90-30 Metropolitan Avenue Site

Voluntary Cleanup Program Code V00253-2

Rego Park, Queens, New York

REMEDIAL INVESTIGATION REPORT

Prepared for:

Titan Management
53 Forest Avenue
Old Greenwich, Connecticut 06870

Prepared by:

AKRF, Inc.
116 East 27th Street, 7th Floor
New York, NY 10016
(646) 459-3500

April 2004

TABLE OF CONTENTS

FIGURES

APPENDICES

1.0 INTRODUCTION

AKRF, Inc. (AKRF) was contracted by Titan Management, Inc., to perform a Remedial Investigation at the property located at 90-30 Metropolitan Avenue in Rego Park, Queens County, New York. As shown on Figure 1, the property is located on the south side of Metropolitan Avenue between Woodhaven Boulevard, 73rd Avenue, and Trotting Course Lane. The site investigation was designed to further supplement the numerous soil and groundwater studies have been performed on and around the site since contamination of groundwater with tetrachloroethene (PCE) was first discovered in the area in 1992. Since then, Titan Management has entered into a Voluntary Agreement for investigation with the New York State Department of Environmental Conservation (NYSDEC). The goals of the Remedial Investigation were:

- To further define the nature and extent of the contamination on the site, and, to a limited degree, off-site;
- To identify any contaminant source areas on the site;
- To produce data to support the development of a Remedial Action Work Plan in the event that a source area is found to be located on the site.

The PCE contaminant plume has affected several properties in the area extending from Woodhaven Boulevard just south of the intersection of Metropolitan Avenue southeastward to the abandoned railroad embankment near the intersection of 73rd Avenue and Trotting Course Lane). Prior studies have done a relatively thorough job of delineating the groundwater contamination, defining the hydrogeological setting, and eliminating potential source areas by soil and soil gas testing. However, despite the numerous investigations, the source of this contamination had never been definitively identified. PCE has never been detected in soil or soil gas samples at levels that could not be attributed to a condition resulting from other than the known groundwater contamination.

This investigation was aimed at addressing some of the areas not targeted in past studies, with the objective of either establishing that there is no on-site source area, or, if an on-site source area can be located, of producing the data to support the development of a Remedial Action Work Plan. Some of the shortcomings of past investigations were:

- No permanent wells were ever been installed within the 90-30 Metropolitan Avenue building. All groundwater sampling within the building footprint had been by Hydropunch probes. While this is an acceptable method of collecting groundwater samples, the results may not be completely compatible with sampling performed on permanent wells. Thus the plume delineation in this critical area may have been distorted. Furthermore, probe sampling points cannot be used to make accurate measurements of groundwater elevations, so there are gaps in the measurement of the groundwater surface elevation.
- Former wells located on the south side of 73rd Avenue (currently the Sports Authority parking lot) were destroyed. Therefore the IT study contains only limited data on the downgradient end of the plume.
- The IT groundwater study did not use the monitoring wells on the north side of the building. These wells would be expected to detect any influence of groundwater pumping at the car wash to the east of the site, across Trotting Course Lane.
- Prior studies used bailers to collect groundwater samples. This technique can introduce a large degree of variability into measurements of concentrations of volatile organic compounds in groundwater.

- Earlier soil gas measurements were grab samples collected at one time without leaving sampling points in the ground for later monitoring. Since soil gas levels can vary based on meteorological conditions and other variables, it is advantageous to be able to monitor soil gas levels over time.

This report presents the results of the soil and groundwater studies comprising the Remedial Investigation. At a meeting on the site on November 7, 2002, the scope of the groundwater study was agreed upon, the well locations were marked out on the ground, and DEC agreed that Titan could proceed with the groundwater portion of the investigation pending agreement on the entire work plan. The scope of the groundwater investigation included the following:

- Installation of shallow and deep monitoring wells within the building to permit more accurate measurements of groundwater elevations and PCE concentrations, and to provide better delineation of the portion of the plume beneath the building.
- Installation of shallow and deep monitoring wells in the parking lot on the south side of 73rd Avenue to provide better delineation of the downgradient portion of the plume.
- Measurement of groundwater surface elevations in new and existing wells, including the wells on the north side of the building, to define groundwater flow conditions, including the effects of any nearby pumping, and provide data required for any future modeling or design.
- Sampling of groundwater using "low flow" sampling methodology to provide more consistent data on PCE concentrations in the groundwater. Combined with the installation of new wells and a more comprehensive hydrogeological evaluation, this would permit a determination of whether there is a PCE source on the site.

Following completion of the groundwater study, the results were transmitted to DEC in an Interim Remedial Investigation Report dated October 2003. That report also outlined a soil testing program intended to detect potential soil contamination in suspected source areas. The results of that study, along with a proposed conceptual remedial design, were transmitted to DEC in a supplemental letter report in February, 2004. This Remedial Investigation Report combines the results of the soil and groundwater testing previously reported to DEC in the interim report and supplement.

2.0 SITE DESCRIPTION AND HISTORY

2.1 Site Conditions

The site is located in the Rego Park section of Queens. It is bounded by Metropolitan Avenue on the north, Trotting Course Lane on the east, 73rd Avenue on the south, and the Woodhaven Lanes bowling alley on the west (see Figure 2). The site is occupied by a vacant two-story building that is roughly 200 feet long (north-south) and 160 feet wide (east-west). The east side of the building contains several loading docks, and there are paved parking areas on the north and west sides. There are also small landscaped areas (now overgrown) on the north and south sides of the property.

