

A. INTRODUCTION

OVERVIEW

This chapter describes a preliminary construction and phasing plan for the proposed project, presents a description of associated construction activities during the three analysis scenarios including the implementation of a modified land fill cover (2011), construction of the Yukon Connection (2016), and construction of the Forest Hill Road and Richmond Hill Road Connections (2016). The design of the proposed roads does not include any paved public walkways or bikeways; therefore, this analysis focuses on the construction of the embankment and the associated road corridor landscaping.

The proposed project involves construction activities that would occur over an extended period (approximately 30 years). The long-term nature of the project is due, in part, to the complexity of the construction program as well as the capital costs of implementation. As would be expected, intensity of construction activity varies over time and depends on the particular construction phase. However, while the construction period is lengthy, this extended construction phasing over many years also has the effect of limiting construction impacts for individual road projects. In addition, the size of the project site and its access to regional highways allows this project to stage the major construction activities within the site and provides significant buffers between the project site and the surrounding neighborhoods. A description of the construction period and potential impacts of the proposed project follows.

CEQR TECHNICAL MANUAL GUIDELINES FOR CONSTRUCTION IMPACT ANALYSES

The *CEQR Technical Manual* states that construction impacts, although temporary, can include noticeable impacts, such as traffic and noise. The degree of the impact is generally dependent on the duration and magnitude of construction. The predominant concerns relative to construction impacts are traffic-related impacts from construction employees and truck traffic or due to street or lane closings for the cranes and other heavy equipment needed for utility installations; air quality that may be affected by mobile source emissions from trucks and other vehicular traffic as well as dust due to earth moving operations (i.e., clearing, grading, excavatory filling) or on-site operations (e.g., a concrete batching plant or soil making operation); noise associated with blasting, pile driving, or other construction activities; and disturbance of soils or groundwater that may contain hazardous materials or impact natural resources.

While the proposed project would have a long construction period, the proposed project would be constructed in three segments and each segment would be constructed over a two- to three-year period.

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Because of the extended construction period, this chapter is comprehensive and includes impact analyses in the areas with the greatest potential for adverse impacts during construction, including:

- Land use and neighborhood character, which is a construction period analysis that is typically prepared when a construction activity is going to affect a property for an extended period of time. This analysis will determine whether the type and duration of effect could affect local land uses and neighborhoods.
- Historic resources that may be potentially affected because of their presence in the area that could be affected by vibration as well as the potential impacts to archaeological resources.
- Natural resources and water quality for activities that would be occurring in wetlands and along water bodies as well as runoff from sediments and the activities that generate sediments such as excavation, grading and exposed soils areas.
- Hazardous materials issues as they relate to soil and groundwater conditions as well as demolition of existing structures.
- Traffic and parking, particularly along major truck routes and vehicle corridors serving the project site as well the potential to impact any street or lane closings. A quantified or detailed study of traffic is usually only undertaken for projects with long construction periods and where traffic during construction could have measurable impacts that are comparable or greater than a project impact for an extended duration. Additional considerations are street or lane closures for cranes and other types of construction activity that may occur in a built City street; also possible are temporary diversions or full or partial street closings.
- Air quality from mobile sources such as increased vehicle and truck traffic, on-site construction equipment and fugitive dust emissions caused by demolition, excavation, and other construction activities as well as stationary sources such as concrete batching plants.
- Noise from mobile sources and heavy equipment operations on the site (e.g., compressors, and gas- and diesel-powered engines).
- Solid waste and the disposal of construction debris.
- Public health.

The determination of impact significance for construction impacts is based on the same criteria as the technical analyses prepared for each of these EIS technical areas (see the preceding chapters). However, since construction impacts are often short-term, the impacts can be described as temporary and, for that reason, not significant.

With respect to other EIS technical areas not cited above, the proposed project would provide significant construction jobs, but would not adversely impact local businesses, nor would it adversely impact any local community facilities or services, or local open spaces. Few transit or pedestrian trips are expected and therefore these technical areas are not analyzed. In addition, while the proposed project would require connections to infrastructure, these connections are expected to be standard utility connections to provide site service extensions or upgrade water, sewer, and electrical service to the site and therefore no significant impacts on infrastructure are expected during construction.

A construction impact analysis typically begins with a description of the anticipated construction activities and phasing, where construction staging would occur, and for multiple phase projects the equipment and activities associated with each phase. This information serves as the basis for describing and analyzing construction impacts. The phasing analysis for this project can also be broken down both temporally and geographically. Measures necessary to address potential impacts during construction are discussed in Chapter 23, "Impact Avoidance Measures and Mitigation."

B. DESCRIPTION OF PROPOSED CONSTRUCTION PROGRAM

PROJECT IMPLEMENTATION AND PHASING

This SEIS analyzes the environmental impacts of the proposed project in three analysis years: 2011, 2016, and 2036 (see Table 20-1). The first year, 2011 addresses construction of a road embankment across Landfill Section 6/7; the second year 2016, is the year by which the Yukon Avenue Connection road construction is expected to be completed; the 2036 year is construction of the Forest Hill Road and Richmond Hill Road connections.

**Table 20-1
Project Phases for Construction Analysis**

Project Phase	Estimated Completion Date
Modified Closure Plan—construction of road embankment across Landfill Section 6/7.	2011
Proposed Park Road (Yukon Avenue Connection)—park road connection extending from Yukon Avenue/Richmond Avenue on the east to Confluence Loop Park Road on the west.	2016
Completed East Park Road System—park road connections extending from Forest Hill Road/Richmond Avenue Richmond Hill Road/Richmond Avenue and the Loop Park Road with connections on the west to Confluence Loop Park Road on the west.	After 2016
Sources: Fresh Kills Park Draft Scope of Work to Prepare an SEIS, New York City Department of Parks & Recreation, March 2009.	

As stated above, the proposed project is a major capital project that would be developed in multiple phases over several decades. It involves the construction of about two miles of park roads and potentially connections/intersections with Richmond Avenue at Yukon Avenue, Forest Hill Road and Richmond Hill Road. Figure 20-4 presents a preliminary anticipated phasing for a number of other major Fresh Kill Park elements currently being considered.

As the road projects are designed, the City’s Department of Parks & Recreation (DPR) and DSNY would create a “development plan” for the proposed project that would address construction coordination and activities through the completion of the East Park Roads project that would be developed to avoid and minimize conflicts between landfill and park road construction. To that end, beyond preparation of the embankment in conjunction with the closure construction of Landfill Section 6/7, construction of the East Park Roads is not expected to commence until closure construction at Landfill Section 6/7 is completed.

A development plan would address long-term coordination needs with respect to avoiding conflicts between construction activities and the Fresh Kills Landfill monitoring and maintenance program, which DSNY must continue long past the completion of construction and at least until 2036. Presented below are the project phasing and typical construction activities for the 2016 and 2036 analysis years.

PARK ROAD TYPICAL CONSTRUCTION ACTIVITIES

Construction activities associated with the proposed park roads would involve the importation of soil for road base as well as material for road surfaces, finishes and corridor landscaping. The Modified Landfill Section 6/7 Final Closure Plan and the Yukon Avenue Connection are nearer term project elements. The road segments proposed for the 2017 to 2036 period are long term, subject to design decisions, and many years away from final design. For the longer-term projects, a development build year and more detailed designs are yet to be finalized. Typical construction activities associated with these park road projects are presented in Tables 20-2 through 20-4.

**Table 20-2
Proposed Project Elements**

Proposed Park Road Connections	Estimated Construction Period
Modified Landfill Section 6/7 Final Closure Plan —roadway embankment preparation over the central and southern portions of Landfill Section 6/7.	2009-2011
Yukon Avenue Connection —roadway connection between the Confluence Loop Park Road and Yukon Avenue at Richmond Avenue totaling approximately 2,000 linear feet including a road segment over the central portion of Landfill Section 6/7 and a new intersection at Richmond Avenue and Yukon Avenue.	2010-2012
Forest Hill Road Connection —road connection between the Confluence Loop Park Road and Richmond Avenue at Forest Hill Road totaling approximately 4,600 linear feet including a roadway segment over the south portion of Landfill Section 6/7, a viaduct crossing of wetlands, and a new intersection at Richmond Avenue and Forest Hill Road.	After 2016
Richmond Hill Road Connection —roadway connection between the Confluence Loop Park Road on the south and Richmond Avenue at Richmond Hill Road on the north totaling approximately 12,600 linear feet and including crossing landfill stormwater management facilities east of Landfill Section 6/7 including embankments and drainage basins and adjacent to wetlands, and creating a new intersection at Richmond Avenue and Richmond Hill Road	After 2016
East Park Loop Road —loop road around the base of Landfill Section 6/7 and including modification to Landfill Section 6/7 infrastructure and regarding to create a two land public road with road segments adjacent to freshwater and tidal wetlands.	After 2016
Source: Fresh Kills Park Development Team, 2009.	

