in other areas along the eastern edge of the site.
- **Native Grassland Meadows and Scrub-Shrub Habitat Creation:** In transition areas between new roads and wetland and aquatic habitats, the mitigation focus would be on the creation of native grassland meadows and scrub-shrub habitat through the use of sandy soils, where structurally practicable. These created habitats can provide an overall ecological context for park users, while protecting sensitive habitat from new and more-heavily used roads. Early investments in good soils, matched to the proposed plant community, can provide long term benefits. Native plant species of local origin, effective erosion and sediment controls, and matching the vegetation with the evolving site conditions will not only make for a more successful park, but will also minimize the post planting care and management.

Mitigation Options outside of East Park

- **Tidal Wetland and Forested Habitat Community Reconnection:** A significant opportunity exists to restore or enhance the tidal inlet channel that occurs between the two landfill sections in South Park. This restoration could be used to mitigate the impacts to the forested- wetlands located in the southeast (Forest Hill Road connection) and northeast (Richmond Hill Road connection) portions of East Park. In the area between the two mounds in South Park, the drainage system was heavily altered by the landfill facility construction and associated roadway infrastructure. The channel and associated wetlands east of the existing landbridge/road are under full tidal influence, but the areas west are only minimally connected hydrologically to the tides. To improve the habitat within this area, the connection beneath the existing land bridge could be opened to allow for tidal influence in the western portion of the inlet. The opening would need to be analyzed hydrologically to ensure it is sized correctly. Once open, the site would be observed through the next year to monitor the plant community changes and water quality. It is expected that the invasives that dominate this section will be controlled by the saline water influence, and that the daily flushing will improve overall water quality. Along with these two benefits, it is assumed that the improved and protected habitat will attract a large number of wildlife, fish and birds, highly visible by visitors to the park. The inlet area and surrounding adjacent areas are known to have been filled with unregulated waste in the past. As a result, the soils in this area would need to be tested to determine whether there are contaminant levels of concern related to wildlife and human access after the area is opened to the tides. Excavation of the soils is not anticipated; however, if areas of concern are found as a result of soil testing, excavation of two feet of existing soils and replacement by two feet of clean soils may be necessary to accomplish the tidal wetland restoration.
- **Stream Enhancement in South Park:** The existing swale that currently serves to drain areas in the southern part of South Park, both north and south of the existing service road, could be enhanced to create an improved visual experience while also improving overall

water quality and stormwater management. This channel is a human-altered system influenced by ditching, road construction and historic landfill operations. The proposed approach to naturalize this swale would be to place natural materials such as rock, tree logs, root wads, and native plantings in strategic locations and allow natural channel design processes and stream geomorphology to slowly assist the channel to adapt to a more natural configuration. Minor manipulations along the stream edges to create small meanders would enhance the system. This stream enhancement could serve to mitigate the stream impacts that are proposed to occur along the east side of East Park.

TRAFFIC (2016 AND 2036)

A number of intersections in the study area would experience significant traffic impacts as a result of vehicular traffic generated by the proposed project in the 2016 and 2036 analysis years (no traffic mitigation is necessary for the 2011 analysis year). Descriptions of that mitigation are provided below.

2016

Four (4) out of the five (5) analyzed intersections would be impacted under the 2016 Build Conditions, as follows.

- **Richmond Hill Road and Forest Hill Road.** The impacts at the westbound approach and the northbound shared through- and right-turn movement at this intersection during the weekday AM peak hour could be mitigated by developing a new signal phasing and timing plan.
The impacts at the westbound approach, northbound shared through- and right-turn movement and southbound shared through- and right-turn movement during the weekday midday, weekday PM and weekend midday and PM peak hours could not be mitigated by standard traffic engineering measures.
- **Richmond Hill Road and Richmond Avenue.** The impact at the southbound left-turn movement at this intersection during the weekday AM, weekday midday, weekday PM, and weekend PM could be mitigated by shifting 1 second of green time from the northbound/southbound phase to the northbound/southbound protected left-turn phase.
The impacts at the westbound exclusive left-turn and the shared left-turn and through movement and the southbound left-turn movement at this intersection during the weekend midday peak hour could not be mitigated by standard traffic engineering measures.
- **Yukon Avenue and Richmond Avenue.** The impact at the westbound approach during the weekday and weekend midday peak hours could be mitigated by restriping the westbound approach to provide one 12-foot exclusive left-turn lane and one 12-foot shared through- and right-turn lane.
The impact at the southbound shared through- and right-turn movement could be mitigated by restriping the westbound approach to provide one 12-foot exclusive left-turn lane and one 12-foot shared through- and right-turn lane. Daylighting the southbound approach to provide an additional moving lane is also required.
- **Forest Hill Road and Richmond Avenue.** The impact at the northbound right-turn movement during the weekday AM peak hour could be mitigated by shifting 1 second of green time from the westbound phase to the northbound/southbound phase.

With the above mitigation measures in place, the majority of the impacted locations would operate at the same or better service levels than the 2016 No Build conditions.

2036

Recognizing that there are multiple Build condition options, with the three connections proposed along Richmond Avenue, recommended mitigation measures for each roadway option are presented below.