The south and west portions of the ground floor of the building contain offices with carpeted floors and dropped ceilings. There is a mechanical room with heating, ventilation, and air conditioning (HVAC) equipment in the southwest corner of the building. The northeast portion of the building adjacent to the loading docks appears to be a former work or storage area with concrete floors and high ceilings.

A 7,500-gallon underground fuel oil storage tank is registered for the subject property. The tank is located on southeastern edge of the building. An aboveground 550-gallon storage tank located in the loading dock area was reportedly used to store waste kerosene or mineral spirits.

To the west of the site is the Woodhaven Lanes bowling alley and farther west, across Woodhaven Boulevard, is a residential area. To the north of the site, the area around Metropolitan Avenue is retail and commercial, with several auto-related businesses, including a gas station located just north of the bowling alley at the southeast corner of Metropolitan Avenue and Woodhaven Boulevard. East of the site is a car wash on the east side of Trotting Course Lane that is reported to have a water supply well. To the east of the car wash is a former railroad embankment, now vacant and overgrown. South of the site is a building housing a Sports Authority store and an associated parking lot.

2.2 Geology and Subsurface Conditions

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 subject 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 subject 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 subject site and the surface of the Gardiners Clay is approximately 150 feet below the ground surface. More recent deposits at the subject site consist primarily 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 subject site form a part of the "Upper Glacial Aquifer."

Soil borings have been performed at and around the subject site as part of several previous investigations for the subject property (discussed further in Section 3.0). Most recently, IT Engineering of New York performed a site assessment of the southeastern corner of Woodhaven Boulevard and Metropolitan Avenue, dated February 2002. The boring logs from previous investigations indicate that medium to fine-grained sand and silt, with some gravel and trace clays, underlie the subject site to a depth of at least 150 feet below the land surface. In some boring logs, dense black clay of low plasticity was recorded at depths around 150 feet. Boring logs from this investigation concur with the soil descriptions in the report from previous investigations.

Soil development is minimal under the buildings and paved areas of the site. Unpaved areas have a distinct "A" horizon but little further soil development, as indicated in the boring logs described above. No fill material has been identified at the site but fill has been reported for the northern part of the south-adjacent property on the opposite side of Trotting Course Lane.

Groundwater is present approximately 45 feet below land surface, as reported in all reports referencing the site, and generally flows in a southeasterly direction. Various reports have shown that the water table is relatively flat, with calculated (by AKRF) hydraulic gradients of 3.1 feet/mile according to data from Roux's 1997 investigation, and 3.3 feet/mile according to data from Roux's 1995 investigation. The USGS report cited above indicates that predevelopment groundwater flow in the area was likely southward, towards Jamaica Bay. Historic pumping of

groundwater in the Jamaica Water Supply Company area to the southeast of the site has depressed the groundwater surface in that area, resulting in a more southeasterly flow.

IT's 2002 report is the only groundwater report for the site that shows a groundwater flow direction that is not to the southeast. The IT report shows shallow groundwater flow to the southwest on the subject site, but a hydraulic gradient could not be calculated from their data for the subject site due to a lack of data points. The indication of a southwesterly flow is derived from an observation of a depression in the groundwater surface measured in October 2000 at a well on the east side of Woodhaven Boulevard, in front of the Woodhaven Lanes bowling alley building. However, when groundwater elevations were remeasured four months later, in February 2001, the groundwater elevation in this well had risen by over two feet, and the groundwater surface in the area was nearly flat. This suggests that the southwesterly flow component reported by IT is an artifact resulting from an anomalous groundwater level reading in this well.

2.3 Site History

Up to 1950, the subject site was occupied by a farmhouse, greenhouse, barns, and other buildings associated with the residential estates and farming activities of the Vandeveer family, but was mostly open and unpaved. In the 1930s, a paved road, "90th Place" ran north-south between the subject site and the site currently occupied by the bowling alley to the west.

The building currently located on the subject site was constructed in 1951 and from that time to 1976 was operated as a pharmaceutical distribution warehouse by Foremost-McKesson, Inc.

From 1977 to 1988 the property was owned by Heidelberg Eastern, Inc., maunufacturers and distributors of printing presses and parts. The primary function of the building appears to have been for administration, equipment repair, and warehousing rather than actual manufacturing. According to the 1997 Roux report, Heidelberg employees at the facility stated that kerosene was the only solvent used at the facility. Kerosene was used in an area known as the "cleaning booth" located in the northeastern portion of the building.

In 1988 the New York City Industrial Development Agency took title to the property, but Heidelberg continued to operate at the site. In 1993, Heidelberg Eastern became EAC USA. The building has been vacant since about that time.

3.0 PRIOR STUDIES

3.1 History of Prior Studies

Prior soil and groundwater studies performed on and around the site are summarized in the Remedial Investigation Work Plan. PCE was first detected in the groundwater beneath the site in a study performed by Environmental Science and Engineering (ES&E) for Heidelberg Eastern in December 1992. ES&E installed three monitoring wells on the site. PCE was detected in the groundwater samples from all three wells, but no PCE was detected in samples of soil from above the groundwater surface.

Efforts at delineating the groundwater contamination and locating a source area continued in 1995. Soil Mechanics installed four wells in March 1995, five wells in May 1995, and four wells in September 1995. A soil gas survey was also performed in the landscaped area on the south side of the building. PCE was detected in the groundwater throughout the southern portion of the site, on the west and south sides of the building. However, no source area could be located.