**Table 20-3
Estimated Duration of Construction**

Roadway Element	Estimated Duration of Construction
Yukon Avenue Connection	2 years
Forest Hill Road Connection	2-3 years
Richmond Hill Road Connection	2-3 years
East Park Loop Road	2 years
Source: Fresh Kills Park Development Team, 2009.	

**Table 20-4
Typical Construction Activities for Three Phases of Construction**

Proposed Project	Typical Construction Activities
Modified Landfill Section 6/7 Final Closure Plan	Site preparation and relocation of landfill infrastructure (as necessary), heavy equipment to import engineered fill for embankment and grading, grading for stormwater swales, construction of road base, final cover of grasses and trail materials.
Yukon Avenue Connection	Site preparation, heavy equipment to import engineered fill for embankment and grading, installation of utilities, grading for stormwater swales, construction of road base and asphalt surface, installation of lighting, road and landscaped edge finishes, signage, and striping.
Forest Hill Road Connection	Site preparation, protection of off-mound environmental monitoring points, and modification to landfill gas vent trench. Heavy equipment to import engineered fill for embankment and grading, installation of utilities, grading for stormwater swales, construction of road base and asphalt surface, installation of lighting, road and landscaped edge finishes, signage, and striping. Viaduct construction involves excavation, drilling of piles, construction of piles caps and piers, forming and placement of the concrete superstructure or erection of steel framing and concrete decking, surfacing with asphalt, installation of barriers and railings, and installation of finishes, lighting, signage and striping. Heavy equipment is utilized to deliver materials, for excavation and pile drilling/driving, erection of steel elements and for lifting construction materials.
Richmond Hill Road Connection	Site preparation, protection of off mound environmental monitoring points and modification to landfill gas vent trench. Heavy equipment to import engineered fill for embankment and grading, installation of utilities, grading for stormwater swales, construction of road base and asphalt surface, installation of lighting, road and landscaped edge finishes, signage, and striping. Viaduct/culvert construction involves excavation, drilling or driving of piles, construction of piles caps and piers, forming and placement of the concrete superstructure or erection of steel framing and concrete decking, surfacing with asphalt, installation of barriers and railings, and installation of finishes, lighting, signage and striping. Heavy equipment is utilized to deliver materials, for excavation and pile drilling/driving, erection of steel elements and for lifting construction materials.
East Park Loop Road	Site preparation, modification, protection and relocation of landfill environmental infrastructure as necessary. Heavy equipment to import engineered fill for embankment and grading, installation of utilities, grading for stormwater swales, construction of road base and asphalt surface, installation of lighting, road and landscaped edge finishes, signage, and striping.
Source: Fresh Kills Park Development Team, 2009.	

TYPICAL CONSTRUCTION EQUIPMENT

Typical construction equipment expected to be used over the duration of park road construction is listed in Table 20-5. Because the intensity of construction activities would vary depending on the construction phase the use of each type of equipment over the many capital phases of construction would differ depending on the phase of construction.

Table 20-5
Typical Construction Equipment

Equipment for Peak Stages	Engine Size (hp)
Backhoes	87.17
Excavators	137.6
Loaders	87.17
Dozers	136.1
Cranes	237.7
Compressors	83.9
Pile Driver	237.7
Concrete Pumps	137.7
Water Pumps	8.5
Generators	33.4
Graders	231.2
Pavers	134.6
Rollers	84.7
Heavy Trucks	N/A

Source: *Hunt's Point WPCP FEIS*, July 12, 2007.

During construction, various types of construction equipment would be used at different locations throughout the site. Some of the equipment is mobile and would operate throughout the site while some would remain stationary on-site at distinct locations. Stationary emission sources include the crane, compressor, concrete pump, water pumps, generator and pile driving, depending on the particular period of construction. The excavators, loaders, backhoes, dozers, graders, pavers, rollers, trucks, and heavy trucks would also operate throughout the site at the particular areas of park road construction or would follow the road alignment during road construction.

CONSTRUCTION TRUCK ROUTES AND ACCESS

It is anticipated that truck movements for the proposed construction would, to a large degree, follow the routes currently used by DSNY and its contractors in the landfills final closure construction. This maximizes use of regional roads for delivery of soils and materials and minimizes use of local roads. Use of truck routes currently used also provides the opportunity for controlled access for deliveries of soil and materials.

Flaggers, temporary dividers, and traffic controls to manage the access and movements of trucks would be used for construction activities along Richmond Avenue, as necessary. These construction activities would all be subject to the review and approval of the New York City Department of Transportation (NYCDOT) as part of a construction access permit that would be necessary to construct the proposed ramps and service roads that are within the jurisdiction of NYCDOT.

Some of the site deliveries would also occur along the perimeters of the project site (e.g. landscape materials, fencing). For projects that require work along or in City streets, as with any other street construction projects, these activities would take place in accordance with

NYCDOT-approved traffic maintenance plans, as appropriate. However, the need for such traffic management plans is expected to be limited since little project construction is proposed within existing City streets. The exceptions include activities associated with the construction of the three connections along Richmond Avenue, which would require work with these intersections. A traffic management plan would be necessary for these activities, particularly since this is a major intersection along a major traffic corridor that carries heavy traffic volumes. As project design proceeds, a plan for maintaining traffic at this intersection would be developed and subject to NYCDOT approval.

Because of the extent of the proposed road construction, vehicles are not likely to have to undertake disruptive back-in maneuvers and would be able to enter all project locations head on. This would also limit backing up into City streets, which can cause temporary disruptions to traffic.

GENERAL CONSTRUCTION PRACTICES

OVERVIEW

It is expected that DPR would have field representatives on-site throughout the entire construction period. Once construction commences, there would also be security provided at the site by both DSNY and DPR. Construction would also have a quality assurance officer.

DELIVERIES AND ACCESS CONTROLS

Because of site constraints, the presence of large equipment, and the type of construction activities, access to the construction sites would be secured. The work areas would be fenced off, with access limited to workers and construction vehicles. Typically, construction worker private vehicles would not be allowed into the construction area. Security guards and flaggers would be posted, and all persons and trucks would have to pass through security points. Workers or trucks without a need to be on site would not be allowed entry. After work hours, the gates would be closed and locked.

As is the case with almost all large urban construction sites, material deliveries to the site would be highly scheduled. Soils would be necessary for landscape and landscape cover. Other materials are expected to include stone, asphalt, cement, lighting, and lighting conduit for the proposed roads.

CONSTRUCTION HOURS

Construction activities generally take place Monday through Friday, with some exceptions. In accordance with City laws and regulations, construction work would generally begin at 7:00 AM on weekdays, with workers typically arriving to prepare work areas between 6:00 AM and 7:00 AM. Typically work ends at 3:30 PM, but some work days may be extended to complete specific tasks beyond normal work hours. In these cases an extended workday would generally not go beyond 6:00 PM and would not include all construction workers on-site, but just those involved in the specific task requiring additional work time.

At limited times over the course of construction weekend or nighttime work may also be required. For example, nighttime work may be necessary for the purposes of performing work in City streets (such as Richmond Avenue) or along the West Shore Expressway. However, it would be the purpose of performing this work at night to minimize impacts on traffic patterns.

Again, the numbers of workers and pieces of equipment in operation would be limited to those needed to complete the particular task at hand. For extended weekday and weekend work, the level of activity would be reduced from the normal workday. The typical weekend workday would be on a Saturday starting from 7:00 AM with worker arrival and site preparation and continuing to 5:00 PM. Nighttime work is expected to be limited to street or highway work and would also be performed in accordance with street and highway access permits from NYCDOT and NYSDOT, respectively, and it is expected that a traffic management plan would be required. For the nighttime work it would be the objective to complete the tasks as soon as possible in order to minimize costs, nighttime construction activity, and disruptions to traffic.

For all work occurring outside the normal construction work day, the necessary approvals would be obtained from City and State agencies. In addition, in accordance with City regulations, a noise control plan would be developed and implemented to minimize intrusive noise emanating into nearby areas and affecting sensitive receptors. The noise control plan would include such restrictions as locations of generators and avoiding unnecessary loud construction activities at night. A copy of the noise mitigation plan would be kept on-site for compliance review by the New York City Department of Environmental Protection (DEP) and the New York City Department of Buildings (DOB) (see also the discussion below under “Noise”).

COORDINATION OF CONSTRUCTION WITH DSNY CLOSURE, MONITORING AND MAINTENANCE ACTIVITIES

Closure Construction

In the future the closure of Landfill Section 6/7 would occur under either the approved closure plan or the Modified Landfill Section 6/7 Final Closure plan which is put forth as part of this proposed project. Thus, if the proposed project is approved, it would not conflict with closure construction at Landfill Section 6/7.

