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

Rebuild Now - NY
Empire State Development

June 2004

O'BRIEN & GERE
ENGINEERS, INC.

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James R. Heckathorne, P.E.
Vice President

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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.



James R. Heckathorne, P.E.
Vice President

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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.

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.

A *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

property. The assessment of the potential for vapor intrusion will be conducted differently on each of the properties.

To evaluate the potential for vapor occurrence at the surface in the vicinity of the source of VOCs following remediation, a series of soil gas samples will be collected and analyzed. The samples will be collected no sooner than 60 days following completion of the remedy to allow for stabilization of subsurface conditions. A total of 5 samples will be collected across the area. One sample should be collected from an area outside of the limit of the excavation. The remaining four samples should be collected within the footprint of the excavated areas. The exact locations should include areas near the edge of the former excavation as well as within the center. The exact locations are to be selected in the field with concurrence by NYSDEC and NYSDOH. Procedures for collection and analysis of soil vapor samples are provided in Appendix B.

Because of the activities being conducted on the ANG property, the assessment of the potential a vapor intrusion potential evaluation (VIPE) will be completed to assess the potential for a complete exposure pathway. A work plan describing this process is included as Appendix C.

6.5. Post excavation monitoring

Once the source material is removed and ground water monitoring program will be established to allow for periodic collection of ground water quality data to evaluate whether natural attenuation processes are occurring to reduce the concentrations.

6.5.1. Monitoring well installation

The monitoring program will include the installation of five ground water monitoring wells. The wells will be located as follows:

- One well will be located upgradient of the plume
- One well will be located within the area in which the soil was removed (source area)
- Two wells will be located downgradient of the source area
- One well will be located downgradient or at the downgradient edge of the plume

The approximate locations of these wells are illustrated on Figure 7.

It is possible that wells present on the ANG facility may be in locations that meet the objectives of one or more of the wells identified above. If so, information pertaining to the construction, integrity, and location of the well should be provided to NYSDEC for approval of the substitution. If new wells will be installed on the ANG property, the Owner will be responsible for obtaining proper access to the property for the purposes of installing the monitoring wells.

The wells shall be installed by a driller registered in New York State. A geologist shall be on Site to observe the well drilling and installation activities and prepare boring and well construction logs.

Borings to facilitate installation of the wells will be completed using hollow stem auger drilling methods. The borings will be completed to between 8 and 10 ft below the water table. Soil samples shall be collected continuously to the base of the boring using split barrel sampling method ASTM D-1586. A geologist will be on site to complete a boring log documenting encountered subsurface material and other pertinent observations including but not limited to soil composition, color, consistency, moisture content, recovery, odor and staining. In addition, each split spoon sample will be screened using a PID.

Upon completion of each boring, a 2-inch diameter PVC well will be installed through the auger string. Well construction will consist of 15-ft of 0.020-inch slot, PVC screen attached to an appropriate length of riser casing. A sandpack suitable for use with the screen slot size will be installed within the annular space between the borehole and the well. A bentonite seal will be installed in the annular space above the sandpack to minimize migration of water vertically along the borehole. The remaining annular space will be filled with a Portland cement/bentonite grout. Protective above-grade or flush-mount surface casings will be installed depending on the location of each well to minimize the potential for unauthorized access.

6.5.2. Well development

Following the completion of the monitoring well installations, each monitoring well will be developed. The purpose of the development is to:

- Remove fine-grained materials from the sand pack and formation
- Reduce the turbidity of ground water samples
- Increase the yield of the well to reduce the potential of the well yielding an insufficient volume of water during ground water sampling

The wells will be developed using a stainless steel bailer. Parameters (pH, conductivity, temperature and turbidity) will be collected subsequent to the removal of each well volume. Development will be considered complete when the parameters for three consecutive measurements stabilize to within 10% of each other. If the well does not produce adequate water or purge water turbidity is unusually high an attempt will be made to remove up to 10 well volumes.

6.5.3. Decontamination

Decontamination procedures are designed to remove particles and compounds which could affect the integrity of samples and, thus, the interpretation of environmental sampling data.

Drilling and soil sampling equipment shall be decontaminated using steam cleaner. Prior to steam cleaning, mud and large soil particles may need to be removed using a brush. Smaller sampling equipment that will be reused may also be cleaned using a soapy water wash followed by a potable water rinse.

6.5.4. Investigation derived wastes

Investigation derived waste (IDW) generated from the installation, development, and sampling of monitoring wells will be handled as follows:

Soil generated during drilling shall be placed in 55-gallon drums for subsequent characterization and off-site disposal.

Purge water generated during the development of the monitoring wells will be discharged to the land surface in the vicinity of the well. If NAPL is observed on the ground water or if strong chemical odors or PID readings above background levels are detected, the purge water will be contained in 55-gallon drums for subsequent characterization and disposal.

Decontamination should take place in the area in which the LNAPL removal excavation occurred. Water generated during decontamination will be discharged to grade in the vicinity of the decontamination activities.

6.5.5. Monitoring frequency

Ground water samples shall be collected from each of the five wells to assess trends in VOC concentrations as well as certain parameters that are indicative of biological activities associated with natural attenuation processes. It is expected that excavation of the source material will result in short term variations in the ground water characteristics followed by a longer period of more gradual variations. Therefore the monitoring frequency will vary as follows:

- First two years following removal: quarterly sampling and analysis to establish a baseline and assess seasonal variations.
- Next three years: Semi annual sampling and analysis
- Subsequent period: will depend on observations and be negotiated with NYSDEC

6.5.6. Monitoring program

Ground water monitoring will consist of collection of ground water elevation and ground water quality data. Ground water samples will be collected using low-flow methods. The Ground Water Monitoring Plan (GWMP) included in Appendix C details the procedures to be implemented during the ground water monitoring program.

Reports summarizing the results of the monitoring completed during each calendar year shall be submitted on an annual basis to the NYSDEC. The report shall be submitted by the first day of April of the following year. A summary of the information to be submitted is included in the GWMP.

7. Health and safety

Invasive work performed at the Site will be performed in accordance with all applicable local, state, and federal regulations to protect worker health and safety.

All contractors performing remedial or maintenance activities involving intrusive work at the Site will be required to prepare a site-specific, activity-specific Health and Safety Plan (HASP). The HASP should include provisions for protection of the community. To assist in the development of an appropriate HASP, copies of the Site Investigation Report are available to the contractor(s) at the Albany and Stony Brooke offices of the NYSDEC.

7.1. Construction personnel protection

Contractors engaged in subsurface construction or maintenance activities will be required to implement appropriate health and safety procedures. These procedures will involve, at a minimum, donning adequate personal protective equipment, performing appropriate air monitoring, and implementing other engineering controls as necessary to mitigate potential ingestion, inhalation and contact with residual constituents in the soils. Recommended health and safety procedures include, but may not be limited to, the following:

- While conducting invasive work at the Site, the Contractor shall provide safe and healthful working conditions. The Contractor shall comply with all New York State Department of Labor regulations and published recommendations and regulations promulgated under the Federal Occupational Safety and Health Act of 1970 and the Construction Safety Act of 1969, as amended, and with laws, rules, and regulations of other authorities having jurisdiction. Compliance with governmental requirements is mandated by law and considered only a minimum level of safety performance. The Contractor shall insure that all work is performed in accordance with recognized safe work practices.

- The Contractor shall be responsible for the safety of the Contractor's employees and the public. The Contractor shall be solely responsible for the adequacy and safety of all construction methods, materials, equipment and the safe prosecution of the work.

- The Contractor is responsible to ensure that all project personnel have been trained in accordance with 29 CFR 1910.120.

- The Contractor shall have a written HASP prepared, signed and sealed by a safety professional; a safety professional and/or a trained safety representative(s) active on the job whenever the work is in progress; an effective and documented safety training program; and a safety work method check list system.

- The Contractor shall stop work whenever a work procedure or a condition at a work site is deemed unsafe by the safety professional or his trained safety representative(s).

- The Contractor shall employ a properly qualified safety professional whose duties shall be to initiate, review and implement measures for the protection of health and prevention of accidents. The Contractor shall also employ safety representative(s) whose duties, working under the direct supervision of the safety professional, shall include the implementation the safety program for the work at the Site.

- Recognition as a safety professional shall be based on a minimum of certification by the Board of Certified Safety Professionals as a Certified Safety Professional and 5 years of professional safety management experience in the types of construction and conditions expected to be encountered on the Site.

- Safety representative(s) who work under the direction of the safety professional will have appropriate qualifications. The required qualifications shall include a minimum of: 5 years of relevant construction experience, two years of which were exclusively in construction safety management; successful completion of a 30-hour OSHA Construction Safety and Health training course; 40-hour training as per 29 CFR 1926.65, Hazardous Waste Operations and Emergency Response; and, if confined space entry is required, training as per 29 CFR 1910.146, Permit-Required Confined Spaces.

- The safety professional shall visit and audit all work areas as often as necessary but at least once each week and shall be available for consultation whenever necessary.

- The safety representative(s) must be at the job site full time whenever work is in progress. When multiple shift work is in progress more than one safety representative may be required.

- The safety professional and his safety representative(s) shall be responsible for ensuring Contractor compliance with governing laws, rules and regulations as well as of good safety practice.

- The safety staff shall maintain and keep available safety records, up-to-date copies of all pertinent safety rules and regulations, Material Safety Data Sheets, and the Contractors' site-specific HASPs and the Site emergency response plan with emergency and telephone contacts for supportive actions.

- The responsible safety professional shall sign and seal the Contractor's written site-specific HASP and the HASP shall be available to workers on site. The Contractor shall provide copies of the HASP to the Contractors' insurer, if required.

- The HASP shall be written in accordance with 29 CFR 1926.65 and it will identify and define the following: the hazards anticipated for each major invasive task; the engineering, administrative and/or personal protective equipment control measures that will be implemented; the surveillance methods, and schedules of both walk through surveys and in-depth safety audits to be performed on site; medical monitoring and screening methods; the Contractors' pre-start-up and continuous safety- training program; emergency response equipment, notification, training and procedures; and include copies of safety inspection check-off sheets, specific to the work methods and crews performing work at the various job locations, to be used on a regular basis in evaluating the Site and work methods.

- The safety professional and/or his trained safety representative(s) shall as a minimum:

- Schedule and conduct safety meetings and safety training programs as required by law, the health and safety plan, and good safety practice. A specific schedule of dates of these meetings and an outline of materials to be covered shall be provided with the health and safety plan. All employees shall be instructed on the recognition of hazards, observance of precautions, of the contents of the health and safety plan and the use of protective and emergency equipment.

- Determine that operators of specific equipment are qualified by training and/or experience before they are allowed to operate such equipment.

- Develop and implement emergency response procedures. Post the name, address and hours of the nearest medical doctor, name and address of nearby clinics and hospitals, and the telephone numbers of the appropriate ambulance service, fire, and the police department.

- Post all appropriate notices regarding safety and health regulations at locations that afford maximum exposure to all personnel at the job site.

- Post appropriate instructions and warning signs in regard to all hazardous areas or conditions that cannot be eliminated. Identification of these areas shall be based on experience, on site surveillance, and severity of hazard. Such signs shall not be used in place of appropriate workplace controls.

- Ascertain by personal inspection that all safety rules and regulations are enforced. Make inspections at least once a shift to ensure that all machines, tools and equipment are in a safe operating condition; and that all work areas are free of hazards. Take necessary and timely corrective actions to eliminate all unsafe acts and/or conditions, and submit to the Engineer each day a copy of his findings on the inspection check list report forms established in the health and safety plan.

- Provide safety training and orientation to authorized visitors to ensure their safety while occupying the job site.

- Perform all related tasks necessary to achieve the highest degree of safety that the nature of the work permits.

- The Contractor shall have proper safety and rescue equipment, adequately maintained and readily available, for foreseeable contingencies. This equipment may include such applicable items as: proper fire extinguishers, first aid supplies, safety ropes and harnesses, stretchers, water safety devices, oxygen breathing apparatus, resuscitators, gas detectors, oxygen deficiency indicators, combustible gas detectors, etc. This equipment should be kept in protected areas and checked at scheduled intervals. A log shall be maintained indicating who checked the equipment, when it was checked, and that it was acceptable. This equipment log shall be updated monthly and be submitted with the monthly report. Equipment that requires calibration shall have copies of dated calibration certificates on site. Substitute safety and rescue equipment must be provided while primary equipment is being serviced or calibrated.

- All personnel employed by the Contractor or his subcontractors or any visitors whenever entering the job site, shall be required to wear appropriate personal protection equipment required for that area. The Contractor may remove from the Site any person who fails to comply with this or any other safety requirement.

7.2. Community air monitoring program

Air monitoring will be performed during excavation activities in accordance with the New York State Department of Health (NYSDOH) *Generic Community Air Monitoring Plan*, which is included in Exhibit 5. Prior to implementation of remedial activities, the developer will prepare and submit a Perimeter Air Monitoring and Dust Control Plan for NYSDEC approval. Ambient air monitoring will be conducted by the Professional Engineer's representative monitoring the work on a real-time basis during all subsurface construction activities. All air monitoring readings will be recorded in a logbook and will be available for review by the NYSDEC and NYSDOH.

Actions levels for dust generation shall be developed based upon the constituents identified in the surface soils.

7.2.1. Vapor emission response plan

If the downwind area perimeter air concentrations of organic vapors exceed the upwind work area perimeter concentration by 5 ppm but less than 25 ppm, the following actions will be taken:

- Monitoring of the perimeter work area location every 30 minutes.
- Monitoring of the organic vapor concentration 200 feet downwind of the work area perimeter or half the distance to the nearest receptor, whichever is less, every 30 minutes. If this reading exceeds the perimeter work area upwind organic vapor concentration by 5 ppm, all work must halt and monitoring increased to every 15 minutes. If, at any time, this reading exceeds the perimeter work area upwind concentration by 10 ppm, the Major Vapor Emissions Response Plan will be initiated.
- If organic vapor levels 200 feet downwind of the perimeter work area or half the distance to the nearest downwind receptor, whichever is less, exceeds by 5 ppm the work area perimeter upwind concentration persistently, then air quality monitoring must be performed within 20 feet of the nearest downwind receptor (20-foot zone). If the readings in the 20-foot zone exceed the perimeter work area upwind concentration by 5 ppm for more than 30 minutes, then the Major Vapor Emissions Response Plan will be implemented.
- Work activities can resume only after the downwind 200 foot reading and the 20-foot zone reading are less than 5 ppm above the perimeter work area upwind concentration. In addition, the downwind perimeter work area concentration must be less than 25 ppm above the perimeter work area upwind concentration.

7.2.2. Major vapor emission response plan

If the downwind work area perimeter organic vapor concentration exceeds the upwind work area perimeter concentration by more than 25 ppm, then the Major Vapor Emission Response Plan will be activated. Upon activation, the following activities will be undertaken:

1. All work will halt.
2. All Emergency Response Contacts as listed in the Health and Safety Plan will be contacted.
3. The NYSDEC, NYSDOH, and the Suffolk County Health Department will be notified and advised of the situation.
4. The local police and fire department authorities will immediately be contacted by the Safety Officer and advised of the situation.

5. Frequent air monitoring will be conducted at 30-minute intervals within the 20-Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Safety Officer and work may resume.

7.2.3. Particulate monitoring and response levels

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the work area at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques, as described in Section 6.3.3, provided that downwind PM-10 particulate levels do not exceed 150 mcg/m3 above the upwind level and provided that no visible dust is migrating from the work area.

If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

8. Quality assurance/quality control

8.1. Analytical data

Characterization samples collected during remedial activities will be analyzed using the most recent NYSDEC Analytical Services Protocol (ASP). Analytical data will be submitted in complete ASP Category B data packs including documentation of laboratory QA/QC procedures that will provide legally defensible data in a court of law. If requested, the Category B data packs will be submitted to the NYSDEC.

The laboratory proposed to perform the analyses will be certified through the New York State Department of Health Environmental Laboratory Approval Program (ELAP) to perform Contract Laboratory Program (CLP) analysis and Solid Waste and Hazardous Waste Analytical testing on all media to be sampled during this investigation. The laboratory will maintain this certification for the duration of the project.

The detection limit for contaminants of concern shall be equal to or less than the noted TAGM 4046 recommended cleanup goals.

Sampling and decontamination procedures for the soil piles are presented in Appendix A. Procedures for chain of custody, laboratory instrumentation calibration, laboratory analyses, reporting of data, internal quality control, and corrective actions shall be followed as per NYSDEC ASP and as per the laboratory's Quality Assurance Plan. Where appropriate, trip blanks, field blanks, field duplicates, and matrix spike, matrix spike duplicate shall be performed at a rate of 5% (1 per up to 20 samples) and will be used to assess the quality of the data. The laboratory's in-house QA/QC limits will be utilized whenever they are more stringent than those suggested by the EPA methods.

After receipt of analytical results, the data package will be sent to a qualified, third party, data validation specialist for evaluation. A Data Usability Summary Report (DUSR) will be prepared. The DUSR will provide a determination of whether or not the data meets the project specific criteria for data quality and data use. DUSR guidelines are included as Exhibit 6.

8.2. Construction quality assurance

This Section has been prepared as a means of providing guidelines and procedures for Construction Quality Assurance (CQA) during

implementation of the remedy. It is the responsibility of the Site developer to prepare and implement a CQA Plan.

The CQA Plan should, at a minimum, contain the following:

- Responsibilities of each entity associated with the project. This should include a delineation of the appropriate lines of communication between, the contractor, developer, and inspection and design personnel associated with the construction activities.

- Qualifications, level of experience, and training required for the contractor, crew and inspectors in sufficient detail to determine personnel permitted to be involved with the project.

- A description of construction quality assurance/construction quality control (CQA/CQC) protocols to be used for documenting construction activities and compliance with remedial objectives set forth in this RAWP. Detailed information including the frequency of inspections, field testing methods, sampling requirements for laboratory testing, testing procedures and equipment to be utilized, criteria for acceptance/failure, and a description of the corrective actions to be initiated upon test failure should be presented.

- Outline testing parameters, procedures, and criteria of construction procedures to be utilized during the remedial activities. These will include, but may not be limited to, areas of excavation, soil management, backfill source and quality, cover thickness and composition, vegetation matrix, asphalt, and concrete.

9. Notification and reporting

The following minimum notification and reporting requirements shall be followed by the property Owner prior to and following Site development, as appropriate:

Table 9-1 *Summary of notification and reporting requirements.*

Notification/Reporting Requirement	*Text Reference*
Remedial plans and design documents that incorporate the requirements set forth in this RAWP must be submitted to NYSDEC for review and approval prior to commencement of remedial activities.	Sections 1.1 and 6.2.2
NYSDEC and SCDH must be notified prior to abandonment of unused sanitary structures.	Section 4.1 and 6.1
The property Owner must obtain and maintain an environmental easement.	Section 4.3
NYSDEC must be notified prior to reuse of excavated soil as on-site backfill material.	Sections 4.2, 6.2.4, 6.2.8, and 6.3.1
NYSDEC must be notified a minimum of 14 days prior to commencement of LNALP area delineation activities.	Section 6.2.1
The property Owner must obtain access to the ANG property as necessary.	Sections 6.2.1 and 6.5.1
NYSDEC must be notified of and approve of the selected soil management option (i.e., biopiles, off-site disposal, ORC)	Sections 6.2.6 and 6.2.7
The property Owner must notify NYSDEC prior to use of off-site backfill material from a source other than a NYSDEC-permitted mine.	Section 6.3.1
Prior to initiation of the LNAPL remedial action, a SWPPP must be submitted for NYSDEC approval.	Section 6.3.2
Prior to initiation of intrusive activities, a Dust Control Plan must be submitted for NYSDEC approval.	Section 6.3.3
Prior to initiation of intrusive activities, a Construction Water Management Plan must be submitted for NYSDEC approval.	Section 6.3.4
Ground water monitoring reports must be submitted to NYSDEC.	Section 6.5.6
NYSDEC, NYSDOH, and SCHD must be notified if the downwind organic vapor concentration exceeds the upwind concentration by greater than 25 ppm.	Section 7.2.2

A construction certification report stamped by a New York State licensed Professional Engineer, will be prepared and submitted to the NYSDEC and NYSDOH within 90 days after completion of the LNAPL remedial action. At a minimum, the report will include:

- Plans showing structures removed or closed in place and areas and depth of soil removal.
- Copies of daily inspection reports for the LNAPL removal activities.
- A text narrative describing the excavation activities performed, health and safety monitoring performed (both site-specific and Community Air Monitoring), quantities and locations of soil excavated, disposal locations or treatment description for the soil, soil sample locations and results, a description of any problems encountered, location results, acceptability test results for backfill sources as appropriate, and other pertinent information necessary to document that the Site activities were carried out properly.
- A certification that all work was performed in conformance with the Remedial Action Work Plan.

The NYSDEC notification contact is as follows:

Chittibabu Vasudevan
Bureau Director
Remedial Bureau A
Department of Environmental Remediation
NYSDEC
625 Broadway
Albany, NY 12233-7015

10. Citizen participation

In accordance with NYSDEC's guidance for Voluntary Cleanup Agreements, a Citizen Participation Plan has been included in the Remedial Action Work Plan as Appendix D.

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Environmental Resource Management, November 13, 2002, Memorandum – Results of Phase II Investigations, Gabreski Airport, Site No. V002956-01-0

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Newell, CJ, SD Acree, RR Ross, and SG Huling, 1995, Light nonaqueous phase liquids; USEPA Ground Water Issue, EPA/540/S-95/500

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Suffolk County Heath Services, Letters (Ground Water and Petroleum Monitoring Data), Dated 1997 through 2002, From Suffolk County to Mr. Paul John of NYSDEC, Monthly Spill Monitoring Data for Gabreski Airport.

UNC Geotech. October 3, 1988. *Letter Report Independent Verification of Alledged J-4 at Suffolk County Airport Long Island, NY.* Grand Junction, Colorado.

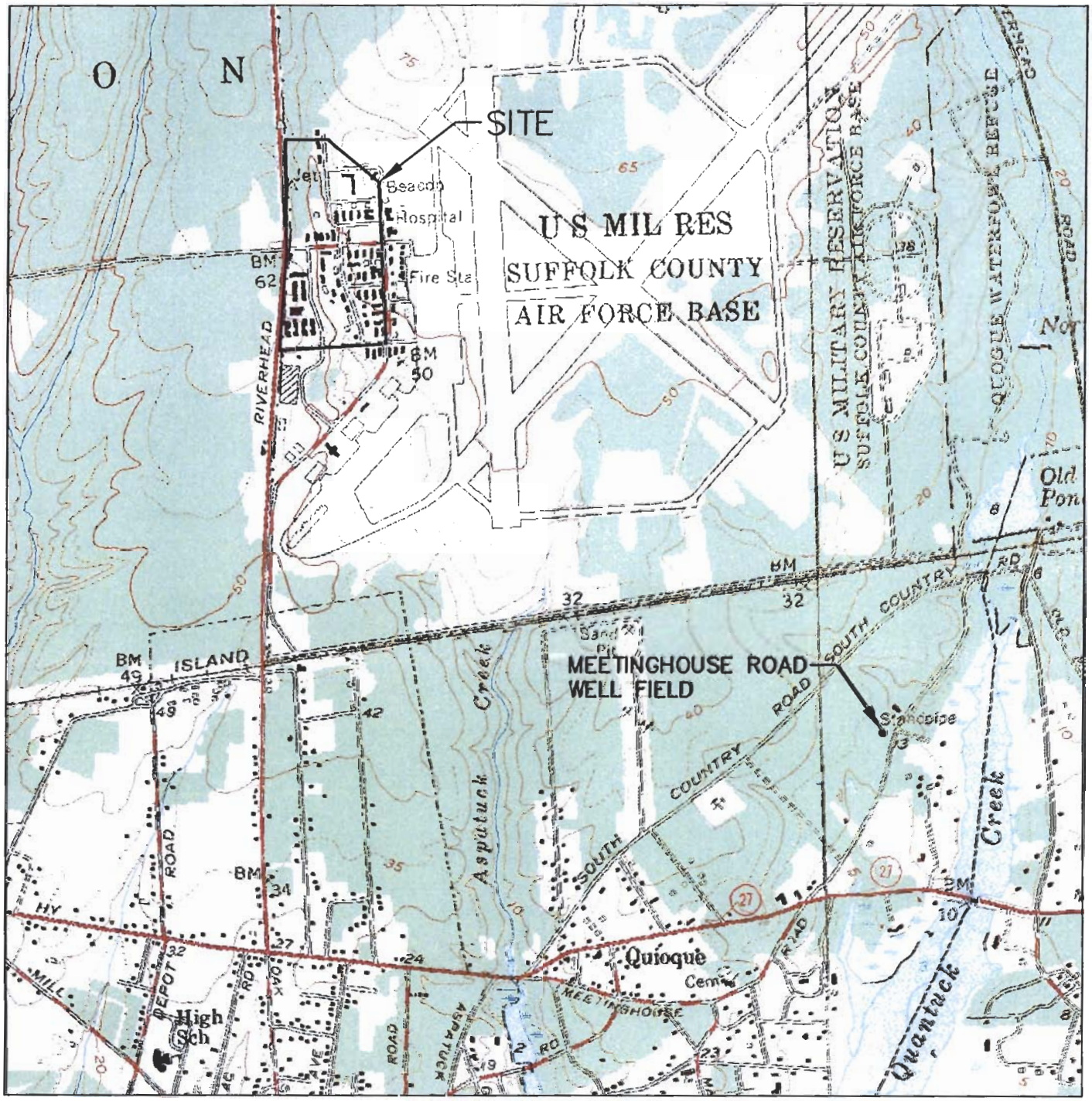
TABLES

Table 5-1. *Potential SCGs*

POTENTIAL CHEMICAL-SPECIFIC SCGs			
MEDIUM	CITATION	REQUIREMENTS	COMMENT
Soil	TAGM No. HWR-94-4046, January 24, 1994, and memos consolidating TAGM 4046 and STARS Memo #1 (12/20/00, 4/10/01, and 7/10/01).	Provides recommended soil cleanup objectives.	Potentially applicable to site soil.
Surface Water Ground Water	6 NYCRR Parts 700 – 706 Water Quality Regulations for Surface Waters and Ground Water	Provides surface water quality standards for Class C waters	Potentially applicable to storm water and groundwater discharges to the ground surface as a pathway to a Class C water body.
Surface Water Ground Water	T.O.G.S 1.1.1 Ambient Water Quality Standards and Guidance Values	Provides surface water quality guidance values and effluent limitations.	Potentially applicable to storm water and groundwater discharges to the ground surface as a pathway to a Class C water body.
POTENTIAL LOCATION-SPECIFIC SCGs			
LOCATION	CITATION	REQUIREMENTS	COMMENTS
Property Uses	Local zoning	States that commercial and light industrial facilities will be allowed to occupy the property.	Potentially applicable with respect to the type of receptors expected at the property.
POTENTIAL ACTION-SPECIFIC SCGs			
ACTION	CITATION	REQUIREMENTS	COMMENTS
Excavation and grading	40 CFR Part 50 – National Air Quality Standards	Site air quality during earth moving activities must meet the National Ambient Air Quality Standard (NAAQS) for particulate matter (150 $\mu g/m^3$ 24-hour average concentration).	Potentially applicable federal air quality standard.
Excavation and grading	NYSDEC TAGM HWR-89-4031 – Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites (10/27/89)	Provides guidance regarding dust monitoring, suppression, and action levels during earth moving activities.	Potentially applicable during excavation activities.
Excavation and grading	NYSDEC Generic Community Air Monitoring Plan	Provides a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of work activities.	Potentially applicable during excavation activities.
Soil/Fill Characterization	6 NYCRR Part 371 – Identification and Listing of Hazardous Wastes	Provides requirements for characterization of hazardous waste.	Potentially applicable for soil/fill material excavated during redevelopment activities.
Remediation of NAPL area	STARS Memo #1 – Petroleum-Contaminated Soil Guidance Policy (August 1992)	Provides direction on the handling, disposal and/or reuse of non-hazardous petroleum-contaminated soils.	Potentially applicable for NAPL-contaminated soils.
Remediation of NAPL area	STARS Memo #2 – Biocell and Biopile Designs for Small-Scale Petroleum-Contaminated Soil Projects (May 1996)	Provides a generic design approach for small-scale petroleum-contaminated soil projects.	Potentially applicable for NAPL-contaminated soils.
On-site Storage of Hazardous Waste	40 CFR Part 264 Subparts I and J – Use and Management of Containers and Tanks	If a hazardous waste is transported for off-site treatment, storage, or disposal, a manifest shall be prepared and distributed in accordance with 40 CFR 262.20 through 262.23.	Potentially applicable for soil/fill material excavated during remedial activities, if characterized as hazardous waste
Landfill Disposal	6 NYCRR Part 376 – Land Disposal Restrictions	Hazardous waste must meet land disposal treatment requirements prior to disposal.	Potentially applicable for soil/fill material excavated during redevelopment activities.

POTENTIAL ACTION-SPECIFIC SCGs			
ACTION	CITATION	REQUIREMENTS	COMMENTS
Transportation	6 NYCRR Part 364 – Waste Transporter Permits	Hazardous waste transport must be conducted by a hauler permitted under 6 NYCRR Part 364.	Potentially applicable for transport of soil/fill material, if characterized as hazardous waste
Transportation	49 CFR 172 – 174 and 177 – 179 – Department of Transportation Regulations	Hazardous waste transport to off-site disposal facilities must be conducted in accordance with applicable DOT requirements.	Potentially applicable for transport of soil/fill material, if characterized as hazardous waste
Transportation of Hazardous Waste	40 CFR Part 262 – Standards Applicable to Generators of Hazardous Waste	If a hazardous waste is transported for off-site treatment, storage, or disposal, a manifest shall be prepared and distributed in accordance with 40 CFR 262.20 through 262.23.	Potentially applicable for soil/fill material excavated during remedial activities, if characterized as hazardous waste
Construction	29 CFR Part 1910 – Occupational Safety and Health Standards and 29 CFR Part 1926 – Safety and Health Regulations for Construction	All construction activities must be conducted in accordance with applicable OSHA requirements.	Potentially applicable during redevelopment construction activities.
Transportation and Off-Site Disposal	6 NYCRR Part 372 – Hazardous Waste Manifest System and Related Standards for Generators, Transporters, and Facilities	Hazardous waste generator and transportation requirements must be met when hazardous waste is generated for disposal. Generator requirements include obtaining an EPA Identification number and manifesting hazardous waste for disposal.	Potentially applicable for soil/fill material excavated during redevelopment activities, if characterized as hazardous waste
Construction storm water management	NYSDEC General permit for storm water discharges associated with industrial activity from construction activities. Permit No. GP-02-01 Issued pursuant to Article 17 Titles 7 and 8 and Article 70 of Environmental Conservation Law.	The regulation prohibits discharge of materials other than storm water and all discharges which contain a hazardous substance in excess of reportable quantities established by 40 CFR 117.3 of 40 CFR 302.4, unless a separate NPDES permit has been issued to regulate those discharges. A permit must be acquired if activities involve the disturbance of more than 1 acre and may be required for disturbances of less than 1 acre if the DEC determines that a SPDES permit is required pursuant to the ECL. If the project is covered under the general permit, the following are required: • development and implementation of a storm water pollution prevention plan • development and implementation of a monitoring program • all records must be retained for a period of at least 3 years after construction is complete.	Potentially applicable for redevelopment construction activities.
Construction Water Discharge	6 NYCRR Part 750-758-State Pollutant discharge Elimination Systems	Discharge to surface water must be in accordance with a SPDES permit.	Potentially applicable to construction water discharge.

FIGURE 1



AIRPORT DEVELOPMENT DISTRICT
FRANCIS S. GABRESKI AIRPORT
WESTHAMPTON, NEW YORK

SITE LOCATION MAP

STATE LOCATION MAP

FILE NO. 10569.25466.004
DATE: JUNE 2004

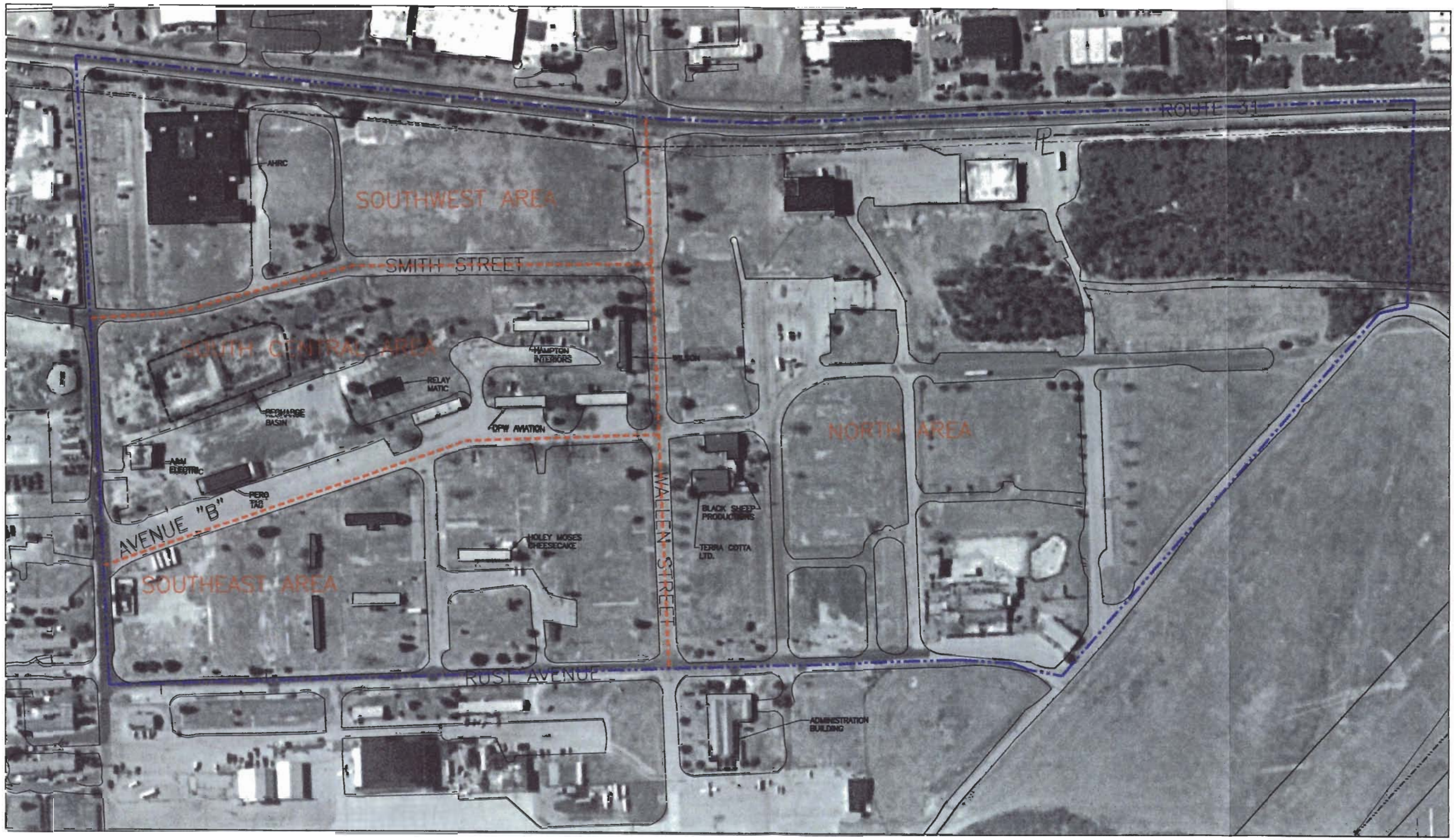
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O'BRIEN & GERE ENGINEERS INC.

I:\DIV83\PROJECTS\10569\25466\...3\004.DWG SF:1
PLOT DATE: 6/...4

PATH: I:\DWGS\PROJECTS\10569\25466\DWGS\022.DWG SF-100

FIGURE 2



LEGEND

APPROXIMATE LIMITS OF AIRPORT DEVELOPMENT DISTRICT

AREA BOUNDARY

EMPIRE STATE DEVELOPMENT

AIRPORT DEVELOPMENT DISTRICT
FRANCIS S. GABRESKI AIRPORT
WESTHAMPTON, NEW YORK

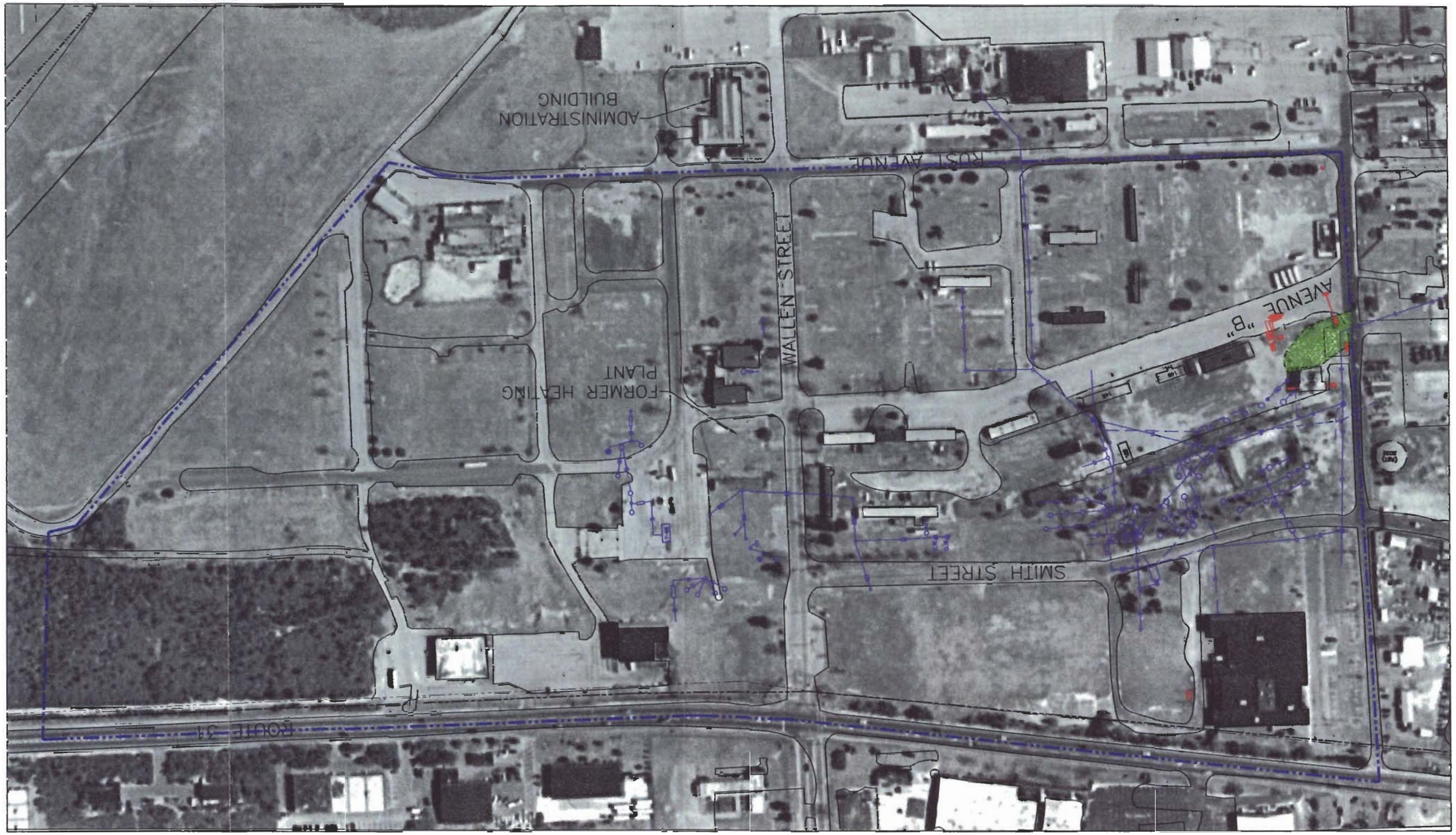
SITE MAP

0 100 200
SCALE IN FEET
APPROXIMATE SCALE

FILE NO. 10569.25466.022
JUNE 2004

O'BRIEN & GERE ENGINEERS, INC.

PLOT DATE: 5/18/04



BUILDING HISTORIC USE

140(32)– VEHICLE REPAIR
144(40)– VEHICLE MAINTENANCE
146(41)– PHOTOTECH
148(42)– ARMAMENT & ELECTRONICS HANGAR

PLOT DATE: 5/18/04

PATH: I:\DWG\PROJECTS\10569\25466\DWGS\023.DWG SF-100

HISTORIC SITE FEATURES

0 100 200
SCALE IN FEET
APPROXIMATE SCALE

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JUNE 2004

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AIRPORT DEVELOPMENT DISTRICT
FRANCIS S. GABRESKI AIRPORT
WESTHAMPTON, NEW YORK

EMPIRE STATE DEVELOPMENT

LEGEND

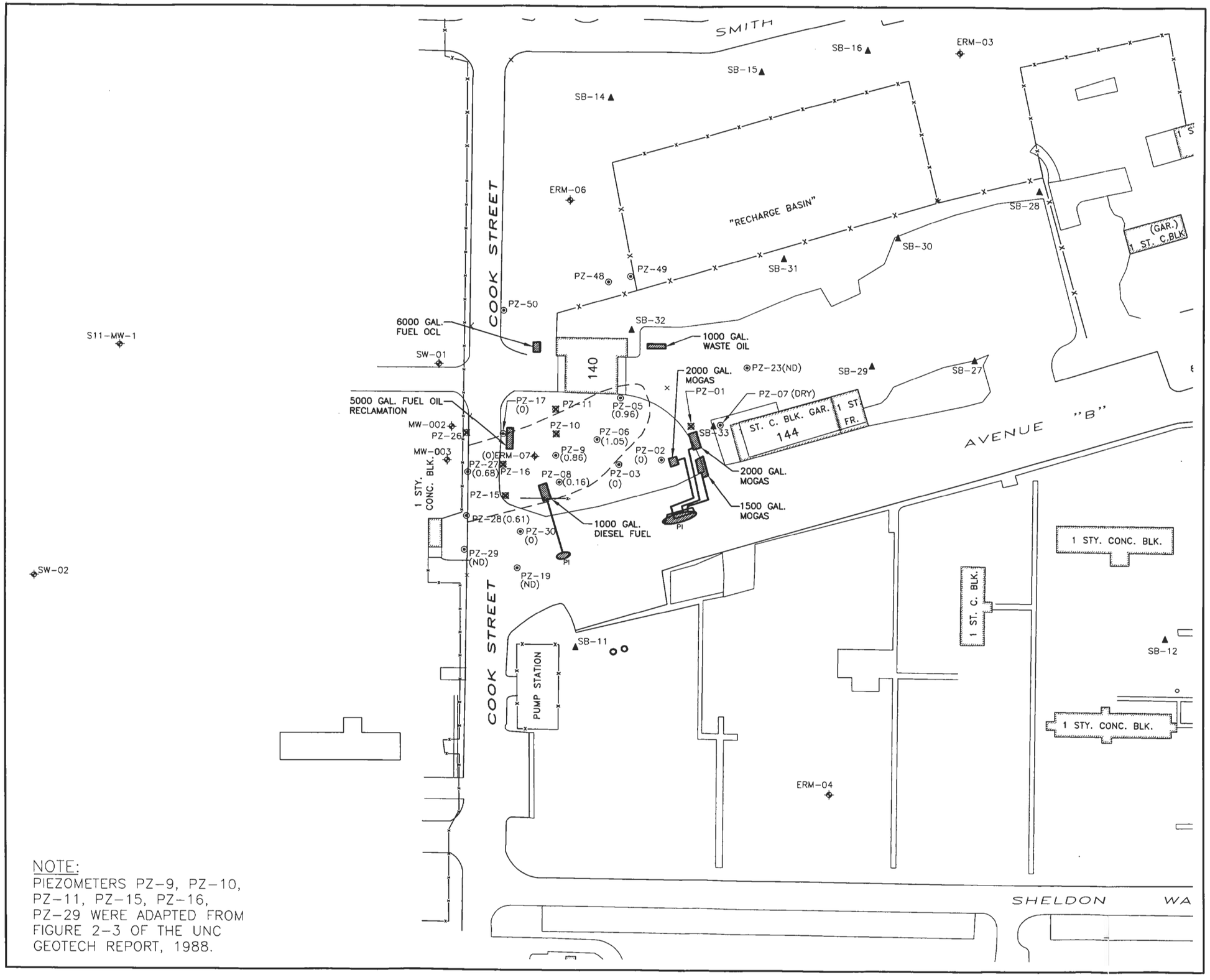
STORM DRAIN
SANITARY LINE
CESSPOOL
PETROLEUM STORAGE TANKS
APPROXIMATE LOCATION OF VOC PLUME
APPROXIMATE LIMITS OF AIRPORT DEVELOPMENT DISTRICT

FIGURE 3

DWG PATH: I:\DW83\PROJECTS\10569\25466\8 DWG\034.DWG

PLOT DATE: 5/16/04

FIGURE 4



NOTE:
PIEZOMETERS PZ-9, PZ-10, PZ-11, PZ-15, PZ-16, PZ-29 WERE ADAPTED FROM FIGURE 2-3 OF THE UNC GEOTECH REPORT, 1988.

LEGEND

- TP-01 — TEXT PIT LOCATION
- SB-02 — SOIL BORING LOCATION
- ERM-03 — MONITORING WELL LOCATION
- PZ-26 — PIEZOMETER LOCATION
- PIEZOMETER DESTROYED OR BROKEN AS OF 2002 (NO DATA)
- (ND) — NO DATA
- (0.16 FT.) — MAXIMUM RECORDED THICKNESS DURING 2002 AT PIEZOMETER LOCATION.
- HYDROCARBON PLUME (DASHED WHERE INFERRED)
- APPROXIMATE LOCATION OF FORMER PETROLEUM STORAGE TANKS

AIRPORT DEVELOPMENT DISTRICT
FRANCIS S. GABRESKI AIRPORT
WESTHAMPTON, N.Y.

2002 EXTENT OF LNAPL

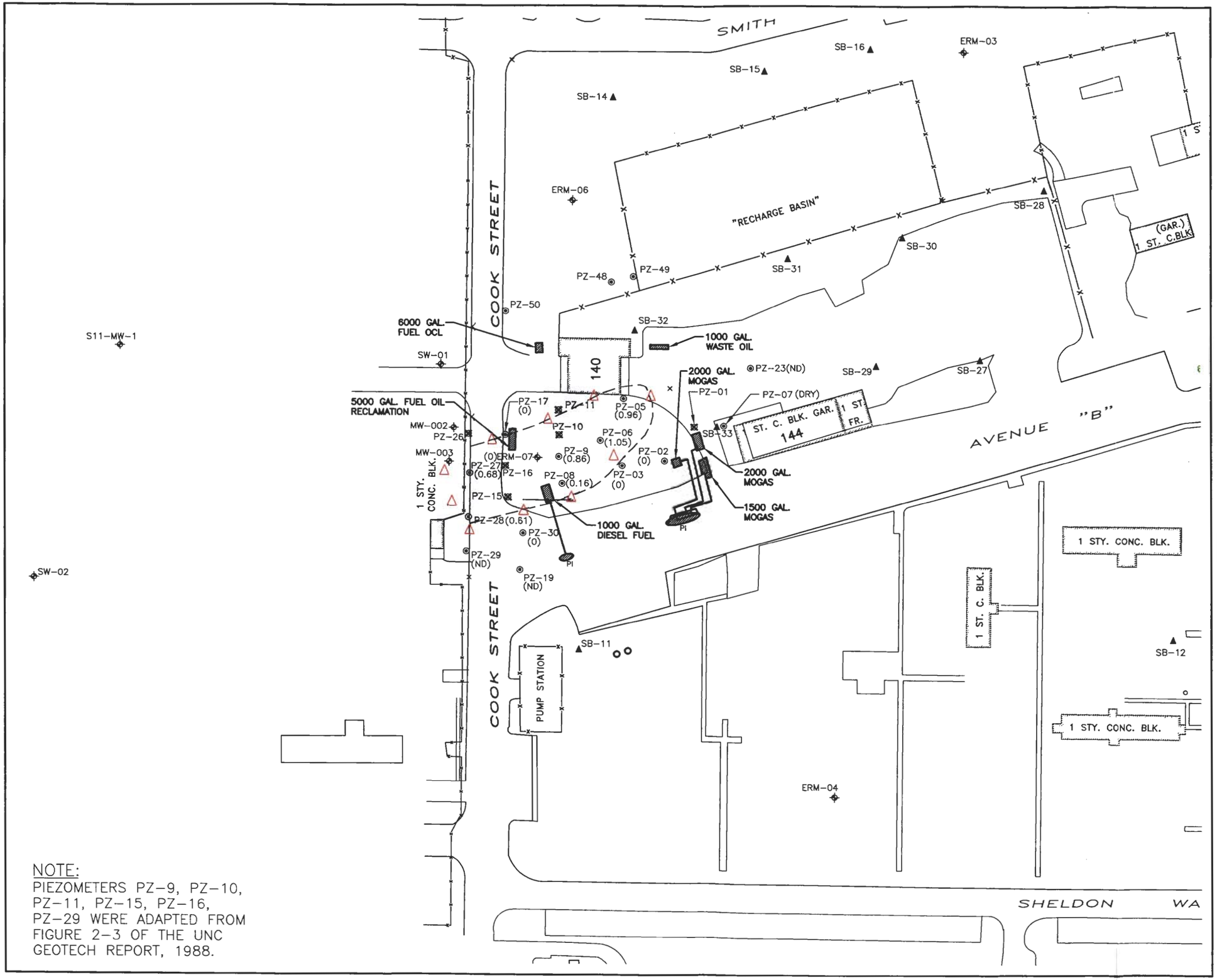
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FILE NO. 10569.25466.034
JUNE 2004

O'BRIEN & GERE ENGINEERS INC.