Roux Associates Inc., on behalf of counsel for EAC USA Inc., performed a subsurface investigation in October 1995. Following a meeting with NYSDEC in October 1996,

supplementary studies were performed in November 1996. Again, the aim of these studies was to delineate the groundwater contamination, and to attempt to locate an on-site source area through soil and soil gas testing. Soil gas samples were collected from 114 locations in and around the building, but only trace levels of PCE were detected. The levels found were consistent with diffusion from the groundwater under building. No PCE was detected in soil samples collected from the locations where PCE was detected in soil gas. Roux concluded that the PCE in the groundwater beneath the site was attributable to an off-site source.

EAC USA entered into a Voluntary Cleanup Agreement with NYSDEC that covered both the site and the south-adjacent property at 73-25 Woodhaven Boulevard. As part of this agreement, Roux produced a Voluntary Cleanup Site Assessment Report dated January 1997, and a Supplemental Investigation Report dated June 23, 1997. These reports included a review of all the prior investigations performed on the site, as well as the results of new soil and groundwater studies. Roux concluded that the source of the PCE groundwater contamination was off-site and upgradient, to the northwest of the property. The conclusion was based on the following:

- Groundwater on the site is flowing to the southeast.
- PCE is present in the groundwater at the western, or upgradient, edge of the site.
- A thorough program of soil gas and soil testing in potential on-site source areas failed to find any evidence of PCE above the groundwater surface.

Based on the evidence presented in the Roux reports, NYSDEC issued a letter to EAC USA stating their conclusion that the source of the PCE plume was farther to the northwest. NYSDEC initiated an investigation of the Woodhaven Lanes bowling alley property at 72-25 Woodhaven Boulevard, immediately west of the site. The report of this Immediate Investigation Work Assignment (IIWA) is dated December 1997. Soil/groundwater probes were used to collect samples at 20 locations surrounding, but not within, the bowling alley. No PCE was detected in any soil samples. PCE was detected in groundwater on both the east and west sides of the building. The report concluded that the source of the groundwater contamination was farther upgradient, since PCE was present in groundwater at the upgradient end of the site, and no source area of soil contamination could be detected.

NYSDEC then extended their investigation farther to the northwest, to the area on the west side of Woodhaven Boulevard near the May Dry Cleaners property at 89-46 Metropolitan Avenue. The report of this IIWA was issued in February 1998. No PCE was detected in any soil samples from this investigation, and only trace levels of PCE were present west of Woodhaven Boulevard. NYSDEC eliminated May Dry Cleaners as a potential source.

IT performed a Preliminary Site Assessment for NYSDEC in 2000 and 2001 that covered all the properties at the southeast corner of Woodhaven Boulevard and Metropolitan Avenue. The final report of this assessment was issued in February 2002. This study was intended to further delineate the groundwater contamination plume, investigate the possibility that the contamination originated from the sewer along Woodhaven Boulevard, and to further define groundwater flow in the area. The study included installation and sampling of new groundwater wells, and soil and soil gas sampling at suspected source locations. The report concluded that the sewer in Woodhaven Boulevard was not likely the source of the groundwater contamination, but that the possibility of a past spill in a catch basin in this area could not be eliminated. No source area was definitively located, but the southern part of the 90-30 Metropolitan Avenue building was suspected as a source. This conclusion was based on:

- The high levels of PCE present in groundwater near the southern wall of the building.

- The past use of the building for servicing printing machinery, which could have involved the use of PCE as a degreasing solvent.
- IT's groundwater study, which suggested that the groundwater flow direction may be to the southwest rather than the southeast.

4.0 FIELD ACTIVITIES

4.1 Soil Sampling at well locations

Soil sampling at the monitoring well locations was completed between March 25, 2003 and April 4, 2003 to characterize subsurface soils and collect soil samples for quantitative laboratory analysis. Figure 3 depicts soil sampling locations. Sampling was performed at the monitoring well locations determined jointly by AKRF and the New York State Department of Environmental Conservation (NYSDEC) project manager during a site visit on November 7, 2002.

Soil borings located outside of the on-site building (A-01, A-11 through A-18) were installed using a truck-mounted drill rig equipped with 6.25-inch-outside-diameter hollow stem augers (HSA). When drilling with the HSA rig, soil samples were collected at 5-foot intervals to a minimum of 6 feet below the apparent groundwater table.

Soil borings were advanced inside of the 90-30 Metropolitan Avenue building using a remote-access direct push probe (DPP) rig. When installing soil borings with the DPP rig, continuous samples were collected from ground surface to the groundwater table. The DPP rig encountered difficult drilling conditions around the groundwater table (around 50 feet below ground surface), and samples were collected at approximately 5-foot intervals at these depths.

HSA soil samples were collected using two-foot-long split spoon samplers advanced ahead of the auger. DPP soil samples were collected above the water table using a 4-foot-long, 2-inch-diameter, macrocore piston rod sampler fitted with an acetate liner, and below the water table with a 2-foot-long, 1-inch-diameter macrocore piston rod sampler. Discrete samples were collected only after slough from soils above the sampling interval were no longer encountered in the sampler.

Each sample was split lengthwise and logged by AKRF field personnel. Logging consisted of: describing the soil according to the modified Burmister Classification System; describing any evidence of contamination (e.g., staining, sheens, odors); and screening for organic vapors using a Thermo 580B Organic Vapor Meter (OVM) equipped with a photoionization detector (PID) calibrated with 100 parts per million (ppm) isobutylene, in 1-foot intervals. Each sample was also tested with a hydrophobic dye (Sudan IV) to determine the presence of non-aqueous phase liquids (NAPL) in soils. The visual results of the hydrophobic dye test were described and documented by AKRF personnel. Boring logs are presented in Appendix A.