Closure of Landfill Section 1/9 is west of the project site and across the West Shore Expressway. Given the separation of distance between the two projects, it is not expected that the proposed modified closure plan and the construction of the proposed roads would conflict with closure construction at Landfill Section 1/9.

Prevention of Interference with Landfill Monitoring and Maintenance

During construction of the public roadway segments associated with the 2016 and 2036 Build years, the City’s capital project manager (i.e., DPR or DDC) will coordinate road construction activities with DSNY maintenance, operation and monitoring activities. Because many of the monitoring activities are performed on a regularly scheduled interval, there will be opportunities to plan the construction schedule around the scheduled activities. On-going communication and coordination between the project owner and DSNY will be also be maintained throughout construction to address unscheduled or non-routine maintenance, operations or monitoring requirements.

Stormwater Management

It is assumed during all three 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. Where this is not possible, temporary stormwater runoff controls would be implemented in accordance with the individual SWPPPs prepared for each build year construction activities

(see the discussion below). It is assumed that this stormwater management could be achieved without any impacts to the DSNY stormwater management systems. All measures would be designed in accordance with and approved by DSNY to ensure no interference or misuse of the DSNY drainage facilities and basins during construction.

STREET CLOSURES

STREET CLOSURES (SIDEWALKS AND TRAVEL LANES)

During the course of construction, since the majority of work would be the construction of new streets within the project site, limited closure of traffic lanes and sidewalks is expected. There would be some closures for some construction phases that require connections to streets at the periphery of the site, such as the entrances along Richmond Avenue. However none of these activities are expected to require extended periods of time. This work would be coordinated with and approved under street opening permits by the appropriate City and State agencies, as necessary.

STORMWATER POLLUTION PREVENTION PLAN

As described above, the project site is large and requires grading and a substantial importation of fill soils. As a result, an important element in the construction plan is that a stormwater pollution prevention plan (SWPPP) that would be developed in accordance with the requirements of DEC's State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity. The SWPPP would include fully designed and engineered stormwater management practices with all necessary maps, plans, and construction drawings, providing the site-specific erosion and sediment control plan and best management practices. It would designate responsible parties and personnel who would have a role in management of construction stormwater runoff and would outline a routine site inspection and reporting program for identification and prompt repair of any deficiencies for the erosion and sediment control structures or practices.

For each capital park road project, stormwater management during construction would then be performed in accordance with a site-specific erosion and sedimentation control plan. A SWPPP contains both structural and non-structural components. The structural components are expected to consist of hay-bale barriers/silt fencing, inlet protection, and installation of a stabilized construction entrance or other appropriate means to limit potential off-site transport of sediment. The non-structural "best management practices" would include routine inspection, dust control, cleaning, and maintenance programs; instruction on the proper management, storage, and handling of potentially hazardous materials; and identification of parties responsible for implementation and ongoing maintenance programs. All temporary control measures would be maintained until disturbed areas of the site are stabilized. A general description of the practices that could be applied to each capital project is presented below under "Natural Resources."

CONSTRUCTION STAGING AND OPERATIONS

CONSTRUCTION STAGING

As stated above, this is a multi-year, multi-phased construction project. It is an objective of the proposed construction program to provide a centralized staging area within the project site and away from sensitive uses from which construction operations could be based, soils and plantings could be stockpiled and stored, equipment could be safely parked, construction worker parking

could be provided, and construction period offices and trailers could be placed. This staging area would both minimize the need to conduct major construction preparation and staging activities at the periphery of the site where it could be more intrusive to local neighborhoods and would also allow construction workers to park within the site rather than using local street parking. It is assumed that this centralized staging area would occupy 5-10 acres depending on the intensity of construction activity. For example, one opportunity for providing centralized staging areas is in the wide service road between Landfill Section 2/8 and the West Shore Expressway (see Figure 20-4). Additionally, over time, localized staging areas could be provided in other locations around the site as construction progresses, such as the Point. Road construction staging areas are expected to follow the corridors for the proposed roads. However, given the size of the project site, it is not expected that construction staging areas would need to be cited near sensitive receptors, such as local neighborhoods, nor would sensitive areas on the site, such as wetlands or woodland landscapes, be necessary.

CONSTRUCTION IMPACT AVOIDANCE OBJECTIVES

Figure 20-5 shows a land use map that identifies the residential uses and communities nearest the project site. As shown in that figure, there are limited residential uses at the periphery of the site. The uses immediately surrounding the site are predominantly parkland, commercial, industrial, and some residential uses. The two neighborhoods nearest the project site are Travis to the north and Arden Heights to the south. The park road construction operations would occur away from local neighborhoods. Some of the general construction principles that would be apply to the proposed project are:

- Prepare staging plans that site construction activities and carefully stage construction 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 thereby avoiding impacts to wetlands and natural features;
- Locate road construction staging and storage 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;
- Protect wetlands and natural resources through flagging and signage to protect areas adjacent to construction activities;
- Undertake wetland enhancement and mitigation during seasons 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;

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- 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;
- Perform invasive species management as part of construction and use 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 three Richmond Avenue intersections);
- Control worker access to the site by stipulating entry and exit points within each contract; and
- Provide for construction worker parking and offices on-site.

The above descriptions are general operational objectives of the construction plan. As the project moves forward, additional site-specific construction measures would be implemented to minimize the impacts of each project and to implement the general operational objectives presented above.

CONSTRUCTION ACTIVITIES

MODIFIED CLOSURE PLAN CONSTRUCTION ACTIVITIES (2011)

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;
- 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 is 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.

ROAD CONSTRUCTION ACTIVITIES (2016 AND 2036)

Assumptions regarding road construction activities include the following:

- Most road construction would be primarily within the landfill site and areas closed to public traffic, thereby limiting conflicts with existing traffic and pedestrians with a plan to minimize impacts to landfill infrastructure;
- Approximately 10-20 workers are expected on-site during road embankment preparation, utilizing heavy equipment such as haul trucks, bulldozers, plows, backhoes, and rollers;
- Limited grading and engineered embankment fill are expected along most Loop Park Road segments as these road segments would primarily reuse existing DSNY landfill access roads;
- Approximately 10-20 workers are expected to be on-site during installation of road finished using haul trucks, backhoes, graders and rollers, mains, sanitary sewers, storm sewers and lighting infrastructure (where necessary);
- Approximately 10-20 workers are expected on-site during road embankment preparation utilizing heavy equipment such as haul trucks, bulldozers, and rollers;
- Approximately 20-30 workers on-site during the asphalt cover phase utilizing haul trucks, pavers and rollers;

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- Box culvert or viaduct construction (e.g., along the Forest Hill Road Connection) is expected to take approximately 2 years with about 10-15 workers involved during the average construction day which may include pile installation during the first year (assuming that construction of the viaduct occurs concurrently with construction of the Forest Hill Road Connection roadway over the landfill);
- Construction of the intersections along Richmond Avenue would be separated from Richmond Avenue by protective safety barriers placed along the western curblineline. Modifications within Richmond Avenue include installation of new traffic signals, adjusting drainage and modifying striping, and are expected to take from 1-2 months at each location, with work disruptive to traffic operations undertaken at night;

CUMULATIVE TOTAL ACTIVITY

Based on the above projections of activity, Tables 20-6 and 20-7 present the cumulative totals for construction truck and employee activity during the park road construction periods.

Table 20-6
Assessment of Construction Activity: Modified Landfill Cover and Road Construction

Road Element (Assumes 4-lane park road and up to two miles of road construction)	Estimated Volume of Material (Cubic Yards) Per Year	Total Truckloads Per Year	Truck Loads/Deliveries Per Day	Truck Deliveries Per Hour (Assumes average 8-hour work day)
Embankment				
Modified Cover (2011) Engineered soils beneath road	60,000	3,000 (Assumes 20 CY per truck)	20 (Assumes 160 delivery days per year)	3-5
Embankment and Asphalt Courses				
Proposed Roads--Gravel embankment (Assumes 1 foot thick throughout)	24,000 cubic yards	1,000-1,500 (Assumes 20 CY per truck)	15-25 (Assumes concentrated 60 delivery days per year)	2-4
Asphalt Courses	20,000 cubic yards	1,000-1,200 (Assumes 20 CY per truck)	30-40 (Assumes concentrated 30 delivery days per year)	4-5
Viaduct/Box Culvert Construction				
2036 Forest Hill Road Connections Viaduct (Assumes 2 years of construction)	N.A.	120-150	8-10	1-2
2036 Richmond Hill Road Connection Viaduct (Assumes 2 years of construction)	N.A.	120-150	8-10	1-2
Note: Work progression would be generally scheduled to have sequential rather than concurrent deliveries of embankment and asphalt course materials. Delivery of bridge construction materials would be sporadic. Source: Fresh Kills Park Development Team, January 2009.				

