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Remedial Action Work Plan
Airport Development District
Francis S. Gabreski Airport
Westhampton, New York

Rebuild Now - NY
Empire State Development

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O'BRIEN & GERE
ENGINEERS, INC.

Certification

I hereby certify that the remedy documented in this Remedial Action Work Plan was evaluated in general conformance with the remedy selection reporting requirements in NYSDEC's Draft DER-10 Technical Guidance for Site Investigation and Remediation, December 2002.



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1. Introduction

1.1. Overview and objectives

This Remedial Action Work Plan (RAWP) was developed as part of the Rebuild NOW-NY program for the Airport Development District (ADD) Property located at the Francis S. Gabreski Airport in Westhampton, New York (the Site). The ADD property is currently owned by Suffolk County. They took title of the property in 1970 from the US Air Force.

The objective of this RAWP is to set guidelines for management of materials removed from the LNAPL/VOC plume area and the subsurface structures including manholes and cesspools prior to and during remedial activities. This RAWP addresses environmental concerns related to residuals management and remediation of localized areas. This plan is not intended to serve as a design document for construction activities related to remedial activities. It is the developer's responsibility to prepare plans and a design that incorporates specific requirements for soil management as set forth in this RAWP. Such plans will be reviewed and approved by the New York State Department of Environmental Conservation (NYSDEC). The developer will prepare a construction completion report to document compliance with the RAWP.

1.2. Facility description and history

1.2.1. Facility description

The ADD encompasses 58.6 acres of the Francis S. Gabreski Airport on the southern shore of Long Island (Figure 1). The Site is located on County Route 31 (Old Riverhead Road) in the Town of Southampton, New York and is owned by Suffolk County. The ADD, as defined in this project, is bounded to the north by the Airport service road, on the south by Cook Street, on the west by County Road 31, and on the east by Sheldon Avenue. Boundaries of the ADD are illustrated on Figure 2.

The Site is bordered to the south by the New York Air National Guard, which occupies approximately 70 acres of runways, hangers, and maintenance and service facilities on the southwest section of the Francis S. Gabreski Airport. The northern side of the Site is bordered by undeveloped "Pine Barrens." The airport runways are adjacent to the eastern side of the Site. The Quogue Wildlife Refuge is located to the east of the runways and separated from the airport area by a small wooded buffer strip. To the west of the Site are several light industrial and commercial properties that are located along County Route 31.

The Site contains several small buildings and roadways. A number of buildings have been demolished. The Site is serviced by public water, sewer, electric, and natural gas. According to the Commercial Real Estate Transaction Screen Questionnaire completed by Dvirka and Bartilucci in August 2000, light industrial activities occur in nine of the 22 buildings currently located at the Site as outlined on Table 1-1.

Table 1-1. *Current Site occupants*

Building Number	Business
AHRC	Association to Help Retarded Children – preparation of commercial packaging such as construction of boxes and holiday kits.
11A	Black Sheep TV – repair of TVs
115	Holey Moses – baker of cheesecake
140	A&M Electronics – repair and installation of electronic equipment and parts
145	Pero Tag – construction of airport sign banners using fabric.
152	DPW Aviation – maintenance and storage of equipment.
155	Wilson – restoration of automobiles
157	Hampton Interiors – reupholsterer
167	Relay Matic – assembly of electric switches

1.2.2. Facility history

The Francis S. Gabreski Airport consists of about 11,550 acres. In 1943, the Federal government built the airport for use as an Air Force base during World War II. After the war, it was returned to Suffolk County until it was reclaimed for the Korean War National Emergency in 1951. In 1960, it was leased by the US Air Force for an Air Defense Command Base, deactivated in 1969, and then released back to Suffolk County in 1970. In 1991, the airport was renamed in honor of Col. Francis S. Gabreski, a former base commander and World War II air ace. The airport is currently utilized by corporations, businesses, and private aviation and air taxi services. Two fixed based operators, Malloy Air East and Long Island Jet Center, provide aviation services to the airport users.

- The ADD portion of the airport was used primarily for base personnel. This area included several types of housing and dormitories for personnel and their families. In addition, training and support services were located in the central portion of the Site. These services included a photographic lab, wash racks, and vehicle repair areas in addition to a flight simulator and armament and electronics storage facility. A theater, church, and PX were also located on the Site. Several storage tanks were located on the Site. These tanks were used to store fuel, gasoline, and diesel. In addition, one of the tanks was reportedly used to temporarily store jet fuel during repairs of air force jets. The tanks were reportedly removed prior to 1990. Approximate locations of the larger tanks are provided on Figure 3.

Historically, the primary method for disposal of sanitary, storm water, and industrial wastewater was through the use of on-site septic tanks and cesspools.

As stated previously, the Site is bounded to the north by the Airport service road, on the south by Cook Street, on the west by County Route 31, and on the east by Sheldon Avenue. The Site has been divided into four areas for the purpose of assessing potential impacts from historical operations. These areas, selected based on the historical operations, are as follows. The areas are also outlined on Figure 2.

Northern area (north of Wallen Street) – This area contained the officers' quarters, administration building as well as a church, theater, and PX. Other than the above-grade heating oil tanks, there are no suspected sources of contamination in this area.

South-central area (south of Wallen Street and between Smith and Avenue B) – Most of the services for the base personnel were located in this portion of the Site. Historical operations included a photographic lab, wash racks, and a vehicle repair area in addition to a flight simulator, and munitions, armament and electronics storage facilities. According to an October 3, 1988 letter report prepared by UNC Geotech on behalf of USAF, up until 1969, the 5,000-gallon tank located along Cook Ave in the vicinity of Building 140 was used to hold JP-4 while truck tankers underwent maintenance. Following completion of repairs, the JP-4 was reportedly returned to the tanker. Subsequent to closure of the air base, some of the buildings in this area were leased to outside commercial businesses. One of the buildings was used as a bus garage that included repair and fueling operations. The bus company stored diesel fuel and gasoline in two 550-gallon, aboveground storage tanks (ASTs). These tanks were removed prior to 1988. An underground storage tank (UST) was located north of Building 140, which was connected to an underground floor drain running from Building 140. The floor drain was ordered closed by SCHD in 1985. The tank was inspected in September 1986 and reported dry and out of use. Another tank on the south side of Building 140 was used for fuel oil but did not appear to have been tested. (UNC Geotech, 1988) As discussed in Section 1.2.4, a petroleum plume is located in this section of the Site.

Southwest area (west of Smith and east of County Route 31) – Air force personnel dormitories were located in this area. Two of the larger petroleum tanks were located in this area (north of the AHRC) building.

Southeast area (east of Avenue B) – This area contained base housing units for military personnel and their families.

2. Investigation summary

2.1 Chronology

Several environmental investigations have been performed at ADD. Following is a brief summary of the significant Site investigations and the results or recommendations of each:

- In 1988, UNC Geotech was hired by the USAF to verify Suffolk County's contention that free product found on the southern portion of their property contained JP-4 and, therefore, was the responsibility of USAF.

- According to the UNC Geotech document referenced above, Suffolk County conducted investigations in the vicinity of the southern part of the ADD parcel (between Smith and Avenue B) in connection with discovery of a plume containing a light non-aqueous phase liquid (LNAPL). These investigations began in October 1984 when a 2,000-gallon tank failed a Petrotite® leak-detection test. Subsequent removal of the tank revealed the presence of petroleum-stained soil. At that time a second 2,500-gallon tank was removed and a third tank was abandoned in placed by filling it with sand. A ground water monitoring program was subsequently initiated to define the extent of impacted ground water.

