Home Depot on Woodhaven Boulevard & Metropolitan Avenue

REGO PARK - GLENDALE, NEW YORK

Site Management Plan

NYSDEC VCP Site Number: V00095

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Revision #	Submitted Date	Summary of Revision	DEC Approval Date

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CERTIFICATION

I, Michelle Lapin, certify that I am currently a NYS registered professional engineer and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

NYS Professional Engineer # 073934-1 Date 5-8-12 Signature

SITE MANAGEMENT PLAN

1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

1.1 INTRODUCTION

This document is required as an element of the remedial program at Home Depot – Rego Park, Rego Park - Glendale, New York (hereinafter referred to as the "Site") under the New York State (NYS) Voluntary Cleanup Program (VCP) administered by New York State Department of Environmental Conservation (NYSDEC). The Site is referred to as "Home Depot in Woodhaven Blvd & Metropol" in the NYSDEC information system. The Site was remediated in accordance with Voluntary Cleanup Agreement (VCA) # D2-0001-97-04, Site # V00095, provided as Appendix A, which was executed on July 14, 1997 and last amended on October 15, 2008. Site remediation was conducted in accordance with the Remedial Work Plan, Allborough Distributors, Inc. and Glendale Properties, Rego Park, Queens, New York, dated May 1997 (RWP), which was provided as an attachment to the VCA and is included as Appendix A. A copy of the RWP is also provided in Appendix B.

1.1.1 General

Allborough Distributors, Inc. (ADI) and Glendale Holding Corp. (Glendale) entered into a VCA with the NYSDEC to remediate a 5.968-acre property located in Glendale, Queens, New York. This VCA required the Remedial Party to investigate and remediate contaminated media at the Site. A modification to the VCA, dated October 15, 2008, was issued by NYSDEC to add Home Depot U.S.A. Inc. (Home Depot) as an additional Volunteer responsible to uphold the terms of the VCA.

The property was remediated and developed for commercial use as a retail store. The VCA identified the Site as Block 3886, Lots 46 and 74. At that time, Lot 46 was a 0.692-acre parcel known as the "ADI Parcel" at 76-01 Woodhaven Boulevard and Lot 74

was a 5.276-acre parcel known as “Glendale Parcel”, at 75-11 Woodhaven Boulevard. The VCP Site boundary was amended on February 28, 2012 to reflect inclusion of a strip of land that previously separated the ADI and Glendale Parcels (the 0.228-acre parcel was formerly a portion of Lot 450). Former Lots 46, 74, and 450 were merged as part of Site development into Block 3886, Lot 74, creating the 6.196-acre VCP Site now known as Block 3886, a portion of Lot 74.

A figure showing the Site location is provided as Figure 1 and the boundaries of the 6.196-acre Site is provided in Figure 2. The boundaries of the Site are more fully described in the Metes and Bounds provided as Appendix A.

After completion of the remedial work described in the RWP, some contamination was left in the subsurface at this Site, which is hereafter referred to as “remaining contamination”. This Site Management Plan (SMP) was prepared to manage remaining contamination at the Site until the Deed Restriction is extinguished in accordance with Environmental Conservation Law (ECL) Article 71, Title 36. The Deed Restriction is provided as Appendix C. All reports associated with the Site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State. Pertinent historical reports are also provided as appendices to this plan, as discussed in Section 1.3.

This SMP was prepared by AKRF Engineering, P.C. (AKRF), on behalf of Home Depot, in accordance with the requirements in NYSDEC Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation, dated May 2010, and the guidelines provided by NYSDEC. This SMP addresses the means for implementing the Institutional Controls (ICs) and Engineering Controls (ECs) that are required by the Deed Restriction for the Site.

1.1.2 Purpose

The Site contains contamination left after implementation of the remedial action. ECs have been incorporated into the Site remedy to control exposure to remaining contamination during the use of the Site to ensure protection of public health and the environment. A Deed Restriction granted to the NYSDEC, and recorded with the Queens

County Clerk, will require compliance with this SMP and all ECs and ICs placed on the Site. The ICs place restrictions on Site use, and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. This SMP specifies the methods necessary to ensure compliance with all ECs and ICs required by the Deed Restriction for the remaining contamination at the Site. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the Deed Restriction and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

This SMP provides a detailed description of all procedures required to manage remaining contamination at the Site after completion of the Remedial Action, including: (1) implementation and management of all Engineering and Institutional Controls; (2) media monitoring; (3) operation and maintenance of all treatment, collection, containment, or recovery systems; (4) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports; and (5) defining criteria for termination of treatment system operations.

To address these needs, this SMP includes three plans: (1) Section 2.0 is an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) Section 3.0 is a Monitoring Plan for implementation of Site Monitoring; and (3) Section 4.0 is an Operation and Maintenance Plan for implementation of remedial treatment systems.

This SMP also includes a description of Periodic Review Reports (PRRs) for the periodic submittal of data, information, recommendations, and certifications to NYSDEC.

It is important to note that:

- This SMP details the Site-specific implementation procedures that are required by the Deed Restriction. Failure to properly implement the SMP is a violation of the Deed Restriction, which is grounds for revocation of the Assignable Release and Covenant Not To Sue.

- Failure to comply with this SMP is also a violation of Environmental Conservation Law, New York Code of Rules and Regulations (6 NYCRR) Part 375 and the VCA Index #D2-0001-97-04, Site #V00095 for the Site, and thereby subject to applicable penalties.

1.1.3 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. In accordance with the Deed Restriction for the Site, the NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.2 SITE BACKGROUND

1.2.1 Site Location and Description

The Site is located in Rego Park-Glendale neighborhood in the County of Queens, New York and is identified as Block 3886, Lot 74 on the Queens County Tax Map. The Site is a 6.196-acre area bounded by commercial properties to the north, the Long Island Railroad train tracks and a park to the south, former railroad tracks and a public school to the east, and Woodhaven Boulevard to the west. The boundaries of the Site are more fully described in the Metes and Bounds, provided in Appendix A.

1.2.2 Site History

Before it was acquired by Home Depot in 1997, the Site comprised two parcels: the ADI Parcel along the Woodhaven Boulevard service road on the western part of the Site; and the Glendale Properties parcel on the remainder of the Site.

The ADI Parcel contained a warehouse building constructed between 1936 and 1950, with an addition annexed to the northern portion in 1960. Historic Sanborn maps show the building as a steel warehouse in 1950 and as a knitting mill in 1981, 1990, and 1993. Title search records indicate that the property was owned/leased by Standard Tube Sales Corp. during the late 1960s, Corum Knit Fabrics, Inc. and Bejan Knitting Mills, Inc. during the early 1970s, and ADI from the late 1970s until the property was acquired

by Home Depot in 1997. ADI was a distributor of stationery and office supplies and utilized the building for office and warehouse purposes.

The Glendale Properties parcel contained a large one-story warehouse building constructed in 1952-53. Reportedly, the building was originally constructed for use by General Electric Company's Lamp Division, which utilized the building for office and warehouse purposes until the late 1980s. Spiro-Wallach Co. Inc., the occupant of the building prior to its acquisition by Home Depot, took over the building in 1989. Spiro-Wallach is a distributor of office, food service, and janitorial products and used the building for office and warehouse purposes.

In performing due diligence studies prior to acquisition of the property by Home Depot, tetrachloroethylene (PCE) was discovered in the soil and groundwater under the ADI warehouse and in adjacent areas to the east. When the warehouse was demolished, the Site was gridded and the soil screened to determine the extent of soil contamination. Two areas of soil contamination were found; one at the southern end of the building close to the railroad tracks, and one further north, where the garden center is currently located. Similar studies were performed after the demolition of the Glendale Properties building, but no further source areas were located. It was determined that PCE contamination had migrated east from the ADI source areas.

The former Site buildings were demolished as part of the redevelopment by Home Depot by 1999, with the current one-story commercial warehouse/retail building with attached open-air garden center and asphalt-paved parking lot. An air sparge (AS) and soil vapor extraction (SVE) system was installed underneath and adjacent to the building as part of the original construction.

1.2.3 Geologic Conditions

A geologic section is shown on Figure 3. A groundwater flow figure, using the latest groundwater depths, is shown on Figure 4. Additional groundwater flow figures, confirming flow direction are provided in the historic pre-remedial action reports and historic post-remedial action reports provided in Appendices D and E, respectively.

Subsurface investigations indicated up to five feet of fill material beneath the surface cover material in some soil borings, including pieces of concrete and brick. The

fill material is underlain by native glacial deposits containing sand with minor percentages of silt, gravel, and cobbles to depths ranging from about 135 to 150 feet below grade. The sand is underlain by a dark gray clay.

Depth to groundwater on the Site ranges between 50 feet and 56 feet below grade. The measurement of groundwater elevations, conducted over the course of various historic Site studies, indicates that groundwater flows towards the southeast, with a gradient of approximately 0.006 feet per foot. Groundwater elevation data from September 2011 generally shows, that the shallowest groundwater elevations are in the northwestern portion of the Site, while the deepest groundwater elevations are in the southeastern corner of the Site, with some outliers adjacent to and within the building and in the southwestern corner, indicating that groundwater likely continues to flow in a southeasterly direction. The September 2011 groundwater elevations are provided as Figure 4. Groundwater in Queens is not used as a source of potable water.

An Open File Report by the U.S. Geological Survey, titled "Reconnaissance of the Groundwater Resources of Kings and Queens Counties, New York" (Report Number 81-1186, 1981), describes general geologic and hydrogeologic conditions at the Site. In a general geologic section of Queens, crystalline bedrock of Precambrian age is overlain by the Cretaceous Raritan Formation, which consists of unconsolidated sands and clays. The Raritan Formation is overlain by the Magothy Formation, also Cretaceous in age, the Pleistocene Jameco Gravel, and the Pleistocene Gardiners Clay. It is likely that all of these units are present underlying the Site, although the Jameco Gravel and Gardiners Clay are somewhat patchy in this area. The crystalline bedrock probably lies more than 400 feet below the ground surface at the Site and the surface of the Gardiners Clay is approximately 150 feet below the ground surface. More recent deposits at the Site primarily consist of glacial moraine - unconsolidated sediments ranging from boulders to clay, but primarily gravel, sand and silt. The Raritan and Magothy Formations have proven aquifer properties, and the glacial moraines immediately underlying the Site form a part of the Upper Glacial Aquifer.

1.3 SUMMARY OF REMEDIAL INVESTIGATION FINDINGS

Numerous Site investigations were performed to characterize the nature and extent of contamination at the Site. The results of the investigations are described in detail in the following reports:

1. Voluntary Cleanup, Supplementary Sampling Program Report, Home Depot Rego Park, New York, AKRF, Inc., October 1996 (provided in Appendix D).

2. Site Assessment Report, ADI and Glendale Properties, Rego Park, Queens, New York, AKRF, Inc., April 1997 (provided in Appendix D).

3. Soil Remediation Report, ADI Property, Rego Park, Queens, New York, AKRF, Inc., March 1999 (provided in Appendix E).

4. Phase II Investigative Report, Glendale Property, Rego Park, Queens, New York, AKRF, Inc., February 2000 (provided in Appendix E).

5. Supplemental Groundwater Investigation Report, Home Depot Rego Park, Queens, New York, AKRF, Inc., May 2005 (provided in Appendix E).

6. Progress Report – Home Depot Woodhaven Boulevard, Rego Park, New York, AKRF, Inc., July 2006 (provided in Appendix E).

Generally, the investigations determined that soil and groundwater in portions of the Site were contaminated by PCE. Soil and groundwater underneath the ADI building had been affected by the PCE source areas identified on Figure 5. In addition, elevated groundwater PCE concentrations had been identified underneath both the former ADI and Glendale buildings. As a result, a separate release of PCE was suspected beneath the Glendale building. Evidence of three underground storage tanks (USTs), one under the ADI property and two under the Glendale property, was also identified.

1.3.1 Soil

Numerous Site investigations identified PCE releases at the ADI Parcel that had affected the soil under the building, as concluded following the detection of PCE concentrations in soil samples of up to $8x10^6$ parts per billion (ppb), identified in the

October 1996 Voluntary Cleanup, Supplementary Sampling Program Report, provided in Appendix D. This concentration was identified under the building floor slab of the northern portion of the ADI building, and which led to the identification of the northern PCE source area, identified in Figure 5. A second PCE detection of 18,000 ppb was identified in the southern portion of the building, and would lead to the identification of the southern PCE source area identified in Figure 5. The remaining detections were much lower and were not indicative of potential PCE source areas.

Elevated PCE concentrations were detected in soil samples collected from depths of up to 10 feet below grade. Soil samples collected from between 10 feet below grade and the groundwater table (approximately 50 feet below grade) contained much lower PCE concentrations (80 ppb or less). Based on the results, the scope of contaminated soil excavation in the RWP was limited to shallow soils up to 6 feet below grade, as shown on Figure 6. As no PCE concentrations above the Technical and Administrative Guidance Memorandum #4046 (TAGM) Recommended Soil Cleanup Objectives (RSCO) were identified in soil samples collected from depths of up to 10 feet below grade underneath the former Glendale building, no remedial excavation was conducted on this parcel.

No other volatile organic compounds (VOCs) were identified in the soil samples. Though previous studies had identified elevated concentrations typical of urban fill of the metals arsenic, lead, and cadmium, no further metals contamination was identified during subsequent investigations, with the exception of mercury in two samples. However, as mercury was not identified in groundwater and no historic mercury-related Site uses/operations were identified, mercury was not considered a Site contaminant.

1.3.2 Site-Related Groundwater

The October 1996 Voluntary Cleanup, Supplementary Sampling Program Report, provided in Appendix D, summarized the findings from numerous on-Site groundwater studies. The overall groundwater flow direction was identified as towards the southeast. Off-Site PCE contamination sources were also suspected following the identification of PCE in monitoring wells upgradient of the ADI building in previous studies.

Historical on-Site groundwater samples contained PCE in concentrations of up to 24,000 ppb, identified in monitoring well SMW-5, a shallow well east-adjacent to the suspect northern PCE source area underneath the ADI building. A PCE concentration of 22,000 ppb was also identified in a groundwater sample collected from monitoring well SMW-6, a shallow monitoring well located east-adjacent to the southern source area.

A PCE concentration of 70 ppb was identified in a groundwater sample collected from monitoring well MW-4, a deep well (screened between 145 and 155 feet below grade) east-adjacent to the ADI building in 1996, indicating that PCE contamination was mostly limited to shallow groundwater. A PCE concentration of 650 ppb was detected at monitoring well MW-3, a shallow well installed east-adjacent to the Glendale building. Though the detection itself was not high enough to indicate the presence of an additional source area underneath the Glendale building, the RWP included additional soil and groundwater sampling to identify potential PCE sources underneath the Glendale building. Further analyses indicated there was no apparent source area on the Glendale Parcel, as documented in the February 2000 Phase II Investigative Report. No other significant VOC concentrations were identified in the groundwater samples. The metals arsenic, chromium and lead, detected in groundwater, were concluded to have been related to suspended solids in the aqueous samples. Dissolved metals in groundwater samples were significantly lower, with no exceedances of the groundwater standards noted.

Further groundwater investigations were performed following the implementation of the RWP, which are discussed in Section 1.4.

1.3.3 Site-Related Soil Vapor Intrusion

The April 1997 Site Assessment Report, provided in Appendix D, detailed the findings of a soil gas survey conducted at the former Glendale building in addition to supplemental soil and groundwater sampling at the building. Soil gas from six locations was field-screened using a photoionization detector (PID). The survey identified elevated PID concentrations at four of the six locations, with a maximum detection of 955 parts per million (ppm) identified at location SG-4, located on the eastern side of the building.

Based on low-level PCE concentrations in soil samples collected from the soil gas sampling locations and groundwater PCE concentrations south-adjacent to the Glendale building, the presence of an additional PCE source area underneath the Glendale building was not dismissed. The RWP contained provisions for further soil and groundwater investigation at the Glendale Parcel following the demolition of the Glendale building. These investigations are discussed further in Section 1.4.

1.3.4 Underground Storage Tanks

Three underground storage tanks were identified in the previous Site studies: one former fuel oil tank of unknown capacity underneath the ADI Parcel and two 10,000-gallon No. 4 fuel oil tanks underneath the Glendale Parcel.

1.3.5 Sludge Sampling

A sludge sample collected in October 1995 from a 12-foot deep grated drainage trench located in the loading area north of the former ADI building contained lead at a concentration of 8×10^5 ppb. An additional sample was collected in March 1997 and analyzed for lead concentrations using the toxicity characteristic leaching procedure (TCLP). The TCLP lead concentration in the sample was 0.530 ppb, below the regulatory hazardous waste limit of 5.0 ppb.

1.4 SUMMARY OF REMEDIAL ACTIONS

The Site was remediated in accordance with the NYSDEC-approved RWP and the Revised AS/SVE Expansion Work Plan, Home Depot – Rego Park, Rego Park – Glendale, New York, dated April 2010 and prepared by AKRF. Initial remedial activities were summarized in the March 1999 Soil Remediation Report and the February 2000 Phase II Investigative Report, both provided in Appendix E.

The following is a summary of the Remedial Actions performed at the Site:

1. Excavation of soil exceeding TAGM 4046 RSCOs, provided in Table 1, to depths of approximately six feet below grade underneath the eastern and

southern portions of the ADI Parcel and to depths of two and four feet below grade underneath the northern and northwestern portions of the ADI Parcel.

2. Design and installation of Zones 1 through 5 of an air sparge/soil vapor extraction (AS/SVE) system to address PCE contamination in the saturated zone in source areas and to prevent potential contaminant migration.

3. Design and completion of Zone 6 AS/SVE system to address deeper PCE contamination in the southern source area.

4. Design and installation of Zones 7 through 10 of the AS/SVE system to extend the AS/SVE containment curtain along the southeastern boundary of the Site and to address deeper contamination in the Site source areas.

5. Execution and recording of a Deed Restriction to restrict land use and prevent future exposure to any contamination remaining at the Site.

6. Development and implementation of a SMP for long term management of remaining contamination as required by the Deed Restriction, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting.

7. Periodic certification of the institutional and engineering controls listed above.

Remedial construction was completed at the Site in December 2010 and the Deed Restriction was recorded on April 30, 2012. A complete summary of the Site remedial history is provided under the separate cover in the Final Engineering Report.

1.4.1 Removal of Contaminated Materials from the Site

A list of the soil cleanup objectives (SCOs) for the primary contaminants of concern and applicable land use for this Site is provided in Table 1. Although TAGM RSCOs are no longer in use, they were the applicable criteria at the time of soil remediation under the approved RWP.

Table 1
Technical Administrative Guidance Memorandum 4046:
Recommended Soil Cleanup Objectives

Compound	TAGM RSCO (parts per billion)	Compound	TAGM RSCO (parts per billion)
1,1,1,2-Tetrachloroethane	NS	Chloroethane	1,900
1,1,1-Trichloroethane	800	Chloroform	300
1,1,2,2-Tetrachloroethane	600	Chloromethane	NS
1,1,2-Trichloroethane	NS	cis-1,2-Dichloroethene	NS
1,1-Dichloroethane	200	cis-1,3-Dichloropropene	NS
1,1-Dichloroethene	400	Dibromochloromethane	NS
1,1-Dichloropropene	NS	Dibromomethane	NS
1,2,3-Trichlorobenzene	NS	Dichlorodifluoromethane	NS
1,2,3-Trichloropropane	400	Ethyl ether	NS
1,2,4-Trichlorobenzene	3,400	Ethyl methacrylate	NS
1,2,4-Trimethylbenzene	NS	Ethylbenzene	5,500
1,2-Dibromo-3-chloropropane	NS	Hexachlorobutadiene	NS
1,2-Dibromoethane	NS	Iodomethane	NS
1,2-Dichlorobenzene	7,900	Isopropylbenzene	NS
1,2-Dichloroethane	100	Methyl tert butyl ether	NS
1,2-Dichloropropane	NS	Methylene chloride	100
1,3,5-Trimethylbenzene	NS	Naphthalene	13,000
1,3-Dichlorobenzene	1,600	n-Butylbenzene	NS
1,3-Dichloropropane	300	n-Propylbenzene	NS
1,4-Dichlorobenzene	8,500	o-Chlorotoluene	NS
1,4-Dichlorobutane	NS	o-Xylene	1,200 (total)
2,2-Dichloropropane	NS	p/m-Xylene	1,200 (total)
2-Butanone	300	p-Chlorotoluene	NS
2-Hexanone	NS	p-Isopropyltoluene	NS
4-Methyl-2-pentanone	1,000	sec-Butylbenzene	NS
Acetone	200	Styrene	NS
Acrolein	NS	tert-Butylbenzene	NS
Acrylonitrile	NS	**Tetrachloroethene**	**1,400**
Benzene	60	Tetrahydrofuran	NS
Bromobenzene	NS	Toluene	1,500
Bromochloromethane	NS	trans-1,2-Dichloroethene	300
Bromodichloromethane	NS	trans-1,3-Dichloropropene	NS
Bromoform	NS	trans-1,4-Dichloro-2-butene	NS
Bromomethane	NS	Trichloroethene	700
Carbon disulfide	2,700	Trichlorofluoromethane	NS

Compound	TAGM RSCO (parts per billion)	Compound	TAGM RSCO (parts per billion)
Carbon tetrachloride	600	Vinyl acetate	NS
Chlorobenzene	1,700	Vinyl chloride	200

Note: NS = No standard

Historic figures showing the total excavation depths, initial endpoint sampling results and final endpoint sampling results are provided as Figures 6, 7A, 7B, and 8, respectively.

Two areas of the Site, both within the ADI Parcel in the western portion of the Site, were targeted for soil removal based on the remedial investigation results and additional soil headspace readings collected to delineate the source area. The initial excavation was performed between July 21 and July 31, 1998. Bottom endpoint samples were collected on a 25-foot grid, and sidewall samples were collected every 25 linear feet along the walls of excavated areas. Samples were analyzed for VOCs by a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory using NYSDEC Analytical Services Protocol (ASP) Method 91-1.

Endpoint sample results indicated concentrations greater than the TAGM RSCO for PCE of 1,400 ppb in three areas within the northern source area, as identified in Figures 7A and 7B, and additional excavation was conducted from September 9 to 14, 1998. The final excavation was performed in an approximately 4,000-square foot (sf) area to depths between two and six feet below grade. The final endpoint sample results indicated that concentrations of PCE were less than the RSCO and the excavation was backfilled. A total of 3,228 tons of contaminated soil were removed from the Site and disposed of as hazardous PCE waste at CWM Chemical Services of Model City, New York. Stockpiled soil with less than 100 ppm total VOCs was reused on-Site.

Though soil headspace readings taken at 25-foot intervals at the Glendale Parcel identified some areas with elevated headspace concentrations, laboratory soil samples collected from depths of up to 10 feet below grade did not identify PCE concentrations above 1,400 ppb. Soil characterization sample locations on the Glendale Parcel are

shown on Figure 8. It was concluded that there were no additional source areas present underneath the former Glendale building. As a result, no remedial soil removal was conducted at the Glendale Parcel other than the tank removal excavation and an area discovered to have greenish-blue colored soil. The soil with apparent contamination (staining/discoloration, odor, or elevated PID readings) was excavated and disposed of off-site. Elevated PCE concentrations were identified in groundwater samples, indicating that any contamination noted on the Glendale Parcel was likely to have migrated from the ADI building source areas.

The current Home Depot building was constructed with a moisture/vapor barrier, below the concrete slab-on-grade, which will reduce the potential for soil vapor intrusion. Zones 1 through 5 of the AS/SVE system were installed underneath the current building during construction of the Home Depot facility.

1.4.2 Site-Related Treatment Systems

A Site plan showing the entire AS/SVE system is provided as Figure 9. An AS/SVE system covering the source areas, the area immediately downgradient of the source area, and the downgradient boundary of the Site was constructed as Zones 1 through 5 in 1999. The equipment for the existing AS/SVE system is in an enclosure near the southwestern corner of the Site. Zone 6 was installed in 2005 to address contamination at a depth of approximately 30 feet below the water table in the southwestern portion of the Site (in the southern ADI source area).

Zones 7 through 10 of the AS/SVE system were constructed in 2010. The addition in the southwestern corner of the Site, Zone 7, was intended to provide additional remediation in the southern ADI source area by extending the sparging system deeper into the saturated zone to treat contamination below the level of the existing Zone 6 sparging wells. The addition along the southern and southeastern boundaries, Zones 8 and 9, was intended to extend the effective area of the overall system further east, to prevent potential off-Site migration by treating the PCE identified in the intermediate groundwater (30 feet below the water table) and also remediate the shallow groundwater interval. The addition of Zone 10 was intended to supplement Zone 2 AS/SVE in the

northern ADI source area, as well as prevent potential eastern migration of the contaminant plume.

This SMP details the ongoing operations and performance monitoring requirements of the entire AS/SVE system.

1.4.3 Remaining Contamination

Excavation was performed to depths between two and six feet below grade in portions of the former ADI Parcel until endpoint samples showed PCE contamination, as well as all VOC concentrations, below the respective TAGM 4046 RSCOs, as summarized in the March 1999 Soil Remediation Report. Site plans showing final excavation depths and final endpoint PCE concentrations are provided in Figures 7A and 7B, respectively.

As no PCE concentrations above 1,400 ppb were identified in soil samples collected from depths of up to 10 feet below grade underneath the former Glendale building, no further remedial excavation was conducted prior to the construction of the current Home Depot building. As such, the known remaining contamination at the Site is limited to VOC contamination in Site groundwater.

Though no residual soil contamination from the historic source areas is expected at the Site, volatilization from the contaminated groundwater may affect Site soil vapor and soil VOC concentrations. The Home Depot building was constructed with a moisture/vapor barrier, which will minimize the potential intrusion of contaminated soil vapor. The Excavation Work Plan (EWP), provided as Appendix F to this SMP, will address all Site soil and soil vapor as potentially contaminated to minimize exposure to hazardous materials during any future work. The March 1999 Soil Remediation Report and the February 2000 Phase II Report summarize the results of all samples of soil remaining at the Site after completion of remedial soil excavation, all of which met the TAGM RSCOs.

Groundwater PCE concentrations continue to be elevated within, and east-adjacent to, the ADI source areas. The March 1999 Soil Remediation Report and the February 2000 Phase II Report summarize groundwater sampling results through 1999. A

summary (spider map) of groundwater PCE concentrations from samples collected from January 2001 through December 2011 is provided as Figure 10.

2.0 ENGINEERING AND INSTITUTIONAL CONTROL PLAN

2.1 INTRODUCTION

2.1.1 General

Since remaining contaminated groundwater and potentially contaminated soil and soil vapor exist beneath the Site, EC/ICs are required to protect human health and the environment. This Engineering and Institutional Control Plan describes the procedures for the implementation and management of all EC/ICs at the Site. The EC/IC Plan is one component of the SMP and is subject to revision by NYSDEC.

2.1.2 Purpose

This plan provides:

- A description of all ECs and ICs on the Site;
- The basic implementation and intended role of each EC/IC;
- A description of the key components of the ICs set forth in the Deed Restriction;
- A description of the features to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of EC/ICs, such as the implementation of the EWP for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the Site; and
- Any other provisions necessary to identify or establish methods for implementing the EC/ICs required by the Site remedy, as determined by the NYSDEC.

2.2 ENGINEERING CONTROLS

2.2.1 Engineering Control Systems

2.2.1.1 Site Cover System

Although the NYSDEC-approved remedial action did not require a vapor barrier or Site cover/cap, the current development at the Site acts as a physical barrier to any potential residual contamination.

This cover system is composed of soil in the discrete landscaped area of the parking lot, asphalt pavement, concrete sidewalks, concrete building slabs and driveways.

A small landscaped area is present on the northeastern part of the Site, as shown on Figure 5, and is located in a crossgradient groundwater flow direction relative to the source areas. Though the landscaped area comprises exposed backfill, due to the depth of the groundwater table (approximately 50 feet below grade) and the groundwater flow direction at the Site, it is unlikely that potential volatilized vapors from the source areas would impact the landscaped area and the asphalt-paved parking lot located in the northern portion of the Site.

During construction of the Home Depot building, a moisture/vapor barrier consisting of polyethylene sheeting was installed below the concrete slab-on-grade. During test pit excavations inside the building during the 2010 AS/SVE expansion, polyethylene sheeting was observed below the main store building slab. There is no documentation as to the methods of taping and lapping of joints and sealing of penetrations.

The EWP that appears in Appendix F outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed, and any underlying soil, including potential remaining contaminated material, is disturbed. Procedures for the inspection and maintenance of this cover are provided in the Monitoring Plan included in Section 3.2.

2.2.1.2 Air Sparging/Soil Vapor Extraction System

2.2.1.2.1 Remedial Objective

The in-situ remediation approach was implemented to treat both potential residual soil and groundwater contamination in source areas of the Site and contain groundwater contamination along the downgradient property boundary. The use of a combined AS/SVE system is designed to remove volatile organic compounds from both the saturated and unsaturated zones.

Air sparging consists of injecting air into the saturated zone via screened wells. The air is delivered to the saturated zone and "strips" VOCs from the groundwater as it passes through to the unsaturated zone, shifting them from the dissolved to vapor phase. Concurrently, the SVE system applies negative pressure (vacuum) to the subsurface for recovery of the volatile organic compounds generated from sparging and of other contaminants susceptible to volatilization in the vadose zone. Recovered vapors are treated by an aboveground vapor treatment system and are subsequently discharged to the atmosphere.

2.2.1.2.2 System Overview

A Site plan showing the entire AS/SVE system is shown on Figure 9, comprising underground AS and SVE wells installed in each of the two source areas (underneath the garden center and in the southwestern corner of the Site), presumed downgradient regions (directly east and south of the garden center), and along the presumed downgradient boundaries of the Site (the southern and eastern retaining walls of the Site). The AS/SVE wells are connected via piping/tubing to above grade AS/SVE equipment.

All aboveground equipment for the AS/SVE system is contained in two enclosures in the southwestern corner of the Site. The enclosures contain piping manifolds, motorized and manual valves to direct air flow, air compressors and blowers, and system alarms and sensors. Zones 1 through 6 are controlled by an AS blower and an SVE blower, while Zones 7 through 10 are controlled by two

SVE blowers and two AS compressors. Effluent from all zones is filtered through activated carbon prior to discharge.

The AS/SVE system was constructed in three mobilizations, with Zones 1 through 5 installed and started in 1999, Zone 6 installed and started in 2005, and Zones 7 through 10 installed and started in 2010.

2.2.1.2.3 Summary of System Design

Each Zone of the AS/SVE system generally consists of AS and SVE wells arranged in clusters. Each cluster comprises a minimum of one 4-inch diameter polyvinyl chloride (PVC) SVE well, which generates negative pressure radially, creating an SVE radius of influence (ROI). Each cluster also comprises a minimum of one 2-inch diameter PVC AS well, which generates positive pressure radially, creating an AS ROI. The AS and SVE wells are located such that any given SVE ROI will sufficiently counteract the positive pressure created by air sparging, spatially and in magnitude.

Zones 1 through 6 of the AS/SVE system were designed to include 35 AS wells with 2-foot long screens installed to total depths of 10 feet below the observed water table, and 21 SVE wells with 10-foot long screens installed to depths of 10 feet above the observed water table. AS wells in Zones 2, 4, and 5 branch off from PVC header pipes, installed between the existing system enclosure and Manholes B, C, and D. A portion of the header pipe for Zone 5, located between the system enclosure and Manhole D, was replaced in September 2010, using 2-inch HDPE tubing. The remaining AS wells were connected to dedicated ½-inch PVC pipes and manifolded at the system.

The well layout for Zones 7 through 10 consists of 28 AS wells with 2- or 5-foot long screens installed to depths of 10, 30 or 75 feet below the observed water table, and 8 SVE wells with 15-foot long screens installed either at a depth of approximately 50 feet below grade (just above the water table), or 25 feet below grade for shallow SVE wells. In the expanded system Zones 7 and 10, deep AS wells (screened just above the confining layer) and shallow SVE wells were installed to create additional positive pressure, and the requisite additional

vacuum, to address sinking PCE contamination in source areas. A complete list of AS and SVE wells is provided as Table 2.

Table 2
AS/SVE Well Construction Details

Location	Date Installed	Approximate Screened Interval/Total Depth (feet below top of casing)
AS-1A	1999	65-67
AS-1B	1999	65-67
AS-1C	1999	65-67
AS-1D	1999	65-67
AS-1E	1999	65-67
AS-1F	1999	65-67
AS-1G	1999	65-67
AS-1H	1999	65-67
SVE-1A	1999	30-40
SVE-1B	1999	30-40
SVE-1C	1999	30-40
SVE-1D	1999	30-40
AS-2A	1999	65-67
AS-2B	1999	65-67
AS-2C	1999	65-67
AS-2D	1999	65-67
AS-2E	1999	65-67
AS-2F	1999	65-67
AS-2G	1999	65-67
AS-2H	1999	65-67
AS-2I	1999	65-67
AS-2J	1999	65-67
SVE-2A	1999	30-40
SVE-2B	1999	30-40
SVE-2C	1999	30-40
SVE-2D	1999	30-40
SVE-2E	1999	30-40
SVE-2F	1999	30-40
AS-3A	1999	65-67
AS-3B	1999	65-67
AS-3C	1999	65-67
AS-3D	1999	65-67
AS-3E	1999	65-67
SVE-3A	1999	30-40
SVE-3B	1999	30-40
SVE-3C	1999	30-40
AS-4A	1999	65-67

Location	Date Installed	Approximate Screened Interval/Total Depth (feet below top of casing)
AS-4B	1999	65-67
AS-4C	1999	65-67
AS-4D	1999	65-67
AS-4E	1999	65-67
SVE-4A	1999	30-40
SVE-4B	1999	30-40
SVE-4C	1999	30-40
SVE-4D	1999	30-40
AS-5A	1999	65-67
AS-5B	1999	65-67
AS-5C	1999	65-67
AS-5D	1999	65-67
AS-5E	1999	65-67
AS-5F	1999	65-67
SVE-5A	1999	30-40
SVE-5B	1999	30-40
SVE-5C	1999	30-40
SVE-5D	1999	30-40
SVE-5E	1999	30-40
AS-7A	5/10/10	60-62
AS-7B	5/13/10	80-82
AS-7C	10/20/10	121-126
AS-7D	5/14/10	60-62
AS-7E	5/6/10	80-82
AS-7F	5/12/10	130-132
SVE-7A	5/14/10	9-24
SVE-7B	10/20/10	33.5-48.5
AS-8A	3/4/10	60-62
AS-8B	3/10/10	80-82
AS-8C	3/15/10	60-62
AS-8D	9/16/11	81-83
AS-8E	3/19/10	60-62
AS-8F	9/15/11	81-83
AS-8G	3/29/10	60-62
AS-8H	3/25/10	80-82
SVE-8A	9/14/11	33-48
SVE-8B	9/13/11	35-50
AS-9A	4/14/10	60-62
AS-9B	4/9/10	80-82
AS-9C	4/20/10	60-62
AS-9D	4/13/10	80-82
AS-9E	4/9/10	60-62
AS-9F	4/5/10	80-82
AS-9G	4/1/10	60-62

Location	Date Installed	Approximate Screened Interval/Total Depth (feet below top of casing)
AS-9H	4/8/10	80-82
SVE-9A	12/23/09	35-50
SVE-9B	4/7/10	35-50
AS-10A	9/10/10	60-65
AS-10B	10/13/10	80-85
AS-10C	10/6/10	120-125
AS-10D	9/21/10	120-125
AS-10E	9/22/10	80-85
AS-10F	9/22/10	60-65
SVE-10A	9/24/10	35-50
SVE-10B	10/7/10	10-25

Notes:
1. Total depths were measured on date indicated following development. Depths are feet below the top of casing (TOC).
2. Screened intervals are approximate depths below TOC based on observations during well installation.
3. Wells SVE-7B, AS-7C, AS-10C and AS-10B were abandoned and reinstalled due to underperforming conditions. Details shown are for the replacement wells only and not the original wells.

2.2.1.2.4 Operating Conditions

The AS and SVE blowers operate continuously at Zones 1 through 6 for approximately 12 hours per day and remain off overnight, to minimize noise at night.

Air sparging is conducted at Zones 7 through 10 in 2-hour cycles per zone. A primary SVE vacuum is applied during an AS operation cycle at any given zone to capture any volatilized vapors generated by air sparging. A secondary, weaker SVE vacuum is applied continuously to the three zones not being sparged at any given time to address any residual positive pressure resulting from previous cycled operation of the respective AS zone. The equipment for Zones 7 through 10 is contained in a sound-insulated enclosure and operates 24 hours per day.

Throttling valves are located along the AS/SVE lines to allow adjustments to operation. Valves are located either in access ways (Manholes B, C and D) for Zones 1 through 5, adjacent to the system enclosure for Zone 6, and within the system enclosure for Zones 7 through 10.

2.2.1.2.5 Treatment Systems

Effluent vapors extracted by the SVE system are treated by granular activated carbon (GAC) units, designed to absorb all volatiles from the extracted vapors prior to discharge at the effluent stack. The three SVE blowers are each connected to two GAC units, connected in series, which prevent the release of volatile vapors into the atmosphere. Zones 1 through 6 are connected to two 2,000-pound (lb) GAC units, connected in series, and Zones 7 through 10 are connected to two sets of GAC units. The primary SVE blower effluent, extracted from one zone at a time, is directed through two 500-lb units connected in series, while the secondary SVE blower effluent, extracted from the remaining three expanded system Zones, is directed through two 1,000-lb units connected in series.

All six GAC units are outfitted with inlet, intermediate and outlet sample ports to provide points to monitor vapor pressure and VOC concentrations. Carbon will be replaced based on field screening and laboratory analysis of extracted vapor VOC concentrations. Vapor sampling and carbon replacement procedures are discussed further in Section 4.3.7.

Procedures for operating and maintaining the AS/SVE system are documented in Section 3.0, the Monitoring Plan, and Section 4.0, the Operation and Maintenance Plan. The Monitoring Plan also addresses severe condition inspections in the event that a severe condition, which may affect controls at the Site, occurs.

2.2.2 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when effectiveness monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.6 of NYSDEC DER-10.

2.2.2.1 Site Cover System

Although the remedial action did not require a Site cover/cap, the current development at the Site acts as a physical barrier to any potential residual contamination.

The quality and integrity of this system will be inspected at defined, regular intervals unless prior written approval is granted by the NYSDEC.

2.2.2.2 Air Sparging/Soil Vapor Extraction System (AS/SVE System)

The AS/SVE system will not be discontinued unless prior written approval is granted by the NYSDEC. In the event that monitoring data indicates that the AS/SVE system is no longer required, a proposal to discontinue the system operation will be submitted by the property owner. Conditions that warrant discontinuing the AS/SVE system include contaminant concentrations in groundwater that: (1) reach levels that are consistently below ambient water quality standards, (2) have become asymptotic to a low level over an extended period of time as accepted by the NYSDEC, or (3) the NYSDEC has determined that the AS/SVE system has reached the limit of its effectiveness. This assessment will be based in part on post-remediation contaminant levels in groundwater collected from monitoring wells located throughout the Site. Systems will remain in place and operational until permission to discontinue their use is granted in writing by the NYSDEC.

2.3 INSTITUTIONAL CONTROLS

A series of ICs is required by the Deed Restriction to: (1) implement, maintain and monitor EC systems; (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; and, (3) limit the use and development of the Site to commercial uses only. Adherence to these ICs on the Site is required by the Deed Restriction and will be implemented under this SMP. These ICs are:

- Compliance with the Deed Restriction and this SMP by the Grantor and the Grantor's successors and assigns;

- All ECs must be operated and maintained as specified in this SMP;
- All ECs on the Controlled Property must be inspected at a frequency and in a manner defined in the SMP;
- Groundwater, soil vapor and other environmental or public health monitoring must be performed as defined in this SMP; and
- Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in this SMP.

ICs identified in the Deed Restriction may not be discontinued without an amendment to or extinguishment of the Deed Restriction.

The Site has a series of ICs in the form of Site restrictions. Adherence to these ICs is required by the Deed Restriction. Site restrictions that apply to the Controlled Property are:

- The property may only be used for Commercial use provided that the long-term Engineering and ICs included in this SMP are employed;
- The property may not be used for a higher level of use, such as unrestricted or Restricted Residential use, without additional remediation and amendment of the Deed Restriction, as approved by the NYSDEC;
- All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the EWP, Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) provided in this SMP;
- The use of the groundwater underlying the property is prohibited without treatment rendering it safe for intended use;
- The potential for vapor intrusion must be evaluated for any buildings developed on the Site, and any potential impacts that are identified must be monitored or mitigated;
- Vegetable gardens and farming on the property are prohibited; and
- The Site owner or remedial party will submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has

occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow and will be made by an expert that the NYSDEC finds acceptable.

2.3.1 Excavation Work Plan

The Site has been remediated for Commercial use. Any future intrusive work that will penetrate the site cover or cap, or encounter or disturb the remaining contamination, including any modifications or repairs to the existing cover system will be performed in compliance with the EWP that is attached as Appendix F to this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in the HASP and CAMP prepared for the Site. A Site-specific HASP is attached as Appendix G to this SMP that is in current compliance with DER-10, and 29 Code of Federal Regulations (CFR) 1910, 29 CFR 1926, and all other applicable Federal, State and local regulations. Based on future changes to State and federal health and safety requirements, and specific methods employed by future contractors, the HASP and CAMP will be updated and re-submitted with the notification provided in Section F-1 of the EWP. Any intrusive construction work will be performed in compliance with the EWP, HASP and CAMP, and will be summarized in the periodic inspection and certification reports submitted under the Periodic Review Report, as discussed in Section 5.0.

The Site owner and associated parties preparing the remedial documents submitted to the State, and parties performing this work, are completely responsible for the safe performance of all intrusive work, the structural integrity of excavations, proper disposal of excavation de-water, control of runoff from open excavations into remaining contamination, and for structures that may be affected by excavations (such as building foundations). The Site owner will ensure that Site development activities will not interfere with, or otherwise impair or compromise, the ECs described in this SMP.

2.3.2 Soil Vapor Intrusion Evaluation

Prior to the construction of any additional enclosed structures located over areas that contain remaining contamination and where the potential for soil vapor intrusion (SVI) exists, an SVI evaluation will be performed to determine whether any mitigation measures are necessary to eliminate potential exposure to vapors in the proposed structure. Alternatively, an SVI mitigation system may be installed as an element of the future building foundation without first conducting an investigation. This mitigation system will include a moisture/ vapor barrier and passive sub-slab depressurization system that is capable of being converted to an active system.

Prior to conducting an SVI investigation or installing a mitigation system, a work plan will be developed and submitted to the NYSDEC and NYSDOH for approval. This work plan will be developed in accordance with the most recent NYSDOH "Guidance for Evaluating Vapor Intrusion in the State of New York". Measures to be employed to mitigate potential vapor intrusion will be evaluated, selected, designed, installed, and maintained based on the SVI evaluation, the NYSDOH guidance, and construction details of the proposed structure.

Preliminary (unvalidated) SVI sampling data will be forwarded to the NYSDEC and NYSDOH for initial review and interpretation. Upon validation, the final data will be transmitted to the agencies, along with a recommendation for follow-up action, such as mitigation. If any indoor air test results exceed NYSDOH guidelines, relevant NYSDOH fact sheets will be provided to all tenants and occupants of the property within 15 days of receipt of validated data.

SVI sampling results, evaluations, and follow-up actions will also be summarized in the subsequent letter report or PRR.

2.4 INSPECTIONS AND NOTIFICATIONS

2.4.1 Inspections

Inspections of all remedial components installed at the Site will be conducted at the frequencies specified in the Site Monitoring Plan schedule, discussed in Section 3.0.

A comprehensive Site-wide inspection will be conducted annually as discussed in Section 3.4. The inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Deed Restriction;
- Achievement of remedial performance criteria;
- Sampling and analysis of appropriate media during monitoring events;
- If Site records are complete and up to date; and
- Changes, or needed changes, to the remedial or monitoring system.

Inspections will be conducted in accordance with the procedures set forth in Sections 3.0 and 4.0 of this SMP. The reporting requirements are outlined in Section 5.0.

If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs, an inspection of the Site will be conducted within 5 days of the event to verify the effectiveness of the EC/ICs implemented at the Site by a qualified environmental professional as determined by NYSDEC. The inspection guidelines are specified in Section 3.4.

2.4.2 Notifications

Notifications will be submitted by the property owner to the NYSDEC as needed for the following reasons:

- 60-day advance notice of any proposed changes in site use that are required under the terms of the VCA, 6NYCRR Part 375, and/or Environmental Conservation Law.
- 7-day advance notice of any proposed ground-intrusive activities pursuant to the EWP.
- Notice within 48-hours of any damage or defect to the foundations structures that reduces or has the potential to reduce the effectiveness of other ECs and likewise any action to be taken to mitigate the damage or defect.
- Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of

ECs in place at the Site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action shall be submitted to the NYSDEC within 45 days and shall describe and document actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the Site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser has been provided with a copy of the VCA, and all approved work plans and reports, including this SMP.
- Within 15 days after the transfer of all or part of the Site, the new owner's name, contact representative, and contact information will be confirmed in writing.

2.5 CONTINGENCY PLAN

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions.

The appropriate action for on-Site emergencies are detailed in the attached HASP, provided as Appendix G.

2.5.1 Emergency Telephone Numbers

In the event of any environmentally related situation or unplanned occurrence requiring assistance, the Owner or Owner's representative(s) should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. Prompt contact should also be made to the qualified environmental professional or acting Site manager. These emergency contact lists must be maintained in an easily accessible location at the Site.

Table 3
Emergency Contact Numbers

Medical, Fire, and Police:	911
One Call Center:	(800) 272-4480 (3 day notice required for utility markout)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362

Table 4
Site Contact Numbers

Company	Individual Name	Title	Contact Number
AKRF	Marc Godick	Project Director	914-922-2356 (office)
	Kate Brunner	Project Manger	646-388-9525 (office) 917-612-3990 (cell)
	Steve Grens	Site Safety Officer	917-613-6022 (cell)
Home Depot	Terri Brophy	Project Manager	781-956-7785 (cell)

* Note: Contact numbers subject to change and should be updated as necessary

2.5.2 Map and Directions to Nearest Health Facility

Site Location: Home Depot, Rego Park
75-09 Woodhaven Boulevard
Glendale, New York 11385

Nearest Hospital Name: North Shore University Hospital

Hospital Location: 10201 66th Road, Forest Hills, New York

Hospital Telephone: (718) 830-4000

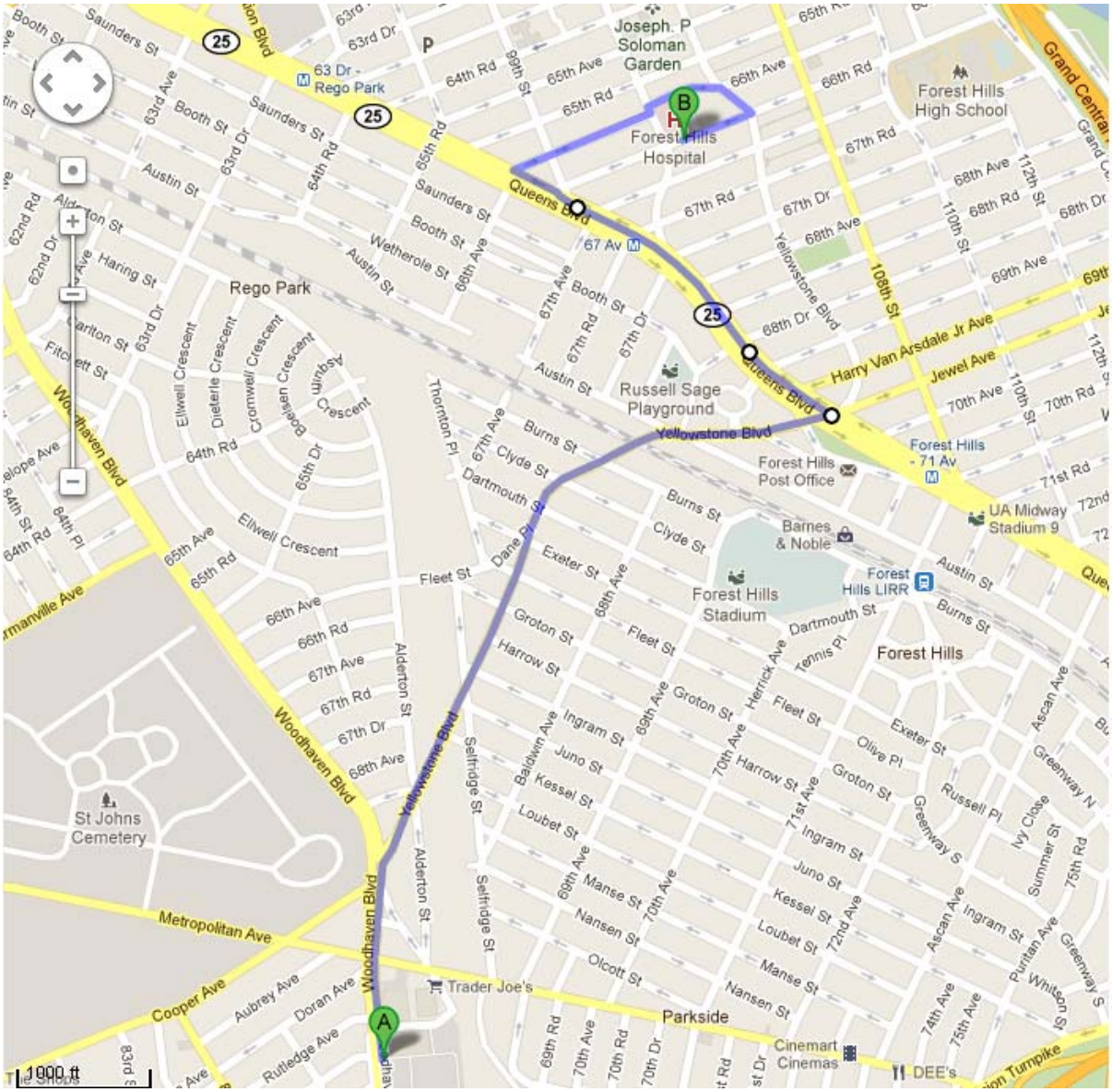
Directions to the Hospital:

1. RIGHT onto Woodhaven Boulevard
2. SLIGHT RIGHT onto Yellowstone Boulevard
3. LEFT onto Queens Boulevard.
4. EXIT onto Queens Boulevard.
5. RIGHT onto 66th Avenue.
6. LEFT onto 102nd Street.
7. First RIGHT onto 66th Avenue.
8. SLIGHT RIGHT onto Yellowstone Boulevard.
9. RIGHT onto 66th Road
10. The hospital will be on the right.

Total Distance: 2.5 miles

Total Estimated Time: 10 minutes

Map Showing Route from the Site to the Hospital:



2.5.3 Response Procedures

As appropriate, the fire department and other emergency response group will be notified immediately by telephone of the emergency. The emergency telephone number list is provided as Table 3. The list will also be posted prominently at the Site and made readily available to all personnel at all times.

The appropriate action for on-Site emergencies are detailed in the attached HASP, provided as Appendix G. The HASP may require revisions as necessitated by changes to Site conditions and project personnel. The plan will be updated as necessary or at a minimum of once every five years to ensure accuracy.

3.0 SITE MONITORING PLAN

3.1 INTRODUCTION

3.1.1 General

The Site Monitoring Plan describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the Site, the Site Cover system, and all affected Site media identified below. Monitoring of other ECs is described in Chapter 4, Operation, Monitoring and Maintenance Plan. This Monitoring Plan may only be revised with the approval of NYSDEC.

3.1.2 Purpose and Schedule

This Monitoring Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater, soil vapor, soils);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly ambient groundwater standards;
- Assessing achievement of the remedial performance criteria;
- Evaluating Site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment; and
- Preparing the necessary reports for the various monitoring activities.

To adequately address these issues, this Monitoring Plan provides information on:

- Sampling locations, protocol, and frequency;
- Information on all designed monitoring systems (e.g., well logs);
- Analytical sampling program requirements;
- Reporting requirements;
- Quality Assurance/Quality Control (QA/QC) requirements;

- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

Quarterly monitoring of the performance of the remedy and overall reduction in contamination on-Site will be conducted until a point in time when pulsing or discontinuation of system operation is viable, as provided for in the RWP. Pulsed operation will be conducted when contaminant concentrations are substantially reduced, at which point potential contaminant concentration rebounding will be evaluated by pulsing the system on and off for periods of time. Groundwater sampling results may also warrant permanent discontinuation of system operation. All decisions regarding system operation will be made in consultation with NYSDEC and NYSDOH.

Trends in contaminant levels in soil, soil vapor, and/or groundwater in the affected areas, will be evaluated to determine if the remedy continues to be effective in achieving remedial goals. Monitoring programs are summarized in Table 5 and outlined in detail in the subsequent subsections of Section 3 below.

Table 5
Site Monitoring/Inspection Schedule

Monitoring Program	Frequency*	Matrix	Analysis
AS/SVE System Operations Inspection	Monthly, and as necessary	AS/SVE System Operations/Extracted Soil Vapor Total VOC concentrations	Field screening (PID)
Groundwater Sampling	Quarterly	Groundwater	Chlorinated VOCs
Site Cover System Inspection	Annually, and as necessary	Site Cover System	NA
Site-Wide Inspection	Annually, and as necessary	General inspection of IC/ECs	NA

Notes:
NA – Not applicable

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC and NYSDOH.

If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs, a Site-wide inspection, as discussed in Section 3.4, will be conducted within 5 days of the event to verify the effectiveness of the EC/ICs implemented at the Site by a qualified environmental professional as determined by NYSDEC.

3.2 SITE COVER SYSTEM INSPECTION

The Site is currently developed with a one-story warehouse-style commercial building with associated asphalt-paved parking lot and driveways, concrete-paved sidewalks, loading dock and driveways and landscaped area. The premises will be inspected annually for the presence of fissures or cracks that could affect the integrity of the cover system as part of the annual Site-wide inspection, discussed in Sections 2.4 and 3.4.

All cover system monitoring activities will be recorded in a field book and a Cover System Inspection Log presented in Appendix H. The Cover System Inspection Log Sheet will be subject to the reporting requirements discussed in Sections 3.6 and 5.0.

3.3 MEDIA MONITORING PROGRAM

3.3.1 Groundwater Monitoring

Groundwater monitoring will be performed at a minimum of a quarterly basis assess the performance of the remedy.

The network of monitoring wells has been installed to monitor both upgradient and downgradient groundwater conditions at the Site. The network of on-Site wells has been designed based on the following criteria:

- Sampling depth: Wells installed to varying depths below the observed groundwater table
- Location relative to source and treatment areas: wells installed within, adjacent to, or downgradient of source/treatment areas)

Twenty-five groundwater monitoring wells are present on-Site. A figure showing the monitoring well array in plan is provided as Figure 11. Available monitoring well construction details are provided in Appendix J. A cross-sectional view showing the depth intervals of all the monitoring well screens relative to the groundwater table is provided as Figure 3.

Groundwater monitoring results will be compared to Class GA Standards and to previous sampling results for observation of trends. A spider map depicting the December 2011 PCE concentrations and historic PCE concentrations dating back to January 2001, is provided as Figure 10.

3.3.1.1 Quarterly Groundwater Sampling

Quarterly groundwater sampling is ongoing and will continue to be conducted to assess chlorinated VOC (CVOC) concentrations in Site groundwater as the AS/SVE system operates. The sampling frequency may be modified with the approval of NYSDEC. The SMP will be modified to reflect changes in sampling plans approved by NYSDEC.

Historic sampling results and the monitoring well layout were reviewed to create a modified list of groundwater wells to be sampled to minimize redundancy while maintaining a comprehensive set of monitoring points. Of the 25 Site monitoring wells, 16 will be analyzed on a quarterly basis and 6 will be analyzed on an annual basis. No wells will be abandoned, allowing for the potential resumption of sampling. The water level in each of the Site monitoring wells will continue to be gauged each quarter. Further recommendations on adjustments to sampling frequency at all well locations will be made in each annual PRR, based on the findings of the previous year's groundwater sampling results.

The following table lists monitoring well details, the proposed monitoring frequencies and brief justifications for the proposed monitoring frequencies. All monitoring well locations are shown in Figure 11.

Table 6
Revised Groundwater Monitoring Well Frequency List

Well Number	Screened Interval (Ft. below top of casing)	Range of PCE Concentrations 12/2009 thru 12/2011 (µg/L)	Monitoring Frequency	Justifications
AMW-2	49-64	80 - 750	Quarterly	Elevated PCE concentrations, maintains spatial distribution
AMW-3	49-64	2,000 - 7,500	Quarterly	Elevated PCE concentrations, maintains spatial distribution
AMW-4	68-78	310 - 1,700	Quarterly	Elevated PCE concentrations, maintains spatial distribution
AMW-6	70-80	170 - 820	Quarterly	Elevated PCE concentrations, maintains spatial distribution
P-1	54-64	2,000 - 15,000	Quarterly	Elevated PCE concentrations, maintains spatial distribution
P-2R	55-65	3.1 - 370	Quarterly	Elevated PCE concentrations, maintains spatial distribution
P-3	55-65	390 - 1,100	Quarterly	Elevated PCE concentrations, maintains spatial distribution
P-4	55-65	4.1 - 400	Quarterly	Elevated PCE concentrations, continue monitoring for trend
P-5	58-63	2.0 - 7.5	Quarterly	Low PCE concentrations, maintains spatial distribution
P-7	55-65	1.9 - 7.6	Quarterly	Upgradient of source area, low PCE concentrations, maintains spatial distribution
P-8R	65-75	26 - 150	Quarterly	Elevated PCE concentrations, maintains spatial distribution
P-10	52-57	110 - 6,100	Quarterly	Elevated PCE concentrations, maintains spatial distribution
P-13	75-85	2.9 - 290	Quarterly	Elevated PCE concentrations, maintains spatial distribution
P-17	100-110	16 - 110	Quarterly	Elevated PCE concentrations, maintains spatial distribution of deep wells
P-20	124-134	0.93 - 400	Quarterly	Elevated PCE concentrations, maintains spatial distribution of deep wells
AMW-1	105-110	69 - 4,900	Quarterly	Elevated PCE concentrations maintains spatial distribution of deep wells
P-9	61-66	110 - 2,400	Annually	Well screened comparably to P-10, P-11 and P-12
P-14	50-60	0.51 - 7.9	Annually	Consistently low PCE concentrations

Well Number	Screened Interval (Ft. below top of casing)	Range of PCE Concentrations 12/2009 thru 12/2011 (µg/L)	Monitoring Frequency	Justifications
P-15	75-85	8.7 - 240	Annually	Declining PCE concentrations, screened comparably to well P-13
P-19	95-105	0.81 - 300	Annually	Low PCE concentrations, screened comparably to well P-20
P-21	120-130	46 - 160	Annually	Screened comparably to well AMW-1
P-22	136-146	1.7 - 280	Annually	Declining but variable PCE concentrations, screened comparably to well AMW-1,
AMW-5	70-80	NA	Discontinue sampling	Damaged, not sampled since June 2009
P-11	57-62	54 - 450	Discontinue sampling	Screened comparably to well P-10
P-12	47-52	250 - 1,100	Discontinue sampling	Screened comparably to well P-9, damaged, not sampled since August 2010
P-16	50-60	1.4 - 8.0	Discontinue sampling	Low PCE concentrations, screened comparably to well P-5
P-18	127-137	0.99 - 1.4	Discontinue sampling	Low PCE concentrations, screened comparably to well P-17

The AS/SVE system in Zones 8 and 9 will be shut down for a minimum of 24 hours prior to sampling groundwater in monitoring wells in the vicinity of those Zones. The purpose of the shut down is to allow time for local groundwater to reach equilibrium prior to sampling so that sample results can provide a more accurate determination of CVOC concentrations in groundwater that could migrate off-Site in the absence of the expanded AS/SVE system Zones 8 and 9. The following monitoring wells will be affected:

Table 7

Groundwater Monitoring Wells Within Zones 8 and 9

Well Designations	Zone
AMW-6, P-4, P-19, P-20	Zone 8
P-5, P-13, P-14, P-15, P-16, P-17, P-18	Zone 9

3.3.1.2 Sampling Protocol

Sampling will be conducted using low-flow sampling techniques, as detailed in the QAPP, provided in Appendix I. All samples will be submitted to a NYSDOH-certified laboratory and analyzed for CVOCs by EPA Method 8260.

During each quarterly sampling event, all Site groundwater monitoring wells will be gauged for pressure/vacuum and total VOC concentrations with a PID prior to the onset of each quarterly monitoring event. These readings will be taken as part of the performance monitoring for the main Site EC, the AS/SVE system and be used to evaluate the need for any adjustments to the applied pressure and vacuum for both the AS and SVE systems since the previous round of sampling.

Accumulated purgewater will be containerized in 55-gallon drums for later off-Site disposal. Procedures for sampling drummed purgewater are provided in the QAPP. Deliverables for the groundwater monitoring program are specified in Section 3.6, Monitoring Reporting Requirements.

All monitoring well sampling activities will be recorded in a field book and a groundwater sampling log presented in Appendix H. Other observations (e.g., well integrity, etc.) will be noted on the well sampling log, which will be subject to the reporting requirements discussed in Section 3.6 and 5.0. Complete groundwater sampling procedures are detailed in the QAPP, provided as Appendix I.

3.3.1.3 Monitoring Well Repairs, Replacement And Decommissioning

If biofouling or silt accumulation occurs in the on-Site monitoring wells or the wells are otherwise determined unusable, the wells will be physically agitated/surged and redeveloped. Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance. Wells determined to be unusable will be properly decommissioned.

The NYSDEC will be notified prior to any repair or decommissioning of monitoring wells for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent PRR. Well decommissioning without replacement will be done only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's "Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

3.3.2 Extracted Vapor Effluent Monitoring

SVE monitoring is an integral portion of Site EC performance monitoring as detailed in Section 4.3.3. Monthly AS/SVE system inspections will include field screening the influent, intermediate and effluent ports of the primary and secondary GAC units for total VOC concentrations using a PID. Field screening results notwithstanding, samples of the SVE effluent will be collected twice a year for laboratory analysis to more accurately assess the VOC concentrations in extracted soil vapor and current condition of the GAC. In addition, extracted soil vapor from individual SVE lines will be sampled annually to assess VOC concentrations from discreet SVE wells, as opposed to Zones which comprise multiple SVE wells.

The sampling frequency may be modified based on field screening and laboratory analytical results with the approval of NYSDEC. The SMP will be modified to reflect changes in sampling plans approved by NYSDEC.

3.3.2.1 Sampling Protocol

Extracted soil vapor samples, along with an instantaneous PID reading, will be collected at the sample ports on the primary, secondary and existing GAC units. SVE effluent sampling locations are discussed in further detail in Section 4.3.7.1.

Samples will be collected by filling one-liter tedlar bags using a peristaltic pump, in accordance with the sampling procedure detailed in the QAPP. All

samples will be submitted to a NYSDOH ELAP-certified laboratory for analysis of VOCs by EPA Method TO-15.

All sampling activities will be recorded in a field book and an extracted vapor sampling log presented in Appendix H. Other observations (e.g., potential VOC sources, etc.) will be noted on the vapor sampling log, which will be subject to the reporting requirements discussed in Section 3.6 and 5.0. Complete vapor sampling procedures are detailed in the QAPP.

3.3.2.2 Carbon Changeout

Based on initial SVE concentrations and system operations data, breakthrough on one unit in each pair of GAC units is expected to occur approximately every six months. However, GAC replacement frequency will be based on field screening using a PID and laboratory analytical results.

All spent carbon will be disposed of or recycled off-Site in accordance with all applicable local and federal regulations. Based on requirements of the disposal/recycling facility and hazardous waste disposal contractor, a carbon sample may need to be collected for facility acceptance purposes. If so, a representative grab sample of the spent carbon will be collected and submitted for laboratory analysis as detailed in the QAPP, provided as Appendix I.

3.4 SITE-WIDE INSPECTION

Site-wide inspections will be performed on a regular schedule at a minimum of once a year. Site-wide inspections will also be performed after all severe weather conditions that may affect ECs or monitoring devices. During these inspections, an inspection form, provided in Appendix H, will be completed. All Site-wide inspection logs will be subject to the reporting requirements discussed in Section 3.6 and 5.0. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including Site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General Site conditions at the time of the inspection;

- The Site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection;
- Compliance with schedules included in the Operation and Maintenance Plan; and
- Confirm that Site records are up to date.

3.5 MONITORING QUALITY ASSURANCE/QUALITY CONTROL

All sampling and analyses will be performed in accordance with the requirements of the QAPP provided as Appendix I. Main Components of the QAPP include:

- QA/QC Objectives for Data Measurement;
- Sampling Program:
    - Sample containers will be properly washed, decontaminated, and appropriate preservative will be added (if applicable) prior to their use by the analytical laboratory. Containers with preservative will be tagged as such.
    - Sample holding times will be in accordance with the NYSDEC ASP requirements.
    - Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.
- Sample Tracking and Custody;
- Calibration Procedures:
    - All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.
    - The laboratory will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures;
- Preparation of a Data Usability Summary Report (DUSR), which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary

assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method;

- Internal QC and Checks; and
- QA Performance and System Audits.

Preventative maintenance procedures and schedules for Site ECs are described in Sections 3.0 and 4.0 of this SMP. Corrective Action Measures are discussion in Section 5.4 of this SMP.

3.6 MONITORING REPORTING REQUIREMENTS

Forms and any other information generated during regular monitoring events and inspections will be kept on file on-Site. All forms, and other relevant reporting formats used during the monitoring/inspection events, will be (1) subject to approval by NYSDEC and (2) submitted at the time of the subsequent PRR, as specified in Section 5.0, the Reporting Plan.

All monitoring results and Site findings will be reported to NYSDEC on a periodic basis in the annual PRR. A quarterly letter report will also be prepared subsequent to each sampling event. In the event that media monitoring, or any other environmental sampling required by this SMP, was conducted in the reporting period, the quarterly report will include, at a minimum:

- Date of event;
- Personnel conducting sampling;
- Description of the activities performed;
- Type of samples collected;
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;

- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether subsurface conditions have changed since the last reporting event.

Data will be reported in hard copy or digital format as determined by NYSDEC. A summary of the monitoring program deliverables are summarized in Table 8.

Table 8
Site Reporting Schedule

Task	Reporting Frequency*
Letter Report	Quarterly
Periodic Review Report	Annually

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC

4.0 OPERATION AND MAINTENANCE PLAN

4.1 INTRODUCTION

This Operation and Maintenance Plan describes the measures necessary to operate, monitor and maintain the mechanical components of the remedy selected for the Site. This Operation and Maintenance Plan:

- Includes the steps necessary to allow individuals unfamiliar with the Site to operate and maintain the AS/SVE systems;
- Includes an operation and maintenance contingency plan; and,
- Will be updated periodically to reflect changes in Site conditions or the manner in which the AS/SVE system is operated and maintained.

Information on non-mechanical ECs (i.e., Site cover system) is provided in Section 3.0 - Engineering and Institutional Control Plan. As-built drawings showing the AS/SVE system are provided in Appendix K. A copy of this Operation and Maintenance Plan, along with the complete SMP, will be kept at the Site. This Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component document of the SMP.

4.2 ENGINEERING CONTROL SYSTEM OPERATION AND MAINTENANCE

4.2.1 Air Sparge/Soil Vapor Extraction System

4.2.1.1 Scope

The System Operation and Maintenance Plan will be implemented to ensure that the entire AS/SVE system is operating according to design and manufacturer's specifications. This will entail concurrent regimens of system enclosure inspections and maintenance, ancillary component inspections and maintenance, ongoing reviews of system performance data, system performance monitoring and additional tasks.

4.2.1.2 System Operation: Routine Operation Procedures

4.2.1.2.1 Operating Conditions

The AS and SVE blowers operate continuously at Zones 1 through 6 for approximately 12 hours per day, between 8 AM and 8 PM and remain off overnight, to minimize noise overnight.

Air sparging is conducted at Zones 7 through 10 in 2-hour cycles per zone, beginning with Zone 7 at 12 AM. A stronger, primary SVE vacuum is applied during AS operation at any given zone to capture any off-gases generated by the AS. A secondary, weaker SVE vacuum is applied continuously to the three zones not being sparged at any given time to address any residual positive pressure following the most recent AS cycle and throughout the remainder of the Site. The expanded system is contained in a sound-insulated container and operates 24 hours per day.

The entire AS/SVE system is designed to operate continuously without any required adjustments or repairs, beyond routine maintenance items discussed in Section 4.2.1.4. Manufacturer's specifications and the troubleshooting guide, included as Appendix L, should be consulted prior to any repairs or adjustments that may become necessary. Regular system inspections, operation parameter documentation and performance assessment guidelines are detailed in Section 4.3.

4.2.1.3 System Operation: Non-Routine Equipment Maintenance

In most instances, non-routine maintenance will be required due to operating conditions that are governed by the AS/SVE alarm system and system telemetry. The primary objective of system telemetry is to notify personnel when operating conditions are likely to reduce or otherwise compromise SVE efficiency, which could lead to the uncontrolled migration of volatile soil vapor. The AS/SVE system is designed such that air sparging cannot be conducted in the absence of soil vapor extraction. The expanded AS/SVE system is also programmed to automatically shut down AS operation if the SVE system is operating, but not meeting certain parameters, including minimum vacuum requirements.

The system telemetry will also notify AKRF personnel when operating conditions are likely to cause damage to the AS/SVE equipment. The expanded system also has additional shutdown/alarm conditions as noted in Table 9:

Table 9

Expanded AS/SVE System Alarm Types

Alarm Type	Equipment Affected	Parameters
Alarm 1	Primary SVE	Low influent vacuum, high effluent temperature, high effluent pressure, moisture separator high level, holding tank high level
Alarm 2	Secondary SVE	Low influent vacuum, high effluent temperature, high effluent pressure, moisture separator high level, holding tank high level
Alarm 3	Shallow, Intermediate and Deep AS	High discharge temp, all sparge valves closed
Alarm 4	All equipment	AS/SVE Overloads (mechanical or electrical)

Most damage to the SVE lines or carbon units will trigger one of the alarms listed in Table 9. Damage to the AS lines will only be noted by unusually high or low air pressure or air flow rates, which will be noted in the routine system inspections and remedied upon identification.

In addition to these alarms, the SVE system was also designed with moisture/particulate separators and moisture holding tanks to prevent solids and liquids from reaching the SVE blowers. The expanded system SVE lines were designed with moisture sumps to collect condensate before it can reach the equipment enclosure. These moisture sumps are located in Concrete Boxes G and H and four manholes, two each for lines SVE-10A and SVE-10B, as shown in the as-built drawing provided in Appendix K. Condensate accumulation in SVE lines occurs at a faster rate during the fall and winter.

The AS compressors were designed with condensate knockout tanks, which collect condensation generated by the compressors. AS condensation accumulation occurs at a faster rate in the spring and summer. Accumulated condensate will be containerized in 55-gallon drums for later off-Site disposal. Procedures for sampling drummed purgewater are provided in the QAPP.

4.2.1.3.1 Reduced effectiveness

In the event that low SVE air flow rates are observed anywhere in the system, further system balancing may be necessary following monthly moisture removal, to ensure that the combined AS air flow rate in a given zone is less than the combined SVE air flow rate. Throttling valves for individual AS and SVE lines are located within the two system enclosures. Zones 2, 4 and 5 each comprise one AS and one SVE feeder line, which then split into individual AS and SVE lines at manifolds located at Concrete Boxes B, C and D, as shown on Figure 9. Individual throttling valves for these Zones are located at the manifold. Condensate accumulation in SVE lines has been a cause of reduced vacuum in the SVE system. As a result, moisture sumps must be pumped regularly in colder months to reduce the impact of accumulated condensate on the SVE lines. Accumulated purgewater will be containerized in 55-gallon drums for later off-Site disposal. Procedures for sampling drummed purgewater are provided in the QAPP.

4.2.1.3.2 Evaluate and identify causes

If operational issues are not rectified after implementing the measures discussed above, the individual well-head and external system components will be inspected in accordance with the procedures detailed in the QAPP. If the cause of malfunction is not identified, a Site-wide inspection may be necessary. These inspections will be conducted in the same manner as the annual Site-wide inspections discussed in Section 3.4. In the unlikely event that the cause of the issue is still not identified, the equipment vendor/system technician will be contacted for on-Site system diagnosis.

4.2.1.3.3 System or component replacement.

Maintenance items that cannot be predicted through runtime data (i.e., the need for filter changes on both of the AS compressors and the SVE system) will be scheduled and conducted based on field measurements taken during routine inspection (i.e., pre- and post-filter pressure/vacuum readings).

The expanded system included spare conduit and design allowances to accommodate potential additional future system expansion.

4.2.1.3.4 AS and SVE Well Repair and Reinstallation

AS and SVE wells may need to be reinstalled based on performance monitoring and Site inspection findings. AS/SVE wells will be replaced according to the specifications detailed in the QAPP.

The NYSDEC will be notified prior to the decommissioning of AS/SVE wells for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent PRR. Well decommissioning without replacement will be done only with the prior approval of NYSDEC. Wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

4.2.1.3.5 Reporting

All non-routine equipment maintenance activities will be reported in the subsequent letter report or PRR per the requirements in Section 5.0 of this SMP.

4.2.1.4 System Operation: Routine Equipment Maintenance

A tentative schedule for AS/SVE routine equipment maintenance work is provided in the following table:

Table 10

AS/SVE System Inspection/Maintenance Timeline

Operations Monitoring Tasks	Frequency
System Inspections (System Enclosure and external system components)	Monthly and as necessary
System Component Maintenance	Quarterly and as necessary
Wellhead and External System Component Maintenance	Annually and as necessary

4.2.1.4.1 System Inspections

Inspections of the AS/SVE system will be performed, at a minimum, on a monthly basis and will include the following tasks:

- General Site inspection, including conditions of security fence, accumulation of trash within fenced areas, system enclosure exterior, concrete box covers and insulation within concrete boxes.
- Identifying/rectifying operations-based maintenance items, such as malfunctioning wells and/or other system components, digital timer adjustments, external oil filters and condensation buckets on AS compressors, SVE blower particulate filter change-out, moisture and particulate separators tanks on SVE blowers, and moisture buildup throughout the external portions of the SVE system, including moisture sumps in Manhole H and moisture buildup in GAC sample ports.

In addition to system enclosure-related inspections, the eight moisture sumps installed throughout the Site for Zones 8, 9, and 10 SVE lines will be inspected. System performance to date indicates that the SVE system is sensitive to extreme temperatures, both hot and cold. Moisture buildup is more pronounced during colder months. Moisture sumps will be inspected and pumped out as necessary during monthly inspections. Depending on weather conditions and the amount of moisture accumulation observed, the frequency may be increased to semi-monthly or weekly. All manholes will be insulated using consumer-grade fiberglass insulation. Insulation, particularly in Manholes E, F, G and I, will be inspected and replaced as necessary, based on visual inspection of the physical condition of the insulation material.

System shutdown (due to high influent SVE temperatures) has been a documented concern during warmer months. The system will be restarted thereafter. Other system components, in particular, the SVE differential pressure gauges, will be reset as necessary following temperature-related troubleshooting.

Both unexpected and deliberate alterations to and/or shutdowns of the system will be recorded in the field book and documented on the Site Maintenance Inspection Log provided in Appendix H. A shutdown log will be maintained separately to track any atypical system activity, including, but not limited to, alarm conditions and responses and scheduled shutdowns for system maintenance, etc.

4.2.1.4.2 Routine System Component Maintenance

The AS/SVE system consists of ten major pieces of equipment: six SVE components and four AS components. The SVE systems each comprise an SVE blower and an associated motor and the AS systems comprise an air sparge compressor or blower/motor pair. Each piece of equipment requires routine maintenance that is dictated either by runtimes or operating conditions, as defined by manufacturer's specifications. However, most maintenance items are required on a quarterly basis. The pertinent material cut sheets and a table summarizing the routine maintenance items are provided as Appendix M. A binder containing complete manufacturer's specifications for all system components is maintained on-Site, as well as digitally at AKRF offices.

4.2.1.4.3 Wellhead and External System Component Maintenance

Individual wellheads and additional manholes will be inspected, at a minimum, on an annual basis. All expanded system AS and SVE wells are accessible via flush-mount well covers. A minimum of a visual inspection of the wellhead will be conducted unless historically problematic AS and/or SVE wells are identified based on operational data review.

Accessible portions of tubing, piping, and associated connections will be inspected in all manholes during the semi-annual inspection. Though most operational issues are likely to have been identified in advance by operations data and monthly and quarterly inspections, any issues identified during annual inspections will be addressed immediately.

Wellhead and external system component inspections should be conducted as detailed in the QAPP, provided in Appendix I.

4.2.1.4.4 Tools and Spare Parts

All tools necessary for inspection and maintenance, with the exception of a PID, will be maintained within the expanded system enclosure. Oil, grease and SVE blower particulate filter elements are maintained within the enclosure in the event that maintenance is required at an unexpected time. Personal protective equipment (PPE), including latex gloves, eye protection and dust masks, are also maintained on-Site.

4.2.1.4.5 Reporting

Barring any unusual findings, the system inspections and maintenance described above will be reported per the requirements of Section 5.0 of this SMP. In the event that an unexpected condition, such as a critical malfunction or extreme weather conditions that may hinder system operation is noted, the NYSDEC may need to be alerted immediately.

4.2.1.5 System Start-Up and Testing

The system testing described below will be conducted if, in the course of the AS/SVE system lifetime, significant changes are made to the system, and the system must be restarted.

As the AS/SVE system is already in operation, this section will discuss testing procedures following the replacement of lines. These procedures need not be followed after routine system restarts, such as those after the remedy of alarm conditions or following routine system maintenance.

Following reconnection and prior to backfilling, all piping will be tested for tightness. AS lines will be pressurized using the existing AS equipment and isolating individual lines and SVE lines will be pressurized by attaching a compressor to the SVE line samples ports identified in the Process and Instrumentation Diagram (P&ID), provided as part of the Operations and Maintenance Manuals provided in Appendix L. Each completed AS line will be

pressure tested for a minimum of 30 minutes maintaining a pressure of 50 pounds per square inch (psi). Each completed SVE line will be pressure tested for a minimum of 30 minutes maintaining a pressure of 15 psi. During each test, the installer will soap test all accessible fittings and inspect for leaks, including any joints in accessible concrete vaults.

Following the reconnection to the expanded AS/SVE system, revisions to system automation timers may be required. Procedures for these adjustments are provided in the manufacturer's specifications provided as Appendix L.

Startup system monitoring will be conducted to verify that AS and SVE design criteria are still being met system-wide following the replacement/repair of AS or SVE wells. Startup monitoring within the system enclosure will consist of monitoring flow and vacuum/pressure readings throughout the system, in the same fashion as routine inspections. The system will be monitored throughout the day to ensure that it is being operated as intended. Following startup, system inspections will continue on a bi-weekly basis for the first month, to ensure proper operation of the new lines, and return to a monthly basis thereafter.

Startup testing may require measurements of pressure/vacuum in existing monitoring wells in the vicinity of the newly repaired/replaced or installed AS/SVE wells to confirm that the new wells are operating as intended. This additional monitoring may be required if startup monitoring indicates that the new wells are not achieving the design parameters for pressure/vacuum and air flow rates.

The monitoring wells will be monitored for induced vacuum/pressure, total VOCs (using a PID) and O_2 at the well cap, and depth to groundwater. Baseline readings will be collected prior to system startup at designated wells for each Zone, and measurements will be collected the day of startup. Based on the startup testing, adjustments may be made to optimize system performance, as discussed in Section 4.2.1.5.1. The wells to be monitored during startup confirmation testing are listed in Table 11 and shown on Figure 9.

Table 11

AS/SVE Startup Testing Well Details

Zone ID	Well ID (west to east)	Approx. Distance from Nearest AS Well (feet)	Screened Interval (feet below grade)
1	P-9	50	61-66
	P-10	60	52-57
	P-11	80	57-62
	P-12	80	47-52
2	AS-10D	45	120-125
	AS-10C	20	120-125
	P-9	65	61-66
	P-10	65	52-57
	AMW-3	90	49-64
3	P-21	75	120-130
	P-1	75	54-64
	P-22	75	136-146
	AMW-1	75	100-110
	P-2	Adjacent	55-65
	P-3	25	55-65
4	P-3	Adjacent	55-65
5	AS-10D	35	120-125
	AS-10C	25	120-125
	AMW-3	25	49-64
	AMW-4	25	68-78
	P-9	50	61-66
	P-10	45	52-67
	P-11	50	57-62
	P-12	40	47-52
6	P-21	10	120-130
	P-1	5	54-64
	P-22	10	136-146
	AMW-1	10	105-110
	P-2	75	55-65
7	P-21	10	120-130
	P-22	10	136-146
	AMW-1	15	100-110
	P-1	20	54-64
	P-2	50	55-65
8	AMW-6	5	70-80
	P-4	5	55-65
	P-19	10	95-105
	P-20	15	124-134
8 and 9	P-13	25	75-85

Zone ID	Well ID (west to east)	Approx. Distance from Nearest AS Well (feet)	Screened Interval (feet below grade)
	P-14	20	50-60
9	P-18	15	127-137
	P-17	10	100-110
	P-15	10	75-85
	P-16	15	50-60
	P-5	35	58-63
10	P-9	40	59-64
	P-10	40	52-57
	P-11	80	57-62
	P-12	80	47-52

4.2.1.5.1 System Balancing

Adjustments to system components may be necessary after any alterations to the overall system. AS and SVE equipment, including individual valves on AS and SVE lines will be throttled to rebalance the system, adjusting AS air flow rates to typical norms and increasing SVE air flow rates to compensate accordingly.

All modifications, adjustments or additions to the AS/SVE system should be completed in accordance with the equipment specifications provided by the manufacturer. The Operations and Maintenance Manuals, which include manufacturers' specifications for all system components, are provided in Appendix L and will be maintained on-Site.

4.2.1.5.2 Sampling

Following the successful startup of any new or repaired SVE lines, a vapor sample will be collected from the repaired or newly installed line(s) to assess the VOC concentration extracted from that well. The sample will be taken a minimum of one week after line startup to avoid any unusually high VOC concentrations that may be detected immediately after startup due to a buildup of volatile vapors within the subsurface. Sampling procedures are discussed in Section 4.3.7.

4.2.1.5.3 Updates and Reporting

Following completion of these activities, the P&ID and Site figures may need to be updated to reflect the work completed. Such revisions would be made and submitted to NYSDEC along with startup ROI monitoring and system operation data as part of a letter report summarizing the repair/reinstallation or addition work.

4.3 ENGINEERING CONTROL SYSTEM PERFORMANCE MONITORING

4.3.1 System Overview

An AS/SVE system is shown on Figure 9, covering the source areas, the area immediately downgradient of the source area, and the downgradient boundaries of the Site. As-built drawings for the AS/SVE system are provided as Appendix K. The Operations and Maintenance Manuals for both the initial and expanded system is provided as Appendix L.

A complete list of AS and SVE wells is provided in Table 2. Available installation logs for the AS/SVE wells are provided in Appendix N.

4.3.2 Remedial Objective

The in-situ remediation approach was implemented to treat both residual soil and groundwater contamination in source areas of the Site and contain groundwater contamination along the downgradient property boundary. The use of a combined AS/SVE system is designed to remove volatile contaminants from both the saturated and unsaturated zones. The system design also accounted for the accessibility issues associated with the retail operations and deep groundwater at the Site. The system expansion included spare conduit and design allowances to accommodate potential additional future system expansion.

4.3.3 Vapor Treatment Systems and Performance Monitoring

Effluent vapors from the SVE blowers are treated by GAC units, which were sized based on pilot testing results. Each blower is connected to two GAC units,

connected in series, which prevent the release of volatile vapors into the atmosphere. All four units are outfitted with inlet and outlet sample ports to provide points to monitor vapor pressure and VOC concentrations. Carbon will be replaced based on field screening and laboratory analysis of extracted vapor VOC concentrations. The evaluation procedure is detailed in Section 4.3.7.

4.3.4 Monitoring Schedule

Inspections of the system will be performed, at a minimum, on a monthly basis and will include the following tasks:

- Routine inspections to document system operational data and system component conditions.
- Visual inspection of all aboveground equipment, including SVE moisture sumps.
- Carbon treatment performance monitoring.

A tentative schedule for AS/SVE system inspection and maintenance work is provided in the following table:

Table 12

AS/SVE System Performance Inspection Schedule

Operations Monitoring Tasks	Frequency	Matrix	Analysis
AS/SVE System Inspection	Monthly and as necessary	AS/SVE System Operations/Extracted Soil Vapor	Field screening with PID
Extracted Soil Vapor Monitoring	Semi-Annually and as necessary	Extracted Soil Vapor	TO-15
Individual SVE Line Vapor Sampling	Annually and as necessary	Extracted Soil Vapor	TO-15

Both systems are designed such that AS cannot be conducted in the absence of SVE. System inspections should be conducted to verify that combined SVE air flow rates are always greater in magnitude than the combined AS air flow rates for any given zone.

To maintain a digital archive and to review operational information in the field, the System Performance Monitoring Log Sheet, provided in Appendix H, will be available on a field tablet computer, which will be used as the primary inspection logging device. As a precaution, paper log sheets will also be maintained within the system enclosure in the event that an unexpected inspection is required.

As the expanded system is designed to cycle to the four expanded system zones in 2-hour periods, operational data will be logged at least once from each zone each month. Historic data will be used to determine a range of acceptable values for each inspection parameter. The range of values is listed for each parameter in the System Performance Monitoring Log Sheet.

Inspection frequency is subject to change with the approval of the NYSDEC. Unscheduled inspections and/or sampling may take place when a suspected failure of the AS/SVE system has been reported or an emergency occurs that is deemed likely to affect the operation of the system. Monitoring deliverables for the AS/SVE system are specified later in this Plan.

4.3.5 General Equipment Monitoring

Visual and quantitative inspections of the aboveground components of the AS/SVE system will be conducted during the monitoring event.

The major system components will be inspected during each Site visit to document operating conditions. The major system components include: the control panel for system runtimes and alarm conditions; SVE blowers for influent vacuum and temperature, post-filter vacuum, and effluent temperature; the SVE manifolds for individual line vacuum and air flow rates; GAC units for influent, intermediate and effluent VOC concentrations and air pressure; the AS compressors/blowers for compressor discharge air flow rates, pressure and temperature; and the AS manifolds for individual line air flow rates and pressure.

A complete list of components and parameters to be checked is provided in the System Performance Monitoring Inspection Log, presented in Appendix H. If any equipment readings are not within their typical range, any equipment is observed to be

malfunctioning, or the system is not performing according to specifications, maintenance and repair will be implemented, as required. Maintenance, repair and troubleshooting guidelines are presented in Section 4.4. The AS/SVE system will be restarted following the adjustments, if necessary.

4.3.6 System Monitoring Devices and Alarms

The entire AS/SVE system is designed to shut down in low SVE vacuum conditions. The expanded AS/SVE system was designed with additional shutdown conditions. These include, but are not limited to, SVE blower failure, high SVE effluent pressure, high SVE effluent temperature, and high SVE moisture accumulation. The expanded system is also designed to shut down in the event that any of the four major system components (primary and secondary SVE blower, shallow/intermediate and deep AS compressors) experience an electrical or mechanical overload. A manual emergency stop switch is also present on the control panel. The alarm system is described in detail in Section 4.2.1.3. In the event of a shut down, the expanded system is equipped with a telemetry unit that alerts specified personnel of the general alarm type, and current overall status of the expanded system.

In the event that the alarm is activated, applicable maintenance and repairs will be conducted, as specified in the Operation and Maintenance Plan, and the AS/SVE system restarted. Operational problems will be noted in the subsequent letter report or PRR. Manual restart steps will be included on the System Operations Logs, provided as Appendix H. A System Shutdown Log will be maintained to track system operation. A copy of the current log is provided in Appendix H.

4.3.7 Extracted Vapor Effluent Sampling Protocol

Carbon treatment system influent and effluent vapor VOC concentrations will be monitored to calculate mass removal, help assess the efficacy of the AS/SVE system as a whole and assess the need to dispose and replace GAC contained within each of the six carbon vessels. Monthly system inspections will include field screening the influent, intermediate and effluent ports of all GAC sets for total VOC concentrations using a PID.

Field screening results notwithstanding, vapor samples will be collected and submitted for laboratory analysis twice a year to verify field screening results. Vapor samples, along with an instantaneous PID reading, will be collected at the sample ports on all the GAC units, as detailed in Section 4.3.7.1 and the QAPP, provided as Appendix I. In addition, individual SVE line vapor samples, accessible in the expanded system only, will be collected at a minimum of annually to assess the VOC concentrations from the individual wells that comprise a Zone.

Vapor sampling frequency may be reassessed based upon field screening and laboratory analytical results. In addition, individual line samples (e.g., a sample from individual SVE line SVE-7A) will be taken at least annually to assess VOC removal from individual wells.

The sampling frequency may be modified with the approval NYSDEC. The SMP would be modified to reflect changes in sampling plans approved by NYSDEC.

4.3.7.1 Sampling Protocol

Vapor samples, along with an instantaneous PID reading, will be collected at the sample ports on the primary, secondary and existing GAC units. A summary of vapor samples is provided in the following table:

Table 13

Extracted Vapor Sampling Summary

Zone ID	Zone Specific Samples				Combined Samples		
	Individual SVE line Influent (2-hr sample)	Zone-specific Influent (2-hr sample)	Zone-specific Intermediate (2-hour sample)	Zone-specific Effluent (2-hour sample)	Combined Influent (6-hour sample)	Combined Intermediate (6-hour sample)	Combined Effluent (6-hour sample)
Zones 1 - 6	NA	NA	NA	NA	X	X	X
Zone 7	SVE-7A/ SVE-7B	X	--	--	X	X	X
Zone 8	SVE-8A/ SVE-8B	X	--	--			

Zone ID	Zone Specific Samples				Combined Samples		
Zone 9	SVE-9A/ SVE-9B	X	--	--			
Zone 10	SVE-10A / SVE-10B	X	X	X			

Notes:
--: No sample taken
NA: Not applicable

An approximate one liter volume of vapor will be purged and collected in a tedlar bag prior to each sample using a peristaltic pump at a rate of approximately 0.1 liter per minute, for screening purposes. The screened tedlar bag will be disposed of thereafter. The vapor sample to be submitted for laboratory analysis will be collected immediately afterwards in a new tedlar bag, using the peristaltic pump at the same flow rate. A complete summary of the sampling protocol, including details regarding the chain-of-custody sample holding times and laboratory deliverables, is provided in the QAPP, provided as Appendix I. All samples will be submitted to a NYSDOH ELAP-certified laboratory for analysis of VOCs by EPA Method TO-15.

All sampling activities will be recorded in a field book and a vapor-sampling log presented in Appendix H. Other observations (e.g., potential VOC sources, etc.) will be noted on the vapor sampling log. Complete vapor sampling procedures are detailed in the QAPP.

4.3.7.2 Carbon Changeout

Breakthrough on one unit in each pair of GAC units is expected to occur approximately every six months. However, field screening and laboratory analytical results will be used to determine the need to replace one or both of the carbon units in any given GAC set.

All spent carbon will be disposed of off-Site in accordance with all applicable local and federal regulations. Based on the requirements of the disposal/recycling facility and hazardous waste disposal contractor, a carbon

sample may need to be collected for facility acceptance purposes. Carbon sampling procedures are identical to soil grab sampling procedures, detailed in the QAPP, provided as Appendix I.

4.3.7.3 Groundwater Monitoring

Groundwater monitoring will be conducted to assess the effect of AS/SVE operation on PCE source areas, as well as groundwater PCE concentrations throughout the Site. Monitoring will be conducted on a quarterly basis, as discussed in Section 3.3.1 and in accordance with the QAPP, provided as Appendix I. Results will be used as part of ongoing AS/SVE performance monitoring.

4.4 MAINTENANCE AND PERFORMANCE MONITORING REPORTING REQUIREMENTS

Maintenance reports and any other information generated during regular operations at the Site will be kept on-file on-Site. All reports, forms, and other relevant information generated will be available upon request to the NYSDEC and submitted as part of the PRR, as specified in the Section 5 of this SMP.

4.4.1 Routine Maintenance Reports

Checklists or forms, provided in Appendix H, will be completed during each routine maintenance event and summarized in the subsequent letter report or PRR. Checklists/forms will include, but not be limited to, the following information:

- Date;
- Name, company, and position of person(s) conducting maintenance activities;
- Standard operation measurements (as discussed in Section 4.3);
- Maintenance activities conducted;
- Any modifications to the system;

- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and,
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc. (attached to the checklist/form).

4.4.2 Non-Routine Maintenance Reports

During each non-routine maintenance event, a form will be completed which will include, but not be limited to, the following information:

- Date;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Presence of leaks or other atypical operating conditions;
- Date of repair;
- Other repairs or adjustments made to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and,
- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

All non-routine maintenance activities will be summarized in the subsequent letter report or PRR.

5.0 INSPECTIONS, REPORTING AND CERTIFICATIONS

5.1 SITE INSPECTIONS

A comprehensive table outlining all inspection and reporting is provided in Table 14.

Table 14
Comprehensive Site Monitoring/Inspection Schedule

Monitoring Program	Frequency	Matrix	Laboratory Analysis
AS/SVE System Components Inspections	Monthly and as necessary	AS/SVE system components	NA
AS/SVE System Operations Inspection	Monthly and as necessary	AS/SVE System Operations/Extracted Soil Vapor Total VOC concentrations	Field screening (PID)
System Component Routine Maintenance	Quarterly and as necessary	System components	NA
Groundwater Sampling	Quarterly	Groundwater	CVOCs
Extracted Soil Vapor Monitoring	Semi-Annually and as necessary	Extracted Soil Vapor	TO-15
Individual SVE Line Vapor Sampling	Annually and as necessary	Extracted Soil Vapor	TO-15
Site Cover System Inspection	Annually and as necessary	Site Cover System	NA

Notes:
1. Total depths were measured on date

5.1.1 Inspection Frequency

All inspections will be conducted at the frequency specified in the schedules provided in Section 3.0 Monitoring Plan and Section 4.0 Operation and Maintenance Plan of this SMP. At a minimum, a Site-wide inspection will be conducted annually. Inspections of remedial components will also be conducted when a breakdown of any

treatment system component has occurred or whenever a severe condition has taken place, such as an erosion or flooding event that may affect the ECs.

5.1.2 Inspection Forms, Sampling Data, and Maintenance Reports

All inspections and monitoring events will be recorded on the appropriate forms for their respective system which are contained in Appendix H. Additionally, a general Site-wide inspection form will be completed during the Site-wide inspection. These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including all media sampling data and system maintenance reports, generated for the Site during the reporting period will be provided in electronic format in the quarterly letter report and PRR. The quarterly report will serve as a progress update with a summary of sampling/inspection events and routine and non-routine maintenance as discussed in Sections 3 and 4 of this SMP. Data analysis and evaluations will be conducted in the annual PRR.

5.1.3 Evaluation of Records and Reporting

Table 15

Schedule of Monitoring/Inspection Reports

Task	Reporting Frequency*
Letter Report	Quarterly
Periodic Review Report	Annually

Note:

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC

The results of the inspection and Site monitoring data will be evaluated as part of the EC/IC certification in the PRR to confirm that the:

- EC/ICs are in place, are performing properly, and remain effective;
- The Monitoring Plan is being implemented;
- Operation and maintenance activities are being conducted properly; and, based on the above items; and

- The Site remedy continues to be protective of public health and the environment and is performing as designed in the RWP and FER.

5.2 CERTIFICATION OF ENGINEERING AND INSTITUTIONAL CONTROLS

After the last inspection of the reporting period, a Professional Engineer licensed to practice in New York State will prepare the following certification:

For each institutional or engineering control identified for the Site, I certify that all of the following statements are true:

- The inspection of the Site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;
- The IC and/or EC employed at this Site is unchanged from the date the control was put in place, or last approved by the Department;
- Nothing has occurred that would impair the ability of the control to protect the public health and environment;
- Nothing has occurred that would constitute a violation or failure to comply with any SMP for this control;
- Access to the Site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;
- If a financial assurance mechanism is required under the oversight document for the Site, the mechanism remains valid and sufficient for the intended purpose under the document;
- Use of the Site is compliant with the Deed Restriction;
- The EC systems are performing as designed and are effective;
- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the Site remedial program and generally accepted engineering practices;
- The information presented in this report is accurate and complete; and
- I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class “A”

misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner or Owner's Designated Site Representative] for the Site.

The signed certification will be included in the PRR as described below.

5.3 PERIODIC REVIEW REPORT

A Periodic Review Report will be submitted to the Department every year, beginning eighteen months after the Assignable Release and Covenant Not To Sue is issued. In the event that the Site is subdivided into separate parcels with different ownership, a single PRR will be prepared that addresses the final metes and bounds of the Site described in Appendix A. The report will be prepared and certified by a New York State Professional Engineer in accordance with NYSDEC DER-10 and submitted within 45 days of the end of each certification period. Media sampling results will also incorporated into the PRR. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the Site;
- Results of the required annual Site inspections and severe condition inspections, if applicable;
- All applicable inspection forms and other records generated for the Site during the reporting period in electronic format;
- A summary of any discharge monitoring data and/or information generated during the reporting period with comments and conclusions;
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends;
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format;

- A Site evaluation, which includes the following:
    - The compliance of the remedy with the requirements of the Site-specific RWP;
    - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;
    - Any new conclusions or observations regarding Site contamination based on inspections or data generated by the Monitoring Plan for the media being monitored;
    - Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan; and
    - The overall performance and effectiveness of the remedy.
- A performance summary for all treatment systems at the Site during the calendar year, including information such as:
    - The number of days the system was run for the reporting period;
    - The contaminant mass removed;
    - A description of breakdowns and/or repairs along with an explanation for any significant downtime;
    - A description of the resolution of performance problems;
    - A summary of the performance, effluent and/or effectiveness monitoring; and
    - Comments, conclusions, and recommendations based on data evaluation.

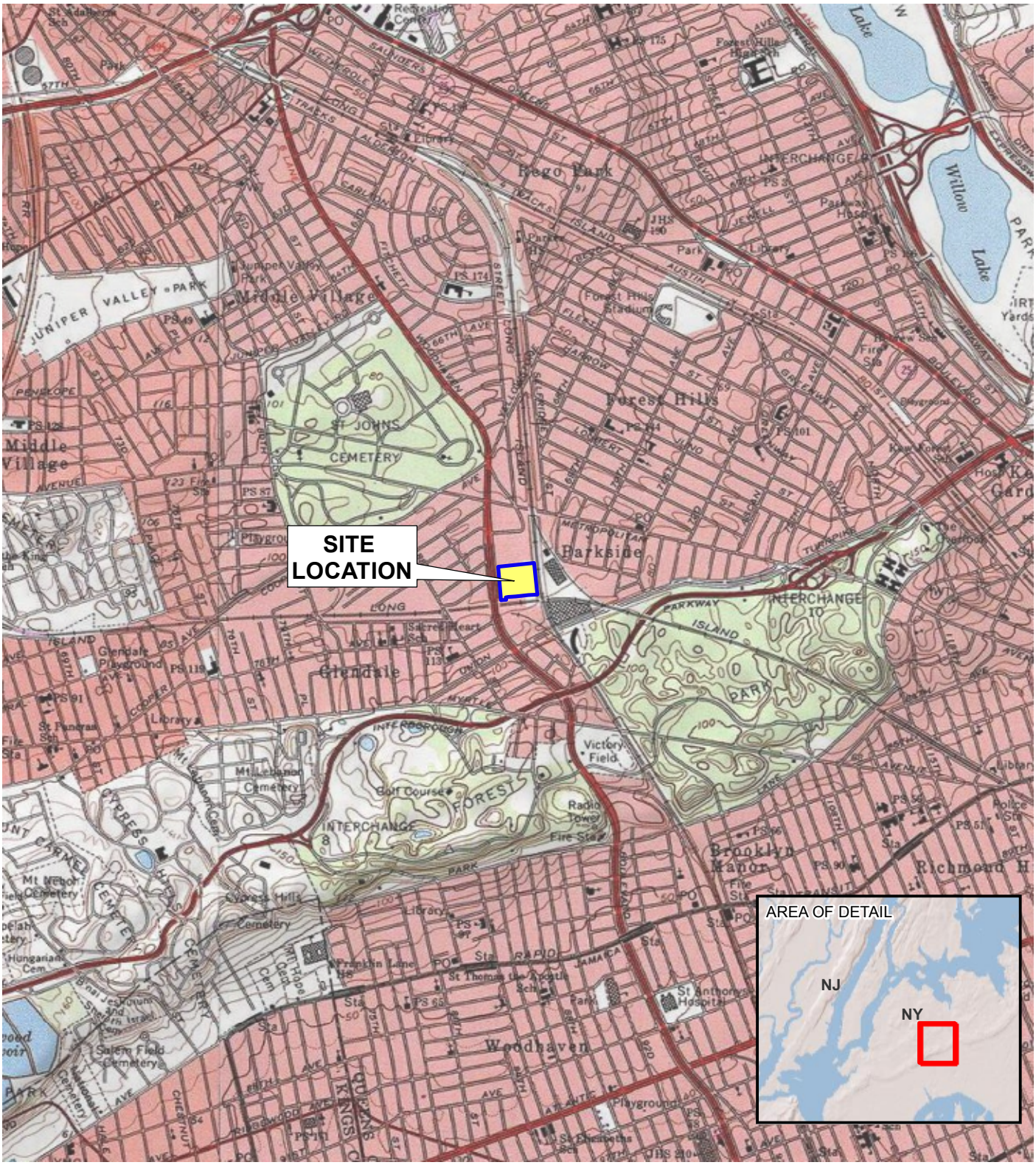
The PRR will be submitted, in hard-copy format, to the NYSDEC Central Office and Regional Office in which the Site is located, and in electronic format to NYSDEC Central Office, Regional Office and the NYSDOH Bureau of Environmental Exposure Investigation.

5.4 CORRECTIVE MEASURES PLAN

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a corrective measures plan will be submitted to the NYSDEC for approval. This

plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the corrective measures plan until it is approved by the NYSDEC.

FIGURES



SOURCE
USGS 7.5 Minute Topographic Map
JAMAICA Quad 1980

0 2,000 4,000 Feet

HOME DEPOT
REGO PARK, NEW YORK

PROJECT SITE LOCATION

AKRF
Environmental Consultants
440 Park Avenue South, New York, N.Y. 10016

DATE
5/7/2012

PROJECT No.
03399

FIGURE
1

©2012 AKRF, Inc. Environmental Consultants O:\Projects\03399 - HOME DEPOT - REGO PARK, NY\03399 Fig 1 loc map.mxd

FORMER OUTPARCEL
ADDED TO VCP IN 2012

GLENDALE PARCEL

ADI
PARCEL

0' 50' 100' 200'
SCALE IN FEET

Source: 2010 New York Statewide Digital Orthoimagery

©2012 AKRF, Inc. Environmental Consultants \\NYCFILES\Hazmat\AKRF Project Files\03399 & 08009 - Home Depot - Rego Park\Figures\Closure Documents - created March 2012\Fig 2 Site Plan_ and DOB permit Georeferenced for lat long.dwg

AKRF
Environmental Consultants
440 Park Avenue South, New York, NY 10016

HOME DEPOT
REGO PARK - GLENDALE, NEW YORK

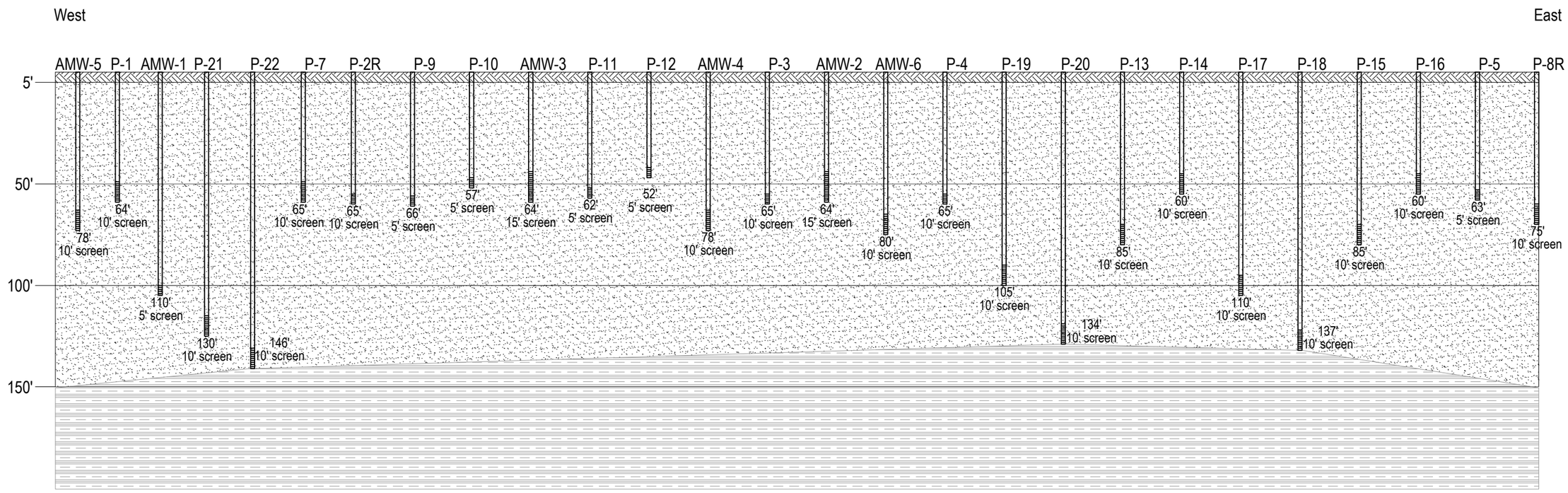
SITE PLAN

DATE
5.9.2012

PROJECT NO.
03399

SCALE
as shown

FIGURE
2



NOTES:
1. INCLUDES ALL SITE MONITORING WELLS ALIGNED ON A SECTION FACING NORTH
2. APPROXIMATE DEPTH TO GROUNDWATER TABLE IS 45 - 52 FEET.

