REMEDIAL WORK PLAN
FOR
GATEWAY CENTER AT BRONX TERMINAL MARKET
BRONX, NEW YORK

Prepared For:

BTM Development Partners, LLC
625 Madison Avenue
New York, New York 10022

Prepared By:

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December 16, 2005
5591006

LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES

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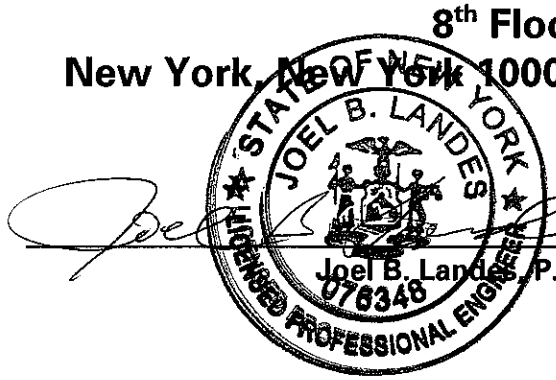

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December 16, 2005
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LIST OF ACRONYMS

µg/L	Microgram per liter
AOC	Area(s) of Concern
BCP Guide	BCP Program Guide (2004)
BCP	NYSDEC Brownfield Cleanup Program
BMPs	Best management practices
CAMP	Community Air Monitoring Plan
COC	Contaminants of Concern
DER-10	draft NYSDEC Division of Environmental Remediation Technical Guidance for Site Investigation and Remediation (2002)
EPA	United States Environmental Protection Agency
ERP	Environmental Remediation Program
mg/kg	Milligrams per kilogram
NYC	New York City
NYCRR	New York Environmental Conservation Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PER	Protection of Ecological Resources
PGW	Protection of Groundwater
PPH	Protection of Public Health
ppm	Parts per million
RAOs	Remedial Action Objectives
RAR	Remedial Action Report
RI	Remedial Investigation
RIR	Remedial Investigation Report
RSCOs	TAGM 4046 Recommended Soil Cleanup Objectives
RWP	Remedial Action Work Plan
SCGs	Standards, Criteria, and Guidance(s)
SSSCO	Site Specific Soil Cleanup Objectives
TAGM 4046	NYSDEC Technical Administrative and Guidance Manual #4046 Determination of Soil Cleanup Objectives and Cleanup Levels
TOGS 1.1.1 AWQS	NYSDEC Division of Water Technical Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (1998)
VOCs	Volatile Organic Compounds

1.0 INTRODUCTION AND PURPOSE

This Remedial Work Plan (RWP) describes the proposed remedial goals, objectives, actions, and remedial design components for the proposed Gateway Center at Bronx Terminal Market (Gateway Center). Gateway Center will be developed on property currently occupied by a portion of the Bronx Terminal Market, a food and produce market, and the Bronx Men's House of Detention (BHOD), a prison which is not currently housing an inmate population. This RWP was completed on behalf of BTM Development Partners, LLC pursuant to the Brownfield Cleanup Program Agreement between BTM Development Partners, LLC and the New York State Department of Environmental Conservation (NYSDEC) (BCP Number W2-1032-04-11, Site Number C203015).

The remedial goals, objectives, actions, and design components are, in part, based on the draft Remedial Investigation Report (RIR) that was dated and submitted to the NYSDEC (and NYSDOH) on November 7, 2005.

1.1 Site Description

1.1.1 General

The site proposed for Gateway Center (the Site) is located in the West Haven neighborhood in Bronx, New York, centered approximately at 40°49.3' north and 73°55.8' west, and is shown in Drawing 1. The Site covers 16.513 acres and, as shown in Drawing 2, is roughly bounded by:

- Ramp A of the Major Deegan Expressway on the north (just south of the Macomb's Dam Bridge and Yankee Stadium);
- River Avenue and the Metro North railroad on the east;
- East 149th Street on the south; and
- Exterior Street, with the Major Deegan elevated expressway above, on the west.

The Site and adjacent properties have a long history of commercial and industrial use.

The Site is owned by the City of New York and leased to BTM Development Partners, LLC. Construction of the existing Bronx Terminal Market buildings began in the 1920s and was completed in the mid 1970s. Site structures include four buildings and the foundation and slab of one demolished building. The foundation and slab are the remnants of a 6-story refrigerated

warehouse razed in 2004 at the direction of New York City due to safety concerns. This former warehouse, referred to as WH-1, has a footprint of approximately 106,000 square feet and is located on the northern side of the Site. The remaining four structures on the Site include:

- S-1 Building – The building has a footprint of approximately 132,700 square feet and is a warehouse on the east side of the property between River and Cromwell Avenues. The building is currently occupied by market tenants selling various foods and spices.
- BHOD – The building has a footprint of approximately 32,500 square feet and is located between River and Cromwell Avenues, to the north of S-1. The detention center is currently vacant.
- Prow Building – The building has a footprint of approximately 20,200 square feet and is located on the southern end of the Site, between Exterior Street and River Avenue. The building is currently occupied by market tenants selling produce and a café.
- Exterior Street Market Building – The building has a footprint of approximately 56,000 square feet and is located on the west side of the Site, along Exterior Street. The building is partially occupied by tenants selling various foods and spices and a refrigerated display case refurbishing business.1

1.1.2 Site Geology

Generally, the ground surface elevation (el) is 5[2] across the majority of the site, with elevations up to el 27 in the northeast corner and up to el 15 in the southeast corner. The entire site is covered with impervious surfaces such as concrete, asphalt, and cobblestone, with the exception of a small area along the northeast side of the Site, which is adjacent to the Metro North Railway.

The fill typically extends from beneath the surface cover to el 0, where it is underlain by native soil. The type of fill within the fill layer is roughly separated by the historic shoreline, which is

[1] These buildings are referred to in the Draft Environmental Impact Statement for the project, certified as complete by the Mayor's Office for Economic Development on July 7, 2005, as Buildings C, BHOD, D, and B, respectively. The WH-1 building is referred to in the DEIS as Building A.

[2] All elevations reported herein are referenced to the Borough President of Bronx Datum, which is 2.608 feet above the USGS NVGD at Sandy Hook, NJ.

shown in Drawing 3. Generally, fill to the west of the historic shoreline is "historic fill", as that term is generally used by NYSDEC and as it is defined in the proposed new regulations for 6 NYCRR Part 375. This historic fill is primarily composed of brick, asphalt, slag, concrete, wood, coal, sand, and gravel. The fill to the east of the historic shoreline is generally historic fill to three feet below the grade surface, with the remainder being general fill (to the depth of native soil) composed of sand, silt, and gravel. In the northeast portion of the Site, where the elevation is higher, the total fill layer generally rises to el 15.

On the west side of the Site the historic fill is underlain by native soil characterized by silty clay. The silty clay pinches out to the east near the historic shoreline. On the east side, the fill is generally underlain by native soil characterized as sand. Bedrock is el 0 to el -15 in the northeast corner of the Site and slopes down to the south and west to el -50 and el -65, respectively.

1.1.3 Site Hydrology

The Harlem River, approximately 500 feet to the west of the Site, is the only nearby surface water body. There are no wetlands on or immediately adjacent to the Site.

Groundwater underlying the Site was encountered at el 1 to el 2.5. Groundwater was found to flow to the southwest toward the Harlem River, based on area topography and the fifteen wells installed and sampled on the Site in 2003 and 2004. The groundwater flow direction is generally consistent with regional maps published by the U.S. Geological Survey. Groundwater in this area of New York City is not used as a potable (drinking) water source. New York City residents receive their drinking water supply from surface reservoirs located in upstate New York.

1.2 Site History

Situated on the banks of the Harlem River, the Bronx Terminal Market area was favored for recreation until the mid 18th century. In 1841, industrial development of the area began with the building of elevated railroads between Manhattan and the Bronx. According to research performed by Columbia University's Historic Preservation graduate program, it is estimated that in 1851, as part of the installation of the Harlem River Line, a large portion of the present site was filled, creating the current shoreline. The historic shoreline is shown on Drawing 3. Subsequent to filling, between 1891 and 1897, five slips and piers were constructed along the new shoreline to the west of the Site, and the waterfront block had became an industrial area occupied by coal, asphalt, and oil storage companies. In the 1930's, the area, including the Site, was designated as a market area.

Prior to the current use, the Site was used for industrial and commercial operations including rail yards; toy, photographic mounts and refrigerator manufacturing; a lumber yard; a saw mill; a NYPD motorcycle storage and/or maintenance facility; and a NYC Department of Sanitation facility. Historic and current property use, adjacent and up-gradient to the Site, includes gasoline stations, garages, and maintenance facilities with underground gasoline and oil tanks, and a Con Edison auto and machine repair garage. In addition, coal yards and an asphalt paving company were formerly located immediately to the west of the Site.

1.3 Current, Intended, and Reasonably Anticipated Site Use

Currently, site use is limited to food and spice markets in parts of the Exterior Street Market Building, the Prow Building, and the S-1 Building. Portions of the Exterior Street Market Building are vacant, and the occupancy of the BHOD is limited to a small number of maintenance personnel.

Gateway Center will include approximately 957,000 square feet of retail space and approximately 2,600 parking spaces. All portions of the site will be covered with buildings, asphalt, concrete, or a minimum of one foot of acceptable soil (herein defined as not exceeding the NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives or the draft NYSDEC 6 NYCRR Part 375 Soil Cleanup Objectives (SCOs) if determined applicable by NYSDEC and NYSDOH). A site plan showing the proposed development is provided herein as Drawing 4.

The retail space and parking garage will include four new and one refurbished structures. The new structures will vary in height between one to six stories. The current Prow building, which the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) has deemed eligible for listing on the National Register of Historic Places, will be retained and reutilized for retail development. One proposed retail building (Retail A) will incorporate the existing WH-1 foundation and floor slab. The use of the entire site will be commercial.

1.4 Summary of Environmental Conditions

Langan submitted a draft Remedial Investigation Report (RIR) to the NYSDEC and NYSDOH in November 2005. The environmental conditions documented in the RIR are summarized in this section. The purpose of the remedial investigation (RI) was to evaluate the nature and extent of contamination associated with potential areas of concern (PAOCs) that were identified in a combined Phase I and II Environmental Site Assessment (ESA) dated January 6, 2004.

Remedial investigation activities were conducted between September 27, 2004 and January 28, 2005 in accordance with a draft Remedial Investigation Work Plan (RIWP – November 2004)

and between September 21, 2005 and October 7, 2005 in accordance with the Supplemental Remedial Investigation Work Plan (SRIWP – March 2005) and Addenda No. 1 and No. 2 (July and September 2005). The RI field program included: utility clearance at each boring and well location; geophysical survey in select areas of the RI area where USTs were suspected; soil sampling from 79 direct push (Geoprobe™) soil borings; surface soil sampling at eight locations; installation of shallow monitoring wells; groundwater sampling; collection of six sub-slab and nine subsurface soil vapor samples.

The following sections describe the nature and extent of the contamination based on a comparison of the analytical data results with the NYSDEC's Technical and Administrative Guidance Memo (TAGM) 4046 Recommended Soil Cleanup Objectives (RSCOs) (Section 1.4.1 through 1.1.4) and a comparison of the data with site-specific soil cleanup objectives (Track 4 SSSCO) derived through a statistical analysis of the historic fill covering the Site (Section 1.4.5). A detailed description of the calculation of the Track 4 SSSCOs is also provided in Section 1.4.5.

1.4.1 Nature and Extent of Contamination

The contaminants of concern (COCs) were identified and delineated in the RIR are as follows:

- Soil COCs:
    - SVOCs- benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, phenanthrene, fluoranthene, and pyrene.
    - Metals- arsenic, barium, beryllium, cadmium, calcium, chromium, copper, lead, magnesium, nickel, mercury, nickel, selenium, and zinc;
    - Pesticide- heptachlor epoxide; and
    - Grossly-contaminated (petroleum) material.
- Groundwater COCs:
    - VOC- vinyl chloride;
    - SVOCs- phenol, 2,4-dimethylphenol, and naphthalene; and
    - Metals- cadmium and lead.
- Soil vapor COCs:
    - Methane; and
    - VOCs- 1,1,1-trichlorthane (TCA) and tetrachloroethene (PCE).

Detailed descriptions of the impacted material types and associated analytical results are found in the RIR.

1.4.1.1 Soil

Historic Fill

The historic fill layer was identified through soil classification in the field. 93 SVOC samples and between 82 and 101 metal samples (depending on the specific metal) were collected from the soil borings. Generally, the fill layer was composed of brick, asphalt, slag, concrete, wood, coal, sand, and gravel. This fill layer covered the entire site at a depth that varied from 2 to 32 feet below grade surface (bgs). Analytical sampling of the historic fill showed exceedances of TAGM RSCOs of SVOCs and metals, at levels commonly detected in historic fill. The following is a summary of the analytical results of the historic fill samples. All historic fill samples exceeded one or more individual RSCO.

SVOCs

No individual sample exhibited a total SVOC concentration above the TAGM RSCOs. However, individual SVOC concentrations above the RSCOs included benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, phenanthrene, fluoranthene, and pyrene. All of the listed compounds are carcinogenic polynuclear aromatic hydrocarbons (cPAHs) with the exception of fluoranthene and pyrene.

VOCs

No VOC concentrations above the RSCO were detected. One VOC, acetone, was detected in the soil sample at MW-9 (5.5 to 7.5 feet bgs) at a concentration exceeding the TAGM RSCO for this compound. Acetone is likely due to field decontamination procedures.

Metals

Metal concentrations above the RSCOs included arsenic, barium, beryllium, cadmium, calcium, chromium, copper, lead, magnesium, mercury, nickel, selenium, and zinc. Areas of atypical concentrations of lead and mercury are discussed separately below.

Grossly-Contaminated (Petroleum) Fill and Soil

Grossly-contaminated fill and soil were found in eight delineated areas, designated as Area's P1 through P8 on Drawing 3. These areas were delineated by visual and olfactory evidence and instrumental field screening using a photo ionization detector (PID). Grossly contaminated material was identified in 19 borings. The COCs found in the grossly contaminated soil areas were essentially the same as in the historic fill. The extent of the grossly contaminated areas is described below.