- Free product was observed to be present on the ground water table in several wells installed in the area between February and September 1986. A total of 47 monitoring wells were installed in the area during this program to define the extent of the plume. Two recovery wells were subsequently installed at the leading edge of the plume and an air-stripping tower was constructed. The groundwater extraction and treatment system reportedly operated for several years and little LNAPL was recovered.(UNC Geotech, 1988)

- A soil gas survey was conducted in 1988 under direction of the USAF (UNC Geotech, 1988). In addition, samples of the LNAPL contained in on-site tanks and observed on the groundwater table were collected for analysis. The results of the analysis indicated that the LNAPL present on the groundwater table consisted predominantly of JP-4 fuel with a smaller fraction of diesel and possible small amounts of other petroleum products.

- Water level and LNAPL thickness measurements have been collected bi-weekly by the Suffolk County Health Department since at least January 1997. LNAPL has also been removed using a bailer

if there was a measurable thickness present during the monitoring event. Product was recovered each month in 1997, one month in 1998, three months in 1999, seven months in 2000, five months in 2001, and six of eight months in 2002. The maximum monthly volume recovered was 1.2 gallons in February 2001. Between February 1998 and September 1999 no product was observed. The maximum annual product volume of 2.99 gallons was recovered over the eight-month period in 2002. Based on review of the information a total of 9 gallons of product was removed from the wells between January 1997 and August 2002.

- Peer Environmental recently completed a Remedial Investigation at the adjacent Air National Guard (ANG), 106th Rescue Wing facility. As the ANG property is located adjacent to, downgradient of the Site, selected information was reviewed to further evaluate downgradient conditions and provide additional information pertaining to the subsurface characteristics of the area.
  The Peer report included groundwater quality data collected from wells on the ANG property by Stearns & Wheler in 1998. The results of the analyses indicted the presence of petroleum-related VOCs at three wells located 10 ft south of Cook Street.

  As part of the RI conducted at the ANG by Peer in 2001, groundwater samples were collected. Groundwater data from two of the areas indicated the presence of petroleum-related compounds that were not attributable to the area being investigated. These data suggest that the VOC plume from the ADD parcel had migrated approximately 350 ft onto the ANG property.

- ERM conducted an investigation as part of the Rebuild Now NY program. The results of these investigations are included in the Site Investigation Report dated December 2003 (O'Brien & Gere, 2003). The findings of this investigation identified two areas of concern: 1) a manhole with residual solids containing polycyclic aromatic hydrocarbons (PAHs) and several inorganics, and 2) the LNAPL and associated dissolved constituents in the groundwater at the southern end of the property.

A more detailed summary of previous investigations can be found in the Site Investigation Report dated December 2003 (O'Brien & Gere, 2003)

2.2 Nature and extent of contamination

Based on the investigations completed there are two areas of concern identified within soil and ground water at the Site.

1. MH-1 residual solids – MH-1 is a manhole that was identified in the field during the investigation. There is no map referencing this manhole and the exact use of this structure and the associated piping is unknown. The material within this manhole contained SVOCs, primarily PAHs, and inorganics above the screening criteria. Based

on the characteristics observed, residuals within MH-1 will require removal or further action.

There are a number of other structures that are also currently present at the Site. These structures are described as dry wells or cesspools on old maps of the property. They were reportedly used for discharge of storm water and/or sanitary water to the subsurface. Inspection of several of these structures did not indicate evidence of impacted materials.

Furthermore, the ground water data from the Site do not suggest that the subsurface structures represent a general source of ground water contamination. This suggests that the presence of impacted residuals in subsurface structures is limited.

Potential exposures
Contractors working on and around the manhole or cesspool may potentially come in contact with impacted soil or the residual solids within the structure.

2. South-Central Area. – The southern portion of this area has been impacted by historic petroleum product losses. The source of the LNAPL was likely one or more of the former storage tanks located in the area. Although data obtained during this investigation did not reveal the presence of petroleum-related constituents in the unsaturated soil, it cannot be ruled out.

   The area in which the LNAPL is located is approximately 70 ft wide by 170 ft long. The downgradient extent of LNAPL appears to extend beyond the ADD property. In 2002, the estimated thickness of LNAPL in these areas was between 0.15 and 0.25 ft (1.8 and 3 in). LNAPL was not observed in early 2003 due to an increase in the groundwater elevation.

   Groundwater data collected by Peer on the ANG property suggest that the VOC plume has migrated approximately 350 ft onto the ANG property. At the leading edge of the plume, concentrations of xylenes, ethylbenzene, and naphthalene were generally observed to be below 100 µg/L.

   Although based on limited temporal data, it appears that natural attenuation processes are occurring within the plume area on the ADD property. This conclusion is based on the occurrence of lower DO concentrations within the plume as compared to background areas. The current DO concentrations should continue to support aerobic biological activity.

   Potential exposures
   The depth of the water table at the Site (30 to 32 ft) will limit direct contact to the LNAPL and the VOCs. LNAPL has likely migrated to the ANG property boundary as evidenced by the presence of product in PZ-27 and PZ-28. The VOC plume has not migrated past 350 ft

onto the ANG property. The closest water supply wells are located 0.61 miles south of the ANG property and draw water from the same aquifer. There is a potential for vapor phase migration of VOCs from the LNAPL or VOC plume into structures constructed over the area.

3. Contemplated use

The ADD is zoned as LI-200 Light Industry. Zoning requirements as outlined in the a Subdivision Plan prepared by Savik & Murray dated March 21, 2000 are as follows:

Description	Size
Lot Area	
• Minimum	200,000 sq ft
• Minimum per dwelling area	Not permitted
Lot Coverage	
• Maximum coverage by main and accessory buildings	20%
Minimum lot width	300ft
Height	
• Stories	3
• Feet	40 ft
Yards, Principal building minimum	
• Front	60 ft
• Side, minimum	60 ft
• Side, total for both on interior lot	120 ft
• Side, abutting side street on corner lot	60 ft
• Rear	60 ft
Yards, accessory buildings and structures except fences and retaining walls, minimum	
• Distance from street	60 ft
• Distance from side and rear	60 ft
Buffer from County Road 31	80 ft

Source: Francis S. Gabreski Airport Subdivision Plan, Alternate A, Savik and Murray, March 21, 2000

Existing structures within the ADD are currently occupied by a variety of small businesses. It is the intent of the Owner to demolish the majority of the existing structures and build to suit for future industrial and commercial businesses. As noted on the zoning requirements and the environmental easement as part of the Voluntary Cleanup Agreement (VCA), residential use is prohibited.

4. Summary of remedy

As indicated in Section 2.2, based on the Site characterization results, two general areas of concern were identified by the investigations: residual solids within subsurface structure MH-1 and the LNAPL/VOC plume located on the south central portion of the Site.

Based on the Site Investigation Report and the commercial/industrial contemplated use of the property, the remedial action objectives (RAOs) for the Site are as follow:

- To reduce the potential for migration of LNAPL and VOCs both on- and off-site
- To remove LNAPL to the extent practicable to reduce further contributions to the groundwater
- To minimize potential exposure to VOCs within groundwater
- To prevent uncontrolled releases from impacted residual solids within the on-site structure MH-1.

To achieve these RAOs the following actions are required as part of the remedial program.