LEGEND:

- FILL 0 < 5 FEET
- SAND 95 < 150 FEET
- CLAY > 150 FEET

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HOME DEPOT, REGO PARK - GLENDALE, NEW YORK

GEOLOGIC CROSS SECTION WITH GROUNDWATER MONITORING WELLS

DATE 5.7.2012

PROJECT NO. 03399

SCALE nts

FIGURE 3

©2011 AKRF, Inc. Environmental Consultants M:\AKRF Project Files\03399 & 08009 - Home Depot - Rego Park\Figures\Closure Documents - created March 2012\Fig 3 X-section well locations.dwg

© 2009 AKRF, Inc. Environmental Consultants \\NYCFILES\Hazmat\AKRF Project Files\03399 & 08009 - Home Depot - Rego Park\Figures\Closure Documents - created March 2012\Fig 4 Groundwater Elevation Map.dwg

P-7 18.66
P-7

P-8R

18

AMW-3
17.10
AMW-3

AMW-2
17.01
AMW-2

18

AMW-4

18.93
P-10
P-9 P-10

P-12
P-11

18

17

17.20
P-5
P-5

16

15.29
P-16
P-16
P-15

CONCRETE CURB

P-17
P-18
P-14
P-13

15.36
P-14

17.44
P-3
P-3

17.00
P-4
AMW-6
P-4
P-19
P-20

P-2R
16.80
P-2R

P-21
AMW-5
P-1
P-22
AMW-1
16.51
P-1

WOODHAVEN BLVD.

0' 25' 50' 100'
SCALE IN FEET

LEGEND:

16 — ELEVATION CONTOUR IN FEET

15.36
P-14
MONITORING WELL
WATER TABLE ELEVATION IN FEET

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HOME DEPOT
REGO PARK - GLENDALE, NEW YORK
SITE PLAN WITH SEPTEMBER 2011 SHALLOW MONITORING WELL GROUNDWATER ELEVATIONS

DATE
5.7.2012

PROJECT NO.
03399

SCALE
as shown

FIGURE
4

WOODHAVEN BOULEVARD

ASPHALT-PAVED PARKING AREA

LANDSCAPED AREA

NURSERY

1 STORY BUILDING WITH CONCRETE SLAB

(HOME DEPOT)

ASPHALT-PAVED DRIVEWAY

CONCRETE CURB

WOODHAVEN BLVD.

CONCRETE-PAVED LOADING DOCK

CONCRETE- AND ASPHALT-PAVED DRIVEWAY

0' 25' 50' 100'

SCALE IN FEET

LEGEND

VOLUNTARY CLEANUP AGREEMENT PROPERTY BOUNDARY

PCE SOURCE AREA

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HOME DEPOT
REGO PARK - GLENDALE, NEW YORK

SITE PLAN WITH PCE SOURCE AREAS AND SITE COVER TYPES

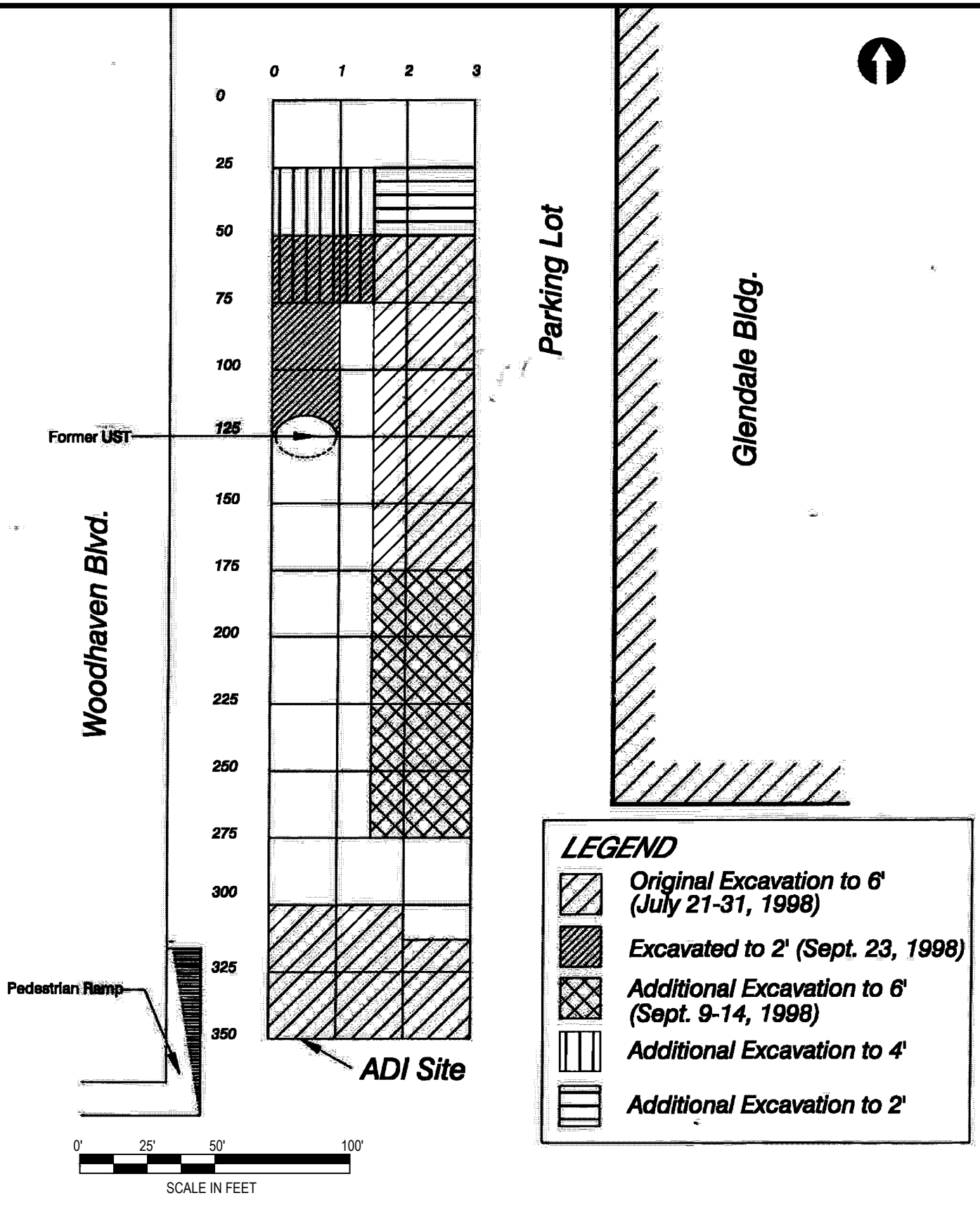
DATE
5/7/12

PROJECT NO.
03399

SCALE
as shown

FIGURE
5

©2008 AKRF, Inc. Environmental Consultants M:\AKRF Project Files\03399 & 08009 - Home Depot - Rego Park\Figures\Closure Documents - created March 2012\fig 5 site plan w-cover system and source areas.dwg



HOME DEPOT
REGO PARK - GLENDALE, NEW YORK

FINAL EXCAVATION DEPTHS

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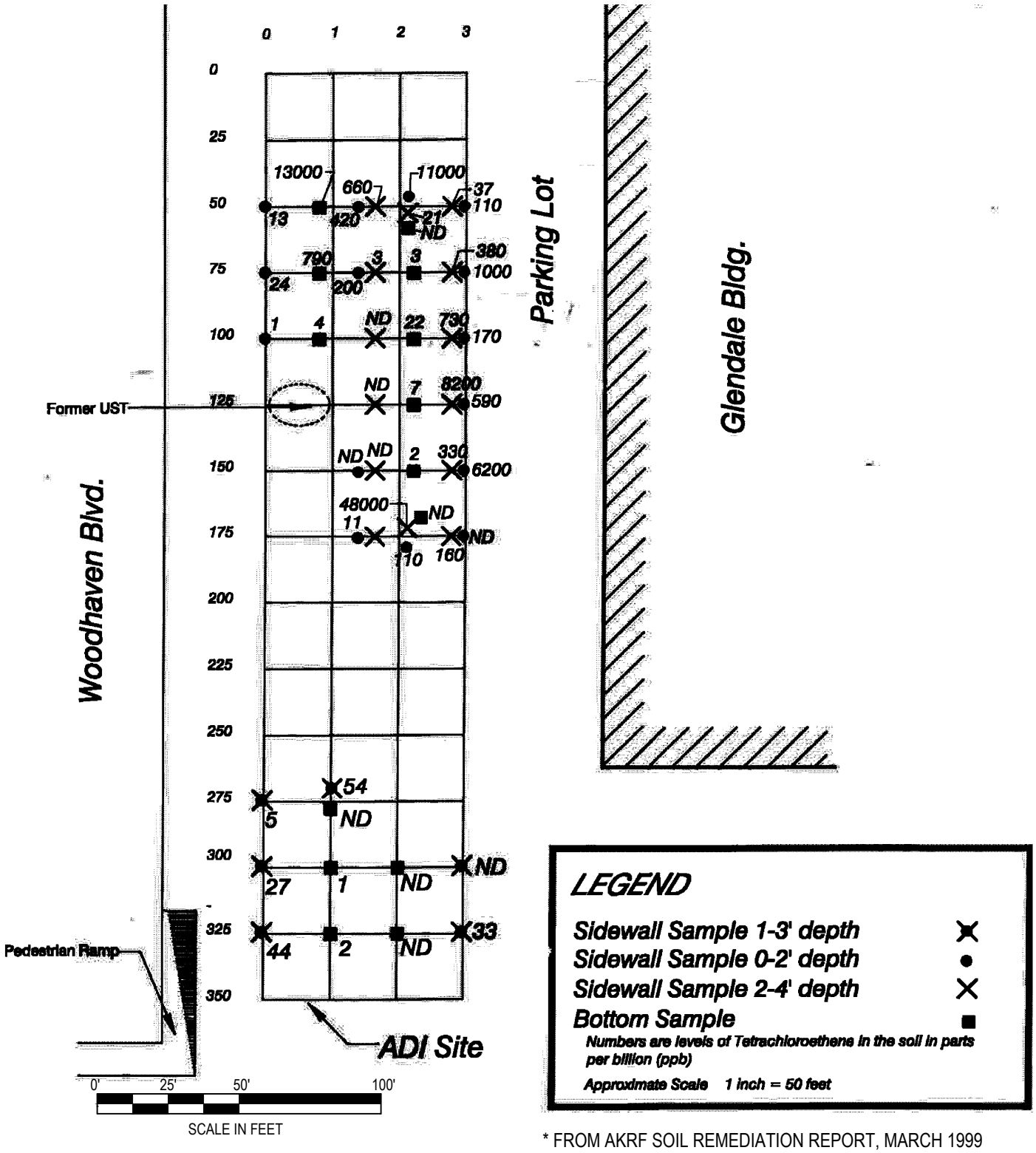
DATE 5.7.2012
PROJECT No. 03399
SCALE as shown
FIGURE 6

© 2012 AKRF, Inc. Environmental Consultants \\NYCFILES\Hazmat\AKRF Project Files\03399 & 08009 - Home Depot - Rego Park\Figures\Closure Documents - created March 2012\Fig 6_7A_7B_Historic Remedial Action.dwg



* FROM AKRF SOIL REMEDIATION REPORT, MARCH 1999

HOME DEPOT
REGO PARK - GLENDALE, NEW YORK

INITIAL ENDPOINT SAMPLING RESULTS

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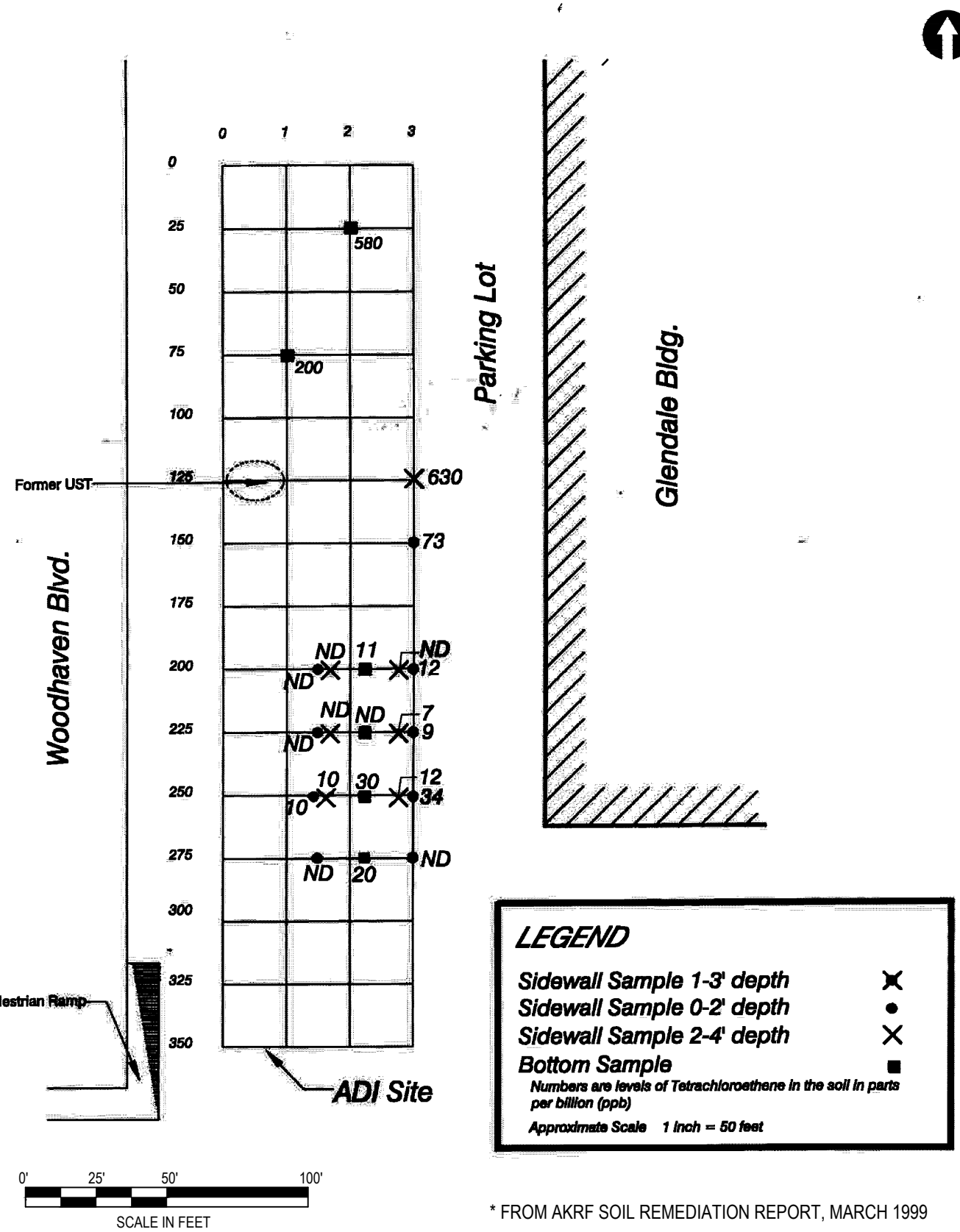
DATE 5.7.2012
PROJECT No. 03399
SCALE as shown
FIGURE 7A

© 2012 AKRF, Inc. Environmental Consultants \\NYCFILES\Hazmat\AKRF Project Files\03399 & 08009 - Home Depot - Rego Park\Figures\Closure Documents - created March 2012\Fig 6, 7A, 7B, Historic Remedial Action.dwg



LEGEND

- Sidewall Sample 1-3' depth
- Sidewall Sample 0-2' depth
- Sidewall Sample 2-4' depth
- Bottom Sample

Numbers are levels of Tetrachloroethene in the soil in parts per billion (ppb)

Approximate Scale 1 inch = 50 feet

* FROM AKRF SOIL REMEDIATION REPORT, MARCH 1999

HOME DEPOT
REGO PARK - GLENDALE, NEW YORK

FINAL ENDPOINT SAMPLING RESULTS

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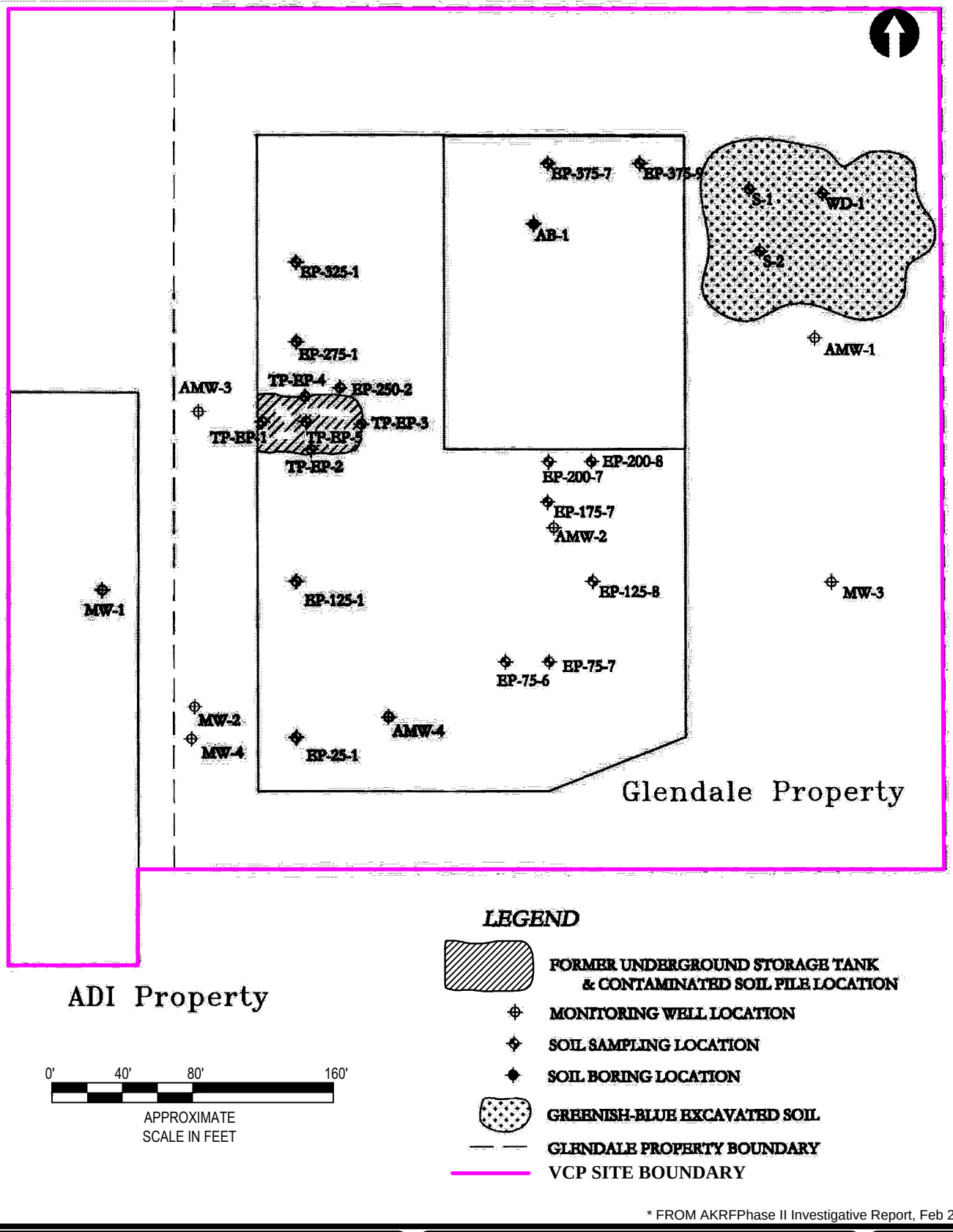
DATE 5.7.2012
PROJECT No. 03399
SCALE as shown
FIGURE 7B

© 2012 AKRF, Inc. Environmental Consultants \\NYCFILES\Hazmat\AKRF Project Files\03399 & 08009 - Home Depot - Rego Park\Figures\Closure Documents - created March 2012\Fig 6, 7A, 7B, Historic Remedial Action.dwg



* FROM AKRFPhase II Investigative Report, Feb 2000

HOME DEPOT

REGO PARK - GLENDALE, NEW YORK

GLENDALE PARCEL ENDPOINT SAMPLING LOCATIONS

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DATE 5.7.2012
PROJECT No. 03399
SCALE as shown
FIGURE 8

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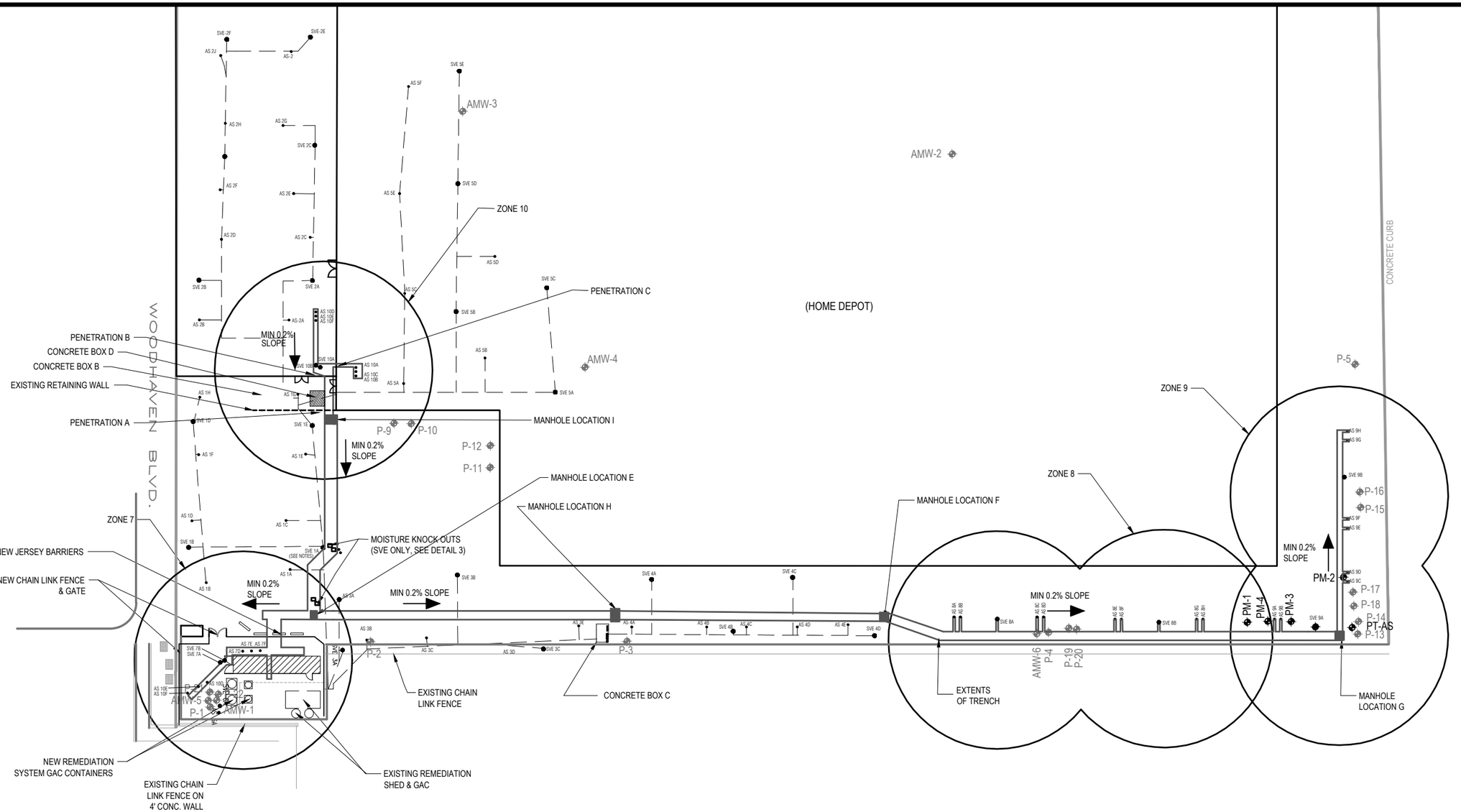

0' 25' 50' 100'

SCALE IN FEET

LEGEND:

- EXISTING MONITORING WELL
- AS 1C — EXISTING AIR SPARGING SYSTEM
- SVE 4C — EXISTING SOIL VAPOR EXTRACTION WELL

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HOME DEPOT
REGO PARK - GLENDALE, NEW YORK

SITE PLAN WITH AS/SVE SYSTEM LAYOUT AND STARTUP MONITORING WELL LOCATIONS

DATE: 5/7/12
PROJECT NO.: 03399
SCALE: as shown
FIGURE: 9

©2011 AKRF, Inc. Environmental Consultants M:\AKRF Project Files\03399 & 08009 - Home Depot - Rego Park\Figures\AS-SVE Figures 1-29-10\Site plan and DOB permit_081710.dwg

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M:\AKRF Project Files\03399 & 08009 - Home Depot - Rego Park\Figures\Closure Documents - created March 2012\Fig 9 Results_PCE.dwg

WOODHAVEN BLVD.

CONCRETE CURB

P-1 P-2 P-3 P-4 P-5 P-7 P-8R P-9 P-10 P-11 P-12 P-13 P-14 P-15 P-16 P-17 P-18 P-19 P-20 P-21 P-22

AMW-1 AMW-2 AMW-3 AMW-4 AMW-5 AMW-6

P1	PCE
Jan-01	24,000
Mar-01	18,000
Apr-01	26,000
Aug-01	17,000
Nov-01	14,000
Mar-02	23,000
Jul-02	22,000
Nov-02	17,700
Feb-03	15,000
Sep-03	8,000
Feb-04	5,800
Jun-06	6,700
Sep-06	5,100
Jan-07	6,500
Apr-07	3,500
Jul-07	2,200
Oct-07	3,400
May-08	4,500
Sep-08	5,900
Dec-08	4,800
Jan/Feb 09	5,100
Mar/Apr-09	6,401
Jun-09	4,500
Sep-09	47,000
Apr-10	16,000
Jul-10	2,800
Aug-10	3,900
Dec-10	6,400
Apr-11	9,300
Jun-11	3,000
Sep-11	2000
Dec-11	4,300

P2	PCE
Jan-01	780
Mar-01	660
Apr-01	220
Aug-01	600
Nov-01	1,500
Mar-02	1,000
Jul-02	1,600
Nov-02	99
Feb-03	380
Sep-03	16
Feb-04	106
Jun-06	7.8
Sep-06	8.1
Jan-07	9.4
Apr-07	7.5
Jul-07	600
Oct-07	4.6
May-08	5.9
Sep-08	8.7
Dec-08	7.9
Jan/Feb 09	12
Mar/Apr-09	9
Jun-09	8.9
Sep-09	9.9
Apr-10	3.6
Jul-10	370
Aug-10	NA
Dec-10	NA
Apr-11	NA
Jun-11	NA
Sep-11	NA
Dec-11	120

P3	PCE
Jan-01	2,200
Mar-01	380
Apr-01	2,000
Aug-01	28
Nov-01	70
Mar-02	1,400
Jul-02	3,700
Feb-03	820
Sep-03	1,200
Feb-04	1,700
Jun-06	1,300
Sep-06	1,300
Jan-07	1,200
Apr-07	1,200
Jul-07	1,200
Oct-07	690
May-08	660
Sep-08	750
Dec-08	780
Jan/Feb 09	620
Mar/Apr-09	630
Jun-09	740
Sep-09	550
Jan-10	550
Apr-10	390
Jul-10	530
Aug-10	1,100
Dec-10	700
Apr-11	NS
Jun-11	460
Sep-11	480
Dec-11	500

P4	PCE
Jan-01	170
Mar-01	490
Apr-01	170
Aug-01	130
Nov-01	160
Mar-02	220
Jul-02	1,700
Feb-03	160
Sep-03	930
Feb-04	1,000
Jun-06	560
Sep-06	510
Jan-07	480
Apr-07	350
Jul-07	330
Oct-07	330
May-08	280
Sep-08	760
Dec-08	360
Jan/Feb 09	290
Mar/Apr-09	510
Jun-09	590
Sep-09	610
Jan-10	400
Apr-10	350
Jul-10	250
Aug-10	16
Dec-10	59
Apr-11	4.1
Jun-11	160
Sep-11	4.1
Dec-11	210

P5	PCE
Jan-01	3
Mar-01	3
Apr-01	2
Aug-01	13
Nov-01	4
Mar-02	1
Jul-02	2
Nov-02	2
Feb-03	2
Sep-03	3
Feb-04	3
Feb-06	1.6
Sep-06	.84
Jan-07	2.3
Apr-07	1.5
Jul-07	3.1
Oct-07	2.9
May-08	3.7
Sep-08	2.2
Jan/Feb 09	3.9
Mar/Apr-09	2.3
Jun-09	5.5
Sep-09	5.2
Jan-10	6.8
Apr-10	5.6
Jul-10	7.5
Aug-10	3
Dec-10	2
Apr-11	2
Jun-11	2.2
Sep-11	2.8
Dec-11	3.0

P6	PCE
Jan-01	19
Mar-01	6
Apr-01	10
Aug-01	6
Nov-01	5
Mar-02	4
Jul-02	10
Nov-02	2
Feb-03	3
Sep-03	6
Feb-04	5
Feb-06	14
Jun-06	8.1
Sep-06	8.4
Jan-07	11
Apr-07	1.2
Jul-07	1.1
Oct-07	ND
May-08	0.81
Sep-08	0.89
Dec-08	0.51
Jan/Feb 09	NA
Mar/Apr-09	NA
Jun-09	NA
Sep-09	NA
Jan-10	NA
Apr-10	NA
Jul-10	NA
Aug-10	NA
Dec-10	NA
Apr-11	NA
Jun-11	NA
Sep-11	NA
Dec-11	NA

P7	PCE
Jan-01	41
Mar-01	51
Apr-01	20
Aug-01	19
Nov-01	15
Mar-02	13
Jul-02	34
Nov-02	6
Feb-03	7
Sep-03	14
Feb-04	13
Feb-06	16
Jun-06	21
Sep-06	10
Jan-07	9.2
Apr-07	6.5
Jul-07	5.5
Oct-07	4.1
May-08	6.6
Sep-08	5.4
Dec-08	9.2
Jan/Feb 09	6.2
Mar/Apr-09	6.2
Jun-09	7.8
Sep-09	8.3
Jan-10	3.1
Apr-10	5.3
Jul-10	3.4
Aug-10	4.6
Dec-10	7.6
Apr-11	7.6
Jun-11	2.6
Sep-11	4.8
Dec-11	1.9

P8	PCE	P8R	PCE
Jan-01	19	Jan-01	NA
Mar-01	6	Mar-01	NA
Apr-01	10	Apr-01	NA
Aug-01	6	Aug-01	NA
Nov-01	5	Nov-01	NA
Mar-02	4	Mar-02	NA
Jul-02	10	Jul-02	NA
Nov-02	2	Nov-02	NA
Feb-03	3	Feb-03	NA
Sep-03	6	Sep-03	NA
Feb-04	5	Feb-04	NA
Feb-06	14	Feb-06	NA
Jun-06	8.1	Sep-06	NA
Sep-06	8.4	Jan-07	NA
Jan-07	11	Apr-07	NA
Apr-07	1.2	Jul-07	220
Jul-07	1.1	Oct-07	780
Oct-07	ND	May-08	210
May-08	0.81	Sep-08	49
Sep-08	0.89	Dec-08	77
Dec-08	0.51	Jan/Feb 09	240
Jan/Feb 09	NA	Mar/Apr-09	42
Mar/Apr-09	NA	Jun-09	NA
Jun-09	NA	Sep-09	NA
Sep-09	NA	Jan-10	39
Jan-10	NA	Apr-10	82
Apr-10	NA	Jul-10	32
Jul-10	NA	Aug-10	40
Aug-10	NA	Dec-10	150
Dec-10	NA	Apr-11	81
Apr-11	NA	Jun-11	28
Jun-11	NA	Sep-11	44
Sep-11	NA	Dec-11	96
Dec-11	NA		

P9	PCE
Jan-01	NA
Mar-01	NA
Apr-01	NA
Aug-01	NA
Nov-01	NA
Mar-02	NA
Jul-02	NA
Nov-02	NA
Feb-03	NA
Sep-03	NA
Feb-04	NA
Jun-06	NA
Sep-06	NA
Jan-07	NA
Apr-07	NA
Jul-07	NA
Oct-07	NA
May-08	NA
Sep-08	NA
Dec-08	2,400
Jan/Feb 09	NA
Mar/Apr-09	1,300
Jun-09	1,900
Sep-09	2,500
Jan-10	6,100
Apr-10	300
Jul-10	110
Aug-10	1,400
Dec-10	1,200
Apr-11	880
Jun-11	780
Sep-11	620
Dec-11	680

P10	PCE
Jan-01	NA
Mar-01	NA
Apr-01	NA
Aug-01	NA
Nov-01	NA
Mar-02	NA
Jul-02	NA
Nov-02	NA
Feb-03	NA
Sep-03	NA
Feb-04	NA
Jun-06	NA
Sep-06	NA
Jan-07	NA
Apr-07	NA
Jul-07	NA
Oct-07	NA
May-08	NA
Sep-08	NA
Dec-08	2,400
Jan/Feb 09	NA
Mar/Apr-09	1,300
Jun-09	1,900
Sep-09	2,500
Jan-10	6,100
Apr-10	300
Jul-10	110
Aug-10	1,400
Dec-10	1,200
Apr-11	880
Jun-11	780
Sep-11	620
Dec-11	680

P11	PCE
Jan-01	NA
Mar-01	NA
Apr-01	NA
Aug-01	NA
Nov-01	NA
Mar-02	NA
Jul-02	NA
Nov-02	NA
Feb-03	NA
Sep-03	NA
Feb-04	NA
Jun-06	NA
Sep-06	NA
Jan-07	NA
Apr-07	NA
Jul-07	NA
Oct-07	NA
May-08	NA
Sep-08	NA
Dec-08	160
Jan/Feb 09	NA
Mar/Apr-09	110
Jun-09	180
Sep-09	110
Jan-10	150
Apr-10	71
Jul-10	85
Aug-10	160
Dec-10	70
Apr-11	54
Jun-11	280
Sep-11	190
Dec-11	450

P12	PCE
Jan-01	NA
Mar-01	NA
Apr-01	NA
Aug-01	NA
Nov-01	NA
Mar-02	NA
Jul-02	NA
Nov-02	NA
Feb-03	NA
Sep-03	NA
Feb-04	NA
Jun-06	NA
Sep-06	NA
Jan-07	NA
Apr-07	NA
Jul-07	NA
Oct-07	NA
May-08	NA
Sep-08	NA
Dec-08	2,700
Jan/Feb 09	NA
Mar/Apr-09	6,900
Jun-09	4,300
Sep-09	250
Jan-10	1,100
Apr-10	830
Jul-10	1,000
Aug-10	1,100
Dec-10	NA
Apr-11	NA
Jun-11	NA
Sep-11	NA
Dec-11	NA

P13	PCE
Jan-01	NA
Mar-01	NA
Apr-01	NA
Aug-01	NA
Nov-01	NA
Mar-02	NA
Jul-02	NA
Nov-02	NA
Feb-03	NA
Sep-03	NA
Feb-04	NA
Jun-06	NA
Sep-06	NA
Jan-07	NA
Apr-07	NA
Jul-07	NA
Oct-07	NA
May-08	NA
Sep-08	NA
Dec-08	320
Jan/Feb 09	NA
Mar/Apr-09	88
Jun-09	220
Sep-09	200
Jan-10	280
Apr-10	2.9
Jul-10	160
Aug-10	40
Dec-10	200
Apr-11	160
Jun-11	160
Sep-11	26
Dec-11	290

P14	PCE
Jan-01	NA
Mar-01	NA
Apr-01	NA
Aug-01	NA
Nov-01	NA
Mar-02	NA
Jul-02	NA
Nov-02	NA
Feb-03	NA
Sep-03	NA
Feb-04	NA
Jun-06	NA
Sep-06	NA
Jan-07	NA
Apr-07	NA
Jul-07	NA
Oct-07	NA
May-08	NA
Sep-08	8
Dec-08	8
Jan/Feb 09	NA
Mar/Apr-09	6.6
Jun-09	7.8
Sep-09	8.4
Jan-10	4.3
Apr-10	7.9
Jul-10	5
Aug-10	3.7
Dec-10	0.81
Apr-11	0.81
Jun-11	0.89
Sep-11	780

P15	PCE
Jan-01	NA
Mar-01	NA
Apr-01	NA
Aug-01	NA
Nov-01	NA
Mar-02	NA
Jul-02	NA
Nov-02	NA
Feb-03	NA
Sep-03	NA
Feb-04	NA
Jun-06	NA
Sep-06	NA
Jan-07	NA
Apr-07	NA
Jul-07	NA
Oct-07	NA
May-08	NA
Sep-08	190
Dec-08	NA
Jan/Feb 09	NA
Mar/Apr-09	33
Jun-09	150
Sep-09	230
Jan-10	120
Apr-10	240
Jul-10	59
Aug-10	24
Dec-10	38
Apr-11	38
Jun-11	39
Sep-11	1.2
Dec-11	8.7

P16	PCE
Jan-01	NA
Mar-01	NA
Apr-01	NA
Aug-01	NA
Nov-01	NA
Mar-02	NA
Jul-02	NA
Nov-02	NA
Feb-03	NA
Sep-03	NA
Feb-04	NA
Jun-06	NA
Sep-06	NA
Jan-07	NA
Apr-07	NA
Jul-07	NA
Oct-07	NA
May-08	NA
Sep-08	NA
Dec-08	3
Jan/Feb 09	NA
Mar/Apr-09	2
Jun-09	6.6
Sep-09	8.7
Jan-10	4.4
Apr-10	8
Jul-10	6.3
Aug-10	1.9
Dec-10	1.9
Apr-11	1.4
Jun-11	3.8
Sep-11	3.8
Dec-11	3.7

P17	PCE
Jan-01	NA
Mar-01	NA
Apr-01	NA
Aug-01	NA
Nov-01	NA
Mar-02	NA
Jul-02	NA
Nov-02	NA
Feb-03	NA
Sep-03	NA
Feb-04	NA
Jun-06	NA
Sep-06	NA
Jan-07	NA
Apr-07	NA
Jul-07	NA
Oct-07	NA
May-08	NA
Sep-08	NA
Dec-08	NA
Jan/Feb 09	NA
Mar/Apr-09	NA
Jun-09	NA
Sep-09	99
Jan-10	ND
Apr-10	30
Jul-10	110
Aug-10	66
Dec-10	88
Apr-11	35
Jun-11	89
Sep-11	16
Dec-11	59

P18	PCE
Jan-01	NA
Mar-01	NA
Apr-01	NA
Aug-01	NA
Nov-01	NA
Mar-02	NA
Jul-02	NA
Nov-02	NA
Feb-03	NA
Sep-03	NA
Feb-04	NA
Jun-06	NA
Sep-06	NA
Jan-07	NA
Apr-07	NA
Jul-07	NA
Oct-07	NA
May-08	NA
Sep-08	NA
Dec-08	NA
Jan/Feb 09	NA
Mar/Apr-09	NA
Jun-09	.95
Sep-09	1.4
Jan-10	1.4
Apr-10	ND
Jul-10	.99
Aug-10	ND
Dec-10	ND
Apr-11	ND
Jun-11	ND
Sep-11	1.2
Dec-11	ND

AMW-1	PCE
Jan-01	NA
Mar-01	NA
Apr-01	NA
Aug-01	NA
Nov-01	NA
Mar-02	NA
Jul-02	NA
Nov-02	NA
Feb-03	NA
Sep-03	NA
Feb-04	NA
Jun-06	NA
Sep-06	NA
Jan-07	NA
Apr-07	NA
Jul-07	NA
Oct-07	NA
May-08	NA
Sep-08	NA
Dec-08	54
Jan/Feb 09	52
Mar/Apr-09	34
Jun-09	44
Sep-09	84
Apr-10	160
Jul-10	2,900
Aug-10	4,700
Dec-10	1,700
Apr-11	4,900
Jun-11	3,800
Sep-11	330
Dec-11	88

AMW-2	PCE
Jan-01	3,100
Mar-01	4,300
Aug-01	4,000
Nov-01	4,300
Mar-02	2,100
Jul-02	2,200
Nov-02	2,800
Feb-03	3,800
Sep-03	1,800
Feb-04	2,000
Jun-06	250
Sep-06	160
Jan-07	4,300
Apr-07	710
Jul-07	480
Oct-07	770
May-08	550
Sep-08	200
Dec-08	79
Jan/Feb 09	270
Mar/Apr-09	210
Jun-09	NA
Sep-09	650
Jan-10	80
Apr-10	600
Jul-10	750
Aug-10	370
Dec-10	300
Apr-11	280
Jun-11	530
Sep-11	580
Dec-11	550

AMW-3	PCE
Jan-01	9,400
Mar-01	4,300
Apr-01	7,100
Aug-01	9,400
Nov-01	4,300
Mar-02	12,000
Jul-02	6,200
Nov-02	3,600
Feb-03	4,400
Sep-03	3,600
Feb-04	3,600
Jun-06	4,600
Sep-06	2,500
Jan-07	1,100
Apr-07	3,400
Jul-07	2,900
Oct-07	2,900
May-08	3,400
Sep-08	4,000
Dec-08	3,700
Jan/Feb 09	3,500
Mar/Apr-09	3,400
Jun-09	3,700
Sep-09	3,700
Jan-10	2,000
Apr-10	4,900
Jul-10	7,900
Aug-10	5,900
Dec-10	5,900
Apr-11	5,500
Jun-11	4,600
Sep-11	3900
Dec-11	3,300

AMW-4	PCE
Jan-01	5,900
Mar-01	5,800
Apr-01	3,800
Aug-01	800
Nov-01	3,500
Mar-02	6,600
Jul-02	3,800
Nov-02	2,800
Feb-03	2,800
Sep-03	7,900
Feb-04	2,800
Feb-06	1,700
Jun-06	6,900
Sep-06	3,700
Jan-07	2,000
Apr-07	830
Jul-07	1,400
Oct-07	1,900
May-08	1,600
Sep-08	2,800
Dec-08	2,800
Jan/Feb 09	1,000
Mar/Apr-09	3,900
Jun-09	3,600
Sep-09	2,600
Jan-10	680
Apr-10	1,700
Jul-10	760
Aug-10	310
Dec-10	730
Apr-11	990
Jun-11	790
Sep-11	620
Dec-11	680

AMW-5	PCE
Jan-01	NA
Mar-01	NA
Apr-01	NA
Aug-01	NA
Nov-01	NA
Mar-02	NA
Jul-02	NA
Nov-02	NA
Feb-03	NA
Sep-03	NA
Feb-04	NA
Jun-06	NA
Sep-06	NA
Jan-07	NA
Apr-07	NA
Jul-07	NA
Oct-07	NA
May-08	NA
Sep-08	NA
Dec-08	NA
Jan/Feb 09	NA
Mar/Apr-09	NA
Jun-09	NA
Sep-09	NA
Jan-10	NA
Apr-10	NA
Jul-10	NA
Aug-10	NA
Dec-10	NA
Apr-11	NA
Jun-11	NA
Sep-11	NA
Dec-11	NA

AMW-6	PCE
Jan-01	NA
Mar-01	NA
Apr-01	NA
Aug-01	NA
Nov-01	NA
Mar-02	NA
Jul-02	NA
Nov-02	NA
Feb-03	NA
Sep-03	NA
Feb-04	NA
Jun-06	NA
Sep-06	NA
Jan-07	NA
Apr-07	NA
Jul-07	NA
Oct-07	NA
May-08	NA
Sep-08	NA
Dec-08	8
Jan/Feb 09	NA
Mar/Apr-09	6.6
Jun-09	7.9
Sep-09	8.4
Jan-10	4.3
Apr-10	7.9
Jul-10	5
Aug-10	3.7
Dec-10	0.81
Apr-11	0.81
Jun-11	0.89
Sep-11	780

Sample ID number

(µg/l) - PCE Concentration in Groundwater (micrograms per cubic liter)

NA - Not applicable - monitoring well not accessible due to obstruction or damage

Not detected - PCE analyzed for but not detected

LEGEND:

EXISTING MONITORING WELL

PCE Tetrachloroethene

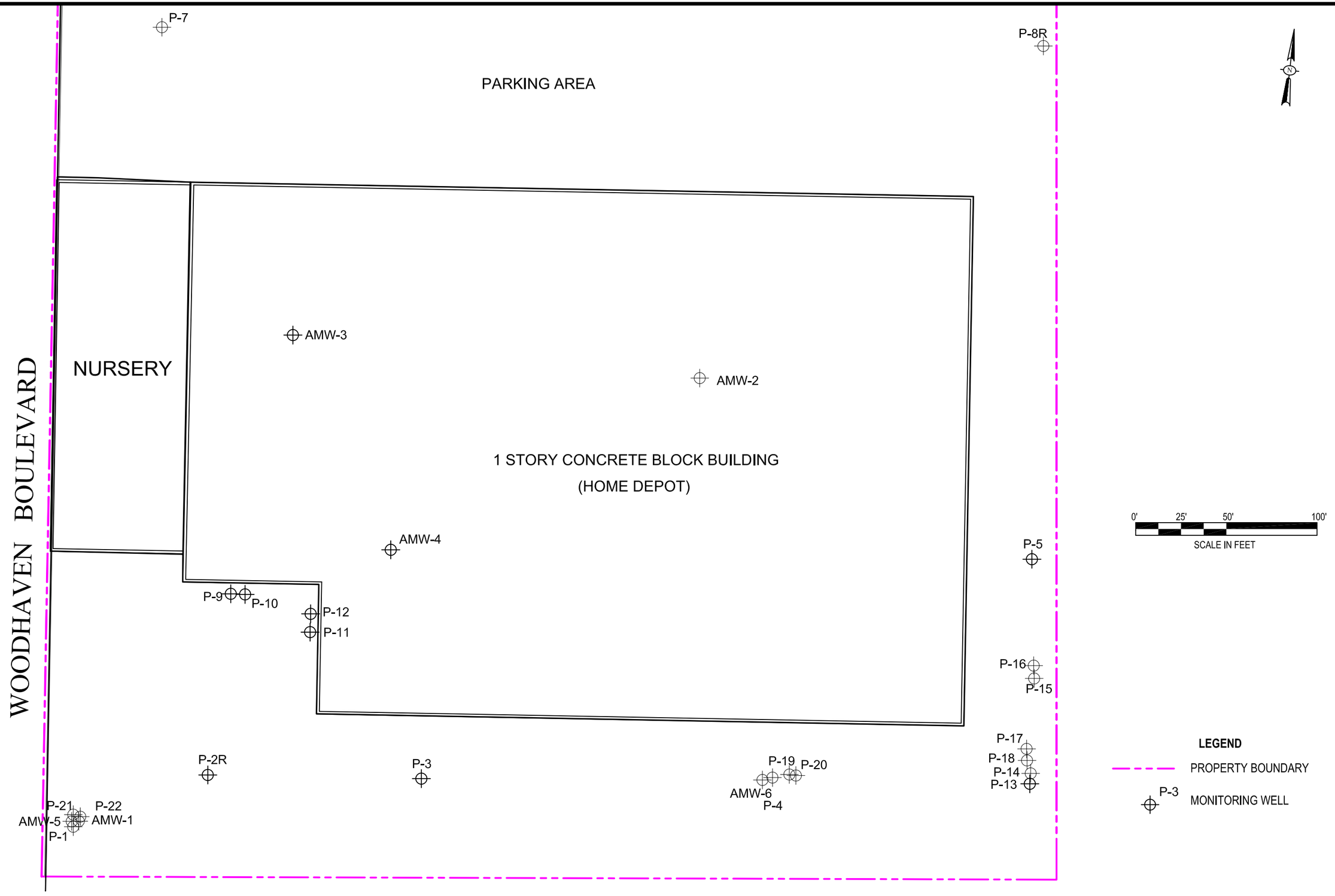
0' 10' 20' 40'
SCALE IN FEET

HOME DEPOT - REGO PARK, REGO PARK - GLENDALE, NEW YORK

SITE PLAN WITH HISTORIC PCE CONCENTRATIONS

AKRF
Environmental Consultants
440 Park Avenue South, New York, N.Y. 10016

DATE 1.24.2012
SCALE as shown
PROJECT No. 03399
FIGURE No. 10



AKRF
Environmental Consultants
440 Park Avenue South, New York, NY 10016

HOME DEPOT, REGO PARK - GLENDALE, NEW YORK

SITE PLAN WITH MONITORING WELL LOCATIONS

DATE
5/7/12

PROJECT NO.
03399

SCALE
as shown

FIGURE
11

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APPENDIX A

VOLUNTARY CLEANUP AGREEMENT, SURVEY MAP AND METES AND BOUNDS

METES AND BOUNDS DESCRIPTION
LOT 671, BLOCK 3886, SECTION 20-3
BOROUGH AND COUNTY OF QUEENS
CITY AND STATE OF NEW YORK

BEGINNING AT A POINT OF INTERSECTION OF THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD (VARIABLE WIDTH) WITH THE SOUTHERLY SIDELINE OF 73RD AVENUE (60 FEET WIDE, F.K.A. KATIE PLACE) AND FROM SAID POINT OF BEGINNING, RUNNING THENCE;

1. ALONG THE SOUTHERLY SIDELINE OF 73RD AVENUE, SOUTH 84 DEGREES – 29 MINUTES – 05 SECONDS EAST, A DISTANCE OF 371.20 TO A POINT, THENCE;
2. STILL ALONG THE SOUTHERLY SIDELINE OF 73RD AVENUE, NORTH 64 DEGREES – 42 MINUTES – 10 SECONDS EAST, A DISTANCE OF 154.50 FEET TO A POINT, THENCE;
3. ALONG THE DIVIDING LINE BETWEEN LOT 671 AND LOT 695, SOUTH 21 DEGREES – 48 – 00 SECONDS EAST, A DISTANCE OF 95.33 FEET TO A POINT, THENCE;
4. ALONG THE DIVIDING LINE BETWEEN LOT 671 AND LOT 449, SOUTH 02 DEGREES – 33 MINUTES – 30 SECONDS WEST, A DISTANCE OF 166.00 FEET TO A POINT, THENCE;
5. ALONG THE DIVIDING LINE BETWEEN LOT 671 AND LOTS 650 AND 660, NORTH 87 DEGREES – 25 MINUTES – 30 SECONDS WEST, A DISTANCE OF 546.62 FEET TO A POINT ON THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD (VARIABLE WIDTH), THENCE;
6. ALONG THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD, NORTH 02 DEGREES – 33 MINUTES – 30 SECONDS EAST, A DISTANCE OF 199.65 FEET TO THE POINT AND PLACE OF BEGINNING.

CONTAINING 108,320 SQUARE FEET OR 2.487 ACRES.

THIS PROPERTY MAY BE SUBJECT TO A USE RESTRICTION AND RIGHT OF WAY AS PER DEED BOOK 3268, PAGE 280.

THIS PROPERTY IS SUBJECT TO UTILITY AND ACCESS EASEMENTS AS PER DEED BOOK 5905, PAGE 332.

THIS PROPERTY IS SUBJECT TO A STORM SEWER EASEMENT AS PER DEED BOOK 6345, PAGE 470.

METES AND BOUNDS DESCRIPTION
LOT 650, BLOCK 3886, SECTION 20-3
BOROUGH AND COUNTY OF QUEENS
CITY AND STATE OF NEW YORK

BEGINNING AT A POINT ON THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD (150 FEET WIDE) SAID POINT BEING DISTANT SOUTHERLY 461.30 FEET ALONG THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD FROM THE INTERSECTION OF THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD (VARIABLE WIDTH) WITH THE SOUTHERLY SIDELINE OF 73 AVENUE (60 FEET WIDE) AND FROM SAID POINT OF BEGINNING, RUNNING THENCE;

1. ALONG THE DIVIDING LINE BETWEEN LOT 650 AND LOT 660, SOUTH 87 DEGREES – 25 MINUTES – 30 SECONDS EAST, A DISTANCE OF 101.43 FEET TO A POINT, THENCE;
2. STILL ALONG THE DIVIDING LINE BETWEEN LOT 650 AND LOT 660, NORTH 02 DEGREES – 33 MINUTES – 30 SECONDS EAST, A DISTANCE OF 261.64 FEET TO A POINT, THENCE;
3. ALONG THE DIVIDING LINE BETWEEN LOT 650 AND LOT 671, SOUTH 87 DEGREES – 25 MINUTES – 30 SECONDS EAST, A DISTANCE OF 446.62 FEET TO A POINT, THENCE;
4. ALONG THE DIVIDING LINE BETWEEN LOT 650 AND LOT 449, SOUTH 02 DEGREES – 33 MINUTES – 30 SECONDS WEST, A DISTANCE OF 281.64 FEET TO A POINT, THENCE;
5. ALONG THE DIVIDING LINE BETWEEN LOT 650 AND LOT 74, NORTH 87 DEGREES – 25 MINUTES – 30 SECONDS WEST, A DISTANCE OF 548.40 FEET TO A POINT ON THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD (150 FEET WIDE), THENCE;
6. ALONG THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD, NORTH 03 DEGREES – 33 MINUTES – 28 SECONDS EAST, A DISTANCE OF 20.00 FEET TO THE POINT AND PLACE OF BEGINNING.

CONTAINING 127,818 SQUARE FEET OR 2.934 ACRES.

THIS PROPERTY IS SUBJECT TO UTILITY AND ACCESS EASEMENTS AS PER DEED BOOK 5905, PAGE 332.

~~THIS PROPERTY IS SUBJECT TO A STORM SEWER EASEMENT AS PER DEED BOOK 6345, PAGE 470.~~

THIS PROPERTY IS SUBJECT TO ROADWAY EASEMENTS AS PER DEED BOOK 6462, PAGE 416.

METES AND BOUNDS DESCRIPTION
LOT 660, BLOCK 3886, SECTION 20-3
BOROUGH AND COUNTY OF QUEENS
CITY AND STATE OF NEW YORK

BEGINNING AT A POINT ON THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD (VARIABLE WIDTH) SAID POINT BEING DISTANT 199.65 FEET SOUTHERLY ALONG THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD FROM THE INTERSECTION OF THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD WITH THE SOUTHERLY SIDELINE OF 73 AVENUE (60 FEET WIDE) AND FROM SAID POINT OF BEGINNING, RUNNING THENCE;

1. ALONG THE DIVIDING LINE BETWEEN LOT 660 AND LOT 671, SOUTH 87 DEGREES – 25 MINUTES – 30 SECONDS EAST, A DISTANCE OF 100.00 FEET TO A POINT, THENCE;
2. ALONG THE DIVIDING LINE BETWEEN LOT 660 AND LOT 650, SOUTH 02 DEGREES – 33 MINUTES – 30 SECONDS WEST, A DISTANCE OF 261.64 FEET TO A POINT, THENCE;
3. STILL ALONG THE DIVIDING LINE BETWEEN LOT 660 AND LOT 650, NORTH 87 DEGREES – 25 MINUTES – 30 SECONDS WEST, A DISTANCE OF 101.43 FEET TO A POINT ON THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD, (150 FEET WIDE), THENCE;
4. ALONG THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD (150 FEET WIDE) NORTH 03 DEGREES – 33 MINUTES – 28 SECONDS EAST, A DISTANCE OF 81.93 FEET TO A POINT, THENCE;
5. ALONG THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD (VARIABLE WIDTH) NORTH 02 DEGREES – 33 MINUTES – 30 SECONDS EAST, A DISTANCE OF 179.72 FEET TO THE POINT AND PLACE OF BEGINNING.

CONTAINING 26,223 SQUARE FEET OR 0.602 ACRES.

THIS PROPERTY IS SUBJECT TO A ROADWAY EASEMENT AS PER DEED BOOK 6462, PAGE 416.

THIS PROPERTY IS SUBJECT TO UTILITY AND ACCESS EASEMENTS AS PER DEED BOOK 5905, PAGE 332.

METES AND BOUNDS DESCRIPTION
LOT 74, BLOCK 3886, SECTION 20-3
BOROUGH AND COUNTY OF QUEENS
CITY AND STATE OF NEW YORK

BEGINNING AT A POINT ON THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD (150 FEET WIDE), SAID POINT BEING DISTANT SOUTHERLY 481.30 FEET ALONG THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD FROM THE INTERSECTION OF THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD (VARIABLE WIDTH) WITH THE SOUTH-ERLY SIDELINE OF 73RD AVENUE (60 FEET WIDE) AND FROM SAID POINT OF BEGINNING, RUNNING THENCE;

1. ALONG THE DIVIDING LINE BETWEEN LOT 74 AND LOT 650, SOUTH 87 DEGREES – 25 MINUTES – 30 SECONDS EAST, A DISTANCE OF 548.40 FEET TO A POINT, THENCE;
2. ALONG THE DIVIDING LINE BETWEEN LOT 74 AND LOT 449, SOUTH 02 DEGREES – 33 MINUTES – 30 SECONDS WEST, A DISTANCE OF 484.54 FEET TO A POINT, THENCE;
3. ALONG A DIVIDING LINE BETWEEN LOT 74 AND LOT 450, NORTH 87 DEGREES – 28 MINUTES – 30 SECONDS WEST, A DISTANCE OF 466.00 FEET TO A POINT, THENCE;
4. STILL ALONG THE DIVIDING LINE BETWEEN LOT 74 AND LOT 450, NORTH 02 DEGREES – 15 MINUTES – 30 SECONDS EAST, A DISTANCE OF 441.51 FEET TO A POINT, THENCE;
5. STILL ALONG THE DIVIDING LINE BETWEEN LOT 74 AND LOT 450, NORTH 84 DEGREES – 29 MINUTES – 05 SECONDS WEST, A DISTANCE OF 80.87 FEET TO A POINT ON THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD (150 FEET WIDE), THENCE;
6. ALONG THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD, NORTH 03 DEGREES – 33 MINUTES – 28 SECONDS EAST, A DISTANCE OF 39.30 FEET TO THE POINT AND PLACE OF BEGINNING.

CONTAINING 229,829 SQUARE FEET OR 5.276 ACRES.

THIS PROPERTY IS SUBJECT TO ROADWAY EASEMENTS AS PER DEED BOOK 6462, PAGE 416.

METES AND BOUNDS DESCRIPTION
PART OF LOT 450, BLOCK 3886, SECTION 20-3 (MAINLINE)
PROPOSED TO BE ACQUIRED BY HOME DEPOT
BOROUGH AND COUNTY OF QUEENS
CITY AND STATE OF NEW YORK

BEGINNING AT A POINT ON THE MOST SOUTHEASTERLY CORNER OF LOT 46, BLOCK 3886, SAID POINT BEING DISTANT THE FOLLOWING THREE COURSES FROM A POINT FORMED BY THE INTERSECTION OF THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD (VARIABLE IN WIDTH) WITH THE SOUTHERLY SIDELINE OF 73RD AVENUE (F.K.A. KATIE PLACE AND 60 FEET WIDE), AND RUNNING THENCE;

A. ALONG THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD, SOUTH 02 DEGREES – 33 MINUTES – 30 SECONDS WEST, A DISTANCE OF 379.37 FEET TO A POINT, THENCE;
B. CONTINUING ALONG THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD, SOUTH 03 DEGREES – 33 MINUTES – 28 SECONDS WEST, A DISTANCE OF 613.01 FEET TO A POINT, THENCE;
C. ALONG THE COMMON DIVIDING LINE BETWEEN LOT 45 & LOT 46 AND LOT 450, SOUTH 86 DEGREES – 26 MINUTES – 32 SECONDS EAST, A DISTANCE OF 75.00 FEET TO THE ABOVE DESCRIBED POINT AND PLACE OF BEGINNING AND RUNNING THENCE;

1. ALONG THE COMMON DIVIDING LINE BETWEEN LOT 450 AND LOT 46, NORTH 03 DEGREES – 33 MINUTES – 28 SECONDS EAST, A DISTANCE OF 27.34 FEET TO A POINT, THENCE;
2. ALONG A NEW LINE RUNNING THROUGH LOT 450 AND THEN CONTINUING ALONG THE EXISTING DIVIDING LINE BETWEEN LOT 450 AND LOT 74, SOUTH 87 DEGREES – 28 MINUTES – 30 SECONDS EAST, A DISTANCE OF 481.85 FEET TO A POINT, THENCE;
3. ALONG THE COMMON DIVIDING LINE BETWEEN LOT 450 AND LOT 449, SOUTH 02 DEGREES – 33 MINUTES – 30 SECONDS WEST, A DISTANCE OF 27.34 FEET TO A POINT, THENCE;
4. ALONG A NEW LINE RUNNING THROUGH LOT 450, NORTH 87 DEGREES – 28 MINUTES – 30 SECONDS WEST, A DISTANCE OF 482.32 FEET TO THE POINT AND PLACE OF BEGINNING.

CONTAINING 13,178 SQUARE FEET OR 0.303 ACRES.

THIS PROPERTY MAY BE SUBJECT TO RAILROAD CONSENTS AS CONTAINED IN LIBER 1331, PAGE 199 AND LIBER 1331, PAGE 201.

THIS PROPERTY MAY ALSO BE SUBJECT TO A RIGHT OF REVERSION AS RECORDED IN LIBER 556, PAGE 347, RECORDED MARCH 20, 1880.

METES AND BOUNDS DESCRIPTION
PART OF LOT 450, BLOCK 3886, SECTION 20-3
PROPOSED TO BE ACQUIRED BY HOME DEPOT
BOROUGH AND COUNTY OF QUEENS
CITY AND STATE OF NEW YORK

BEGINNING AT A POINT ON THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD (100 FEET IN WIDTH), SAID POINT BEING DISTANT SOUTHERLY 520.60 FEET ALONG THE EASTERLY SIDE OF WOODHAVEN BOULEVARD FROM THE INTERSECTION OF THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD (VARIABLE IN WIDTH,) WITH THE SOUTHERLY SIDELINE OF 73RD AVENUE (F.K.A. KATIE PLACE AND 60 FEET WIDE), AND FROM SAID POINT OF BEGINNING RUNNING THENCE;

1. ALONG THE DIVIDING LINE BETWEEN LOT 450 AND LOT 74, SOUTH 84 DEGREES – 29 MINUTES – 05 SECONDS EAST, A DISTANCE OF 80.87 FEET TO A POINT, THENCE;
2. STILL ALONG THE DIVIDING LINE BETWEEN LOT 450 AND LOT 74, SOUTH 02 DEGREES – 15 MINUTES – 30 SECONDS WEST, A DISTANCE OF 441.51 FEET TO A POINT, THENCE;
3. ALONG A NEW LINE RUNNING THROUGH LOT 450, NORTH 87 DEGREES – 28 MINUTES – 30 SECONDS WEST, A DISTANCE OF 15.85 FEET TO A POINT, THENCE;
4. ALONG THE DIVIDING LINE BETWEEN LOT 450 AND LOT 46, NORTH 03 DEGREES – 33 MINUTES – 28 SECONDS EAST, A DISTANCE OF 374.66 FEET TO A POINT, THENCE;
5. STILL ALONG THE DIVIDING LINE BETWEEN LOT 450 AND LOT 46, NORTH 86 DEGREES – 26 MINUTES – 32 SECONDS WEST, A DISTANCE OF 75.00 FEET TO A POINT, THENCE;
6. ALONG THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD, NORTH 03 DEGREES – 33 MINUTES – 28 SECONDS EAST, A DISTANCE OF 69.78 FEET TO THE POINT AND PLACE OF BEGINNING.

CONTAINING 9,925 SQUARE FEET OR 0.228 ACRES.

THIS PROPERTY MAY BE SUBJECT TO RAILROAD CONSENTS AS CONTAINED IN LIBER 1331, PAGE 199 AND LIBER 1331, PAGE 201.

~~THIS PROPERTY MAY ALSO BE SUBJECT TO A RIGHT OF REVERSION AS RECORDED IN LIBER 556, PAGE 347, RECORDED MARCH 20, 1880.~~

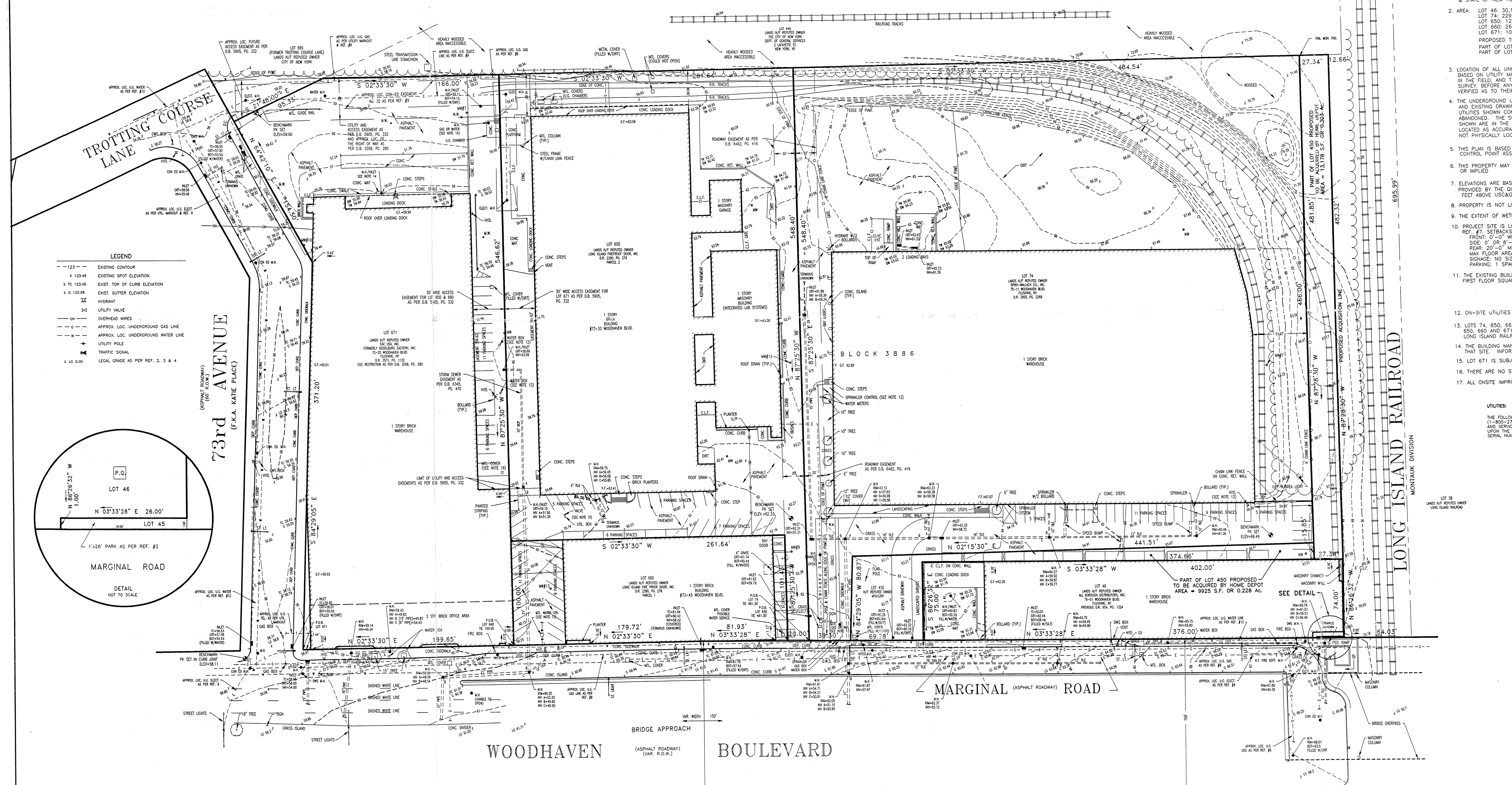
METES AND BOUNDS DESCRIPTION
LOT 46, BLOCK 3886, SECTION 20-3
BOROUGH AND COUNTY OF QUEENS
CITY AND STATE OF NEW YORK

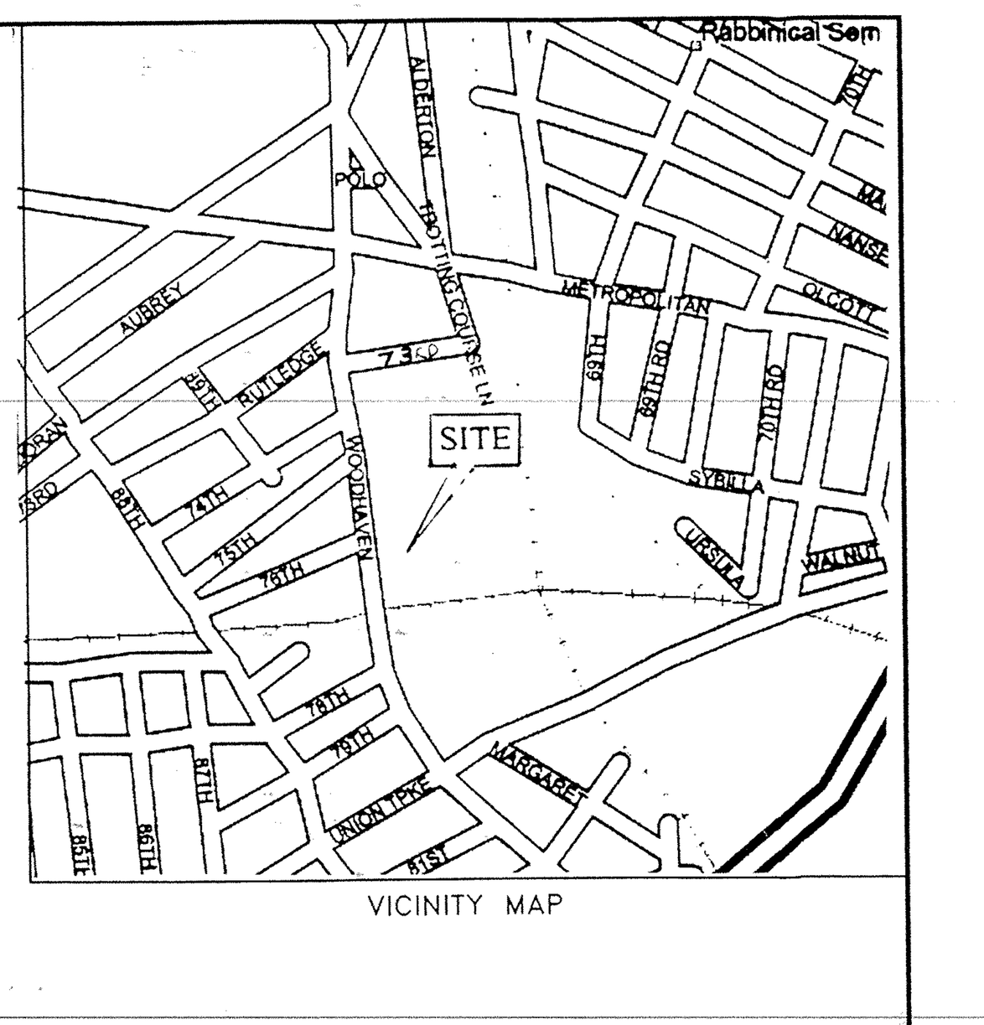
BEGINNING AT A POINT ON THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD (150 FEET WIDE) SAID POINT BEING DISTANT SOUTHERLY 590.39 FEET ALONG THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD FROM THE INTERSECTION OF THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD (VARIABLE WIDTH) WITH THE SOUTHERLY SIDELINE OF 73RD AVENUE (60 FEET WIDE) AND FROM SAID POINT OF BEGINNING, RUNNING THENCE;

1. ALONG THE DIVIDING LINE BETWEEN LOT 46 AND LOT 450, SOUTH 86 DEGREES – 26 MINUTES – 32 SECONDS EAST, A DISTANCE OF 75.00 TO A POINT, THENCE;
2. STILL ALONG THE DIVIDING LINE BETWEEN LOT 450 AND LOT 46, SOUTH 03 DEGREES – 33 MINUTES – 28 SECONDS WEST, A DISTANCE OF 402.00 FEET TO A POINT, THENCE;
3. STILL ALONG THE DIVIDING LINE BETWEEN LOT 46 AND LOT 450, NORTH 86 DEGREES – 26 MINUTES – 32 SECONDS WEST, A DISTANCE OF 74.00 FEET TO A POINT, THENCE;
4. ALONG THE DIVIDING LINE BETWEEN LOT 46 AND A PARK AS PER CITY PLAN MAP NUMBER 4143 FILED IN QUEENS TOPOGRAPHIC BUREAU, NORTH 03 DEGREES – 33 MINUTES – 28 SECONDS EAST, A DISTANCE OF 26.00 FEET TO A POINT, THENCE;
5. STILL ALONG THE DIVIDING LINE BETWEEN LOT 46 AND SAID PARK, NORTH 86 DEGREES – 26 MINUTES – 32 SECONDS WEST, A DISTANCE OF 1.00 FEET TO A POINT ON THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD (150 FEET WIDE), THENCE;
6. ALONG THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD, NORTH 03 DEGREES – 33 MINUTES – 28 SECONDS EAST, A DISTANCE OF 376.00 TO THE POINT AND PLACE OF BEGINNING.

CONTAINING 30,124 SQUARE FEET OR 0.692 ACRES.

THIS PROPERTY MAY BE SUBJECT TO ANY RESTRICTIONS, COVENANTS, AND/OR EASEMENTS EITHER WRITTEN OR IMPLIED.





REF. MAP #10

NOTES:

1. PROPERTY KNOWN AS LOTS 46, 74, 450, 650, 660, 671 AND PART OF LOT 450, BLOCK 3886, SECTION 20-3, AS SHOWN ON THE TAX MAPS OF THE BOROUGH & COUNTY OF QUEENS, CITY & & STATE OF NEW YORK, PAGES 16 & 17
2. AREA: LOT 46: 30,124 S.F. OR 0.692 Ac.
   LOT 74: 229,829 S.F. OR 5.276 Ac.
   LOT 650: 127,818 S.F. OR 2.934 Ac.
   LOT 660: 26,223 S.F. OR 0.602 Ac.
   LOT 671: 108,320 S.F. OR 2.487 Ac.

   PROPOSED TO BE ACQUIRED BY HOME DEPOT
   PART OF LOT 450: 9925 S.F. OR 0.228 Ac.
   PART OF LOT 450 (MAINLINE): 13,178 S.F. OR 0.303 Ac.
3. LOCATION OF ALL UNDERGROUND UTILITIES ARE APPROXIMATE. ALL LOCATIONS AND SIZES ARE BASED ON UTILITY MARK-OUTS, ABOVE GROUND STRUCTURES THAT WERE VISIBLE & ACCESSIBLE IN THE FIELD, AND THE MAPS AS LISTED IN THE REFERENCES AVAILABLE AT THE TIME OF THE SURVEY. BEFORE ANY EXCAVATION IS TO BEGIN, ALL UNDERGROUND UTILITIES SHOULD BE VERIFIED AS TO THEIR LOCATION, SIZE, AND TYPE BY THE PROPER UTILITY COMPANIES
4. THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GURANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.
5. THIS PLAN IS BASED ON INFORMATION PROVIDED BY A SURVEY PREPARED IN THE FIELD BY CONTROL POINT ASSOCIATES, INC. AND OTHER REFERENCE MATERIAL AS LISTED HEREON.
6. THIS PROPERTY MAY BE SUBJECT TO RESTRICTIONS, COVENANTS AND/OR EASEMENTS, WRITTEN OR IMPLIED
7. ELEVATIONS ARE BASED UPON QUEENS BOROUGH DATUM, BENCHMARKS 4289 AND 2413 AS PROVIDED BY THE QUEENS TOPOGRAPHICAL BUREAU. THE BOROUGH OF QUEENS DATUM IS 2.725 FEET ABOVE USC&G DATUM AS PER REF. #3
8. PROPERTY IS NOT LOCATED IN A FLOOD HAZARD ZONE AS PER REF. MAP #11
9. THE EXTENT OF WETLANDS, IF ANY, HAVE NOT BEEN DELINEATED ON THIS MAP
10. PROJECT SITE IS LOCATED IN ZONE M1-1 (MANUFACTURING). ZONING INFORMATION IS AS PER REF. #7. SETBACKS:
    FRONT: 0'-0" WITH A 30' HIGH BUILDING WITHIN INITIAL SETBACK AREA
    SIDE: 0' OR 8'-0" MINIMUM
    REAR: 20'-0" MINIMUM
    MAX FLOOR AREA RATIO = 1.0
    SIGNAGE: NO SIZE OR HEIGHT RESTRICTIONS
    PARKING: 1 SPACE PER 300 S.F. GROSS FLOOR AREA
11. THE EXISTING BUILDINGS CONSIST OF 5 BRICK & MASONRY BUILDINGS WITH AN APPROXIMATE FIRST FLOOR SQUARE FOOTAGE OF:
    LOT 46: 25,300 S.F.
    LOT 74: 97,000 S.F.
    LOT 650: 68,400 S.F.
    LOT 660: 20,000 S.F.
    LOT 671: 71,300 S.F.
12. ON-SITE UTILITIES WERE NOT MARKED OUT.
13. LOTS 74, 650, 660 AND 671 ARE CONTIGUOUS. LOT 46 IS SEPARATED FROM LOTS 74, 650, 660 AND 671 BY LOT 450, REPUTED OWNER THE METROPOLITAN TRANSIT AUTHORITY/ LONG ISLAND RAILROAD. PROPOSED TO BE ACQUIRED BY HOME DEPOT
14. THE BUILDING MANAGER FOR LOT 671 REQUESTED THAT THE FIELD CREW TERMINATE WORK ON THAT SITE. INFORMATION WAS NOT OBTAINED FOR SOME UNDERGROUND STRUCTURES
15. LOT 671 IS SUBJECT TO A LEASE AGREEMENT AS PER D.R. 1773, PG. 1333
16. THERE ARE NO STREAMS OR NATURAL WATERCOURSES IN THE PROPERTY AS SHOWN
17. ALL ONSITE IMPROVEMENTS ON LOT 450 ARE NOT SHOWN PER CONTRACTUAL AGREEMENT

UTILITIES:

THE FOLLOWING COMPANIES WERE NOTIFIED BY THE NEW YORK CITY ONE-CALL SYSTEM (1-800-272-4480) AND REQUESTED TO MARK OUT UNDERGROUND FACILITIES AFFECTING AND AND SERVICING THIS SITE. THE UNDERGROUND UTILITY INFORMATION SHOWN HEREON IS BASED UPON THE UTILITY COMPANIES RESPONSE TO THIS REQUEST. SERIAL NUMBERS: 1390221, 1390223, 1390224, 1390227, 1390228 & 1390231

UTILITY COMPANY	PHONE NUMBER
BROOKLYN UNION GAS	718-403-2853
TIME WARNER CABLE	718-463-4100
CONSOLIDATED EDISON	718-802-6000
NYNEX	718-890-1820
AT&T	212-387-5400

THIS SURVEY IS CERTIFIED TO:
HOME DEPOT U.S.A., INC.
STEWART TITLE INSURANCE COMPANY
ALTMAN, KRITZER & LEVICK, P.C.

STATE OF NEW YORK
COUNTY OF QUEENS

I, GREGORY S. GALLAS, PROFESSIONAL LAND SURVEYOR OF THE STATE OF NEW YORK, HEREBY CERTIFY TO THE PARTIES LISTED HEREON THAT (A) THE SURVEY FROM WHICH THIS PLAT WAS PREPARED WAS CONDUCTED BY OUR FIRM, (B) THE LEGAL DESCRIPTION OF THE PROPERTY, AND THE LOCATION OF ALL IMPROVEMENTS, ENCROACHMENTS, FENCES, EASEMENTS, ROADWAYS, RIGHTS-OF-WAY AND SET-BACK LINES WHICH ARE EITHER VISIBLE OR OF RECORD IN QUEENS COUNTY, ACCORDING TO COMMITMENT FOR TITLE INSURANCE No'S SA8764, SA8765, SA8766 & SA8767 DATED 2-10-95 ISSUED BY STEWART TITLE INSURANCE COMPANY ARE ACCURATELY REFLECTED HEREON, (C) THIS PLAT ACCURATELY DEPICTS THE STATE OF FACTS AS THEY APPEAR ON THE GROUND, (D) EXCEPT AS SHOWN HEREON, THERE ARE NO IMPROVEMENTS, ENCROACHMENTS, FENCES OR ROADWAYS ON ANY PROTION OF THE PROPERTY REFLECTED HEREON, (E) THE PROPERTY SHOWN HEREON HAS ACCESS TO A PUBLICLY DEDICATED ROADWAY SUBJECT TO LOCAL REGULATIONS, (F) THE PROPERTY DESCRIBED HEREON DOES NOT LIE IN A FLOODPLAIN, A FLOODWAY OR AN AREA THAT HAS BEEN IDENTIFIED BY THE SECRETARY OF HOUSING AND URBAN DEVELOPMENT OR ANY OTHER GOVERNMENTAL AUTHORITY AS A FLOOD HAZARD AREA UNDER THE NATIONAL FLOOD INSURANCE ACT OF 1968 (24 CFR 1909.1), AS AMENDED (SUCH DETERMINATION HAVING BEEN MADE FROM A PERSONAL REVIEW OF THE FLOOD MAPS AS LISTED IN REF. #11 WHICH IS THE LATEST AVAILABLE MAP FOR THE PROPERTY), (G) THAT THE TITLE LINES AND LINES OF ACTUAL POSSESSION ARE THE SAME UNLESS SHOWN OTHERWISE, (H) THAT ALL UTILITY SERVICES REQUIRED FOR THE OPERATION OF THE PROPERTY EITHER ENTER THE PROPERTY THROUGH ADJOINING PUBLIC STREET, OR THIS SURVEY SHOWS THE POINT OF ENTRY AND LOCATION OF ANY VISIBLE UTILITIES WHICH PASS THROUGH OR ARE LOCATED ON ADJOINING PRIVATE LAND, (J) THAT THIS SURVEY SHOWS THE LOCATION AND DIRECTION OF ALL VISIBLE STORM DRAINAGE SYSTEMS FOR THE COLLECTION AND DISPOSAL OF ALL ROOF AND SURFACE DRAINAGE, (K) THAT ANY DISCHARGE INTO STREAMS, RIVERS, OR OTHER CONVEYANCE SYSTEMS IS SHOWN ON THE SURVEY. THIS HAS BEEN MADE IN ACCORDANCE WITH "MINIMUM STANDARD DETAIL REQUIREMENTS FOR LAND TITLE SURVEYS" FOR AN URBAN SURVEY AND INCLUDES ITEMS 2,3,4,5,6,8,9,10 & 11, JOINTLY ESTABLISHED AND ADOPTED BY AMERICAN LAND TITLE ASSOCIATION ("ALTA") AND AMERICAN CONGRESS ON SURVEYING AND MAPPING ("ACSM") IN 1992, AS AMENDED.

THIS 2ND DAY OF JULY, 1997.

No.	DESCRIPTION OF REVISION	BY:	DATE
3	REVISE AS PER FIELD VISIT ON 6/27/97	J.P.L.	7-2-97
2	REVISE TO SHOW LOT 450	D.R.A.	7-29-96
1	MISC. REVISIONS	J.D.B.	4-5-96

REFERENCES:

1. MAP ENTITLED "MAP OF PROPERTY IN THE TOWN OF NEWTOWN, QUEENS CO., L.I. BELONGING TO THE HEIRS OF GARRETT VAN DINE, DECEASED" PREPARED BY MARTIN G. JOHNSON, DATED DEC., 1859, FILED JUNE 7, 1882 AS MAP No. 58
2. MAP ENTITLED "CITY OF NEW YORK, BOROUGH OF QUEENS, OFFICE OF THE PRESIDENT, TOPOGRAPHICAL BUREAU, MAP No. 4143 SHOWING A CHANGE IN THE STREET SYSTEM HERETOFORE LAID OUT ALONG WOODHAVEN BOULEVARD BETWEEN METROPOLITAN AVENUE AND UNION TURNPIKE" DATED JULY 25, 1960 AND FILED AT THE TOPOGRAPHICAL BUREAU, BOROUGH OF QUEENS, CITY OF NEW YORK ON JAN. 24, 1962
3. MAP ENTITLED "CITY OF NEW YORK, BOROUGH OF QUEENS, OFFICE OF THE PRESIDENT, TOPOGRAPHICAL BUREAU, MAP No. 3506 SHOWING A CHANGE IN THE STREET SYSTEM HERETOFORE LAID OUT WITHIN THE TERRITORY BOUNDED BY WOODHAVEN BOULEVARD, METROPOLITAN AVENUE, TROTTING COURSE LANE AND 73rd AVENUE, IN THE SECOND WARD, NEW YORK" DATED APRIL 16, 1951 AND FILED AT THE TOPOGRAPHICAL BUREAU, BOOROUGH OF QUEENS, CITY OF NEW YORK SEPT. 21, 1951
4. MAP ENTITLED "MAP SHOWING STREET SYSTEM FOR THE TERRITORY DESIGNATED AS SECTION 45 OF THE FINAL MAPS OF THE BOROUGH OF QUEENS, NEW YORK" PREPARED BY THE CITY OF NEW YORK, BOROUGH OF QUEENS, OFFICE OF THE PRESIDENT, DEPARTMENT OF ENGINEERING, TOPOGRAPHICAL BUREAU, DATED JULY 15, 1909
5. MAP ENTITLED "THE HOME DEPOT, QUEENS, NY, METROPOLITAN AVENUE & TROTTING COURSE LANE", PREPARED BY GREENBERG FARROW ARCHITECTURE, DATED 7/22/94, LAST REV. 2/28/95
6. TITLE REPORTS PREPARED BY SELECT ABSTRACT CORP. FOR STEWART TITLE INSURANCE COMPANY, TITLE NUMBERS SA8764 (LOT 46), EFFECTIVE DATE 12/13/94, CORRESPONDANCE DATE 2/10/95; SA8765 (LOT 671), CORRESPONDANCE DATE 2/15/95; SA8766 (LOT 74), CORRESPONDANCE DATE 2/10/95; SA8767 (LOTS 650 & 660), CORRESPONDANCE DATE 2/9/95; AND SA8764-B (LOT 450), EFFECTIVE DATE 12/27/94.
7. SITE INVESTIGATION REPORT ENTITLED "HOME DEPOT, WOODHAVEN BLVD., QUEENS (FOREST HILLS), NEW YORK" PREPARED BY BOHLER ENGINEERING, P.C., DATED MAY 1995
8. GAS MAPS FROM BROOKLYN UNION GAS COMPANY, SHEETS 23-35, 23-38, 23-40, 23-89, 23-90, 23-91, 23-103, 23-107, 23-117 & 23-118
9. MAP ENTITLED "LOW TENSION MAINS AND SERVICE PLATE, CONSOLIDATED EDISION CO., OF N.Y., INC., QUEENS" MAPS 46-AN, LAST ISSUE 11/5/91; 47-AN, LAST ISSUE 11/28/94; 46-AO, LAST ISSUE 1/7/94; AND 47-AO, LAST ISSUE 11/28/94
10. MAP ENTITLED "RIGHT OF WAY AND TRACK MAP, THE LONG ISLAND RAILROAD COMPANY, GLENDALE CUTOFF, STATION 45+00 TO 79+87, VALUATION MAP #V2E179" REVISED 12/31/42
11. FIRM FLOOD INSURANCE RATE MAP, CITY OF NEW YORK MAP INDEX
12. UNDERGROUND WATERLINE MAPS PREPARED BY THE NEW YORK CITY DEPT. OF ENVIRONMENTAL PROTECTION, BUREAU OF WATER SUPPLY, CENTRAL MAPPING, QDM MAP 7/2 AND DDM MAPS 440 & 441

UNAUTHORIZED ALTERATION OR ADDITION TO A SURVEY MAP BEARING A LICENSED LAND SURVEYOR'S SEAL IS A VIOLATION OF SECTION 7209, SUB-DIVISION 2, OF THE NEW YORK STATE EDUCATION LAW.

ONLY COPIES FROM THE ORIGINAL OF THIS SURVEY MARKED WITH AN ORIGINAL OF THE LAND SURVEYOR'S EMBOSSED SEAL SHALL BE CONSIDERED TO BE VALID TRUE COPIES. CERTIFICATIONS INDICATED HEREON SIGNIFY THAT THIS SURVEY WAS PREPARED IN ACCORDANCE WITH THE EXISTING CODE OF PRACTICE FOR LAND SURVEYORS ADOPTED BY THE NEW YORK STATE ASSOCIATION OF PROFESSIONAL LAND SURVEYORS. SAID CERTIFICATIONS SHALL RUN ONLY TO THE PERSON FOR WHOM THE SURVEY IS PREPARED, AND ON HIS BEHALF TO THE TITLE COMPANY, GOVERNMENTAL AGENCY AND LENDING INSTITUTION LISTED HEREON, AND TO THE ASSIGNEES OF THE LENDING INSTITUTION. CERTIFICATIONS ARE NOT TRANSFERABLE TO ADDITIONAL INSTITUTIONS

GREGORY S. GALLAS — 7/2/97
NEW YORK PROFESSIONAL LAND SURVEYOR #50124 — DATE

ALTA/ACSM LAND TITLE
BOUNDARY & TOPOGRAPHICAL SURVEY

HOME DEPOT, U.S.A., INC.

WOODHAVEN BOULEVARD & 73rd AVENUE
BOROUGH OF QUEENS, QUEENS COUNTY
CITY AND STATE OF NEW YORK

CONTROL POINT ASSOCIATES, INC.
776 MOUNTAIN BLVD. WATCHUNG, N.J. 07060
(908) 668-0099
LAND SURVEYING • PLANNING • ENGINEERING

FIELD DATE	F/B NO.	F/B PG.	DRAWN:	CHECKED:	REV. NO.
6-2-95, 4-3-96, 6-27-97	95-20	87	J.D.B.	J.P.L.	3

DATE	SCALE	FILE NO.	DWG. NO.
7-7-95	1"=40'	C95196	1 OF 1

New York State Department of Environmental Conservation
Division of Environmental Enforcement
Bureau of State Superfund and Voluntary Cleanup,
625 Broadway, 14th Floor, Albany, New York 12233-5550
Phone: (518) 402-9522• **FAX:** (518) 402-9019
Website: www.dec.state.ny.us

CERTIFIED MAIL\ RETURN RECEIPT REQUESTED

October 15, 2008

Mark A. Chertok, Esq.
Sive Paget & Riesel, P.C.
460 Park Avenue
New York, N.Y. 10022-1906

Re: VCA Modification, Home Depot Site, Rego Park, Queens (the "Site"),
VCP Site No. V00095,
VCA No. D2-0001-97-04 (the "Agreement"),
Glendale Holding Corp., ("Glendale") representing the known Volunteers.

Dear Mr. Chertok:

This letter is forwarded to your attention in response to your letter to Commissioner Grannis dated September 30, wherein the known Volunteers and your client Home Depot U.S.A. Inc. ("Home Depot") requested a modification to the above referenced Voluntary Cleanup Agreement ("VCA").

In reliance upon and in furtherance of the letter and your client's previous discussions of this matter with the Department's staff and your client's contributions to the Site's remediation program to date, the Agreement modification requested is hereby granted and incorporated into and is enforceable pursuant to the subject Agreement, effective immediately upon receipt of this letter.

Specifically, Home Depot U.S.A. Inc. is hereby added as an additional party to the above referenced Agreement in the status of a Volunteer. All other substantive and procedural terms of the Agreement will remain unchanged and in full force and effect and will apply to Home Depot.

Nothing contained herein constitutes a waiver by the Department or the State of New York of any rights held in accordance with the Agreement or any applicable state and/or federal law or a release for any party from any obligations held under the Agreement or those same laws.

Please contact me if this you have any questions in this regard. Thank you for your assistance in this matter.

Sincerely,

Michael J. Lesser, Esq.

Michael J. Lesser, Esq.
Assistant Counsel

MJL:mjl/320626

cc: D. Desnoyers (via email)
D. Christian "
R. Cozzy "
J. Aversa "
S. Ahmed "
D. Weigel "
L. Zeppetelli "
Joseph Crua (NYSDOH) "
Bridget Callaghan (NYSDOH) "
K. Lewandowski "
Charlotte Biblow
Sheldon Goldstein

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

In the Matter of the
Implementation of a Remedial
Response Program for
property located immediately
to the southeast of the intersection of
Woodhaven Boulevard and Metropolitan Avenue,
Queens, New York by

AGREEMENT

INDEX NUMBER: D2-0001-97-04

Allborough Distributors, Inc. ("ADI"); and Glendale Holding Corp. ("Glendale")

Responding Parties

CONSIDERING,

1. The New York State Department of Environmental Conservation (the "Department") is responsible for enforcement of the Environmental Conservation Law of the State of New York ("ECL"). This Agreement is entered into pursuant to the Department's authority and discretion under that law.

2. A. The property subject to this Agreement is located at 75-11 Woodhaven Boulevard and 76-01 Woodhaven Boulevard, located in Rego Park, Queens, New York. The legal description of the property, which consists of Tax Block 3886, Section 20-3, Lots 046 and 074 (collectively, the "Site"), is attached hereto as Exhibit "A" of this Agreement. The Site, which consists of a total area of about 5.968 acres, is bounded as follows: (i) the parcel owned by ADI is bounded by Woodhaven Boulevard on the west, and a part of Tax Lot 450, which is now owned by the Long Island Railroad Company on the north, east and south; and (ii) the parcel owned by Glendale is bounded by Woodhaven Boulevard, Tax Lot 450, which is owned by the Long Island Railroad Company on the west; by Tax Lot 650, which is owned by Long Island Fire Proof Door, Inc. on the north; by part of Tax Lot 449, which is owned by the Long Island Railroad Company on the east; and by part of Tax Lot 450, which is owned by the Long Island Railroad Company on the south.

B. Several Site investigations have been performed by Soil Mechanics Environmental Services, Inc. and AKRF, Inc. The results of those investigations are set forth in the following reports:

(1) Environmental Site Assessment, Property located at: Proposed Home Depot, Woodhaven Boulevard, Rego Park, New York, Soil Mechanics Environmental Services, September 1995.

(2) Letter report, dated October 26, 1995, describing results of site investigations, Soil Mechanics Environmental Services.

(3) Letter report, dated February 7, 1996, describing results of site investigations, Soil Mechanics Environmental Services.

(4) Letter report, dated March 27, 1996, describing results of site investigations, Soil Mechanics Environmental Services.

(5) Voluntary Cleanup Site Assessment Report, Home Depot Rego Park, New York, AKRF, Inc., May 1996.

(6) Voluntary Cleanup, Supplementary Site Assessment Report, Home Depot Rego Park, New York AKRF, Inc., July 1996.

(7) Voluntary Cleanup, Supplementary Sampling Program Report, Home Depot Rego Park, New York AKRF, Inc., October 1996.

(8) Additional Sampling Work Plan and Remediation, Proposed Home Depot Site, Rego Park, Queens, New York, AKRF, Inc., December 1996.

(9) Site Assessment Report, ADI and Glendale Properties, Rego Park, Queens, New York, AKRF, Inc., April 1997.

The above-listed reports show there is contamination on and under the Site (called, for purposes of this Agreement, the "Existing Contamination"), which is generally summarized as follows:

1. Soil testing at the Site included analysis for volatile organic compounds ("VOCs"), Base Neutrals ("BNs"), and priority pollutant metals. Analysis showed concentrations of tetrachloroethene ("PCE"), a VOC, of up to 8,000 parts per million ("ppm"), which exceeds both the Department's clean-up objective level of 1.4 ppm for PCE as a single species and the maximum level of total VOCs allowable of 10 ppm.

2. Groundwater testing at the Site included analysis for VOCs, BN's, and priority pollutant metals. Analysis showed concentrations of PCE of up to 24,000 parts per billion ("ppb"), in excess of the allowable standard of 5 ppb. Other VOC contaminants found to be present in excess of allowable standards were 1,2 dichloroethene (7 ppb measured, 5 ppb standard), benzene (1.0 ppb measured, 0.7 ppb standard), and trichloroethylene (12 ppb measured, 5 ppb standard). Concentrations of BN's are reported to be below applicable standards. Priority pollutant metals detected at levels in excess of applicable standards included arsenic at 0.041 ppm (0.025 ppm std), chromium at 0.34 ppm (0.05 ppm std), lead at 0.15 ppm (0.025 ppm std), barium at 1.1 ppm (1.0 ppm std) and mercury at 0.0021 ppm (0.0020 ppm std).

Also present at the Site are four underground storage tanks. The above-described investigations have not conclusively established the absence of petroleum contamination. The existence or absence of petroleum contamination at the Site will be confirmed by excavations and further

investigation performed in connection with the removal of the underground storage tanks.

3. ADI and Glendale respectively represent (and for the purposes of this Agreement, the Department relies on those representations) that their involvement with the Site and with the facility on the Site is limited to the following: that ADI is the current owner and operator of the ADI Parcel, that Glendale is the current owner and operator of the Glendale Parcel, and that they are not otherwise responsible under law to remediate the Existing Contamination. ADI and Glendale are hereinafter referred to collectively as the "Responding Parties."

4. The Department has the power, *inter alia*, to provide for the prevention and abatement of all water, land, and air pollution. ECL 3-0301.1.i.

5. A. The Department alleges that the Existing Contamination demonstrates that the Site is an inactive hazardous waste disposal site, as that term is defined at ECL 27-1301.2.

B. ECL 27-1313.3 provides that the Department shall be responsible for inactive hazardous waste disposal site remedial programs, except as provided in Section 1389-b of the Public Health Law. ECL 27-1313.3.a provides that whenever the Commissioner of Environmental Conservation finds that hazardous wastes at an inactive hazardous waste disposal site constitute a significant threat to the environment, he may order the owner of such site and/or any person responsible for the disposal of hazardous wastes at such site (i) to develop an inactive hazardous waste disposal site remedial program, subject to the approval of the Department, at such site, and (ii) to implement such program within reasonable time limits specified in the order.

C. The regulations implementing ECL Article 27, Title 13 authorize at 6 NYCRR 375-1.2(e)(2)(ii) the proponents of any activity to demonstrate to the Department that such activity will not have the effect described in 6 NYCRR 375-1.2(e)(2)(i) by such demonstration as the Department may find acceptable.

D. Responding Parties wish to enter into this Agreement in order to ensure, and the Department hereby determines that this Agreement constitutes a demonstration, that the response action undertaken under this Agreement will be in compliance with the ECL and will not:

(1) prevent or interfere significantly with any proposed, ongoing or completed remedial program at the Site, or

(2) expose the public health or the environment to a significantly increased threat of harm or damage.

E. The Department, having consulted with the Department of Health, believes that upon satisfactory completion of the activities set forth in the remedial work plan attached to this Agreement (the "Work Plan"), the Site will not present a significant threat to human health or the environment. This belief is based upon the understanding that the Site will henceforth be used for commercial or industrial purposes.

6. A. Responding Parties also wish to enter into this Agreement in order to resolve their potential liability for remediating the Existing Contamination. The Department finds that such resolution, undertaken in accordance with the terms of this Agreement, is in the public interest.

B. Responding Parties, desirous of implementing a response program acceptable to the Department sufficient to allow the conveyance of the site for redevelopment as a retail store with parking (the "Contemplated Use"), consent to the terms and conditions of this Agreement.

7. The Department and Responding Parties agree that the goals of this Agreement are:

A. for Responding Parties to (i) implement the Department-approved remedial work plan pertaining to the Site; and (ii) reimburse the State's administrative costs as provided in this Agreement;

B. for the Department and the Trustee of New York State's natural resources (the "Trustee") to release Responding Parties and their successors and assigns, under the conditions set forth in this Agreement, from any and all claims, actions, suits, and proceedings (including but not limited to any claims for State administrative costs) by the Department or by the Trustee, which may arise under any applicable law as a result of the Existing Contamination.

8. The Department published a notice of proposed entry into this Agreement in the Department's *Environmental Notice Bulletin* and provided written notice to various individuals and entities of the proposed entry of this Agreement and solicited comments from the public and from those local governments on this Agreement, including the remedial work plan for the Site.

9. Responding Parties agree to be bound by the terms of this Agreement; consent to and agree not to contest the authority or jurisdiction of the Department to enter into or enforce this Agreement; and agree not to contest the validity of this Agreement or its terms.

IN CONSIDERATION OF AND IN EXCHANGE FOR THE DEPARTMENT'S RELEASE AND COVENANT NOT TO SUE SET FORTH IN THIS AGREEMENT, RESPONDING PARTIES AGREE TO THE FOLLOWING:

I. Performance and Reporting of the Work Plan

A. 1. Within 30 days after the effective date of this Agreement, Responding Parties shall commence implementation of the Work Plan attached to this Agreement as Exhibit "B" and made a part of this Agreement, and implement it in accordance with its terms. Responding Parties shall notify the Department of any significant difficulties that may be encountered in implementing the Work Plan or any Department-approved modification to it and shall not modify any obligation unless first approved by the Department.

2. The Work Plan contemplates the supplemental investigation and remediation of the Site being performed in two phases.

3. i. If upon completion of the investigation of the Glendale parcel required under the Work Plan contained in Exhibit "B," one or more contamination sources are encountered on the Glendale parcel that the Department determines require remedial actions to be undertaken in order to prevent a significant threat to the public health or to the environment or to ensure that the Contemplated Use may proceed safely from a human health and environmental protection perspective, it shall so state in writing. After receipt of such writing, the parties will immediately commence negotiations to modify the Work Plan in order to have it provide for the remediation of such contamination sources to an extent as to ensure that the Site will not present a significant threat to human health or the environment.

ii. Upon development of the proposed modified Work Plan, the Department will publish a notice in its *Environmental Notice Bulletin* and will mail equivalent written notice to various individuals and entities to inform the public of the public's opportunity to submit to the Department by no later than 30 days after the date of the issue of the Environmental Notice Bulletin in which the notice shall appear, comments on the proposed modified Work Plan. The proposed modified Work Plan shall be attached to this Agreement as Exhibit "B-1" and made a part of this Agreement and all references to "Work Plan" hereafter shall refer to that contained in Exhibit "B-1," unless, as a result of its review of the comments received, the Department determines that the proposed modified Work Plan to implement the Department-approved remedial activities for the Site must be further revised:

a. due to environmental conditions related to the Site that were unknown to the Department at the time of its approval of the proposed modified Work Plan; or

b. due to information received, in whole or in part, after the Department's approval of the proposed modified Work Plan, which indicates that the activities carried out in accordance with it will not adequately address any significant threats to the public health or to the environment that hazardous wastes disposed at the Site may pose.

In either event, the Department will so notify Responding Parties and will immediately commence negotiations with Responding Parties to revise the proposed modified Work Plan accordingly. If the Department and Responding Parties agree upon revisions to the proposed modified Work Plan, the revised proposed modified Work Plan shall be attached to this Agreement as Exhibit "B-1" and made a part of this Agreement and all references to "Work Plan" hereafter shall refer to that contained in Exhibit "B-1."

4. The parties agree that they will immediately commence negotiations to modify the Work Plan in the event that:

i. contamination previously unknown or inadequately characterized is encountered during the Work Plan's implementation; and

ii. such contamination must be remediated in order to avoid a

significant threat to the public health and the environment.

Any such modification(s) shall appear in Exhibit "B-2" and all references to "Work Plan" in this Agreement shall refer to the one contained in Exhibit "B" or "B-1," as appropriate, as modified by Exhibit "B-2."

5. If, after good faith negotiations, Responding Parties and the Department cannot agree upon revisions to the Work Plan as provided for in Subparagraphs I.A.3 and I.A.4 of this Agreement, then except with respect to Responding Parties' obligations under Paragraph VI and VIII of this Agreement, this Agreement shall terminate effective the date of the Department's written notification to Responding Parties that negotiations have failed to develop an acceptable modified Work Plan; Responding Parties shall not leave the Site in a condition, from the perspective of human health and environmental protection, worse than that which prevailed before activities subject to this Agreement were commenced; and (except with respect to the Department's right to enforce the obligations of Responding Parties previously described in this sentence, which it may enforce under this Agreement) all parties retain whatever rights they may have had respecting each other as they had before the effective date of this Agreement.