Table 20-7
Average Daily Construction Activity

Project Element	Total Average Workers per Day	Total Average Trucks per Day
Park Roads	20-40	50-70
Note: Assumptions for park roads and park features are for the more intensive periods of construction.		
Source: Fresh Kills Park Development Team, January 2009.		

PROTECTION OF DSNY INFRASTRUCTURE DURING CONSTRUCTION¹

Construction of the 2011 road embankment would be performed by a contractor familiar with landfill construction who is under contract to DSNY. The contractor would be responsible installing the landfill final cover system including various components of the landfill gas system and stormwater management system. The contractor will employ care when working around existing infrastructure.

During 2016 and 2036 Build years, the proposed park roads would be built on a landfill and which contains extensive infrastructure that is in-place to protect the surrounding environment and public health. As a result, during construction of the park road elements, the protection of landfill infrastructure is essential and would be accomplished through multiple means, including training and, as necessary, use of physical barriers or protections. Among the general principles that would be part of the project plan for protecting landfill infrastructure are the following:

- Pre-construction contractor education and training that addresses identification of landfill above and below grade infrastructure that roads contractor must be aware of ;
- 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;
- For construction that would come in close proximity to critical landfill infrastructure, trained personnel would provide field monitoring of the construction activities to document any potential effects to the infrastructure; and
- Observations of the construction activities and any monitoring results will be recorded.

As project design moves forward, it is expected that additional measures would become part of the project’s construction protection program and contained within the capital project design drawings. All designs would also be subject to the review and approval of DSNY and DEC prior to construction.

C. POTENTIAL CONSTRUCTION PERIOD IMPACTS OF THE PROPOSED PROJECT

INTRODUCTION

The analysis below 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

¹ A detailed discussion of protection measures is also provided in Chapter 23, “Impact Avoidance Measures and Mitigation.”

Connection; and 3) Forest Hill Road and Richmond Hill Road Connections. Where separate analyses are necessary for each scenario, they are presented below.

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. As shown in Figure 20-5, 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.

As described above, 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. As described in greater detail later in this chapter, 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 described in Chapter 23, “Impact Avoidance Measures and Mitigation.” These mitigation measures are to be instituted prior to construction, but can also be 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

Overview

As summarized above and described in greater detail in Chapter 1 “Project Description,” the proposed project would create the proposed park roads, as well as a large new open space with significant cultural, recreational and environmental amenities while at the same time protecting and enhancing aquatic and terrestrial landscapes. The habitat enhancement elements could include enhancement and/or expansion of the existing freshwater wetlands, with possible creation of additional wetlands within certain existing stormwater management basins as part of mitigation.

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;

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- 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

In typical construction activities, short-term construction impacts to wildlife can include loss of habitat due to staging areas for construction equipment and work sites, habitat degradation due to partial removal of necessary substrate for wildlife activity (i.e., non-permanent removal or damage of vegetation as a result of a temporary project, such as tree trimming or temporary blocking of a drainageway to limit stormwater runoff), wildlife avoidance of construction sites due to noise, human disturbance, lighting, and other construction period factors that cause habitats to be unsuitable. 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. These protection zones would be flagged and staked in the field by a professional (i.e., certified/registered arborist for trees, and by a horticulturist or botanist for wetlands and other sensitive plant communities), and identified on all construction drawings along with notes indicating activities allowed and prohibited within each protection zone.

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. Maintaining existing mature trees provides benefits in temperature reduction (via shading,

evapotranspiration potential, air quality improvements) and aesthetic value to park visitors that could take decades to restore through reforestation programs.

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. Typical minimum operating standards include: (i) performing waste operations within a limited area that can be easily managed; (ii) diverting stormwater runoff away from 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.

Liquid that does percolate into the waste mass migrates through the waste along the path of highest permeability until it reaches the base of the landfill. At Fresh Kills, the base of the landfill is a natural low permeability soil layer that impedes the downward migration of liquid. Around the perimeter of the landfill a high-permeability gravel drain is used to collect leachate from the waste mass. The gravel drain is continuously pumped and the collected leachate is transported and processed at the on-site leachate treatment plant. The leachate collection and treatment system at the site was design and installed as approved by NYSDEC under the Fresh Kills Consent Order. The system has been in operation for over ten years and has continually operated within the parameters established as part of the approved design. During this time period the site has been in a state of intermediate closure (i.e., a soil cover is in place over the waste and cover slopes provide positive drainage), which is expected to have a higher percolation rate than following application of the engineered final cover system.

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.

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In addition, cutting and filling would be necessary for the proposed road segments off Landfill Section 6/7. Total cut and fill quantities under the proposed project are presented below in Tables 20-8a and 20-8b for both the overall project and for the off landfill road segments. (These tables show volumes of cut and fill compared to the Alternative Final Cover grades developed by Geosyntec, May 2009. Achieving the Alternative Final Cover system grades would require cutting and filling of material on Landfill Section 6/7 that is not included in the volumes shown in these tables. See Chapter 13, "Infrastructure.")

Table 20-8a
Cut and Fill Quantities for Road Options
(Overall)

Road Option	Cut (cubic yards)	Fill (cubic yards)	Net
Yukon Connection (2 lane road)	11,955	24,110	12,155
Yukon Connection (4 lane road)	15,125	35,180	20,055
Richmond Hill Road Connection (4 lane road)	18,535	87,405	68,870
Richmond Hill Road Connection (2 lane road)	16,230	70,559	54,230
Forest Hill Road Connection (4 lane road)	24,400	37,400	13,000
Forest Hill Road Connection (2 lane road)	17,010	27,495	10,485
Source: HDR, May 2009.			

Table 20-8b
Cut and Fill Quantities for Road Options
(off Landfill Section 6/7)

Road Option	Cut (cubic yards)	Fill (cubic yards)	Net
Yukon Connection (2 lane road)	3,345	2,040	-1,305
Yukon Connection (4 lane road)	3,785	5,685	1,900
Richmond Hill Road Connection (4 lane road)	21,265	87,405	66,140
Richmond Hill Road Connection (2 lane road)	16,320	70,550	54,230
Forest Hill Road Connection (4 lane road)	1,195	33,365	32,170
Forest Hill Road Connection (2 lane road)	970	25,175	24,205
Source: HDR, May 2009.			

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).

Development of the roads would require limited activities in the floodplain including vegetation clearing, fill for construction of embankment and surface, the viaduct and culvert installation for the Forest Hill Road and Richmond Hill Road connections, and possible construction of stormwater outlets associated with the management of stormwater runoff from the road surfaces. Stormwater runoff generated by the additional impervious surfaces of the roads would be

directed to the stormwater management system that would treat the runoff and attenuate the rate of discharge using best management practices and low impact designs. Neither the increased fill or structure nor the increased runoff from the road would affect local flood levels. As discussed above, the floodplains of the project site are primarily influenced by coastal flooding. Increased stormwater flow and the limited amount of fill and structure to construct the proposed roadways would therefore not impact the mapped floodplain at the project site or in the adjacent areas.

WETLANDS

Introduction

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 USACE for activities in waterways and wetlands. Permit applications for these would require site specific design data and would be accompanied by site specific impact analyses relative to natural resources. Applications for these permits would be reviewable by both Federal and State agencies to ensure that impacts to landscapes and wildlife are minimized or avoided to the extent feasible and that mitigation of impacts is also part of each capital project, as necessary. 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. This assessment is presented below.

Yukon Connection (2016)

Construction of the proposed two-lane Yukon Avenue Connection would not result in any direct adverse impacts to wetlands. This assessment is presented below.

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. 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. The Structure would affect about 1.3 acres of wetlands. 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 USACE 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

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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. A description of the impact of this road option on local wetlands is described in Chapter 10 “Natural Resources” and mitigation is provided in Chapter 23 “Impact Avoidance and Mitigation Measures.”

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. A description of the impact of this road option on local wetlands is described in Chapter 10 “Natural Resources” and mitigation is provided in Chapter 23 “Impact Avoidance and Mitigation Measures.”

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. A description of the impact of this road option on local wetlands is described in Chapter 10 “Natural Resources” and mitigation is provided in Chapter 23 “Impact Avoidance and Mitigation Measures.”

Yukon Avenue Connection (Two-Lane Road)

As stated above, construction of the Yukon Avenue Connection only as a two-lane road connection would not have any direct or indirect impacts on wetlands.

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. A description of the impact of this road option on local wetlands is described in Chapter 10 “Natural Resources” and mitigation is provided in Chapter 23 “Impact Avoidance and Mitigation Measures.”

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. A description of the impact of this road option on local wetlands is described in Chapter 10 “Natural Resources” and mitigation is provided in Chapter 23 “Impact Avoidance and Mitigation Measures.”