- **Area P1**: includes boring locations B1/OW and MW-8, and has an area of approximately 17,000 square-feet, with an estimated thickness of eight feet (el 8 to el 0). Area P1 contamination is potentially associated with PAOC-2 and the historic UST thought to be located under the Prow Building. PAOCs are shown on Drawing 6 in the RIR.

- **Area P2:** includes boring locations GB0307 and GB0307A, and has an area of approximately 5,000 square-feet, with an estimated thickness of six feet (el 6.5 to el 0.5). Area P2 contamination is potentially associated with PAOC-3 and a historic UST under the Exterior Street sidewalk on the south side of the Exterior Street Market Building.

- **Area P3:** includes boring location GB0602, and has an area of approximately 12,000 square-feet, with an estimated thickness of six feet (el 5 to el -1). Area P3 contamination is potentially associated with PAOC-6 and closed-in-place UST(s) under the east side of the S-1 Building slab.

- **Area P4:** includes boring locations GB0706 and GB0708, and has an area of approximately 7,000 square-feet, with an estimated thickness of three feet (el 4.5 to el 1.5). Area P4 contamination is potentially associated with PAOC-7 and former USTs located in the southwest corner of the BHOD property.

- **Area P5:** includes boring location GB1114, and has an area of approximately 9,000 square-feet, with an estimated thickness of five feet (el 5 to el 0). Area P5 contamination is potentially associated with PAOC-11 and former railway operations.

- **Area P6**: includes boring location MW-13, and has an area of approximately 11,000 square-feet, with an estimated thickness of 2 feet (el 1 to el -1). Area P6 contamination is potentially associated with PAOC-3 and market operations.

- **Area P7:** includes boring locations GB1108, GB1109, GB1111, and GB1112, and has an area of approximately 35,000 square-feet, with an estimated thickness of four feet (el 4.5 to el -0.5). Area P7 contamination is potentially associated with PAOC-11 and railway operations.

- **Area P8:** includes boring locations GB1001, GB1002, GB1008, GB1009, and GB1011, and has an area of approximately 35,000 square-feet, with an estimated thickness of 2 feet (el 3 to el 1). Area P8 contamination is potentially associated with PAOC-10 and operations at building WH-1 including the use of an AST.

Atypical Lead and Mercury

Four areas with atypical levels of lead, mercury or both were identified during the RI and delineated. The locations of these areas and their associated potential sources are listed below. The locations and delineations are also shown on Drawing 3.

- **Area M1:** Mercury Delineation surrounding GB0706

  Two delineation borings (GB0709 and GB0713) were completed immediately to the north and west of GB0706. Delineation borings were not necessary to the south due to the presence of a subsurface wall, or to the east due to a recent excavation to install several new USTs. A sample was collected at each location from 4 to 4.5 feet bgs and analyzed for mercury. The analytical results showed a drop in mercury concentrations in both samples. At GB0713 mercury was detected slightly above the RSCO. At GB0709 mercury concentrations were slightly higher than at GB0713.

  Area M1 includes boring locations GB0706 and GB0709, and totals an area of approximately 2,000 square-feet, with an estimated thickness of 3 feet (el 4.5 to el 1.5). Area M1 contamination is potentially associated with PAOC-7 and historic BHOD operations including the operation of a motorcycle repair and/or storage facility.

- **Area M2:** Mercury Delineation surrounding GB0704

  Three delineation borings (GB0710, GB0711 and GB0712) were completed in locations surrounding GB0704. A sample was collected at each location from 1 to 3 feet bgs and analyzed for mercury. The analytical results showed a drop in mercury concentration in the three samples, with mercury detected slightly above the RSCO value at GB0710, GB0711, and GB0712.

Area M2 includes boring location GB0704, and totals an area of approximately 500 square-feet, with an estimated thickness of 4 feet (el 26 to el 22). Area M2 contamination is potentially associated with PAOC-7 and historic BHOD operations including the operation of a motorcycle repair and storage facility.

- **Area M3:** Surface Characterization Soil Samples

  Six out of ten surface characterization soil samples collected from two to six inches bgs showed atypical lead concentrations greater than the RSCO value. The sample locations were all located along the northeast perimeter of the Site, shared with the Metro North railway. Soil samples from other borings in the area (MW-15, MW-17) indicate that the lead-contaminated soil is confined to the exposed surficial area adjacent to the northeast perimeter of the Site.

  Area M3 includes boring locations GB1118, GB1120 through GB1122 and GB1124, extends approximately 35 feet into the site along the northeast perimeter, and totals an area of approximately 20,000 square feet, with an estimated thickness of 1 foot (el 5.5 to el 4.5). Area M3 contamination is potentially associated with PAOC-11, the Metro-North Railway (lead paint on the cars), and illegal dumping and debris along the Railway.

- **Area M4:** Mercury and Lead Delineation surrounding GB0101 and B4

  Five delineation borings (GB0104, GB0105, GB0106, GB0107, and GB0108) were completed in the vicinity of GB0101 and B4 to delineate Area M4. At each boring, samples were collected at two depths; a shallow sample from 2 to 5 feet bgs and a deep sample from 7 to 8.5 feet bgs. All samples were analyzed for mercury and lead. The analytical results showed lower lead and mercury concentrations in all delineation samples relative to the concentrations found in GB0101 and B4. All samples except for GB0104 (2.5 to 3.5 feet bgs) and GB0107 (8 to 8.5 feet bgs) showed lead and mercury concentrations slight above their RSCO. The highest concentrations of lead and mercury were detected in GB0106 (2.5 to 3.5 feet bgs).

  Area M4 is divided into a deep atypical metals contamination area from 7 to 8.5 feet bgs, and a shallow atypical metals contamination area from 2 to 5 feet bgs. The shallow section of Area M4 includes boring locations GB0101, GB0106, and B4, and totals an area of approximately 4,000 square feet, with an estimated thickness of 4

feet (el 4 to el 0). The deep section of Area M4 includes boring location GB0101 and totals an area of approximately 500 square feet, with an estimated thickness of 7 feet (el 4 to el -3). Potential sources of contamination at Area M4 are PAOC-1 and former railway traffic and refrigerated warehouse (WH-1) operations.

1.4.1.2 Groundwater

Two rounds of groundwater samples were collected from up to 19 monitoring wells. The well locations are shown in the RIR, Drawing 5. Groundwater quality results indicate that compounds commonly found in brackish water such as iron, magnesium, manganese, and sodium were found in most of the groundwater samples. Other than these compounds, the results indicate that the Site's groundwater is, in general, not impacted above NYSDEC Ambient Water Quality Standard (AWQS). Notable exceptions are:

MW-13 (a downgradient property line well)

The following was found during in both rounds of sampling.

- VOCs: acetone, methylene chloride, 2-butanone (MEK), benzene, toluene, ethylbenzene, styrene, and total xylenes.
- SVOCs: phenol, 2,4-dimethylphenol, and naphthalene.
- Metal: cadmium.

All VOC and SVOC concentrations decreased from the 2004 to 2005 sampling events in MW-13. The acetone exceedance that was found in one well was noted in the RIR to be likely due to field decontamination procedures. It is likely that the VOCs and SVOCs detected in MW-13 are due to the petroleum contaminated soil found in area P6. MW-13 is at the western boundary of the Site. Downgradient and off-site from MW-13 is Exterior Street, additional BTM market buildings and the Harlem River. Analysis of the fate and effects of these compounds indicate that there is no potential for impact to public health or the environment. The fate and effects analysis is detailed in Section 6.1 of the RIR.

MW-17 (an upgradient well)

One VOC, vinyl chloride, was detected.

MW-8

One metal, lead, was detected during both rounds of sampling.

MW-11

One pesticide, Beta-BHC, was detected in the first round of sampling but not in the second round.

MW -14

One metal, lead, was detected in the first round of sampling but not in the second.

MW-15

One PCB, Aroclor 1260, was detected in the first round but not in the second round.

1.4.1.3 Soil Vapor

Generally, two types of soil vapor impacts were identified; naturally-occurring methane and VOCs. Methane is a naturally-occurring subsurface gas that is an asphyxiant and combustible. There are no workplace limits or residential standards for methane in air. Most soil vapor samples contained methane concentrations significantly below one percent but, in SG-9, south of the Exterior Street Market Building, methane levels were found at 15 percent (a potentially explosive concentration). Methane is formed by the anaerobic decomposition of organic material and is commonly found in sewers. We suspect that the highest concentrations are related to the decomposition of sewage or another type of concentrated organic material. The lower concentrations are likely due to the organic sediments found beneath the fill over the historic natural shoreline.

VOC results were compared to the draft NYSDOH Guidance for Evaluating Soil Vapor Intrusion (February 2005). Sub-slab guidance values, derived from matrices developed by the NYSDOH, are contained in the guidance document for tetrachloroethene (PCE), trichloroethene (TCE), and 111- trichloroethane (111-TCA).

TCE was not detected in the soil vapor samples. 1,1,1-TCA was detected at SG-2 and SG-5 at concentrations below the guidance thresholds for further action. PCE was detected in SG-5 slightly above its threshold. The sample from SG-5 was collected beneath the River Avenue sidewalk and adjacent to the proposed Retail B Building. The concentrations of 1,1,1-TCA and PCE do not warrant further action because Retail B will be constructed with a parking garage on the ground floor. The parking level will be independently ventilated per NYC building code requirements.

The source of these soil vapors is unknown. PCE was not detected in any of the soil or groundwater samples collected and there are no suspected historic uses of this solvent. Vinyl chloride, a product of the breakdown of PCE and other chlorinated compounds, was detected in upgradient monitoring well MW-17, indicating a potential source of chlorinated compounds upgradient of the Site. Other non-chlorinated VOC constituents were detected in some of the soil vapor samples, but there are no chemical-specific standards for these constituents to compare to the soil vapor analytical results.

1.4.2 Statistically-Derived Nature and Extent of Contamination

Statistics were used to determine source areas (atypical concentrations of COCs) at the Site that would warrant removal under a NYSDEC Track 4 (described in the draft NYSDEC Brownfield Cleanup Program Guide and 6 NYCRR Part 375) remediation scenario. Under the Track 4 scenario, the protection of human health and the environment will be mitigated through the use of long-term, maintained institutional and engineering controls. One example of these controls would be the installation and maintenance of a continuous site cap consisting of buildings, asphalt, concrete, or a minimum of one feet of acceptable soil. All institutional and engineering controls under the Track 4 scenario are described in Sections 2.4.7 and 2.4.8.

In order to determine the nature of atypical concentrations of contaminants of concern (COC) or source areas in the Site historic fill, a statistical evaluation was performed on the metal COCs (lead, mercury) and the SVOC COCs (Phenanthrene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenzo(a,h)anthracene). This statistical evaluation was used to determine the Track 4 SSSCOs for Remediation Alternative II proposed in Section 2.4. The resulting Track 4 SSSCOs alters the extent of the RIR's estimated impact areas. A discussion of how the extent differs follows the derivation of the Track 4 SSSCOs.

1.4.2.1 Statistical Derivation of Track 4 SSSCOs

General statistics of the historic fill's TAGM 4046's exceedances were presented in the RIR. The general historic fill statistics included the minimum value, maximum value, mean, median, standard deviation, coefficient of variation, skewness, and variance. One hundred seven SVOC samples and between 82 and 101 metal samples (depending on the specific metal) were used for the statistical analysis of the historic fill material; defined as the sample set. Quality control samples and samples where petroleum contamination was observed were excluded from the sample set.

To determine the distribution type of the COCs, a goodness-of-fit test was performed for each analyte in the sample set. The Lilliefors Test[3] was used as the goodness-of-fit test, given that the size of the sample set was greater than 50. The test showed that the majority of the COCs followed a lognormal distribution, with the remainder of the samples failing the test by a small

[3] The Lilliefors Test computation was performed using the U.S. Environmental Protection Agency's ProUCL 3.0 software in accordance with the April 2004 User Guide.

margin, more than likely due to sample values below the method detection limit (MDL). The results of the Lilliefors Tests are included in Appendix A. The standard practice for sample values below the MDL is to reduce the MDL by half and input that value into the statistical analysis. The lack of actual historic fill values at the lower end of the data set could cause an irregularity that would cause the Lilliefors Test to determine that the data set was not lognormal.

To determine the Track 4 SSSCO or the upper limit value that represents historic fill quality typical of the Site, two methodologies were used; calculation of the value at which approximately 95 percent of the values are contained (mean plus two standard deviations), and analysis of a histogram for each COC. For the first methodology, the mean for each COC was added to a value equal to twice the standard deviation of the corresponding COC. This value provides the upper limit of the interval within which approximately 95 percent of the sample values are contained. The remaining five percent of the samples are considered not representative of the sample set or the historic fill and could be considered source areas that require remediation as part of this development. The upper limit value for the historic fill for each COC is also used as the Track 4 SSSCO. A summary of the TAGM 4046 exceedances of the historic fill as well as the statistically-derived Track 4 SSSCOs are shown in Table 1. Table 2 shows a comparison of the Track 4 SSSCOs with TAGM 4046, Track 1, and Track 2 SCOs (described in NYSDEC draft 6 NYCRR Part 375).

To confirm that the calculated values coincided with natural breaks in the data, the second methodology is a histogram generated for each COC. Natural breaks in the data set indicate that particular values above the natural break are not representative of the data set (historic fill) and could be considered a source area to be remediated. The histogram is a graphical methodology for displaying the magnitudes of frequencies of the sample analytical results for each COC. The histograms were generated as bar graphs fit to 50 graph bins uniform in size. Generally, the histograms show that the statistically-derived Track 4 SSSCOs for each COC coincide with a natural break in the analytical data set. Histograms for each COC are provided in Appendix A.