DWG PATH: I:\DIV83\PROJECTS\10569\25466\8 DWG\035.DWG

FIGURE 5



NOTE:
PIEZOMETERS PZ-9, PZ-10, PZ-11, PZ-15, PZ-16, PZ-29 WERE ADAPTED FROM FIGURE 2-3 OF THE UNC GEOTECH REPORT, 1988.

PLOT DATE: 5/16/04

LEGEND

- TP-01 — TEXT PIT LOCATION
- SB-02 — SOIL BORING LOCATION
- ERM-03 — MONITORING WELL LOCATION
- PZ-26 — PIEZOMETER LOCATION
- PIEZOMETER DESTROYED OR BROKEN AS OF 2002 (NO DATA)
- △ — INITIAL DELINEATION BORING LOCATION
- (ND) — NO DATA
- (0.16 FT.) — MAXIMUM RECORDED THICKNESS DURING 2002 AT PIEZOMETER LOCATION.
- ———— HYDROCARBON PLUME (DASHED WHERE INFERRED)
- APPROXIMATE LOCATION OF FORMER PETROLEUM STORAGE TANKS

AIRPORT DEVELOPMENT DISTRICT
FRANCIS S. GABRESKI AIRPORT
WESTHAMPTON, N.Y.

INITIAL LNAPL DELINEATION BORINGS

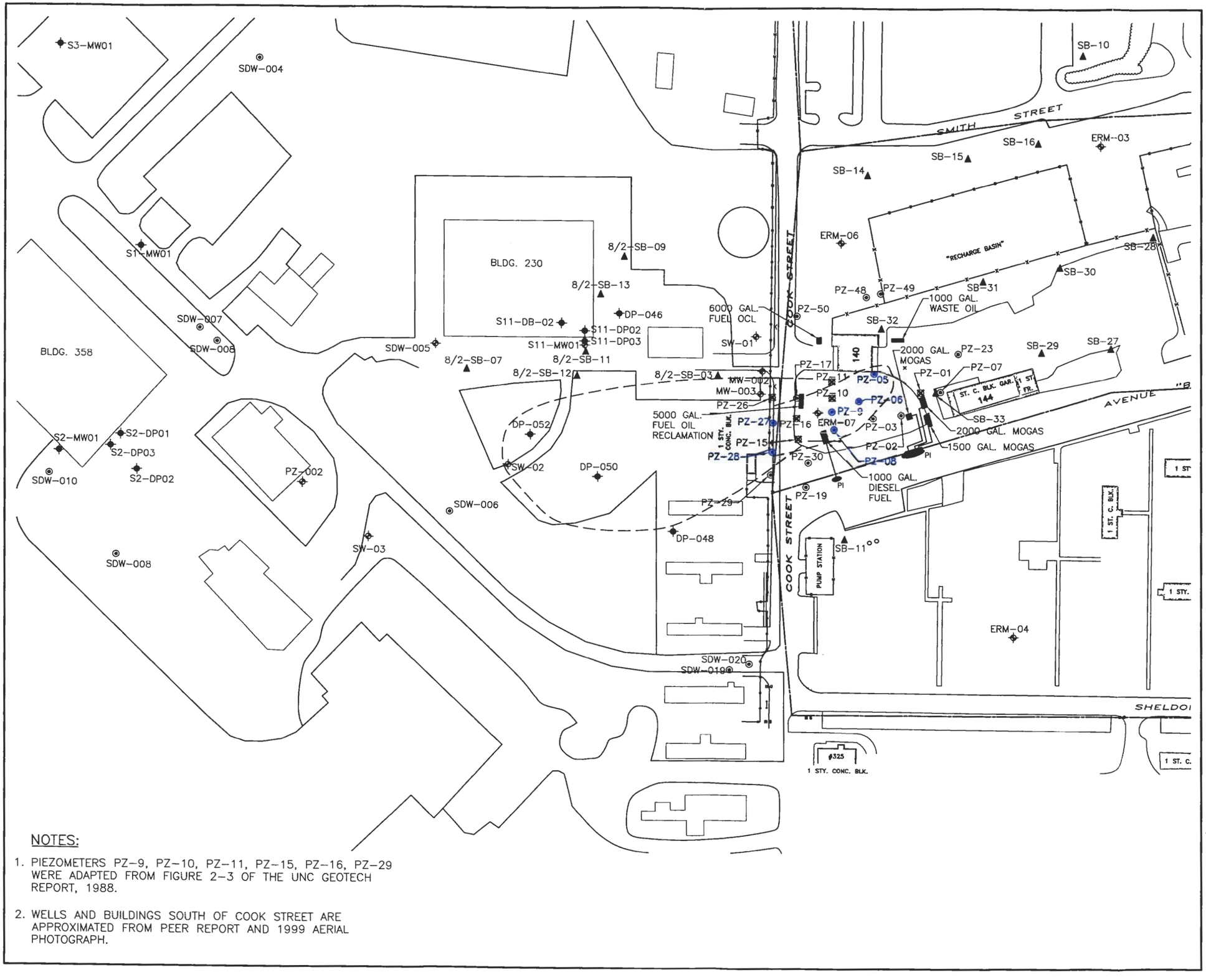
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FILE NO. 10569.25466.035
JUNE 2004

O'BRIEN & GERE ENGINEERS INC.

DWG PATH: I:\DIV03\PROJECTS\10569\25466\8 DWG\031.DWG

FIGURE 6



LEGEND

- TP-01 — TEXT PIT LOCATION
- SB-02 — SOIL BORING LOCATION
- ERM-03 — MONITORING WELL LOCATION
- PZ-26 — PIEZOMETER LOCATION
- PZ-28 — PIEZOMETERS WITH LNAPL IN 2002
- PIEZOMETER DESTROYED OR BROKEN AS OF 2002 (NO DATA)
- HYDROCARBON PLUME (DASHED WHERE INFERRED)

AIRPORT DEVELOPMENT DISTRICT
FRANCIS S. GABRESKI AIRPORT
WESTHAMPTON, N.Y.

APPROXIMATE LIMIT OF HAPL AND VOC PLUME

1"=120' 120 0 120

NOTES:

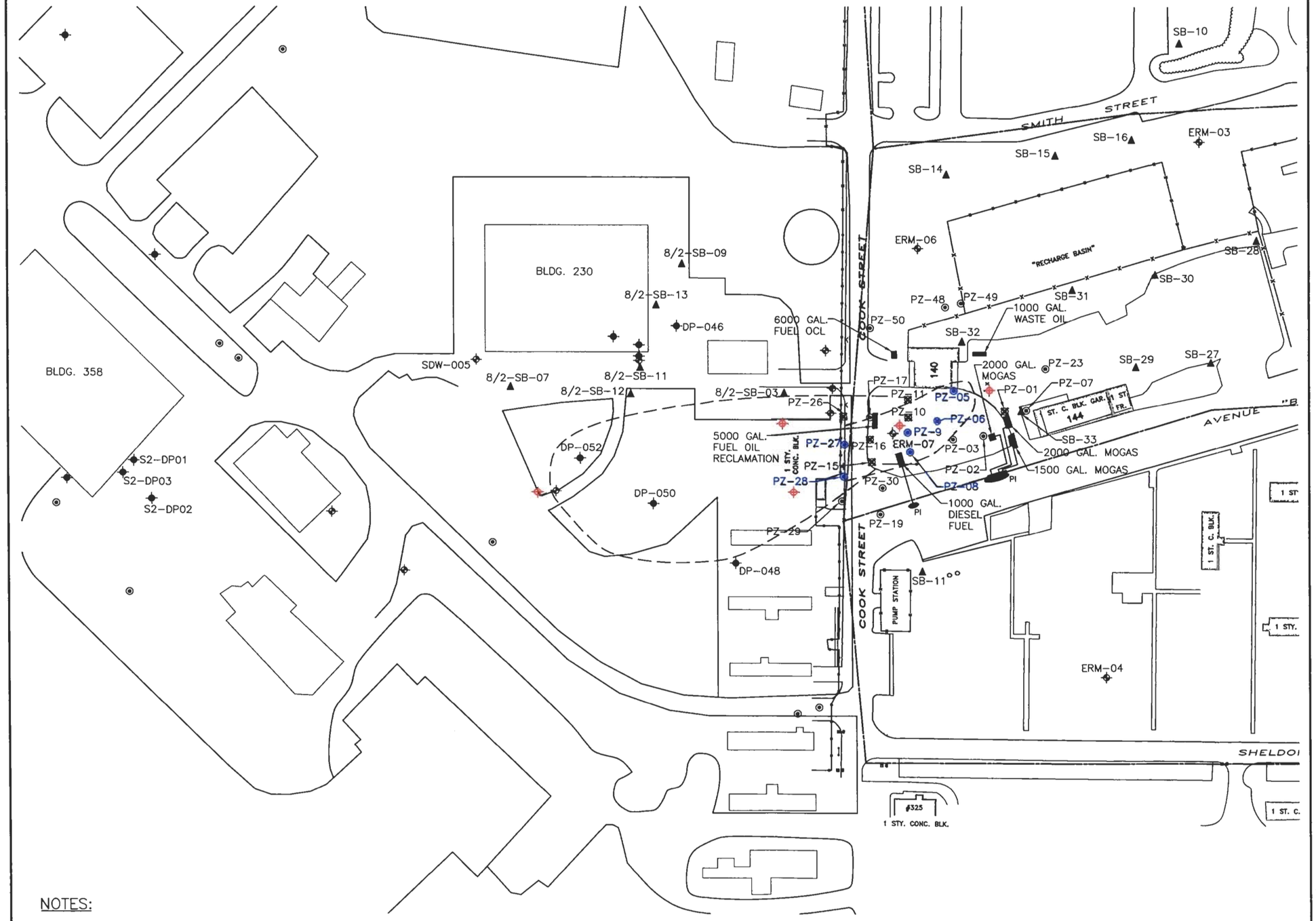
1. PIEZOMETERS PZ-9, PZ-10, PZ-11, PZ-15, PZ-16, PZ-29 WERE ADAPTED FROM FIGURE 2-3 OF THE UNC GEOTECH REPORT, 1988.
2. WELLS AND BUILDINGS SOUTH OF COOK STREET ARE APPROXIMATED FROM PEER REPORT AND 1999 AERIAL PHOTOGRAPH.

FILE NO. 10569.25466.031
JUNE 2004

O'BRIEN & GERE ENGINEERS INC.

PLOT DATE: 5/16/04

DWG PATH: I:\DIV83\PROJECTS\10569\25466\8 DWG\036.DWG



NOTES:

1. PIEZOMETERS PZ-9, PZ-10, PZ-11, PZ-15, PZ-16, PZ-29 WERE ADAPTED FROM FIGURE 2-3 OF THE UNC GEOTECH REPORT, 1988.
2. WELLS AND BUILDINGS SOUTH OF COOK STREET ARE APPROXIMATED FROM PEER REPORT AND 1999 AERIAL PHOTOGRAPH.

PLOT DATE: 5/16/04

FIGURE 7

LEGEND

- TP-01 — TEXT PIT LOCATION
- SB-02 — SOIL BORING LOCATION
- ERM-03 — MONITORING WELL LOCATION
- PZ-26 — PIEZOMETER LOCATION
- PZ-28 — PIEZOMETERS WITH LNAPL IN 2002
- PIEZOMETER DESTROYED OR BROKEN AS OF 2002 (NO DATA)
- FUTURE MONITORING WELL
- HYDROCARBON PLUME (DASHED WHERE INFERRED)

AIRPORT DEVELOPMENT DISTRICT
FRANCIS S. GABRESKI AIRPORT
WESTHAMPTON, N.Y.

FUTURE MONITORING WELL LOCATIONS

1"=120' 120 0 120

FILE NO. 10569.25466.036
JUNE 2004

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Appendix A

Soil Pile Sampling Procedures

Sampling Procedure and Equipment Decontamination Procedures

Soil excavated at the site will generally be staged in piles. Samples will be collected and analyzed to characterize the soils to determine whether or not they can be reused at the site or need to be properly treated or disposed at an off-site location.

The sampling methods employed will be one of the following: a hand auger; a standard 2-foot long, 2-inch outside diameter split-barrel sampler; lexan tubing; or similar equipment capable of reaching at least 3 ft below the surface of the pile. Once recovered, soil will be removed from the sampling device for examination and placement into a container for inspection and analysis.

Samples will be collected from five locations within one or multiple soil piles totaling the volume specified in the RAWP. The sampling interval should be at least 2 ft below the surface of the pile. A portion of one of the five individual samples will be submitted as a grab sample for VOC analysis. The five samples will be composited into one sample and submitted for the remaining analyses.

Soil sampling procedures

1. Identify the soil pile(s) designation and record the location information in the field log book or other record book.

2. Put on a new pair of disposable gloves.

3. At the designated sample location attempt to hand auger or drive a split barrel sampling, 2 to 3 ft below the surface of the pile. If an obstruction is encountered prior to reaching a depth of 2 ft, backfill the hole, move over several feet and attempt another hole. The sample should be collected from the interval no less than 2 ft below the surface of the pile and a 1-ft sample interval should be obtained from each location. For large piles consideration should be given to collecting samples from deeper intervals to obtain soil samples representative of the entire pile or piles for analysis.

4. Measure the length of soil sample retrieved, if applicable, and record result on the soil boring log.

5. Place one portion of the sample (grab sample) into a precleaned 4 oz. laboratory sample container for VOC analysis (as applicable), and a second portion into a glass container and cover with aluminum foil, or place into a Ziploc® bag and seal for PID headspace screening. The headspace sample will be allowed to attain ambient temperatures prior to screening with the PID equipped with a minimum 10.2 eV lamp. Results of the PID screening will be recorded with the location information.

6. Place the equal portions of the five soil samples into a stainless steel bowl, glass container or equivalent container. After the five grab samples have been added to the container, mix the soil together and place a portion in the appropriate laboratory sample jars for analyses.

7. After the last sample has been collected, record the date and time. Place sample bottles to be analyzed by the laboratory in a cooler with ice.

- TCL Semivolatile Organic Compounds (SVOCs) by NYSDEC ASP 95-2
- TCL Pesticides and polychlorinated benzenes (PCBs) by NYSDEC ASP 95-3
- Target Analyte List (TAL) metals and cyanide by NYSDEC ASP
- pH by SW-846 Method 9045

If contaminants are present at concentrations above the TAGM 4046 values, additional analysis will be required by the disposal facility and will likely include:

- Toxicity Leaching Characteristic Procedure (TCLP)
- RCRA Characteristics (Ignitability, Corrosivity, and Reactivity)
- Additional analyses as required by the disposal facility.

Pile Sampling Requirements

Requirements for sampling piles based upon size and potential contamination are provided in the following table:

Frequency	*Samples*	*Duplicate samples*	*Minimum Total Samples*
Contaminated Soil (based on PID/visual)			
250 cy	1 composite* 1 grab	1 composite 1 grab	2 composite 2 grab
Non-contaminated Soil (based on PID/visual)			
<2000 cy	1 composite* 1 grab	1 composite 1 grab	2 composite 2 grab
>2000 cy	1 composite* 1 grab	1 composite 1 grab	2 composite 2 grab

Notes: Additional composite and grab sample (duplicates) will only be analyzed in the event that the results of the initial analyses indicate that offsite disposal is needed.
* - composite samples consist of five grab samples homogenized together

Appendix B

Soil Vapor Sampling Procedures

Soil vapor sample collection and analysis procedures

1.0. Sampling objectives

This method involves the collection of a sample of vapor from the unsaturated soil for analysis for use in evaluating the potential exposure through migration to indoor air. The samples will be analyzed using method TO-15. This method involves the use of a pre-evacuated canister for collection and transport of the sample.

2.0 Sampling considerations

The following factors should be considered when designing the sampling program:

- *Depth to ground water* – Soil vapor samples should be collected from between 3 to 5 ft below grade to minimize potential for influence from surface air intrusion. In situations where the ground water is less than 3 ft below grade extra caution should be taken to minimize infiltration of air through the hole during sampling.
- *Type of soil* – It may be difficult to draw air into the sampler in low-permeability soils. In these instances, there is a likely chance that surface air will be drawn in via the sampling hole. Low flow rates, smaller air volumes, and/or thicker, more substantial surface seals may be needed to minimize this potential.
- *Constituents of concern* –The constituents of concern should be identified prior to selecting the analytical method to be used for the program.
- *Detection limit* – Different constituents have different action levels. Therefore, it is important to consider the action levels to assess whether the detection limit is sufficient.
- *Sample depth* – The depth of the sample should be between a minimum of 3 to 5 ft below the depth of the lowest point in the building and a minimum of 5 ft below grade to avoid short-circuiting. At depths shallower than 5 ft there are issues associated with pressure gradients induced by ambient and internal air pressure differences. However, the sample should not be collected within 1 ft of the ground water table to avoid entrainment of water.

3.0 Sample collection point installation

The sample collection device is typically tubing constructed of Teflon. Caution should be used when using Tygon® or other flexible tubing as volatile organics are adsorbed to this type of material.

1. If surface is covered by asphalt or concrete, a nominal hole shall be drilled through the surface.
2. A 1 to 2 inch hole shall hole shall be completed to 5 ft below grade using a slide hammer, drill, or soil gas sampling device.

3. A 6 ft length of 3/16-inch (outside diameter) Teflon tubing shall be placed to the base of the hole
4. Bentonite chips or other low permeability material shall be placed into the hole at the surface to act as a seal to minimize short circuiting of the vapor extraction process.
5. Attach a 6- to 8-in length of Tygon® tubing to the end of the Teflon tubing
6. Attach the Tygon® tubing to the metering pump of the Summa canister

If a shield point sampling device is used:

1. Attach length of 3/16-inch (outside diameter) Teflon® tubing in the end of a 3-inch slotted aluminum shield point.
2. Feed this assembly through a hollow hardened, steel sampling probe.
3. Drive the probe to the desired depth using a slide hammer or hand-held electric impact hammer.
4. Retract the probe 3 to 6 inch using a manual jack to expose the vapor intake slots of the shield point.
5. Remove the hollow probe from around the tubing.
6. Bentonite chips shall be placed into upper portion of the hole to act as a seal to minimize short- circuiting of the vapor extraction process.
7. Attach the tubing to the metering pump of the Summa canister
8. Proceed with sample collection
9. Once the sample is collected, withdraw the tubing and fill the hole with bentonite
10. Restore the surface with like materials as appropriate

4.0 Sample collection

Consistent with the TO-15 method requirements, a Summa canister will be used to collect the sample. The pre-evacuated canister results in a vacuum that is used to draw the sample into the canister. A canister size of 6 liters should be used.

1. Evacuate the sampling probe by drawing 1 to 3 hole-volumes of air using a personal sampling pump (Gilian model HFS113A or equivalent) set at a flow rate of 0.2 L/min or other air evacuation device.
2. Attach the sampling valve of the Summa canister to the tubing.
3. Open the valve on the summa canister. The rate at which the sample is drawn into the canister is regulated by a flow meter that is preset. To minimize the potential for desorption of constituents from the soil, the flow rate should be low, less than 0.2 liters per minute. In low permeability soil the flow rates may need to be adjusted even lower to also avoid short-circuiting.
4. Once the meter shows that the canister is full, close the valve and detach the sampling valve from the tubing.
5. A tag or similar device should be attached to the canister with the following information: site name, sample location identification, sample

date, sampling time, and total draw time. This information should also be provided on the chain-of-custody form.

Appendix C

Vapor Intrusion Potential Evaluation Plan

Vapor Intrusion Potential Evaluation
Airport Development District
Francis S. Gabreski Airport
Westhampton, New York

Rebuild Now - NY
Empire State Development

May 2004

O'BRIEN & GERE
ENGINEERS, INC.

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1.2. General Methodology 1

2. Site-Specific Methodology 3
2.1 Structure Evaluation 3
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2.3 Data Evaluation and Health-Based Screening 4

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4. Reporting and Coordination with Regulators 7

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1 Approximate Limit of VOC Plume

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1 Structure Survey Information
2 Soil Vapor Sampling Procedures

1. Introduction

1.1. Vapor Intrusion Potential Evaluation

In 2002, USEPA developed a guidance document entitled *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils*, USEPA-OSWER, Docket ID No. RCRA-2002-0033 (OSWER Guidance), which outlines a step by step approach for the assessment of the potential for vapor intrusion pathway. Consistent with this guidance, the following scope has been developed to address the potential for vapor intrusion associated with the petroleum VOC plume identified at the Site.

1.2. General Methodology

The OSWER guidance recommends a tiered approach to VIPEs. In general, the evaluation is be guided by the Site conditions and available Site data and the "starting tier" may be selected based on these criteria. As part of the data evaluation, the draft OSWER guidance identifies three tiers of assessment that involve increasing levels of complexity and specificity.

- *Tier 1 - Primary Screening:* The primary screening is designed to be used with general knowledge of a site and the chemicals known or reasonably suspected to be present in the subsurface. The primary screening process evaluates if chemicals of sufficient volatility and toxicity are present; if inhabited buildings are located above or in close proximity to subsurface contamination; and if current conditions warrant immediate action. If these conditions do not occur, the pathway is classified as incomplete and not evaluated further.

- *Tier 2 - Secondary Screening*: The secondary screening analysis compares measured or modeled concentrations of target chemicals in various media (groundwater, soil gas, and/or indoor air) to conservative health based numerical criteria. These numerical criteria reflect reasonable worst-case estimates of site-specific conditions such as depth of contamination, soil type, building specific properties, and receptor populations.

- *Tier 3 – Detailed Site-Specific Pathway Assessment*: If the results of the Tier 1 and Tier 2 evaluation suggests that further assessment is warranted, a Tier 3 evaluation may be considered. The Tier 3 assessment may involve the collection of more detailed site-specific information such as confirmatory soil vapor, sub-slab, and/or indoor air sampling.

The tiered evaluation process presented in the OSWER Guidance represents a logical and linear progression designed to screen out sites not needing further consideration and focuses attention on those sites that need further consideration of the vapor intrusion pathway. However, the OSWER Guidance also states that the evaluation may proceed directly to Tier 2 or 3, or may use other technically sound approaches in evaluating the vapor intrusion pathway.

2. Site-Specific Methodology

A variety of data has already been developed for the ANG property by Peer (Peer, 2002). The Air National Guard provides search and rescue services and maintains the base as a backup landing point for the space shuttle. As such, the base perimeter is fenced and access to the base is restricted to airport personnel, base personnel and authorized civilians. Buildings on the ANG portion of the property that are described in the Peer report include hangars, maintenance buildings, and garages. It is expected that some of the buildings will have office spaces.

The VIPE for this program follows the OSWER Guidance and will incorporate site-specific information including a site inspection and structure survey to assess the types of uses as well as occupancy of the structures. In addition, available environmental data for the areas of interest will be reviewed. This information will be assembled to form a conceptual site model to assess the potential for vapor intrusion and exposures to humans occupying the buildings. This information will provided the basis for evaluating whether the vapor intrusion pathway is complete and screening of potential human exposures to VOCs related to the ground water plume if the pathway is found to be complete.

2.1 Structure Evaluation

A field inspection will be completed at each of the buildings within 100 ft of the VOC plume as identified on Figure A-1. The inspection shall document the use of the building, as well as the size and general construction of the building. A sketch of the building including parking and roads in the vicinity shall be prepared. Documentation of any uses and storage of chemicals in or around the building shall also be provided. Building inspection forms and questionnaires are provided in the USEPA OSWER Guidance and the NYSDOH guidance referenced at the end of this work plan. These documents focus primarily on residential structures and there may be information that is not applicable to the buildings on the ANG property. A list of suggested information to be gathered during the structure surveys is included as Attachment 1.

2.2 Development of the Conceptual Site Model

Based on the information reviewed, a summary conceptual site model (CSM) will be developed. The CSM will identify the potential source areas, migration pathways, receptor populations, and receptor exposures. The CSM will be used as the basis to discuss the potential design of proposed measurement and/or modeling activities, as well as health-based screening values (i.e. occupational) to support the VIPE.

Specifically, the data pertaining to structures and the VOC plume shall be compiled and reviewed to assess whether the potential exists for

intrusion of vapors from the VOCs plume to each of the targeted structures (a complete pathway) and whether this migration poses a potential risk to occupants of the structure. Consideration should be given to the amount of time occupants are present in the building, type of activities being conducted, as well as the type of materials used during these activities. If the pathway for exposure is considered to be complete then the next step of the process as defined in Section 2.3 shall be completed.

2.3 Data Evaluation and Health-Based Screening

Groundwater data generated by ANG in the area in which the plume and target structures are located should be assembled and evaluated for use to assess the potential for migration of volatile organics to the surface.

The analytical data shall be reviewed to identify constituents of potential concern (COPCs). If appropriate, statistical summaries should include the frequency of detection, minimum, maximum, and average detected concentrations, range of detection limits, and the location of the maximum detected concentration of each of the compounds identified. The analytical data summaries should be presented on tables and figures as appropriate.

Available data shall be reviewed to evaluate site characteristics as they relate to the potential vapor intrusion. Specifically, the site geology, soil properties, and hydrogeology will be identified using the data generated by the SIR or Peer document. First, the ground water concentrations shall be compared to risk-based screening values, which are contained in the OSWER guidance. Then the data can be used to derive indoor air screening values using modeling. These values are compared to appropriate health-based screening values for indoor air.

Soil vapor information (either actual or estimated values) can also be used in conjunction with the structure-specific considerations to further evaluate the potential indoor air concentrations using an indoor air model such as the Johnson & Ettinger Model recommended by USEPA (USEPA 2002). This model uses site-specific information (e.g. porosity, permeability, moisture, depth to contamination and chemical specific data (e.g. diffusion coefficients, Henry's law constant, solubility). Structure information includes building construction, uses, size and ventilation rates, potential preferential migration pathways, worker activities, and other relevant information. If Site-specific data are not available then appropriate default values will be selected for model inputs. The derived concentrations shall be screened by comparison to published risk-based indoor air screening concentrations.

If the results of screening process indicate that concentrations are below the published risk-based concentrations it would be concluded that the vapor intrusion pathway is incomplete and no further action would be necessary.

3. Soil Vapor Sampling

Should the representative groundwater concentrations result in derived values of indoor air concentrations that are above the appropriate screening criteria, it may be appropriate to collect soil vapor samples from around the perimeter of the structure of from below a specific area within the structure. An outline of procedures for collecting soil vapor samples is provided as Attachment 2.

The soil vapor data can then be compared to screening values provided in the OSWER guidance and, if appropriate, used in the *Johnson & Ettinger Model* to estimate indoor air concentrations as described in Section 2.3.

4. Reporting and Coordination with Regulators

The VIPE as developed consists of several steps with decision points in between. The necessity to proceed to each subsequent step will be dependent on the information developed in the previous step. Coordination with the regulatory agencies throughout the process will therefore, be needed. At a minimum, information should be assembled and provided to NYSDEC and NYSDOH at the following points in the program, if they are implemented:

- Following development of the conceptual site model
- Following completion of initial pathway evaluation and screening step using available site data
- Following collection and screening of site-specific soil vapor data

The purpose of the submittals will be to provide documentation to support whether or not there is need for completion of the next step of the evaluation.

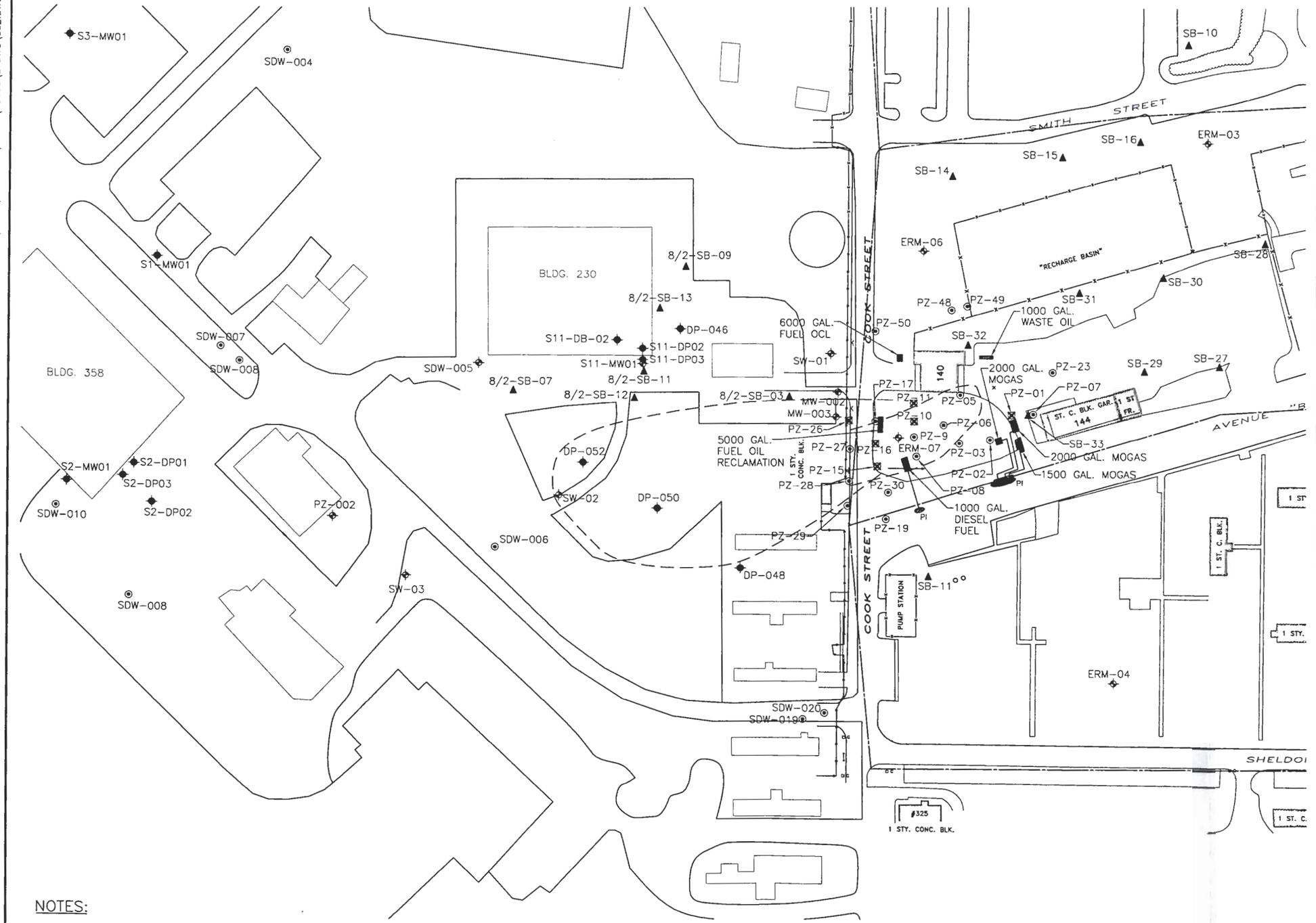
References

USEPA-OSWER, *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils*, November 2002, Docket ID No. RCRA-2002-0033.

NYSDOH Division of Environmental Health Assessment, Indoor Air Sampling & Analysis Guidance, August 8, 2001.

NYSDOH, Correspondence to Paul J. Merges, Ph.D. of NYSDEC dated May 10, 2002 providing Benchmark Air Concentrations.

DWG PATH: I:\DIV83\PROJECTS\10569\25466\8 DWG\032.DWG



NOTES:

1. PIEZOMETERS PZ-9, PZ-10, PZ-11, PZ-15, PZ-16, PZ-29 WERE ADAPTED FROM FIGURE 2-3 OF THE UNC GEOTECH REPORT, 1988.
2. WELLS AND BUILDINGS SOUTH OF COOK STREET ARE APPROXIMATED FROM PEER REPORT AND 1999 AERIAL PHOTOGRAPH.

PLOT DATE: 2/02/04

FIGURE 1

LEGEND

- TP-01 — TEXT PIT LOCATION
- SB-02 — SOIL BORING LOCATION
- ERM-03 — MONITORING WELL LOCATION
- PZ-26 — PIEZOMETER LOCATION
- PZ-28 — PIEZOMETERS WITH LNAPL IN 2002
- PIEZOMETER DESTROYED OR BROKEN AS OF 2002 (NO DATA)
- HYDROCARBON PLUME (DASHED WHERE INFERRED)

AIRPORT DEVELOPMENT DISTRICT
FRANCIS S. GABRESKI AIRPORT
WESTHAMPTON, N.Y.

APPROXIMATE LIMIT OF VOC PLUME

1"=120' 120 0 120

FILE NO. 10569.25466.032
FEBRUARY 2004

O'BRIEN & GERE ENGINEERS INC.

Attachment 1

Structure Survey Information

Structure Survey Considerations

Airport Development District
Francis S. Gabreski Airport
Westhampton, New York

In addition to the typical structure information collected for air monitoring purposes, the following information should also be considered given the general nature of the Air National Guard facility.

Type of foundation (slab-on-grade, basement, crawlspace, laid block walls, vapor barrier)- describe

Asphalt or concrete present immediately adjacent to structure – yes/no – describe on map/drawing

Building usage:

1. Type of use and percentage of building for each use (office, sleeping quarters, maintenance/shop, eating facilities) – provide map
2. Amount of time each space is typically occupied on a daily basis
3. Type of activities conducted by persons occupying the building
4. Is all or part of the building used for maintenance of vehicles, airplanes or machinery

Overhead doors – presence, size and amount of time open during a 24-hour period

Storage of petroleum products – what, where, and how much

Use of petroleum products - what, where, how often, and how much

Ventilation System

1. One system for entire structure or separate systems (describe)

2. System specifics: air exchange rates, blower type & speed, intake location

Attachment 2

Soil Vapor Sampling Procedures

Soil vapor sample collection and analysis procedures

1.0. Sampling objectives

This method involves the collection of a sample of vapor from the unsaturated soil for analysis for use in evaluating the potential exposure through migration to indoor air. The samples will be analyzed using method TO-15. This method involves the use of a pre-evacuated canister for collection and transport of the sample.

2.0 Sampling considerations

The following factors should be considered when designing the sampling program:

- *Depth to ground water* – Soil vapor samples should be collected from between 3 to 5 ft below grade to minimize potential for influence from surface air intrusion. In situations where the ground water is less than 3 ft below grade extra caution should be taken to minimize infiltration of air through the hole during sampling.
- *Type of soil* – It may be difficult to draw air into the sampler in low-permeability soils. In these instances, there is a likely chance that surface air will be drawn in via the sampling hole. Low flow rates, smaller air volumes, and/or thicker, more substantial surface seals may be needed to minimize this potential.
- *Constituents of concern* –The constituents of concern should be identified prior to selecting the analytical method to be used for the program.
- *Detection limit* – Different constituents have different action levels. Therefore, it is important to consider the action levels to assess whether the detection limit is sufficient.
- *Sample depth* – The depth of the sample should be between a minimum of 3 to 5 ft below the depth of the lowest point in the building and a minimum of 5 ft below grade to avoid short-circuiting. At depths shallower than 5 ft there are issues associated with pressure gradients induced by ambient and internal air pressure differences. However, the sample should not be collected within 1 ft of the ground water table to avoid entrainment of water.

3.0 Sample collection point installation

The sample collection device is typically tubing constructed of Teflon. Caution should be used when using Tygon® or other flexible tubing as volatile organics are adsorbed to this type of material.

1. If surface is covered by asphalt or concrete, a nominal hole shall be drilled through the surface.
2. A 1 to 2 inch hole shall hole shall be completed to 5 ft below grade using a slide hammer, drill, or soil gas sampling device.

3. A 6 ft length of 3/16-inch (outside diameter) Teflon tubing shall be placed to the base of the hole
4. Bentonite chips or other low permeability material shall be placed into the hole at the surface to act as a seal to minimize short circuiting of the vapor extraction process.
5. Attach a 6- to 8-in length of Tygon® tubing to the end of the Teflon tubing
6. Attach the Tygon® tubing to the metering pump of the Summa canister

If a shield point sampling device is used:

1. Attach length of 3/16-inch (outside diameter) Teflon® tubing in the end of a 3-inch slotted aluminum shield point.
2. Feed this assembly through a hollow hardened, steel sampling probe.
3. Drive the probe to the desired depth using a slide hammer or hand-held electric impact hammer.
4. Retract the probe 3 to 6 inch using a manual jack to expose the vapor intake slots of the shield point.
5. Remove the hollow probe from around the tubing.
6. Bentonite chips shall be placed into upper portion of the hole to act as a seal to minimize short- circuiting of the vapor extraction process.
7. Attach the tubing to the metering pump of the Summa canister
8. Proceed with sample collection
9. Once the sample is collected, withdraw the tubing and fill the hole with bentonite
10. Restore the surface with like materials as appropriate

4.0 Sample collection

Consistent with the TO-15 method requirements, a Summa canister will be used to collect the sample. The pre-evacuated canister results in a vacuum that is used to draw the sample into the canister. A canister size of 6 liters should be used.

1. Evacuate the sampling probe by drawing 1 to 3 hole-volumes of air using a personal sampling pump (Gilian model HFS113A or equivalent) set at a flow rate of 0.2 L/min or other air evacuation device.
2. Attach the sampling valve of the Summa canister to the tubing.
3. Open the valve on the summa canister. The rate at which the sample is drawn into the canister is regulated by a flow meter that is preset. To minimize the potential for desorption of constituents from the soil, the flow rate should be low, less than 0.2 liters per minute. In low permeability soil the flow rates may need to be adjusted even lower to also avoid short-circuiting.
4. Once the meter shows that the canister is full, close the valve and detach the sampling valve from the tubing.
5. A tag or similar device should be attached to the canister with the following information: site name, sample location identification, sample

date, sampling time, and total draw time. This information should also be provided on the chain-of-custody form.

Appendix D

Groundwater Monitoring Plan

Ground Water Monitoring Plan
Airport Development District
Francis S. Gabreski Airport
Westhampton, New York

Rebuild Now - NY
Empire State Development

May 2004

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2-1 Natural Attenuation Parameters

1. Introduction

1.1. General

This Ground Water Monitoring Plan (GWMP) presents the scope of work and the analytical requirements for the Natural Attenuation Ground Water Monitoring Program at the Airport Development District (ADD) Property located at the Francis S. Gabreski Airport in Westhampton, New York. This GWMP is a component of the Remedial Action Work Plan (RAWP) for the site.

This GWMP defines in detail the procedures for implementing the Natural Attenuation Ground Water Monitoring Program. Specific procedures that are defined include the methodologies for the collection of ground water samples, field documentation requirements, equipment and personnel requirements, sampling equipment decontamination requirements, and handling requirements for investigation-derived-wastes (IDW).

1.2. Objectives

The objectives of the Ground Water Monitoring Program are to provide the following:

- Monitor the concentration of petroleum-related compounds in ground water.
- Collect information to evaluate whether natural attenuation processes occur subsequent to removal of source material.

To accomplish the objectives, ground water samples monitoring wells will be sampled for volatile organic compounds (VOCs) and natural attenuation parameters on a quarterly basis for a period of two years.

1.3. Plan organization

Section 2 of this GWMP identifies the wells to be sampled, the field sampling procedures, and the analytical requirements. Information pertaining to sampling frequency and well installation procedures are provided in the RAWP.

2. Field sampling plan

This section identifies the selected ground water monitoring wells, irrigation wells, and residential drinking water wells to be sampled. This section also describes the field sampling procedures to be followed and the analytical requirements to be utilized.

2.1. Sample locations

The ground water monitoring wells to be sampled during the Natural Attenuation Ground Water Sampling Program will be installed following the completion of the source removal program. Five wells will be installed to provide monitoring locations as follows:

- 1 well upgradient of the plume area
- 1 well within the area in which the source was located
- 2 wells at the leading edge of the VOC plume
- 1 well downgradient of the VOC plume

It is expected that the latter two locations will be on the Air National Guard property that bounds the ADD to the south. Well installation procedures are defined in the RAWP.

2.2. Ground water monitoring well purging and sampling procedures

2.2.1. Pre-sampling

Prior to sampling, a complete round of ground water elevations will be recorded at each of the monitoring wells. An electronic water level probe will be used to measure the depth to water in each well. The depth to water will be measured to the nearest 0.01 foot from the surveyed points on the well casings. The depth-to-water measurements will be recorded in the field log book. In addition to the depth-to-water measurements, the condition of the well pads, the protective casings and locks, and the well heads will also be recorded in the field log book.

Prior to commencing sampling activities, the ground water quality monitoring probes/meters including pH, conductivity, ORP, dissolved oxygen will be calibrated daily in accordance with the manufacturers' instructions. At a minimum, two-point calibrations will be conducted for pH and conductivity. The dissolved oxygen probe will be checked against a zero-dissolved oxygen solution. In addition, the dissolved

oxygen calibration will be corrected for local barometric pressure and elevation. Calibration results will be recorded in the field log notebook.

2.2.2. Low-flow purging and sampling procedures

The well depths and well screen intervals will be acquired from site-specific drilling logs and monitoring well specifications. The following describes the low-flow purging and sampling procedures:

1. Don a new pair of gloves, and lay out plastic sheeting on the ground in the vicinity of the well head.

2. Prepare the pumping system for operation. Connect the tubing to the in-line, water quality parameter meter.

3. Commence well purging by low-flow pumping from the well. The flow rate shall not exceed 0.5 liters/min. Initially, a flow rate between 200 ml/min and 500 ml/min will be used. Efforts should be made to minimize the generation of air bubbles in the sample tubing by either increasing the flow rate as appropriate, or restricting the flow by clamping the tubing. Record purge rate on the Low-Flow Ground Water Sampling Log. An example of the Low-Flow Ground Water Sampling Log to be utilized during this project is provided in Exhibit A.

4. During purging, monitor and record pH, specific conductivity, temperature, oxidation-reduction potential (redox), dissolved oxygen, and turbidity at time intervals sufficient to evacuate the volume of the flow-through cell. This time interval can be calculated by dividing the volume of the flow through the cell by the pumping rate.

5. Well sampling can commence after equilibration of water quality parameters. Equilibrated trends are generally obvious and usually follow either an exponential decay or asymptotic trend during purging. Equilibration will be defined as three consecutive water quality parameter readings that meet the following equilibration guidelines:

Temperature	± 3%
pH	± 0.1 pH units
Specific conductance	± 3%
Redox	±10 mV
DO	±10%
Turbidity	± 10%

6. If the indicator field parameters have not equilibrated within the above specified limits after 4 hours of purging, then one of the following options may be taken: 1) continue purging until stabilization is achieved; or 2) discontinue purging and collect samples (document attempts to achieve stabilization). Record total volume of water purged and purging time on the Low-Flow Ground Water Sampling Log for future reference.

7. Ideally, drawdown in the well should not exceed 0.3 ft. Pumping rates should, if needed, be reduced to the minimum capabilities of the pump to avoid pumping the well dry and/or allow stabilization of indicator parameters. If the recharge rate of the well is very low and it appears that the well will be purged dry, the pump should be shut down prior to pumping the water level below the top of the well screen and/or purging the well dry. Sampling should commence as soon as the well has recharged to a sufficient level to collect the appropriate volume of samples. Sample collection using bailing techniques may be used in this situation. However, turbidity levels shall be maintained as low as possible by minimizing agitation of the water column within the well.

8. Remove the sampling bottles from their transport containers, and prepare the bottles for receiving samples. Inspect all labels for proper sample identification. Sample bottles should be kept cool with their caps on until they are ready to receive samples. Arrange the sampling containers to allow for convenient filling.

9. Sample bottles for VOC analyses, containing hydrochloric acid for preservation, will be filled completely so that there is no headspace or bubbles. The VOC sample vials will be examined for proper filling by inverting the vials immediately after filling. Occasionally, the HCl will react with the water sample creating effervescence. If this situation is observed, discard the contents of the sample vial, rinse the inside with fresh ground water, and refill sample vial. This sample will not be preserved and must be noted as such on the Chain of Custody

   After filling the sample containers, conduct field tests for ferrous iron and total iron as follows:

   Field test – Ferrous iron
   A Hach7 ferrous iron field test kit (Model IR-18C) will be used to measure dissolved ferrous iron in the field. Prior to arriving in the field, the reagent lot of the Hach7 ferrous iron test kit will be verified using ferrous iron standards at two different concentrations. The collection and measurement procedures of the Hach7 ferrous iron test kit will be as follows:

   a. Fill a viewing tube to the first (5-mL) line with sample water. This is the blank.

   b. Place this tube in the top left opening of the color comparator.

   c. Fill the measuring vial to the 25-mL mark with sample water.

   d. Add contents of one Ferrous Iron Reagent Powder Pillow to the measuring vial.

   e. Swirl to mix, and allow three minutes for full color development.

f. Fill another viewing tube to the first (5-mL) mark with the prepared sample.

g. Place the second tube in the top right opening of the color comparator.

h. Hold the comparator up to a light source (such as the sky, a window, or a light), look through the opening in the front of the comparator, and rotate the color disk until the color matches in the two openings.

i. Read the mg/L ferrous iron in the scale window, and record in the field logbook.

Field test – Total iron
A Hach® field test kit (Model IR-18B) for total iron will be used to measure total dissolved iron in the field. The collection and measurement procedures of the Hach7 total iron test kit will be as follows:

a. Fill a viewing tube to the first (5-ml) line with sample water. This is the blank.

b. Place this tube in the top left opening of the color comparator.

c. Fill another viewing tube to the first (5-ml) line with sample water.

d. Add the contents of one FerroVer® Iron Reagent Powder Pillow to the second tube.

e. Swirl to mix. An orange color will develop if iron is present.

f. Place the second tube in the top right opening of the color comparator.

g. Hold the comparator up to a light source such as the sky, a window, or lamp. Look through the openings in front.

h. Rotate the color disc until the color matches in the two openings.

i. Read the mg/L iron in the scale window.

9. After the last sample has been collected, record the date and time.

10. Begin preparing the Chain of Custody documentation.

Quality control samples, consisting of equipment blanks, field duplicates, and MS/MSDs, will be obtained in the same type sample containers and handled in the same manner as the field samples for contaminant

determination. Field duplicate samples will not be distinguishable from the field samples.

Triplicate volumes of sample will be collected for samples designated for MS/MSD analyses. Laboratory quality control samples will be collected at a frequency of one per matrix type and/or sample batch and every 20 samples of similar matrix.

Equipment blanks of the non-dedicated sampling equipment (*i.e.* sampling pump) will be required. Equipment blank samples will be collected at a frequency of five percent for each analysis.

Field duplicate samples will be two samples collected at the same time from the same source, but submitted as separate samples, for the purpose of assessing the consistency of the overall sampling and analytical system. Field duplicate samples will be collected at a frequency of five percent for each analysis.

Trip blanks will be submitted to the laboratory. One trip blank will be required per cooler.

A temperature control blank will be included in each cooler shipment to the laboratory.

2.2.3. Procedure after taking sample

After taking a ground water sample, the following practices will be performed to complete the documentation and leave the well intact and secure:

1. Pack the ground water sample. The type of analysis for which a ground water sample is collected determines the type of container, preservative, holding time, and filtering requirement. This information is presented on Table 4 of the QAPP. Ground water samples are transferred directly from the sampler to the container. The container should hold any necessary preservative and should be correctly labeled before the sample is transferred to it.

   Next, log the ground water sample. Put the ground water samples in a cooler containing ice. Ship the ground water samples within twenty-four hours via overnight delivery. Include adequate packing and ice with the ground water samples so that the samples arrive unimpaired.

2. Complete the chain of custody.

3. Replace the well cap and lock the well protection assembly before leaving the well location.

4. Put the gloves and plastic sheet in a plastic bag for disposal.

2.2.4. Field documentation

Field documentation is an essential part of the sampling program. The field crew will have an assigned team leader who is responsible for written documentation. Field logbooks will serve as permanent documentation for the monitoring work. In addition, the field investigator will summarize the events and conditions of the work in a logbook.

Field Logbook. A bound field logbook will be maintained for documentation purposes by the sampling team leader, or a designee. The log book will contain information such as names of the sampling team and other people on-site, weather conditions, samples collected, measurements, and significant events, observations, or other pertinent data - notably, unusual occurrences during field investigations. Pages will be numbered, signed, and dated. Field logbooks will be kept neat and organized. Original data recorded in field logbooks will be written in ink. Entries will be legible, factual, detailed, and objective.