4.1. Subsurface structures

Subsurface structures include catch basins, septic tanks, cesspools and piping that were formerly used to control and dispose of storm water and sewage at the base. A number of these structures, which are located throughout the ADD property, are not in use due to building inactivity and the addition of a sanitary sewer line. In accordance with local regulations, unused sanitary subsurface structures should be closed as follows:

1. notification of appropriate SCHD and NYSDEC personnel
2. inspection of subsurface structures
3. removal of liquids and residual solids
4. disposal of the liquids and residual solids
5. structure abandonment
6. investigation of impacted soil if visual inspection reveals the potential for impacted materials within the structure.

Details are provided in Section 6. Subsurface structures associated with storm water management will be abandoned on an as needed basis (i.e., for the construction of a new building).

Residual solids contained in MH-1 will be removed and appropriately disposed off-site so as to prevent migration of contaminants to the ground water.

4.2. LNAPL/VOC plume area

An area approximately 70 ft wide by 170 ft long that contains free-phase LNAPL and dissolved VOCs have migrated approximately 350 ft south of the ADD property boundary. The groundwater table is approximately 30 to 32 ft below grade. In addition to the periodic presence of 0.15 to 0.25 ft of free phase product on the water table, concentrations of VOCs exceed the NYSDEC Class GA standards. Review of information indicates that the LNAPL is entrapped within the saturated soil at and below the water table a majority of the time. To eliminate the need for long term operation and maintenance of a remedial system, petroleum-impacted soil will be removed to the extent possible by excavation. Based on the soil characterization detailed in Section 6.2.4 and subsequent review and approval by the NYSDEC, the excavated material will either be treated on-site in accordance with STARS Memo #2 – Biocell and Biopile Designs for Small-Scale Petroleum-Contaminated Soil Projects or disposed off-site at a permitted disposal facility. Following excavation activities, ground water quality will be monitored at frequencies described in Section 6.5.5 to document ground water quality trends and assess natural attenuation processes. More details regarding ground water monitoring are provided in Section 6.5.6.

The potential exposure to airborne VOCs as a result of intrusion of the VOCs from the ground water plume to overlying structures will be evaluated by completing a building use survey. A soil gas survey will then be completed as necessary to evaluate the potential vapor concentrations in the vicinity of identified buildings. More details are presented in Section 6.

4.3 Institutional controls

The industrial/commercial use of the Site will be controlled through county and town zoning, land use and design guidelines, and environmental easements. The Owner will be responsible for the recording of an institutional control in the form of an environmental easement. The easement will require that the property Owner comply with the approved Site management plan, limit the use and development of the property to commercial or industrial uses only, restrict the use of ground water as a source of potable water or process water, and require the property Owner to complete and submit an annual certification to the NYSDEC. The easement will be applicable to the entire Site and include a map showing the area of control, a description of the controls, and the Property Owner Agreement enforceable by the State of New York to establish and maintain the environmental easement. Environmental easements will be described in detail in the VCA.

5. Engineering evaluation of the remedy

The following sections present an engineering evaluation of the remedy with respect to the evaluation criteria presented in 6 NYCRR Part 375-1.10 and the RAOs as presented in Section 4.

5.1. Protection of human health and the environment

The analysis of the remedy with respect to overall protection of human health and the environment provides an evaluation of whether the remedy will achieve and maintain adequate protection of public health and the environment under the contemplated use of the Site and a description of how protection will be achieved through treatment, engineering, and institutional controls.

The excavation and treatment of soil containing VOCs and SVOCs, which exceed the potential cleanup goals will provide adequate protection of human health and the environment, and will achieve the RAOs for the Site. The removal of this contaminant source will reduce the potential for direct contact with contaminated materials and eliminate contact between the excavated materials and Site ground water, thus diminishing the ability for off-site contaminant migration. A ground water monitoring plan will be implemented to assess effectiveness of the source removal on ground water quality.

Similarly, the removal and disposal of impacted residual solids within subsurface structure MH-1 will provide protection of human health and the environment, as it removes a potential source of ground water contamination from the Site.

Potential exposures to VOCs in indoor air will be addressed by evaluation of the potential presence of VOCs in soil vapor and potential migration of soil vapor to the indoor air. The Vapor Intrusion Potential Evaluation Plan provided in Appendix B will be used to complete this assessment.

has this been executed yet?

In addition, the industrial/commercial use of the Site will be controlled through City zoning, land use and design guidelines, and environmental easements. The required environmental easements will be specified in the Voluntary Cleanup Agreement (VCA) to be executed for this Site.

5.2. Compliance with standards, criteria, and guidelines

There are three categories of standards, criteria, and guidelines (SCGs) that must be considered during the evaluation of the remedy: chemical-specific, location-specific, and action-specific. Chemical-specific SCGs are health-based or risk-based numerical values or methodologies which, when applied to site-specific conditions, establish the acceptable amount or concentration of a chemical that may be found in, or discharged to, the ambient environment. Location-specific SCGs set restrictions on activities based on the characteristics of the Site or immediate environs. Action-specific SCGs set controls or restrictions on particular types of remedial actions once the remedial actions have been identified as part of a remedy. Potentially applicable or relevant and appropriate SCGs are summarized in Table 5-1. Selected SCGs are also discussed below.

5.2.1. Chemical-specific SCGs

Chemical-specific SCGs for soil removal in the LNAPL area consist of TAGM 4046 recommended cleanup goals. These cleanup values are guidance and are typically used in conjunction with site-specific information, past experience, and intended future uses of the property to select the most appropriate cleanup criteria.

The potentially applicable chemical-specific SCG for construction water is 6 NYCRR Part 703.5 – Surface Water and Ground Water Quality Standards.

5.2.2. Location-specific SCGs

The lack of an inland body of water, coastal boundary or wildlife on or in close proximity to the Site renders a majority of the location-specific SCGs irrelevant. The closest body of water to the Site is the head of the Aspatuck Creek, which lies approximately one-mile southeast of the Site. This distance also renders any SCGs pertaining to floodplains irrelevant.

A potentially applicable location-specific SCG for property usage is the local zoning requirement. The local zoning requirement states that the property may only be occupied by commercial and light industrial facilities. The zoning requirement is potentially applicable with respect to the receptors that may be present on the property.

5.2.3. Action-specific SCGs

During Site clearing, grading, excavating, and stockpiling of excavated soil, dust suppression and air monitoring will be conducted in accordance with NYSDEC TAGM HWR-89-4031, Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites and the NYSDOH Generic Community Air Monitoring Plan (CAMP). The program to be implemented at the Site is described in Section 6.3.3.

TAGM HWR-89-4031 is included as Exhibit 1. The CAMP is included as Exhibit 5.

Subsurface soil exhibiting evidence of the presence of petroleum product may be managed in accordance with STARS Memo #1 – *Petroleum – Contaminated Soil Guidance Policy* and STARS Memo #2 – *Biocell and Biopile Designs for Small-scale Petroleum-Contaminated Soil Projects*. The STARS #1 and #2 Memos are included as Exhibit 2.

Abandonment of septic tanks requires notification to the Suffolk County Department of Health Services (SCDHS) using the Certification of Sewage Disposal System Abandonment form (form WWM-080). If evidence of contamination of materials beyond typical septic waste is observed, then per Article 12 of the Suffolk County Sanitary Code, the Owner is required to report the occurrence to the SCDHS Office of Pollution Control within 2 hours of knowledge of the discharge, leak, or spill. Standard Operating Procedure (SOP) 9-95 provides the Pumpout and Soil Cleanup Criteria used for the administration of Article 12. A second document entitled *Guidelines for Equipment and Procedures for the Remediation of Contaminated Leaching Pools* is used for reference for the cleanup of the impacted materials. Copies of these documents are included in Exhibit 3.