1.4.2.2 Track 4 Remediation Areas

In redefining areas of "atypical" contamination as those areas exhibiting levels of COCs above the Track 4 SSSCOs, the location and extent of some atypical metal-contaminated areas previously identified as M-1 through M-4 in the RIR were altered, and several atypical SVOC areas were identified. The RIR-identified petroleum areas (Areas P1 through P8) remain unchanged. For continuity, the M-# notation for atypical metals-contaminated areas has been converted to the A-# notation for atypical (exceeding the Track 4 SSSCOs) metals- and SVOC-

contaminated areas. The bulleted list below describes the changes and additions to the remediation areas based on the Track 4 SSSCOs. A map showing the remediation areas based on delineation in accordance with the calculated Track 4 SSSCOs is provided as Drawing 5.

Altered Areas

- **RIR Area M-1 (Renamed Area A-1):** The area has reduced in size, because the delineation boring (GB0709) defining the northern side of the excavation was found to have a value below the calculated Track 4 SSSCO for mercury.

- **RIR Area M-2 (Renamed Area A-2):** The area remains the same size. Comparison of the results to the Track 4 SSSCOs found that in addition to a mercury exceedance, the sample exceeds for indeno(1,2,3-cd)pyrene. Final delineation for the additional exceedance will be performed during the remediation.

- **RIR Area M-3 (Renamed Area A-3):** Comparison of the mercury and lead values to the Track 4 SSSCOs found that all samples in this area are below the SSSCOs. Comparison of the SSSCOs to the SVOC results found benzo(b)fluoranthene exceeds the SSSCO in one sample from boring GB1120. As a result, the Area A-3 remediation area has been reduced to an approximately 2,000 square foot remediation area centered on boring GB1120, based on the delineation provided by borings GB1119 and GB1121.

- **RIR Area M-4 (Renamed Area A-4):** The nature and extent of the remediation area remains unchanged.

Additional Areas

- **Area A-5**: Comparison of the analytical results from a boring GB0205 sample to the SSSCOs found several SVOC exceedances from approximately 0 to 3 feet bgs. The new remediation area has an approximate square footage of 1,200 feet roughly centered on boring GB0205, based on the abutment with Remediation Areas P-1 and B-3 and delineation borings GB0202 and GB0601.

- **Area A-6**: Comparison of the analytical results from a boring GB0618 sample to the SSSCOs found several SVOC exceedances from approximately 9 to 11 feet bgs. The new remediation area has an approximate square footage of 4,400 square feet roughly centered on boring GB0618, based on delineation borings GB0604 and GB0610. The area is within the delineation area estimated in the RIR for grossly contaminated Area P-3 that is approximately centered on GB0602.

- **Area A-7**: Comparison of the analytical results from a boring GB0617 sample to the SSSCOs found several SVOC exceedances from 2 to 4 feet bgs. The new remediation area has an approximate square footage of 7,000 feet centered on boring GB0617, based on delineation borings GB0605, GB0606, GB0607, and GB0616.

1.5 Exposure and Risk Assessment

A human health and wildlife exposure and risk assessment was completed for the draft RIR, and its conclusions for the Site's current configuration and use are summarized here.

Soil throughout the Site has primarily been contaminated with petroleum, various SVOCs and the metals lead and mercury. Where the site is not currently covered with concrete, asphalt, or cobblestone, the potential for human exposure is present. There is also a potential for exposure to occur during construction activities. The proposed development will result in capping the entire site with structures, concrete, asphalt, or one foot of soil acceptable to the NYSDEC and NYSDOH in the minimal areas of landscaping. There will be no potential for exposure under future development conditions.

Groundwater at the Site has been contaminated with various SVOCs and metals. The VOC and SVOC COCs are localized at monitoring well MW-13 along the western boundary of the Site. The metal COCs are generally found throughout the Site. Under current and future conditions, there is no potential for human exposure to groundwater COCs. During foundation construction, due to the potential for dewatering, there is potential for exposure to construction workers. An analysis of groundwater transport and fate (EPA BIOSCREEN model) indicates that the COCs will decay before reaching the river or off-site structures. Therefore, the SVOC COCs are not expected to reach a surface water body to potentially complete an exposure pathway.

Soil vapor samples were collected from beneath the existing and proposed Site buildings. Soil vapor results indicated the presence of several VOCs and methane in the soil vapor. However, no COCs were detected in locations where future retail spaces would be in direct contact with soil vapors containing COCs.

2.0 REMEDIAL ALTERNATIVE ANALYSIS

Two remediation concepts that conform to the Site's remedial goals and action objectives are evaluated in accordance with the NYSDEC Brownfield Cleanup Guide (draft 2004), DER-10 (draft 2002), and 6 NYCRR Part 375 ERP (draft 2005). Alternative I evaluates a BCP unrestricted Track 1 concept and is described in Section 2.3. Alternative II evaluates a BCP restricted Track 4 concept and is described in Section 2.4.

2.1 Remedial Goals and Remedial Action Objectives

In accordance with DER-10 and ECL § 27-1415, the goal for the remedial action is to be protective of public health and the environment, provided that the Site is developed into a new retail complex. In addition, where identifiable sources of contamination are found on site, the sources should be removed or eliminated to the greatest extent feasible, regardless of presumed risk or intended use of the site.

Also in accordance with DER-10, the Remedial Action Objectives (RAOs) for this Site are defined as medium-specific objectives for the protection of public health and the environment and are developed based on contaminant-specific standards, criteria, and guidance (SCGs). The SCGs for the Site include:

- NYSDEC – Brownfield Cleanup Program Guide (draft 2004);
- NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation (where applicable) (draft 2002);
- NYSDEC TAGM No. 4031– Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Waste Sites (1989)
- NYSDEC TOGS 1.1.1 – Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (1998);
- NYSDEC TOGS 5.1.8 – Stormwater Management Guidelines for New Development (1990);
- NYSDEC TOGS 5.1.10 – Erosion and Sediment Control Guidelines for New Development (1991);
- NYSDEC Memorandum – Permanent Closure of Petroleum Storage Tanks (modified 2003);

- NYSDOH – Guidance for Evaluating Soil Vapor Intrusions in the State of New York (draft 2005);
- New York State Codes Rules and Regulations (NYCRR) Title 6 Part 364 – Waste Transporter Permits;
- 6 NYCRR Part 370 – Hazardous Waste Management System;
- 6 NYCRR Part 375 – Environmental Remediation Program (proposed November 2005);
- 6 NYCRR Part 376 – Land Disposal Restrictions;
- 6 NYCRR 613.9(b) – Closure of Tanks Permanently Out-of-Service;
- 6 NYCRR Part 750 – State Pollutant Discharge Elimination System (SPDES) Regulations
- Code of Federal Regulations (CFR) Title 29 Part 1910.120 Hazardous Waste Operations and Emergency Response Standard; and,
- CFR Title 29 Part 1926 Safety and Health Regulations for Construction.

In addition to the SCGs that are listed above, the RAOs were developed from information derived in the RIR, including identified contaminated media and potential public health and environmental exposure pathways, which were summarized in Section 1.4 and 1.5, and detailed in the RIR. The RAOs for this RWP are the following:

- For Public Health Protection
    a. Prevent ingestion and direct contact with contaminated soil.
    b. Prevent contact with or inhalation of volatiles from contaminated groundwater.
    c. Prevent inhalation of or exposure from contaminants volatilizing from contaminated soil.
- For Environmental Protection
    a. Prevent impacts to biota from ingestion and direct contact with the contaminated soil.

b. Remove to the greatest extent feasible the identified petroleum-impacted and atypical metals-and SVOC-impacted soil sources of groundwater contamination.

SSSCOs were chosen for the grossly contaminated soils and the lead- and mercury-contaminated soils. Grossly contaminated soils will be identified and delineated during remediation by visual, olfactory, and instrumental observations, with the final remediation delineation confirmed by analytical sampling. Removal of the grossly contaminated material may be restricted by structural or groundwater limitations that are described in the proposed remedy. The SCOs for lead, mercury, and SVOCs are TRACK 1 SCOs for the Alternative I analysis, and Track 4 SSSCOs outlined in Section 1.4.5 for the Alternative II analysis. Alternative I and II are described in detail in the following sections.

2.2 Development and Analysis of Alternatives

Two alternatives are considered to achieve the remedial goals and remedial action objectives that are defined in Section 2.1. The two alternatives are:

- Alternative I – Unrestricted Use

  a. Includes the removal of all fill and soil exceeding the Track 1 – Unrestricted Use SCOs, remediation of the groundwater to asymptotic levels that are protective of human health and the environment, remediation of all source material causing elevated methane levels, and the removal of the Site USTs.

  b. Per ECL § 27-1415, alternative I does not allow restrictions on the use of the site (e.g. commercial, industrial), and does not allow the reliance on long-term institutional or engineering controls.

- Alternative II – Restricted Commercial Use

  a. Includes the removal of all fill and soil exceeding the calculated Track 4 SSSCOs presented in Section 1.4.5, remediation of grossly contaminated soil and site source areas causing groundwater to be impacted with VOCs and SVOCs, removal and mitigation of elevated methane levels, and the removal of the Site USTs, along with any required remediation of the surrounding soils.

Following a detailed description of each alternative in the next two sections, the two alternatives are evaluated against NYSDEC BCP remedy evaluation criteria listed below.

A. Protection of Human Health and Environment
B. Standards, Criteria, and Guidance (SCG);
C. Short-Term Effectiveness and Permanence;
D. Long-Term Effectiveness and Permanence;
E. Reduction of Toxicity, Mobility, or Volume;
F. Implementability
G. Cost Effectiveness
H. Community Acceptance
I. Land Use

2.3 Alternative I: Unrestricted Use

Achieving a Track 1 unrestrictive-use status for the site will require the remediation of all contaminated soil that exceeds the NYSDEC TAGM 4046 RSCOs or the draft NYSDEC 6 NYCRR Part 375 Track 1 Soil Cleanup Objectives (RSCOs) if determined applicable by NYSDEC and NYSDOH. The only long-term institutional or engineering control that may be considered is a groundwater-use restriction placed upon the site. This may be considered if the groundwater contamination has been reduced to asymptotic levels that are protective of health and the environment, and all contaminated soil has been remediated.

2.3.1 Alternative I Concept

Alternative I would be executed by accomplishing the following tasks:

- Removal of all Site fill and soil that exceeds Track 1 SCOs
- Treatment of groundwater located within the vicinity of the grossly contaminated area identified as Area P6 and the treatment of construction-related dewatering
- Removal of a potential methane source located on the east side of the Exterior Street Market Building
- Removal of the 16 known and 1 suspected USTs located on the Site
- Backfilling of all excavation/removal areas with acceptable soil ;
- Development and execution of plans for the protection of on-site workers, community, and environment during remediation and construction activities.

The requirements for each of the above tasks are described below, with areas of remediation shown on Drawing 6.

2.3.2 Targeted Fill and Soil Removal

All historical fill samples analyzed as part of the RI contained Track 1 SCOs exceedances. Therefore, it is assumed that the entire site, which according to field observations is covered

with historic fill, would have to be excavated to remove the contaminated soil. The estimated total volume of targeted (exceeding Track 1 SCOs) fill and soil that would be required to be removed and properly disposed off-site under Alternative I is 225,000 cubic yards. This estimate was developed under the assumption that the targeted fill and soil would have to be removed, on average, to el 0 west of the historic shoreline, to el 2.5 for a portion under the existing building S-1, and to el 8 for a portion under the existing structures at the former BHOD. These vertical excavation limits were derived from the findings of the completed remedial investigation.

Access to the targeted fill and soil would require demolishing two existing Site structures that were scheduled to remain as part of the proposed development; the Prow Building and the floor slab of WH-1. The Prow Building has been deemed eligible for the National Register of Historic Places, and has been the subject of consultation between BTM Development Partners, LLC and the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) as part of the environmental review process for the proposed project.[4] OPRHP has recommended that the Prow Building be preserved as mitigation for adverse impacts on historic resources, and BTM Development Partners, LLC has agreed to retain and reutilize it for retail use as part of the project. That proposed mitigation is included in the EIS for the project. Accordingly, demolition of the Prow Building would cause the loss of a historic building and may require additional regulatory review. Removal of the targeted fill under the WH-1 slab would require special consideration due to the planned reuse of the existing foundations. Special consideration refers to the extensive, close-knit foundation system beneath the WH-1 slab. The existing foundations consist of a grid of narrowly-spaced pile caps with between 48 to 94 timber piles each. Excavating the soil between the pile caps would require special methods or protection of the existing foundations in order to execute the remediation. Removal operations between the foundation structures may damage some or all of the foundation system.

The streets, sidewalks, and other structures would need to be supported along the property line from the potential destabilizing effects of the remedial excavation. The excavation support controls for the Track I concept are described below and shown on Drawing 6.

[4] The lead agency for the City Environmental Quality Review and State Environmental Quality Review Act review is the Office of the Deputy Mayor for Economic Development of the City of New York. A Draft Environmental Impact Statement was accepted by the lead agency on July 7, 2005, and a public hearing on that document was held on November 2, 2005, in conjunction with the public hearing on the project by the New York City Planning Commission.

Approximately one third of the perimeter would require the bordering soils and structures to be supported with a minimum 1-to-1.5 sloped excavation. Along Exterior Street, excavation by the Major Deegan columns would also require 1-to-1.5 sloping to ensure their structural integrity.

Approximately another third of the perimeter would require the bordering soil and structures to be supported with sheet piles driven to the appropriate depth and, where necessary, supported with anchors and walers. Sheet pile support is assumed to be required for the perimeter bordering the Metro North railroad tracks to guard against settlement of the railroad tracks.

The final third of the perimeter includes a permanent retaining wall along River Avenue that is part of the planned development for the Site. This retailing wall could be incorporated into the remediation, negating the need to install temporary sheeting in this area.

2.3.3 Groundwater Treatment

It is anticipated that the removal of the targeted grossly contaminated soil in Area P6 would result in improved water quality. If the water quality does not meet TOGS 1.1.1 AWQS standards after removal of the Site source area, the groundwater would be pumped and treated until the water quality meets TOGS 1.1.1 AWQS standards, or reaches asymptotic levels that are protective of the health and the environment. Treatment of the dewatering effluent during construction would be considered part of the remediation work. Treatment methods would include, as necessary, an oil/water separator tank, settling tank and carbon filtration. Effluent that is discharged to the sewer system would meet NYCDEP quality standards.