If an error is made on an entry, corrections will be made by crossing a single line through the error and entering the correct information above. Erroneous information will not be erased, obliterated, or torn out. Errors in the field logbook will be corrected by the person who made the entry. Corrections will be initialed and dated.

The following items will be included in the field logbook:

- Name, address and phone number of the sampling team leader
- Owner and client information
- Names and affiliations of the personnel on site
- General description of the day's field activities
- Documentation of weather conditions during sampling
- Location of sampling (station number as description)
- Name and address of field contact (in cover of log book)
- Description of accidents involving personnel on site
- Records of field equipment malfunction and repair
- Records of site visitations
- Records of field and lab equipment calibrations
- Matrix type and sample description
- Date and time of sample collection

- Collector's sample identification number
- Sample distribution (e.g., laboratory, hauler, etc.)
- Observations of sample collection environment, if required
- Field measurements made
- Sampler's name
- Sample type (composite, split, etc.)
- Sources and types of preservatives used.

At the end of the sampling day, the sampling team leader or a designee will collect and store the logbooks in a safe location.

Chain of custody. The collection and handling of samples will be documented to demonstrate that a sample was collected following the appropriate sampling protocols. A standard chain of custody form (as shown in the QAPP) is developed when the sample is collected. As possession of the sample is relinquished by one party and transferred to another, the chain of custody document will be so revised.

2.2.5. Decontamination

This section provides procedures for decontamination. Non-dedicated sampling equipment that has the potential to contact the environmental medium to be sampled will be decontaminated to avoid cross contamination between samples and to prevent contaminated equipment from leaving the Site.

Field equipment decontamination. Whenever possible, field sampling will be initiated at the well the lowest constituent levels and proceed to the area of highest suspected constituent levels.

Non-dedicated sampling equipment will be decontaminated prior to use and following sampling of each well. Pumps will not be removed between purging and sampling operations. If a submersible pump used for the purging and sampling, the pump, support cable, and electrical wires that are in contact with the water column will be decontaminated by the procedures listed below.

- The decontamination solutions can either be pumped from buckets through the pump or the pump can be disassembled and flushed with the decontaminating solutions. It is recommended that detergent is used sparingly in the decontamination process and water-flushing steps are extended so that sediment trapped in the pump is flushed out. The outside of the pump and the

electrical wires must be rinsed with the decontaminating solutions, as well. The procedure is as follows:

- Flush the equipment/pump with potable water
- Flush with non-phosphate detergent solution (five gallons)
- Flush with potable water to remove all of the detergent solution
- Flush with distilled water

The decontamination process will be documented. Each step, materials used, and the disposition of waste will be recorded in a field notebook. Miscellaneous items such as weather conditions, nearby activities, and other issues that could affect results will be recorded.

2.2.6. Handling of investigation-derived waste (IDW)

Purge water and decontamination fluids generated during the Natural Attenuation Ground Water Sampling Program will temporarily be containerized and secured in 55-gallon drums for periodic disposal off-site.

2.3. Laboratory analyses

The ground water samples collected from the monitoring wells will be analyzed by by a New York State ELAP-approved laboratory for volatile organic compounds (VOCs) using USEPA Method 8260, and the following natural attenuation parameters:

Table 2-1. Natural Attenuation Parameters.

Natural attenuation parameter	*Analysis method*
Sulfide	376.1
Methane	3810
TOC	415.1
Alkalinity	310.1
Sulfate	375.4
Nitrate/Nitrite	353.2
Ferrous Iron	Field Test
Total Iron	Field Test

Source: O'Brien & Gere Engineers, Inc.

Samples collected from the residential drinking water well will be analyzed for VOCs using USEPA Method 524.2. Samples collected from the irrigation wells will be analyzed for VOCs using USEPA Method 601.

Appendix E

Citizen Participation Plan

Citizen Participation Plan
Airport Development District
Francis S. Gabreski Airport
Westhampton, New York

ReBuild Now - NY
Empire State Development

May 2004

O'BRIEN & GERE
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10569\25466

Citizen Participation Plan
Airport Development District
Frances S. Gabreski Airport
Westhampton, New York

ReBuild Now - NY
Empire State Development



James R. Heckathorne, P.E.
Vice President

May 2004

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2 Site map
3 Historic site features
4 Approximate location of LNAPL and VOC Plume

1. Introduction

This document is a site-specific Citizen Participation Plan (CPP) for voluntary cleanup activities at the Airport Development District (ADD) portion of the Francis S. Gabreski Airport property in Westhampton, New York (the Site).

New York State Department of Environmental Conservation (NYSDEC) is committed to a citizen participation program as a part of its responsibilities for the inactive hazardous waste site remedial program. Citizen participation promotes public understanding of NYSDEC's responsibilities, planning activities, and remedial activities at inactive hazardous waste sites. It provides an opportunity for NYSDEC to learn from the public, information that will enable NYSDEC to develop a comprehensive remedial program that is protective of both public health and the environment.

2. Site Background

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 ADD 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

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, 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 ADD 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 above-ground 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.

2.3 Environmental Issues Identified at the Site

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 on the Site. These structures are described as dry wells or cesspools on older maps of the property. They were reportedly used for discharge of storm water and/or sanitary water to the subsurface. Inspection of a number of these structures did not indicate evidence of impacted materials.

   Furthermore, the groundwater data from the Site do not suggest that the subsurface structures represent a general source of groundwater 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 napthalene 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. Project Description

3.1 Voluntary Cleanup Objective

To facilitate the redevelopment of the ADD property, the Owner has chosen to partake in the ReBuild Now Program with the remedial action objectives (RAOs) of minimizing potential exposure of contaminants of concern to on-site groundwater and to prevent releases from the petroleum-impacted soils.

3.2 Voluntary Cleanup Activities

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

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

3.2.1. Subsurface structures

Subsurface structures include catch basins, 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.

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.

3.2.2. LNAPL/VOC plume area

An area approximately 70 ft wide by 170 ft long that contains free-phase LNAPL and dissolved VOCs has migrated approximately 350 ft south of the ADD property boundary. The impacted area is approximately 30 - 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, 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 hazardous waste disposal facility. Following excavation activities, ground water quality will be monitored periodically to document ground water quality trends and assess 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.

3.3. Project Schedule

Due to the nature of commercial and industrial site development, the specific schedule for remedial activities and subsequent redevelopment has not been defined. However, it is the intent of the Owner to demolish a majority of the existing structures and build to suit for future industrial and commercial businesses. Presently several of the existing structures within the ADD are occupied by a variety of small businesses.

4. Project Contacts

For more information about his project, please contact the following persons:

Environmental Concerns

Chittibabu Vasudevan
Bureau Director
Remedial Bureau A
Department of Environmental Remediation
NYSDEC
625 Broadway
Albany, NY 12233-7015

Health Related Concerns

Mr. Ian Ushe
NY State Dept. of Health
Flanigan Square
547 River Street
Troy, NY 12180-2216

Citizen Participation

Bill Fonda , Citizen Participation Specialist
NYSDEC
SUNY Bldg. 40
Stony Brook ,N.Y. 11790-2356

5. Identification of Document Repositories

Documents related to the Francis S. Gabreski Airport voluntary cleanup will be available for public review at the locations listed below. As additional documents are created during the remediation process they will be added to the repositories.

NYSDEC
Region 1 Office
SUNY – Building 40
Stony Brook, New York 11790
(631) 444-0345

Westhampton Free Library
7 Library Avenue
Westhampton Beach, NY 11978
(631) 288-3335

6. Description of Specific Citizen Participation Activities

NYSDEC and NYSDOH are committed to keeping the public informed and involved throughout the process of investigating and remediating this Site.

In accordance with the requirements of the VCP, the NYSDEC Project Manager will distribute a Fact Sheet to the public and other interested parties to inform them of the proposed remedial action at the Site, the start and end dates of the public comment period, where to find and review the project documents, and how to submit comments. The NYSDEC will then issue a notice of availability of the RAWP for public review and comment in the Environmental News Bulletin. This will occur at least 30 days prior to NYSDEC approval of the RAWP. A document repository has been established at the Westhampton Free Libraary located at 7 Library Avenue in Westhampton Beach.

After construction is completed, an End of Construction Fact Sheet will be issued.

At any time, the public is encouraged to contact the officials listed in Chapter 4 of the CPP to express any concerns or questions they may have regarding this project.

7. Glossary of Key Terms and Major Program Elements

This glossary defines terms associated with New York's hazardous waste Site citizen participation program, and important elements of the hazardous waste site remedial program. Words in **bold** in the definitions are defined elsewhere in the glossary. A list of acronyms often used in the remedial program is presented at the end of this section.

Administrative Record
Part of a site's **Record of Decision** that lists and defines documents used in the development of NYSDEC's decision about selection of a remedial action.

Availability Session
A scheduled gathering of program staff and members of the public in a casual setting, without a formal presentation or agenda but usually focusing on a specific aspect of a site's remedial process

Citizen Participation
A program of planning and activities to encourage communication among people affected by or interested in hazardous waste sites and the government agencies responsible for investigating and remediating them.

Citizen Participation (CP) Record
A document prepared at a major remedial stage that describes the citizen participation activities required at that stage. A CP Record also directs a scoping process to determine if additional citizen participation activities are appropriate and feasible.

Citizen Participation Specialist
A staff member from a NYSDEC central office or regional office who has specialized training and experience to assist a **project manager** and other staff to plan, conduct and evaluate a site-specific citizen participation program.

Classification
A process to place a hazardous waste site within a category which defines its hazardous waste status and its threat or potential threat to public health and the environment. Sites are listed along with their classification in the **Registry of Inactive Hazardous Waste Disposal Sites**.

- **Class 1** – causing or representing an imminent danger of causing irreversible or irreparable damage to public health or environment – immediate action required.

- **Class 2** – significant threat to public health or environment – action required.
- **Class 2a** – temporary classification assigned to a site for which there is inadequate or insufficient data for inclusions in any other classification.
- **Class 3** – does not present a significant threat to public health or environment – action may be deferred.
- **Class 4** – site properly closed – requires continued management.
- **Class 5** – site properly closed – no further action required.
- **Delisted** – site no longer considered an inactive hazardous waste disposal site.

Comment Period
A time period for the public to review and comment about various documents and **Division of Environmental Remediation (DER)** actions. For example, a 30-day comment period is provided when DER issues a **Proposed Remedial Action Plan (PRAP)**, and when DER proposes to **delist** a site from the **Registry of Inactive Hazardous Waste Disposal Sites.**

Consent Order
A legal and enforceable agreement negotiated between NYSDEC and a **responsible party**. The order sets forth agreed upon terms by which a responsible party will undertake site investigation and/or cleanup, or pay for the costs of those activities. The order includes a description of the remedial actions to be taken by the responsible party with NYSDEC oversight, and a schedule for implementation.

Contact List
Names, addresses and/or telephone numbers of individuals, groups, organizations, government officials and media affected by or interested in a particular hazardous waste site. The size of a contact list and the categories included are influenced by population density, degree of interest in a site, the stage of the remedial process and other factors. It is an important tool needed to conduct outreach activities.

Delist
Action by which DER removes a hazardous waste site from the **Registry of Inactive Hazardous Waste Disposal Sites** upon determination that: the site contains inconsequential amounts of hazardous wastes; or that a remediated site no longer requires **Operation and Maintenance.** A proposal to delist a site triggers a public notification and **comment period** process.

Division of Environmental Enforcement (DEE)
A unit within NYSDEC that works with the **Division of Environmental Remediation** and others to negotiate with **responsible parties** to achieve agreements for the investigation and remediation of hazardous waste sites. A negotiated agreement is contained in a **consent order**.

Division of Environmental Remediation (DER)
Formerly the **Division of Hazardous Waste Remediation**, a major program unit within NYSDEC created to manage the hazardous waste site remedial program from site discovery through **Operation and Maintenance** activities. Staff include: engineers, geologists, chemists, attorneys, citizen participation specialists, environmental program specialists and support staff.

Division of Hazardous Waste Remediation
(See **Division of Environmental Remediation**.)

Document Repository
A file of documents pertaining to a site's remedial and citizen participation programs which is made available for public review. The file generally is maintained in a public building near the hazardous waste site to provide access at times and a location convenient to the public.

Enforcement
NYSDEC's effort, through legal action if necessary, to compel a **responsible party** to perform or pay for site remedial activities. NYSDEC may perform this effort by itself or in concert with other agencies.

Environmental Quality Bond Act (EQBA)
The 1986 Environmental Quality Bond Act which gives New York State bonding authority of up to $1.2 billion to fund the State's share of the total cost of remediating hazardous waste sites in New York State.

Fact Sheet
A written discussion about part or all of a site's remedial process, prepared and provided by DER to the public. A fact sheet may focus on: a particular element of the site's remedial program; opportunities for public involvement; availability of a report or other information, or announcement of a **public meeting** or **comment period**. A fact sheet may be mailed to all or part of a site's **contact list**, distributed at meetings, placed in a **document repository** and/or sent on an "as requested" basis.

Interim Remedial Measure (IRM)
A discrete action which can be conducted at a site relatively quickly to reduce the risk to people's health and the environment from a well-defined hazardous waste problem. Examples of IRMs include removing contaminated soil and drums, providing alternative water supplies or securing a site to prevent access.

National Priorities List
The U.S. Environmental Protection Agency's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial response using money from a special trust fund.

New York State Department of Health
Agency within the executive branch of New York State government which: performs health-related inspections at suspected hazardous waste sites; conducts health assessments to determine potential risk from environmental exposure; reviews Risk Assessments prepared during the **Remedial Investigation and Feasibility Study**; conducts health-related community outreach around sites; and review remedial actions to assure that public health concerns are adequately addressed.

New York State Department of Law
Agency within the executive branch of New York State government that takes the lead on hazardous waste sites requiring civil enforcement through court action. Litigation can involve negotiations and court action with **responsible parties** to clean up sites; natural resource damage claims, and recovery of remedial costs.

New York State Registry of Inactive Hazardous Waste Disposal Sites
The "Registry." A document that NYSDEC is directed by law to maintain and that lists and provides information about every hazardous waste site in New York State that meets criteria established through a definition of hazardous waste and **classification** system.

Operable Unit
A discrete part of an entire site that produces a release, threat of release, or pathway of exposure. An Operable Unit can receive specific investigation, and a particular remedy may be proposed. A **Record of Decision** is prepared for each Operable Unit.

Operation and Maintenance
A period in which remedial action may be conducted following construction at a site (for example, operation of a "pump and treat" system), or which is performed after a remedial action to assure its continued effectiveness and protection of people's health and the environment. Activities can include site inspections, well monitoring and other sampling.

Preliminary Site Assessment (PSA)
A PSA is DER's first investigation of a site. A PSA is performed to determine if a site meets New York State's definition of an inactive hazardous waste disposal site by confirming the presence of hazardous waste and determining if the site poses a significant threat to public health or the environment.

Project Manager
An NYSDEC staff member within the DER (usually an engineer, geologist or hydrogeologist) responsible for the day-to-day administration of remedial activities at, and ultimate disposition of, a hazardous waste site. The Project Manager works with legal, health, **citizen participation** and other staff to accomplish site-related goals and objectives.

Proposed Remedial Action Plan (PRAP)
An analysis by DER of each alternative considered for the remediation of a hazardous waste site and a rationale for selection of the alternative it recommends. The PRAP is created based on information developed during the site's **Remedial Investigation and Feasibility Study**. The PRAP is reviewed by the public and other state agencies.

Public Meeting
A scheduled gathering of DER staff with the affected/interested public to give and receive information, ask questions and discuss concerns about a site's remedial program. Staff from other NYSDEC divisions, legal and health staff, and staff from consultants and a responsible party often also attend. A public meeting, unlike an **availability session**, generally features a formal presentation and a detailed agenda.

Reclassification
A process by which DER redefines the threat posed by a hazardous waste site to public health and the environment by developing and assessing site information and, based on findings and conclusions, assigning a new **classification** code.

Record of Decision (ROD)
A document that provides definitive record of the cleanup alternative that will be used to remediate a hazardous waste site. The ROD is based on information and analyses developed during the **Remedial Investigation/Feasibility Study** and the public comment.

Remedial Alternatives Report (RAR)
A report that contains an evaluation of options for the remediation of any contamination in, on, or under, or emanating from, a property that includes an analysis of data and other information concerning the nature and extent of that property's contamination and is generally performed concurrently, and in an interactive fashion, with the site investigation.

Remedial Construction
The physical development, assembly and implementation of the remedial alternative selected to remediate a site. Construction follows the **Remedial Design** stage of a site's remedial program.

Remedial Design
The process following finalization of a **Record of Decision** in which plans and specifications are developed for the **Remedial Construction** of the alternative selected to remediate a site.

Remedial Investigation/Feasibility Study (RI/FS)
The RI fully defines and characterizes the type and extent of hazardous waste contamination at the site. The FS, which may be conducted during or after the RI, uses information developed during the RI to develop alternative remedial actions to eliminate or reduce the threat of hazardous waste contamination to public health and the environment.

Responsible Party
An individual or business who: currently owns or operates a hazardous waste site; or historically owned or operated a site when hazardous waste was disposed; or generated hazardous waste at a site; or transported hazardous waste to a site.

Responsiveness Summary
A written summary of major oral and written comments received by DER during a **comment period** about key elements of a site's remedial program, such as a **Proposed Remedial Action Plan**, and DER's response to those comments.

Site Investigation (SI)
A process undertaken to determine the nature and extent of contamination in, on, and under, and emanating from a property. The **SI** includes the gathering of sufficient information to determine the necessity for, and the selection of the appropriate method of, remediation of contamination in, on, or under, or emanating from a property.

Site Issues And Community Profile Scoping Sheet
A document prepared to support each **Citizen Participation Record**. Each Scoping Sheet identifies issues and information important to DER and the community and information that needs to be exchanged at a particular remedial stage. The Scoping Sheet also summarizes information about the surrounding community, including demographics, special needs, etc.

Superfund
The common name for the Federal program established by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended in 1986. The Superfund law authorizes the U.S. Environmental Protection Agency to investigate and clean up sites nominated to the **National Priorities List**.

Title 3 Project
Remediation of a municipally owned site through the State Superfund Title 3 Program whereby New York State pays 75 percent of eligible costs for remediation and the municipality pays 25 percent.

Toll-Free "800" Number
An information line (800) 367-4448 maintained by the DER to provide convenient access for people who have questions, concerns or information about hazardous waste sites and their remedial programs.

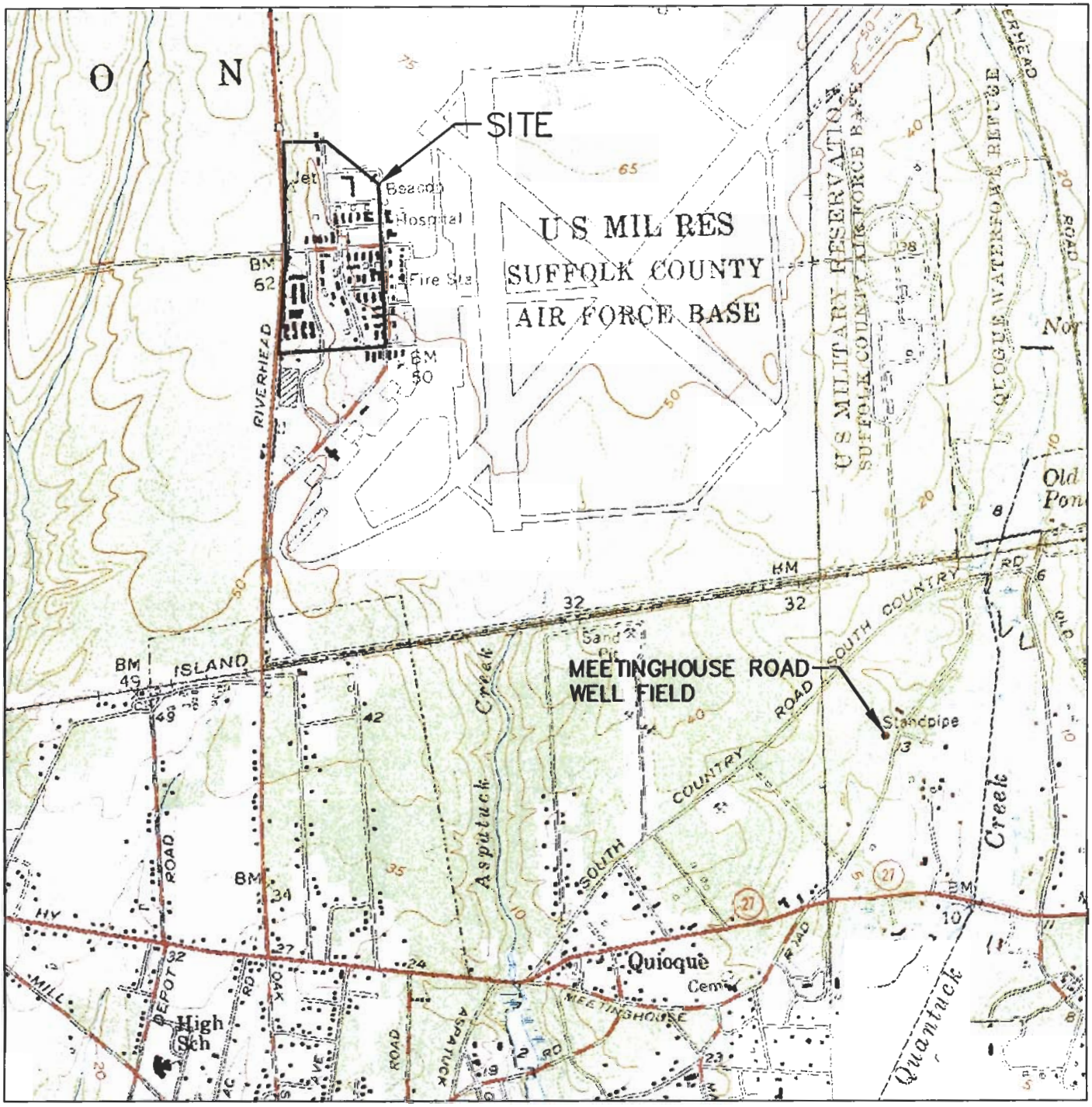
Acronyms

AG	New York State Attorney General's Office
ARAR	Applicable or Relevant and Appropriate Requirement
C&D	Construction and Debris
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CO	Consent Order
CP	Citizen Participation

CPP	Citizen Participation Plan
CPS	Citizen Participation Specialist
CQC/CQA	Construction Quality Control/Construction Quality Assurance
DEE	Division of Environmental Enforcement
DER	Division of Environmental Remediation, formerly the Division of Hazardous Waste Remediation
DHWR	Division of Hazardous Waste Remediation, now the Division of Environmental Remediation
DOD	Department of Defense
DOL	Department of Law
DOW	Division of Water
ENB	Environmental Notice Bulletin
EQBA	1986 Environmental Quality Bond Act
EPA	Environmental Protection Agency
F&W	Division of Fish and Wildlife
FDA	Food and Drug Administration
FSF	Federal Superfund
FOIL	Freedom of Information Law
FS	Feasibility Study
FY	Fiscal Year
GPM	Gallons Per Minute
HeLP	Health Liaison Program
IRM	Interim Remedial Measure
mg/kg	milligrams per kilogram
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PAH	Polynuclear Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PM	Project Manager
ppm/ppb/ppt	parts per million/parts per billion/parts per trillion
PRAP	Proposed Remedial Action Plan
PRP	Potentially Responsible Party
PRS	Priority Ranking System
PSA	Preliminary Site Assessment
QA/QC	Quality Assurance/Quality Control
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RFP	Request for Proposals
RHWRE	Regional Hazardous Waste Remediation Engineer
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RP	Responsible Party
SSF	State Superfund
SVOC	Semi-Volatile Organic Compound

TAGM	Technical and Administrative Guidance Memorandum
TCLP	Toxicity Characteristic Leading Procedure
TSDF	Treatment, Storage and Disposal Facility
ug/l	micrograms per liter
USGS	U.S. Geological Service
VCP	Voluntary Cleanup Program
VOC	Volatile Organic Compound

FIGURE 1



AIRPORT DEVELOPMENT DISTRICT
FRANCIS S. GABRESKI AIRPORT
WESTHAMPTON, NEW YORK

SITE LOCATION MAP

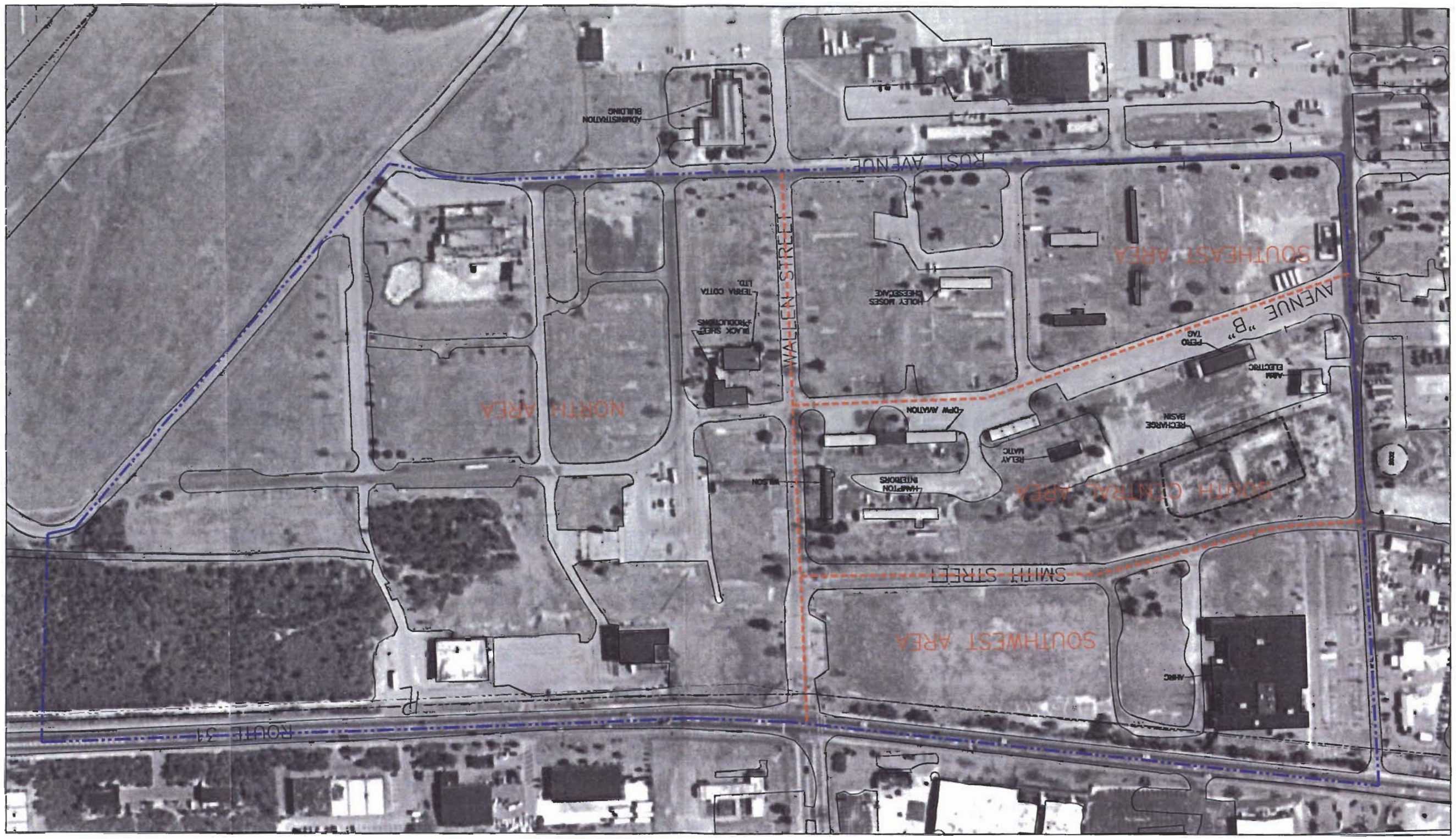
STATE LOCATION MAP

FILE NO. 10569.25466.004
DATE: JANUARY 2002

1"=800' 800 0 800

O'BRIEN & GERE ENGINEERS INC.

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AIRPORT DEVELOPMENT
DISTRICT
FRANCIS S. GABRESKI
AIRPORT
WESTHAMPTON, NEW YORK

SITE MAP

EMPIRE STATE DEVELOPMENT

LEGEND

APPROXIMATE LIMITS OF AIRPORT DEVELOPMENT DISTRICT

AREA BOUNDARY

SCALE IN FEET
APPROXIMATE SCALE
0 100 200

FILE NO. 10569.25466.022
MAY 2003

O'BRIEN & GERE ENGINEERS, INC.

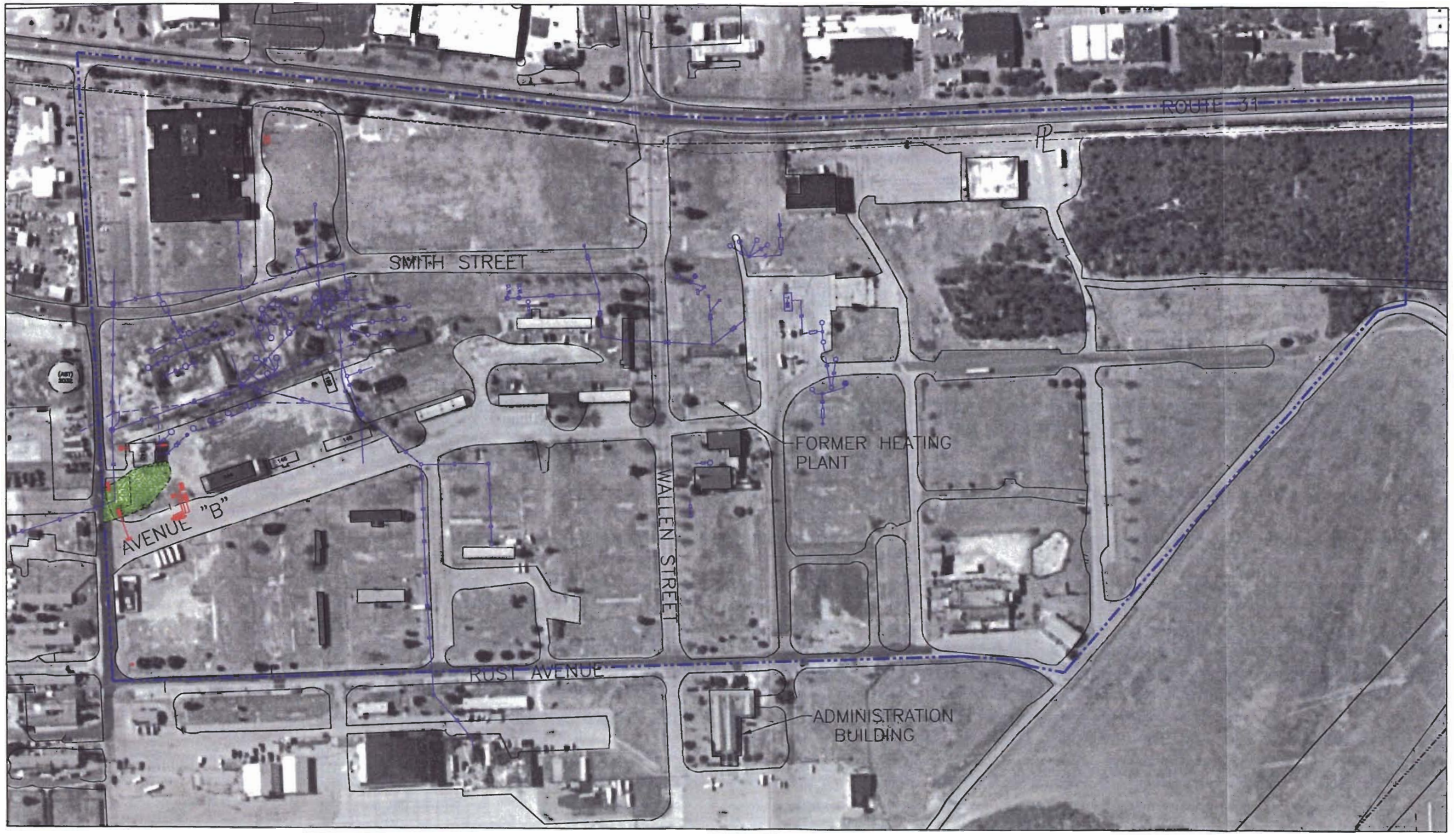
FIGURE 2

PLOT DATE: 9/24/03

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BUILDING HISTORIC USE

140(32)– VEHICLE REPAIR
144(40)– VEHICLE MAINTENANCE
146(41)– PHOTOTECH
148(42)– ARMAMENT & ELECTRONICS HANGAR

FIGURE 3

LEGEND

- STORM DRAIN
- SANITARY LINE
- CESSPOOL
- PETROLEUM STORAGE TANKS
- APPROXIMATE LOCATION OF VOC PLUME
- APPROXIMATE LIMITS OF AIRPORT DEVELOPMENT DISTRICT

EMPIRE STATE DEVELOPMENT

AIRPORT DEVELOPMENT DISTRICT
FRANCIS S. GABRESKI AIRPORT
WESTHAMPTON, NEW YORK

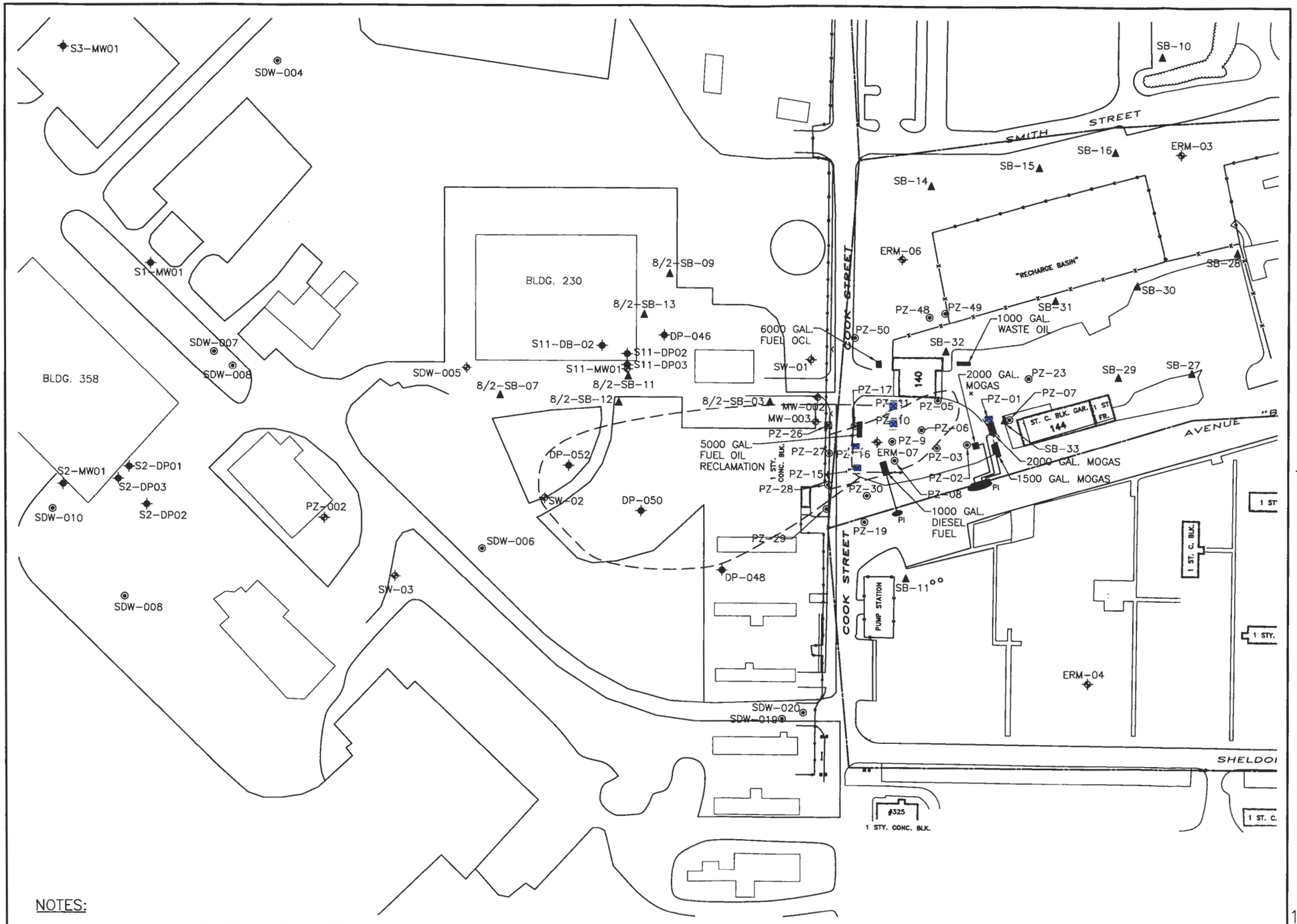
HISTORIC SITE FEATURES

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SCALE IN FEET
APPROXIMATE SCALE

FILE NO. 10569.25466.023
MAY 2003

O'BRIEN & GERE
ENGINEERS, INC.

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NOTES:

1. PIEZOMETERS PZ-9, PZ-10, PZ-11, PZ-15, PZ-16, PZ-29 WERE ADAPTED FROM FIGURE 2-3 OF THE UNC GEOTECH REPORT, 1988.
2. WELLS AND BUILDINGS SOUTH OF COOK STREET ARE APPROXIMATED FROM PEER REPORT AND 1999 AERIAL PHOTOGRAPH.

PLOT DATE: 2/02/04

FIGURE 4

LEGEND

- TP-01 — TEXT PIT LOCATION
- SB-02 — SOIL BORING LOCATION
- ERM-03 — MONITORING WELL LOCAT
- PZ-26 — PIEZOMETER LOCATION
- PZ-28 — PIEZOMETERS WITH LNAPL IN 2002
- PIEZOMETER DESTROYED BROKEN AS OF 2002 (NO DATA)
- HYDROCARBON PLUME (DASHED WHERE INFERRE

AIRPORT DEVELOPMENT DISTRICT
FRANCIS S. GABRESKI AIRPORT
WESTHAMPTON, N.Y.

APPROXIMATE LOCATION OF LNAPL AND VOC PLUME

1"=120' 120 0 1

FILE NO. 10569.25466.033
FEBRUARY 2004

O'BRIEN & GERE ENGINEERS INC.

EXHIBITS

Exhibit 1

NYSDEC TAGM 4031

TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM #4031

FUGITIVE DUST SUPPRESSION AND PARTICULATE MONITORING PROGRAM AT INACTIVE HAZARDOUS WASTE SITES

TO: Regional Hazardous Waste Remediation Engrs., Bur. Directors & Section Chiefs

FROM: Michael J. O'Toole, Jr., Director, Division of Hazardous Waste Remediation

SUBJECT: DIVISION TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM -- FUGITIVE DUST SUPRESSION AND PARTICULATE MONITORING PROGRAM AT INACTIVE HAZARDOUS WASTE SITES

DATE: Oct 27, 1989

Michael J. O'Toole, Jr. (signed)

1. Introduction

Fugitive dust suppression, particulate monitoring, and subsequent action levels for such must be used and applied consistently during remedial activities at hazardous waste sites. This guidance provides a basis for developing and implementing a fugitive dust suppression and particulate monitoring program as an element of a hazardous waste site's health and safety program.

2. Background

Fugitive dust is particulate matter--a generic term for a broad class of chemically and physically diverse substances that exist as discrete particles, liquid droplets or solids, over a wide range of sizes--which becomes airborne and contributes to air quality as a nuisance and threat to human health and the environment.

On July 1, 1987, the United States Environmental Protection Agency (USEPA) revised the ambient air quality standard for particulates so as to reflect direct impact on human health by setting the standard for particulate matter less than ten microns in diameter (PM_{10}); this involves fugitive dust whether contaminated or not. Based upon an examination of air quality composition, respiratory tract deposition, and health effects, PM_{10} is considered conservative for the primary standard--that requisite to protect public health with an adequate margin of safety. The primary standards are 150 ug/m^3 over a 24-hour averaging time and 50 ug/m^3 over an annual averaging time. Both of these standards are to be averaged arithmetically.

There exists real-time monitoring equipment available to measure PM_{10} and capable of integrating over a period of six seconds to ten hours. Combined with an adequate fugitive dust suppression program, such equipment will aid in preventing the off-site migration of contaminated soil. It will also protect both on-site personnel from exposure to high levels of dust and the public around the site from any exposure to any dust. While specifically intended for the protection of on-site personnel as well as the public, this program is not meant to replace long-term monitoring which may be required given the contaminants inherent to the site and its air quality.

3. Guidance

A program for suppressing fugitive dust and monitoring particulate matter at hazardous waste sites can be developed without placing an undue burden on remedial activities while still being protective of health and environment. Since the responsibility for implementing this program ultimately will fall on the party performing the work, these procedures must be incorporated into appropriate work plans. The following fugitive dust suppression and particulate monitoring program will be employed at hazardous waste sites during construction and other activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Such activities shall also include the excavation, grading, or placement of clean fill, and control measures therefore should be considered.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM_{10}) with the following minimum performance standards:

   Object to be measured: Dust, Mists, Aerosols
   Size range: <0.1 to 10 microns
   Sensitivity: 0.001 mg/m^3
   Range: 0.001 to 10 mg/m^3
   Overall Accuracy: ±10% as compared to gravimetric analysis of stearic acid or reference dust

   Operating Conditions:
   Temperature: 0 to 40°C
   Humidity: 10 to 99% Relative Humidity

   Power: Battery operated with a minimum capacity of eight hours continuous operation

   Automatic alarms are suggested.

   Particulate levels will be monitored immediately downwind at the working site and integrated over a period not to exceed 15 minutes. Consequently, instrumentation

shall require necessary averaging hardware to accomplish this task; the P-5 Digital Dust Indicator as manufactured by MDA Scientific, Inc. or similar is appropriate.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the entity operating the equipment to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m^3 over the integrated period not to exceed 15 minutes. While conservative, this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m^3, the upwind background level must be measured immediately using the same portable monitor. If the working site particulate measurement is greater than 100 ug/m^3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see Paragraph 7). Should the action level of 150 ug/m^3 be exceeded, the Division of Air Resources must be notified in writing within five working days; the notification shall include a description of the control measures implemented to prevent further exceedences.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM_{10} at or above the action level. Since this situation has the potential to migrate contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

    1. Applying water on haul roads.
    2. Wetting equipment and excavation faces.
    3. Spraying water on buckets during excavation and dumping.
    4. Hauling materials in properly tarped or watertight containers.
    5. Restricting vehicle speeds to 10 mph.
    6. Covering excavated areas and material after excavation activity ceases.
    7. Reducing the excavation size and/or number of excavations.

    Experience has shown that utilizing the above-mentioned dust suppression techniques, within reason as not to create excess water which would result in unacceptable wet

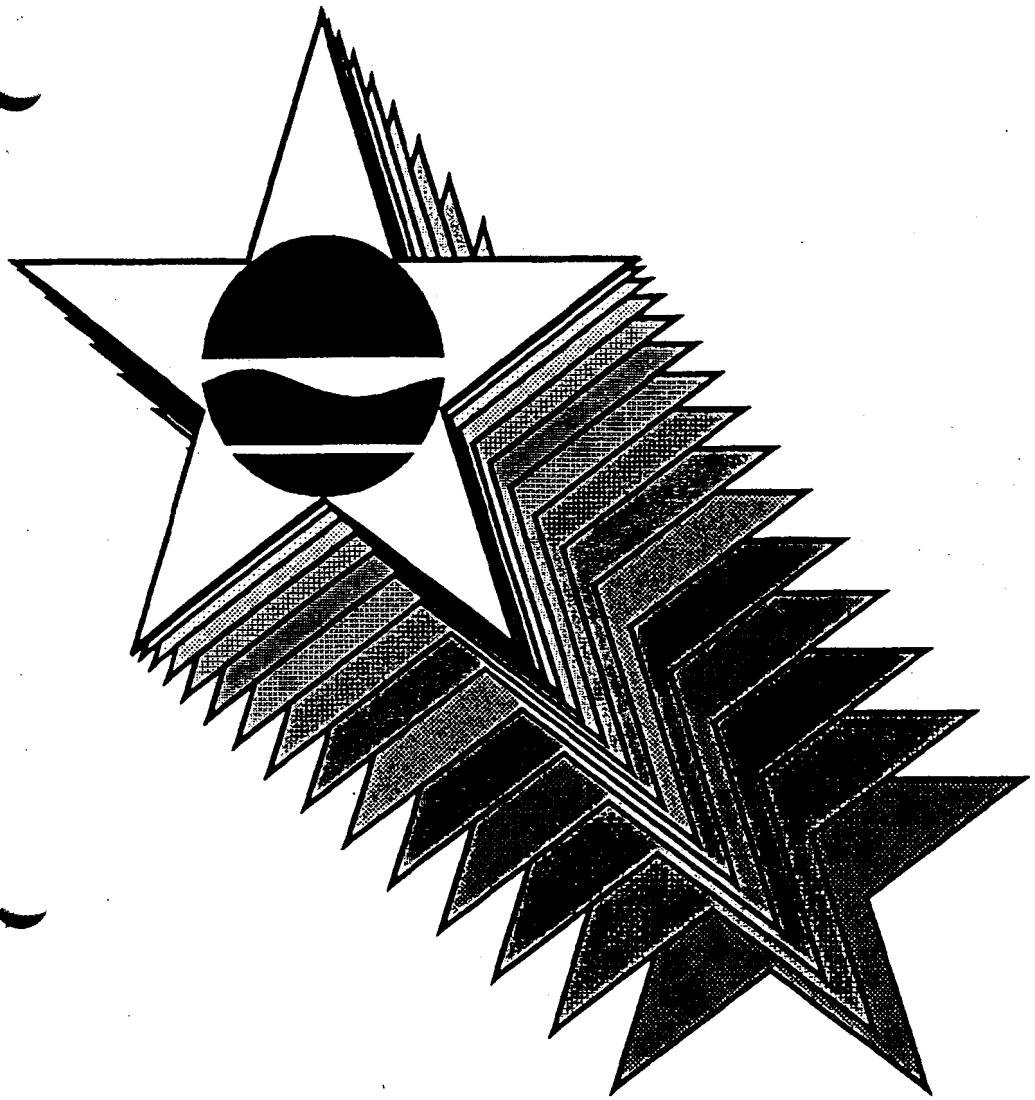
conditions, the chance of exceeding the 150 ug/m^3 action level at hazardous waste site remediations is remote. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. If the dust suppression techniques being utilized at the site do not lower particulates to an acceptable level (that is, below 150 ug/m^3 and no visible dust), work must be suspended until appropriate corrective measures are approved to remedy the situation. Also, the evaluation of weather conditions will be necessary for proper fugitive dust control--when extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended.

There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require appropriate toxics monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

Exhibit 2

STARS Memoranda



Spill
Technology
And
Remediation
Series

STARS Memo #1
Petroleum-Contaminated Soil Guidance Policy

Prepared by:
New York State Department of Environmental Conservation
Division of Construction Management
Bureau of Spill Prevention and Response
August 1992

NEW YORK STATE PETROLEUM-CONTAMINATED SOIL GUIDANCE

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SECTION I
PURPOSE AND APPLICABILITY

The goal at each petroleum spill site is to remove the spilled petroleum product from the soil in the most efficient and safe manner in order that the soil may be returned to a reusable product. When complete removal is not possible, practical, or cost effective, the objective is to remediate the contaminated media to concentration levels which will protect groundwater, human health and the environment.

The Petroleum-Contaminated Soil Guidance Policy is intended to provide direction on the handling, disposal and/or reuse of non-hazardous petroleum-contaminated soils. The reuse or disposal options for excavated soils vary depending on the level of treatment provided consistent with protecting the public health and the environment. While this document does not establish standards, it is intended as guidance in determining whether soils have been contaminated to levels which require investigation and remediation.

This document also constitutes a determination of beneficial use by the Department, as defined in Solid Waste Regulation NYCRR Part 360. Petroleum-contaminated soil, if determined to satisfy the criteria herein, can be reused or disposed of as directed in this guidance. Therefore, soils which meet beneficial use conditions are no longer a solid waste in accordance with NYCRR Part 360-1.2(a)(4).

This guidance is intended for Regional Spill Investigators, Regional Solid Waste staff and responsible parties to assist them in determining the acceptability of remedial activities petroleum spill site or in determining the acceptability of a site assessment. It may be applied to both excavated and non-excavated material. The evaluation method and guidance values included in this guidance may be used to determine the limits of contamination, such as defining the extent of contamination in an excavation which contains contaminated material. Situations may exist where results of sampling analysis will require interpretations or subjective judgement, as with certain nuisance characteristics such as odors. These interpretations and judgements will be made solely by the DEC representative on site. There may be instances where the DEC will opt to digress from this guidance to establish cleanup goals reflecting site-specific circumstances at a particular petroleum spill site.

The guidance may also be used by responsible parties to develop corrective action plans which will achieve the criteria set forth in this document.