B. 1. It is hereby understood and acknowledged by the parties hereto, that ADI shall be responsible for the implementation of the Work Plan insofar as it relates to the ADI Parcel and that Glendale shall be responsible for implementation of the Work Plan as it relates to the Glendale Parcel.

2. In the event that the Department determines that the Work Plan should be modified pursuant to Subparagraph I.A.3 or I.A.4 of this Agreement, Responding Parties, their successors, successors-in-title, and assigns shall be permitted to continue the construction relating to the Contemplated Use during the modification period provided it does not interfere with the subsequent remedial measures required to address such contamination. The Department will expeditiously review the reports submitted regarding the contamination.

3. Responding Parties shall notify the Department of any significant difficulties that may be encountered in implementing the Work Plan, any Department-approved modification to the Work Plan, or any Department-approved detail, document, or specification prepared by or on behalf of Responding Parties pursuant thereto and this Agreement; and shall not modify any obligation unless first approved by the Department.

C. During implementation of all construction activities identified in the Work Plan, Responding Parties shall have on-Site a full-time representative who is qualified to supervise the work done.

D. In accordance with the schedule contained in the Work Plan, as may be modified by agreement between the parties, Responding Parties shall submit to the Department a final engineering report. The final engineering report shall include a detailed post-remedial operation and maintenance plan ("O&M Plan"), to the extent necessary; "as-built" drawings showing all

changes made during construction, to the extent necessary; and a certification that all activities were completed in full accordance with the Work Plan, any Department-approved modification to the Work Plan, any Department-approved detail, document, or specification prepared by or on behalf of Responding Parties pursuant thereto, and this Agreement. The O&M Plan, "as built" drawings, final engineering report, and certification must be prepared, signed, and sealed by a professional engineer.

E. Should post-remedial operation and maintenance prove to be necessary, upon the Department's approval of the O&M Plan, Responding Parties shall implement the O&M Plan in accordance with the schedule and requirements of the Department-approved O&M Plan.

F. 1. i. Within 60 days after receipt of the final engineering report and certification, the Department shall notify Responding Parties in writing whether the Department is satisfied with the implementation of the Work Plan, any Department-approved modification to the Work Plan, any Department-approved detail, document, or specification prepared by or on behalf of Responding Parties pursuant thereto, and this Agreement.

ii. Within 60 days after completion of the Department-approved O&M Plan, if any, Responding Parties shall submit to the Department a final engineering report and certification that the post-remedial operation and maintenance activities identified in the Department-approved O&M Plan were implemented in accordance with that plan. The Department shall notify Responding Parties whether it is satisfied with the O&M Plan's implementation.

2. Upon being satisfied that the Site-specific cleanup levels identified in, or to be identified in accordance with, the Work Plan have been reached, the Department shall notify Responding Parties in writing of its satisfaction and, except for the reservations identified below, the Department and the Trustee release, covenant not to sue, and shall forbear from bringing any action, proceeding, or suit against, Responding Parties, their successors, successors-in-title and assigns, for the further investigation and remediation of the Site, or for natural resources damages, based upon the release or threatened release of any Existing Contamination, provided that (a) timely payments of the amounts specified in Paragraph VI of this Agreement continue to be or have been made to the Department, (b) appropriate notices and deed restrictions have been recorded in accordance with Paragraphs IX and X of this Agreement, and (c) Responding Parties and/or their respective lessees, sublessees, successors, successors-in-title, or assigns promptly commence and diligently pursue to completion the Department-approved O&M Plan, if any. Nonetheless, the Department and the Trustee hereby reserve all of their respective rights concerning, and such release, covenant not to sue, and forbearance shall not extend to, any further investigation or remedial action the Department deems necessary:

i. due to off-Site migration of petroleum contaminants that was not addressed by the Work Plan;

ii. due to environmental conditions related to the Site that were

unknown to the Department at the time of its approval of the Work Plan which indicate that Site conditions are not sufficiently protective of human health and the environment for the Contemplated Use;

iii. due to information received, in whole or in part, after the Department's approval of the final engineering report and certification, which indicates that the activities carried out in accordance with the Work Plan are not sufficiently protective of human health and the environment for the Contemplated Use;

iv. due to either Responding Parties' failure to implement this Agreement to the Department's satisfaction; or

v. due to fraud or mistake committed by either of Responding Parties in demonstrating that the Site-specific cleanup levels identified in, or to be identified in accordance with, the Work Plan were reached.

Additionally, the Department and the Trustee hereby reserve all of their respective rights concerning, and any such release, covenant not to sue, and forbearance shall not extend to, any further investigation or abatement the Department deems necessary to be undertaken in the event that either of Responding Parties causes or suffers the release or threat of release at the Site of any hazardous substance (as that term is defined at 42 USC 9601[14]) or petroleum (as that term is defined in Navigation Law §172[15]) after the effective date of this Agreement; or either of Responding Parties causes a, or suffers the use of the Site to, change from the Contemplated Use to one requiring a lower level of residual contamination before that use can be implemented with sufficient protection of human health and the environment.

3. Notwithstanding any other provision in this Agreement, if with respect to the Site there exists or may exist a claim of any kind or nature on the part of the New York State Environmental Protection and Spill Compensation Fund against any party, nothing in this Agreement shall be construed, or deemed, to preclude the State of New York from recovering such claim.

G. If the Department is satisfied with the implementation of the Work Plan and Department-approved design, the Department shall provide Responding Parties with a written "no further action" letter substantially similar to the model letter attached to this Agreement and incorporated in this Agreement as Exhibit "C."

H. 1. Notwithstanding any other provision of this Agreement, with respect to any claim or cause of action asserted by the Department or the Trustee, the one seeking the benefit of the forbearance, covenant not to sue, or release set forth in Subparagraph I.F or in a "no further action" letter issued under Subparagraph I.G of this Agreement shall bear the burden of proving that the claim or cause of action, or any part thereof, is attributable solely to Existing Contamination; provided, however, that in the event that the Department were to require Responding Parties to undertake remedial activities with respect to contamination other than

Existing Contamination, evidence demonstrating that such remedial activities would also affect Existing Contamination shall not relieve Responding Parties of any obligation they may have to perform such remedial activities.

2. Prior to issuance of the release, covenant not to sue, and forbearance pursuant to Subparagraph I.F of this Agreement, the Department shall refrain and forbear from bringing administrative or judicial proceedings against any person or from commencing any investigation or remedial activity in the exercise of its powers under ECL Article 27 with respect to the Existing Contamination at the Site so long as the Work Plan is being implemented in accordance with the terms of this Agreement.

3. Except as above provided in Subparagraphs I.F and I.H.2 of this Agreement and in the "no further action" letter issued under Subparagraph I.G of this Agreement, nothing in this Agreement is intended as a release, forbearance, or covenant not to sue for any claim or cause of action, administrative or judicial, civil or criminal, past or future, in law or in equity, which the Department, the Trustee, or the State of New York may have against any person, firm, corporation, or other entity not a party to this Agreement. In addition, notwithstanding any other provision in this Paragraph I of this Agreement, the forbearance, covenant not to sue, and release described in Subparagraph I.F and in the "no further action" letter issued under Subparagraph I.G of this Agreement shall not extend to parties (other than Responding Parties) that were responsible under law before the effective date of this Agreement to address the Existing Contamination.

II. Progress Reports

A. Responding Parties shall submit to the parties identified in Subparagraph XI.A.1 in the numbers specified therein copies of written monthly progress reports that:

1. describe the actions which have been taken toward achieving compliance with this Agreement during the previous month;

2. include all results of sampling and tests and all other data received or generated in connection with implementation of the Work Plan in the previous month, including quality assurance/quality control information;

3. identify all work plans, reports, and other deliverables required by this Agreement that were completed and submitted during the previous month;

4. describe all actions, including, but not limited to, data collection and implementation of the Work Plan, that are scheduled for the next month and provide other information relating to the progress at the Site;

5. include information regarding percentage of completion, unresolved delays encountered or anticipated that may affect the future schedule for implementation of Responding

Parties' obligations under the Agreement, and efforts made to mitigate those delays or anticipated delays;

6. include any modifications to any work plans, including the Work Plan, that have been proposed to the Department and any that the Department has approved.

B. Responding Parties shall submit these progress reports to the Department by the tenth day of every month following the effective date of this Agreement and Responding Parties' obligation to submit the progress reports shall terminate upon its receipt of the written satisfaction notification identified in Subparagraph I.F of this Agreement.

C. Responding Parties also shall allow the Department to attend, and shall provide the Department at least five days advance notice of, any of the following: prebid meetings, job progress meetings, substantial completion meeting and inspection, and final inspection and meeting.

III. Review of Submittals

A. The Department shall review each of the submittals Responding Parties make pursuant to this Agreement to determine whether it was prepared, and whether the work done to generate the data and other information in the submittal was done, in accordance with this Agreement and generally accepted technical and scientific principles. The Department shall notify Responding Parties in writing of its approval or disapproval of the submittal. All Department-approved submittals shall be incorporated into and become an enforceable part of this Agreement.

B. If the Department disapproves a submittal, except with respect to the final engineering report and certification (in which case the period shall be 60 days), it shall so notify Responding Parties in writing and shall specify the reasons for its disapproval within 30 days after its receipt of the submittal and may request Responding Parties to modify or expand the submittal; provided, however, that the matters to be addressed by such modification or expansion are within the specific scope of work as described in the Work Plan. Within 30 days after receiving written notice that Responding Parties' submittal has been disapproved, Responding Parties shall make a revised submittal to the Department which endeavors to address and resolve all of the Department's stated reasons for disapproving the first submittal.

C. After receipt of the revised submittal, the Department shall notify Responding Parties in writing within 30 days of its approval or disapproval. If the Department disapproves the revised submittal, the Department and Responding Parties may pursue whatever remedies at law or in equity (by declaratory relief) that may be available to them, without prejudice to either's right to contest the same. If the Department approves the revised submittal, it shall be incorporated into and become an enforceable part of this Agreement.

D. Within 30 days after the Department's approval of the final engineering report and certification, Responding Parties shall submit to the Department one microfilm copy (16

millimeter roll film M type cartridge) of that report and all other Department-approved drawings and submittals. Such submission shall be made to:

Director, Division of Environmental Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-7010

IV. Enforcement

A. This Agreement shall be enforceable as a contractual agreement under the laws of the State of New York.

B. Responding Parties shall not suffer any penalty under this Agreement or be subject to any proceeding or action if they cannot comply with any requirement of this Agreement because of fire, lightning, earthquake, flood, adverse weather conditions, strike, shortages of labor and materials, war, riot, obstruction or interference by adjoining landowners, or any other fact or circumstance beyond Responding Parties' reasonable control ("force majeure event"). The Responding Party invoking this provision shall, within five working days of when it obtains knowledge of such force majeure event or that a circumstance is a force majeure event, notify the Department in writing. Said Responding Party shall include in such notice the measures taken and to be taken to prevent or minimize any delays and shall request an appropriate extension or modification of this Agreement. Said Responding Party shall have the burden of proving by a preponderance of the evidence that an event is a defense to compliance with this Agreement pursuant to this Subparagraph IV.B of this Agreement.

V. Entry upon Site

Responding Parties hereby consent to the entry upon those areas of the Site or areas in the vicinity of the Site which may be under their respective control by any duly designated employee, consultant, contractor, or agent of the Department or any State agency having jurisdiction with respect to the Response Program for purposes of inspection, sampling, and testing and to ensure Responding Parties' compliance with this Agreement. The Department shall abide by the health and safety rules in effect for work performed at the Site under the terms of this Agreement. Upon request, Responding Parties shall provide the Department with suitable office space at the Site, including access to a telephone, and shall permit the Department full access to all records relating to matters addressed by this Agreement and to job meetings.

VI. Payment of State Costs

Within thirty days after receipt of an itemized invoice from the Department, Responding Parties shall cause to be paid to the Department a sum of money which shall represent reimbursement for the State's expenses including, but not limited to, direct labor, fringe benefits, indirect costs, travel, analytical costs, and contractor costs incurred by the State of New York for

negotiating this Agreement, reviewing and revising submittals made pursuant to this Agreement, overseeing activities conducted pursuant to this Agreement, collecting and analyzing samples, and administrative costs associated with this Agreement, but not including the State's expenses incurred after the Department's notification identified in Subparagraph I.H.1 of this Agreement. Such payment shall be made by certified check payable to the Department of Environmental Conservation and shall be sent to:

Bureau of Program Management
Division of Environment Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, NY 12233-7010

Personal service costs shall be documented by reports of Direct Personal Service, which shall identify the employee name, title, biweekly salary, and time spent (in hours) on the project during the billing period, as identified by an assigned time and activity code. Approved agency fringe benefit and indirect cost rates shall be applied. Non-personal service costs shall be summarized by category of expense (*e.g.*, supplies, materials, travel, contractual) and shall be documented by expenditure reports. The Department intends to provide Responding Parties with an invoice as described in this Paragraph VI upon completion of the activities required by the Work Plan. The parties estimate that the State's reimbursable costs will be approximately $10,000.

VII. Department Reservation of Rights

A. Except as provided in Subparagraph I.F.2 and I.H.2 of this Agreement and in any "no further action" letter issued under Subparagraph I.G of this Agreement, nothing contained in this Agreement shall be construed as barring, diminishing, adjudicating, or in any way affecting any of the Department's rights with respect to any party other than Responding Parties.

B. Nothing contained in this Agreement shall prejudice any rights of the Department to take any investigatory or remedial action it may deem necessary if either of Responding Parties fails to comply with this Agreement or contamination other than Existing Contamination is encountered at the Site.

C. Nothing contained in this Agreement shall be construed to prohibit the Commissioner or his duly authorized representative from exercising any summary abatement powers.

D. Nothing contained in this Agreement shall be construed to affect the Department's right to terminate this Agreement at any time during its implementation if either of Responding Parties fails to comply substantially with this Agreement's terms and conditions.

VIII. Indemnification

Responding Parties shall indemnify and hold the Department, the State of New York, and their representatives and employees harmless for all claims, suits, actions, damages, and costs of every name and description arising out of or resulting from the fulfillment or attempted fulfillment of this Agreement by Responding Parties and/or any of Responding Parties' directors, officers, employees, servants, agents, successors, and assigns, other than claims, suits, actions, damages, and costs arising out of or resulting from the gross negligence of the State, the Department, or their representatives, agents, contractors, or employees.

IX. Notice of Sale or Conveyance

A. Within 30 days after the effective date of this Agreement, Responding Parties shall each file the Notice of Agreement, which is attached to this Agreement as Exhibit "D," with the Queens County Register to give all parties who may acquire any interest in the Site notice of this Agreement.

B. If either of Responding Parties proposes to convey the whole or any part of its respective ownership interest in the Site, that Responding Party shall, not fewer than 15 days before the date of conveyance, notify the Department in writing of the identity of the transferee and of the nature and proposed date of the conveyance and shall notify the transferee in writing, with a copy to the Department, of the applicability of this Agreement. Such Responding Party shall include in such notice the name and address of the person or persons who should receive correspondence and notices under this Agreement on behalf of the transferee. The Department shall thereafter direct such correspondence and notices to those persons, as well as to Responding Parties.

X. Deed Restriction

Within 30 days of its receipt of the Department's notification pursuant to Subparagraph I.F of this Agreement approving Responding Parties' final engineering report and certification, Responding Parties shall record an instrument with the Queens County Register, to run with the land, that shall prohibit the Site from ever being used for purposes other than of the Contemplated Use or other commercial or industrial use without the express written waiver of such prohibition by the Department, or if at such time the Department shall no longer exist, any New York State department, bureau, or other entity replacing the Department. Such instrument also will include a provision prohibiting the use of the groundwater underlying the Site without treatment rendering it safe for drinking water or industrial purposes, as appropriate, unless the user first obtains permission to do so from the Department, or if at such time the Department shall no longer exist, any New York State department, bureau, or other entity replacing the Department. Such instrument also will include a provision requiring Responding Parties and Responding Parties' successors and assigns to continue to operate any soil or groundwater remediation system installed under the Work Plan until such time as the system may be shut down in accordance with the provisions of the Work Plan. Responding Parties shall provide the Department with a copy of

such instrument certified by the Queens County Register to be a true and faithful copy of the instrument as recorded in the Office of the Queens County Register.

XI. Communications

A. All written communications required by this Agreement shall be transmitted by United States Postal Service, by private courier service, or hand delivered.

1. Communication from Responding Parties shall be sent to:

Richard Gardineer, P.E.
New York State Department of Environmental Conservation
47-20 21st Street
Long Island City, New York 11101

with copies to:

G. Anders Carlson, Ph.D.
Director, Bureau of Environmental Exposure Investigation
New York State Department of Health
2 University Place
Albany, New York 12203

Charles E. Sullivan, Jr., Esq.
New York State Department of Environmental Conservation
50 Wolf Road, Room 410A
Albany, New York 12233-5550

Copies of work plans and reports shall be submitted as follows:

Four copies (one unbound) to Mr. Gardineer

Two copies to Dr. Carlson

One copy to Mr. Sullivan

2. Communications to be made from the Department to ADI shall be sent to:

Charlotte Biblow, Esq.
Rivkin Radler and Kremer
EAB Plaza
Uniondale, NY 11556

William Rosson
2000 Broadway, Apt. 26D
New York, NY 10023

Perry Cohen, Esq.
Todtman, Young, Tunick, Nachamie
Hendler & Spizz, P.C.
425 Park Avenue
New York, NY 10022

3. Communications to Glendale shall be sent to:

Sheldon M. Goldstein, Esq.
Meltzer, Lippe, Goldstein, Wolf & Schlissel, P.C.
190 Willis Avenue
Mineola, New York 11501

Kevin Dwyer, President
Glendale Holding Corp., Inc.
75-11 Woodhaven Boulevard
Rego Park, New York 11374

B. The Department and Responding Parties reserve the right to designate additional or different addressees for communication on written notice to the other given in accordance with this Paragraph XI.

XII. Miscellaneous

A. By entering into this Agreement, ADI certifies that it has fully and accurately disclosed to the Department all information known to ADI and all information in the possession or control of ADI's officers, directors, employees, contractors, and agents which relates in any way to the contamination existing on the effective date of this Agreement on or under the Site or any past or potential future release of hazardous substances, pollutants, or contaminants at or from the Site and to their application for this Agreement. ADI also certifies that it has not caused or contributed to a release or threat of release of hazardous substances or pollutants or contaminants at, or from, the Site.

B. By entering into this Agreement, Glendale certifies that it has fully and accurately disclosed to the Department all information known to Glendale and all information in the possession or control of Glendale's officers, directors, employees, contractors, and agents which relates in any way to the contamination existing on the effective date of this Agreement on or under the Site or any past or potential future release of hazardous substances, pollutants, or contaminants at or from the Site and to their application for this Agreement. Glendale also certifies that it has not caused or contributed to a release or threat of release of hazardous

substances or pollutants or contaminants at, or from, the Site.

C. If the Department determines that information provided or certifications made by either of Responding Parties are not materially accurate and complete, this Agreement, within the sole discretion of the Department, shall be null and void *ab initio* as to the party providing such materially inaccurate or incomplete information or statement, and the Department shall reserve all rights it may have against that party.

D. Responding Parties shall retain professional consultants, contractors, laboratories, quality assurance/quality control personnel, and data validators acceptable to the Department to perform the technical, engineering, and analytical obligations required by this Agreement. The responsibility for the performance of the professionals retained by Responding Parties shall rest solely with Responding Parties.

E. The Department shall have the right to obtain split samples, duplicate samples, or both, of all substances and materials sampled by Responding Parties, and the Department also shall have the right to take its own samples. Responding Parties shall make available to the Department the results of all sampling and/or tests or other data generated by Responding Parties with respect to implementation of this Agreement and shall submit these results in the progress reports required by this Agreement.

F. Responding Parties shall notify the Department at least five working days in advance of any field activities to be conducted pursuant to this Agreement.

G. 1. Subject to Subparagraph XII.G.2 of this Agreement, Responding Parties shall obtain all permits, easements, rights-of-way, rights-of-entry, approvals, or authorizations necessary to perform their obligations under this Agreement.

2. In carrying out the activities identified in the Work Plan, the Department shall exempt Responding Parties from the requirement to obtain any Department permit for any activity that is conducted on the Site and that satisfies all substantive technical requirements applicable to like activity conducted pursuant to a permit.

H. Responding Parties and Responding Parties' lessees, successors, successors-in-title and assigns shall be bound by and may implement the terms of this Agreement, provided that Responding Parties shall remain responsible to the Department for the satisfactory performance of the obligations established under this Agreement. Any change in ownership or corporate status of either of Responding Parties including, but not limited to, any transfer of assets or real or personal property, shall in no way alter Responding Parties' responsibilities under this Agreement. Responding Parties shall obligate their respective officers, directors, employees, servants, and agents to comply with the relevant provisions of this Agreement in the performance of their designated duties on behalf of Responding Parties.

I. Responding Parties shall provide a copy of this Agreement to each contractor

hired to perform work required by this Agreement and to each person representing Responding Parties with respect to the Site and shall condition all contracts entered into in order to carry out the obligations identified in this Agreement upon performance in conformity with the terms of this Agreement. Responding Parties or their contractors shall provide written notice of this Agreement to all subcontractors hired to perform any portion of the work required by this Agreement. Responding Parties shall nonetheless be responsible for ensuring that their contractors and subcontractors perform the work in satisfaction of the requirements of this Agreement.

J. All references to "professional engineer" in this Agreement are to an individual registered as a professional engineer in accordance with Article 145 of the New York State Education Law. If such individual is a member of a firm, that firm must be authorized to offer professional engineering services in the State of New York in accordance with Article 145 of the New York State Education Law.

K. All references to "days" in this Agreement are to calendar days unless otherwise specified.

L. The paragraph headings set forth in this Agreement are included for convenience of reference only and shall be disregarded in the construction and interpretation of any of the provisions of this Agreement.

M. 1. No term, condition, understanding, or agreement purporting to modify or vary any term of this Agreement shall be binding unless made in writing and subscribed by the party to be bound. No informal advice, guidance, suggestion, or comment by the Department regarding any report, proposal, plan, specification, schedule, or any other submittal shall be construed as relieving Responding Parties of their obligation to obtain such formal approvals as may be required by this Agreement.

2. If Responding Parties desire that any provision of this Agreement be changed, Responding Parties shall make timely written application, signed by Responding Parties, to the Commissioner setting forth reasonable grounds for the relief sought. Copies of such written application shall be delivered or mailed to Mr. Gardineer and to Mr. Sullivan.

N. This Agreement constitutes an exercise of the Department's prosecutorial discretion and accordingly, neither the execution of this Agreement nor the remedial activities to be undertaken under the terms of this Agreement are subject to review under the State Environmental Quality Review Act, ECL Article 8, and its implementing regulations, 6 NYCRR Part 617. ECL 8-0105.5(i), 6 NYCRR 617.5(c)(29).

O. In undertaking the work required under this Agreement, Responding Parties and their officers, directors, employees, representatives, agents, contractors, and subcontractors are deemed for the purpose of ECL 27-1321.3 and any other similar provision of state or federal law, to be performing services related to cleanup or restorative work which is conducted pursuant to a

contract with the Department.

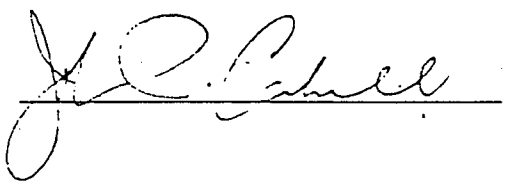
P. The provisions of this Agreement do not constitute and shall not be deemed a waiver of any right Responding Parties otherwise may have to seek and obtain contribution and/or indemnification from other potentially responsible parties or their insurers, or Responding Parties' insurers, for payments made previously or in the future for response costs. To the extent authorized under 42 USC 9613 and any other applicable law (including the common law), Responding Parties shall not be liable for any claim, now or in the future, in the nature of contribution by potentially responsible parties concerning the Existing Contamination. In any future action brought by Responding Parties against a potentially responsible party under the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, the provisions of 42 USC 9613(f)(3) and 9607 shall apply.

Q. Responding Parties and their employees, servants, agents, lessees, successors, and assigns hereby affirmatively waive any right they had, have, or may have to make a claim pursuant to Article 12 of the Navigation Law with respect to the Site, and further release and hold harmless the New York State Environmental Protection and Spill Compensation Fund from any and all legal or equitable claims, suits, causes of action, or demands whatsoever that any of same has or may have as a result of Responding Parties' entering into or fulfilling the terms of this Agreement with respect to the Site.

R. The effective date of this Agreement shall be the later of six months from the date this Agreement is signed by ADI and Glendale or the date of transfer of the ADI and Glendale parcels to third parties, provided that either or both of the Responding Parties may, by written notice provided to the persons identified in Paragraph XI of this Agreement prior to the effective date withdraw this Agreement, in which event it shall become null, void and of no force and effect.

DATED: JUL 14 1997

JOHN P. CAHILL, ~~ACTING~~ COMMISSIONER
NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION AND TRUSTEE
OF THE STATE'S NATURAL RESOURCES



CONSENT BY ADI

Allborough Distributors, Inc. hereby consents to the issuing and entering of this Agreement, waives its right to a hearing herein as provided by law, and agrees to be bound by this Agreement.

ALLBOROUGH ~~DISTRIBUT~~ORS, INC.

By: _____

Date: 5/20/97

STATE OF NEW YORK)
) s.s.:
COUNTY OF)

On this 20th day of May, 19 97 before me personally came Ronald B. Rosson, to me known, who being duly sworn, did depose and say that he resides in New York City; that he is President of Allborough Distributors, Inc., the corporation described in and which executed the foregoing instrument; and that he signed his name on behalf of Allborough Distributors, Inc. and was authorized to do so.

_____
Notary Public State of New York
My commission expires _____

MARY H. McDONALD
Notary Public, State of New York
No. 30-4515756
Qualified in Nassau County
Commission Expires Nov. 30, 19 97

CONSENT BY GLENDALE

Glendale Holding Corp. hereby consents to the issuing and entering of this Agreement, waives its right to a hearing herein as provided by law, and agrees to be bound by this Agreement.

GLENDALE HOLDING CORP.

By: _____

Date: May 27, 1997

STATE OF NEW YORK)
[QUEENS]) s.s.:
COUNTY OF ~~NASSAU~~)

On this 27th day of May, 1997, before me personally came KEVIN J GILLOOLY, to me known, who being duly sworn, did depose and say that he resides in NASSAU County NY; that he is PRESIDENT of Glendale Holding Corp., the corporation described in and which executed the foregoing instrument; and that he signed his name on behalf of Glendale Holding Corp. and was authorized to do so.

_____
Notary Public State of New York
My commission expires_____

KEVIN J. GILLOOLY
NOTARY PUBLIC, State of New York
No. 30-1436850
Qualified in Nassau County
Cert. Filed in Nassau Co. Clk. & Reg.
Term Expires May 31, 1997

EXHIBIT "A"

Description of the Premises

1. Allborough Distributors, Inc. Parcel

76-01 Woodhaven Boulevard
Lot 46, Block 3886, Section 20-3
Pages 16 and 17, Tax Maps of
Borough and County of Queens
City and State of New York

The property is shown on plat prepared by Control Point Associates, Inc., 776 Mountain Boulevard, Watchung, New Jersey 07060, certified by Gregory S. Gallas, New York P.L.S., File No. C95196, dated July 7, 1995, revised April 5, 1996 (the "Control Point Plat"), to which reference is hereby made for a complete and accurate legal description and which is more particularly described thereon as follows:

TO FIND THE TRUE POINT OF BEGINNING, begin at the intersection of the easterly sideline of Woodhaven Boulevard (variable width) with the southerly sideline of 73rd Avenue (60 feet wide, F.K.A. Katie Place) run thence South 02 33' 30" West along the westerly line of Lot 671 a distance of 199.65 feet to the northwesterly corner of Lot 660; run thence South 02 33' 30" West along the westerly line of said Lot 660 and the easterly sideline of Woodhaven Boulevard a distance of 179.72 feet to a point; run thence South 03 33' 28" West along the westerly line of said Lot 660 and the easterly sideline of Woodhaven Boulevard a distance of 81.93 feet to a point on the westerly line of Lot 650 and the easterly line of Woodhaven Boulevard; run thence South 03 33' 28" West along the westerly line of said Lot 650 and the easterly sideline of Woodhaven Boulevard a distance of 20.00 feet to a point on the westerly line of Lot 74 and the easterly line of Woodhaven Boulevard; run thence South 03 33' 28" West along the westerly line of said Lot 74 and the easterly sideline of Woodhaven Boulevard a distance of 39.30 feet to a point at the corner of Lot 450 and the easterly sideline of Woodhaven Boulevard; run thence South 03 33' 28" West along the westerly line of said Lot 450 and the easterly sideline of Woodhaven Boulevard a distance of 69.78 feet to a point at the corner of Lot 450, the easterly sideline of Woodhaven Boulevard and the northwest corner of Lot 46, being **THE TRUE POINT OF BEGINNING**.

FROM THE POINT OF BEGINNING THUS ESTABLISHED, run thence

1. South 86 26' 32" East along the northerly line of Lot 46 and a common line with Lot 450, a distance of 75.00 feet to a point; run thence

2. South 03 33' 28" West along the easterly line of said Lot 46 and a common line with Lot 450, a distance of 402.00 feet to a point; run thence

3. North 86 26' 32" West along the southerly line of said Lot 46, a distance of 74.00 feet to a point; run thence

4. North 03 33' 28" East, a distance of 26.00 feet to a point, along the dividing line between said Lot 46 and a park as per City Plan Map Number 4143 filed in Queens Topographic Bureau; run thence

5. North 86 26' 32" West along the dividing line between said Lot 46 and said park, a distance of 1.00 foot to a point on the easterly sideline of Woodhaven Boulevard (150 feet wide); run thence

6. North 03 33' 28" East along the easterly sideline of Woodhaven Boulevard and the westerly line of said Lot 46 a distance of 376.00 feet to **THE TRUE POINT OF BEGINNING**.

Containing 30,124 square feet or 0.692 acres.

Together with all right, title and interest of, in and to any streets and roads abutting the above described premises, to the center line thereof.

2. Glendale Holding Corp. Parcel
(f/k/a Spiro-Wallach, Inc.)

75-11 Woodhaven Boulevard
Lot 74, Block 3886, Section 20-3
Pages 16 and 17, Tax Maps of
Borough and County of Queens
City and State of New York

The property is shown on a plat prepared by Control Point Associates, Inc., 776 Mountain Boulevard, Watchung, New Jersey 07060, certified by Gregory S. Gallas, New York P.L.S., File No. C95196, dated July 7, 1995, to which reference is hereby made for a complete and accurate legal description and which is more particularly described thereon as follows:

Begin at a point on the easterly sideline of Woodhaven Boulevard (150 feet wide), said point being distant southerly 481.30 feet along the easterly sideline of Woodhaven Boulevard from the

intersection of the easterly sideline of Woodhaven Boulevard (variable width) with the southerly sideline of 73rd Avenue (60 feet wide) and **THE TRUE POINT OF BEGINNING.**

FROM THE POINT OF BEGINNING THUS ESTABLISHED, run thence

1. Along the dividing line between Lot 74 and Lot 650, South 87 degrees - 25 minutes - 30 seconds East, a distance of 548.40 feet to a point, run thence

2. Along the dividing line between Lot 74 and Lot 449, South 02 degrees - 33 minutes - 30 seconds West, a distance of 484.54 feet to a point; run thence

3. Along a dividing line between Lot 74 and Lot 450, North 87 degrees - 28 minutes - 30 seconds West, a distance of 466.00 feet to a point; run thence

4. Still along the dividing line between Lot 74 and Lot 450, North 02 degrees - 15 minutes - 30 seconds East, a distance of 441. 51 feet to a point; run thence

5. Still along the dividing line between Lot 74 and Lot 450, North 84 degrees - 29 minutes - 05 seconds West, a distance of 80.87 feet to a point on the easterly sideline of Woodhaven Boulevard (150 feet wide); run thence

6. Along the easterly sideline of Woodhaven Boulevard, North 03 degrees - 33 minutes - 28 seconds East, a distance of 39.30 feet to **THE TRUE POINT OF BEGINNING.**

Containing 229,829 square feet or 5.276 acres.

Together with all right, title and interest of, in and to any streets and roads abutting the above described premises, to the center line thereof.

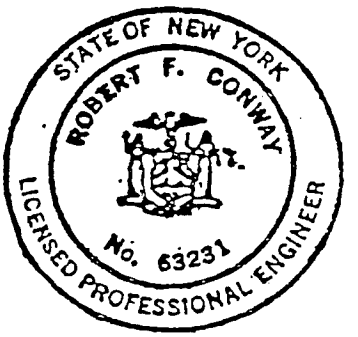
EXHIBIT "B"

Department Approved Work Plan

REMEDIAL WORK PLAN
ADI AND GLENDALE PROPERTIES
REGO PARK, QUEENS, NEW YORK

Prepared By:

AKRF Engineering , P.C.
117 East 29th Street
New York, New York 10017
(212) 696-0670



Robert Conway, P.E. #063231
Vice President

May 1997

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1. INTRODUCTION

The Voluntary Cleanup site comprises two parcels under separate ownership (see Figure 1). The smaller parcel, on the western part of the site along Woodhaven Boulevard is occupied by Allborough Distributors Inc. (the "ADI property"). The building on the ADI property was designated as Building E in earlier site investigations. The larger parcel, owned by Glendale Holding Corporation and occupied by the Spiro Wallach Corporation (the "Glendale property") is located on the eastern portion of the site. The building on the Glendale property was designated as Building D in earlier site investigations.

The parcel to the north, occupied by the Long Island Fire Door Company, was included in earlier site investigations, but is not included in the Voluntary Cleanup Agreement and is not part of this remedial work plan. The buildings on this property were designated as Buildings A, B, and C in earlier site investigations. Previous investigations have shown that the only remedial work required on this parcel is related to the underground petroleum storage tanks on the property. Groundwater contamination on this parcel is apparently entering from an upgradient source.

This Remedial Work Plan presents the conceptual plan for remediation of the site. Further submissions will be made to DEC as described below. The goal of the remediation is to clean soil to DEC's recommended cleanup objectives as presented in Technical and Administrative Guidance Memorandum 4046 and to clean groundwater to New York State Part 703 standards for Class GA groundwater as described below.

2. OVERVIEW OF REMEDIATION PLAN

Soil and groundwater on portions of the site have been found to be contaminated by tetrachloroethene (PCE). Figures summarizing prior soil and groundwater testing data are presented in Appendix A. A release of PCE within the ADI building has impacted the soil under the building, and groundwater under the building and in areas to the south and east, including groundwater under a portion of the Glendale building. In addition, there may have been a separate release of PCE under the Glendale building. The remediation will comprise two phases. Phase I will address the soil and groundwater contamination from the release under the ADI building. Phase II will address soil and groundwater contamination from any releases discovered under the Glendale building.

The basic remediation methods for the site will be:

- Excavate PCE-contaminated soil within ten feet of the ground surface for off-site treatment/disposal.

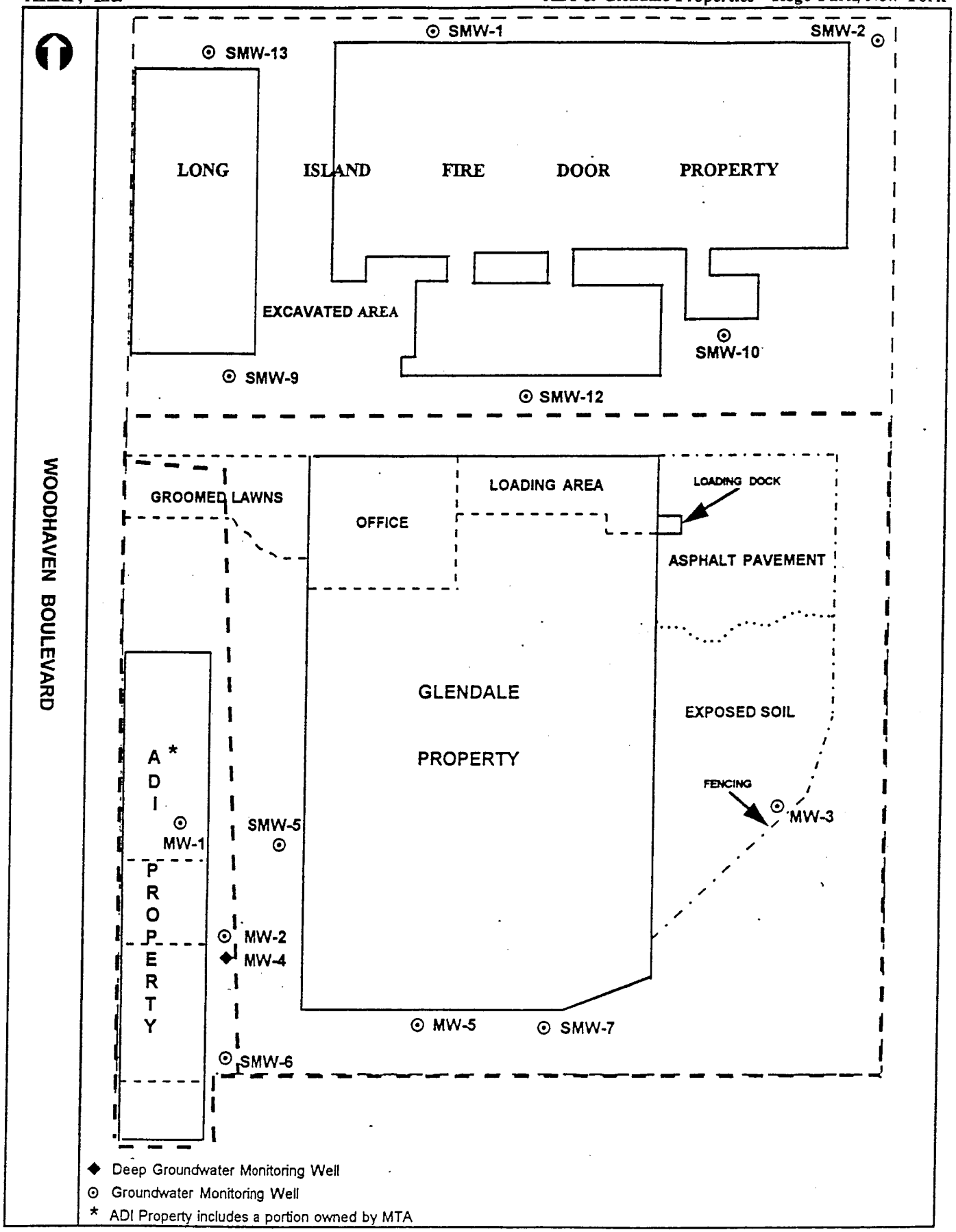

FIGURE 1
EXISTING CONDITIONS

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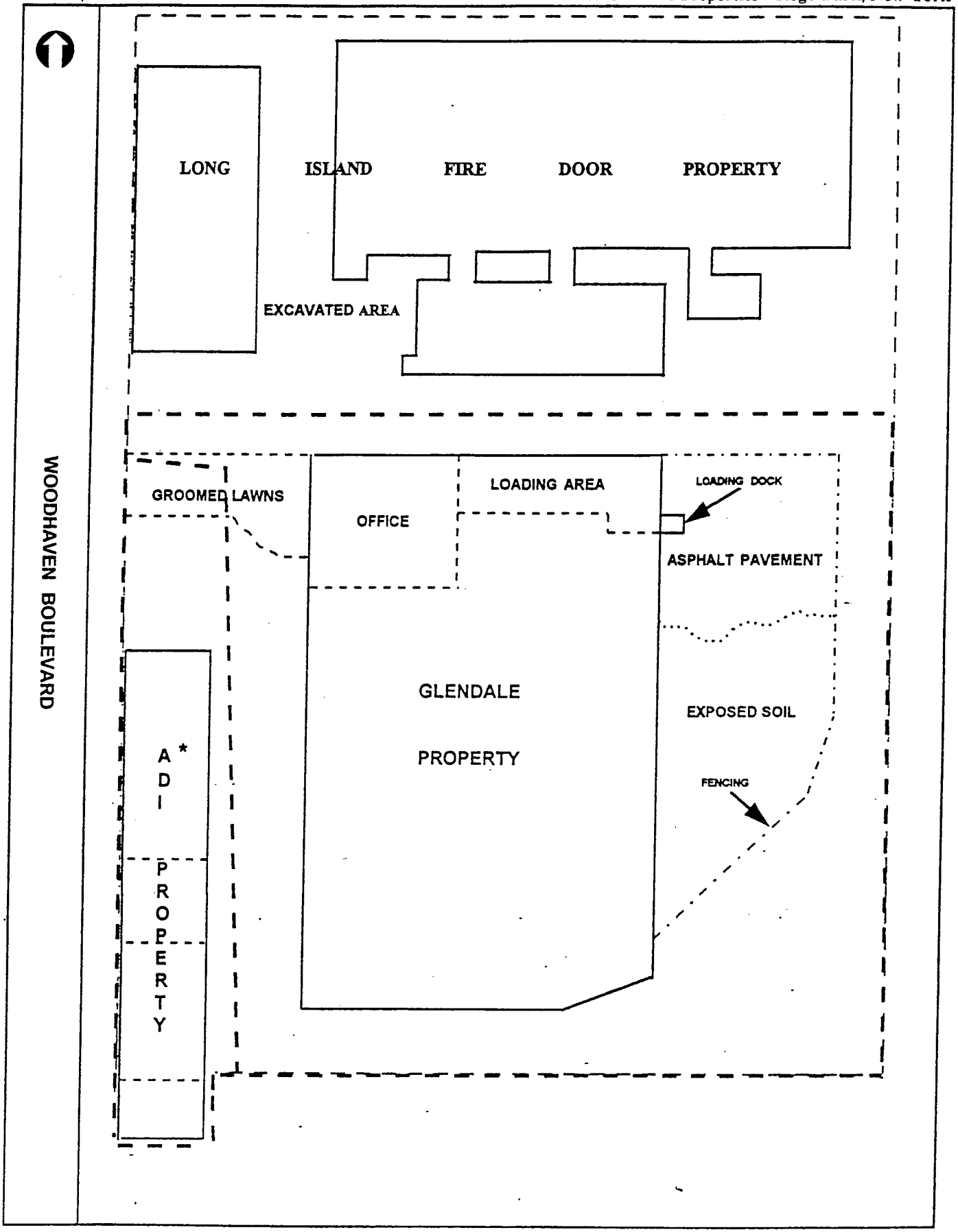

FIGURE 2
SITE MAP

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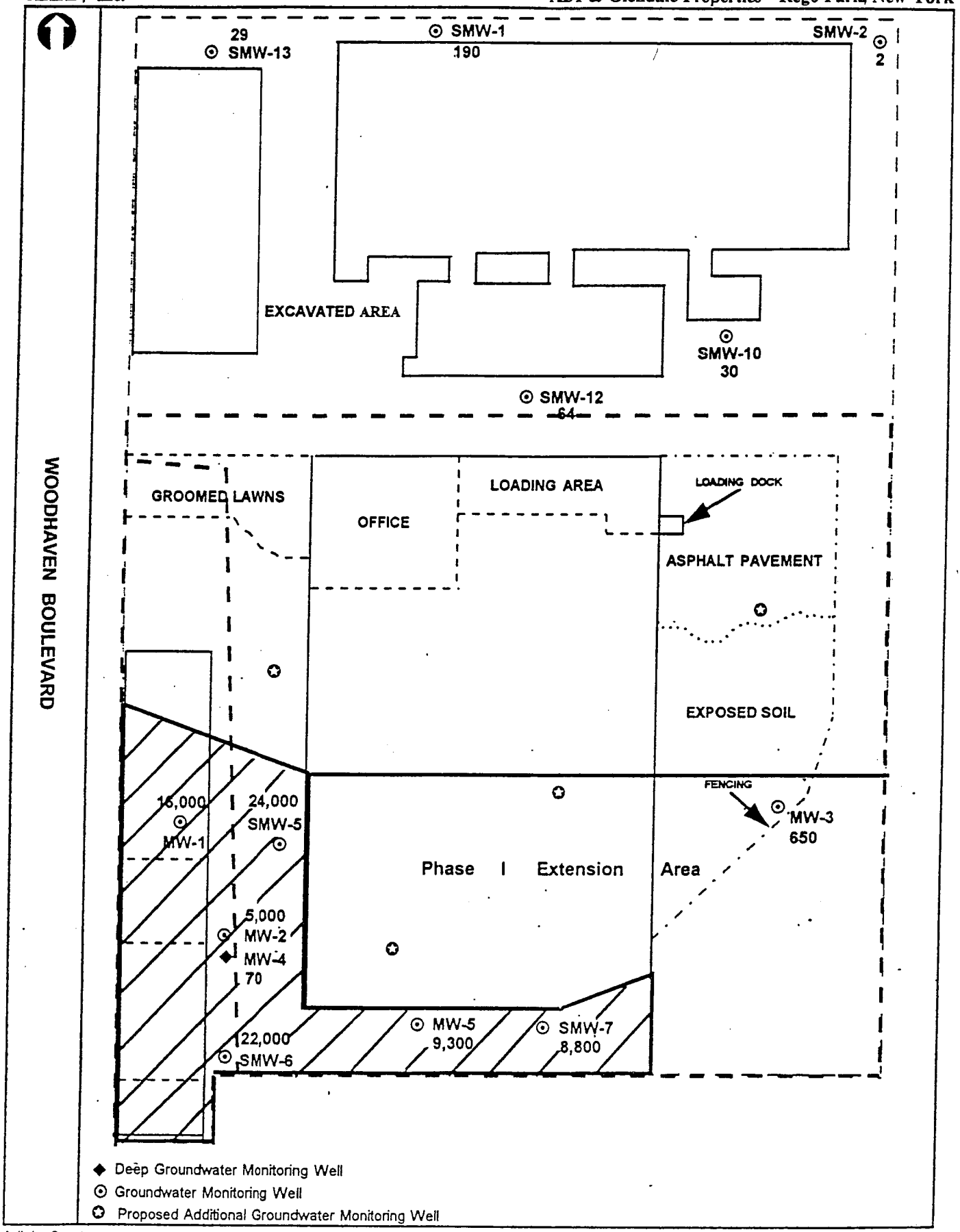

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FIGURE 2

Phase I groundwater remediation area and monitoring well location.

- Soil vapor extraction to remove PCE from contaminated soil deeper than ten feet below the surface.
- In-situ air sparging/vapor extraction to remove PCE from soil and groundwater in the saturated zone.

All investigation and remediation operations on the site will be performed in accordance with the project Health and Safety Plan (Appendix B).

The two buildings on the site are currently occupied by commercial businesses. The ADI building is expected to be vacated soon, and the Glendale building will be vacated six to nine months later. Since the planned investigation and remediation work in and around the building footprint areas cannot be performed until the buildings are vacated and demolished, the remediation work on the ADI property will be performed first, and the investigation and remediation work on the Glendale property will be performed after that property becomes vacant.

The Phase I work will begin when the ADI building is demolished. First, soil remediation will be performed under the ADI building and groundwater remediation will be performed on the ADI property and in some accessible adjacent areas on the Glendale property (see Figure 2). When the Glendale building is vacated and demolished, additional investigations of soil and groundwater conditions will be performed under and adjacent to the Glendale building footprint. The investigation will be aimed at delineating the plume of groundwater contamination extending from the ADI property under the Glendale building, and at detecting any releases of PCE under the Glendale building. The Phase I groundwater remediation system will be extended to cover the portion of the groundwater contamination plume in and adjacent to the Glendale building footprint.

If the additional investigations on the Glendale property detect evidence of a release from a source on the Glendale site, then Phase II remediation will be performed. Phase II will comprise soil remediation under the Glendale building, and groundwater remediation where appropriate within the footprint and to the east of the Glendale building (see Figure 3).

The phasing of the project, the items to be submitted to DEC at each stage, and the approximate schedule, are summarized below:

Task	Approximate Start Time (Month)	Deliverables to DEC
Demolition of ADI building	1	

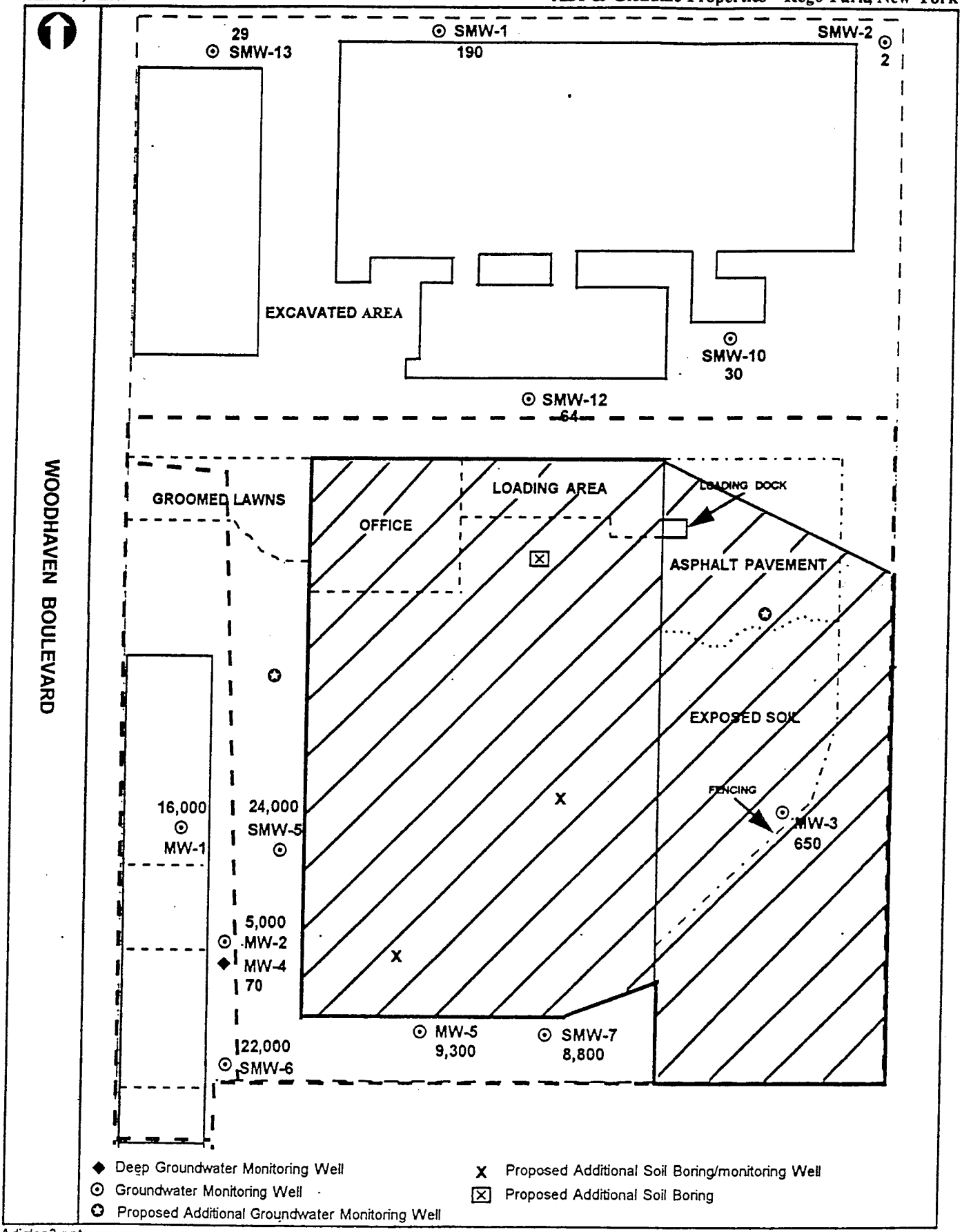

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FIGURE 3

Potential Phase II remediation area. Extent of groundwater remediation system will be based on additional groundwater testing.

Soil remediation by excavation under ADI building. Identify areas greater than 10 feet deep requiring remediation (PCE > 1.4 ppm).	1	Report on soil remediation.
Install two soil vapor extraction wells. Perform permeability test.	1	Design of Phase I in-situ air sparging system.
Install Phase I air sparging/soil vapor extraction system and monitoring wells on ADI property and accessible areas of Glendale property.	2	
Test system and start operation.	3	Monthly reports on system operation.
Demolition of Glendale building.	8	
Soil and groundwater sampling under and adjacent to Glendale building.	8	Report on soil and groundwater sampling. Extension of of Phase I in-situ air sparging system design to Glendale building area. If required, design of Phase II in-situ air sparging system.
Install portion of Phase I air sparging system on Glendale property.	9	
Test new portion of system and start operation.	10	
If required, Phase II soil remediation by excavation under Glendale building. Identify areas greater than 10 feet deep requiring remediation (PCE > 1.4 ppm).	8	Report on soil remediation.
If required, install Phase II air sparging/soil vapor extraction system and monitoring wells.	9	
Test Phase II system and start operation.	10	Monthly reports on system operation.

Remediation system no longer recovering significant levels of contaminant.	?	Request to suspend system operation.
Post-remediation monitoring.	On DEC approval of system suspension.	Reports on semi-annual sampling.
End of post-remediation monitoring.	18 months following system suspension.	Request for release under agreement.

It is expected that the soil remediation, the additional testing, and the construction and testing of the groundwater remediation system for both Phase I and Phase II will be completed before construction associated with development of the site begins. The groundwater remediation system will be designed to permit operations to continue, if necessary, during and following construction. Any monitoring wells which will be destroyed by site development activities will be replaced as close as possible to their original locations.

3. PHASE I SOIL REMEDIATION

3.1 Remediation Site Preparation

Soil contamination by tetrachloroethene (PCE) has been detected in soil beneath the ADI building. The contamination appears to be primarily within the top two feet of soil beneath the floor slab, but extends as deep as ten feet at one location and could be deeper in limited areas. No PCE has been detected in soil outside the ADI building. It is believed that the release of PCE occurred within the building and the horizontal extent of the contamination is limited by the building's foundation footings.

When the building is demolished the floor slab and foundation footings will be removed. As the slab is removed, plastic sheeting will be placed over the soil beneath the slab and weighted down to contain the PCE vapors in the soil.

3.2 Delineation of Contaminated Areas

Following demolition, the extent of contamination in the soil directly beneath the slab of each building will be delineated by visual inspection, and by headspace analysis of soil samples

using a photoionization detector (PID). Headspace analysis will be performed on a 25-foot grid. Samples will not be collected from the exposed surface but rather from a newly disturbed area (a 3" X 3" X 3" hole). Any location with reading above non-detect will be targeted for removal. The approximate extent of soil contamination under the ADI building, based on prior testing data is shown in Figure 4.

Areas where contamination is detected will be excavated to a depth of two feet and the soil stockpiled as described below. Soil contamination at the bottom of the excavated area will then be delineated as described above, and a further two feet of soil will be removed. This will continue until contaminated soil has been removed down to a depth of ten feet below grade. If soil contamination is detected at any location at a depth greater than ten feet below grade, it will be remediated as described below under "Contingency Plan for Deep Contamination".

3.3 Excavation and Disposal of Contaminated Soil

All removed impacted soils that show staining or solvent odor, or in which field-screening instruments detect significant (>1400 ppb) levels of volatile organic compounds will be stockpiled in a secure, fenced area on the site which has been securely covered with 6-mil plastic sheeting. As shown in Figure 4, the soil stockpile area for both Phase I and Phase II will be located immediately north of the ADI building. Piles will be sized to be manageable, coverable, and fit in available areas. 6-mil plastic covering will be sized and lapped to completely enclose the stockpiled soils. Plastic covering will be applied and secured to protect the soils from wind and weather, and will be shaped and secured to drain runoff. The soil stockpiles and plastic covering will be maintained in good condition until the soil can be removed from the site.

Soil samples from the impacted soil stockpile will be collected and submitted for analysis for disposal characterization. The number and type of samples and the parameters analyzed will depend on disposal facility requirements. Contingent on analytical results, the impacted soils will be transported by a licensed hauler and disposed of in a regulated disposal facility, in accordance with all local, State and Federal regulations.

Any unimpacted soil which must be excavated to remove the contaminated soil will be stockpiled separately and may be backfilled on-site.

3.4 End Point Sampling

Grab samples of soil will be collected from the sidewalls and bottom of the excavated area for laboratory analysis. One grab sample will be collected from approximately each 25 feet of sidewall and each 1250 square feet of bottom (25 by 25 foot grid). All soil samples will be properly containerized, each container will be properly labeled, sealed, and refrigerated at approximately 4°C for shipment to the laboratory. A chain of custody will be maintained

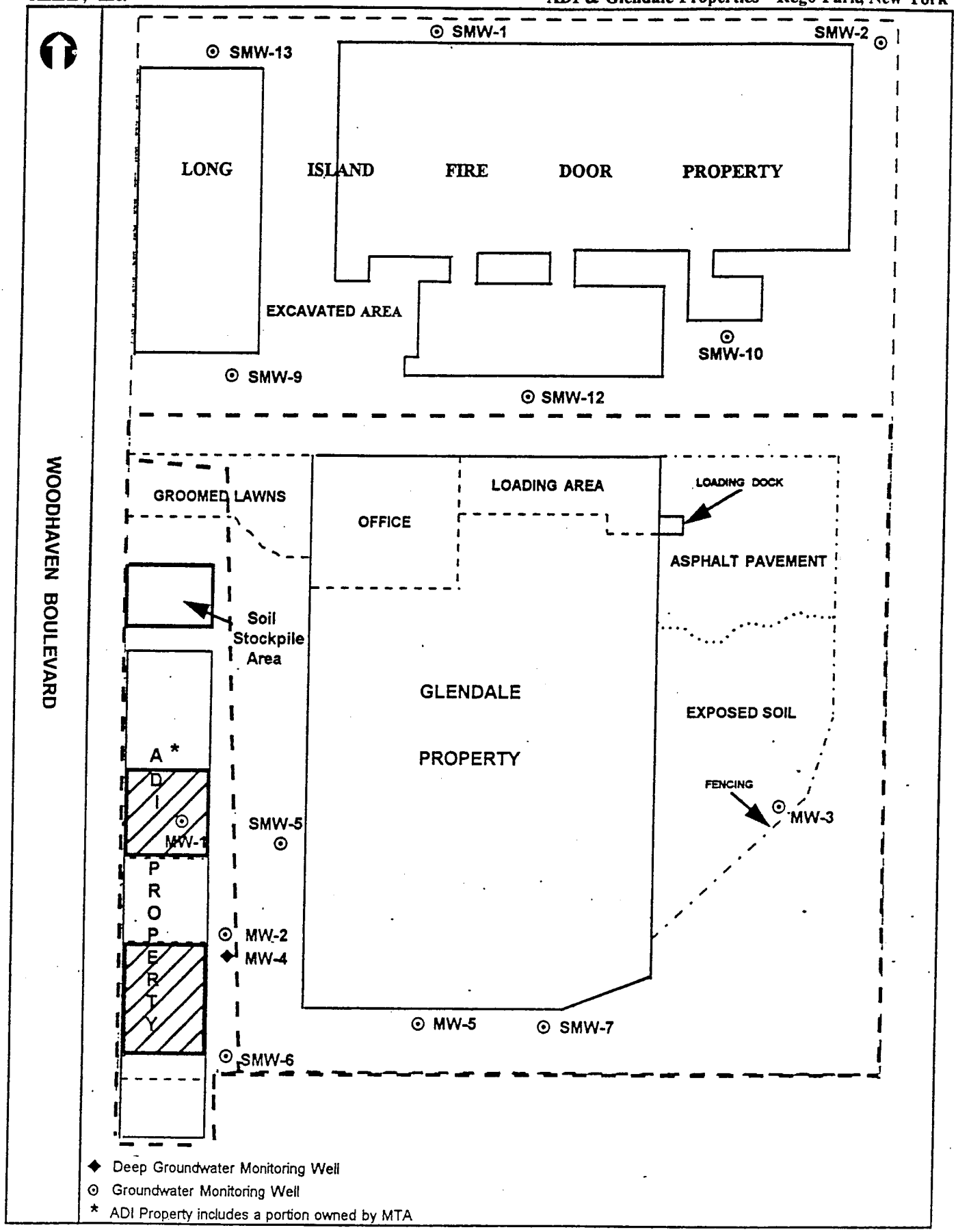

FIGURE 4
KNOWN AREAS REQUIRING SOIL REMEDIATION

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throughout the field sampling, transport of samples to the laboratory, and during lab analysis. All soil samples will be analyzed for volatile organic compounds (VOCs) by NYSDEC ASP Method 91-1 by a New York State Department of Health ELAP-certified laboratory. If PCE levels in any of the soil samples significantly exceeds the clean-up objective of 1400 parts per billion, then additional soil will be removed, or additional remedial measures will be implemented as described below. The excavation will not be backfilled until the end point samples meet the clean-up objective. Any backfill material which must be brought in to restore grades prior to development will be clean soil meeting the TAGM 4046 clean-up objectives.

3.5 Contingency Plan for Deep Contamination

The soil testing below the ADI building has shown that contamination is generally limited to a few feet of soil directly under the slab. None of the soil samples collected from depths greater than ten feet below grade contained levels of TCE exceeding the 1400 parts per billion cleanup objective. However, it is possible that contamination may have penetrated deeper in some limited areas under the ADI and/or Glendale buildings. It would be impractical to try to excavate contaminated soil which could extend as deep as the groundwater table, which is about 55 feet below grade. Therefore, if any areas are detected where contamination above the cleanup objective extends deeper than ten feet below the slab, then the vapor extraction system described below as part of the groundwater remediation system will be extended to remediate the area of deep soil contamination. A vapor extraction well will be located in the contaminated area. Unlike the vapor extraction wells installed as part of the groundwater remediation system, which are screened just above the groundwater level, the screens for the wells in contaminated soil areas will be extended so they extend from ten feet above the groundwater level to ten feet below grade.

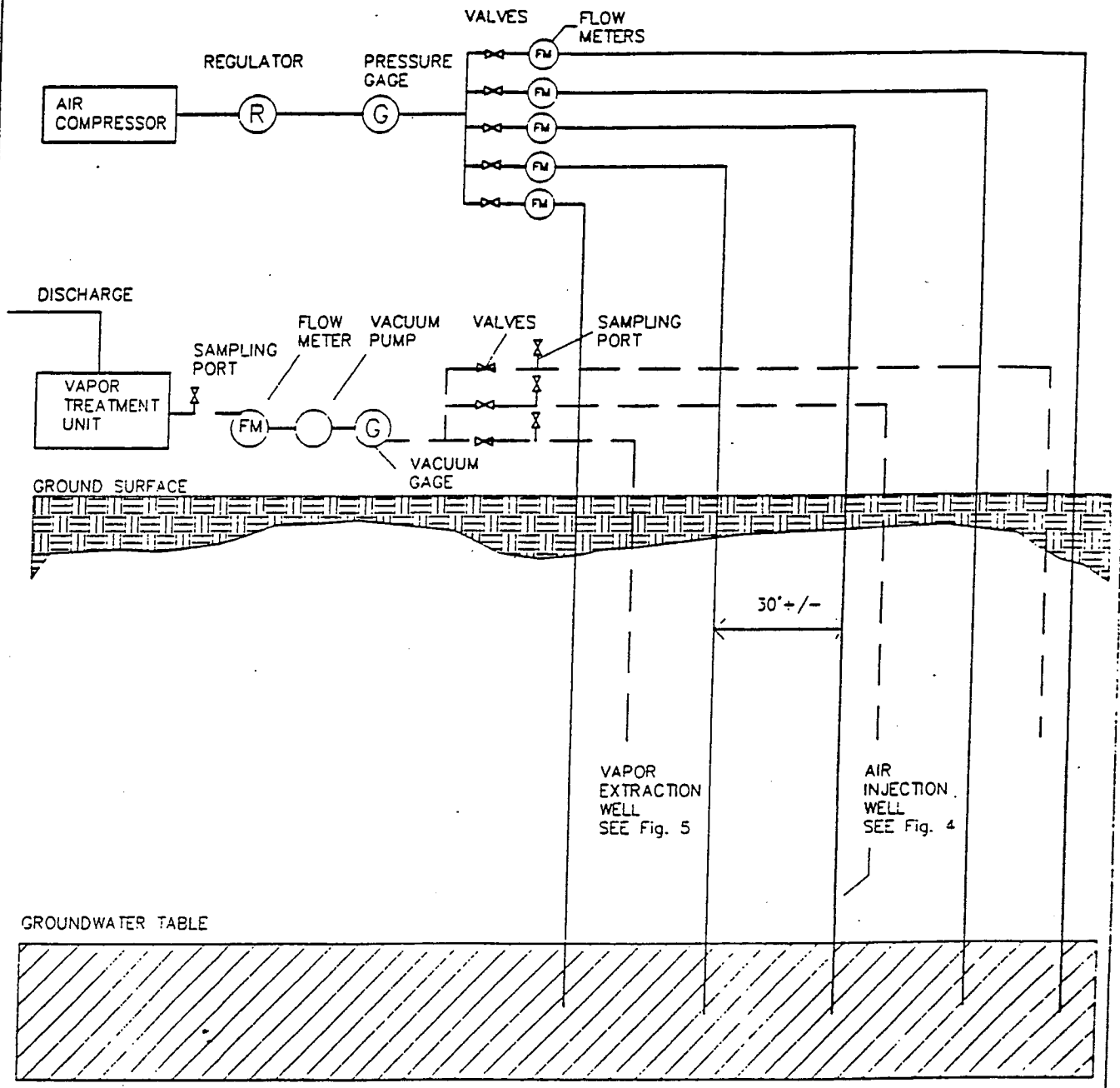
4. PHASE I GROUNDWATER REMEDIATION

4.1 Design

The groundwater remediation will be performed using an in situ air sparging system in association with a soil vapor extraction system. The overall schematic design of the system is shown in Figure 5. Air will be pumped into the saturated zone through a series of air injection wells. Dissolved, sorbed, and free phase PCE will volatilize and be transported by the buoyancy effect into the vadose zone. Vapor extraction wells, installed in the vadose zone above the area of groundwater contamination, will collect the vapors for treatment by an activated charcoal vapor treatment unit.

4.2 Vapor Extraction Wells

The vapor extraction well design is shown in Figure 6. The wells will be constructed of



NOT TO SCALE

LAST EDITED BY: E. DIEDEL e-mail: eymund@aol.com
FILE NAME: HOME DEPOT drawings FORMAT: ACAD r 13
FILE LOCATION: 3rd Fl. Cad St. D:/FILES/EYMUND

PROJECT # 8009

prepared by:
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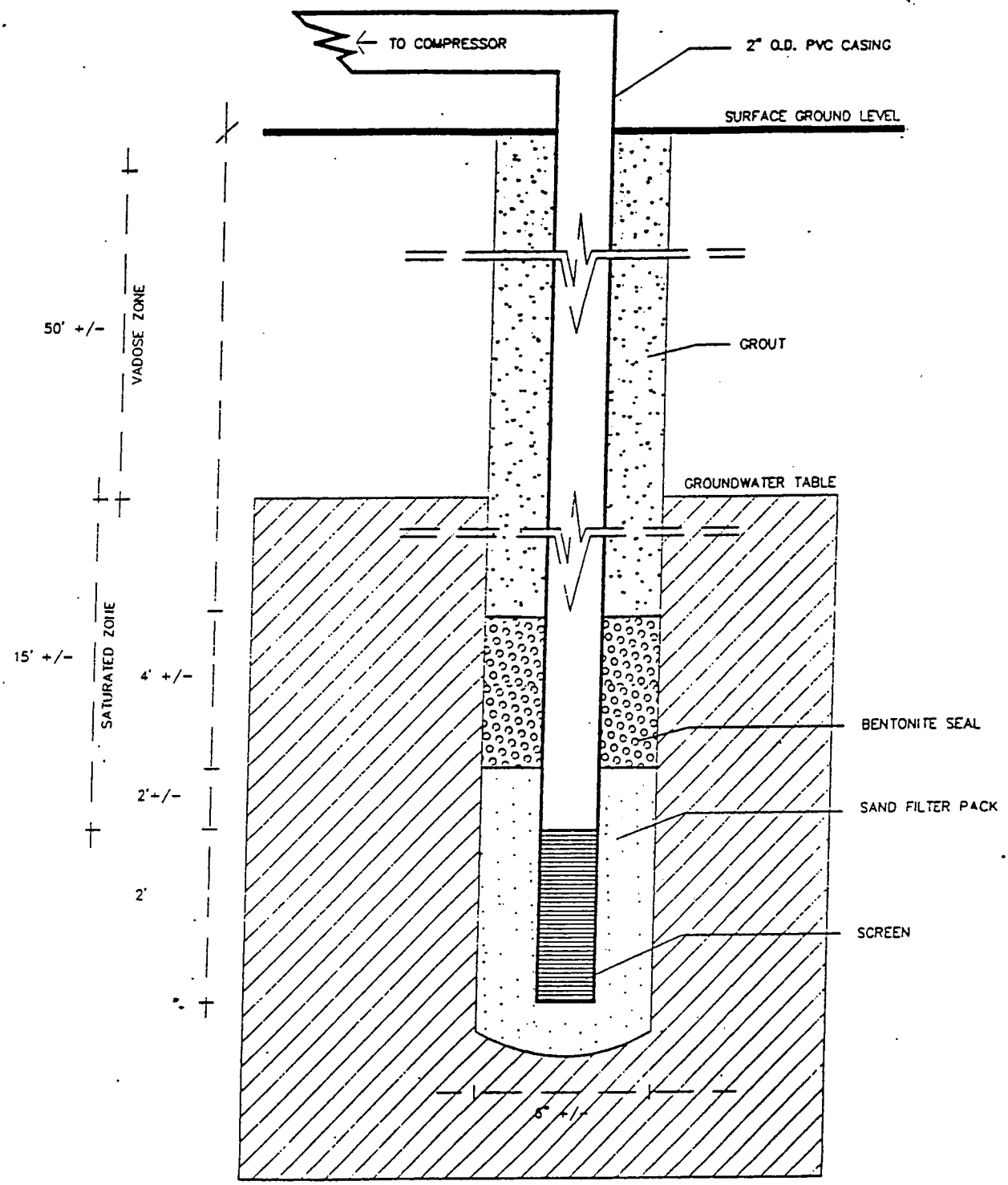
AIR SPARGING / VAPOR EXTRACTION SYSTEM SCHEMATIC FOR HOME DEPOT, REGO PARK

ISSUE: 1
SHEET: 1 OF 1

FIGURE NUMBER: 5



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AIR INJECTION WELL
HOME DEPOT, REGO PARK

ISSUE: 1
SHEET: 1 OF 1

FIGURE NUMBER: 6

two-inch O.D. PVC casing with a ten-foot screen. The bottom of the screen will be placed about ten feet above the groundwater table to accommodate possible variations in the groundwater level, including the probable rise in the groundwater level resulting from reducing the pressure in the vadose zone. To prevent atmospheric air from leaking into the well, the area above the filter pack will be sealed with about four feet of bentonite, and then grouted up to the ground surface, a space of about thirty feet.

At the beginning of the construction of the remediation system, two vapor extraction wells will be constructed about sixty feet apart. A vacuum pump will be attached to one well, and the pressure response in the other well will be measured. The soil permeability to vapor flow, and the radial distance in which vapor flow is induced can then be calculated using the method described by Johnson et.al. (Ground Water Monitoring Review, Spring 1990). This value will be used to calculate the spacing between the vapor extraction wells.

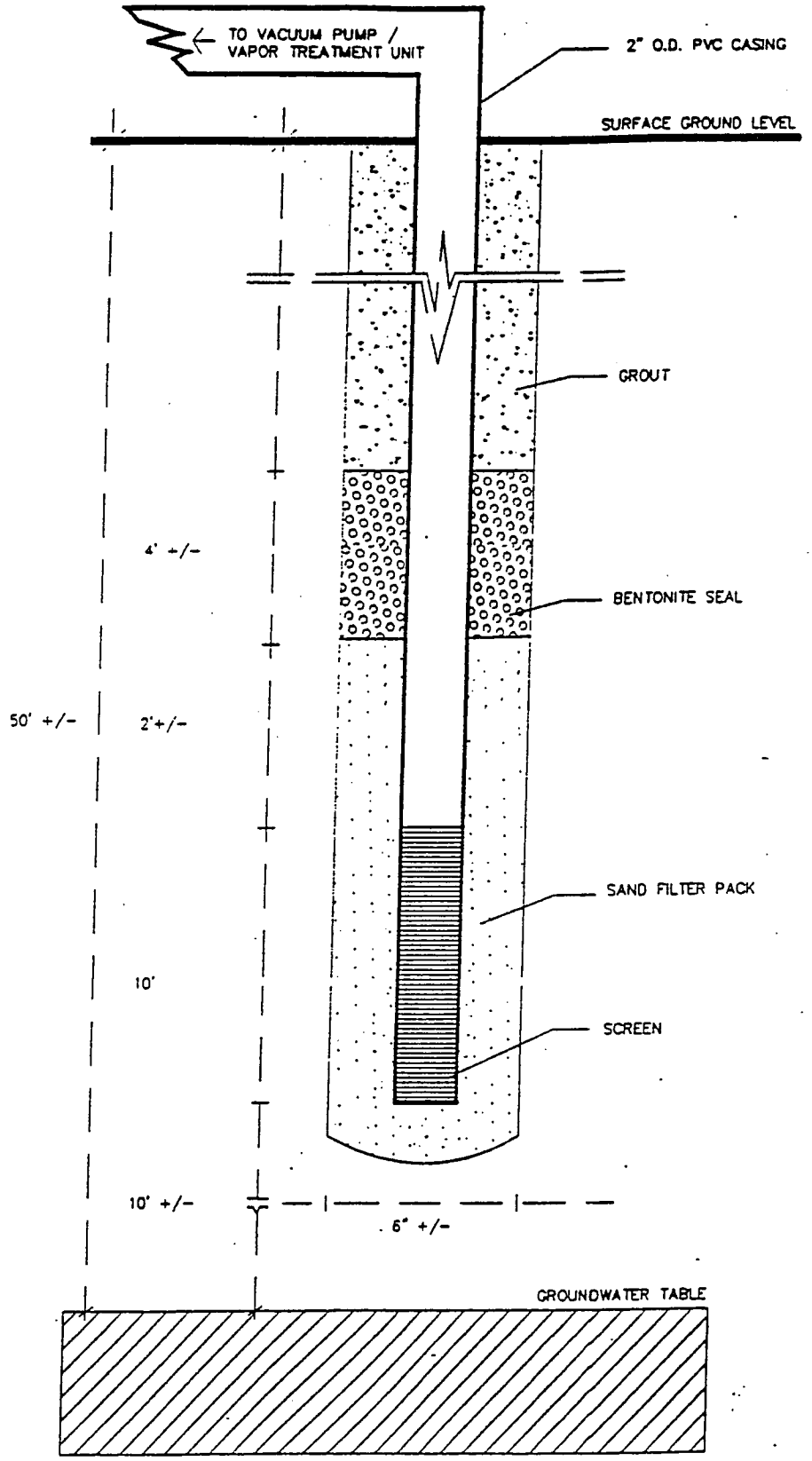
4.3 Air Injection Wells

The air injection well design is shown in Figure 7. The wells will be constructed of two-inch O.D. PVC casing with a two-foot screen. The top of the screen will be placed about fifteen feet below the groundwater table. Sampling of soil below the groundwater level has indicated that the PCE contamination is concentrated within a few feet of the groundwater interface. Based on both laboratory studies and experience in the field, locating the screen 15 feet below the interface is sufficient to provide a maximum dispersion of air in the contaminated area (Reddy, et. al., "A Review of In-Situ Air Sparging for the Remediation of VOC-Contaminated Saturated Soils and Groundwater", Hazardous Waste and Hazardous Materials, v.12(2) 1995; Marley, et. al., "The Application of In Situ Air Sparging as an Innovative Soils and Groundwater Remediation Technology", Ground Water Monitoring Review, Spring 1992). To prevent injected air from "short circuiting" up along the well casing, the area above the filter pack will be sealed with about four feet of bentonite, and then grouted up to the ground surface, a space of over sixty feet.

No satisfactory method has been reported for calculating the ideal spacing between air injection wells. The reviews cited above report successful systems with injection well spacings ranging from 10 to 150 feet. Laboratory studies suggest that the type of soil on the site, which is fairly heterogeneous and has neither very high nor very low permeability, provides the best conditions for air dispersion in the saturated zone. A spacing of 30 feet between injection wells is therefore considered conservative.

4.4 System Operation

The proposed layout for the groundwater remediation system is shown in Figure 8. As noted above, the spacing for the vapor extraction wells is tentative, and the actual spacing will be



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VAPOR EXTRACTION WELL
HOME DEPOT, REGO PARK

ISSUE: 1
SHEET: 1 OF 1

FIGURE NUMBER: 7

based on a soil permeability test. After demolition of the Glendale building and completion of the supplemental groundwater testing described in Section 5 below, the system will be extended into the portion of the Glendale property affected by the plume.

During the system start-up, the blower pressure will be set and adjusted to maintain an average air flow of about 10 to 15 scfm in each air injection well. The vacuum pump will be set to maintain a total vapor extraction flow rate from 50 to 100 percent greater than the total rate of air injection. This will maintain a negative pressure in the vadose zone over the contamination area and prevent contaminants from being spread to unimpacted areas.

The vapor concentration in the extracted air will be monitored with an on-line total hydrocarbon analyzer calibrated to PCE. In addition, the following system operating parameters will be measured on a regular basis:

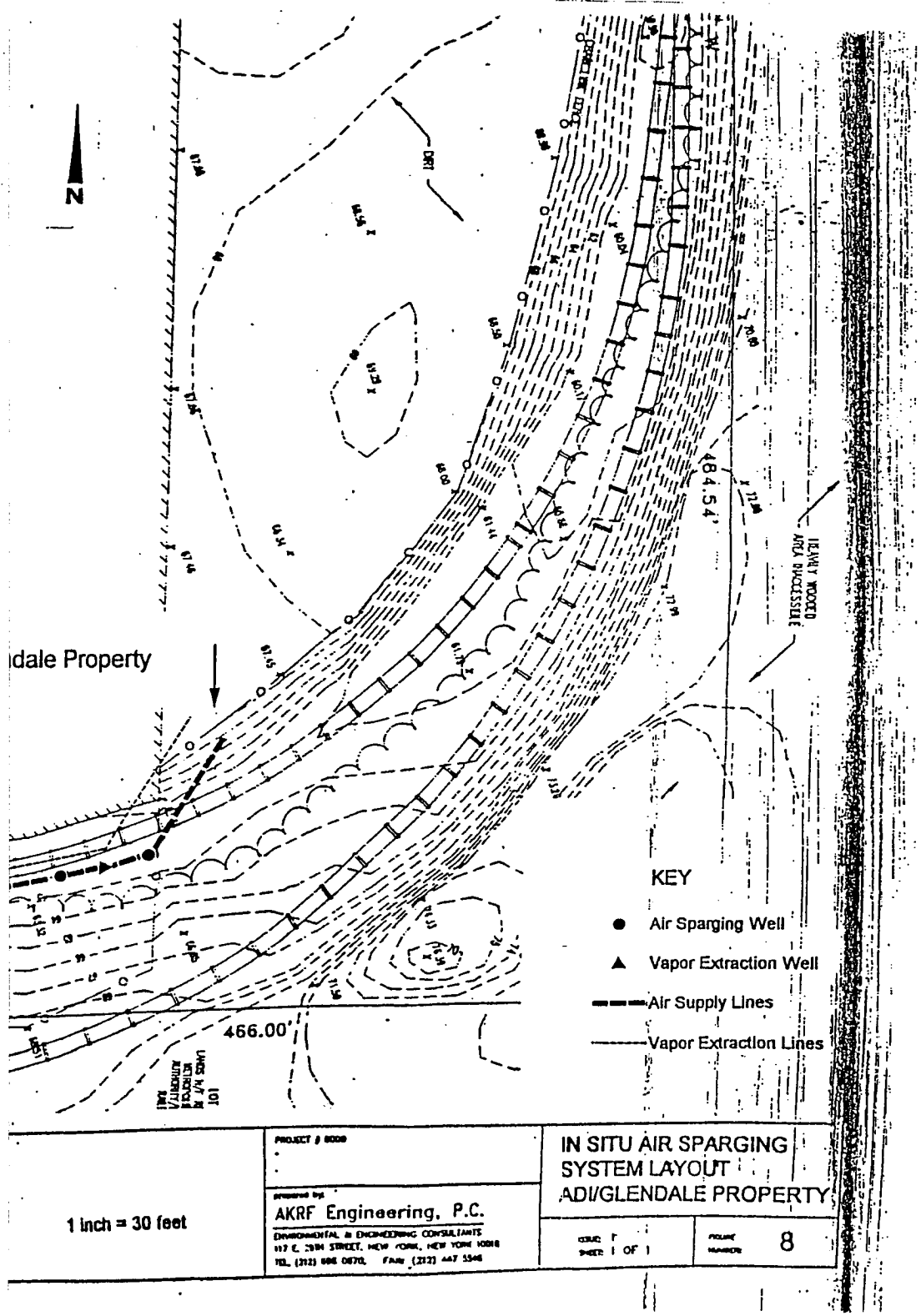
Air Injection System - pressure, temperature, air flow (in individual injection wells).

Vapor Extraction System - pressure, temperature, vapor flow, vapor concentration in individual extraction wells, discharge vapor concentration.

4.5 Remediation Groundwater Monitoring

Groundwater monitoring will be performed in the existing downgradient wells, and in new monitoring wells installed in the remediation area. A new monitoring well will be installed for each 5,000 to 10,000 square feet of area covered by the sparging system. Sampling will be performed at 30-day intervals after the start-up of the remediation system. All groundwater samples will be analyzed for volatile organic compounds (VOCs) by NYSDEC ASP Method 91-1 by a New York State Department of Health ELAP-certified laboratory. A report will be submitted to DEC every 30 days giving the results of the groundwater analyses and a report on the operation of the remediation system. If the month-to-month sampling results stabililize, DEC will be asked for permission to extent the sampling interval.

The remediation system will operate until asymptotic contaminant levels are reached in the groundwater (i.e. PCE levels in extracted air more than 90 percent below initial concentrations). At that point, the vapor extraction wells will be cleaned out, and the system will be reactivated. If monitoring at the end of 30 days indicates no improvement in recovery, then the system will be "pulsed" by turning it off for two weeks and then back on for two weeks. Pulsing will be continued until asymptotic conditions are reached, and for a minimum of two four-week cycles. At that point, operation of the system will be terminated and post-remediation monitoring will begin as described in Section 9.


N
484.54'
466.00'
dale Property
KEY
Air Sparging Well
Vapor Extraction Well
Air Supply Lines
Vapor Extraction Lines
1 inch = 30 feet
AKRF Engineering, P.C.
IN SITU AIR SPARGING SYSTEM LAYOUT
ADI/GLENDALE PROPERTY
8

5. SUPPLEMENTAL SOIL AND GROUNDWATER TESTING

5.1 Purpose

The soil gas survey performed under the Glendale building detected organic vapors at several locations, and low levels of PCE were detected in the four soil samples collected at widely spaced locations under the building floor slab. The presence of low levels of PCE in samples from locations throughout the Glendale building suggests that PCE has spread through the vapors trapped under the slab. The source could either be the plume passing under the building from the ADI property or a release of PCE somewhere within the Glendale building. Groundwater analyses from the monitoring wells to the south and southeast of the Glendale building show the presence of PCE, but do not conclusively indicate whether all the PCE originates from the release in the ADI site, or whether there is a separate source of PCE on the Glendale site.

The supplemental sampling program will be aimed at determining whether there has been a PCE release within the Glendale building, locating any areas under the Glendale building where soil remediation is required, and delineating the portion of the Phase II area where groundwater remediation is required. This sampling will begin when the Glendale building is demolished.

5.2 Sampling Plan

Following demolition, the extent of contamination in the soil directly beneath the slab of each building will be delineated by visual inspection, and by headspace analysis of soil samples using a photoionization detector (PID). Headspace analysis will be performed on a 25-foot grid.

If no soil contamination is located, then confirmatory soil samples will be collected from the two well locations and one boring location within the building footprint at 0-2, 4-6, and 8-10 foot depths and at the groundwater interface and 10 feet above the groundwater interface. If apparent soil contamination is located, DEC will be notified and one of the proposed soil borings/monitoring wells will be relocated to the area of the release. Soil samples will be collected from this location at 0-2, 2-4, 4-6, 6-8, 8-10, foot depths and at the groundwater interface and 10 feet above the groundwater interface. The soil samples will be analyzed for volatile organic compounds in accordance with NYSDEC ASP Category B 95-1.

Four additional groundwater monitoring wells will be installed and developed at the locations shown in Figure 3 to delineate the lateral extent of contamination in the shallow aquifer. The groundwater samples will be analyzed for volatile organic compounds in accordance with NYSDEC ASP Category B 95-1. The wells will be sampled in accordance with NYSDEC sampling protocol, as described in Technical and Administrative Guidance Memorandum #4007: Phase II Investigation Generic Work Plan; DEC Division of Hazardous Waste Remediation, 1988.

5.3 Sampling Methodologies

5.3.1 Soil Sampling

Soil samples will be obtained by a steel, 24-inch long, 2-inch in diameter split-spoon sampler that will be driven through the subsurface soils ahead of a hollow-stem (4.25-inch inside diameter) auger that bores into the soil to just above the desired sampling depth. The split-spoon sampler will be driven through the next 2 feet of soil to obtain the surface sample.

All samples will be containerized and stored in accordance with NYSDEC sampling protocols. Each container will be properly sealed, labeled, and placed in a refrigeration unit for transport to the laboratory. A record of each sample, including notation of any odors, color, or sample matrix, will be kept in the sampler's field log book. A chain of custody will be maintained throughout the field sampling, transport of samples to the laboratory, and during lab analysis.

5.3.2. Groundwater Sampling

The new monitoring well will be drilled using a hollow-stemmed auger and will consist of 2-inch Schedule 40 PVC casing in a 6¼-inch augured hole. A 10-foot PVC screen (0.020 inch slot) will be installed in the top 8 feet of groundwater. A filter pack of sand (US Std sieve sizes 30 to 8) will be placed in the annular space around the screens and will extend 2 feet above the screen.

The annular area around the well casing will be sealed with bentonite pellets for an interval of 2 feet above the filter pack. A grout, consisting of a cement and bentonite mixture or an anti-shrink mixture, will then extend from the bentonite pellet seal to a level 2 feet below ground. The remaining annular space will be sealed with a concrete cap and well apron (expanding cement). A locking well cap will be installed upon completion of the well.

The wells will be developed the day after they are drilled by pumping. Dedicated PVC tubing will be used. The well will be developed until the turbidity of the water sample, as measured by a nephelometer, becomes less than 50 Nephelometric Turbidity Units (NTU) or at least 15 well volumes of groundwater have been pumped out. The new wells will not be sampled for at least seven days after development.

Before sampling the new wells, water levels will be measured using an electronic water level indicator. A dedicated bailer or a submersible sample pump will be used for sample collection. A minimum of three well volumes will be purged from the well before sampling. Samples will not be collected until the water is visually free of suspended materials and the pH, temperature, and conductivity readings have stabilized.

All water samples will be containerized and stored in accordance with applicable EPA or NYSDEC analytical protocols. After collection, each container will be properly labeled, sealed, and refrigerated for shipment to the laboratory. All sampling equipment will be decontaminated before its use.

The well locations and their elevations will be surveyed. Using these data and the measured water levels, the previous hydraulic gradient map will be modified as necessary to confirm the direction of groundwater flow on the site.

6. PHASE II SOIL REMEDIATION

If significant soil contamination (PCE > 1400 parts per billion) is discovered on the Glendale property, then Phase II soil remediation will be performed using the same methodology as the Phase I soil remediation described in Section 3 above.

7. PHASE II GROUNDWATER REMEDIATION

If evidence of a separate release of PCE is discovered on the Glendale property, then a design for a Phase II groundwater remediation system for the second release will be prepared for DEC's review. The system will use the same methodology as the Phase I groundwater remediation system described in Section 4 above.

8. UNDERGROUND STORAGE TANKS

8.1 Underground Storage Tanks on the Site

The following underground storage tanks have been identified on the site:

ADI Property

Size - Unknown capacity
Contents - formerly fuel oil
Location - situated beneath the western central portion of the building.
Status - inactive.
Compliance - unknown.
Date Installed - unknown
Visual Evidence - fill port and vent pipe identified outside the western central portion of the

building; access manway identified within warehouse area. Reportedly this tank was abandoned in-place in 1978

Glendale Building

Size - 10,000-gallon capacity.
Location - situated beneath the western central portion of the building.
Contents - #4 fuel oil.
Status - active.
Compliance - unknown.
Date Installed - 1952-1953.
Visual Evidence - fill port and vent pipe identified outside the western central portion of the building; access manway identified within warehouse area.

Size - 10,000-gallon capacity.
Location - situated beneath the western central portion of the building.
Contents - #4 fuel oil.
Status - active.
Compliance - unknown.
Date Installed - 1952-1953.
Visual Evidence - fill port and vent pipe identified outside the western central portion of the building; access manway identified within warehouse area.

Previous site testing programs have detected no widespread soil contamination by petroleum products, and no petroleum-related contamination in the groundwater. Localized soil contamination may be present in the tank areas.

8.2 Underground Storage Tank Removals and Soil Remediation

All tanks will be cleaned, removed and disposed of in accordance with accepted industry standards and applicable Federal, State, and local regulatory agency requirements. Typical tank removal procedures are summarized below.

1. Empty the tanks of any remaining fuels and pumpable tank bottoms.

2. Excavate around the tank with care to avoid release of tank and piping contents. Hand excavation around tanks may be necessary. The sides of all excavated areas will be properly stabilized in accordance with OSHA regulations. Continuously monitor the excavated areas for the presence of flammable, toxic or oxygen deficient atmosphere.

3. Purge tanks of all flammable vapors. An access hole will be cut in the tanks and the tanks

thoroughly cleaned of residual liquids and sludges.

4. Remaining fuels, loose slurry, sludge materials and wastewater will be collected in DOT-approved drums, sampled and analyzed for disposal characterization. After disposal characterization, waste material will be removed and disposed of in accordance with applicable regulations.

5. Remove the tanks and all associated piping from the ground and clean the outside of the tanks. The tanks and piping will be rendered "not reusable," removed from the site and disposed of according to applicable regulations with proper documentation. Remove and dispose of all concrete tank support structures or vaults as encountered. If concrete is contaminated by gasoline or petroleum product, the concrete will be stockpiled in a separate pile and disposed of as a regulated waste.

6. After tanks are removed, examine for evidence of petroleum releases in accordance with New York State Department of Environmental Conservation, Division of Spills Management Spill Prevention Operations Technology Series (SPOTS) Memo No. 14 "Site Assessments at Bulk Storage Facilities". If soil contamination is present, excavate and remove contaminated soils from the tank areas, stockpile soils on plastic sheeting and cover with well-secured plastic sheeting. After contaminated soil removal, collect soil samples at each sidewall and at the bottom of the for analytical testing as specified in the New York State Department of Environmental Conservation, Bureau of Spill Response, STARS Memo No. 1, "Petroleum-Contaminated Soil Guidance Policy", August 1992.

7. Previous testing detected petroleum sludges in a drain in the loading area just north of the ADI building. This sludge and any similar material found on the site will be cleaned out and disposed of with the tank bottom sludge.

8. Contaminated soils will be disposed of in accordance with the NYSDEC "Petroleum-Contaminated Soil Guidance Policy".

9. POST-REMEDIATION MONITORING

When the remediation system is no longer effective, as described in Section 4.5 above, monitoring will be performed to determine whether contaminant levels have been reduced to acceptable levels. Groundwater will be sampled at the locations shown in Figure 9. Locations P-2 and P-6 are at the locations of existing wells which show the highest levels of PCE. P-1, P-3, P-4, and P-5 are downgradient wells, and P-7 is an upgradient well. Monitoring will be performed immediately following the suspension of operations of the groundwater remediation system, and repeated on a semiannual basis for one and a half years.

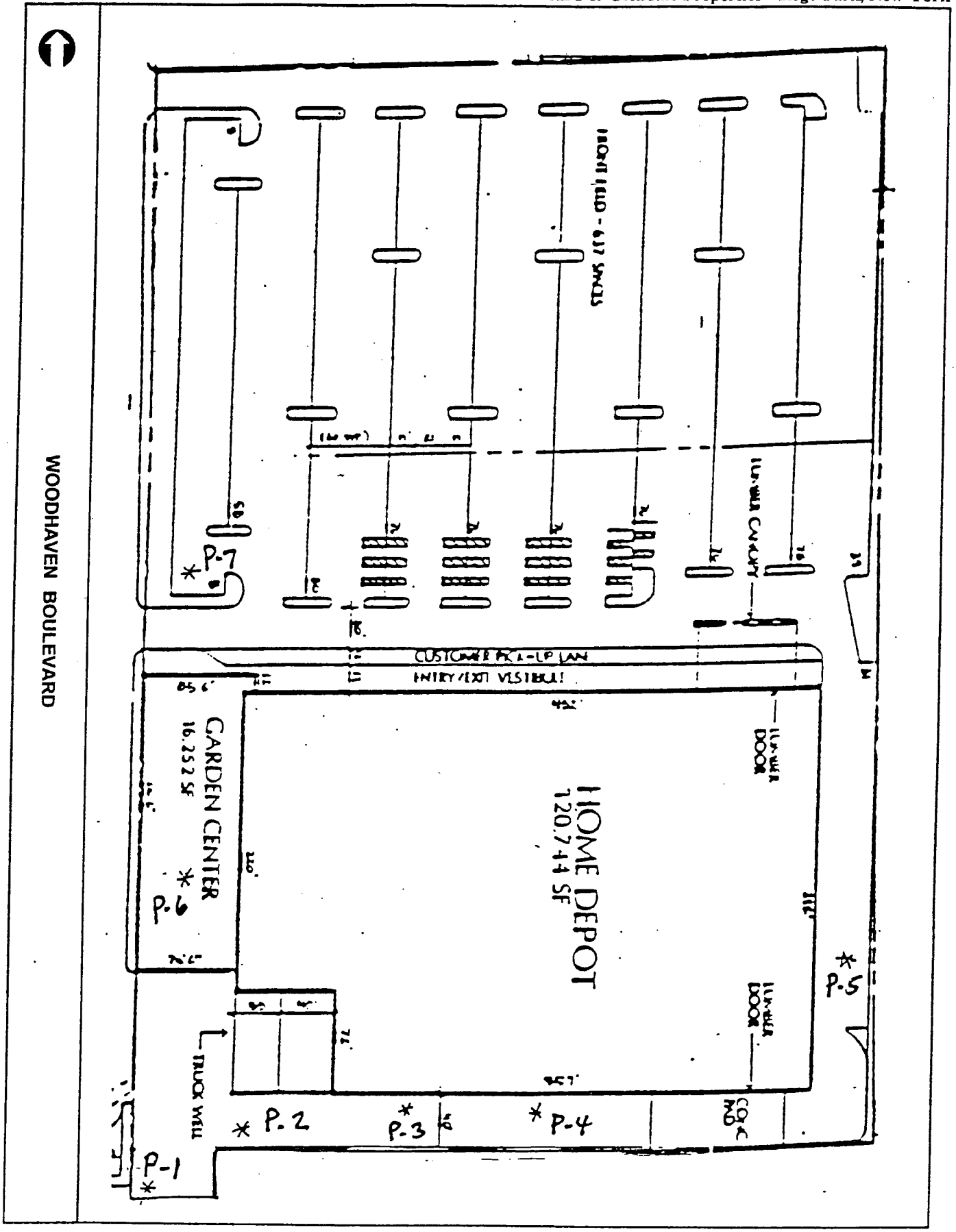


FIGURE 9
REMEDIATION MONITORING WELL LOCATIONS

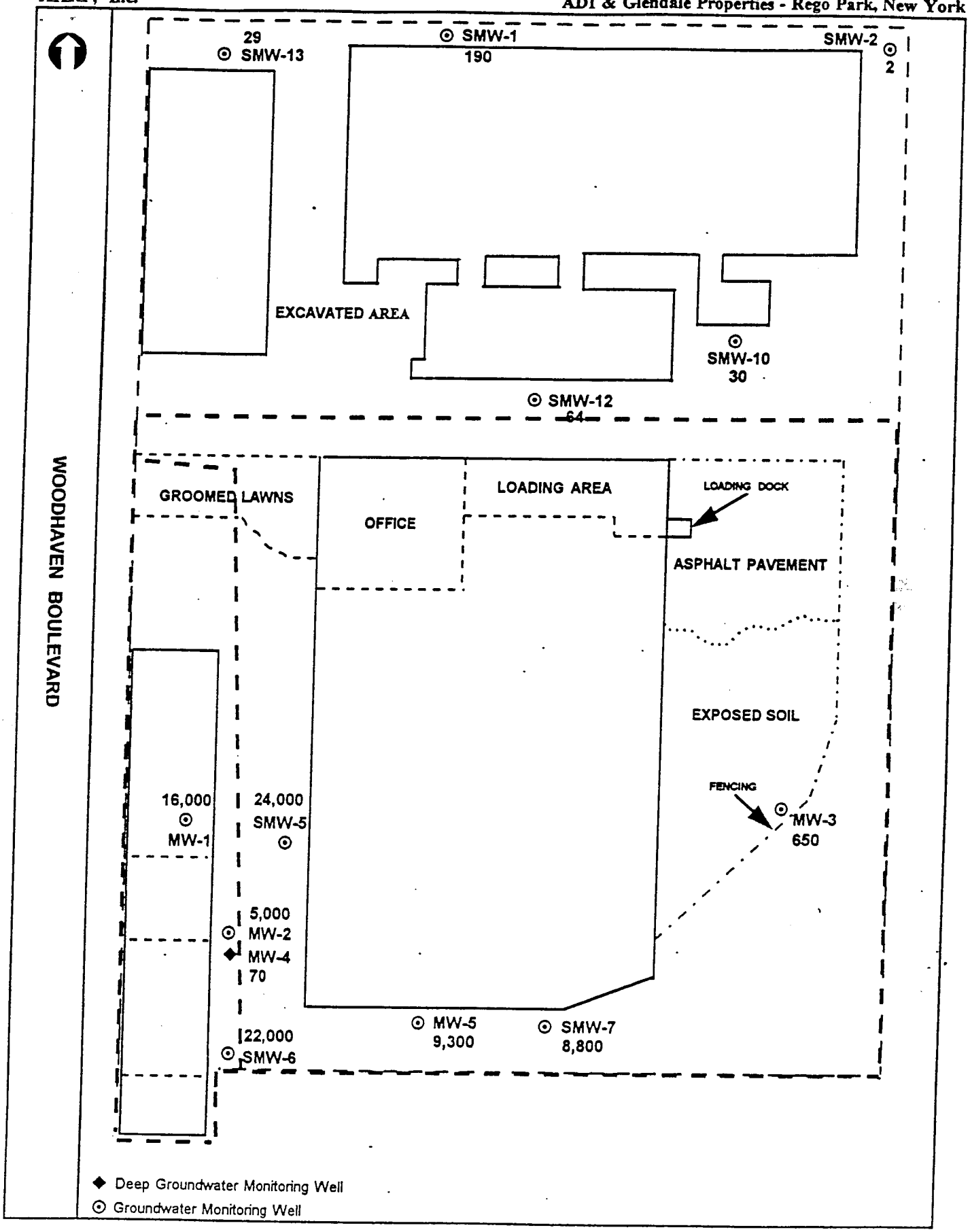
In addition, soil samples will be collected at any areas where contingency soil remediation is performed, i.e. where soil contamination extends greater than 10 feet below the surface. A soil boring will be performed at a distance of 15 to 20 feet from each vapor extraction well and samples will be collected from depths of 10-12, 20-22, and 45-47 feet below the surface.

All soil and groundwater samples will be analyzed for volatile organic compounds in accordance with NYSDEC ASP Category B 95-1.

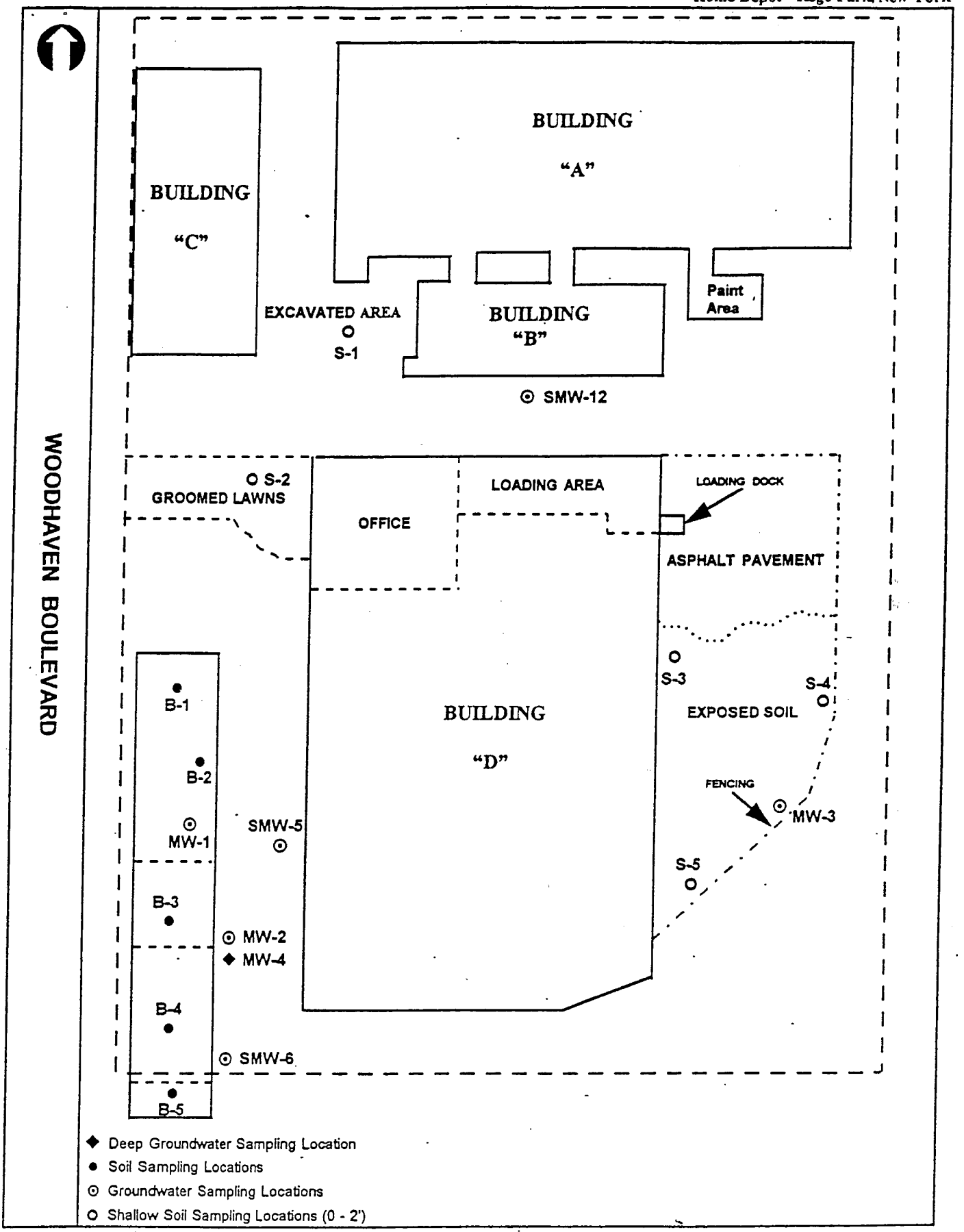
If the concentrations of contaminants in the soil and groundwater can be demonstrated to be sufficiently protective of human health and the environment given the current and potential uses of the aquifer, then the remediation work will be concluded. This finding will be based on a demonstration that groundwater standards will not be exceeded at the first property line of a downgradient residential property. If the PCE levels achieved after remediation are not sufficient, then a plan for further monitoring and/or resumption and possible expansion of the operation of the remediation system will be submitted.