If residual solids present within the subsurface structures are identified as hazardous material, they will be transported for off-site disposal in accordance with 6 NYCRR Part 364 – Waste Transporter Permits; 49 CFR 172 – 174 and 177 – 179 – Department of Transportation Regulations; 40 CFR 262.20 through 40 CFR 262.23 – Standards Applicable to Generators of Hazardous Waste; and 6 NYCRR Part 372 – Hazardous Waste Manifest System and Related Standards for Generators, Transporters, and Facilities.

Remedial construction activities will be performed in accordance with 29 CFR Part 1910 – Occupational Safety and Health Standards and 29 CFR Part 1926 – Safety and Health Regulations for Construction.

5.3. Short-term effectiveness

The short-term effectiveness criterion addresses the protection of workers and the community during construction and implementation of the remedy, environmental effects resulting from implementation of the remedy, and the time required to achieve the remedial action objectives.

The removal and treatment or disposal of soil material exhibiting petroleum compound concentrations in excess of TAGM 4046 values is an effective remedial activity, as it removes the source of ground water contamination from the Site. Similarly, the removal of residual solids containing elevated concentrations of contaminants of concern will minimize the potential for contaminant migration to soil and ground water. However, in the short-term excavation activities can increase the risk of exposure to the general public and on-site workers, as it creates several new pathways for contaminant transport.

To diminish the risks posed by excavation activities, fencing will be employed as necessary to restrict community access to the contaminated soil and contaminant transport will be minimized through appropriate methods, such as erosion control, dust control and construction water management. These methods are outlined in sections 6.3.2, 6.3.3 and 6.3.4, respectively.

Workers engaged in subsurface construction or maintenance activities will be required to implement a site-specific, activity-specific health and safety plan. Recommended health and safety procedures are presented in Section 7.

5.4. Long-term effectiveness

For the evaluation of long-term effectiveness, the magnitude of residual risk remaining from untreated material remaining at the Site and the adequacy and reliability of controls used to manage untreated materials were assessed for the remedy.

The excavation and treatment or disposal of petroleum-impacted soil and residual materials containing elevated concentrations of contaminants of concern in conjunction with the removal or closure of subsurface structures, such as storm water and sewage catch basins, cesspools and piping, will effectively reduce the long-term risk to public heath and the environment. The removal of these contaminant sources will reduce the potential for direct contact with contaminated materials and eliminate contact between the excavated materials and Site ground water, thus diminishing the ability for off-site contaminant migration.

The long-term protection of public heath and the environment is further enhanced through the periodic monitoring of on-site groundwater to document ground water quality trends and assess the natural attenuation processes.

In addition, the industrial/commercial use of the Site will be controlled through City zoning, land use and design guidelines, and environmental easements.

5.5. Reduction of toxicity, mobility, or volume

The evaluation of reduction of toxicity, mobility, or volume through treatment addressed the expected performance of treatment technology employed in the remedy.

Petroleum impacted soil will be treated on-site or disposed off-site thereby decreasing the volume of contamination at the Site. Similarly residual solids found within subsurface structures will be disposed of off-site.

The proposed remedy is sufficient to be protective of public health and the environment. Therefore, other remedial action treatment alternatives (e.g., destruction, and solidification/ chemical fixation) are unwarranted.

5.6. Implementability

The analysis of implementability involved the assessment of the following: the ability to construct and operate the technology, the reliability of the technology, the ease of undertaking additional remedial action, the ability to monitor the effectiveness of the remedy, the ability to obtain necessary approvals from other agencies, and the availability of services, capacities, equipment, materials and specialists.

The proposed remedy for the Site is suitable to current and future Site conditions and uses. For the LNAPL area, excavation of petroleum-impacted soil is a reliable remedial action since it reduces the volume of source material, thereby diminishing the change of off-site migration via groundwater. In addition, this remedial action can be implemented as the materials and equipment for Site clearing, removal and treatment of impacted soils, removal of subsurface structures, and grading are readily available and access to the Site is sufficient. Furthermore, the surficial structures in the area have been identified for demolition as part of the redevelopment program. The effectiveness of the remedial action can be easily monitored through the sampling of down-gradient monitoring wells.

With respect to the removal and disposal of residual solids within subsurface structure MH-1, it is a reliable remedial action as it removes potential source material from the Site. This remedial action can also be readily implemented, as equipment is available.

6. Remedy implementation

The purpose of this section is to provide environmental guidelines for construction of the remedy.

6.1 Subsurface structures

Subsurface structures include catch basins, septic tanks, cesspools and piping that were formerly used to control and dispose of storm water and sewage at the Site. The Site Investigation Report (OBG, May 2003) included the sampling and analyses of residuals from subsurface structure MH-1. The analytical results indicated the presence of several SVOCs, primarily PAHs, and a variety of inorganic constituents at concentrations exceeding TAGM 4046 soil screening values. Based on these data, the residual solids contained in MH-1 will be removed and appropriately disposed off-site to prevent the migration of contaminants to the ground water.

As indicated in Section 4, the remedial action for the unused sanitary subsurface structures involves inspection and appropriate abandonment. Unused subsurface structures associated with storm water management will be abandoned on an as needed basis (i.e., for the construction of a new building). SCHD and NYSDEC will be notified prior to removal of any subsurface structure.

The locations of known structures are depicted in Figure 3. It should be noted that the septic tank and cesspool information was transferred to this figure from several different sources, which were provided by SCHD. Some of these maps did not contain legends or scales. Therefore, the existence and exact location of these features have been estimated. Furthermore, one of the maps indicated that several of the cesspool systems were scheduled for abandonment. The current status of many of the cesspool and septic systems is unknown at this time. The procedures outlined below are those required by the Suffolk County Sanitary Department. Information pertaining to codes and required forms is provided in Exhibit 3.

6.1.1. Inspection

Inspection will involve the visual examination of subsurface structures, cesspools, and piping to evaluate the presence of sludges and residual solids. Inspection shall include locating and uncovering the first septic tank/leaching pool from the foundation. The tank pool shall be inspected for an outlet line to and overflow pool and if present, the overflow pools shall be uncovered and inspected.

6.1.2. Residual solids removal

Following the confirmation of residuals within a given subsurface structure, residual solids and liquids within the structure shall be removed. Should oily sheens or chemical be observed, the materials will be considered potentially contaminated and stockpiled for further assessment.

6.1.3. Disposal

If sampling is required by the SCHD or the NYSDEC, it will be completed in accordance with the protocols delineated by the participating off-site permitted waste management facility.

To reduce the infiltration of precipitation and the entrainment of dust during the analysis and disposal period the potentially contaminated material will be placed in 55-gallon drums or stockpiled on and completely covered by polyethylene sheeting.

6.1.4 Structure abandonment

Subsequent to the removal of residuals, the subsurface structure shall be either removed and disposed of appropriately or be broken up or filled in place with clean backfill (fill material approved by SCHD) in accordance with all applicable local, state, and federal regulations.

Certification of Sewage Disposal System Abandonment shall be filed with the Suffolk County Department of Health Services Office of Wastewater Management (see Exhibit 3). A contractor licensed by Suffolk County who shall complete and sign the certificate shall complete the abandonment.

6.1.5. Investigation

Subsequent to removal or abandonment of subsurface structures, investigation for impacted materials in or surrounding the subsurface structures will be performed in accordance with Article 12 of the Suffolk County Sanitary Code and the Suffolk County Guidelines for Equipment and Procedures for the Remediation of Contaminated Leaching Pools (see Exhibit 3).