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SECTION II

HAZARDOUS WASTE DETERMINATION

An initial determination[1] must be made on all excavated petroleum-contaminated soil as to whether or not it is a hazardous waste. The hazardous waste determination typically involves laboratory analysis to quantify contaminant concentrations in the waste material. The DEC and EPA regulations, however, allow the generator of the waste to use knowledge of the waste and/or laboratory analysis to make a hazardous waste determination. Petroleum-contaminated soils are generally stored on site while laboratory analysis results are obtained and evaluated. As long as the material is segregated from the environment by impervious material, such as polyethylene sheeting, the petroleum-contaminated soil may remain on site until appropriate laboratory results are available and interpreted.

A petroleum-contaminated soil is considered a characteristic hazardous waste when it exhibits any of the following characteristics: ignitability, corrosivity, reactivity, or toxicity, as defined in 6NYCRR Part 371, Section 371.3, or 40 CFR Section 261. Knowledge of soils contaminated with virgin petroleum products indicates that those waste materials do not demonstrate ignitability, corrosivity, or reactivity characteristics. Therefore, the only characteristic of concern for virgin petroleum-contaminated soil is toxicity. The Toxicity Characteristic (TC) Rule identifies benzene and lead as compounds which may cause petroleum-contaminated waste to be hazardous. Analysis of additional parameters may be necessary for petroleum-contaminated soil located at sites where other contaminants may be present. Refer to Appendix A for more specific information regarding the procedures for hazardous waste determination, and the TC Rule regulatory levels.

If the contaminated soil has been excavated and if the hazardous waste criteria apply, then the contaminated soil is classified as a hazardous waste. Excavated soil which is hazardous due to any non-petroleum component will be referred to the Division of Hazardous Waste Remediation, and the Division of Hazardous Substances Regulation to determine appropriate remedial actions.

If in-situ soil is contaminated by a petroleum product, and if the above hazardous waste criteria are met, the site will be remediated under the direction of the Bureau of Spill Prevention and Response to provide for protection of human health and environmental quality. In-situ soil, which violates any of the hazardous waste criteria due to any non-petroleum component, will be referred to the Division of Hazardous Waste Remediation, and the Division of Hazardous Substances Regulation to determine appropriate remedial actions.

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[1] In-situ or excavated soils which could contain contaminants other than petroleum products, by virtue of laboratory analysis, history, visual observations, etc., will be sampled and analyzed by either the responsible party or by the Bureau of Spill Prevention and Response (BSPR). The Division of Hazardous Substances Regulation (DHSR) will provide assistance to BSPR staff (for state-funded projects) and responsible parties in making hazardous waste determinations for their generated waste.

SECTION III

SOIL CLEANUP GUIDELINES

There are four essential guidelines which must be satisfied in order for soil to be considered acceptably remediated or not sufficiently contaminated. These are: A) protection of the groundwater; B) protection of human health; C) protection of fish and wildlife and the environment in which they live; and D) protection against objectionable nuisance characteristics. Compliance with these guidelines is satisfied by analysis of soil samples for contaminant concentrations and leachability, and subsequent comparison of the sampling results to guidance values, values which have been determined to be acceptable by DEC.

Contaminant concentrations are determined using EPA standard Methods 8021 or 8270. Leachability is determined using a procedure known as the Toxicity Characteristic Leaching Procedure (TCLP). Satisfactory protection of groundwater is indicated by TCLP Extraction Guidance Values or by TCLP Alternative Guidance Values. Satisfactory protection of human health is indicated by Human Health Guidance Values. Satisfactory protection of water body sediment is indicated by Sediment Guidance Values. Finally, satisfactory protection against objectionable nuisance characteristics is indicated by the lack of odor and by each contaminant concentration being less than 10,000 ppb. Tables 1 and 2 in Section VIII list the contaminants of concern and their corresponding guidance values for acceptable soil concentrations for components of gasoline and fuel oil, respectively. Analysis of additional parameters may be necessary for petroleum-contaminated soil located at sites where other contaminants may be present.

The procedures used when evaluating soil samples to satisfy these guidelines are discussed further in this section.

A. Protection of Groundwater

The presence of a contaminant in the soil does not determine its potential for groundwater contamination. Soil particles can adsorb contaminants which will not be released through infiltration and groundwater recharge mechanisms. Therefore, it is the leachability of the soil which must be measured. To be protective of groundwater quality, the soil must not leach contaminants to the groundwater at concentrations which violate groundwater standards. The **Toxicity Characteristic Leaching Procedure (TCLP)** has been accepted by the Department[2] as a method of determining leachability of petroleum-contaminated soil.

The Toxicity Characteristic Leaching Procedure (TCLP) is an extraction process designed to address the leaching potential of organic and inorganic contaminants. It is used to simulate the actual site-specific leaching potential of individual contaminants present in the soil. In the extraction process, the soil sample is mixed with an acid solution and shaken for

[2]Accepted by NYSDEC Cleanup Standards Task Force.

approximately eighteen hours. For non-volatile organic and inorganic compounds, the soil/acid solution is filtered to produce an extract liquid. For volatile organic compounds, the soil/acid solution is held in a Zero Headspace Extractor (ZHE), preventing the escape of volatile organics, and a liquid extract is squeezed out of the soil/acid solution. The extracted liquid is then analyzed to determine the concentration of the petroleum compounds in question. If the concentrations in the extract are less than or equal to the groundwater standards, then the soil may be considered environmentally acceptable for groundwater protection. Tables 1 and 2 in Appendix B identify the TCLP Extraction Guidance Values for the primary components of gasoline and fuel oil. The tabulated TCLP Extraction Guidance Values are equal to the NYSDEC groundwater standards or the NYSDOH drinking water standards, whichever is more stringent.

An alternative approach to the actual extraction process of the TCLP laboratory procedure which may be a cost-saving shortcut is to evaluate the concentration of the contaminant in the soil and mathematically determine if it will satisfy the leachate criteria. The TCLP laboratory procedure requires the soil sample to be diluted by a ratio of 20:1 when preparing the sample for the acidic extraction, and subsequent leachate analysis. Assuming that the entire mass of the contaminants present in the soil will leach out during the extraction process, the dilution factor of 20 can be applied to the actual soil contaminant concentration to give a maximum possible contaminant concentration obtainable in the leachate.

If a contaminant concentration in the soil is known, then the maximum possible contaminant concentration in the TCLP extract can be determined by the following equation:

Contaminant Concentration in Soil (ug/kg or ppb)	÷ 20 =	Maximum Possible Contaminant Concentration in Extract Liquid (ug/l or ppb)

If the maximum possible contaminant concentration in the extract liquid, as determined by the above equation, is less than or equal to the contaminant's TCLP Extraction Guidance Value, then the contaminant satisfies the groundwater quality protection criterion. If the calculated maximum possible contaminant concentration in the extract liquid is greater than the TCLP Extraction Guidance Value, then no conclusion can be drawn and groundwater quality protection must be confirmed by actually performing the TCLP extraction for that contaminant.

Example:

If the total concentration of Toluene in the soil as determined by

Method 8021 is 100 ug/kg or 100 ppb for Sample A and 140 ug/kg or 140 ppb for Sample B, and the groundwater standard is 5 ppb then:

Sample A is: 100 ug/kg ÷ 20 = 5 ug/l = 5 ppb
Sample B is: 140 ug/kg ÷ 20 = 7 ug/l > 5 ppb

Sample A is considered to have satisfied groundwater protection by the TCLP extraction test for Toluene at 5 ppb. In Sample B, the calculated extract value is greater than 5 ug/l, therefore, no conclusion can be drawn from the calculation, and an actual TCLP extraction test must be performed.

To simplify this alternative approach, TCLP Alternative Guidance Values, which are equal to 20 times the TCLP Extraction Guidance Values, have been included in Tables 1 and 2. Therefore, if a contaminant's soil concentration is known, it can simply be compared to the TCLP Alternative Guidance Values.

The above methodology can also be used to make the hazardous waste determination, with the soil or sediment concentration compared to the respective hazardous waste limit for the leachate. A considerable decrease in analytical costs may be realized if the above equation is used to evaluate contaminant concentration acceptability.

In summary, if the contaminant concentrations in the soil are less than or equal to the TCLP Alternative Guidance Values, or if the contaminant concentrations in the soil extract are less than or equal to the TCLP Extraction Guidance Values, then the soil is considered environmentally acceptable for groundwater quality protection.

B. Protection of Human Health

Protection of human health is an essential requirement of both treatment and reuse of petroleum-contaminated soil. EPA has published health-based standards for many contaminants in soil. The standards are contained in the Health Effects Assessment Summary Table (HEAST REPORT). These standards were derived from methodologies based on soil ingestion values for carcinogens and systemic toxicants.

The appropriate health-based soil Guidance Values are listed in Tables 1 and 2 for the primary components of gasoline and fuel oil.

If the contaminant concentrations in the soil are less than or equal to the Human Health Guidance Values, then the soil is considered safe for human health concerns.

C. Protection of Fish and Wildlife

Protection of fish and wildlife must be satisfied when dealing with contaminated sediment. Some Sediment Guidance Values for protection of aquatic life and animals which consume aquatic life, have been developed and are noted in Tables 1 and 2. Where sediments are contaminated, these Guidance Values should be used. The appropriate natural resource division (eg. Marine, Fish & Wildlife, etc.) should be contacted for situations involving sediment contaminants which do not have tabulated Sediment Guidance Values. If a spill has occurred at a location that may be sensitive to wildlife (eg. wetlands), the Division of Fish and Wildlife should be consulted to determine whether the soil cleanup levels are adequate for natural resource protection.

If the contaminant concentrations in the sediment are less than or equal to the tabulated Sediment Guidance Values, then the sediment is considered environmentally acceptable for fish and wildlife concerns.

D. Protection Against Objectionable Nuisance Characteristics

Petroleum-contaminated soil must not exhibit objectionable nuisance characteristics to be eligible for some reuse options described later in this guidance and listed in Table 3.

1) Petroleum-Type Odors

The soil must not exhibit any discernible petroleum-type odors in order to be considered for the reuse options identified later in this guidance. Odor determinations for state-funded spill projects will be made by the Regional Spill Investigator. Odor determinations for responsible party (RP) sites are the responsibility of the RP. The Regional Spill Investigator may or may not be available to assess the odor criteria at all sites. When the Regional Spill Investigator is on-site, he/she may override the decision of the RP if, in the investigator's opinion, sufficient odors still persist. Determinations by DEC Spill Investigators do not relinquish a responsible party's responsibilities or liabilities under the law.

2) Contaminant Concentrations

The soil shall not contain any contaminant at a concentration above **10,000 ug/kg (10,000 ppb)**. This maximum individual contaminant concentration should support the above odor determination, since some petroleum constituents will not leach at high concentrations but may exhibit odors.

If the soil does not exhibit petroleum-type odors and does not contain any individual contaminant at greater than 10,000 ppb, then the soil is considered acceptable for nuisance characteristics.

SECTION IV

GUIDANCE VALUES

A. Gasoline-Contaminated Soils

Table 1 lists the primary gasoline components of concern. The table identifies the compound names, the preferred EPA laboratory methods for determining contaminant concentration, the detection limits for a liquid matrix (water), the detection limits for a solid matrix (soil), the TCLP Extraction Guidance Values (C_w), the TCLP Alternative Guidance Values (C_a), the Human Health Guidance Values (C_h), and the Sediment Guidance Values (C_s).

Although EPA Method 8021 is preferred, other laboratory methods may be used with prior approval from the DEC Regional Spill Investigator. Other proposed methods should be evaluated on their ability to quantify the compounds of concern at acceptable detection levels.

The tabulated detection limits are the practical quantitation limits (PQLs). The PQL is the lowest level that can be measured within specified limits of precision during routine laboratory operations on most matrices. Efforts should be made to obtain the best detection possible when selecting a laboratory.

To demonstrate groundwater quality protection via the TCLP Extraction Method, the concentration of the hydrocarbon compound in the TCLP extract, as determined by EPA Method 8021 for a liquid matrix, must be less than or equal to the TCLP Extraction Guidance Value, C_w.

-or-

To demonstrate groundwater quality protection via the TCLP Alternative Method, the concentration of the hydrocarbon compound in the soil, as determined by EPA Method 8021 for a solid matrix, must be less than or equal to the TCLP Alternative Guidance Value, C_a.

To demonstrate human health protection, the concentration of the hydrocarbon compound in the soil, as determined by EPA Method 8021 for a solid matrix, must be less than or equal to the Human Health Guidance Value, C_h.

To demonstrate fish and wildlife protection, the concentration of the hydrocarbon compound in the soil, as determined by EPA Method 8021 for a solid matrix, must be less than or equal to the Sediment Guidance Value C_s. Meeting this requirement is only necessary when dealing with contaminated sediment.

To demonstrate nuisance protection, the soil must not exhibit petroleum-type odors, and must not contain any contaminant at greater than 10,000 ppb, as determined by EPA Method 8021 for a solid matrix.

When the Guidance Value or standard is below the detection limit, achieving the detection limit will be considered acceptable for meeting the Guidance Value or standard, as long as the reported laboratory detection limits are reasonably close to the listed PQLs.

B. Fuel Oil-Contaminated Soil

Table 2 lists the primary fuel oil components of concern. As with Table 1, Table 2 identifies compound names, preferred EPA laboratory methods, detection limits, and Guidance Values.

Although EPA Methods 8021 and 8270 are preferred for identifying compounds of concern for gasoline and fuel oil, other laboratory methods may be used with prior approval from the DEC Regional Spill Investigator. Other proposed methods should be evaluated on their ability to quantify the compounds of interest at acceptable detection levels.

Since there is no single laboratory method which will analyze for all of the volatile and semi-volatile compounds of concern, it is generally necessary to use more than one laboratory method for fuel oil analysis. Both volatile and semi-volatile compounds must be addressed initially, but a reduced list of analytes may be acceptable for subsequent sampling depending upon the initial results.

As with Table 1, the detection limits in Table 2 are PQLs. Efforts should be made to obtain the best detection possible when selecting a laboratory.

Experience has shown that soil containing some of the insoluble semi-volatile compounds at high concentrations can exhibit a distinct odor even though the substances will not leach from the soil. Therefore, the maximum individual contaminant concentration of 10,000 ppb is instituted to help address this problem. In addition, anytime a soil exhibits discernible petroleum odors, even if it has met the numerical criteria, it shall not be considered clean enough for some reuse options under 6NYCRR Part 360, as described later in this document.

Odor determination is subjective. Since there is no recognized odor measuring device, some discrepancies may arise between responsible parties and the DEC on this subject. In order to document odor determinations and to address the need for remediation due to odors, the following approaches may be considered: (1) direct the laboratory to identify and quantify all pollutants present in the soil and/or leachate samples instead of just the

method's target compounds; and (2) establish site-specific conditions based on an evaluation of the characteristics of the site. The determination and evaluation of odors remains a subject requiring further research and policy development.

Some of the semi-volatiles are carcinogens, and subsequently have groundwater quality Guidance Values of 0.002 ppb. The TCLP Extraction Guidance Values are 0.002 ppb, and the TCLP Alternative Guidance Values are 0.04 ppb. The solid matrix detection limit does not approach this low value. Therefore, when these compounds are determined to be present, the TCLP Extraction Method and the Alternative Guidance Values must be satisfied to demonstrate groundwater quality protection for these particular contaminants. The following compounds listed in Table 2 are affected by this limitation: benzo(a)anthracene; benzo(b)fluoranthene; benzo(k)fluoranthene; benzo(a)pyrene; chrysene; benzo(ghi)perylene; and indeno(1,2,3-cd)pyrene.

Particular attention should be paid to the Human Health Guidance Values for fuel oil-contaminated soil. While the majority of the semi-volatiles have health Guidance Values considerably higher than the contaminant concentration generally encountered at spill sites, there are seven compounds listed in Table 2 which have Human Health Guidance Values lower than the detection limits. When any of these compounds (benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene and dibenz(a,h)anthracene) are present, the Human Health Guidance Value most likely will be the limiting factor for achieving acceptable cleanup levels.

To demonstrate groundwater quality protection via the TCLP Extraction Method, the concentrations of the hydrocarbon compounds in the TCLP extract, as determined by EPA Methods 8021 and 8270 Base/Neutral for a liquid matrix, must be less than or equal to the TCLP Extraction Guidance Value, C_w;

-or-

To demonstrate groundwater quality protection via the TCLP Alternative Method, the concentrations of the hydrocarbon compounds in the soil, as determined by EPA Methods 8021 and 8270 Base/Neutral for a solid matrix, must be less than or equal to the TCLP Alternative Guidance Value, C_a. As described above, the TCLP Alternative Method is not a sufficient demonstration of groundwater protection for some contaminants.

To demonstrate human health protection, the concentrations of the hydrocarbon compounds in the soil, as determined by EPA Methods 8021 and 8270 Base/Neutral for a solid matrix, must be less than or equal to the Human Health Guidance Value, C_h.

To demonstrate fish and wildlife protection, the concentrations of the hydrocarbon compounds in the soil, as determined by EPA Methods 8021

and 8270 Base/Neutral for a solid matrix, must be less than or equal to the Sediment Guidance Value, C_s. Meeting this requirement is only necessary when dealing with contaminated sediment.

To demonstrate nuisance protection, the soil must not exhibit petroleum-type odors, and must not contain any contaminant at greater than 10,000 ppb, as determined by EPA Methods 8021 and 8270 Base/Neutral for a solid matrix.

When the Guidance Value or standard is below the detection limit, achieving the detection limit will be considered acceptable for meeting the Guidance Value or standard, as long as the reported laboratory detection limits are reasonably close to the listed PQLs.

SECTION V

LABORATORY ANALYSIS

There are a variety of laboratory methods, established by the USEPA and the NYS Department of Health (DOH), which can be used to analyze petroleum-contaminated soils. The selection of appropriate laboratory methods depends on the compounds of concern, the detection limits for each compound, the nature of the samples to be analyzed, the capabilities of the laboratory, and the regulatory limits or Guidance Values to be achieved. The methods recommended and most often used for petroleum-contaminated soils are EPA Standard Methods 8021, 8270 (Base/Neutrals) and the TCLP extraction process. In every case, the NYSDEC will evaluate laboratory results from NYSDOH-approved laboratories only.

Each laboratory method identifies compounds which can be quantified with an acceptable degree of precision and accuracy. Many laboratory methods have petroleum compounds as target compounds, along with non-petroleum compounds. Method 8270, for example, identifies acid extractable hydrocarbons and base/neutral extractable hydrocarbons. The semi-volatile constituents of petroleum products are a sub-set of the base/neutral extractable compounds under Method 8270. Therefore, when requesting this analysis, base/neutrals only should be specified.

Some laboratories may be able to quantify non-target compounds of concern with particular methods. For example, there is no laboratory method which lists MTBE (methyl t-butyl ether) as a target compound; however, laboratories can include MTBE in their analysis using Method 8021. Therefore, when requesting this analysis, Method 8021 plus MTBE should be specified.

Each laboratory method establishes minimum concentrations of the target compounds which can be detected under ideal conditions using that particular procedure. These Method Detection Limits (MDLs) are rarely achievable under actual conditions in an analytical laboratory. Laboratories report their actual detection limits as Practical Quantitation Limits (PQLs). The PQLs for analysis on a liquid matrix are generally four times the MDLs. With a solid matrix, the PQLs will be affected by the quantity of contamination present, categorized as low, medium or high concentrations. Lower PQLs are generally possible with low level soil contamination. Laboratories must identify their PQLs when reporting analytical results.

Laboratories and methods to be utilized should be selected according to the best detection possible for the compounds of interest, and the regulatory or guidance levels needed to be achieved. For example, Table 2 indicates that naphthalene is a target compound for Method 8021 and Method 8270. Both of these methods can provide detection levels in a liquid matrix below the TCLP Extraction Guidance Value of 10 ppb. Therefore, either method could be used for analysis of a liquid matrix of naphthalene. However, for a solid matrix, Method 8021 is capable of providing much better detection of naphthalene than Method 8270. If the soil concentrations for naphthalene will be compared to the TCLP Alternative Guidance Value of 200 ppb, then Method 8021 should be used instead of Method

8270. If the soil concentrations for naphthalene will be compared only with the nuisance protection level of 10,000 ppb, or the Human Health Guidance Value of 300,000 ppb, then both Method 8021 and Method 8270 are capable of providing satisfactory detection levels for naphthalene.

Initial laboratory analysis should address the full range of compounds which may be present, considering the petroleum products involved. In consideration of prior laboratory results, potential contaminants may be eliminated from subsequent sampling analysis lists. As the contaminants are identified or eliminated, it may be appropriate to change laboratory methods during a project, to avoid unnecessary laboratory expenses. In addition, it may be appropriate to discuss analytical work with the laboratory in terms of the actual compounds of interest rather than method numbers and their defined target compounds. The final laboratory results for a project, however, should address the same full range of compounds as the initial sampling results, to confirm that the interim results did not overlook the appearance of other compounds. For example, gasoline-contaminated soil which is undergoing on-site bioremediation should be analyzed initially using Method 8021 plus MTBE. If only benzene, toluene, ethyl benzene and xylenes are detected, then Method 8020 could be used for interim sampling events. Upon completion of the bioremediation project, the soil should be analyzed using Method 8021 plus MTBE, to demonstrate the satisfaction of the Guidance Values applicable to the selected reuse option.

A detailed description of analytical protocols and procedures is available in the DEC Sampling Guidelines and Protocols manual.

SECTION VI

SAMPLING

Samples should be collected in such a manner so as to best characterize the extent of contamination of the soil in question. There is no specific number or type of samples which will apply to all situations and best engineering judgement will have to be used. The type of sample, grab or composite, will vary depending upon the constituent being identified. While grab samples come from one location, composites come from several locations and are joined to form one sample. When volatiles are in question, care must be taken when collecting composite samples to minimize the loss of volatiles during handling. In order to minimize handling of volatiles, several grab samples are preferred, with confirmatory composite samples. When sampling for semi-volatiles, several composite samples are preferred, with confirmatory grab samples.

The treatment process (if any) will also have a bearing as to how well a soil may be characterized. Low temperature thermal treatment units (e.g. rotary kiln dryers) process soil resulting in a more homogeneous mixture than would be obtained from a stationary pile. The following guidance is offered to assist the Regional Spill Investigator in determining the number and types of samples which should be requested for various treatment scenarios. More comprehensive samples may be required depending on the reuse or disposal alternative to be used.

The responsible party and the Regional Spill Investigator should agree on a sampling plan and review procedure before the samples are collected. All sample results submitted for regulatory compliance must be analyzed by New York State Department of Health approved laboratories.

A detailed description of soil sampling protocols and procedures is available in the DEC Sampling Guidelines and Protocols manual.

A. Tank Pit

If there is a question as to the extent of residual contamination, or if comprehensive documentation is necessary, a tank pit may be sampled for laboratory analysis.

A total of five samples should be taken from the excavation. One composite sample from each of the side walls at a distance approximately one third up from the bottom of the pit. Several samples should also be collected to form one composite sample from the bottom of the pit. Any remaining samples should be grab samples from areas with greater potential for contamination such as stained soils, adjacent to a corrosion hole, opposite a manway, or opposite a tank opening. All samples shall be taken no less than six inches below the exposed surface being sampled. Samples for compositing should be taken from random locations on the floor and walls of the tank pit.

B. Soil Pile

The number of samples required for an excavated pile will be related to the quantity of soil stockpiled. The table below can be used as a guide in determining the appropriate number of samples. If, in the opinion of the Regional Spill Investigator, additional samples are warranted, they should be requested.

Recommended Number of Soil Pile Samples

CONTAMINANT	SEMI-VOLATILES		VOLATILES	
SAMPLE TYPE	Grab	Composite	Grab	Composite
SOIL QUANTITY (yd^3)				
0-50	1	1	1	1
50-100	1	2	2	1
100-200	1	3	3	1
200-300	1	4	4	1
300-400	2	4	4	2
400-500	2	5	5	2
500-800	2	6	6	2
800-1000	2	7	7	2
> 1000 - Proposed Sampling plan shall be submitted for approval on site specific basis				

Best engineering judgement is needed to determine the most appropriate sampling locations. The objective of the sampling is to characterize the extent of contamination of the pile. Consideration should be given to how the soil was stockpiled. Is the most contaminated soil toward the top? Are areas visibly contaminated? How high and how long is the pile? It may be preferable to divide the pile into manageable segments. Samples should be taken from within the pile. Surface soil should not be used as sampling material. Samples shall be collected in accordance with proper sample collection techniques. All samples must be collected in glass containers with air-tight sealable tops.

Using the above sampling table, considering the factors mentioned above, and applying best engineering judgement, an acceptable evaluation of the contaminant concentrations in the soil can be made.

C. Processed Soil

Processed soil is soil which undergoes physical handling during a treatment process. Examples of treatment processes are rotary kiln dryers (low temperature thermal treatment units) or soil washing units. Soil under these conditions are more homogeneously mixed; therefore, individual

samples are more likely to characterize the entire lot. Since these processes are continuous in nature, the samples should be collected over a period of time similar to that described below:

1) A sample may be collected every twenty minutes for a period of two hours. The samples are then mixed to form one composite sample. This frequency will continue until all soils are processed. The twenty minute composite interval is a guideline which can be adjusted based on the amount of soil processed and the processing period. Testing protocols are specifically defined in the treatment unit's operating permit.

2) At least one grab sample should be taken for every two sets of composites.

3) A minimum of two samples (1 grab, 1 composite) should be taken for any treated soil batch.

D. Aboveground (Ex-Situ) Treatment

Typical aboveground treatment technologies are bioremediation and soil vapor extraction. Soil remediated under these conditions will be mixed (tilled) and spread evenly over a wide area. The soil will be spread to a uniform thickness, usually no higher than two feet, although depths may be higher for soil vapor extraction treatment. The shallow depth makes sample collection an easy process. The number of required samples can be based on the quantity of soil being treated (see above table). Depth of the sample can be anywhere from six inches to the bottom of the treatment layer. Care must be taken not to penetrate the liner material. The sampling locations and depths must be randomized.

E. Non-Excavated (In-Situ) Treatment

Treatment of non-excavated soil is similar to aboveground treatment in that the contamination is spread over a wide area. It differs, however, in that the depths of the contaminated zone are varied and usually extend much deeper. Once the volume of contaminated material is determined, the above table can be used to determine the number of required samples. The sampling locations and depths must be randomized.

SECTION VII

MANAGEMENT OF EXCAVATED (EX-SITU) CONTAMINATED SOILS

Once non-hazardous petroleum-contaminated soil is moved from its original state, it is by definition a solid industrial waste and must be managed in accordance with Part 360 and transported in accordance with Part 364 regulations. There are several alternatives available to properly handle this contaminated soil.

A. Soils Which Do Not Meet Guidance Values

Soils which do not meet the guidance values can be processed under a specific DEC Beneficial Use Determination (BUD), such as at an approved hot-mix asphalt batching plant or at a cold-mix asphalt plant, disposed of at a DEC authorized landfill, or treated on site.

1) Reuse Under Specific Beneficial Use Determinations

The DEC Division of Solid Waste has made Beneficial Use Determinations (BUD's) under 6 NYCRR Part 360, identifying recycling or re-use activities which are not subject to Part 360 regulations. The use of petroleum-contaminated soil in a manufacturing process to produce a marketable product may be eligible for BUD issuance. Each manufacturing process operator must maintain compliance with the specific requirements of the issued BUD. Hot-mix and cold-mix asphalt manufacturing are two examples of processes which have received BUD's, and other processes may be approved by the Division of Solid Waste in the future.

a. Reuse at an Approved Asphalt Batching Plant

Several asphalt plants have been authorized to accept non-hazardous contaminated soil, for use as aggregate, provided the plant is in compliance with any other DEC regulations which may apply to the facility. For example, the use of petroleum-contaminated soil may require a modification of the facility's air emission permit.

b. Production of Cold-Mix Asphalt

A Beneficial Use Determination (BUD) has been issued to the process which combines liquid asphalt emulsion with the contaminated soil to produce a cold-mix asphalt. Approval to process petroleum-contaminated soil to produce a cold-mix asphalt is issued by the Spill Response Program. The applicant must satisfy specific testing requirements prior to receiving approval to process. Each BUD identifies allowable uses for

the manufactured cold-mix asphalt and any qualifying conditions and post-treatment testing protocols.

These asphalt products, if being stockpiled or transported for disposal rather than reuse, no longer meet the requirements for these BUDs and are subject to all applicable regulatory provisions of 6NYCRR Parts 360 and 364.

PCS containing asphalt products, which are left in a stockpile and are not being beneficially used, remain a solid waste until such use is accomplished. These materials shall be removed from the stockpile for beneficial use in accordance with their beneficial use approval requirements, or disposal if necessary, as rapidly as possible.

2) Disposal at an Authorized Landfill

A DEC-authorized landfill is one which either has an operating permit or is under a consent order. While this is not the preferred method of dealing with contaminated soil, it may be the most economical or, due to site constraints, the only alternative. Additional restrictions may be required by the landfill operators prior to accepting materials at their facilities.

3) Treatment On Site

Non-hazardous petroleum-contaminated soil may be treated on the site of generation without a DEC Part 360 Permit. Depending on the treatment technologies being utilized, other DEC permits may be required for air emissions and water discharges.The soil treatment processes may involve excavation of soils, securely stockpiling the soils until treatment is initiated, aboveground treatment of the soils, and/or placement of soils back into an excavation for treatment. The Regional Spill Investigator should require a remedial plan, signed by the responsible party, prior to the placement of contaminated soils into an excavation for treatment.

If the soil is to be placed back in an excavation for treatment, and if the excavation is determined to be uncontaminated, the excavation must be prepared and lined in such a manner to protect it against contamination from the soil which will be treated. However, if the excavation is contaminated it shall be the decision of the Regional Spill Investigator as to whether a liner is necessary.

All excavated soil shall be placed on an impervious material (eg: polyethylene sheeting) with the sides banked so as to control and contain run-off. During periods when no treatment is on-going, the surface of the pile(s) must also be covered with an impervious material.

The site may have to be evaluated for its impact to the ambient air. Cross media contamination shall be minimized and aesthetic or nuisance issues shall be addressed. If space on the site is limited, or if the protection of the public health is in jeopardy, then on-site treatment will not be allowed and soil must be removed to a permitted location for treatment or disposal.

There are several methods of on-site soil treatment. Typical among these are soil venting, bioremediation, soil washing and low temperature thermal treatment. All treatment should be evaluated based on its ability to achieve the desired result in the most economical and efficient manner.

B. Soils Which Meet Guidance Values

The reuse options available for de-contaminated soil depends upon which particular Guidance Values are satisfied by the soil. Table 3 identifies the reuse options and the Guidance Values which must be met to use each reuse option.

As described earlier, the DEC Division of Solid Waste (DSW) has issued a Generic Beneficial Use Determination (BUD) which exempts petroleum-contaminated soils, which have been successfully incorporated into an asphalt product by a Bureau of Spill Prevention and Response (BSPR) approved producer and which will be utilized in a bonified paving project.

In addition, the DSW has determined that soils which satisfy the appropriate Guidance Values and which will be reused as highway sub-base material, fill for the original excavation, fill elsewhere on the site of generation, or fill off-site at pre-approved locations, are being beneficially used and are exempt from the provisions of 6NYCRR Part 360. These soils are also exempt from 6NYCRR Part 364 since they no longer meet the Part 364 definition of "solid waste".

The reuse options are not listed as a hierarchy; however, off-site reuse is generally less desirable. The Regional Spill Supervisor or his/her designee will review all appropriate soil sampling data to determine if the criteria has been met for the requested reuse option. Upon request from the responsible party, the evaluation of the submitted data shall be documented with a statement from the Regional Spill Supervisor that the soil does or does not meet the criteria for the desired reuse option. **The DEC and its designee assume no liability when evaluating data for a responsible party with regard to the reuse or disposal of the soil in question.** The generator of the soil has the ultimate responsibility for the accurate and precise characterization, and the safe and proper reuse or disposal of the material. In addition, soil which is being reused off site shall not be allowed to be transported prior to the receipt of the laboratory reports confirming that the

soil has satisfied the appropriate Guidance Values of this guidance document. **The responsible party shall maintain all field data, laboratory results, and final disposition records for three years.**

The possible reuse options are presented below. Additional uses of decontaminated petroleum-contaminated soil may be identified in a Part 360 Permit or BUD for a specific facility.

1) Reuse as a Construction Material

Soil which satisfies the Guidance Values for groundwater protection, human health protection and nuisance characteristics can be reused as construction material. Construction material can include hot asphalt, cold-mix asphalt, concrete, roadway sub-base, etc. Final destination of the soil shall be identified prior to removal from the site.

2) Returned to the Original Excavation

Soil which satisfies the Guidance Values for groundwater protection, human health protection, and nuisance characteristics, can be placed back in the hole from which it was excavated.

3) Placed Elsewhere on Site

Soil which satisfies the Guidance Values for groundwater protection, human health protection, and nuisance characteristics, can be placed anywhere within the confines of the contiguously-owned property from which it originated.

4) Reuse Off-Site at a Pre-Approved Location

The Regional Spill Engineer and Regional Solid Waste Engineer may approve a request for an off-site reuse location for remediated soil which satisfies the Guidance Values for groundwater protection, human health protection, and nuisance characteristics. Sites which may be considered for this option are industrial sites, authorized construction and demolition debris landfills, petroleum storage facilities, authorized landfills, or other locations where public access is limited. Written approval must be received from the property owner(s) prior to exercising this reuse option. The responsible party may submit such a request to the Regional Spill Engineer who will coordinate with the Regional Solid Waste Engineer to approve or disapprove the request.

C. Rock Debris

Rock debris, for purposes of this policy, is defined as those rocks which are four (4) inches or greater in diameter. They shall be cleaned of any packed-on petroleum-contaminated soil. These rocks are not treated as a solid waste and can be disposed of as construction and demolition debris.

If rock debris cannot be separated from the petroleum-contaminated soil, it shall be handled as a solid waste in accordance with NYCRR Part 360 and/or Part 364 requirements.

SECTION VIII

MANAGEMENT OF NON-EXCAVATED (IN-SITU) CONTAMINATED SOIL

In-situ contaminated soil may pose a threat to the groundwater, human health and the environment. These sites must be evaluated to determine the extent of contamination and the appropriate investigative or remedial actions necessary. The soil may be treated in-situ and evaluated by the same guidelines as excavated soil, while taking into account site-specific considerations and conditions.

Additional guidance will be developed to establish procedures for evaluating the potential impacts of non-excavated (in-situ) contaminated soils. Issues which should be considered when evaluating in-situ contaminated soil are environmental sensitivity of the site, level of residual contamination, soil characteristics, depth to groundwater, present and potential land use. A proper sampling plan will be necessary to determine the number, quantity and depth of samples to properly characterize the site.

SECTION IX

REFERENCES

NYS Department of Environmental Conservation, Cleanup Standards Task Force, DRAFT Cleanup Policy and Guidelines, October 1991.

NYS Department of Environmental Conservation, Division of Hazardous Substances Regulation, 6NYCRR Part 364, Waste Transporter Permits, January 12, 1990.

NYS Department of Environmental Conservation, Division of Hazardous Substances Regulation, 6NYCRR Part 371 Identification and Listing of Hazardous Wastes, December 25, 1988.

NYS Department of Environmental Conservation, Division of Solid Waste, 6NYCRR Part 360 Solid Waste Management Facilities, May 28, 1991.

NYS Department of Environmental Conservation, Division of Water, Sampling Guidelines and Protocols, March 1991.

NYS Department of Environmental Conservation, Division of Water, Spill Response Guidance Manual, January 1990.

NYS Department of Environmental Conservation, Division of Water, Technical and Operation Guidance Series (1.1.1), Ambient Water Quality Standards and Guidance Values, November 15, 1991.

US Environmental Protection Agency, 40 CFR Part 261 Identification and Listing of Hazardous Wastes, June 29, 1990.

US Environmental Protection Agency, Health Effects Assessment Summary Table, April 4, 1991.

APPENDIX A

HAZARDOUS WASTE DETERMINATION AND REGULATORY LEVELS

In accordance with DEC and EPA regulations, the generator of a waste material must determine if the material is a hazardous waste or a non-hazardous waste. The generator can make this determination using knowledge of the waste and/or laboratory analyses.

A waste material can be a hazardous waste due to its origin, its listed waste content, or its characteristics.

Soil contaminated with virgin petroleum products is a hazardous waste if it exhibits a characteristic of a hazardous waste, namely, ignitability, corrosivity, reactivity, and toxicity. The hazardous waste characteristics, defined in 6NYCRR Part 371, Section 371.3, and 40 CFR Section 261, are described below.

A. <u>Ignitability</u>:

A solid waste exhibits the characteristic of ignitability if a representative sample of the waste has any of the following properties:

1) Is not a liquid and is capable under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard.

2) It is a liquid, other than an aqueous solution containing less than 24 percent ethyl alcohol by volume, and has a flash point less than 60°C (140°F).

3) It is an ignitable compressed gas.

4) It is an oxidizer.

In accordance with guidance from the DEC Division of Hazardous Substances Regulation and based on knowledge of the waste, soils contaminated with virgin petroleum products do not exhibit the above properties and do not have to be tested for the ignitability characteristic.

B. <u>Corrosivity</u>:

A solid waste exhibits the characteristic of corrosivity if a representative sample of the waste has either of the following properties:

1) It is aqueous and has pH less than or equal to 2 or greater than or equal to 12.5.

2) It is a liquid and corrodes steel at a rate greater than 6.35 mm (0.250 inch) per year at a test temperature of 55°C (130°F).

Based on knowledge of the waste, soils contaminated with virgin petroleum products do not exhibit the above properties, and do not have to be tested for the corrosivity characteristic.

C. Reactivity:

A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has any of the following properties:

1) It is normally unstable and readily undergoes violent change without detonating.

2) It reacts violently with water.

3) It forms potentially explosive mixtures with water.

4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes in quantity sufficient to present a danger to human health or the environment.

6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.

7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

8) It is a forbidden explosive, a Class A explosive or a Class B explosive.

Based on knowledge of the waste, soils contaminated with virgin petroleum products do not exhibit the above properties, and do not have to be tested for the reactivity characteristic.

D. Toxicity:

If the Toxicity Characteristic Leaching Procedure (TCLP) extract from a representative sample of the waste contain any of the contaminants identified in the attached listing of Hazardous Waste Regulatory levels at concentrations equal to or greater than the values listed, it is a hazardous waste.

With respect to petroleum-contaminated soil, the primary compound of concern is benzene. If the benzene concentration in a TCLP extract is equal

to or greater than 500 ppb, the contaminated material is a characteristic hazardous waste. For gasoline contaminated soil, toxicity for lead must also be evaluated.

The regulatory level of benzene in the soil is determined by analyzing the soil using the TCLP extraction method and determining the concentration in the extract.

A second method of determination is to identify the total concentration of the contaminant in the soil. If the total concentration is less than the regulatory level, then the leachate level could not possibly exceed the standard. This approach would save laboratory costs because the TCLP would not have to be run. If the total concentration in the soil exceeds the regulatory level required in the extract, no conclusion can be drawn from these results and a complete TCLP must be run.

Additional Information on Toxicity Characteristics

On March 29, 1990, the U.S. Environmental Protection Agency established the Toxicity Characteristic (TC) Rule. The TC Rule expands the list of contaminants by which a waste can be classified as hazardous due to toxicity, and it replaces the Extraction Procedure Toxicity (EP Tox) with the Toxicity Characteristic Leaching Procedure (TCLP). The TC Rule's specified contaminant list includes the same 14 metals and pesticides as the original toxicity list, plus 25 additional organic chemicals. Each of the 39 listed contaminants has the potential for rendering a particular material a characteristic hazardous waste due to toxicity. Since benzene is one of the 25 organic compounds added to the toxicity list, and since benzene is commonly found in petroleum products, it is possible that petroleum-contaminated soil may classify as a hazardous waste. Limited relief from these hazardous waste regulations is currently available because the TC Rule has specifically deferred petroleum-contaminated soil, groundwater, and debris generated from underground storage tank (UST) releases, until the impact of the regulation is further evaluated.

UST sites are essentially those sites which have underground storage tanks containing transportation fuels, such as gasoline, jet fuel, aviation gas, and diesel fuel. (See 40 CFR Section 280.12 for a more complete definition). The TC Rule does not apply to petroleum-contaminated media produced by a leak from an UST, including associated underground piping. However, DEC regulations state that the materials contaminated by transportation fuels can be hazardous wastes if they exhibit other hazardous waste characteristics, such as toxicity due to lead.

The TC Rule, as published on March 29, 1990, became effective on September 25, 1990, for large-quantity generators, and March 29, 1991, for small quantity generators. Large quantity generators are defined as those parties who generate 2,200 pounds or more of hazardous waste in any month. Small quantity generators are those parties who generate between 220 and 2,200 pounds of hazardous waste in any month. Until the DEC adopts the TC Rule, waste generators must comply with both the EPA and DEC waste regulations. Refer to the specific regulations of interest for more information.

HAZARDOUS WASTE REGULATORY LEVELS FOR TOXICITY CHARACTERISTIC

CONSTITUENT	REGULATORY LEVEL (mg/L)
Arsenic	5.0
Barium	100.0
Benzene	0.5*
Cadmium	1.0
Carbon tetrachloride	0.5*
Chlordane	0.03*
Chlorobenzene	100.0*
Chloroform	6.0*
Chromium	5.0
o-Cresol	200.0*
m-Cresol	200.0*
Cresol (TOTAL)	200.0*
2,4-D	10.0
1,4-Dichlorobenzene	7.5*
1,2-Dichloroethane	0.5*
1,1-Dichloroethylene	0.7*
2,4-Dinitrotoluene	0.13*
Endrin	0.02
Heptachlor (and its epoxide)	0.008*
Hexachlorobenzene	0.13*
Hexachloro-1,3butadiene	0.5*
Hexachloroethane	3.0*
Lead	5.0
Lindane	0.4
Mercury	0.2

HAZARDOUS WASTE REGULATORY LEVELS FOR TOXICITY CHARACTERISTIC (Cont'd)

CONSTITUENT	REGULATORY LEVEL (mg/L)
Methoxychlor	10.0
Methyl ethyl ketone	200.0*
Nitrobenzene	2.0*
Pentachlorophenol	100.0*
Pyridine	5.0*
Selenium	1.0
Silver	5.0
Tetrachloroethylene	0.7*
Toxaphene	0.5
Trichloroethylene	0.5*
2,4,5-Trichlorophenol	400.0*
2,4,6-Trichlorophenol	2.0*
2,4,5-TP (Silvex)	1.0
Vinyl chloride	0.2*

* New Toxicity Characteristics Effective 9/25/90

APPENDIX B

GUIDANCE VALUES AND REUSE OPTIONS

TABLE 1
Guidance Values For Gasoline Contaminated Soil*

Compound	EPA Method	Detection Limit[1] (ppb)		TCLP Extraction Guidance Value[2] C_w (ppb)	TCLP Alternative Guidance Value C_a (ppb)	Human Health Guidance Value C_h (ppb)	Sediment Guidance Value C_s (ppb)
		Liquid	Solid				
Benzene	8021 (8020)	1	2	0.7	14	2.4×10^4	
Ethylbenzene	8021 (8020)	1	2	5	100	8.0×10^6	
Toluene	8021 (8020)	1	2	5	100	2.0×10^7	
o-Xylene	8021 (8020)	2	2	5	100	2.0×10^8	
m-Xylene	8021 (8020)	2	2	5	100	2.0×10^8	
p-Xylene	8021 (8020)	2	2	5	100	•••	
Mixed Xylenes	8021 (8020)	2	2	5	100	2.0×10^8	
Isopropylbenzene	8021	1	1	5	100	•••	
n-Propylbenzene	8021	1	1	5	100	•••	
p-Isopropyltoluene	8021	1	1	5	100	•••	
1,2,4-Trimethylbenzene	8021	1	1	5	100	•••	
1,3,5-Trimethylbenzene	8021	1	1	5	100	•••	
n-Butylbenzene	8021	1	1	5	100	•••	
sec-Butylbenzene	8021	1	1	5	100	•••	
Naphthalene	8021	1	1	10	200	3.0×10^5	
Methyl t-butyl ether (MTBE)[3]	8021 (8020)	1	1	50	1,000	•••	

*Nuisance Characteristics Guidance:

No petroleum-type odors.

No individual contaminant in soil at greater than 10,000 ppb.

[1] The listed Detection Limits are Practical Quantitation Limits (PQLs). The Method Detection Limit (MDL) is the best possible detection. Laboratories report the Practical Quantitation Limit (PQL), which is generally 4 times the MDL. Efforts should be made to obtain the best detection possible when selecting a laboratory. When the Guidance Value or standard is below the detection limit, achieving the detection limit will be considered acceptable for meeting the Guidance Value or standard.

[2] The TCLP Extraction Guidance Values are equal to the NYSDEC groundwater quality standards or Guidance Values, or the NYSDOH drinking water quality standards or Guidance Values, whichever is more stringent.

[3] Methyl t-butyl ether (MTBE) is not a target compound of Methods 8021 and 8020, but MTBE may be determined using these methods with appropriate quality assurance and quality control measures.

••• No Guidance Value identified in EPA HEAST Report.

TABLE 2
Guidance Values for Fuel Oil Contaminated Soil*

Compound	EPA Method	Detection Limit[1] (ppb)		TCLP Extraction Guidance Value[2] C_w (ppb)	TCLP Alternative Guidance Value C_s (ppb)	Human Health Guidance Value C_h (ppb)	Sediment Guidance Value C_s (ppb)	
		Liquid	Solid				Fresh	Marine
Benzene	8021 (8020)	1	2	0.7	14	2.4×10^4		
Ethylbenzene	8021 (8020)	1	2	5	100	8.0×10^6		
Toluene	8021 (8020)	1	2	5	100	2.0×10^7		
o-Xylene	8021 (8020)	2	2	5	100	2.0×10^8		
m-Xylene	8021 (8020)	2	2	5	100	2.0×10^8		
p-Xylene	8021 (8020)	2	2	5	100	• • •		
Mixed Xylenes	8021 (8020)	2	2	5	100	2.0×10^8		
Isopropylbenzene	8021	1	1	5	100	• • •		
n-Propylbenzene	8021	1	1	5	100	• • •		
p-Isopropyltoluene	8021	1	1	5	100	• • •		
1,2,4-Trimethylbenzene	8021	1	1	5	100	• • •		
1,3,5-Trimethylbenzene	8021	1	1	5	100	• • •		
n-Butylbenzene	8021	1	1	5	100	• • •		
sec-Butylbenzene	8021	1	1	5	100	• • •		
t-Butyl benzene	8021	1	1	5	100	• • •		
Naphthalene[3]	8021 (8270)	1 (6)	1 (330)	10	200	3.0×10^5		
Anthracene	8270	8	330	50	1,000	2.0×10^7		
Fluorene	8270	8	330	50	1,000	3.0×10^6		
Phenanthrene	8270	22	330	50	1,000	• • •		
Pyrene	8270	8	330	50	1,000	2.0×10^6		
Acenaphthene	8270	8	330	20	400	5.0×10^6		
Benzo(a)anthracene	8270	31	330	.002	.04[4]	220	33	18
Fluoranthene	8270	9	330	50	1,000	3.0×10^6		

(CONTINUED ON THE NEXT PAGE)

TABLE 2 (Cont'd)
Guidance Values for Fuel Oil Contaminated Soil*

Compound	EPA Method	Detection Limit (ppb)		TCLP Extraction Guidance Value[3] C_w (ppb)	TCLP Alternative Guidance Value C_a (ppb)	Human Health Guidance Value C_h (ppb)	Sediment Guidance Value C_s (ppb)	
		Liquid	Solid				Fresh	Marine
Benzo(b)fluoranthene	8270	19	330	.002	.04[4]	220	33	18
Benzo(k)fluoranthene	8270	10	330	.002	.04[4]	220	33	18
Chrysene	8270	10	330	.002	.04[4]	***	33	18
Benzo(a)pyrene	8270	10	330	.002	.04[4]	61	33	18
Benzo(g,h,i)perylene	8270	10	330	.002	.04[4]	***		
Indeno(1,2,3-cd)pyrene	8270	10	330	.002	.04[4]	***		
Dibenz(a,h)anthracene	8270	10	330	50	1,000	14		

*** Nuisance Characteristics Guidance:**
No Petroleum-type odors.
No individual contaminant in soil at greater than 10,000 ppb.

[1] The listed Detection Limits are Practical Quantitation Limits (PQL's). The Method Detection Limit (MDL) is the best possible detection. Laboratories report the Practical Quantitation Limit (PQL), which is generally 4 times the MDL. Efforts should be made to obtain the best detection possible when selecting a laboratory. When the Guidance Value or standard is below the detection limit, achieving the detection limit will be considered acceptable for meeting the Guidance Value or standard.

[2] The TCLP Extraction Guidance Values are equal to the NYSDEC groundwater quality standards or Guidance Values, or the NYSDOH drinking water quality standards or Guidance Values, whichever is more stringent.

[3] For naphthalene analysis in a liquid matrix, both Method 8021 and Method 8270 can provide satisfactory levels for comparison to the C_w of 10 ppb.