Two soil samples from each boring, one from the vadose zone and one from below the groundwater table, were selected for laboratory analysis based on PID response and visual indications of contamination. As no visual or olfactory evidence of contamination was encountered in shallow soils, laboratory samples were collected from the shallowest soil interval available. In the absence of contamination, soil samples from the saturated zone were collected immediately below the water table.

Soil samples collected for laboratory analysis were transferred directly from the sampling spoon into appropriately labeled laboratory-supplied sample jars and placed into ice-filled coolers. At the end of each workday, the sample jars were transferred into a refrigerator in a secure AKRF office. At the end of each work week, the sample containers were placed into sealable plastic bags, surrounded by plastic bubble wrap, and transferred into ice-filled coolers. The coolers were sealed for shipment and delivered to the laboratory via courier. All soil samples were analyzed for Target Compound List (TCL) VOCs by EPA Method 8260. All soil samples and waste characterization samples were analyzed at Severn Trent Laboratories in Shelton, Connecticut, a New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP) certified laboratory, certified to perform NYSDEC Analytical Services Protocol (ASP).

4.2 Groundwater Sampling

4.2.1 Well Installation

A total of 18 new monitoring wells were installed during the field work activities conducted on the site. Nine wells were installed within the building footprint and nine wells were installed south and west of the building and in the parking lot and sidewalk on the south side of 73rd Avenue. The new wells are designated A-01 to A-18. Eleven of the wells are shallow wells screened across the groundwater surface, four are intermediate wells screened between 75 and 85 feet below grade, and three are deep wells screened between 100 and 110 feet below grade. The new wells are listed in Table 1.

Table 1
Well Designations and Types

	Shallow Wells	Intermediate Wells	Deep Wells
Inside the building	A-02, A-03, A-04, A-05, A-06, A-09	A-08, A-10	A-07
Outside the building	A-01, A-14, A-15, A-16, A-18	A-12, A-13	A-11, A-17

Locations of the new and existing monitoring wells are shown in Figure 4.

The new monitoring wells were drilled using a hollow-stemmed auger, except for the deep well inside the building (A-07), which was drilled using mud-rotary drilling. The mud-rotary method was used because the limited-access drill rig used to drill the wells within the building did not have sufficient torque to drill deeper than 85 feet. The new wells consist of 2-inch Schedule 40 PVC casing in a 6¼-inch augured hole. A 15-foot PVC screen (0.020-inch slot) was installed in the top 10 feet of groundwater in the shallow wells. A 10-foot screen (0.020-inch slot) was installed in the lower 10 feet of each deep well. A filter pack of sand (US Std. sieve sizes 30 to 8) was placed in the annular space around the screens and was extended 2 feet above the screen in the shallow wells and 2 feet above the groundwater interface in the deep wells.

The annular area around the well casing was sealed with bentonite pellets for an interval of 2 feet above the filter pack. The annular space above the bentonite pellets to 1 foot below grade was backfilled with drilling cuttings. The remaining 1 foot was sealed with a concrete cap and well apron (expanding cement). A locking well cap was installed upon completion of the well. Well construction diagrams are presented in Appendix A.

All existing onsite wells, and wells newly installed within the building, in the parking lot, and other exterior areas of the site were developed using Grundfos and Whale-type submersible pumps. A minimum of three well volumes of water was pumped from each well and turbidity, pH, and conductivity measurements were collected during well development.

4.2.2 Well Sampling

Groundwater samples were collected from all newly installed and onsite existing monitoring wells at least seven days after development. Before sampling, depths to water were measured to determine the static water level for each well. Water level measurements and groundwater elevations are shown in Appendix A. Prior to sample collection, the wells were purged using a QED low-flow sampling pump at rates ranging between 200 and 500 milliliters per minute (ml/min). The extracted water stream was monitored for turbidity and water quality indicators (i.e., pH, temperature, dissolved oxygen, and specific conductivity) with measurements collected approximately every five to ten minutes. Development of the wells continued until turbidity was less than 50 Nephelometric Turbidity Units (NTU) for three successive readings and until the water quality indicators had stabilized. The criterion for stabilization was three successive readings within 10 percent for turbidity and dissolved oxygen, within 0.1 pH, within 3 percent for specific conductivity, and within 10 mv for redox potential. After stabilization, groundwater samples were collected from the pump at a flow rate of 300 ml/min.

The groundwater samples were containerized in accordance with EPA analytical protocols. Each sample was labeled, sealed, and placed in a chilled cooler for shipment to Severn Trent Laboratories. Groundwater samples were analyzed for target compound list volatile organic compounds (EPA Method 8260B) in accordance with NYSDEC ASP Category B 95-1.

4.3 Exploratory Excavation

On April 18 and 21, 2003, exploratory trenching was performed outside the onsite building. The purpose of the trenching was to attempt to locate any pipes or drains coming out of the building that could be potential sources of contamination. Since previous studies found little or no groundwater contamination on the north or east sides of the building, and due to the presence of underground utilities, the trenching was performed only around the south and west sides of the building.

A backhoe was used to dig a 5-foot-deep and 3-foot-wide trench at a distance of 5 feet from the building's wall. Excavated soil was screened for organic vapors using a PID. No pipes and no soil contamination were detected during the exploratory excavation. However, a subsurface structure was observed on the west side of the building, as shown in Figure 5. Further trenching was performed to try to delineate this structure.

The subsurface structure is located in an area about 36 feet long (north-south) by about 10 feet wide (east-west) running parallel to the building. There is a thin concrete slab about 18 inches below the asphalt surface of the parking lot, with a layer of cobbles (stones about 4 to 8 inches in diameter) below it. The layer of cobbles is about 18 inches thick, but at one location in the center of this area, the cobbles extend down to about 8 feet. Photographs of the structure are in Figure 6. The subsurface structure appears to be some type of drainage structure. No pipes leading to it were observed.