2.3.4 Methane Source Removal

As part of the targeted fill and soil removal work described earlier, the area where the high-methane concentration was found (by the Exterior Street Market Building) would be excavated to about el 0. This work should, as a consequence, remove the potential methane source. Any additional high-concentration methane sources identified below el 0 would also be removed.

2.3.5 UST Removals

There are 16 known and 1 suspected USTs located on site. All tanks would be exposed and properly removed/closed as the excavation progresses. Any contaminated soil associated with the USTs would be removed as part of targeted fill and soil removal work.

2.3.6 Excavation Backfill

After an area has been successfully excavated of all the targeted materials, end-point samples collected, and proper closure documentation generated, the excavation area would be backfilled with recycled concrete aggregate (RCA) obtained from a NYSDEC-permitted or registered recycling facility or other acceptable fill material and compacted. Following completion of all remediation areas, the site would be filled with RCA or acceptable fill material to the sub-grade elevation of the proposed development (approximately el 8.5 across the Site). Filling of the site will be performed in stages to allow for some of the backfill material to be used as a surcharge in the central portion of the site for approximately six months. The quantity of off-site fill material required to be imported is estimated at 235,000 cubic yards.

2.3.7 On-Site Worker, Public Health, and Environmental Protection

A site-specific health and safety plan would be developed and enforced to protect on-site workers from accidents and acute and chronic exposures from the identified contaminated media on site. The public health would be ensured by implementing and enforcing dust, odor, and organic vapor control and monitoring procedures, including a Community Air Monitoring Program (CAMP). However, it is not expected that the implementation of odor and organic vapor control measures would be required based on the findings of the remedial investigation. The environment would be protected by implementing and enforcing the appropriate soil erosion prevention measures.

2.4 Alternative II: Restricted Use

Achieving the Track 4 - Restricted Use status for the site, which would be protective of public health and the environment, would require the removal of source areas defined by the field-identified grossly contaminated fill and soil, and the analytically-identified atypical mercury-, lead-, and SVOC-contaminated fill that exceeds the Track 4 SSSCOs. Alternative II would also require the implementation of institutional and engineering controls. This alternative assumes that the Prow building and the WH-1 floor slab would be left intact, and incorporated into the proposed retail center.

2.4.1 Alternative II Concept

Alternative II could be executed by accomplishing the following tasks:

- Removal of the grossly contaminated fill and soil (with the exception of some contaminated material beneath the Prow Building and the slab of WH-1, as described below), and lead-, mercury-, and SVOC-contaminated fill (exceedance of Track 4 SSSCOs)
- Treatment, as necessary, of groundwater that is pumped as part of construction-related dewatering
- Removal of a potential methane source located on the east side of the Exterior Street Market Building
- Removal of the 16 known USTs and the closure-in-place of 1 suspected UST;
- Backfilling all excavation/removal areas with Site fill or recycled, crushed Site building concrete that contains no exceedances of the Track 4 SSSCOs
- Constructing Engineering Controls, which will include capping all surfaces with concrete, asphalt or 1 foot of acceptable soil
- Imposing Institutional Controls, which include an environmental easement and "notice of use restrictions" on the land and groundwater
- Development and execution of plans for the management of the site, and the protection of on-site workers, community, and environment during remediation and construction activities

The requirements for each of the above tasks are described below, with areas of remediation shown on Drawing 7.

2.4.2 Targeted Fill and Soil Removal

There are eight areas containing grossly contaminated soils (areas P1 through P9) and seven areas containing material that exceed the Track 4 SSSCOs for lead, mercury, or SVOC COCs (Areas A-1 through A-7). In two areas, there is an overlap of the two types of delineated areas; Area A6 overlaps Area P3, and Area A1 overlaps Area P4. Portions of grossly contaminated Areas P1 and P8 are underneath the Prow Building (P1) and WH-1 (P8). The planned reuse and renovation of the Prow Building will prevent the removal of all grossly contaminated material associated with P-1. The WH-1 foundation and slab will be left in-place, with the exception of an approximately 30 foot wide utility trench running through the middle in a north-south orientation. The reuse of the slab will prevent the removal of all grossly contaminated material associated with P8. Removal of grossly contaminated soil may also be limited by the need to undertake dewatering or use structural support not already anticipated to protect neighboring structures. For both the Prow Building and WH-1, the grossly contaminated material left in-place will be capped by the existing and proposed structures in accordance with the requirements of Alternative II.

Remediation areas are further detailed in the RIR and Section 1.4. Excavation areas to include both Area types (P1 through P8 and A1 through A8) are shown condensed into excavation area (Excavation 1 through 11) on Drawing 8 - Track 4 Remediation Area Contour Map. The contour map shows the estimated final lateral and vertical extent of the Track 4 excavation areas, barring any newly discovered contaminated areas or unplanned limitations to excavation extents. Excavation areas will change based on field delineation and evaluation of the limitations discussed above during the remedial action. The estimated volume of targeted fill and soil (grossly contaminated or exceeding Track 4 SSSCOs) that would be required to be removed and properly disposed under Alternative II is 10,000 to 15,000 cubic yards.

Slab-on-grade removal inspection and sampling will be conducted during the removal of Site structures. The removal inspection will consist of a visual, olfactory and instrument screening process to evaluate if any areas of concern (AOCs) exist below the Site building slabs. If AOCs are present, they will be investigated with further screening and sampling as required to adequately delineate impacted areas. The delineated impacted areas will then be remediated in accordance with the Alternative II remedial action objectives. The NYSDEC will be informed of all inspection results and proposed removal actions, if necessary.

Excavations would preferentially use 1-to-2 side slopes, which exceed OSHA minimum slope requirements, in lieu of other types of earth support. Sheet piles or other types of earth support may be required for Excavations 2, 6, and 11 where the column foundations for the Major Deegan Expressway or DOT-access ramp foundation components are located nearby. Sheeting would also be used for Excavation 1, where the excavation abuts the Prow Building and River Avenue. Excavation 9 may also require additional earth support due to the adjacent Metro North rail lines.

2.4.3 Groundwater Treatment

Construction for the new development may require dewatering in those work areas that are excavated below the groundwater table. Treatment of the dewatering effluent during construction would be considered part of the remediation work. Treatment methods would include, as necessary, an oil/water separator tank, settling tank and carbon filtration. Effluent that is discharged to the sewer system would meet NYCDEP quality standards; a permit for this discharge would be obtained from NYCDEP.

The SVOC and VOC groundwater exceedances at Excavation 6 would be remediated by removing the soil and fill source material in the area. Two groundwater samples, three months apart, would be collected to confirm that contaminant levels have decreased.

2.4.4 Methane Source Removal

As part of the targeted fill and soil removal work described earlier, the area where the high-methane concentration was found (by the Exterior Street Market Building) would be excavated to about el 0. This work should, as a consequence, remove the potential methane source. Any additional high-concentration methane sources identified below el 0 would also be removed.

2.4.5 UST Removal

There are 16 known USTs and 1 suspected UST on the Site. The suspected UST is thought to be located under the Prow building and would be closed in-place if found to exist. The 16 known USTs would be removed along with any contaminated soil encountered around the tanks.

2.4.6 Excavation Backfill

After an area has been successfully excavated of all the targeted materials, with proper closure documentation generated, the excavation area would be backfilled and compacted to an elevation required for the Gateway Center construction. The backfill material will consist of Site fill or recycled, crushed Site building concrete that contains no exceedances of the Track 4 SSSCOs. Filling of the site will be performed in stages to allow for some of the backfill material to be used as a surcharge in the central portion of the site for approximately six months. It is estimated that the quantity of required fill material should be satisfied by on-site fill or recycled, crushed Site building concrete that contains no exceedances of the Track 4 SSSCOs.

2.4.7 Capping of all Surfaces (Engineering Control)

The proposed development includes capping all site surfaces with barriers of concrete, asphalt or with one foot of acceptable soil. This engineering control would prevent complete exposure pathways for dermal absorption and ingestion related to the contaminated material that would be left in-place as part of Alternative II.

2.4.8 Institutional Controls

An environmental easement would be recorded referencing any institutional or engineering controls that are part of the selected remedy, which would be binding upon all subsequent owners and occupants of the property. The institutional controls would restrict the Site's use to commercial and include notice-of-use restrictions of the Site's soil and groundwater. The

engineering controls that would be included in the easement are the requirements for the maintenance of the appropriate surface cover (cap) previously described in this alternative.

2.4.9 On-Site Worker, Public Health, and Environmental Protection

A site-specific health and safety plan would be developed and enforced to protect on-site workers from accidents and acute and chronic exposures from the identified contaminated media on site. The public health would be ensured by implementing and enforcing dust, odor, and organic vapor control and monitoring procedures, including a CAMP. However, it is not expected that the implementation of odor and organic vapor control measures would be required based on the findings of the remedial investigation. The environment would be protected by implementing and enforcing the selected soil erosion plans.

2.5 Evaluation of Alternatives

The following is an evaluation of Alternatives I and II based on the NYSDEC BCP remedy evaluation criteria listed below.

A. Protection of Human Health and Environment
B. Standards, Criteria, and Guidance (SCG);
C. Short-Term Effectiveness and Permanence;
D. Long-Term Effectiveness and Permanence;
E. Reduction of Toxicity, Mobility, or Volume;
F. Implementability
G. Cost Effectiveness
H. Community Acceptance
I. Land Use

Each criterion evaluation is prefaced by the NYSDEC description as provided in the DER-10 guidance document.

2.5.1 Overall Protection of Public Health and the Environment

"This criterion is an evaluation of the remedy's ability to protect public health and the environment, assessing how risks posed through each existing or potential pathway of exposure are eliminated, reduced or controlled through removal, treatment, engineering controls or institutional controls. The remedy's ability to achieve each of the RAOs is evaluated."

Alternative I

Remediating the site to the unrestricted use standard will result in the elimination of all soil with Track 1 SCO exceedances, groundwater with TOGS 1.1.1 AWQS exceedances, and soil vapor contamination in excess of the NYSDOH guidance levels. Therefore, the remedy would result in the elimination of all pathways of exposure from on-site contaminated media. A possible exception would be asymptotic levels of COCs in the groundwater, which would not be expected to complete an exposure pathway, as the groundwater in the area is not used as a source of drinking water and is not expected to be used for that purpose in the future. The public health during remediation activities will be protected by implementing and enforcing dust, odor, and organic vapor control and monitoring procedures when needed. The environment will be protected by implementing and enforcing the selected soil erosion plans.

The RAOs for public health and environmental protection will be met through the removal of all contaminated media at the Site, which would eliminate any possible ingestion, inhalation or dermal contact.

Alternative II

Remediating the site to the restricted use standard will result in the removal of all site material considered a source area (grossly contaminated material or atypical historic fill above the Track 4 SSSCOs). This will result in the removal of a significant quantity of impacted soil at the site. The remaining historic fill and soil will be capped by barriers like concrete, asphalt, buildings or a minimum of one feet of acceptable soil. The capped site will prevent dermal contact or ingestion exposure pathways for the impacted historic fill and soil to be left in-place. The Site cap will be considered an engineering control to be enforced via the institutional controls imposed for this alternative to ensure that the cap is maintained.

With the removal of the site source areas, the contamination of groundwater found on Exterior Street should be reduced, and will continue to be reduced over time through natural attenuation. Even at current contamination levels, as described in the draft RIR, the plume of dissolved petroleum contaminants is not expected to reach the Harlem River (the closest surface water) or adjacent off-site buildings, at concentrations in excess of the TOGS 1.1.1 AWQS standards. The potential exposure pathway of the contaminated water, if any remains at the end of the remediation, to the Harlem River, should be incomplete. Due to the anticipated TOGS 1.1.1 AWQS exceedances in the groundwater even after the remediation of site soil and fill sources, an institutional control will be imposed on the Site that prevents groundwater use.

The potential soil vapor sources identified in the draft RIR will either be eliminated or controlled by this alternative. The methane source found within Area P7 will likely be removed as part of the excavation of the grossly contaminated soil and, therefore eliminating this potential

inhalation pathway. If any methane source remains after the excavation, the pathway will be controlled naturally as the area is under a proposed open deck garage. Any methane soil vapor being emitted from underneath the parking structure will naturally dissipate into the atmosphere.

Similarly, the TCE detected in a RI soil vapor sample was found in the area of the proposed ground floor parking garage in Retail B. This garage will be equipped with a dedicated mechanical ventilation system per the NYC Building Code requirements for that garage type. The mechanical ventilation will not only serve the fresh air requirements of the parking garage but will also collect and discharge to the atmosphere any soil vapor that may enter the garage. Therefore, the inhalation pathway for soil vapor is incomplete.

The potential soil vapors from the contaminated groundwater in Area P6 (along Exterior Street) will be eliminated by removing its source of contamination (i.e., grossly contaminated soil in area P6).

In summary, implementing the Alternative II remediation concept will meet the stated remedial goals and remedial action objectives. The remediated site and the new construction will together be protective of the public health and environment by eliminating or controlling potential pathways of exposure.

2.5.2 Standards, Criteria, and Guidance (SCG)

"Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance. All SCGs for the site will be listed along with a discussion of whether or not the remedy will achieve compliance. For those SCGs that will not be met, provide a discussion and evaluation of the impacts of each, and whether waivers are necessary."

Alternative I

Remediating the site to unrestricted-use standards will ensure compliance with all applicable SCGs that were listed in Section 2.1.

Alternative II

The remedy will be in compliance with those SCGs that involve protection of the public health and environment during the remedial action by implementing and enforcing a site-specific

Health and Safety Plan and the control plans described in the Alternative II concept. OSHA requirements for on-site construction safety will also be enforced by the Site Contractors.

Discussed below are implications of the Alternative 2 remedy's compliance with SCGs.

NYSDEC – Brownfield Cleanup Program Guide (draft 2004) and 6 NYCRR Part 375 (proposed 2005)

The Alternative II remedy was designed to meet the requirements of a restricted use Track 4 remedy; including the use of engineering and institutional controls. Therefore, this remedy meets the requirements of these guidance documents.