For naphthalene analysis in a solid matrix, Method 8021 is preferred over Method 8270 for comparison to the C_a of 200 ppb. If the C_a Guidance Value is not being used in the soil evaluation, then both Method 8021 and 8270 can provide satisfactory detection levels for comparison to the C_h of 3.0×10^6, and nuisance characteristic of 10,000 ppb.

[4] Due to the high detection limit for a solid matrix, the TCLP Extraction Method must be used to demonstrate groundwater quality protection for these compounds.

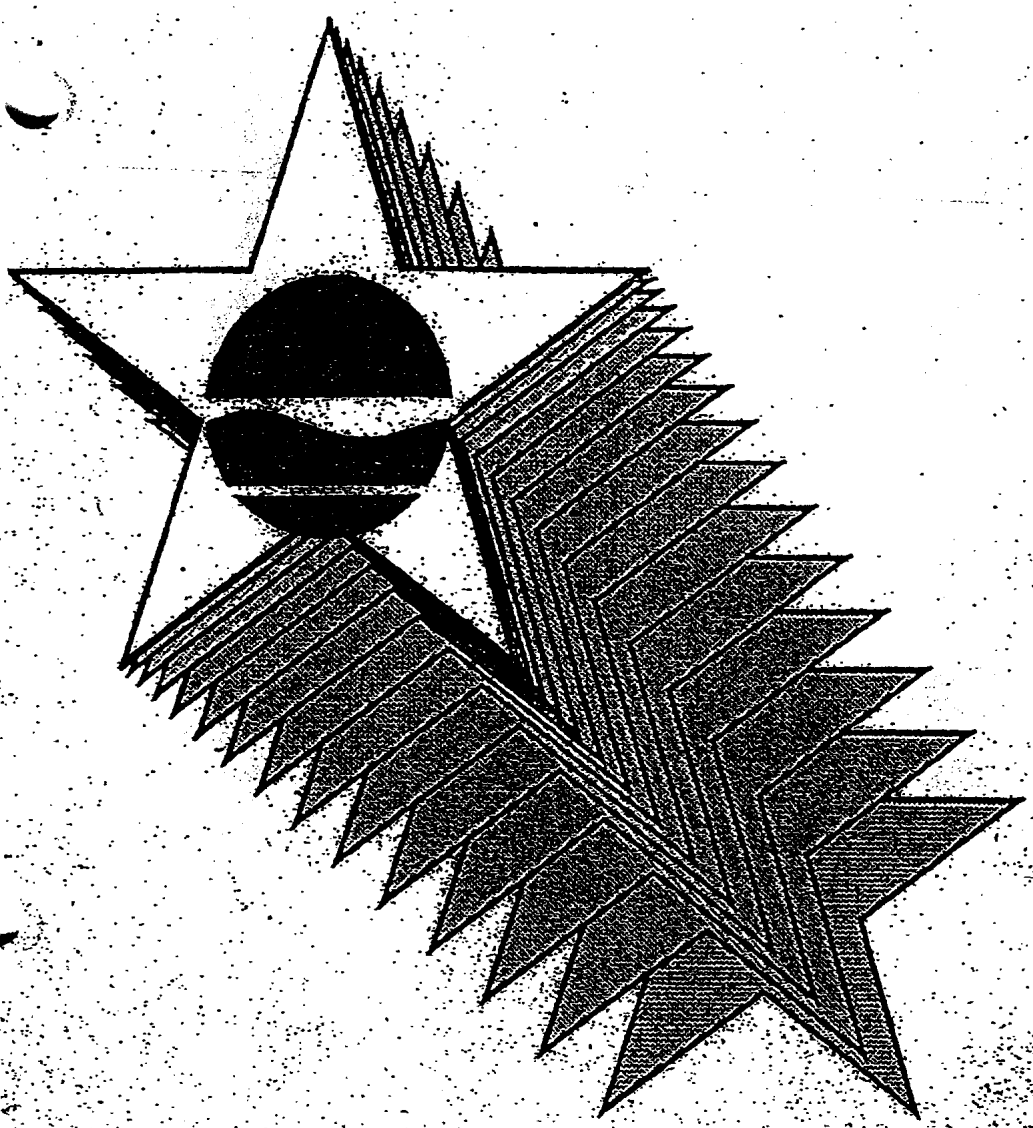
*** No Guidance Value identified in EPA HEAST Report.

TABLE 3
Soil Reuse Options

Reuse Option	Minimum Criteria To Be Met[1]		
	Protection of Groundwater	Protection of Human Health	Protection Against Nuisance Characteristics
Asphalt[2] or Concrete Manufacturing			
Cold-Mix Asphalt[2]			
Construction Material	X	X	X
Fill for Original Excavation	X	X	X
Fill Elsewhere On-Site	X	X	X
Off-Site at Pre-Approved Location	X	X	X

[1] In addition, the criteria for protection of fish and wildlife must be met when sediments are the waste materials being handled, and when these soils or sediments are being disposed in surface waters, marine waters, or wetland areas.

[2] The soils must satisfy the criteria established under the particular BUD issuance.



Spill
Technology
And
Remediation
Series

STARS Memo #2

Biocell and Biopile Designs for Small-Scale Petroleum-Contaminated Soil Projects

Prepared by:
New York State Department of Environmental Conservation
Division of Spills Management

May 1996

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BACKGROUND AND APPLICABILITY

As the number of petroleum-contaminated sites requiring cleanup in New York State increases, so does the desire for better, faster and more cost-effective ways to investigate and remediate these sites. This situation becomes more significant as the option of landfilling petroleum-contaminated soils decreases as more landfills close. As a result, landfilling becomes more costly for the few which remain in operation. Landfilling also brings with it the liability of stored petroleum-contaminated soil as well as the transfer of contaminated material from one location to another.

The New York State Department of Environmental Conservation (NYSDEC) Division of Spill Management (DSM) is concerned that the Responsible Parties (RPs) get their money's worth so they will continue to be responsible and cooperative in remediating petroleum releases to the environment. In addition, DSM wants to control expenditures from the New York State Spill Fund, which is a revolving fund of State and federal money used to investigate and remediate spills when an RP is unidentifiable, or is unwilling or unable to perform the work deemed necessary by DSM. The New York State Department of Environmental Conservation (NYS DEC) has been investigating and encouraging reuse and recycling alternatives to landfilling, which are efficient, cost-effective, and environmentally-protective. 6 NYCRR Part 611 refers to guidance that encourages recycling or on-site treatment versus disposal.

DEC has also been seeking alternatives which lend themselves to the development of a generic design approach for small-scale projects. Generic approaches are desirable because they could reduce the time lag and the overall costs of a spill cleanup for small-scale projects, by providing the preliminary design work for an (RP) or contractor to adapt to similar projects and by minimizing (or virtually eliminating) the engineering design phase. Generic approaches could also help educate RPs and contractors who do not have knowledge and experience in innovative remedial technologies.

Ex-situ (aboveground) bioremediation has been developed as a generic design approach for small-scale projects. This was possible because aboveground soil bioremediation technology can be adjusted to address soil type, contaminant type, soil quantity, and concentration.

Bioremediation creates and maintains a favorable environment to stimulate microorganisms to use contaminants (hydrocarbons) in soil as a food source. Under proper conditions, microorganisms, can break down contaminants into non-hazardous inorganic substances. Small-scale bioremediation lends itself to a generic design approach because the design criteria, which include moisture content, temperature and pH of the soil, can be simply measured and adjusted to optimum conditions for the process. The additional design criteria, nutrient and oxygen requirements, can be estimated based on contaminant concentrations in the soil. It is understood that generic parameters established by a standardized method may not provide the same remedial efficiencies as those based on a site-specific feasibility study; however, it is anticipated that the results will be adequate for small-scale projects.

The advantages of bioremediation include the following:

- it can be conducted on site,
- the waste is permanently eliminated,
- capital costs for these small-scale applications are cheaper than other processes,
- there is positive public acceptance because it provides for recycling,
- the long-term liability risks associated with leaving contamination on site are eliminated,
- there is minimum site disruption,
- transportation costs and liability of landfilling are eliminated, and
- it can be coupled with other treatment techniques.

Disadvantages of bioremediation include the following:

- the design criteria for highly efficient remediation are site-specific, and
- extensive monitoring may be necessary.

This design approach uses indigenous microorganisms applied to petroleum-contaminated soils of approximately 30 - 100 yd^3, typical of the removal of an underground storage tank. This volume of soil was chosen because it should reduce costs for many RPs who do not have the resources to hire professionals with experience in bioremediation. In addition, it would reduce project duration time compared to less active approaches, and it would be a manageable quantity of soil for application of a

generic design approach. The same principles can be used for smaller or larger quantities. A less elaborate design would be appropriate for smaller quantities, and an experienced professional consultant is recommended for larger quantities.

The generic biocell and biopile designs are intended to provide an overview and direction to spillers on the use of ex-situ bioremediation of small-scale (approx. 30 - 100 yd^3) petroleum-contaminated soil. While this document does not establish standards, it is intended as guidance to regional spill investigators and RPs for designing bioremediation cells and piles.

BIOREMEDIATION TECHNOLOGY

Bioremediation consists of creating and maintaining a favorable environment for microorganisms, either indigenous (naturally existing) or non-indigenous (brought in from another site), to use contaminants in soil as a carbon food source. The basic requirements for bioremediation to occur include a food source (hydrocarbons), oxygen, and nutrients (phosphorous and nitrogen), in a compatible environment (proper pH, temperature and moisture.) Other nutrients such as potassium, calcium, iron, manganese, cobalt, copper, and zinc, are generally present in adequate concentrations in most soil and aquifer systems, and usually need no further attention in the design of a bioremediation process.

Two commonly used designs for ex-situ bioremediation are the biocell and the biopile. In a biocell, the contaminated soil is spread in 1 to 2-foot layers. In a biopile, the contaminated soil is mounded in 3 to 4-foot piles.

pH

Petroleum-consuming microorganisms grow best at pH near 7. Where high concentrations of volatile compounds are present and where soils have low alkalinity (acidic conditions, i.e., pH<7), liming may be necessary. Adding enough lime to attain a pH of 7.2 to 7.5 should be sufficient to maintain appropriate pH throughout the life of the project without having to monitor the pH. The lime added should be in the form of ground agricultural limestone ($CaCO_3$), similar to pelletized limestone sold in garden stores. Ground limestone is recommended because it is less expensive than other forms and applying excessive amounts will not affect treatment. Soil samples can be collected and taken to a local garden store for pH measurement and liming requirements to achieve pH near 7.

The pH of alkaline soil (pH>7) should be reduced by the acidic by-products generated from the biological activity in the soil. As biological activity and resulting pH reduction continue, monitoring may be necessary to determine if acidic conditions occur and subsequent liming is necessary. For a project of this size and duration, pH monitoring may not be necessary after measuring and adjusting at the start of the project. As a conservative approach, pH could be measured once per season.

Note: Some studies have reported that lime may be harmful to hydrocarbon-degrading bacteria and magnesium sulfate may be used as a substitute. Since magnesium sulfate is apparently difficult to obtain, and since DSM has limited data discouraging the use of lime, DSM will continue recommending its use. Further investigation of the use of lime for pH control is recommended in a project where pH control is a concern.

Temperature

The microorganisms will operate best at ambient temperatures between 40° and 100°F. The heat generated by covering the soil, and from the biodegradation reactions should allow operation of a bioremediation process in most of New York State for approximately 9 months per year. Efficiency will improve as temperature rises and petroleum hydrocarbon degradation does not generate enough heat to be concerned with excessively high temperatures.

Covering piles will help to sustain heat. Black polyethylene covers are generally more durable than standard polyethylene, and will absorb heat to keep the pile warm. Clear polyethylene degrades more rapidly due to exposure to weather and sunlight. Therefore, to prolong the life of bioremediation processes in the Northeast, the use of black polyethylene covers is recommended.

Moisture

Moisture content should be maintained at 50-60 percent field moisture capacity, which means that the soil should be wet but not puddly. (Values of field moisture capacity for various soil textures are tabulated in the appendices of the original design paper.) If desired, moisture can be measured regularly using a lysimeter, monitored visually, and added as necessary. However, for this simple approach, moisture can be added using a spray applicator, and distributed in the cells by the weekly tilling process, or by natural dispersion through the piles. If spraying is not expected to provide enough moisture throughout a pile, then moisture could be added through a system of slotted pipes woven through the pile, to ensure even distribution.

Dechlorinated water must be used for bioremediation because chlorine can kill the microorganisms. In addition, the water must be potable quality water to avoid propagation of pathogenic bacteria during the bioremediation process.

If too much moisture is present in the soil, leachate may collect in the sump areas of the cells or piles. This leachate must be disposed of properly in accordance with local State and federal regulations. Depending on the level of contamination, disposal options may include discharging to a municipal sewer system with prior approval from the sewage treatment plant owner/operator, or to a regulated disposal facility. An acceptable alternative is to re-use the leachate for moistening the cells or piles. If there is more leachate than is needed, the excess must be properly disposed of, as described above.

Nutrient Requirements

Microorganisms degrade hydrocarbons through chemical reactions between microbial enzymes and the hydrocarbons. Nutrient requirements for these biodegradation reactions include nitrogen, phosphorous and oxygen. These requirements were calculated based on the average composition of

gasoline and fuel oil contaminants in the soil and the amount of soil to be treated, by solving the chemical reaction equations for biodegradation. The derivation of the reaction equations and calculation of the nutrient requirements are found in the appendices of the DSM design paper, "Generic Biocell and Biopile Designs for Small-Scale Petroleum-Contaminated Soil Projects.

Oxygen can be added to a biocell by tilling at least once per week, and to a pile through a system of slotted pipes to ensure even distribution of oxygen. Oxygen rates need to be greater than or equal to the calculated requirements. An excess oxygen supply is desirable to ensure adequate distribution of oxygen throughout a pile. Conversely, too much air can dry out the soil, decrease the biological activity, and volatilize the contaminants.

Based on the amount of oxygen required (found in the appendices of the DSM design paper), a 1-hp blower can be operated at a low flow rate while monitoring moisture content. If the soil is drying out, then the pump flow rate should be decreased or water should be added.

Nitrogen and phosphorous requirements can be satisfied by applying the appropriate fertilizer or a custom fertilizer blend based on the calculated requirements. Ammonia is the preferred source of nitrogen for hydrocarbons. Nitrogen and phosphorous can be added in the form of "off-the-shelf" fertilizer. If it is assumed that nitrogen and phosphorous initially in the soil is negligible, then a 6:1, nitrogen: phosphorous ratio is desirable. Therefore, a lawn fertilizer of 19:3:3 (nitrogen:phosphorous:potassium) ratio can be used.

The amount of fertilizer required has been tabulated in Table 1 based on the amount of soil to be treated and total petroleum hydrocarbons (TPH) found in the soil. All the fertilizer can be applied at the start of the project. The bacteria will consume the nutrients as they need them. Fertilizer can be added all at once, in dry pelletized form. Liquid fertilizer and periodic fertilizer application might also be viable options.

Table 1 lists the amount of fertilizer required to treat fuel oil or gasoline-contaminated soil for a range of contamination and quantities of soil to be treated.[1] The nitrogen:phosphorous ratio in the fertilizer should be 6:1, such as 19:3:3 (N:P:K) lawn feed which can be found in garden stores.

Monitoring Requirements

Regular sampling and analysis of contamination levels and microbial counts are necessary to monitor the progress of the biodegradation. Contaminant sampling and analysis should be conducted in accordance with the DEC Division of Spill Management's Sampling Guidelines and Protocols, and STARS Memo #1: Petroleum-Contaminated Soil Guidance Policy, under guidance of a DEC Regional Project Manager.

Microbe counts are conducted using Colony-Forming Units (CFU) analysis, a numerical tally of the total microbial population present, and Colony-Utilizing Population (CUP) analysis, the percentage of the microbe population capable of consuming the petroleum products. Low microbial counts and high contamination levels can indicate that the environmental conditions are not ideal for microbial growth. High microbial counts and lower contamination levels probably indicate that biodegradation is working well. Low microbial counts and low contamination levels can indicate that biodegradation was successful and that the microbes are dying off because the contamination (food source) is decreasing.

Table 2 is an example of an aggressive sampling and analysis procedure that may be used on a fast-track small-scale bioremediation project. Small-scale projects, including the sampling and analysis procedures, should be conducted under the guidance of a DEC Regional Project Manager. Each sampling plan can be developed on a site-by-site basis. Critical factors which indicate successful bioremediation include pH, contaminant concentration, and microbe count.

Table 1: Amount of Fertilizer Required to Treat Fuel Oil or Gasoline-Contaminated Soil (lbs.) (N:P=6:1)

Total Petroleum Hydrocarbons (TPH) (ppm)	Volume of Soil ($yd.^3$)							
	30	40	50	60	70	80	90	100
1000	59	79	99	118	138	158	177	197
2000	118	158	197	236	276	315	355	394
3000	177	236	296	355	414	473	532	591
4000	236	315	394	473	552	631	709	788
5000	296	394	493	591	690	788	887	985
6000	355	473	591	709	828	946	1064	1182
7000	414	552	690	828	966	1104	1242	1379
8000	473	631	788	946	1104	1261	1419	1577
9000	532	709	887	1064	1242	1419	1596	177
10000	591	788	985	1182	1379	1577	1774	1971
12500	739	985	1232	1478	1724	1971	2217	2463
15000	887	1182	1478	1774	2069	2365	2660	2956
17500	1035	1379	1724	2069	2414	2759	3104	3449
20000	1182	1577	1971	2365	2759	3153	3547	3941

[1] Fertilizer requirements were calculated for the average composition of fuel oil and for gasoline. Amounts for gasoline and fuel oil were within 10% of each other; therefore, the same table will be used for both substances.

Table 2. Small-Scale Bioremediation Sampling Plan

Pretreatment Sampling:	TPH[1], total soil concentration[2], microbes[3], and soil sieve analysis (grain size distribution)[4], and pH[5]
Sampling During Treatment:	
every 4 - 6 weeks:	TPH and microbes
every 8 - 12 weeks:	TPH, indicator compounds[6], microbes and pH
End of Season:	TPH, total soil concentration, and microbes
Next Season Start-up:	TPH, total soil concentration, microbes, and pH
Project Closeout:	Total soil concentration, TCLP[2], and microbes

1 TPH analysis is performed using EPA Method 418.1.

2 Total soil concentration analysis and TCLP extract analysis will be performed using EPA Method 8021 plus MTBE for gasoline and EPA Methods 8021 and 8270 (base neutrals) for fuel oil, in accordance with STARS Memo #1.

3 Microbe counts can be measured by colony-forming units (CFU) and colony-utilizing population (CUP). According to literature, 10^6 - 10^8 CFU/gram is the recommended level of microbes sufficient to support contaminant degradation.

4 Soil sieve analysis (grain size distribution) is conducted to classify soil type and to determine whether or not composting would be recommended to promote better aeration, such as in clays. Composting is beyond the scope of this guidance paper.

5 pH measurements can be done at a local garden store.

6 Indicator compounds to be analyzed for gasoline include BTEX using EPA Method 8020. Indicator compounds to be analyzed for fuel oil will be determined based on the total soil concentration analysis results.

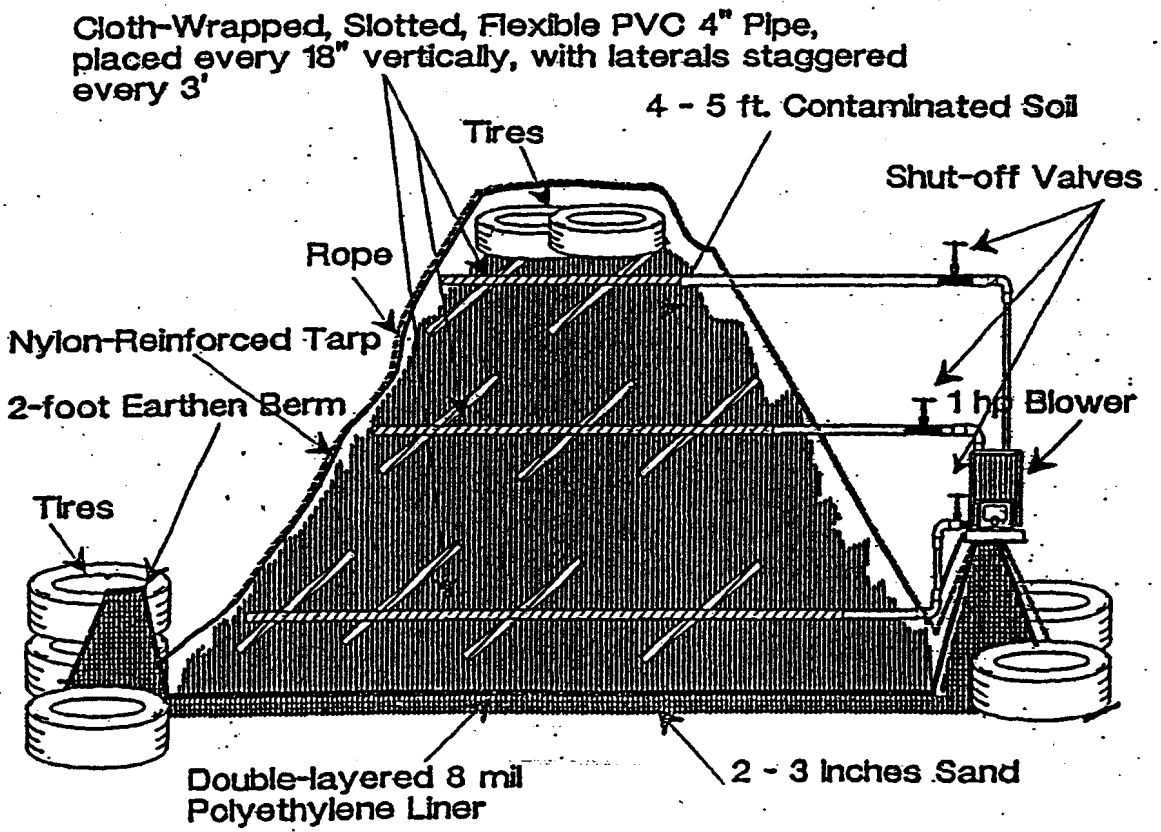
BIOREMEDIATION APPROACHES

The engineering technologies for bioremediation can be characterized as physical controls, pump and treat, excavate and treat (ex-situ), and in-place (in-situ) technology. Physical controls consist of impermeable barriers designed to prevent contaminant migration and to allow natural biodegradation to occur. Pump and treat, and excavate and treat methods bring contaminated groundwater or soil to the surface where it is treated by biological reactors, possibly coupled with physical and chemical processes. In-situ technologies process the contaminated groundwater or soil in place in the subsurface. This paper addresses excavating and treating soil in a pile, also known as a biopile, or in a layer, also known as a biocell.

Biopile

Figure 1

Design Specifications for Biopile



Design Specifications and Operating Conditions for a Biopile

Setup

A biopile is set up according to the following design specifications and accompanying sketch. (See Figure 1.)

1. Clear and grade an area for construction. The foundation should be sloped to allow drainage and collection of rainwater.
2. Build a two-foot earthen berm around the pile to prevent run-on of surface waters and run-off of leachate. If this curb is constructed of soil, it should also be covered with the polyethylene liner to protect the curb from erosion.
3. Lay a double-layered 8 mil polyethylene liner on top of a 2 - 3 inch layer of sand and 2-foot berms. The liner should be durable enough so that soil-moving equipment will not tear it, and it is impermeable to leachate in the soil.
4. Pile the soil into a 4 - 5 foot flat-top pile on the liner, by adding soil in 1 to 2-foot lifts, installing air distribution piping and lime, fertilizer, and water with each lift.
5. While constructing the pile, install a ventilation system (a network of 4", slotted PVC piping woven throughout the pile, shut-off valves, explosion-proof blower, particle filter, moisture trap, and muffler) according to manufacturers' recommended practices. The piping system includes shut-off valves at each elevation of piping to allow varying air flow depending on moisture and contaminant levels. Slotted PVC pipes should be wrapped in a geotextile cloth to prevent soil from clogging the screens.
6. Add lime and fertilizer, and spray each soil layer with dechlorinated water until soil is wet but not puddly. (See the Operation section of this design for details on adding lime and fertilizer.)
7. Place tires or hay bales on top of the pile to provide air space between the soil and the cover, allowing air circulation under the cover.

8. Cover the pile with a black nylon-reinforced tarp, or at least a double layer of 8 mil polyethylene, or a greenhouse-type structure, to protect the soil from rain and to keep it warm. This cover should be durable enough to withstand wind and weathering.
9. Anchor the cover using tires or hay bales around the perimeter of the cover, and ropes run over the top of the cover and tied to the tires or bales.
10. Secure the entire area with a safety fence to deter vandalism.

Operation

The process specifications include proper pH, temperature, moisture, nutrients and aeration:

pH

1. Determine the amount of soil to be treated.
2. Take one composite soil sample to a local garden store to be tested for pH. Refer to a liming chart for amount of lime ($CaCO_3$) to be added to obtain pH 7.
3. Add lime and mix with soil and fertilizer as the pile is constructed.
4. Check pH once per season.

Temperature

1. Operate at soil temperature above 40° F.
2. When soil temperature is below 40° F, follow end-of-season sampling procedures and secure site.

Moisture

1. Check soil weekly for dryness.
2. When the soil appears dry, remove cover, spray soil with potable, dechlorinated water until it is wet but not puddly. (Dehydration can be somewhat controlled by varying flow rate of vacuum pump. Water can be dechlorinated with tablets purchased at a local aquarium store.)
3. Adjust schedule or pump flow rate based on results.

Nutrients

1. Determine the amount of soil to be treated and the TPH of the soil. TPH analysis should be conducted using EPA Method 418.1, Modified Method 8015, or similar method. Refer to nutrient addition table in this guidance document.
2. Add fertilizer and mix with the soil and lime (if needed) as the pile is constructed.

Aeration

1. Supply air through a system of slotted pipes to ensure even distribution of oxygen. The design for the piping needs to be such that it avoids short-circuiting of air. Short-circuiting occurs due to varying resistance to air flow such as soil settling or clogging of pipe perforations. This results in air preferentially flowing through the path of least resistance. One way to avoid short-circuiting is to cover the perforated piping with a geotextile material to prevent clogging of the perforations. This geotextile material can be purchased in a plumbing or building supply store. Notes: A manifold of piping with valves at the manifold may be a better design than a helical piping structure. It may improve air distribution by allowing control of the direction and flow rate of air passing through the piping. Air could be directed to the most contaminated parts of the pile to promote contaminant biodegradation. Air flows could also be directed to dry out the very wet areas or away from areas which may be drying out from too much air.

The smallest available diameter pipe is desired to allow maximum surface area of soil to be in contact with the air.

Small diameter piping also facilitates easier sampling which may contribute to solving the aeration problem. Sampling challenges could be encountered when the piping is struck by the auger and subsequent auguring locations are necessary to avoid the piping obstruction. These sampling problems could also cause the geotextile material on the piping to be torn up. The purpose of this geotextile is to prevent soil from entering the perforations in the piping and contribute to poor air distribution in the pile.

An excess oxygen supply is desirable to ensure adequate distribution of oxygen throughout the pile. However, too much air can dry out the soil and volatilize the contaminants.

Based on the oxygen requirements found in the appendices of the original design paper, and the operating capabilities of a 1 hp pump, a 1 hp pump can be operated at a low flow rate to meet oxygen requirements. If the soil is drying out, then the pump flow rate should be decreased or water should be added.

Monitoring

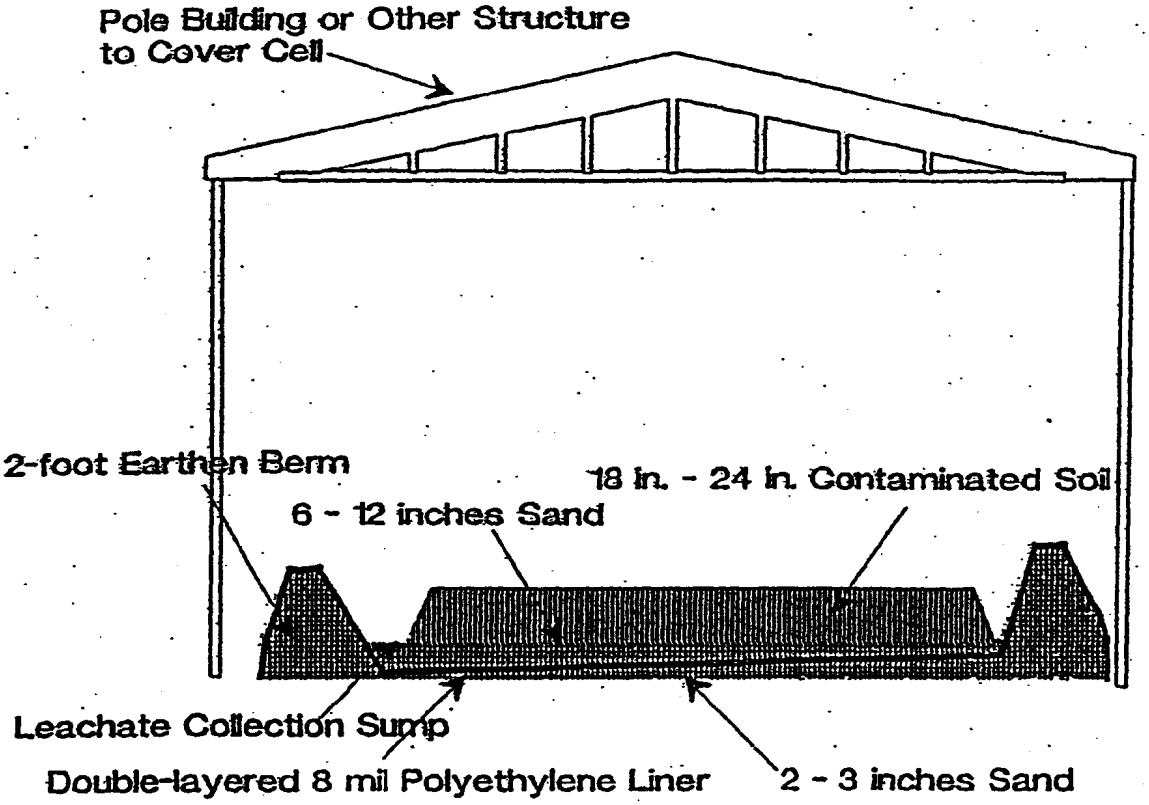
1. Perform types, numbers, and frequency of sampling as outlined in the Monitoring Requirements section of this guidance document.

Project Close-out

1. Conduct process under the guidance of NYS DEC until the soil reaches the guidance values listed in STARS Memo #1 or until determined appropriate by NYS DEC. Perform closure samples as described in STARS #1.

Figure 2

Design Specifications for Biocell



Design Specifications and Operating Conditions for a Biocell

Setup

A biocell is set up according to the following design specifications and accompanying sketch. (See Figure 2.)

1. Clear and grade a sloped area for construction. The foundation should be sloped towards a sump to collect leachate.

2. Lay a double-layered 8 mil polyethylene liner on top of a 2 - 3 inch layer of sand with 6 - 12-inch berms. The liner should be durable enough so that soil-moving equipment will not tear it, and it is impermeable to leachate in the soil.
   Build a 6 - 12-inch earthen berm around the pile to prevent run-on of surface waters and run-off of leachate. If this curb is constructed of soil, it should also be covered with the polyethylene liner to protect the curb from erosion.
   Cover the liner with a 2-foot layer of sand or gravel to protect against tilling equipment.

3. Spread the soil into a 18 - 24 inch layer on the sand.

4. While constructing the cell, add lime and fertilizer, and spray with dechlorinated water until soil is wet but not puddly. (See the Operation section of this design for details on adding lime and fertilizer.)

5. Cover the cell with a durable peaked or sloped-roof cover to prevent puddling on top of the cover and to protect against rainfall and the resulting leachate.
   A peaked or sloped roof is required so that water will not collect on it. The cell cover also should be designed to allow soil tilling operations to occur without disturbing the cover, or to be easily removed and replaced to allow for soil tilling as needed.

   Tents constructed of reinforced-nylon tarps can be used. However, this approach allows puddling of rain water on the covers and into the cells which makes it difficult to remove the cover for tilling.

Other alternatives which should be investigated are portable garages or surplus army tents or any other viable structure. These structures should be cheaper than a pole barn, stronger than the tarpaulin tents, and tall enough that they will not have to be removed for tilling. An alternative is to leave the cell uncovered until rain becomes a problem, or the project could be active during the "dry" season only and shut-down when conditions are too wet and cold to support bioremediation.

6. Secure the entire area with a safety fence to deter vandalism.

Operation

The process specifications include proper pH, temperature, moisture, nutrients and aeration:

pH

1. Determine the amount of soil to be treated.
2. Take one composite soil sample to a local garden store to be tested for pH. Refer to a liming chart for amount of lime ($CaCO_3$) to be added to obtain pH 7.
3. Add lime and mix with soil and fertilizer as the soil layer is constructed.
4. Check pH once per season.

Temperature

1. Operate at soil temperature above 40° F.
2. When soil temperature is below 40° F, follow end-of-season sampling procedures and secure site.

Moisture

1. Check soil weekly for dryness.

2. When the soil appears dry, spray soil with potable, dechlorinated water until it is wet but not puddly. (Water can be dechlorinated with tablets purchased at a local aquarium store.)
3. Distribute by tilling once per week.
4. Adjust schedule based on results.

Nutrients

1. Determine the amount of soil to be treated and the TPH of the soil. TPH analysis should be conducted using EPA Method 418.1, Modified Method 8015, or similar method. Refer to nutrient addition table in this guidance document.
2. Add fertilizer and mix with the soil and lime as the cell is constructed.

Aeration

1. Till at least once per week or supply air through a system of slotted pipes (see biopile design specifications).

   Tilling is a very difficult, labor-intensive process in saturated soil, clayey soil, and soil deeper than 10 inches. Based on the difficulty of tilling the soil with a garden tiller, it is recommended that a farm tiller should be used, or that the cells should be constructed with thinner layers of soil. If thinner layers are used (10 inches or less of soil), a suitable rototiller could be rented at a garden store or a rental center, to efficiently turn the soil layer over in the cell.

   An alternative for both the tilling problem in the cells and the aeration of clayey soils may be the use of oxygen-containing nutrient blends being marketed by various vendors in the industry. These blends, containing nutrients and oxygen in a solid form, are mixed into the soil and solubilize when moisture is added.

Monitoring

1. Perform types, numbers, and frequency of sampling as outlined in the Monitoring Requirements section of this guidance document.

Project Close-out

1. Conduct process under the guidance of NYS DEC until the soil reaches the guidance values listed in STARS Memo #1 or until determined appropriate by NYS DEC. Perform closure samples as described in STARS #1.

COST ESTIMATES

Based on limited experience with this type of project in NYS, it is estimated that the cost of conducting this type of project can range from less than $100 per ton to several hundred dollars per ton. Costs can vary greatly based on soil quantity, soil type, amount and type of contamination, access to and choice of materials and labor, and the monitoring plan.

ACKNOWLEDGEMENTS

This Document, prepared by the NYSDEC DSM, presents guidelines and recommended practices for bioremediation of small-scale amounts of petroleum-contaminated soil.

The information contained herein is based on reference documents and a research project completed with the dedicated and cooperative effort of Stewart's Ice Cream Shops, Inc., Lebanon Valley Landscaping, Inc., American Spill Abatement, Inc., and Waste Stream Technology, the USEPA and the NYSDEC.

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New York State Department of Environmental Conservation, Division of Spills Management, Bureau of Spill Prevention and Response, Albany, New York, "STARS Memo #1: Petroleum-Contaminated Soil Guidance Policy," August 1992.

New York State Department of Environmental Conservation, Division of Water, Bureau of Spill Prevention and Response, Albany, New York, "Sampling Guidelines & Protocols: Technical Background and Quality Control/Quality Assurance For NYS DEC Spill Response Program," March 1991.

Exhibit 3

Suffolk County Sanitary Code Documents

Suffolk County Department of Health Services
Office of Wastewater Management
Suffolk County Center
Riverhead, New York 11901
(631) 852-2100

CERTIFICATION OF SEWAGE DISPOSAL SYSTEM ABANDONMENT

Health Department Reference Number: _____

Suffolk Tax Map #: Dist: _____Sect(s)_____Blk(s)_____Lot(s)_____

Project Name or Address: _____

Subdivision Name & Lot #_____

Applicant Name:_____

I HEREBY CERTIFY THAT:

1. The first septic tank/leaching pool, from the foundation, was located and uncovered, **AND**
2. If liquid sewage was noted therein, was pumped dry by a licensed sewage hauler, **AND**
3. Tank/pool was inspected for outlet line to an overflow pool, **AND**
4. Overflow pool(s) was/were located, uncovered and items #2 and #3 were repeated until all parts of sanitary system were located, **AND**
5. All parts of sanitary system were removed or filled with clean backfill and any corbelled block domes collapsed.

I also certify that the sanitary system abandoned consisted of:

First tank/pool _____feet diameter_____ feet deep ( )precast ( )block ( ) other_____

First overflow pool_____feet diameter_____feet deep ( )precast ( )block ( ) other_____

Next overflow pool_____feet diameter_____feet deep ( )precast ( )block ( )other_____

Next overflow pool_____feet diameter_____feet deep ( )precast ( )block ( )other_____ _____

Company which pumped out sanitary system if different from certifying company:
Name of Company:_____
Address:_____
Consumer Affairs License Number: _____

Contractor Signature:_____Date_____
Print Name/Company:_____Phone_____
Address:_____
Consumer Affairs License Number: _____

This certification <u>shall not</u> be used in lieu of inspections required by personnel of the Department and <u>may be</u> duplicated on company letterhead, provided it contains the above information.

DIVISION OF SANITATION

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SPECIAL SEWER PERMIT APPLICATION
IMPORTANT INSTRUCTIONS

TO INSURE PROMPT HANDLING OF YOUR "SPECIAL" BUILDING SEWER CONNECTION APPLICATION, PLEASE PAY ADDED ATTENTION TO THE FOLLOWING POINTS:

1. BE SURE THAT THE APPLICATION IS SIGNED BY THE OWNER OF THE PROPERTY (PARTS I, III, AND DPW SURVEY FORM).

2. BE SURE THAN AN ESTIMATED COST OF CONSTRUCTION IS INCLUDED (CAN BE OBTAINED FROM YOUR CONTRACTOR OR PLUMBING SUPPLY DEALER) (PART I).

3. BE SURE TO ATTACH COPIES OF YOUR WATER BILLS FOR THE PREVIOUS YEAR (PART II - ITEM 8).

4. BE SURE TO ATTACH A SKETCH SHOWING EXISTING PLUMBING, GREASE TRAPS, HAIR INTERCEPTORS, KNOWN UNDERGROUND UTILITIES, DRAINAGE, ETC., AS WELL AS HOW THE CONNECTION WILL BE MADE (PART II - ITEM 9).

5. BE SURE THAT ALL THE REQUIRED INFORMATION HAS BEEN PROVIDED ON PART I, PART II, AND PART III. (PLEASE PRESS FIRMLY WITH PEN TO INSURE THAT ALL COPIES WILL BE LEGIBLE.)

6. BE SURE TO ATTACH A COPY OF YOUR MOST RECENT TAX BILL.

7. PART II MUST BE FILLED OUT BY TE OPERATOR OF THE BUSINESS. IF THE PROPERTY IS A MULTI-OCCUPANT BUILDING, EACH BUSINESS OPERATOR MUST FILL OUT A PART II.

8. SC DPW SURVEY FORM MUST BE FILLED OUT IN ITS ENTIRETY.

9. THE NAME AND HOME IMPROVEMENT LICENSE NUMBER OF THE CONTRACTOR BACKFILLING CESSPOOLS IS TO BE PROVIDED.

10. INTERCEPTORS (i.e., GREASE, LINT, ETC.) WILL BE DELIVERED WITH A LETTER OF CERTIFICATION CONFIRMING FABRICATION WITHIN THE MINIMUM DESIGN REQUIREMENTS SET BY SC DPW. THE FOUR WALLS OF THE SAMPLING MANHOLES WILL BE THE FULL THICKNESS FOR THE HEIGHT OF THE STRUCTURE.

11. FAILURE TO DO ALL OF THE ABOVE WILL DELAY YOUR PERMIT.

PART I

APPLICATION FOR SPECIAL BUILDING SEWER CONNECTION PERMIT

This Application Is Not Valid Until Stamped

Permit No. _____ – _____

ISSUED BY:

SUFFOLK COUNTY DEPARTMENT OF PUBLIC WORKS
DIVISION OF SANITATION
600 Bergen Avenue
West Babylon, New York 11704

INSTRUCTIONS:
1. Complete this form by printing or typewriting the required information.
2. The owner must obtain all required permits from local agencies having jurisdiction, including but not limited to Highway and Building Departments. Attach a copy of required permits to this application.
3. Contractors must be registered by SCDPW prior to performing building connection work.
4. To complete processing of this application it may be necessary for a facility inspection to be performed. This inspection and all aspects of Special Building Sewer Connection procedures are authorized under the jurisdiction of Suffolk County Local Law - "Suffolk County Sewer Ordinance". False or misleading statements on this application is a violation of the local law.
5. See SPECIAL NOTES on reverse side of application.

FACILITY LOCATION

Name of Facility:

Address:

Telephone:

Contact Person:

Title:

Telephone:

Owner:

Address:

Telephone:

ESTIMATED COST OF CONNECTION:
By Owner ☐ ; By Contractor ☐

Suffolk County Real Property Tax Map No.

Dist.	Section	Block	Lot

Name of Nearest Intersecting Street

Connection Contractor

Name

Address

Telephone No. | S.C. Registration No.

Plumbers Lic. No. | Licensing Authority

WATER SUPPLY

Public: _____ District Private Well: _____ Depth _____ Diameter

EXISTING WASTE TREATMENT FACILITY: Yes No

If Yes, SPDES Permit No. NY _____ –

SUFFOLK COUNTY HAZARDOUS MATERIAL PERMIT: Yes No

If Yes, Permit No. _____

TYPE OF FACILITY: Industrial Municipal Commercial Institutional

Other (Specify) _____

No. of Employees/Occupants _____ , No. of Shifts _____ No. of Beds/Seats _____.

OWNER'S SIGNATURE Date

FOR SUFFOLK COUNTY DEPARTMENT USE ONLY

Installation Inspected & Approved (Signature of Authorized SCDPW Inspector) Date

DPW FORM A2 (9/81)

42-236: 10/81

SPECIAL NOTES

1) This connection and discharge permit is issued subject to the terms and conditions of the "Suffolk County Sewer Regulations" and is contingent upon the permittee complying with all terms contained therein.

2) Connection to County sewage works without prior approval is unlawful. The entire installation must be inspected and approved prior to backfilling. Backfilling of the connection prior to inspection and approval is a violation of the "Suffolk County Sewer Regulations" and violators are subject to penalties. No building sewer will be approved unless visually inspected by an inspector authorized by SCDPW. An authorized SCDPW inspector must be present when the connection is made to the sewer stub.

3) Notify the SCDPW at least two working days prior to commencing work to schedule an inspection; between the hours of 8:30 AM and 4:30 PM, call 631-854-4186. Inspections will be made only during the normal working hours.

4) All construction methods and materials shall comply with the regulations issued for building sewer connections. Copies may be obtained at the offices of the SCDPW.

5) Where use of septic tanks, cesspools, or overflow pools is discontinued following connection to sewage works, the owner of the property containing such septic tanks, cesspools or overflow pools shall have all such structures located and all shall be properly emptied, cleaned and backfilled with earth, sand or other clean material within 15 days of abandonment. Access for inspection must be provided. Failure to have all cesspools, septic tanks and overflow pools, whose use is discontinued properly abandoned is unlawful.

6) In accordance with New York State Industrial Code Rule 753, prior to performing excavation with mechanical or power equipment, the excavator must notify the operators of any public or private underground facilities of the proposed excavation.

7) Attention is directed to the New York State Department of Health's **Recommended Standards for Waterworks**, Section 15.4, which states in part:

- "Wherever possible, sewer lines are to be at least 10 feet horizontally from a water main."
- "If it is impractical to maintain that clearance, the sewer must be laid in a separate trench or undisturbed earth shelf and must be at least 18 inches below the water main."
- "Wherever possible, lines which cross water mains shall have at least 18 inches vertical separation within 10 feet of the crossing."
- "Where it is impossible to obtain such separations, the sewer must be designed and constructed equal to water (pressure) pipe.

Pipe conforming to these requirements and meeting SCDPW standards are listed in the **Technical Specifications for the Construction of Building Sewer Connections.**

8) Keep this permit on the premises, available for exhibition at all times during the construction of the work.

9) **Warning:** Construction of a building connection is dangerous. **DO NOT** attempt unless familiar with proper construction techniques.

PART II - APPLICATION FOR SPECIAL BUILDING SEWER CONNECTION
INDUSTRIAL WASTES IDENTIFICATION

1. Number of work shifts per day: _____

2. Number of personnel per shift: _____

3. Describe the nature of business activity (Please be specific and include SIC code number if known): ____
_____
_____
_____

4. Describe all manufacturing, finishing, assembly, packaging and clean-up processes: _____
_____
_____
_____
_____
_____

5. Specify all sources of wastewater from processes described in Item 4: (e.g., rinsewater from metal finishing, cooling water, wash water from mixer clean-up, spent chemicals, sources of potential accidental spills from liquid warehousing or storage) _____
_____
_____
_____
_____
_____

6. Specify all chemicals used in the processes described in Item 4: (cutting oils and coolant fluids, paints, thinners, solvents, solid and liquid chemical raw materials, liquid metal finishing solutions) _____
_____
_____
_____
_____
_____
_____

7. Describe the sources of solid or sludge residue produced: _____
_____
_____
_____
_____

8. List all sources of drinking, process and cooling water used at the facility. Attach copies of water bills for the previous 12 month period. _____
_____
_____

9. Attach sketch of proposed installation showing property lines, underground utilities, utility poles, structures and trees within 10' of installation.

PART III -APPLICATION FOR SPECIAL BUILDING SEWER CONNECTION

FACILITY _____

LOCATION _____

THE BELOW LISTED QUESTIONS MUST BE ANSWERED BEFORE THE PERMIT WILL BE APPROVED.

YES [ ] NO [ ] ARE THERE ANY RESIDENTIAL FACILITY ON THE TAX PARCEL

IF YES NUMBER OF DWELLING UNITS &/OR APARTMENTS _____

YES [ ] NO [ ] ARE THERE MORE THAN ONE TENANT OR USER OF THE NON-RESIDENTIAL PORTION OF THE TAX PARCEL?

IF YES NUMBER OF STORES _____

NUMBER OF OFFICES _____

OTHER USES - TYPE _____ NUMBER _____

- TYPE _____ NUMBER _____

TOTAL NUMBER OF UNITS ON PARCEL		OFFICIAL USE ONLY

THE UNDERSIGNED ACKNOWLEDGES THE CORRECTNESS AND ACCURACY OF THE ABOVE STATEMENTS KNOWING FULL WELL THAT THEY WILL BE RELIED UPON BY THE ADMINISTRATIVE HEAD OF THE DISTRICT.

SIGNATURE _____

TITLE (IF ANY) _____

FIRM NAME (IF ANY) _____

(TO BE COMPLETED BY DISTRICT PERSONNEL)

PERMIT # ___ ___ ___ - ___ ___ ___ - ___ ___ ___ ___

CORRECTION TO SHOW }
TRUE OWNER OF PARCEL } _____

MAILING ADDRESS IF DIFFERENT _____

_____

FOR OFFICIAL USE ONLY
VOLUME DISCHARGE PER YEAR _____ GALS

DEPARTMENT OF PUBLIC WORKS DIVISION OF SANITATION

REQUIRED SURVEY - SPECIAL PERMIT

Please provide on the attached sheet the information requested below regarding occupancy and water usage so that sewer use fee levels may be correctly determined. This information will also aid our review of chemical/objectionable waste discharge.

THIS FORM MUST BE COMPLETED AND RETURNED WITHIN 45 DAYS OF RECEIPT. FAILURE TO DO SO IS A VIOLATION OF SUFFOLK COUNTY SEWER REGULATIONS AND MAY RESULT IN PENALTIES AND/OR ON-SITE INSPECTION BEING PERFORMED WITH THE COST BEING ASSESSED TO THE CURRENT PROPERTY OWNER.

If ownership has changed since the last report, please forward this survey to the current owner or return it with the name and address of the new owner.

INSTRUCTIONS FOR COMPLETING PART 'B' ANSWER SHEET

1. Please provide the number of residential dwelling units (if any).

2. Please indicate the Suffolk County Water Authority Office, or the name and location of any other public water company through which you receive water service. If your source of water is a private well, please indicate the yearly flow in gallons as well as the number of employees.

3. Please indicate on the attached sheet under "ID" column the street address or your space identification number for each tenant and your business name and nonresidential tenants' business name. ALL UNITS, VACANT OR OTHERWISE, MUST BE LISTED IN DETAIL. Also please indicate the type of business and the water service account number in the appropriate columns. If there has been a change in tenancy (including newly occupied space), show the beginning date for the new tenant in the 'FIRST DATE OF OCCUPANCY" column. Use additional sheets if necessary.