Two grab soil samples were collected from the bottom of the deeper portion of the subsurface structure and analyzed for target compound list VOCs in accordance with NYSDEC ASP Category B 95-1. No VOCs were detected in any of the soil samples.

4.4 Suspected Source Area Soil Borings

The purpose of the supplementary investigation was to attempt to confirm the presence of a possible source of PCE contamination in the area between wells ME-7, ME-14, located just west of the building and the cluster well A-06/A-07/A-08 located inside the on-site building in the former office area in the southwestern corner. The dimensions of the building's corner area, where the wells are located, are 35 by 40 feet. The investigation covered the area within the building around the cluster wells and the adjacent area outside the building. A potential secondary source area, located in the area between wells A-04 and A-05 and the cluster well A-09/A-10, was also investigated.

The supplementary soil sampling was performed between July 22, 2003 and August 19, 2003. Soil borings were advanced at 26 locations outside and inside the on-site building: 21 locations around A-06/A-07/A-08 and five locations around A-09/A-10. Sampling locations were spaced approximately 10-feet apart where walls, footings, and other obstructions permitted. Sampling locations are shown in Figures 7 and 8.

Soil borings located outside of the on-site building (GP-1 through GP-6) were installed using a truck-mounted Geoprobe equipped with a 4-foot long and 2-inch-outside-diameter macrocorer sampler. Soil samples were collected at 4-foot intervals to the groundwater interface. Drilling outside the building had some difficulties due to refusals at a few locations at shallow depths.

Soil borings were advanced inside of the 90-30 Metropolitan Avenue building at 20 locations (GP-7 to GP-26) using a limited-access Geoprobe unit. Soil samples were collected by using a 4-foot-long, 2-inch-diameter, macrocore piston rod sampler fitted with an acetate liner. Continuous samples were collected from ground surface to the groundwater table or to the depths where refusal was encountered. Discrete samples were not collected until slough from soils above the sampling interval were no longer encountered in the sampler.

Each sample was split lengthwise and logged by AKRF field personnel in 1-foot intervals. Logging consisted of: describing the soil according to the modified Burmister Classification System; describing any evidence of contamination (e.g., staining, sheens, odors); and screening for organic vapors using a Thermo 580B OVM equipped with a PID calibrated with 100 ppm isobutylene. The boring logs are in Appendix A..

Only seven soil samples exhibited slightly elevated organic vapor levels. The samples from four locations (GP-2, GP-3, GP-17, and GP-22) were at about 36 feet below grade. The sample from location GP-7 was at ten feet below grade and the samples from GP-20 and GP-23 were from about four feet below grade. Sudan IV dye tests on these samples were negative for free product. The samples were transferred directly into appropriately labeled laboratory-supplied sample jars and placed into ice-filled coolers. The coolers were sealed for shipment and delivered to the laboratory via courier. The soil samples were analyzed for TCL VOCs by EPA Method 8260. All soil samples were analyzed at Severn Trent Laboratories in Shelton, Connecticut, a NYSDOH ELAP certified laboratory, certified to perform NYSDEC ASP. PCE was detected only in the sample from GP-7 at a concentration of 55 parts per billion. Table 4 shows the complete analytic results.

5.0 FINDINGS

5.1 Geology and Hydrogeology

An Open File Report by the U.S. Geological Survey (USGS), 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 subject 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 subject 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 subject site and the surface of the Gardiners Clay would be at about 150 feet below the ground surface. More recent deposits at the subject site consist primarily of glacial moraine-unconsolidated sediments ranging from boulders to clay, but primarily gravel, sand, and silt.

Soil borings performed at and around the subject site by AKRF as part of the current site investigation indicate that medium to fine-grained sand and silt with some gravel, underlie the site to a depth of at least 50 feet below the land surface. Some boulders and cobbles were also encountered at a few boring locations.

Groundwater is present approximately 45 feet below the ground surface. The elevation of the groundwater surface (see Figure 9) ranges from about 16.0 feet (Queens borough datum) at the northwest corner of the site to about 14.5 feet at the southern end of the site. (Ground surface elevations on the site range from 58 to 60 feet outside the building. The building floor elevation is 61.8 feet.) The groundwater contour shows groundwater flow to the south on the western part of the site and to the southeast on the eastern part. The contour map is in fairly good agreement with the contour map prepared by IT, based on their February 20, 2002, observations.

The USGS report cited above indicates that predevelopment groundwater flow in the area was likely southward, towards Jamaica Bay. Historic pumping of groundwater in the Jamaica Water Supply Company area, to the southeast of the site, has depressed the groundwater surface in that area, resulting in a more southeasterly flow.

5.2 Soil Analysis

No significant odors, staining, PID response, or other indications of contamination were observed in soil samples collected above the water table. Soil samples from below the water table exhibited mild to moderate solvent-like odors, but did not produce elevated PID headspace readings. No soil samples produced a positive reaction with the hydrophobic dye test (Sudan IV), which would indicate the presence of NAPL.

A total of 13 shallow soil samples were collected from the vadose zone for laboratory analysis for volatile organic compounds (VOCs) by Method 8260. As no visual or olfactory evidence of contamination was encountered in shallow soils, laboratory samples were collected from the shallowest soil interval available, as described in Section 2.1. VOC results for soil samples are provided in Table 2.