6.2 LNAPL area

The goal of the LNAPL remedial program is to remove the source of petroleum-related compounds that are present in the ground water. At a minimum, free-phased product and heavily contaminated soil will be removed. cleanup goals for the removal of soil containing petroleum-related compounds are total values for VOCs (10 ppm) and SVOCs (500 ppm) as provided in TAGM 4046.

6.2.1 Excavation boundaries

The LNAPL plume as currently identified is occupies a 70 ft wide by 170 ft long portion of the ADD property located south of Wallen Street and between Smith and Avenue B. The approximate boundaries of the LNAPL in 2002 are depicted in Figure 4. An 8-inch diameter sanitary line crosses over the area in which the LNAPL plume is located. An associated manhole is located within the area as well. The invert of the line and manhole are not known.

Ground water elevation and product recovery data between 1997 and 2003 suggest that product is not present on the water table unless the elevations decrease to below 17 ft above mean sea level (msl). During other periods, product is not observed on the water table as it is likely smeared within the fluctuation zone. The water table is located at approximately 30 - 32 ft below grade.

Due to the fluctuations observed in the water table depth, the impacted soils may occur between 28 ft and 36 ft below grade or 4 ft above and below the water table observed at the time the investigations were conducted. This is supported by review of the boring log for well ERM-07 where staining and photoionization detector (PID) readings on the order of 230 ppm were noted at the water table (32 ft) and at 35 ft below grade. Horizontally, the minimum area of impacted soil is likely within the area where free product has been observed as indicated on Figure 4. However, the actual horizontal and vertical boundaries are currently undefined. In addition, although there is no existing evidence of shallow impacted soil, given the suspected source of the LNAPL is one or more of the USTs formerly located in the plume area, there is a possibility for shallow impacted soils to be present in the area as well. Therefore, a soil boring program will be necessary to establish the boundaries of the excavation.

Due to a lack of certainty with regard to the plume boundaries, the LNAPL area will be further delineated prior to excavation activities via additional borings with sampling and analysis. In general, soil borings shall be completed around the perimeter and within the plume area. Field observations shall be used in conjunction with laboratory analyses to establish the boundaries of the excavation.

The NYSDEC will be notified 14 days prior to the commencement of the field work associated with the delineation of the LNAPL area. Further, the NYSDEC will be provided the opportunity to oversee the field efforts and approve all field decisions involved with the delineation efforts. The scope of the investigation will be flexible such that additional work (*i.e.*, drilling, sampling, and analysis, etc.) shall be performed, as needed to adequately delineate the LNAPL area.

Soil borings

A minimum of three soil borings shall be completed down the centerline of the plume to assess the vertical extent of contamination. Soil samples shall be collected and used to assess the presence or absence of impacts based on field observations and field screening. The boring shall be

completed to at least 5 ft below the deepest impacted zone as identified by field observations but no less than 36 ft below grade. One impacted sample and samples from two depth intervals below the deepest impacted interval shall be collected at a minimum for analysis of VOCs and SVOCs to assess the vertical extent

Currently, the minimum horizontal area is defined by the wells/piezometers, which have contained free product as outlined on Figure 4. The outer boundaries shall be established by completion of additional borings around this perimeter. The first series of borings shall be completed approximately 10 ft away from the currently identified perimeter. Subsequent borings will be completed outward from these locations as needed. Soil borings shall be completed to a depth equal to 5 ft below the deepest impacted zone as identified by field observations but no less than 36 ft below grade. Should field observations indicate the presence of impacted soil (staining or elevated PID readings) then a new boring shall be advanced at a location selected in an outward direction from the original location. While it is not necessary to collect samples from borings where visually impacted soil is present, analytical data will be required to establish the concentrations at the boundary of the excavation. At a minimum, the sample with the highest PID reading at any given location shall be selected for analysis. In cases where there is no evidence of impacts at the perimeter boring, the soil sample immediately above the water table shall be collected for analysis. In the event that field observations suggest that impacted soils are significantly shallower or deeper than those used to define the vertical extent, soil samples shall be collected at two depth intervals below the deepest impacted zone to establish the vertical extent for excavation.

Soil borings shall be completed using conventional hollow-stem auger or direct-push drilling methods. Soil samples shall be collected continuously to the base of each boring which shall be a minimum of 36 ft below grade. The locations of initial soil borings are provided on Figure 5. At a minimum, the three locations down the center of the known area of the plume will be used to assess the vertical extent. The remaining locations correspond to the suspected outer reaches of the plume. As the intent of the program will be to establish the horizontal and vertical limits of the excavation, the locations of subsequent soil borings shall be selected in the field based on the findings of the initial borings. As depicted on Figure 5, soil borings are proposed to be installed on the adjacent ANG property. The Owner will be responsible for appropriately obtaining access to the ANG property for the purposes of completing the delineation effort.

A portion of the each 2 ft interval shall be used for field screening for the presence of VOCs using a PID. The field screening sample shall be placed in a Ziploc® bag and allowed to equilibrate to ambient temperature for a minimum of 15 minutes. The PID will then be inserted into the bag to screen for VOCs. The results of the field screening shall be noted on the boring log. If PID readings above background values are noted, then the second portion of the sample shall be retained for

potential laboratory analysis if warranted based on the rationale for sampling provided in the approach section above.

Soil analysis

Samples selected for analysis shall be analyzed for VOCs and SVOCs using USEPA methods 8260 and 8270 in accordance with current New York State Analytical Services Program (NYSASP) procedures. The laboratory conducting the analysis is required to have a current New York State Department of Health Environmental Laboratory Accreditation Program (ELAP) certification for the analytical methods being completed. The laboratory is required to provide Category B deliverable data packages. QA/QC samples (MS, MSD, and field duplicate) will be submitted at a frequency of 1 per 20 samples. Trip blanks shall also be used for each set of samples delivered to the laboratory.

Companion field screening methods

Field screening tools can be used as a companion to the sampling and analysis program defined above by providing qualitative information pertaining to impacted soils prior to collection of soil samples. An example of a field screening tool is the Geoprobe Membrane Interface Probe or MIP®, which can be used to detect VOCs in the subsurface. This device is advanced using direct-push methods. The MIP is equipped with a heated probe and a permeable membrane. The soil is heated as the tool is advanced and the VOCs pass through the membrane to PID or flame-ionization detector (FID) calibrated to the compound of interest. Real-time data is provided to show relative VOC concentrations in graphical form. The MIP can be used to preliminarily delineate the horizontal and vertical extent of impacted soil. This information can then be used to select locations for the collection of samples to quantify the VOCs and SVOCs for comparison to SCGs to set the excavation limits. Use of a field screening methods such as the MIP may speed up the field program.

Delineation report

The results of the field investigation shall be used to provide justification for the horizontal and vertical extent of soil to be removed. The report shall consist of a summary of the data collected and a map outlining the horizontal and vertical limits of the proposed removal action. This information shall be provided to the NYSDEC project manager for review and approval.

6.2.2. Pre - excavation preparation

Prior to commencement of remedial activities, the Contractor or the Contractor's Engineer must submit remedial design plans to the NYSDEC for review and approval. The Contractor must provide the NYSDEC a minimum of ten days to review these plans. The plans required to be submitted include, but may not be limited to, the following: a Site management plan, a storm water pollution prevention plan (including an erosion control plan), a dust control plan, a decontamination plan, a construction water management plan, a

hazardous/non-hazardous waste management plan, a soil staging plan, and a soil/fill management plan.