4. Please make sure that the account number matches that shown on your water bill.

5. Please read and sign the declaration at the bottom of the attached sheet.

Return signed completed form to:

Commercial Survey
P.O. BOX 9000
Yaphank, New York 11980-9000

If you have any questions, please contact this office at: (631) 852-4060.

DEPARTMENT OF PUBLIC WORKS DIVISION OF SANITATION

REQUIRED SURVEY--SPECIAL PERMIT - PART B

BUILDING ADDRESS(ES) (MUST BE INDICATED) ZIP CODE

1. Number of residential dwelling units (if any): _____

2. Water Source:
( ) Suffolk County Water Authority ( ) Private Well
( ) East Farmingdale Yearly Flow ____Gals.

3. Number of Employees____

ID	Tenant and Business Name and Telephone Vacant Units Must be Indicated	First Date of Occupancy	Type of Business	Water Company Account No.

4. Any false statements made on this form are in violation of the "Suffolk County Sewer Regulations" Article VI - Section 2.

Please be reminded that unpaid sewer bills are collected by placement on the property tax bill of the legal owner of the building involved. Your cooperation in providing all the above requested information is appreciated. FAILURE TO COMPLETE AND RETURN THIS SURVEY CAN RESULT IN JEOPARDY BILLING AT AN INFLATED AMOUNT.

5. I hereby certify that the information provided on this form and any attachments is true to the best of my knowledge and belief. I am either the owner of the said tax parcel or an officer or designated party of such owner.

Legal Name of Owner Signature Date

Return signed completed form to:
Commercial Survey
P. O. Box 9000
Yaphank, NY 11980-9000

PERMIT NUMBER _____
(As indicated on Your Sewer Bill)

SUFFOLK COUNTY SANITARY CODE - ARTICLE 7

Water Pollution Control

§760-701 Declaration of Policy

The designated best use of all groundwaters of Suffolk County is for public and private water supply, and of most surface waters for food production, bathing and recreation. The federal government has officially designated the aquifer below Suffolk County as a sole-source for water supply. Therefore, it is hereby declared to be the policy of the County of Suffolk to maintain its water resources as near to their natural condition of purity as reasonably possible for the safeguarding of the public health and, to that end, to require the use of all available practical methods of preventing and controlling water pollution from sewage, industrial and other wastes, toxic or hazardous materials, and stormwater runoff.

§760-702 Statement of Purpose

It is the intent and purpose of this Article to safeguard all the water resources of the County of Suffolk, especially in deep recharge areas and water supply sensitive areas, from discharges of sewage, industrial and other wastes, toxic or hazardous materials and stormwater runoff by preventing and controlling such sources in existence when this Article is enacted and also by preventing further pollution from new sources under a program which is consistent with the above-stated Declaration of Policy.

§760-703 Definitions

Whenever used in this Article, unless otherwise expressly stated, or unless the context or subject matter requires a different meaning, the following terms shall have the respective meanings set forth or indicated.

A. Board means the Suffolk County Board of Health.

B. Commissioner means the Commissioner of the Suffolk County Department of Health Services.

C. Communal Sewage System means a series of sanitary intercepting sewers or intercepting collecting sewers, pumping stations, sewage treatment plants, and associated pollution control facilities for the conveyance, treatment, and disposal of

sewage operated by a person other than a municipality.

D. Deep Recharge Area means a geographic area of Suffolk County that contributes recharge water to a deep groundwater flow system, thus replenishing the quantity and affecting the quality of the long-term water supply. These areas are identified as Groundwater Management Zones I, II, III and V.

E. Department means the Suffolk County Department of Health Services.

F. Discharge means to release by any means or to relinquish control in a manner that could result in a release to the surface waters, groundwaters, surface of the ground, or below ground.

G. Disposal System means any plumbing or conveyances which result in or are capable of resulting in a discharge of sewage, industrial wastes, toxic or hazardous materials, stormwater runoff, cooling water or other wastes. This includes but is not limited to septic tanks, leaching pools, sumps, tile fields, holding tanks, outfalls and connecting piping.

H. Groundwater Management Zone means any of the areas delineated in Suffolk County by the "Long Island Comprehensive Waste Treatment Management Plan (L.I. 208 Study)," as revised by the "Long Island Groundwater Management Plan," and subsequent revisions adopted by the Board identifying differences in regional hydrogeologic and groundwater quality conditions. The boundaries of the Groundwater Management Zones are set forth on a map adopted by the Board, filed in the Office of the Commissioner in Hauppauge, New York.

I. Housebarge means the same as Houseboat except that a housebarge has no self-contained mechanical method of propulsion.

J. Houseboat means a floating structure used as a dwelling with a self-contained mechanical method of propulsion, not primarily designed to be a means of locomotion over water. The design criteria shall be generally accepted standards of naval architecture.

K. Industrial Waste means any liquid, gaseous, or solid waste substance or a combination thereof resulting from any operation or process of industry, manufacturing, trade or business or from the development or recovery of any natural resources, which may cause or might reasonably be expected to cause pollution of the water resources of the County of Suffolk in contravention of the requirements of this Article.

L. Municipal Sewage System means the series of sanitary intercepting sewers or intercepting collecting sewers, pumping stations, sewage treatment plants, or pollution control facilities, drains and other facilities, connections and equipment or any combination of the aforementioned, for the conveyance, treatment and disposal of sewage operated by the County of Suffolk or a municipality within the County of

Suffolk.

M. Offensive Material means any sewage or non-sewage fecal matter, urine, garbage, waste, or any putrescible organic matter, scavenger waste, the contents of private or individual sewage disposal systems, either liquid or solid, or other substances or liquid which may adversely affect health.

N. Other Wastes means refuse, spillage and the leaching from these materials, oil, tar, acids, chemicals, and all other discarded matter which may reasonably be expected to cause pollution of the waters of the County of Suffolk.

O. Private or Individual Sewage Disposal System means a water-flush facility for the disposal of sewage which does not connect either with a municipal or communal sewage system. This includes, but is not limited to, septic tanks, leaching pools and tile fields.

P. Restricted Toxic or Hazardous Materials shall mean the following toxic or hazardous chemicals that have been or could be expected to be detected in the groundwater, or in discharges to he groundwater, of Suffolk County. This definition applies to these substances alone or in combination, solution or mixture with other substances, or chemically compounded with other elements or compounds.

Arsenic	1,1 Dichloroethane	Roadway Deicing Salt
Barium	1,2 Dichloroethane	Silver
Benzene	1,1 Dichloroethylene	Styrene
Bromobenzene	1,2 Dichloropropane	Tetrachloroethylene
Bromodichloromethane	p-Diethylbenzene	1,2,4,5
Bromoform	Ethylbenzene	Tetramethylbenzene
Cadmium	p-Ethyltoluene	Toluene
Carbon	Fluoride	1,2,3 Trichlorobenzene
Chlorobenzene	Freon 113	1,2,4 Trichlorobenzene
Chlorodibromomethane	Lead	1,1,1 Trichloroethane
Chloroform	Mercury	1,1,2 Trichloroethane
Chlorotoluene	Methylene	1,1,2 Trichloroethylene
Chromium	Chloride	1,2,3 Trichloropropane
Cis 1,2 Dichloroethylene	Nickel	1,2,4 Trimethylbenzene
Creosotes	Pesticides	1,3,5 Trimethylbenzene
Cyanide	Petroleum Distillates	Vinyl Chloride
Dichlorobenzene	Phenols	Xylenes
	Phthalates	

All other halogenated hydrocarbon compounds.

Q. Sewage means the water-carried human or animal wastes from residences, buildings, industrial establishments or other places, together with such groundwater

infiltration and surface water as may be present. A mixture of sewage as herein defined and industrial wastes or other wastes as defined above may be considered industrial wastes or commingling within the meaning of this Article.

R. Stormwater Runoff means the portion of total precipitation that travels over natural and developed land surfaces (e.g., woodlands, lawns, farms, gardens, roofs, driveways, parking lots, roads, etc.) transporting contaminants that may be present.

S. Temporary Disposal System means a system for the disposal of sewage where such system is intended for use for a specified period of time prior to completion of the construction of an approved sewage treatment and disposal system.

T. Toxic or Hazardous Materials shall mean the same as defined in Article 12 of this Code.

U. Toxic or Hazardous Wastes shall mean the same as defined in Article 12 of this Code.

V. Treatment System means a system designed to reduce or alter the contaminant content of sewage or industrial waste for the purpose of permitting the discharge of some portion of said waste.

W. Water Supply Sensitive Areas means:

1. A groundwater area separated from a larger regional groundwater system where salty groundwater may occur within the Upper Glacial aquifer, and where deepening of private wells and/or the development of community water supplies may be limited; or

2. Areas in close proximity to existing or identified future public water supply wellfields. In general, for the purposes of this Article, "close proximity" shall mean within 1,500 feet upgradient or 500 feet downgradient of public supply wells screened in the Upper Glacial aquifer.

3. A limited water budget area, not underlined by fresh Magothy, defined by published reports acceptable to the Commissioner.

4. The areas described in items W.1.,2.,3., above are set forth on a map adopted by the Board filed in the Office of the Commissioner in Hauppauge, New York.

§760-704 Powers of the Commissioner

The Commissioner may:

A. make, or cause to be made, or order the owner or operator of any property or facility to make any investigation or study which, in the Commissioner's opinion, is

needed for the enforcement of this Article or for controlling or reducing the potential for contamination of the waters of the County from sewage, industrial or other wastes, toxic or hazardous materials and/or stormwater runoff. This may include the ordering of an independent groundwater investigation where evidence suggests that a discharge of toxic or hazardous materials may have occurred.

B. approve, with conditions, non-residential structures, processes, facilities and activities in deep recharge areas and water supply sensitive areas to assure compliance with §760-706. Such conditions shall be embodied in covenants running with the land as specified in the Department's standards;

C. promulgate and establish standards and schedules to effect the purpose of this Article;

D. order the posting of a performance bond or other undertaking either prior to or subsequent to the construction or operation of an industrial facility within Suffolk County on a case-by-case basis if evidence indicates such may be necessary to protect water resources from the adverse effects of operating such a facility.

E. Notwithstanding any other provision of this Article, if the Commissioner finds a condition which has the potential for contaminating the waters of the County with toxic or hazardous materials, or which otherwise constitutes an immediate danger to public health, and determines that it could appear prejudicial to the public interest to delay action, the Commissioner may serve an order upon the permit holder, or if there is no permit upon the person in charge of the facility or site, citing such conditions and specifying the corrective action to be taken and a time period of less than fifteen (15) days within which such action shall be taken.

Such order may state that a permit is immediately suspended and/or that all operations are to be discontinued forthwith.

Any order requiring certain action or the cessation of certain activities immediately or within a specified period of less than fifteen (15) days shall provide such person an opportunity to be heard, which hearing shall be scheduled for a time no more than fifteen (15) days after the date the order is served.

§760-705 General Restrictions and Prohibitions

A. Construction of a Disposal System

1. It shall be unlawful for any person to construct, reconstruct, install or substantially modify any disposal system without first having obtained a permit therefor issued by or acceptable to the Commissioner, pursuant to Department standards.

2. §760-705.A.1 does not apply to stormwater disposal systems unless

there is an actual or potential discharge into the system of industrial wastes, toxic or hazardous materials, or sewage.

B. Discharge

1. It shall be unlawful for any person to discharge sewage, industrial wastes, offensive materials, toxic or hazardous materials or other wastes to any surface waters or groundwaters, to the surface of the ground or to a disposal system unless such discharge is specifically in accordance with a State Pollutant Discharge Elimination System (SPDES) Permit or other permit issued by or acceptable to the Commissioner for that purpose.

2. No permits, as stipulated in §760-705.B.1, are required for the following types of discharges:

a. discharge of sewage from an existing residential structure to a private or individual sewage disposal system, or from any residential structure, houseboat or housebarge to a communal sewage system or municipal sewage system that does not contravene standards or result in a public health nuisance;

b. discharge of sewage from a commercial or industrial facility to a communal sewage system or municipal sewage system;

c. discharge of stormwater to a disposal system unless there is an actual or potential discharge into the system of industrial wastes or toxic or hazardous materials or sewage.

3. For existing discharges not prohibited by law prior to the effective date of this Article, a permit shall be obtained within the time limit provided in §760-707.

C. Construction or Operation of a Treatment System

1. It shall be unlawful for any person to construct, modify or operate a treatment system without first obtaining a permit therefor issued by or acceptable to the Commissioner.

D. Commingling

1. It shall be unlawful for any person to commingle stormwater runoff, cooling water, sewage or industrial wastes in any disposal system not approved for that purpose pursuant to this Article.

E. Stormwater Discharges

1. It shall be unlawful for any person to develop or use land in such a manner as to cause stormwater runoff from that land to become contaminated and

discharged in contravention of the other provisions of this Article.

F. Marinas

1. It shall be unlawful for any marina to permit overnight docking of any houseboat or housebarge unless the marina has a waste pump-out facility. Construction of said pump-out facilities shall be in accordance with standards which may be promulgated by the Commissioner.

§760-706 Deep Recharge Areas and Water Supply Sensitive Areas

The following additional restrictions and prohibitions shall apply in deep recharge areas and water supply sensitive areas.

A. It shall be unlawful for any person to discharge any restricted toxic or hazardous materials or to discharge industrial wastes from any facility containing restricted toxic or hazardous materials to the groundwaters, to the surface of the ground, beneath the surface of the ground, to a municipal or communal sewage system, or to a disposal system except as follows:

1. application of fertilizers, pesticides or other agricultural chemicals approved for that purpose by the appropriate state and federal agencies; or

2. application of road surfacing or road construction materials or deicing salts to roadways, walkways, and parking areas; or

3. discharge from an establishment to a municipal or communal sewage system with effluent disposal to marine surface waters or recharge outside of the deep recharge areas and water supply sensitive areas, and the following minimum requirements are satisfied pursuant to a permit issued by or acceptable to the Commissioner:

a. Dual plumbing systems shall be installed, one for sanitary wastes and one for industrial wastes.

b. Sampling access approved by the administrative head of the municipal or communal sewage system and the Department shall be provided for both the sanitary and industrial waste systems.

c. The administrative head of the municipal or communal sewage system, with approval of the Department, shall determine which industrial wastes are acceptable to "hold and haul" and which require pretreatment prior to discharge to the collection system in order to assure compliance with the applicable sewer use ordinance.

d. Personnel authorized by the administrative head of the municipal or communal sewage system or other individual(s) acceptable to the

Commissioner, pursuant to Department standards, shall operate at each establishment its pretreatment facility for industrial wastes prior to discharge to the collection system.

e. Only batch pretreatment of industrial wastes will be permitted. Batch facilities and facilities for storage of drums containing toxic or hazardous wastes shall be located in an area accessible at all times by district personnel, in or adjacent to the industrial building, with heat and power provided by the owner.

f. Personnel authorized by the administrative head of the municipal or communal sewage system or other individual(s) acceptable to the Commissioner, will be responsible for collection and disposal of pretreatment sludges, and other "hold and haul" materials.

g. The owner shall allow the personnel authorized by the administrative head of the municipal or communal sewage system or other individual(s) acceptable to the Commissioner, access, from time to time, to wet process areas to perform their duties and inspections.

h. Industrial process-area floors shall be provided with adequate means to contain any spill of restricted toxic or hazardous materials. The design of containment facilities shall be subject to the approval of the Commissioner.

i. A minimum of four (4) groundwater monitoring wells shall be installed at the owner's expense.

j. Financial assurance shall be provided to pay for cleanup of spills. This cost shall be entered as a judgment upon notice against the owner, occupant, tenant, or lessee responsible for such spill or spills.

B. It shall be unlawful to use or store any restricted toxic or hazardous materials on any premises except as follows:

1. a. the intended use of the product stored is solely for on-site heating, or intermittent stationary power production such as stand-by electricity generation or irrigation pump power; and

b. the facility for such storage is intended solely for the storage of kerosene, number 2 fuel oil, number 4 fuel oil, number 6 fuel oil, diesel oil or lubricating oil; and

c. the facility for such storage is constructed in accordance with the requirements of Article 12 of the Suffolk County Sanitary Code for new construction; and

d. the materials so stored are not industrial wastes from processes containing restricted toxic or hazardous materials; and

e. the materials stored are not intended for resale; or

2. a. for buildings with gross floor area of less than or equal to 20,000 square feet (s.f.), the materials so stored are in containers where the total liquid capacity stored at any time does not exceed 250 gallons and where the dry storage in bags, bulk or small containers does not exceed 2,000 pounds; and

b. for buildings with gross floor area greater than 20,000 square feet (s.f.), the materials so stored are in containers where the total liquid capacity stored at any time does not exceed 0.0125 gals/s.f. of gross floor area and where the dry storage in bags, bulk or small containers does not exceed 0.1 pounds/s.f. of gross floor area; and

c. for the purpose of determining quantity of allowable storage, the internal fluids within production machinery shall not be included; and

d. if storage of restricted toxic or hazardous materials at a facility exceeds 1250 gallons or 10,000 pounds dry storage, then an annual environmental audit is to be conducted of the property, buildings and appurtenances, and the audit will conform to any standards which may be promulgated by the Commissioner; or

3. a. the materials so stored are intended solely for treatment or disinfection of water or sewage in treatment processes located at the site; or

4. a. the materials are stored solely incident to office operations, or wholesale/retail sales on premises and are not processed, pumped, packaged, or repackaged at the site; and

b. for the purpose of these regulations, Office Operations means a place in which business, clerical or professional activities are exclusively conducted and there are no manufacturing or other industrial activities; and

c. wholesale storage shall be limited to 5-gallon maximum size containers and the total storage capacity shall not exceed the storage allowed under §760-706 B.2.b or 5,000 gallons or 40,000 pounds of dry storage in bags, bulk, or small containers, whichever is greater; or

5. a. the materials are stored at a service station or similar installation solely incident to the distribution of gasoline, kerosene, diesel oil or other petroleum products for motor vehicular uses and repair; and

b. the facility for such storage is constructed in accordance with the requirements of Article 12 of the Suffolk County Sanitary Code for new construction; or

6. a. the materials are stored at an establishment for which a permit has been secured in accordance with §760-706.A.3, and a permit for such

storage has been granted by the Department.

7. a. the materials are stored on a farm site solely incident to on-premises use, and consist of fertilizers, pesticides, or other agricultural chemicals to be applied in accordance with the provisions of §760-706.A.1.

C. The provisions of §760-706.A and §760-706.B of this Article shall not apply to residential facilities, but shall be applicable:

1. immediately for all non-residential facilities which have not been approved, constructed, or put into operation prior to the effective date of this Article; and

2. immediately for all non-residential facilities which were approved, constructed, or put into operation prior to the effective date of this Article upon:

a. any change in use or process which results in an increase of mass loading in the discharge of restricted toxic or hazardous materials, or introduces a toxic or hazardous material not previously discharged; or

b. any change in use or process which results in an increase of the storage or change of type of restricted toxic or hazardous materials.

D. When upgraded in accordance with the time schedule specified in Article 12, existing facilities, including those for petroleum products, not otherwise covered by items §760-706.A., §760-706.B. or §760-706.C., above, shall conform to the requirements of Article 12 for new construction. These requirements do not apply to facilities upgraded in accordance with Article 12 prior to the effective date of this Article.

§760-707 Permits

A. All permits required by this Article shall be applied for in accordance with the provisions of Article 3 of the Suffolk County Sanitary Code.

B. All persons required to obtain a permit by reason of any law, rule or regulation in effect prior to the effective date of this Article shall be governed by such law, rule or regulation in determining when said permit shall be obtained.

C. All persons newly required to obtain a permit by this Article due to any act or condition in existence as of the date this Article becomes effective, shall apply for said permit within one (1) year of that date.

D. All persons required to obtain a permit by this Article due to any act or condition not in existence on the effective date of this Article must apply for and receive said permit prior to undertaking such act or creating such condition.

§760-708 Emergency Embargo; Seizure

A. In accordance with the general provisions of Article 2 of the Suffolk County Sanitary Code, the Commissioner or his authorized agent is authorized to seize and embargo materials consisting of industrial wastes, toxic or hazardous materials, or any combination thereof when in the judgment of the Commissioner, the nature and condition of said material constitutes an actual or potential hazard to the source of drinking water supply.

B. The following additional requirements shall also apply:

1. When materials are embargoed or seized pursuant to subsection A. above, they shall not be moved, used or removed except by or under the direction of an agent authorized by the Commissioner.

2. It shall be unlawful for a person not authorized by the Commissioner to remove or alter an embargo order or tag.

3. After having embargoed, condemned or otherwise seized materials pursuant to this section, the Commissioner shall afford the owner of the seized material an opportunity to be heard at a hearing held within ninety-six (96) hours after the seizure. The Commissioner may then vacate the order or sustain it and order a proper and safe disposition of the material seized.

4. Unless ordered otherwise, removal shall be at the expense of the owner.

§760-709 Monitoring and Reporting

A. All persons maintaining subsurface leaching facilities and holding tanks for the purposes defined in §760-703.G shall make them accessible to representatives of the Department for sampling and monitoring purposes. The type of access shall be in conformance with the requirements of the Commissioner.

B. All persons maintaining a discharge of industrial wastes, toxic or hazardous materials, and/or offensive materials pursuant to a permit issued by the Commissioner must, at their own expense, monitor the discharge for such constituents at such intervals as specified in the permit.

1. The samples shall be collected in a manner acceptable to the Commissioner, pursuant to Department standards, and analytical results shall be reported to the Department as specified in the permit.

2. The permittee may employ private laboratory facilities of its own choosing. However, the laboratory shall be approved by New York State Departments of Health or Environmental Conservation or other agency acceptable to the Commissioner for the type of analyses performed.

3. Sampling shall be by an employee of the laboratory which prepares the analysis, and the laboratory shall be responsible for the accuracy and quality of the sample.

C. Owners, tenants and occupants of industrial facilities may be required to install monitoring systems, such as monitoring wells, both upgradient and downgradient in the groundwater flow. The number and location of the monitoring wells and their installation shall be in conformance with the requirements of the Department. The owner, tenant and occupant shall be responsible for all costs, as well as costs for groundwater monitoring and evaluation as required by the Department.

D. The owners of all real property used for non-residential purposes shall, within thirty (30) days of change, report in writing to the Department:

1. New Facility

a. Name of tenant or occupant; address, including tax map number.

b. Description of process, operation, or use.

2. Existing Facility

a. Name of new tenant or occupant; address, including tax map number; description of process, operation, or use.

b. Description of change of process, operation, or use.

This notification requirement shall not apply to changes in tenancy or occupancy of the space where a permit is not, or would not be, required for the use.

§760-710 Requirement to Connect to Public Sanitary Sewer

A. Sewage and industrial wastes from any building or premises shall be discharged directly into a municipal sewage system, if available and accessible. Discharge of industrial wastes to a municipal sewage system shall be in accordance with the applicable sewer use ordinance.

B. If there is no municipal sewage system or facility connecting therewith available and accessible, sewage from any new building or premises shall be discharged directly into a communal sewage system or a facility connecting with a communal sewage system, if available and accessible.

C. If there is no municipal or communal sewage system or facility connecting therewith available and accessible, a private sewage disposal system approved by the Department may be used.

D. In the event that a municipal or communal sewage system or facility connecting therewith becomes available and accessible, any building or premises shall be

connected to such municipal or communal sewage system, and immediately thereafter the use of any other sewage disposal system or facility shall be discontinued.

§760-711 Abandonment of Disposal Systems

Existing disposal systems abandoned as a result of connection to municipal sewage systems or communal sewage systems or different disposal systems or for other reasons shall be removed or permanently sealed in a manner acceptable to the Commissioner.

§760-712 Engineering Plans

A. All plans, specifications, and reports required by this Article shall be prepared by a New York State licensed Professional Engineer unless otherwise prescribed in the New York State Education Law.

B. No permit to construct, reconstruct, modify, use or operate shall be issued without the prior submission of plans and/or reports acceptable to the Commissioner, pursuant to Department standards.

§760-713 Operation, Maintenance and Repair of Sewage or Industrial Waste Treatment Facilities

A. All sewage and industrial waste treatment facilities shall be operated by a person or persons with qualifications acceptable to the Commissioner, pursuant to Department standards.

B. An operator of a sewage or industrial waste treatment system shall be physically present at the sewage or industrial waste treatment plants he is responsible for operating for a period of time each day satisfactory to the Commissioner.

C. This section does not apply to underground septic tank and leaching pool systems used for the disposal of domestic sewage.

D. All sewage or industrial waste treatment facilities shall be operated in strict accordance with the discharge permit issued for the facility.

E. All sewage or industrial waste treatment facilities shall be maintained in good operating condition at all times in accordance with good engineering practice. All structures and equipment shall be protected against corrosion and deterioration. Repairs shall be made in a timely fashion to minimize downtime of equipment.

Preventative maintenance shall be performed on a scheduled basis to anticipate and prevent equipment failure.

§760-714 Enforcement

The provisions of this Article shall be enforced in accordance with the enforcement provisions of Article 2 of the Suffolk County Sanitary Code.

§760-715 Variances and Waivers

In any case where an applicant for a permit or approval is dissatisfied with a determination of the authorized agent to act for the Commissioner, or seeks a variance or waiver from the strict application of the letter of the requirements of this Article, or standards promulgated pursuant to this Article, the applicant may appeal from the determination of the deputy or for consideration of the application to the Board of Review in accordance with the provisions of §760-609 of the Suffolk County Sanitary Code.

§760-716 Separability of Provisions

In the event that any provision of this Article is declared unconstitutional or invalid, or the application thereof to any person or circumstance is held invalid, the applicability of such provision to other persons and circumstances and the constitutionality or validity of every other provision of this Article shall not be affected thereby.

(Adopted 5/22/1985; Amended 4/9/1986, 1/14/1987, 1/24/1990, 11/4/1992, 6/30/1993)

SUFFOLK COUNTY SANITARY CODE - ARTICLE 12

Toxic And Hazardous Materials Storage And Handling Controls

§760-1201 Declaration of Policy

The designated best use of all groundwaters of Suffolk County is for public and private water supply, and of most surface waters for food production, bathing and recreation. The federal government has officially designated the aquifer below Suffolk County as a sole-source for water supply. Therefore, it is hereby declared to be the policy of the County of Suffolk to maintain its water resources as near to their natural condition of purity as reasonably possible for the safeguarding of the public health and, to that end, to require the use of all available practical methods of preventing and controlling water pollution from toxic and hazardous materials.

§760-1202 Statement of Purpose

It is the intent and purpose of this Article to safeguard the water resources of the County of Suffolk from toxic or hazardous materials pollution by controlling or abating pollution from such sources in existence when this Article is enacted and also by preventing further pollution from new sources under a program which is consistent with the above-stated Declaration of Policy.

§760-1203 Definitions

Whenever used in the Article, unless otherwise expressly stated, or unless the context or subject matter requires a different meaning, the following terms shall have the respective meanings set forth or indicated:

A. Aboveground, when referring to tanks, means more than 90 percent exposed above the final ground elevation.

B. Bulk Storage means the loose or bagged torage of dry or semi-dry materials.

C. Commissioner means the Commissioner of the Suffolk County Department of Health Services.

D. Discharge means to release by any means or to relinquish control in a manner

that could result in a release to the surface waters, groundwaters, surface of the ground or below ground. Discharge includes but is not necessarily limited to the following, either singly or in any combination:

1. leaks from the failure of a storage facility;

2. spills during transport or transfer of toxic or hazardous materials;

3. disposal or storage of soils, sand or debris containing toxic or hazardous materials;

4. disposal to: storm drains, cooling water, roof drains, sanitary systems, or any other drainage system or leaching system of toxic or hazardous materials;

5. burial, land-spreading or dumping anywhere of toxic or hazardous materials, including but not limited to landfill and scavenger facilities, notwithstanding that the material so buried, spread or dumped was containerized at the time of said burial, spreading or dumping;

6. passing of toxic or hazardous waste materials to any person;

7. abandonment of containers, tanks, pipes, vehicles or premises containing toxic or hazardous materials or residues. For the purpose of this subdivision, abandonment shall mean:

a. substantially empty and unattended, or

b. the relinquishment or termination of possession, ownership or control without full disclosure to the new owner thereof of containers, tanks, pipes, vehicles or premises containing toxic or hazardous materials or residues, whether by vacating or by disposition thereof, and shall not depend on a mere lapse of time.

E. Double-Walled means constructed with more than one containment layer with space between the layers sufficient to allow monitoring of any leakage into or out of the space.

F. Impervious means a layer of natural and/or man-made material of sufficient thickness, density and composition as to prevent the discharge into the underlying groundwater or adjacent surface waters of any toxic or hazardous substances for a period of at least as long as the maximum anticipated time during which the toxic or hazardous substances will be in contact with the material, and sufficient to allow complete recovery of the spilled product with minimum disturbance of the containment material.

G. New York State Discharge Standards means standards of quality and purity and special standards, and groundwater quality standards and effluent standards, and/or limitations as found in Title 6, Parts 701-703 of the Official New York Compilation of Codes, Rules and Regulations.

H. Pollution means the presence in the environment of conditions and/or contaminants in quantities or characteristics, which are or may be injurious to human, plant or animal life or to property, or which unreasonably interfere with the comfortable enjoyment of life and property throughout such areas of the County as shall be affected thereby.

I. Product-Tight means impervious to the material which is or could be contained therein so as to prevent the detectable seepage of the product through the container. To be product-tight, the container shall be made of a material that is not subject to physical or chemical deterioration by the product being contained.

J. Properly Registered Industrial Waste Scavenger means a person in the business of collecting industrial wastes who carries a current, valid industrial waste collector registration issued by the New York State Department of Environmental Conservation.

K. Substantial Modifications shall mean the construction of any additions to an existing storage facility as defined under §760-1203.M, or restoration, refurbishment or renovation which:

1. increases or decreases the in-place storage capacity of the facility;

2. alters the physical configuration; or

3. impairs or affects the physical integrity of the facility or its monitoring systems.

L. Single-Walled means constructed with walls made of but one thickness of material. Laminated, coated, or clad materials shall be considered as single-walled.

M. Storage Facility means tanks, pipes, vaults, buildings, yards, pavements or fixed containers used or designed to be used, either singly or in any combination thereof, for the storage and/or transmission of toxic or hazardous materials or for the storage of portable containers containing toxic or hazardous materials. This shall include skid or wheel mounted tanks if they are used for storing toxic or hazardous materials in a manner that could be accomplished by use of fixed or permanently installed tanks, but shall not include the temporary use of wheeled or skid mounted tanks for the purpose of dispensing petroleum products into "off- road" vehicles and other equipment used for construction-related purposes at construction sites, or for

temporary use at spill cleanup or groundwater remediation sites.

N. Toxic or Hazardous Materials means any substance, solution or mixture which, because of its quality, quantity, concentration, physical, chemical or infectious characteristics, or any combination of the foregoing, presents or may present an actual or potential hazard to human health or to the drinking water supply if such substance, solution, mixture or combination thereof is discharged to the land or waters of the County of Suffolk. Toxic or Hazardous Materials shall include:

1. each and every substance, material or waste identified or listed anywhere in Part 116, Part 261, or Part 302, Title 40 of the Code of Federal Regulations; or in either or both Part 371 and Part 597, of Title 6 of the New York State Codes, Rules and Regulations;

2. acids and alkalies beyond the pH range of 4 to 10;

3. heavy metal sludges, mixtures and solutions in excess of standards;

4. petroleum products, including fuels and waste oils, except heavy tars and asphalts;

5. organic solvents, including petroleum solvents, halogenated and non-halogenated hydrocarbons;

6. any material listed in Part 703.6 of the Official Compilation of New York Codes, Rules and Regulations, in excess of the concentration standards thereof, except for iron, manganese, foaming agents and pH unless otherwise provided elsewhere in this Article;

7. any substance not included within subdivisions one through six above subsequently declared to be a Toxic or Hazardous Material by the Commissioner;

8. any solid or semi-solid material which, if left to stand or if exposed to water will leach out or wholly or partially dissolve forming a Toxic or Hazardous Material as defined in subdivisions one through seven above.

All Toxic or Hazardous Materials are hereby declared to also be offensive materials for the purposes of Article 5.

O. Toxic or Hazardous Wastes mean:

1. Toxic or Hazardous Materials as defined in subdivision (N) above, generated by or as the result of operations in or the existence of any manufacturing or

other industrial or commercial establishment, which toxic or hazardous materials are not actually used in a final product for sale, and shall include those toxic or hazardous materials retained as byproducts of the operations within such manufacturing or other industrial or commercial establishment for the purpose of recouping salvage value; or

2. Toxic or Hazardous Materials generated by one in possession or control of any residential premises, for which materials disposal is intended, and which waste is not domestic wastewater without the admixture of non-sewage wastewater from any industrial process.

3. All toxic or hazardous wastes are Toxic or Hazardous Materials.

P. Underground, when referring to tanks, means 10 percent or more below the final ground elevation.

Q. Existing Storage Facility means any one constructed before January 1, 1980. It also means any outdoor heating oil tank of 1,100 gallons or less and any indoor heating oil tank of any size constructed before November 1, 1982.

R. New Storage Facility means any one constructed after January 1, 1980, except that for any outdoor heating oil tank of 1,100 gallons or less and for any indoor heating oil tank of any size, it shall mean one constructed after November 1, 1982.

S. Installation shall mean the same as facility.

§760-1204 Powers of the Commissioner

A. The Commissioner may make, or cause to be made, or order the owner or operator of any property or facility to make any investigation or study which, in his/her opinion, is desirable for enforcing this Article or controlling or reducing the potential for contamination of the waters of the County from toxic or hazardous materials. This may include the ordering of a groundwater investigation where information suggests that a discharge of toxic or hazardous materials may have occurred.

B. The Commissioner may order the owner or any other person in possession or control of any land, structure or equipment, or agent of such owner or other person, to take whatever action is necessary in the opinion of the Commissioner to bring said land, structure or equipment into compliance with the provisions of this Article and any standards or regulations promulgated thereunder. Such action may include but is not necessarily limited to the following, either singly or in any combination thereof:

1. ordering tank-testing or the testing of the physical integrity of pipes or any other part of a storage facility or ordering the physical testing of the integrity of an entire storage facility;

2. ordering the removal of the contents of a tank, portable container, storage facility or any part thereof;

3. ordering the removal or abandonment or reconstruction of any installation, tank, storage facility or any part thereof installed in contravention of any of the requirements of this Article or any standards or regulations promulgated thereunder;

4. ordering that physical improvements be performed on any tank, storage facility or part thereof before permitting it to be returned to service including such improvements as tank lining removal and replacement, bottom and structural repairs;

5. ordering the drafting of and/or implementation of contingency plans if there is evidence that such plans may be necessary to protect the public from toxic or hazardous materials stored at any particular facility;

6. ordering the posting of a performance bond or other undertaking either prior to or subsequent to the construction or operation of a storage facility within Suffolk County on a case-by-case basis if evidence indicates such may be necessary to protect the public from the effects of operating or closing such a facility.

C. The Commissioner may require the licensing, pursuant to standards adopted by the Department, of persons and/or companies installing, constructing, testing, inspecting or removing tanks, piping, pipelines, fittings, connections, alarms, and other related equipment required by this Article.

D Notwithstanding any other provision of this Article, if the Commissioner finds a condition which has the potential for contaminating the waters of the County with toxic or hazardous materials, or which otherwise constitutes an immediate danger to public health, and determines that it could appear prejudicial to the public interest to delay action, the Commissioner may serve an order upon the permit holder, or if there is no permit upon the person in charge of the facility or site, citing such conditions and specifying the corrective action to be taken and a time period of less than fifteen (15) days within which such action shall be taken.

Such order may state that a permit is immediately suspended and/or that all operations are to be discontinued forthwith.

Any order requiring certain action or the cessation of certain activities immediately or within a specified period of less than fifteen (15) days shall provide such person an opportunity to be heard, which hearing shall be scheduled for a time no more than fifteen (15) days after the date the order is served.

§760-1205 Prohibited Discharges, Transporting, Disposal, Improper Storage

A. It shall be unlawful for any person to discharge toxic or hazardous materials in Suffolk County, unless such discharge is specifically in accordance with a State Pollutant Discharge Elimination System (SPDES) Permit or other permit issued by or acceptable to the Commissioner for that purpose.

B. It shall be unlawful for any person to pick up, transport or dispose of toxic or hazardous waste materials in Suffolk County without having a valid and appropriate New York State industrial waste collector registration.

C. It shall be unlawful for any industrial waste collector with a registration issued by the New York State Department of Environmental Conservation to fail to maintain a copy thereof on each vehicle operated by said collector at all times.

D. It shall be unlawful for any person to store toxic or hazardous materials in a facility unless the materials of construction of the facility are compatible with the product being stored.

E. No reactive toxic or hazardous materials shall be stored in close proximity to each other in a manner that could allow a reaction to occur in the case of leakage, spillage or fire.

§760-1206 Construction and Modification Permits

A. It shall be unlawful for any person to construct, install or substantially repair or modify a storage facility, or part thereof, without a valid permit therefor issued by or acceptable to the Commissioner.

B. It shall be unlawful for any person in possession of or acting pursuant to a permit issued under this section to act, allow or cause any act in contravention of any provision of the permit.

C. Any permit issued pursuant to this section shall be effective for the specified duration of time indicated thereon, not to exceed one year from the effective date

thereof.

§760-1207 Permits to Operate

A. It shall be unlawful for any person to use, cause to be used, maintain, or fill or cause to be filled with toxic or hazardous materials any storage facility or part thereof without having registered all the tanks at the facility on forms provided by the Commissioner, and without having obtained a valid permit to operate such storage facility or part thereof issued by or acceptable to the Commissioner. Changes to registration information, such as owner name, facility operator, tank contents, use, etc., shall be submitted to the Department by the storage facility owner as they occur.

B. It shall be unlawful for any person in possession of or acting pursuant to a permit issued pursuant to this section to act, permit or cause any act in contravention of any provision of the permit.

C. (Deleted 12/16/92)

D. Any permit issued pursuant to this section shall be effective only for the specified duration of time indicated thereon, not to exceed five (5) years from the effective date thereof. Such permit shall be permanently displayed in a front window of the facility or other equally prominent location clearly visible to any inspector positioned outside the facility.

§760-1208 Exemptions

A. All storage facilities which meet all of the following criteria shall be exempt from all provisions of this Article except those contained in §760-1203 - Definitions; §760-1204 - Powers of the Commissioner; §760-1205 - Prohibited Discharges; §760-1208 - Exemptions; §760-1210.A - New Storage Facilities; §760-1210.F - General Provisions and Requirements; §760-1210.H - Overfill Protection; §760-1211.A.4 - Overfill Detection; §760- 1211.D.1 and 2 - Leaks; Repairs; §760-1213.B.1 and 4 - Transfer Operations; and §760-1220 - Variances and Waivers:

1. the materials so stored are not toxic or hazardous wastes; and

2. the volume of the storage facility is less than 1,100 gallons; and

3. the facility is intended solely for the storage of kerosene, number 2 fuel oil, number 4 fuel oil, number 6 fuel oil, diesel oil or lubricating oil, gasoline in aboveground tanks; and

4. the intended use of the product stored is solely for on-site heating, or intermittent stationary power production such as stand-by electricity generation or irrigation pump power; and

5. the materials stored are not intended for resale.

B. All storage facilities which meet the following criteria shall be exempt from the provisions of this Article contained in §760-1210.B, §760-1210.C, §760-1214, §760-1219, and any regulations or standards promulgated thereunder:

1. the materials so stored are not toxic or hazardous wastes; and

2. the volume of the storage facility is greater than 1,100 gallons; and

3. the facility is intended solely for the storage of kerosene, number 2 fuel oil, number 4 fuel oil, number 6 fuel oil, diesel oil, or lubricating oil; and

4. the intended use of the product stored is solely for on-site heating, or intermittent stationary power production such as stand-by electricity generation or irrigation pump power; and

5. the materials stored are not intended for resale.

C. All storage facilities no longer receiving the benefit of any exemption but which were previously exempted from any or all provisions of this Article shall be required to appropriately conform to all of the provisions of this Article and all regulations and standards promulgated pursuant thereto by November 1, 1983.

D. Tanks for the storage of number 6 fuel oil, or other petroleum products of equivalent viscosity, located outside of the deep recharge areas and water supply sensitive areas as defined in Article 7 of this Code, are exempt from the internal inspection and tank lining requirements.

Diked areas surrounding such tanks, regardless of location, need not be lined with material more impervious than sand due to the viscose nature of the oil at ambient temperature.

E. Existing aboveground tanks that are in contact with the ground, but which are, in the opinion of the Commissioner, too large to be moved, are exempt from the requirement for a secondary containment barrier beneath the tank bottom.

F. All storage of toxic or hazardous materials in containers of five-gallon capacity or smaller where the total capacity stored at any time does not exceed 250 gallons or

where the dry storage in bags, bulk, or small containers does not exceed 2,000 pounds is exempt from all portions of this Article unless specifically ruled otherwise by the Commissioner on a case-by-case basis.

§760-1209 Transfer of Permits Prohibited

It shall be unlawful for any person to transfer a permit issued pursuant to §760-1206 and §760-1207 of this Article from one location to another, from one storage facility to another, or from one person to another. Any permit transferred in violation of this section shall be deemed null and void and without any effect whatsoever as of the date of said unlawful transfer.

However, upon making proper application, a new owner of a facility which was previously operating under a valid permit may continue operation under the terms of the old permit until such time as the new permit is issued or denied.

§760-1210 Underground Storage Facilities

A. New Storage Facilities

1. All new storage facilities used or to be used for the underground storage of toxic or hazardous materials shall be designed and constructed in a manner which will, in the opinion of the Commissioner, provide the maximum reasonable protection available against leakage or spillage from the facility due to corrosion, breakage, structural failure, or other means. Double-walled or equivalent facilities are required for all toxic or hazardous materials, except for tanks for the storage of on-premises heating oil at residential homes. For these, single-walled, non-corrodible facilities may be used. Acceptable designs for tanks include cathodically protected steel; glass fiber reinforced plastic; cathodically protected steel clad with glass fiber reinforced plastic; or other equivalent design approved by the Commissioner.

2. Approval of design by the Commissioner is required before installation, and the determination of equivalency or adequacy lies with the Commissioner.

3. Design, construction, fabrication, and installation of new underground storage facilities shall be in accordance with regulations and standards as they may be adopted by the Commissioner under this Article from time to time.

4. (Deleted 12/16/92)

5. It shall be unlawful for any person to sell for use in Suffolk County, install,

use, put into service or maintain the existence of any new underground storage facility or part thereof if said new storage facility or part thereof fails to conform to all of the provisions of subsections 1, 2, and 3 above, that were in effect at the time of construction and all regulations and standards promulgated thereunder; subject however to the exemptions contained in §760-1208.

B. Existing Storage Facilities

1. (Deleted 12/16/92)

2. It shall be unlawful for any person to substantially modify or cause the substantial modification of any existing underground storage facility or part thereof without complying with the provisions of subdivision A above and all regulations and standards promulgated thereunder.

3. It shall be unlawful to use, or maintain the existence of any existing underground storage facility beyond January 1, 1990, which is intended for use with toxic or hazardous materials with a specific gravity of less than one and which are only slightly soluble in water such as oils and gasoline, without modifying said storage facility so as to comply with all of the provisions of subdivision A above and all regulations and standards promulgated thereunder.

4. It shall be unlawful to use or maintain the existence of any existing underground storage facility beyond January 1, 1987, which is intended for use with any toxic or hazardous materials other than those with a specific gravity of less than one and which are only slightly soluble in water such as oils and gasoline, without modifying said storage facility so as to comply with all of the provisions of subdivision A above and all regulations and standards promulgated thereunder.

C. Single-walled Non-corrodible Facilities

1. Single-walled non-corrodible facilities with leak detection and overfill protection must be upgraded to meet the secondary containment requirements of new construction. It shall be unlawful to use or maintain the existence of any facility of this description beyond January 1, 2010 for the storage of any toxic or hazardous material which is not adequately protected with a secondary containment system.

D. Abandonment

1. It shall be unlawful for any person to use or maintain the existence of an abandoned underground storage facility or part thereof.

2. It shall be unlawful for anyone to sell or transfer to another an improperly abandoned underground storage facility or land containing an improperly abandoned underground storage facility if there exists any reasonable evidence of the existence of such a facility, unless the purchasing party has been made fully aware of the presence of such facility or evidence.

3. It shall be unlawful for any person to repair, alter or prepare for use any abandoned storage facility without first obtaining a permit to construct from the Commissioner.

4. It shall be unlawful for the owner or other person in possession or control of any real property, building or place or vehicle to fail to immediately empty of all toxic or hazardous materials and to completely fill with sand or concrete or permanently remove an abandoned storage facility or part thereof within ninety (90) days of the discovery thereof on or in said real property, building or place pursuant to the provisions of subdivision 1 below unless approval is granted by the Commissioner to do otherwise.

5. For the purposes of this section, an abandoned storage facility or part thereof means one which has remained out of service for two (2) years or more, or which has been declared by the owner to be abandoned.

6. For the purposes of this section, out of service means substantially empty, meaning five (5%) percent or less filled; or not in use, meaning no regular filling or drawing; or not being maintained, meaning lacking adherence to the requirements of this Article; or uncontrolled, meaning not attended or secured; or any combination thereof.

7. For the purposes of this section, discovery means either actual discovery or knowledge of the existence of the abandoned storage facility or part thereof or possession of sufficient knowledge of the facts and circumstances involved so that the existence of the abandoned storage facility or part thereof should have been discovered or known of.

E. Testing and Inspection

1. All existing underground storage facilities or parts thereof which do not meet the construction standards in subdivision A above must be tested and inspected in accordance with the schedule set forth below. It shall be unlawful for any existing underground storage facility owner, operator or lessee to fail to test his/her tanks, and he/she shall be responsible for insuring that an acceptable certificate of test completion is filed with the Commissioner in accordance with the following schedule:

TESTING SCHEDULE FOR EXISTING UNDERGROUND TANKS
AGE OF SYSTEM BY 1980
(in years)

	1-4	5-9	10-14	15-19	20 or more
1980					
1981					X
1982				X	
1983			X		X
1984		X			
1985	X			X	X
1986			X		

ALL TANKS COVERED BY §760-1208.B BY VIRTUE
OF THE 1986 AMENDMENT SHALL BE INITIALLY TESTED IN 1986
IF THE TANK IS TEN (10) YEARS OR OLDER, AND/OR ALL TANKS
SHALL BE TESTED ON THEIR TENTH ANNIVERSARY AND
EVERY FIVE (5) YEARS THEREAFTER UNTIL PERMANENTLY CLOSED.
FULL COMPLIANCE FOR ALL FACILITIES EXCEPT THOSE
DESCRIBED IN §760-1210.B.3

	1-4	5-9	10-14	15-19	20 or more
1987			X		X
1988		X			
1989					
1990	Full Compliance for all Facilities				

2. If for any reason testing satisfactory to the Commissioner cannot be performed, the tank must be removed from service or brought up to the standards of subsection A by the first scheduled test date.

3. The Final Test of the National Fire Protection Association (NFPA), Recommended Practice No. 329 or other test of equivalent or superior accuracy as approved by the Commissioner must be used to comply with the testing and inspection requirement of 760-1210.E.1.

4. Any test and inspection as required by this subdivision shall be performed by a person whose qualifications are acceptable to the Commissioner, pursuant to Department standards, for performing such tests. Certificates of test completion containing the results of such tests as performed shall be prepared by the tester and shall be filed by him/her with the Commissioner within thirty (30) days after

completion of the testing of the storage facility. No certificate of test completion shall be acceptable to the Commissioner to indicate satisfactory compliance with the testing requirements of this subdivision if the qualifications of the tester have not been accepted by the Commissioner prior to the test. No certificate of test completion shall be acceptable to the Commissioner, pursuant to Department standards, if the test and inspection were not performed in accordance with subsection 3 of this subdivision and in accordance with any regulations and standards which may be promulgated pursuant thereto.

5. The Certificate of Test Completion shall be filed on a form provided by the Commissioner and a copy of such form, completed, shall be kept by the storage facility owner, operator or lessee and by the tester for a period of not less than five (5) years from the date of its issuance. It shall be unlawful for the storage facility owner, operator or lessee and for the tester thereof to fail to keep a copy of the Certificate of Test Completion for the required five (5) year period.

6. Certificates of Test Completion shall contain a legally authorized form notice to the effect that false statements made knowingly therein are punishable pursuant to 210.45 of the Penal Law.

7. A Certificate of Test Completion not properly completed and/or not subscribed by the tester shall not be acceptable to the Commissioner.

F. General Provisions and Requirements

1. When an underground storage facility or part thereof is found to be leaking, the portion containing the leak must be immediately emptied of all contents therein and removed from service. It shall be unlawful to cause or permit a leaking underground storage facility or part thereof to remain in service or to continue to retain its toxic or hazardous contents after the owner, operator or lessee of said storage facility or part thereof knows or should have known of the existence of the leak therein.