APPENDIX A

SUMMARY OF PRIOR TESTING DATA

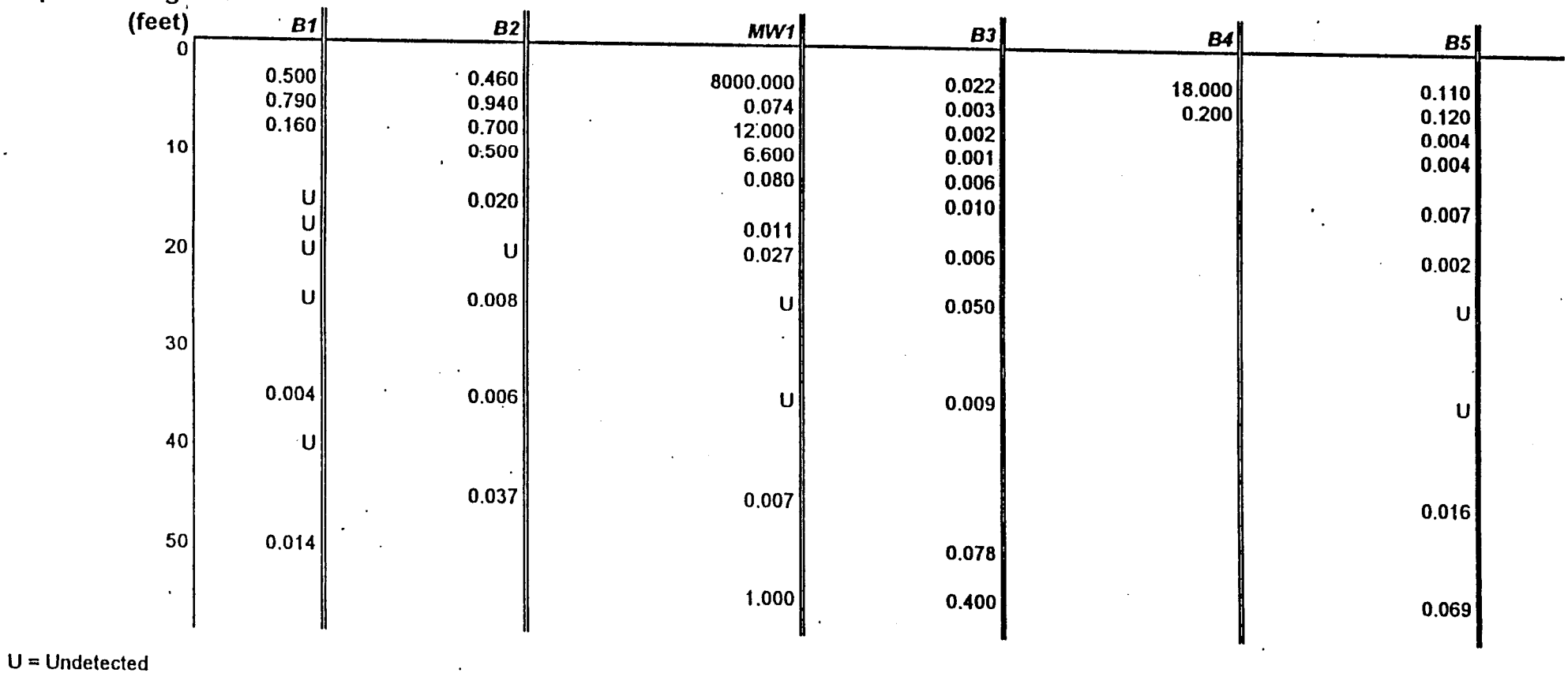


PCE CONCENTRATIONS IN GROUNDWATER (PPB) 10/96 & 3/97 SAMPLES



SAMPLING LOCATIONS - 10/96

Profile of tetrachloroethene concentrations in soil under ADI warehouse (parts per million)



U = Undetected

APPENDIX B

SITE HEALTH AND SAFETY AND COMMUNITY AIR MONITORING PLAN

Health and Safety and Community Air Monitoring Plan

Remedial Action at ADI and Glendale Properties
Rego Park, Queens, New York

Prepared By:

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April 1997

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List of Figures

1. INTRODUCTION

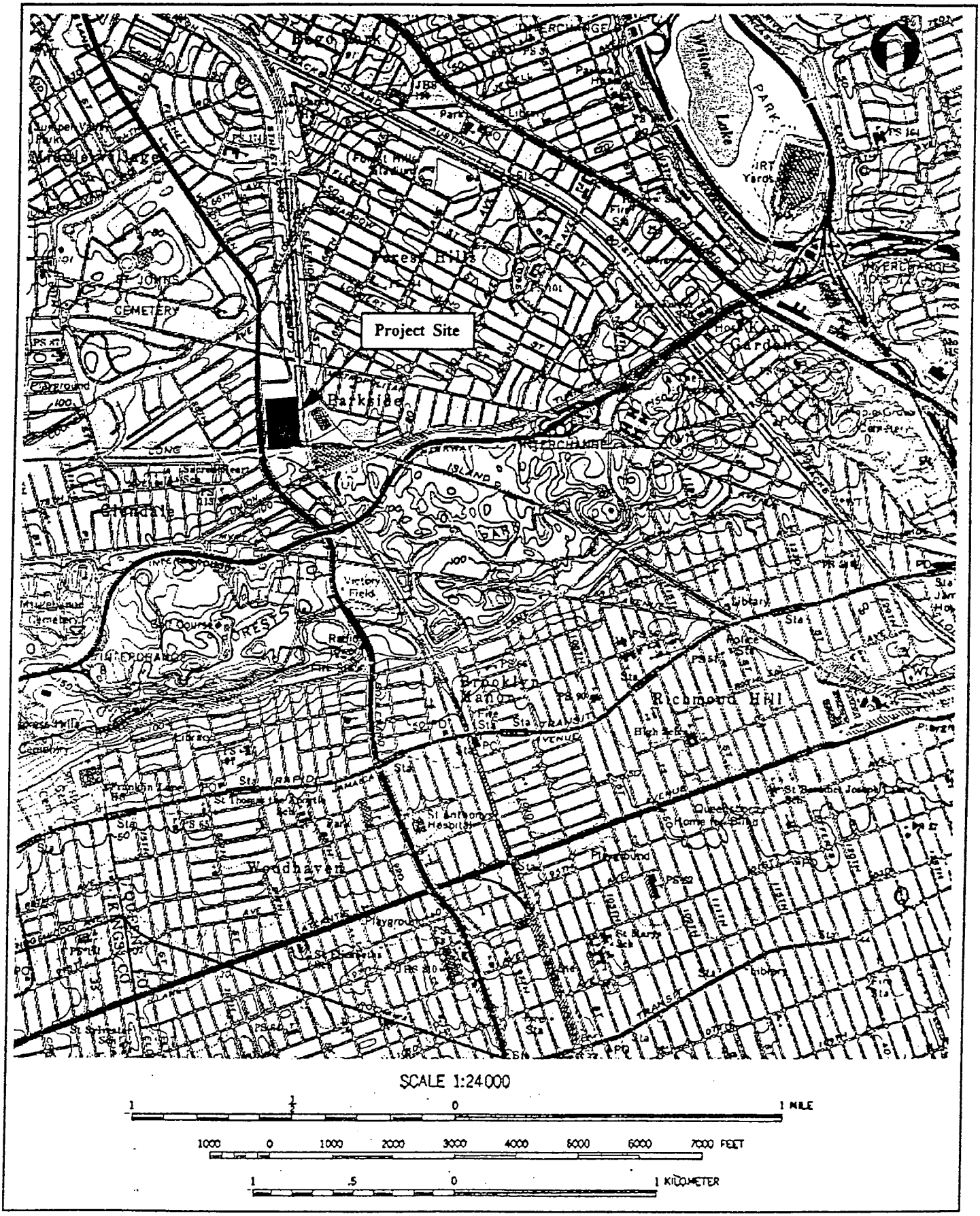
The ADI and Glendale properties are located in Rego Park, Queens, on the east side of Woodhaven Boulevard to the south of 73rd Avenue (see Figure 1, Project Location Map). The existing buildings at the site are shown in Figure 2. The ADI building was constructed between 1936 and 1950. It was first used as a steel warehouse and then, from 1967 to 1977, as a knitting mill. Since 1977 it has been used as office/warehouse space. The Glendale building has been used as office/warehouse space since its construction in 1952-53. There are also known to be three underground petroleum storage tanks (one beneath the western central portion of the ADI property and two beneath the western central portion of the Glendale property). However, the removal of these tanks will be covered by a separate Health and Safety Plan (see Section 2E below)

Various investigations since 1995 have found soil contaminated with tetrachloroethene (PCE) beneath the ADI building as well as PCE groundwater contamination (the water table is approximately 55 feet below grade) with the highest levels beneath the ADI building. The source of the contamination is believed to be past leakage from the knitting factory, though there is groundwater contamination in other areas including areas presumed to be upgradient of the site. Testing did not reveal widespread soil or groundwater contamination by petroleum products. However, localized soil contamination may be present.

A Remedial Work Plan has been developed to:

1. Remediate the soil under the ADI building once the building is demolished and the slab is removed;
2. Investigate soil conditions under the Glendale building and remediate any contamination detected in that area;
3. Remediate the groundwater using an in-situ air sparging system; and
4. Remove underground storage tanks in accordance with industry standards and applicable regulations.

The purpose of this Health and Safety Plan (HSP) is to protect field personnel and others during the implementation of the Remedial Work Plan. It is in conformance with the various Occupational Safety and Health Administration (OSHA) standards and other applicable regulations governing site investigation operations, and all AKRF, Inc. policies and procedures on health and safety. It has been prepared to establish practices and procedures to protect the health of AKRF personnel and others during implementation of the Remedial Work Plan.



Source: USGS Topographic Map - Jamaica Quadrangle: New York Dated 1966; Photorevised 1979. Contour Interval 10 feet. Quadrangle Longitude: 73° 45' Quadrangle Latitude: 40° 37' 30" National Geodetic Vertical Datum of 1929.

FIGURE I.1
PROJECT LOCATION MAP

2. HEALTH AND SAFETY GUIDELINES AND PROCEDURES

A. HAZARD EVALUATION

Existing environmental conditions on the site were summarized in the Voluntary Cleanup Site Assessment Report, dated May 1996 and in reports of subsequent sampling activities dated October 1996 and April 1997. Results of the soil sampling indicated that significant PCE contamination appeared to be confined to the top few feet under the ADI building with levels of up to 130 parts per million (ppm). Levels of PCE in groundwater were elevated in all samples. The highest levels (up to 2.3 ppm) were found to the east of the ADI building. The contamination appeared to be confined to the top few feet of groundwater i.e., approximately 50 to 60 feet below grade. These contaminants, without remediation, represent a potential health and safety hazard to AKRF, Inc. personnel, the drilling crew, and others during soil removal, drilling and well installation activities. Potential exposure pathways are inhalation of vapors, dermal contact, and accidental ingestion. In addition, removal of the underground petroleum storage tanks also has the potential for exposure to volatile organic compounds.

B. DESIGNATED PERSONNEL

AKRF will appoint one of its on-site personnel as the on-site Health and Safety Officer (HSO). This individual will be responsible for the implementation of the HSP. The HSO will have a 4-year college degree in occupational safety or a related science/engineering field, and 2 years of experience in implementation of air monitoring and hazardous materials sample programs. The HSO will have completed a 40-hour training course that meets OSHA requirements of 29 CFR Part 1910, Occupational Safety and Health Standards.

The HSO will be present on-site during the conduct of all field operations, and will be responsible for all health and safety activities and the delegation of duties to the field crew. The HSO has stop-work authorization, which he/she will execute on his/her determination of an imminent safety hazard, emergency situation, or other potentially dangerous situation. If the HSO must be absent from the field, he/she will designate a replacement who is familiar with the health and safety plan, air monitoring, and protection equipment.

C. TRAINING

All those who enter the work area must recognize and understand the potential hazards to health and safety. All field personnel must attend a training program, whose purpose is to:

- Make them aware of the potential hazards they may encounter;
- Provide the knowledge and skills necessary for them to perform the work with minimal risk to health and safety;
- Make them aware of the purpose and limitations of safety equipment; and
- Ensure that they can safely avoid or escape from emergencies.

Each member of the field crew will be instructed in the above objectives before he/she goes onto the site. The HSO will be responsible for conducting the training program.

D. MEDICAL SURVEILLANCE PROCEDURE.

All AKRF, Inc. and subcontractor personnel performing field work at the site are required to have passed a complete medical surveillance examination in accordance with 29 CFR 1910.120 (f). A physicians medical release for wok will be confirmed by the HSO before an employee can begin site activities. The medical examination will, at a minimum, be provided annually and upon termination of hazardous waste site work.

E. SITE WORK ZONES

In areas of concern, the work area must be divided into various zones to prevent the spread of contamination, ensure that proper protective equipment is donned, and provide an area for contamination.

The Exclusion Zone is defined as the area where soil contamination occurs or could occur. The Exclusion Zone is the area where the PCE-contaminated soils are generated as the result of soil removal activities. In is anticipated that soils will be stockpiled to the north of the ADI building. The Contamination Reduction Zone (CRZ) is the area where decontamination procedures take place and is located next to the Exclusion Zone. The Support Zone is the zone area where support-facilities-such as vehicles, a field phone, fire extinguisher, and first aid supplies-are located. The emergency staging area (part of the Support Zone) is the area where all workers on site would assemble in the event of an emergency. These zones shall be designated daily, depending on that day's activities. All field personnel will be informed of the location of these zones before work begins.

Control measures such as "Caution" tape and traffic cones will be placed around the perimeter of the work area when work is being done in the areas of concern to prevent entrance onto the area with exposed soil.

Where there is a need for excavation or drilling in areas where shallow contaminated soils are not anticipated, the air monitoring set out below will still be implemented.

Note on Underground Storage Tank Removal: Removal of underground storage tanks will be accomplished by a separate contractor, who will be responsible for preparing and implementing a site-specific Health and Safety Plan which will be provided to NYS DEC prior to any tank removal activities It will address all tasks including excavation, removal, cleaning, and disposal of the tanks in accordance with OSHA requirements and the most current publications of the following documents, regulations, codes, and memoranda:

- United States Environmental Protection Agency (USEPA): "Underground Storage Tank; Technical Requirements," (40 CFR 280)
- Occupational Safety and Health Administration (OSHA): "Regulation concerning Construction," (29 CFR 1910 and 1926)
- NYDEC STARS Memo #1, Petroleum-Contaminated Soil Guidance Policy (August 1992)
- NYSDEC Petroleum Bulk Storage Regulation (6 NYCRR Part 613.9(b))
- NYSDEC Petroleum-Contaminated Soil Guidance Policy (August 1992)
- NYSDEC Site Assessment at Bulk Storage Facilities: (SPOTS Memo #14, August 1994)
- New York City Administrative Code (Title 27, Chapter 4): Fire Prevention Code
- National Fire Prevention Association (Volume 30): "Flammable and Combustible Liquid Codes"
- National Fire Protection Association (Volume 327): "Cleaning and Safeguarding Small Tanks and Containers"
- American Petroleum Institute, API-2015A, "A Guide for Controlling the Lead Hazard Associated with Tank Entry and Cleaning"
- American Petroleum Institute, API-2015, "Cleaning Petroleum Storage Tanks"
- American Petroleum Institute, API-1604, "Recommended Practice for Closure of Underground Petroleum Storage Tanks"

F. AIR MONITORING

An Organic Vapor Meter (OVM) will be used to perform air monitoring during all soil removal, drilling and well installation. The purpose of the air monitoring program is to avoid or minimize exposure of the field personnel and the public to potential environmental hazards in the soil and groundwater. Results of the air monitoring will be used to determine the appropriate response action, if needed. The OVM will be calibrated with isobutylene in accordance with the manufacturers recommendations.

Work Zone Air Monitoring

Real time air monitoring will be done, with the OVM, whenever soil removal or drilling is being performed. Measurements will be taken prior to commencement of work and for at least 1 minute

every 60 minutes during the work. Continuous monitoring will be undertaken when first exposing soils in areas where contamination is expected e.g., when removing the slab under the ADI building or around the underground storage tanks. These measurements will be made as close to the workers as practical and at the breathing height of the workers. The HSO shall set up the equipment and confirm that it is working properly. His/her designee may oversee the air measurements during the day. The initial measurement for the day will be performed before the start of work and will establish the background level for that day. The final measurement for the day will be performed after the end of work. The action levels and required responses are listed below.

ACTION LEVEL	RESPONSE ACTION
Less than 20 ppm above background	Continue work in Level D
Between 20 and 100 ppm above background	Upgrade to Level C Initiate perimeter air monitoring
More than 100 ppm above background*	Stop work. Resume work when source of vapors is abated and readings are less than 100 ppm above background

** OSHA's 8-hour time-weighted-average Permissible Exposure Limit (PEL) for PCE is 100 ppm*

Community Air Monitoring

During work, when air monitoring in the work zone indicates a need to conduct perimeter air monitoring, it will be performed as follows. Air quality will be monitored at two locations at the perimeter of the work area. One will be immediately upwind and the other will be downwind of the activity, half the distance between the perimeter of the work area and the closest potential public receptor (e.g., sidewalk, office worker etc.). Measurements will be taken for 1 minute every 60 minutes, with the OVM. The initial measurement will be performed when the action level listed above is triggered. Measurements will continue until the air monitoring in the work zone indicates that perimeter monitoring is no longer required, i.e., readings are less than 20 ppm above background in the work zone. The action levels and required responses are listed below.

ACTION LEVEL	RESPONSE ACTION
Less than 10 ppm above background *	Continue work

More than 10 ppm above background	Stop work until source of vapors is abated and readings are less than 10 ppm above background

** The NYSDEC Short Term Guidance (SGC) concentration for PCE is 11.7 ppm*

Response Actions

AKRF will respond to the results of the air monitoring in accordance with the actions specified above. Compliance with the specified response action for the listed action levels will ensure the protection of the health and safety of AKRF personnel and others during site activities.

G. PERSONAL PROTECTION EQUIPMENT

The personal protection equipment required for various kinds of site investigation tasks are based on 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response, Appendix B, "General Description and Discussion of the Levels of Protection and Protective Gear."

AKRF field personnel and other site personnel shall wear Level D personal protective equipment. During activities where is a chance of contact with contaminated materials modified Level D equipment will be worn. The protection will be upgraded to Level C if the results of the air monitoring indicates that Level C equipment is warranted.

Level D
Respiratory Protection: None
Protective Clothing: Coveralls, work shoes

Modified Level D
Respiratory Protection: None
Protective Clothing: Coveralls, work shoes, gloves

Level C
Respiratory Protection: Air purifying respirator with organic vapor cartridges.
Protective Clothing: Same as modified Level D

H. GENERAL WORK PRACTICES

To protect the health and safety of the field personnel, all field personnel will adhere to the guidelines listed below.

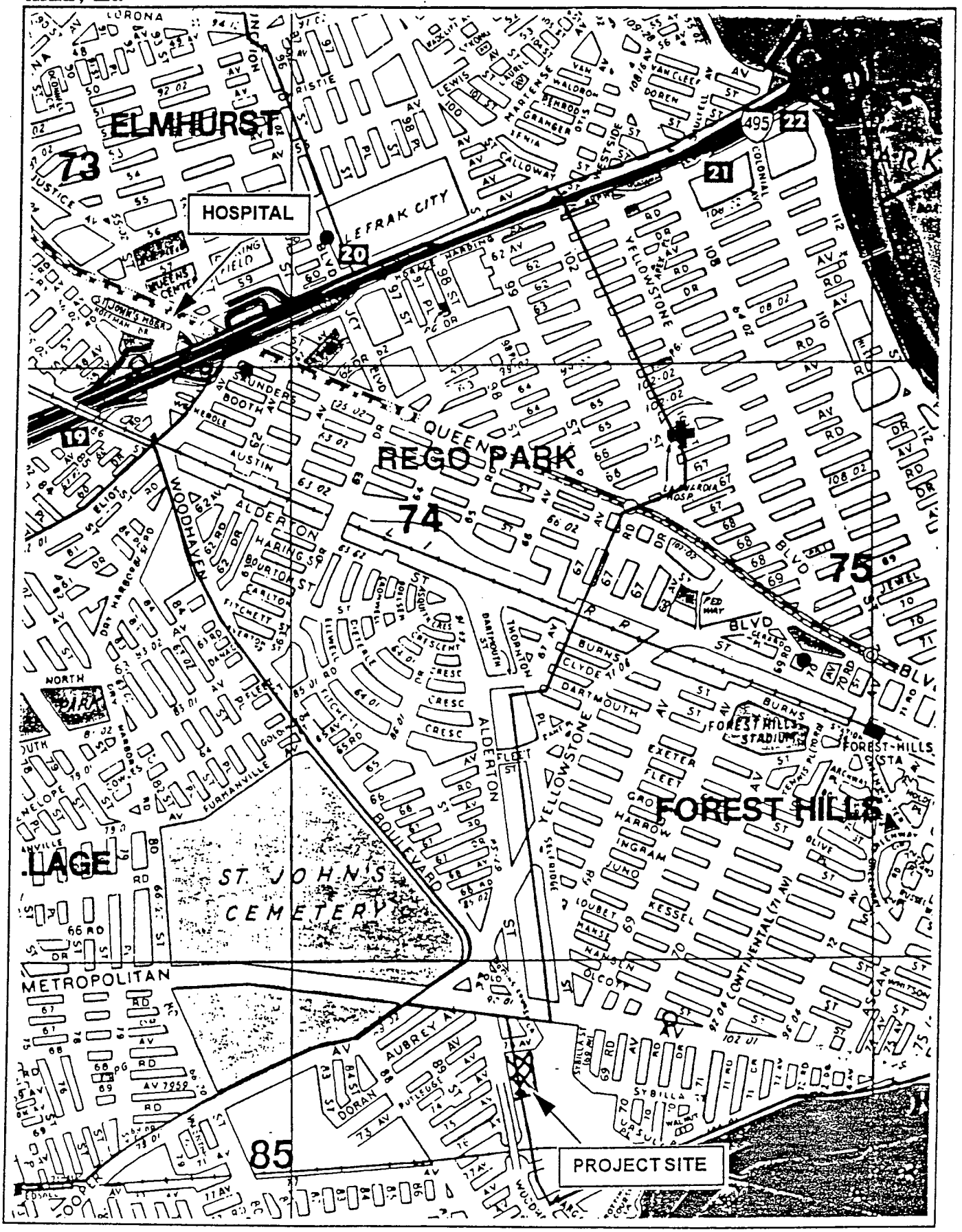


FIGURE 3
LOCATION OF NEAREST HOSPITAL

- Eating, drinking, chewing gum or tobacco, and smoking are prohibited, except in designated areas on the site. These areas will be designated by the HSO.
- Workers must wash their hands and face thoroughly on leaving the work area and before eating, drinking, or any other such activity. The workers should shower as soon as possible after leaving the site.
- Contact with contaminated or suspected surfaces should be avoided.
- Contact lenses should not be worn on-site.
- The buddy system should always be used; each buddy should watch for signs of fatigue, exposure, and heat stress.

I. EMERGENCY PROCEDURES AND EMERGENCY RESPONSE PLAN

The field crew will be equipped with emergency equipment, such as a first aid kit and disposable eye washes. In the case of a medical emergency, the HSO will determine the nature of the emergency and he/she will have someone call for an ambulance, if needed. If the nature of the injury is not serious—i.e., the person can be moved without expert emergency medical personnel—he/she should be driven to a hospital by on-site personnel. There will be an on-site field phone. The location of the nearest hospital, shown on Figure 3, is 90-02 Queens Boulevard, approximately one mile north of the site at the intersection of Woodhaven Boulevard and Queens Boulevard, just past the ramps for the Long Island Expressway. Telephone numbers are:

Ambulance 911 St. John's Queens Hospital (718) 558 1000

3. ACKNOWLEDGMENTS OF HSP

Below is an affidavit that must be signed by all workers who enter the site. A copy of the HSP must be on-site at all times and will be kept by the HSO.

AFFIDAVIT

I, _____ (name), of _____ (company name), have read the Health and Safety Plan (HSP) for the ADI and Glendale properties. I agree to conduct all on-site work in accordance with the requirements set forth in this HSP and understand that failure to comply with this HSP could lead to my removal from the site.

Signed: _____ Date: _____

EXHIBIT "C"

Assignable Release and Covenant Not To Sue by Department

[On Department Letterhead]

[Insert Date]

To whom it may concern:

Unless otherwise specified herein, all terms used herein shall have the meaning assigned to them under the terms of the Voluntary Agreement entered into between the New York State Department of Environmental Conservation (the "Department"), Allborough Distributors, Inc., and Glendale Holding Corp. ("Responding Parties" or each individually, "Responding Party"), Index No. D2-0001-97-04 (the "Agreement").

The Department is pleased to report that the Department is satisfied that the Department-approved Work Plan to implement a remedial program at the Site, a description of which is attached hereto as Appendix "A," has been successfully implemented. So long as no information has been withheld from the Department or circumstances exist as described in the reservations of rights provisions set forth hereinbelow, the Department believes that no further investigation or response will be required at the Site for the Existing Contamination to render the Site safe for the Contemplated Use or other commercial or industrial use.

Assignable Release and Covenant Not To Sue by Department:

The Department and the Trustee of New York State's natural resources ("Trustee"), therefore, hereby release, covenant not to sue, and shall forbear from bringing any action, proceeding, or suit against Responding Parties and Responding Parties' lessees and sublessees and Responding Parties' successors and assigns (including successors-in-title) and their respective secured creditors, for the further investigation and remediation of the Site, or for natural resources damages, based upon the release or threatened release of Existing Contamination, provided that (a) timely payments of the amounts specified in Paragraph VI of the Agreement continue to be or have been made to the Department, (b) appropriate notices and deed restrictions have been recorded in accordance with Paragraphs IX and X of the Agreement, and Responding Parties and/or their respective lessees, sublessees, successors, or assigns promptly commence and diligently pursue to completion the Department-approved O&M Plan, if any. Nonetheless, the Department and the Trustee hereby reserve all of their respective rights concerning, and such release, covenant not to sue, and forbearance shall not extend to, any further investigation or remedial action the Department deems necessary:

_ due to off-Site migration of petroleum that was not addressed in the Work Plan;

_ due to environmental conditions related to the Site that were unknown to the Department

at the time of its approval of the Work Plan which indicate that Site conditions are not sufficiently protective of human health and the environment for the Contemplated Use;

– due to information received, in whole or in part, after the Department's approval of the final engineering report and certification, which indicates that the activities carried out in accordance with the Work Plan are not sufficiently protective of human health and the environment for the Contemplated Use;

– due to either Responding Parties' failure to implement the Agreement to the Department's satisfaction; or

– due to fraud or mistake committed by either Responding Parties in demonstrating that the Site-specific cleanup levels identified in, or to be identified in accordance with, the Work Plan were reached.

Additionally, the Department and the Trustee hereby reserve all of their respective rights concerning, and any such release, covenant not to sue, and forbearance shall not extend to:

– Responding Parties if either causes a, or suffers the, release or threat of release, at the Site of any hazardous substance (as that term is defined at 42 USC 9601[14]) or petroleum (as that term is defined in Navigation Law ' 172[15]), other than Existing Contamination; or if either causes a, or suffers the use of the Site to, change from the Contemplated Use to one requiring a lower level of residual contamination before that use can be implemented with sufficient protection of human health and the environment; nor to

– any of Responding Parties' lessees, sublessees, successors, or assigns who causes a, or suffers the, release or threat of release, at the Site of any hazardous substance (as that term is defined at 42 USC 9601[14]) or petroleum (as that term is defined in Navigation Law ' 172[15]), other than Existing Contamination, after the effective date of the Agreement; who causes a, or suffers the use of the Site to, change from the Contemplated Use to one requiring a lower level of residual contamination before that use can be implemented with sufficient protection of human health and the environment; or who, at the time of the Agreement's execution, is otherwise a party responsible under law for the remediation of the Existing Contamination independent of any obligation that party may have respecting same established resulting solely from the Agreement's execution.

Notwithstanding the above, however, with respect to any claim or cause of action asserted by the Department, the one seeking the benefit of this release shall bear the burden of proving that the claim or cause of action, or any such part thereof to which this release is asserted to apply, relates to Existing Contamination; provided, however, that in the event the Department were to require Responding Parties to undertake remedial activities with respect to contamination other than Existing Contamination, evidence demonstrating that such remedial activities would also affect Existing Contamination shall not relieve Responding Parties of any obligation they may

have to perform such remedial activities.

Notwithstanding any other provision in this release, if with respect to the property there exists or may exist a claim of any kind or nature on the part of the New York State Environmental Protection and Spill Compensation Fund against any party, nothing in this release shall be construed, or deemed, to preclude the State of New York from recovering such claim.

In conclusion, the Department is pleased to be part of this effort to return the subject property to a use of benefit to the entire community.

NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION

By:_____

Its:_____

APPENDIX "A" TO EXHIBIT "C"

Description of the Premises

1. Allborough Distributors, Inc. Parcel

76-01 Woodhaven Boulevard
Lot 46, Block 3886, Section 20-3
Pages 16 and 17, Tax Maps of
Borough and County of Queens
City and State of New York

The property is shown on plat prepared by Control Point Associates, Inc., 776 Mountain Boulevard, Watchung, New Jersey 07060, certified by Gregory S. Gallas, New York P.L.S., File No. C95196, dated July 7, 1995, revised April 5, 1996 (the "Control Point Plat"), to which reference is hereby made for a complete and accurate legal description and which is more particularly described thereon as follows:

TO FIND THE TRUE POINT OF BEGINNING, begin at the intersection of the easterly sideline of Woodhaven Boulevard (variable width) with the southerly sideline of 73rd Avenue (60 feet wide, F.K.A. Katie Place) run thence South 02 33' 30" West along the westerly line of Lot 671 a distance of 199.65 feet to the northwesterly corner of Lot 660; run thence South 02 33' 30" West along the westerly line of said Lot 660 and the easterly sideline of Woodhaven Boulevard a distance of 179.72 feet to a point; run thence South 03 33' 28" West along the westerly line of said Lot 660 and the easterly sideline of Woodhaven Boulevard a distance of 81.93 feet to a point on the westerly line of Lot 650 and the easterly line of Woodhaven Boulevard; run thence South 03 33' 28" West along the westerly line of said Lot 650 and the easterly sideline of Woodhaven Boulevard a distance of 20.00 feet to a point on the westerly line of Lot 74 and the easterly line of Woodhaven Boulevard; run thence South 03 33' 28" West along the westerly line of said Lot 74 and the easterly sideline of Woodhaven Boulevard a distance of 39.30 feet to a point at the corner of Lot 450 and the easterly sideline of Woodhaven Boulevard; run thence South 03 33' 28" West along the westerly line of said Lot 450 and the easterly sideline of Woodhaven Boulevard a distance of 69.78 feet to a point at the corner of Lot 450, the easterly sideline of Woodhaven Boulevard and the northwest corner of Lot 46, being **THE TRUE POINT OF BEGINNING**.

FROM THE POINT OF BEGINNING THUS ESTABLISHED, run thence

1. South 86 26' 32" East along the northerly line of Lot 46 and a common line with Lot 450, a distance of 75.00 feet to a point; run thence

2. South 03 33' 28" West along the easterly line of said Lot 46 and a common line with Lot 450, a distance of 402.00 feet to a point; run thence

3. North 86 26' 32" West along the southerly line of said Lot 46, a distance of 74.00 feet to a point; run thence

4. North 03 33' 28" East, a distance of 26.00 feet to a point, along the dividing line between said Lot 46 and a park as per City Plan Map Number 4143 filed in Queens Topographic Bureau; run thence

5. North 86 26' 32" West along the dividing line between said Lot 46 and said park, a distance of 1.00 foot to a point on the easterly sideline of Woodhaven Boulevard (150 feet wide); run thence

6. North 03 33' 28" East along the easterly sideline of Woodhaven Boulevard and the westerly line of said Lot 46 a distance of 376.00 feet to **THE TRUE POINT OF BEGINNING**.

Containing 30,124 square feet or 0.692 acres.

Together with all right, title and interest of, in and to any streets and roads abutting the above described premises, to the center line thereof.

2. Glendale Holding Corp. Parcel
(f/k/a Spiro-Wallach, Inc.)

75-11 Woodhaven Boulevard
Lot 74, Block 3886, Section 20-3
Pages 16 and 17, Tax Maps of
Borough and County of Queens
City and State of New York

The property is shown on a plat prepared by Control Point Associates, Inc., 776 Mountain Boulevard, Watchung, New Jersey 07060, certified by Gregory S. Gallas, New York P.L.S., File No. C95196, dated July 7, 1995, to which reference is hereby made for a complete and accurate legal description and which is more particularly described thereon as follows:

Begin at a point on the easterly sideline of Woodhaven Boulevard (150 feet wide), said point being distant southerly 481.30 feet along the easterly sideline of Woodhaven Boulevard from the

intersection of the easterly sideline of Woodhaven Boulevard (variable width) with the southerly sideline of 73rd Avenue (60 feet wide) and **THE TRUE POINT OF BEGINNING.**

FROM THE POINT OF BEGINNING THUS ESTABLISHED, run thence

1. Along the dividing line between Lot 74 and Lot 650, South 87 degrees - 25 minutes - 30 seconds East, a distance of 548.40 feet to a point, run thence

2. Along the dividing line between Lot 74 and Lot 449, South 02 degrees - 33 minutes - 30 seconds West, a distance of 484.54 feet to a point; run thence

3. Along a dividing line between Lot 74 and Lot 450, North 87 degrees - 28 minutes - 30 seconds West, a distance of 466.00 feet to a point; run thence

4. Still along the dividing line between Lot 74 and Lot 450, North 02 degrees - 15 minutes - 30 seconds East, a distance of 441. 51 feet to a point; run thence

5. Still along the dividing line between Lot 74 and Lot 450, North 84 degrees - 29 minutes - 05 seconds West, a distance of 80.87 feet to a point on the easterly sideline of Woodhaven Boulevard (150 feet wide); run thence

6. Along the easterly sideline of Woodhaven Boulevard, North 03 degrees - 33 minutes - 28 seconds East, a distance of 39.30 feet to **THE TRUE POINT OF BEGINNING.**

Containing 229,829 square feet or 5.276 acres.

Together with all right, title and interest of, in and to any streets and roads abutting the above described premises, to the center line thereof.

Exhibit "D-1"

NOTICE OF AGREEMENT

With Respect to ADI parcel

This Notice is made as of the 14th day of July, 1997 by Allborough Distributors, Inc. ("ADI"), the fee owner of a parcel of real property located at Woodhaven Boulevard and 73rd Avenue and as more particularly described on Appendix "A" attached hereto (the "Property"); and

WHEREAS, ADI, by authorized signature, entered into an administrative Agreement with the New York State Department of Environmental Conservation and with the Trustee of New York State's natural resources (the "Trustee"), Department Index #D2-0001-97-04 (the "Agreement"), concerning the remediation of the Property; and

WHEREAS, there is presently located on the Property contaminants identified in the Agreement; and

WHEREAS, in return for the remediation of the Property pursuant to the Agreement to the satisfaction of the Department and the Trustee have provided ADI and its successors and assigns (other than those who are parties responsible under law to remediate the contaminants identified in the Agreement as Existing Contamination) (collectively, "ADI and its successors"), including their respective secured creditors, with a release and covenant not to sue or bring any action, proceeding, or suit related to the further investigation or remediation of the Existing Contamination, or for natural resource damages, subject to certain reservations set forth in the Agreement; and

WHEREAS, pursuant to the Agreement, ADI agreed that it would give notice of the Agreement to all parties who may acquire any interest in the Property by filing this Notice with the Queens County Register,

NOW, THEREFORE, ADI, for itself, its successors and its assigns, declares that:

1. Notice of the Agreement is hereby given to all parties who may acquire any interest in the Property.

2. This Notice shall terminate upon the filing by ADI or its successors and assigns, of a termination of this Notice of Agreement.

IN WITNESS WHEREOF, ADI has executed this Notice of Agreement by its duly authorized representative.

Allborough Distributors, Inc.

Dated: _____, 1997

By: _____

Its: _____

[acknowledgment]

APPENDIX B

Remedial Work Plan

REMEDIAL WORK PLAN
ADI AND GLENDALE PROPERTIES
REGO PARK, QUEENS, NEW YORK

Prepared By:

AKRF Engineering , P.C.
117 East 29th Street
New York, New York 10017
(212) 696-0670

Robert Conway, P.E. #063231
Vice President

May 1997

TABLE OF CONTENTS

1. INTRODUCTION

The Voluntary Cleanup site comprises two parcels under separate ownership (see Figure 1). The smaller parcel, on the western part of the site along Woodhaven Boulevard is occupied by Allborough Distributors Inc. (the "ADI property"). The building on the ADI property was designated as Building E in earlier site investigations. The larger parcel, owned by Glendale Holding Corporation and occupied by the Spiro Wallach Corporation (the "Glendale property") is located on the eastern portion of the site. The building on the Glendale property was designated as Building D in earlier site investigations.

The parcel to the north, occupied by the Long Island Fire Door Company, was included in earlier site investigations, but is not included in the Voluntary Cleanup Agreement and is not part of this remedial work plan. The buildings on this property were designated as Buildings A, B, and C in earlier site investigations. Previous investigations have shown that the only remedial work required on this parcel is related to the underground petroleum storage tanks on the property. Groundwater contamination on this parcel is apparently entering from an upgradient source.

This Remedial Work Plan presents the conceptual plan for remediation of the site. Further submissions will be made to DEC as described below. The goal of the remediation is to clean soil to DEC's recommended cleanup objectives as presented in Technical and Administrative Guidance Memorandum 4046 and to clean groundwater to New York State Part 703 standards for Class GA groundwater as described below.

2. OVERVIEW OF REMEDIATION PLAN

Soil and groundwater on portions of the site have been found to be contaminated by tetrachloroethene (PCE). Figures summarizing prior soil and groundwater testing data are presented in Appendix A. A release of PCE within the ADI building has impacted the soil under the building, and groundwater under the building and in areas to the south and east, including groundwater under a portion of the Glendale building. In addition, there may have been a separate release of PCE under the Glendale building. The remediation will comprise two phases. Phase I will address the soil and groundwater contamination from the release under the ADI building. Phase II will address soil and groundwater contamination from any releases discovered under the Glendale building.

The basic remediation methods for the site will be:

- Excavate PCE-contaminated soil within ten feet of the ground surface for off-site treatment/disposal.

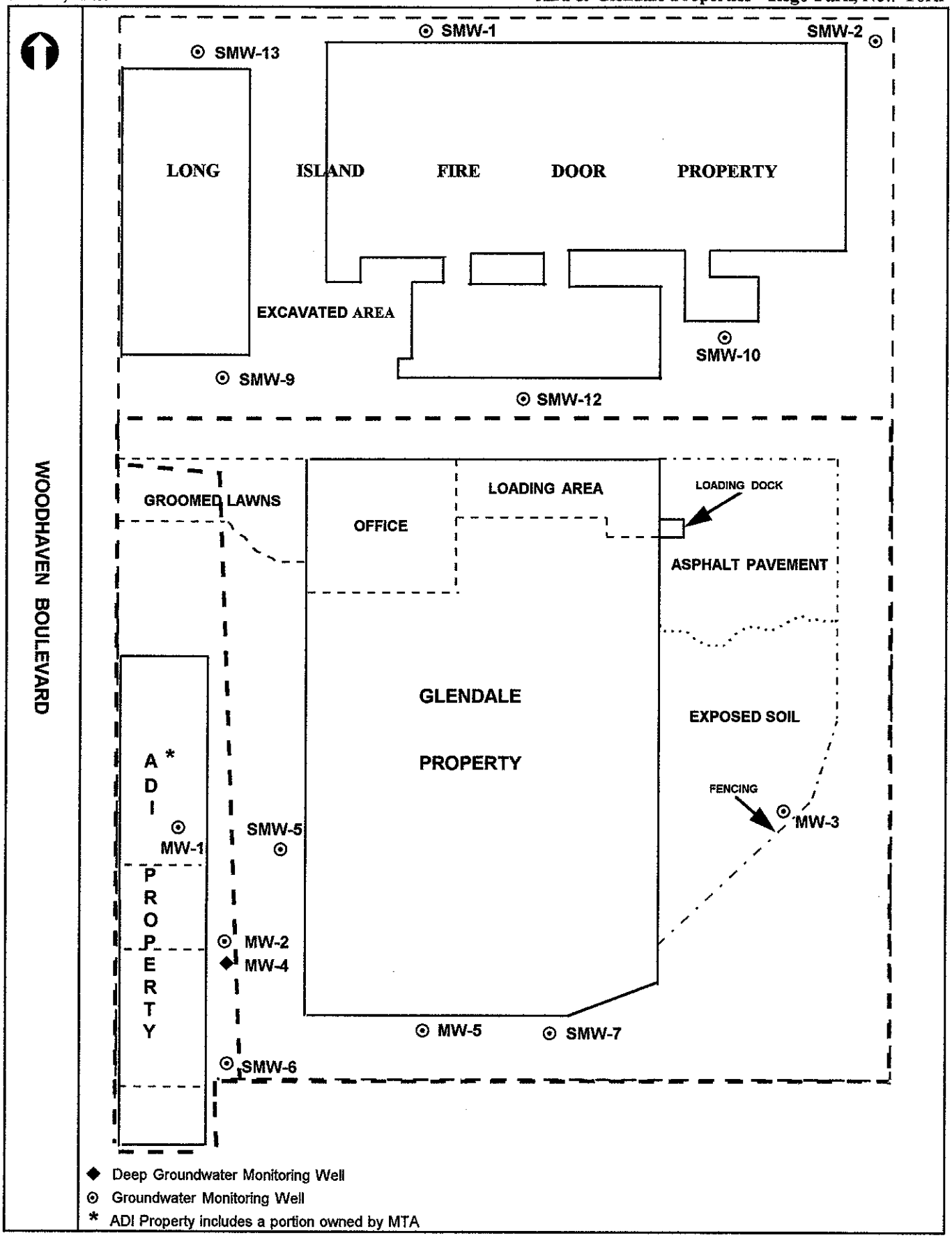


FIGURE 1
EXISTING CONDITIONS

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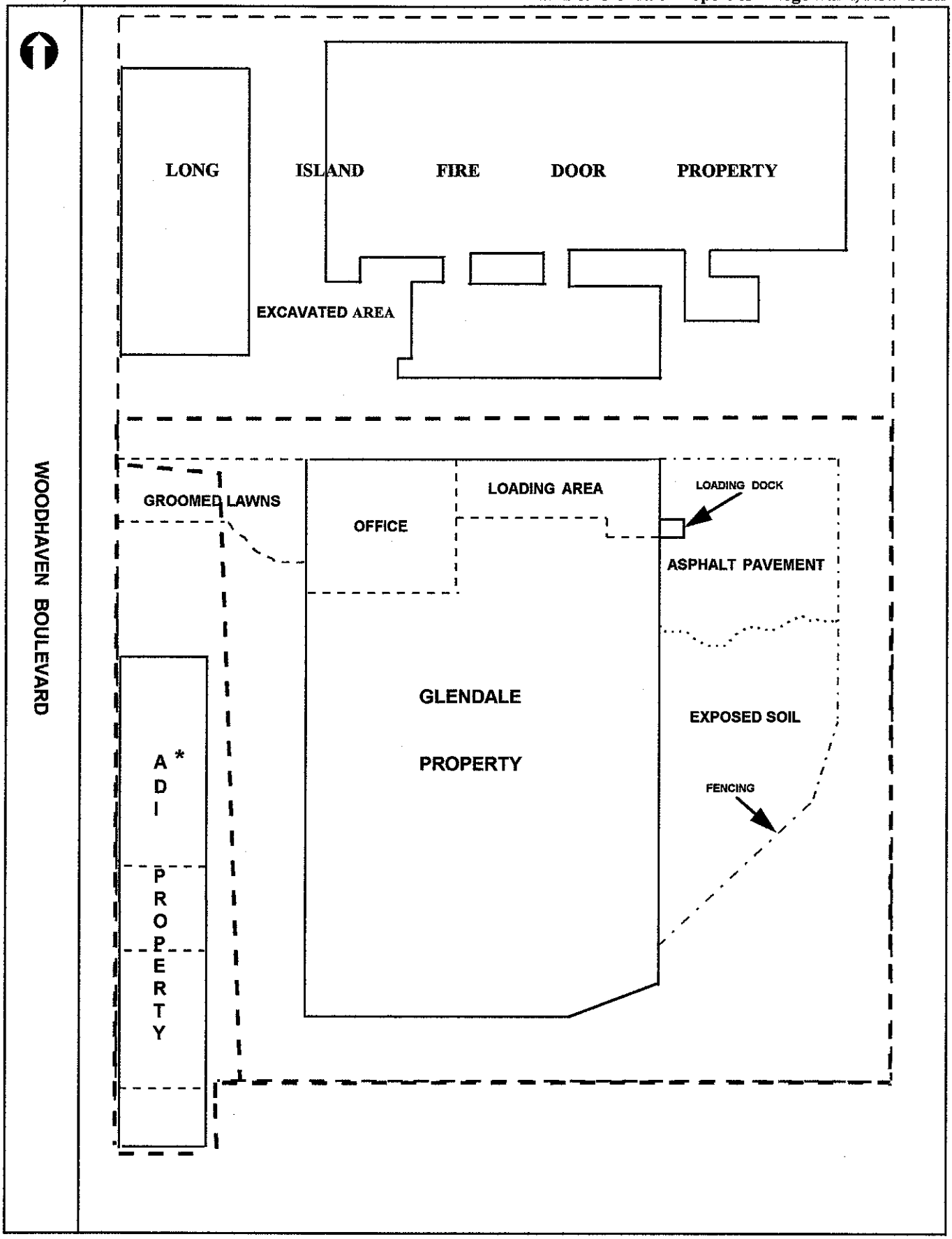

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FIGURE 2
SITE MAP

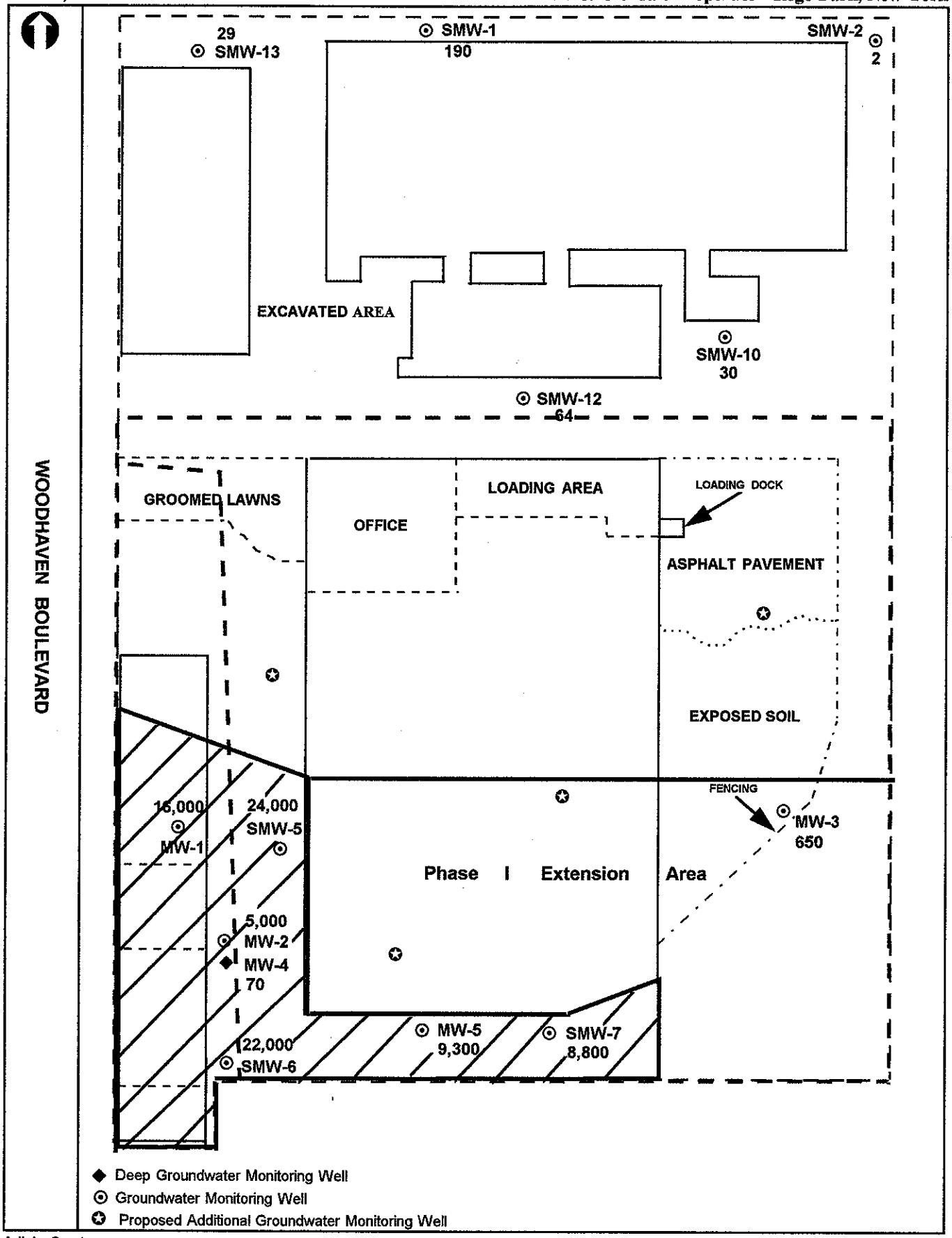

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FIGURE 2

Phase I groundwater remediation area and monitoring well location.

- Soil vapor extraction to remove PCE from contaminated soil deeper than ten feet below the surface.

- In-situ air sparging/vapor extraction to remove PCE from soil and groundwater in the saturated zone.

All investigation and remediation operations on the site will be performed in accordance with the project Health and Safety Plan (Appendix B).

The two buildings on the site are currently occupied by commercial businesses. The ADI building is expected to be vacated soon, and the Glendale building will be vacated six to nine months later. Since the planned investigation and remediation work in and around the building footprint areas cannot be performed until the buildings are vacated and demolished, the remediation work on the ADI property will be performed first, and the investigation and remediation work on the Glendale property will be performed after that property becomes vacant.

The Phase I work will begin when the ADI building is demolished. First, soil remediation will be performed under the ADI building and groundwater remediation will be performed on the ADI property and in some accessible adjacent areas on the Glendale property (see Figure 2). When the Glendale building is vacated and demolished, additional investigations of soil and groundwater conditions will be performed under and adjacent to the Glendale building footprint. The investigation will be aimed at delineating the plume of groundwater contamination extending from the ADI property under the Glendale building, and at detecting any releases of PCE under the Glendale building. The Phase I groundwater remediation system will be extended to cover the portion of the groundwater contamination plume in and adjacent to the Glendale building footprint.

If the additional investigations on the Glendale property detect evidence of a release from a source on the Glendale site, then Phase II remediation will be performed. Phase II will comprise soil remediation under the Glendale building, and groundwater remediation where appropriate within the footprint and to the east of the Glendale building (see Figure 3).

The phasing of the project, the items to be submitted to DEC at each stage, and the approximate schedule, are summarized below:

Task	**Approximate Start Time (Month)**	**Deliverables to DEC**
Demolition of ADI building	1	

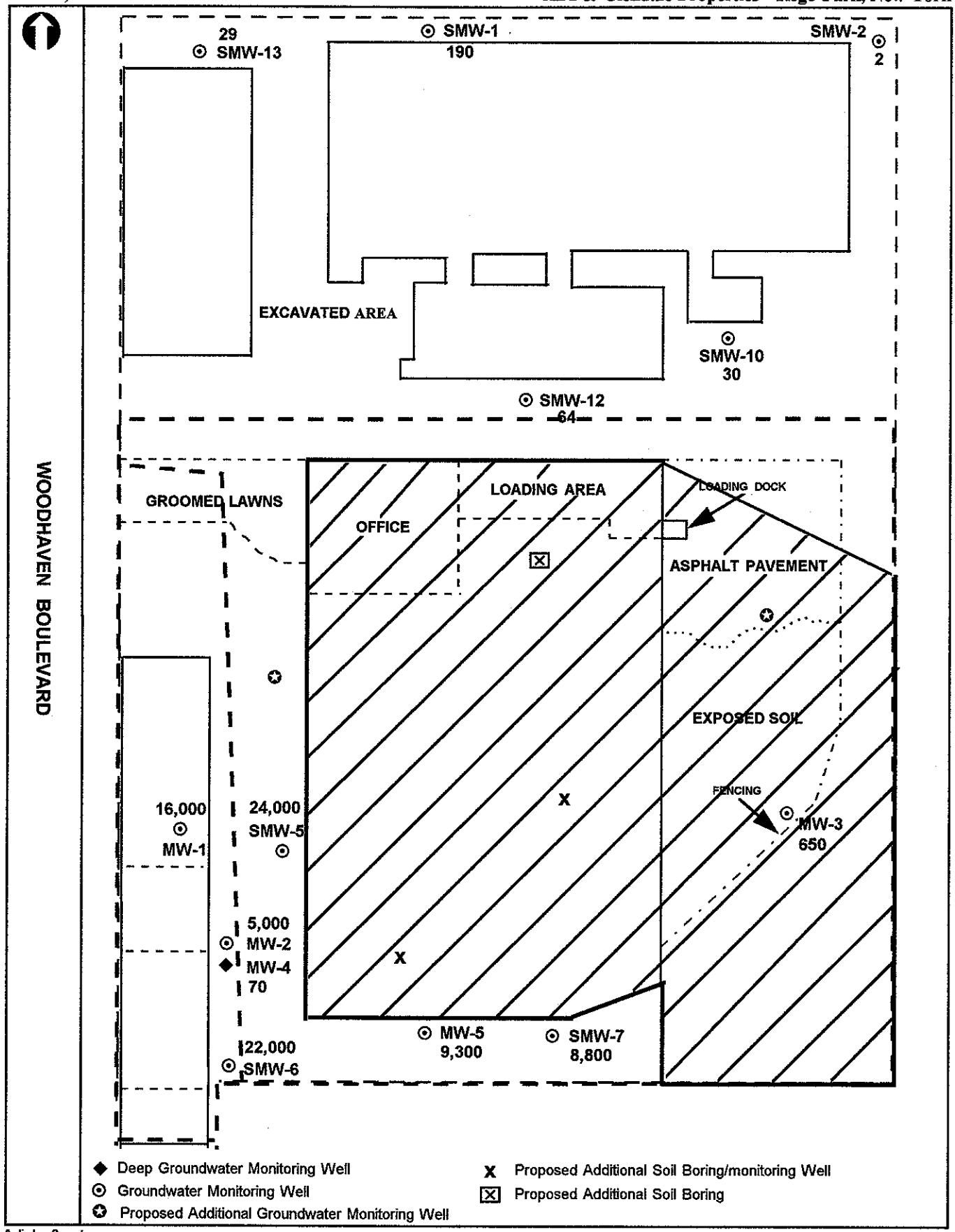

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FIGURE 3

Potential Phase II remediation area. Extent of groundwater remediation system will be based on additional groundwater testing.

Soil remediation by excavation under ADI building. Identify areas greater than 10 feet deep requiring remediation (PCE > 1.4 ppm).	1	Report on soil remediation.
Install two soil vapor extraction wells. Perform permeability test.	1	Design of Phase I in-situ air sparging system.
Install Phase I air sparging/soil vapor extraction system and monitoring wells on ADI property and accessible areas of Glendale property.	2	
Test system and start operation.	3	Monthly reports on system operation.
Demolition of Glendale building.	8	
Soil and groundwater sampling under and adjacent to Glendale building.	8	Report on soil and groundwater sampling. Extension of of Phase I in-situ air sparging system design to Glendale building area. If required, design of Phase II in-situ air sparging system.
Install portion of Phase I air sparging system on Glendale property.	9	
Test new portion of system and start operation.	10	
If required, Phase II soil remediation by excavation under Glendale building. Identify areas greater than 10 feet deep requiring remediation (PCE > 1.4 ppm).	8	Report on soil remediation.
If required, install Phase II air sparging/soil vapor extraction system and monitoring wells.	9	
Test Phase II system and start operation.	10	Monthly reports on system operation.

Remediation system no longer recovering significant levels of contaminant.	?	Request to suspend system operation.
Post-remediation monitoring.	On DEC approval of system suspension.	Reports on semi-annual sampling.
End of post-remediation monitoring.	18 months following system suspension.	Request for release under agreement.

It is expected that the soil remediation, the additional testing, and the construction and testing of the groundwater remediation system for both Phase I and Phase II will be completed before construction associated with development of the site begins. The groundwater remediation system will be designed to permit operations to continue, if necessary, during and following construction. Any monitoring wells which will be destroyed by site development activities will be replaced as close as possible to their original locations.

3. PHASE I SOIL REMEDIATION

3.1 Remediation Site Preparation

Soil contamination by tetrachloroethene (PCE) has been detected in soil beneath the ADI building. The contamination appears to be primarily within the top two feet of soil beneath the floor slab, but extends as deep as ten feet at one location and could be deeper in limited areas. No PCE has been detected in soil outside the ADI building. It is believed that the release of PCE occurred within the building and the horizontal extent of the contamination is limited by the building's foundation footings.

When the building is demolished the floor slab and foundation footings will be removed. As the slab is removed, plastic sheeting will be placed over the soil beneath the slab and weighted down to contain the PCE vapors in the soil.

3.2 Delineation of Contaminated Areas

Following demolition, the extent of contamination in the soil directly beneath the slab of each building will be delineated by visual inspection, and by headspace analysis of soil samples

using a photoionization detector (PID). Headspace analysis will be performed on a 25-foot grid. Samples will not be collected from the exposed surface but rather from a newly disturbed area (a 3" X 3" X 3" hole). Any location with reading above non-detect will be targeted for removal. The approximate extent of soil contamination under the ADI building, based on prior testing data is shown in Figure 4.

Areas where contamination is detected will be excavated to a depth of two feet and the soil stockpiled as described below. Soil contamination at the bottom of the excavated area will then be delineated as described above, and a further two feet of soil will be removed. This will continue until contaminated soil has been removed down to a depth of ten feet below grade. If soil contamination is detected at any location at a depth greater than ten feet below grade, it will be remediated as described below under "Contingency Plan for Deep Contamination".

3.3 Excavation and Disposal of Contaminated Soil

All removed impacted soils that show staining or solvent odor, or in which field-screening instruments detect significant (>1400 ppb) levels of volatile organic compounds will be stockpiled in a secure, fenced area on the site which has been securely covered with 6-mil plastic sheeting. As shown in Figure 4, the soil stockpile area for both Phase I and Phase II will be located immediately north of the ADI building. Piles will be sized to be manageable, coverable, and fit in available areas. 6-mil plastic covering will be sized and lapped to completely enclose the stockpiled soils. Plastic covering will be applied and secured to protect the soils from wind and weather, and will be shaped and secured to drain runoff. The soil stockpiles and plastic covering will be maintained in good condition until the soil can be removed from the site.

Soil samples from the impacted soil stockpile will be collected and submitted for analysis for disposal characterization. The number and type of samples and the parameters analyzed will depend on disposal facility requirements. Contingent on analytical results, the impacted soils will be transported by a licensed hauler and disposed of in a regulated disposal facility, in accordance with all local, State and Federal regulations.

Any unimpacted soil which must be excavated to remove the contaminated soil will be stockpiled separately and may be backfilled on-site.

3.4 End Point Sampling

Grab samples of soil will be collected from the sidewalls and bottom of the excavated area for laboratory analysis. One grab sample will be collected from approximately each 25 feet of sidewall and each 1250 square feet of bottom (25 by 25 foot grid). All soil samples will be properly containerized, each container will be properly labeled, sealed, and refrigerated at approximately 4°C for shipment to the laboratory. A chain of custody will be maintained

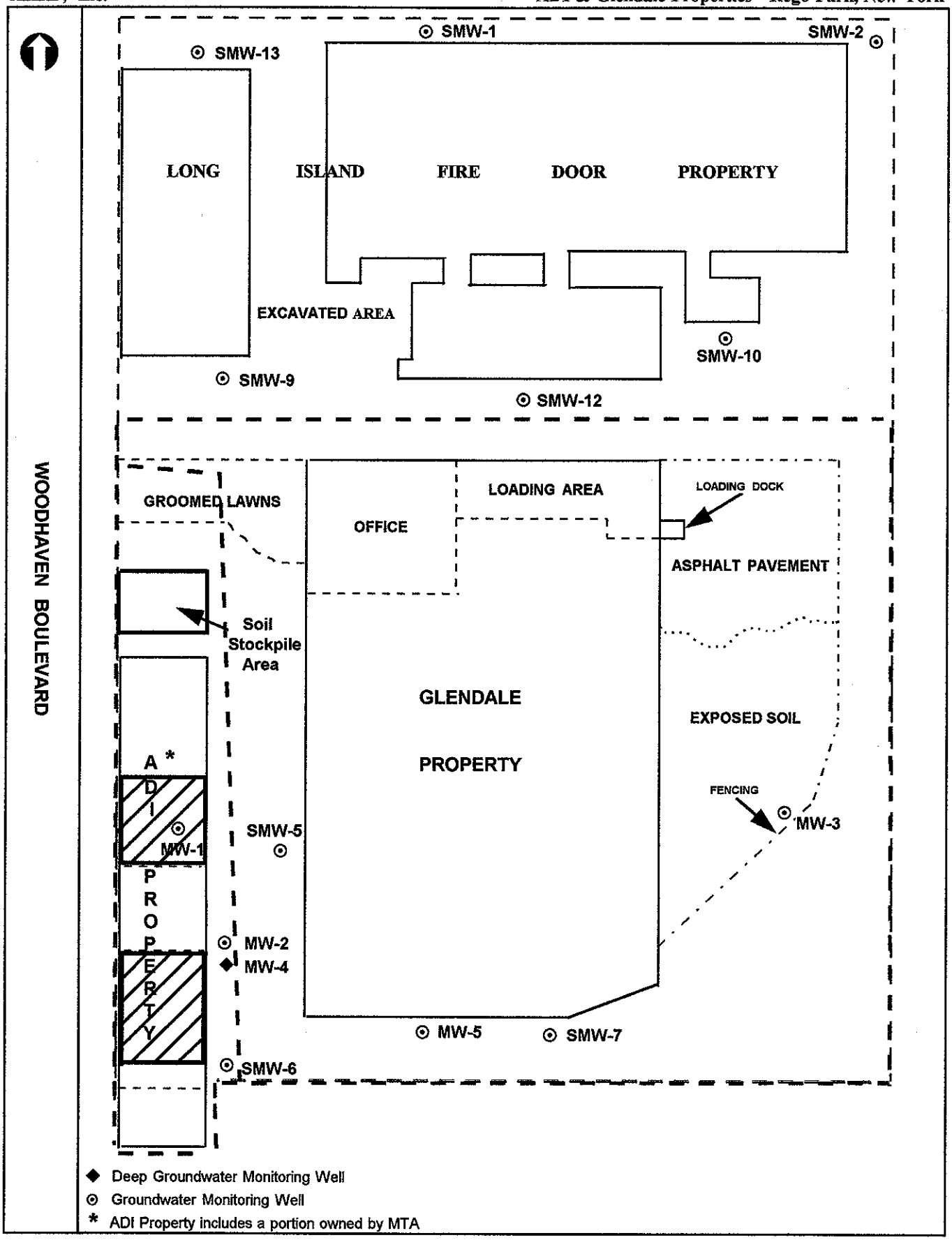

FIGURE 4

KNOWN AREAS REQUIRING SOIL REMEDIATION

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throughout the field sampling, transport of samples to the laboratory, and during lab analysis. All soil samples will be analyzed for volatile organic compounds (VOCs) by NYSDEC ASP Method 91-1 by a New York State Department of Health ELAP-certified laboratory. If PCE levels in any of the soil samples significantly exceeds the clean-up objective of 1400 parts per billion, then additional soil will be removed, or additional remedial measures will be implemented as described below. The excavation will not be backfilled until the end point samples meet the clean-up objective. Any backfill material which must be brought in to restore grades prior to development will be clean soil meeting the TAGM 4046 clean-up objectives.

3.5 Contingency Plan for Deep Contamination

The soil testing below the ADI building has shown that contamination is generally limited to a few feet of soil directly under the slab. None of the soil samples collected from depths greater than ten feet below grade contained levels of TCE exceeding the 1400 parts per billion cleanup objective. However, it is possible that contamination may have penetrated deeper in some limited areas under the ADI and/or Glendale buildings. It would be impractical to try to excavate contaminated soil which could extend as deep as the groundwater table, which is about 55 feet below grade. Therefore, if any areas are detected where contamination above the cleanup objective extends deeper than ten feet below the slab, then the vapor extraction system described below as part of the groundwater remediation system will be extended to remediate the area of deep soil contamination. A vapor extraction well will be located in the contaminated area. Unlike the vapor extraction wells installed as part of the groundwater remediation system, which are screened just above the groundwater level, the screens for the wells in contaminated soil areas will be extended so they extend from ten feet above the groundwater level to ten feet below grade.

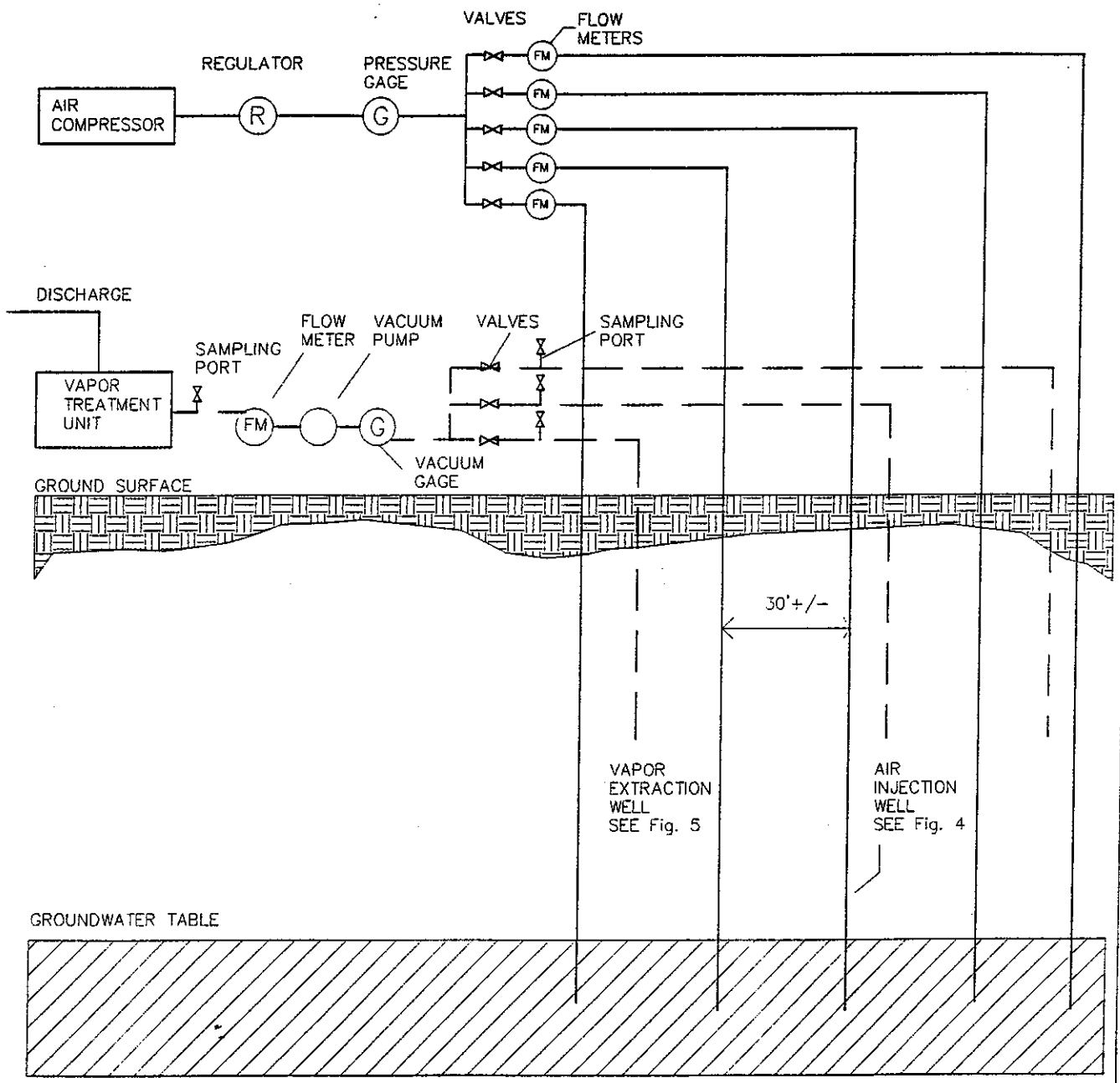
4. PHASE I GROUNDWATER REMEDIATION

4.1 Design

The groundwater remediation will be performed using an in situ air sparging system in association with a soil vapor extraction system. The overall schematic design of the system is shown in Figure 5. Air will be pumped into the saturated zone through a series of air injection wells. Dissolved, sorbed, and free phase PCE will volatilize and be transported by the buoyancy effect into the vadose zone. Vapor extraction wells, installed in the vadose zone above the area of groundwater contamination, will collect the vapors for treatment by an activated charcoal vapor treatment unit.

4.2 Vapor Extraction Wells

The vapor extraction well design is shown in Figure 6. The wells will be constructed of



NOT TO SCALE

LAST EDITED BY: E. DIEGEL e-mail: eymund@panix.com
FILE NAME: HOME DEPOT drawings FORMAT: ACAD r.13
FILE LOCATION: 3rd Fl. Cad St., D:/FILES/EYMUND

PROJECT # 8009

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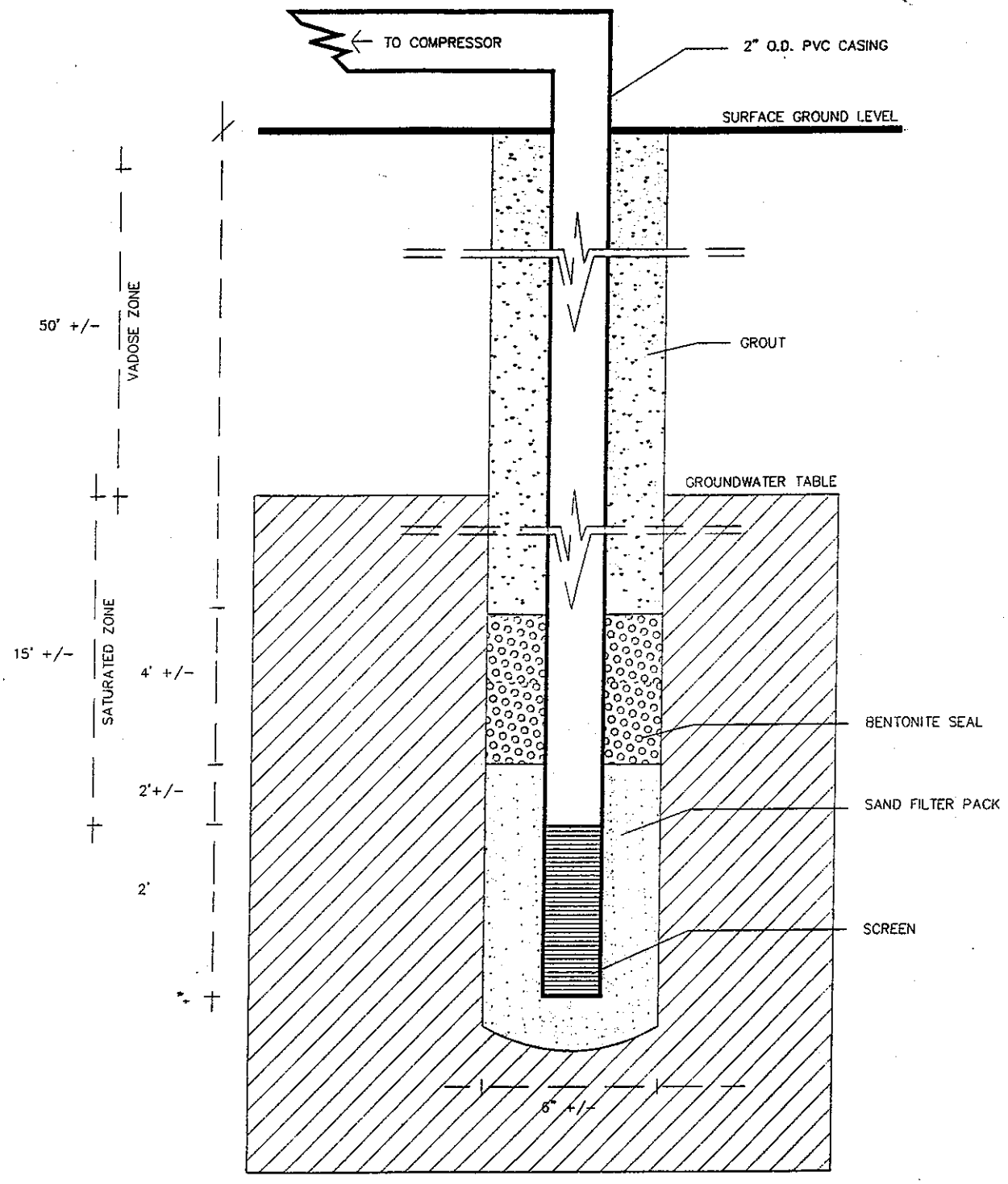
AIR SPARGING / VAPOR EXTRACTION SYSTEM SCHEMATIC FOR HOME DEPOT, REGO PARK

ISSUE: 1
SHEET: 1 OF 1

FIGURE NUMBER: 5



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AIR INJECTION WELL
HOME DEPOT, REGO PARK

ISSUE: 1
SHEET: 1 OF 1

FIGURE NUMBER: 6

two-inch O.D. PVC casing with a ten-foot screen. The bottom of the screen will be placed about ten feet above the groundwater table to accommodate possible variations in the groundwater level, including the probable rise in the groundwater level resulting from reducing the pressure in the vadose zone. To prevent atmospheric air from leaking into the well, the area above the filter pack will be sealed with about four feet of bentonite, and then grouted up to the ground surface, a space of about thirty feet.

At the beginning of the construction of the remediation system, two vapor extraction wells will be constructed about sixty feet apart. A vacuum pump will be attached to one well, and the pressure response in the other well will be measured. The soil permeability to vapor flow, and the radial distance in which vapor flow is induced can then be calculated using the method described by Johnson et.al. (Ground Water Monitoring Review, Spring 1990). This value will be used to calculate the spacing between the vapor extraction wells.

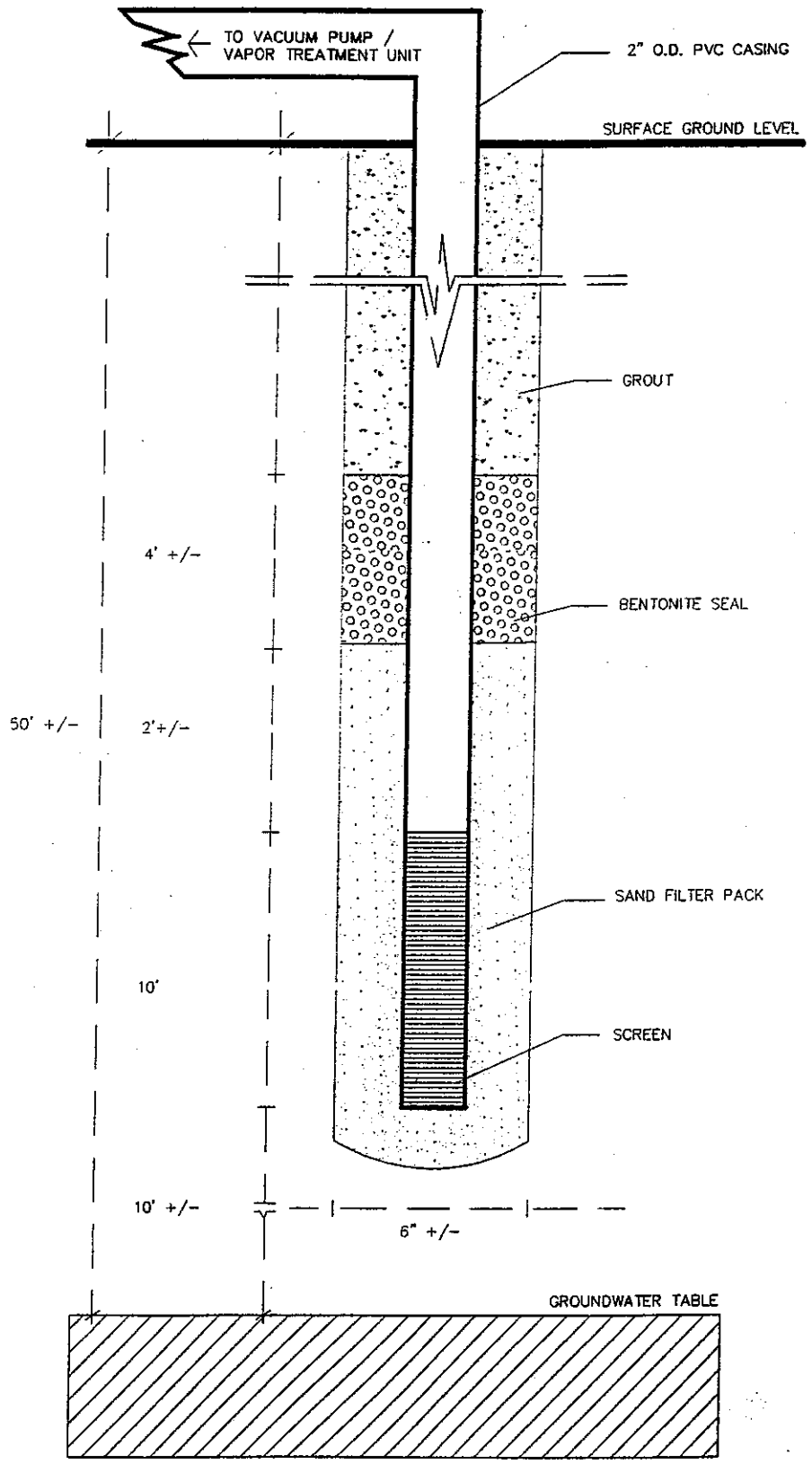
4.3 Air Injection Wells

The air injection well design is shown in Figure 7. The wells will be constructed of two-inch O.D. PVC casing with a two-foot screen. The top of the screen will be placed about fifteen feet below the groundwater table. Sampling of soil below the groundwater level has indicated that the PCE contamination is concentrated within a few feet of the groundwater interface. Based on both laboratory studies and experience in the field, locating the screen 15 feet below the interface is sufficient to provide a maximum dispersion of air in the contaminated area (Reddy, et. al., "A Review of In-Situ Air Sparging for the Remediation of VOC-Contaminated Saturated Soils and Groundwater", Hazardous Waste and Hazardous Materials, v.12(2) 1995; Marley, et. al., "The Application of In Situ Air Sparging as an Innovative Soils and Groundwater Remediation Technology", Ground Water Monitoring Review, Spring 1992). To prevent injected air from "short circuiting" up along the well casing, the area above the filter pack will be sealed with about four feet of bentonite, and then grouted up to the ground surface, a space of over sixty feet.

No satisfactory method has been reported for calculating the ideal spacing between air injection wells. The reviews cited above report successful systems with injection well spacings ranging from 10 to 150 feet. Laboratory studies suggest that the type of soil on the site, which is fairly heterogeneous and has neither very high nor very low permeability, provides the best conditions for air dispersion in the saturated zone. A spacing of 30 feet between injection wells is therefore considered conservative.

4.4 System Operation

The proposed layout for the groundwater remediation system is shown in Figure 8. As noted above, the spacing for the vapor extraction wells is tentative, and the actual spacing will be



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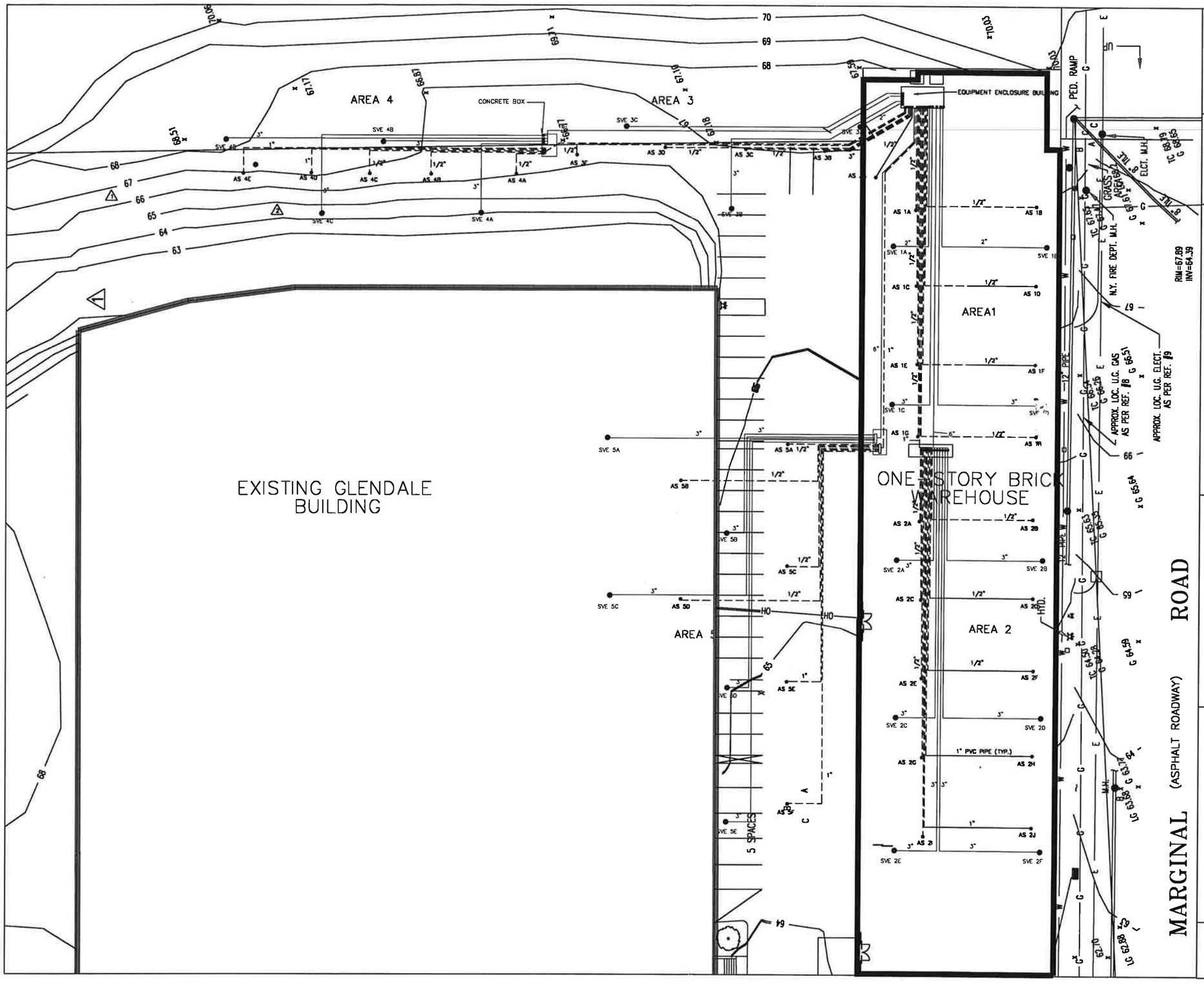
VAPOR EXTRACTION WELL HOME DEPOT, REGO PARK

ISSUE: 1
SHEET: 1 OF 1

FIGURE NUMBER: 7



prepared for:
HOME DEPOT U.S.A. INC.

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AS 5B — AIR SPARGING WELL
SVE 5A — SOIL VAPOR EXTRACTION WELL
SOIL VAPOR EXTRACTION PIPES
AIR SPARGING PIPES

SCALE: 1" = 30'

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FILE NAME: HD AIR SPARGING PLAN FORMAT: ACAD r.14					
FILE LOCATION: COLLEEN: HOME DEPOT\SURVEY\HD DETAILS					
4	MAY/99	CB	CB	EXTENSION	AF
3	SEPT/98	CB	CB	ISSUE WITH REVISIONS	AF
2	APR/98	CB	CB	ISSUE WITH REVISIONS	AF
1	FEB/98	CB	CB	PRELIMINARY ISSUE	AF
ISSUE	DATE	ORIG	BY	DESCRIPTION	CHKD
LOCATION: QUEENS, NY				PROJECT NO: 08009-0001	

DRAWING TITLE:

AIR SPARGING AND SOIL VAPOR EXTRACTION REMEDIATION SYSTEM

HOME DEPOT- REGO PARK
Woodhaven Blvd & 73rd Ave.
Queens, N.Y.

1 OF 1

8

based on a soil permeability test. After demolition of the Glendale building and completion of the supplemental groundwater testing described in Section 5 below, the system will be extended into the portion of the Glendale property affected by the plume.

During the system start-up, the blower pressure will be set and adjusted to maintain an average air flow of about 10 to 15 scfm in each air injection well. The vacuum pump will be set to maintain a total vapor extraction flow rate from 50 to 100 percent greater than the total rate of air injection. This will maintain a negative pressure in the vadose zone over the contamination area and prevent contaminants from being spread to unimpacted areas.

The vapor concentration in the extracted air will be monitored with an on-line total hydrocarbon analyzer calibrated to PCE. In addition, the following system operating parameters will be measured on a regular basis:

Air Injection System - pressure, temperature, air flow (in individual injection wells).

Vapor Extraction System - pressure, temperature, vapor flow, vapor concentration in individual extraction wells, discharge vapor concentration.

4.5 Remediation Groundwater Monitoring

Groundwater monitoring will be performed in the existing downgradient wells, and in new monitoring wells installed in the remediation area. A new monitoring well will be installed for each 5,000 to 10,000 square feet of area covered by the sparging system. Sampling will be performed at 30-day intervals after the start-up of the remediation system. All groundwater samples will be analyzed for volatile organic compounds (VOCs) by NYSDEC ASP Method 91-1 by a New York State Department of Health ELAP-certified laboratory. A report will be submitted to DEC every 30 days giving the results of the groundwater analyses and a report on the operation of the remediation system. If the month-to-month sampling results stabililize, DEC will be asked for permission to extent the sampling interval.

The remediation system will operate until asymptotic contaminant levels are reached in the groundwater (i.e. PCE levels in extracted air more than 90 percent below initial concentrations). At that point, the vapor extraction wells will be cleaned out, and the system will be reactivated. If monitoring at the end of 30 days indicates no improvement in recovery, then the system will be "pulsed" by turning it off for two weeks and then back on for two weeks. Pulsing will be continued until asymptotic conditions are reached, and for a minimum of two four-week cycles. At that point, operation of the system will be terminated and post-remediation monitoring will begin as described in Section 9.

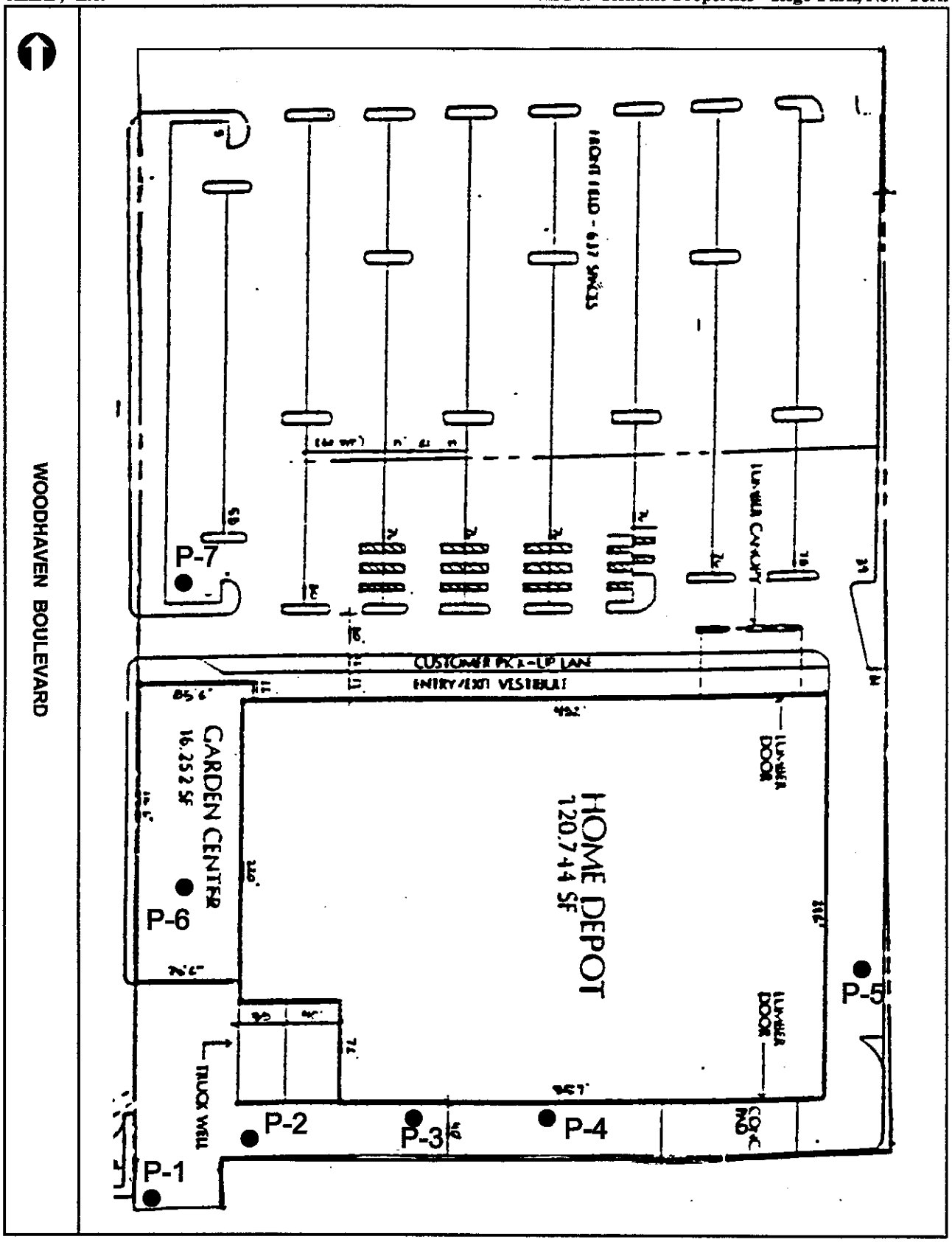


FIGURE 9
REMEDIATION MONITORING WELL LOCATIONS

5. SUPPLEMENTAL SOIL AND GROUNDWATER TESTING

5.1 Purpose

The soil gas survey performed under the Glendale building detected organic vapors at several locations, and low levels of PCE were detected in the four soil samples collected at widely spaced locations under the building floor slab. The presence of low levels of PCE in samples from locations throughout the Glendale building suggests that PCE has spread through the vapors trapped under the slab. The source could either be the plume passing under the building from the ADI property or a release of PCE somewhere within the Glendale building. Groundwater analyses from the monitoring wells to the south and southeast of the Glendale building show the presence of PCE, but do not conclusively indicate whether all the PCE originates from the release in the ADI site, or whether there is a separate source of PCE on the Glendale site.

The supplemental sampling program will be aimed at determining whether there has been a PCE release within the Glendale building, locating any areas under the Glendale building where soil remediation is required, and delineating the portion of the Phase II area where groundwater remediation is required. This sampling will begin when the Glendale building is demolished.

5.2 Sampling Plan

Following demolition, the extent of contamination in the soil directly beneath the slab of each building will be delineated by visual inspection, and by headspace analysis of soil samples using a photoionization detector (PID). Headspace analysis will be performed on a 25-foot grid.

If no soil contamination is located, then confirmatory soil samples will be collected from the two well locations and one boring location within the building footprint at 0-2, 4-6, and 8-10 foot depths and at the groundwater interface and 10 feet above the groundwater interface. If apparent soil contamination is located, DEC will be notified and one of the proposed soil borings/monitoring wells will be relocated to the area of the release. Soil samples will be collected from this location at 0-2, 2-4, 4-6, 6-8, 8-10, foot depths and at the groundwater interface and 10 feet above the groundwater interface. The soil samples will be analyzed for volatile organic compounds in accordance with NYSDEC ASP Category B 95-1.

Four additional groundwater monitoring wells will be installed and developed at the locations shown in Figure 3 to delineate the lateral extent of contamination in the shallow aquifer. The groundwater samples will be analyzed for volatile organic compounds in accordance with NYSDEC ASP Category B 95-1. The wells will be sampled in accordance with NYSDEC sampling protocol, as described in Technical and Administrative Guidance Memorandum #4007: Phase II Investigation Generic Work Plan; DEC Division of Hazardous Waste Remediation, 1988.

5.3 Sampling Methodologies

5.3.1 Soil Sampling

Soil samples will be obtained by a steel, 24-inch long, 2-inch in diameter split-spoon sampler that will be driven through the subsurface soils ahead of a hollow-stem (4.25-inch inside diameter) auger that bores into the soil to just above the desired sampling depth. The split-spoon sampler will be driven through the next 2 feet of soil to obtain the surface sample.

All samples will be containerized and stored in accordance with NYSDEC sampling protocols. Each container will be properly sealed, labeled, and placed in a refrigeration unit for transport to the laboratory. A record of each sample, including notation of any odors, color, or sample matrix, will be kept in the sampler's field log book. A chain of custody will be maintained throughout the field sampling, transport of samples to the laboratory, and during lab analysis.

5.3.2. Groundwater Sampling

The new monitoring well will be drilled using a hollow-stemmed auger and will consist of 2-inch Schedule 40 PVC casing in a 6¼-inch augured hole. A 10-foot PVC screen (0.020 inch slot) will be installed in the top 8 feet of groundwater. A filter pack of sand (US Std sieve sizes 30 to 8) will be placed in the annular space around the screens and will extend 2 feet above the screen.

The annular area around the well casing will be sealed with bentonite pellets for an interval of 2 feet above the filter pack. A grout, consisting of a cement and bentonite mixture or an anti-shrink mixture, will then extend from the bentonite pellet seal to a level 2 feet below ground. The remaining annular space will be sealed with a concrete cap and well apron (expanding cement). A locking well cap will be installed upon completion of the well.

The wells will be developed the day after they are drilled by pumping. Dedicated PVC tubing will be used. The well will be developed until the turbidity of the water sample, as measured by a nephelometer, becomes less than 50 Nephelometric Turbidity Units (NTU) or at least 15 well volumes of groundwater have been pumped out. The new wells will not be sampled for at least seven days after development.

Before sampling the new wells, water levels will be measured using an electronic water level indicator. A dedicated bailer or a submersible sample pump will be used for sample collection. A minimum of three well volumes will be purged from the well before sampling. Samples will not be collected until the water is visually free of suspended materials and the pH, temperature, and conductivity readings have stabilized.

All water samples will be containerized and stored in accordance with applicable EPA or NYSDEC analytical protocols. After collection, each container will be properly labeled, sealed, and refrigerated for shipment to the laboratory. All sampling equipment will be decontaminated before its use.

The well locations and their elevations will be surveyed. Using these data and the measured water levels, the previous hydraulic gradient map will be modified as necessary to confirm the direction of groundwater flow on the site.

6. PHASE II SOIL REMEDIATION

If significant soil contamination (PCE > 1400 parts per billion) is discovered on the Glendale property, then Phase II soil remediation will be performed using the same methodology as the Phase I soil remediation described in Section 3 above.

7. PHASE II GROUNDWATER REMEDIATION

If evidence of a separate release of PCE is discovered on the Glendale property, then a design for a Phase II groundwater remediation system for the second release will be prepared for DEC's review. The system will use the same methodology as the Phase I groundwater remediation system described in Section 4 above.

8. UNDERGROUND STORAGE TANKS

8.1 Underground Storage Tanks on the Site

The following underground storage tanks have been identified on the site:

ADI Property

Size - Unknown capacity
Contents - formerly fuel oil
Location - situated beneath the western central portion of the building.
Status - inactive.
Compliance - unknown.
Date Installed - unknown
Visual Evidence - fill port and vent pipe identified outside the western central portion of the

building; access manway identified within warehouse area. Reportedly this tank was abandoned in-place in 1978

Glendale Building

Size - 10,000-gallon capacity.
Location - situated beneath the western central portion of the building.
Contents - #4 fuel oil.
Status - active.
Compliance - unknown.
Date Installed - 1952-1953.
Visual Evidence - fill port and vent pipe identified outside the western central portion of the building; access manway identified within warehouse area.

Size - 10,000-gallon capacity.
Location - situated beneath the western central portion of the building.
Contents - #4 fuel oil.
Status - active.
Compliance - unknown.
Date Installed - 1952-1953.
Visual Evidence - fill port and vent pipe identified outside the western central portion of the building; access manway identified within warehouse area.

Previous site testing programs have detected no widespread soil contamination by petroleum products, and no petroleum-related contamination in the groundwater. Localized soil contamination may be present in the tank areas.

8.2 Underground Storage Tank Removals and Soil Remediation

All tanks will be cleaned, removed and disposed of in accordance with accepted industry standards and applicable Federal, State, and local regulatory agency requirements. Typical tank removal procedures are summarized below.

1. Empty the tanks of any remaining fuels and pumpable tank bottoms.

2. Excavate around the tank with care to avoid release of tank and piping contents. Hand excavation around tanks may be necessary. The sides of all excavated areas will be properly stabilized in accordance with OSHA regulations. Continuously monitor the excavated areas for the presence of flammable, toxic or oxygen deficient atmosphere.

3. Purge tanks of all flammable vapors. An access hole will be cut in the tanks and the tanks

thoroughly cleaned of residual liquids and sludges.

4. Remaining fuels, loose slurry, sludge materials and wastewater will be collected in DOT-approved drums, sampled and analyzed for disposal characterization. After disposal characterization, waste material will be removed and disposed of in accordance with applicable regulations.

5. Remove the tanks and all associated piping from the ground and clean the outside of the tanks. The tanks and piping will be rendered "not reusable," removed from the site and disposed of according to applicable regulations with proper documentation. Remove and dispose of all concrete tank support structures or vaults as encountered. If concrete is contaminated by gasoline or petroleum product, the concrete will be stockpiled in a separate pile and disposed of as a regulated waste.

6. After tanks are removed, examine for evidence of petroleum releases in accordance with New York State Department of Environmental Conservation, Division of Spills Management Spill Prevention Operations Technology Series (SPOTS) Memo No. 14 "Site Assessments at Bulk Storage Facilities". If soil contamination is present, excavate and remove contaminated soils from the tank areas, stockpile soils on plastic sheeting and cover with well-secured plastic sheeting. After contaminated soil removal, collect soil samples at each sidewall and at the bottom of the for analytical testing as specified in the New York State Department of Environmental Conservation, Bureau of Spill Response, STARS Memo No. 1, "Petroleum-Contaminated Soil Guidance Policy", August 1992.

7. Previous testing detected petroleum sludges in a drain in the loading area just north of the ADI building. This sludge and any similar material found on the site will be cleaned out and disposed of with the tank bottom sludge.

8. Contaminated soils will be disposed of in accordance with the NYSDEC "Petroleum-Contaminated Soil Guidance Policy".

9. POST-REMEDIATION MONITORING

When the remediation system is no longer effective, as described in Section 4.5 above, monitoring will be performed to determine whether contaminant levels have been reduced to acceptable levels. Groundwater will be sampled at the locations shown in Figure 9. Locations P-2 and P-6 are at the locations of existing wells which show the highest levels of PCE. P-1, P-3, P-4, and P-5 are downgradient wells, and P-7 is an upgradient well. Monitoring will be performed immediately following the suspension of operations of the groundwater remediation system, and repeated on a semiannual basis for one and a half years.

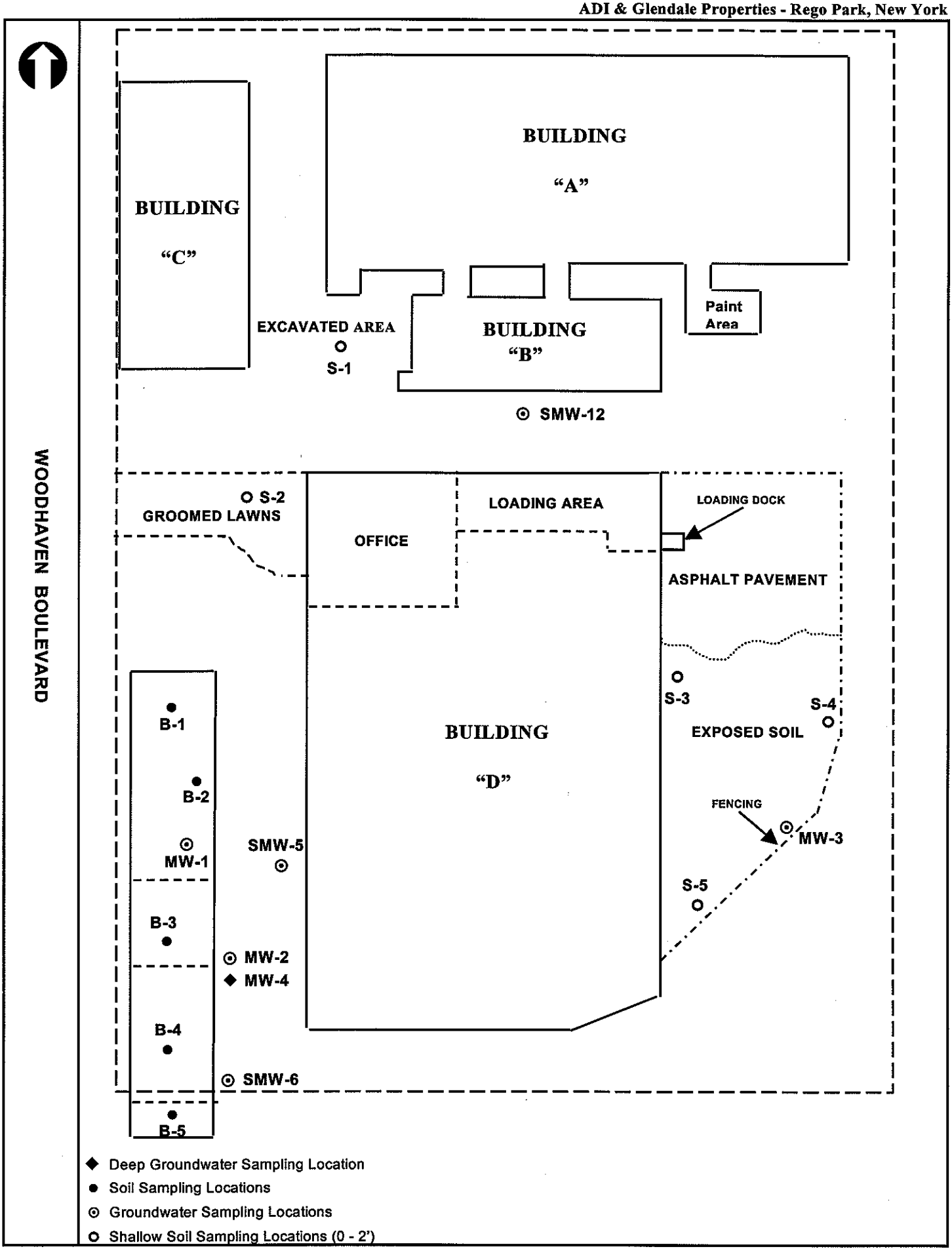
In addition, soil samples will be collected at any areas where contingency soil remediation is performed, i.e. where soil contamination extends greater than 10 feet below the surface. A soil boring will be performed at a distance of 15 to 20 feet from each vapor extraction well and samples will be collected from depths of 10-12, 20-22, and 45-47 feet below the surface.

All soil and groundwater samples will be analyzed for volatile organic compounds in accordance with NYSDEC ASP Category B 95-1.

If the concentrations of contaminants in the soil and groundwater can be demonstrated to be sufficiently protective of human health and the environment given the current and potential uses of the aquifer, then the remediation work will be concluded. This finding will be based on a demonstration that groundwater standards will not be exceeded at the first property line of a downgradient residential property. If the PCE levels achieved after remediation are not sufficient, then a plan for further monitoring and/or resumption and possible expansion of the operation of the remediation system will be submitted.