NYSDEC TOGS 1.1.1 – Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (1998);

During the 2005 sampling of 18 monitoring wells, only one groundwater sample, from MW-13, showed multiple TOGS 1.1.1 AWQS exceedances. However, the quality of the groundwater in the vicinity of this well should improve after grossly contaminated soil is removed from Area P6. Groundwater will only be treated under this alternative when construction dewatering will be required. Because of this, there is a possibility that the groundwater under the site will not meet the TOGS 1.1.1 AWQS at the conclusion of the remedy. Potential exposure to the groundwater will be prevented with institutional controls to prohibit the use of groundwater and control disturbance of the Site cap.

NYSDEC Memorandum – Permanent Closure of Petroleum Storage Tanks (modified 2003) and 6 NYCRR 613.9(b) – Closure of Tanks Permanently Out-of-Service

All UST closures and removals performed under this alternative remedy will meet the standards as listed in this memorandum and code.

NYSDOH – Guidance for Evaluating Soil Vapor Intrusions in the State of New York (draft 2005)

This alternative will meet the requirements of this guidance as the soil vapors encountered during the RI will not need any specific soil vapor intrusion mitigation. This is because of the combination of source removal and planned structure designs that will eliminate or control the potential exposure pathways for soil vapor.

2.5.3 Short-Term Effectiveness and Permanence

"The potential for short-term adverse impacts and risks of the remedy upon the community, the workers, and the environment during the construction and/or

implementation are evaluated. A discussion of how the identified adverse impacts and health risks to the community or workers at the site will be controlled, and the effectiveness of the controls, should be presented. Provide a discussion of engineering controls that will be used to mitigate short term impacts (i.e. dust control measures). The length of time needed to achieve the remedial objectives is also estimated."

Alternative I

The most significant short-term adverse impact and risk to the community would be the large volumes of truck traffic required to haul out the targeted fill and soil and haul in the backfill. The excavated soil and fill will require approximately 12,500 30-ton-capacity truck trips, and the incoming backfill will require approximately 12,170 30-ton-capacity truck trips. Considered together, the large truck volume will result in an increase in diesel emissions, increase in traffic and wear and tear to the local roadways and the Major Deegan ramps and expressway. Barges can not be used to replace the trucks due to the offshore location of an active rail line that would impede maritime vessels.

Implementing the Alternative I concept could require at approximately 11 to 13 months of effort (assuming normal work hours).

Although the resulting dust, odors, and organic vapor from the excavation and traffic would be controlled by implementing their respective control plans, the risk of exposure to these contaminants to the public, on-site workers, and environment would be increased due to the increased excavation and duration of the remedial action under this Alternative. The dust would be controlled by the application of water spray on the local roads, and on site, when and where needed. Work will be modified or stopped according to the action levels set in the CAMP. However, even under the best of circumstances, the dust may become an issue of contention to the local community.

The on-site workers would be exposed longer to the contaminated media than if a more limited remediation plan were implemented. However, the exposures will be controlled through the site specific HASP.

Alternative II

The amount of excavated contaminated soil that is to be removed under Alternative II is less than ten percent that of the Alternative I, which would reduce the truck traffic required under the first alternative by a corresponding amount. The resulting traffic from this alternative should have much less impact on the local roads and on the Major Deegan Expressway than would be experienced under Alternative 1.

Implementing the Alternative II concept could require approximately 5 to 7 months of effort (assuming normal work hours).

The dust, odors, and organic vapor from the excavation and traffic would be controlled by implementing their respective control plans. It is anticipated that the dust would pose the greatest adverse effect on the public, on-site workers, and environment. The dust would be controlled by the continuous application of water spray on the local roads and on site, when and where needed. Work will be modified or stopped according to the action levels set in the CAMP. The limited contaminated soil excavations under this alternative would result in relatively less exposure than with Alternative I. Exposure will be controlled through a site-specific HASP.

2.5.4 Long-Term Effectiveness and Permanence

"This criterion evaluates the long-term effectiveness of the remedy after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated:

i. The magnitude of the remaining risks;
ii. The adequacy of the engineering control and institutional controls intended to limit the risk;
iii. The reliability of these controls; and,
iv. The ability of the remedy to continue to meet the RAOs in the future."

Alternative I

The Alternative I remedy will remove all contaminated-media from the Site exceeding Track 1 SCOs for soil, TOGS 1.1.1 AWQS for groundwater[5], and the NYSDOH soil vapor guidance for soil vapor. Therefore the long term effectiveness of this remedy is complete.

Alternative II

The magnitude of the remaining risks will be minimal if this alternative is implemented. Exposure pathways to the contaminated soil, groundwater, and soil vapor will be eliminated for the removed soils or controlled for the remaining contaminated soil, groundwater and soil vapor.

The potential exposure pathways for the contaminated soil will be adequately controlled with surface barriers (i.e., asphalt, concrete) to the contamination The institutional controls (to be referenced in an environmental easement) will require maintenance of the engineering controls and restricted use of the Site and groundwater. The engineering and institutional controls are passive, meaning they will be low maintenance. An annual certification would be required for this alternative due to the use of long-term engineering and institutional controls.

The one active pathway control system, the garage ventilation system, is required by the New York City Building Code for the proper ventilation of car motor emissions, which pose a potentially greater risk to the public than the measured on-site soil vapors. In addition, any methane that enters the open-air garage will naturally dissipate into the outside air. An annual certification, signed by the Remediation Engineer (defined in Section 6), will be provided to NYSDEC certifying that the institutional and engineering controls are still in place, un-altered, and effective.

Because the engineering controls are primarily passive, their reliability will be high. For the one active system, the garage cannot be used if the ventilation system is not operational. This requirement will help limit exposure to the contaminated soil vapor, if any is present.

Barrier maintenance, groundwater use-restrictions, and the use of the garage ventilation system will ensure that the RAOs for this remediation will continue to be met in the future.

[5] Except, possibly, if asymptotic levels of groundwater contamination protective of public health and the environment are achieved.

2.5.5 Reduction of Toxicity, Mobility, and Volume

"The remedy's ability to reduce the toxicity, mobility, or volume of site contamination is evaluated. Preference should be given to remedies that permanently and significantly reduce the toxicity, mobility, or volume of the wastes at the site."

Alternative I

The Alternative I remedy will remove all contaminated-media from the Site exceeding Track 1 SCOs for soil, TOGS 1.1.1 AWQS for groundwater, and the NYSDOH soil vapor guidance for soil vapor. Therefore the criterion is satisfied.

Alternative II

The Alternative II remedy will reduce the toxicity of the contaminated site soils by removing the most contaminated soils, including those that are grossly contaminated with petroleum and those that have Track 4 SSSCOs exceedances of lead, mercury, and SVOC COCs. Based on the groundwater results, the SVOC and metal contaminants are not readily mobile in the groundwater, with the possible exception of the VOCs and SVOCs found in the groundwater at Area P6. Even at that location, the levels of contamination are expected to decrease under this alternative by removing the source (grossly contaminated soil). The remaining contaminated soil is largely historic fill material containing contaminant levels that are typical of fill in New York City.

2.5.6 Implementability

"The technical and administrative feasibility of implementing the remedy is evaluated. Technical feasibility includes the difficulties associated with the construction and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc."

Alternative I

The technical feasibility of implementing the remedy is generally good when considering on-site activities only, which is dominated by the excavation of targeted fill and soil. The majority of the site requires only shallow excavations (about 5 ft on average). The deepest excavations

(maximum is about 21 ft at the BHOD area) are required for those areas that already require, as part of the development, permanent retaining walls (which have higher safety factors than temporary retaining walls).

Technical issues that could make the Alternative I remediation problematic are the excavations surrounding the Major Deegan Expressway support columns and the excavations surrounding the foundation piles under building WH-1. The Major Deegan's structural columns and foundation can not be compromised under any circumstance. The foundations under WH-1 are scheduled to be reused. Excavating around either the Major Deegan or building WH-1 foundations may pose unacceptable engineering risks.

The groundwater will be treated using industry standard oil and water separator tanks and carbon filtration systems. The technical feasibility is also good for the high-methane source remediation, which involves source removal, and the UST remediation, which involves tank closure and removal. As all the identified sources of contaminated media will have been removed as part of this Alternative I remediation, there is no need to monitor the effectiveness of the remedy.

The administrative feasibility is high for the availability of experienced personnel and equipment within the New York City area, as this type of remediation is common in the region.

The administrative feasibility in obtaining specific regulatory approvals is low. The Prow Building has been deemed eligible for the National Register of Historic Places, and as noted above, is to be retained and reutilized per mitigation agreed to between the Applicant and OPRHP. However, demolition of the building would be necessary to gain access to the grossly contaminated fill and other targeted fill and soil that is believed to lie underneath. Other options would be to attempt to underpin and shore the structure, which would lead to exorbitant costs that were not evaluated for this alternative, or to bio-remediate the soil, which may take years and does not assure levels below Track 1 SCOs. Other problematic issues stem from the approximately 24,000 high capacity truck trips that may be required to transport the material on and off the Site over the remediation period. The potential for community opposition, as well as environmental impacts, exists due to the expected volume of diesel emissions, congested traffic, and other dangers these trucks pose. These factors may lesson the probability of the required local approvals being granted or could result in restrictions that may increase the cost of the remedy and/or the length of the remedy construction process.

Alternative II

The technical feasibility of implementing the Alternative II remedy is high. This alternative would consist mostly of excavation with standard bucket excavators of the targeted fill and soil.

The long-term effectiveness of the remedy will require proper maintenance on the constructed structures to ensure the integrity of the soil barriers and the thickness of the imported soil cover. The remedy could be monitored, should the need unexpectedly arise, via permanent monitoring wells that could be constructed at certain locations across the site.

The administrative feasibility is high for the availability of experienced personnel and equipment within the New York City area, as this type of remediation is common in the region. The administrative feasibility in obtaining specific regulatory approvals is higher than for Alternative I, because this alternative requires significantly less truck trips and would not derogate from the historic resources mitigation agreed upon between the Applicant and OPRHP.

2.5.7 Cost Effectiveness

"Capital, operation, maintenance, and monitoring costs are estimated for the remedy and presented on a present worth basis".

Alternative 1

Based on the assumptions detailed for Alternative I, including groundwater treatment for Area P6, the total capital cost to complete the remediation for unrestricted use is estimated at $65 million. As the site will be remediated to an unrestricted-use level, there are no operations, maintenance, or monitoring costs associated with Alternative I. Table 2 lists the individual cost-components that were used to arrive at the Alternative I cost estimate.

Alternative II

Based on the assumptions detailed for Alternative II, the total estimated capital cost to complete the remediation for restricted use is $5 million. The operations and maintenance costs for Alternative II are the costs associated with maintaining the site engineering control or surface cover. The inspection and minor repair of the integrity of the surface, beyond the inevitable replacement costs after the life expectancy has expired, is estimated at $5,000 per year. An annual evaluation will be performed to ensure that all institutional and engineering controls at the Site continue to be protective of human health and the environment. The annual evaluation will be certified by a licensed professional and submitted to the NYSDEC and NYSDOH. The annual review is estimated to cost $5,000 per year. Table 3 lists the individual cost components that were used to arrive at the Alternative II cost estimate.

2.5.8 Community Acceptance

"Provide a summary of the public participation program that was followed for the project, see section 1.10 for requirements. The public's comments, concerns, and overall perception of the remedy are evaluated in a format that responds to all the questions that were raised."

For both alternatives, public comments that are provided during the draft RWP 45-day public comment period would be evaluated and could result in a modified RWP.

2.5.9 Land Use

The following land use factors that were required to be analyzed in the BCP application materials are reproduced here and are the same for both alternatives. The current, intended, and reasonably anticipated future land use of the Site and its surroundings are compatible with the selected remedy of soil remediation. The proposed use is commercial, and this remedy is being designed to meet appropriate cleanup levels for commercial use. The reasonably anticipated future use of the Site and its surroundings has been documented by the applicant in the application, which led to the following conclusions:

- The use proposed for the Site does not currently conform to applicable zoning laws or maps. The Site is undergoing a Uniform Land Use Review Procedure process to change the zoning from manufacturing (M2-1) to commercial (C4-4), which is the proper zoning necessary for the anticipated use of the Site. The areas adjacent to the site are zoned for manufacturing and commercial uses. The areas surrounding the site are zoned for mixed residential and commercial uses.
- The proposed use conforms to historical and/or recent development patterns in the area;
- The Site falls within the project area for which a Brownfield Opportunity Area (BOA) grant was made to the Bronx Council for Environmental Quality to undertake a pre-nomination study. Gateway Center was referenced in the BOA funding application as one of the private projects proposed for the area, which the proposed BOA would complement and build upon.
- To the best of our knowledge, no land use plans have been developed for this section of the Bronx. The proposed development will require approvals from local, state and federal regulatory agencies. The final plan design will be a collaborative effort between the Applicant and the City of New York and will be consistent with the City of New York Waterfront Revitalization Program and the

City of New York Zoning Ordinance (as amended), and state and federal agencies having jurisdiction, including but not limited to the New York State Department of Environmental Conservation and the US Army Corps of Engineers.

- The proposed redevelopment of the underused retail site will support the economic revitalization of the West Haven neighborhood of the Bronx by modernizing a portion of the underutilized and dilapidated current market. The development would replace dilapidated buildings and utilities with a major retail center. The proposed development would create new employment opportunities, convenient shopping and dining opportunities, and economic and fiscal benefits to the city in the form of economic revitalization and tax revenue.
- There are no environmental justice concerns, since the proposed use will not cause or increase a disproportionate burden on the community in which the Site is located, and will not result in a disproportionate concentration of commercial use.
- The property is completely developed with commercial buildings and associated parking and loading areas. There are several buildings that have been deemed eligible for the National Register of Historic Places, including the Exterior Street Market Building, the Prow Building and the BHOD. Yankee Stadium and Macomb's Dam Park are located to the northeast with parking facilities in between.
- The Harlem River waterfront, including interpier (cove) areas, lies to the west of Exterior Street and the site. The proposed project would involve the construction of a single outfall in the Harlem River, which would not be within the boundaries of the Site.
- Site geology and hydrology are discussed briefly in section 1.1 and detailed in the RIR.
- The Site is accessible to existing infrastructure.
- Municipal water supply wells are not present in the Bronx, New York. Groundwater flow is west, toward the Harlem River. Groundwater from the Site therefore cannot affect either municipal water supply wells or recharge areas.
- A portion of the site lies in the 100 year flood plain.