Prior to the initiation of remedial activities, the Site will require preparation to allow for excavation and reduce the associated risks to the general public and on-site workers.

To allow for the initiation of excavation activities all existing structures located in the area to be excavated will be demolished and disposed of as needed to provide unencumbered access to the area. In addition, the Site will require clearing and grubbing. Trees, brush, and other vegetation will be cut at ground surface and processed using a wood chipper or other appropriate equipment such that the material can be used as on-site fill or transported off-site.

To reduce the risk posed by excavation, fencing and barricades will be constructed to restrict community access to the exposed contaminated material and several contaminant transport reduction systems, such as erosion control, construction water management and dust control will be established prior to the initiation of remedial activities.

6.2.3. Excavation requirements

Excavation to the depth required (greater than 36 ft) can be completed in using a variety of methods. Three of the common methods are 1) sheet piling, 2) step-excavation, and 3) laying back the slope. Each method has its advantages and disadvantages and it will be up to the contractor to work with Suffolk County representatives to establish the most appropriate method for removal of the impacted soil.

As previously stated, an 8-inch diameter sanitary line is located within the area to be excavated. Prior to initiating work, the contractor shall work with the appropriate local, county, and state personnel and agencies to identify the exact location, depth and type of construction of this structure. Any excavation plans shall identify the means and methods for protecting the structure or temporarily rerouting and removal of the structure during excavation.

Excavations for remedial activities will be open excavations in accordance with applicable local, state, and federal regulations. All excavations must be backfilled as soon as the work allows. If excavations are left open, they will be barricaded and warning lights will be posted, if necessary. Subsequent to backfilling all disturbed soils will be graded and revegetated.

Excavated material may be used for backfill, if deemed appropriate by the NYSDEC, following characterization performed in accordance with Section 6.2.4.

6.2.4. Soil screening

Stained soil is soil that is observed to be discolored, tinted, dyed, unnaturally mottled, or has a sheen, or contains NAPL. Excavated soil that is visibly stained or produces elevated PID readings (i.e., sustained

PID readings above background levels) will be considered potentially contaminated and stockpiled in up to 250 cu yd piles for further assessment. The potentially contaminated soil will be stockpiled on and covered by polyethylene sheeting to reduce the infiltration of precipitation and the entrainment of dust. The stockpiled soil will then sampled for reuse, treatment, or disposal as directed by the NYSDEC.

Excavated soils that do not exhibit a sheen, do not contain NAPL, or exhibit PID readings above background levels will be inspected by the NYSDEC and considered for reuse as backfill in the excavated areas only. If such material is not reused as backfill in the excavated area from which it came, and if the material is not sampled for VOCs, SVOCs, PCBs, and metals, it will be transported to a permitted off-site disposal facility within 90 days of generation. If the material is sampled and does not meet TAGM 4046 soil screening values, the material must be transported off-site. If the material is sampled and is in compliance with TAGM 4046 screening values, the soil can be reused as subgrade fill on the ADD property with concurrence of the NYSDEC.

6.2.5. Soil segregation

Soil segregation will be completed based on two criteria. The first criterion will be the depth of the soil within the excavation and the second consideration will be the results of the screening procedures outlined in section 6.2.4. A representative of the NYSDEC will observe soil segregation activities to ensure that the segregation criteria are followed.

Soil from 0 to 25 ft below grade

Excavated soil that is visibly stained or identified as contaminated based on elevated PID readings will be characterized for reuse, treatment or disposal. For excavated soil that exhibits visual evidence of contamination, one composite sample and a duplicate sample will be collected for 250 cy of stockpiled soil, and a minimum of 1 sample will be collected for volumes less than 250 cy.

The composite sample will be collected from five locations within each stockpile. A duplicate composite sample will also be collected. PID measurements will be recorded for each of the five individual locations. One grab sample will be collected from the individual location with the highest PID measurement. If none of the five individual sample locations exhibit PID readings, one location will be selected at random. The composite sample will be analyzed by a NYSDOH ELAP-certified laboratory for SVOCs using USEPA method 8270. The grab sample will be analyzed for VOCs using USEPA method 8260.

Soil samples will be composited by placing equal portions of soil from each of the five composite sample locations into a pre-cleaned, stainless steel (or Pyrex glass) mixing bowl. The soil will be thoroughly homogenized using a stainless steel scope or trowel and transferred to pre-cleaned jars provided by the laboratory. Sample jars will then be labeled and a chain-of-custody form will be prepared. Procedures for soil sampling are provided in Appendix A.

Soil containing one or more constituents in excess of the TAGM 4046 values will be managed in accordance with Section 6.2.7. Soil that meets the screening criteria can be placed back into the base of the excavation, with concurrence of the NYSDEC, in accordance with Section 6.2.4.

Soil from 25 ft to the base of the excavation
Soil removed from the base of the excavation will be considered impacted and require management as defined in section 6.2.7.

Documentation samples will be collected once the excavation has been completed. These samples will serve to document the condition of soil left in place at the Site. At a minimum, documentation samples will include one sample collected from the bottom of the excavation and one sample from each of four sidewalls of the excavation.

6.2.6. Oxygen release compound amendment

Oxygen release compound (ORC®) is a proprietary formulation of phosphate-intercalated magnesium peroxide that time releases oxygen when hydrated. ORC® was developed and is sold by Regenesis. It has been proven that the addition of oxygen can promote aerobic biodegradation of petroleum compounds. ORC® provides slow release of oxygen to ground water and subsurface soil. Information pertaining to ORC® is provided in Exhibit 4.

If the LNAPL removal process leaves residual petroleum compounds at concentrations in excess of the TAGM 4046 values, ORC® may be used to further reduce the concentrations by adding oxygen to stimulate microbial degradation of the remaining material in both soil and ground water.

A worksheet supplied online by Regenesis was used to estimate the quantity of ORC® to be placed into the base of the excavation once removal activities are completed to the extent possible. The worksheet takes into consideration the concentration of petroleum compounds in the aquifer as well as the size of the source area and the ground water plume. Other values that are used in the calculation include total petroleum hydrocarbons (TPH) and the fraction of organics (FOC) present in the aquifer material. Notably, given the size of the area, the amount of FOC in the aquifer can significantly alter the volume of ORC® required.

A copy of the worksheet completed for an initial estimation of the amount of ORC® required is provided in Exhibit 4. The values used to complete this worksheet included a source area of 70 ft by 170 ft, a plume dimension of 75 ft by 350 ft, and concentrations of individual petroleum compounds as identified in analysis of samples collected from ERM-07 and PZ-08. The value used for TPH was the total VOC and SVOC concentration as this parameter was not analyzed. Although the worksheet can also use site-specific results for Biological Oxygen Demand (BOD), and Chemical Oxygen Demand (COD) to calculate the

usage requirements these data were not collected so the results shown on the worksheet are default values.

Based on the worksheet calculations using the individual parameters for the Site, a total of 6,638 pounds of ORC® should be used. This value includes a multiplication factor of 5 for undefined oxygen demands.

Regenesis recommends that application of ORC® into excavations containing standing water be completed using ORC® in a slurry form. This will minimize the potential mixing and wetting problems. Once the slurry is mixed it can either be placed by a backhoe bucket or pumped into the excavation. The slurry should subsequently be mixed with soil. Regenesis information pertaining to the installation of ORC® into an excavation is included in Exhibit 4.

If ORC® will be used, the Contractor will provide details regarding addition of ORC® to the final excavation in the remedial design documents, which is to be submitted to the NYSDEC for review and approval prior to commencement of remedial activities.