APPENDIX A

SUMMARY OF PRIOR TESTING DATA



SAMPLING LOCATIONS - October 1996

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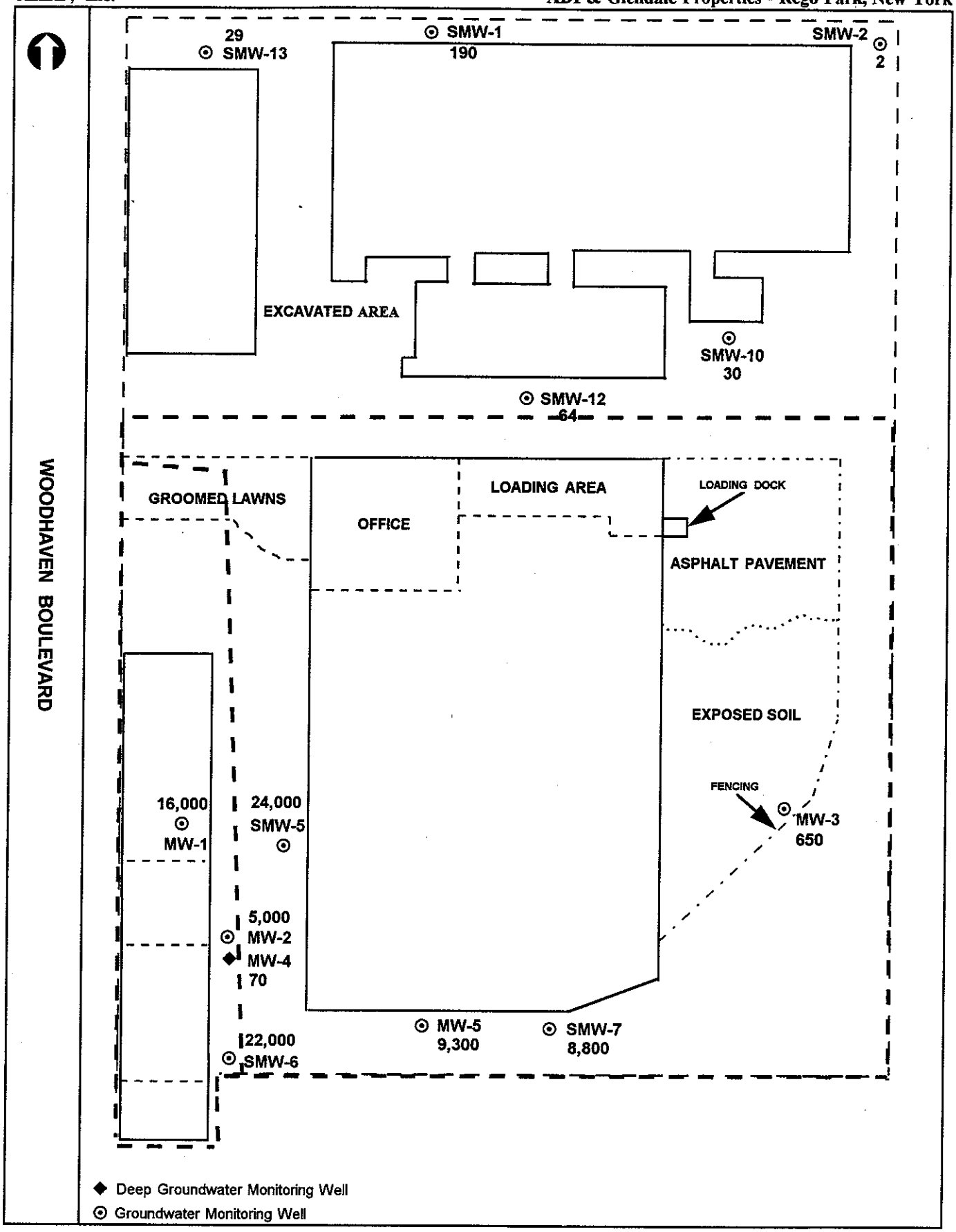
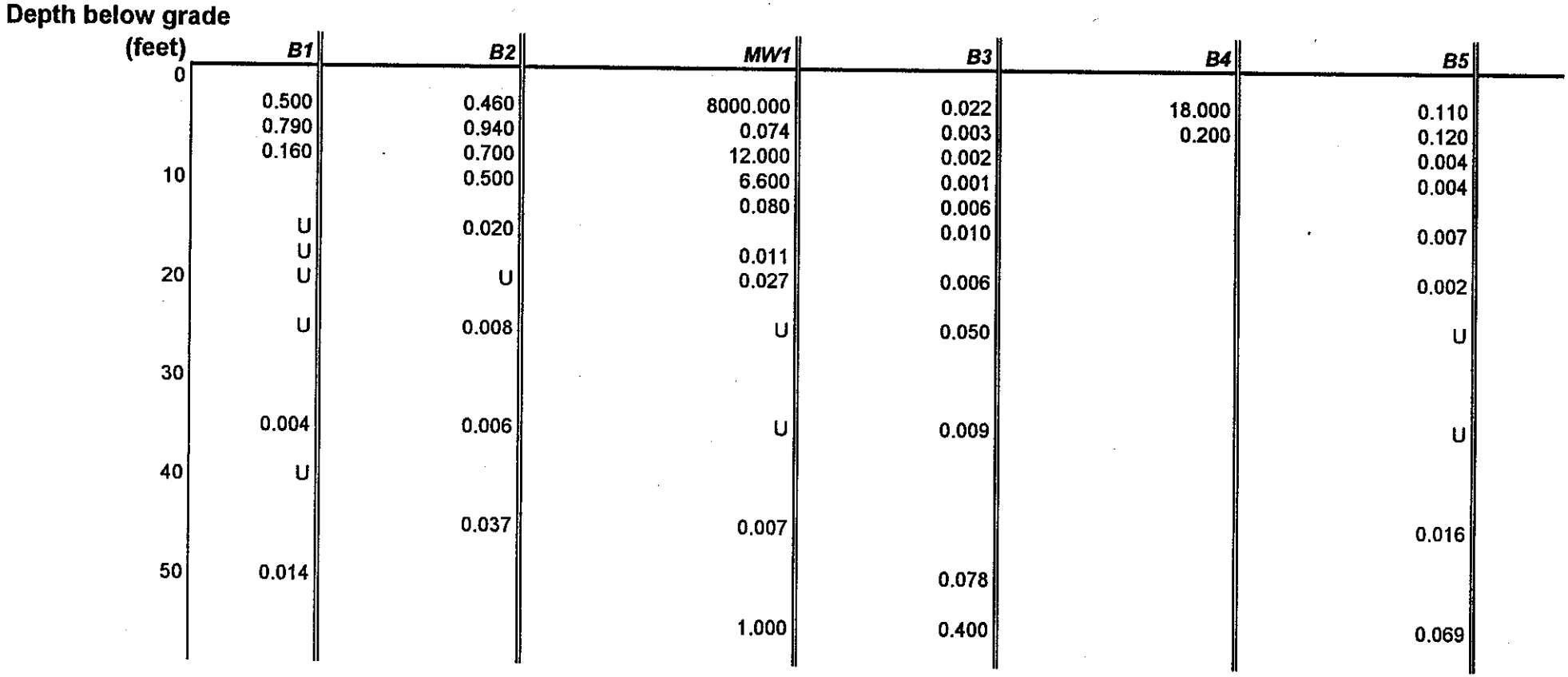


PCE CONCENTRATIONS IN GROUNDWATER (PPB) 10/96 & 3/97 SAMPLES

Profile of tetrachloroethene concentrations in soil under ADI warehouse (parts per million)



U = Undetected

APPENDIX B

SITE HEALTH AND SAFETY AND COMMUNITY AIR MONITORING PLAN

Health and Safety and Community Air Monitoring Plan

Remedial Action at ADI and Glendale Properties
Rego Park, Queens, New York

Prepared By:

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117 East 29th Street
New York, New York 10016
(212)696-0670

April 1997

TABLE OF CONTENTS

List of Figures

1. INTRODUCTION

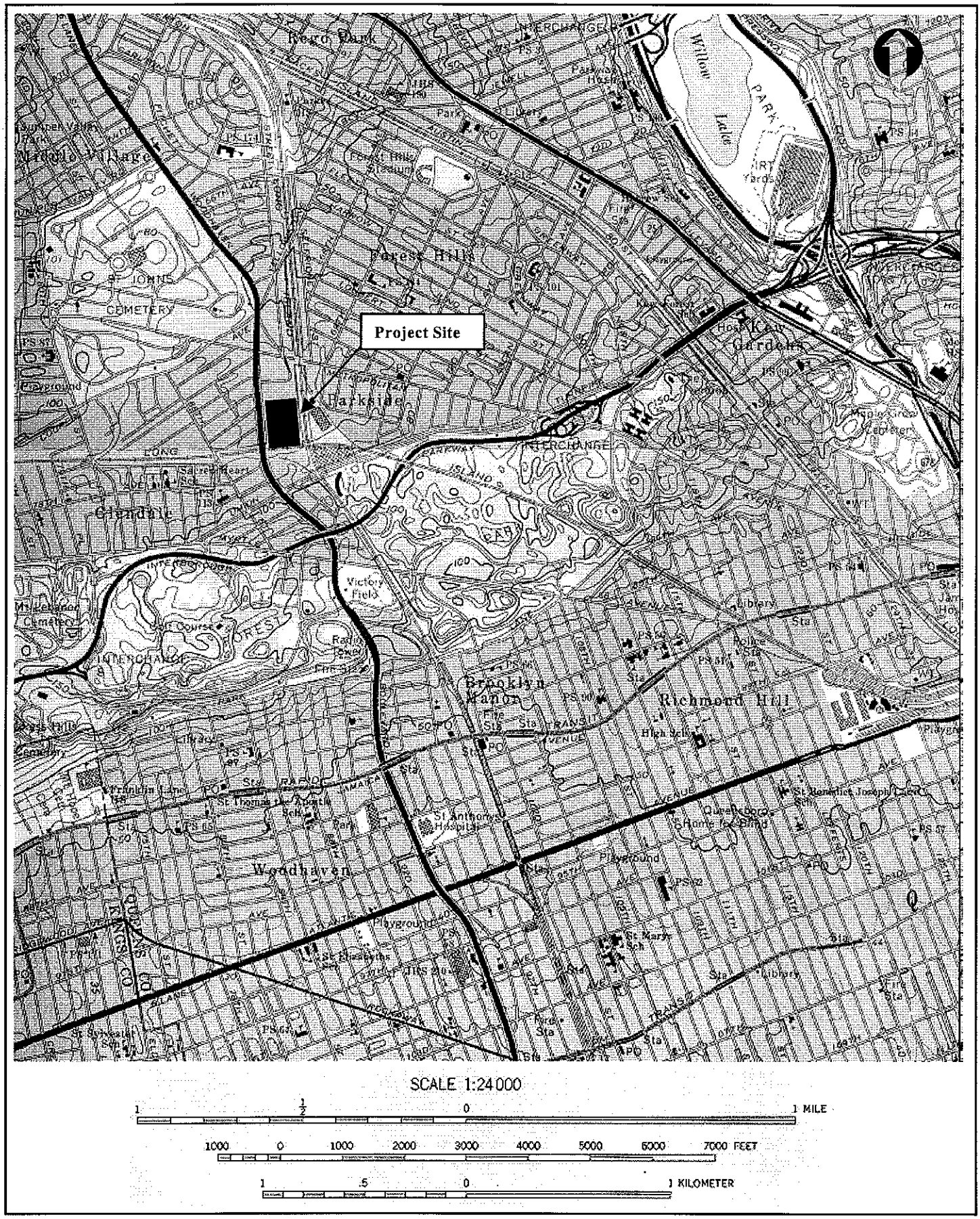
The ADI and Glendale properties are located in Rego Park, Queens, on the east side of Woodhaven Boulevard to the south of 73rd Avenue (see Figure 1, Project Location Map). The existing buildings at the site are shown in Figure 2. The ADI building was constructed between 1936 and 1950. It was first used as a steel warehouse and then, from 1967 to 1977, as a knitting mill. Since 1977 it has been used as office/warehouse space. The Glendale building has been used as office/warehouse space since its construction in 1952-53. There are also known to be three underground petroleum storage tanks (one beneath the western central portion of the ADI property and two beneath the western central portion of the Glendale property). However, the removal of these tanks will be covered by a separate Health and Safety Plan (see Section 2E below)

Various investigations since 1995 have found soil contaminated with tetrachloroethene (PCE) beneath the ADI building as well as PCE groundwater contamination (the water table is approximately 55 feet below grade) with the highest levels beneath the ADI building. The source of the contamination is believed to be past leakage from the knitting factory, though there is groundwater contamination in other areas including areas presumed to be upgradient of the site. Testing did not reveal widespread soil or groundwater contamination by petroleum products. However, localized soil contamination may be present.

A Remedial Work Plan has been developed to:

1. Remediate the soil under the ADI building once the building is demolished and the slab is removed;
2. Investigate soil conditions under the Glendale building and remediate any contamination detected in that area;
3. Remediate the groundwater using an in-situ air sparging system; and
4. Remove underground storage tanks in accordance with industry standards and applicable regulations.

The purpose of this Health and Safety Plan (HSP) is to protect field personnel and others during the implementation of the Remedial Work Plan. It is in conformance with the various Occupational Safety and Health Administration (OSHA) standards and other applicable regulations governing site investigation operations, and all AKRF, Inc. policies and procedures on health and safety. It has been prepared to establish practices and procedures to protect the health of AKRF personnel and others during implementation of the Remedial Work Plan.



Source: USGS Topographic Map - Jamaica Quadrangle: New York Dated 1966; Photorevised 1979. Contour Interval 10 feet. Quadrangle Longitude: 73° 45' Quadrangle Latitude: 40° 37' 30" National Geodetic Vertical Datum of 1929.

FIGURE I.1
PROJECT LOCATION MAP

homedepo.ppt

2. HEALTH AND SAFETY GUIDELINES AND PROCEDURES

A. HAZARD EVALUATION

Existing environmental conditions on the site were summarized in the Voluntary Cleanup Site Assessment Report, dated May 1996 and in reports of subsequent sampling activities dated October 1996 and April 1997. Results of the soil sampling indicated that significant PCE contamination appeared to be confined to the top few feet under the ADI building with levels of up to 130 parts per million (ppm). Levels of PCE in groundwater were elevated in all samples. The highest levels (up to 2.3 ppm) were found to the east of the ADI building. The contamination appeared to be confined to the top few feet of groundwater i.e., approximately 50 to 60 feet below grade. These contaminants, without remediation, represent a potential health and safety hazard to AKRF, Inc. personnel, the drilling crew, and others during soil removal, drilling and well installation activities. Potential exposure pathways are inhalation of vapors, dermal contact, and accidental ingestion. In addition, removal of the underground petroleum storage tanks also has the potential for exposure to volatile organic compounds.

B. DESIGNATED PERSONNEL

AKRF will appoint one of its on-site personnel as the on-site Health and Safety Officer (HSO). This individual will be responsible for the implementation of the HSP. The HSO will have a 4-year college degree in occupational safety or a related science/engineering field, and 2 years of experience in implementation of air monitoring and hazardous materials sample programs. The HSO will have completed a 40-hour training course that meets OSHA requirements of 29 CFR Part 1910, Occupational Safety and Health Standards.

The HSO will be present on-site during the conduct of all field operations, and will be responsible for all health and safety activities and the delegation of duties to the field crew. The HSO has stop-work authorization, which he/she will execute on his/her determination of an imminent safety hazard, emergency situation, or other potentially dangerous situation. If the HSO must be absent from the field, he/she will designate a replacement who is familiar with the health and safety plan, air monitoring, and protection equipment.

C. TRAINING

All those who enter the work area must recognize and understand the potential hazards to health and safety. All field personnel must attend a training program, whose purpose is to:

- Make them aware of the potential hazards they may encounter;
- Provide the knowledge and skills necessary for them to perform the work with minimal risk to health and safety;
- Make them aware of the purpose and limitations of safety equipment; and
- Ensure that they can safely avoid or escape from emergencies.

Each member of the field crew will be instructed in the above objectives before he/she goes onto the site. The HSO will be responsible for conducting the training program.

D. MEDICAL SURVEILLANCE PROCEDURE.

All AKRF, Inc. and subcontractor personnel performing field work at the site are required to have passed a complete medical surveillance examination in accordance with 29 CFR 1910.120 (f). A physicians medical release for wok will be confirmed by the HSO before an employee can begin site activities. The medical examination will, at a minimum, be provided annually and upon termination of hazardous waste site work.

E. SITE WORK ZONES

In areas of concern, the work area must be divided into various zones to prevent the spread of contamination, ensure that proper protective equipment is donned, and provide an area for contamination.

The Exclusion Zone is defined as the area where soil contamination occurs or could occur. The Exclusion Zone is the area where the PCE-contaminated soils are generated as the result of soil removal activities. In is anticipated that soils will be stockpiled to the north of the ADI building. The Contamination Reduction Zone (CRZ) is the area where decontamination procedures take place and is located next to the Exclusion Zone. The Support Zone is the zone area where support-facilities-such as vehicles, a field phone, fire extinguisher, and first aid supplies-are located. The emergency staging area (part of the Support Zone) is the area where all workers on site would assemble in the event of an emergency. These zones shall be designated daily, depending on that day's activities. All field personnel will be informed of the location of these zones before work begins.

Control measures such as "Caution" tape and traffic cones will be placed around the perimeter of the work area when work is being done in the areas of concern to prevent entrance onto the area with exposed soil.

Where there is a need for excavation or drilling in areas where shallow contaminated soils are not anticipated, the air monitoring set out below will still be implemented.

Note on Underground Storage Tank Removal: Removal of underground storage tanks will be accomplished by a separate contractor, who will be responsible for preparing and implementing a site-specific Health and Safety Plan which will be provided to NYS DEC prior to any tank removal activities It will address all tasks including excavation, removal, cleaning, and disposal of the tanks in accordance with OSHA requirements and the most current publications of the following documents, regulations, codes, and memoranda:

- United States Environmental Protection Agency (USEPA): "Underground Storage Tank; Technical Requirements," (40 CFR 280)
- Occupational Safety and Health Administration (OSHA): "Regulation concerning Construction," (29 CFR 1910 and 1926)
- NYDEC STARS Memo #1, Petroleum-Contaminated Soil Guidance Policy (August 1992)
- NYSDEC Petroleum Bulk Storage Regulation (6 NYCRR Part 613.9(b))
- NYSDEC Petroleum-Contaminated Soil Guidance Policy (August 1992)
- NYSDEC Site Assessment at Bulk Storage Facilities: (SPOTS Memo #14, August 1994)
- New York City Administrative Code (Title 27, Chapter 4): Fire Prevention Code
- National Fire Prevention Association (Volume 30): "Flammable and Combustible Liquid Codes"
- National Fire Protection Association (Volume 327): "Cleaning and Safeguarding Small Tanks and Containers"
- American Petroleum Institute, API-2015A, "A Guide for Controlling the Lead Hazard Associated with Tank Entry and Cleaning"
- American Petroleum Institute, API-2015, "Cleaning Petroleum Storage Tanks"
- American Petroleum Institute, API-1604, "Recommended Practice for Closure of Underground Petroleum Storage Tanks"

F. AIR MONITORING

An Organic Vapor Meter (OVM) will be used to perform air monitoring during all soil removal, drilling and well installation. The purpose of the air monitoring program is to avoid or minimize exposure of the field personnel and the public to potential environmental hazards in the soil and groundwater. Results of the air monitoring will be used to determine the appropriate response action, if needed. The OVM will be calibrated with isobutylene in accordance with the manufacturers recommendations.

Work Zone Air Monitoring

Real time air monitoring will be done, with the OVM, whenever soil removal or drilling is being performed. Measurements will be taken prior to commencement of work and for at least 1 minute

every 60 minutes during the work. Continuous monitoring will be undertaken when first exposing soils in areas where contamination is expected e.g., when removing the slab under the ADI building or around the underground storage tanks. These measurements will be made as close to the workers as practical and at the breathing height of the workers. The HSO shall set up the equipment and confirm that it is working properly. His/her designee may oversee the air measurements during the day. The initial measurement for the day will be performed before the start of work and will establish the background level for that day. The final measurement for the day will be performed after the end of work. The action levels and required responses are listed below.

ACTION LEVEL	RESPONSE ACTION
Less than 20 ppm above background	Continue work in Level D
Between 20 and 100 ppm above background	Upgrade to Level C Initiate perimeter air monitoring
More than 100 ppm above background*	Stop work. Resume work when source of vapors is abated and readings are less than 100 ppm above background

** OSHA's 8-hour time-weighted-average Permissible Exposure Limit (PEL) for PCE is 100 ppm*

Community Air Monitoring

During work, when air monitoring in the work zone indicates a need to conduct perimeter air monitoring, it will be performed as follows. Air quality will be monitored at two locations at the perimeter of the work area. One will be immediately upwind and the other will be downwind of the activity, half the distance between the perimeter of the work area and the closest potential public receptor (e.g., sidewalk, office worker etc.). Measurements will be taken for 1 minute every 60 minutes, with the OVM. The initial measurement will be performed when the action level listed above is triggered. Measurements will continue until the air monitoring in the work zone indicates that perimeter monitoring is no longer required, i.e., readings are less than 20 ppm above background in the work zone. The action levels and required responses are listed below.

ACTION LEVEL	RESPONSE ACTION
Less than 10 ppm above background *	Continue work

More than 10 ppm above background	Stop work until source of vapors is abated and readings are less than 10 ppm above background

** The NYSDEC Short Term Guidance (SGC) concentration for PCE is 11.7 ppm*

Response Actions

AKRF will respond to the results of the air monitoring in accordance with the actions specified above. Compliance with the specified response action for the listed action levels will ensure the protection of the health and safety of AKRF personnel and others during site activities.

G. PERSONAL PROTECTION EQUIPMENT

The personal protection equipment required for various kinds of site investigation tasks are based on 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response, Appendix B, "General Description and Discussion of the Levels of Protection and Protective Gear."

AKRF field personnel and other site personnel shall wear Level D personal protective equipment. During activities where is a chance of contact with contaminated materials modified Level D equipment will be worn. The protection will be upgraded to Level C if the results of the air monitoring indicates that Level C equipment is warranted.

Level D
Respiratory Protection: None
Protective Clothing: Coveralls, work shoes

Modified Level D
Respiratory Protection: None
Protective Clothing: Coveralls, work shoes, gloves

Level C
Respiratory Protection: Air purifying respirator with organic vapor cartridges.
Protective Clothing: Same as modified Level D

H. GENERAL WORK PRACTICES

To protect the health and safety of the field personnel, all field personnel will adhere to the guidelines listed below.

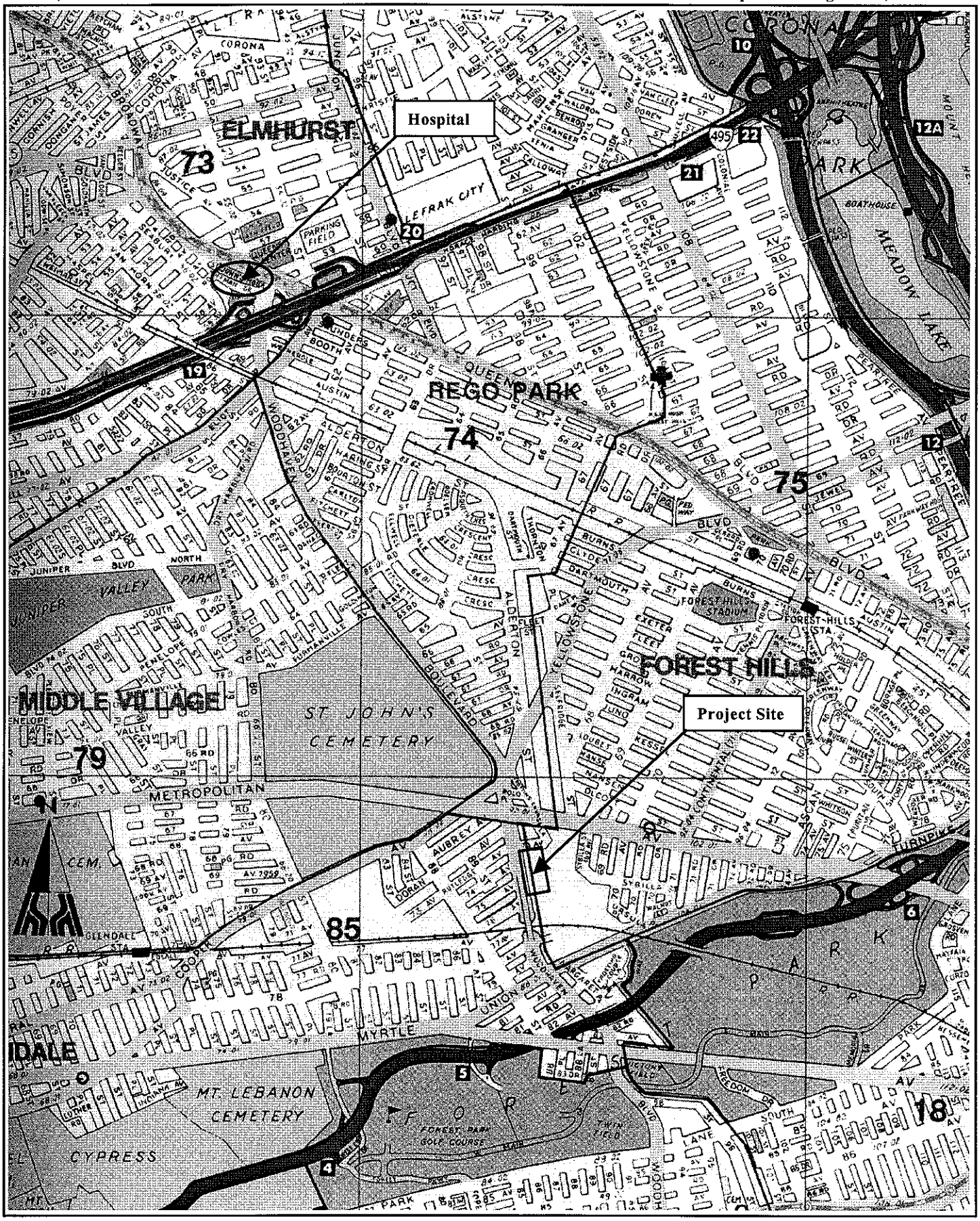


FIGURE 3

LOCATION OF NEAREST HOSPITAL

- Eating, drinking, chewing gum or tobacco, and smoking are prohibited, except in designated areas on the site. These areas will be designated by the HSO.
- Workers must wash their hands and face thoroughly on leaving the work area and before eating, drinking, or any other such activity. The workers should shower as soon as possible after leaving the site.
- Contact with contaminated or suspected surfaces should be avoided.
- Contact lenses should not be worn on-site.
- The buddy system should always be used; each buddy should watch for signs of fatigue, exposure, and heat stress.

I. EMERGENCY PROCEDURES AND EMERGENCY RESPONSE PLAN

The field crew will be equipped with emergency equipment, such as a first aid kit and disposable eye washes. In the case of a medical emergency, the HSO will determine the nature of the emergency and he/she will have someone call for an ambulance, if needed. If the nature of the injury is not serious—i.e., the person can be moved without expert emergency medical personnel—he/she should be driven to a hospital by on-site personnel. There will be an on-site field phone. The location of the nearest hospital, shown on Figure 3, is 90-02 Queens Boulevard, approximately one mile north of the site at the intersection of Woodhaven Boulevard and Queens Boulevard, just past the ramps for the Long Island Expressway. Telephone numbers are:

Ambulance 911 St. John's Queens Hospital (718) 558 1000

3. ACKNOWLEDGMENTS OF HSP

Below is an affidavit that must be signed by all workers who enter the site. A copy of the HSP must be on-site at all times and will be kept by the HSO.

AFFIDAVIT

I, _____ (name), of _____ (company name), have read the Health and Safety Plan (HSP) for the ADI and Glendale properties. I agree to conduct all on-site work in accordance with the requirements set forth in this HSP and understand that failure to comply with this HSP could lead to my removal from the site.

Signed: _____ Date: _____

APPENDIX C

DEED RESTRICTION

Frontier Abstract & Research Services, Inc.

30 West Broad Street Suite 100
Old City Hall/ Irving Place
Rochester, NY 14614

Invoice

DATE	INVOICE #
4/24/2012	312537

BILL TO
AECOM 100 Corporate Parkway Suite 341 Amherst, New York 14226

NET 30	COUNTY
Net 30	Queen

ITEM	DESCRIPTION	AMOUNT
Filing	5023367 Home Depot USA, Inc., 76-01 Woodhaven Blvd, New York	100.00
Fees Advanced		57.00
	Sales Tax	0.00

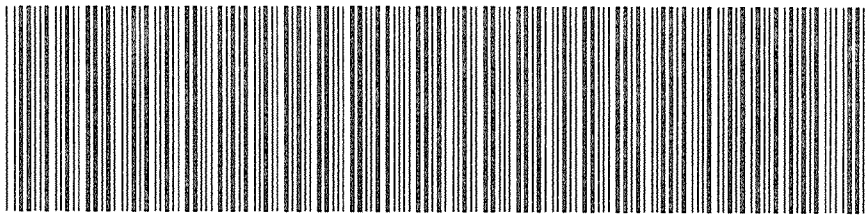
Thank you. This invoice is due and payable 30 days from invoice date.

Invoice Total $157.00

Open Balance Due $157.00

NYC DEPARTMENT OF FINANCE
OFFICE OF THE CITY REGISTER

This page is part of the instrument. The City Register will rely on the information provided by you on this page for purposes of indexing this instrument. The information on this page will control for indexing purposes in the event of any conflict with the rest of the document.



2012042400601001001E299E

RECORDING AND ENDORSEMENT COVER PAGE PAGE 1 OF 5

Document ID: 2012042400601001 Document Date: 04-17-2012 Preparation Date: 04-24-2012
Document Type: MISCELLANEOUS
Document Page Count: 4

PRESENTER:	**RETURN TO:**
FRONTIERABSTRACT	FRONTIERABSTRACT
30 WEST BROAD STREET	30 WEST BROAD STREET
SUITE 100	SUITE 100
ROCHESTER, NY 14614	ROCHESTER, NY 14614
585-955-6111	585-955-6111
tmortimer@frontierabstract.com	tmortimer@frontierabstract.com

PROPERTY DATA

Borough **Block** **Lot** **Unit** **Address**

Property Type:

CROSS REFERENCE DATA

CRFN_____ *or* Document ID_____ *or* _____ Year____ Reel ___ Page____ *or* File Number_____

PARTIES

PARTY 1:	**PARTY 2:**
HOME DEPOT USA, INC.	NYS DEPARTMENT OF ENVIRONMENTAL
2455 PACES FERRY ROAD, NW, BUILDING C-20	CONSERVATION
ATLANTA, GA 30339	93 HONORINE DRIVE
	DEPEW, NY 14043

FEES AND TAXES

Mortgage			Filing Fee:	
Mortgage Amount:	$	0.00	$	0.00
Taxable Mortgage Amount:	$	0.00	NYC Real Property Transfer Tax:	
Exemption:			$	0.00
TAXES: County (Basic):	$	0.00	NYS Real Estate Transfer Tax:	
City (Additional):	$	0.00	$	0.00
Spec (Additional):	$	0.00		
TASF:	$	0.00		
MTA:	$	0.00		
NYCTA:	$	0.00		
Additional MRT:	$	0.00		
TOTAL:	$	0.00		
Recording Fee:	$	57.00		
Affidavit Fee:	$	0.00		

RECORDED OR FILED IN THE OFFICE OF THE CITY REGISTER OF THE CITY OF NEW YORK

Recorded/Filed 04-30-2012 16:17
City Register File No.(CRFN):
2012000171722

City Register Official Signature

DECLARATION of COVENANTS and RESTRICTIONS

THIS COVENANT is made the 17th day of April 2012, by Home Depot U.S.A., Inc., a corporation organized and existing under the laws of the State of Delaware and having an office for the transaction of business at 2455 Paces Ferry Road, NW, Building C-20, Atlanta, Georgia 30339.

WHEREAS, The Home Depot Site on Woodhaven Blvd. & Metropolitan Avenue Site is the subject of a Voluntary Cleanup Agreement executed by Allborough Distributors, Inc and Glendale Holding Corp., as part of the New York State Department of Environmental Conservation's (the "Department's) Voluntary Cleanup Program, namely that parcel of real property located on 76-01 Woodhaven Blvd, in the City of New York, County of Queens, State of New York, which is part of lands conveyed by Allborough Distributors, Inc to Home Depot U.S.A., Inc. by deed dated July 17, 1997 and recorded in the City Registrar of the City of New York, Reel 4692, Page 0010, and that the parcel of real property located on 75-11 Woodhaven Blvd. in the City of New York, County of Queens, State of New York, which is part of the lands conveyed by Glendale Holdings, Inc to Home Depot, U.S.A., Inc. by deed dated July 17, 1997 and recorded in the City Registrar of the City of New York, Reel 4691, Page 2511, and hereinafter referred to as "the Property"; and

WHEREAS, on September 2008, Home Depot, U.S.A, Inc., requested that it be added as a Volunteer under the Voluntary Cleanup Agreement for the Property, which requested was accepted by the Department on October 15, 2008; and

WHEREAS, on February 3, 2012, Home Depot U.S.A, Inc. requested that the VCA be amended to include a 0.228-acre portion of lot 450, to which request was granted by the Department on February 28, 2012; and

WHEREAS, the Site is more particularly described in Appendix "A", attached to this declaration and made part hereof; and

WHEREAS, the Department approved a remedy to eliminate or mitigate all significant threats to the environment presented by the contamination disposed at the Property and such remedy requires that the Property be subject to restrictive covenants.

NOW, THEREFORE, Home Depot U.S.A., Inc., for itself and its successors and/or assigns, covenants that:

First, the Property subject to this Declaration of Covenants and Restrictions is as shown on a map attached to this declaration as Appendix "B" and made a part hereof.

Second, unless prior written approval by the Department or, if the Department shall no longer exist, any New York State agency or agencies subsequently created to protect the

environment of the State and the health of the State's citizens, hereinafter referred to as "the Relevant Agency," is first obtained, where contamination remains at the Property subject to the provisions of the Site Management Plan ("SMP"), there shall be no construction, use or occupancy of the Property that results in the disturbance or excavation of the Property which threatens the integrity of the engineering controls or which results in unacceptable human exposure to contaminated soils.

Third, the owner of the Property shall not disturb, remove, or otherwise interfere with the installation, use, operation, and maintenance of engineering controls required for the Remedy, which are described in the SMP, unless in each instance the owner first obtains a written waiver of such prohibition from the Department or Relevant Agency.

Fourth, the owner of the Property shall prohibit the Property from ever being used for purposes other than for Commercial or Industrial use , without the express written waiver of such prohibition by the Department or Relevant Agency.

Fifth, the owner of the Property shall prohibit the use of the groundwater underlying the Property without treatment rendering it safe for drinking water or industrial purposes, as appropriate, unless the user first obtains permission to do so from the Department or Relevant Agency.

Sixth, the owner of the Property shall provide a periodic certification, prepared and submitted by a professional engineer or environmental professional acceptable to the Department or Relevant Agency, which will certify that the institutional and engineering controls put in place are unchanged from the previous certification, comply with the SMP, and have not been impaired.

Seventh, the owner of the Property shall continue in full force and effect any institutional and engineering controls required for the Remedy and maintain such controls, unless the owner first obtains permission to discontinue such controls from the Department or Relevant Agency, in compliance with the approved SMP, which is incorporated and made enforceable hereto, subject to modifications as approved by the Department or Relevant Agency.

Eighth, this Declaration is and shall be deemed a covenant that shall run with the land and shall be binding upon all future owners of the Property, and shall provide that the owner and its successors and assigns consent to enforcement by the Department or Relevant Agency of the prohibitions and restrictions that the Voluntary Cleanup Agreement requires to be recorded, and hereby covenant not to contest the authority of the Department or Relevant Agency to seek enforcement.

Ninth, any deed of conveyance of the Property, or any portion thereof, shall recite, unless the Department or Relevant Agency has consented to the termination of such covenants and restrictions, that said conveyance is subject to this Declaration of Covenants and Restrictions.

IN WITNESS WHEREOF, the undersigned has executed this instrument the day written below.

By: _____

Print Name: Brett D. Soloway

Title: Sr. Counsel Date: 4-17-2012

STATE OF ~~NEW YORK~~ Georgia)

) s.s.:

COUNTY OF Cobb)

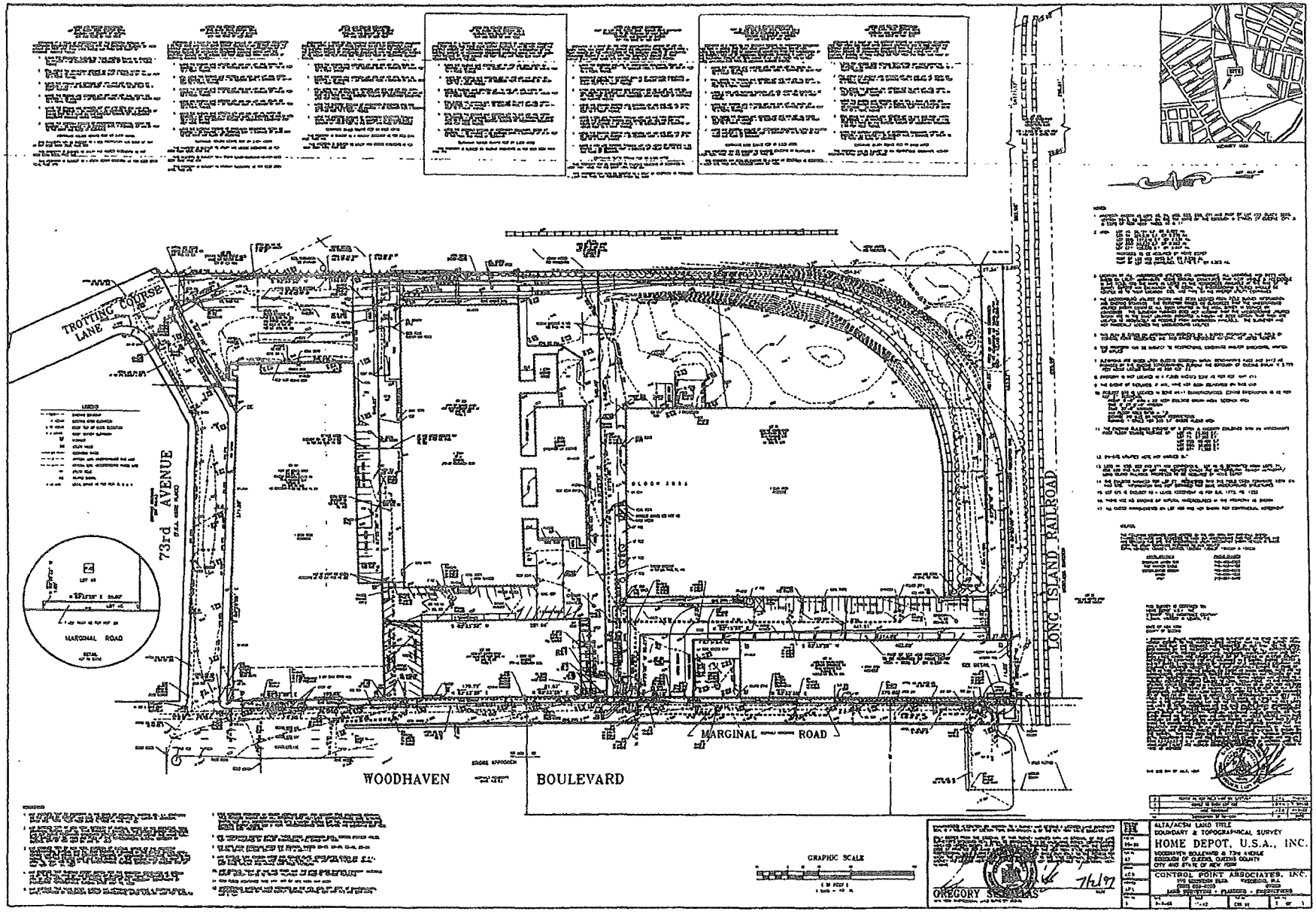
On the 17th day of April, in the year 2012 before me, the undersigned, personally appeared Brett D. Soloway, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

CONNIE D. ROCKWELL NOTARY PUBLIC MY COMMISSION EXPIRES OCTOBER 16, 2015 COBB COUNTY, GEORGIA

Connie D. Rockwell

Notary Public State of ~~New York~~ Georgia

SEAL


TROTTING COURSE LANE
73rd AVENUE
LONG ISLAND RAILROAD
MARGINAL ROAD
WOODHAVEN BOULEVARD
MARGINAL ROAD
GRAPHIC SCALE
ALTA/ACSM LAND TITLE
BOUNDARY & TOPOGRAPHICAL SURVEY
HOME DEPOT, U.S.A., INC.
WOODHAVEN BOULEVARD & 73rd AVENUE
BOROUGH OF QUEENS, QUEENS COUNTY
CITY AND STATE OF NEW YORK
CONTROL POINT ASSOCIATES, INC.
GREGORY SKOMORAS
7/1/97

APPENDIX D

HISTORIC PRE-REMEDIAL ACTION REPORTS

[SEE SEPARATE PDF FILE]

APPENDIX D

Historic Pre-Remedial Action Reports

1. Voluntary Cleanup, Supplementary Sampling Program Report, Home Depot Rego Park, New York, AKRF, Inc., October 1996.
2. Site Assessment Report, ADI and Glendale Properties, Rego Park, Queens, New York, AKRF, Inc., April 1997.

APPENDIX E

HISTORIC POST-REMEDIAL ACTION REPORTS

[SEE SEPARATE PDF FILE]

APPENDIX E

Historic Post-Remedial Action Reports

1. Soil Remediation Report, ADI Property, Rego Park, Queens, New York, AKRF, Inc., March 1999.
2. Phase II Investigative Report, Glendale Property, Rego Park, Queens, New York, AKRF, Inc., February 2000.
3. Supplemental Groundwater Investigation Report, Home Depot Rego Park, Queens, New York, AKRF, Inc., May 2005.
4. Progress Report – Home Depot Woodhaven Boulevard, Rego Park, New York, AKRF, Inc., July 2006.

APPENDIX F

EXCAVATION WORK PLAN

APPENDIX F – EXCAVATION WORK PLAN

F-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the Site owner or their representative will notify the Department. Currently, this notification will be made to:

Mr. Sadique Ahmed, P.E.

Environmental Engineer 1, Central Office

625 Broadway, 12th Floor Albany, New York 12233-7016

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent, plans for Site re-grading, intrusive elements or utilities to be installed below the site cover, estimated volumes of contaminated soil to be excavated and any work that may impact an EC;
- A summary of environmental conditions anticipated in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work; and
- A summary of the applicable components of this EWP.

Simple excavations may only require compliance with a portion of the EWP as applicable.

- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120;
- A copy of the contractor's health and safety plan, in electronic format, if it differs from the HASP provided in Appendix H of this SMP;
- Identification of disposal facilities for potential waste streams; and

- Identification of sources of any anticipated backfill, along with all required chemical testing results.

F-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based soil screening will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material (remaining contamination) as a preliminary characterization of the soil, as well as to monitor working conditions in excavations to minimize exposure to potential contaminants. Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the Assignable Release and Covenant Not To Sue.

Soils will be segregated based on previous environmental data and screening results into material approved for off-Site disposal and material that requires testing. Excavated soils will be sampled and submitted for laboratory analysis and any required predisposal characterization testing, as described in Section F-6, or for reuse on-Site, as described in Section F-7.

F-3 STOCKPILE METHODS

Soil stockpiles will be underlain with anchored polyethylene sheeting with a minimum thickness of 6-mils and continuously encircled with a berm and/or silt fence. Hay bales or silt fencing will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in the field book and maintained at the Site and available for inspection by NYSDEC.

F-4 MATERIALS EXCAVATION AND LOAD OUT

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the property and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the Site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the Site.

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and New York State Department of Transportation (NYSDOT) requirements (and all other applicable transportation requirements).

A truck wash will be operated on-Site. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the Site until the activities performed under this section are complete.

Locations where vehicles enter or exit the Site shall be inspected daily for evidence of off-Site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the Site are clean of dirt and other materials derived from the Site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

F-5 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

All trucks will be washed prior to leaving the Site. Truck wash waters will be collected and disposed of off-Site in an appropriate manner.

Woodhaven Boulevard, west-adjacent to the Site, is a local truck route that leads directly to Interstate 495 to the north and numerous through truck routes to the south. As such, all trucks exiting the Site will join Woodhaven Boulevard immediately en route to the disposal/recycling facility, which will be determined at a later date. All trucks loaded with Site materials will exit the vicinity of the Site using only Woodhaven Boulevard and subsequent approved-truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive Sites; (b) use of city mapped truck routes; (c) prohibiting off-Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project Site.

Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site remediation and development.

Queuing of trucks will be performed on-Site to minimize off-Site disturbance. Off-Site queuing will be prohibited.

F-6 MATERIALS DISPOSAL OFF-SITE

All soil/fill/solid waste excavated and removed from the Site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6 NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this Site is proposed for unregulated off-Site disposal (i.e., clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-Site management of materials from this Site will not occur without formal NYSDEC approval.

Off-Site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal/recycling facility if appropriate, i.e., hazardous waste disposal/recycling facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the PRR. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-Site will be handled, at minimum, as a Municipal Solid Waste per 6 NYCRR Part 360-1.2. Material that does not meet Track 1 Unrestricted SCOs, as shown in Table F-1, is prohibited from being taken to a New York State recycling facility (6 NYCRR Part 360-16 Registration Facility).

Excavated material will be stockpiled on-Site according to the procedures detailed in Section F-3 and sampled in accordance with disposal facility requirements for predisposal characterization. At a minimum, prior to off-Site disposal, soil will be sampled at a frequency of one sample per each 2,000 cubic yards of soil and analyzed for Target Compound List (TCL) Volatile Organic Compounds (VOCs).

Table F-1

NYSDEC Part 375 Soil Cleanup Objectives

Compound/Analyte (µg/kg)	NYSDEC Part 375 Unrestricted	NYSDEC Part 375 Residential	NYSDEC Part 375 Restricted Residential	NYSDEC Part 375 Commercial	NYSDEC Part 375 Industrial	NYSDEC Part 375 Groundwater
VOCs						
1,1,1-Trichloroethane	680	100000	100000	500000	1000000	680
1,1,2,2-Tetrachloroethane	NS	NS	NS	NS	NS	NS
1,1-Dichloroethane	270	19000	26000	240000	480000	270
1,1-Dichloroethene	330	100000	100000	500000	1000000	330
1,2,3-Trichloropropane	NS	NS	NS	NS	NS	NS
1,2,4-Trichlorobenzene	NS	NS	NS	NS	NS	NS
1,2,4-Trimethylbenzene	3600	47000	52000	190000	380000	3600
1,2-Dichlorobenzene	1100	100000	100000	500000	1000000	1100
1,2-Dichloroethane	20	2300	3100	30000	60000	20
1,1,2-trichloro-1,2,2-trifluoroethane	NS	NS	NS	NS	NS	NS
1,3,5-Trimethylbenzene	8400	47000	52000	190000	380000	8400
1,3-Dichlorobenzene	2400	17000	49000	280000	560000	2400
1,3-Dichloropropane	NS	NS	NS	NS	NS	NS
1,4-Dichlorobenzene	1800	9800	13000	130000	250000	1800
1,4-Dioxane	100	9800	13000	130000	250000	100
2-Butanone	120	100000	100000	500000	1000000	120
2-methoxy-2-methylpropane	930	62000	100000	500000	1000000	930
4-Methyl-2-pentanone	NS	NS	NS	NS	NS	NS
Acetone	50	100000	100000	500000	1000000	50
Benzene	60	2900	4800	44000	89000	60
butyl benzene	12000	100000	100000	500000	1000000	12000
Carbon disulfide	NS	NS	NS	NS	NS	NS
Carbon Tetrachloride	760	1400	2400	22000	44000	760
Chlorobenzene	1100	100000	100000	500000	1000000	1100
Chloroform	370	10000	49000	350000	700000	370
cis-1,2-Dichloroethene	250	59000	100000	500000	1000000	250

Compound/Analyte (µg/kg)	NYSDEC Part 375 Unrestricted	NYSDEC Part 375 Residential	NYSDEC Part 375 Restricted Residential	NYSDEC Part 375 Commercial	NYSDEC Part 375 Industrial	NYSDEC Part 375 Groundwater
cis-1,2-Dichloroethylene	250	59000	100000	500000	1000000	250
Ethyl Benzene	1000	30000	41000	390000	780000	1000
Isopropylbenzene	NS	NS	NS	NS	NS	NS
m-Xylene	260	100000	100000	500000	1000000	1600
m/p-Xylene	260	100000	100000	500000	1000000	1600
m-Xylene & p-Xylene	260	100000	100000	500000	1000000	1600
Methyl tert-butyl Ether	930	62000	100000	500000	1000000	930
Methyl tertiary-butyl ether	930	62000	100000	500000	1000000	930
Methylene Chloride	50	51000	100000	500000	1000000	50
Methyl ethyl ketone	120	100000	100000	500000	1000000	120
Methyl ethyl ketoneMEK	120	100000	100000	500000	1000000	120
Naphthalene	12000	100000	100000	500000	1000000	12000
n-Propylbenzene	3900	100000	100000	500000	1000000	3900
o-Xylene	260	100000	100000	500000	1000000	1600
p-Isopropyltoluene	NS	NS	NS	NS	NS	NS
p-Xylene	260	100000	100000	500000	1000000	1600
sec-Butylbenzene	11000	100000	100000	500000	1000000	11000
tert-Butylbenzene	5900	100000	100000	500000	1000000	5900
Tetrachloroethene	1300	5500	19000	150000	300000	1300
Toluene	700	100000	100000	500000	1000000	700
trans-1,2-Dichloroethene	190	100000	100000	500000	1000000	190
trans-1,2-Dichloroethylene	190	100000	100000	500000	1000000	190
Trichloroethene	470	10000	21000	200000	400000	470
Vinyl Chloride	20	210	900	13000	27000	20
Xylene (mixed)	260	100000	100000	500000	1000000	1600
Xylenes (mixed)	260	100000	100000	500000	1000000	1600
SVOCs						
2,4,5-Trichlorophenol	NS	NS	NS	NS	NS	NS
2,4-Dichlorophenol	NS	NS	NS	NS	NS	NS
2,4-Dinitrophenol	NS	NS	NS	NS	NS	NS
2,6-Dinitrotoluene	NS	NS	NS	NS	NS	NS
2-Chlorophenol	NS	NS	NS	NS	NS	NS

Compound/Analyte (µg/kg)	NYSDEC Part 375 Unrestricted	NYSDEC Part 375 Residential	NYSDEC Part 375 Restricted Residential	NYSDEC Part 375 Commercial	NYSDEC Part 375 Industrial	NYSDEC Part 375 Groundwater
2-Methylnaphthalene	NS	NS	NS	NS	NS	NS
2-Methylphenol	330	100000	100000	500000	1000000	330
2-Methylphenol (o-Cresol)	330	100000	100000	500000	1000000	330
2-Nitroaniline	NS	NS	NS	NS	NS	NS
2-Nitrophenol	NS	NS	NS	NS	NS	NS
3-Methylphenol (m-Cresol)	330	100000	100000	500000	1000000	330
3-Methylphenol/4-Methylphenol	330	34000	100000	500000	1000000	330
3-Nitroaniline	NS	NS	NS	NS	NS	NS
4-Chloroaniline	NS	NS	NS	NS	NS	NS
4-Methylphenol	330	34000	100000	500000	1000000	330
4-Nitrophenol	NS	NS	NS	NS	NS	NS
Acenaphthene	20000	100000	100000	500000	1000000	98000
Acenaphthylene	100000	100000	100000	500000	1000000	107000
Aniline	NS	NS	NS	NS	NS	NS
Anthracene	100000	100000	100000	500000	1000000	1000000
Benzo(a)anthracene	1000	1000	1000	5600	11000	1000
Benzo(a)pyrene	1000	1000	1000	1000	1100	22000
Benzo(b)fluoranthene	1000	1000	1000	5600	11000	1700
Benzo(g,h,i)perylene	100000	100000	100000	500000	1000000	1000000
Benzo(k)fluoranthene	800	1000	3900	56000	110000	1700
Benzoic Acid	NS	NS	NS	NS	NS	NS
Bis(2-ethylhexyl)phthalate	NS	NS	NS	NS	NS	NS
Butyl benzyl phthalate	NS	NS	NS	NS	NS	NS
Chrysene	1000	1000	3900	56000	110000	1000
Dibenz(a,h)anthracene	330	330	330	560	1100	1000000
Dibenzofuran	7000	14000	59000	350000	1000000	210000
Diethyl phthalate	NS	NS	NS	NS	NS	NS
Dimethyl phthalate	NS	NS	NS	NS	NS	NS
Di-n-butyl phthalate	NS	NS	NS	NS	NS	NS
Di-n-octyl phthalate	NS	NS	NS	NS	NS	NS
Fluoranthene	100000	100000	100000	500000	1000000	1000000
Fluorene	30000	100000	100000	500000	1000000	386000
Hexachlorobenzene	330	330	1200	6000	12000	3200

Compound/Analyte (µg/kg)	NYSDEC Part 375 Unrestricted	NYSDEC Part 375 Residential	NYSDEC Part 375 Restricted Residential	NYSDEC Part 375 Commercial	NYSDEC Part 375 Industrial	NYSDEC Part 375 Groundwater
Indeno(1,2,3-cd)pyrene	500	500	500	5600	11000	8200
Isophorone	NS	NS	NS	NS	NS	NS
m-Cresol	330	100000	100000	500000	1000000	330
Nitrobenzene	NS	NS	NS	NS	NS	NS
Naphthalene	12000	100000	100000	500000	1000000	12000
Pentachlorophenol	800	2400	6700	6700	55000	800
Phenanthrene	100000	100000	100000	500000	1000000	1000000
Phenol	330	100000	100000	500000	1000000	330
Pyrene	100000	100000	100000	500000	1000000	1000000
Metals						
Arsenic	13000	16000	16000	16000	16000	16000
ArsenicSPLP	13000	16000	16000	16000	16000	16000
Barium	350000	350000	400000	400000	10000000	820000
BariumSPLP	350000	350000	400000	400000	10000000	820000
Beryllium	7200	14000	72000	590000	2700000	47000
BerylliumSPLP	7200	14000	72000	590000	2700000	47000
Cadmium	2500	2500	4300	9300	60000	7500
CadmiumSPLP	2500	2500	4300	9300	60000	7500
Chromium	30000	36000	180000	1500000	6800000	19000
Chromium (hexavalent)	1000	22000	110000	400000	800000	19000
Chromium (trivalent)	30000	36000	180000	1500000	6800000	NS
ChromiumSPLP	30000	36000	180000	1500000	6800000	19000
Cobalt	NS	NS	NS	NS	NS	NS
Copper	50000	270000	270000	270000	10000000	1720000
CopperSPLP	50000	270000	270000	270000	10000000	1720000
Cyanide	27000	27000	27000	27000	10000000	40000
Total Cyanide	27000	27000	27000	27000	10000000	40000
Iron	NS	NS	NS	NS	NS	NS
Lead	63000	400000	400000	1000000	3900000	450000
LeadSPLP	63000	400000	400000	1000000	3900000	450000
Manganese	1600000	2000000	2000000	10000000	10000000	2000000
ManganeseSPLP	1600000	2000000	2000000	10000000	10000000	2000000
Mercury	180	810	810	2800	5700	730
Mercury,total	180	810	810	2800	5700	730
MercurySPLP	180	810	810	2800	5700	730

Compound/Analyte (µg/kg)	NYSDEC Part 375 Unrestricted	NYSDEC Part 375 Residential	NYSDEC Part 375 Restricted Residential	NYSDEC Part 375 Commercial	NYSDEC Part 375 Industrial	NYSDEC Part 375 Groundwater
Nickel	30000	140000	310000	310000	10000000	130000
NickelSPLP	30000	140000	310000	310000	10000000	130000
Selenium	3900	36000	180000	1500000	6800000	4000
SeleniumSPLP	3900	36000	180000	1500000	6800000	4000
Silver	2000	36000	180000	1500000	6800000	8300
SilverSPLP	2000	36000	180000	1500000	6800000	8300
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	109000	2200000	10000000	10000000	10000000	2480000
ZincSPLP	109000	2200000	10000000	10000000	10000000	2480000
PCBs						
Aroclor-1016	100	1000	1000	1000	25000	3200
Aroclor-1221	100	1000	1000	1000	25000	3200
Aroclor-1232	100	1000	1000	1000	25000	3200
Aroclor-1242	100	1000	1000	1000	25000	3200
Aroclor-1248	100	1000	1000	1000	25000	3200
Aroclor-1254	100	1000	1000	1000	25000	3200
Aroclor-1260	100	1000	1000	1000	25000	3200
Aroclor-1262	100	1000	1000	1000	25000	3200
Aroclor-1268	100	1000	1000	1000	25000	3200
PCBs	100	1000	1000	1000	25000	3200
Polychlorinated biphenyls	100	1000	1000	1000	25000	3200
Pesticides						
2,4,5-T	NS	NS	NS	NS	NS	NS
2,4,5-TP (Silvex)	3800	58000	100000	500000	1000000	3800
2,4,5-TP Acid	3800	58000	100000	500000	1000000	3800
2,4,5-TP Acid (Silvex)	3800	58000	100000	500000	1000000	3800
2,4-D	NS	NS	NS	NS	NS	NS
4,4-DDD	3.3	2600	13000	92000	180000	14000
4,4-DDE	3.3	1800	8900	62000	120000	17000
4,4-DDT	3.3	1700	7900	47000	94000	136000
Aldrin	5	19	97	680	1400	190
alpha-BHC	20	97	480	3400	6800	20
alpha-Chlordane	94	910	4200	24000	47000	2900
beta-BHC	36	72	360	3000	14000	90
Chlordane	94	910	4200	24000	47000	2900

Compound/Analyte (µg/kg)	NYSDEC Part 375 Unrestricted	NYSDEC Part 375 Residential	NYSDEC Part 375 Restricted Residential	NYSDEC Part 375 Commercial	NYSDEC Part 375 Industrial	NYSDEC Part 375 Groundwater
Chlordane	94	910	4200	24000	47000	2900
cis-Chlordane	94	910	4200	24000	47000	2900
delta-BHC	40	100000	100000	500000	1000000	250
Dieldrin	5	39	200	1400	2800	100
Endosulfan	2400	4800	24000	200000	920000	NS
Endosulfan I	2400	See Totals	See Totals	See Totals	See Totals	102000
Endosulfan I	2400	See Totals	See Totals	See Totals	See Totals	102000
Endosulfan I	2400	See Totals	See Totals	See Totals	See Totals	102000
Endosulfan I	2400	See Totals	See Totals	See Totals	See Totals	102000
Endosulfan I	2400	See Totals	See Totals	See Totals	See Totals	102000
Endosulfan II	2400	See Totals	See Totals	See Totals	See Totals	102000
Endosulfan II	2400	See Totals	See Totals	See Totals	See Totals	102000
Endosulfan II	2400	See Totals	See Totals	See Totals	See Totals	102000
Endosulfan II	2400	See Totals	See Totals	See Totals	See Totals	102000
Endosulfan Sulfate	2400	See Totals	See Totals	See Totals	See Totals	1000000
Endrin	14	2200	11000	89000	410000	60
gamma-BHC	100	280	1300	9200	23000	100
gamma-BHC (Lindane)	100	280	1300	9200	23000	100
Heptachlor	42	420	2100	15000	29000	380
Heptachlor epoxide	NS	NS	NS	NS	NS	NS
p,p'-DDD	3.3	2600	13000	92000	180000	14000
p,p'-DDE	3.3	1800	8900	62000	120000	17000
p,p-DDT	3.3	1700	7900	47000	94000	136000
parathion	NS	NS	NS	NS	NS	NS

Notes:
µg/kg – micrograms per kilograms

F-7 MATERIALS REUSE ON-SITE

Reuse of excavated material may be permissible in select cases, but must be approved in advance by the NYSDEC.

Prior to reuse as backfill, excavated material will be sampled at a minimum frequency of one sample per each 2,000 cubic yards and analyzed by a NYSDOH ELAP laboratory for the following parameters and analytical methods:

–VOCs by EPA Method 8260C (rev. 2006)

Laboratory results will be compared to the Commercial Soil Cleanup Objectives criteria listed in Table F-1. The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-Site. Any demolition material proposed for reuse on-Site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-Site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the Site will not be reused on-Site.

Soils will be segregated based on previous environmental data, screening results and the latest laboratory analytical results into material that requires off-Site disposal, material that requires testing for pre-disposal characterization, material that can be returned to the subsurface, and material that can be used as cover soil. Due to the existing Home Depot facility, the location of stockpiles will vary depending on the location of the excavation and the potential impact of the excavation/stockpile location to ongoing store operations.

F-8 FLUIDS MANAGEMENT

All liquids to be removed from the Site, including excavation dewatering and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the Site, but will be managed off-Site.

Discharge of water generated during large-scale construction activities to surface waters (i.e., a local pond, stream or river) will be performed under a State Pollutant Discharge Elimination System (SPDES) permit. However, based on the depth of the groundwater table, approximately 50 feet below grade, it is unlikely that groundwater will be discharged as part of any excavation-related work.

Water used as part of excavation related work (e.g., wetting down particulate during excavation, runoff from stockpiles) must be inhibited from draining into the stormwater drains in the Site driveways. Hay bales will be placed around the perimeter of the storm drain, and around the perimeter of the source in the case of stockpiles, to minimize runoff, as discussed in Section F-3.

F-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the RWP. The demarcation layer, consisting of orange snow fencing material or equivalent material will be replaced to provide a visual reference to the top of the 'Remaining Contamination Zone', the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this SMP. This zone comprises all Site soil with the exception of shallow soil from select portions of the ADI Parcel as identified in the March 1999 Soil Remediation Report, provided as Appendix F of the SMP. Any portions of the moisture/vapor barrier that is encountered during invasive work must also be repaired or replaced in kind.

If the type of cover system changes from that which exists prior to the excavation (i.e., a site cover is replaced by asphalt), as shown on Figure 5 of the SMP and discussed in SMP Section 1.4.4, this will constitute a modification of the cover element of the remedy and the upper surface of the Remaining Contamination. A figure showing the modified surface would be included in the subsequent PRR and in any updates to the SMP.

F-10 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the Site, with the exception of certain NYSDEC-approved materials, such as virgin quarried material or material from other clean sources with a Beneficial Use Determination (BUD), will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the Site. Material from industrial sites, spill sites, or other

environmental remediation sites or potentially contaminated sites will not be imported to the Site without a BUD.

Prior to import, the proposed backfill material will be sampled at a minimum frequency of one five point composite sample per each 1,000 cubic yards and analyzed by a NYSDOH ELAP laboratory for the following parameters and analytical methods:

–VOCs by EPA Method 8260C (rev. 2006)

–SVOCs by EPA Method 8270D (rev. 2007)

–Pesticides by EPA Method 8081B (rev. 2000)

–PCBs by EPA Method 8082A (rev. 2000)

–TAL Metals by EPA Method 6010C (rev. 2007)

All imported soils will meet the backfill and cover soil quality standards established in 6 NYCRR 375-6.7(d). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards are based upon the lower of the Commercial and Protection of Groundwater Soil Cleanup Objectives listed in Table F-1. Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC. Solid waste will not be imported onto the Site. The qualified environmental professional will ensure that procedures defined for materials import in this SMP are followed and that unacceptable material is not imported on-Site.

Trucks entering the Site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

F-11 STORMWATER POLLUTION PREVENTION

As the Site is currently developed as a Home Depot facility, it is not likely that a large scale excavation, as is typically required during (re)development, will need to be conducted. However, any excavation at the Site exceeding one acre in area, regardless of the purpose of the excavation, must be conducted in compliance with an NYSDEC-

approved Stormwater Pollution Prevention Plan, in accordance with all NYSDEC requirements.

For all other excavations, the following requirements must be met to ensure the minimization of stormwater runoff impacts on local water bodies.

- Barriers and/or hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC. All necessary repairs shall be made immediately.
- Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.
- All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.
- Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.
- Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters
- Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

F-12 CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical

analysis will be performed for full a full list of analytes (TCL volatiles and semi-volatiles, TCL pesticides and PCBs; TAL metals), unless the Site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive Site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the periodic reports prepared pursuant to Section 5.0 of the SMP. Following NYSDEC-notification and contaminant identification, the contaminated media or potential pollutant will be excavated and containerized or stockpiled prior to off-Site disposal.

If encountered, subsurface anomalies such as drums and tanks will be excavated and placed on a plastic tarp, surrounded by hay bales or silt fencing as appropriate, to minimize the likelihood of runoff, and covered with an additional tarp until disposal options have been proposed and approved by NYSDEC.

The transportation and off-Site disposal of all hazardous materials and related waste will be conducted in accordance with all local, State and Federal regulations.

F-13 COMMUNITY AIR MONITORING PLAN

Due to the presence of the current Home Depot building on-Site, it is unlikely that the entire perimeter of the Site would be affected by any single excavation, barring an excavation related to the redevelopment of the entire Site. As such, the existing CAMP, prepared as part of the April 2010 Revised AS/SVE Expansion Work Plan, required a minimum of one roving work zone air monitor in close proximity to the active portion of any excavation with a contingency for community air monitoring, comprising additional stationary air monitoring locations at upwind and downwind boundary locations to monitor the quality of air likely to migrate off-Site. The upwind and downwind monitoring contingency would become required if work zone monitoring resulted in an exceedance of the action levels described in Table F-2.

Table F-2

Air Monitoring Action Levels and Response Actions

Instrument	Task to be Monitored	Action Level (15-min Time Weighted Averages)	Response Action
PID (OVM 580B or equivalent)	All tasks disturbing potentially contaminated soil	Less than 5 ppm in breathing zone.	Level D or D-Modified Personal Protective Equipment
		Between 5 and 200 ppm	Level C Personal Protective Equipment Perform perimeter community air monitoring
		More than 200 ppm	Stop work. Resume work when readings are less than 500 ppm.
Particulate monitor	All tasks disturbing potentially contaminated soil	Less than 5 mg/m^3	Level D Personal Protective Equipment
		Between 5 mg/m^3 and 125 mg/m^3	Level C Personal Protective Equipment Apply additional dust suppression measures. If < 2.5 mg/m^3, resume work using Level D. Otherwise, use Level C. Perform community air monitoring
		Above 125 mg/m3	Stop work. Apply additional dust suppression measures. Resume work when less than 125 mg/m^3. Perform community air monitoring
Notes: 1 – 15-minute time-weighted average mg/m^3 = milligrams per cubic meter ppm = parts per million			

Air monitoring requirements are discussed in the HASP, provided as Appendix G of the SMP. 15-minute average particulate concentrations and instantaneous total VOC

concentrations will be taken at all monitoring points. Action levels and response actions are detailed in Table F-2.

On- and off-Site sensitive receptors include the Home Depot building, an east-adjacent off-Site public school and a south-adjacent off-Site baseball field. The downwind monitoring point should be located at the closest threshold between the excavation and the sensitive receptor (a store entrance for the Home Depot building and along a Site boundary for all off-site sensitive receptors). All stationary air monitoring locations will be adjusted at a minimum of a daily basis, based on wind direction.

A revised CAMP will be prepared and submitted to NYSDEC along with future Site work plans for review and approval. The revised CAMP will address air quality concerns as warranted by the specific proposed work. A figure showing the location of air sampling stations based on generally prevailing wind conditions will be provided with the revised CAMP. Monitoring locations will be determined based on the location of the invasive work.

Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

F-14 ODOR CONTROL PLAN

The purpose of the odor control plan is to mitigate emissions of nuisance odors on- and off-Site. If nuisance odors are identified at the Site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the property owner's QEP or Remediation Engineer, and any measures that are implemented will be discussed in the PRR.

All necessary means will be employed to prevent on- and off-Site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise

controlled, additional means to eliminate odor nuisances will include: (d) a preference towards direct load-out of soils to trucks for off-Site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods. Total VOC monitoring conducted as part of the CAMP requirements is intended to supplement the odor monitoring procedures.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-Site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

F-15 DUST CONTROL PLAN

In addition to the particulate monitoring discussed as part of the CAMP procedures, the following measures will also be implemented, where applicable, to minimize nuisance dust:

- Dust suppression will be achieved though the use of a dedicated on-Site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of any vegetated portions of the Site will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on unpaved roadways to provide a clean and dust-free road surface.
- On-Site unpaved roads will be limited in total area to minimize the area required for water truck sprinkling.

F-16 OTHER NUISANCES

A plan for rodent control will be developed and utilized by the contractor prior to and during Site clearing and Site grubbing, and during all remedial work.

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

APPENDIX G

HEALTH AND SAFETY PLAN

Home Depot on Woodhaven Boulevard and Metropolitan Avenue

REGO PARK - GLENDALE, NEW YORK

Health and Safety Plan

NYSDEC VCP Site No. V00095

AKRF Project Number: 03399

Prepared for:

Home Depot U.S.A., Inc.
2455 Paces Ferry Road, NW, C-19
Atlanta, GA 30339-4024

Prepared by:

AKRF Engineering, P.C.
440 Park Avenue South, 7th Floor
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212-696-0670

MAY 2012

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1.0 INTRODUCTION

The Home Depot - Rego Park Voluntary Cleanup Program site is located at 75-09 Woodhaven Boulevard in the Rego Park–Glendale section of Queens, New York. The Home Depot building is a single-story slab-on-grade structure with public access on the north side, a loading dock near the southwestern corner, and a garden center on the west side. The Site is bounded on the west by the Woodhaven Boulevard service road, on the south by active tracks of the Long Island Railroad, and on the east by an abandoned former railroad embankment, beyond which is a school building. Commercial properties are located north-adjacent to the Site. A baseball field with associated parking area and concession stand is located across the railroad tracks to the south of the Site. A residential area is located further to the south of the railroad tracks.

The major contaminant of concern identified on the Site is tetrachloroethene (PCE). The site was historically occupied by two parcels with warehouses. PCE contamination in soil and groundwater was discovered during due diligence studies prior to acquisition of the property by Home Depot U.S.A., Inc., and confirmed by supplemental groundwater sampling in 2003 – 2005. Two areas of elevated PCE in groundwater were detected in the western and southwestern areas of the Site, and an air sparging soil vapor extraction (AS/SVE) system was installed at these locations.

This environmental Health and Safety Plan (HASP) has been developed for implementation of the Site Management Plan (SMP), which details the activities associated with ongoing remediation monitoring at the Site.

This HASP applies to subsurface activities conducted by all personnel on-site, both AKRF employees and others. This HASP does not discuss other routine health and safety issues common to general construction/excavation, including but not limited to slips, trips, falls, shoring, and other physical hazards.

All AKRF employees are directed that all work must be performed in accordance with the Company's Generic HASP and all OSHA applicable regulations for the work activities required for the project. All project personnel are furthermore directed that they are not permitted to enter Permit Required Confined Spaces (as defined by OSHA). For issues unrelated to contaminated materials, all non-AKRF employees are to be bound by all applicable OSHA regulations as well as any more stringent requirements specified by their employer in their corporate HASP or otherwise. AKRF is not responsible for providing oversight for issues unrelated to contaminated materials for non-employees. This oversight shall be the responsibility of the employer of that worker or other official designated by that employer.

2.0 HEALTH AND SAFETY GUIDELINES AND PROCEDURES

2.1 Hazard Evaluation

2.1.1 Hazards of Concern

Check all that apply		
(**X**) Organic Chemicals	( ) Inorganic Chemicals	( ) Radiological
( ) Biological	( ) Explosive/Flammable	( ) Oxygen Deficient Atm
(**X**) Heat Stress	(**X**) Cold Stress	( ) Carbon Monoxide
Comments: No personnel are permitted to enter permit confined spaces.		

2.1.2 Physical Characteristics

Check all that apply		
(**X**) Liquid	(**X**) Solid	( ) Sludge
(**X**) Vapors	( ) Unknown	( ) Other
Comments:		

2.1.3 Hazardous Materials

Check all that apply					
Chemicals	**Solids**	**Sludges**	**Solvents**	**Oils**	**Other**
( ) Acids	( ) Ash	( ) Paints	( ) Halogens	( ) Transformer	( ) Lab
( ) Caustics	( ) Asbestos	( ) Metals	( ) Petroleum	( ) Other DF	( ) Pharm
( ) Pesticides	( ) Tailings	( ) POTW	(**X**) Other: PCE, TCE	( ) Motor or Hydraulic Oil	( ) Hospital
( ) Petroleum	( ) Other	( ) Other		( ) Gasoline	( ) Rad
( ) Inks				( ) Fuel Oil	( ) MGP
( ) PCBs					( ) Mold
( ) Metals					( ) Cyanide
(**X**)Other: VOCs and SVOCs					

2.1.4 Chemicals of Concern

Chemicals	REL/PEL/STEL (ppm)	Health Hazards
Tetrachloroethene	PEL = 100 ppm Ceiling = 200 ppm Five minute max peak in any 3 hours = 300 ppm	High concentrations of tetrachloroethylene (particularly in closed, poorly ventilated areas) can cause dizziness, headache, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness, and death.
Trichloroethene	PEL = 100 ppm Ceiling = 200 ppm Five minute max peak in any 3 hours = 300 ppm	Breathing small amounts may cause headaches, lung irritation, dizziness, poor coordination, and difficulty concentrating. Breathing large amounts of trichloroethylene may cause impaired heart function, unconsciousness, and death. Breathing it for long periods may cause nerve, kidney, and liver damage. Drinking large amounts of trichloroethylene may cause nausea, liver damage, unconsciousness, impaired heart function, or death. Drinking small amounts of trichloroethylene for long periods may cause liver and kidney damage, impaired immune system function, and impaired fetal development in pregnant women, although the extent of some of these effects is not yet clear. Skin contact with trichloroethylene for short periods may cause skin rashes.
Comments: REL = NIOSH Recommended Exposure Limit PEL = OSHA Permissible Exposure Limit STEL = OSHA Short Term Exposure Limit		

2.2 Designated Personnel

AKRF will appoint one of its on-site personnel as the Site Safety Officer (SSO). This individual will be responsible for the implementation of the HASP. The SSO will have experience in implementation of air monitoring and hazardous materials sampling programs. Health and safety training required for the SSO and all field personnel is outlined in Section 2.3 of this HASP.

2.3 Training

All personnel who enter the work area while intrusive activities are being performed will have completed a 40-hour training course that meets OSHA requirements of 29 CFR Part 1910, Occupational Safety and Health Standards. In addition, all personnel will have up-to-date 8-hour refresher training. The training will allow personnel to recognize and understand the potential hazards to health and safety. All field personnel must attend a training program, whose purpose is to:

- Make them aware of the potential hazards they may encounter;
- Provide the knowledge and skills necessary for them to perform the work with minimal risk to health and safety; Make them aware of the purpose and limitations of safety equipment; and

- Ensure that they can safely avoid or escape from emergencies.

Each member of the field crew will be instructed in these objectives before he/she goes onto the site. A site safety meeting will be conducted at the start of the project. Additional meetings shall be conducted, as necessary, for new personnel working at the site.

2.4 Medical Surveillance Program

All AKRF and subcontractor personnel performing field work involving subsurface disturbance at the site are required to have passed a complete medical surveillance examination in accordance with 29 CFR 1910.120 (f). A physician's medical release for work will be confirmed by the SSO before an employee can begin site activities. The medical release shall consider the type of work to be performed and the required PPE. The medical examination will, at a minimum, be provided annually and upon termination of hazardous waste site work.

2.5 Site Work Zones

During any activities involving subsurface disturbance, the work area must be divided into various zones to prevent the spread of contamination, ensure that proper protective equipment is donned, and provide an area for decontamination.

The Exclusion Zone is defined as the area where exposure to impacted media could be encountered. The Contamination Reduction Zone (CRZ) is the area where decontamination procedures take place and is located next to the Exclusion Zone. The Support is the zone area where support facilities such as vehicles, fire extinguisher, and first aid supplies are located. The emergency staging area (part of the Support Zone) is the area where all workers on-site would assemble in the event of an emergency. A summary of these areas is provided below. These zones may changed by SSO, depending on that day's activities. All field personnel will be informed of the location of these zones before work begins.

Site Work Zones

Task	Exclusion Zone	CRZ	Support Zone
Well Drilling	10 ft from Borehole	25 ft from Borehole	As Needed
Trench Excavation and Pipe Installation	10 ft from Open Excavation	25 ft from Open Excavation	As Needed
Comments: Control measures such as "caution tape" and/or traffic cones will be placed around the perimeter of the exclusion zone work area when work is being done in a public area.			

2.6 Air Monitoring

The purpose of the air monitoring program is to identify any exposure of the field personnel to potential environmental hazards in the soil and groundwater. Results of the air monitoring will be used to determine the appropriate response action, if needed.

An organic vapor meter [OVM – or photoionization detector (PID)] will be used to perform air monitoring during soil disturbance activities to determine airborne levels of total VOCs. The PID will be calibrated daily with a 100 ppm isobutylene standard.

A particulate monitor will be used to measure airborne levels of respirable particulates less than 10 microns in size (PM_{10}). The particulate monitor will be zeroed daily and used in accordance with the manufacturer's specifications. Real time continuous air monitoring will be performed with the OVM and particulate monitor during activities that will disturb potentially contaminated soil.

2.6.1 Work Zone Air Monitoring

Work zone measurements will be taken prior to commencement of work and continuously during the work as outlined in the following table. Measurements will be made as close to the workers as practicable and at the breathing height of the workers. The SSO will set up the equipment and confirm that it is working properly. His/her designee may oversee the air measurements during the day. The initial measurement for the day will be performed before the start of work and will establish the background level for that day. The final measurement for the day will be performed after the end of work. The action levels and required responses are listed in the following table.

Work Zone Air Monitoring Action Levels and Response Actions

Instrument	Task to be Monitored	Action Level (15-min TWA)	Response Action
PID (OVM 580B or equivalent)	All tasks disturbing potentially contaminated soil	Less than 5 ppm in breathing zone.	Level D or D-Modified
		Between 5 and 200 ppm	Level C Perform perimeter community air monitoring (Sec. 2.6.2)
		More than 200 ppm	Stop work. Resume work when readings are less than 500 ppm.
Particulate monitor	All tasks disturbing potentially contaminated soil	Less than 5 mg/m^3	Level D
		Between 5 mg/m^3 and 125 mg/m^3	Level C. Apply additional dust suppression measures. If < 2.5 mg/m^3, resume work using Level D. Otherwise, use Level C. Perform community air monitoring (Sec. 2.6.2)
		Above 125 mg/m3	Stop work. Apply additional dust suppression measures. Resume work when less than 125 mg/m^3. Perform community air monitoring (Sec. 2.6.2)

Notes: 1 – 15-minute time-weighted average
mg/m^3 = milligrams per cubic meter
ppm = parts per million

2.6.2 Community Air Monitoring

At the start of work, air monitoring stations will be established upwind of the work activities and at the downwind perimeter of the work zone. Monitoring for VOCs and PM_{10} at the upwind and downwind stations will be conducted at the start of each workday where potentially contaminated soil is disturbed, and every time the wind direction changes.

If during the continuous work zone air monitoring detailed in Section 2.6.1, any air monitoring readings in the work zone reach the community action levels, then monitoring at the downwind site perimeter station will be conducted. If no exceedances of the community action levels are noted at the downwind perimeter station at this time, then community air monitoring can stop and work zone air monitoring will recommence.

Background readings and any readings that trigger response actions will be recorded in the project logbook, which will be available on-site for NYSDEC or NYSDOH review. If exceedances in the community action levels at the downwind perimeter station are noted, additional control measures will be immediately implemented, and continuous monitoring at the downwind perimeter station will be conducted until any exceedance is corrected and air monitoring levels are re-established at the background conditions. Any exceedances of community air monitoring action levels and the corrective actions taken will be detailed in an email to the project managers for NYSDEC and NYSDOH.

Due to the presence of the current Home Depot building on-Site, it is unlikely that the entire perimeter of the Site would be affected by any single excavation, barring an excavation related to the redevelopment of the entire Site. As such, a revised CAMP will be prepared and submitted to NYSDEC along with future Site work plans for review and approval. The revised CAMP will address air quality concerns as warranted by the specific proposed work. A figure showing the location of air sampling stations based on generally prevailing wind conditions and any on- or off-Site sensitive receptors will be provided with the revised CAMP.

Community Air Monitoring Requirements

Instrument	Task to be Monitored	Action Level (Note 1)	Response Action
PID	When work zone action levels exceeded	Less than 5 ppm above background at downwind perimeter.	Continue work
		Between 5 and 25 ppm above background at downwind perimeter.	**Stop work** and continue monitoring. Apply vapor suppression measures. If organic vapor levels (instantaneous reading) steadily decrease to <5 ppm, resume work. If organic vapor levels persists at >5 ppm, identify source and take steps to abate emissions. Work can resume if 15-minute average of VOCs <5 ppm 200 feet downwind of work zone or half the distance to the nearest potential receptor, whichever is closer.
		More than 25 ppm above background at downwind perimeter.	**Shut down job**. Apply additional vapor suppression measures. Resume work when perimeter readings are less than 5 ppm above background at downwind perimeter.
Particulate monitor	When work zone action levels exceeded	Less than 0.1 mg/m^3 above background (upwind perimeter) at downwind perimeter.	Continue work.
		Between 0.1 mg/m^3 and 0.15 mg/m^3 above background (upwind perimeter) at downwind perimeter.	Apply additional dust suppression measures. Work can continue provided downwind PM_{10} particulate levels do not exceed 150 mg/m^3 above background levels and no visible dust is migrating from the work area.
		Greater than 0.15 mg/m^3 above background (upwind perimeter) at downwind perimeter after dust suppression.	**Stop work**. Apply additional dust suppression measures. Resume work when less than 0.15 mg/m^3 above background levels and no visible dust is migrating from the work area.
Notes: 1 – 15-minute time-weighted average mg/m^3 = milligrams per cubic meter ppm = parts per million			

2.7 Personal Protection Equipment

The personal protection equipment required for various kinds of site investigation tasks are based on 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response, Appendix B, "General Description and Discussion of the Levels of Protection and Protective Gear."

AKRF field personnel and other site personnel shall wear, at a minimum, Level D personal protective equipment. The protection will be based on the air monitoring described in Section 2.6.

Personal Protection Equipment

LEVEL OF PROTECTION & PPE		Tasks
Level D		
(x) Steel Toe Shoes	(x) Safety Glasses	Potential contact with suspected contaminated materials
(x) Hard Hat (within 25 ft of drill rig/excavator)	( ) Face Shield	
(x) Work Gloves	(x) Ear Plugs (within 25 ft of drill rig/excavator)	
	(x) Latex Gloves	
Level D – Modified ***(in addition to Level D)***		Potential contact with NAPL or soil with elevated PCE
(x) Tyvek Coveralls	(x) Nitrile Gloves	
( ) Saranex Coveralls	( ) Overboots	
Level C ***(in addition to Level D – Modified)***		If PID > 5 ppm or particulate > 5 mg/m^3 in breathing zone
( ) Half-Face Respirator	( ) Particulate Cartridge	
(x) Full Face Respirator	( ) Organic Cartridge	
( ) Full-Face PAPR	(x) Dual Organic/Particulate Cartridge	
Notes: Cartridges to be changed out at least once per shift unless warranted beforehand (e.g., more difficult to breathe or any odors detected).		

2.8 General Work Practices

To protect the health and safety of the field personnel, field personnel will adhere to the guidelines listed below during activities involving subsurface disturbance:

- Eating, drinking, chewing gum or tobacco, and smoking are prohibited, except in designated areas on the site. These areas will be designated by the SSO.
- Workers must wash their hands thoroughly on leaving the work area and before eating, drinking, or any other such activity.
- The workers should shower as soon as possible after leaving the site. Contact with contaminated or suspected surfaces should be avoided.
- The buddy system should always be used; each buddy should watch for signs of fatigue, exposure, and heat/cold stress.

3.0 EMERGENCY PROCEDURES AND EMERGENCY RESPONSE PLAN

The field crew will be equipped with emergency equipment, such as a first aid kit and disposable eye washes. In the case of a medical emergency, the SSO will determine the nature of the emergency and he/she will have someone call for an ambulance, if needed. If the nature of the injury is not serious, i.e., the person can be moved without expert emergency medical personnel, he/she should be driven to a hospital by on-site personnel. Directions to the hospital are provided below, and a hospital route map is attached.

3.1 Hospital Directions

Hospital Name:	North Shore University Hospital – Forest Hills
Phone Number:	(718) 830-4200
Address/Location:	102-01 66th Road, Forest Hills, NY (66th Road between 102nd Street and 103rd Street)
Directions:	1. RIGHT onto *Woodhaven Boulevard* 2. SLIGHT RIGHT onto *Yellowstone Boulevard* 3. LEFT onto Queens Boulevard. 4. EXIT onto Queens Boulevard. 5. RIGHT onto 66th Avenue. 6. LEFT onto 102nd Street. 7. First RIGHT onto 66th Avenue. 8. SLIGHT RIGHT onto Yellowstone Boulevard. 9. RIGHT onto 66th Road 10. The hospital will be on the right.

3.2 Emergency Contacts

Company	Individual Name	Title	Contact Number
AKRF	Marc Godick	Project Director	914-922-2356 (office)
	Kate Brunner	Project Manger	646-388-9525 (office)
	Steve Grens	SSO	917-613-6022 (cell)
The Home Depot	Terri Brophy	Project Manager	781-956-7785 (cell)
Ambulance, Fire Department & Police Department	-	-	911
NYSDEC Spill Hotline	-	-	800-457-7362

3.3 Approval and Acknowledgement of HASP

APPROVAL

Signed: _____ Date: _____

AKRF Project Manager

Signed: _____ Date: _____

AKRF Health and Safety Officer

Below is an affidavit that must be signed by all workers who enter the site. A copy of the HASP must be on-site at all times and will be kept by the SSO.

AFFIDAVIT

I,_____(name), of_____(company name), have read the Health and Safety Plan (HASP) for the Home Depot - Rego Park site. I agree to conduct all on-site work in accordance with the requirements set forth in this HASP and understand that failure to comply with this HASP could lead to my removal from the site.

Signed: _____ Company: _____ Date: _____

Signed: _____ Company: _____ Date: _____

Signed: _____ Company: _____ Date: _____

Signed: _____ Company: _____ Date: _____

Signed: _____ Company: _____ Date: _____

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Signed: _____ Company: _____ Date: _____

Signed: _____ Company: _____ Date: _____

Signed: _____ Company: _____ Date: _____

AFFIDAVIT

I,__________________________(name), of_________________________________(company name), have read the Health and Safety Plan (HASP) for the Home Depot Rego Park, NY site. I agree to conduct all on-site work in accordance with the requirements set forth in this HASP and understand that failure to comply with this HASP could lead to my removal from the site.

Signed:		Company:		Date:	
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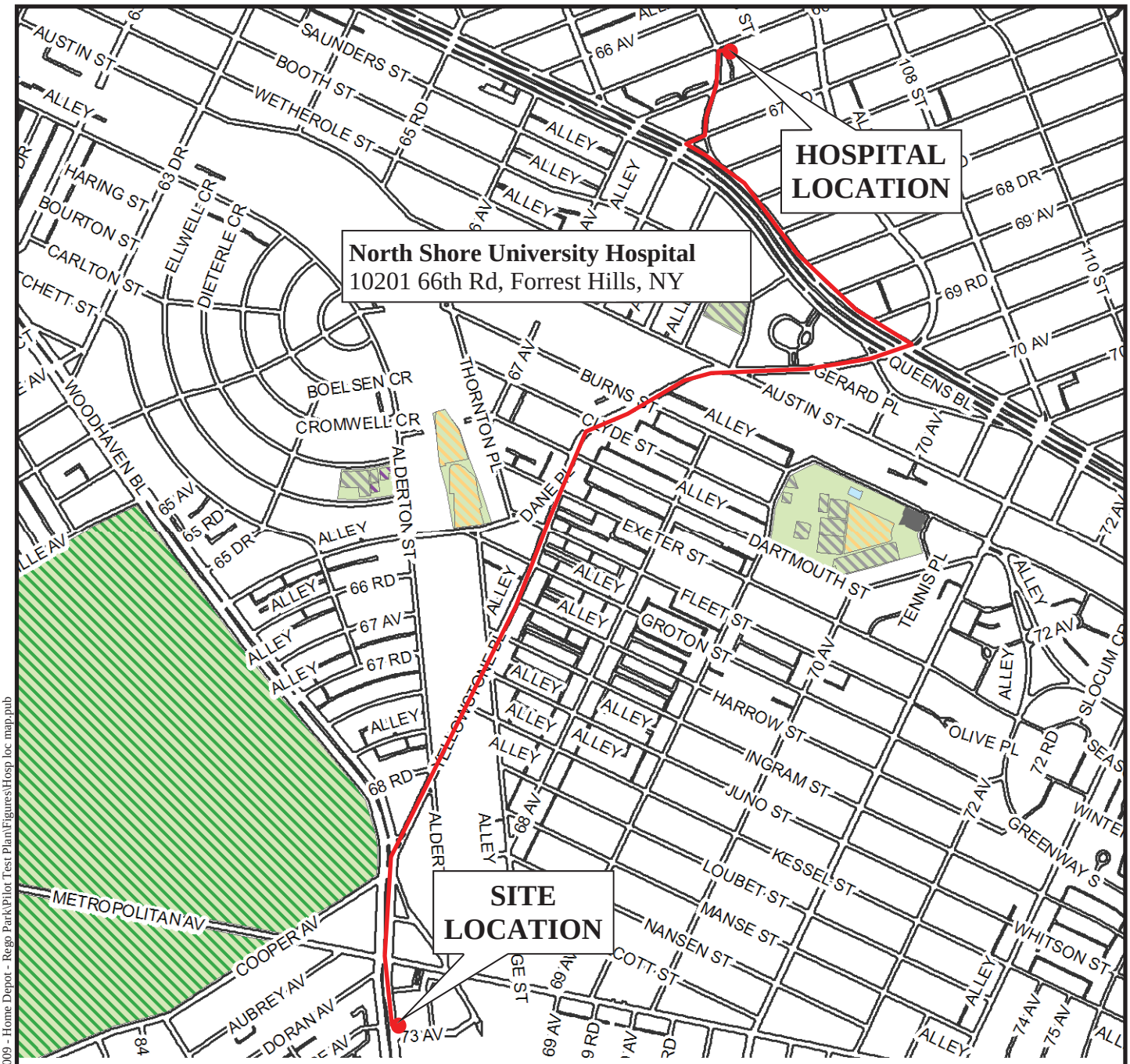
FIGURES



NEW YORK

SCALE IN FEET

0’ 500’ 1000’ 2000’

SCALE: 1”=1000’

N

HOME DEPOT—REGO PARK
REGO PARK, NEW YORK

HOSPITAL LOCATION MAP

AKRF
Environmental Consultants
440 Park Avenue South, New York, N.Y. 10016

DATE **02.02.08**

PROJECT No. **03399**

SCALE **AS SHOWN**

FIGURE

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APPENDIX A

POTENTIAL HEALTH EFFECTS FROM ON-SITE CONTAMINANTS

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

TETRACHLOROETHYLENE
CAS # 127-18-4

This fact sheet answers the most frequently asked health questions (FAQs) about tetrachloroethylene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Tetrachloroethylene is a manufactured chemical used for dry cleaning and metal degreasing. Exposure to very high concentrations of tetrachloroethylene can cause dizziness, headaches, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness, and death. Tetrachloroethylene has been found in at least 771 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is tetrachloroethylene?

(Pronounced tĕt′rə-klôr′ ō-ĕth′ə-lēn′)

Tetrachloroethylene is a manufactured chemical that is widely used for dry cleaning of fabrics and for metal-degreasing. It is also used to make other chemicals and is used in some consumer products.

Other names for tetrachloroethylene include perchloroethylene, PCE, and tetrachloroethene. It is a nonflammable liquid at room temperature. It evaporates easily into the air and has a sharp, sweet odor. Most people can smell tetrachloroethylene when it is present in the air at a level of 1 part tetrachloroethylene per million parts of air (1 ppm) or more, although some can smell it at even lower levels.

What happens to tetrachloroethylene when it enters the environment?

- Much of the tetrachloroethylene that gets into water or soil evaporates into the air.
- Microorganisms can break down some of the tetrachloroethylene in soil or underground water.
- In the air, it is broken down by sunlight into other chemicals or brought back to the soil and water by rain.
- It does not appear to collect in fish or other animals that live in water.

How might I be exposed to tetrachloroethylene?

- When you bring clothes from the dry cleaners, they will release small amounts of tetrachloroethylene into the air.
- When you drink water containing tetrachloroethylene, you are exposed to it.

How can tetrachloroethylene affect my health?

High concentrations of tetrachloroethylene (particularly in closed, poorly ventilated areas) can cause dizziness, headache, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness, and death.

Irritation may result from repeated or extended skin contact with it. These symptoms occur almost entirely in work (or hobby) environments when people have been accidentally exposed to high concentrations or have intentionally used tetrachloroethylene to get a "high."

In industry, most workers are exposed to levels lower than those causing obvious nervous system effects. The health effects of breathing in air or drinking water with low levels of tetrachloroethylene are not known.

Results from some studies suggest that women who work in dry cleaning industries where exposures to tetrachloroethyl-

ene can be quite high may have more menstrual problems and spontaneous abortions than women who are not exposed. However, it is not known if tetrachloroethylene was responsible for these problems because other possible causes were not considered.

Results of animal studies, conducted with amounts much higher than those that most people are exposed to, show that tetrachloroethylene can cause liver and kidney damage. Exposure to very high levels of tetrachloroethylene can be toxic to the unborn pups of pregnant rats and mice. Changes in behavior were observed in the offspring of rats that breathed high levels of the chemical while they were pregnant.

How likely is tetrachloroethylene to cause cancer?

The Department of Health and Human Services (DHHS) has determined that tetrachloroethylene may reasonably be anticipated to be a carcinogen. Tetrachloroethylene has been shown to cause liver tumors in mice and kidney tumors in male rats.

Is there a medical test to show whether I've been exposed to tetrachloroethylene?

One way of testing for tetrachloroethylene exposure is to measure the amount of the chemical in the breath, much the same way breath-alcohol measurements are used to determine the amount of alcohol in the blood.

Because it is stored in the body's fat and slowly released into the bloodstream, tetrachloroethylene can be detected in the breath for weeks following a heavy exposure.

Tetrachloroethylene and trichloroacetic acid (TCA), a breakdown product of tetrachloroethylene, can be detected in the blood. These tests are relatively simple to perform. These tests aren't available at most doctors' offices, but can be performed at special laboratories that have the right equipment.

Because exposure to other chemicals can produce the same breakdown products in the urine and blood, the tests for breakdown products cannot determine if you have been exposed to tetrachloroethylene or the other chemicals.

Has the federal government made recommendations to protect human health?

The EPA maximum contaminant level for the amount of tetrachloroethylene that can be in drinking water is 0.005 milligrams tetrachloroethylene per liter of water (0.005 mg/L).

The Occupational Safety and Health Administration (OSHA) has set a limit of 100 ppm for an 8-hour workday over a 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) recommends that tetrachloroethylene be handled as a potential carcinogen and recommends that levels in workplace air should be as low as possible.

Glossary

Carcinogen: A substance with the ability to cause cancer.

CAS: Chemical Abstracts Service.

Milligram (mg): One thousandth of a gram.

Nonflammable: Will not burn.

References

This ToxFAQs information is taken from the 1997 Toxicological Profile for Tetrachloroethylene (update) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone:1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

TRICHLOROETHYLENE

CAS # 79-01-6

Division of Toxicology ToxFAQs™ **July 2003**

This fact sheet answers the most frequently asked health questions (FAQs) about trichloroethylene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Trichloroethylene is a colorless liquid which is used as a solvent for cleaning metal parts. Drinking or breathing high levels of trichloroethylene may cause nervous system effects, liver and lung damage, abnormal heartbeat, coma, and possibly death. Trichloroethylene has been found in at least 852 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is trichloroethylene?

Trichloroethylene (TCE) is a nonflammable, colorless liquid with a somewhat sweet odor and a sweet, burning taste. It is used mainly as a solvent to remove grease from metal parts, but it is also an ingredient in adhesives, paint removers, typewriter correction fluids, and spot removers.

Trichloroethylene is not thought to occur naturally in the environment. However, it has been found in underground water sources and many surface waters as a result of the manufacture, use, and disposal of the chemical.

What happens to trichloroethylene when it enters the environment?

- Trichloroethylene dissolves a little in water, but it can remain in ground water for a long time.
- Trichloroethylene quickly evaporates from surface water, so it is commonly found as a vapor in the air.
- Trichloroethylene evaporates less easily from the soil than from surface water. It may stick to particles and remain for a long time.
- Trichloroethylene may stick to particles in water, which will cause it to eventually settle to the bottom sediment.
- Trichloroethylene does not build up significantly in plants and animals.

How might I be exposed to trichloroethylene?

- Breathing air in and around the home which has been contaminated with trichloroethylene vapors from shower water or household products such as spot removers and typewriter correction fluid.
- Drinking, swimming, or showering in water that has been contaminated with trichloroethylene.
- Contact with soil contaminated with trichloroethylene, such as near a hazardous waste site.
- Contact with the skin or breathing contaminated air while manufacturing trichloroethylene or using it at work to wash paint or grease from skin or equipment.

How can trichloroethylene affect my health?

Breathing small amounts may cause headaches, lung irritation, dizziness, poor coordination, and difficulty concentrating.

Breathing large amounts of trichloroethylene may cause impaired heart function, unconsciousness, and death. Breathing it for long periods may cause nerve, kidney, and liver damage.

ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html

Drinking large amounts of trichloroethylene may cause nausea, liver damage, unconsciousness, impaired heart function, or death.

Drinking small amounts of trichloroethylene for long periods may cause liver and kidney damage, impaired immune system function, and impaired fetal development in pregnant women, although the extent of some of these effects is not yet clear.

Skin contact with trichloroethylene for short periods may cause skin rashes.

How likely is trichloroethylene to cause cancer?

Some studies with mice and rats have suggested that high levels of trichloroethylene may cause liver, kidney, or lung cancer. Some studies of people exposed over long periods to high levels of trichloroethylene in drinking water or in workplace air have found evidence of increased cancer. Although, there are some concerns about the studies of people who were exposed to trichloroethylene, some of the effects found in people were similar to effects in animals.

In its 9th Report on Carcinogens, the National Toxicology Program (NTP) determined that trichloroethylene is "reasonably anticipated to be a human carcinogen." The International Agency for Research on Cancer (IARC) has determined that trichloroethylene is "probably carcinogenic to humans."

Is there a medical test to show whether I've been exposed to trichloroethylene?

If you have recently been exposed to trichloroethylene, it can be detected in your breath, blood, or urine. The breath test, if it is performed soon after exposure, can tell if you have been exposed to even a small amount of trichloroethylene.

Exposure to larger amounts is assessed by blood and urine tests, which can detect trichloroethylene and many of its breakdown products for up to a week after exposure. However, exposure to other similar chemicals can produce the same breakdown products, so their detection is not absolute proof of exposure to trichloroethylene. This test isn't available at most doctors' offices, but can be done at special laboratories that have the right equipment.

Has the federal government made recommendations to protect human health?

The EPA has set a maximum contaminant level for trichloroethylene in drinking water at 0.005 milligrams per liter (0.005 mg/L) or 5 parts of TCE per billion parts water.

The EPA has also developed regulations for the handling and disposal of trichloroethylene.

The Occupational Safety and Health Administration (OSHA) has set an exposure limit of 100 parts of trichloroethylene per million parts of air (100 ppm) for an 8-hour workday, 40-hour workweek.

Glossary

Carcinogenicity: The ability of a substance to cause cancer.
CAS: Chemical Abstracts Service.
Evaporate: To change into a vapor or gas.
Milligram (mg): One thousandth of a gram.
Nonflammable: Will not burn.
ppm: Parts per million.
Sediment: Mud and debris that have settled to the bottom of a body of water.
Solvent: A chemical that dissolves other substances.

References

This ToxFAQs information is taken from the 1997 Toxicological Profile for Trichloroethylene (update) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html . ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

APPENDIX B

REPORT FORMS

WEEKLY SAFETY REPORT FORM

Week Ending: _____ Project Name/Number: _____

Report Date: _____ Project Manager Name: _____

Summary of any violations of procedures occurring that week:

_____

_____

_____

Summary of any job related injuries, illnesses, or near misses that week:

_____

_____

_____

_____

Summary of air monitoring data that week (include and sample analyses, action levels exceeded, and actions taken):

_____

_____

_____

Comments:

_____

_____

_____

Name: _____ Company: _____

Signature: _____ Title: _____

INCIDENT REPORT FORM

Date of Report: _____

Injured: _____

Employer: _____

Site: _____ Site Location: _____

Report Prepared By: _____ _____
Signature Title

ACCIDENT/INCIDENT CATEGORY (check all that applies)

___Injury	___ Illness	___ Near Miss
__ Property Damage	___ Fire	___ Chemical Exposure
__ On-site Equipment	___ Motor Vehicle	___ Electrical
__ Mechanical	___ Spill	___ Other

DATE AND TIME OF ACCIDENT/INCIDENT: Narrative report of Accident/Incident: Identify: 1) actions leading to or contributing to the accident/incident; 2) the accident/incident occurrence; and 3) actions following the accident/incident.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

WITNESS TO ACCIDENT/INCIDENT:

Name:	_____	Company:	_____
Address:	_____	Address:	_____
Phone No.:	_____	Phone No.:	_____
Name:	_____	Company:	_____
Address:	_____	Address:	_____
Phone No.:	_____	Phone No.:	_____

INJURED - ILL:

Name: _____ SSN: _____

Address: _____ Age: _____

Length of Service: _____ Time on Present Job: _____

Time/Classification: _____

SEVERITY OF INJURY OR ILLNESS:

____ Disabling ___ Non-disabling ___ Fatality

____ Medical Treatment ___ First Aid Only

ESTIMATED NUMBER OF DAYS AWAY FROM JOB: _____

NATURE OF INJURY OR ILLNESS: _____

_____

_____

_____

CLASSIFICATION OF INJURY:

__ Abrasions _____ Dislocations ____ Punctures

__ Bites _____ Faint/Dizziness ____ Radiation Burns

__ Blisters _____ Fractures ____ Respiratory Allergy

__ Bruises _____ Frostbite ____ Sprains

__ Chemical Burns _____ Heat Burns ____ Toxic Resp. Exposure

__ Cold Exposure _____ Heat Exhaustion ____ Toxic Ingestion

__ Concussion _____ Heat Stroke ____ Dermal Allergy

__ Lacerations

Part of Body Affected: _____

Degree of Disability: _____

Date Medical Care was Received: _____

Where Medical Care was Received: _____

Address (if off-site): _____

(If two or more injuries, record on separate sheets)

PROPERTY DAMAGE:

Description of Damage: _____

_____

Cost of Damage: $ _____

ACCIDENT/INCIDENT LOCATION: _____

ACCIDENT/INCIDENT ANALYSIS: Causative agent most directly related to accident/incident (Object, substance, material, machinery, equipment, conditions)

_____

_____

_____

_____

Was weather a factor?:_____

_____

Unsafe mechanical/physical/environmental condition at time of accident/incident (Be specific):

_____

_____

_____

Personal factors (Attitude, knowledge or skill, reaction time, fatigue):

_____

_____

ON-SITE ACCIDENTS/INCIDENTS:

Level of personal protection equipment required in Site Safety Plan:

_____

_____

Modifications:

_____

Was injured using required equipment?:

_____

_____

If not, how did actual equipment use differ from plan?:

_____

_____

ACTION TAKEN TO PREVENT RECURRENCE: (Be specific. What has or will be done? When will it be done? Who is the responsible party to insure that the correction is made?

ACCIDENT/INCIDENT REPORT REVIEWED BY:

SSO Name Printed SSO Signature

OTHERS PARTICIPATING IN INVESTIGATION:

Signature Title

Signature Title

Signature Title

ACCIDENT/INCIDENT FOLLOW-UP: Date: _____

Outcome of accident/incident: _____

Physician's recommendations: _____

Date injured returned to work: _____
Follow-up performed by:

Signature Title

ATTACH ANY ADDITIONAL INFORMATION TO THIS FORM

APPENDIX C

EMERGENCY HAND SIGNALS

EMERGENCY SIGNALS

In most cases, field personnel will carry portable radios for communication. If this is the case, a transmission that indicates an emergency will take priority over all other transmissions. All other site radios will yield the frequency to the emergency transmissions.

Where radio communications is not available, the following air-horn and/or hand signals will be used:

EMERGENCY HAND SIGNALS

OUT OF AIR, CAN'T BREATH!

Hand gripping throat

LEAVE AREA IMMEDIATELY, NO DEBATE!

(No Picture) Grip partner's wrist or place both hands around waist

NEED ASSISTANCE!

Hands on top of head

OKAY! – I'M ALL RIGHT!

- I UNDERSTAND!

Thumbs up

NO! - NEGATIVE!

Thumbs down

APPENDIX H

SITE INSPECTION AND SAMPLING LOG FORMS

Annual Site-Wide Inspection

Overview of Annual Site-Wide Inspection requirements:

1) General Site conditions at time of inspection;

2) Site Cover System Inspection;

3) Any Site activities currently being conducted (including active AS/SVE);

4) Last SMP-related Site Activity conducted, upcoming SMP-related tasks;

5) Institutional Control Checklist (SMP, EWP maintained on-Site, routine SMP tasks being conducted);

6) Evaluation of Engineering Controls (in office); and

7) Site Documentation .

_____

1) General Site conditions at time of inspection:

NAME:	DATE:
TIME:	WEATHER:
Annual Inspection or Emergency Inspection (if emergency, specify nature)?	

Notes:_____

_____

_____

_____

_____

2) Cover System Inspection

Confirm no changes to Site usage.