AQUATIC RESOURCES

Water Quality and Sediment Control Practices¹

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, which is described below, establishes 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. Implementation of these techniques would be ensured not only by DPR, but through the SPDES General Permit requirements (see description above), since most capital projects are expected to cover at least 1 acre. The overall objectives of the plan are as follows:

- 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 the SPDES General Permit for stormwater construction from construction activities and on subsequent amendments as well as Article 17 of the New York State Environmental 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).

Stormwater Pollution Preventions Plans (SWPPP) and Erosion and Sediment Control Plans

The New York State Department of Environmental Conservation (NYSDEC) would need to review and approve an Individual State Pollutant Discharge Elimination (SPDES) permits for stormwater discharges associated with the proposed park roads. Each permit would require the road construction project to prepare a stormwater pollution prevention plan (SWPPP) and erosion and sediment control plan (ESCP). It is expected that the 2011 modified closure plan activities would be covered under the current DSNY SPDES permit that covers the current closure construction.

The SWPPP would be implemented by the site contractor for the purposes of minimizing erosion and sediment impacts on receiving waters and natural resources associated with the project construction. A conceptual site-wide ESCP was developed to present conceptual erosion and sediment controls that may be used during construction (see FGEIS, March 2009).

These requirements include development of the SWPPP by a qualified professional (e.g., Professional Engineer, CPESC, etc.) and implementation of the plan controls at the site prior to the start of construction and continuing through construction until the site is stabilized and permanent storm water best management practices (BMPs) have been installed. The project-specific permit would be prepared in accordance with the:

¹ Conceptual Site Wide Erosion and Sediment Control Plan (ESCP), Fresh Kills Park, Geosyntec Consultants, September 28, 2007.

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- Individual SPDES Permit No. NYC-2 for Stormwater Discharge Associated with Construction Activity.
- New York State Standards and Specifications for Erosion and Sediment Control developed by the NYSDEC, dated August 2005.
- New York State Stormwater Management Design Manual developed by the NYSDEC and the Center for Watershed Protection, dated August 2003.

The project-specific SWPPP will identify the existing site's topography and how it will be altered as well as the location, details, and maintenance requirements of erosion control measures that will be used to reduce sediment and other pollution from the construction site. The SWPPP will also include the coordination of erosion controls with construction activities by a phasing and sequencing schedule.

The ESCP will include temporary and permanent structural and vegetative erosion control measures that will be used to control erosion and sedimentation for each stage of the project from clearing to finish grading.

Additional factors would include:

- Existing infrastructure (e.g., landfill gas and leachate collection systems);
- Proximity to and protection of landfill cover;
- Areas sensitive to infiltration;
- Maintaining positive drainage in channels on landfill surface; and
- **Differential settling.**

Structural erosion controls may include, but are not limited to the following.

Sediment Basins. Sediment basins are intended to intercept sediment-laden runoff and reduce the amount of sediment leaving the disturbed area by trapping and retaining sediment. A sediment basin is temporary with a controlled storm water release structure. Sediment basins may be formed by constructing a temporary barrier or dam across a drainage way or other suitable location to intercept runoff. Sediment basins should be used in combination with additional erosion and sediment controls to reduce erosion and the sediment load to the basin.

Sediment Trap. Sediment traps should be used to collect and temporarily retain storm water runoff from drainage ways, storm drain inlets, or other points of collection within a disturbed area. Sediment traps should be used to break up a drainage area into smaller sections where a larger device such as a sediment basin would be inappropriate. Sediment basins should be constructed in accordance with the details provided in Appendix B. Sediment should not be allowed to accumulate to a depth greater than 50 percent of the total sediment trap depth.

Stone and Block Inlet Protection. Inlet protection at the individual project sites may likely consist of stone and block inlet protection placed at drop or curb inlets that drain to the storm drain system. Inlets should have a drainage area of no more than one acre. This technique uses a berm of stone or stone and cement blocks to filter water prior to entering the outlet. Steps to avoid excessive ponding or slumping of aggregate into inlet should be taken.

Turbidity Barrier. A series of turbidity barriers may be installed in sediment basins to provide interior settling pools to trap and store accumulated sediment. The turbidity barriers should be inspected to ensure that they are in place and functioning and that water cannot bypass the

barrier around its sides. Should a turbidity barrier be used, accumulated sediment should be removed from the upgradient end of the barrier periodically. In some site specific instances, turbidity curtains or barriers may also be used to facilitate tidal marsh restoration.

Riprap Inlet Filter Ring. A riprap filter ring or berm may be installed around the sediment basin inlets during construction. The filter ring would function to reduce the amount of sediment entering into the sediment basin outlet pipe and ultimately into the receiving water.

Rock Outlet Protection. Rock outlet energy dissipation and protection should be utilized at culvert outfalls to reduce scour and erosion in the receiving downstream reach. Rock outlet protection commonly is constructed using rip-rap and woven geotextile. In instances where significant flows are expected, gabion baskets may provide a more appropriate stabilization technique.

Silt Fence. Standard erosion control practices consisting of silt fence may be used at the limits of work and around soil stockpiles. Silt fences should be securely installed so as to prevent sediment bypass. Silt fences should be inspected and maintained to ensure proper function.

Compost Sock. Compost socks may be used as an alternative method of perimeter control. Compost socks should be installed and maintained in accordance with the manufacturer's specifications.

Perimeter Dike/Swale. Perimeter dikes and swales may be used as an alternative method of perimeter control/stormwater conveyance for drainage areas less than two acres in size. Dikes/swales should be constructed by excavating a swale and creating a dike on the downstream side with the cut material.

Filter Berm. A filter berm may consist of rip-rap and stone and may be installed to trap sediment in storm water runoff from disturbed areas. The filter berm is a temporary control that should be inspected periodically and after major storm events to ensure it is still in place and functioning. The filter berm should be inspected for accumulated sediment.

Construction Entrances/Exits. A temporary construction entrance comprised of crushed stone may be installed at all entrances and exits to disturbed areas in order to reduce tracking of sediment onto streets and roads. The entrance should be maintained in a condition that will prevent tracking of sediment onto public streets.

Non-structural erosion controls may include, but are not limited to the following:

Dust Control. During site grading activities, mitigation measures may be implemented by the contractor as necessary to control fugitive dust. Dust control measures may include seeding, wet suppression, application of soil stabilization agents, or other measures to control dust generated by construction activities.

Dewatering Techniques. Should dewatering be required (e.g., of dredged sand for soil manufacturing), a non-woven geotextile dewater bag or prior approved equal product should be used to filter resulting dewatering discharge. The bag should be installed in accordance with the details and maintained in accordance with manufacturer's specifications.

Temporary controls for waste excavation and relocation may include, but are not limited to the following. Storm water runoff that comes in contact with exposed waste shall be treated as leachate and shall not be discharged to the storm water management system.

Temporary Perimeter Berm. During waste excavation or placement, a temporary perimeter berm should be installed down gradient of the excavation area. The perimeter berm shall be made of a low-permeable material and compacted to contain storm water runoff from the exposed waste. A temporary collection point (see below) may be installed on the upgradient side of the berm.

Temporary Collection Point. A temporary collection point may be installed on the upgradient side of temporary perimeter berm or in a low area of waste excavation to collect storm water runoff that comes in contact with exposed waste. The collection point may consist of a sump with gravel and a perforated pipe placed in the center to dewater. The dewatering should be pumped to the leachate collection system or temporary storage container and managed as leachate in accordance with the facility's leachate management procedures.

Run-on Diversion Berms. Temporary run-on diversion berms should be installed on the upgradient side of the waste excavation areas to divert storm water run-on around the waste excavation and placement area and into the storm water management system. The volume of run-on that comes in contact with the exposed waste shall be minimized.

Temporary Cover. Temporary cover may be installed over waste excavation areas that are temporarily inactive. The temporary cover should be installed to the facility's standard operating procedures and should be temporarily stabilized.

Stabilization practices will be used to control the source of sediment in combination with structural and non-structural erosion and sediment control described above. Stabilization practices reduce erosion by creating a protective cover over the soil. The root network of vegetative stabilization methods provide subsurface stabilization network in addition to the protection offered by the surface vegetation.

Erosion controls will remain in place until disturbed areas have been stabilized and vegetation has established with a minimum cover of 75 percent. Removal of the controls will be based on requirements established in the SWPPP or Individual Permit as appropriate. Controls will be inspected and maintained throughout the construction sequence for each area. Stabilization controls may include, but are not limited to the following:

Temporary Seeding and Stabilization. Denuded areas that will not be brought to final grade or on which construction will be stopped for a period of more than 14 working days (or otherwise specified by the Individual SPDES permit) should be stabilized with temporary stabilization practices. Temporary stabilization practices may include seed, mulch, track-walking, and erosion control blankets. Mulch may be used as temporary stabilization and applied to disturbed soils to reduce erosion. Temporary mulch should be applied to areas that have been seeded to facilitate vegetative establishment. Mulch may also be used to temporarily stabilize areas that cannot be seeded because of the season of the year and need for soil protection; for mud or dust control, and/or to provide protection during a period when construction or seeding cannot be done. Mulch should include organic materials such as clean, toxin-free wood fiber, paper, or straw, and should not contain plant seed heads.