6.2.7. Management of petroleum impacted soils

NYSDEC's STARS Memo #1, *Petroleum Contaminated Soil Guidance Policy*, provides three options for the management of petroleum-impacted soils:

1. Process under a specific NYSDEC BUD such as an approved hot-mix asphalt or cold-mix asphalt plant
2. Dispose at a permitted off-site disposal facility
3. Treat on-site in accordance with NYSDEC's STARS Memo #2, *Biocell and Biopile Designs for Small-Scale Petroleum-Contaminated Soil Projects*. Soil that has been treated on-site and complies with TAGM 4046 may be used for subgrade fill on the ADD property with concurrence by the NYSDEC.

NYSDEC's STARS Memo #1 and STARS Memo #2 are included as Exhibit 2.

The soil management option selected will need to be approved by NYSDEC prior to implementation. Notification of the preferred option for soil management should be provided in writing and contain the basis for the decision as well as any supporting information pertaining to soil disposition.

If on-site treatment is selected, biopiles may be constructed as described in the following sections, and in accordance with NYSDEC's STARS Memo #2. A plan describing the biopile implementation shall be provided to NYSDEC for approval prior to excavation. This plan should include current concentrations of compounds within the soil to be treated, location of the treatment area, and the operation, monitoring and maintenance of the piles during treatment.

The following subsections provide information pertaining to the construction of biopiles. This information has been excerpted from STARS Memo #2. More detailed information can be found in the document (Exhibit 2).

Construction equipment
It is anticipated that the following equipment may be needed for constructing biopiles:

- Excavator
- Front end loader equipped with grinder bucket (or other mixing equipment) for mixing and transferring materials.
- Bulldozer
- Dump truck
- Water tank
- Backhoe

Biopile base construction
A layer of sand approximately 3 inches thick should be used as a base for each biopile. The sand base should be sloped approximately 1% across the width of the pile to promote drainage. The sand should be hauled from a local borrow source and spread with a bulldozer. The sand base should be surrounded by an earthen berm approximately 2 feet high. A liner should be placed over the sand and berm. The liner should consist of a continuous double layer of 8-mil reinforced polyethylene. The edges of the liner should be anchored with sandbags.

Soil amendment
Prior to transferring material to the biopile, 19:3:3 (nitrogen: phosphorous: potassium) granular fertilizer should be mixed with the soil. If soil pH exceeds 8.5, the soil pile may be seeded with uncontaminated soil as a source of viable microbes. A loader equipped with a grinder bucket (or other mixing equipment) should be used to thoroughly mix the fertilizer and soil. Water should be applied until soils are wet, but not saturated.

Biopile construction
The biopile should be constructed by placing amended material over the liner. Areas where equipment has traveled and compacted the placed material should be manually or mechanically tilled to re-establish porosity.

While constructing the pile, a ventilation system (including a network of 4-inch, slotted PVC piping, shut-off valves, explosion-proof blower, particle filter, moisture trap, and muffler) should be installed in accordance with the attached STARS Memo #2.

After the amended material has been placed, the pile should be covered with non-woven geotextile specifically designed for compost and biopiles. The geotextile should be air permeable, but have a minimal water permeability. The structure of the fabric should encourage water

to flow along the horizontal slope and minimize vertical flow. The covers placed on the side slopes should be keyed into the biopile a minimum of 12 inches. Seams in cover sections should be overlapped a minimum of 2 feet. The cover should be anchored using sandbags. Tires or hay bales should be placed on top of the pile to provide air space between the soil and the cover to allow air circulation beneath the cover.

Biopile operations/inspections
The system should be inspected at a frequency approved by NYSDEC and adjustments should be made if necessary.

When soil temperature is below 40 F, the end-of-season sampling procedures should be followed in accordance with STARS Memo #2 and the Site should be secured.

Process monitoring
Process monitoring should include, but may not be limited to, pH, temperature, moisture, nutrients, and aeration. These process specifications should be monitored in accordance with the STARS Memo #2, which is attached as Exhibit 2.

The bioremediation process should be performed under the guidance of NYSDEC until the soil reaches guidance values listed in STARS Memo #1 or until deemed appropriate by NYSDEC. Closure samples should also be collected and analyzed as described in STARS Memo #1. STARS Memo #1 is included as Exhibit 2. The monitoring and closure sampling program should be coordinated with NYSDEC. At a minimum, monitoring and closure sample results should be provided to NYSDEC.

Following bioremediation, the treated soil material should be managed in accordance with STARS Memo #1 with NYSDEC notification and approval.

6.2.8 Reuse of petroleum-impacted soil

Soil meeting the criteria defined as recommended soil cleanup objectives in TAGM 4046 may be reused on the property as subgrade fill, with concurrence of NYSDEC. A minimum of 12 inches of clean fill or soil shall be placed over the top of the fill material. The fill should not be placed within 100 ft of an existing or future structure. A plan outlining the areas where treated soil will be placed shall be provided to NYSDEC for approval prior to placement.

6.3. Related requirements

6.3.1. Subgrade material

Subgrade material used to backfill the excavation shall meet the following criteria.

- Excavated on-site soil that meets the screening criteria as outlined in Section 6.2.4 and approved by NYSDEC for reuse may be placed into the base of the excavation as backfill.

- Backfill material obtained from a NYSDEC-permitted mine.

If off-site soils from a source other than a NYSDEC-permitted mine, the following criteria must be met:

- Off-site soils will be documented as having originated from locations having no evidence of disposal or release of hazardous, toxic or radioactive substances, wastes or petroleum products. Samples will need to be analyzed as discussed in following bullets of this section. This documentation shall be provided to NYSDEC for approval prior to use of the fill material.

- Off-site soils intended for use as site backfill cannot otherwise be defined as a solid waste in accordance with 6 NYCRR Part 360-1.2(a).

- If the contractor designates a source as "virgin" soil, it shall be further documented in writing to be native soil material from areas not having supported any known prior industrial or commercial development or agricultural use. This documentation shall be provided to NYSDEC for approval prior to use of the fill material.

- Virgin soils should be subject to collection of one representative composite sample per source. The sample should be analyzed for TCL VOCs, SVOCs, pesticides, PCBs, and TAL metals and cyanide. The soil will be acceptable for use as backfill provided that all parameters meet the TAGM 4046 screening values. Documentation as such shall be provided to NYSDEC prior to use of the material.

- Non-virgin soils will be tested via collection of one composite sample per 500 cubic yards of material from each source area. If more than 1,000 cubic yards of soil are borrowed from a given off-site non-virgin soil source area and both samples of the first 1,000 cubic yards meet TAGM 4046 screening values, the sample collection frequency will be reduced to one composite for every 2,500 cubic yards of additional soils from the same source, up to 5,000 cubic yards. For borrow sources greater than 5,000 cubic yards, sampling frequency may be reduced to one sample per 5,000

cubic yards, provided all earlier samples met the TAGM 4046 screening values.

6.3.2. Erosion control

When remedial actions at the Site require the disturbance of more than 1 acre of land, federal and state laws require that the project obtain coverage under the NYSDEC SPDES General Permit for Storm Water Discharges from Construction Activities, Permit #GP-02-01 (Construction Storm Water General Permit). It should be noted that a project involving soil disturbances of less than 1 acre may be required to obtain coverage under the aforementioned permit if the DEC determines that a SPDES permit is required pursuant to the ECL. Requirements for coverage under the Construction Storm Water General Permit include the submittal of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must fulfill the requirements of GP-02-01 and include an Erosion Control Plan. The Erosion Control Plan, in accordance with permit requirements, will provide the following information:

- A background discussion of the scope of the construction project.
- A statement of the storm water management objectives.
- An evaluation of post-development runoff conditions.
- A description of proposed storm water control measures.
- A description of the type and frequency of maintenance activities required to support the control measure.