Home Depot building with Garden Center area to west ___

Note any changes to or any unusual conditions of Site cover system: _____

_____

_____

_____

_____

Asphalt-paved parking lot north of building ___

Note any changes to or any unusual conditions of Site cover system:
_____
_____
_____
_____
_____

Landscaped area northeast of building ___

Note any changes to or any unusual conditions of Site cover system:
_____
_____
_____
_____
_____

Concrete-paved loading dock southeast-adjacent to the building ___

Note any changes to or any unusual conditions of Site cover system:
_____
_____
_____
_____
_____

Asphalt- and concrete-paved driveways south- and east-adjacent to Home Depot building ___

Note any changes to or any unusual conditions of Site cover system:
_____
_____
_____
_____
_____

3) Any SMP-related site activities currently being conducted (including active AS/SVE)

Notes:_____

_____

_____

_____

_____

4) Last SMP-related Site Activity conducted, next SMP-related task

Notes:_____

_____

_____

_____

_____

5) IC Checklist (SMP, EWP maintained on-Site, routine SMP tasks being conducted)

Copy of SMP on-Site?	
Copy of EWP on-Site?	

Routine SMP tasks being conducted?

Monthly AS/SVE system operations monitoring __

Quarterly AS/SVE system maintenance monitoring __

Quarterly groundwater monitoring __

Semi-annual extracted vapor monitoring __

Annual Indoor air sampling __

Annual cover system monitoring __

Notes:_____

_____

_____

_____

_____

6) Evaluation of ECs

AS/SVE system operations summary to be provided as part of annual PRR.

Notes:_____

_____

_____

_____

_____

7) Site documentation

Including updates regarding new Site hazardous materials to local agencies, notification to NYSDEC regarding any changes to Site conditions/operations, annual hazardous waste tax filings, routine reporting to NYSDEC).

Notes:_____

_____

_____

_____

_____

AS/SVE System/System Enclosure Maintenance Worksheet

Site conditions: Inspect fence, system enclosures, carbon units, Concrete boxes B, C, D, E, F, G, H and I covers, AS/SVE and groundwater monitoring well covers. Note any irregular conditions (e.g. broken manholes, vandalized property, etc.) and corrective measures taken.

_____

_____

_____

_____

_____

_____

_____

_____

Fences enclosure conditions: Inspect exterior (SVE/AS piping condition, garbage and drums) and interior (leaks, garbage, unexpected noises/behavior). Note any irregular conditions (e.g. moisture leaks, irregular system behavior, vandalized property, etc.) and corrective measures taken.

_____

_____

_____

_____

_____

_____

_____

_____

Conditions leaving the site: Sheds and fence gate locked, system left on or off and why, any other abnormal conditions.

_____

_____

_____

_____

_____

_____

_____

_____

Site Cover System Inspection

NAME:	DATE:
TIME:	WEATHER:
Annual Inspection or Emergency Inspection (if emergency, specify nature)?	

Home Depot building with Garden Center area to west ___

Description of Site conditions:

_____

_____

Note any changes to or any unusual conditions of Site cover system component:

_____

_____

_____

_____

_____

Asphalt-paved parking lot north of building ___

Description of Site conditions:

_____

_____

Note any changes to or any unusual conditions of Site cover system component:

_____

_____

_____

_____

_____

Landscaped area northeast of building ___

Description of Site conditions:

_____

_____

Note any changes to or any unusual conditions of Site cover system component:
_____
_____
_____
_____
_____

Concrete-paved loading dock southeast-adjacent to the building ___
Description of Site conditions:
_____
_____

Note any changes to or any unusual conditions of Site cover system component:
_____
_____
_____
_____
_____

Asphalt- and concrete-paved driveways south- and east-adjacent to Home Depot building ___
Description of Site conditions:
_____
_____

Note any changes to or any unusual conditions of Site cover system component:
_____
_____
_____
_____
_____

Provide images to document any unusual conditions.

Name Date/Time

Reason for visit Routine inspection? Alarm? Circle one.

Condition	Action	Location	Parameter	Action item	Guage ID	Reading	Units	Emergency conditions
Expanded System	**Are blowers running?**	Blower area in rear		Primary SVE audible y/n?	PS-001		Yes/No	If NO, then call
				Secondary SVE audible y/n?	SS-001		Yes/No	If NO, then call
		S/I Compressor		S/I Compressor audible y/n or standby light on y/n?	SI-001		Yes/No	If NO and NO, then call
		D Compressor		D Compressor audible y/n or standby light on y/n?	D-001		Yes/No	If NO and NO, then call
		S/I Compressor		Is S/I Compressor condensate bucket full y/n?	SI-007		Yes/No	If YES, empty
	Run time checks	Control Panel	Runtime	Primary SVE blower runtime	Analog meter (PS-		Hours	Check against previous inspection
				Secondary SVE blower runtime	Analog meter (SS-002)		Hours	Check against previous inspection
		S/I Compressor		S/I Compressor runtime	Analog meter (SI-002)		Hours	Check against previous inspection
		D Compressor		D Compressor runtime	Digital readout (D-002)		Hours	Check against previous inspection
	Active Zone check	Sparge manifold		Which Zone of AS manifold is being sparged?	NA	Zone __	Zone #	If no Zones being sparged, call
		Primary SVE Blower	Vacuum	Pre filter	(VI-101)		InH2O	If Pre=0, call
				Post Filter	(VI-102)		InH2O	If delta > 15, call
			Pressure	Post Blower	(PI-101)		InH2O	If x=0, call
			Air flow rate	Dilution valve	(FI-101)		InH2O	
			Temperature	Pre blower	(TI-101)		F	
				Post blower	(TI-102)		F	If delta > 30-35, call
		SVE manifold	Vacuum	SVE-_A Vaccum?	(VI-_101)		InH2O	If x≤10 or x≥40, call
			Air flow rate	SVE-_A Flow?	(FI-_101)		InH2O	If x<0.01 or x>0.4, call
			VOC Concentration	SVE-_A PID	SP		PPM	
			Vacuum	SVE-_B Vaccum?	(VI-_102)		InH2O	If x≤10 or x≥40, call
			Air flow rate	SVE-_B Flow?	(FI-_102)		InH2O	If x<0.01 or x>0.4, call
			VOC Concentration	SVE-_A PID	SP		PPM	
		S/I Compressor	Pressure	Compressor	(PI-301)		PSI	If less than ~125, call
				Pre Filter	(PI-302)		PSI	
				Post Filter	(PI-303)		PSI	If delta > 20, call
				Regulator pressure (this is preset)	(PI-304)		PSI	If not __(33?), call
			Air flow rate	Bleed valve flow	(FI-301)		ACFM	
			Temperature	Post-compressor temperature	(TI-301)		F	
		Sparge manifold	Pressure	AS-_A Pressure?	(PI-_30_)		PSI	If x=0 or x≥40, call
			Air flow rate	AS-_A Flow?	(FI-_30_)		ACFM	If x=0 or x≥4, call
			Pressure	AS-_B Pressure?	(PI-_30_)		PSI	If x=0 or x≥40, call
			Air flow rate	AS-_B Flow?	(FI-_30_)		ACFM	If x=0 or x≥4, call
			Pressure	AS-_ _ Pressure?	(PI-_30_)		PSI	If x=0 or x≥40, call
			Air flow rate	AS-_ _ Flow?	(FI-_30_)		ACFM	If x=0 or x≥4, call
			Pressure	AS-_ _ Pressure?	(PI-_30_)		PSI	If x=0 or x≥40, call
			Air flow rate	AS-_ _ Flow?	(FI-_30_)		ACFM	If x=0 or x≥4, call
			Pressure	AS-_ _ Pressure?	(PI-_30_)		PSI	If x=0 or x≥40, call
			Air flow rate	AS-_ _ Flow?	(FI-_30_)		ACFM	If x=0 or x≥4, call
			Pressure	AS-_ _ Pressure?	(PI-_30_)		PSI	If x=0 or x≥40, call
			Air flow rate	AS-_ _ Flow?	(FI-_30_)		ACFM	If x=0 or x≥4, call
			Pressure	AS-_G Pressure?	(PI-_30_)		PSI	If x=0 or x≥40, call
			Air flow rate	AS-_G Flow?	(FI-_30_)		ACFM	If x=0 or x≥4, call
			Pressure	AS-_H Pressure?	(PI-_30_)		PSI	If x=0 or x≥40, call
			Air flow rate	AS-_H Flow?	(FI-_30_)		ACFM	If x=0 or x≥4, call
	If Zones 7 active, check Deep Compressor	D Compressor	Pressure	Compressor	(PI-401)		PSI	
				Pre Filter	(PI-402)		PSI	
				Post Filter	(PI-403)		PSI	If delta > 20, call
				Regulator pressure	(PI-404)		PSI	If not __(33?), call
			Air flow rate	Bleed valve flow	(FI-401)		ACFM	
			Temperature	Post-compressor temperature	(TI-401)		F	

Condition	Action	Location	Parameter	Action item	Guage ID	Reading	Units	Emergency conditions
				Which zones are on Secondary mode?	NA	Zones __	Zone #	
				Inactive SVE zone	NA	Zone __	Zone #	
			Vacuum	SVE-_A Vaccum?	(VI-_101)		InH2O	If x=0 or x≥30, call
			Air flow rate	SVE-_A Flow?	(FI-_101)		InH2O	If x<0.01 or x>0.4, call
			VOC Concentration	SVE-_A PID	SP		PPM	
			Vacuum	SVE-_B Vaccum?	(VI-_102)		InH2O	If x=0 or x≥30, call
			Air flow rate	SVE-_B Flow?	(FI-_102)		InH2O	If x<0.01 or x>0.4, call
			VOC Concentration	SVE-_B PID	SP		PPM	
				Inactive SVE zone	NA	Zone __	Zone #	
			Vacuum	SVE-_A Vaccum?	(VI-_101)		InH2O	If x=0 or x≥30, call
		SVE manifold	Air flow rate	SVE-_A Flow?	(FI-_101)		InH2O	If x<0.01 or x>0.4, call
			VOC Concentration	SVE-_A PID	SP		PPM	
			Vacuum	SVE-_B Vaccum?	(VI-_102)		InH2O	If x=0 or x≥30, call
			Air flow rate	SVE-_B Flow?	(FI-_102)		InH2O	If x<0.01 or x>0.4, call
	Secondary mode zones		VOC Concentration	SVE-_B PID	SP		PPM	
				Inactive SVE zone	NA	Zone __	Zone #	
			Vacuum	SVE-_A Vaccum?	(VI-_101)		InH2O	If x=0 or x≥30, call
			Air flow rate	SVE-_A Flow?	(FI-_101)		InH2O	If x<0.01 or x>0.4, call
			VOC Concentration	SVE-_A PID	SP		PPM	
Expanded System			Vacuum	SVE-_B Vaccum?	(VI-_102)		InH2O	If x=0 or x≥30, call
			Air flow rate	SVE-_B Flow?	(FI-_102)		InH2O	If x<0.01 or x>0.4, call
			VOC Concentration	SVE-_B PID	SP		PPM	
			Vacuum	Pre filter	(VI-201)		InH2O	If Pre=0, call
				Post Filter	(VI-202)		InH2O	If delta > 15, call
			Pressure	Post Blower	(PI-201)		inH2O	If 0, call
		Secondary SVE Blower	Air flow rate	Dilution Valve	(FI-201)		InH2O	
			Temperature	Pre blower	(TI-201)		F	
				Post blower	(TI-202)		F	If delta > 30-35, call
				Influent Pressure	(PI-102)		inH2O	
			Pressure	Intermediate Pressure	(PI-103)		inH2O	
		Primary Carbon (easternmost units)		Effluent Pressure	(PI-104)		inH2O	
				Influent VOC concentration	(PC-101)		PPM	
			VOC concentration	Intermediate VOC concentration	(PC-102)		PPM	If x>0, call
	Carbon unit checks (outside shed, use portable Magnahelic)			Effluent VOC concentration	(PC-103)		PPM	If x>0, call
				Influent Pressure	(PI-202)		inH2O	
			Pressure	Intermediate Pressure	(PI-203)		inH2O	
				Effluent Pressure	(PI-204)		inH2O	
		Secondary carbon (westernmost units)		Influent VOC concentration	(SC-101)		PPM	
			VOC concentration	Intermediate VOC concentration	(SC-102)		PPM	If x>0, call
				Effluent VOC concentration	(SC-103)		PPM	If x>0, call

Condition	Action	Location	Parameter	Action item	Guage ID	Reading	Units	Emergency conditions
Existing System	General conditions check	SVE blower		SVE blower on?	ESVE-01		Yes/No	
		AS blower		AS blower on?	EAS-01		Yes/No	If between 8am and 8pm and NO, call
	SVE blower check	Overhead	Vacuum	Pre-filter vacuum?	ESVE-02		inH2O	
				Post-filter vacuum?	ESVE-03		inH2O	If x < pre-filter vacuum, call
			Air flow rate	Air flow rate?	ESVE-04		CFM	
		Outside	Pressure	Post-blower pressure?	ESVE-05		inH2O	
	Individual SVE line check	SVE gauge cluster along inside east wall	Vacuum	1A	ESVE-06		inH2O	If x≤10, call
				1B	ESVE-07		inH2O	If x<10, call
				1C	ESVE-08		inH2O	If x<10, call
				1D	ESVE-09		inH2O	If x<10, call
				3A/6A	ESVE-10		inH2O	If x<10, call
				3B	ESVE-11		inH2O	If x<10, call
				3C	ESVE-12		inH2O	If x<10, call
				B	ESVE-13		inH2O	If x<10, call
				MANHOLE B SVE-2A			inH2O	If x<10, call
				MANHOLE B SVE-2B			inH2O	If x<10, call
				MANHOLE B SVE-2C			inH2O	If x<10, call
				MANHOLE B SVE-2D			inH2O	If x<10, call
				MANHOLE B SVE-2E			inH2O	If x<10, call
				MANHOLE B SVE-2F			inH2O	If x<10, call
				C	ESVE-14		inH2O	If x<10, call
				MANHOLE C SVE-4A			inH2O	If x<10, call
				MANHOLE C SVE-4B			inH2O	If x<10, call
				MANHOLE C SVE-4C			inH2O	If x<10, call
				MANHOLE C SVE-4D			inH2O	If x<10, call
				D	ESVE-15		inH2O	If x<10, call
				MANHOLE D SVE-5A			inH2O	If x<10, call
				MANHOLE D SVE-5B			inH2O	If x<10, call
				MANHOLE D SVE-5C			inH2O	If x<10, call
				MANHOLE D SVE-5D			inH2O	If x<10, call
				MANHOLE D SVE-5E			inH2O	If x<10, call
	AS blower check	Overhead	Applied pressure	Applied pressure?	EAS-02		PSI	If x< 1.0, call
	Individual AS line check	AS gauge cluster along inside east wall	Pressure	3A/6A	EAS-03		PSI	If x≤ 1.0, call
				3E	EAS-04		PSI	If x< 1.0, call
				3C	EAS-05		PSI	If x< 1.0, call
				1C	EAS-06		PSI	If x< 1.0, call
				3B	EAS-07		PSI	If x< 1.0, call
				3D	EAS-08		PSI	If x< 1.0, call
				1E	EAS-09		PSI	If x< 1.0, call
				1F	EAS-10		PSI	If x< 1.0, call
				1G	EAS-11		PSI	If x< 1.0, call
				1D	EAS-12		PSI	If x< 1.0, call
				1B	EAS-13		PSI	If x< 1.0, call
				1A	EAS-14		PSI	If x< 1.0, call
				1H	EAS-15		PSI	If x< 1.0, call
				B	EAS-16		PSI	If x< 1.0, call
				MANHOLE B AS-2A			PSI	If x< 1.0, call
				MANHOLE B AS-2B			PSI	If x< 1.0, call
				MANHOLE B AS-2C			PSI	If x< 1.0, call
				MANHOLE B AS-2D			PSI	If x< 1.0, call
				MANHOLE B AS-2E			PSI	If x< 1.0, call
				MANHOLE B AS-2F			PSI	If x< 1.0, call
				MANHOLE B AS-2G			PSI	If x< 1.0, call
				MANHOLE B AS-2H			PSI	If x< 1.0, call
				MANHOLE B AS-2I			PSI	If x< 1.0, call
				MANHOLE B AS-2J			PSI	If x< 1.0, call
				C	EAS-17		PSI	If x< 1.0, call
				MANHOLE C AS-4A				If x< 1.0, call
				MANHOLE C AS-4B				If x< 1.0, call
				MANHOLE C AS-4C				If x< 1.0, call
				MANHOLE C AS-4D				If x< 1.0, call
				MANHOLE C AS-4E				If x< 1.0, call
				D	EAS-18		PSI	If x< 1.0, call
				MANHOLE D AS-5A			PSI	If x< 1.0, call
				MANHOLE D AS-5B			PSI	If x< 1.0, call
				MANHOLE D AS-5C			PSI	If x< 1.0, call
				MANHOLE D AS-5D			PSI	If x< 1.0, call
				MANHOLE D AS-5E			PSI	If x< 1.0, call
				MANHOLE D AS-5F			PSI	If x< 1.0, call
				MANHOLE D	FLOW		SCFM	If x=0, call
	Carbon unit checks	Carbon manifold	VOC concentration	Influent PID?	ECARB-01		PPM	If x>0, call
				Intermediate PID?	ECARB-02		PPM	If x>0, call
				Effluent PID?	ECARB-03		PPM	If x>0, call

Condition	Action	Location	Parameter	Action item	Notes/Issues
Entire System	**Shutdowns**	Existing System	Log shutdown/reasons	Duration of/Reasons for shutdown	
		Expanded System			
Expanded System	**Remote Alarm Notification**	Cell phone	Alarm details	Listen to entire message (if message cuts out, it will loop and play again)	Remote shutdown code is "555". The remote alarm system will reference Zones 1, 2, 3, and/or 4 during the alarm message. These do not correspond to our remediation Zones but instead indicate the following: Zone 1 : Anything Primary SVE related (except motor overload Zone 2: Anything Secondary SVE related (except motor overload) Zone 3: Anything AS related (except motor overload) Zone 4: Motor overload(s) on any of the equipment
			Alarm acknowledgement	When all alarm details are noted, press 5.	
				If done correctly, alarm message loop will stop and will acknowledge "5"	
				Press 5 and get acknowledgement two more times.	
				Alarm system should say "Alarm acknowledged. Goodbye."	
	System Stop/Restart Instructions	Control Panel	Push in emergency stop knob	All running equipment should stop	
			Twist and pull emergency stop knob	SVE blowers should restart	
		S/I Compressor	Turn power switch off		
			Push reset button	Audible click as compressor reboots	
			Turn power switch on	Compressor resets or yellow auxiliary light turns on	
		D Compressor	Push reset button	Compressor turns on or yellow standby light turns on	
	Single Zone Shutdown Instructions	Control Panel	Switch Zone AS switch (SV-_ _ _) to CLOSED		
			Switch Zone SVE switch (MOV-_ _ _) to 10_		
			Switch associated TIMER to PI or PII and alternate holding P and * together until programmed time disappears and pressing P to cycle to the next programmed time (then erasing it, etc.)		
			Adjust times on all remaining zones to account for removal of zone. Cycle through ON and OFF times by pressing P, adjust time uding H and M, hold 1…7 button to make sure 1 through 7 are checked off on time screen (indicating days of week)		
		SVE manifold	Manually crank both SVE wells shut		
	Single Zone Restart Instructions	Control Panel	Switch Zone AS switch (SV-_ _ _) to AUTO		
			Switch Zone SVE switch (MOV-_ _ _) to AUTO		
			Switch associated TIMER to PI or PII and alternate setting ON time and pressing P to cycle to the next programmed time then setting OFF time (then press P to cycle to next ON time, program ON time, press P, etc. etc.)		
			Adjust times on all remaining zones to account for reinclusion of zone. Cycle through ON and OFF times by pressing P, adjust time uding H and M, hold 1…7 button to make sure 1 through 7 are checked off on time screen (indicating days of week)		
		SVE manifold	Manually crank both SVE wells OPEN		
Existing System	**System Stop/Restart Instructions**	Control Panel	Turn all three switches to OFF		
			Turn all three switches to AUTO	All equipment should restart. Startup noise is very loud.	

Well Sampling Log

Job No: 03399	**Client:** Home Depot	**Well No:**	
Project Location: Rego Park	**Sampled By:**		
Date:	**Sampling Time:**		
PID at surface:			
Total Depth: ft. below top of casing	**Water Column (WC):** feet	*= 0.163 * WC for 2" wells	
Depth to Water: ft. below top of casing	**Well Volume*:** gallons	*= 0.653 * WC for 4" wells	
Depth to Product: ft. below top of casing	**Volume Purged:** gallons	*= 1.469 * WC for 6" wells	
Depth to top of screen: ft. below top of casing	**Well Diam.:** inches	Target maximum flow rate is 500 ml/min	
Depth to bottom of screen: ft. below top of casing	**Pump type:** QED Sample Pro Bladder Pump		
Approx. Pump Intake: ft. below top of casing	**Field Screening Instrument:** Horiba U-22		

Time	**Depth to Water** (Ft.)	**Purge Rate** (ml/min)	**Temp** (^{o}C)	**Conductivity** (mS/cm)	**DO** (mg/L)	**pH**	**ORP** (mV)	**Tubidity*** (NTU)	**Comments** (problems, odor, sheen)
Stabilization Criteria:				**+/- 3 mS/cm**	**+/- 0.3 mg/L**	**+/- 0.1 pH units**	**+/- 10 mV**	**<50 NTU**	If water quality parameters do not stabilize and/or turbidity is greater than 50 NTU within two hours, discontinue purging and collect sample.

Notes: Including condition of well

System Maintenance Tasks	Frequency	Part Number
Zones 1through 6 SVE Blower Particulate filter replacement	As necessary	
Zones 1through 6 SVE Blower Oil change	Quarterly	Dresser Roots ISO-VG-220
Zones 1through 6 SVE Blower Grease	Quarterly	Grainger #4ZF49: Synthetic bearing grease, NLGI 2, 12.5 oz. (Mobilith SHC100)
Zones 1through 6 SVE Motor Grease	Semi-annually	Grainger #4ZF49: Synthetic bearing grease, NLGI 2, 12.5 oz. (Mobilith SHC100)
Zones 1through 6 AS Blower Oil change	Quarterly	Dresser Roots ISO-VG-220
Zones 1through 6 AS Blower Grease	Quarterly	Grainger #4ZF49: Synthetic bearing grease, NLGI 2, 12.5 oz. (Mobilith SHC100)
Zones 1through 6 AS Motor Grease	Semi-annually	Grainger #4ZF49: Synthetic bearing grease, NLGI 2, 12.5 oz. (Mobilith SHC100)
Zones 7 through 10 Primary SVE Blower Particulate filter replacement	As necessary	Grainger #4FY79, Filter Element, Solberg 235P
Zones 7 through 10 Primary SVE Blower Oil change	Quarterly	Dresser Roots ISO-VG-220
Zones 7 through 10 Primary SVE Blower Grease	Quarterly	Grainger #4ZF49: Synthetic bearing grease, NLGI 2, 12.5 oz. (Mobilith SHC100)
Zones 7 through 10 Primary SVE Motor Grease	Semi-annually	Grainger #4ZF49: Synthetic bearing grease, NLGI 2, 12.5 oz. (Mobilith SHC100)
Zones 7 through 10 Secondary SVE Blower Particulate filter replacement	As necessary	Grainger #4FY79, Filter Element, Solberg 235P
Zones 7 through 10 Secondary SVE Blower Oil change	Quarterly	Dresser Roots ISO-VG-220
Zones 7 through 10 Secondary SVE Blower Grease	Quarterly	Grainger #4ZF49: Synthetic bearing grease, NLGI 2, 12.5 oz. (Mobilith SHC100)
Zones 7 through 10 Secondary SVE Motor Grease	Semi-annually	Grainger #4ZF49: Synthetic bearing grease, NLGI 2, 12.5 oz. (Mobilith SHC100)
Zones 7 through 10 Shallow/Intermediate AS Compressor Coolant Filter replacement	Quarterly	KIT
Zones 7 through 10 Shallow/Intermediate AS Compressor Air Filter replacement	Quarterly	KIT

System Maintenance Tasks	Frequency	Part Number
Zones 7 through 10 Shallow/Intermediate AS Compressor Coalescing filter replacement	As necessary	KIT
Zones 7 through 10 Shallow/Intermediate AS Compressor Drive Belt Replacement	Annually	KIT
Zones 7 through 10 Shallow/Intermediate AS Compressor Hose Replacement	Every two years	KIT
Zones 7 through 10 Shallow/Intermediate AS Compressor Oil filter replacement	As necessary	Grainger # 4ZJ99, Ingersoll-Rand # 39329602
Zones 7 through 10 Shallow/Intermediate AS Compressor Moisture evacuation	As necessary	Not applicable
Zones 7 through 10 Deep AS Compressor Coolant Filter replacement	Quarterly	KIT
Zones 7 through 10 Deep AS Compressor Air Filter replacement	Quarterly	KIT
Zones 7 through 10 Deep AS Compressor Coalescing filter replacement	As necessary	KIT
Zones 7 through 10 Deep AS Compressor Drive Belt Replacement	Annually	KIT
Zones 7 through 10 Deep AS Compressor Hose Replacement	Every two years	KIT
Zones 7 through 10 Deep AS Compressor Oil filter replacement	As necessary	Grainger # 4ZJ99, Ingersoll-Rand # 39329602
Zones 7 through 10 Deep AS Compressor Moisture evacuation	As necessary	Not applicable

Home Depot - Rego Park
Rego Park - Glendale, NY
Vapor Sampling Log Sheet

Sample ID	**PPB Reading** (parts per billion)	**Sampling Time** Date:	**Notes**
Zone 7 INF			
Zone 7 INT			
ZONE 7 EFF			
SVE-7A			
SVE-7B			
ZONE 8 INF			
SVE-8A			
SVE-8B			
ZONE 9 INF			
SVE-9A			
SVE-9B			
COMB-INF			Biased during Zone 8 or 9 operation
COMB-INT			
COMB-EFF			
ZONE 10 INF			
ZONE 10 INT			
ZONE 10 EFF			
SVE-10A			
SVE-10B			
EXISTING INF			
EXISTING INT			
EXISTING EFF			

APPENDIX I

QUALITY ASSURANCE PROJECT PLAN

Home Depot on Woodhaven Boulevard and Metropolitan Avenue

REGO PARK - GLENDALE, NEW YORK

Quality Assurance Project Plan

NYSDEC VCP Site No. V00095

AKRF Project Number: 03399

Prepared for:

Home Depot U.S.A., Inc.
2455 Paces Ferry Road, NW, C-19
Atlanta, GA 30339-4024

Prepared by:

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440 Park Avenue South
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MAY 2012

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TABLES

ATTACHMENTS

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) describes the protocols and procedures that will be followed during ongoing remediation monitoring at the Home Depot – Rego Park site in the Rego Park – Glendale section of Queens, New York (the Site). The objective of the QAPP is to provide for Quality Assurance (QA) and maintain Quality Control (QC) of environmental investigative, sampling and remedial activities conducted under the *Site Management Plan* (SMP), dated December 2011. Adherence to the QAPP will ensure that defensible data will be obtained during performance of the work.

2.0 PROJECT TEAM

The project team will be drawn from AKRF professional and technical personnel and AKRF's subcontractors. All field personnel and subcontractors will have completed a 40-hour training course and updated 8-hour refresher course that meet the Occupational Safety and Health Administration (OSHA) requirements of 29 CFR Part 1910. The following sections describe the key project personnel and their responsibilities.

2.1 Project Director

The project director will be responsible for the general oversight of all aspects of the project, including scheduling, budgeting, data management and decision-making regarding the field program. The project director will communicate regularly with all members of the AKRF project team, the New York State Department of Environmental Conservation (NYSDEC), and Home Depot U.S.A., Inc. to ensure a smooth flow of information between involved parties. Marc Godick, LEP, will serve as the project director for the project. Mr. Godick's resume is included in Attachment A.

2.2 Project Manager

The project manager will be responsible for directing and coordinating all elements of the Pilot Test Work Plan. The project manager will prepare reports and participate in meetings with Home Depot U.S.A., Inc. and/or the NYSDEC. Kathleen Brunner will serve as the project manager for the AS/SVE expansion activities. Ms. Brunner's resume is included in Attachment A.

2.3 Field Team Leader

The field team leader will be responsible for supervising the daily activities, including health and safety activities, in the field and will ensure adherence to the Work Plans and HASP. He will report to the Project Manager on a regular basis regarding daily progress and any deviations from the Work Plan. The field team leader will be a qualified, responsible person, able to act professionally and promptly during soil disturbing activities. It is anticipated that Stephen Grens will serve as the field team leader for the AS/SVE expansion activities. Mr. Grens' resume is included in Attachment A.

2.4 Project Quality Assurance/Quality Control Officer

The Quality Assurance/Quality Control (QA/QC) Officer will be responsible for adherence to the QAPP. The QA/QC Officer will review the procedures with all personnel prior to commencing any fieldwork and will conduct periodic site visits to assess implementation of the procedures. The QA/QC officer will also be responsible for preparing or coordinating for equally qualified personnel to prepare a Data Usability Summary Report (DUSR) for analytical results, as

described in Section 5.0 of this QAPP. Marcus Simons will serve as the QA/QC officer for the pilot testing activities. Mr. Simons's resume is included in Attachment A.

2.5 Laboratory Quality Assurance/Quality Control Officer

The laboratory QA/QC officer will be responsible for quality control procedures and checks in the laboratory and ensuring adherence to laboratory protocols. He/she will track the movement of samples from the time they are checked in at the laboratory to the time that analytical results are issued. He/she will conduct a final check on the analytical calculations and sign off on the laboratory reports. The laboratory QA/QC officer will be determined upon selection of a contract laboratory or laboratories.

3.0 STANDARD OPERATING PROCEDURES

The following sections describe the standard operating procedures (SOPs) for the activities included in the SMP. During these operations, safety monitoring will be performed as described in the project Health and Safety Plan (HASP) and all field personnel will wear appropriate personal protective equipment.

3.1 Site Inspections

As discussed in the SMP, Site inspections will be conducted at the Site to ensure that the Institutional and Engineering Controls instituted at the Site are maintained properly. All inspections will be conducted at the frequency and to the specifications discussed in the SMP. The following are details regarding Site inspection procedures which will require a protocol:

3.1.1 Wellhead and External System Component Inspection

In the event that an AS wellhead requires opening, the expanded AS/SVE system will be shut down in its entirety for approximately one hour and the AS manifold will be depressurized by leaving the shallow/intermediate and deep AS dilution valves, located within the expanded system enclosure, completely open until all pressure gauges on the AS compressors, lines and related equipment read zero. The AS wellheads (comprising both threaded and locking stainless steel caps) will be opened approximately half way (by loosening the cap or releasing one of two locks) until all qualitative signs of pressure (typically audible hissing) have dissipated.

3.1.2 Site Cover System Inspection

Site cover system inspections comprise a visual inspection of the interior and exterior regions of the Site. All findings will be documented in the Site Cover System Inspection Log Sheet, provided in Appendix I of the SMP.

3.2 Well Installation

AS, SVE or groundwater monitoring wells may be installed as part of the ongoing remedial work at the site. The well installation and development data (location, depth, construction details, water level measurements, volume purged, etc.) will be documented in the field logbook or on field data sheets. The drilling equipment will be decontaminated after the work in the presumed contamination source areas, and if evidence of contamination is noted in other areas of the site at the discretion of the field team leader. Decontamination protocol is described in Section 3.2 of this QAPP.

3.2.1 Soil Vapor Extraction Well Installation

The borings for the wells will be installed using sonic and/or hollow stem auger drilling techniques. The SVE wells will be constructed of 4-inch diameter Schedule 40 polyvinyl chloride (PVC) riser and 15-foot long 0.020-inch slotted screen. The screened interval for deep SVE wells will be from 35 feet below grade to 50 feet below grade, and the screened interval for shallow SVE wells will be from 10 feet below grade to 25 feet below grade. The screen annulus will be backfilled with #1 sand pack material, which corresponds with the surrounding sandy soil, ensuring adequate air flow while restricting fines in the soil from clogging the filter sand or entering the well. The well will be completed using a flush-mount manhole, with a concrete apron set around the manhole to prevent drainage of surface runoff toward the well.

No soil samples will be collected during drilling; however, the soil will be characterized and field-screened based on drill cuttings. A PID will be used to measure total VOCs of the soil headspace from drill cuttings.

The SVE wells will be installed according to the following procedure:

- Drill to the desired well depth (25 feet below grade or 50 feet below grade).
- Measure the total depth (and depth to water, if any) in the open hole using a Solinst® Water Table Meter – Model 101 or equivalent.
- Place 4-inch diameter PVC riser with a 15-foot length of 0.020-inch slotted PVC screen at the bottom of the borehole.
- Install #1 sand filter pack around the well screen to a depth of six inches above the top of the screen.
- Install a wetted bentonite seal to a depth of four feet above the filter pack.
- Backfill the annular space to a depth of 5 feet below grade using a bentonite-cement grout (no grout will be used in the two shallow SVE wells).
- Backfill the remainder of the annular space using sand filter pack to a depth of 0.5 feet below grade.
- Complete the well temporarily with a locking cap and a flush-with-grade curb box set in concrete. Provide a concrete apron around the curb box to direct runoff away from the well.
- As part of the piping connections to the SVE blower, the well head will be reconstructed with a threaded plug at the surface and a tee with 4-inch PVC connecting the well to the blower.

3.2.2 Air Sparge Well Installation and Development

The borings for the wells will be installed using sonic and/or hollow stem auger drilling techniques. The AS wells will be constructed of 2-inch diameter Schedule 40 PVC riser, 2-foot long, 0.020-inch slotted screen, and 2-foot long sump. The screened intervals will be:

- 60 to 62 feet below grade for shallow AS wells;
- 80 to 82 feet below grade for intermediate AS wells; and
- 120 to 122 or 130 to 132 feet below grade for deep AS wells.

The screen annulus will be backfilled with #1 sand pack material, which corresponds with the surrounding sandy soil, ensuring adequate air flow while restricting fines in the soil from clogging the filter sand or entering the well. The well will be completed using a flush-mount manhole, with a concrete apron set around the manhole to prevent drainage of surface runoff toward the well.

No soil samples will be collected during drilling; however, the soil will be characterized and field screened based on drill cuttings. A PID will be used to measure total VOCs of the soil headspace from drill cuttings.

AS wells will be installed according to the following procedure:

- Drill to the desired well depth (64 feet below grade, 84 feet below grade, 124 feet below grade or 134 feet below grade).
- Measure the total depth and depth to water in the open hole using a Solinst® Water Table Meter – Model 101 or equivalent.
- Place 2-inch diameter PVC riser with a 2-foot length of 0.020-inch slotted PVC screen at the bottom of the borehole.
- Install #1 sand filter pack around the well screen to a depth of six inches above the top of the screen.
- Install a wetted bentonite seal to a depth of four feet above the filter pack.
- Backfill the annular space to a depth of 5 feet below grade using a bentonite-cement grout.
- Backfill the remainder of the annular space using sand filter pack to a depth of 0.5 feet below grade.
- Complete the well temporarily with a locking cap and a flush-with-grade curb box set in concrete. Provide a concrete apron around the curb box to direct runoff away from the well.
- As part of the piping connections to the AS blower, the well head will be reconstructed with a threaded plug at the surface and a tee with 1-inch HDPE tubing connecting the well to the blower.

The new air sparge wells will be developed according to the following procedure:

- Measure the depth to water using an oil/water interface probe and the total depth of the well using a weighted tape. Use these measurements to calculate the length of the water column. Calculate the volume of water in the well using 0.163 volumes per foot of water column (gallons) as the conversion factor for a 2-inch diameter well.
- For the first five minutes of well development, develop the well by re-circulating the water back into the well to create maximum agitation. This method is intended to remove fines from the sand pack, the adjacent formation and from the well.

  After the first five minutes of well development, develop the well by discharging the water to five-gallon buckets or directly into 55-gallon drums. Water from the buckets will be transferred to 55-gallon drums designated for well development water before the end of each work day.

- During development, collect periodic samples and analyze for turbidity with measurements collected approximately every five minutes.
- Continue developing the well until turbidity is less than 50 nephelometric turbidity units (NTUs) for three successive readings. If the turbidity does not decrease to 50 NTUs, then development should continue for a maximum of three well volumes.
- All well development water, decontamination, and purge water will be containerized in 55-gallon drums and handled as described in the Section 3.3 of this QAPP.

3.2.3 AS/SVE Well Reconnection

All well reconnection work will be conducted in accordance with the Excavation Work Plan, provided as an appendix to the Site Management Plan.

All replaced AS or SVE wells must be reconnected to the AS/SVE system. Existing or spare piping and tubing will be pressure tested and connected to the AS or SVE well head, based on the following procedures:

- Break surface to expose replacement well, and if necessary the replaced well to salvage materials. In some instances, the damaged wells will be repurposed as monitoring wells. In these instances, the damaged wells will be cut at approximately 5 feet below grade, coupled with solid PVC of the appropriate diameter and extended to grade.
- Excavate soil to a depth of approximately 5 feet below grade and stockpile or containerize soil in 55-gallon drums.
- Salvage existing piping/tubing or lead spare piping/tubing to new well.
- Prepare wellhead connection at replacement wells. AS and SVE wellheads will be restored to the specifications proposed in the AS/SVE Expansion Work Plan. In some instances, the length of the horizontal segment of the T leading from the wellhead may need to be extended to safely connect to the trenched piping/tubing.
- Cap piping/tubing and pressure test. All expanded system (Zones 7 through 10) pressure testing can be conducted using the expanded system equipment. Pressure testing methodology for replacement lines for Zones 1 through 6 will vary depending on the nature of the replacement. Any deviation from the pressure testing methodology presented below will be scoped and submitted to NYSDEC for pre-approval. During each test, Contractor shall soap test all test fittings and any other fittings and inspect for leaks.

  - AS lines will be capped within the excavated area and prior to reconnection to the replacement AS well. Within the equipment enclosure, the Control Panel and manual AS throttling valves will be adjusted to isolate the single AS line that will be tested. The AS compressor regulator will be throttled down to 30 psi. Each AS line shall be pressure tested for a minimum of 30 minutes maintaining a pressure of 30 psi. If the AS line fails to maintain 30 psi for 30 minutes, the leak must be isolated (by soap testing and listening for air leaks along the exposed portions of the line), remedied and the line retested.

  - SVE lines will be capped within the excavated area and prior to reconnection to the replacement SVE well. Within the equipment enclosure, the Control Panel and manual SVE throttling valves will be adjusted to isolate the single SVE line that will

be tested. An air compressor must then be attached to the sample port and used to pressurize the SVE line. Each SVE line shall be pressure tested for a minimum of 30 minutes maintaining a pressure of 15 psi. If the SVE line fails to maintain 15 psi for 30 minutes, the leak must be isolated (by soap testing and listening for air leaks along the exposed portions of the line), remedied and the line retested.

- Following successful pressure testing, reconnect piping/tubing to the new AS/SVE wellhead and backfill using clean fill.
- The excavation must be restored with either concrete or asphalt, based on the existing conditions.

3.2.4 Groundwater Monitoring Well Installation and Development

The borings for the wells will be installed using sonic and/or hollow stem auger drilling techniques. The monitoring wells will be constructed of 2-inch diameter Schedule 40 PVC riser and 10-foot long 0.020-inch slotted screen. The screened intervals will be determined by the location and purpose of the monitoring well.

The screen annulus will be backfilled with #1 sand pack material, which corresponds with the surrounding sandy soil, ensuring adequate air flow while restricting fines in the soil from clogging the filter sand or entering the well. The well will be completed using a flush-mount manhole, with a concrete apron set around the manhole to prevent drainage of surface runoff toward the well.

No soil samples will be collected during drilling; however, the soil will be characterized and field screened based on drill cuttings. A PID will be used to measure total VOCs of the soil headspace from drill cuttings.

Monitoring wells will be installed according to the following procedure:

- Drill to the desired well depth.
- Measure the total depth and depth to water in the open hole using a Solinst® Water Table Meter – Model 101 or equivalent.
- Place 2-inch diameter PVC riser with a 2-foot length of 0.020-inch slotted PVC screen at the bottom of the borehole.
- Install #1 sand filter pack around the well screen to a depth of six inches above the top of the screen.
- Install a wetted bentonite seal to a depth of four feet above the filter pack.
- Backfill the annular space to a depth of five feet below grade using a bentonite-cement grout.
- Backfill the remainder of the annular space using sand filter pack to a depth of 0.5 feet below grade.
- Complete the well with a locking cap and a flush-with-grade curb box set in concrete. Provide a concrete apron around the curb box to direct runoff away from the well.

The new monitoring wells will be developed according to the following procedure:

- Measure the depth to water using an oil/water interface probe and the total depth of the well using a weighted tape. Use these measurements to calculate the length of the

water column. Calculate the volume of water in the well using 0.163 volumes per foot of water column (gallons) as the conversion factor for a 2-inch diameter well.

- For the first five minutes of well development, develop the well by re-circulating the water back into the well to create maximum agitation. This method is intended to remove fines from the sand pack, the adjacent formation and from the well.

  After the first five minutes of well development, develop the well by discharging the water to five-gallon buckets or directly into 55-gallon drums. Water from the buckets will be transferred to 55-gallon drums designated for well development water before the end of each work day.

- During development, collect periodic samples and analyze for turbidity with measurements collected approximately every five minutes.
- Continue developing the well until turbidity is less than 50 nephelometric turbidity units (NTUs) for three successive readings. If the turbidity does not decrease to 50 NTUs, then development should continue for a maximum of three well volumes.
- All well development water, decontamination, and purge water will be containerized in 55-gallon drums and handled as described in the Section 3.4 of this QAPP.

3.3 Decontamination of Drilling and Sampling Equipment

The drilling and purging equipment will be decontaminated after each location.

If environmental sampling is to be performed, all sampling equipment will be either dedicated or decontaminated between sampling locations. The decontamination procedure will be as follows:

1. Scrub using tap water/Simple Green® mixture and bristle brush.
2. Rinse with tap water.
3. Scrub again with tap water/ Simple Green® and bristle brush.
4. Rinse with tap water.
5. Rinse with distilled water.
6. Air-dry the equipment, if possible.

Decontamination will be conducted on plastic sheeting (or equivalent) that is bermed to prevent discharge to the ground. Wash water will be handled as described in Section 3.4.

3.4 Management of Investigation Derived Waste

All investigation-derived waste and excavation spoils not being used as backfill material will be containerized in Department of Transportation (DOT)-approved 55-gallon drums, roll-off boxes or other equivalent containers. The drums will be sealed at the end of each work day and labeled with the date, the well or boring number(s), the type of waste (i.e., drill cuttings; development water or purge water) and the name of an AKRF point-of-contact. The material will be analyzed for waste characterization, if warranted. All containers will be labeled "pending analysis" until laboratory data is available. All waste will be disposed of or treated according to applicable local, state and federal regulations.

3.5 Field Instrumentation

Field personnel will be trained in the proper operation of all field instruments at the start of the field program. Instruction manuals for the equipment will be on file at the site for referencing

proper operation, maintenance and calibration procedures. The equipment will be calibrated according to manufacturer specifications at the start of each day of fieldwork, if applicable. If an instrument fails calibration, the project manager or QA/QC officer will be contacted immediately to obtain a replacement instrument. A calibration log will be maintained to record the date of each calibration, any failure to calibrate and corrective actions taken. The photoionization detector (PID) will be calibrated each day using 100 parts per million (ppm) isobutylene standard gas.

4.0 SAMPLING AND LABORATORY PROCEDURES

4.1 Sample Collection Methodology

Where appropriate, equipment blank, trip blank, blind duplicate and matrix spike and matrix spike duplicate samples will be collected, as described in Section 4.4. Chain of Custody forms will include project name, names of sampling personnel, sample number, date and time of collection, sample matrix, signatures of individuals involved in sample transfer, and the dates and times of transfers. All samples will be analyzed using the most recent NYSDEC Analytical Services Protocol (ASP) by a laboratory certified through the NYSDOH ELAP.

4.1.1 Soil Vapor Sample Collection

Confirmatory vapor samples will be collected from the influent and effluent sample ports according to the following procedure:

- A peristaltic pump will be used to extract vapors for carbon treatment unit samples. A 1 liter tedlar bag will be filled with extracted vapors by attaching the tubing from the sampling port to the inlet of the peristaltic pump. The tedlar bag fill port will be attached to the outlet of the peristaltic pump. Both ports will be opened and the peristaltic pump will be started. The pump rate will be throttled to fill the one liter Tedlar bag in approximately 10 minutes, resulting in a an approximate air flow rate of 0.1 liters per minute. The tedlar bag will be removed after its fill port has been closed.
- The tedlar bag will be labeled with an ink pen and enclosed in a zip-lock bag which will be used as an added protection layer to ensure safety in transit to the laboratory.
- The silicone tubing used in the peristaltic pump will be replaced after each sample collected.

4.1.2 Groundwater Sample Collection

Groundwater samples will be collected using low-flow purging and sampling methods based on the procedures described in the U.S. EPA's Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers (EPA 542-S-02-001). Sampling will be conducted according to the following procedure:

- Prior to sampling, a round of depth to water, total depth, PID, and pressure measurements will be taken at all wells to be sampled, with the exclusion of any AS/SVE wells that may need to be sampled. PID and pressure measurements will be taken by temporarily applying a well cap with brass nipple and sampling tube installed.

- Prior to all groundwater sampling in the vicinity of Zones 8 and 9, or sampling groundwater from any AS/SVE wells in Zones 7, 8, 9 and/or 10, the Zone in question will be shut down 24 hours before the onset of sampling. Shut down procedures will entail closing Zone control valves at the system control panel in addition to closing valves on all appropriate individual AS and SVE wells.
- Prepare the sampling area by placing plastic sheeting over the well. Cut a hole in the sheeting to provide access to the well.
- Remove the locking cap and measure the vapor concentrations in the well with a PID.
- Measure the total well depth, depth to water and check for the presence of light non-aqueous phase liquid (LNAPL) or dense non-aqueous phase liquid (DNAPL) using an oil/water interface probe. Groundwater samples will not be collected from wells containing measurable NAPL.
- Use the water level and total well depth measurements to calculate the length of the mid-point of the water column within the screened interval. For example, for a shallow well where the total depth is 60 feet, screened interval is 45 to 60 feet, and depth to water is 50 feet, the mid-point of the water column within the screened interval would be 55 feet.
- Connect dedicated tubing to either a submersible or bladder pump and lower the pump such that the intake of the pump is set at the mid-point of water column within the screened interval of the well. Connect the discharge end of the tubing to the flow-through cell of a Hydrolab Quanta multi-parameter meter or equivalent. Connect tubing to the output of the cell and place the discharge end of the tubing in a five-gallon bucket or other container.
- Activate the pump at the lowest flow rate setting of the pump.
- Measure the depth to water within the well. The pump flow rate may be increased such that the water level measurements do not change by more than 0.3 feet as compared to the initial static reading. The well purging rate should be adjusted so as to produce a smooth, constant (laminar) flow and so as not to produce excessive turbulence in the well.
- Transfer discharged water from the 5-gallon buckets to 55-gallon drums designated for well-purge water.
- During purging, collect periodic samples and analyze for water quality indicators (e.g., turbidity, pH, temperature, dissolved oxygen, oxidation-reduction potential, and specific conductivity) with measurements collected approximately every five minutes.
- Continue purging the well until water quality indicators have stabilized to the extent practicable. The criteria for stabilization will be three successive readings for the following parameters and criteria:

Groundwater Stabilization Parameters and Criteria

Parameter	Stabilization Criteria
pH	+/- 0.1 pH units
Specific Conductance	+/- 3% mS/cm
Oxidation-reduction potential	+/- 10 mV
Turbidity	< 50 NTUs
Dissolved Oxygen	+/- 0.3 mg/l

Notes:
mS/cm= milliSiemens per centimeter
mV= millivolts
NTUs= nephelometric turbidity units

- If the water quality parameters do not stabilize within two hours, purging may be discontinued, and samples will be collected as described in the following subsections. Efforts to stabilize the water quality for the well must be recorded in the field book.
- After purging, disconnect the tubing to the inlet of the flow-through cell. Collect groundwater samples directly from the discharge end of the tubing into the required labeled sample containers and place in a chilled cooler.
- Collect one final field sample and analyze for turbidity and water quality parameters (e.g., pH, temperature, dissolved oxygen, oxidation-reduction potential, and specific conductivity).
- Once sampling is complete, remove the pump and tubing from the well. Dispose of the PPE and other disposable sampling materials appropriately.
- Decontaminate the pump, water level indicator, and flow-through cell as described in Section 3.3.
- Record all measurements (depth to water, depth to NAPL, water quality parameters, turbidity), calculations (well volume) and observations in the project logbook or field data sheet.

4.1.3 Waste Characterization Sample Collection

Investigation-derived waste and excess excavation material requiring off-site disposal will be sampled for waste characterization analyses. Sampling and analytical methods, sampling frequency, analytical results and QA/QC will be performed in a manner suitable to the anticipated receiving facility. Generally, waste characterization samples will be collected such that the submitted sample is representative of the volume of material that will be characterized by the analytical results. All composite samples will comprise a minimum of three grab samples collected below the immediate surface of the containerized material (soil, groundwater, carbon). If there are fewer than three containers of waste to be characterized, a minimum of one sample per container will be grabbed to combine into a composite sample.

4.2 Laboratory Methods

A NYSDOH certified laboratory will perform all analytical work. The laboratory will operate a QA/QC program that will consist of proper laboratory practices (including the required chain-of-custody), an internal quality control program, and external quality control audits by New York State.

The following table summarizes the laboratory methods that will be used to analyze field samples and the sample container type, preservation, and applicable holding times. An ELAP Certified laboratory will be used for all chemical analyses in accordance with DER-10 2.1(b) and 2.1(f). Category B laboratory data deliverables will be required for all samples.

Laboratory Analytical Methods for Field Samples

Analysis Group	Parameter	Method	Sample Containers	Preservative	Holding Times
Soil Vapor (Influent and Effluent)	VOCs	EPA TO-15	Tedlar bag	None	3 days
Groundwater	VOCs	EPA 8260	2-40 mL clear glass vials	HCl, 4 ^{o}C	14 days
Waste Characterization Sampling	TBD - Depending on Disposal/Recycling Facility				

Due to the limited holding time of tedlar bag samples, all tedlar bag sampling will be conducted early in the week so weekends will have no impact on holding times. The laboratory will also be alerted prior to sample submittal to ensure that they are prepared to take receipt of and analyze all samples in a timely fashion.

4.3 Sample Handling

4.3.1 Sample Identification

All samples will be consistently identified in all field documentation, chain-of-custody documents and laboratory reports using an alpha-numeric code. Per NYSDEC sample naming methodology, all samples will be designated "Sample location – Sample date". Vapor samples will be identified by the SVE well number. For example, a vapor sample of influent extracted vapors collected from SVE-8A on January 2, 2012, will be identified as "SVE-8A Influent - 01022012". Waste characterization samples collected from 55-gallon drums or other containers will be identified by the container number (e.g., DRUM-1 or DRUM-2). Composite samples are named sequentially and will always be designated as the next sample in the sequence, regardless of sample matrix.

The field duplicate samples will be labeled with a dummy sample location to ensure that they are submitted as blind samples to the laboratory. The dummy identification will consist of the sample type followed by a letter. For duplicate soil boring samples, the sample depth will be the actual sample depth interval. Trip blanks and field blanks collected, for example on January 2, 2012, will be identified with "TB-01022012" and "FB-01022012", respectively.

4.3.2 Sample Labeling and Shipping

All sample containers will be provided with labels containing the following information:

- Project identification
- Sample identification
- Date and time of collection
- Analysis(es) to be performed
- Sampler's initials

Once the soil or water samples are collected and labeled, they will be placed in chilled coolers and stored in a cool area away from direct sunlight to await shipment to the laboratory. At the start and end of each workday, field personnel will add ice to the coolers as needed.

The samples will be prepared for shipment by preparing the shipping container with packing materials and/or bubble wrap to prevent breakage, adding freezer packs and/or fresh ice in sealable plastic bags if necessary, and the chain-of-custody form. Samples will be shipped overnight (e.g., Federal Express) or transported by a laboratory courier. All coolers shipped to the laboratory will be sealed with mailing tape and a chain-of-custody (COC) seal to ensure that the coolers remain sealed during delivery.

4.3.3 Sample Custody

Field personnel will be responsible for maintaining the sample coolers in a secured location until they are picked up and/or sent to the laboratory. The record of possession of samples from the time they are obtained in the field to the time they are delivered to the laboratory or shipped off-site will be documented on chain-of-custody (COC) forms. The COC forms will contain the following information: project name; names of sampling personnel; sample number; date and time of collection and matrix; and signatures of individuals involved in sample transfer, and the dates and times of transfers. Laboratory personnel will note the condition of the custody seal and sample containers at sample check-in.

4.4 Quality Control Sampling

In addition to the laboratory analysis of the groundwater samples, additional analysis may be included for quality control measures, as required by Category A and Category B sampling techniques. These samples will include equipment blank, trip blank, blind duplicate and matrix spike and matrix spike duplicate samples. Equipment blank and duplicate samples will be analyzed for the same parameter set for which the samples will be analyzed. If the requested parameters include VOCs, a trip blank will be analyzed for volatile organic compounds only. Quality control sampling in accordance with the disposal/recycling facility requirements will be performed when collecting samples for waste characterization.

5.0 DATA REVIEW

The QA/QC officer will conduct a review of all analytical data. If necessary, a data usability summary report (DUSR) would further assess the quality of the data and determine its usability. To assess the data, the QA/QC officer or qualified designee will:

- Ensure the data package is complete as defined under the requirements for the NYSDEC ASP Category A or Category B deliverables as appropriate, and that all data were generated using established and agreed upon protocols.
- Check that all holding times were met.
- Check that all QC data (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.
- Compare raw data with results provided in the data summary sheets and quality control verification forms.
- Check that correct data qualifiers were used.
- Evaluate the raw data and confirm the results provided in the data summary sheets and quality control verification forms.

If performed, any QC exceedances will be specified in the DUSR, and the corresponding data package QC summary sheet identifying the exceedances will be attached. The DUSR would identify any data deficiencies, analytical protocol deviations and quality control problems and discuss their effect on the data. Recommendations for resampling and/or reanalysis would be made. No DUSR will be required for samples collected for Category B analysis, as aforementioned criteria are already included in the Category B Deliverable Requirements.

ATTACHMENT A

RESUMES OF PROJECT QA/QC PERSONNEL

MARC S. GODICK, LEP

SENIOR VICE PRESIDENT

General Introduction

Marc S. Godick, a Senior Vice President of the firm, has over 18 years of experience in the environmental consulting industry. Mr. Godick's broad-based environmental experience includes expertise in remedial investigation, design and implementation of remedial measures, environmental/compliance assessment, litigation support, and storage tank management.

Remedial Investigation, Remediation, and Risk Assessment

Mr. Godick has comprehensive experience with completed projects throughout the Mid-Atlantic and New England regions. His specific experience includes development and implementation of multi-site strategies related to regulatory compliance including brownfields redevelopment, release reporting, remedial investigations, remediation, and risk assessment at bulk fuel storage/distribution, utility, chemical distribution, landfill, industrial, and commercial facilities.

Environmental/Compliance Assessment

Mr. Godick's experience in this area includes the completion and management of Phase I and Phase II environmental site assessment (ESA) and compliance audit projects throughout the United States and in Canada. He has provided management support to multi-site environmental assessment programs, with responsibilities including environmental liability analysis, compliance review, and waste management practices. His projects have included assessments of semiconductor reclamation facilities, food processing plants, and numerous other types of industrial and commercial facilities. Several of the projects were multiple-facility audits on a fast-track basis for venture capital firms, banks, and multinational corporations.

Litigation Support

Mr. Godick provided litigation support services for several remediation projects including insurance claims and other cost recovery actions. He provided expert testimony and developed detailed costing estimates and cost allocation models.

Storage Tank Management

Mr. Godick has managed several single and multi-facility underground and aboveground storage tank (UST/AST) replacement projects. His responsibilities included the management of design, preparation of specifications, contractor bidding, construction oversight, project budgets, and documentation. His compliance experience includes development and implementation of inspection, maintenance, record-keeping, and Spill Prevention Control Countermeasures (SPCC) programs.

BACKGROUND

Education

M.E., Engineering Science/Environmental Engineering, Pennsylvania State University, 1998

B.S., Chemical Engineering, Carnegie Mellon University, 1989

Licenses/Certifications

Licensed Environmental Professional (License # 396) – State of Connecticut – 2003

40 Hour HAZWOPER and Annual Refresher Training, 1990-2008

Supervisors of Hazardous Waste Operations (8 Hour), 1990

Professional Memberships

Member, Village of Larchmont/Town of Mamaroneck Coastal Zone Management Commission, 1997 - Present

Board of Directors, Westchester County Soil and Water Conservation District, 2005 - Present

Board of Directors, Sheldrake Environmental Center, Larchmont, New York, 2006 - Present

Member, NYSDEC Risk-Based Corrective Action (RBCA) Advisory Group for Petroleum-Impacted Sites, 1997

Community Leadership Alliance, Pace University School of Law, 2001

Seminars, Lectures & Publications

"Let Nature Do the Work – Onsite Stormwater Management," Westchester County Department of Parks, Recreation and Conservation, Fall 2003

"Water Pollution Control and Site Assessments and Audits," Environmental Health and Safety Issues Course, Building Owners and Managers Institute (BOMI), 1997-1999

"Hydrogeologic and Geological Aspects of Tank Closures and Remedial Action," Underground Storage Tanks Course, Government Institutes, Summer 1996, Fall 1997

"Soil and Groundwater Cleanup at What Cost? A Review of State-of-the-Art Technologies," Pennsylvania Chamber of Commerce, PennExpo, Fall 1995

Technical Review of "Soil Remediation Technologies" and "Ground Water Remediation Technologies" Chapters, Underground Storage Tank Manual, Thompson Publishing Group

Years of Experience

Year started in company: 2002

Year started in industry: 1990

RELEVANT EXPERIENCE

Flint Park Improvements, Village of Larchmont, NY

As a member of the joint Village of Larchmont/Town of Mamaroneck Coastal Zone Management Committee (CZMC), Mr. Godick was part of a committee involved in development of a master plan for improvements throughout Flint Park. The improvements including restoration of natural grass fields, development of an artificial turf field, and creation of an environmental restoration area along the park's waterfront. Mr. Godick reviewed available technical literature and provided recommendations to the Village Board regarding the use of artificial turf and limitations regarding potential environmental and health concerns.

Brownfield Opportunity Area (BOA) Grant Program Services for the Town of Babylon, Wyandanch, NY

AKRF was retained by the Town of Babylon to prepare a blight study, market study, NYS BOA Step 2 Nomination, an Urban Renewal Plan, and a Generic Environmental Impact Statement (GEIS) as part of a revitalization and redevelopment effort for downtown Wyandanch. Mr. Godick was responsible for overseeing the environmental data collection effort for the 226 brownfields identified in the 105-acre project area, and for identifying strategic sites for which site assessment funding should be sought. He also prepared the Hazardous Materials section of the Wyandanch Downtown Revitalization Plan (which incorporates the Nomination, Urban Renewal Plan, and GEIS), involving a summary of available environmental reports, a review of regulatory records, and limited street-level site inspections.

Alexander Street Urban Renewal Plan, Master Plan, Brownfield Opportunity Area Plan, Yonkers, NY

AKRF was retained by the City of Yonkers to prepare an Urban Renewal Plan, Master Plan, Brownfield Opportunity Area Plan, and **a** Generic Environmental Impact Statement (GEIS) for a 153 acre industrial area along Alexander Street on the Yonkers Waterfront. Mr. Godick is coordinating the preparation of BOA documents and was responsible for the Hazardous Materials sections of the GEIS and Urban Renewal Plan. Mr. Godick managed the environmental data collection effort for the entire study area which involved review and summary of existing environmental reports, a review of regulatory records, and field inspections. The collected information was used to prioritize individual parcels for funding and remediation. The Master Plan for the area calls for the development of a mixed-use neighborhood consisting of residential, neighborhood retail, and office space uses with substantial public open space, access to the Hudson River, and marina facilities.

Queens West Development Project, Avalon Bay Communities, Queens, NY

For over 20 years, AKRF has played a key role in advancing the Queens West development, which promises to transform an underused industrial waterfront property into one of largest and most vibrant mixed-use communities just across the East River from the United Nations. AKRF has prepared an **E**nvironmental Impact Statement (EIS) that examines issues pertaining to air quality, land use and community character, economic impacts, historic and archaeological resources, and infrastructure. Mr. Godick managed one of the largest remediation projects completed to date under the New York State Department of Environmental Conservation (NYSDEC) Brownfields Cleanup Program (BCP) that was contaminated by coal tar and petroleum. The remedy included the installation of a hydraulic barrier (sheet pile cut off wall), excavation of contaminated soil under a temporary structure to control odors during remediation, a vapor mitigation system below the buildings, and implementation of institution controls. The investigation, remediation design, and remedy implementation, and final sign-off (issuance of Certificate of Completion) were completed in two years. Total remediation costs were in excess of $13 million.

Williamsburg Waterfront Redevelopment, RD Management/L&M Equities/Toll Brothers, Brooklyn, NY

The project is one of the largest development projects in the Greenpoint/Williamsburg Rezoning Area, which includes the construction of nearly 1 million square feet of residential and retail space along the Williamsburg waterfront. The site had a variety of industrial uses, including a railyard, junk yard, and waste transfer station. As part of the City's rezoning, the site was assigned an E-designation for hazardous materials. Mr. Godick managed the preparation of the Phase I and II environmental site assessments, remedial action plan (RAP), and construction health and safety plan (CHASP). Mr. Godick obtained NYSDEC closure of an open spill associated with former underground storage tanks at the site. The NYCDEP-approved RAP and CHASP included provisions for reuse of the existing fill material, with the excess being disposed off-site, installation of a vapor barrier below the new buildings, installation of a site cap, and environmental monitoring during the construction activities. Mr. Godick is currently managing the environmental monitoring work that began in 2006. A Notice of Satisfaction has been issued by NYCDEP for the first phase of the development.

West 37th Street Redevelopment, Rockrose, New York, NY

The project is a redevelopment in the Hudson Yards Rezoning Area, which includes the construction of a 250,000 square foot residential/retail building in Manhattan. The site had several motor vehicle service operations, which resulted in a petroleum release to the underlying soil, bedrock, and groundwater. As part of the City's rezoning, the site was assigned an E-designation for hazardous materials. Mr. Godick managed the preparation of the Phase I and II environmental site assessments, remedial action plan (RAP), and construction health and safety plan (CHASP). Mr. Godick obtained approval for the RAP and CHASP by both the NYSDEC and NYCDEP. The RAP and CHASP included provisions for excavation of contaminated soil and bedrock, installation of waterproofing that will also serve as a vapor barrier for the new building, environmental monitoring during the construction activities, and post-development groundwater monitoring. Construction of the building is anticipated to be completed in 2009.

KATHLEEN BRUNNER

TECHNICAL DIRECTOR

Kathleen Brunner is a Technical Director with more than 12 years of professional environmental consulting experience. She specializes in environmental site assessments and investigations, site remediation, and hazardous materials planning studies. Ms. Brunner has extensive experience performing Phase I and II environmental site assessments, directing and overseeing site remediation projects, and addressing the hazardous materials aspects of Environmental Impact Statements (EISs).

Ms. Brunner has managed complex remedial investigation and remedial action projects under the oversight of New York City Department of Environmental Protection and New York State Department of Environmental Conservation. Ms. Brunner has coordinated work and acted as a liaison between clients, property owners, subcontractors, and regulatory agencies on City, State and Federal levels. Her range of project experience includes preparation of proposals, sampling protocols, work plans, health and safety plans, site investigation reports, and closure requests, as well as project scheduling and budgeting. Ms. Brunner's experience also includes supervising the installation of soil borings and groundwater monitoring wells; sampling soil, groundwater, air and soil gas; maintaining and sampling groundwater remediation systems, and overseeing and directing construction-related soil management plans and environmental remediation projects.

Prior to joining AKRF, Ms. Brunner worked for a multidisciplinary consulting firm at their offices in Pewaukee, Wisconsin and New York, New York as an environmental scientist.

BACKGROUND

Education

B.A., Physical Geography, University of Wisconsin – Milwaukee, 1995

Licenses/Certifications

40-Hr Hazardous Waste Operations Site Worker, 1997 to present

Years of Experience

Year started in company: 2004

Year started in industry: 1996

RELEVANT EXPERIENCE

Laundry/Dry Cleaning Plant, New York, NY

Ms. Brunner is managing the assessment and cleanup of the only New York State Department of Environmental Conservation's (NYSDEC) listed hazardous waste site in Manhattan, a former laundry/dry cleaning plant in Harlem. Remedial investigation has included evaluation of soil, groundwater, soil vapor, indoor air, and building materials. Interim remediation completed to date has included the removal of contaminated building materials and operation of an innovative sub-slab vapor extraction system retrofitted into the existing building. The final Remedial Investigation/Feasibility Study (RI/FS) is expected to be approved in 2010.

C.E. Flushing Site, Flushing, NY

Ms. Brunner is managing and coordinating the investigation, remediation and post-remediation monitoring of a former industrial site in Flushing, Queens, NY as part of redevelopment of the property. The investigation included groundwater sampling, delineation of known areas of soil contamination, and delineating PCB-containing non-aqueous phase liquid (NAPL). Remedial activities included removal of aboveground and underground storage tanks, NAPL product removal, removal of on-site drainage structures, and excavation of delineated hot spots, including hazardous and non-hazardous waste streams. Ms. Brunner was responsible for developing work plans for approval by the NYSDEC and New York State Department of Health (NYSDOH), and preparation of summary reports for public comment under the Brownfield Cleanup Program (BCP). Remediation was completed in 2007 and Certificates of Completion under the BCP were issued in December 2007. Post-remediation monitoring includes oversight of construction-related soil disturbance, quarterly groundwater and vapor sampling, and continued annual reporting to NYSDEC and NYSDOH. Ms. Brunner also assisted coordination with the New York City Department of Environmental Protection (NYCDEP) due to an E-designation on the property. As part of the project, Ms. Brunner coordinated with the client, lawyers, architects and engineers of the planned development, tenants of a neighboring property, remediation and construction contractors, US Environmental Protection Agency (USEPA), NYSDEC, NYSDOH, and NYCDEP.

Brownfield Opportunity Area (BOA) Grant Program Services for the Town of Babylon, Wyandanch, NY

AKRF was retained by the Town of Babylon to prepare a blight study, market study, NYS BOA Step 2 Nomination, an Urban Renewal Plan, and a Generic Environmental Impact Statement (GEIS) as part of a revitalization and redevelopment effort for downtown Wyandanch. Ms. Brunner was responsible for overseeing the environmental data collection effort for the 226 brownfields identified in the 105-acre project area, and for identifying strategic sites for which site assessment funding should be sought. She also prepared the Hazardous Materials section of the Wyandanch Downtown Revitalization Plan (which incorporates the Nomination, Urban Renewal Plan, and GEIS), involving a summary of available environmental reports, a review of regulatory records, and limited street-level site inspections.

Bayside Fuel Oil Depot, Brooklyn, NY

Ms. Brunner is managing the site assessment for a major oil storage facility (MOSF) located on the Gowanus Canal waterfront. Work included follow-up investigation related to a petroleum release and preparation of a remedial action plan. Additional investigation and initial remedial activities are expected to be completed in 2010, and the site is being considered for redevelopment for retail and residential use.

Fresh Kills Park, Staten Island, NY

AKRF prepared the Generic Environmental Impact Statement (GEIS) for this large-scale, multi-phase project to turn the former Fresh Kills Landfill into a public park. The project involves New York City Department of Sanitation and Department of Parks with regulatory oversight and approval by both NYCDEP and NYSDEC. As part of the hazardous materials chapter for the GEIS, Ms. Brunner researched site history, performed a regulatory records review and prepared a data summary and recommendations for mitigation of potential future impacts.

Atlantic Yards Arena and Redevelopment Project, Brooklyn, NY

AKRF prepared the Environmental Impact Statement (EIS) and Blight Study for this ambitious and controversial land use initiative. The project, overseen by the Empire State Development Corporation (ESDC), calls for the redevelopment of an underutilized and underdeveloped 22-acre site in the Atlantic Terminal area of Brooklyn, adjacent to Downtown Brooklyn. The project includes a new arena for the Nets basketball team, along with mixed-income residential, commercial office, retail, hotel, and community facility uses. The total project cost is estimated at $4.5 billion. Key issues addressed in the EIS include: potential impacts on water quality in the Gowanus Canal and East River; concerns over land use compatibility and urban design; potential adverse traffic and air quality impacts; and potential adverse effects on socioeconomic conditions in the study area. In addition,

the EIS presented a detailed description of construction activities and phasing, and an analysis of potential averse impacts during project construction. The FEIS was issued in December, 2006. Ms. Brunner served on a team of Hazmat staff conducting Phase I Environmental Site Assessments in accordance with ASTM E-1527-00 related to the potential development of up to 8 city blocks. As part of the study, Ms. Brunner coordinated with the client, property owners or their representatives, and tenants. Her work scope included site reconnaissance, site history and records review, interviews, report preparation, recommendations and data summary to be used in preparation of the EIS chapter.

Edgemere By the Sea, Rockaway, NY

Ms. Brunner performed a Phase I Environmental Site Assessment of 73 city lots located on nine blocks in accordance with ASTM E-1527-00 related to the potential development of the area. Her work scope included site reconnaissance, site history and records review, interviews, report preparation and recommendations. Based on the findings in the Phase I, Phase II was performed. Ms. Brunner coordinated and oversaw soil boring installation and collected soil and groundwater samples.

Fulton Street Transit Center, New York, NY

While working with another firm, Ms. Brunner worked with a multi-company project team assisting with work pertaining to subsurface environmental issues. Ms. Brunner provided general environmental oversight of soil borings, collected groundwater samples from wells, conducted rising head slug tests, and calculated hydraulic conductivity estimates. She prepared the Health and Safety Plan, environmental portions of the work plan, and the Environmental Subsurface Investigation Plan.

DaimlerChrysler, Kenosha, WI

While with another firm, Ms. Brunner assisted in multiple phases of work at an approximately 100-acre DaimlerChrysler manufacturing facility. During construction of a new building, Ms. Brunner observed excavation activities, directed contaminated soil excavation, and managed dewatering treatment and discharge. Post-construction, Ms. Brunner assisted in the reconstruction of two groundwater remediation systems and an SVE system, including plumbing an oil water separator and stripper, and installing appropriate venting and sampling ports. Ms. Brunner also assisted in equipment start-up and subsequent troubleshooting and sampling of influent and effluent. On a quarterly basis, routine and troubleshooting maintenance work was performed on the pumps, flow meters, strippers, oil/water separators and other system components for six remediation systems. Ms. Brunner also directed and documented monitoring well installation, collected groundwater samples from up to 50 monitoring wells and sumps, and air samples from soil vapor extraction systems, reviewed and summarized field and laboratory data, and assisted in writing semi-annual and annual reports for this facility. Report preparation included quality assurance calculations, determination of quantity of free product and dissolved phase contaminant removal, and project narrative of activities completed during the reporting period.

STEPHEN R. GRENS, JR.

ENVIRONMENTAL SPECIALIST

Stephen Grens, Jr. is an Environmental Specialist with expertise in Phase I and II site assessments and comprehensive asbestos surveys. He has completed assessments in New York, New Jersey, Connecticut, Pennsylvania, North Carolina, South Carolina, and Georgia. Mr. Grens is also actively involved in data interpretation and report preparation.

BACKGROUND

Education

B.S., Environmental Sciences, State University of New York (SUNY), Purchase, Expected Graduation Date: May 2010

Licenses/Certifications

New York State Certified Asbestos Inspector, Asbestos Project Monitor, and Air Sampling Technician, 1998

LIRR Roadway Worker, 2007

OSHA HAZWOPER Site Safety Supervisor , 2006

NYC Department of Buildings (DOB) Expediter, 2000

Years of Experience

Year started in company: 1996

Year started in industry: 1996

RELEVANT EXPERIENCE

Former Domino Sugar Refinery

The Refinery LLC is proposing to redevelop the former Domino Sugar site located along the Williamsburg waterfront in Brooklyn with residential and mixed-use buildings. The EIS must examine the full range of issues including land use, zoning and public policy and consistency with the Greenpoint-Williamsburg plan to the north, open space, coastal zone consistency, natural resources, traffic and parking, transit, air quality including any potential impacts from industrial sources and nearby major sources, noise and potential impacts from elevated locations (e.g., the Williamsburg Bridge), historic resources and industrial archeology, urban design and shadows. Mr. Grens performed environmental oversight for the installation of numerous groundwater monitor wells, soil borings and soil and groundwater sampling. Soil and groundwater sampling and monitoring are being performed in accordance with the NYCDEP approved workplan.

Triangle Parcel

Mr. Grens performed environmental oversight for the installation of numerous groundwater monitor wells, soil borings and soil and groundwater sampling. Soil and groundwater sampling and monitoring are being performed in accordance with the NYSDEC approved workplan.

Gedney Way Landfill, White Plains, NY

Mr. Grens performed environmental oversight for the installation of numerous groundwater monitor wells, soil gas vapor extraction points, test pits, soil removal and soil and groundwater sampling. Remedial activities at the landfill are being performed for landfill closure in accordance with the NYSDEC approved workplan.

Flushing Industrial Park, Flushing, NY

Mr. Grens performed environmental and remediation oversight including the implantation of the site specific health and safety plan (HASP) during excavation activities at the Flushing Industrial Park site. Approximately 22,762 tons of PCB contaminated soil and 55,629 tons of non-hazardous soil were remediated and disposed of at the appropriate receiving facilities. The environmental clean-up activities at the Flushing Industrial site were done in accordance with the U.S. Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (NYSDEC) under the Brownfields Clean-Up Program. Mr. Grens is currently overseeing the construction related remedial oversight activities at the Flushing Industrial Park site and will continue through 2008/2009.

Queens West Development Project, Long Island City, NY

For over 20 years, AKRF has played a key role in advancing the Queens West development, which promises to transform an underused industrial waterfront property into one of largest and most vibrant mixed-use communities just across the East River from the United Nations. AKRF has prepared an EIS that examines issues pertaining to air quality, land use and community character, economic impacts, historic and archaeological resources, and infrastructure. As part of the project, AKRF also undertook the largest remediation venture completed to date under the Brownfields Cleanup Program (BCP). Mr. Grens performed environmental oversight including the implantation of the site specific health and safety plan (HASP) during excavation activities at the site. The environmental clean-up activities were done in accordance with the U.S. Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (NYSDEC) under the Brownfields Clean-Up Program.

Sutphin Boulevard Underpass, Jamaica, Queens

Mr. Grens performed the Phase I Environmental Site Assessment, Phase II Subsurface Investigation and asbestos and lead-based paint surveys at the LIRR-owned Sutphin Boulevard site. Portions of the Phase I report were used in the Hazardous Materials Chapter of the Environmental Impact Statement. Mr. Grens reviewed previous environmental reports, performed oversight for the installation of soil gas points and soil borings, and performed the asbestos and lead paint surveys. The proposed redevelopment of the property included retail and commercial spaces.

Parkway Road Site, Bronxville, NY

Mr. Grens supervised and documented the removal of USTs, two hydraulic lifts, dry wells, and petroleum contaminated soil from a parcel that was formerly utilized as a gasoline service station. This site would eventually be redeveloped into multi-unit residential apartments.

Hanover Hall, Stamford, CT

Mr. Grens performed a remote camera observation of the sanitary sewer line to determine the presence of cracks associated with the contamination of surrounding soil. This procedure was implemented as a cost effective means to determine the precise location of possible soil and/or groundwater contamination.

East 135th Street Site, Bronx, NY

Mr. Grens supervised and documented the removal of approximately 8,000 tons of urban fill and metal-contaminated soil for the construction of a storage facility on the Harlem River. He was responsible for the delineation of contaminated areas, and subsequent confirmation soil sampling. Soil was delineated to the extent feasible in order to make way for the storage facility.

Montagano Oil Blending Facility, Pleasantville, NY

Mr. Grens supervised and documented the removal of numerous aboveground storage tanks (ASTs) and oil mixing kettles. Approximately ten 550-gallon aboveground fuel oil storage tanks were rendered free of their contents, cleaned, cut, and removed off-site for disposal. All removal activities were performed in accordance with applicable state and federal regulations. Additional on-site activities included the removal of a 1,000-gallon underground gasoline storage tank, and the installation of site-wide groundwater monitoring wells.

Bridgeport Municipal Stadium (Former Jenkins Valve Property), Bridgeport, CT

As part of the City of Bridgeport's revitalization program for the construction of a minor league baseball facility, Mr. Grens supervised and documented the removal of approximately 14,000 tons of solvent, petroleum, and metal-contaminated soil. He was responsible for the delineation of contaminated areas as well as subsequent confirmation soil sampling for the local sponsoring municipality. Additional on-site activities included the installation of groundwater monitoring wells, removal of underground storage tanks, and management of the current groundwater monitoring program.

Catskill/Delaware Water Treatment Facility, Mount Pleasant and Greenburgh, NY

Mr. Grens was responsible for the contaminated materials analysis as part of the Environmental Impact Statement (EIS) for the New York City Department of Environmental Protection (DEP). The analysis included the Phase I site assessment, a description of the chemicals to be used in the direct filtration process, and their alternatives. Mr. Grens also worked on the Electromagnetic Fields (EMF) analysis for this EIS. It included the interpretation of electromagnetic data from existing on-site sources, including transformers, high-voltage lines, and electrical panels.

East 75th/76th Street Development Site, New York, NY

As the designated health and safety officer (HSO), Mr. Grens' responsibilities included the personal well-being of all on-site personnel during Phase II activities. He managed and supervised the excavation, removal, and off-site disposal of numerous hazardous materials and petroleum-containing underground storage tanks, associated hazardous and contaminated soil, and stained bedrock. This site was formerly utilized as a dry-cleaning facility, parking garage, and automobile repair facility. It was classified as a hazardous waste site because of leaking underground storage tanks. Additional tasks at this site included the continuous monitoring of work-zone and community air and dust particulate levels, implementing the health and safety plan (HASP), and collecting soil and tank product samples in accordance with applicable New York State regulations. Remedial activities at the site began in December 2000 (prior to the demolition of the on-site buildings) and were successfully completed in May 2001. The construction of a new school is anticipated on the site in the near future.

MARCUS SIMONS

SENIOR VICE PRESIDENT

Marcus Simons is a Senior Vice President of AKRF with 20 years of environmental consulting experience, specializing in the assessment and cleanup of contaminated sites, including federal and state superfund, RCRA, TSCA, brownfield, voluntary cleanup and spill sites. His expertise includes health risk assessment, development of sampling plans, economic evaluations of remedial alternatives, and regulatory analysis.

Mr. Simons directs much of AKRF environmental due diligence work (recently managing environmental due diligence on Tishman/Blackrock's Peter Cooper/Stuyvesant Town acquisition, reportedly the largest real estate transaction in US history), including supervising preparation of numerous Phase I and Phase II Environmental Site Assessments, as well as more complex multi-site and litigation-related projects. Mr. Simons manages preparation of the contaminated-materials portions of AKRF's Environmental Impact Statements and Environmental Assessments and has experience with procedures for hazardous material requirements under NEPA and New York SEQRA/CEQR and E-designation programs. He also has extensive experience in statistics, selection of sites for controversial facilities, and federal and state wetland regulations and waterfront permitting. In addition to analytical work, Mr. Simons has considerable experience in presenting results to regulatory agencies and the general public.

Mr. Simons has managed some of the most complex cleanup sites in New York State including: the recently completed cleanup of a 12-acre PCB-contaminated former utility property in Flushing, Queens where a 3 million square foot retail/residential building is nearing completion (remediation was performed under the State Brownfield Cleanup Program, though the site was also subject to City jurisdiction under its E-Designation program); cleanup of the nation's largest former dental factory in Staten Island for reuse as single family housing; the investigation of several former manufactured gas plants; and the investigation and remediation associated with the reconstruction of the West Side Highway and Hudson River Park in Manhattan (from the Battery to 59th Street). Mr. Simons also has extensive experience with transportation projects (Second Avenue Subway, MTA/LIRR East Side Access, Cross Harbor Freight Movement Study, Route 9A Reconstruction), large-scale rezoning projects (Long Island City, Downtown Brooklyn, Jamaica) and public and private redevelopment work (Atlantic Yards, School Construction Authority, Queens West)

BACKGROUND

Education

M.S., Engineering and Public Policy, Carnegie-Mellon University, 1988

M.A. and B.A. (Honors), Mathematics/Engineering, Cambridge University, England, 1986

Years of Experience

Year started in company: 1995

Year started in industry: 1988

RELEVANT EXPERIENCE

CE Flushing Site, Flushing, NY

Mr. Simons directed the remediation of a former industrial site in Flushing, Queens, NY prior to its redevelopment as a 3 million square foot retail/residential complex. The property was cleaned up under the NYS Department of

Environmental Conservation Brownfield Cleanup Program and the NYC Department of Environmental Protection's E-Designation requirements. The remedial measures included the removal of aboveground and underground storage tanks, excavation and off-site disposal of TSCA, RCRA and non-hazardous wastes, NAPL removal, and removal and investigation of on-site drainage structures. The remediation and subsequent construction involved obtaining (or obtaining waivers from) numerous permits including those for NYSDEC Tidal Wetlands, NYSDEC Long Island Wells, NYSDEC SPDES/Stormwater and NYCDEP Sewer Use.

Peter Cooper Village/Stuyvesant Town, New York, NY

Mr. Simons directed the purchaser's environmental due diligence efforts for the bidding and subsequent acquisition of this 80-acre property in Manhattan. Much of the 110-building complex is underlain by former manufactured gas plants and Con Edison entered the site into NYSDEC's Voluntary Cleanup Program. Going forward Mr. Simons will manage oversight of activities that involve disturbance of MGP-contaminated soils, as well as future testing and potentially remediation.

MTA New York City Transit Manhattan East Side Transit Alternative (MESA)/Second Avenue Subway, New York, NY

Mr. Simons directed the contaminated material assessment for this multi-billion dollar transit initiative that would provide subway service to Manhattan's East Side. The assessment identified several hundred facilities along the alignment that could have impacted soil and/or groundwater and could require special materials handling and enhanced health and safety procedures. Additional evaluation of these sites is underway.

Ferry Point Park, Bronx, NY

Mr. Simons developed the material acceptance criteria (soil standards for capping materials) for the development of Ferry Point Park (including a golf course) in the Bronx. The New York City Department of Environmental Protection DEP and the New York State Departments of Health (DOH) and Environmental Conservation (DEC) agreed for the first time to relax their strict (TAGM 4046) criteria for clean soil, based on statistical analyses of background conditions and risk-based modeling.

Prince's Point, Staten Island, NY

Mr. Simons managed the complex cleanup (including the relocation of a contaminated tidal creek) of the nation's largest former dental factory site on Staten Island's waterfront. The site was on the State Superfund list. The future use of the site as single-family residential property entailed extensive negotiations with NYSDEC and NYSDOH. The project required obtaining (or obtaining waivers from) numerous permits including those for NYSDEC Tidal and Fresh Water Wetlands, USACOE (Nationwide) Permits, NYSDEC Coastal Erosion Hazard Area, NYSDEC SPDES and Stormwater, FEMA Modifications to Land in Floodplain, and USEPA Notification of PCB Waste Activity.

Route 9A Reconstruction, New York, NY

AKRF directed extensive studies for the reconstruction in Lower Manhattan proposed by the New York State Department of Transportation (NYSDOT) in cooperation with the Federal Highway Administration (FHWA). The project is arguably the most complex environmental analyses performed for a federally funded transportation project in New York City in the last 10 years. The firm was responsible for all environmental tasks as well as the preparation for the Draft, Supplementary, and Final Environmental Impact Statements (EISs) and Section 4(f) Evaluation for this 5-mile $250 million reconstruction of Route 9A as part of the recovery effort following the events of September 11th, 2001. Mr. Simons managed the extensive hazardous materials investigations and prepared the contract specifications for contaminated soil and tank removal, including Health and Safety oversight.

Hudson River Park, New York, NY

Mr. Simons is managing hazardous materials issues for the ongoing Hudson River Park construction, located adjacent to the Route 9A roadway. Construction is ongoing and Mr. Simons directs health and safety oversight and remediation during construction.

Jamaica Rezoning, Queens, NY

As part of the preparation of an Environmental Impact Statement, Mr. Simons managed the hazardous materials assessment of a multi-block area. In addition to conducting the assessment, Mr. Simons made recommendation as to the properties where "E-Designations" (city-recorded institutional controls on future development) should be placed.

Outlet City, Long Island City, Queens, NY

In Long Island City, Mr. Simons managed the investigation and interim remediation of an old factory complex where large volumes of creosote were spilled. The investigations and interim remedial measures (IRMs) took place under the New York State's Voluntary Cleanup Program (VCP).

MTA/LIRR East Side Access Project, New York, NY

Mr. Simons managed the hazardous materials investigations for multiple sites in the Bronx, Manhattan, and Queens associated with the Environmental Impact Statement (EIS) for the Long Island Rail Road connection to Grand Central Terminal. Mr. Simons continues to be involved in health and safety oversight related to the construction of the project.

New York City Department of Transportation, Lead Paint Removal and Disposal on Bridges Project, New York, NY

Mr. Simons conducted a regulatory analysis of related to the removal of lead paint from nearly 800 bridges. This analysis included an evaluation of the regulatory compliance of various proposed procedures with federal and state hazardous and solid waste management requirements.

American Felt and Filter Company, New Windsor, NY

Mr. Simons prepared a Remedial Investigation (including exposure assessment) and Feasibility Study for the country's oldest active felt manufacturing facility, located in Orange County. This solvent-contaminated site is on the State Superfund List.

APPENDIX J

MONITORING WELL BORING AND WELL INSTALLATION LOGS

Soil Boring and Well Installation Log

Well No.			
P-9	**Job Number:** 03399	**Client:** Home Depot	**Sheet 1 of 4**
	Location: Home Depot Rego Park		**Drilling**
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start** / **Finish**
	Depth to Water: ‹47' below grade	**Logged By:** Mark Acceturi	**Date** 10/30/2008 / **Date** 10/31/2008
			Time / **Time** 12:40

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction	Depth
NA	1	NA	NA	Concrete	1
	2				2
NA	3	NA	NA		3
	4				4
NA	5	NA	NA		5
	6				6
NA	7	NA	NA		7
	8				8
NA	9	NA	NA		9
	10				10
NA	11	NA	NA	Grout	11
	12				12
NA	13	NA	NA		13
	14				14
NA	15	NA	NA		15
	16				16
NA	17	NA	NA		17
	18				18
NA	19	NA	NA		19
	20				20

Well Construction		
Concrete		Concrete
Grout		Grout

Notes: No soil samples collected for field screening until 54' below grade.

Soil Boring and Well Installation Log

Well No.	Job Number: 03399	Client: Home Depot	Sheet 2 of 4	
P-9	Location: Home Depot Rego Park		Drilling	
	Drilling Method: Hollow Stem Auger	Driller: Paragon	Start	Finish
	Depth to Water: 147' below grade	Logged By: Mark Acceturi	Date 10/30/2008	Date 10/31/2008
			Time	Time 12:40

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction			Depth
NA	21	NA	NA				21
	22						22
NA	23	NA	NA				23
	24						24
NA	25	NA	NA				25
	26						26
NA	27	NA	NA				27
	28						28
NA	29	NA	NA				29
	30			Grout		Grout	30
NA	31	NA	NA				31
	32						32
NA	33	NA	NA				33
	34						34
NA	35	NA	NA				35
	36						36
NA	37	NA	NA				37
	38						38
NA	39	NA	NA				39
	40						40

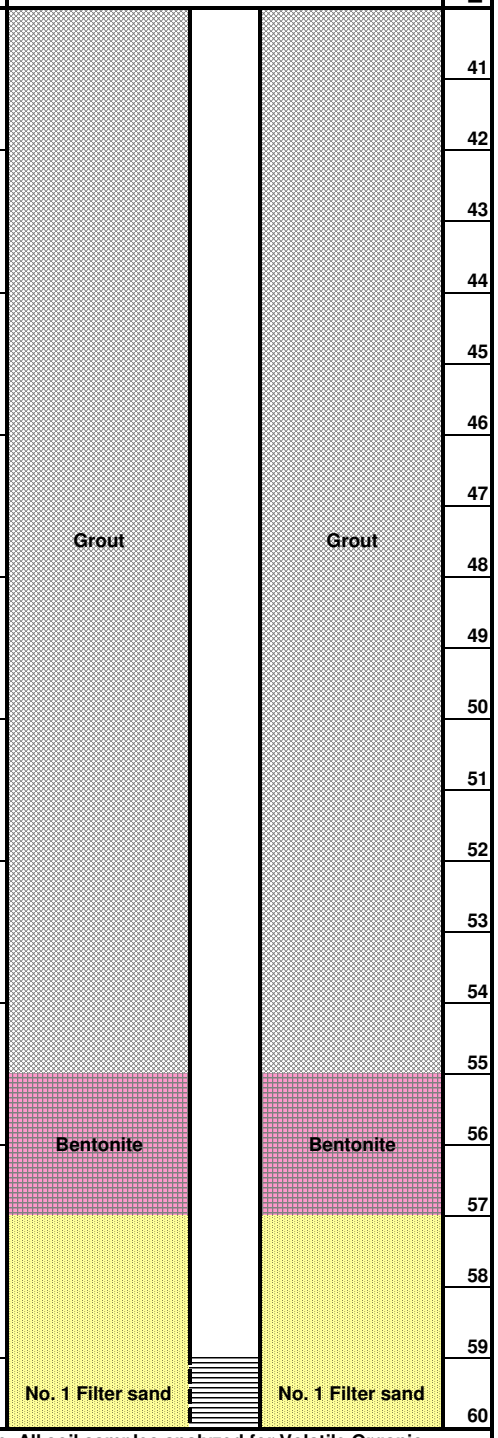
Notes: No soil samples collected for field screening until 54' below grade.

Soil Boring and Well Installation Log

Well No.			
P-9	**Job Number:** 03399	**Client:** Home Depot	**Sheet 3 of 4**
	Location: Home Depot Rego Park		**Drilling**
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start** / **Finish**
	Depth to Water: 147' below grade	**Logged By:** Mark Acceturi	**Date** 10/30/2008 / **Date** 10/31/2008
			Time / **Time** 12:40

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID
NA	41	NA	NA
	42		
NA	43	NA	NA
	44		
NA	45	NA	NA
	46		
NA	47	NA	NA
	48		
NA	49	NA	NA
	50		
NA	51	NA	NA
	52		
NA	53	NA	NA
	54		
15		100% Recovery	22.0 ppm
17	55	All= Brown Fine SAND, Some Fine Gravel.	37.0 ppm
15			41.0 ppm
19	56		58.0 ppm
NA	57	NA	NA
	58		
	59		
15		100% Recovery Top 6"= Brown SAND, Some Fine Gravel	43.0 ppm
25	60	Mid 6"= Brown Fine SILTY SAND, some Fine Gravel	51.0 ppm



Notes: Sample 1P9 collected at 54 and 56' below grade. Sample 2P9 collected at 59 and 61' below grade. All soil samples analyzed for Volatile Organic Compounds by EPA Method 8260, Total Organic Carbon by EPA Method 8060mod, and Chemical Oxygen Demand by EPA Method SM5220D.

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Soil Boring and Well Installation Log

Well No.					
P-9	**Job Number:** 03399	**Client:** Home Depot	**Sheet 4 of 4**		
	Location: Home Depot Rego Park		**Drilling**		
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start**	**Finish**	
	Depth to Water: 147' below grade	**Logged By:** Mark Acceturi	**Date** 10/30/2008	**Date** 10/31/2008	
			Time	**Time** 12:40	

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction	Depth
34		Mid 6"= Light brown SILT, some Fine Gravel	21.0 ppm		
45	61	Bottom 6"= Brown fine SILTY SAND, some Fine Gravel	65.0 ppm		61
	62			No. 1 Filter sand	62
NA	63	NA	NA		63
	64			No. 1 Filter sand	64
27		50% Recovery	8.0 ppm		
34	65	Top 6" Brown SILT.	2.0 ppm		65
46		Bottom 6"= Brown fine SILTY SAND, some Fine Gravel			
48	66				66
	67	End of boring @ 66' below grade			67
	68				68
	69				69
	70				70
	71				71
	72				72
	73				73
	74				74
	75				75
	76				76
	77				77
	78				78
	79				79
	80				80

Notes: Sample 3P11 collected at 64 and 66' below grade. All soil samples analyzed for Volatile Organic Compounds by EPA Method 8260, Total Organic Carbon by EPA Method 8060mod, and Chemical Oxygen Demand by EPA Method SM5220D. End of boring at 66' below grade. Backfill to 63.5' below grade. Well set at 63.5' below grade, with a 5' 0.010 slot screen.

Soil Boring and Well Installation Log

Well No.			
P-10	**Job Number:** 03399	**Client:** Home Depot	**Sheet 1 of 3**
	Location: Home Depot Rego Park		**Drilling**
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start** / **Finish**
	Depth to Water: 147' below grade	**Logged By:** Mark Acceturi	**Date** 10/31/2008 / **Date** 11/4/2008
			Time 15:10 / **Time** 15:30

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction	Depth
NA	1	NA	NA	Concrete	1
	2				2
NA	3	NA	NA		3
	4				4
NA	5	NA	NA		5
	6				6
NA	7	NA	NA		7
	8				8
NA	9	NA	NA		9
	10				10
NA	11	NA	NA	Grout	11
	12				12
NA	13	NA	NA		13
	14				14
NA	15	NA	NA		15
	16				16
NA	17	NA	NA		17
	18				18
NA	19	NA	NA		19
	20				20

Notes: See log for adjacent boring P-9 for soil description.

Soil Boring and Well Installation Log

Well No.	Job Number: 03399	Client: Home Depot	Sheet 2 of 5	
P-10	Location: Home Depot Rego Park		Drilling	
	Drilling Method: Hollow Stem Auger	Driller: Paragon	Start	Finish
	Depth to Water: 147' below grade	Logged By: Mark Acceturi	Date 10/31/2008	Date 11/4/2008
			Time 15:10	Time 15:30

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction			Depth
NA	21	NA	NA				21
	22						22
NA	23	NA	NA				23
	24						24
NA	25	NA	NA				25
	26						26
NA	27	NA	NA				27
	28						28
NA	29	NA	NA				29
	30			Grout		Grout	30
NA	31	NA	NA				31
	32						32
NA	33	NA	NA				33
	34						34
NA	35	NA	NA				35
	36						36
NA	37	NA	NA				37
	38						38
NA	39	NA	NA				39
	40						40

Notes: See log for adjacent boring P-9 for soil description.

Soil Boring and Well Installation Log

Well No.					
P-10	**Job Number:** 03399	**Client:** Home Depot	**Sheet 3 of 3**		
	Location: Home Depot Rego Park		**Drilling**		
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start**	**Finish**	
	Depth to Water: 147' below grade	**Logged By:** Mark Acceturi	**Date** 10/31/2008	**Date** 11/4/2008	
			Time 15:10	**Time** 15:30	

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction	Depth
NA	41	NA	NA	Grout	41
	42				42
NA	43	NA	NA		43
	44				44
NA	45	NA	NA		45
	46				46
NA	47	NA	NA		47
	48				48
NA	49	NA	NA	Bentonite	49
	50				50
NA	51	NA	NA	No. 1 Filter sand	51
	52				52
NA	53	NA	NA		53
	54				54
NA	55	NA	NA		55
	56				56
NA	57	NA	NA		57
	58	End of boring @ 57' below grade			58
	59				59
	60				60

Notes: See log for adjacent boring P-9 for soil description. Well set at 57' below grade with a 5' 0.010 slot screen.

Soil Boring and Well Installation Log

Well No.			
P-11	**Job Number:** 03399	**Client:** Home Depot	**Sheet 1 of 4**
	Location: Home Depot Rego Park		**Drilling**
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start** / **Finish**
	Depth to Water: 146' below grade	**Logged By:** Mark Acceturi	**Date** 11/5/2008 / **Date** 11/5/2008
			Time 10:00 / **Time** 16:00

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction	Depth
NA	1	NA	NA	Concrete	1
	2				2
NA	3	NA	NA		3
	4				4
NA	5	NA	NA		5
	6				6
NA	7	NA	NA		7
	8				8
NA	9	NA	NA		9
	10				10
NA	11	NA	NA	Grout	11
	12				12
NA	13	NA	NA		13
	14				14
NA	15	NA	NA		15
	16				16
NA	17	NA	NA		17
	18				18
NA	19	NA	NA		19
	20				20

	Concrete	Concrete
	Grout	Grout

Notes: No soil samples collected for field screening until 52' below grade.

Soil Boring and Well Installation Log

Well No.	Job Number: 03399	Client: Home Depot	Sheet 2 of 4	
P-11	Location: Home Depot Rego Park		Drilling	
	Drilling Method: Hollow Stem Auger	Driller: Paragon	Start	Finish
	Depth to Water: 146' below grade	Logged By: Mark Acceturi	Date 11/5/2008	Date 11/5/2008
			Time 10:00	Time 16:00

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction			Depth
NA	21	NA	NA				21
	22						22
NA	23	NA	NA				23
	24						24
NA	25	NA	NA				25
	26						26
NA	27	NA	NA				27
	28						28
NA	29	NA	NA				29
	30			Grout		Grout	30
NA	31	NA	NA				31
	32						32
NA	33	NA	NA				33
	34						34
NA	35	NA	NA				35
	36						36
NA	37	NA	NA				37
	38						38
NA	39	NA	NA				39
	40						40

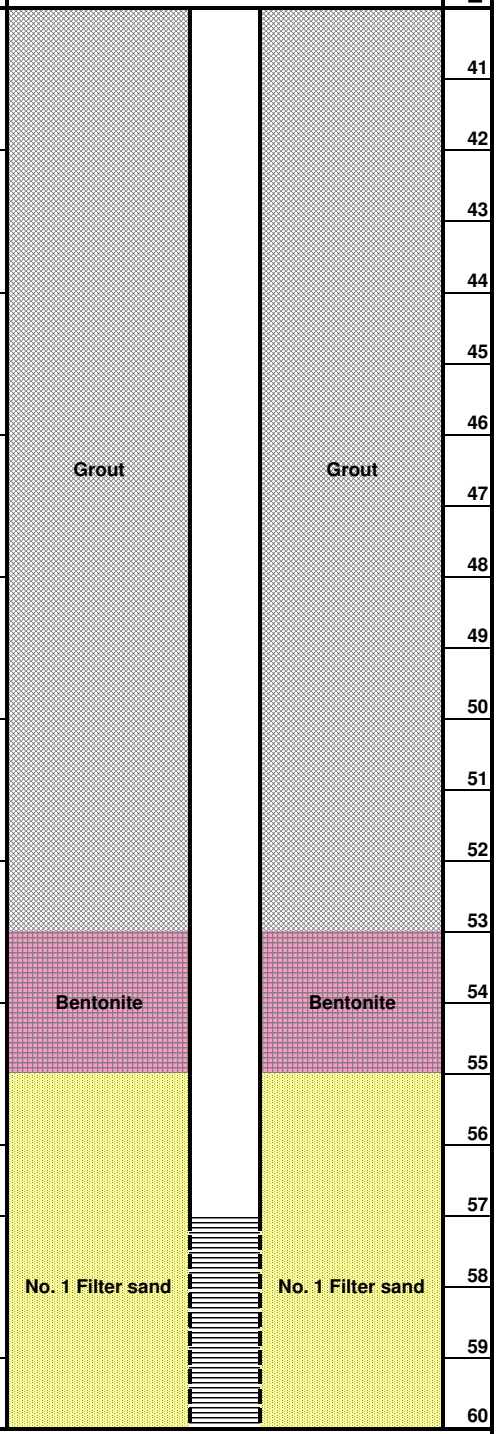
Notes: No soil samples collected for field screening until 52' below grade.

Soil Boring and Well Installation Log

Well No.	Job Number: 03399	Client: Home Depot	Sheet 3 of 4	
P-11	Location: Home Depot Rego Park		Drilling	
	Drilling Method: Hollow Stem Auger	Driller: Paragon	Start	Finish
	Depth to Water: 146' below grade	Logged By: Mark Acceturi	Date 11/5/2008	Date 11/5/2008
			Time 10:00	Time 16:00

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID
NA	41	NA	NA
	42		
NA	43	NA	NA
	44		
NA	45	NA	NA
	46		
NA	47	NA	NA
	48		
NA	49	NA	NA
	50		
NA	51	NA	NA
	52		
11			
36	53	Brown SAND, Some Fine Gravel	8.0 ppm
31			
27	54		
NA	55	NA	NA
	56		
NA	57	NA	NA
37			
34	58	Top 6": Brown SAND, some fine Gravel.	8.0ppm
37		Mid 6": Brown fine SAND, some silt, some fine Gravel.	4.0ppm
36	59	Bottom 6": Brown Medium SAND, Some fine Gravel.	2.2ppm
	60		



Notes: Sample 1P11 collected at 52 and 54' below grade. Sample 2P11 collected at 57 and 59' below grade. All soil samples analyzed for Volatile Organic Compounds by EPA Method 8260, Total Organic Carbon by EPA Method 8060mod, and Chemical Oxygen Demand by EPA Method SM5220D.

Soil Boring and Well Installation Log

Well No.					
P-11	**Job Number:** 03399	**Client:** Home Depot	**Sheet 4 of 4**		
	Location: Home Depot Rego Park		**Drilling**		
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start**	**Finish**	
	Depth to Water: 146' below grade	**Logged By:** Mark Acceturi	**Date** 11/5/2008	**Date** 11/5/2008	
			Time 10:00	**Time** 16:00	

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction	Depth
37 90	61 62	NA	NA	No. 1 Filter sand / No. 1 Filter sand	61 62
15 25 34 45	63 64	Top 6": Brown SAND, some fine Gravel. Mid 6": Brown SAND, some silt, trace fine Gravel. Bottom 6": Brown Medium SAND, some fine Gravel.	2.0 ppm 3.0 ppm 1.2 ppm		63 64
	65 66	End of boring @ 64' below grade.			65 66
	67 68				67 68
	69 70				69 70
	71 72				71 72
	73 74				73 74
	75 76				75 76
	77 78				77 78
	79 80				79 80

Notes: Sample 3P11 collected at 62 and 64' below grade. All soil samples analyzed for Volatile Organic Compounds by EPA Method 8260, Total Organic Carbon by EPA Method 8060mod, and Chemical Oxygen Demand by EPA Method SM5220D. End of boring at 64' below grade. Backfill to 62' below grade. Well set at 62' below grade with 5' of 0.010 slot screen.

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Soil Boring and Well Installation Log

Well No.					
P-12	**Job Number:** 03399	**Client:** Home Depot	**Sheet 1 of 3**		
	Location: Home Depot Rego Park		**Drilling**		
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start**	**Finish**	
	Depth to Water: 146' below grade	**Logged By:** Mark Acceturi	**Date** 11/6/2008	**Date** 11/6/2008	
			Time 8:10	**Time** 16:00	

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction			Depth
NA	1	NA	NA	Concrete		Concrete	1
	2						2
NA	3	NA	NA				3
	4						4
NA	5	NA	NA				5
	6						6
NA	7	NA	NA				7
	8						8
NA	9	NA	NA				9
	10						10
NA	11	NA	NA	Grout		Grout	11
	12						12
NA	13	NA	NA				13
	14						14
NA	15	NA	NA				15
	16						16
NA	17	NA	NA				17
	18						18
NA	19	NA	NA				19
	20						20

Notes: No soil samples collected for field screening until 45' below grade.

Soil Boring and Well Installation Log

Well No.	Job Number: 03399	Client: Home Depot	Sheet 2 of 5	
P-12	Location: Home Depot Rego Park		Drilling	
	Drilling Method: Hollow Stem Auger	Driller: Paragon	Start	Finish
	Depth to Water: 146' below grade	Logged By: Mark Acceturi	Date 11/6/2008	Date 11/6/2008
			Time 8:10	Time 16:00

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction			Depth
NA	21	NA	NA				21
	22						22
NA	23	NA	NA				23
	24						24
NA	25	NA	NA				25
	26						26
NA	27	NA	NA				27
	28						28
NA	29	NA	NA				29
	30			Grout		Grout	30
NA	31	NA	NA				31
	32						32
NA	33	NA	NA				33
	34						34
NA	35	NA	NA				35
	36						36
NA	37	NA	NA				37
	38						38
NA	39	NA	NA				39
	40						40

Notes: No soil samples collected for field screening until 45' below grade.