2. It shall be unlawful for any person to repair or to permit the repair, in place, of any underground storage facility or part thereof which has leaked or has otherwise failed, for the purpose of reusing said storage facility, unless:

a. such repair will result in the storage facility or part thereof complying with the requirements of subdivision A above and all regulations and standards promulgated thereunder; and unless

b. such repair occurs pursuant to plans therefor previously submitted to and approved by the Commissioner.

3. It shall be unlawful for any person to replace or cause the replacement of any underground storage facility or part thereof for any reason if the replacement facility does not meet the requirements of subdivision A above and all regulations and standards promulgated thereunder.

4. It shall be unlawful for any person to use, maintain, or put into service any underground storage facility or part thereof without first complying with the testing and inspection requirements of subdivision E above and regulations and standards promulgated thereunder.

5. It shall be unlawful not to maintain any secondary containment system for underground storage in a dry condition except for tanks that utilize a fluid-filled space between the tank walls for leak detection. Any liquid which enters a secondary containment system shall be removed within 24 hours, the source determined and corrected, and a permanent record of the event made and kept available for inspection by a Department representative.

G. Monitoring and Leak Detection

1. All underground storage facilities or parts thereof must be equipped with means of calculating product delivery and consumption. Accurate records must be kept of all deliveries and consumption and the figures reconciled daily in an approved manner unless a less frequent schedule is allowed by the Commissioner.

2. All underground storage facilities or parts thereof, except those for residential homes, must be provided with a means of monitoring frequently and accurately for any leakage and spillage that might occur. All leak detection systems and tanks shall be monitored by the facility operator at least on a weekly basis and the results recorded and kept with the product records. Leak detection and monitoring can be provided by an electrical continuous leak detection system; visually operated or float operated alarms for tanks in pits; pressure, vacuum or fluid level detectors for double-walled facilities; or other equivalent design approved by the Commissioner. Permanent records of all monitoring shall be kept for a period of five (5) years.

3. It shall be unlawful for the owner or other person in possession or control of a storage facility or part thereof to fail to comply with any of the requirements of this subdivision and of any regulations and standards promulgated pursuant thereto.

H. Overfill Protection

1. A means of overfill protection shall be provided for all new underground

storage facilities or parts thereof and for all replacement underground storage facilities or parts thereof. Overfill protection shall consist of either an overfill prevention device or a product-tight containment capable of intercepting and preventing the release to the ground or groundwater of an overfill spill.

2. It shall be unlawful for the owner, operator or lessee to fail to provide satisfactory overfill protection for any new underground storage facility or part thereof in accordance with the provisions of this subdivision and any regulations and standards promulgated pursuant thereto.

I. Removal of Underground Storage Facilities From Service

1. It shall be unlawful for the owner or any other person in possession or control of an underground storage facility or part thereof, to remove it from service unless:

a. said storage facility or part thereof is declared abandoned, emptied immediately and removed within ninety (90) days of so declaring, and is disposed of as junk by first rendering it vapor-free and by sufficiently perforating it so as to render it unfit for further use; or

b. said storage facility or part thereof is declared abandoned, emptied immediately and removed within ninety (90) days for reuse for the storage of toxic or hazardous materials after having met all of the requirements of subdivision A and all regulations and standards promulgated pursuant thereto; or

c. said storage facility or part thereof is declared abandoned, emptied immediately and removed within ninety (90) days for the storage of other than toxic and hazardous materials in which case the facility shall be emptied, cleaned of all residue, and made safe and vapor-free; or

d. said storage facility is declared temporarily out of service and maintained in accordance with subdivision 3 of this section; or

e. said storage facility or part thereof is declared abandoned, emptied immediately and made inert by completely filling with sand or concrete within ninety (90) days; however, this can only be done by special permission by the Department upon application demonstrating the absence of leaks and upon inspection by the Department or its representatives at the owner's expense, or for extraordinary circumstances where complete removal is unreasonable such as beneath a building foundation; or

f. said storage facility is declared to be suspected of leaking and maintained

in accordance with §760- 1210.F; and

g. proof is obtained and presented to the Department as to whether or not leakage has occurred from said storage facility. Such proof shall be to the satisfaction of the Commissioner.

2. Any declaration of facility abandonment or of taking a facility temporarily out of or returning a facility to service, must be made to the Commissioner in writing.

3. It shall be unlawful for the owner or any other person in possession or control of any underground storage facility or part thereof to render it temporarily out of service unless said storage facility or part thereof substantially meets the requirements of §760-1210.A, and it is emptied of its contents immediately, the fill line, gauge opening and pump line are capped and secured against tampering, the vent line is left open, and approval is granted by the Commissioner. No facility in a temporarily out of service condition shall be returned to use prior to approval by the Commissioner and prior to the successful completion of any tightness testing the Commissioner may require. The temporarily out-of-service designation may be extended in two-year increments by the Commissioner upon application. No tank in a temporarily out-of-service condition may be brought back into service after January 1, 1990 without first meeting the requirements of 760-1210.A.

4. It shall be unlawful for anyone to place toxic or hazardous materials in a facility which is temporarily out of service.

§760-1211 Outdoor Aboveground Storage Facilities

A. New Storage Facilities

1. (Deleted 12/16/92)

2. It shall be unlawful to fabricate, construct, install, use or maintain any new aboveground storage facility or part thereof in a manner which will allow the discharge of a toxic or hazardous material to the ground, groundwaters, or surface waters of Suffolk County.

3. It shall be unlawful to fabricate, construct, install, use or maintain any new aboveground storage facility or part thereof without having constructed around and under it an impervious containment and dike enclosing the storage facility or part thereof, conforming to the following requirements:

a. The volume of the diked area shall be at least 110% of the volume of the largest tank contained therein excluding the volume below the dike level occupied by other tanks. Additional volume up to 10% of the total volume of all other tanks or vessels contained in the diked area may be required if the configuration, arrangement and spacing of the tanks and dikes do not meet National Fire Protection Association standards.

b. The dikes and the entire area enclosed by the dikes including the area under the tanks shall be made permanently impervious to the types of products expected to be stored in the tanks. A tank cannot be switched from one product to another unless the barrier is impervious to the new material stored.

c. Drainage of precipitation from within the diked area shall be controlled in a manner that will prevent any toxic or hazardous material from entering the ground, groundwaters or surface waters of Suffolk County.

d. Alternate designs may be approved if, in the opinion of the Commissioner, they provide protection equivalent to that of a diked enclosure.

4. It shall be unlawful to construct, fabricate, install, use or maintain any new aboveground storage facility without providing a positive means of detecting an overfilling condition therein before any spillage can occur, which detection system shall include, but shall not necessarily be limited to, both visual and audible alarms at a point on the storage facility most frequently manned. The overflow point must be clearly visible to the operator filling the facility or the operator at the receiving facility where possible. If not possible, adequate means must be provided to immediately detect an overflow.

5. It shall be unlawful to fabricate, construct, install, use or maintain any new aboveground storage facility or part thereof without conforming to all regulations and standards promulgated pursuant to this section relating to such new storage facilities.

6. It shall be unlawful to fabricate, construct, install, use or maintain any new aboveground storage facility sitting on the ground and making contact therewith or partially buried in the ground and making contact therewith, or part thereof, unless and until the exterior surface of the areas in contact with the ground are cathodically protected in conformance with a design approved by the Commissioner. The interior bottom of such facilities shall be coated with a properly bonded epoxy coating or other approved coating system to minimize interior corrosion. (See Exemptions Section 760-1208.)

B. Existing Storage Facilities

1. (Deleted 12/16/92)

2. Commencing January 1, 1990, it shall be unlawful for any person to use, maintain or fill with toxic or hazardous materials any existing aboveground storage facility or part thereof without conforming to all of the requirements of subdivision A above and all regulations and standards promulgated pursuant thereto, except as noted in the Exemptions Section 760-1208. In achieving the above compliance, the following schedule shall be adhered to:

a. By January 1, 1985, all interior coating of facilities shall be completed.

b. By January 1, 1985, all facilities shall be protected against overfill.

c. By January 1, 1987, installation of cathodic protection shall be completed on all facilities in contact with the ground which were built prior to 1967.

d. By January 1, 1988, installation of cathodic protection shall be completed on all facilities in contact with the ground which were built between 1967 and 1972.

e. By January 1, 1989, installation of cathodic protection shall be completed on all facilities in contact with the ground which were built between 1972 and 1977.

f. By January 1, 1992, all inspections and interior coating of tanks containing No. 6 fuel oil shall be completed.

3. It shall be unlawful for any person to use, maintain or fill with toxic or hazardous materials an existing aboveground storage facility or part thereof without complying with the following inspection schedule and all regulations and standards promulgated pursuant thereto, and without submitting to the Commissioner a statement of Proof of Inspection.

a. Any owner or other person in possession or control of an aboveground storage facility or part thereof shall have said tanks and vessels inspected and shall file a Proof of Inspection with the Commissioner by January 1, 1985. Where interior coating has not yet been applied, such inspection will be performed before coating.

b. For the purpose of this section, inspection means the inspection of all aboveground tanks and other vessels for the storage of toxic or hazardous materials constituting an aboveground storage facility or part thereof.

c. Any inspection of an existing aboveground storage facility of greater than

10,000 gallon capacity or part thereof as required by this subdivision shall be performed in accordance with a written protocol submitted to and approved by the Commissioner, pursuant to Department standards, by an authorized tank inspection firm or person or by a professional engineer licensed to practice professional engineering in the State of New York, and it shall be performed in compliance with any regulations and standards promulgated pursuant to this section relating to such inspections.

d. Aboveground storage facilities or parts thereof sitting on the ground and in contact therewith or partially buried in the ground and in contact therewith, shall be emptied and cleaned to facilitate inspection of portions thereof not accessible from the outside.

e. Proofs of Inspection must be filed with the Commissioner on a form provided by the Commissioner or one acceptably equivalent thereto within thirty (30) days of each inspection and before the tank is refilled, and a copy of such form shall be kept and maintained by both the owner or other person in possession or control of the aboveground storage facility or part thereof and the inspector for a period of not less than five (5) years from the date of the inspection. The Proof of Inspection form shall be subscribed by both the owner or other person in possession or control of the aboveground storage facility inspected and the inspector. This Proof of Inspection form shall contain a legally authorized form notice to the effect that false statements made knowingly therein are punishable pursuant to 210.45 of the Penal Law.

4. It shall be unlawful for any person to substantially modify or cause the substantial modification of any aboveground storage facility or part thereof without complying with the provisions of subdivision A above and all regulations and standards promulgated pursuant thereto.

C. General Provisions

1. It shall be unlawful for any person to abandon an aboveground storage facility or part thereof. Aboveground tanks, if they are not in active service, must be either placed in a temporarily out of service condition or removed. A temporarily out-of-service tank need not meet all requirements of the Code for storage until it is ready to be brought back into service, however, it must be completely protected from deterioration during the time it is held in a temporarily out-of-service condition. This shall include at least the following:

a. sufficient exterior coating to prevent rusting;

b. cathodic protection continuously applied and maintained for all portions of the tank in contact with the soil.

c. maintenance of the interior in a dry condition to prevent rusting from moisture accumulation.

To place a tank in a temporarily out-of-service condition it must first be cleaned of all residue, vented until dry and safe and secured with hatches opened for ventilation but protected from precipitation. All connections shall be severed or blank-flanged to prevent filling.

Notice must be given to the Department and approval granted before a tank can be placed in a temporarily out of service condition. Approval will be granted for up to two years and can be renewed at two-year intervals upon satisfactory demonstration to the Department that the tank is being maintained sufficiently to prevent degradation. For the purpose of this subdivision, an abandoned aboveground storage facility or part thereof means one that has remained substantially empty or unattended for one (1) year or more without being either declared temporarily out-of-service or maintained in all respects as an active tank as required by this Code.

2. It shall be unlawful for the owner or other person in possession or control of an aboveground storage facility or part thereof to remove it from service unless:

a. said storage facility or part thereof is disposed of as junk by first rendering it vapor-free and by sufficiently perforating it so as to render it unfit for further use, and demolishing it and removing it from the site; or

b. said storage facility or part thereof is demolished for sale or use elsewhere in which case it must be first cleaned and made vapor-free to be safe in transit, and such reuse shall be in accordance with all pertinent portions of this Article if relocation is to be within Suffolk County; or

c. said storage facility is declared temporarily out of service; and

d. the Commissioner has been notified of the intended status of removal from service.

3. It shall be unlawful for anyone to place toxic or hazardous materials in an abandoned or temporarily out-of-service aboveground storage facility.

4. It shall be unlawful for any person to bring an abandoned aboveground storage facility back into service without meeting all of the requirements of subsections A or B above. No abandoned facility shall be brought back into service without a complete inspection acceptable to the Commissioner.

5. It shall be unlawful for any person to bring a temporarily out of service facility

back into use after January 1, 1990, without first meeting all the requirements of subsections A or B above.

6. It shall be unlawful for the owner or other person in possession or control of an aboveground storage facility or part thereof to fail to empty, clean, and inspect pursuant to subsection B.3.c above, to file Proof of Inspection pursuant to subsection B.3.e above, to leak test, and/or to recoat if necessary every seven (7) years each tank or vessel for the storage of toxic or hazardous materials within the said storage facility or part thereof.

7. It shall be unlawful for any person to replace or cause the replacement of any aboveground storage facility or part thereof for any reason without complying with the new storage requirements of subdivision A above and without complying with the inspection and Proof of Inspection requirements of subsections B.3.c and B.3.e, respectively.

8. It shall be unlawful for any person to use, maintain, construct, fabricate, modify or install any aboveground storage facility or part thereof without conforming to all plans and specifications submitted to and approved by the Commissioner prior to such use, maintenance, construction, fabrication, modification or installation.

9. It shall be unlawful after January 1, 1990 for any person to use, maintain, construct, fabricate, modify or install any aboveground storage facility or part thereof, which has tanks that rest on the ground or which has underground piping, unless permanent groundwater monitoring wells are installed to the satisfaction of the Department for the purpose of detecting any leakage that may have occurred from the facility into the ground. The wells shall be constructed and installed in accordance with standards established by the Department and shall number 4 (1 upstream and 3 downstream) unless directed otherwise by the Department.

D. Leaks; Repairs

1. When an aboveground storage facility or part thereof is found to be leaking, it must immediately be emptied of all contents therein contained and removed from service unless approval is specifically granted by the Commissioner to do otherwise.

2. It shall be unlawful for the owner or other person in possession or control of a leaking aboveground storage facility or part thereof to cause or permit it to remain in service or to continue to retain its toxic or hazardous contents after said owner or other person knows or should have known of the existence of the leak.

3. It shall be unlawful for any person to reuse and repair or cause the reuse and repair of an aboveground storage facility or part thereof which is leaking or which has leaked without:

a. performing or having said repairs performed in accordance with a written protocol submitted to and approved by the Commissioner prior to said repairs; and

b. inspecting or having said leaking storage facility or part thereof inspected by a person whose qualifications are acceptable to the Commissioner, with such inspection in accordance with subsection B.3.c above and filing a Proof of Inspection in accordance with subsection B.3.e above, with such inspection performed and Proof of Inspection filed prior to reuse of the storage facility or part thereof or filling it with a toxic or hazardous material but after repairs have been effected.

§760-1212 Piping, Fittings, Connections

A. New Installations

1. (Deleted 12/16/92)

2. All new installations shall:

a. be fabricated, constructed and installed in a manner that will prevent the escape of the toxic or hazardous materials contained therein to the ground, groundwater or surface waters of Suffolk County; and

b. be protected against corrosion by the use of non-corrodible materials, cathodic protection with coatings approved by the Commissioner or the functional equivalent of the foregoing options approved by the Commissioner; and

c. be designed, constructed and installed with access points as required by the Commissioner to permit periodic pressure testing of all underground piping without the need of extensive excavation; and

d. be designed, constructed and installed with a simple, effective, reliable means of monitoring the new installation for leakage including a warning device to indicate the presence of a leak, spill or other failure or breach of integrity for piping installed underground or in areas where piping is not clearly visible; and

e. be constructed of double-walled pipe or be constructed in durable product-tight galleries or otherwise be protected by a secondary containment system approved by the Commissioner. This applies to aboveground as well as below ground piping, except that piping for No. 6 oil need not have secondary containment other than underground in the groundwater management zones and water supply sensitive areas and where a discharge from a pipe might threaten surface waters.

3. It shall be unlawful for any person to fabricate, construct, install, use or maintain or to cause the fabrication, construction, installation, use or maintenance of any new substantial installation or part thereof for use with toxic or hazardous materials:

a. without previously having submitted plans therefor to the Commissioner, and without having received approval of said plans; and

b. without complying with the plans submitted to and approved by the Commissioner as required in subsection A.3.a above; and

c. without complying with the provisions of subsections A.1 and A.2 above and any regulations and standards promulgated thereunder.

B. Existing Installations

1. (Deleted 12/16/92)

2. Existing aboveground piping and underground piping not associated with underground tanks shall be brought into conformance with the provisions of subdivision A above by January 1, 1995.

Underground piping associated with underground tanks shall be brought into conformance with the provisions of subdivision A above at the time the tanks are upgraded.

3. (Deleted 12/16/92)

4. (Deleted 12/16/92)

C. General Provisions

1. Notwithstanding the requirements of subsection C.4, it shall be unlawful for the owner or other person in possession or control of a new or existing installation or part thereof not to test said installation or part in accordance with

the procedures set forth in subsection C.4 and in all regulations and standards promulgated thereunder whenever the Commissioner has determined that such a test is necessary, or whenever the Commissioner has ordered that such a test be performed.

2. Whenever an existing or new installation or part thereof is found to be leaking, it must immediately be emptied of all contents therein contained and removed from service.

a. It shall be unlawful for the owner or other person in possession or control of said leaking installation or part thereof to cause or permit it to remain in service or to continue to retain its toxic or hazardous contents after said owner or other person knows or should have known of the existence of the leak.

b. It shall be unlawful for any person to repair or cause the repair of any new or existing installation or part thereof which has leaked or otherwise failed without performing said repairs or having said repairs performed in a manner approved by the Commissioner.

c. It shall be unlawful for any person to reuse or cause the reuse of any new or existing installation or part thereof which had leaked or otherwise failed without repairing said installation pursuant to the provisions of subsection C.2.b above and all regulations and standards promulgated thereunder.

d. It shall be unlawful for any person to reuse or to cause the reuse of any new or existing installation or part thereof which had leaked or otherwise failed without repairing said installation or part so as to conform to the requirements of subdivision A above and all regulations and standards promulgated thereunder.

e. It shall be unlawful for any person to reuse or cause the reuse of any new or existing installation or part thereof which had leaked or otherwise failed without inspecting or having said installation or part inspected subsequent to the completion of any repairs but prior to said reuse by a person whose qualifications are acceptable to the Commissioner in accordance with §760-1211.B.3.c and any regulations and standards promulgated thereunder and without filing with the Commissioner a Proof of Inspection prior to said reuse in accordance with §760-1211 B.3.e and any regulations and standards promulgated thereunder.

3. It shall be unlawful not to maintain a secondary containment piping system in a dry condition unless it is a system that depends on the space between primary and secondary pipes being filled with fluid for leak detection in which case it shall

be unlawful not to maintain the leak detection fluid at the proper level. Any liquid which enters a secondary containment system shall be removed within 24 hours.

4. It shall be unlawful for the owner or other person in possession or control of any single-walled piping installation or part thereof to fail to pressure test said piping or part thereof by January 1, 1994 and every year thereafter.

Testing of all pressure piping shall be to at least 150% of maximum operating pressure, but not to exceed the manufacturer's maximum design specifications, and the pressure shall be held for at least one-half hour.

5. It shall be unlawful for the owner or other person in possession or control of an existing installation or part thereof when testing or contracting to test said installation or part pursuant to subsection C.4 above:

a. to fail to test or have said installation or part thereof tested by a person whose qualifications are acceptable to the Commissioner; and

b. to fail to test or have tested said installation in a manner acceptable to the Commissioner; and

c. to fail to test or have tested said installation in accordance with a written protocol submitted to and approved by the Commissioner prior to said test; and

d. to fail to test or have tested said installation in accordance with any regulations or standards which may be promulgated under this subdivision relating to said testing; and

e. to fail to submit to the Commissioner within thirty (30) days of said test a completed Certificate of Test Completion form, pursuant to §760-1210.E.3-6 and any regulations and standards promulgated thereunder.

§760-1213 Transfer of Toxic or Hazardous Materials

A. Transfer Facilities

1. Transfer facilities means truck fill stands and/or any other facility for the loading or unloading of toxic or hazardous materials.

2. It shall be unlawful for any person to fabricate, construct or install a transfer facility or part thereof:

a. without first submitting plans therefor to the Commissioner and without first obtaining the Commissioner's approval thereof; and

b. without fabricating, constructing and installing said transfer facility or part thereof in accordance with the plans submitted and approved pursuant to subsection A.2.a above; and

c. without providing a simple, effective, reliable means of monitoring the transfer facility or part thereof for leakage or spillage, including a warning device; and

d. without providing a level of spill protection equivalent to that provided by a fill stand area completely paved and curbed with an impervious material and drained to a holding tank of adequate size to contain any spill that could reasonably be expected to occur from the normal operation of the facility, and roofed so as to exclude precipitation which would otherwise tend to fill the holding tank.

3. It shall be unlawful for any person to operate, maintain or use a transfer facility or part thereof so as to permit the escape therefrom of toxic or hazardous materials to the ground, groundwaters or surface waters of Suffolk County. All holding tanks associated with spill control shall be maintained in an empty condition at all times to provide maximum storage capacity at the time of a spill.

4. It shall be unlawful for any person to fabricate, construct, install, use, operate or maintain any transfer facility or part thereof without doing so in accordance with all regulations and standards pertaining thereto which may be promulgated by the Commissioner.

B. Transfer Operations

1. It shall be unlawful for any person to transfer, cause the transfer or permit the transfer of toxic or hazardous materials to or from a storage facility, part thereof or vehicle, where conditions at the transfer facility are inadequate at the time of said transfer to ensure a safe transfer operation without the occurrence of spills, leaks or accidents.

2. Failure of a transfer facility to conform and comply with the provisions of subdivision A and all regulations and standards promulgated thereunder shall constitute a rebuttable presumption that conditions at said transfer facility are inadequate for the purposes of subsection B.1 above.

3. The transfer of toxic or hazardous materials to any storage facility or part

thereof which does not comply with all provisions of this Article applicable thereto and any regulations and standards promulgated under this Article applicable thereto, shall constitute a rebuttable presumption that conditions at said transfer facility are inadequate for the purposes of subdivision B.1 above.
4. Conditions at the transfer facility shall be deemed to be inadequate at the time of a transfer if:

a. the transfer facility is constructed so that all possible points of overflow are not visible from the loading and unloading locations; or

b. the truck, storage facility or part thereof being delivered to does not have adequate capacity to contain the amount of toxic or hazardous material being transferred or to be transferred, or if a person performing or causing said transfer does not insure by some reliable means that the truck, storage facility or part thereof has adequate capacity to contain the amount of toxic or hazardous material being transferred or to be transferred.

5. Vehicles shall not be used for transferring toxic or hazardous materials in situations where a permanently installed transfer facility is considered by the Commissioner to be more appropriate, such as multiple deliveries of fuel to small boats at a marina.

§760-1214 Indoor Storage Facilities

A. General

1. An indoor storage facility is specifically intended to include within its meaning all tanks, vessels and appurtenant plumbing which contain or are to contain or be used for the transmission of toxic or hazardous materials regardless of the volume of said tanks and vessels and regardless of the duration of time said tanks and vessels may contain the toxic or hazardous materials and regardless of their use. All processing baths and tanks including dip tanks and rinse tanks and tanks associated with wastewater treatment located indoors shall constitute an indoor storage facility or part thereof.

2. All portable containers and tanks with an individual volume of greater than 80 gallons, stored or located indoors and used to contain toxic or hazardous materials, shall be deemed to be an indoor storage facility or part thereof and shall be subject to all of the provisions of this section and any regulations and standards promulgated pursuant hereto, and not the provisions of §760-1215 and the regulations and standards created thereunder.

B. New Storage Facilities

1. (Deleted 12/16/92)

2. It shall be unlawful to fabricate, construct or install a new indoor storage facility or part thereof unless:

a. plans and specifications for said storage facility have been first submitted to and approved by the Commissioner; and unless

b. said fabrication, construction or installation is accomplished in accordance with the approved plans and specifications submitted pursuant to subsection B.2.a above; and unless

c. said fabrication, construction or installation is accomplished in accordance with all regulations and standards which may be promulgated under this subdivision; and unless

d. the fabrication, construction or installation provides for impervious secondary containment for the new storage facility or part thereof equal to or greater than 110% of the entire volume to be contained; and unless

e. said storage facility or part thereof is fabricated, constructed or installed in a manner which will prevent the release into the ground, groundwaters or surface waters of Suffolk County of any toxic or hazardous materials; and unless

f. any open tanks or vessels containing or to contain toxic or hazardous materials within the storage facility or part thereof in a building equipped with a sprinkler system are provided with head deflectors or automatic covers or the equivalent thereof acceptable to the Commissioner to prevent the overflow of the tanks by reason of flow from the sprinkler system; and unless

g. high level alarms or other adequate means of detecting an impending overfill condition have been provided for all tanks not readily visible by the operator controlling filling.

3. It shall be unlawful to operate, maintain or use a new indoor storage facility or part thereof unless:

a. said storage facility or part thereof has been fabricated, constructed and installed in accordance with all of the provisions of subdivision B above and any regulations and standards promulgated thereunder; and unless

b. said storage facility or part thereof has been inspected prior to said operation, maintenance or use pursuant to the provisions of §760-1211.B.3.c and any regulations and standards promulgated thereunder; and unless

c. Proof of Inspection is filed with the Commissioner within thirty (30) days of the inspection conducted pursuant to subsection B.3.b above and such filing occurs prior to said operation, maintenance or use, and said Proof of Inspection conforms to all of the provisions of §760-1211.B.3.e and any regulations and standards promulgated thereunder; and unless

d. said storage facility or part thereof is operated, used or maintained in a manner which will prevent the discharge of toxic or hazardous materials therefrom into the ground, groundwaters or surface waters of Suffolk County.

4. It shall be unlawful to repair and reuse a new indoor storage facility or part thereof without complying with all of the provisions of subsection B.2 above and all regulations and standards promulgated pursuant thereto.

C. Existing Storage Facilities

1. (Deleted 12/16/92)

2. Commencing November 1, 1982, it shall be unlawful to fabricate, construct, install, modify, operate, maintain or use any indoor storage facility or part thereof which does not conform to all of the provisions of subdivision B above and all regulations and standards promulgated thereunder.

3. It shall be unlawful for any person to operate, maintain or use an existing indoor storage facility or part thereof in a manner which will allow the discharge of toxic or hazardous materials therefrom into the ground, groundwaters or surface waters of Suffolk County.

§760-1215 Portable Containers and Tanks

A. Storage Facilities

1. It shall be unlawful to fabricate, construct, install or otherwise create a storage facility or part thereof for portable containers and tanks in excess of 250 gallons total capacity containing toxic or hazardous materials if the facility has to be used for more than thirty (30) days without:

a. first having submitted satisfactory plans and specifications therefor to the

Commissioner; and without

b. constructing, installing, fabricating or otherwise creating said storage facility in accordance with the reports and plans submitted pursuant to subsection A.1.a above; and without

c. constructing, installing, fabricating or otherwise creating said storage facility so as to prevent the discharge of any of the toxic or hazardous contents of the portable containers therein to the ground, groundwaters or surface waters of Suffolk County; and without

d. providing a chemically resistant pad on which to place the portable containers or tanks, impervious to the toxic or hazardous materials being stored in said containers and tanks; and without

e. providing a complete impervious containment of the storage facility or part thereof sufficient to contain at least thirty (30%) percent of the volume to be stored; and without

f. constructing, fabricating, installing or otherwise creating a storage facility or part thereof in accordance with all regulations and standards promulgated under this subdivision.

2. It shall be unlawful for any person to use, maintain or operate a storage facility containing portable containers or tanks for the storage of toxic or hazardous materials without:

a. preventing the discharge of any of the toxic or hazardous contents of the portable containers or tanks to the ground, groundwaters or surface waters of Suffolk County; and without

b. properly securing the portable containers or tanks containing toxic or hazardous materials so as to protect them from vandalism, unauthorized access and damage by traffic, machinery or falling objects; and without

c. storing the portable containers and tanks containing toxic or hazardous materials indoors except where such storage is prevented by fire regulations, or where sufficient evidence is presented that physical or financial constraints of the facility make indoor storage impractical. Waiver of the indoor storage requirements shall be only by permission of the Commissioner; and without

d. protecting any outdoor storage of portable containers or tanks containing toxic or hazardous materials from damage from heat, cold, rust and other weather-related conditions; and without

e. complying with all regulations and standards promulgated relating to the maintenance, use or operation of a storage facility containing portable containers containing toxic or hazardous materials; and without

f. complying with all of the provisions of subdivision B below and any regulations and standards promulgated thereunder.

B. Handling of Portable Containers or Tanks

1. It shall be unlawful for the owner or other person in possession or control of a storage facility containing portable containers or tanks which contain toxic or hazardous materials:

a. to stack said portable containers or tanks more than two (2) high without using a properly designed storage rack for that purpose, or to attempt any stacking without adequate equipment; and

b. to store said portable containers or tanks in a manner so as to prevent all sides thereof from being available for inspection; and

c. to fail to maintain current inventory records indicating deliveries, consumption, sale and final disposal of all toxic or hazardous materials stored in portable containers or tanks and to maintain said records for five (5) years from the occurrence recorded; and

d. to fail to handle the said portable containers or tanks in accordance with any regulations and standards promulgated pursuant to this subdivision; and

e. to store said portable containers in numbers in excess of the maximum allowed by the approved design of the storage facility.

C. Inspections

1. It shall be unlawful for the owner or other person in possession or control of a storage facility containing portable containers or tanks for the storage of toxic or hazardous materials to fail to have said facility or part thereof containing said portable containers or tanks inspected:

a. prior to application for the renewal of a permit to operate a storage facility issued pursuant to §760-1207; and

b. subsequent to any substantial modification of the storage facility or part thereof containing said portable containers or tanks, and prior to the using or

putting into service of a storage facility or part thereof; and

c. prior to the using or putting into service of said storage facility or part thereof after repairs had been performed on it.

2. It shall be unlawful to fail to have the inspections required by subsection C.1 above performed in accordance with the provisions of §760-1211.B.3.c and all regulations and standards promulgated pursuant thereto and those promulgated under this subdivision.

3. It shall be unlawful to fail to file a Proof of Inspection with the Commissioner within thirty (30) days of the performance of an inspection required by subsection C.1 above complying with the provisions of §760-1211.B.3.e and any regulations and standards promulgated pursuant thereto.

D. It shall be unlawful for any person to repair or modify or to cause or permit said repairs or modifications of a storage facility or part thereof containing portable containers or tanks for the storage of toxic or hazardous materials without performing said repairs or modifications or to have them performed pursuant to a written protocol previously submitted to and approved by the Commissioner.

E. At the discretion of the Commissioner, §760-1215.A.1.d, e, f, and §760-1215.C, may be waived for temporary facilities such as spill cleanup operations.

F. Empty Containers

1. Once toxic or hazardous materials containers are empty and no longer in use, they must be labeled as such, and not reused unless they are properly relabeled with their contents. Unless containers are labeled empty, they must be treated as active containers.

2. Empty containers must be stored in a way that will prevent precipitation from entering the containers. Water accumulated in this manner will be presumed to be contaminated with the previous contents of the containers.

§760-1216 Bulk Storage of Toxic or Hazardous Materials

A. It shall be unlawful for any person to fabricate, construct, install, repair or modify any bulk storage facility or part thereof without doing so in accordance with a written protocol previously submitted to and approved by the Commissioner.

B. It shall be unlawful for any person to fabricate, construct, install, modify, repair, use, maintain or operate any bulk storage facility or part thereof without:

1. doing so in a manner that will prevent the toxic or hazardous materials contained therein from coming into contact with precipitation or other sources of moisture unless there is provision made for collecting and treating the leachate and runoff generated so as to prevent a discharge of toxic or hazardous materials to the ground, groundwaters or surface waters of Suffolk County and so as to prevent the development of an explosive, incendiary or other hazardous or dangerous condition; and without

2. providing for the segregation of and without segregating potentially reactive chemicals which are toxic or hazardous materials or which may react so as to form toxic or hazardous materials, which reaction may present or cause a hazardous or dangerous condition; and without

3. providing for and storing bagged toxic or hazardous materials on pallets, and within a roofed structure which prevents precipitation from reaching the bags; and

4. in the case of an indoor bulk storage facility, without providing for and providing an impervious floor without floor drains with a surrounding impervious dike so as to provide containment for hazardous or toxic materials generated from firefighting within the building; and without

5. providing for and providing adequate security so as to protect the storage facility and toxic or hazardous contents therein from vandalism and accident; and without

6. complying with any regulations and standards which may be promulgated pursuant to this section.

C. Road deicing salt and other deicing materials are toxic or hazardous materials. In addition to the foregoing provisions of this section, road deicing salt may be stored near the shore or other areas where no adverse environmental impact will occur without brine control so long as the Commissioner's approval for such a storage facility has been applied for and received in advance.

§760-1217 Reporting; Records; Clean-up; Maintenance

A. It shall be unlawful for the owner or other person in possession or control of any storage facility or part thereof to fail to report any unauthorized discharge, spill, leak or recognizable loss of toxic or hazardous materials therefrom or the failure of said storage facility to the Commissioner within two (2) hours of the time such owner or other person had sufficient evidence that he knew or should have known of said

unauthorized discharge, spill, leak, loss or failure.

1. A report to the Commissioner shall not be deemed compliance with any reporting requirement of any other federal, state or local law.

B. It shall be unlawful for the owner or other person in possession or control of any storage facility or part thereof to fail to keep records in writing reflecting the types and amounts of toxic or hazardous materials stored in the said storage facility or part thereof at any given time.

1. It shall be unlawful for the owner or other person in possession or control of any storage facility or part thereof to fail to keep records of the disposal or other transfer in or out of the said storage facility or part thereof, such records reflecting the types and amounts of toxic or hazardous materials involved in the transfer. The name and vehicle license and registration numbers of the transporter, and the intended destination must also be included if the material is waste.

2. It shall be unlawful for any person required to keep records by any provision of this Article to fail to maintain said records available for inspection by the Commissioner for at least five (5) years from the date of the event, occurrence or transaction recorded. Copies shall be provided by the owner or operator for the Commissioner if requested.

3. It shall be unlawful for any person required to keep records by any provision of this Article to fail to keep, record and maintain said records in accordance with any regulations and standards promulgated pursuant to this section.

C. It shall be the responsibility and obligation of any person who discharges, or causes or permits the discharge of any toxic or hazardous material to the ground, groundwaters or surface waters of Suffolk County to cease said discharge, to reclaim, recover and/or properly dispose of the discharged toxic or hazardous material and any other substance contaminated therefrom, to restore the environment to a condition and quality acceptable to the Commissioner, and to repair any damages caused thereby, all to the satisfaction of the Commissioner.

1. It shall be unlawful for the owner or any other person in possession or control of any source discharging toxic or hazardous materials to the ground, groundwaters or surface waters of Suffolk County to fail to cease said discharge immediately upon obtaining knowledge or notice of its existence.

2. It shall be unlawful for the owner or any other person in possession or control of any source discharging or which has discharged toxic or hazardous materials to the ground, groundwaters or surface waters of Suffolk County to fail to

reclaim, recover and/or dispose of the discharged toxic or hazardous materials. Where time permits, cleanup shall be in accordance with a written protocol previously submitted to and approved by the Commissioner.

3. It shall be unlawful for the owner or other person in possession or control of any premises or place to fail to reclaim, recover and/or otherwise dispose of any toxic or hazardous materials discharged thereto, in accordance with a written protocol previously submitted to and approved by the Commissioner, in the event the persons described in subsection C.2 above are not ascertainable or otherwise fail to comply with the provisions of subsection C.2. This provision shall not abridge any existing right of action in any person, nor shall it create any new right of action in any person.

4. It shall be unlawful for the owner or any person in possession or control of any source which has discharged toxic or hazardous materials to the ground, groundwaters or surface waters of Suffolk County to fail to restore the environment contaminated or damaged by the said discharge to its condition prior to the discharge, repairing any damages caused thereby in accordance with a written protocol previously submitted to and approved by the Commissioner.

5. It shall be unlawful for any person required by this Article or by any order of the Commissioner to reclaim, recover or otherwise dispose of discharged toxic or hazardous materials and other substances contaminated therefrom and/or to restore the environment to the condition that existed prior to the discharge of toxic or hazardous materials thereto, to fail to perform said required acts pursuant to any regulations and standards promulgated pursuant to this subdivision.

D. All storage facility appurtenances, such as level monitors, leak detection systems, cathodic protection systems, etc., shall be kept in proper operating conditions at all times. All systems shall be inspected and tested at least monthly and records kept on each inspection.

§760-1218 Confidentiality of Records

A. Any information relating to secret processes, or methods of manufacture or production, obtained in the course of an inspection or investigation, or submitted to the Department, shall be kept confidential except for the use and purpose of the Department in the enforcement of this Article and the rules and regulations promulgated thereunder.

B. In the event that a person claims to be unable to file complete reports and/or plans and specifications on the grounds that it relates to and is part of a secret

process or method of manufacture or production, an affidavit signed by an authorized person must be filed with the Commissioner, stipulating:

1. location of process or equipment, specifying the building and the section or part of the building in which it is located;

2. in general terms, the name of the process equipment;

3. means to be employed for the control of water contaminants;

4. nature and estimated rate of discharge of contaminants to the ground or surface waters:

5. authority of the person signing the affidavit;

6. a statement that the installation is related to a secret process or method of manufacture or production.

In the event any such affidavit is filed, the Commissioner shall determine the extent to which an exemption should be granted. Any information relating to secret processes, methods of manufacture or production which may be required, ascertained or discovered by the Commissioner shall not be disclosed and shall be kept confidential.

§760-1219 Posting and Labeling

A. It shall be unlawful for the owner or other person in possession or control of any place, building, land, vehicle or thing to store toxic or hazardous materials therein without conspicuously posting a notice thereat or thereon warning of the presence of such materials and providing any safety information necessary to protect the public and assist emergency response personnel in carrying out their responsibilities.

B. It shall be unlawful for any person to use, maintain or operate any storage facility or part thereof:

1. without clearly labeling the specific contents of each portable container conspicuously on said container; and

2. without clearly labeling the specific contents of each indoor and aboveground tank or vessel conspicuously thereon; and

3. without clearly labeling the specific actual, intended and possible contents of piping associated with any storage facility or part thereof at or near the points of

filling or drawing; and

4. without conspicuously posting any permit issued pursuant to this Article.

C. It shall be unlawful for any person to falsely post or label any container or storage facility or to post an invalid permit.

D. It shall be unlawful for any person to use, maintain or operate any storage facility or part thereof without complying with all regulations and standards promulgated pursuant to this section.

§760-1220 Variances and Waivers

In any case where an applicant for a permit or approval is dissatisfied with a determination of the authorized agent to act for the Commissioner, or seeks a variance or waiver from the strict application of the letter of the requirements of this Article, or standards promulgated pursuant to this Article, he may appeal from the determination of the deputy or for consideration of his application to the Board of Review in accordance with the provisions of §760-609 of the Suffolk County Sanitary Code.

(Adopted 9/12/1979; Effective 1/1/1980; Amended 7/28/1982, 8/29/1984, 4/9/1986, 1/14/1987, 10/5/1988, 4/12/1989, 11/8/1989, 1/24/1990, 5/15/1991, 12/16/1992)

Standard Operating Procedure For The Administration Of Article 12 Of The Suffolk County Sanitary Code

SOP No. 9-95 - *Pumpout And Soil Cleanup Criteria*

(January 7, 1999)

Statement of Purpose:

Article 12 of the Suffolk County Sanitary Code, requires the owner, operator or any other person in possession or control of an industrial facility to report to the Department of Health Services (the Department) any unauthorized discharge, leak or spill of toxic or hazardous material within two hours of knowledge of that discharge, leak or spill. Knowledge includes information generated during Phase I and Phase II Environmental Assessments, such as results from groundwater and soil sampling. In addition, Article 12 requires the owner, or any other person in possession or control of the source of the discharge, and/or the owner of the property onto which the discharge has occurred, to immediately cease the discharge and to reclaim, recover and dispose of the discharged material and to restore the environment to the condition that existed prior to the discharge. Since it is not always possible to achieve pre-discharge conditions, this document was generated to provide guidance when evaluating the potential impact of a discharge on the environment and to provide assistance when determining if, and to what extent, contaminated liquids and/or solids must be removed from sanitary systems, storm drains, the surface of the ground, or other locations at a facility. It was generated to be applicable to most situations; however, the Department reserves the right to apply additional requirements when warranted by conditions encountered at a particular site.

This document is not meant to represent approval by the Department of any remedial activities, or to represent the Department's determination that a site either does or does not require remediation. All spills, leaks, or discharges of toxic or hazardous materials, as defined by §760-1203 of the Sanitary Code, must be reported to the Office of Pollution Control, which will have the sole authority to make the determination as to what, if any, cleanup will be required. When assessing the need for cleanup at a specific site, the Department will consider all human health and environmental factors that are available. In many cases, site specific cleanup criteria may vary from the values listed in this SOP. Be advised that, in addition to meeting the Suffolk County Department of Health Services (SCDHS) requirements, the responsible party must meet the requirements of the New York State Department of Environmental Conservation (NYSDEC) and the United States Environmental Protection Agency (USEPA).

Criteria:

Table 1 lists Action Levels and Cleanup Objectives for Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (Semi-VOCs) and heavy metals commonly found in both liquid and solid samples. When the concentration of a single contaminant, or a class of contaminants such as total petroleum hydrocarbons, meets or exceeds the "Action Level", a cleanup, or other action, is required.

As stated in the Sanitary Code, the goal of any remedial action required by this Department, is to return the site to pre-discharge conditions. If this is not possible, at a minimum, the cleanup must ensure reasonable protection for public health and the drinking water supply. Therefore, under most conditions, the contaminant concentration in the soil after a cleanup, should not exceed the values indicated in the "Cleanup Objective" column.

Table 1. Cleanup Criteria

SAMPLE TYPE	CONTAMINANT	ACTION LEVEL	CLEANUP OBJECTIVE
Liquid	Volatile Organics (VOCs) or Metals*	100 x Discharge Standard or 1000 ppb Total VOCs	(1)
Soil/Sludge	Volatile Organics (VOCs)	Appendix A or 15,000 ppb total VOCs.	Appendix A or 10,000 ppb total VOCs
	Metals*	Appendix B	Appendix B
	TPH	500 ppm (2)	500 ppm (2)
	Semi-VOCs	Appendix A	Appendix A

* Laboratory analysis for heavy metals must be performed by acid digestion for "total metals". TCLP, or other extraction methods, are not to be used for this purpose.

(1) - *Liquid Endpoint Samples*

Liquid endpoint samples must be collected when groundwater is encountered during a cleanup operation. If the concentration of VOCs, or metals, in the sample meets, or exceeds 100 times the discharge standard for a specific parameter, or the total VOC concentration meets, or exceeds 1000 ppb, a groundwater sample must be collected immediately downgradient of the point of contamination to determine if there has been an impact on the groundwater. If significant groundwater contamination is found, a more extensive groundwater investigation will be required. The Department reserves the right to require the installation of monitoring well(s) at lower contaminant levels based on the type of contaminant encountered and other site specific conditions.

(2) - Remediation Based on Total Petroleum Hydrocarbon (TPH) Concentration.

Although the analysis is not normally required by this Department, if TPH analysis is performed on a sample where all VOC and heavy metal parameters are within guidance values, and the TPH concentration is greater than, or equal to, 500 ppm, the responsible party must provide the Department with a semi-volatile (base/neutral) analysis of the effected soil. The results of this analysis will then be compared with the semi-volatile organic values listed in Appendix A, subject to a maximum allowable total semi-volatile concentration of 500 ppm. In summation, soil containing a TPH concentration below 500 ppm will normally be allowed to remain in place if no individual constituent meets, or exceeds its guidance value listed in either Appendix A or B, the total VOC concentration does not equal, or exceed 10 ppm and the material does not exhibit a petroleum odor.

NOTE: In order to perform an adequate environmental evaluation, the Department may, in certain instances, require additional analysis to be performed based on the chemicals stored, or in use, at a site. This can include TPH, cyanides, phenols, PCBs, pesticides and/or a more extensive list of heavy metals, VOCs and/or Semi-VOCs.

Other factors to be considered when evaluating a site :

In many instances, additional information is available which the Department will utilize when establishing cleanup goals, or action levels, for a specific site. Some factors that are considered when reviewing site specific conditions to decide if cleanup goals should be set higher or lower than the guidance values listed in this document include, but are not be limited to:

Site history - Past discharge practices, as well as the extent and type of discharge, should be evaluated.

Site location - If the facility is in a water sensitive area, more stringent cleanup goals may be warranted.

Distance to groundwater - This guidance document assumes a 100 fold reduction in contaminant concentration between the source area and the drinking water supply. If the distance between the contamination and the groundwater is less than three feet, or a drinking water supply well is located nearby, the guidance values listed may not provide adequate protection for the water supply.

Impact of discharge - If the Magothy aquifer, shallow drinking water wells or sensitive surface waters may be effected, more stringent cleanup criteria may be necessary.

TCLP analysis - If the listed cleanup objectives can not be obtained, TCLP analysis may provide assistance in determining site specific conditions and/or cleanup goals.

Monitoring well data - If groundwater degradation can be attributed to the contamination, more conservative cleanup goals should be established.

Future use of site - Although it is not this department's policy to allow pockets of contamination to remain in the ground throughout the county, in certain cases, where the cleanup objectives listed in this document can not be achieved, higher concentrations of contaminants may be allowed to remain in place if the site is to be stabilized in a manner acceptable to the Office of Pollution Control. In these instances, land, or deed, restrictions may be required.

APPENDIX A
CLEANUP OBJECTIVES AND ACTION LEVELS FOR VOLATILE ORGANICS (UG/KG)

(see note A-1)

Contaminant	Action Levels (ppb)	Cleanup Objectives (ppb)
Acetone	**	**
Benzene	120	60
Bromobenzene	1,600	800
Bromochloromethane	400	200
Bromodichloromethane	600	300
Bromoform	1000	500
n-Butylbenzene	6,800	3,400
sec-Butylbenzene	10,000	5,000
tert-Butylbenzene	6,800	3,400
CarbonTetrachloride	1,200	600
Chlorobenzene	3,400	1,700
Chloroethane	400	200
Chloroform	600	300
Chlorotoluene(s)	3,600	1,800
Dibromochloromethane	600	300
1,2-Dibromo-3-chloropropane	1,000	500
1,2-Dibromoethane	600	300
Dibromomethane	400	200

o-(1,2)-Dichlorobenzene	15,000	8,000
m-(1,3)-Dichlorobenzene	3,200	1,600
p-(1,4)-Dichlorobenzene	15,000	8,000
Dichlorodifluoromethane	600	300
1,1-Dichloroethane	400	200
1,2-Dichloroethane	200	100
1,1-Dichloroethene	800	400
cis-1,2-Dichloroethene	600	300
trans-1,2-Dichloroethene	600	300
1,2-Dichloropropane	600	300
1,3-Dichloropropane	600	300
2,2-Dichloropropane	600	300
1,1-Dichloropropene	600	300
cis-1,3-Dichloropropene	600	300
trans-1,3-Dichloropropene	600	300
p-Diethylbenzene	7,600	3,800
Ethylbenzene	11,000	5,500
p-Ethyltoluene	3,600	1,800
Freon113	12,000	6,000
Hexachlorobutadiene	15,000	10,000
Isopropylbenzene	5,200	2,600
p-Isopropyltoluene	7,800	3,900
MethyleneChloride	200	100
(MTBE)tert-Butylmethylether	1,200	600
Methylethylketone	600	300
Methylisobutylketone	2,000	1,000
Naphthalene	15,000	10,000
n-Propylbenzene	5,000	2,500
Styrene	2,000	1,000
1,1,1,2-Tetrachloroethane	600	300
1,1,2,2-Tetrachloroethane	1,200	600
Tetrachloroethene	2,800	1,400
1,2,4,5-Tetramethylbenzene	15,000	10,000
Toluene	3,000	1,500

1,2,3-Trichlorobenzene	6,800	3,400
1,2,4-Trichlorobenzene	6,800	3,400
1,1,1-Trichloroethane	1,600	800
1,1,2-Trichloroethane	600	300
Trichloroethene	1,400	700
Trichlorofluoromethane	1,600	800
1,2,3-Trichloropropane	800	400
1,2,4-Trimethylbenzene	4,800	2,400
1,3,5-Trimethylbenzene	5,200	2,600
VinylChloride	400	200
Xylene(s)	2,400	1,200

Semi-Volatile Organics

Contaminant	Action Levels (ppb)	Cleanup Objectives (ppb)
Acenaphthene	75,000	50,000
Anthracene	75,000	50,000
Benzo(a)anthracene	6,000*	3,000*
Benzo(b)fluoranthene	2,200*	1,100*
Benzo(k)fluoranthene	2,200*	1,100*
Benzo(g, h, i)perylene	75,000	50,000
Benzo(a)pyrene	22,000*	11,000*
Chrysene	800	400
Dibenzo(a,h)anthracene	75,000*	50,000*
Fluoranthene	75,000	50,000
Fluorene	75,000	50,000
Indeno(1,2,3-cd)pyrene	6,400	3,200
Phenanthrene	75,000	50,000
Pyrene	75,000	50,000

**If direct human exposure from ingestion or inhalation is a concern, the human health guidance values published by the USEPA should be used to formulate a cleanup goal, if that value is lower than the "Cleanup Objective" listed in this document.*

*** Due to its relatively short half life in nature, if acetone is the only contaminant of concern in a sample, the primary response should be to determine and*

eliminate the source of the acetone discharge. The requirement to perform a remediation will be determined on a case by case basis.
Note A-1: Organic contaminants were evaluated in a manner consistent with the New York State Department of Environmental Conservation's Technical and Administrative Guidance Memorandum, (TAGM) HWR-94-4046. Cleanup objectives were calculated using the following relationship, subject to maximum contaminant concentrations of 10 ppm for total VOCs, 50 ppm for individual semi-VOCs and 500 ppm total semi-VOCs. Action levels were generally set at twice the cleanup objective, subject to maximum contaminant concentrations:

$\mathbf{C_s = (D)(f)(C_w)(K_{oc})}$
Where:
C_s = Allowable Soil Concentrations (ppb)

D = Dilution Attenuation Factor of 100

f = organic fraction in soil (assumed to be 1%, or 0.01)

C_w = Water Quality Value (6NYCCR 703.5, or TOGS 1.1.1) in ppb

K_{oc} = Organic Carbon Partition Coefficient (an approximation of the propensity of a compound to adsorb to organic matter in the soil)

APPENDIX B

SOIL CLEANUP OBJECTIVES AND ACTION LEVELS FOR HEAVY METALS (MG/KG)

(see Note B-1)

Contaminant	Action Levels	Cleanup Objective	Background Concentrations Eastern USA
Arsenic	25.0	7.5	3.0 - 12
Beryllium	8.0	1.6	0.0 - 1.75
Cadmium	10.0	1.0	0.1 - 1
Chromium	100.0	10.0	1.5 - 40
Copper	500.0	25.0	1.0 - 50
Lead	400.0	100.0	4.0 - 61
Mercury	2.0	0.1	0.001 - 0.2
Nickel	1000.0	13.0	0.5 - 25
Silver	100.0	5.0	N/A

Note B-1: Certain metals, such as aluminum, iron and manganese, appear naturally in Long Island soils and are not considered to be significant under most conditions. Other metals will be evaluated on a case by case basis.