Tetrachloroethene was detected at trace levels (0.7 ppb) in the shallow soil sample from boring WB-A13 (2-3 feet below ground surface [bgs]). The TAGM 4046 Recommended Soil Cleanup Objective (RSCO) for tetracholoroethene is 1,400 ppb. Nine shallow soil samples contained benzene at trace levels (less than 15 parts per billion [ppb]), below the RSCO of 60 ppb.

Additional VOCs detected at concentrations below their respective TAGM RSCOs included bromodichloromethane, methylene chloride, acetone, 2-butanone and xylenes. Methylene chloride and acetone are common laboratory contaminants and these compounds were also detected in field blank samples collected during soil sampling activities.

Thirteen soil samples were collected for laboratory analysis from water table, between 41 and 47 feet below ground surface. Tetrachloroethene was detected at trace levels (less than 1 ppb) in soil samples at borings WB-A01 (45-46 feet bgs) and WB-A12 (43-44 feet bgs). Methylene chloride and acetone were both detected in soil samples from the water table, at trace levels that were below their respective TAGM RSCOs. No other VOCs were detected in water table soil samples.

The TAGM RSCO for total VOCs of 10,000 ppb was not exceeded in any soil sample.

5.3 Groundwater Analysis

Groundwater samples from 44 monitoring wells were submitted for laboratory analysis of VOCs by Method 8260. Groundwater VOC results are shown in Table 3 and tetrachloroethene concentrations in groundwater samples are depicted in Figures 10 , 11, and 12.

No visual or olfactory evidence of contamination was noted in groundwater samples. Groundwater samples were tested in the field for the presence of NAPL using a hydrophobic dye test (Sudan IV). No groundwater samples produced a positive reaction with the dye test.

Thirty-one shallow wells (those screened around fifty feet below ground surface, at the top of the water table) were sampled for laboratory analysis. Tetrachloroethene was detected in twenty-nine of these samples at concentrations ranging from less than 1 ppb in the sample from well A-16, to 8,000 ppb in the sample from well A-06. Groundwater samples from shallow wells A-02, A-03, A-05, A-06, A-09, A-14 and A-15, ME-1, ME-6, ME-7, ME-9, ME-11, ME-13 through ME-16, and wells MW-103 through MW-106, exceeded the GA Groundwater Standard for tetrachloroethene, of 5 ppb. As depicted in Figure 10, tetrachloroethene concentrations in shallow wells were highest in the southern portion of the 90-30 Metropolitan Avenue building, and the grassy area between that building and 73rd Avenue.

Groundwater from five medium-depth wells (screened between 70 and 90 feet below ground surface) was sampled for laboratory analysis. Tetrachloroethene was detected in these samples at levels ranging from 5 ppb at MW-84 in the Sports Authority parking lot, to 8,500 ppb at A-08 in the southern portion of the 90-30 Metropolitan Avenue building. Groundwater samples from medium-depth wells A-08, A-10, A-12, A-13, and MW-84 exceeded the GA Groundwater Standard for tetracholoroethene, of 5 ppb. These data are depicted in Figure 11.

Groundwater from seven deep wells was sampled for laboratory analysis. Deep wells were identified as those screened below 100 feet below ground surface. Tetrachloroethene was detected in these samples at levels ranging from 0.5 ppb at well A-11, located between the 90-30 Metropolitan Avenue building and the bowling alley, to 1,600 ppb at A-07, in the southern portion of the 90-30 Metropolitan Avenue building. Groundwater samples from deep wells A-07, A-11, MW-107 and MW-112 exceeded the GA Groundwater Standard for tetracholoroethene, of 5 ppb. Tetrachloroethene was not detected in the groundwater sample from deep well MW-108. Tetrachloroethene concentrations in deep wells are depicted in Figure12. Although there are relatively few data points regarding tetracholoroethene in deep groundwater, it appears, as evidenced by Figure 12, that the highest concentrations are limited to the vicinity of the southwestern portion of the 90-30 Metropolitan Avenue building.

Methylene chloride and chloroform were detected at levels exceeding the GA groundwater standards of 5 ppb and 7 ppb, respectively, in various groundwater samples from shallow, medium, and deep wells. The maximum detected methylene chloride concentration was 34 ppb in the sample from well MW-106; the maximum detected chloroform concentration was 20 ppb in the sample from well ME-5. Methylene chloride and chloroform are common laboratory contaminants; methylene chloride was detected in field blank samples collected during groundwater sampling activities. Other Target Compound List VOCs detected in groundwater samples at concentrations below their respective GA groundwater standards included 2-butanone (MEK), toluene, trichloroethene, 1,1,1-trichloroethane and bromodichloromethane.

Methyl t-butyl ether (MTBE), a non-target compound used as a gasoline additive, was detected in many of the samples. In the shallow wells, the highest levels of MTBE (over 1000 ppb) were detected in wells MW-104, MW-103, and ME-9, all of which are directly downgradient of the Exxon gasoline station immediately north of the bowling alley. Similarly high concentrations were detected in samples in the intermediate depth wells (screened 70 to 90 feet below the ground surface) further downgradient to the southeast.

5.4 Conclusions

5.4.1 Groundwater Flow

The measurement of shallow groundwater elevations indicates that groundwater flow is to the south at the western end of the site, and to the southeast at the eastern end of the site. This is in agreement with results of the February 2001 IT measurements. (The earlier October 2000 IT groundwater contours are dominated by the anomalous results from well MW-106, in the southwestern corner of the study area.) The Roux Associates October 1995 groundwater study showed groundwater flow to the southeast. It is possible that the difference between the Roux results and the more recent studies is an artifact of the smaller number of wells measured in the Roux study. However, it is also possible that groundwater conditions have been altered by long-term changes in groundwater pumping in southeastern Queens.