Soil Boring and Well Installation Log

Well No.					
P-12	**Job Number:** 03399	**Client:** Home Depot	**Sheet 3 of 3**		
	Location: Home Depot Rego Park		**Drilling**		
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start**	**Finish**	
	Depth to Water: 146' below grade	**Logged By:** Mark Acceturi	**Date** 11/6/2008	**Date** 11/6/2008	
			Time 8:10	**Time** 16:00	

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction	Depth
NA	41	NA	NA	Grout / Grout	41
	42				42
NA	43	NA	NA		43
	44			Bentonite / Bentonite	44
NA	45	NA	NA		45
NA	46	Brown fine SILT and SAND, some fine Gravel.	29.0 ppm		46
	47				47
	48			No. 1 Filter sand / No. 1 Filter sand	48
NA	49	NA	NA		49
	50				50
NA	51	NA	NA		51
	52				52
	53	End of boring @ 52' below grade			53
	54				54
	55				55
	56				56
	57				57
	58				58
	59				59
	60				60

Notes: Sample 1P12 collected at 45 and 47' below grade. All soil samples analyzed for Volatile Organic Compounds by EPA Method 8260, Total Organic Carbon by EPA Method 8060mod, and Chemical Oxygen Demand by EPA Method SM5220D. End of boring at 52' below grade. Well set at 52' below grade with 5' of 0.010 slot screen.

Soil Boring and Well Installation Log

Well No.			
P-13	**Job Number:** 03399	**Client:** Home Depot	**Sheet 1 of 5**
	Location: Home Depot Rego Park		**Drilling**
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start** / **Finish**
	Depth to Water: 150' below grade	**Logged By:** Mark Acceturi	**Date** 11/11/2008 / **Date** 11/12/2008
			Time 10:20 / **Time** 17:00

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction	Depth
NA	1	NA	NA	Concrete	1
	2				2
NA	3	Drilling slowed as augers encountered railroad ballast.	NA		3
	4				4
NA	5	NA	NA		5
	6				6
NA	7	NA	NA		7
	8				8
NA	9	NA	NA		9
	10				10
NA	11	NA	NA	Grout	11
	12				12
NA	13	NA	NA		13
	14				14
NA	15	NA	NA		15
	16				16
NA	17	NA	NA		17
	18				18
NA	19	NA	NA		19
	20				20

Well Construction		
Concrete		Concrete
Grout		Grout

Notes: No soil samples collected for field screening until 50' below grade.

Soil Boring and Well Installation Log

Well No.					
P-13	**Job Number:** 03399	**Client:** Home Depot	**Sheet 2 of 5**		
	Location: Home Depot Rego Park		**Drilling**		
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start**	**Finish**	
	Depth to Water: 150' below grade	**Logged By:** Mark Acceturi	**Date** 11/11/2008	**Date** 11/12/2008	
			Time 10:20	**Time** 17:00	

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction	Depth
NA	21	NA	NA		21
	22				22
NA	23	NA	NA		23
	24				24
NA	25	NA	NA		25
	26				26
NA	27	NA	NA		27
	28				28
NA	29	NA	NA		29
	30			Grout Grout	30
NA	31	NA	NA		31
	32				32
NA	33	NA	NA		33
	34				34
NA	35	NA	NA		35
	36				36
NA	37	NA	NA		37
	38				38
NA	39	NA	NA		39
	40				40

Notes: No soil samples collected for field screening until 50' below grade.

Soil Boring and Well Installation Log

Well No.	Job Number: 03399	Client: Home Depot	Sheet 3 of 5	
P-13	Location: Home Depot Rego Park		Drilling	
	Drilling Method: Hollow Stem Auger	Driller: Paragon	Start	Finish
	Depth to Water: 150' below grade	Logged By: Mark Acceturi	Date 11/11/2008	Date 11/12/2008
			Time 10:20	Time 17:00

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction	Depth
NA	41	NA	NA	Grout	41
	42				42
NA	43	NA	NA		43
	44				44
NA	45	NA	NA		45
	46				46
NA	47	NA	NA		47
	48				48
NA	49	NA	NA		49
	50				50
10	51	Dark brown fine SAND, some fine Gravel.	ND		51
18 17					
24	52				52
NA	53	NA	NA		53
	54				54
NA	55	NA	NA		55
	56				56
NA	57	NA	NA		57
	58				58
NA	59	NA	NA		59
	60				60

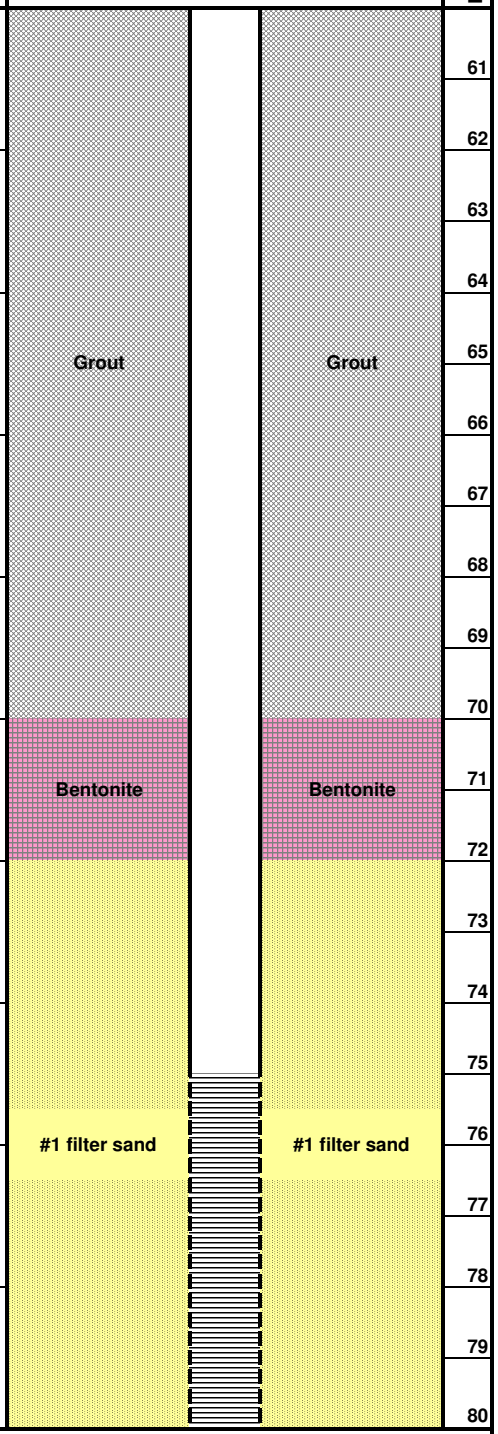
Notes: Sample 1P13 collected at 50 and 52' below grade. All soil samples analyzed for Volatile Organic Compounds by EPA Method 8260, Total Organic Carbon by EPA Method 8060mod, and Chemical Oxygen Demand by EPA Method SM5220D.
ND - None Detected

Soil Boring and Well Installation Log

Well No.			
P-13	**Job Number:** 03399	**Client:** Home Depot	**Sheet 4 of 5**
	Location: Home Depot Rego Park		**Drilling**
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start** / **Finish**
	Depth to Water: 150' below grade	**Logged By:** Mark Acceturi	**Date** 11/11/2008 / **Date** 11/12/2008
			Time 10:20 / **Time** 17:00

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID
37 90	61 62	Brown fine SAND, some fine Gravel.	ND
NA	63 64	NA	NA
NA	65 66	NA	NA
NA	67 68	NA	NA
NA	69 70	NA	NA
NA	71 72	Top 12": Brown fine SAND. Bottom 3": Brown medium SAND, some fine Gravel.	ND
NA	73 74	NA	NA
NA	75 76	NA	NA
NA	77 78	NA	NA
NA	79 80	NA	NA



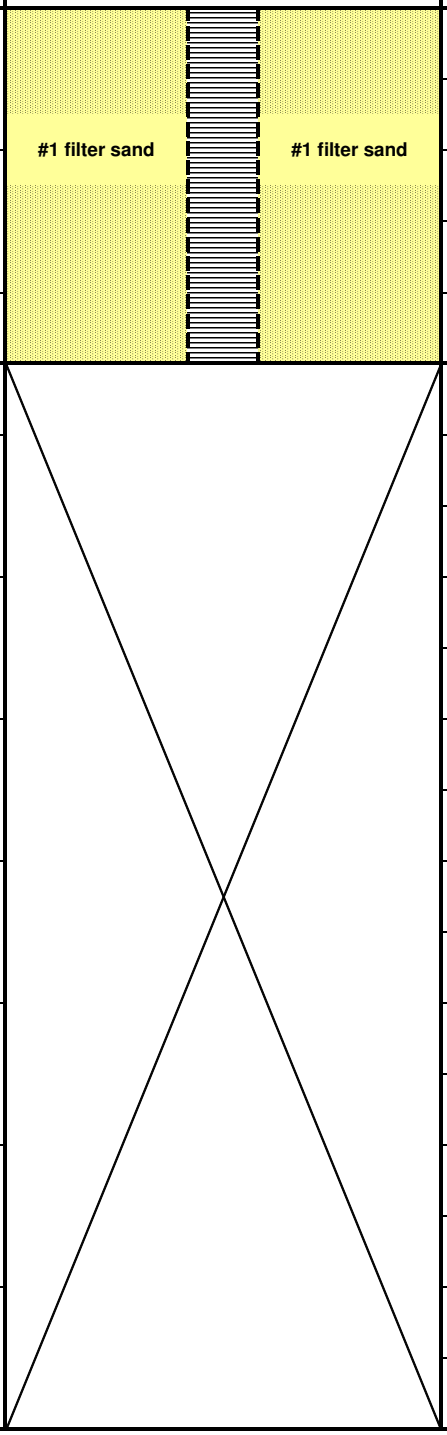
Notes: Sample 2P13 collected at 60 and 62' below grade. Sample 3P13 collected at 70 and 72' below grade. All soil samples analyzed for Volatile Organic Compounds by EPA Method 8260, Total Organic Carbon by EPA Method 8060mod, and Chemical Oxygen Demand by EPA Method SM5220D.
ND - None detected

Soil Boring and Well Installation Log

Well No.				
P-13	**Job Number:** 03399	**Client:** Home Depot	**Sheet 5 of 5**	
	Location: Home Depot Rego Park		**Drilling**	
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start**	**Finish**
	Depth to Water: 150' below grade	**Logged By:** Mark Acceturi	**Date** 11/11/2008	**Date** 11/12/2008
			Time 10:20	**Time** 17:00

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction	Depth
NA	81	NA	ND		81
	82			#1 filter sand	82
NA	83	NA	ND		83
	84				84
	85				85
	86	End of Boring at 85' below grade			86
	87				87
	88				88
	89				89
	90				90
	91				91
	92				92
	93				93
	94				94
	95				95
	96				96
	97				97
	98				98
	99				99
	100				100



Notes: End of boring at 85' below grade. Well set at 85' below grade with 10' of 0.010 slot screen.

Soil Boring and Well Installation Log

Well No.			
P-14	**Job Number:** 03399	**Client:** Home Depot	**Sheet 1 of 3**
	Location: Home Depot Rego Park	**Weather:** Light rain	**Drilling**
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start** / **Finish**
	Depth to Water: 150' below grade	**Logged By:** Mark Acceturi	**Date** 11/13/2008 / **Date** 11/14/2008
			Time 12:00 / **Time** 10:15

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction	Depth
NA	1	NA	NA	Concrete	1
	2				2
NA	3	NA	NA		3
	4				4
NA	5	NA	NA		5
	6				6
NA	7	NA	NA		7
	8				8
NA	9	NA	NA		9
	10				10
NA	11	NA	NA	Grout	11
	12				12
NA	13	NA	NA		13
	14				14
NA	15	NA	NA		15
	16				16
NA	17	NA	NA		17
	18				18
NA	19	NA	NA		19
	20				20

Notes: No soil samples collected from boring P-14.

Soil Boring and Well Installation Log

Well No.				
P-14	**Job Number:** 03399	**Client:** Home Depot	**Sheet 2 of 3**	
	Location: Home Depot Rego Park	**Weather:** Light rain	**Drilling**	
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start**	**Finish**
	Depth to Water: 150' below grade	**Logged By:** Mark Acceturi	**Date** 11/13/2008	**Date** 11/14/2008
			Time 12:00	**Time** 10:15

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction	Depth
NA	21	NA	NA	Grout	21
	22				22
NA	23	NA	NA		23
	24				24
NA	25	NA	NA		25
	26				26
NA	27	NA	NA		27
	28				28
NA	29	NA	NA		29
	30				30
NA	31	NA	NA		31
	32				32
NA	33	NA	NA		33
	34				34
NA	35	NA	NA		35
	36				36
NA	37	NA	NA		37
	38				38
NA	39	NA	NA		39
	40				40

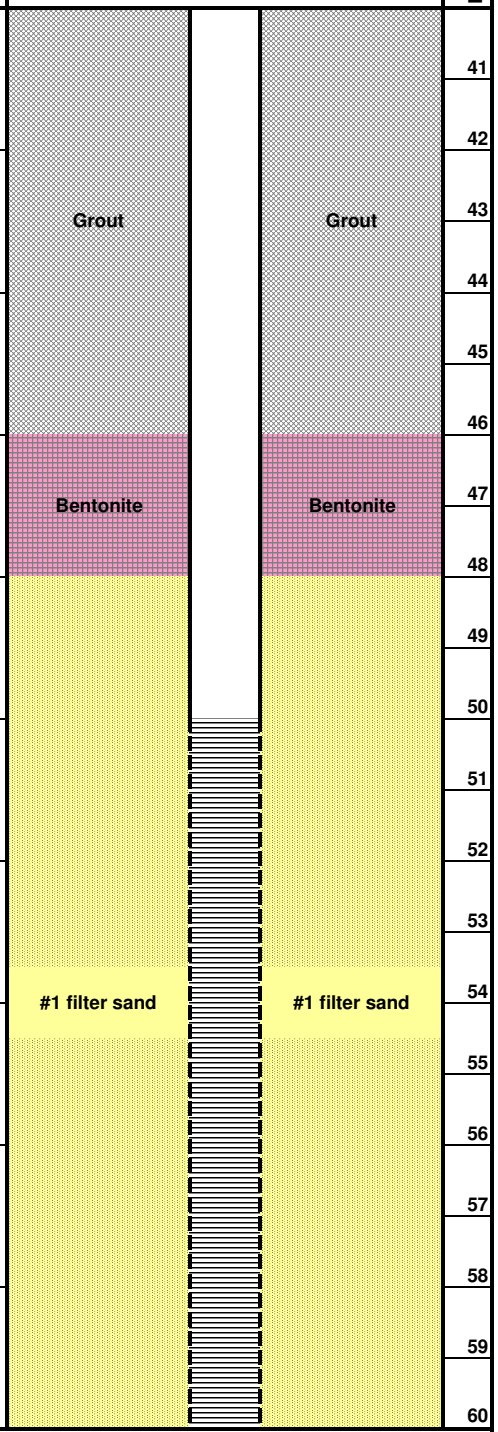
Notes: No soil samples collected from boring P-14.

Soil Boring and Well Installation Log

Well No.					
P-14	**Job Number:** 03399	**Client:** Home Depot	**Sheet 3 of 3**		
	Location: Home Depot Rego Park	**Weather:** Light rain	**Drilling**		
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start**	**Finish**	
	Depth to Water: 150' below grade	**Logged By:** Mark Acceturi	**Date** 12/15/2008	**Date** 12/16/2008	
			Time 12:30	**Time** 17:00	

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Depth
NA	41 42	NA	NA	41 42
NA	43 44	NA	NA	43 44
NA	45 46	NA	NA	45 46
NA	47 48	NA	NA	47 48
NA	49 50	NA	NA	49 50
NA	51 52	NA	NA	51 52
NA	53 54	NA	NA	53 54
NA	55 56	NA	NA	55 56
NA	57 58	NA	NA	57 58
NA	59 60	NA	NA	59 60



Notes: * Logging drill cuttings down to 40' below grade. No soil samples collected from boring P-14. End of boring @ 60' below grade. Well set @ 60' below grade with 10' of 0.010 slot screen.

Soil Boring and Well Installation Log

Well No.					
P-15	**Job Number:** 03399	**Client:** Home Depot	**Sheet 1 of 5**		
	Location: Home Depot Rego Park	**Weather:** Clear 60˚F	**Drilling**		
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start**	**Finish**	
	Depth to Water: 150' below grade	**Logged By:** Eric Park	**Date** 12/15/2008	**Date** 12/16/2008	
			Time 12:30	**Time** 17:00	

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction	Depth
NA	1	Dark brown fine SAND and SILT.	ND	Concrete	1
	2				2
NA	3	Brown fine SAND, trace fine Gravel.	ND		3
	4				4
NA	5	Brown fine SAND, some Gravel.	ND		5
	6	(Drilling slowed as auger hit ballast layer of historic rail lines)			6
NA	7	Brown fine SAND, some Gravel.	ND		7
	8				8
NA	9	Brown fine SAND, some Gravel.	ND		9
	10				10
NA	11	Brown fine SAND, some Gravel.	ND	Grout	11
	12				12
NA	13	Brown fine SAND, some Gravel.	ND		13
	14				14
NA	15	Light brown fine SAND.	ND		15
	16				16
NA	17	Light brown fine SAND.	ND		17
	18				18
NA	19	Light brown fine SAND.	ND		19
	20				20

Concrete

Grout

Notes: Logged drill cuttings down to 40' below grade.
ND - None detected

Soil Boring and Well Installation Log

Well No.				
P-15	**Job Number:** 03399	**Client:** Home Depot	**Sheet 2 of 5**	
	Location: Home Depot Rego Park	**Weather:** Clear 60˚F	**Drilling**	
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start**	**Finish**
	Depth to Water: 150' below grade	**Logged By:** Eric Park	**Date** 12/15/2008	**Date** 12/16/2008
			Time 12:30	**Time** 17:00

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction	Depth
NA	21 22	Light brown fine SAND, trace fine Gravel.	ND	Grout	21 22
NA	23 24	Light brown fine SAND, trace fine Gravel.	ND		23 24
NA	25 26	Light brown fine SAND, trace fine Gravel.	ND		25 26
NA	27 28	Light brown fine SAND, trace fine Gravel.	ND		27 28
NA	29 30	Light brown fine SAND, trace fine Gravel.	ND		29 30
NA	31 32	Light brown fine SAND, trace fine Gravel.	ND		31 32
NA	33 34	Light brown fine SAND, trace fine Gravel.	ND		33 34
NA	35 36	Light brown fine SAND, trace fine Gravel.	ND		35 36
NA	37 38	Light brown fine SAND, trace fine Gravel.	ND		37 38
NA	39 40	Light brown fine SAND, trace fine Gravel.	ND		39 40

Notes: Logged drill cuttings down to 40' below grade.
ND - None detected

Soil Boring and Well Installation Log

Well No.					
P-15	**Job Number:** 03399	**Client:** Home Depot	**Sheet 3 of 5**		
	Location: Home Depot Rego Park	**Weather:** Clear 60˚F	**Drilling**		
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start**	**Finish**	
	Depth to Water: 150' below grade	**Logged By:** Eric Park	**Date** 12/15/2008	**Date** 12/16/2008	
			Time 12:30	**Time** 17:00	

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction	Depth
10 19 20 21	41 42	Light brown fine SAND, trace fine Gravel.	ND		41 42
31 42 48 49	43 44	Light brown fine SAND, trace fine Gravel.	ND		43 44
14 28 50/.4	45 46	Light brown fine SAND, trace fine Gravel.	ND		45 46
31 24 38 46	47 48	Light brown fine SAND, trace fine Gravel.	ND		47 48
14 26 29 32	49 50	Light brown fine SAND, trace fine Gravel.	ND	Grout	49 Grout 50
21 28 34 42	51 52	Light brown fine SAND, trace fine Gravel.	ND		51 52
25 50/.4	53 54	Top 6": Slough from above. Bottom 10": Light brown fine SAND, trace fine Gravel.	ND		53 54
10 18 31 34	55 56	Light brown fine SAND, trace fine Gravel.	ND		55 56
10 14 22 34	57 58	No Recovery	NA		57 58
16 21 28 40	59 60	Top 14": Light brown fine SAND, trace fine Gravel. Bottom 2": Brown fine SAND, some Gravel.	ND		59 60

Notes: ND - None detected

Soil Boring and Well Installation Log

Well No.					
P-15	**Job Number:** 03399	**Client:** Home Depot	**Sheet 4 of 5**		
	Location: Home Depot Rego Park	**Weather:** Clear 60˚F	**Drilling**		
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start**	**Finish**	
	Depth to Water: 150' below grade	**Logged By:** Eric Park	**Date** 12/15/2008	**Date** 12/16/2008	
			Time 12:30	**Time** 17:00	

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction	Depth
22					
31	61	Top 14": Brown fine SAND, trace fine Gravel.	ND		61
41		Bottom 2": Brown fine SAND, Some fine Gravel.			
48	62				62
27					
33	63	Brown fine SAND, Some fine Gravel.	ND		63
47					
50/.3	64				64
15					
29	65	Brown fine SAND, trace fine Gravel.	ND	Grout	65
31					
42	66				66
17					
25	67	Brown fine SAND, trace fine Gravel.	ND		67
29					
33	68				68
22					
35	69	Brown fine SAND, trace fine Gravel.	ND		69
42					
48	70				70
25					
32	71	Brown fine SAND, trace fine Gravel.	ND	Bentonite	71
41					
48	72				72
21					
32	73	Brown fine SAND, trace fine Gravel.	ND		73
42					
47	74				74
17					
26	75	Brown fine SAND, trace fine Gravel.	ND		75
37					
44	76			#1 filter sand	76
18					
38	77	Brown fine SAND, trace fine Gravel.	ND		77
35					
42	78				78
31					
50/.4	79	No Recovery	NA		79
	80				80

Notes: ND - None detected

Soil Boring and Well Installation Log

Well No.			
P-15	**Job Number:** 03399	**Client:** Home Depot	**Sheet 5 of 5**
	Location: Home Depot Rego Park	**Weather:** Clear 60˚F	**Drilling**
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start** / **Finish**
	Depth to Water: 150' below grade	**Logged By:** Eric Park	**Date** 12/15/2008 / **Date** 12/16/2008
			Time 12:30 / **Time** 17:00

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction	Depth
24 45 50 50	81 82	Brown fine SAND, trace fine Gravel.	ND	#1 filter sand	81 82
27 37 50 50	83 84	Brown fine SAND, trace fine Gravel.	ND	#1 filter sand	83 84
	85 86	End of Boring at 84' below grade			85 86
	87 88				87 88
	89 90				89 90
	91 92				91 92
	93 94				93 94
	95 96				95 96
	97 98				97 98
	99 100				99 100

Notes: End of boring at 84' below grade. Well set at 84' below grade with 10' of 0.010 slot screen.
ND - None detected

Soil Boring and Well Installation Log

Well No.					
P-16	**Job Number:** 03399	**Client:** Home Depot	**Sheet 1 of 3**		
	Location: Home Depot Rego Park	**Weather:** Coudy 30˚F	**Drilling**		
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start**	**Finish**	
	Depth to Water: 50' below grade	**Logged By:** Eric Park	**Date** 12/17/2008	**Date** 12/17/2008	
			Time 13:30	**Time** 17:00	

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction	Depth
NA	1	Dark brown fine SAND, trace fine Gravel.	ND	Concrete	1
	2				2
NA	3	Brown fine SAND, trace fine Gravel.	NA		3
	4				4
NA	5	Brown fine SAND, trace fine Gravel.	NA		5
	6				6
NA	7	Brown fine SAND, trace fine Gravel.	NA		7
	8				8
NA	9	Brown fine SAND, trace fine Gravel.	NA		9
	10				10
NA	11	Brown fine SAND, trace fine Gravel.	ND	Grout	11
	12				12
NA	13	Brown fine SAND, trace fine Gravel.	NA		13
	14				14
NA	15	Brown fine SAND, trace fine Gravel.	NA		15
	16				16
NA	17	Brown fine SAND, trace fine Gravel.	NA		17
	18				18
NA	19	Brown fine SAND, trace fine Gravel.	NA		19
	20				20

Concrete

Grout

Concrete

Grout

Notes: Logged drill cuttings down to end of boring. No soil samples collected from boring P-16.
ND - None detected

Soil Boring and Well Installation Log

Well No.					
P-16	**Job Number:** 03399	**Client:** Home Depot	**Sheet 2 of 3**		
	Location: Home Depot Rego Park	**Weather:** Cloudy 30˚F	**Drilling**		
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start**	**Finish**	
	Depth to Water: 50' below grade	**Logged By:** Eric Park	**Date** 12/17/2008	**Date** 12/17/2008	
			Time 13:30	**Time** 16:00	

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID	Well Construction	Depth
NA	21	Brown fine SAND, trace fine Gravel.	ND		21
	22				22
NA	23	Brown fine SAND, trace fine Gravel.	NA		23
	24				24
NA	25	Brown fine SAND, trace fine Gravel.	NA		25
	26				26
NA	27	Brown fine SAND, trace fine Gravel.	NA		27
	28				28
NA	29	Brown fine SAND, trace fine Gravel.	NA		29
	30				30
NA	31	Brown fine SAND, trace fine Gravel.	ND		31
	32				32
NA	33	Brown fine SAND, trace fine Gravel.	NA		33
	34				34
NA	35	Brown fine SAND, trace fine Gravel.	NA		35
	36				36
NA	37	Brown fine SAND, trace fine Gravel.	NA		37
	38				38
NA	39	Brown fine SAND, trace fine Gravel.	NA		39
	40				40

Grout

Grout

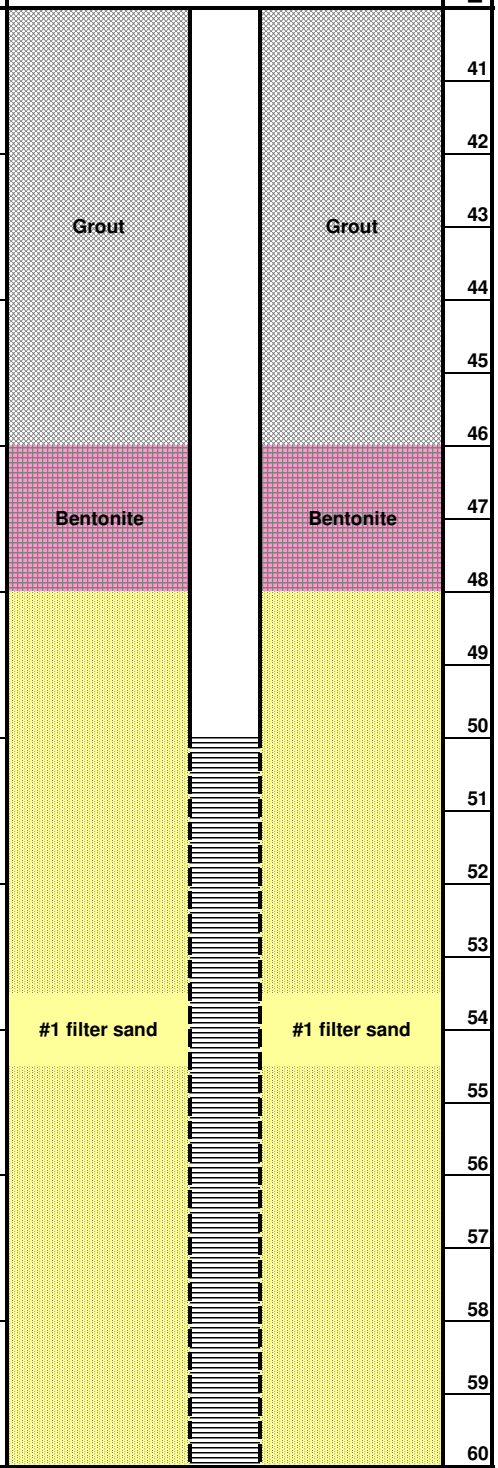
Notes: Logged drill cuttings down to end of boring. No soil samples collected from boring P-16.
ND - None detected

Soil Boring and Well Installation Log

Well No.					
P-16	**Job Number:** 03399	**Client:** Home Depot	**Sheet 3 of 3**		
	Location: Home Depot Rego Park	**Weather:** Clear 60˚F	**Drilling**		
	Drilling Method: Hollow Stem Auger	**Driller:** Paragon	**Start**	**Finish**	
	Depth to Water: 50' below grade	**Logged By:** Eric Park	**Date** 12/15/2008	**Date** 12/16/2008	
			Time 12:30	**Time** 17:00	

Surface Conditions: Asphalt

Blows	Depth	Soil Description	PID
NA	41	Brown fine SAND, trace fine Gravel.	ND
	42		
NA	43	Brown fine SAND, trace fine Gravel.	NA
	44		
NA	45	Brown fine SAND, trace fine Gravel.	NA
	46		
NA	47	Brown fine SAND, trace fine Gravel.	NA
	48		
NA	49	Brown fine SAND, trace fine Gravel.	NA
	50		
NA	51	Brown fine SAND, trace fine Gravel.	ND
	52		
NA	53	Brown fine SAND, trace fine Gravel.	NA
	54		
NA	55	Brown fine SAND, trace fine Gravel.	NA
	56		
NA	57	Brown fine SAND, trace fine Gravel.	NA
	58		
NA	59	Brown fine SAND, trace fine Gravel.	NA
	60	End of boring at 60' below grade.	



Notes: Logged drill cuttings down to end of boring. No soil samples collected from boring P-16. End of boring at 60' below grade. Well set at 60' below grade with 10' of 0.010 slot screen.
ND - None detected

AKRF, Inc.	Home Depot - Rego Park, NY AKRF Project Number : 03399-0029		Well No. P-8 Sheet 1 of 1	
Environmental Consultants 440 Park Avenue South New York, NY	**Drilling Method:**	Hollow Stem Auger (CME 85)	**Drilling**	
	Sampling Method:	Split Spoon (see boring log P-8)	**Start**	**Finish**
	Driller :	Aquifer Drilling & Testing, Inc.	**Time:** 10:46	**Time:** 11:45
	Weather:	Partly cloudy, ~65 deg F	**Date:** 10/22/09	**Date:** 10/23/09
	Field Supervisor:	Glen Stefaniak, AKRF		

Depth (Feet)	Well Construction	Surface Condition: Grass, topsoil.
0		Flush-mounted steel roadbox set within concrete pad. EXISTING GRADE
2		No. 2 Silica Sand (0 - 1 foot below grade)
4		
6		Portland Cement/Bentonite Grout (1 - 61 feet below grade)
8		
10		
12		
14		2" x 65' SCH 40 PVC Riser (0 - 65 feet below grade)
46		
48		
50		
52		
54		
56		
58		
60		
62		Bentonite (61 - 63 feet below grade)
64		
66		No. 2 Silica Sand (63 - 75 feet below grade)
68		
70		2" x 10' SCH 40 PVC 0.010-inch Slotted Screen (65 - 75 feet below grade)
72		
74		
76		

Notes:

Groundwater measured at 48.28 feet below top of casing on October 23, 2009

AKRF, Inc.	Home Depot - Rego Park, NY AKRF Project Number : 03399-0029		Well No. P-17 Sheet 1 of 1	
Environmental Consultants 440 Park Avenue South New York, NY	Drilling Method:	Hollow Stem Auger (CME 85)	Drilling	
	Sampling Method:	Split Spoon (see boring log P-18)	Start	Finish
	Driller :	Aquifer Drilling & Testing, Inc.	Time: 12:15	Time: 11:25
	Weather:	Partly cloudy, ~60 deg F	Date: 10/09/09	Date: 10/12/09
	Field Supervisor:	Glen Stefaniak, AKRF		

Depth (Feet)	Well Construction	Surface Condition: Asphalt Pavement
0		Flush-mounted steel roadbox set within concrete pad. EXISTING GRADE
2		No. 2 Silica Sand (0 - 1 foot below grade)
4		
6		Portland Cement/Bentonite Grout (1 - 88 feet below grade)
8		
10		
12		
14		2" x 100' SCH 40 PVC Riser (0 - 100 feet below grade)
80		
82		
84		
86		
88		
90		
92		Bentonite Slurry (88 - 98 feet below grade)
94		
96		
98		
100		No. 2 Silica Sand (98 - 110 feet below grade)
102		
104		2" x 10' SCH 40 PVC 0.010-inch Slotted Screen (100 - 110 feet below grade)
106		
108		
110		

Notes:	Groundwater measured at 50.22 feet below top of casing on October 20, 2009

AKRF, Inc.	Home Depot - Rego Park, NY AKRF Project Number : 03399-0029		Well No. P-18 Sheet 1 of 1	
Environmental Consultants 440 Park Avenue South New York, NY	Drilling Method:	Hollow Stem Auger (CME 85)	Drilling	
	Sampling Method:	Split Spoon (see boring log P-18)	Start	Finish
	Driller :	Aquifer Drilling & Testing, Inc.	Time: 09:05	Time: 10:09
	Weather:	Clear, ~70 deg F	Date: 10/06/09	Date: 10/09/09
	Field Supervisor:	Glen Stefaniak, AKRF		

Depth (Feet)	Well Construction	Surface Condition: Asphalt Pavement
0		Flush-mounted steel roadbox set within concrete pad. EXISTING GRADE
2		No. 2 Silica Sand (0 - 1 foot below grade)
4		
6		Portland Cement/Bentonite Grout (1 - 115 feet below grade)
8		
10		
12		
14		2" x 127' SCH 40 PVC Riser (0 - 127 feet below grade)
108		
110		
112		
114		
116		
118		
120		Bentonite Slurry (115 - 125 feet below grade)
122		
124		
126		No. 2 Silica Sand (125 - 137 feet below grade)
128		
130		2" x 10' SCH 40 PVC 0.010-inch Slotted Screen (127 - 137 feet below grade)
132		
134		
136		
138		

Notes:

Groundwater measured at 50.18 feet below top of casing on October 20, 2009

AKRF, Inc.	Home Depot - Rego Park, NY AKRF Project Number : 03399-0029		Well No. P-19 Sheet 1 of 1	
Environmental Consultants 440 Park Avenue South New York, NY	Drilling Method:	Hollow Stem Auger (CME 85)	Drilling	
	Sampling Method:	Split Spoon (see boring log P-20)	Start	Finish
	Driller :	Aquifer Drilling & Testing, Inc.	Time: 11:20	Time: 11:18
	Weather:	Clear, ~60 deg F	Date: 10/20/09	Date: 10/21/09
	Field Supervisor:	Glen Stefaniak, AKRF		

Depth (Feet)	Well Construction	Surface Condition: Concrete
0		Flush-mounted steel roadbox set within concrete pad. EXISTING GRADE
2		No. 2 Silica Sand (0 - 1 foot below grade)
4		
6		Portland Cement/Bentonite Grout (1 - 83 feet below grade)
8		
10		
12		
14		2" x 95' SCH 40 PVC Riser (0 - 95 feet below grade)
76		
78		
80		
82		
84		
86		
88		Bentonite Slurry (83 - 93 feet below grade)
90		
92		
94		
96		No. 2 Silica Sand (93 - 105 feet below grade)
98		
100		2" x 10' SCH 40 PVC 0.010-inch Slotted Screen (95 - 105 feet below grade)
102		
104		
106		

Notes:

Groundwater measured at 50.55 feet below top of casing on October 23, 2009

AKRF, Inc.	Home Depot - Rego Park, NY AKRF Project Number : 03399-0029		Well No. P-20 Sheet 1 of 1	
Environmental Consultants 440 Park Avenue South New York, NY	Drilling Method:	Hollow Stem Auger (CME 85)	Drilling	
	Sampling Method:	Split Spoon (see boring log P-20)	Start	Finish
	Driller :	Aquifer Drilling & Testing, Inc.	Time: 08:58	Time: 09:35
	Weather:	Clear, ~50 deg F	Date: 10/019/09	Date: 10/20/09
	Field Supervisor:	Glen Stefaniak, AKRF		

Depth (Feet)	Well Construction	Surface Condition: Concrete
0		Flush-mounted steel roadbox set within concrete pad. EXISTING GRADE
2		No. 2 Silica Sand (0 - 1 foot below grade)
4		
6		Portland Cement/Bentonite Grout (1 - 112 feet below grade)
8		
10		
12		
14		2" x 122' SCH 40 PVC Riser (0 - 124 feet below grade)
104		
106		
108		
110		
112		
114		Bentonite Slurry (112 - 122 feet below grade)
116		
118		
120		
122		No. 2 Silica Sand (122 - 134 feet below grade)
124		
126		2" x 10' SCH 40 PVC 0.010-inch Slotted Screen (124 - 134 feet below grade)
128		
130		
132		
134		

Notes:

Groundwater measured at 50.42 feet below top of casing on October 23, 2009

AKRF, Inc.	Home Depot - Rego Park, NY AKRF Project Number : 03399-0029		Well No. P-21 Sheet 1 of 1	
Environmental Consultants 440 Park Avenue South New York, NY	Drilling Method:	Hollow Stem Auger (CME 85)	Drilling	
	Sampling Method:	Split Spoon (see boring log P-22)	Start	Finish
	Driller :	Aquifer Drilling & Testing, Inc.	Time: 13:32	Time: 13:25
	Weather:	Cloudy, rain, ~50 deg F	Date: 10/15/09	Date: 10/16/09
	Field Supervisor:	Glen Stefaniak, AKRF		

Depth (Feet)	Well Construction	Surface Condition: Concrete
0		Flush-mounted steel roadbox set within concrete pad. EXISTING GRADE
2		No. 2 Silica Sand (0 - 1 foot below grade)
4		
6		Portland Cement/Bentonite Grout (1 - 108 feet below grade)
8		
10		
12		
14		2" x 100' SCH 40 PVC Riser (0 - 120 feet below grade)
100		
102		
104		
106		
108		
110		Bentonite Slurry (108 - 118 feet below grade)
112		
114		
116		
118		
120		No. 2 Silica Sand (118 - 130 feet below grade)
122		2" x 10' SCH 40 PVC 0.010-inch Slotted Screen (120 - 130 feet below grade)
124		
126		
128		
130		

Notes:

Groundwater measured at 52.65 feet below top of casing on October 20, 2009

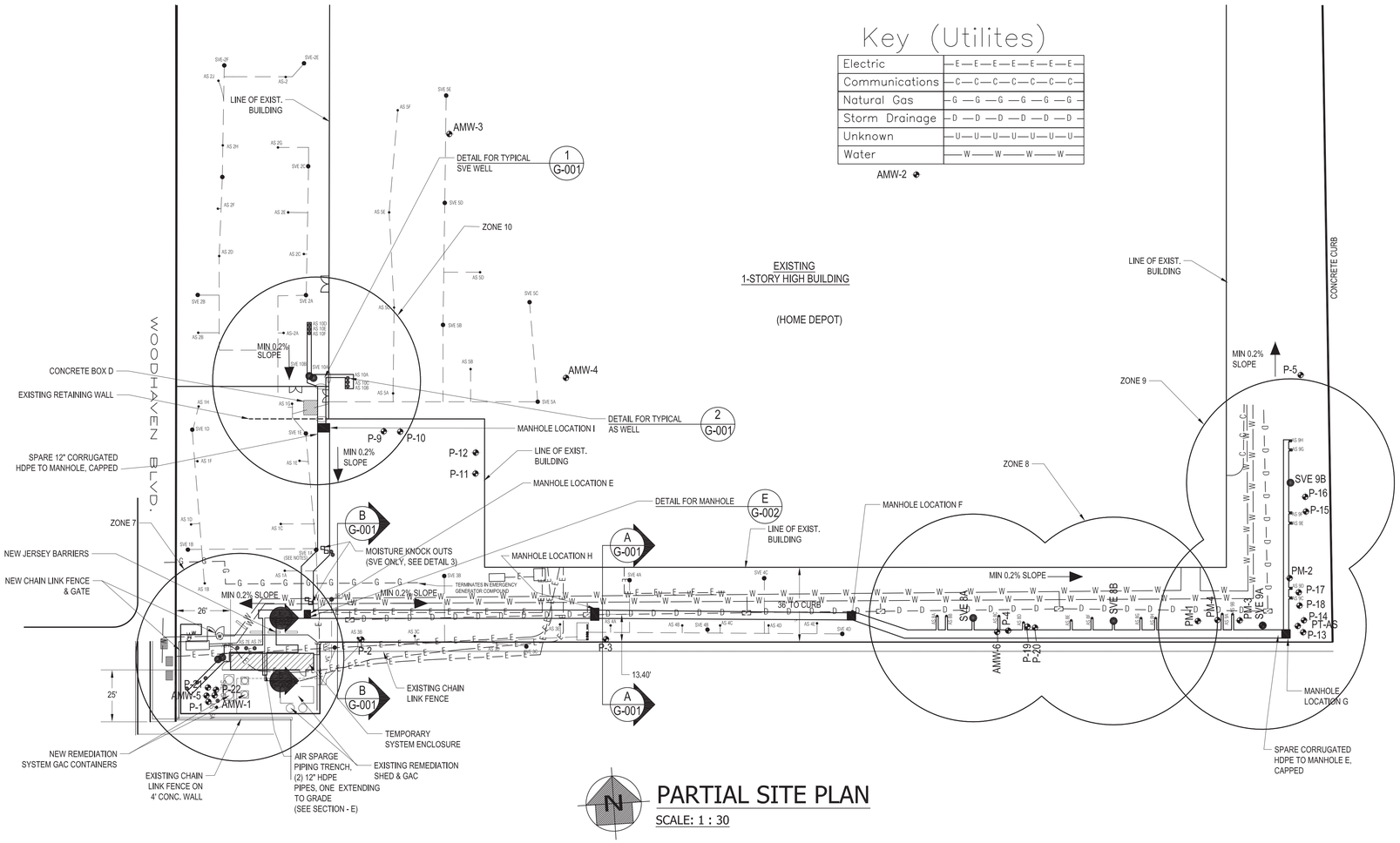
AKRF, Inc.	Home Depot - Rego Park, NY AKRF Project Number : 03399-0029		Well No. P-22 Sheet 1 of 1	
Environmental Consultants 440 Park Avenue South New York, NY	**Drilling Method:**	Hollow Stem Auger (CME 85)	**Drilling**	
	Sampling Method:	Split Spoon (see boring log P-22)	**Start**	**Finish**
	Driller :	Aquifer Drilling & Testing, Inc.	**Time:** 14:12	**Time:** 13:02
	Weather:	Cloudy, rain, ~50 deg F	**Date:** 10/12/09	**Date:** 10/15/09
	Field Supervisor:	Glen Stefaniak, AKRF		

Depth (Feet)	Well Construction	Surface Condition: Concrete
0		Flush-mounted steel roadbox set within concrete pad. EXISTING GRADE
2		No. 2 Silica Sand (0 - 1 foot below grade)
4		
6		Portland Cement/Bentonite Grout (1 - 124 feet below grade)
8		
10		
12		
14		2" x 136' SCH 40 PVC Riser (0 - 136 feet below grade)
116		
118		
120		
122		
124		
126		Bentonite Slurry (124 - 134 feet below grade)
128		
130		
132		
134		No. 2 Silica Sand (134 - 146 feet below grade)
136		
138		2" x 10' SCH 40 PVC 0.010-inch Slotted Screen (136 - 146 feet below grade)
140		
142		
144		
146		

Notes: Groundwater measured at 52.31 feet below top of casing on October 21, 2009

APPENDIX K

AS/SVE SYSTEM AS-BUILT DRAWINGS



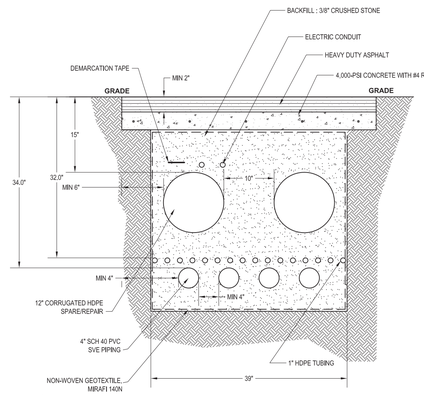
PARTIAL SITE PLAN
SCALE: 1 : 30

NOTES
1) THESE AS-BUILT DRAWINGS SHOW THE TRENCHING LIMITS AND CONSTRUCITON DETAILS OF THE NEW EXPANDED REMEDIAL SYSTEM.
2) DEDICATED 4" PVC PIPING WAS INSTALLED FROM THE EXPANDED SYSTEM ENCLOSURE TO EACH SVE WELL.
3) DEDICATED 1" HDPE TUBING WAS INSTALLED FROM THE EXPANDED SYSTEM ENCLOSURE TO EACH AIR SPARGE WELL.
4) ALL SVE LINES ARE SLOPED AS INDICATED. SLOPE VARIES BASED ON TRENCH LOCATION AND VARIABLE LOCATION OF NEIGHBORING UNDERGROUND INFRASTRUCTURE. THE MINIMUM SLOPE MAINTAINED IS 0.2 PERCENT.
5) ALL TRENCHES ARE BACKFILLED WITH 3/8" CLEAN CRUSHED STONE AROUND THE PIPING AND TOPPED WITH DENSE GRADE AGGREGATE (DGA).
6) EXISTING WELL SVE 1A WAS ENCOUNTERED DURING TRENCHING OF THE EXPANDED SYSTEM. THE WELL WAS EXTENDED TO GRADE AND COMPLETED WITH A FLUSH MOUNT MANHOLE.

LEGEND:

- NEW EXPANDED SYSTEM TRENCH
- CHAIN LINK FENCE
- APPROXIMATE NEW AIR SPARGE WELL LOCATIONS
- APPROXIMATE NEW SOIL VAPOR EXTRACTION WELL LOCATIONS
- MONITORING WELL
- AS 1C — EXISTING AIR SPARGING WELL
- SVE 4C — EXISTING SOIL VAPOR EXTRACTION WELL

* NOT ALL WELL LOCATIONS SURVEYED



B G-001 TRENCH CROSS SECTION DETAIL
N.T.S.

DATE	REVISION
7.29.11	DRAFT
11.21.11	REVISED DRAFT
12.7.11	REVISED DRAFT
2.24.12	REVISED DRAFT
4.30.12	REVISED DRAFT

Drawing Prepared by:
AWT, Environmental Services, Inc.

PROJECT TITLE:
HOME DEPOT- REGO PARK NEW YORK

75-09 WOODHAVEN BLVD
QUEENS, NEW YORK

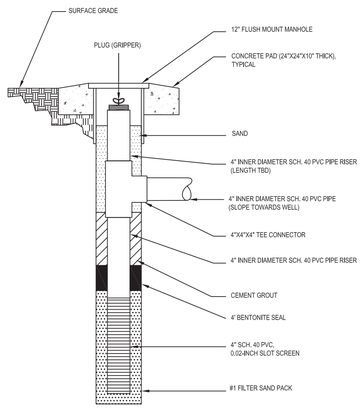
PROJECT No: 03399

DRAWING TITLE:
AS-SVE SYSTEM AS-BUILT SHEET 1 OF 2

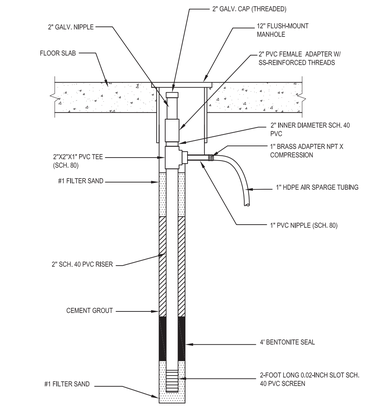
SCALE: AS SHOWN

G-001.01

ZONE 10 WELLS

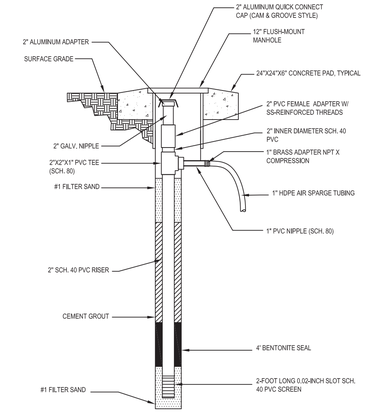


1 G-001 TYPICAL SVE WELL CONSTRUCTION
N.T.S.

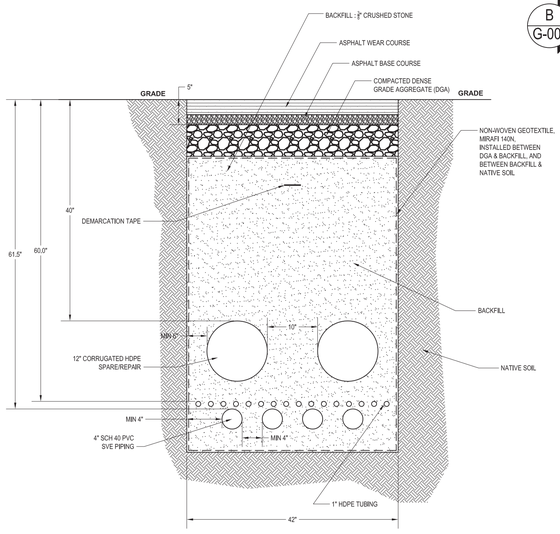


2 G-001 TYPICAL AS WELL CONSTRUCTION
N.T.S.

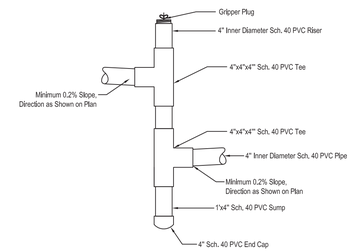
ZONE 7, 8 & 9 WELLS



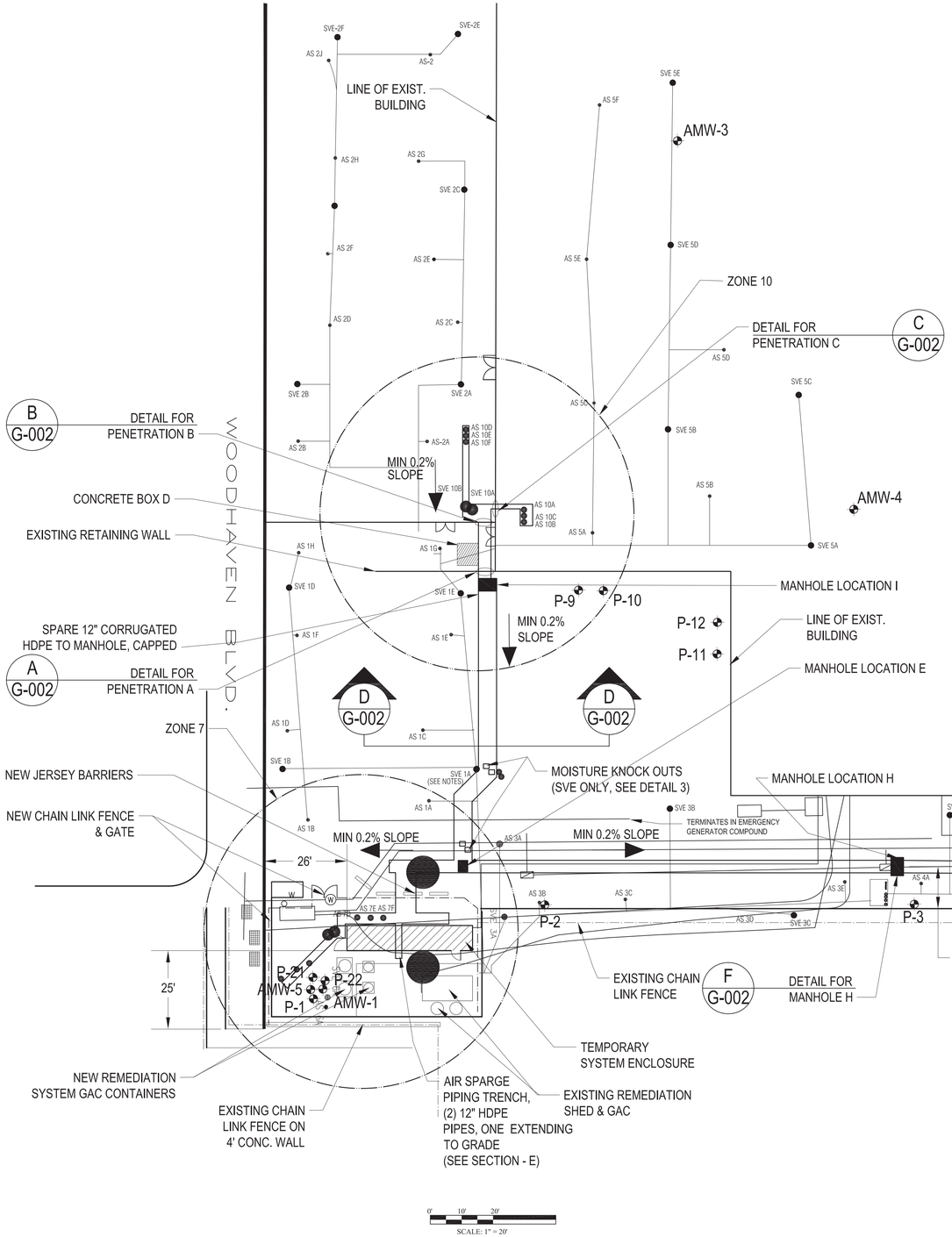
3 G-001 TYPICAL AS WELL CONSTRUCTION
N.T.S.



A G-001 TRENCH CROSS SECTION DETAIL
N.T.S.

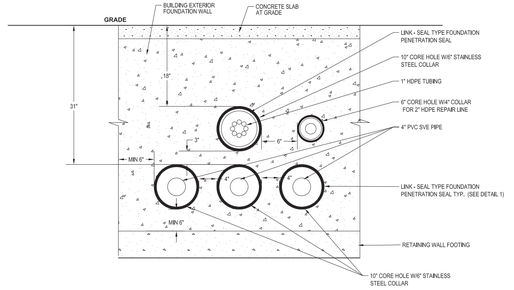


3 G-001 MOISTURE KNOCKOUT ZONE 10
N.T.S.

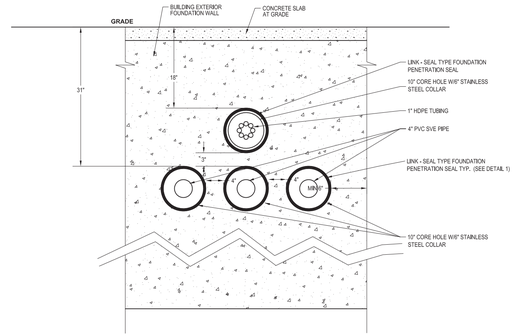


PARTIAL SITE PLAN

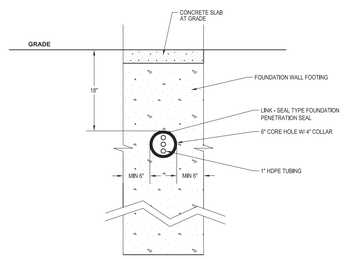
SCALE: 1 : 20



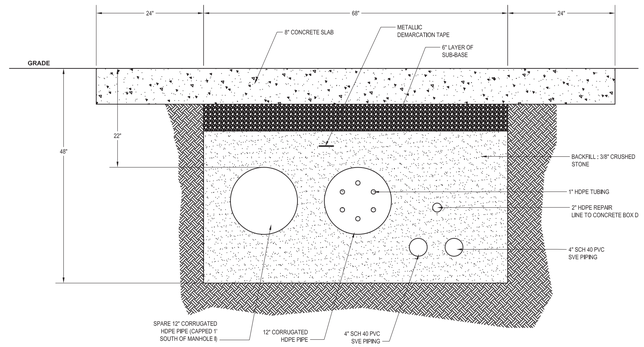
A G-002 PENETRATION A
N.T.S.



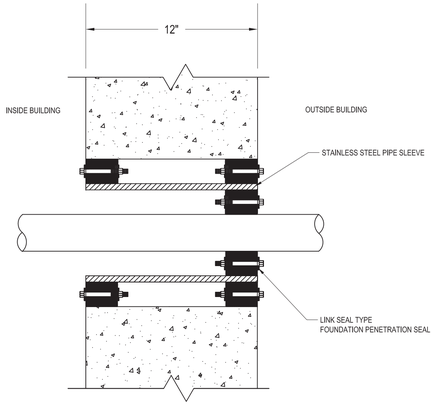
B G-002 PENETRATION B
N.T.S.



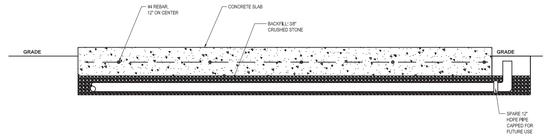
C G-002 PENETRATION C
N.T.S.



D G-002 TRENCH CROSS SECTION DETAIL
N.T.S.



1 G-002 PENETRATION BELOW GRADE
N.T.S.



E G-002 EXPANDED SYSTEM ENCLOSURE FOUNDATION SECTION
N.T.S.

LEGEND:

- APPROXIMATE EXPANDED SYSTEM AIR SPARGE WELL LOCATIONS
- APPROXIMATE EXPANDED SYSTEM SOIL VAPOR EXTRACTION WELL LOCATIONS
- NEW EXPANDED SYSTEM TRENCH
- EXISTING MONITORING WELL
- AS 1C EXISTING AIR SPARGING WELL
- SVE 4C EXISTING SOIL VAPOR EXTRACTION WELL

* NOT ALL WELL LOCATIONS SURVEYED

DATE	REVISION
7.29.11	DRAFT
11.21.11	REVISED DRAFT
12.7.11	REVISED DRAFT
2.24.12	REVISED DRAFT
4.30.12	REVISED DRAFT

Drawing Prepared by:
AWT Environmental Services, Inc.

PROJECT TITLE:

HOME DEPOT-REGO PARK NEW YORK

75–09 WOODHAVEN BLVD
QUEENS, NEW YORK

PROJECT No: 03399

DRAWING TITLE:

AS-SVE SYSTEM AS-BUILT SHEET 2 OF 2

SCALE: AS SHOWN

G-001.02

APPENDIX L

AS/SVE SYSTEM FULL MANUFACTURER'S SPECIFICATION SHEETS

[SEE SEPARATE PDF FILE]

APPENDIX M

ROUTINE MAINTENANCE CHECKLIST

System Maintenance Tasks	Frequency	Part Number
Zones 1through 6 SVE Blower Particulate filter replacement	As necessary	See Maintenance Manual
Zones 1through 6 SVE Blower Oil change	Quarterly	Dresser Roots ISO-VG-220
Zones 1through 6 SVE Blower Grease	Quarterly	Grainger #4ZF49: Synthetic bearing grease, NLGI 2, 12.5 oz. (Mobilith SHC100)
Zones 1through 6 SVE Motor Grease	Semi-annually	Grainger #4ZF49: Synthetic bearing grease, NLGI 2, 12.5 oz. (Mobilith SHC100)
Zones 1through 6 AS Blower Oil change	Quarterly	Dresser Roots ISO-VG-220
Zones 1through 6 AS Blower Grease	Weekly	Grainger #4ZF49: Synthetic bearing grease, NLGI 2, 12.5 oz. (Mobilith SHC100)
Zones 1through 6 AS Motor Grease	Semi-annually	Grainger #4ZF49: Synthetic bearing grease, NLGI 2, 12.5 oz. (Mobilith SHC100)
Zones 6 through 10 Primary SVE Blower Particulate filter replacement	As necessary	Grainger #4FY79, Filter Element, Solberg 235P
Zones 6 through 10 Primary SVE Blower Oil change	Quarterly	Dresser Roots ISO-VG-220
Zones 6 through 10 Primary SVE Blower Grease	Quarterly	Grainger #4ZF49: Synthetic bearing grease, NLGI 2, 12.5 oz. (Mobilith SHC100)
Zones 6 through 10 Primary SVE Motor Grease	Semi-annually	Grainger #4ZF49: Synthetic bearing grease, NLGI 2, 12.5 oz. (Mobilith SHC100)
Zones 6 through 10 Secondary SVE Blower Particulate filter replacement	As necessary	Grainger #4FY79, Filter Element, Solberg 235P
Zones 6 through 10 Secondary SVE Blower Oil change	Quarterly	Dresser Roots ISO-VG-220
Zones 6 through 10 Secondary SVE Blower Grease	Quarterly	Grainger #4ZF49: Synthetic bearing grease, NLGI 2, 12.5 oz. (Mobilith SHC100)
Zones 6 through 10 Secondary SVE Motor Grease	Semi-annually	Grainger #4ZF49: Synthetic bearing grease, NLGI 2, 12.5 oz. (Mobilith SHC100)
Zones 6 through 10 Shallow/Intermediate AS Compressor Coolant Filter replacement	Quarterly	Kit: Grainger # 5HYJ4 Ingersoll-Rand # 38462750
Zones 6 through 10 Shallow/Intermediate AS Compressor Air Filter replacement	Quarterly	Kit: Grainger # 5HYJ4 Ingersoll-Rand # 38462750

System Maintenance Tasks	Frequency	Part Number
Zones 6 through 10 Shallow/Intermediate AS Compressor Coalescing filter replacement	As necessary	Kit: Grainger # 5HYJ4 Ingersoll-Rand # 38462750
Zones 6 through 10 Shallow/Intermediate AS Compressor Drive Belt Replacement	Annually	See Maintenance Manual
Zones 6 through 10 Shallow/Intermediate AS Compressor Hose Replacement	Every two years	See Maintenance Manual
Zones 6 through 10 Shallow/Intermediate AS Compressor Oil filter replacement	As necessary	Grainger # 4ZJ99, Ingersoll-Rand # 39329602
Zones 6 through 10 Shallow/Intermediate AS Compressor Moisture evacuation	As necessary	Not applicable
Zones 6 through 10 Deep AS Compressor Coolant Filter replacement	Quarterly	Kit: Grainger # 5HYJ3 Ingersoll-Rand # 23352149
Zones 6 through 10 Deep AS Compressor Air Filter replacement	Quarterly	Kit: Grainger # 5HYJ3 Ingersoll-Rand # 23352149
Zones 6 through 10 Deep AS Compressor Coalescing filter replacement	As necessary	Kit: Grainger # 5HYJ3 Ingersoll-Rand # 23352149
Zones 6 through 10 Deep AS Compressor Drive Belt Replacement	Annually	See Maintenance Manual
Zones 6 through 10 Deep AS Compressor Hose Replacement	Every two years	See Maintenance Manual
Zones 6 through 10 Deep AS Compressor Oil filter replacement	As necessary	Grainger # 4ZJ99, Ingersoll-Rand # 39329602
Zones 6 through 10 Deep AS Compressor Moisture evacuation	As necessary	Not applicable

INSTALLATION, OPERATION & MAINTENANCE

Universal RAI®, URAI-J™,URAI-DSL, URAI-J™ DSL, URAI-G™ and Metric Series Blowers

Contents

Do These Things To Get The Most From Your ROOTS™ blower

- ❑ Check shipment for damage. If found, file claim with carrier and notify Roots.
- ❑ Unpack shipment carefully, and check contents against Packing List. Notify Roots if a shortage appears.
- ❑ Store in a clean, dry location until ready for installation. Lift by methods discussed under INSTALLATION to avoid straining or distorting the equipment. Keep covers on all openings. Protect against weather and corrosion if outdoor storage is necessary.
- ❑ Read OPERATING LIMITATIONS and INSTALLATION sections in this manual and plan the complete installation.
- ❑ Provide for adequate safeguards against accidents to persons working on or near the equipment during both installation and operation. See SAFETY PRECAUTIONS.
- ❑ Install all equipment correctly. Foundation design must be adequate and piping carefully done. Use recommended accessories for operating protection.
- ❑ **Make sure both driving and driven equipment is correctly lubricated before start-up. See LUBRICATION.**
- ❑ Read starting check points under OPERATION. Run equipment briefly to check for installation errors and make corrections. Follow with a trial run under normal operating conditions.
- ❑ In event of trouble during installation or operation, do not attempt repairs of Roots furnished equipment. Notify Roots, giving all nameplate information plus an outline of operating conditions and a description of the trouble. Unauthorized attempts at equipment repair may void Roots warranty.
- ❑ Units out of warranty may be repaired or adjusted by the owner. Good inspection and maintenance practices should reduce the need for repairs.

NOTE: Information in this manual is correct as of the date of publication. Roots reserves the right to make design or material changes without notice, and without obligation to make similar changes on equipment of prior manufacture.

For your nearest Roots Office, dial our Customer Service Hot Line toll free; 1 877 363 ROOT(S) (7668) or direct 832-590-2600.

Due to sludge build-up and seal leakage problems, Roots recommendation is DO NOT USE Mobil SHC synthetic oils in Roots blowers.

URAI AIR and GAS gear end bearing lubrication/oil with splash lubrication on the gear end only (Drive end grease lubricated).

- The specified and recommended oil is ROOTS™ Synthetic oil of correct viscosity per Table 2, page 17.
- To fill the gearbox, remove the breather plug (25) and the oil overflow plug (21) - see page 17. Fill the reservoir up to the overflow hole. **DO NOT OVERFILL**. Place the breather and the overflow plug back into their respective holes.
- The lubrication should be changed after initial 100 hours of operation.
- Proper service intervals of the oil thereafter are based on the discharge air temperature of the blower. Please refer to the information below to "How to properly determine the oil service intervals" shown on this page.
- If you choose to use another oil other than the specified and recommended ROOTS™ Synthetic, use a good grade of **industrial type** non-detergent, rust inhibiting, anti-foaming oil and of correct viscosity per Table 2, page 17.
- Roots does **NOT** recommend the use of automotive type lubricants, as they are not formulated with the properties mentioned above.

URAI-DSL blowers with splash lubrication/oil on each end. No grease.

- The specified and recommended oil is ROOTS™ Synthetic oil of correct viscosity per Table 2, page 17.
- The proper oil level should be half way or middle of the sight gauge when the blower is not operating. **DO NOT OVERFILL OIL SUMP/S** as damage to the blower may occur.
- Oil level may rise or fall in the gauge during operation to an extent depending somewhat on oil temperature and blower speed.
- The oil level should not fall below the middle of the site gauge when the blower is idle.
- The lubrication should be changed after initial 100 hours of operation.
- Proper service intervals of the oil thereafter are based on the discharge air temperature of the blower. Please refer to the information below to "How to properly determine the oil service intervals" shown on this page
- If you choose to use another oil other than the specified and recommended ROOTS™ Synthetic, use a good grade of **industrial type** non-detergent, rust inhibiting, anti-foaming oil and of correct viscosity per Table 2, page 17.
- Roots does **NOT** recommend the use of automotive type lubricants, as they are not formulated with the properties mentioned above.

How to properly determine the oil service intervals.

Normal life expectancy of the specified and recommended ROOTS™ Synthetic oil is approximately 6000 hours with an oil temperature of 180°F (82°C) or less. As the oil temperature increases by increments of 15°F (8°C), the oil life is reduced by half for each 15°F (8°C) increase. Example: Oil temperatures of 195°F (90.5°C) will produce a life expectancy reduced by half or 3000 hours oil service life.

Normal life expectancy of petroleum based oils is about 2000 hours with an oil temperature of about 180°F (82°C). As the oil temperature increases by increments of 15°F (8°C), the life is reduced by half for each 15°F (8°C) increase. Example: Oil temperatures of 195°F (90.5°C) will produce life expectancy reduced by half or 1000 hours oil service life.

NOTE: To estimate oil temperature, multiply the discharge temperature of the blower by 0.80. Example: if the discharge air temperature of the blower is 200° F, it is estimated that the oil temperature is 160° F

For Units with grease lubricated drive end bearings.

URAI AIR (Non GAS) blower grease specifications.

- When servicing drive end bearings of a AIR (Non Gas) blower, use the specified and recommended Shell Darina SD 2 NLGI #2 product code 506762B.
- For grease lubricated drive end blowers see page 17, table 4, regarding specified greasing intervals.
- Lithium based greases are not compatible with the specified and recommended Shell Darina SD 2 grease used when assembling the blower. **Lithium based grease is not approved for any ROOTS blowers**.
- Table 4 page 17 has been prepared as a general greasing schedule guide based on average operating conditions. More frequent intervals may be necessary depending on the grease operating temperature and unusual circumstances.

URAI GAS blower grease specifications.

- When servicing drive end bearings of a URAI GAS blower, use the specified NLGI #2 premium grade aluminum complex* grease, ROOTS P/N T20019001.
- Lithium based greases are not compatible with the specified and recommended ROOTS Synthetic grease used when assembling a GAS blower. **Lithium based grease is not approved for any ROOTS blowers**.

- Lithium based greases are not compatible with the specified and recommended ROOTS Synthetic grease used when assembling a GAS blower. **Lithium based grease is not approved for any ROOTS blowers**.

- The lubricants selected must be compatible with the gas.

*ROOTS Synthetic Oil & Grease is superior in performance to other synthetic lubrications. It has high oxidation stability, excellent corrosion protection, extremely high film strength and low coefficient of friction.

*ROOTS™ Synthetic oil is superior in performance to petroleum based products. It has high oxidation stability, excellent corrosion protection, extremely high film strength and low coefficient of friction. Typical oil change intervals are increased 2-3 times over petroleum based lubricants. Also, ROOTS™ Synthetic oil is 100% compatible with petroleum based oils. Simply drain the oil in the blower and refill the reservoirs with ROOTS™ Synthetic oil to maintain optimum performance of your ROOTS™ blower.

Table 2 - Recommended Oil Grades

Ambient Temperature °F (°C)	ISO Viscosity No.
Above 90° (32°)	320
32° to 90° (0° to 32°)	220
0° to 32° (-18° to 0°)	150
Below 0° (-18°)	100

URAI GAS Blower Oil and Grease Specifications

The specified oil should be ROOTS synthetic P/N 813-106- of the proper viscosity.

Table 3 - Approximate Oil Sump Capacities

These capacities are provided to assist in stocking the correct amount of oil. Exact sump capacities may differ slightly. See "Lubrication" section for proper filling instructions.

UNIVERSAL RAI, URAI-J, URAI-G

Frame Size	Gear End Capacity Fl. Oz. (Liters)	
	Vertical	Horizontal
22	3.4 (.1)	6.1 (.18)
24	3.4 (.1)	6.1 (.18)
32	8.5 (.25)	10.5 (.31)
33	8.5 (.25)	10.5 (.31)
36	8.5 (.25)	10.5 (.31)
42	12.7 (.37)	14.5 (.43)
45	12.7 (.37)	14.5 (.43)
47	12.7 (.37)	14.5 (.43)
53	16.0 (.47)	27.6 (.82)
56	16.0 (.47)	27.6 (.82)
59	16.0 (.47)	27.6 (.82)
65	28.3 (.84)	52.1 (1.54)
68	28.3 (.84)	52.1 (1.54)
615	28.3 (.84)	52.1 (1.54)
76	32.3 (.96)	59.5 (1.76)
711	32.3 (.96)	59.5 (1.76)
718	32.3 (.96)	59.5 (1.76)

See page 14 and 15 for illustration of vertical and horizontal configurations.

UNIVERSAL URAI series-DSL Splash Lubricated Drive End

Note that the gear end sump capacity is provided on the adjacent table.

Frame Size	Drive End Capacity Fl. Oz. (Liters)	
	Vertical	Horizontal
32	4.0 (.12)	6.5 (.19)
33	4.0 (.12)	6.5 (.19)
36	4.0 (.12)	6.5 (.19)
42	5.5 (.16)	10.8 (.32)
45	5.5 (.16)	10.8 (.32)
47	5.5 (.16)	10.8 (.32)
53	7.5 (.22)	14.8 (.44)
56	7.5 (.22)	14.8 (.44))
59	7.5 (.22)	14.8 (.44)
65	16 (0.47)	31 (0.91)
68	16 (0.47)	31 (0.91)
615	16 (0.47)	31 (0.91)

Table 4 - Universal URAI series with Grease Lubricated Drive End: Specified Bearing Greasing Intervals

Speed In RPM	Operating Hours Per Day		
	8	16	24
	Greasing Intervals in Weeks		
750-1000	7	4	2
1000-1500	5	2	1
1500-2000	4	2	1
2000-2500	3	1	1
2500-3000	2	1	1
3000 and up	1	1	1

The specified grease for servicing drive end bearings of a Gas blower, use a NLGI #2 premium grade aluminum complex* grease, ROOTS P/N T20019001 with 300°F (149°C) service temperature and moisture resistance and good mechanical stability.

When servicing drive end bearings of Non Gas blower, use a NLGI #2 premium grade microgel grease with 250°F (121°C) service temperature and moisture resistance and good mechanical stability. ROOTS specifies Shell Darina EP NLGI Grade 2. Product Code 71522.

NOTE: Lithium based greases are not compatible with the ROOTS Synthetic grease used when assembling a Gas blower or the non-soap base grease used when assembling a standard URAI blower. Lithium based grease is not approved for any ROOTS blowers.

BALDOR • RELIANCE

Integral Horsepower
AC Induction Motors
ODP, WPI, WPII Enclosure
TEFC Enclosure
Explosion Proof

Installation & Operating Manual

2/07 MN400

Section 3
Maintenance & Troubleshooting

WARNING: UL Listed motors must only be serviced by UL Approved Authorized Baldor Service Centers if these motors are to be returned to a hazardous and/or explosive atmosphere.

General Inspection

Inspect the motor at regular intervals, approximately every 500 hours of operation or every 3 months, whichever occurs first. Keep the motor clean and the ventilation openings clear. The following steps should be performed at each inspection:

WARNING: Do not touch electrical connections before you first ensure that power has been disconnected. Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt the installation, operation and maintenance of this equipment.

1. Check that the motor is clean. Check that the interior and exterior of the motor is free of dirt, oil, grease, water, etc. Oily vapor, paper pulp, textile lint, etc. can accumulate and block motor ventilation. If the motor is not properly ventilated, overheating can occur and cause early motor failure.
2. Use a "Megger" periodically to ensure that the integrity of the winding insulation has been maintained. Record the Megger readings. Immediately investigate any significant drop in insulation resistance.
3. Check all electrical connectors to be sure that they are tight.

Relubrication & Bearings

Bearing grease will lose its lubricating ability over time, not suddenly. The lubricating ability of a grease (over time) depends primarily on the type of grease, the size of the bearing, the speed at which the bearing operates and the severity of the operating conditions. Good results can be obtained if the following recommendations are used in your maintenance program.

Type of Grease

A high grade ball or roller bearing grease should be used. Recommended grease for standard service conditions is Polyrex EM (Exxon Mobil).

Equivalent and compatible greases include:
Texaco Polystar, Rykon Premium #2, Pennzoil Pen 2 Lube and Chevron SRI.

Relubrication Intervals

Recommended relubrication intervals are shown in Table 3-1. It is important to realize that the recommended intervals of Table 3-1 are based on average use.

Refer to additional information contained in Tables 3-2, 3-3 and 3-4.

Table 3-1 Relubrication Intervals *

NEMA / (IEC) Frame Size	Rated Speed - RPM					
	10000	6000	3600	1800	1200	900
Up to 210 incl. (132)	**	2700 Hrs.	5500 Hrs.	12000 Hrs.	18000 Hrs.	22000 Hrs.
Over 210 to 280 incl. (180)		**	3600 Hrs.	9500 Hrs.	15000 Hrs.	18000 Hrs.
Over 280 to 360 incl. (225)		**	* 2200 Hrs.	7400 Hrs.	12000 Hrs.	15000 Hrs.
Over 360 to 5800 incl. (300)		**	*2200 Hrs.	3500 Hrs.	7400 Hrs.	10500 Hrs.

* Relubrication intervals are for ball bearings.
For vertically mounted motors and roller bearings, divide the relubrication interval by 2.

** For motors operating at speeds greater than 3600 RPM, contact Baldor for relubrication recommendations.

Table 3-2 Service Conditions

Severity of Service	Hours per day of Operation	Ambient Temperature Maximum	Atmospheric Contamination
Standard	8	40° C	Clean, Little Corrosion
Severe	16 Plus	50° C	Moderate dirt, Corrosion
Extreme	16 Plus	>50° C* or Class H Insulation	Severe dirt, Abrasive dust, Corrosion, Heavy Shock or Vibration
Low Temperature		<-29 ° C **	

* Special high temperature grease is recommended (Dow Corning DC44). Note that Dow Corning DC44 grease does not mix with other grease types. Thoroughly clean bearing & cavity before adding grease.

** Special low temperature grease is recommended (Aeroshell 7).

Table 3-3 Relubrication Interval Multiplier

Severity of Service	Multiplier
Standard	1.0
Severe	0.5
Extreme	0.1
Low Temperature	1.0

Some motor designs use different bearings on each motor end. This is normally indicated on the motor nameplate. In this case, the larger bearing is installed on the motor Drive endplate. For best relubrication results, only use the appropriate amount of grease for each bearing size (not the same for both).

Table 3-4 Bearings Sizes and Types

Frame Size NEMA (IEC)	Bearing Description (These are the "Large" bearings (Shaft End) in each frame size)			
	Bearing	Weight of Grease to add * oz (Grams)	Volume of grease to be added	
			in^3	teaspoon
56 to 140 (90)	6203	0.08 (2.4)	0.15	0.5
140 (90)	6205	0.15 (3.9)	0.2	0.8
180 (100-112)	6206	0.19 (5.0)	0.3	1.0
210 (132)	6307	0.30 (8.4)	0.6	2.0
250 (160)	6309	0.47 (12.5)	0.7	2.5
280 (180)	6311	0.61 (17)	1.2	3.9
320 (200)	6312	0.76 (20.1)	1.2	4.0
360 (225)	6313	0.81 (23)	1.5	5.2
400 (250)	6316	1.25 (33)	2.0	6.6
440 (280)	6319	2.12 (60)	4.1	13.4
5000 to 5800 (315-450)	6328	4.70 (130)	9.2	30.0
5000 to 5800 (315-450)	NU328	4.70 (130)	9.2	30.0
360 to 449 (225-280)	NU319	2.12 (60)	4.1	13.4
AC Induction Servo				
76 Frame 180 (112)	6207	0.22 (6.1)	0.44	1.4
77 Frame 210 (132)	6210	0.32 (9.0)	0.64	2.1
80 Frame 250(160)	6213	0.49 (14.0)	0.99	3.3

* Weight in grams = .005 DB of grease to be added

Note: Not all bearing sizes are listed. For intermediate bearing sizes, use the grease volume for the next larger size bearing.

Caution: To avoid damage to motor bearings, grease must be kept free of dirt. For an extremely dirty environment, contact your Baldor distributor or an authorized Baldor Service Center for additional information.

Relubrication Procedure

Be sure that the grease you are adding to the motor is compatible with the grease already in the motor. Consult your Baldor distributor or an authorized service center if a grease other than the recommended type is to be used.

Caution: Do not over-lubricate motor as this may cause premature bearing failure.

With Grease Outlet Plug

1. With the motor stopped, clean all grease fittings with a clean cloth.
2. Remove grease outlet plug.

Caution: Over-lubricating can cause excessive bearing temperatures, premature lubrication breakdown and bearing failure.

3. Add the recommended amount of grease.
4. Operate the motor for 15 minutes with grease plug removed. This allows excess grease to purge.
5. Re-install grease outlet plug.

Without Grease Provisions

Note: Only a Baldor authorized and UL or CSA certified service center can disassemble a UL/CSA listed explosion proof motor to maintain it's UL/CSA listing.

1. Disassemble the motor.
2. Add recommended amount of grease to bearing and bearing cavity. (Bearing should be about 1/3 full of grease and outboard bearing cavity should be about 1/2 full of grease.)
3. Assemble the motor.

Sample Relubrication Determination

Assume - NEMA 286T (IEC 180), 1750 RPM motor driving an exhaust fan in an ambient temperature of 43° C and the atmosphere is moderately corrosive.

1. Table 3-1 list 9500 hours for standard conditions.
2. Table 3-2 classifies severity of service as "Severe".
3. Table 3-4 shows that 1.2 in^3 or 3.9 teaspoon of grease is to be added.

Note: Smaller bearings in size category may require reduced amounts of grease.

SOLBERG

Filter Silencers and Inlet Filters Maintenance Manual

www.solbergmfg.com

Note: Please read the maintenance instructions given by the OEM for the machinery first. The OEM's manual should be adhered to in order to protect the equipment. Solberg Manufacturing, Inc has made every effort to make sure that these instructions are accurate but is not responsible for any typos, slight variations or for human errors that may occur.

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Rev: MMIFS-407

B. Place top plate (if necessary) on element by centering on tap bolt.

C. Secure washer and wing nut to end cap (or top plate) and tap bolt. Element must be tightly secured. Note: Do NOT over tighten!

WARNING

Defective installation may cause system or pump contamination. Use only genuine Solberg replacement parts.

5. Securing canister top to canister base.

A. Make sure all surfaces are free from dust and other particulate.

B. Small QB/FS/F/FT: Replace top plate and/or weather hood if necessary. Feed threaded rod into corresponding bolthole and tighten. Note: Do NOT over tighten!

C. Large 2G/QB/FS/F/FT: Replace cover. Feed threaded rod into corresponding bolt hole(s) and tighten. Note: Do NOT over tighten!

D. FS-04-06-10 (or 05-07-11): Reassemble top housing to bottom housing by aligning tabs and turning into place.

Section D

MAINTENANCE RECOMMENDATIONS

1. Pressure drop readings are recommended to have an effective air filter. Always document initial pressure drop during start-up when element is clean. Replacement cartridge is needed when system experiences 10” to 15” / 250-380mm H^2O above drop above the initial reading. Refer to page 4 for initial values.

2. Always check replacement cartridge gaskets to insure they are adhered uniformly along the end caps during handling. If not, contact Solberg Manufacturing, Inc. immediately. Do not modify or change!

3. Always check inlets/outlets, element base and its components when replacing element to insure cleanliness. Wipe clean if necessary.

4. Operate only when a proper seal exists.

SPARE PARTS LIST:

2G/QB/FS Series

Parent Model 2G/QB-Element-Connection	Prefilter Model	Housing Weatherhood/Top for FS Series Model No.	Housing Weatherhood/Top for 2G/QB Series Model No.	Element Top Plate Model No.	Wingnut(s)/ Lock Hex Nut(s) Model No.	Washer(s) Model No.
Model-15/14-xxx	PF14	WH6X2	N/A	N/A	WN25X20	WR25X20
Model-19/18-xxx	PF18	WH6X5	QB6X5	N/A	WN25X20	WR25X20
Model-31/30-xxx	PF30	WH10X5	QB10X5	N/A	WN25X20	WR25X20
Model-231/230-xxx	PF230	WH10X10	QB10X10	N/A	WN38X16	WR38X16
Model-235/234-xxx	PF234	WH16X10	QB16X10	N/A	WN38X16	WR38X16
Model-245/244-xxx	PF244	WH16X10	QB16X10	N/A	WN38X16	WR38X16
Model-275/274-xxx	PF274	WH16X10	QB16X10	N/A	WN38X16	WR38X16
Model-375/374-xxx	PF374	T16000625	T16000625	T12000625	LHN50X13	WR50X13
Model-377/376-xxx	PF376	T22000625	T22000625	T14750625	LHN50X13	WR50X13
Model-385/384-xxx	PF384	T28000625	T28000625	T19750625	LHN50X13	WR50X13
Model-384(2)-xxx	PF384(2)	T28000625	T28000625	T19750625	LHN50X13	WR50X13
Model-485/484-xxx	PF484	T28000625	T28000625	T19750625	LHN50X13	WR50X13
Model-485(2)/484(2)-xxx	PF484(2)	T28000625	T28000625	T19750625	LHN50X13	WR50X13
Model-685-xxx	PF684	T28000625	T28000625	T19750625	LHN50X13	WR50X13

F/FT Series

Parent Model F/FT-Element-Connection	Prefilter Model	Weatherhood/Top for F Series Model No.	Element Top for F Series Model No.	Top for FT Series Model No.	Wingnut(s)/ Lock Hex Nut(s) Model No.	Washer(s) Model No.
Model-15/14-xxx	PF14	WH6X2	N/A	T4500312	WN25X20	WR25X20
Model-19/18-xxx	PF18	WH6X5	N/A	T4500312	WN25X20	WR25X20
Model-31/30-xxx	PF30	WH7.625X5	N/A	T6000312	WN25X20	WR25X20
Model-231/230-xxx	PF230	WH10X10	N/A	T6000312	WN38X16	WR38X16
Model-235/234-xxx	PF234	WH10X10	N/A	T8000437	WN38X16	WR38X16
Model-245/244-xxx	PF244	WH16X10	N/A	T1000437	WN38X16	WR38X16
Model-275/274-xxx	PF274	WH16X10	N/A	T12000437	WN38X16	WR38X16
Model-375/374-xxx	PF374	WH16X16	N/A	T12000625	LHN50X13	WR50X13
Model-377/376-xxx	PF376	WH22.5X15	N/A	T14750625	LHN50X13	WR50X13
Model-385/384-xxx	PF384	WH28X15	N/A	T19750625	LHN50X13	WR50X13
Model-384(2)-xxx	PF384(2)	T28000625	T19750625	T19750625	LHN50X13	WR50X13
Model-485/484-xxx	PF484	WH28X24	N/A	T19750625	LHN50X13	WR50X13
Model-485(2)/484(2)-xxx	PF484(2)	T28000625	T19750625	T19750625	LHN50X13	WR50X13
Model-685-xxx	PF684	T28000625	T19750625	T19750625	LHN50X13	WR50X13

*Note: Spare parts are for standard products. See page 4 for replacement element.

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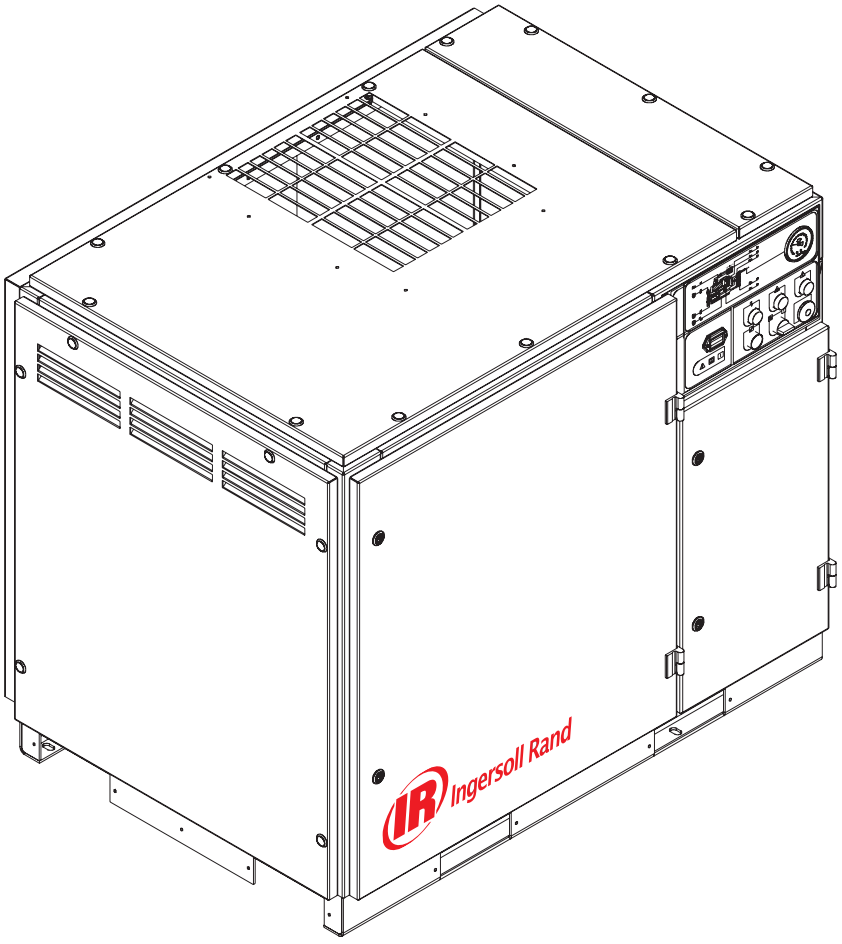
Rev: MMIFS-407

Ingersoll Rand

UP6 15, UP6 20, UP6 25, UP6 30
60Hz

OPERATION AND MAINTENANCE MANUAL



This manual contains important safety information and must be made available to personnel who operate and maintain this machine.

C.C.N.: 80445158
REV. : A
DATE : OCTOBER 2008

UP Series Maintenance Schedule

PERIOD	MAINTENANCE
Each 24 hours operation	Check the coolant level and replenish if necessary.
Visual check of machine for any leaks, dust build up or unusual noise or vibration	Report immediately, contact Ingersoll R and authorized distributor for assistance if in doubt
When compressor is receiver mounted	Drain air receiver of condensate, or check that automatic drain is operating
Visual check condition of package pre–filter	Blow clean if needed
If the air filter indicator locks into the red position before the 2000 hour/1 year change out period	Check the Condition of filter. Change the air filter if needed. Dusty environments require more frequent replacement or, optional high dust filter (The indicator sould be checked with the unit stopped.)
First 150 hours	Change the coolant filter.
Each month or 100 hours	Remove and clean package pre-filter, replace if needed Check the cooler(s) for build up of foreign matter. Clean if necessary by blowing out with air or by pressure washing.
Each year or 2000 hours	Change the coolant filter. Check motors with grease fittings and grease bearings per motor data tag. Check scavenge screen for blockage, clean if required. Change the separator cartridge. Change the Air Filter element. Take coolant sample for fluid analysis. Change the package pre–filter. Check the inlet valve flapper, recondition as necessary. Visual Check of Drive Belts and tensioning gas spring.
Pressure vessel inspection frequency may be otherwise defined by local or national legislation.	Separator vessel and air receiver when fitted. Fully inspect all external surfaces, and fittings. Report any excessive corrosion, mechanical or impact damage, leakage or other deterioration.
Every two years or 8000 hours	Change drive belt and gas spring. Replace the Ultra Coolant at whichever interval occurs first. Check and replace all items included within 2000 hour service Strip, clean and re–Grease motor bearings of ODP motors. Fit the following reconditioning parts as appropriate: Solenoid valves, Inlet valve kit, Minimum Pressure valve kit, Thermostatic Valve Kit
Every 4 years or 16000 hours	Replace all hoses. Strip, clean and re–Grease motor bearings on motors with grease fittings. Replace sealed bearing on motors without grease fittings. Fit replacement electrical contactor tips.
6 years/16000 hours or as defined by local or national legislation.	Separator tank . Remove the cover plate and any necessary fittings. Clean the interior thoroughly and inspect all internal surfaces.

ROUTINE MAINTENANCE

This section refers to the various components which require periodic maintenance and replacement.

It should be noted that the intervals between service requirements may be significantly reduced as a consequence of poor operating environment. This would include effects of atmospheric contamination and extremes of temperature.

The SE RVICE/MAINTENANCE CHA RT indicates the various components' descriptions and the intervals when maintenance has to take place. Oil capacities, etc., can be found in the GENERAL INFORM ATION section of this manual.

Compressed air can be dangerous if incorrectly handled. Before doing any work on the unit, ensure that all pressure is vented from the system and that the machine cannot be started accidentally.

CAUTION: Before beginning any work on the compressor, open, lock and tag the main electrical disconnect and close the isolation valve on the compressor discharge. Vent pressure from the unit by slowly unscrewing the coolant fill cap one turn. Unscrewing the fill cap opens a vent hole, drilled in the cap, allowing pressure to release to atmosphere. Do not remove the fill cap until all pressure has vented from the unit. Also vent piping by slightly opening the drain valve. When opening the drain valve or the coolant fill cap, stand clear of the valve discharge and wear appropriate eye protection.

Ensure that maintenance personnel are properly trained, competent and have read the Maintenance Manuals.

Prior to attempting any maintenance work, ensure that:–

. all air pressure is fully discharged and isolated from the system. If the automatic blowdown valve is used for this purpose, then allow enough time for it to complete the operation.

. the machine cannot be started accidently or otherwise.

. all residual electrical power sources (mains and battery) are isolated.

Prior to opening or removing panels or covers to work inside **a machine, ensure that:–**

. anyone entering the machine is aware of the reduced level of protection and the additional hazards, including hot surfaces and intermittently moving parts.

. the machine cannot be started accidently or otherwise.

Prior to attempting any maintenance work on a running **machine, ensure that:–**

DANGER
Only properly trained and competent persons should undertake any maintanence tasks with the compressor running or with electrical power connected.

. the work carried out is limited to only those tasks which require the machine to run.

. the work carried out with safety protection devices disabled or removed is limited to only those tasks which require the machine to be running with safety protection devices disabled or removed.

. all hazards present are known (e.g. pressurised components, electrically live components, removed panels, covers and guards, extreme temperatures, inflow and outflow of air, intermittently moving parts, safety valve discharge etc.).

. appropriate personal protective equipment is worn.

. loose clothing, jewelry, long hair etc. is made safe.

. warning signs indicating that *Maintenance Work is in Progress* are posted in a position that can be clearly seen.

Upon completion of maintenance tasks and prior to returning the machine into service, ensure that:–

. the machine is suitably tested.

. all guards and safety protection devices are refitted and correctly working.

. all panels are replaced, canopy and doors closed.

. hazardous materials are effectively contained and disposed of in a manner compliant with local or National environmental protection codes.

WARNING
Do not under any circumstances open any drain valve or remove components from the compressor without first ensuring that the compressor is FULLY SHUT– DOWN, power isolated and all air pressure relieved from the system.

TOP UP COOLANT PROCEDURE

The reservoir is designed to prevent overfill. With warm unit stopped in the normal way, the sight tube level should be within 15mm (0.6in) of the top of the green strip. The level should not drop beyond the bottom of the sight tube when running with a steady load.

CAUTION
Ensure that ULTRA coolant is used. Failure to do so will void manufacturers warranty.

COOLANT CHANGE PROCEDURE

It is better to drain the coolant immediately after the compressor has been operating as the liquid will drain more easily and any contaminant will still be in suspension.

1. Stop the machine, electrically isolate and vent all trapped pressure.
2. Place a suitable container close to the drain valve.
3. Slowly remove fill/vent cap.
4. Remove plug from drain valve.
5. Open the drain valve and drain coolant into container.
6. Close the drain valve.
7. Replace plug in drain valve.
8. Refill the machine following the ”top up coolant” procedure above. After initial fill, to purge any airlocks, the machine should be run for a few minutes cycling between load and no load, before checking that the level is correct.
9. Replace and tighten oil fill cap.

COOLANT FILTER CHANGE PROCEDURE

1. Stop the machine, electrically isolate and vent all trapped pressure.
2. Loosen filter with the correct tool.
3. Remove the filter from the housing.
4. Place the old filter in a sealed bag and dispose of in a safe way.
5. Clean the mating face of the housing taking care to avoid any particles entering the machine.
6. Remove the new Ingersoll Rand replacement filter from its protective package.
7. Apply a small amount of lubricant to the filter seal.
8. Screw the new filter down until the seal makes contact with the housing, then hand tighten a further half turn.
9. Start the compressor and check for leaks.

AIR FILTER ELEMENT CHANGE PROCEDURE

1. Stop the machine, electrically isolate and vent all trapped pressure.
2. Unscrew the retaining cap and withdraw the old element.
3. Fit the new element.
4. Replace the retaining cap.

SEPARATOR CARTRIDGE CHANGE PROCEDURE

1. Stop the machine, electrically isolate and vent all trapped pressure.

2. Loosen separator cartridge with the correct tool.

3. Remove the cartridge from the housing; place it in a sealed bag and dispose of it safely.

4. Clean the mating face of the housing.

5. Remove the new Ingersoll Rand replacement cartridge from its protective package.

6. Apply a small amount of lubricant to the cartridge seal.

7. Screw the new cartridge down until the seal makes contact with the housing, then hand tighten a further half turn.

8. Start the compressor and check for leaks.

CAUTION
This unit is not designed or intended to operate when contaminated with silicone. Lubricants, greases or other items containing silicone should not be used on this unit.

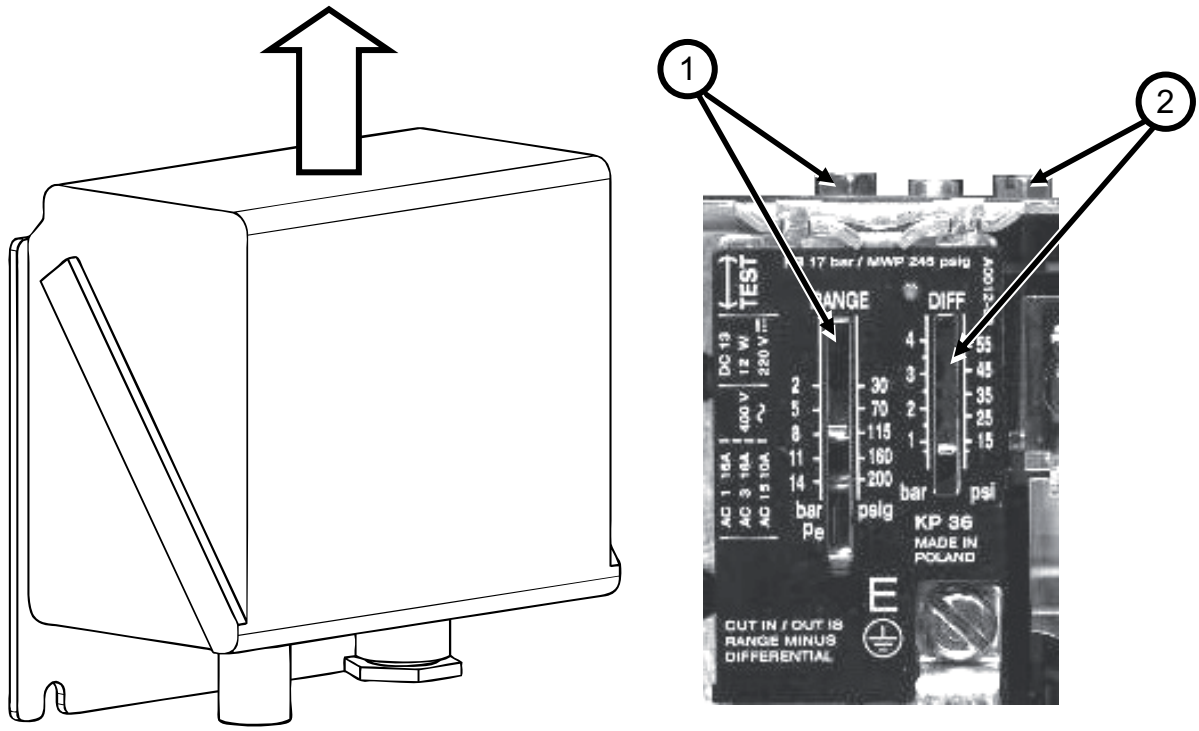
COOLER CLEANING PROCEDURE

1. Stop the machine, electrically isolate and vent all trapped pressure.

2. Remove the top cover to obtain access to the cooler.

3. Clean the cooler.

4. Rebuild in reverse order.



22505309
REV. A

SETTING THE PRESSURE SWITCH (1PS)

TO CHECK THE MAXIMUM DISCHARGE PRESSURE
(Pressure switch upper trip point)

Slowly close the isolation valve located adjacent to the compressor. Observe the rise in pressure and ensure that the pressure switch opens (and unloads the compressor) at the correct Maximum discharge pressure.

The maximum discharge pressure is shown on the machine data plate.

DO NOT exceed these figures.

TO CHECK THE LOWER SET POINT

Observe the line pressure fall and note the point at which the pressure switch closes (and loads the compressor).

TO ADJUST THE UPPER SET POINT

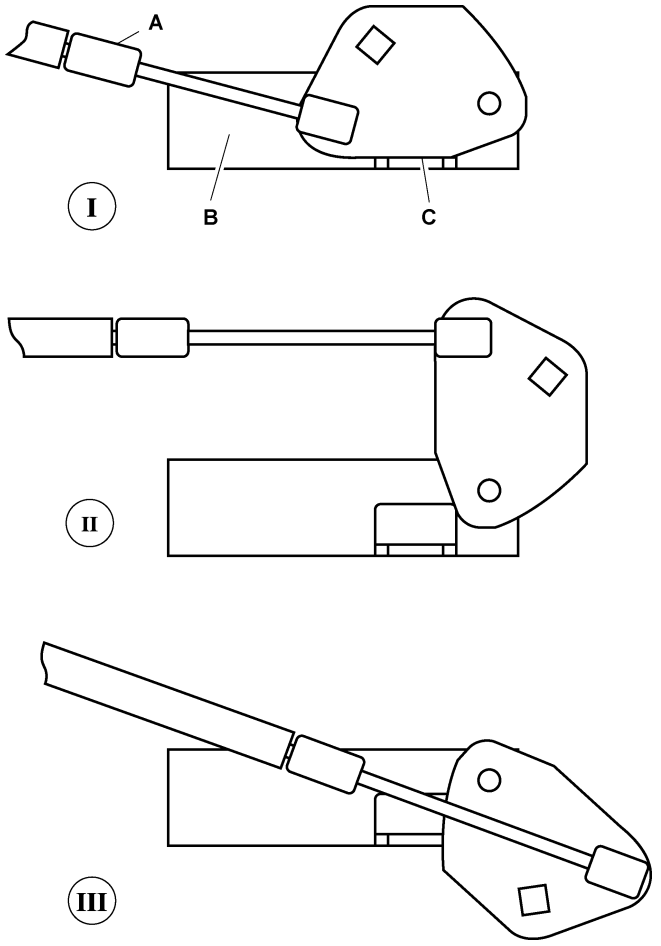
Remove the cover and turn the adjuster [1]. The pointer will move. Turn the adjuster anti–clockwise to increase the set point or clockwise to decrease it.

TO ADJUST THE LOWER SET POINT

Remove the cover and turn the adjuster [2]. The pointer will move. Turn the adjuster anti–clockwise to increase the set point or clockwise to decrease it.

NOTE
The pressure switch scale is a guide only. Use the machine pressure gauge to verify the upper and lower set points.

BELT CHANGE / GAS STRUT CHANGE PROCEDURE



A. Gas strut.

B. Support bracket (part of pivoted assembly).

C. Tension cam.

1. Stop the machine, electrically isolate and vent all trapped pressure.

2. Remove the side cover from the machine.

3. Fit a $^1/_2$" square drive wrench in the tension cam located above the airend (access from front door). Turn clockwise $^1/_4$ turn to Position II to release gas strut tension on the belts.

4. Using a small screwdriver under the spring clip, ease the ball ends off the spherical studs at the ends of the gas strut.

5. Replace the gas strut and the studs at the same time by removing and replacing the studs then pushing the new gas strut firmly onto the studs until it clicks into place.

6. Turn the tension cam clockwise $^1/_4$ turn to Position III to raise and support the airend. Place a block of wood or similar under the separator tank for support.

7. Replace the belts from the left side of the machine.

8. Turn the tension cam counter–clockwise $^1/_2$ turn to Position I to tension the gas strut.

9. Spin the drive to check alignment of the belt ribs on the pulleys (sheaves).

ELECTRIC DRAIN VALVE

PRODUCT DESCRIPTION

The Electric Drain Valve removes condensed water and oil from the air receiver tank. Additional drains may be installed throughout your compressed air system, including aftercoolers, filters, drip legs and dryers.

The Electric Drain Valve operates on a timer which can be set to automatically drain the air receiver tank at operator–determined intervals.

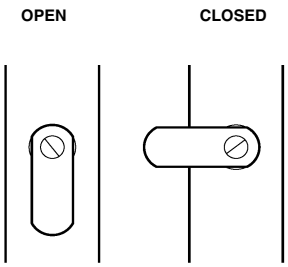
Key features include:

- 100% continuous duty
- NEMA 4 enclosure
- Adjustable time on (0.5 – 10 seconds)
- Adjustable time off (0.5 – 45 minutes)
- Stainless steel operator
- LED to indicate electrical power is on
- LED to indicate valve is open
- Manual override

OPERATION

1. Open the strainer ball valve.

Strainer Ball Valve.



2. Set the “time off” and “time on” knobs. See TIMER SETTINGS (below) for an explanation of the settings.

3. During compressor operation, check for air leaks.

TIMER SETTINGS

The “time off” setting determines the interval between cycles from 30 seconds to 45 minutes. The “time on” setting determines the actual time the compressor drains condensate.

The timer’s cycle rate and drain opening time should be adjusted to open just long enough to discharge the condensate. The timer is properly set when it opens and discharges condensate and then vents air for approximately one second before closing. Adjustments may be made depending on mny factors, including humidity and duty cycle.

TROUBLESHOOTING

TROUBLE	CAUSE	ACTION
Valve will not close.	1. Debris in solenoid valve prevents diaphragm from seating.	1. Remove solenoid valve, disassemble, clean and reassemble.
	2. Short in electrical component.	2. Check and replace power cord or timer as needed.
Timer will not activate	1. No electrical supply.	1. Apply power.
	2. Timer malfunction	2. Replace timer.
	3. Clogged port.	3. Clean valve.
	4 Solenoid valve malfunction.	4. Replace solenoid valve.
	5. Clogged strainer.	5. Clean strainer.

MAINTENANCE

Periodically clean the screen inside the valve to keep the drain functioning at maximum capacity. To do this, perform the following steps:

1. Close the strainer ball valve completely to isolate it from the air receiver tank.

2. Press the TEST button on the timer to vent the pressure remaining in the valve. Repeat until all pressure is removed.

CAUTION! High pressure air can cause injury from flying debris. Ensure the strainer ball valve is completely closed and pressure is released from the valve prior to cleaning.