GUIDELINES FOR EQUIPMENT AND PROCEDURES FOR THE REMEDIATION OF CONTAMINATED LEACHING POOLS

BACKGROUND:

As part of its groundwater protection program, the Suffolk County Department of Health Services (the Department) routinely reviews industrial waste disposal practices at commercial facilities throughout the county. As part of the evaluation, the septic tanks and/or leaching pools associated with sanitary systems, floor drains, storm water runoff etc. are often sampled for the presence of toxic or hazardous materials. (For the purpose of this document, storm drains, dry wells, sanitary pools and "Class V Injection Wells" will all be referred to as leaching pools.) If the level of contamination exceeds the Department's "action levels" (see SOP 9.95), the person(s) responsible for the discharge and/or those in possession and/or control of the property will be required to remove the contaminants from the leaching pool. This is done in order to prevent the contaminants from ultimately leaching into groundwater, which is the sole source of the drinking water supply for Suffolk County.

Since available removal and/or remediation techniques may vary depending on the site-specific conditions and the capabilities of contractors, the responsible parties should discuss their remediation plan with the Department's representative prior to initiating any remedial activity.

REQUIREMENTS UNDER THE LAW:

Section 760-1217 of the Suffolk County Sanitary Code requires:

1) the person(s) who discharge(s),
2) the person(s) in possession or control of the source of a discharge and/or
3) the person(s) in possession or control of a premises that has had a discharge of toxic or hazardous material

to reclaim, recover and dispose of the discharged toxic or hazardous material and any substances contaminated by them. Where time permits, this cleanup must be in accordance with a written protocol previously submitted to and approved by the Commissioner.

The Department will allow the use of this document in lieu of the required written protocol. Minor changes may be permitted, but only with prior approval from this office. Any major deviation from these procedures will require the submission of a site specific written protocol.

PLANNING:

Thorough planning prior to the initiation of cleanup activities will expedite the project and help ensure that all required work is accomplished. The following concerns should be considered in this process:

1) Selecting a contractor
2) Determining the extent of the contamination
3) Sample collection and analysis
4) Remediation techniques
5) Safety
6) Waste storage and disposal
7) Permits
8) Closure

A careful review of this planning step with a representative of the Department may help to prevent excessive delays, which may result in needless penalties and/or additional costs.

SELECTING A CONTRACTOR:

Performing the remediation of a leaching pool includes the removal of contaminated material from the leaching pool and the transportation of this material from the site to a suitable disposal facility. In order to do this work, you should hire a company properly equipped and permitted to perform the work **or** an environmental consultant who is capable of coordinating the necessary work through subcontractors.

The Department does not recommend contractors. It is up to the responsible parties to evaluate their needs and capabilities of the contractors under consideration. Costs will vary between contractors based on a number of factors including but not limited to hourly rates for personnel and equipment, laboratory fees and transportation/disposal costs. Therefore, you may wish to secure written estimates for the remediation from several contractors in order to compare the costs. Questions, which should be addressed, include:

1) How complex is the task? i.e., Do other structures need to be located and sampled? Will groundwater be encountered?

2) Which phases of the job can the responsible parties handle directly?

3) Which phases will have to be contracted or subcontracted?

4) How will the waste be classified, since this effects the cost of its disposal?

5) Where is the ultimate disposal site?

DETERMINING THE EXTENT OF THE CONTAMINATION:

The Department assumes that if contaminants are discovered in one structure within a leaching system, then all portions of the system contain similar contaminants. The Department will, therefore, require all associated septic tanks, distribution boxes and leaching pools be remediated if sufficiently high levels of contamination are found in the original sample. Therefore, the responsible parties or their contractors must determine the number and types of structures in the system.

The requirement to remediate specific structures within a leaching system may be waived if it can be demonstrated that these structures do not contain levels of contamination which exceed the Department's action levels as defined by SOP 9.95. In order to determine the level of contamination in a leaching pool, septic tank or other portion of the system, samples must be collected and analyzed (see below). The Department will then determine the need for remediation based on the results of the sample analyses.

Determining the depth of the contamination both within and below the bottom of specific structures prior to performing a cleanup is possible. However, since most cleanups are found to be satisfactory after excavating to visually clean soil, determining the depth of the contamination is usually required only after the removal of contaminated material has approached a point where the structural integrity is in jeopardy or safety considerations have been compromised.

SAMPLING AND ANALYSIS:

It will be necessary to take samples from the leaching pool(s) at several points during the process of remediation. Initial samples are taken to determine the extent of contamination prior to the actual removal of contaminated material. Waste characterization samples are taken by the contractor for the purpose of complying with state and federal transportation and disposal laws. Post-excavation or end point samples are taken from the sediments remaining after the removal of known contaminated materials and are used to determine the effectiveness of the remediation and/or the need for additional removals.

It is the usual practice of the Department to require initial samples of both the liquid and sludge portions of the waste in a pool. These samples are then analyzed for volatile organic compounds (VOCs) by EPA method 8240 or 8260 and total heavy metals by acid digestion. The parameters included in these analyses are listed in Tables 1 and Tables 2 below. Additional testing may be required by the Department as warranted.

Waste characterization tests may have to be performed on the extracted material to determine possible disposal sites. A representative sample of the waste must be obtained and submitted to a state certified laboratory for analysis. Waste characterization samples may include analyses for flash point, corrosivity, reactivity and leachability (TCLP). These analyses are not required by the Department but may be required by the disposal facility and are taken at the discretion of the contractors responsible for the transportation and disposal of the contaminated material.

In general, the cleanup operation proceeds until either visibly clean soil is encountered or the excavation is determined, by the firm's representative, to be unsafe. End point samples must then be collected and analyzed using the same methods used for the initial samples. The results of these analyses are reviewed by the Department to determine if additional remediation will be necessary or if "no further action" will be required.

If groundwater is encountered, a sample of the water entering the excavation must also be collected. Unless other arrangements are made in advance, these samples must be analyzed for the same parameters and by the same methods listed above and/or others as required by this Department. Results of these analyses must be submitted to the Department for review.

When additional sampling and/or remediation is to be done, the activities must be witnessed by a representative of the Department. Therefore, it will be necessary to establish a mutually agreeable time with the Department's representative scheduling any field activities. The Department reserves the right to split samples at any time. Any variation of the above protocol must be approved by the Department in advance.

REMEDIATION TECHNIQUES:

In most cases, excavation of the contaminated material is the quickest, the most thorough and the most cost effective method of addressing a problem. This normally requires the use of a pumper truck to extract the liquid portion of a pool and a "super sucker", "guzzler" or similar vactor truck for removing sludge/soil. Depending on site-specific conditions, "orange peelers", backhoes and cranes may also be used.

Scraping and/or powerwashing the sidewalls of a pool may also be necessary to remove residual contamination. A high pressure, low volume power washing unit is generally the most efficient and cost effective method to remove residue on the walls of a pool. Again, site specific conditions should be reviewed with a representative of the Department prior to initiating the cleanup.

Be advised that aeration and/or chemical treatment of any subsurface leaching system to enhance the leachability of hazardous material is a violation of Article 12 of the Suffolk County Sanitary Code.

In order to adequately clean a contaminated pool, the pool's collar or dome may have to be removed, especially if the cover is off center. In some cases the contamination may be so extensive that ring removal is also necessary. These possibilities should be discussed with the Department so that the required equipment is available at the site.

Some older leaching pools are constructed of tiers of concrete block or brick. These pools are subject to collapse as bottom sediments are removed. Should such a pool collapse during the course of a remediation it may be necessary to replace the leaching pool. The contractor must be prepared for this possibility.

If satisfactory soil/groundwater conditions can not be attained by removal techniques, soil venting or groundwater treatment may be necessary. A subsurface site investigation, including the installation of soil borings and/or monitoring wells may be required in order to make this determination.

SAFETY:

Although the Department of Health Services does not enforce the standards established by the Office of Safety and Health Administration (OSHA), all work must be performed in compliance with OSHA regulations especially 29 CFR Section 1910.

Certain activities, such as lowering an employee into a leaching pool to perform the cleanup, are considered confined space entries, which increase the level of risk to which the worker is exposed. These activities are prohibited without strict adherence to 29 CFR 1910.134. Air monitoring equipment, respiratory protection, safety lines, a worker extraction system etc. must be provided.

As stated above, older block pools are more susceptible to collapse, especially during and after remediation. Since removal of the underlying soil increases the probability of pool collapse, the Department strongly recommends replacing block pools with precast rings. If the pool is intended to remain in use after the cleanup has been performed, a qualified professional should certify the integrity of the structure.

If the Department's representative witnesses any conditions that are interpreted as unsafe, the contractor will be notified to take corrective action. If the contractor fails to correct the problem noted, the inspector will leave the site without approving the cleanup. In addition, OSHA will be notified of the activity and take whatever action it deems necessary to resolve the matter.

WASTE STORAGE AND DISPOSAL:

At certain contaminant levels, liquid and/or sludge wastes may be acceptable for disposal at the Bergen Point Sewage Treatment Facility. Approval from the Suffolk County Department of Public Works (SCDPW) is required **prior** to disposal at the Bergen Point Sewage Treatment Facility. Contact Robert Falk (631) 852-4107 or Kevin Oldham (631) 852-4108 of the SCDPW for approval prior to pumping this material.

If any portion of the contaminated material is allowed at the Bergen Point Sewage Treatment Facility, a regular cesspool pump truck can be used.

If the liquid portion is not acceptable to SCDPW, it must be removed and disposed of, along with the sludge, by a licensed industrial waste transporter. A partial list of State approved transporters is included to assist you in your efforts. Additional industrial waste transporters are listed in the phone book under several headings including "Environmental Services" and "Waste Disposal". You may also contact the Solid Waste Unit of the New York State Department Environmental Conservation (DEC) in Stony Brook at (631) 444-0375 or in Albany at (518) 457-3254 to confirm that the hauler can transport the material. Be advised that it is the responsibility of the generator of the waste to ensure that the transporter is licensed to handle the material.

The transportation of the contaminated material from the site will require the use of appropriate containment vessels. In some cases, the vehicles removing the material from the ground are permitted to transport the material from the site. In other cases, secondary vessels such as Department of Transportation (DOT) approved drums or liquid tight "rolloff" containers specifically designed for this purpose may be used. The containers must be free of residual waste from prior usage. Once filled, they must be immediately labeled to indicate their contents and properly sealed.

Immediate removal of contaminated material from the site may not always be possible. Should delays in the disposal of contaminated material be encountered the material must stored in properly sealed and labeled drums and/or rolloff containers. Storage of this material on tarps is not acceptable. The storage of this waste on site may lead to odor and/or other regulatory problems. Permits may be required by county, state and federal agencies for the extended storage of industrial and/or hazardous wastes. It is, therefore, best to have this material removed by a licensed hauler as quickly as possible.

In order for the cleanup to be considered complete, copies of all disposal receipts must be submitted to this office.

PERMITS:

Since the remediation will result in the generation of a quantity of contaminated liquid, soil and/or sludge, you may be required to obtain a Federal Industrial Waste Generator's Permit. You should contact Mr. Jack Hoyt of the USEPA, RCRA Programs, at (212) 637-4106 and request form #8700-12.

As discussed above under Waste Storage and Disposal, transporters must be permitted to transport contaminated material from the site.

CLOSURE:

Upon acceptable completion of the remediation, sanitary pools will be allowed to remain in use for sanitary wastes only. Likewise, storm drains adequately cleaned will be allowed to remain in use exclusively for collection of storm water. Floor drain leaching pools, on the other hand, must be abandoned after the remediation. This can be accomplished by filling the pool with a clean inert material such as sand and permanently sealing it with concrete or other material. The continued use of the pool as a storm drain after the remediation must be approved by the Department.

SUMMARY:

During the entire remediation process, from the planning stage through the final closure, it is imperative that the Department is kept informed. All variations from the above protocol must be discussed with this office and approved in advance. The responsible parties and/or their contractors must work out mutually agreeable times with the Department's contact person prior to performing any field activities. If the Department's contact person can not be reached, call either the office's general number (631) 854-2501 or FAX the information to (631) 854-2505.

Table 1. Volatile Organic Compound (VOC) Analytes	
Acetone	cis-1,3-Dichloropropene
Acrylonitrile	trans-1,3-Dichloropropene
t-Amyl methyl ether	1,1-Dichloropropene
Benzene	Diethyl ether
Bromobenzene	p-Diethylbenzene
Bromochloromethane	Ethylbenzene
Bromodichloromethane	p-Ethyltoluene
Bromoform	Freon 113
Bromomethane	Hexachlorobutadiene
t-Butyl ethyl ether	Hexane
n-Butylbenzene	Isopropylbenzene
sec-Butylbenzene	p-Isopropyltoluene
tert-Butylbenzene	Methyl ethyl ketone
Carbon disulfide	Methyl iodide
Carbon Tetrachloride	Methyl isobutyl ketone
Chlorobenzene	Methyl methacrylate
Chlorodifluoromethane	Methyl tert-Butyl Ether(MTBE)
2-Chloroethyl vinyl ether	Methylene Chloride
Chloroform	Naphthalene
Chloromethane	Nonane
Chlorotoluene(s)	Octane
trans-Decahydronaphthalene	n-Propylbenzene
cis-Decahydronaphthalene	Styrene
Decane	1,1,1,2-Tetrachloroethane
1,2-Dibromo-3-chloropropane	1,1,2,2-Tetrachloroethane
Dibromochloromethane	Tetrachloroethene
1,2-Dibromoethane	Tetrahydrofuran
Dibromomethane	1,2,4,5-Tetramethylbenzene
1,2-Dichlorobenzene	Toluene
1,3-Dichlorobenzene	1,2,3-Trichlorobenzene
1,4-Dichlorobenzene	1,2,4-Trichlorobenzene
Dichlorodifluoromethane	1,1,1-Trichloroethane
1,1-Dichloroethane	1,1,2-Trichloroethane
1,2-Dichloroethane	Trichloroethene
cis-1,2-Dichloroethene	1,2,3-Trichloropropane
trans-1,2-Dichloroethene	1,2,4-Trimethylbenzene
1,1-Dichloroethene	1,3,5-Trimethylbenzene
1,2-Dichloropropane	Undecane
1,3-Dichloropropane	Vinyl chloride
2,2-Dichloropropane	Xylene(s)

Table 2. Metal Analytes
Arsenic
Cadmium
Chromium
Chromium +6 (if Total Chromium is found)
Copper
Lead
Manganese
Nickel
Silver
Zinc

Other* Oil/Grease, Cyanide, TPH, PCB, Pesticides, other Volatile Organics, Semi-Volatile Organics, Mercury and Other Heavy Metals, and other parameters maybe required on a case by case basis.

*If specifically required based on individual site conditions.

Exhibit 4

ORC Application Information

OVERVIEW



Product

ORC is a proprietary formulation of phosphate-intercalated magnesium peroxide that time releases oxygen when hydrated.

Purpose

To supply oxygen to accelerate the rate of naturally occurring aerobic contaminant biodegradation in groundwater and saturated soils.

Functionality

ORC is typically applied using direct-injection techniques. This process requires ORC to be mixed with water to form an injectable slurry which is then pressure injected (using a pump), into the zone of contamination. Once in the aquifer, ORC particles will sorb to or reside in the soil matrix and slowly release oxygen for periods of up to 1 year. ORC is also available in 2", 4" and 6" filter socks that can be emplaced in wells and removed when exhausted. Upon removal the old socks can be replaced with new ones to rejuvenate the oxygen supply and maintain aerobic biodegradation as needed.

Product Specifications

- A powdery material less than 10 microns in diameter
- Composition - Magnesium Peroxide (MgO_2)
- Non-hazardous, food grade product
- Intercalated design allows for slow-release of oxygen without "lock-up"
- Releases 10% of its weight as oxygen when hydrated
- Packaged and delivered in 30 lb. PVC buckets

By-Products

- "Milk of magnesia" or $Mg(OH)_2$ a common antacid formula

Field Applications

- Straight powder application in excavations
- ORC and water mixture (slurry) application in excavations
- Replaceable filter socks for single well and barrier applications
- Directly-injectable slurry (most common) for source area and permeable reactive barrier applications

Benefits of Use

- Slow-release of molecular oxygen to support aerobic microbial activity
- Long-term source of oxygen to the subsurface (up to 12 months)
- Clean, low-cost, non-disruptive application (direct-push or socks)
- Direct Injection not limited by presence of surface structures
- No Operations and Maintenance
- Faster and often lower cost than drawn out natural attenuation approaches
- Complimentary product application design and site analysis from Regenesis

LE
Ha
Ex
Yo

SI
EV
Re
Ev
Us
or
Sit

Brochure

ORC Br

Application Considerations

- Contaminant mass
- Groundwater Flow Rates
- Distribution of oxygen in the aquifer
- Longevity

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HRC HYDROGEN RELEASE COMPOUND

MATERIAL SAFETY DATA SHEET

A printable PDF version of the MSDS is available here.

MATERIAL SAFETY DATA SHEET

Last Revised: March 10, 2003

Section 1 - Material Identification

Supplier:	Regenesis Bioremediation Products, Inc. 1011 Calle Sombra San Clemente, CA 92673
Telephone:	(949) 366-8000
Facsimile:	(949) 366-8090
Email:	info@regenesis.com
Chemical Name:	Glycerol Tripolylactate
Chemical Family:	Organic Chemical
Trade Name:	Hydrogen Release Compound (HRC®)

Section 2 - Chemical Identification

CAS#	Compound	Percent Composition
201167-72-8	Glycerol Tripolylactate	52.5 - 65.0%
56-81-5	Glycerol	35.0 - 47.5%

Section 3 - Physical Data

Melting Point:	NA
Boiling Point:	ND

LE
Ha
Ex
Yo

SI
EV
Re
Ev
Us
or
Sit

Brochure
HRC Br

Flash Point:	ND
Density:	1.347
Solubility:	Acetone and DMSO
Appearance:	Amber semi-solid
Odor:	Not detectable
Vapor Pressure:	None

Section 4 - Fire and Explosion Hazard Data

Extinguishing Media: Carbon Dioxide, Dry Chemical Powder or Appropriate Foam.

Water may be used to keep exposed containers cool.

For large quantities involved in a fire, one should wear full protective clothing and a NIOSH approved self contained breathing apparatus with full face piece operated in the pressure demand or positive pressure mode as for a situation where lack of oxygen and excess heat are present.

Section 5 - Toxicological Information

Acute Effects: May be harmful by inhalation, ingestion, or skin absorption.

May cause irritation. To the best of our knowledge, the chemical, physical, and toxicological properties of the glycerol tripolylactate have not been investigated. Listed below are the toxicological information for glycerol and lactic acid.

RTECS#: MA8050000
Glycerol

Irritation data:	SKN-RBT 500 MG/24H MLD	85JCAE-,207,1986
	EYE-RBT 126 MG MLD	BIOFX* 9-4/1970
	EYE-RBT 500 MG/24H MLD	85JCAE-,207,1986
Toxicity data:	ORL-MUS LD50:4090 MG/KG	FRZKAP (6),56,1977
	SCU-RBT LD50:100 MG/KG	NIIRDN 6,215,1982
	ORL-RAT LD50:12600 MG/KG	FEPRA7 4,142,1945
	IHL-RAT LC50: >570 MG/M3/1H	BIOFX* 9-4/1970
	IPR-RAT LD50: 4420 MG/KG	RCOCB8 56,125,1987
	IVN-RAT LD50:5566 MG/KG	ARZNAD 26,1581,1976
	IPR-MUS LD50: 8700 MG/KG	ARZNAD 26,1579,1978
	SCU-MUS LD50:91 MG/KG	NIIRDN 6,215,1982
	IVN-MUS LD50: 4250 MG/KG	JAPMA8 39,583,1950

	ORL-RBT LD50: 27 GM/KG	DMDJAP 31,276,1959
	SKN-RBT LD50:>10GM/KG	BIOFX* 9-4/1970
	IVN-RBT LD50: 53 GM/KG	NIIRDN 6,215,1982
	ORL-GPG LD50: 7750 MG/KG	JIHTAB 23,259,1941

Target Organ data: Behavioral (headache), gastrointestinal (nausea or vomiting), Paternal effects (spermatogenesis, testes, epididymis, sperm duct), effects of fertility (male fertility index, postimplantation mortality).

RTECS#: OD2800000
Lactic acid

Irritation data:	SKN-RBT 5MG/24H SEV	85JCAE -,656,86
	EYE-RBT 750 UG SEV	AJOPAA 29,1363,46
Toxicity data:	ORL-RAT LD50:3543 MG/KG	FMCHA2-,C252,91
	SKN-RBT LD50:>2 GM/KG	FMCHA2-,C252,91
	ORL-MUS LD50: 4875 MG/KG	FAONAU 40,144,67
	ORL-GPG LD50: 1810 MG/KG	JIHTAB 23,259,41
	ORL-QAL LD50: >2250 MG/KG	FMCHA2-,C252,91

Only selected registry of toxic effects of chemical substances (RTECS) data is presented here. See actual entry in RTECS for complete information on lactic acid and glycerol.

Section 6 - Health Hazard Data

Handling: Avoid continued contact with skin.
Avoid contact with eyes.

In any case of any exposure which elicits a response, a physician should be consulted immediately.

First Aid Procedures:

Inhalation:	Remove to fresh air. If not breathing give artificial respiration. In case of labored breathing give oxygen. Call a physician.
Ingestion:	No effects expected. Do not give anything to an unconscious person. Call a physician immediately.
Skin Contact:	Flush with plenty of water. Contaminated clothing may be washed or dry cleaned normally.
Eye contact:	Wash eyes with plenty of water for at least 15 minutes lifting both upper and lower lids. Call a physician.

Section 7 - Reactivity Data

Conditions to Avoid: Strong oxidizing agents, bases and acids

Hazardous Polymerization:	None known
Further Information:	Hydrolyses in water to form Lactic Acid and Glycerol.

Section 8 - Spill, Leak or Accident Procedures

After Spillage or Leakage:	Neutralization is not required. This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber.
Disposal:	Laws and regulations for disposal vary widely by locality. Observe all applicable regulations and laws. This material, may be disposed of in solid waste. Material is readily degradable and hydrolyses in several hours.

No requirement for a reportable quantity (CERCLA) of a spill is known.

Section 9 - Special Protection or Handling

Should be stored in plastic lined steel, plastic, glass, aluminum, stainless steel, or reinforced fiberglass containers.

Protective Gloves:	Vinyl or Rubber
Eyes:	Splash Goggles or Full Face Shield Area should have approved means of washing eyes.
tilation:	General exhaust.
Storage:	Store in cool, dry, ventilated area. Protect from imcompatible materials.

Section 10 - Other Information

This material will degrade in the environment by hydrolysis to lactic acid and glycerol. Materials containing reactive chemicals should be used only by personnel with appropriate chemical training.

The information contained in this document is the best available to the supplier as of the time of writing. Some possible hazards have been determined by analogy to similar classes of material. No separate tests have been performed on the toxicity of this material. The items in this document are subject to change and clarification as more information becomes available.

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REGENESIS ONLINE APPLICATION DESIGN SOFTWARE

- Excavations | Load Defaults | Imperial (U.S.) Units

ORC DESIGN SOFTWARE FOR EXCAVATION APPLICATIONS

Notes on Software Use:

- Use the **Tab** key or the mouse to move between fields. Note that the **Tab** key will move between all fields (including read-only output fields).
- Pressing **Enter** will submit the form, performing the same action as the "Save Calculator Results" at the bottom of the page. Note that posting data to the server may take time (especially on a slow connection); consider using **Tab** or the mouse to move between fields, rather than pressing **Enter**.
- "Saved" data in the Calculator only persists as long as this browser window remains open; note that there is a six hour inactivity timeout, after which all 'saved' calculator data is discarded. To permanently save your results, select "Save and Submit Calculator Results to Regenesis", which will email you a link from which you can later access your results at any time.
- The Software will not update calcuations until focus is removed from the field that is being edited (e.g. by selecting a new field, pressing **Tab**, or clicking elsewhere on the page) or when the calculator is saved by pressing **Enter**.
- Some printer-browser combinations have problems printing the results of the Software directly (via the File menu). You may need to select 'Print Preview' in your browser before selecting 'Print' (from within the 'Print Preview' interface).

Validation indicators:

= The data present in this field is valid.

= The entered data is invalid. It may be non-numeric, out of range, or is otherwise an unacceptable value for this field.

= One or more dependencies of this field are invalid. Check the form for invalid input fields.

= The validity of this field is unknown.

Site Conceptual Model / Extent of Plume Requiring Remediation

Planned Excavation:

Width of planned excavation	70	ft		
Length of planned excavation	170	ft =	11900	ft^2
Thickness of saturated zone to be excavated	6	ft =	71400	ft^3
GW Plume:				
Width of plume containing contaminant:	75	ft		
Length of plume containing contaminant:	350	ft =	26250	ft^2
Thickness of contaminated saturated zone:	10	ft	262500	ft
Total porosity:	0.3			
Plume Pore Volume:	78750	ft^3 =	589129	gallons

Dissolved Phase Oxygen Demand:	Contaminant		Stoich. (wt/wt)	ORC (lbs)
Individual species that represent oxygen demand:	Conc (mg/L)	Mass (lbs)	O_2/contam.	(10% O_2)
P ene	0.00	0.0	3.1	0
Toluene	0.60	2.9	3.1	91
Ethylbenzene	0.60	2.9	3.2	94

Xylenes	3.30	16.2	3.2	519
MTBE	0.00	0.0	2.7	0
User-Added (Please add Stoichometric Demand)	0.00	0.0	0.0	0
User-Added (Please add Stoichometric Demand)	0.00	0.0	0.0	0
Measures of total oxygen demand:				
Total Petroleum Hydrocarbons	5.00	24.6	3.1	761
Biological Oxygen Demand (BOD)	30.00	147.4	1.00	1474
Chemical Oxygen Demand (COD)	60.00	294.7	1.00	2947

Estimates for Sorbed Phase Oxygen Demand:

Soil bulk density: 1.76 g/cm^3 = 110 lb/cf

Fraction of organic carbon: foc: 0.001 range: 0 to 0.01

(Estimated using Soil Conc=foc*Koc*Cgw)

(Adjust Koc as nec. to provide realistic est.)

Individual species that represent oxygen demand:	Koc (L/kg)	Contaminant Conc (mg/L)	Contaminant Mass (lbs)	Stoich. (wt/wt) O_2/contam.	ORC (lbs) (10% O_2)
Benzene	96	0.00	0.0	3.1	0
Toluene	135	0.08	1.7	3.1	53
Ethylbenzene	95	0.06	1.2	3.2	38
Xylenes	240	0.79	16.6	3.2	532
MTBE	12	0.00	0.0	2.7	0
User-Added (Please add Stoichometric Demand)	0	0.00	0.0	0.0	0
User-Added (Please add Stoichometric Demand)	0	0.00	0.0	0.0	0
Measures of total oxygen demand:					
Total Petroleum Hydrocarbons	186	0.93	19.5	3.1	605
Biological Oxygen Demand (BOD):	Multiple of Dis. Phase: 1.00		147.4	1.00	1474
Chemical Oxygen Demand (COD):	Multiple of Dis. Phase: 1.00		294.7	1.00	2947

Summary of Estimated ORC Requirements:

		ORC For Dissolved Phase (lbs)	ORC For Sorbed Phase (lbs)	Add Dem Factor (1 to 10x)	ORC Total w/ Add Dem Factor	ORC Cost ($)
Individual Species: Total BTEX, MTBE	◉	704	623	5	6638	56422
Petroleum Hydrocarbons	○	761	605	2	2733	25968
Biological Oxygen Demand (BOD)	○	1474	1474	2	5895	53053
Chemical Oxygen Demand (COD)	○	2947	2947	1	5895	53053

Select above measure (radio button) to specify required ORC quantity (in 30 lb increments): 6660 **pounds ORC**

Slurry Mixing Volume

Design solids content (20-40% by wt. for injections)	30	%
Total water for mixing slurry (gal)	1863	gallons

Project Summary

ORC bulk material for slurry injection (lbs)	6660
Number of ORC containers	222.0
ORC bulk material unit cost ($ per lb)	8.5
Total cost for ORC bulk material	56610

Shipping and Tax Estimates in U.S. Dollars

Sales Tax / Duty Rate (%)	0.00
Sales Tax ($)	0
Total material cost ($)	56610
Shipping (Call for Rate)	0
Total Regenesis Material Cost ($)	56610

Other Project Cost Estimates

Design	0
Permitting and Reporting	0
Construction Management	0
Groundwater Monitoring and Reports	0
Other	0
Other	0
Other	0
Other	0
Total Project Cost ($)	56610

Save Calculator Results

Save and Submit Calculator Results to Regenesis

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REGENESIS
Oxygen Release Compound (ORC®) Installation Instructions
(Excavation Applications)

SAFETY:

Pure ORC is shipped to you as a fine powder, which is rated at -325 mesh (passes through a 44 micron screen). It is considered to be a mild oxidizer and as such should be handled with care while in the field. Field personnel should take precautions while applying the pure ORC. Typically, the operator should work up wind of the product as well as use appropriate safety equipment. These would include eye, respiratory protection and gloves as deemed appropriate by exposure duration and field conditions.

Although two options are discussed, application of ORC should never be applied by personnel within the tank excavation, unless proper shoring or sidewall cutback is in place.

GENERAL GUIDELINES:

ORC can be applied in a dry powder form or as a slurry. Field conditions dictate which form of ORC can be used most effectively.

Installation of ORC should be within the tank excavation floor and/or in an adequate backfill section thickness to account for the anticipated groundwater "smear zone".

Maximum treatment effect is obtained when ORC is mixed as thoroughly as possible within the backfill material. The more dispersed the ORC slurry/powder within the excavation backfill, the more effective the treatment.

The quantity of ORC to be used is generally calculated prior to moving into the field for installation. Generally it is applied at a rate of between 0.1% and 1.0% by weight of the soil matrix. The following illustrates a dilute application rate calculation:

> Use a weight/weight percent of ORC/backfill material to ensure distribution of the ORC into the desired aquifer section. For example: a 0.15% weight of ORC to weight of backfill for the standard ORC weight (30 pounds) per container calculates as follows: 30 lb. ORC/0.15% = 20,000 lbs. of soil matrix. Thus, to achieve a 0.15% mixture of ORC in the backfill material, 30 lb. of pure ORC should be mixed into 10 tons (20,000 lbs. ÷2,000 lbs./ton) of backfill, or approximately 7 - 10 cubic yards of soil depending on field conditions. Professional judgment should be used to select the appropriate soil mass per cubic yard for designing each site treatment.

CHOOSING THE FORM OF INSTALLATION:

Pure ORC is shipped to you in a powder form. Weather conditions (especially wind) may have a direct effect on the application of ORC as a tank backfill amendment.

Application of the dry powder may be difficult in windy conditions. To counter the effects of wind (and the subsequent potential loss of ORC), Regenesis recommends that a water source or a spray tank be on-site to wet down the ORC and the backfill material as ORC is applied.

Application of ORC in a slurry format is a very effective method and eliminates the wind issue.

Four somewhat different installation conditions can be encountered in the field:

- ORC in a pea gravel back-fill. ("Type 1")
- ORC in a soil back-fill. ("Type 2")
- ORC mixed in native soil in the bottom of a tank pit. ("Type 3")
- ORC installed in soil under standing water in the bottom of a tank pit. ("Type 4")

A single tank pit excavation can include more than one of these conditions, depending on the site and extent of treatment. Instructions for each condition are discussed separately in the following sections. After the installation instructions are detailed instructions for mixing the slurry, if that is the option chosen.

INSTALLATION INSTRUCTIONS:

"Type 1," ORC in a Pea Gravel Back-fill

The easiest method for installing ORC in pea gravel back-fill is to mix the ORC in the material in a backhoe or skiploader bucket before placing it in the excavation.

- **Dry Powder method**

Into each scoop of back-fill material add the appropriate portion of ORC being installed. Generally, it is advisable to moisten the material in the bucket to reduce wind blown ORC loss. Excessive winds make this method not feasible.

After mixing the dry powder in the bucket, it is dumped into the bottom of the excavation. The backhoe bucket can be used for further mixing in the excavation.

- **Slurry method**

Mix a 63% solids slurry of ORC and water (see "Steps to make ORC slurry). This relatively thick slurry is used to help keep the ORC dispersed through the pea gravel, even when it contacts water in the bottom of the excavation during installation. It is generally desirable to avoid having the ORC run down through the pea gravel and collect in the bottom of the excavation. The thick slurry addresses this issue.

In each scoop of back-fill material, add the appropriate amount of ORC slurry. Pre-mix the materials in the backhoe bucket After mixing, dump the slurry and back-fill into the bottom of the excavation. The backhoe bucket can be used for further mixing in the

excavation.

If the slurry method is being used, observe the physical behavior of the ORC in the fill material. If the ORC collects at the bottom of the back-fill material, increase the percent solids content by reducing the amount of water being used to make the slurry.

"Type 2," ORC in a Soil Back-fill

Follow the instructions for the pea gravel back-fill method, except:

If the slurry method is being used, the solids content should be reduced. Typically a 50% solids is appropriate, although soil conditions sometimes dictate lower solids contents (see "Steps to make ORC slurry").

" Type 3," ORC Mixed in Native Soil in the Bottom of the Tank Pit

When ORC is added to the bottom of a tank pit it may be done by backhoe or injection. CAUTION: Personnel should never work within the tank excavation, unless proper shoring or sidewall cutback is in place.

- **Backhoe method**

A skilled backhoe operator can distribute the ORC around the bottom of the tank excavation and, using the bucket, mix it thoroughly. If there are no winds, it may be possible to:

1. Put the dry ORC powder in the backhoe bucket,
2. Lower it to the bottom of the pit,
3. Gently deposit the ORC evenly on the remaining soil,
4. Use the bucket to mix the powder into the soil,
5. To mitigate dusting, if necessary, spray water into the excavation during the process.

An alternative backhoe method is to use a 50% (or less) solids ORC slurry (see "Steps to make ORC slurry) in place of the dry powder. This eliminates the dusting problem, and in some cases enhances the even distribution of ORC into the soil. Observe the slurry mixing behavior in the bottom of the excavation, and adjust the water content of the slurry to optimize mixing, if necessary.

- **Injection method**

If available, a pump and root feeder may be used to inject an ORC slurry into the excavation floor. This may require a more dilute slurry mix, and care should be taken to assure that the solids do not settle out of the slurry prior to injection.

" Type 4." ORC installed in standing water in the bottom of a tank pit

Application of ORC into tank excavations with standing water requires the operator apply ORC in a slurry form. ORC powder application in this scenario is not advised because a portion of the ORC particle fraction is not likely to pass through the surface tension of the standing water. Caution: Personnel should never work within the tank excavation, unless proper shoring or sidewall cutback is in place.

- **Backhoe method**

A skilled backhoe operator can distribute the ORC slurry within the excavation, and mix it into the soil underlying the standing water with the bucket. Steps for installation:

1. Mix a high solids content ORC slurry (63% solids). See ("Steps to make ORC slurry").
2. Pour slurry into the backhoe bucket.
3. Lower the bucket to the standing water level in the excavation, and deposit the slurry as evenly as possible across the excavation floor. The dense slurry (63%solids is 1.6 grams per ml) will tend to make the majority of the slurry sink quickly to the bottom of the water layer.
4. Use the bucket to mix the slurry into the soil.
5. Water in the vicinity of the ORC slurry will often turn white and milky, since some of the ORC is dispersed within the standing water. This provides additional dispersion within the standing water and back-fill material as it is added to the excavation.

- **Injection method**

If available, a pump and root feeder may be used to inject an ORC slurry into the soil in an excavation. This may require a more dilute slurry mix, and care should be taken to assure that the solids do not settle out of the slurry prior to injection.

MIXING ORC SLURRY:

ORC powder is shipped to you in pre-measured batches. Each batch is contained in a plastic bag which is shipped in a 5-gallon bucket.

Remove the pre-measured ORC bag from the 5-gallon bucket and open
Measure and pour the appropriate amount of water from the following table into the 5 gallon bucket

Slurry Solids Content (%)	Pounds of ORC	Gallons of Water
63%	30 lbs.	2.1 gal. (2 gal. + 2 cups)
50%	30 lbs.	3.6 gal. (3 gal + 2 1/2 qts.)

Add the entire ORC pre-measured bag to the water (30 pounds). If the slurry solids contents of less than 50% are desired, the quantity of ORC per batch mixed in the bucket must be reduced. For example, a bucket containing four gallons of water would require 22.4 pounds of ORC to make a 40% solids slurry, and 16.6 pounds of ORC to make a 33% slurry.

Use an appropriate mixing device to thoroughly mix ORC and water. Regenesis

recommends use of a 0.5 Horsepower (minimum) hand held drill with a "jiffy mixer" or stucco mixer. A common paint paddle can be used to scrape the bottom and sides of the container to ensure thorough mixing. Standard environmental slurry mixers may also be used.

After mixing, small amounts of water can be added to adjust the consistency of the slurry.

When slurries are used, the early batches should be observed in the process of mixing with the soil. Each site can vary, due to soil type and moisture content. Based on professional judgment, additional water can be added to subsequent slurry batches.

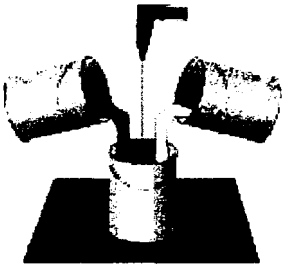
ORC slurry should be used ASAP; if the ORC slurry has been standing more than 15 minutes, it should be remixed immediately before using. Do not let stand more than 30 minutes without stirring. Otherwise, the slurry will begin to harden into a weak cement.

For direct assistance or answers to any questions you may have regarding these instructions, contact Regenesis Technical Services at 949-366-8000.

REGENESIS, 2002
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REGENESIS
Oxygen Release Compound (ORC®) Installation Instructions
(Slurry Mixing)

1. OPEN 5 GALLON BUCKET, AND REMOVE PRE-MEASURED BAG OF ORC.
2. MEASURE AND POUR WATER INTO THE 5-GALLON BUCKET ACCORDING TO THE FOLLOWING DESIRED CONSISTENCY:



65% Solids Slurry	Mix .63 gallons of water per 10 pounds of ORC powder.	
	Example:	Mix 20 pounds of ORC with 1.26 gallons of water.
		Mix 30 pounds of ORC with 1.89 gallons of water.
60% Solids Slurry	Mix .79 gallons of water per 10 pounds of ORC powder.	
	Example:	Mix 20 pounds of ORC with 1.58 gallons of water.
		Mix 30 pounds of ORC with 2.37 gallons of water.
50% Solids Slurry	Mix 1.19 gallons of water per 10 pounds of ORC powder.	
	Example:	Mix 20 pounds of ORC with 2.38 gallons of water.
		Mix 30 pounds of ORC with 3.57 gallons of water.
25% Solids Slurry	Mix 3.57 gallons of water per 10 pounds of ORC powder.	
	Example:	Mix 10 pounds of ORC with 3.57gallons of water.

3. ADD THE APPROPRIATE ORC QUANTITY TO THE WATER. Check weight of each bucket (see label). The 5 gallon shipping bucket weighs 2 pounds. An additional 4 pounds of ORC would require one additional quart of water, at the 65% solids level.
4. USE AN APPROPRIATE MIXING DEVICE TO THOROUGHLY MIX ORC AND WATER. A hand held drill with a "jiffy mixer" or a stucco mixer on it may be used in conjunction with a small paddle to scrape the bottom and sides of the container. Standard environmental slurry mixers may also be used, following the equipment instructions for operation. For small quantities a usable slurry can be mixed by hand, if care is taken to blend all lumps into the mixture thoroughly.

CAUTION: ORC MAY SETTLE OUT OF SLURRY IF LEFT STANDING. ALSO, ORC EVENTUALLY HARDENS INTO A CEMENT-LIKE COMPOUND, AND CANNOT BE RE-MIXED AFTER THAT HAS HAPPENED. THEREFORE:

Mix immediately before using. Do not let stand more than 30 minutes, and re-mix immediately before use, to be sure the mixture has not settled out. If a mechanical slurry mixer attached to a pump is being used, the material may be cycled back through the mixer to maintain slurry suspension and consistency.

5. CHECK SLURRY CONSISTENCY FOR POURABILITY. ADD WATER IF NECESSARY (IN 1 CUP INCREMENTS) TO ACHIEVE THE CORRECT CONSISTENCY.

For direct assistance or answers to any questions you may have regarding these instructions, contact Regenesis Technical Services at 949-366-8000.

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Exhibit 5

NYSDOH Generic Community Air Monitoring Plan

New York State Department of Health
Generic Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical-specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate NYSDEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a **continuous** basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored **continuously** at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring partculate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

June 20, 2000

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Exhibit 6

DUSR Guidelines

Appendix B: Minimum Requirements for QA/QC

Guidance for the Development of Quality Assurance Plans and Data Usability Summary Reports (DUSR)

I. General Discussion

A. Data Quality Assurance/Quality Control: A separate Quality Assurance Project Plan (QAPjP) is not required when the following quality assurance points are included in the Work Plan:

1. Project description and project goals - Include the site environmental history and project goals.

2. Project organization - Include designation of the Project Manager, Quality Assurance Officer and Field Analyst, if field analysis is planned. These resumes must be included as a Work Plan Appendix.

3. Sampling procedure and equipment decontamination procedures - Include a sampling chart that specifies the sample matrix, number of samples, analysis methods and data reporting level. EPA or Department Analytical Services Protocol (ASP) methods are acceptable. Also include a site map that shows proposed sampling sites and previous sampling locations and results.

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4. Proposed laboratory - The proposed laboratory must be identified in the Work Plan and it must be NYSDOH ELAP-certified for the planned laboratory analyses. Ten (10) percent of field screening analyses are to be confirmed by an ELAP certified laboratory. In most cases, the investigation and cleanup confirmation sample analysis reporting level will be DEC ASP Category B deliverables in order to fully evaluate and document the project. This reporting level gives the necessary documentation that will be reviewed to evaluate the usability of the data. It also gives calibration data needed to verify "not-detected" analytes that are possible compounds of concern, as indicated by site history or previous screening level data. Detection limits must be low enough to be compared to applicable standards.

   When Category B deliverables are required, the laboratory must be NYSDOH ELAP CLP-certified, since the CLP certification program evaluates the proficiency of the laboratory in the quality control parameters required by the analytical methods and the reporting format for the Category B deliverables package. For sites where the Department already has valid and usable investigative data verified by Category B deliverables, intermediate samples (SPDES, interim remedial measures, construction, and operation and maintenance samples) usually only require a standard, one page analysis report done by an ELAP- certified laboratory.

5. Standard Operating Procedures (SOPs) - Include SOPs for well construction, sample collection, decontamination procedures, field instruments and field screening methods.

6. Data validation - While not required, the data should be evaluated according to the Division of Environmental Remediation (DER) Data Usability Summary Report (DUSR) guidelines.

II. Data Usability Summary Reports

A. **Background:** The Data Usability Summary Report (DUSR) provides a thorough evaluation of analytical data without the costly and time consuming process of third party data validation. The primary objective of a DUSR is to determine whether or not the data, as presented, meets the site/project specific criteria for data quality and data use.
The development of the DUSR must be carried out by an experienced environmental scientist, such as the project Quality Assurance Officer, who is fully capable of conducting a full data validation. Furthermore, the DUSR is developed from a full New York State Department of Environmental Conservation Analytical Services Protocol (NYSDEC ASP) Category B or a United States Environmental Protection Agency Contract Laboratory Protocol (USEPA CLP) deliverables package.

B. **Review:** If the DUSR and the data deliverables package indicates significant problems with some or all of the data in the package, the data should be either rejected or validated to determine if it can be used. This decision will be based upon several factors and should be made with advice from a qualified person in the Department's Quality Assurance Unit. In some cases, the data may be usable for screening purposes only.

C. **Personnel Requirements:** The Environmental Scientist preparing the DUSR must hold a Bachelors Degree in a relevant natural or physical science or field of engineering and must submit a resume to the Division's Quality Assurance Unit documenting experience in environmental sampling, analysis and data review.

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D. **Preparation of a DUSR:** The DUSR is developed by reviewing and evaluating the analytical data package. During the course of this review the following questions must be asked and answered:

1. Is the data package complete as defined under the requirements for the NYSDEC ASP Category B or USEPA CLP deliverables?

2. Have all holding times been met?

3. Do all the QC data (i.e., blanks, instrument tunings, calibration standards, calibration verifications, surrogate recoveries, spike recoveries, replicate analyses, laboratory controls and sample data) fall within the protocol required limits and specifications?

4. Have all of the data been generated using established and agreed upon analytical protocols?

5. Does an evaluation of the raw data confirm the results provided in the data summary sheets and quality control verification forms?

6. Have the correct data qualifiers been used?

Once the data package has been reviewed and the questions given above have been answered, the DUSR proceeds to describe the samples and the analytical parameters. Data deficiencies, analytical protocol deviations, and quality control problems are identified and their effect on the data is discussed. The DUSR shall also include recommendations on resampling and/or reanalysis. All data qualifications must be documented following the latest NYSDEC ASP guidelines.

E. **Questions:** Contact the Department's Division of Environmental Remediation Quality Assurance Group with any questions on the preparation of a DUSR.

III. Quality Assurance Officer Guidelines

A. QAO Description and Requirements

1. The Quality Assurance Officer (QAO) is an employee of the same consulting firm generating the work plan and acts in conjunction with the project manager to develop a site-specific quality assurance plan. The QAO must not have another position on the project, such as a project or task manager, that involves project productivity or profitability as a job performance criteria.

2. The project QAO must have a minimum of a bachelors degree in chemistry or natural science with a minimum of 20 hours in chemistry.

3. The QAO must be proficient in analytical methodology, data interpretation and validation, the development of sampling plans, quality control procedures, and auditing techniques.

4. The QAO will assist the project manager in the development of the sampling and analytical portion of the Quality Assurance Project Plan. The QAO or his/her designee shall conduct periodic field and sampling audits, interface with the analytical laboratory to make requests and resolve problems, interface with the data validator, and develop a project specific data usability report. Because on site work may be necessary, verification of completion of the 40-hour OSHA safety training course and 8-hour refresher is required.

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