Both the IT and Roux studies indicated that the groundwater gradient was very small, with a change in elevation of only about 0.2 to 0.3 feet over the entire site, for a slope on the order of 0.0005. The current measurements show a much greater gradient, with a slope on the order of 0.004.

The groundwater surface elevations measured in the intermediate depth wells, screened at about 30 to 40 feet below the groundwater surface, are between 1.0 and 1.5 feet lower than the levels in the wells screened at the groundwater surface. This indicates a relatively strong downward vertical gradient. However, the groundwater surface elevations measured in the deep wells, screened 65 to 80 feet below the groundwater surface, are higher than those in the intermediate depth wells. These data are inconsistent, but suggest that there is an upward gradient deeper in the aquifer.

Because of the limited numbers of intermediate and deep wells, the variations in the depth of the screens in these wells, and the locations of all of these wells close to a line running from northwest to southeast across the site, it is not possible to derive groundwater flow directions from the elevations measured in these wells.

Prior reports have indicated that groundwater pumping may occur at the car wash to the northeast of the site, across Trotting Course Lane. No evidence of any depression in the

groundwater in the vicinity of Trotting Course Lane was noted in this study or any prior studies.

5.4.2 PCE in the Groundwater

Earlier studies concluded that there was an elongated plume of perchlorethylene (PCE) contamination in the groundwater extending southeastward from Woodhaven Boulevard, under the bowling alley building, and under the southwest corner of the 90-30 Metropolitan Avenue building. The current groundwater study suggests that the groundwater contamination actually comprises two slightly overlapping plumes, one to the west and one to the east. The western plume extends from the east side of Woodhaven Boulevard eastward under the bowling alley, extending into the parking area on the west side of the site. The eastern plume extends from the west side of the 90-30 Metropolitan Avenue building under the southwest corner of the building and the grassy area on the south side of the building to 73rd Avenue.

Because there are relatively few monitoring wells on the bowling alley property, and none under the bowling alley building, the western plume is not very well defined. Evidence from the few wells on the site, and from the direct probe groundwater sampling performed for NYSDEC in the December 1997 IIWA, suggests that this plume extends under the entire bowling alley building, with significant PCE concentrations detected in groundwater samples on the north, west, south, and east sides of the building. The vertical distribution of PCE in the western plume is unknown, but it is suggestive that the highest PCE levels detected in the December 1997 study were in deeper samples collected from 10 to 15 feet below the groundwater surface.

The eastern plume appears to originate in the area between wells ME-7, ME-14, and the cluster well A-06/A-07/A-08. It is notable that this is the same area where an underground drainage structure was observed in the exploratory excavation. Difficulties were encountered in shallow drilling in the area of A-06/A-07/A-08, and cobbles were observed in the cuttings, suggesting that the drainage structure may extend beneath the building in this area. Historic Sanborn maps indicate that the area of the drainage structure corresponds to the former location of a greenhouse that existed on the site from prior to 1914 until the existing building was constructed in the 1950's. This structure may be associated with the PCE source. Although the distribution of PCE in the groundwater suggests the presence of a source in this area, no soil contamination above the saturated zone has been detected in either the current study or in past studies.

Because of the tight distribution of monitoring wells in the southwestern portion of the site, both the horizontal and vertical extent of the eastern plume are well-defined. The major portion of the contamination is restricted to an area of about 150 by 200 feet. The only off-site monitoring well affected by the plume is A-15, with 40 ppb of PCE. This well, located on the sidewalk on the south side of 73rd Avenue, is directly downgradient of the eastern plume, about 150 feet from the presumed source area.

The cluster well A-06/A-07/A-08 is located near the center of the eastern plume. Groundwater samples from this location contained 8,000 parts per million of PCE at the groundwater surface, 8,500 parts per million at a depth of 75 to 85 feet and 1,600 parts per million at a depth of 100 to 110 feet below grade. This indicates that PCE is present well below the groundwater surface, but that DNAPL has not penetrated down to the Gardiners Clay confining layer, which is about 150 feet below the surface. Furthermore,

PCE levels detected in groundwater samples in the earlier studies performed in 1992-1995 were several times higher than the levels detected in the current study and in the IT study performed in 2000. The table below shows typical results for PCE levels measured in the same wells (all screened at the groundwater surface):

Historical PCE Levels

Monitoring Well	PCE levels (ppb) in samples collected 1992-1995 reported in 1997 Roux report	PCE levels (ppb) in samples collected in 2000 reported in 2002 IT report	PCE levels (ppb) in samples collected by AKRF in 2003
ME-7	17,000	2,000	50
ME-8	33,000	8,000	2,200
ME-11	2,500	1,000	810
ME-13	13,000	620	2,700
ME-14	13,000	1,400	230
ME-15	7,500	760	1,100

Since PCE decomposition products (trichloroethene or dichloroethene) have never been detected above trace levels, the decreasing trend in PCE concentrations cannot be explained by biodegradation. The decrease also does not reflect migration of contaminants off-site, since no increase in downgradient concentrations has been observed. It is most likely that the decrease in PCE levels in the groundwater simply reflects dispersion of the plume.

5.4.3 MTBE in the Groundwater

The distribution of MTBE in the groundwater strongly suggests that the source is at the Exxon gasoline station at the corner of Woodhaven Boulevard and Metropolitan Avenue. There have been a number of gasoline spills reported at this location. DEC database information included in the IT report indicates that there are three currently open spills: 9701869, 9704180, and 980677.

TABLES

AKRF, Inc.