3.0 PROPOSED REMEDY AND TECHNICAL PLANS

3.1 Proposed Remedy

The proposed remedy for this site is Alternative II: Restricted-Commercial Use. Once constructed and then properly maintained the Alternative II concept provides nearly the same level of long term public and environmental protection as the unrestricted use standard but would be much more cost effective. In addition, the short-term impacts to the public health and environment are less for Alternative II than for Alternative I, primarily due to the lower volume of excavated soil, which translates to lower truck transit requirements, as well as the shorter duration of the remediation.

3.1.1 Permits

All required permits should be issued to the Developer and assignable to the Construction Manager and subcontractors. Copies of the required federal, state, and city permits will be kept on site.

3.1.2 Site Security, Control, and Access

The site will be secured with an 8-foot high fence at the start of the remedial and construction activities. A 24-hour security service will be employed to control access, and visitors will be required to sign in. A log will be maintained of all vehicles and other equipment entering and leaving the site. After normal work hours, the gates on the two entrances and one exit will be locked.

3.2 Project Plans

The Remediation Engineer (defined in section 6), will oversee all components of the remedial action planning and implementation that are part of the selected alternative, which are described in the following plans. The Remediation Engineer is responsible for ensuring that the contractor documents for remedial work conform to the terms defined in the approved RWP. These contractor documents will be submitted to the NYSDEC.

The Remediation Engineer will provide representatives for full time oversight of all remedial and related activities. The activities that occur during the site remediation will be properly documented in periodic reports and in the final report titled Remedial Action Report (RAR) as described in section 5.

Site development activities are prohibited from interfering or otherwise impairing remedial activities that are part of this RWP. BTM Development Partners, LLC and associated parties preparing the remedial documents submitted to the state, and parties performing this work, are completely responsible for the safe performance of all invasive work and the structural integrity of excavations and structures that may be affected by those excavations (such as building foundations, roadways, sidewalks, utilities, etc.).

3.2.1 Soil Management and Reuse Plan

This section presents the approach to managing, disposing, and reusing soil, fill, and debris excavated from the Site. This plan is based on the current knowledge of site conditions, and will be augmented with the additional data collected during remediation. The Remediation Engineer will monitor and document the handling and transporting of material removed from the Site to a proper disposal facility as a regulated waste or as an unregulated waste, as applicable. The Remediation Engineer will assist the remedial contractor in identifying impacted materials during excavation, determining materials suitable for direct load out versus temporary on-site stockpiling, selection of samples for waste characterization, and determining the proper off-site disposal facility. Separate stockpile areas will be constructed as needed for the various materials to be excavated or generated, with the intent to most efficiently manage and characterize the materials and to avoid co-mingling impacted materials with non-impacted soil. The following are three material types to be disposed or reused during the remediation:

- **Track 4 Contaminated Material** – This material will be excavated from the remediation areas described in the proposed Alternative and will include Excavations 1 through 11. The defining characteristics of the material being that it is grossly contaminated with petroleum or contains levels of lead, mercury, or SVOC COCs that exceed the Track 4 SSSCOs. Track 4 contaminated material will not be reused on-site and must by sampled for characterization, transported off-site and disposed at a facility certified to accept the material. Sampling will be undertaking in conformance with the requirements of the disposal facility.
- **Site Fill Material** – This material does not contain exceedances of the Track 4 SSSCOs and includes materials in planned development cuts or soil above Track 4 contaminated material that must be removed in order to access the Track 4 contaminated material. Sampling during the RI has shown that site fill material is similar to the historic fill that will be left on-site as part of the Track 4 remediation. Therefore, the material will be reused on-site as backfill, provided that additional characterization sampling verifies that the material does not exceed the SSSCOs.

- **Recycled Building Material** – This material will be generated by milling or crushing the razed site buildings into backfill material. The material will be sampled to verify that there are no exceedances of the Track 4 SSSCOs in order to qualify for reuse on-site. The buildings will be milled on-site in a mobile crushing unit that is designed to minimize dust emission. Information on the crusher is provided below.

3.2.2 Slab-On-Grade Removal Inspection and Sampling Plan

During the demolition of the site structures, the Remediation Engineers field inspectors will screen the subsurface during removal of all slabs and pavements on grade to identify any grossly contaminated soils, and other environmental AOCs requiring further evaluation. Specifically, the following will be performed by the designated field inspectors:

1. Identify and mark opening in the slabs such as sumps, large drains, and manholes prior to the removal the slabs and coordinate with the demolition activities to facilitate further investigation, as necessary.

2. Screen sub-slab soils through visual and olfactory observation and with a PID in an effort to identify impacted materials or other AOC. If PID readings exceed ambient background levels by 5 ppm or observations indicate impacted soil distinct from typical urban fill, such as staining or residual product, the soils in the area will be considered an AOC and be further evaluated.

3. The location and description of identified sub-slab areas of concern will be recorded and demarcated using barricade tape or temporary fencing to protect the area pending further investigation and remedial measures.

4. After completion of the slab removal in the immediate vicinity of the AOC, conditions within these areas of concern will be evaluated in accordance with DER-10. Specifically, soil samples will be collected to delineate and characterize the AOC. Soils with the highest PID readings will be collected (ideally within 24 hours of the slab removal) for laboratory analysis.

5. Representative grab samples from the suspected grossly (petroleum) contaminated soils will be analyzed for the NYSDEC STARS #1 listed-analytes. Representative grab samples from other potentially impacted areas will be analyzed for the Track 4 COCs.

6. All results and proposed actions concerning AOC will be communicated to the NYSDEC for review and approval.

3.2.3 Waste Characterization Plan

Following demolition of existing on-site structures and removal of the existing surface barriers, test pits may be excavated to collect samples for waste characterization purposes. This activity will be coordinated and inspected by the Remediation Engineer. Test pit samples will be collected from depths and at a frequency depending on the disposal facility requirements. In a similar manner, soil stockpile sampling frequencies and methods (e.g., grab versus composite sampling) will also conform to the facility's requirements.

Laboratory tests for characterization of a waste stream typically include all or a subset of the following list. The actual testing will be determined by the facility's permit requirements.

- Total petroleum hydrocarbons (TPH) by gas chromatograph/ photoionization device (GC/PID);
- Total VOCs, Method 8260;
- Total SVOCs, Method 8270;
- Total PCBs, Method 8082;
- Total metals (14), Method 6010B;
- Ignitability, corrosivity, and reactivity;
- Toxic Characteristics Leaching Procedure (TCLP) VOCs, SVOCs, metals and pesticides and herbicides; and,
- Diesel Range Organics (DRO) and Gasoline Range Organics (GRO).

Characterization samples collected will be submitted to an ELAP-approved laboratory for analysis. Analytical reports will be maintained and copies will be available for inspection in the field and will be included in the RAR (described in section 5).

3.2.4 Soil Excavation and Stabilization Plan

3.2.4.1 Soil Excavation Method and Approach

Excavation will be conducted using conventional hydraulic excavation equipment. In areas where underground utilities, piping, or other structures are located, the soil excavation may be conducted by hand. Estimated excavation depths are indicated on Drawing 7 and 8. The

estimated depths may alter based on field delineation and limitations preventing additional excavation. The quantity of contaminated material may increase if additional grossly contaminated soil is observed during field delineation or end-point samples collected from an excavation do not meet the Track 4 SSSCO. The quantity of grossly contaminated soil removed may decrease if, based on field observation, the extent of the contaminated area was over-estimated from the RI data. Limitations preventing additional excavation include structures that would be potentially compromised if additional excavation was attempted, and excavation beneath the groundwater table that may require dewatering outside of the project scope. Where applicable, the excavation will extend until grossly contaminated soil can no longer be identified by visual indicators, odor, or by a portable photoionization detector (PID), and end-point samples (section 3.2.7) demonstrate that the soil does not exceed the Track 4 SSSCOs.

Areas that have specific SVOCs, lead and mercury as their COC(s) will be excavated to the limits shown in Drawing 7 and 8. The sidewalls and bottom will be sampled as per the end-point sampling plan and analyzed with an expedited turn-around-time (24 to 72 hours). Any section of the sidewall or bottom that does exceed any of these Track 4 SSSCOs for the COCs for that excavation will be extended laterally 3 feet or down 1 foot and tested again, except where the stated limitations apply. In lieu of this method, field screening instrumentation may be used to determine the extent of mercury and lead, where analyzer detection limits, and field conditions allow. The use of field screening instrumentation for lead and mercury may be limited, given the low reliability of most field screening instrumentation for these analytes.

Most excavations will use OSHA-recommended safe side slopes as the preferred excavation support mechanism. Excavation structural support will be required for several of the planned excavations due to the proximity of adjacent structures. For example, Excavation 1 will require structural support for a section along River Avenue and along a section of the Prow Building. Specific structural support requirements will be determined by the Construction Manager.

Where excavated soil is too saturated to meet the disposal facility soil moisture requirements, the saturated soil may need to be drained of residual contained water or stabilized as discussed in the next section.

3.2.4.2 Soil Dewatering/Stabilization

It is anticipated that the majority of the excavated soil will be free of water. Soil excavated below the water table may require dewatering prior to offsite transportation as specified by the treatment and disposal facilities. In general, excavated soil that contains free liquid will be stockpiled adjacent to its excavation source and allowed to dewatering using gravity drainage. The stockpiles so constructed will be required to comply with the requirements described later

in this subsection. Water collected during the soil dewatering will either be returned to the excavation from which it came or be screened for impacts, treated if necessary, and discharged into the city's sewerage system.

The general contractor will have the option to stabilize the wet excavated soil with other materials on-site or with the addition of a stabilization agent. Stabilizing agents such as quick lime or cement are added to the wet soils by some type of mechanical mixing (i.e., pug mill, backhoe, etc.). Stabilizing operations may also be conducted after the soil has been loaded into lined roll offs for offsite disposition provided the integrity of the liner is maintained. Following gravity dewatering or stabilization, the paint-filter test (USEPA SW-846 Method 9095) and visual observation will be used to determine when the soil meets the receiving facilities requirements.

3.2.4.3 Soil Stockpiles

Soil stockpile areas, if needed, will be constructed for staging of site soil, pending loading or characterization testing. Separate stockpile areas will be constructed to avoid co-mingling materials of differing types. All stockpile areas will meet the following minimum requirements:

- The excavated soil will be placed onto double layers of a minimum 8-mil low-permeability liner of sufficient strength and thickness to prevent puncture during use.
- Equipment and procedures will be used to place and remove the soil that will minimize the potential to jeopardize the integrity of the liner.
- Stockpiles will be covered at the designated times (see below) with minimum 8-mil plastic sheeting or tarps which will be securely anchored to the ground. Stockpiles will be routinely inspected and broken sheeting covers will be promptly replaced.
- Stockpiles will be covered upon reaching their capacity of approximately 2,000 cu. yards until ready for loading. Stockpiles that have not reached their capacity will be covered at the end of each work day.
- Active stockpiles will be covered at the end of each work day.
- Each stockpile area will be encircled with silt fences and hay bales, as needed to contain and filter particulates from any rainwater that has drained off the soils, and to mitigate the potential for surface water run-on.

- The stockpile areas will be inspected daily and noted deficiencies will be promptly addressed.

Individual stockpiles will not exceed 2,000 cubic yards. Each pile will be staked and labeled with a number to coincide with labeling on the associated sample container for proper correlation of the analytical results to the pile. General stockpile locations for some of the different material types are shown on Drawing 9.

3.2.5 Material Reuse Plan

The site soil, historic fill, and on-site building material that do not exceed the Track 4 SSSCOs will be reused on site as structural fill wherever possible. This strategy will help keep the development costs reasonable and reduce the need for the import of soil and its associated large number of truck trips.

The buildings scheduled for demolition will undergo asbestos abatement to meet regulatory requirements and allow their reuse as fill on-site. Prior to reuse, the recycled building material will be sampled as described below. Any building material that does not meet the Track 4 SSSCOs will be segregated from the reusable material and properly disposed offsite. Building material and site soil that have been selected for reuse will be stockpiled (as described in subsection 3.2.3) and composite samples from each stockpile will be tested at a frequency of one sample per 2,000 cubic yards to confirm adherence to the Track 4 SSSCOs. Any material reuse stockpile that does not pass the Track 4 SSSCO will be properly disposed offsite. The reuse stockpile composite samples will be sent to an ELAP-approved laboratory for comparison to the Track 4 SSSCOs by Method 8270 for the SVOCs and Method 6010B for mercury and lead.

It is anticipated that a Komat'su mobile crusher, model BR380JG, or approved equivalent will be used to convert the building material into fill usable on the Site. This crusher unit minimizes dust emissions by crushing material internally. Dust emissions are further controlled with an integrated sprinkler system. Additional information about the Komat'su mobile crusher is included in Appendix B. Additional information on dust control is provided in section 3.2.13. Crushed building material from the mobile crusher will be temporarily stockpiled on top of the building WH-1 floor slab as indicated in the Site Control Plan provided as Drawing 9.

It is anticipated that material and soil reuse will negate the need for the import of structural fill. If however, additional soil needs to be imported for fill, the imported material will meet Track 2 commercial restricted SCOs for the protection of health in accordance with the draft 6 NYCRR Part 375.

3.2.6 Load Out Transport and Off-Site Disposal Plan

Track 4 contaminated soil, fill, and demolished building material, and solid waste will be handled, transported and disposed in accordance with applicable Part 360 regulations and other applicable local, state and federal regulations. Proposed disposal facilities will be reviewed by the Remediation Engineer before any materials leave the site to verify that the facility has the proper permits and to review their requirements. Documents obtained during the review including applicable permits will be provided the NYSDEC in the RAR. Non-hazardous historic fill taken off-site will be handled as municipal solid waste per 6 NYCRR Part 360-1.2 and will be treated as contaminated material. The material will be prohibited from being disposed at a registration and recycling facility as defined in 6 NYCRR Part 360.