Completed East Park Road System

Under the 2036 Completed East Park Road Build Conditions, all five (5) analyzed intersections would be impacted under the 2036 Build Conditions, as follows:

- **Richmond Hill Road and Forest Hill Road.** The impacts at the westbound approach, northbound shared through- and right-turn movement and southbound shared through- and right-turn movement during all five analyzed peak hours could not be mitigated by standard traffic engineering measures.
- **Richmond Hill Road and Richmond Avenue.** The impacts at the westbound left-turn, northbound through and southbound shared through- and right-turn movements at this intersection during the weekday midday peak hour could not be mitigated by standard traffic engineering measures.

The impacts at the southbound approach at this intersection during the weekday PM peak hour could not be mitigated by standard traffic engineering measures.

The impacts at the westbound left-turn, northbound through and southbound approach at this intersection during the weekend midday peak hour could not be mitigated by standard traffic engineering measures.

The impacts at the northbound through movement and the southbound shared through- and right-turn movement at this intersection during the weekend PM peak hour could not be mitigated by standard traffic engineering measures.

- **Yukon Avenue and Richmond Avenue.** The impact at the southbound shared through- and right-turn movement at this intersection during the weekday PM peak hour could be mitigated by daylighting the southbound approach to provide an additional moving lane. Restriping the westbound approach to provide one 12-foot left-turn lane and one 12-foot shared through and right-turn lane is also required.

The impacts at the westbound approach and the southbound shared through- and right-turn movement at this intersection during the weekend midday peak hour could be mitigated by daylighting the southbound approach to provide an additional moving lane and by restriping the westbound approach to provide one 12-foot left-turn lane and one 12-foot shared through and right-turn lane. Shifting 2 second of green time from the northbound/southbound phase to the eastbound/westbound phase is also required.

- **Forest Hill Road and Richmond Avenue.** The impacts at the westbound left-turn and northbound through and right-turn movements at this intersection during the weekday AM and weekend midday peak hours could not be mitigated by standard traffic engineering measures.

The impacts at the westbound left-turn, northbound through and right-turn and southbound shared through- and right-turn movement at this intersection during the weekday midday, weekday PM, and weekend PM peak hours could not be mitigated by standard traffic engineering measures.

- **Yukon Avenue and Forest Hill Road.** The impact at the northbound approach at this intersection during the five analyzed peak hours could be mitigated by daylighting the northbound approach.

With the above mitigation measures in place, majority of the impacted locations would operate at the same or better service levels than the 2036 No Build conditions.

Yukon Avenue Connection Option

Under the 2036 Yukon Avenue Connection Option Build Conditions, four (4) out of the five (5) analyzed intersections would be impacted, as follows:

- **Richmond Hill Road and Forest Hill Road.** The impacts at the westbound approach, northbound shared through- and right-turn movement and southbound shared through- and right-turn movement during all five analyzed peak hours could not be mitigated by standard traffic engineering measures.
- **Richmond Hill Road and Richmond Avenue.** The impact at the southbound exclusive left-turn movement during the weekday AM peak hour could be mitigated by shifting 1 second of green time from the northbound/southbound phase to the northbound/southbound exclusive left-turn phase.

The impacts at the westbound exclusive left-turn, the westbound shared left-turn and through and the southbound exclusive left-turn movements during the weekday midday peak hour could not be mitigated by standard traffic engineering measures.

The impacts at the westbound exclusive left-turn movement, the westbound shared left-turn and through movement, and the southbound approach during the weekday PM and weekend midday peak hours could not be mitigated by standard traffic engineering measures.

The impacts at the southbound approach during the weekend PM peak hour could not be mitigated by standard traffic engineering measures.

- **Yukon Avenue and Richmond Avenue.** The impacts at the westbound approach and the southbound shared through- and right-turn movement during the weekday midday peak hour could be mitigated by restriping the westbound approach to provide one 12-foot left-turn lane and one 12-foot shared through- and right-turn lane. In addition, daylighting the southbound approach to provide an additional moving lane is also required.

The impacts at the westbound approach and the southbound shared through- and right-turn movement during the weekday PM and weekend midday peak hours could not be mitigated by standard traffic engineering measures.

The impacts at the westbound approach and the southbound shared through- and right-turn movement during the weekend PM peak hour could be mitigated by restriping the westbound approach to provide one 12-foot left-turn lane and one 12-foot shared through- and right-turn lane. In addition, daylighting the southbound approach is also required.

- **Forest Hill Road and Richmond Avenue.** The impact at the northbound right-turn movement during the weekday AM and PM peak hours could be mitigated by shifting 1 second of green time from the westbound phase to the northbound/southbound phase.

The impact at the northbound through movement during the weekend midday peak hour could not be mitigated by standard traffic engineering measures.

With the above mitigation measures in place, majority of the impacted locations would operate at the same or better service levels than the 2036 No Build conditions.

E. UNAVOIDABLE SIGNIFICANT IMPACTS

The proposed project would result in significant adverse traffic impacts at a number of study area intersections. As discussed above in Mitigation,” traffic mitigation measures would be employed at individual intersections to mitigate the adverse significant traffic impacts. The proposed mitigation measures consist of standard traffic capacity improvement measures, such as lane restriping, signal timing modifications and installation of new traffic signals at unsignalized intersections. However, even with these measures in place, some of the study area intersections would not be completely mitigated in the future conditions back to the No Build conditions. *