3. Remove the plug from the strainer with a suitable wrench. If you hear air escaping from the cleaning port, STOP IMMEDIATELY and repeat steps I and 2.

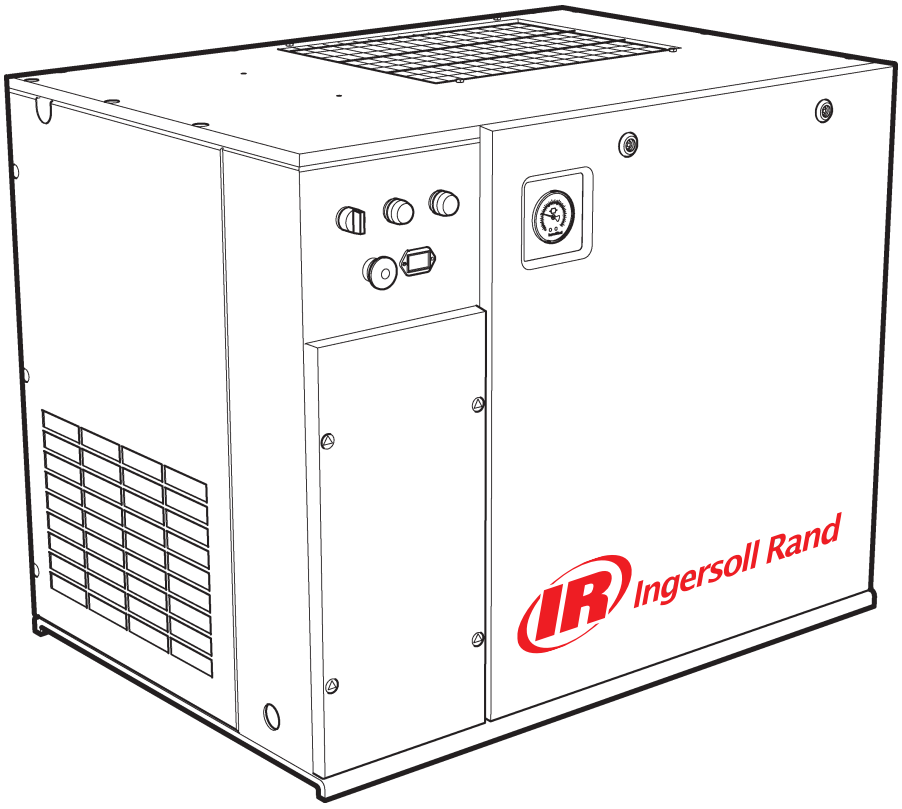
4. Remove the stainless steel filter screen and clean it. Remove any debris that may be in the strainer body before replacing the filter screen.

5. Replace plug and tighten with wrench.

6. When putting the Electric Drain Valve back into service, press the TEST button to confirm proper function.

SSR UP5-4, UP5-5.5, UP5-7.5, UP5-11c
50 Hz
SSR UP6-5, UP6-7.5, UP6-10, UP6-15c
60 Hz

OPERATION AND MAINTENANCE MANUAL



This manual contains important safety information and must be made available to personnel who operate and maintain this machine.

Refer all communications to the nearest Ingersoll Rand Full Service Distributor.

C.C.N. : 80445273
REV. : A
DATE : OCTOBER 2008

MAINTENANCE

MAINTENANCE SCHEDULE

UP Series Maintenance Schedule

PERIOD	MAINTENANCE
Each 24 hours operation	Check the coolant level and replenish if necessary.
Visual check of machine for any leaks, dust build up or unusual noise or vibration	Report immediately, contact **Ingersoll Rand** authorized distributor for assistance if in doubt.
When compressor is receiver mounted	Drain air receiver of condensate, or check that automatic drain is operating.
Visual check condition of package pre-filter	Blow clean if needed.
First 150 hours	Change the coolant filter.
Each month or 100 hours	Remove and clean package pre-filter, replace if needed Check the cooler(s) for build up of foreign matter. Clean if necessary by blowing out with air or by pressure washing.
Each year or 2000 hours	Check the operation of the high temperature protection switch (109˚C).
	Replace elements in IRGP and IRHE filters.
	Change the coolant filter.
	Check scavenge screen for blockage, clean if required.
	Change the separator element.
	Change the Air Filter element.
	Take coolant sample for fluid analysis.
	Change the package pre–filter.
	Check Drive Belts.
	Motors without grease fittings - Replace sealed bearings
1 year external and 6 years internal pressure vessel inspection. Frequency may be otherwise defined by local or national legislation.	*Separator vessel and air receiver when fitted.*
	Fully inspect all external surfaces, and fittings. Report any excessive corrosion, mechanical or impact damage, leakage or other deterioration.
Every two years or 8000 hours	Change drive belts.
	Replace the *Ultra* at whichever interval occurs first.
	Check and replace all items included within 2000 hour service.
	Fit the following reconditioning parts as appropriate: Solenoid valves Inlet valve kit Minimum Pressure valve kit Thermostatic Valve Kit
Every 4 years or 16000 hours	Replace all hoses.
	Check motors with grease fittings and grease per motor data tag
	Fit replacement electrical contactor tips.
	Motors without grease fittings - Replace sealed bearings

ROUTINE MAINTENANCE

This section refers to the various components which require periodic maintenance and replacement.

It should be noted that the intervals between service requirement may be significantly reduced as a consequence of poor operating environment. This would include effects of atmospheric contamination and extremes of temperature.

The *SERVICE/MAINTENANCE CHART* indicates the various components' descriptions and the intervals when maintenance has to take place. Oil capacities, etc., can be found in the *GENERAL INFORMATION* section of this manual.

Compressed air can be dangerous if incorrectly handled. Before doing any work on the unit, ensure that all pressure is vented from the system and that the machine cannot be started accidentally.

CAUTION

Before beginning any work on the compressor, open, lock and tag the main electrical disconnect and close the isolation valve on the compressor discharge. Vent pressure from the unit by slowly unscrewing the coolant fill cap one turn. Unscrewing the fill cap opens a vent hole, drilled in the cap, allowing pressure to release to atmosphere. Do not remove the fill cap until all pressure has vented from the unit. Also vent piping by slightly opening the drain valve. When opening the drain valve or the coolant fill cap, stand clear of the valve discharge and wear appropriate eye protection.

Ensure that maintenance personnel are properly trained, competent and have read the Maintenance Manuals.

Prior to attempting any maintenance work, ensure that:-

- all air pressure is fully discharged and isolated from the system. If the automatic blowdown valve is used for this purpose, then allow enough time for it to complete the operation.
- the machine cannot be started accidentally or otherwise.
- all residual electrical power sources (mains and battery) are isolated.

Prior to opening or removing panels or covers to work inside a machine, ensure that:-

- anyone entering the machine is aware of the reduced level of protection and the additional hazards, including hot surfaces and intermittently moving parts.
- the machine cannot be started accidentally or otherwise.

Prior to attempting any maintenance work on a running machine, ensure that:-

DANGER

Only properly trained and competent persons should undertake any maintenance tasks with the compressor running or with electrical power connected.

- the work carried out is limited to only those tasks which require the machine to run.
- the work carried out with safety protection devices disabled or removed is limited to only those tasks which require the machine to be running with safety protection devices disabled or removed.
- all hazards present are known (e.g. pressurised components, electrically live components, removed panels, covers and guards, extreme temperatures, inflow and outflow of air, intermittently moving parts, safety valve discharge etc.).
- appropriate personal protective equipment is worn.
- loose clothing, jewellery, long hair etc. is made safe.
- warning signs indicating that *Maintenance Work is in Progress* are posted in a position that can be clearly seen.

Upon completion of maintenance tasks and prior to returning the machine into service, ensure that:-

- the machine is suitably tested.
- all guards and safety protection devices are refitted and correctly working.
- all panels are replaced, canopy and doors closed.
- hazardous materials are effectively contained and disposed of in a manner compliant with local or National environmental protection codes.

WARNING

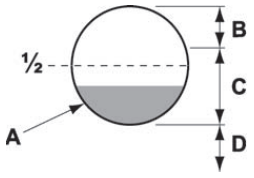
Do not under any circumstances open any drain valve or remove components from the compressor without first ensuring that the compressor is FULLY SHUT- DOWN, power isolated and all air pressure relieved from the system.

TOP UP COOLANT PROCEDURE

1. Slowly remove fill cap.
2. Pour coolant into spout untill spout almost overflows.
3. Replace and tighten oil fill cap.
4. Start unit for about 10 seconds (until coolant drains out the bottom of the sight glass).
5. Slowly remove fill cap.
6. Re–fill into spout until spout almost overflows.
7. Replace and tighten oil fill cap.
8. Run unit.

NOTE

Coolant level is correct when a unit is showing coolant in bottom half of sight glass when up to operating temperature (ten minutes running loaded).



A. Correct at operating temperature
B. Too much
C. OK
D. Too little

Repeat this procedure to get coolant to proper level when up to operating temperature.
When the unit is shut down, coolant will usually fill up sight glass. Do not adjust level based on level at shutdown. Proper level is always set for a running unit at operating temperature.

CAUTION

Ensure that SSR ULTRA is used. Failure to do so will void manufacturers warranty.

COOLANT CHANGE PROCEDURE

It is better to drain the coolant immediately after the compressor has been operating as the liquid will drain more easily and any contaminant will still be in suspension.

1. Stop the machine, electrically isolate and vent all trapped pressure.
2. Place a suitable container close to the drain valve.
3. Slowly remove fill cap.
4. Remove plug from drain valve.
5. Open the drain valve and drain coolant into container.
6. Close the drain valve.
7. Replace plug in drain valve.
8. Refill the machine following the ”top up coolant” procedure above. After initial fill, to purge any airlocks, the machine should be run for a few minutes cycling between load and no load, before checking that the level is correct.
9. Replace and tighten oil fill cap.

COOLANT FILTER CHANGE PROCEDURE

1. Stop the machine, electrically isolate and vent all trapped pressure.
2. Loosen filter with the correct tool.
3. Remove the filter from the housing.
4. Place the old filter in a sealed bag and dispose of in a safe way.
5. Clean the mating face of the housing taking care to avoid any particles entering the machine.
6. Remove the new **Ingersoll Rand** replacement filter from its protective package.
7. Apply a small amount of lubricant to the filter seal.
8. Screw the new filter down until the seal makes contact with the housing, then hand tighten a further half turn.
9. Start the compressor and check for leaks.

AIR FILTER ELEMENT CHANGE PROCEDURE

1. Stop the machine, electrically isolate and vent all trapped pressure.
2. Unscrew the retaining cap and withdraw the old element.
3. Fit the new element.
4. Replace the retaining cap.

SEPARATOR ELEMENT CHANGE PROCEDURE

1. Stop the machine, electrically isolate and vent all trapped pressure.
2. Loosen separator element with the correct tool.
3. Remove the element from the housing; place it in a sealed bag and dispose of it safely.
4. Clean the mating face of the housing.
5. Remove the new **Ingersoll Rand** replacement element from its protective package.
6. Apply a small amount of lubricant to the element seal.
7. Screw the new element down until the seal makes contact with the housing, then hand tighten a further half turn.
8. Start the compressor and check for leaks.

CAUTION

This unit is not designed or intended to operate when contaminated with silicone. Lubricants, greases or other items containing silicone should not be used on this unit.

COOLER CLEANING PROCEDURE

1. Stop the machine, electrically isolate and vent all trapped pressure.
2. Remove the top cover to obtain access to the cooler.
3. Clean the cooler.
4. Rebuild in reverse order.

BELT CHECKING AND ADJUSTMENT PROCEDURE

Check belt tension occasionally, especially if looseness is suspected. A quick check to determine if adjustment is proper may be made by observing the slack side of the belt for a slight bow when the unit is in operation. If a slight bow is evident, the belt is usually adjusted satisfactorily.

A belt tension measurement device can be used to determine the tension of the belt.

Belt tensioning can be achieved by loosening the airend anchor screws, a belt tensioning bolt is provided to aid in moving the airend.

Follow the procedures outlined below to correctly set and measure belt tension.

1. Lay a straight edge across the top outer surface of the belt drive from pulley to sheave.
2. At the center of the span, perpendicular to the belt, apply pressure to the outer surface of the belt with a tension gauge. Force the belt to the deflection indicated in the table below, and compare the reading on the tension gauge to the figures shown.

BELT TENSION

	5hp/4kw *		7.5hp/5.5kw *		10hp/7.5kw *		15hp/11kw **	
	New	Used	New	Used	New	Used	New	Used
60hz								
125 psig	75 Lb (34 Kg)	62 Lb (28 Kg)	110 Lb (50 Kg)	90 Lb (41 Kg)	110 Lb (50 Kg)	90 Lb (41 Kg)	140 Lb (64 Kg)	120 Lb (54 Kg)
150 psig	75 Lb (34 Kg)	62 Lb (28 Kg)	90 Lb (41 Kg)	75 Lb (34 Kg)	110 Lb (50 Kg)	90 Lb (41 Kg)	140 Lb (64 Kg)	120 Lb (54 Kg)
210 psig	75 Lb (34 Kg)	62 Lb (28 Kg)	90 Lb (41 Kg)	75 Lb (34 Kg)	110 Lb (50 Kg)	90 Lb (41 Kg)	150 Lb (68 Kg)	125 Lb (57 Kg)
50hz								
8 bar	85 Lb (39 Kg)	70 Lb (32 Kg)	85 Lb (39 Kg)	70 Lb (32 Kg)	110 Lb (50 Kg)	90 Lb (41 Kg)	140 Lb (64 Kg)	120 Lb (54 Kg)
10 bar	90 Lb (41 Kg)	75 Lb (34 Kg)	85 Lb (39 Kg)	70 Lb (32 Kg)	120 Lb (54 Kg)	100 Lb (45 Kg)	140 Lb (64 Kg)	120 Lb (54 Kg)
14.5 bar	90 Lb (41 Kg)	75 Lb (34 Kg)	100 Lb (45 Kg)	80 Lb (36 Kg)	120 Lb (54 Kg)	100 Lb (45 Kg)	150 Lb (68 Kg)	125 Lb (57 Kg)
* "Krikit I" gauge or equal								
** "Krikit II" gauge or equal								

Ensure the pulley and sheave are properly aligned and the motor anchor screws are adequately retightened prior to restarting the compressor.

CAUTION

Improper pulley/sheave alignment and belt tension can result in motor overload, excessive vibration, and premature belt and/or bearing failure.
To prevent these problems from occurring, ensure the pulley and sheave are aligned and belt tension is satisfactory after installing new belts or tensioning existing belts.

ELECTRIC DRAIN VALVE (OPTIONAL)

PRODUCT DESCRIPTION

The Electric Drain Valve removes condensed water and oil from the air receiver tank. Additional drains may be installed throughout your compressed air system, including aftercoolers, filters, drip legs and dryers.

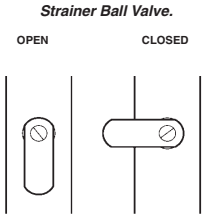
The Electric Drain Valve operates on a timer which can be set to automatically drain the air receiver tank at operator-determined intervals.

Key features include:

- 100% continuous duty
- NEMA 4 enclosure
- Adjustable time on (0.5 - 10 seconds)
- Adjustable time off (0.5 - 45 minutes)
- Stainless steel operator
- LED to indicate electrical power is on
- LED to indicate valve is open
- Manual override

OPERATION

1. Open the strainer ball valve.



2. Set the "time off" and "time on" knobs. See TIMER SETTINGS (below) for an explanation of the settings.
3. During compressor operation, check for air leaks.

TIMER SETTINGS

The "time off" setting determines the interval between cycles from 30 seconds to 45 minutes. The "time on" setting determines the actual time the compressor drains condensate.

The timer's cycle rate and drain opening time should be adjusted to open just long enough to discharge the condensate. The timer is properly set when it opens and discharges condensate and then vents air for approximately one second before closing. Adjustments may be made depending on many factors, including humidity and duty cycle.

TROUBLESHOOTING

TROUBLE	CAUSE	ACTION
Valve will not close.	Debris in solenoid valve prevents diaphragm from seating.	Remove solenoid valve, disassemble, clean and reassemble.
	Short in electrical component.	Check and replace power cord or timer as needed.
Timer will not activate	No electrical supply.	Apply power.
	Timer malfunction	Replace timer.
	Clogged port.	Clean valve.
	Solenoid valve malfunction.	Replace solenoid valve.
	Clogged strainer.	Clean strainer.

MAINTENANCE

Periodically clean the screen inside the valve to keep the drain functioning at maximum capacity. To do this, perform the following steps:

1. Close the strainer ball valve completely to isolate it from the air receiver tank.
2. Press the TEST button on the timer to vent the pressure remaining in the valve. Repeat until all pressure is removed.

CAUTION

High pressure air can cause injury from flying debris. Ensure the strainer ball valve is completely closed and pressure is released from the valve prior to cleaning.

3. Remove the plug from the strainer with a suitable wrench. If you hear air escaping from the cleaning port, STOP IMMEDIATELY and repeat steps 1 and 2.
4. Remove the stainless steel filter screen and clean it. Remove any debris that may be in the strainer body before replacing the filter screen.
5. Replace plug and tighten with wrench.
6. When putting the Electric Drain Valve back into service, press the TEST button to confirm proper function.

Before accessing live electrical parts, disconnect the power supply to the dryer using disconnect switch or disconnect the cable connections.

Preventive maintenance

For optimum performance from your dryer, follow the periodic maintenance schedule described below.

WEEKLY	**CONDENSATE DRAINS** Verify that the condensate drains are operating correctly.
EVERY 4 MONTHS	**CONDENSER** Remove any dust from the condenser fins. **COMPRESSOR** Make sure compressor power consumption complies with data plate specifications.
YEARLY	**CONDENSATE DRAINS** Completely disassemble the drains and clean all their components. **AIR FILTER** Replace air filter element.

MOISTURE SEPARATOR MAINTENANCE

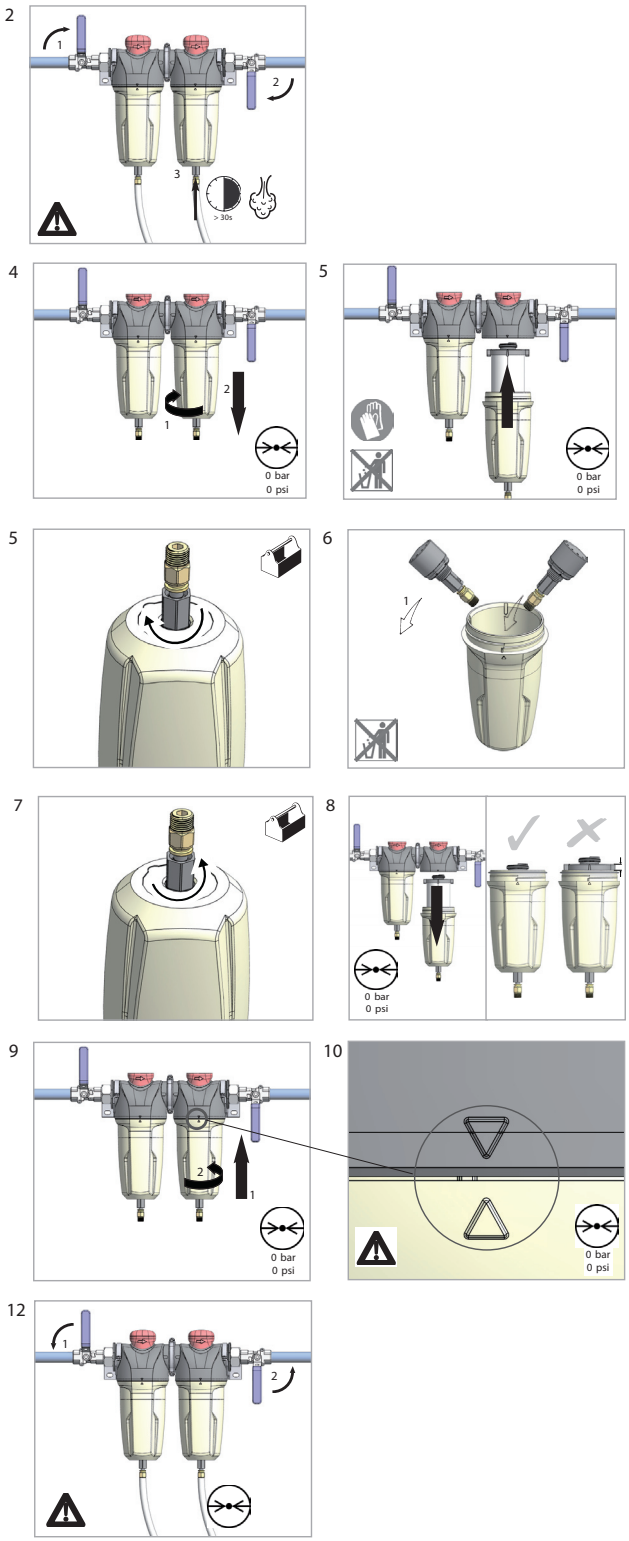
The moisture separator will operate indefinitely under normal working conditions, however at some time it may be necessary to replace the seals should the housing leak.

1. Isolate the housing from the air supply.
2. Fully depressurize in drain bowl as appropriate.
3. Unscrew bowl and remove. If pressure has not been completely released from the housing, air will escape from the warning hole giving an audible alarm. Screw back bowl and repeat instruction 2 before attempting again. Should resistance to unscrewing be experienced, provision is made for a 'C' spanner to fit onto the ribs of the bowl.
4. Check condition of bowl seal and replace if necessary. Clean screw threads.
5. Refit bowl with 'O' ring seal.
6. Repressurize and check for leaks. If leaks occur they will most probably be from the bowl 'O' ring. Depressurize housing and remove 'O' ring as stated above and inspect and clean. Ensure that mating surfaces are clean and then refit 'O' ring and repressurize.

AIR FILTER MAINTENANCE

In order to ensure optimum compressed air quality the filter element should be replaced as follows. (Used filter elements must be disposed of in accordance with local regulations.)

Use only genuine **Ingersoll Rand** replacement elements.



DISASSEMBLING THE UNIT

The unit has been designed and constructed to guarantee continuous operation.

The long service life of some components such as the fan and compressor depends on good maintenance.

The unit must only be disassembled by a refrigerant specialist.

Refrigerant liquid and lubricating oil inside the refrigeration circuit must be recovered in compliance with current norms in the country where the machine is installed.

RECYCLING DISASSEMBLY	
Frame and panels	Steel / epoxy resin polyester
Heat exchanger (cooler)	Stainless steel
Pipes	Copper
Insulation	Gum synthetic
Compressor	Steel / copper / aluminium / oil
Condenser	Aluminium
Refrigerant	R134a
Valve	Steel

REFRIGERANT LEAKS IN THE REFRIGERATION CIRCUIT

The unit is despatched in perfect working order, already charged.

Refrigerant leaks may be identified by tripping of the refrigeration overload protector.

IF A LEAK IS DETECTED IN THE REFRIGERANT CIRCUIT, SEEK TECHNICAL ASSISTANCE.

REFRIGERANT CHARGING

THIS OPERATION MUST ONLY BE PERFORMED BY A REFRIGERANT SPECIALIST.

WHEN REPAIRING THE REFRIGERANT CIRCUIT, COLLECT ALL THE REFRIGERANT IN A CONTAINER AND DISPOSE OF IT IN THE APPROPRIATE MANNER.

CHARACTERISTICS OF REFRIGERANT R134A

In normal temperature and pressure conditions the above refrigerant is a colorless, class A1/A1 gas with TVL value of 1000 ppm (ASHRAE classification).

If a refrigerant leak occurs, thoroughly air the room before commencing work.

TROUBLESHOOTING

TROUBLE	CAUSE	ACTION
Solenoid condensate valve will not close.	Debris in solenoid valve prevents diaphragm from seating.	Remove solenoid valve, disassemble, clean and reassemble.
	Short in electrical component.	Check and replace power cord or timer as needed.
Drain timer will not operate.	No electrical supply.	Apply power.
	Timer malfunction	Replace timer.
	Clogged port.	Clean valve.
	Solenoid valve malfunction.	Replace solenoid valve.
	Clogged strainer.	Clean strainer.

MAINTENANCE

Periodically clean the screen inside the valve to keep the drain functioning at maximum capacity. To do this, perform the following steps:

1. Close the strainer ball valve completely to isolate it from the air receiver tank.
2. Press the TEST button on the timer to vent the pressure remaining in the valve. Repeat until all pressure is removed.

CAUTION

High pressure air can cause injury from flying debris. Ensure the strainer ball valve is completely closed and pressure is released from the valve prior to cleaning.

3. Remove the plug from the strainer with a suitable wrench. If you hear air escaping from the cleaning port, STOP IMMEDIATELY and repeat steps 1 and 2.
4. Remove the stainless steel filter screen and clean it. Remove any debris that may be in the strainer body before replacing the filter screen.
5. Replace plug and tighten with wrench.
6. When putting the Electric Drain Valve back into service, press the TEST button to confirm proper function.

APPENDIX N

AS/SVE WELL INSTALLATION LOGS

AKRF, Inc.

Environmental Consultants

440 Park Avenue South, 7th Fl. New York, NY 10016

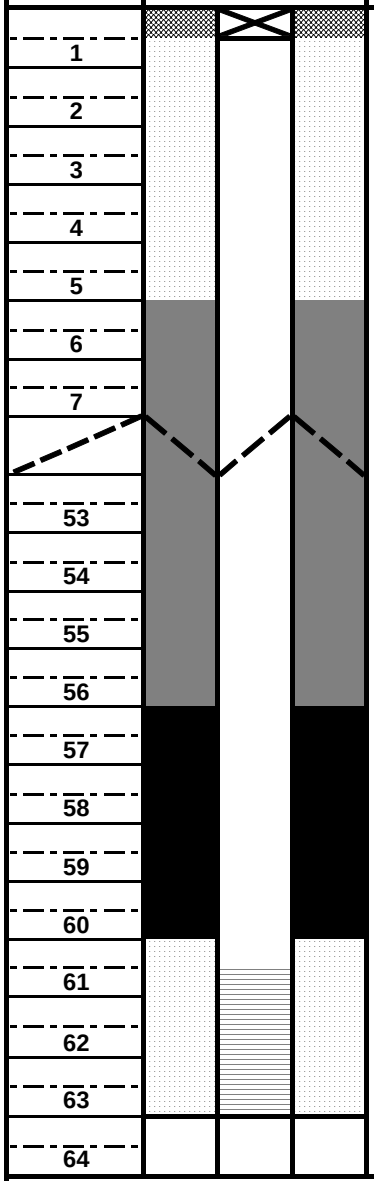
AKRF Project Number : 03399

Well No. AS-7A

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	ADT
Weather:	Clear, 55˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 0850	**Time: 1210**
Date: 5/10/10	**Date: 5/10/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0-60.5 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5-56.0 feet below grade)**
7		
53		
54		
55		
56		
57		**Bentonite (56.0-60.0 feet below grade)**
58		
59		
60		**No.1 sand filter pack (60.0-62.5 feet below grade)**
61		
62		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (60.5-62.5 feet below grade)**
63		
64		

Notes:

No soil samples collected during well installation
Total well depth measured at 61.5 feet below top of PVC following well installation on 4/1/10.
Total well depth measured at 61.7 feet below top of PVC following well installation on 5/21/10 .
Total well depth measured at 62.4 feet below top of PVC following well development on 6/24/10.
Groundwater measured at 51.6 feet below top of PVC on 6/24/10.

AKRF, Inc.

Environmental Consultants

440 Park Avenue South, 7th Fl. New York, NY 10016

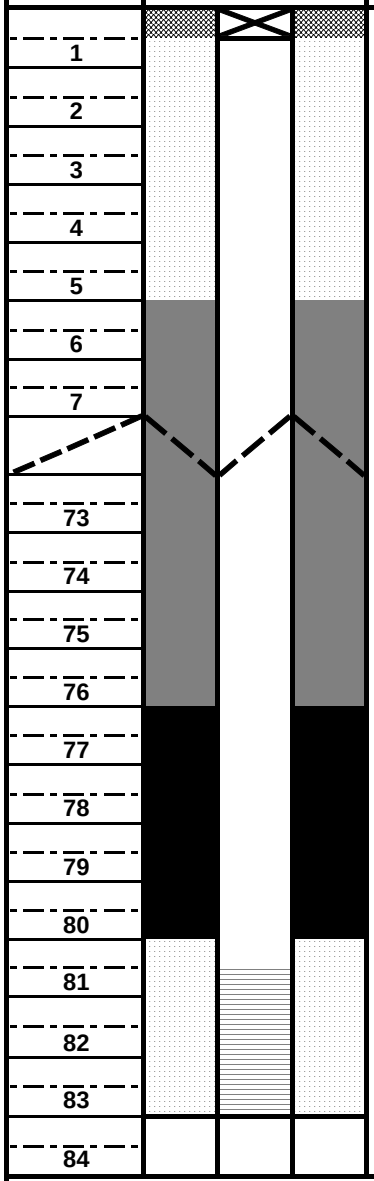
AKRF Project Number : 03399

Well No. AS-7B

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	ADT
Weather:	Clear, 55˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 1230	**Time: 1040**
Date: 5/10/10	**Date: 5/13/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-80.5 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-76.0 feet below grade)**
7		
73		
74		
75		
76		
77		**Bentonite (76.0-80.0 feet below grade)**
78		
79		
80		**No.1 sand filter pack (80.0-82.5 feet below grade)**
81		
82		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (80.5-82.5 feet below grade)**
83		
84		

Notes: **No soil samples collected during well installation**
Total well depth measured at 82.5 feet below top of PVC following well installation on 5/13/10.
Total well depth measured at 82.4 feet below top of PVC following well development on 6/24/10.
Groundwater measured at 51.2 feet below top of PVC on 6/24/10.

AKRF, Inc.

Environmental Consultants

440 Park Avenue South, 7th Fl. New York, NY 10016

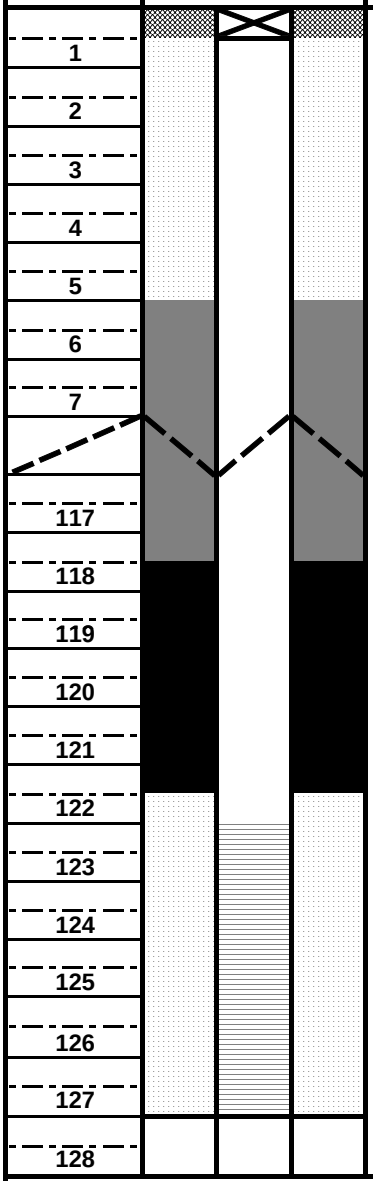
AKRF Project Number : 03399

Well No. AS-7C

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	ADT
Weather:	Clear, 55˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 0830	**Time: 2030**
Date: 10/20/10	**Date: 10/20/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-121.6 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-117.1 feet below grade)**
7		
117		
118		
119		**Bentonite (117.1-121.1 feet below grade)**
120		
121		**No.1 sand filter pack (121.1-126.6 feet below grade)**
122		
123		
124		
125		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (121.6-126.6 feet below grade)**
126		
127		
128		

Notes:

No soil samples collected during well installation
Total well depth measured at 126.6 feet below top of PVC following well installation on 10/20/10.
AS-10C was originally installed on 5/11/10, but was replaced on 10/20/10 due to the integrity of the well screen.

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440 Park Avenue South, 7th Fl. New York, NY 10016

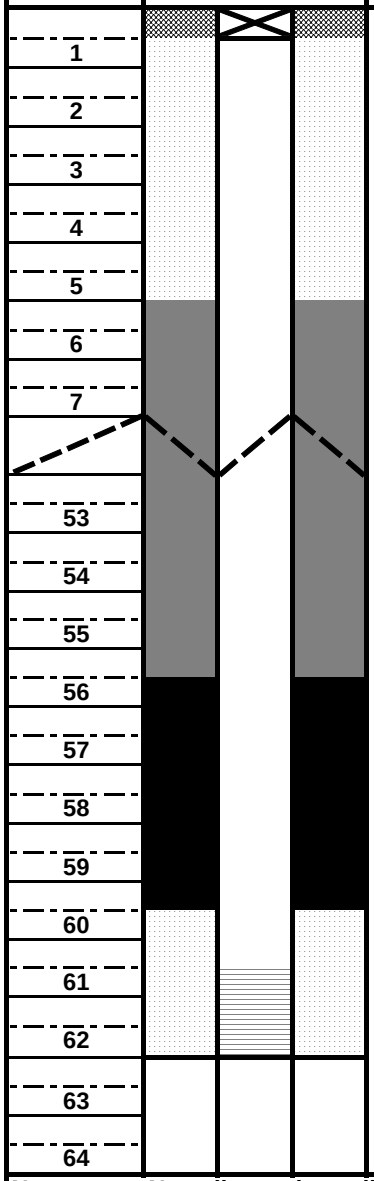
AKRF Project Number : 03399

Well No. AS-7D

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	ADT
Weather:	Overcast, 65˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 0705	**Time: 0838**
Date: 5/14/10	**Date: 5/14/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-60.0 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-55.5 feet below grade)**
7		
53		
54		
55		
56		**Bentonite (55.5-59.5 feet below grade)**
57		
58		
59		
60		**No.1 sand filter pack (59.5-62.0 feet below grade)**
61		
62		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (60.0-62.0 feet below grade)**
63		
64		

Notes:

No soil samples collected during well installation
Total well depth measured at 61.9 feet below top of PVC following well installation on 5/14/10.
Total well depth measured at 62.0 feet below top of PVC following well installation on 5/21/10.
Total well depth measured at 59.5 feet below top of PVC following well development on 6/24/10.
Groundwater measured at 45.4 feet below top of PVC on 6/24/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

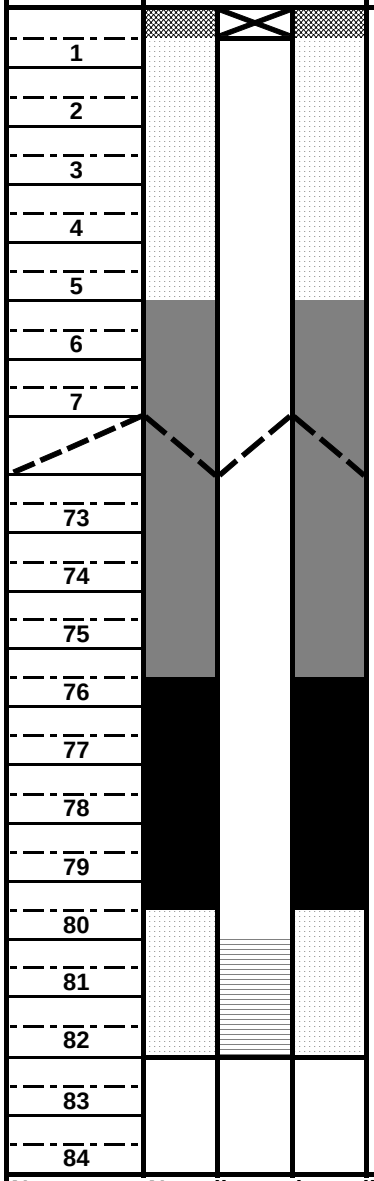
AKRF Project Number : 03399

Well No. AS-7E

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	ADT
Weather:	Clear, 60˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 0845	**Time: 1120**
Date: 5/6/10	**Date: 5/6/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-80.3 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-75.8 feet below grade)**
7		
73		
74		
75		
76		
77		**Bentonite (75.8-79.8 feet below grade)**
78		
79		
80		**No.1 sand filter pack (79.8-82.3 feet below grade)**
81		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (80.3-82.3 feet below grade)**
82		
83		
84		

Notes:

No soil samples collected during well installation
Total well depth measured at 82.3 feet below top of PVC following well installation on 5/6/10.
Total well depth measured at 81.1 feet below top of PVC following well development on 6/24/10.
Groundwater measured at 49.3 feet below top of PVC on 6/24/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

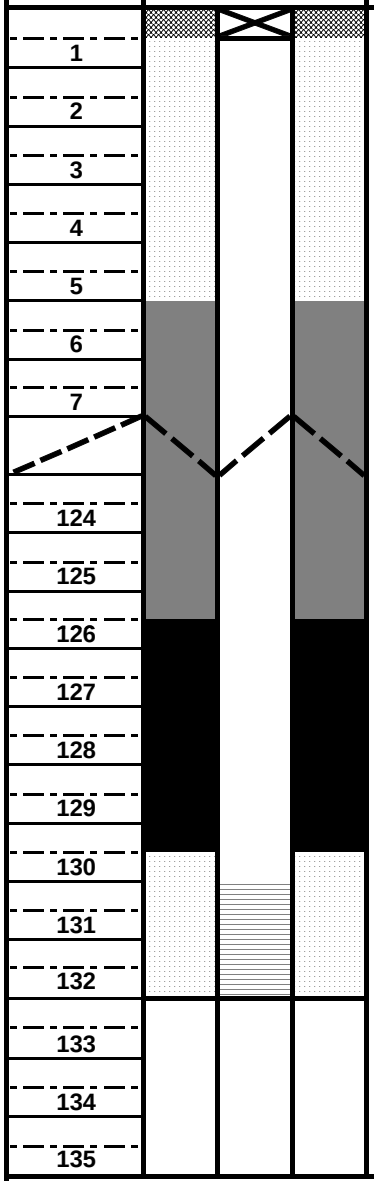
AKRF Project Number : 03399

Well No. AS-7F

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	ADT
Weather:	Clear, 55˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 0710	**Time: 1525**
Date: 5/12/10	**Date: 5/12/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-129.8 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-125.8 feet below grade)**
7		
124		
125		
126		
127		**Bentonite (125.8-129.8 feet below grade)**
128		
129		
130		**No.1 sand filter pack (129.3-131.8 feet below grade)**
131		
132		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (129.8-131.8 feet below grade)**
133		
134		
135		

Notes:

No soil samples collected during well installation
Total well depth measured at 131.9 feet below top of PVC following well installation on 5/12/10.
Total well depth measured at 132.8 feet below top of PVC following well development on 7/12/10. on 6/24/10.
Groundwater measured at 49.1 feet below top of PVC on 6/24/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

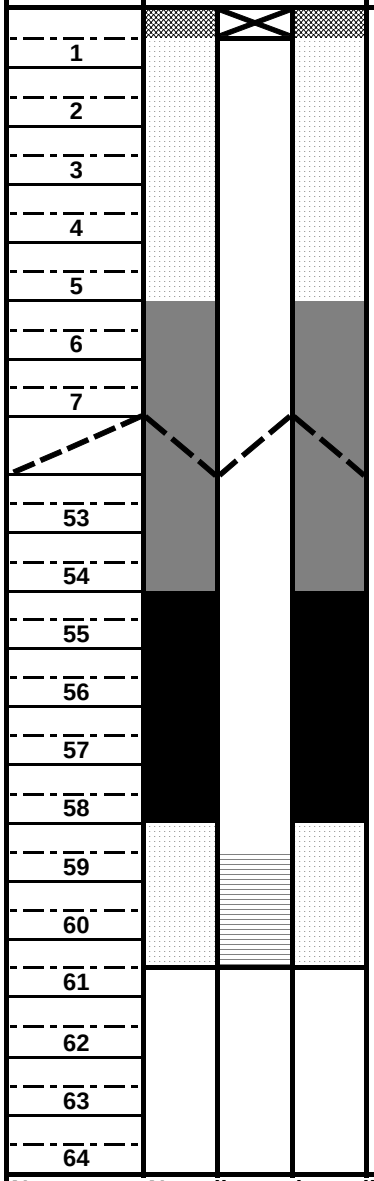
AKRF Project Number : 03399

Well No. AS-8A

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	Warren George
Weather:	Rain, 35˚F
Logged by:	EK/SG -AKRF

Drilling	
Start	**Finish**
Time: 1305	**Time: 1015**
Date: 2/24/10	**Date: 3/5/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-58.5 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-53.7 feet below grade)**
7		
53		
54		
55		
56		**Bentonite (53.7-57.7 feet below grade)**
57		
58		
59		**No.1 sand filter pack (57.7-60.5 feet below grade)**
60		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (58.5-60.5 feet below grade)**
61		
62		
63		
64		

Notes:

No soil samples collected during well installation
Total well depth measured at 60.3 feet below top of PVC following well installation on 4/23/10.
Total well depth measured at 60.5 feet below top of PVC following well development on 6/24/10.
Groundwater measured at 49.0 feet below top of PVC on 6/24/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

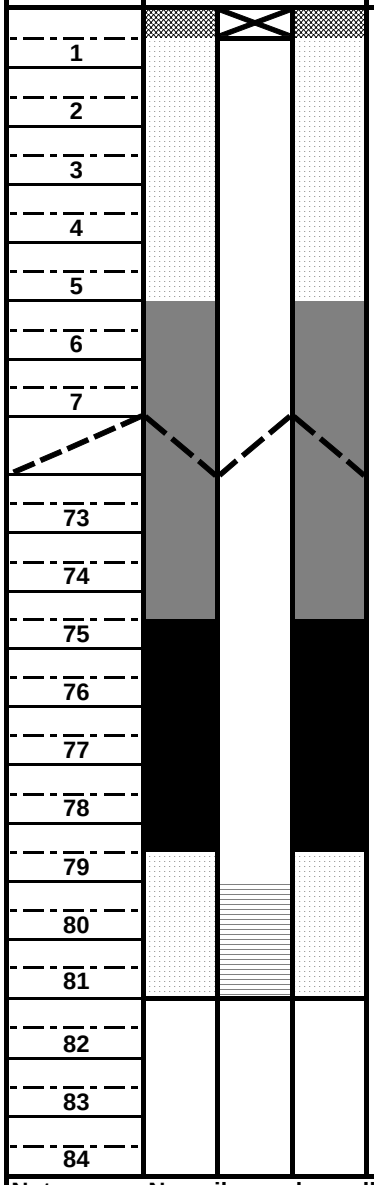
AKRF Project Number : 03399

Well No. AS-8B

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	Warren George
Weather:	Clear, 55˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 1100	**Time: 1200**
Date: 3/5/10	**Date: 3/10/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-79.0 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-74.5 feet below grade)**
7		
73		
74		
75		**Bentonite (74.5-78.5 feet below grade)**
76		
77		
78		
79		**No.1 sand filter pack (78.5-81.0 feet below grade)**
80		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (79.0-81.0 feet below grade)**
81		
82		
83		
84		

Notes:

No soil samples collected during well installation

Total well depth measured at 78.2 feet below top of PVC following well installation on 3/10/10.

Total well depth measured at 81.0 feet below top of PVC following well development on 6/24/10.

Groundwater measured at 48.9 feet below top of PVC on 6/24/10.

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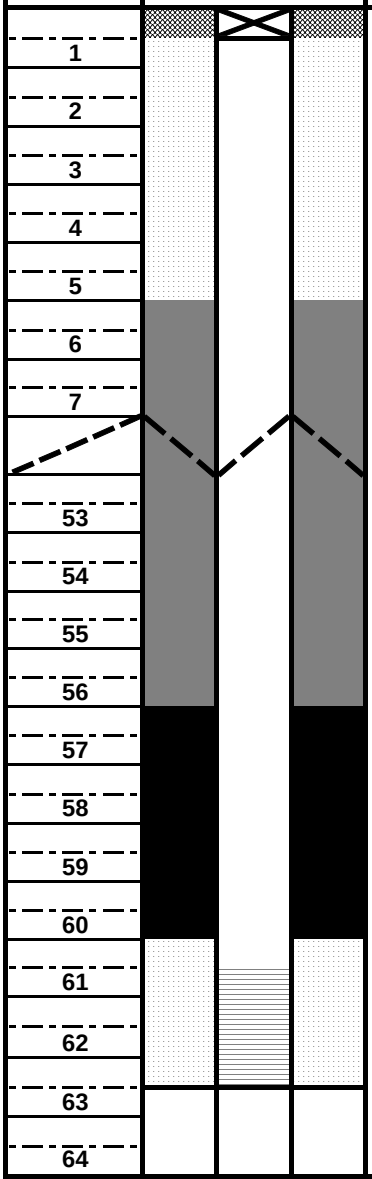
AKRF Project Number : 03399

Well No. AS-8C

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	Warren George
Weather:	Rain, 47˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 1340	**Time: 1500**
Date: 3/12/10	**Date: 3/15/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-60.2 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-55.7 feet below grade)**
7		
53		
54		
55		
56		
57		**Bentonite (55.7-59.7 feet below grade)**
58		
59		
60		**No.1 sand filter pack (59.7-60.2 feet below grade)**
61		
62		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (60.2-62.2 feet below grade)**
63		
64		

Notes:

No soil samples collected during well installation
Total well depth measured at 61.1 feet below top of PVC following well installation on 3/15/10.
Total well depth measured at 62.2 feet below top of PVC following well development on 5/21/10.
Total well depth measured at 61.9 feet below top of PVC following well development on 6/24/10.
Groundwater measured at 48.9 feet below top of PVC on 6/24/10.

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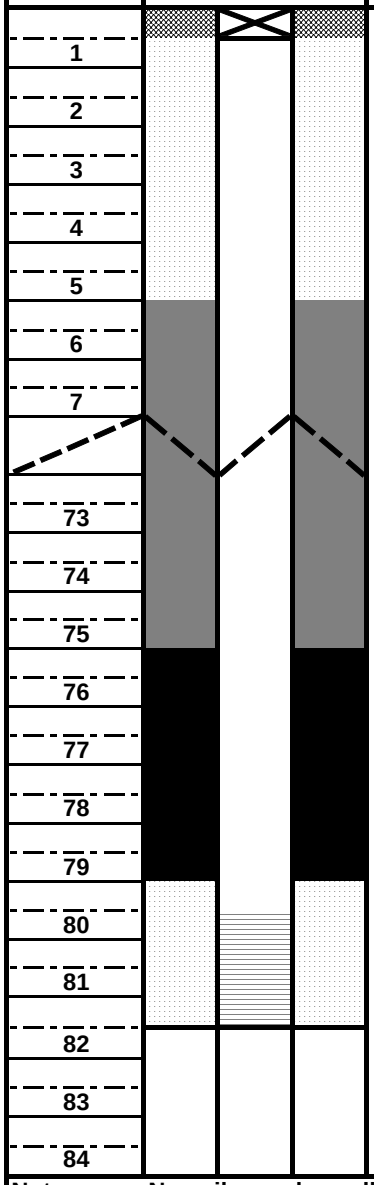
AKRF Project Number : 03399

Well No. AS-8D

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	Warren George
Weather:	Clear, 60˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 0826	**Time: 1500**
Date: 4/21/10	**Date: 4/23/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-79.3 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-74.8 feet below grade)**
7		
73		
74		
75		
76		**Bentonite (74.8-78.8 feet below grade)**
77		
78		
79		**No.1 sand filter pack (78.8-81.3 feet below grade)**
80		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (79.3-81.3 feet below grade)**
81		
82		
83		
84		

Notes:

No soil samples collected during well installation
Total well depth measured at 81.3 feet below top of PVC following well installation on 4/23/10.
Total well depth measured at 80.7 feet below top of PVC following well development on 7/8/10.
Groundwater measured at 48.8 feet below top of PVC on 7/8/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

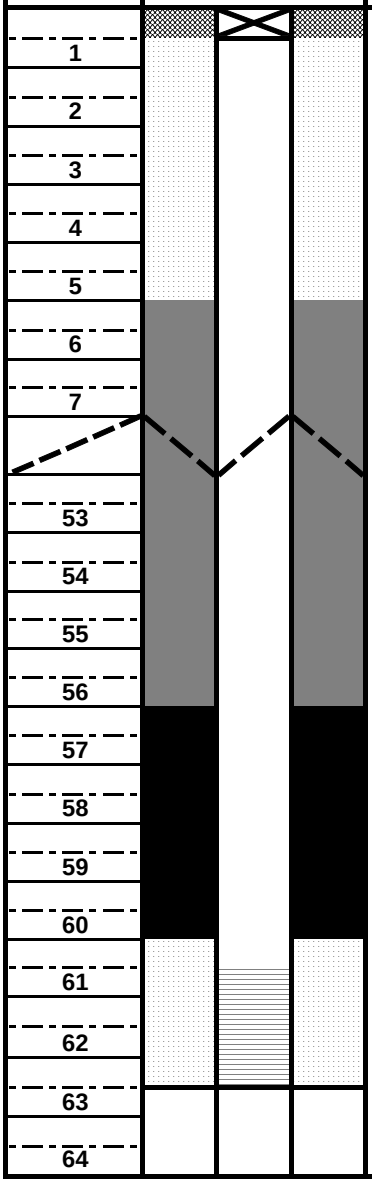
AKRF Project Number : 03399

Well No. AS-8E

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	Warren George
Weather:	Clear, 44˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 1240	**Time: 1330**
Date: 3/18/10	**Date: 3/19/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-60.2 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-55.7 feet below grade)**
7		
53		
54		
55		
56		
57		
58		**Bentonite (55.7-59.7 feet below grade)**
59		
60		
61		**No.1 sand filter pack (59.7-62.2 feet below grade)**
62		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (60.2-62.2 feet below grade)**
63		
64		

Notes:

No soil samples collected during well installation
Total well depth measured at 61.9 feet below top of PVC following well installation on 3/19/10.
Total well depth measured at 62.2 feet below top of PVC following well development on 5/21/10.
Total well depth measured at 62.0 feet below top of PVC following well development on 6/24/10.
Groundwater measured at 49.2 feet below top of PVC on 6/24/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

AKRF Project Number : 03399

Well No. AS-8F

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	Warren George
Weather:	Overcast, 49˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 1340	**Time: 1206**
Date: 3/16/10	**Date: 3/1810**

Depth (feet)	Well Construction	Construction Description
1		Flush-mounted steel roadbox set within concrete pad.
2		2" diameter Sch. 40 PVC riser (0.0-80.2 feet below grade)
3		No.1 sand filter pack (0.5-5.0 feet below grade)
4		
5		
6		Portland cement/Bentonite grout (5.0-75.7 feet below grade)
7		
73		
74		
75		
76		
77		Bentonite (75.7-79.7 feet below grade)
78		Bentonite (75.7-79.7 feet below grade)
79		
80		
81		No.1 sand filter pack (79.7-82.2 feet below grade)
82		2" x 2' Sch. 40 PVC 0.020-inch slotted screen (80.2-82.2 feet below grade)
83		
84		

Notes:

No soil samples collected during well installation

Total well depth measured at 81.0 feet below top of PVC following well installation on 3/18/10.

Total well depth measured at 82.2 feet below top of PVC following well development on 6/24/10.

Groundwater measured at 49.2 feet below top of PVC on 6/24/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

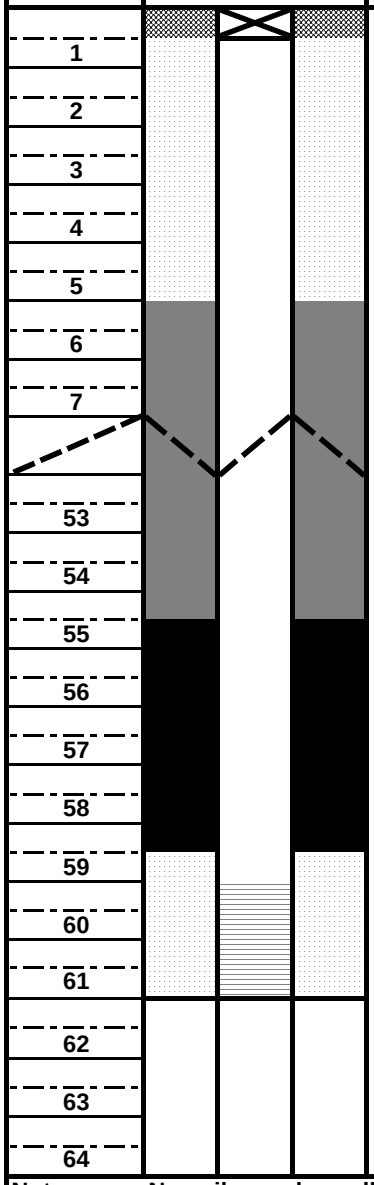
AKRF Project Number : 03399

Well No. AS-8G

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	Warren George
Weather:	Overcast, 48˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 1240	**Time: 1330**
Date: 3/25/10	**Date: 3/29/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-58.8 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-54.3 feet below grade)**
7		
53		
54		
55		
56		**Bentonite (54.3-58.3 feet below grade)**
57		
58		
59		**No.1 sand filter pack (58.3-60.8 feet below grade)**
60		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (58.8-60.8 feet below grade)**
61		
62		
63		
64		

Notes:

No soil samples collected during well installation
Total well depth measured at 60.4 feet below top of PVC following well installation on 3/29/10.
Total well depth measured at 60.8 feet below top of PVC following well development on 5/21/10.
Total well depth measured at 60.5 feet below top of PVC following well development on 6/24/10.
Groundwater measured at 48.6 feet below top of PVC on 6/24/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

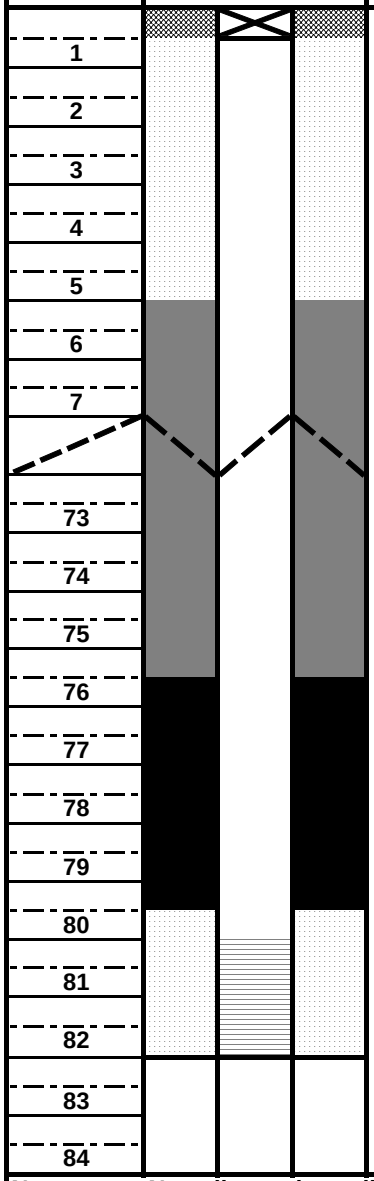
AKRF Project Number : 03399

Well No. AS-8H

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	Warren George
Weather:	Overcast, 55˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 1415	**Time: 0900**
Date: 3/23/10	**Date: 3/25/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-80.0 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-75.5 feet below grade)**
7		
73		
74		
75		
76		
77		**Bentonite (75.5-79.5 feet below grade)**
78		**No.1 sand filter pack (79.5-82.0 feet below grade)**
79		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (80.0-82.0 feet below grade)**
80		
81		
82		
83		
84		

Notes:

No soil samples collected during well installation
Total well depth measured at 82.0 feet below top of PVC following well installation on 3/25/10.
Total well depth measured at 81.9 feet below top of PVC following well development on 6/24/20.
Groundwater measured at 48.7 feet below top of PVC on 6/24/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

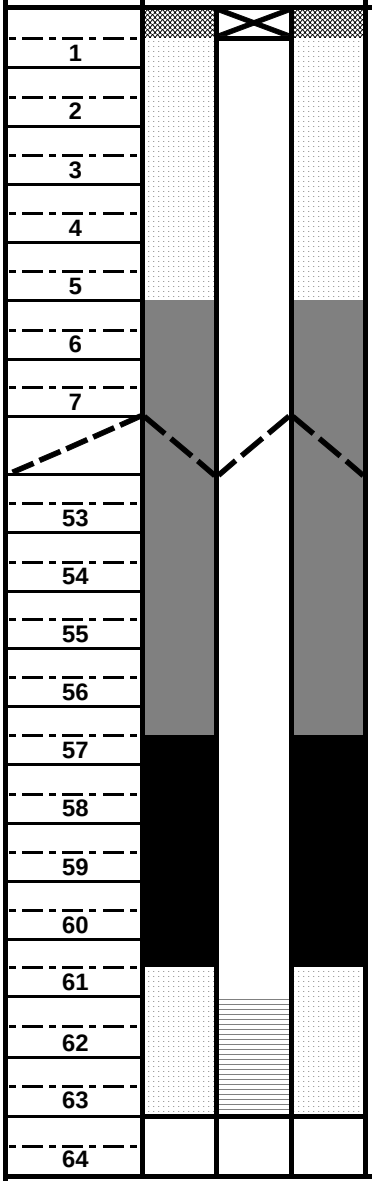
AKRF Project Number : 03399

Well No. AS-9A

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	Warren George
Weather:	Overcast, 60˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 1250	**Time: 1330**
Date: 4/13/10	**Date: 4/14/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-60.8 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-56.3 feet below grade)**
7		
53		
54		
55		
56		
57		
58		**Bentonite (56.3-60.3 feet below grade)**
59		
60		
61		**No.1 sand filter pack (60.3-60.8 feet below grade)**
62		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (60.8-62.8 feet below grade)**
63		
64		

Notes: **No soil samples collected during well installation**
Total well depth measured at 62.8 feet below top of PVC following well installation on 4/14/10.
Total well depth measured at 61.3 feet below top of PVC following well development on 6/24/10.
Groundwater measured at 48.9 feet below top of PVC on 6/24/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

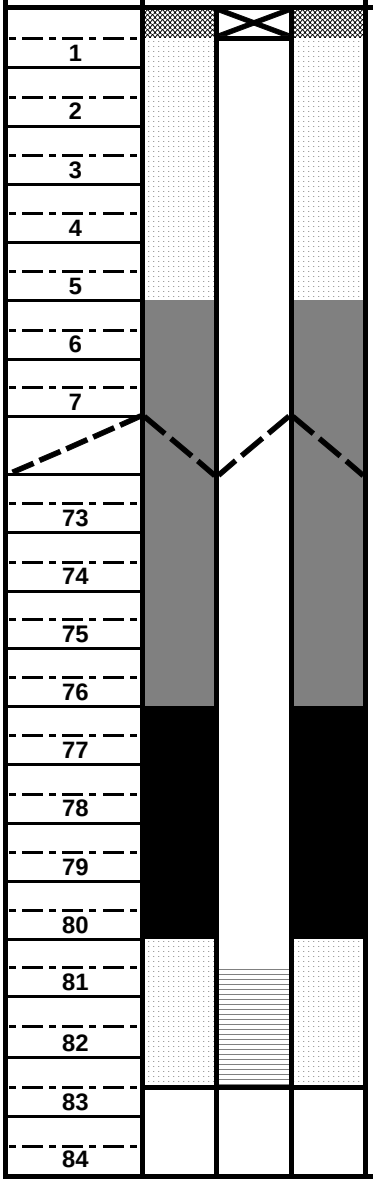
AKRF Project Number : 03399

Well No. AS-9B

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	Warren George
Weather:	Overcast, 60˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 1420	**Time: 1530**
Date: 4/6/10	**Date: 4/9/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-80.4 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-75.5 feet below grade)**
7		
73		
74		
75		
76		
77		
78		**Bentonite (75.5-79.5 feet below grade)**
79		
80		
81		**No.1 sand filter pack (79.5-82.4 feet below grade)**
82		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (80.4-82.4 feet below grade)**
83		
84		

Notes:

No soil samples collected during well installation
Total well depth measured at 82.4 feet below top of PVC following well installation on 4/20/10.
Total well depth measured at 80.2 feet below top of PVC following well development on 6/24/10.
Groundwater measured at 48.8 feet below top of PVC on 6/24/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

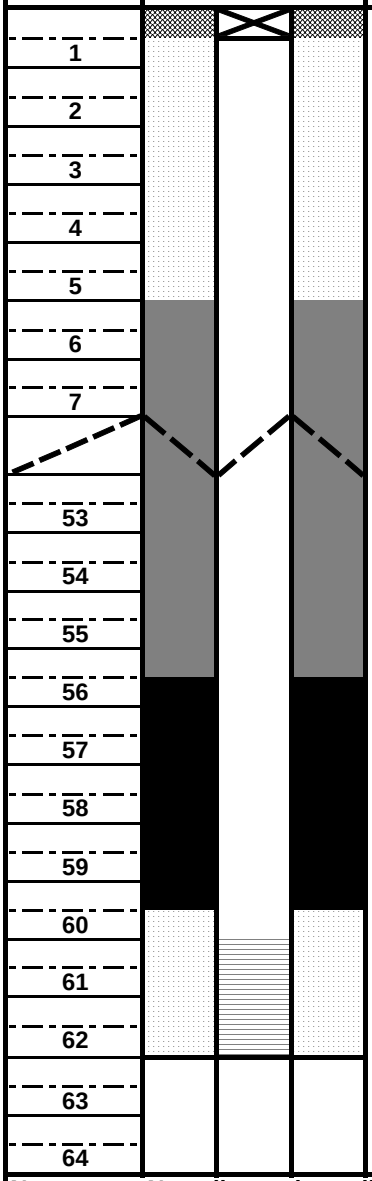
AKRF Project Number : 03399

Well No. AS-9C

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	Warren George
Weather:	Clear, 55˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 0827	**Time: 1515**
Date: 4/20/10	**Date: 4/20/10**

Depth (feet)	Well Construction	Construction Description
1		Flush-mounted steel roadbox set within concrete pad.
2		2" diameter Sch. 40 PVC riser (0.0-60.0 feet below grade)
3		No.1 sand filter pack (0.5-5.0 feet below grade)
4		
5		
6		Portland cement/Bentonite grout (5.0-55.5 feet below grade)
7		
53		
54		
55		
56		
57		Bentonite (55.5-59.5 feet below grade)
58		
59		
60		No.1 sand filter pack (59.5-62.0 feet below grade)
61		
62		2" x 2' Sch. 40 PVC 0.020-inch slotted screen (60.0-62.0 feet below grade)
63		
64		

Notes:

No soil samples collected during well installation

Total well depth measured at 62.8 feet below top of PVC following well installation on 4/14/10.

Total well depth measured at 61.3 feet below top of PVC following well development on 6/24/10.

Groundwater measured at 48.9 feet below top of PVC on 6/24/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

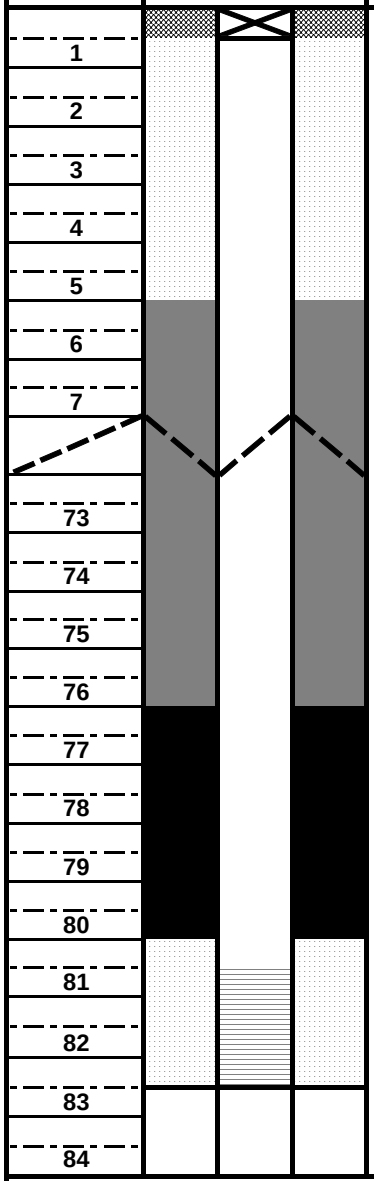
AKRF Project Number : 03399

Well No. AS-9D

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	Warren George
Weather:	Clear, 65˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 1500	**Time: 0930**
Date: 4/12/10	**Date: 4/13/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-80.1 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-75.6 feet below grade)**
7		
73		
74		
75		
76		
77		
78		**Bentonite (75.6-79.6 feet below grade)**
79		
80		
81		**No.1 sand filter pack (79.6-82.1 feet below grade)**
82		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (80.1-82.1 feet below grade)**
83		
84		

Notes:

No soil samples collected during well installation
Total well depth measured at 82.1 feet below top of PVC following well installation on 4/13/20.
Total well depth measured at 82.1 feet below top of PVC following well Development on 5/21/10.
Total well depth measured at 82.0 feet below top of PVC following well development on 6/24/10.
Groundwater measured at 48.7 feet below top of PVC on 6/24/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

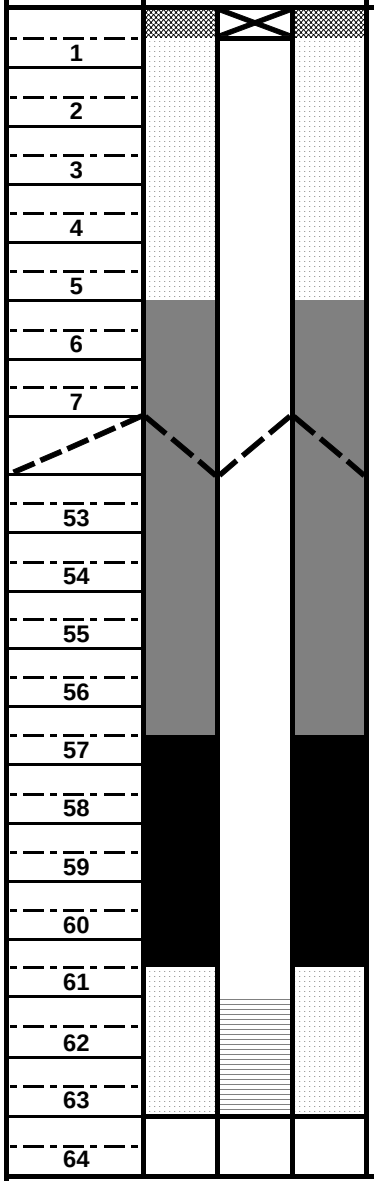
AKRF Project Number : 03399

Well No. AS-9E

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	Warren George
Weather:	Rain, 58˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 0850	**Time: 1350**
Date: 4/9/10	**Date: 4/9/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-60.6 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-56.1 feet below grade)**
7		
53		
54		
55		
56		
57		
58		**Bentonite (56.1-60.1 feet below grade)**
59		
60		
61		**No.1 sand filter pack (60.1-62.6 feet below grade)**
62		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (60.6-62.6 feet below grade)**
63		
64		

Notes:

No soil samples collected during well installation
Total well depth measured at 61.8 feet below top of PVC following well installation on 4/9/10.
Total well depth measured at 62.6 feet below top of PVC following well development on 5/21/10.
Total well depth measured at 62.2 feet below top of PVC following well development on 6/24/10.
Groundwater measured at 48.7 feet below top of PVC on 6/24/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

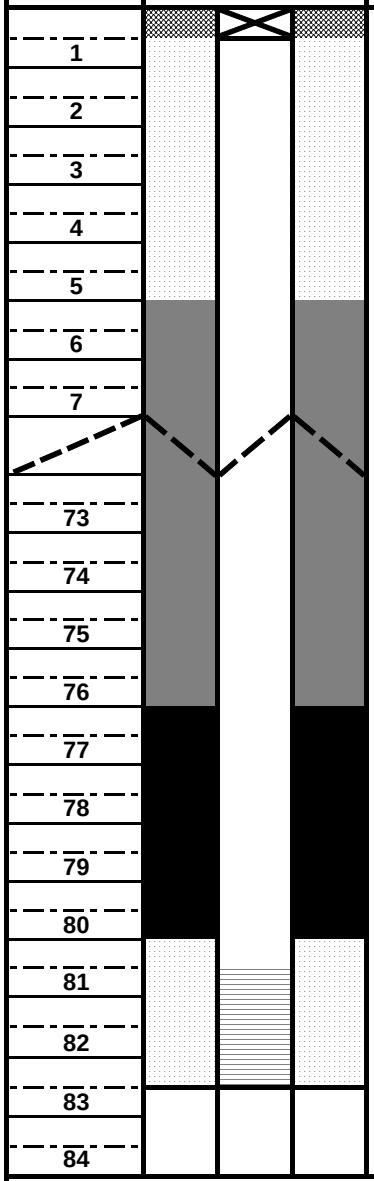
AKRF Project Number : 03399

Well No. AS-9F

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	Warren George
Weather:	Clear, 55˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 1320	**Time: 1450**
Date: 4/1/10	**Date: 4/5/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-80.2 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-75.7 feet below grade)**
7		
73		
74		
75		
76		
77		**Bentonite (75.7-79.7 feet below grade)**
78		
79		
80		**No.1 sand filter pack (79.7-82.2 feet below grade)**
81		
82		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (80.2-82.2 feet below grade)**
83		
84		

Notes:

No soil samples collected during well installation
Total well depth measured at 82.1 feet below top of PVC following well installation on 4/13/20.
Total well depth measured at 82.1 feet below top of PVC following well Development on 5/21/10.
Total well depth measured at 81.4 feet below top of PVC following well development on 6/24/10.
Groundwater measured at 49.1 feet below top of PVC on 6/24/10.

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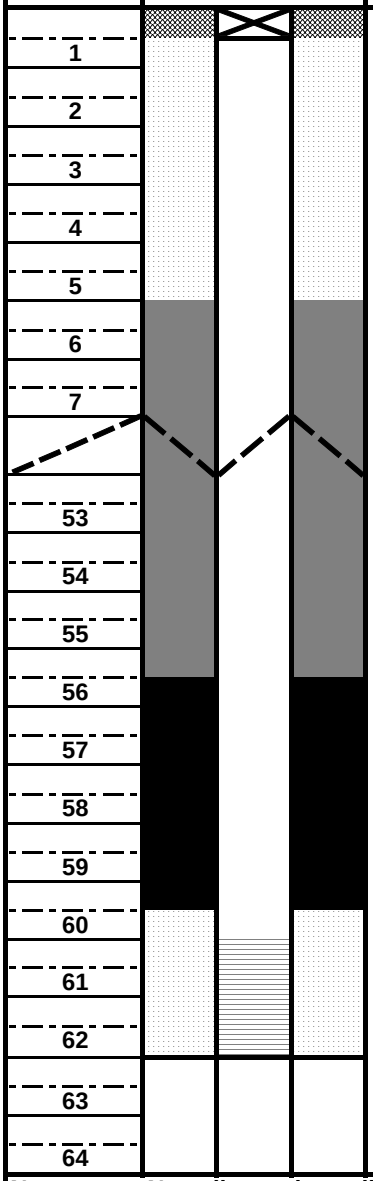
AKRF Project Number : 03399

Well No. AS-9G

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	Warren George
Weather:	Rain, 46˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 1130	**Time: 0740**
Date: 3/30/10	**Date: 4/1/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-59.7 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-55.2 feet below grade)**
7		
53		
54		
55		
56		**Bentonite (55.2-59.2 feet below grade)**
57		
58		
59		
60		**No.1 sand filter pack (59.2-61.7 feet below grade)**
61		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (59.7-61.7 feet below grade)**
62		
63		
64		

Notes:

No soil samples collected during well installation
Total well depth measured at 61.5 feet below top of PVC following well installation 0n 4/1/10.
Total well depth measured at 61.7 feet below top of PVC following well installation on 5/21/10.
Total well depth measured at 61.5 feet below top of PVC following well development on 6/24/10.
Groundwater measured at 48.8 feet below top of PVC on 6/24/10.

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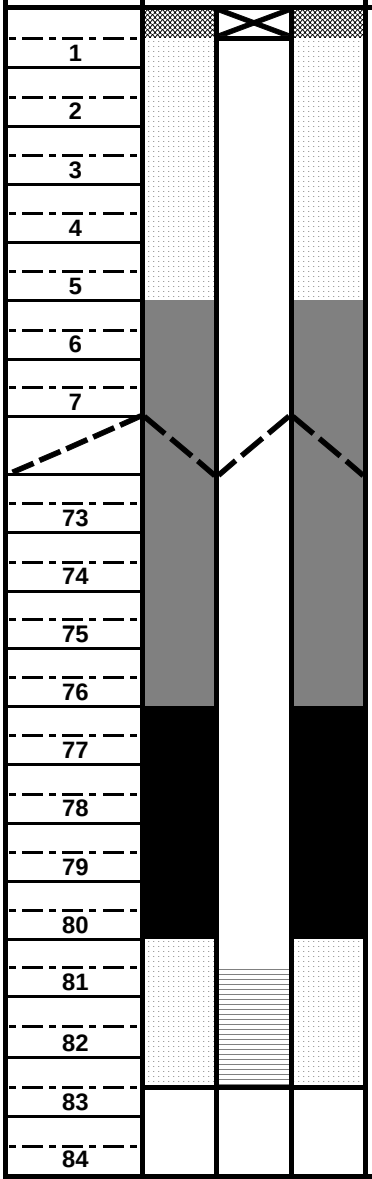
AKRF Project Number : 03399

Well No. AS-9H

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	Warren George
Weather:	Clear, 83˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 1035	**Time: 1120**
Date: 4/7/10	**Date: 4/8/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-79.2 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-74.7 feet below grade)**
7		
73		
74		
75		
76		
77		**Bentonite (74.7-78.7 feet below grade)**
78		
79		
80		**No.1 sand filter pack (78.7-81.6 feet below grade)**
81		
82		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (79.2-81.6 feet below grade)**
83		
84		

Notes:

No soil samples collected during well installation
Total well depth measured at 81.6 feet below top of PVC following well installation on 4/8/20.
Total well depth measured at 81.6 feet below top of PVC following well Development on 5/21/10.
Total well depth measured at 81.3 feet below top of PVC following well development on 6/24/10.
Groundwater measured at 48.7 feet below top of PVC on 6/24/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

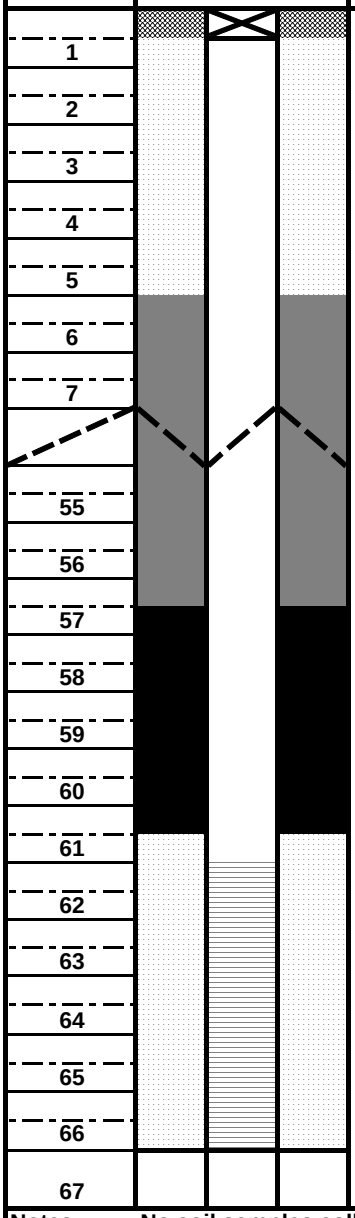
AKRF Project Number : 03399

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	ADT
Weather:	Clear, 60˚F
Logged by:	SG -AKRF

Well No. AS-10A

Sheet 1 of 1

Drilling	
Start	**Finish**
Time: 0105	**Time: 2430**
Date: 9/7/10	**Date: 9/10/10**



Construction Description

Flush-mounted steel roadbox set within concrete pad.

2" diameter Sch. 40 PVC riser (0.0-60.7 feet below grade)

No.1 sand filter pack (0.5-5.0 feet below grade)

Portland cement/Bentonite grout (5.0-56.2 feet below grade)

Bentonite (56.2-60.2 feet below grade)

No.1 sand filter pack (60.2-65.7 feet below grade)

2" x 2' Sch. 40 PVC 0.020-inch slotted screen (60.7-65.7 feet below grade)

Notes:

No soil samples collected during well installation

Total well depth measured at 65.6 feet below top of PVC following well installation on 9/10/10.

Total well depth measured at 65.7 feet below top of PVC following well development on 9/23/10.

Groundwater measured at 49.2 feet below top of PVC on 9/23/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

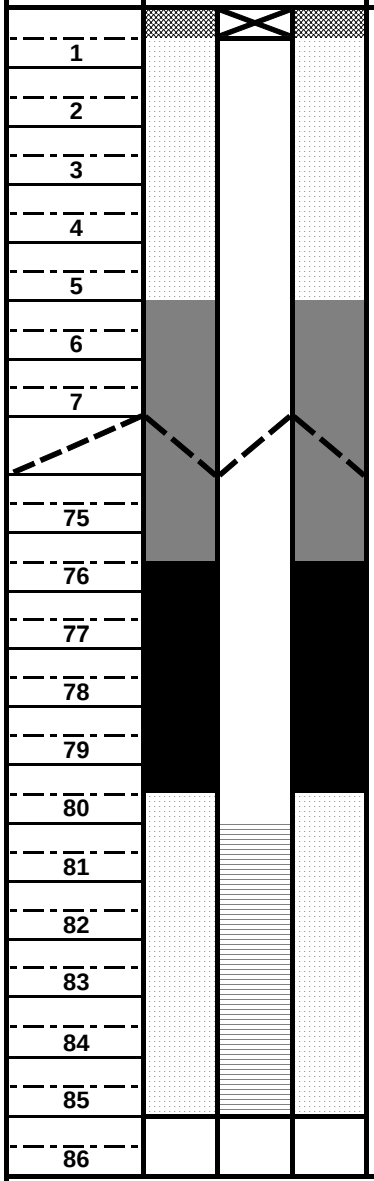
AKRF Project Number : 03399

Well No. AS-10B

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	ADT
Weather:	Rain, 60˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 2410	**Time: 0148**
Date: 10/11/10	**Date: 10/13/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-80.0 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-75.5 feet below grade)**
7		
75		
76		**Bentonite (75.5-79.5 feet below grade)**
77		
78		
79		
80		**No.1 sand filter pack (79.5-85.0 feet below grade)**
81		
82		
83		
84		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (80.0-85.0 feet below grade)**
85		
86		

Notes:

No soil samples collected during well installation
Total well depth measured at 83.4 feet below top of PVC following well installation on 10/13/10.
Groundwater measured at 49.8 feet below top of PVC following well development on 10/13/10.
AS-10B was originally installed on 9/17/10, but was replaced on 10/13/10 due to the integrity of the well screen.

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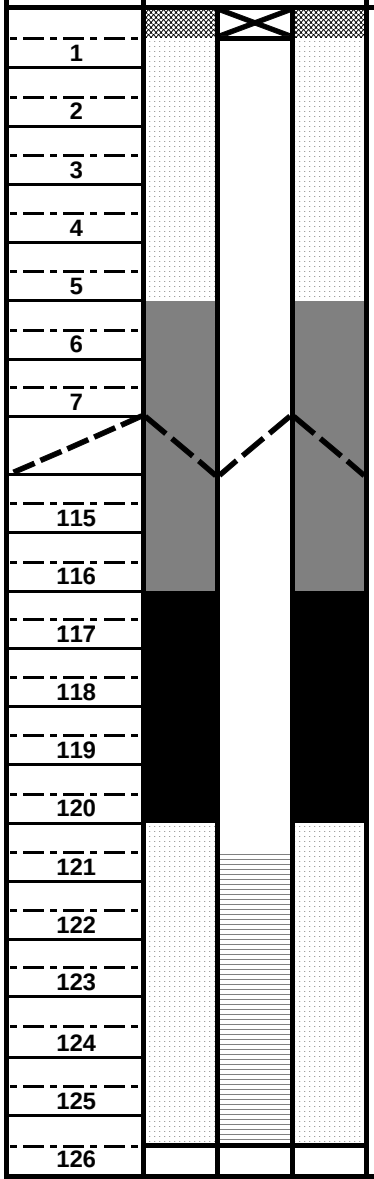
AKRF Project Number : 03399

Well No. AS-10C

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	ADT
Weather:	Clear, 50˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 0013	**Time: 0245**
Date: 10/1/10	**Date: 10/7/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-120.3 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-115.8 feet below grade)**
7		
115		
116		
117		**Bentonite (115.8-119.8 feet below grade)**
118		
119		
120		**No.1 sand filter pack (119.8-125.3 feet below grade)**
121		
122		
123		
124		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (120.3-125.3 feet below grade)**
125		
126		

Notes:

No soil samples collected during well installation
Total well depth measured at 125.3 feet below top of PVC following well installation on 10/7/10.
AS-10C was originally installed on 9/16/10, but was replaced on 10/7/10 due to the integrity of the well screen.

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440 Park Avenue South, 7th Fl. New York, NY 10016

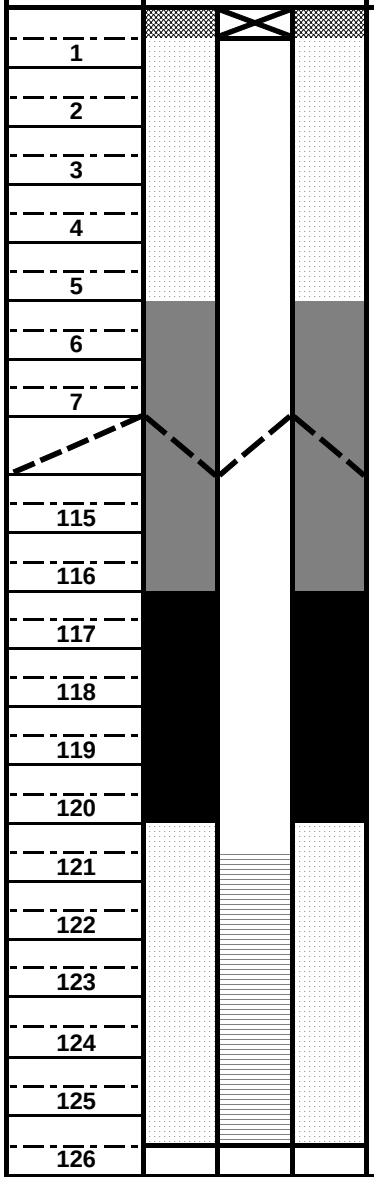
AKRF Project Number : 03399

Well No. AS-10D

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	ADT
Weather:	Clear, 70˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 2409	**Time: 2230**
Date: 9/20/10	**Date: 9/21/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-120.4 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-115.9 feet below grade)**
7		
115		
116		
117		**Bentonite (115.9-119.9 feet below grade)**
118		
119		
120		**No.1 sand filter pack (119.9-125.4 feet below grade)**
121		
122		
123		
124		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (120.4-125.4 feet below grade)**
125		
126		

Notes:

No soil samples collected during well installation
Total well depth measured at 124.6 feet below top of PVC following well installation on 9/21/10.
Total well depth measured at 125.4 feet below top of PVC following well development on 9/23/10.
Groundwater measured at 49.5 feet below top of PVC on 9/23/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

AKRF Project Number : 03399

Well No. AS-10E

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	ADT
Weather:	Clear, 70˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 2430	**Time: 0230**
Date: 9/21/10	**Date: 9/22/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-79.5 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-75.5 feet below grade)**
7		
75		
76		
77		**Bentonite (75.0-79.0 feet below grade)**
78		
79		
80		**No.1 sand filter pack (79.0-85.0 feet below grade)**
81		
82		
83		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (79.5-84.5 feet below grade)**
84		
85		
86		

Notes:

No soil samples collected during well installation
Total well depth measured at 84.5 feet below top of PVC following well installation on 9/22/10.
Total well depth measured at 84.5 feet below top of PVC following well development on 9/24/10.
Groundwater measured at 49.6 feet below top of PVC on 9/24/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

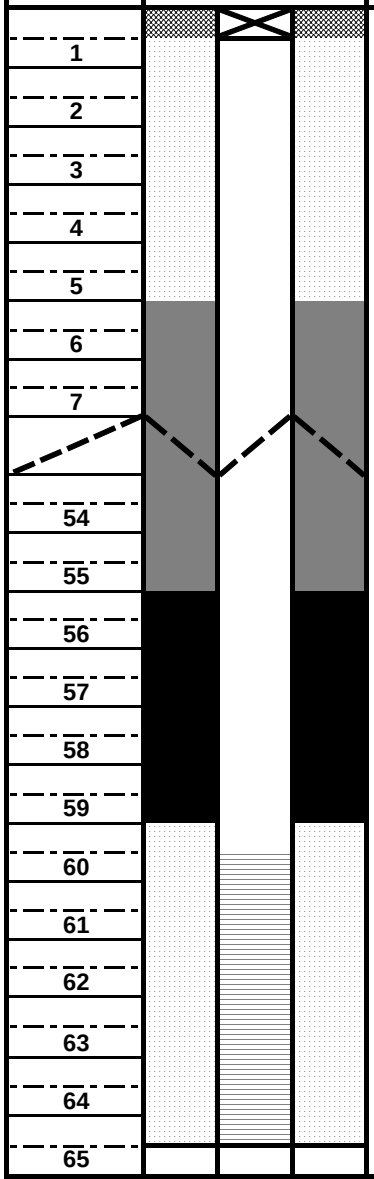
AKRF Project Number : 03399

Well No. AS-10F

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	ADT
Weather:	Clear, 70˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 0352	**Time: 2320**
Date: 9/21/10	**Date: 9/22/10**

Depth (feet)	Well Construction	Construction Description
1		**Flush-mounted steel roadbox set within concrete pad.**
2		**2" diameter Sch. 40 PVC riser (0.0-59.1 feet below grade)**
3		**No.1 sand filter pack (0.5-5.0 feet below grade)**
4		
5		
6		**Portland cement/Bentonite grout (5.0-54.6 feet below grade)**
7		
54		
55		
56		**Bentonite (54.6-58.6 feet below grade)**
57		
58		
59		**No.1 sand filter pack (58.6-64.1 feet below grade)**
60		
61		
62		
63		**2" x 2' Sch. 40 PVC 0.020-inch slotted screen (59.1-64.1 feet below grade)**
64		
65		

Notes: **No soil samples collected during well installation**
Total well depth measured at 59.1 feet below top of PVC following well installation on 9/22/10.
Groundwater measured at 49.6 feet below top of PVC on 9/24/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

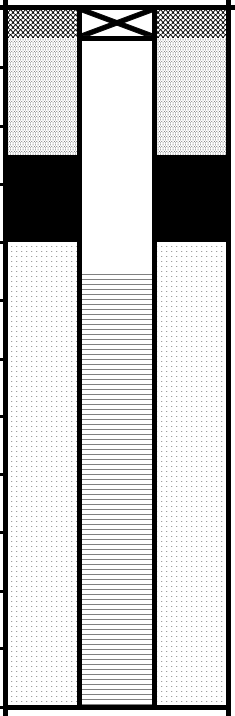
AKRF Project Number : 03399

Well No. SVE-7A

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	ADT
Weather:	Overcast, 65˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 1000	**Time: 1200**
Date: 5/14/10	**Date: 5/14/10**

Depth (feet)	Well Construction	Construction Description
2		**Flush-mounted steel roadbox set within concrete pad.**
4		**4" diameter Sch. 40 PVC riser (0.0-9.1 feet below grade)**
6		**No.1 sand filter pack (0.5-5.0 feet below grade)**
8		**Bentonite (4.6-8.6 feet below grade)**
10		**No.1 sand filter pack (8.6-24.1 feet below grade)**
12		
14		
16		
18		
20		
22		**4" diameter Sch. 40 PVC 0.020-inch slotted screen (9.1-24.1 feet below grade)**
24		
26		
28		
30		
32		
34		
36		
38		
40		

Notes: **No soil samples collected during well installation**
Total well depth measured at 24.1 feet below top of PVC following well installation on 5/14/10.
Groundwater not encountered.

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440 Park Avenue South, 7th Fl. New York, NY 10016

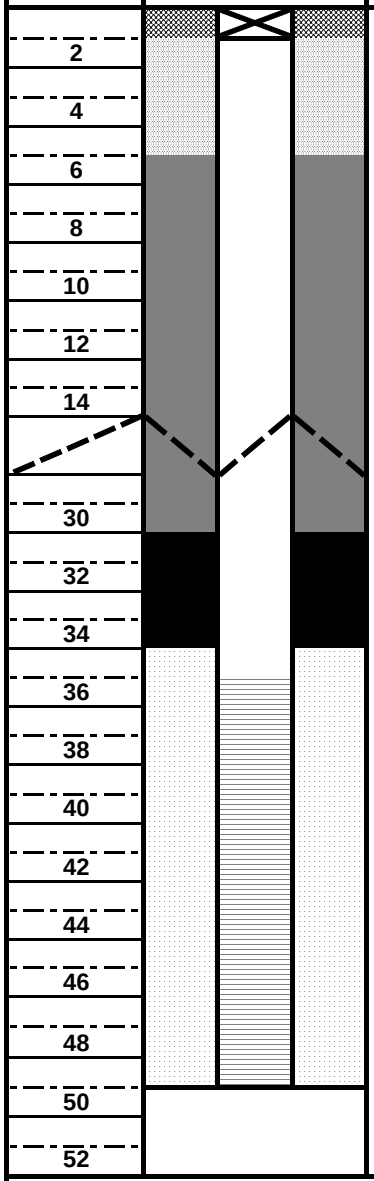
AKRF Project Number : 03399

Well No. SVE-7B

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	ADT
Weather:	Clear, 50˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 1130	**Time: 1600**
Date: 10/19/10	**Date: 10/19/10**

Depth (feet)	Well Construction	Construction Description
2		**Flush-mounted steel roadbox set within concrete pad.**
4		**4" diameter Sch. 40 PVC riser (0.0-34.5 feet below grade)**
6		
8		
10		
12		**Portland cement/Bentonite grout (5.0-30.0 feet below grade)**
14		
30		
32		**Bentonite (30.0-34.0 feet below grade)**
34		
36		**No.1 sand filter pack (34.0-49.5 feet below grade)**
38		
40		
42		
44		
46		**4" diameter Sch. 40 PVC 0.020-inch slotted screen (34.5-49.5 feet below grade)**
48		
50		
52		

Notes:

No soil samples collected during well installation
Total well depth measured at 49.5 feet below top of PVC following well installation on 10/19/10.
Groundwater not encountered.
SVE-7B was originally installed on 5/17/10, but was replaced on 10/19/10 due to the integrity of the well screen.

AKRF, Inc.

Environmental Consultants

440 Park Avenue South, 7th Fl. New York, NY 10016

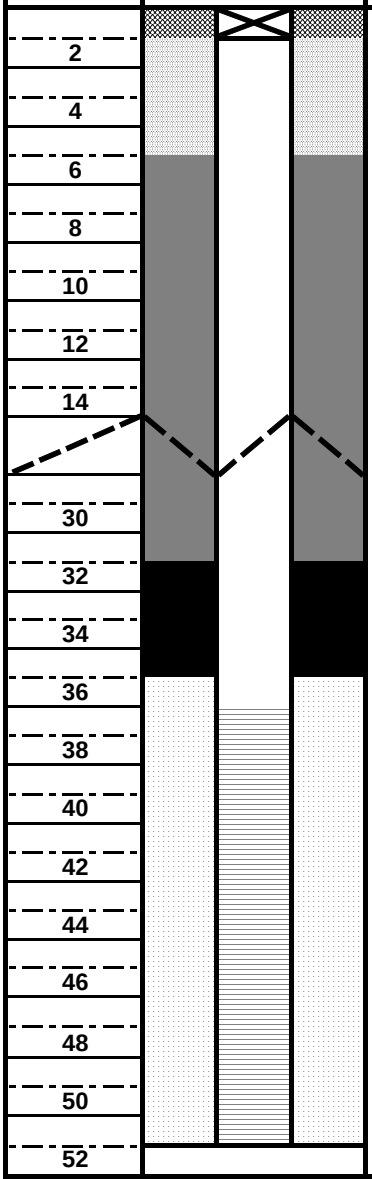
AKRF Project Number : 03399

Well No. SVE-8A

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	Warren George
Weather:	Rain, 48˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 1305	**Time: 1015**
Date: 3/11/10	**Date: 3/12/10**

Depth (feet)	Well Construction	Construction Description
2		**Flush-mounted steel roadbox set within concrete pad.**
4		**4" diameter Sch. 40 PVC riser (0.0-35.0 feet below grade)**
6		
8		
10		
12		**Portland cement/Bentonite grout (5.0-30.5 feet below grade)**
14		
30		
32		
34		**Bentonite (30.5-34.5 feet below grade)**
36		**No.1 sand filter pack (34.5-50.0 feet below grade)**
38		
40		
42		
44		**4" diameter Sch. 40 PVC 0.020-inch slotted screen (35.0-50.0 feet below grade)**
46		
48		
50		
52		

Notes:

No soil samples collected during well installation

Total well depth measured at 48.4 feet below top of PVC following well installation on 3/12/10.

Total well depth measured at 50.0 feet below top of PVC following well development on 7/8/10.

Groundwater measured at 46.1 feet below top of PVC on 7/8/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

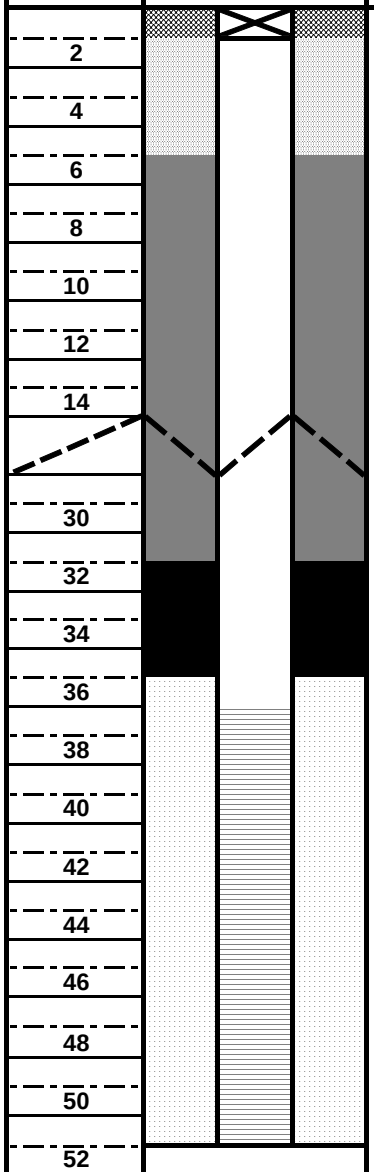
AKRF Project Number : 03399

Well No. SVE-8B

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	Warren George
Weather:	Overcast, 50˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 0900	**Time: 1052**
Date: 3/22/10	**Date: 3/23/10**

Depth (feet)	Well Construction	Construction Description
2		**Flush-mounted steel roadbox set within concrete pad.**
4		**4" diameter Sch. 40 PVC riser (0.0-35.5 feet below grade)**
6		
8		
10		
12		**Portland cement/Bentonite grout (5.0-31.5 feet below grade)**
14		
30		
32		**Bentonite (31.5-35.0 feet below grade)**
34		
36		**No.1 sand filter pack (35.0-50.5 feet below grade)**
38		
40		
42		
44		**4" diameter Sch. 40 PVC 0.020-inch slotted screen (35.5-50.5 feet below grade)**
46		
48		
50		
52		

Notes: **No soil samples collected during well installation**
Total well depth measured at 50.5 feet below top of PVC following well installation on 3/23/10.
Groundwater measured at 48.9 feet below top of PVC on 6/24/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

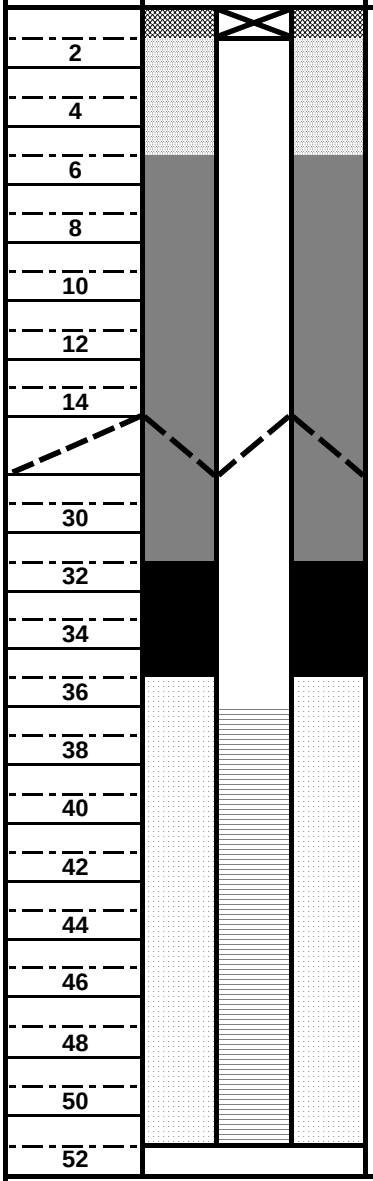
AKRF Project Number : 03399

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	ADT
Weather:	Clear, 25˚F
Logged by:	SG -AKRF

Well No. SVE-9A

Sheet 1 of 1

Drilling	
Start	Finish
Time: 0900	Time: 1200
Date: 12/22/09	Date: 12/23/09



Depth (feet)	Well Construction	Construction Description
		Flush-mounted steel roadbox set within concrete pad.
		4" diameter Sch. 40 PVC riser (0.0-35.9 feet below grade)
		Portland cement/Bentonite grout (5.0-31.4 feet below grade)
		Bentonite (31.4-35.4 feet below grade)
		No.1 sand filter pack (35.4-50.9 feet below grade)
		4" diameter Sch. 40 PVC 0.020-inch slotted screen (35.9-50.9 feet below grade)

Notes:

No soil samples collected during well installation

Total well depth measured at 50.9 feet below top of PVC following well installation on 12/23/09.

Groundwater measured at 48.8 feet below top of PVC on 6/24/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

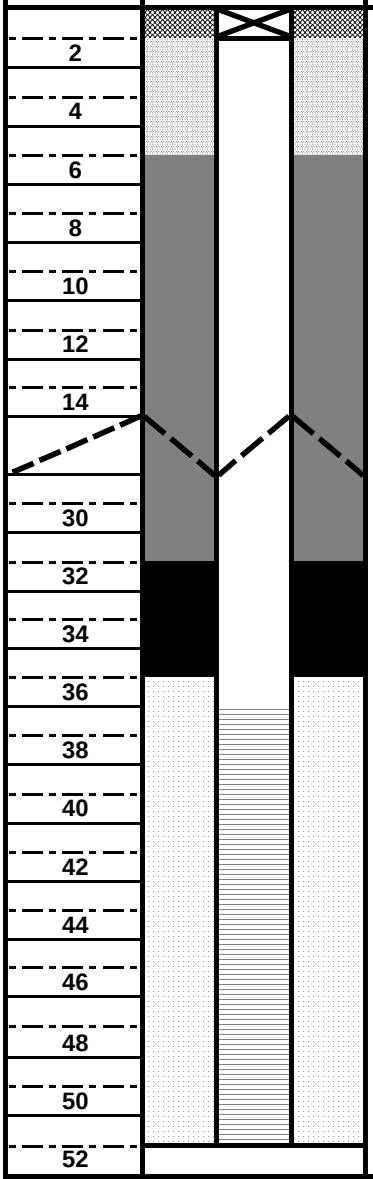
AKRF Project Number : 03399

Well No. SVE-9B

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	Warren George
Weather:	Clear, 60˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 1250	**Time: 1530**
Date: 4/5/10	**Date: 4/6/10**

Depth (feet)	Well Construction	Construction Description
2		**Flush-mounted steel roadbox set within concrete pad.** **4" diameter Sch. 40 PVC riser (0.0-35.8 feet below grade)**
4		
6		
8		
10		
12		**Portland cement/Bentonite grout (5.0-31.3 feet below grade)**
14		
30		
32		**Bentonite (31.3-35.3 feet below grade)**
34		
36		**No.1 sand filter pack (35.3-50.8 feet below grade)**
38		
40		
42		
44		**4" diameter Sch. 40 PVC 0.020-inch slotted screen (35.8-50.8 feet below grade)**
46		
48		
50		
52		

Notes: **No soil samples collected during well installation**
Total well depth measured at 50.8 feet below top of PVC following well installation on 4/6/10.
Groundwater measured at 48.0 feet below top of PVC on 6/24/10.

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440 Park Avenue South, 7th Fl. New York, NY 10016

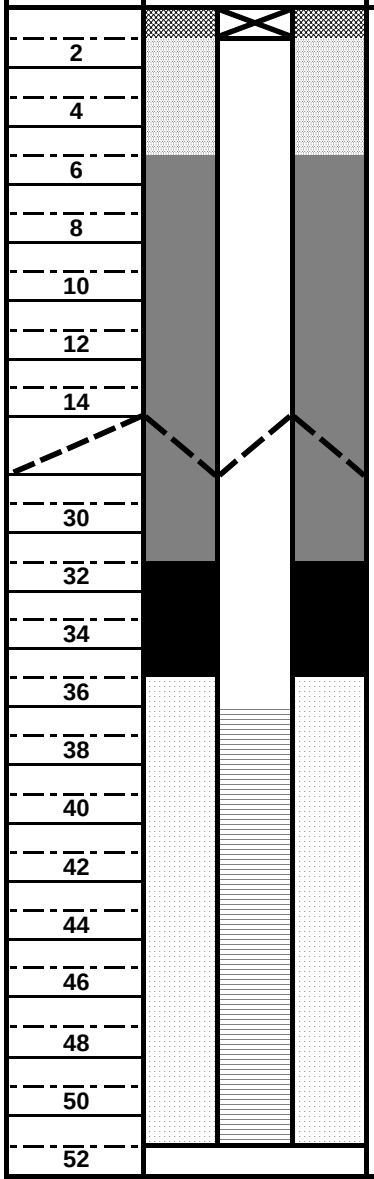
AKRF Project Number : 03399

Well No. SVE-10A

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	Warren George
Weather:	Clear, 70˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 0145	**Time: 0440**
Date: 4/5/10	**Date: 4/6/10**

Depth (feet)	Well Construction	Construction Description
2		**Flush-mounted steel roadbox set within concrete pad.**
4		**4" diameter Sch. 40 PVC riser (0.0-35.1 feet below grade)**
6		
8		
10		
12		**Portland cement/Bentonite grout (5.0-30.6 feet below grade)**
14		
30		
32		**Bentonite (30.6-34.6 feet below grade)**
34		
36		**No.1 sand filter pack (34.6-50.1 feet below grade)**
38		
40		
42		
44		**4" diameter Sch. 40 PVC 0.020-inch slotted screen (35.1-50.1 feet below grade)**
46		
48		
50		
52		

Notes: **No soil samples collected during well installation**
Total well depth measured at 50.1 feet below top of PVC following well installation on 9/24/10.

AKRF, Inc.

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440 Park Avenue South, 7th Fl. New York, NY 10016

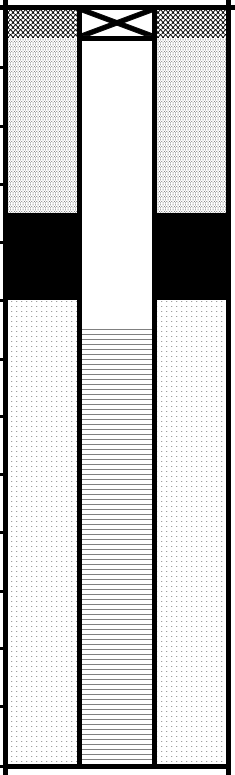
AKRF Project Number : 03399

Well No. SVE-10B

Sheet 1 of 1

Drilling Method:	Sonic
Sampling Method:	NA
Driller :	ADT
Weather:	Rain, 55˚F
Logged by:	SG -AKRF

Drilling	
Start	**Finish**
Time: 0340	**Time: 0200**
Date: 10/7/10	**Date: 10/8/10**

Depth (feet)	Well Construction	Construction Description
2		**Flush-mounted steel roadbox set within concrete pad.**
4		**4" diameter Sch. 40 PVC riser (0.0-10.9 feet below grade)**
6		**No.1 sand filter pack (0.5-5.0 feet below grade)**
8		
10		**Bentonite (5.0-10.4 feet below grade)**
12		**No.1 sand filter pack (10.4-25.9 feet below grade)**
14		
16		
18		
20		
22		**4" diameter Sch. 40 PVC 0.020-inch slotted screen (10.9-25.9 feet below grade)**
24		
26		
28		
30		
32		
34		
36		
38		
40		

Notes:

No soil samples collected during well installation
Total well depth measured at 25.9 feet below top of PVC following well installation on 10/8/10.
Groundwater not encountered.