The SWPPP will address issues such as erosion prevention, sedimentation control, hydraulic loading, pollutant loading, physical Site characteristics that impact design, and Site management planning. All descriptions of proposed features and structures at the Site will include a description of structure placement, supporting engineering data and calculations, construction scheduling, and references to established detailed design criteria. The SWPPP will conform to all requirements as established by applicable regulatory agencies. The SWPPP will be reviewed and approved by NYSDEC prior to commencement of field work.

Soil conservation practices will be incorporated in the construction and development plans to mitigate soil erosion, off-site sediment migration, and water pollution from erosion. These practices include vegetative and structural measures. These measures will be temporary and serve only during the construction stage. The contractor will remove temporary measures at the completion of construction and upon final Site stabilization. The selection of erosion and sediment control measures will be based on several general principles, including:

- The minimization of erosion through project design (maximum slopes, phased construction, etc.).

- The incorporation of temporary erosion control measures.

- The removal of sediment from sediment-laden storm water before it leaves the Site.

The use of appropriate temporary erosion control measures such as silt fencing and/or straw bales will be required around soil stockpiles and unvegetated soil surfaces during remedial activities. These methods are described below. Stockpiles shall be graded and compacted as necessary for positive surface water runoff and dust control. Stockpiles of soil will be placed a minimum of 50 feet from the Site boundaries.

Temporary erosion and sedimentation control measures and facilities will be employed during construction activities. Prior to any construction activity, the temporary erosion and sediment control measures described below, will be designed and installed to provide the required sediment and erosion control. The following temporary measures will be incorporated into construction activities:

- Silt fencing.
- Straw bales/stone check-dams.
- Temporary vegetation/mulching.

Regrading may result in sheet flow to various areas of the Site; therefore, silt fencing will be used as the primary sediment control measure. Prior to extensive clearing, grading and excavation, silt fences will be installed adjacent to areas of disturbance to prevent sedimentation. The location and orientation of silt fencing to be used during remedial operations shall be indicated on an erosion and sediment control plan.

Sediment collected along silt fences shall be removed to maintain desired performance and prevent structural failure of the fence. Accumulated sediment will be removed when 60% of the storage capacity of the silt fence is achieved. Removed sediment will be stockpiled and characterized in accordance with Section 6.3. Silt fences will remain in place until construction activities in the area are completed and vegetative cover or other erosion control measures are adequately established per GP-02-01. Silt fences will be provided and installed in accordance with the New York Guidelines for Urban Erosion and Sediment Control.

Straw bales will be used to intercept sediment-laden runoff from storm water channels as needed during various phases of construction. Additional straw bale dikes may be necessary in some areas during some phases of construction.

Use of straw bales will be limited to swales and/or diversion ditches where the anticipated flow velocity will not be greater than 5 feet per second (fps). Where flows may eventually exceed 5 fps along a swale or diversion ditch, stone check-dams shall be installed upgradient of the final bale barrier. The stone check-dams shall effectively reduce flow velocities and sediment load to the final barrier.

As with the silt fencing, sediment will be removed to maintain performance and prevent overtopping or failure of the straw bale barrier when 60% of the storage capacity of the straw bale barrier is full. Removed sediment will be stockpiled and characterized in accordance with Section 6.2.5. Sediment laden straw bales that have lost their structural integrity and/or effectiveness will be disposed of off-site as a solid waste. Straw bale barriers and stone check-dams will remain in place until construction activities contributing sediment to the barrier are complete and vegetative cover or other erosion control measures are adequately established. Straw bales will be provided and installed in accordance with the New York Guidelines for Urban Erosion and Sediment Control.

As a result of phased construction and split construction schedule, portions of the Site may be left in intermediate/incomplete conditions. Intermediate areas may include rough graded areas awaiting finer grading or areas awaiting topsoil placement. Intermediate areas where activities will not resume for a period in excess of 21-days weeks shall be seeded with a quick germinating variety of grass or covered with a layer of straw mulch.

The temporary cover will act to stabilize the soil and reduce erosion. As construction progresses, areas containing temporary vegetation or straw mulch can be covered without removal of the temporary vegetation or mulch.

6.3.3. Dust control

The surface of unvegetated or disturbed soil areas will be wetted with water or other dust suppressive agents to control dust during construction. Any subgrade material left exposed during extended interim periods (greater than 90 days) prior to placement of final cover shall be covered with a temporary cover system (i.e., tarps, spray type cover system, etc.) or planted with vegetation to control fugitive dust to the extent practicable. Particulate monitoring will be performed along the downwind perimeter during subgrade excavation, grading, and handling activities in accordance with the Community Air Monitoring Plan further detailed in Section 7.2 and in accordance with NYSDEC TAGM 4031 (Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites), which is included in Exhibit 1.

Dust suppression techniques will be employed at the Site in accordance with NYSDEC TAGM 4031. This TAGM describes guidance for dust monitoring, and includes a list of effective dust suppression techniques. As per TAGM 4031, dust suppression techniques that may be used at the Site include applying water on roadways, wetting equipment, spraying water on buckets during excavation and dumping, hauling materials in properly covered or watertight containers, covering excavated areas and material after excavation activity ceases, establishing vegetative cover, and reducing the excavation size and/or number of excavations. The use of atomizing sprays is recommended so that excessively wet areas will not be created but fugitive dust will be suppressed.

A Dust Control Plan will be submitted to NYSDEC for review and approval prior to commencement of field work.

6.3.4. Construction water management

Pumping of water (i.e., ground water and/or storm water that has accumulated in an excavation) from excavations, if necessary, will be done in such a manner as to prevent the migration of particulates, soil, or unsolidified concrete materials, and to prevent damage to the existing subgrade. Water pumped from excavations will be directed to the recharge basin (see Figure 2) or an equivalent basin/trap to be identified in the SWPP or otherwise managed in accordance with all applicable regulations so as to prevent endangerment of public health, property, or any portion of the construction.

Water in the excavations will not be discharged to the basin if:

- staining or PID measurements above background are observed in the excavation
- a sheen is present on the water surface

If any of these conditions exist, the water pumped from the excavations will be containerized and analyzed in accordance with the Surface Water and Ground Water Quality Standards set forth in 6 NYCRR Part 703.5 and the relevant discharge permit. If the water meets the surface water and ground water quality standards, it will either be disposed off-site or treated to meet standards prior to discharge.

Runoff from surface discharges shall be controlled. No discharges shall enter a surface water body without proper permits.

A Construction Water Management Plan will be submitted to NYSDEC for review and approval prior to commencement of field work.

6.4 Vapor intrusion potential evaluation

As stated in the SIR (O'Brien & Gere, January 2004) and Section 2.2 of this document, in addition to the area on the ADD property, VOCs have been identified in groundwater at a distance of approximately 350 ft to the south of the source area. As such the VOC plume underlies the adjoining ANG property as illustrated on Figure 6.

Because of the volatile nature of the constituents, there is a potential for migration of the VOCs from the groundwater through the permeable soils to the surface. The VOCs may then enter overlying structures through the floor where they would represent a potential exposure to current or future human occupants.

The structures in the vicinity of the source area will be removed during remediation. However, structures may be constructed in the area in the future. In addition, there are structures currently present on the ANG