The waste removal contractor will provide the appropriate permits, certifications, and written commitments from disposal facilities to accept the material throughout the life of the contract. All submittals will be reviewed by the Remediation Engineer and submitted to the NYSDEC as required. Commitment letters will be supplied on the facility's letterhead, and will include the Site as the originating site, the specific analytical data provided to and reviewed by the facility, a statement that the facility is in compliance with its permit, any restrictions on delivery schedules or other conditions that may cause rejection of transported materials, and the accepted daily quantities of soil that may be disposed.

The Remediation Engineer will oversee the load-out of all excavated material. Once the loading of any container, dump truck, or trailer has been completed, the material will be immediately transported to the off-site disposal facility. All transport of materials will be performed by licensed haulers in accordance with appropriate local, state, and federal regulations. Loaded vehicles leaving the site will be appropriately lined, securely covered, manifested, and placarded in accordance with appropriate federal, state, local, and NYSDOT requirements (or other applicable transportation requirements).

The RAR will include an accounting of the destination of all material removed from the site, including excavated contaminated soil, solid waste and fluids, and documentation associated with that disposal showing requisite approvals for receipt of the material. Any hazardous wastes derived from on-site (not anticipated) will be stored, transported, and disposed off-site in full compliance with applicable local, state and federal regulations.

3.2.7 UST Removal Plan

All UST closures will comply with the following NYSDEC SCGs:

1. DER-10 section 5.5, dated 2002;

2. STARS #1 – Petroleum-Contaminated Soil Guidance Policy, dated 1992;

3. Memorandum "Permanent Closure of Petroleum Storage Tanks", modified 2003; and

4. TOGS 1.1.1, dated 1998.

The DER-10 section 5.5 and memorandum "Permanent Closure of Petroleum Storage Tanks" are included for in-field reference in Appendix C.

The Site contains 16 known and 1 suspected USTs. The Prow building's suspected UST, if found, will be closed-in-place. All the known tanks will be properly removed. Before being transported off-site or having additional cleaning performed, the tank's interior will be made safe by applying one of the approved methods to purge any petroleum vapors that might remain. Completed UST Closure Report forms will be sent to the NYSDEC project manager and included in the RAR. A summary of the 17 USTS are shown below:

- Exterior Street Market Building: one tank of unknown size; likely fill-port found and geophysical survey identified probable position.

- Prow Street Building: one tank of unknown size; noted on Sanborn map, fill-port found, and geophysical survey identified probable position.

- Building S-1: two 3,000-gallon and nine 1,500-gallon tanks; closed in place in 2001.

- BHOD: four approximately 6-foot high by 10 foot diameter fiberglass tanks installed in 2004.

The excavation bottom and sidewalls will be field screened to detect evidence of discharges from the removed tanks. Evidence might include observation of petroleum-stained soils, groundwater with sheen, free product, or readings from a photoionization detector (PID). If evidence indicating a discharge of petroleum is observed, Langan will immediately contact BTM Development Partners, LLC to notify it of its release-reporting obligations to the NYSDEC. Any discharges found will be removed in accordance with the Soil Excavation and Stabilization Plan in section 3.2.3. Soil and groundwater samples will be collected and analyzed in the laboratory, as detailed in the End-Point Sampling Plan, contained in section 3.2.7.

3.2.8 End-Point Sampling Plan

End-point samples will be taken for soil and groundwater to confirm the efficacy of the remedial actions. The Field Sampling Plan (FSP) was developed to define the methods and procedures

for conducting the end-point sampling. The FSP includes general field guidelines, sample equipment decontamination, soil and groundwater sampling procedures, and field instrument descriptions and calibration procedures. The FSB is included in Appendix D. The following subsections detail the end-point sampling plan for soil and groundwater.

3.2.8.1 Soil End-Point Samples

The soil end-point samples will be taken within the excavation areas and UST closure areas. The samples will be collected when the limits of the remediation excavation have been reached as described in Section 3.2.3. The soil end-point sampling plan for the soil is summarized in Table 4.

The number of end-point soil samples collected within the excavations is based on taking one bottom sample for every 2,000 square feet of excavation area and taking one sidewall sample for every 100 linear feet of perimeter. Each excavation will have a minimum of one bottom sample and three sidewall samples. The one exception to this is within the smaller excavation within Excavation 11; one additional bottom sample and two sidewall samples will be collected and analyzed for mercury and lead.

The end-point sampling program required for the USTS will be in accordance with DER-10. For the purposes of planning, it was assumed that all of the USTs that will be removed have held fuel oil that is lighter than water and that they were located above the groundwater table. The resulting end-point sampling plan for the USTs divides the closures into the following four categories.

1. Closed-in-Place

   The Prow Building suspected UST will be closed in place if it is found to exist, and will require two bottom samples (along the tank's centerline) that will be collected via borings through the bottom of the tank.

2. Outside Excavation Areas and No Discharge

   A minimum of 2 bottom samples (along the tank's centerline) will be required.

3. Outside Excavation Areas and Discharge Observed

   The contaminated soil will be removed in accordance with the soil excavation plan and the end-point samples will be in accordance with the excavation end-point sampling plan described above.

4. Within Excavation Area

   The UST will be removed and the contaminated soil will be removed and tested as planned for the excavation area in question.

The soil end-point samples will be analyzed for the particular contaminant of concern for the area that they were collected from. For the areas where petroleum is a concern, the end-point samples will be analyzed for the NYSDEC STARS #1-listed analytes. Where only individual SVOCs are the concern, only those analytes' results will be reported. All the SVOCs contaminants of concern are also listed on the STARS #1 list. The following EPA methods will be used:

- VOCs, Method 8260B;
- SVOCs, Method 8270C;
- Lead, Method 6019B; and,
- Mercury, Method 7471A.

3.2.8.2 Groundwater End-Point Samples

Groundwater end-point samples will be taken from monitoring well MW-13 to confirm the efficacy of the source removal in Excavation 6. The first sample will be collected one month after the completion of the excavation. The second sample will be collected three months after the first to monitor the reduction of groundwater impacts. The groundwater samples will be analyzed for the SVOCs- and VOCs-contaminants found during the RI (benzene, ethylbenzene, toluene, xylenes, styrene, methyl ethyl ketone, phenol, 2,4-dimetylphenol, and naphthalene) using the EPA methods 8260 for the VOCs and 8270 for the SVOCs. The end-point sampling plan for the groundwater is summarized in Table 5.

During the closure of USTS that are outside the planned excavations, groundwater end-point samples will also be collected if impacts from the tanks are observed in the groundwater at the bottom of the UST-excavations. These samples will be collected in accordance with DER-10 and analyzed for the STARS #1-listed analytes.

3.2.8.3 Laboratory Analysis

All laboratory analyses of the end-point soil and groundwater samples will be conducted by a NYSDOH Environmental Analysis Program (ELAP)-approved laboratory. Laboratory analyses will

be conducted in accordance with EPA SW-846 methods and NYSDEC Analytical Services Protocol (ASP) B-deliverable format.

The analytical methods and number and type of quality control samples required are summarized in Table 6. The quality assurance and quality control procedures required by the NYSDEC ASP and SW-846 methods will be followed. This will include instrument calibration, standard compound spikes, surrogate compound spikes, and analysis of quality control samples. The laboratory will provide sample bottles which are pre-cleaned and preserved. Where there are differences in the SW-846 and NYSDEC ASP requirements, the NYSDEC ASP shall take precedence.

A third party will be used to generate a data usability summary report (DUSR) that will be included in the final report. Quality control procedures for the sampling are included in the Quality Assurance and Quality Control Plan, described in section 3.2.18.

3.2.9 Retail Construction-Support Plan

Retail construction-support will include providing air, soil, and groundwater monitoring and control support until all site ground surfaces are covered with the engineering barriers such as concrete and asphalt. The air monitoring and control plan is described in the dust, odor, and organic vapor control and monitoring plan in subsection 3.2.13. Soil monitoring will consist of a field engineer screening the soils with the appropriate hand-held monitors. Contaminated soil not identified in the RI but that is found during construction activities will be removed in accordance with the contingency plan in subsection 3.2.14.

Construction for the new development may require dewatering in those work areas that are excavated below the groundwater table. Any groundwater treatment on the Site that is required for the construction phase will be considered part of the remediation work. Effluent that is discharged to the sewer system will meet NYCDEP quality standards and the appropriate NYCDEP permit will be obtained. If necessary, the treatment system anticipated for this task will be a mobile oil/water separator tank used in conjunction, if needed, with a carbon filtration system.

3.2.10 Remedy Facilities Plan

At the start of remedial activities, temporary facilities and utilities will be installed on site. Systems to control access and egress from the site are indicated on the site control plan, included in Drawing 9. An 8-foot high fence placarded with the appropriate signs will be installed around the site (except around the Prow Building) to control access. A sidewalk bridge

system to protect the public will be constructed along Exterior Street, River Avenue, and part of Cromwell Avenue. Concrete Jersey barriers will be used to protect the sidewalk bridge along Cromwell Avenue.

Access and exit ramps to the site will be constructed only on Exterior Street. The entrances will be constructed with gravel and the exit, located adjacent to the Major Deegan Expressway access ramp, will be equipped with a truck wash pad. Exiting trucks may be required to undergo a wash down of the undercarriage and tires if the conditions warrant it. Any wash water collected will be properly disposed off-site.

The building material crusher will be located to the east of the building WH-1 slab and the manufactured crushed materials will be stored on the slab itself until their reuse as on-site fill. A temporary stockpile area for soil will be located at the corner of the Site where River Avenue and the rail lines intersect once that area has been cut to 8 ft, the final grade of the site before the new construction is erected.

It is anticipated that electric and water supplies will be provided via River Avenue. Office and supply trailers will be set up along the northern border of the site, near the site exit.

3.2.11 Traffic Control Plan

The Traffic Control Plan, set forth in Drawing 10, was developed to limit the impact of the remedial activity on the local community and road infrastructure. It is anticipated that the excavated soil will be disposed outside New York State. Therefore, trucks hauling the excavated soil will most likely require roundtrips via the George Washington Bridge in Manhattan. The most direct route to this bridge is via the Major Deegan Expressway, which is adjacent to the project site.

Access to the Major Deegan Expressway will be via the access ramp located at the northwest corner of the site on Exterior Street. Access from the Major Deegan will be from the Exit 5 ramp to Exterior Street, whose intersection is also located at the northwest corner of the site. Once on Exterior Street, the trucks will access the site via two gates along Exterior Street. It is not anticipated that trucks handling the soil will have to use the heavily trafficked East 149th Street.

3.2.12 Soil and Sediment Erosion Plan

The Soil and Sediment Erosion Plan (SSE Plan) will be developed in accordance with NYS Standards and Specifications for Erosion and Stormwater Control (August 2005). Best

Management Practices for soil erosion shall be selected to minimize erosion and sedimentation off-site from the start of the remediation to the completion of the development. The SSE Plan will include the following information:

1. Descriptions of the selected BMPs that will be used to control erosion and sedimentation for each stage of remediation and construction.

2. Map showing the location of the proposed BMPs.

3. Implementation schedule and maintenance requirements for the proposed BMPs.

4. For active remediation and construction work zones such as excavation pits, stockpile areas and truck wash down areas, a perimeter BMP system should be installed and maintained to contain soil and sediment.

5. Accumulated sediment in the BMPs that is removed will be screened for the presence of petroleum and disposed of properly if found.

3.2.13 Storm Water Management and Monitoring Plan

The Storm Water Management and Monitoring Plan (SWMM Plan) will be developed in accordance with NYS Standards and Specifications for Erosion and Stormwater Control (August 2005). The SWMM Plan will be designed to include a variety of structural and non-structural measures such as diversion ditches and infiltration pits and trenches to control and alleviate the adverse impacts of stormwater runoff.

The design of the SWMM Plan will take into account the reality that the existing storm water lines downgradient of the site (which are along Exterior Street) may not be able to handle the Site's stormwater flows during the remediation. Therefore, the design will emphasize infiltration and retention as the primary stormwater control systems. Quantity of runoff and stormwater shall be designed in accordance with NYCDEP Rules and Regulations. Permits for any stormwater connections to existing sewers shall be obtained from the NYCDEP.

3.2.14 Dust, Odor, and Organic Vapor Control and Monitoring Plan

This dust, odor, and organic vapor control and monitoring plan (DOOVCM Plan) was developed in accordance with the NYSDOH Generic Community Air Monitoring Plan and OSHA standards for construction (29 CFR 1926). Remediation and construction activities will be monitored for dust and odors by the Remediation Engineer's and the construction manager's field inspectors. Continuous monitoring on the perimeter of the work zones for odor, VOCs, and dust will be

required for all ground intrusive activities such as soil excavation and handling activities and during demolition of potentially contaminated buildings. The work zone is defined as the general area in which machinery is operating in support of demolition or remediation activities. Periodic monitoring for VOCs will be required during non-intrusive activities such as soil and groundwater sampling. Portable units will also be used to monitor the breathing areas of the site workers within the work zones.

Action levels for the protection of the community and visitors are set forth in the CAMP that is included in the HASP. Action levels for site worker respiratory use are also set forth in the HASP.

Preventative measures for dust generation will include construction of an engineered construction entrance with gravel pad, a truck wash area, covering soils with tarps, and limiting vehicle speeds to under 10 miles per hour.

Dust suppression will be achieved on-site through the use of a dedicated water-mist projection rig equipped to spray water over off-road areas including excavations and stockpiles. The selected project unit for this remediation is Dust Control Technology's Dust Boss, the specifications of which are found in Appendix B. Dust suppression off-site will be achieved by applying water spray with a dedicated water truck along the local roads.

Work practices to minimize odors and vapors include limiting the time that the excavations remain open, minimizing stockpiling of contaminated-source soil, and minimizing the handling of contaminated material.

Offending odor and organic vapor controls may include the application of foam suppressants or tarps over the odor or VOC source areas. Foam suppressants may include biodegradable foams that are applied over the source material for short-term control of the odor and VOC s. Long-term control of source material can be accomplished using a non-hazardous and nonflammable compound that cures to form a hard surface. Tarps, properly anchored, may also be used to offer long term control of odors and VOCs.