Permanent Stabilization. Once work is complete in an area, the area will be permanently stabilized. In most cases, establishment of permanent vegetation is the preferred method of stabilization. Permanent stabilization for erosion and sediment control may differ from the final cover. Project specific conditions and constraints may require customized seed mixes of native vegetation that will be developed based on the specified final land use and soil characteristics of each project area. Seed should be applied through broadcasting, drilling, cultipack seeding,

hydroseeding or any combination thereof. Native vegetation planting will also include plugs, peat pots, container and ball and burlapped nursery stock. Topsoil used on-site will be tested to confirm it meets NYSDEC standards.

Rip-rap may also be used to permanently stabilize slopes where the establishment of vegetation is not feasible or appropriate (e.g., very steep slopes, stream banks with high flow). A filter fabric may also be used with rip-rap to prevent soil migration through the rip-rap.

Control of Solid Waste. As described in greater detail below, measures would also be employed in the SWPP and ESCP with respect to controlling impacts from solid waste that may be exposed during construction. These measures would include disposing of all water that has contacted exposed solid waste into the on-site leachate conveyance system; conveying water from the construction site in a closed conduit; not placing solid waste in areas of exposed surface water; compacting solid waste; applying 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 build-out 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.

Channel Protection. Another element of the SWPPP is channel protections. Stormwater conveyances such as channels and swales ultimately receive the runoff from the site. In certain cases, it may be prudent to line channels and swales with erosion-resistant materials. For example, channels with anticipated low velocities and flow rates may be lined with vegetation and temporary erosion control blankets. Channels with anticipated high velocities and flow rates may be lined with a permanent erosion-resistant lining such as rip-rap, rock, or permanent erosion control blanket

In addition to the structural techniques, discussed above, the following non-structural erosion and sediment controls and best management practices are likely to be used during park construction (see also Table 20-9).

**Table 20-9
Construction Period Water Quality Protection Measures**

Concrete Washout
Contaminated Soil Management
Debris/Waste Management
Dewatering
Dust Control
Hazardous Waste Management
Long Term Pollutant Control
Material Storage Areas
Material Use
Pesticides and Fertilizers
Portable Toilets
Secondary Containment
Spill Prevention
Stockpile Management
Vehicle and Equipment Cleaning
Vehicle and Equipment Fueling and Maintenance
Water Management
Source: Geosyntec, December 2007.

Additional Stabilization Practices. Additional stabilization practices may also be used in addition to the erosion and sediment control methods described above. These added measures would reduce erosion by creating a protective cover over the soil. This would include the vegetation cover that provides soil in addition to the protection offered by the surface vegetation. All denuded areas that would not have final cover for a period of more than 14 working days could be temporarily stabilized with temporary stabilization practices, including: seed, mulch, track-walking, and erosion control blankets. Temporary seed may include types of seed described below (see Table 20-10), which describes a customized seed mixture that could potentially be used by the project.

**Table 20-10
Temporary Seeding/Mulching Options**

Time	Seed Type	Application Rate (lbs/acre)	Application Rate (lbs/1000 ft²)
Spring, Summer, Early Fall	Rye Grass (annual or perennial)	30	0.7–1.0
Late Fall, Early Winter	Aroostook Winter Rye (cereal rye)	100	2.5
All Year	Mulch with Hay or Straw	4000	90 (2 bales)

Source: Geosyntec, December 2007.

The above seed specifications are those specified by DEC as construction period protection measures. Additional alternatives that may be considered would also be subject to DEC under the permit approval process.

Mulch may also be used as temporary stabilization and applied to disturbed soils to reduce erosion. Temporary mulch can be applied to areas that have been seeded to facilitate vegetative establishment. Mulch may also be used to temporarily stabilize areas that cannot be seeded because of the season of the year and need for soil protection.

Once construction is complete, these areas would be permanently stabilized. In most cases, efficient implementation of permanent vegetation or cover is the preferred method of stabilization.

In-Water Construction Activities

Certain elements of park construction would require activities in the water (see Tables 20-1 through 20-8). As summarized below 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 USACE 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.

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Impact Analyses

Modified Closure Plan (2011)

As stated above, a SPDES permit implementing stormwater pollution prevention, erosion and sediment control measures practices would minimize the potential for indirect adverse impacts to water quality and aquatic resources during construction of the modified closure cover.

Yukon Connection (2016)

As presented above under the general discussion of potential impacts from upland construction and wetland enhancement activities, implementation of erosion and sediment control measures included in the SWPPP would minimize indirect impacts during construction with the proposed Yukon Connection.

Completion of East Park Road System (2036)

As presented above, implementation of erosion and sediment control measures discussed above, as well as the use of silt curtains and other measures in open water areas to minimize sediment suspension during in-water construction activities (e.g., installation of viaduct supports) would minimize the potential for significant adverse impacts to water quality and aquatic resources during construction of all the proposed 2036 park road segments, all options the 2036 roadway segments. Additional protection measures would need to be implemented during the construction activities within the freshwater wetlands east of Landfill Section 6/7 to ensure that in addition to the 4.25 acres that would be directly impacted by construction of the proposed roadway, additional areas of freshwater wetland are not indirectly impacted during construction. These protection measures are described above.

As stated above, in order to avoid these indirect impacts during construction, the proposed project's environmental protection measures during construction would be implemented (see the discussion above). In addition, these long-term construction activities would be subject to the permitting review of the USACE and DEC. It would be the objective of the permitting process to minimize the impacts and require the implementation of the projects freshwater wetland improvement program.

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 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 (see Figures 10-2a and 10-7a), 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.

Competed 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

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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 have a significant impact on 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 waterbird 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. (see also Chapter 10 “Natural Resources”).

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/ALTERNATIVE FINAL COVER (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 the those being used for the on-going 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 construction. These measures are as follows:

- The work would be monitored by the construction quality assurance Quality Assurance Site Manager who would identify and resolve unsatisfactory work conditions. Work would not continue until corrective measures are implemented.
- Prevent surface and subsurface water from flowing into excavation areas with exposed waste.
- Dispose of all water that has contacted exposed solid waste into the on-site leachate conveyance system.
- 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 6-inch deep soil cover over exposed waste at the end of a work shift of waste excavation or placement.
- 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. Where this is not possible, temporary stormwater runoff controls would be implemented in accordance with the project specific SPDES permit.

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 may result in the need for planned and unplanned maintenance of environmental protection systems. The potential long-term settlement of the proposed park roads has been estimated based on recorded settlements associated with a soil stockpile constructed within and nearby the Yukon Avenue corridor during 2007 and 2008. The data which is presented in Attachment 3 to the report "Alternate Final Cover Report," Appendix B (Geosyntec, May 2009) indicates a very consistent rate of settlement over the approximately one year that monitoring data was collected. Settlement would occur regardless of whether the proposed park roads are constructed or not. Consequently, operation and maintenance for the landfill gas management system, stormwater management system or cover system would not be different with or without the roadway. 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. The following list the techniques and procedures required by Specification 02224 to minimize waste exposure related impacts during construction.

- Prevent surface water from flowing into excavations.
- Dispose of collected water into the onsite leachate collection system.
- Apply odor suppressant as may be required at the end of each shift or work day.
- Apply 6-inch thick layer of general fill soil over exposed waste at the end of each shift or day when the next shift will not begin work for more than 24 hours.
- Quality Assurance Site Manager will examine areas and conditions of waste during water relocation operations; should unsatisfactory conditions be observed the work will not resume until the conditions are corrected.

In addition to these requirements listed above, the following subsections describe additional measures that will be used to manage nuisance conditions during the alternate design construction activities.

Inclement Weather

Inclement weather such as heavy rains, snow, ice conditions, high winds, or extreme temperatures may impact on the construction operations. Additional procedures to be implemented in these conditions are as follows.

- *Heavy rains.* If heavy rain occurs during waste relocation operations, the contractor personnel will check drainage channels, culverts, and erosion and sediment control features for debris that may block water flow. This debris will be removed as necessary. Stormwater sumps may be used to collect non-waste contact runoff from areas up gradient of the work area, so that stormwater does not mix with solid waste. The non-contact water will be directed to a sediment trapping device or permanent stormwater/sediments ponds.
- *Heavy snow.* Snow accumulation may be cleared from work area, as needed, by contractor personnel.
- *Ice conditions.* If adverse weather creates dangerous icing conditions, work will cease.
- *High winds.* During periods of high winds, the extent of the waste relocation excavation area will be minimized to be reduced the possibility of blowing litter. After periods of high winds, the site will be inspected by the contractor for blown litter and the observed blown litter collected.

Litter and Debris Control

During waste relocation activities litter and debris control program will include the following.

- *Blown litter and debris* will be collected by contractor on a daily basis. Collected litter waste will be placed with other relocated waste.
- *Debris Control.* Debris that falls off of waste transportation vehicles will be picked up placed with other relocate wastes.
- *Scavenging.* No waste scavenging will be allowed.

Dust Control

A dust control program will be implemented at the facility and will include the following activities:

- To the extent practical, the contractor will use existing aggregate or stabilized haul roads for transporting relocated waste from the excavation are to the spoil area to limit the generation of dust.
- Dust will be primarily controlled through the application of water to roads, and other surfaces from which dust could be generated. A truck equipped with a portable water storage tank (water wagon) will be used periodically to dampen these surfaces as conditions warrant. Dust suppressants may also be utilized to reduce dust.
- As necessary, a power broom may also be used to remove accumulated soil from paved roadways in order to minimize dust generation.

Vector Control

Vectors such as birds, rodents, and insects can be attracted to putrescible wastes exposed during the relocation activities. The primary method for control of vectors will be:

- Application of soil cover over waste to reduce the access to putrescibles;
- Implementing good housekeeping measures during waste relocation activities to eliminate conditions that could attract vectors; and
- Limiting the working area to minimize the area of exposed waste.

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Should rodent and insects become a problem during waste relocation activities, control measures will be implemented in accordance with New York City and New York State Department of Health requirements.

Odor Control

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. Some routine measures can be implemented to limit noise problems including the following.

- Operations will be performed during working hours established for the current construction operations.
- During preconstruction hours, trucks will be queued on-site, not on State or city highways/streets, queues will be formed away from residential areas.

In accordance with Part 3601.14(p), noise levels resulting from equipment or operations will not exceed 67 decibels (A) beyond the property line during construction between 7 a.m and 10 p.m.

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. Landfill gas migration monitoring point GX-40 is located in the vicinity of the alignment but not within the roadway alignment itself. GX-40 would be flagged and protected from disturbance during construction. To mitigate the encroachment of the road over the gas vent trench, 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, in connection with placement of a gravel venting layer beneath the road, would not compromise the function of the vent trench.

For the segment of the Richmond Hill Road Connection between the base of the landfill and the Yukon Avenue Corridor, 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 and not disturbed. (These impacts are also discussed in Chapter 13, “Infrastructure.”)

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. Table 20-11 identifies some of the construction activity products that are potentially recyclable.

Table 20-11

Principal Recyclable Materials for New York City Construction Projects

The principal materials present in the NYC C& D waste stream that are currently recyclable in the New York City area include:	
Asphalt	Fluorescent Lamps
Brick	Glass
Cardboard	Land Clearing Debris
Corrugated Cardboard	Metal
Carpet	Pallets
Concrete	Roofing (asphalt)
Film Plastic	Wood
Materials that manufacturers will take back if they are installing new material include:	
Carpet	Ceiling Tile
Materials common in the C&D waste stream that could be recovered, but for which there is currently no local market/outlet include:	
Gypsum/Dry Wall (Current Outlet in Montgomery, NY)	Rigid Foam Insulation (Current Outlet in Florida)
Materials that may be salvageable before renovation or demolition begins include:	
Appliances	Office Furniture
Architectural Features	Windows/Doors
Circuit Breakers	Wood Timbers
Source: New York City Department of Design and Construction, 2005.	

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. The project site is located in southwest Staten Island and has direct access to a regional highway, the West Shore Expressway, and local access via Arthur Kill Road, Richmond Avenue and other local streets surrounding the project site. Construction of the proposed project is scheduled to begin in the mid 2009. 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. Tables 20-10 and 20-11 project the potential truck traffic

during construction. 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. Truck deliveries are expected to include:

- Engineered fill and asphalt for road construction; and
- Landscape materials for park road corridor landscaping.

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 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. Actual quantities of emission depend on the extent and nature of the clearing operations, the type of equipment employed, physical characteristics of the underlying soils, speed at which construction vehicles are operated and the fugitive dust control methods that are employed. 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

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.

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.

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. To prevent fugitive dust from becoming airborne, those measures include:

- Use of water to control dust in the construction operations and during the clearing and grading of land;
- Application of water to dirt paths, materials, stockpiles, and other surfaces that can generate airborne dust over extended periods;
- Construction of temporary roads would be built with properly sized stone or concrete equivalent over filtering material;
- Covering of open-body trucks transporting materials likely to generate airborne dust at all times when in motion;
- Paving and management of access roads to control dust; and
- Prompt removal of earth or other material from paved streets where earth or other material has been deposited by trucking or earth-moving equipment, erosion by water, or other means.

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 cited above, 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 (see also the description above under "Hazardous Materials") 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.

Concentrations of NO_x tend to be localized phenomena. Some small increase in ambient concentrations can be expected from construction delivery vehicles in the vicinity of the

Fresh Kills Park East Park Roads SEIS

construction site, emissions from the construction worker vehicles, and from construction vehicles at the site. Construction workers tend to start work early (before the AM peak hour) and finish work early (before the PM peak hour). Consequently, these vehicles should cause only a relatively small increase in the traffic and air pollutant concentrations in the area. Emissions from construction vehicles would not be a major source of CO since most equipment is diesel powered and emits relatively low amounts of CO. No violations of National Ambient Air Quality Standards (NAAQS) would occur as a result of the proposed project.

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 road base 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 by the Quality Assurance Site Manager.
- Cessation of activities if unsatisfactory conditions exist.
- Application of commercial odor suppressants at the end of each work shift or as needed based on field observations.
- 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 road base 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 dispersed 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 (see also the description above under “Hazardous Materials”). The health and safety plan includes 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 Roads: 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.

Summary

During construction of the proposed project, emissions from on-site construction equipment and on-road construction-related vehicles, and their effect on background traffic congestion could have short-term impacts on air quality. In general, most construction engines are diesel-powered, and produce relatively high levels of nitrogen oxides (NO_x) and particulate matter (PM). Construction activities also emit fugitive dust. Although diesel engines emit much lower levels of CO than gasoline engines, the stationary nature of construction emissions and the large quantity of engines could lead to elevated CO concentrations, and impacts on traffic could increase mobile source-related emissions of CO as well, although these increases are not expected to be significant. Potential measures that could be implemented to reduce short-term impacts of the proposed project include the following:

1. *Diesel Equipment Reduction.* Individual capital projects could minimize the use of diesel engines and use electric engines by operating from grid power instead, to the extent possible. This would allow the use of electric engines where practicable and could potentially eliminate some generators that would normally be needed for construction equipment.
2. *Clean Fuel.* ULSD would be used exclusively for all diesel engines throughout the project duration.
3. *Newer Equipment.* The use of newer engine models with cleaner emissions standards would reduce air emissions particularly with respect to particulate matter. While all engines undergo some decline in performance over time, newer as well as better maintained engines emit less particulate matter than their older, unregulated counterparts. Therefore, requiring the use of new equipment as well as the anticipated turnover and technological advances in construction equipment through the life of the project would reduce emissions for future projects. Use of cleaner small engines and gasoline engines would further reduce emissions.
4. *Point Source Site Selection.* In addition, to reduce the resulting concentration increments at sensitive receptors, large emissions sources and activities, such as concrete trucks and pumps, would be located away from residential buildings, schools, and playgrounds.

5. *Dust Control/Soil Erosion and Sediment Control Practices.* Each contractor would be required to implement a dust control plan that includes strict fugitive dust control plans as part of contract specifications. For example, stabilized truck exit areas would be established for washing off the wheels of all trucks that exit the project site. In addition, truck access points would be either watered as needed or, in cases where such routes would remain in the same place for an extended duration, the routes would be stabilized, covered with gravel, or temporarily paved to minimize dust. All trucks hauling loose material could also be equipped with tight fitting tailgates and covered prior to leaving the site. In addition to regular cleaning by the City, area roads adjacent to the sites should be cleaned as frequently as needed. Water sprays could be used for all excavation, demolition, and transfer of spoils to ensure that materials are dampened as necessary to avoid the suspension of dust into the air. Loose materials could be watered, stabilized with a biodegradable suppressing agent, or covered. By implementing the above, an aggressive fugitive emissions reduction program could reduce fugitive dust emissions by at least 50 percent. In addition, the soil erosion and sediment control practices presented above would have the dual benefit of providing dust suppression.
6. *Construction Vehicle Speeds and Idling.* Limiting on-site travel speeds to 5 miles per hour would 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.
7. *Odors and Methane.* 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 construction activities would result in any significant odor or methane impacts (see also the discussions in Chapter 23, “Impact Avoidance and Mitigation Measures”).