3.2.15 Contingency Plans

Contingency plans have been developed to effectively deal with unexpected discoveries of contaminated media or USTS on site.

3.2.15.1 Discovery of Additional Targeted Contaminated Soil

During the remedial and construction activities, the soil will be continuously monitored by the remedial engineer's field representatives using field screening techniques to identify additional soil that might exceed the Track 4 SSSCOs for this site. Any soil so identified will be confirmed by collecting and analyzing a soil sample in accordance with the methods described in soil end-point sampling plan. If the laboratory analysis indicates that the soil is in exceedance of the selected SSSCOs for the site, the contaminated soil will be delineated and removed after consultation with the NYSDEC.

3.2.15.2 Discovery of Additional Contaminated Water

Any groundwater encountered during remediation and construction activities will be field screened by the Remediation Engineer's field representative. If impacts are detected, the NYSDEC will be notified and precautions outlined in the HASP will be taken to minimize worker exposure to the groundwater.

3.2.15.3 Discovery of Additional USTs

If USTs that were not identified during the RI are discovered during the remedial or construction activities, work will be halted in the area of the discovery. The tank will be registered with the NYSDEC and closed following the same procedures as for the other USTS on site, as listed in subsection 3.2.6.

3.2.16 Site Management Plan

The Site Management Plan (SMP) will be developed near the completion of the proposed remedy, coinciding with the submission of the RAR, in accordance with the applicable provisions of DER-10. The SMP will be designed to maintain the engineering and institutional controls and to provide inspection and evaluation frequencies to verify the protection of human health and the environment at the Site. Specifically, the effectiveness of the institutional and engineering controls will be evaluated to confirm that the engineering controls are intact and the institutional controls are adhered to and enforced. A licensed engineer will certify the results of this inspection and review in a report submitted to the NYSDEC within 90 days after the anniversary of the certificate-of-completion date. Any lapses in the engineering or institutional controls noted in the annual review will be required to be corrected expeditiously and the NYSDEC notified of the correction. The SMP includes:

1. Introduction with purpose, summary of remediation, and site conditions;
2. List of required engineering and institutional controls;
3. Monitoring plan that includes annual inspection and review requirements;
4. Site maintenance requirements ;
5. SMP Citizen Participation Plan;
6. Personnel organization and responsibilities;
7. Health and Safety Plan
8. Records and forms;
9. Emergency Contingency Plan; and
10. Copies of environmental easement and applicable site plans, including electronic versions.

3.2.17 Institutional and Engineering Controls

The environmental easement will reference the required institutional controls. These controls include the following notices and requirements:

- Notice to future property owners of the site's environmental condition after the remedial action and of any use restrictions placed on the site;
- Notice that the site cannot be developed for residential use without further remediation and the approval of NYSDEC;
- Restriction of the use of the groundwater at the end of the remedial action;
- Requirement of appropriate preventive maintenance on the contaminated fill and soil barriers;
- Requirement of immediate corrective action if a soil barrier has been compromised;
- Requirement of prior notice to the NYSDEC and involved on-site workers of ground intrusive activities and the potential contaminated media they may encounter.

Excluded from the notification are typical utility repairs and similar work that is performed under a HASP included in the SMP plan; and,

- Copy of the SMP plan.

The Engineering control required by the selected alternative is a contaminated-fill barrier. The contaminated fill barrier is to prevent ingestion or dermal adsorption of the contaminated fill material that is left in place. The fill barrier will consist of buildings, concrete, asphalt, and a minimum of one foot of acceptable soil.

3.2.18 Health and Safety Plan

The Remediation Engineer prepared the site-specific Health and Safety Plan (HASP), which is included in Appendix E. It will apply to all remedial and construction-related work until all ground surfaces have been capped with barriers or acceptable soil. The HASP provides a mechanism for establishing on-site safe working conditions, safety organization, procedures, and personal protective equipment requirements. The HASP meets the requirements of 29 CFR 1910 and 29 CFR 1926 (which includes 29 CFR 1910.120 and 29 CFR 1926.65). The HASP will include, but will not be limited to, the following components listed below.

- Organization and Identification of key personnel;
- Training requirements;
- Medical surveillance requirements;
- List of site hazards;
- Excavation safety;
- Work zone descriptions;
- Personal safety equipment and protective clothing requirements;
- Decontamination requirements;
- Standard operating procedures;
- Contingency Plan;
- Community Air Monitoring Plan; and
- Material Safety Data Sheets;

3.2.19 Quality Assurance and Quality Control Plan

The Remediation Engineer has prepared a Quality Assurance and Quality Control Plan (QAQCP) that describes the quality control components that will ensure that the proposed remedy accomplishes the remedial goals, remedial action objectives, and is completed in accordance with the design specifications. The QAQCP is attached in Appendix F. The components include:

- Responsibilities of key personnel and their organizations for the proposed remedy;
- Qualifications of the quality assurance officer;
- Sampling requirements including methodologies, quantity, volume, locations, frequency, acceptance and rejection criteria;
- Description of the reporting requirements for quality assurance activities including weekly quality assurance review reports, periodic QAQCP audits, and other report and data submissions.

3.2.20 Citizen Participation Plan for Construction Activities

Before the RWP is approved by the NYSDEC, BTM Development Partners, LLC will place the draft RWP, along with a Fact Sheet approved by NYSDEC, in the document repository. The Fact Sheet will also be mailed to all of the entities on the Site Contact List found in the approved Community Participation Plan. These notifications will precede a 45-day public comment period on the RWP. After the NYSDEC approves the RWP, BTM Development Partners, LLC will mail a Pre-Construction Notice, including a project Fact Sheet approved by NYSDEC, to all entities on the Site Contact List.

After the remedial action has been completed, a RAR will be prepared by a New York State-licensed Professional Engineer and submitted to NYSDEC for review and final approval. Upon submission of this report to NYSDEC and prior to its approval, BTM Development Partners, LLC will provide notice to all entities on the Site Contact List, in the form of a cover letter and associated Fact Sheet (approved by NYSDEC), indicating that the remedy construction is complete and the RAR has been submitted for final review.

4.0 SCHEDULE

Implementation of the proposed remedial activities is expected to last over the course of approximately one year, with all or at least the major excavation and backfill work to be completed within the first 6 months of construction. The following are anticipated milestones for the completion of the remediation:

- Month 0 - Anticipated start of remediation under an approved RWP in spring 2006. Issue Construction Notice Fact Sheet in accordance with the Citizen Participation Plan (CPP).

- Month 6 – Completion of the major excavation and backfill work

- Month 7 – Completion of all remedial actions.

- Month 8 – Submission of RAR with all certifications to NYSDEC and NYSDOH. Issue RAR fact sheet.

- Month 11 – Obtain approval of the RAR and a Certificate of Completion. Issue an institutional and engineering control fact sheet. Project is complete. Start SMP and perform annual inspections of institutional and engineering controls.

5.0 REPORTING

Periodic reports and a RAR will be required for the remedial action. The Project Remedial Engineer responsible for certifying all reports will an individual licensed to practice engineering in the State of New York. Joel Landes of Langan Engineering will have this responsibility. Should Mr. Landes become unable to fulfill this responsibility, another suitably qualified New York State professional engineer will take his place.

In addition to the periodic reports and the RAR, copies of all the contractor documents will be submitted to the NYSDEC.

5.1 Periodic Progress Reports

Periodic progress reports will be provided to NYSDEC's project manager weekly during remediation activities and monthly during construction activities until all ground surfaces have been covered with barriers or acceptable soil. Initial submissions will be electronic and a hard copy of all the reports will be included in the RAR, which is submitted at the end of all remediation activities. Information included in the periodic progress reports will, in accordance with DER-10 section 5.7, include:

1. Reporting of all remedial actions accomplished during the reported period;
2. Proposed modifications to the approved RWP;
3. Reporting of problems and delays to the RWP, along with proposed corrections and a revised schedule;
4. Planned remedial activities during the next work period;
5. Tabulation and preliminary analysis of sample results received;
6. Listing of all types and quantities of waste generated and disposed of during the reporting period; and
7. Support documentation as required.

5.2 Remedial Action Report

In accordance with the draft BCP Program Guide, a Remedial Action Report (RAR) will be submitted to the NYSDEC Project Manager with 90 days of completing the remedial action. This RAR will include the following:

1. Certification by the Project Remedial Engineer that the data generated was useable and met the remedial requirements;

2. Certification by the Project Remedial Engineer that the engineering controls, institutional controls, and any SMP requirements are adequately referenced in a filed environmental easement;

3. Certification by the Project Remedial Engineer that the SMP plan has been approved by the NYSDEC;

4. Certification the Project Remedial Engineer that any financial assurance mechanisms required by the NYSDEC have been executed;

5. Certification by the Project Remedial Engineer that the remedial work conformed to the RWP;

6. Certification by the Project Remedial Engineer that dust, odor, and vapor control measures were implemented during invasive work and conformed with the RWP;

7. Certification by the Project Remedial Engineer that all the remedial waste was transported and disposed in accordance with the RWP;

8. Certification by the Project Remedial Engineer that the source approval and sampling of imported acceptable fill was completed in a manner consistent with the methodology of the RWP;

9. Summary of the remedy from the decision document;

10. Summary by area of concern of all remedial actions completed, which includes:

11. Description of any problems encountered and their resolutions;

12. Description of changes to the design documents and the reasons for them;

13. Quantities and concentration of contaminants removed;

14. Description of the deviations from the approved RWP;

15. Listing of waste streams, quantity of materials disposed, and where they were disposed;

16. Analytical QAQC completed for the environmental media sampling during the remedial activities, including DUSR or other data validation;

17. List of the remediation standards applied to the remedial actions;

18. List of all applicable local, regional, and national governmental permits, certificates, or other approvals required for the remedial and development work;

19. Tables and figures containing all pre- and post-remedial data, including volumes of soil removed;

20. Description of source and quality of fill;

21. "As-built" drawings including excavation areas, UST removals, and permanent structures;

22. Air quality and dust monitoring screening data reported in table format and map (with posted data);

23. Copies of all the submitted periodic reports;

24. Copies of all manifests of off-site transport of waste material; and

25. Copy of the engineering and institutional controls as recorded on the deed.

All documents and reports submitted to the NYSDEC will be in both hard copy and in digital format on CD. These digital documents shall be in PDF form and, where appropriate, supplemented by photos and Microsoft Excel files. In addition two copies of the digital photos shall be sent to the NYSDEC project manager and one copy shall be sent to the NUSDOH project manager. Included with the photo CD should be a photo index.

6.0 PROJECT ORGANIZATION

This Section presents the project organization and associated roles, including key personnel, descriptions of duties, and lines of authority for the implementation of this RWP. Information regarding the organizations/personnel and their associated duties are provided below.

NYSDEC

NYSDEC, Region 2, will serve as the lead regulatory agency for this remediation. The NYSDEC project manager, Mr. Joseph O'Connell, and Region 2 Engineer, Dr. Daniel Walsh, will provide and coordinate regulatory oversight and direction.

NYSDOH

The NYSDOH will work closely with NYSDEC and will provide input from a health and safety perspective. The primary contact for NYSDOH will be Mr. Geoffrey Laccetti.

Owner/Developer

As ground lessee of the Site, BTM Development Partners, LLC will implement the voluntary cleanup of the Site. General responsibilities of BTM Development Partners, LLC are set forth in the BCP agreement. To assist in the remediation implementation BTM Development Partners, LLC will contract a Construction Manager, Plaza Construction, and a Remediation Engineer, Joel Landes of Langan Engineering & Environmental Services, P.C.

Remediation Engineer

The Remediation Engineer will coordinate the work of other contractors and subcontractors to BTM Development Partners, LLC for the services associated with the Site preparation, soil excavation, stockpiling, characterization, removal and disposal, air monitoring, emergency spill response services (if necessary), and management of waste transport and disposal. The Remediation Engineer will provide full-time engineering observation services for the duration of the remedial activities. The Remediation Engineer will document and certify that the remedial activities were conducted in accordance with this RWP and any NYSDEC-approved changes. In addition to oversight and final engineering certification, the Remediation Engineer may prepare and/or review pre-remedial plans such as the Standard Operating Procedures (SOP), HASP, CAMP, Erosion and Sedimentation Control Plan, and other appropriate plans.

Analytical Laboratory

STL Connecticut, a NYSDOH-certified laboratory, will provide analytical services required for this project. Additional or alternate laboratories may be contracted as needed. The contracted laboratories will be provided with the necessary information to complete the QAQCP and will follow the procedures required in the QAQCP.

Off-Site Disposal Facilities

Impacted materials that are excavated will be transported to and disposed of at licensed disposal facilities. Transportation to these facilities will be via legally permitted (such as permits required in NYCRR Part 364 and NYCRR Part 360) and NYSDEC-acceptable methods.

7.0 REFERENCES

Langan Engineering and Environmental Services, Inc., Addendum No. 2, Remedial Investigation Report, Gateway Center at Bronx Terminal Market - Eastern Parcel, Bronx, New York," November 11, 2005.

Langan Engineering and Environmental Services, Inc., Addendum No. 1, Remedial Investigation Report, Gateway Center at Bronx Terminal Market - Eastern Parcel, Bronx, New York," November 10, 2005.

Langan Engineering and Environmental Services, Inc., Remedial Investigation Report, Gateway Center at Bronx Terminal Market - Eastern Parcel, Bronx, New York," November 7, 2005.

Langan Engineering and Environmental Services, Inc., Addendum No. 2, Supplemental Remedial Investigation Work Plan, Gateway Center at Bronx Terminal Market - Eastern Parcel, Bronx, New York," September 15, 2005.

Langan Engineering and Environmental Services, Inc., Addendum No. 1, Supplemental Remedial Investigation Work Plan, Eastern Parcel and Park Area, Bronx Terminal Market, Bronx, New York," dated July 28, 2005.

Langan Engineering and Environmental Services, Inc., Supplemental Remedial Investigation Work Plan, Eastern Parcel and Park Area, Bronx Terminal Market, Bronx, New York," dated March 2005.

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