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 (see Table 20-12). 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.

Table 20-12
Noise Levels for Typical Construction Equipment

Equipment	FTA (or FHWA) Typical Noise Level (dBA) at 50 feet
Arc Welder	73
Asphalt Pavers	85
Asphalt laying equipment	85
Backhoe	80
Bulldozer	85
Compactor	80
Compressors	80
Cement Mixer	85
Concrete Pumps	82
Concrete Trucks	85
Delivery Trucks	84
Dual Hoist	85
Crane (Crawler Crane)	85
Crane (Hydraulic Crane)	85
Crane (Tower Crane)	85
Crane (Rubber Tire Crane)	83
Drill Rigs	85
Dump Trucks	84
Excavators	85
Forklift	85
Generators	82
Impact Wrenches	85
Jackhammers	85
Pavers Cutter	85
Pile driving rig	95
Rebar Bender	80
Roller	85
Saw (Chain Saw)	85
Saw (Circular Saw)	76
Saw (Table Saw)	76
Scissor Lift	85
Slurry supply system	85
Tamper	85
Trailers	85
Toweling Machine	85
Water Pumps	77

Sources: Transit Noise and Vibration Impacts Assessment, Federal Transit Administration, May 2006; and Federal Highway Administration Roadway Construction Noise Model (FHWA RCNM), 2006.

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

The *CEQR Technical Manual* states that significant noise impacts due to construction would occur “only at sensitive receptors that would be subjected to high construction noise levels for an extensive period of time.” In addition, the *CEQR Technical Manual* states that impact criteria for vehicular sources, using existing noise levels as the baseline, should be used for assessing construction impacts (see Chapter 19, “Noise,” for a description of noise measurement and sound levels).

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. The degree of potential construction noise includes:

- Noise emission level of the equipment;
- A usage factor, or percentage of time the equipment is operating;
- Distance between the equipment and the receptor;
- Topography and ground effects; and
- Shielding.

Similarly, noise levels due to construction-related traffic are a function of:

- Noise emission levels generated by the type of vehicle (e.g., auto, light-duty truck, heavy-duty truck, bus, etc.);
- Vehicle speed;
- Distance between the roadway and the receptor;
- Topography and ground effects; and
- Shielding.

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. Table 20-13 shows the vibration source levels for typical construction equipment. Table 20-14 shows typical vibration induced risk criteria. 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”).

**Table 20-13
Vibration Source Levels for Construction Equipment**

Equipment	PPV_{ref} (in/sec)	Approximate L_v (ref) (VdB)
Pile Driver (impact)	0.644	104
Pile Driver (sonic)	0.170	93
Clam Shovel drop (slurry wall)	0.202	94
Hydromill (slurry wall in rock)	0.017	75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drilling	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58
Source: <i>Transit Noise and Vibration Impact Assessment, FTA-VA-90-1003-06, May 2006.</i>		

**Table 20-14
Typical Vibration-Induced Risk Criteria for Residential Buildings^{*,**}**

Activity	Perceptible Distance (feet)	Damage Risk Distance (Feet)
Pile Driving	200	50
Pavement Breaking	150	40
Bulldozing	60	20
Heavy Truck Traffic	50	15
Jackhammers	30	10
Notes:		
* Wiss, John F. Construction Vibrations: State-of-the-Art. Journal of the Geotechnical Engineering Division, Proceedings of the American Society of Civil Engineering Division, Proceedings of the American Society of Civil Engineers, Volume 107, No. GT2, February, 1981.		
** Standard Recommended Practice for Evaluation of Transportation Related Earthborne Vibrations, ASSHTO Designation R8-81(1986).		

PUBLIC HEALTH

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.

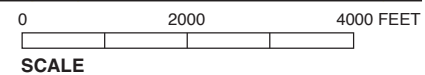
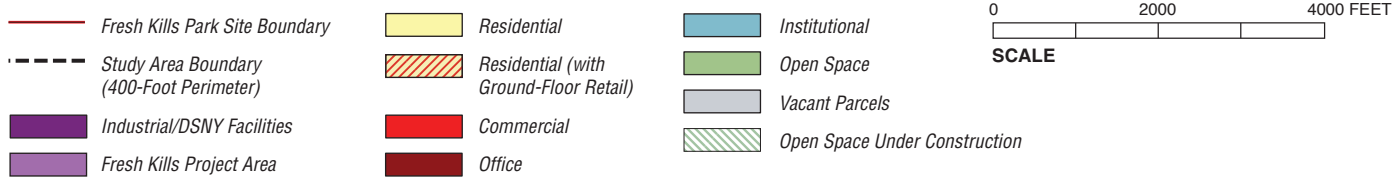
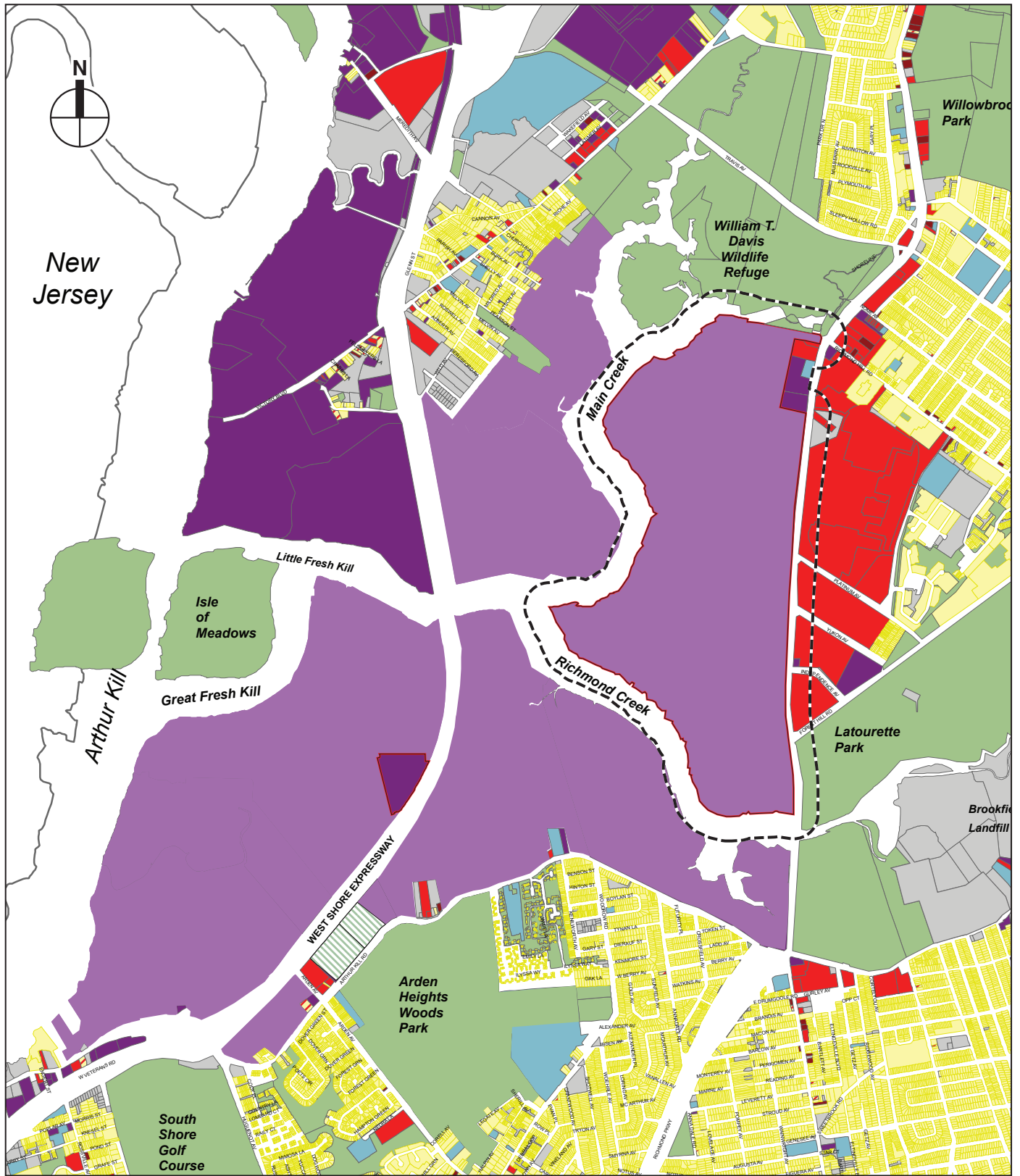
Considering that a significant reduction in percolation would occur with approximately 50 percent of Landfill Section 6/7 having an engineered final cover system in place during the 2011 build-out, it is concluded that construction activities associated with the proposed Landfill Section 6/7 Modified Closure Construction, 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. *



Land Uses Within 400 Feet of Project Construction Site
Figure 20-1