TABLE 2: Volatile Organic Compounds In Soil Samples

90-30 Metropolitan Avenue,
Rego Park, Queens

Client ID	TAGM	WB-A01 (0-2)	WB-A01 (45-46)	WB-A02 (10-11)	WB-A02 (46-47)	WB-A03 (0-2)	WB-A03 (43-45)	WB-A04 (0-2)
Lab Sample ID		203335-001	203335-002	203391-016	203391-017	203335-008	203335-009	203391-003
Date Sampled		3/25/2003	3/25/2003	4/4/2003	4/4/2003	3/27/2003	3/27/2003	4/3/2003
Units	µg/kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Volatile Organic Compounds								
1 1 1-Trichloroethane	800	0.6 U	0.6 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1 1 2 2-Tetrachloroethane	600	1 U	1 U	1 U	0.9 U	1 U	0.9 U	1 U
1 1 2-Trichloroethane	--	0.6 U	0.6 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1 1-Dichloroethane	200	0.6 U	0.6 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1 1-Dichloroethene	400	0.6 U	0.6 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1 2-Dichloroethane	100	0.5 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1 2-Dichloropropane	--	0.5 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2-Butanone (MEK)	300	4 U	3 U	3 U	3 U	3 U	3 U	12
2-Hexanone	--	4 U	4 U	4 U	4 U	4 U	4 U	4 U
4-Methyl-2-pentanone (MIBK)	1,000	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Acetone	200	6 U	6 UB	36	19	6 UB	95	80
Benzene	60	0.6 U	0.6 U	0.9 J	0.5 U	0.5 U	0.5 U	4 J
Bromodichloromethane	--	0.6 U	0.6 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromoform	--	0.7 U	0.7 U	0.6 U	0.6 U	0.6 U	0.6 U	0.7 U
Bromomethane	--	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Carbon disulfide	2,700	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 J
Carbon tetrachloride	600	0.5 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Chlorobenzene	1,700	0.6 U	0.6 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroethane	1,900	0.9 U	0.8 U	0.8 U	0.7 U	0.8 U	0.7 U	0.8 U
Chloroform	300	0.7 U	0.7 U	0.6 U	0.6 U	0.6 U	0.6 U	0.7 U
Chloromethane	--	1 U	0.9 U	0.9 U	0.8 U	0.9 U	0.8 U	0.9 U
cis-1 2-Dichloroethene	--	0.6 U	0.6 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1 3-Dichloropropene	--	0.5 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Dibromochloromethane	--	0.5 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Ethylbenzene	5,500	0.5 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.5 J
Methylene chloride	100	3 JB	3 JB	3 JB	2 JB	2 JB	2 JB	5 JB
Styrene	--	0.6 U	0.6 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	1,400	0.5 U	0.6 J	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Toluene	1,500	0.5 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	3 J
trans-1 2-Dichloroethene	300	0.6 U	0.6 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1 3-Dichloropropene	--	0.5 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Trichloroethene	700	0.6 U	0.6 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl acetate	AES needs to chec	4 U	3 U	3 U	3 U	3 U	3 U	3 U
Vinyl chloride	200	0.5 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Xylenes (total)	1,200	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL VOCs		**3**	**3.6**	**39.9**	**21**	**2**	**97**	**105.5**

TABLE 2: Volatile Organic Compounds In Soil Samples

Client ID	TAGM	WB-A04 (45-46)	WB-A05 (3-4)	WB-A05 (45-46)	WB-A06 (1-2)	WB-A06 (46-47)	WB-AB (4-5)	WB-A10 (0-2)
Lab Sample ID		203391-004	203391-009	203391-010	203391-013	203391-014	203391-015	203335-012
Date Sampled		4/3/2003	4/3/2003	4/3/2003	4/4/2003	4/4/2003	4/4/2003	3/28/2003
Units	µg/kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Volatile Organic Compounds								
1 1 1-Trichloroethane	800	0.5 U	0.6 U	0.5 U	0.6 U	0.5 U	0.6 U	0.5 U
1 1 2 2-Tetrachloroethane	600	0.9 U	1 U	0.9 U	1 U	1 U	1 U	1 U
1 1 2-Trichloroethane	--	0.5 U	0.6 U	0.5 U	0.6 U	0.5 U	0.6 U	0.5 U
1 1-Dichloroethane	200	0.5 U	0.6 U	0.5 U	0.6 U	0.5 U	0.6 U	0.5 U
1 1-Dichloroethene	400	0.5 U	0.6 U	0.5 U	0.6 U	0.5 U	0.6 U	0.5 U
1 2-Dichloroethane	100	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U	0.4 U
1 2-Dichloropropane	--	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U	0.4 U
2-Butanone (MEK)	300	3 U	13	3 U	3 U	3 U	3 U	3 U
2-Hexanone	--	4 U	4 U	4 U	4 U	4 U	4 U	4 U
4-Methyl-2-pentanone (MIBK)	1,000	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Acetone	200	12	94	8 J	9 J	16	20	80
Benzene	60	0.5 U	3 J	0.5 U	1 J	0.5 U	2 J	3 J
Bromodichloromethane	--	0.5 U	0.6 U	0.5 U	0.6 U	0.5 U	0.6 U	0.5 U
Bromoform	--	0.6 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Bromomethane	--	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Carbon disulfide	2,700	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Carbon tetrachloride	600	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U	0.4 U
Chlorobenzene	1,700	0.5 U	0.6 U	0.5 U	0.6 U	0.5 U	0.6 U	0.5 U
Chloroethane	1,900	0.7 U	0.8 U	0.7 U	0.8 U	0.7 U	0.8 U	0.8 U
Chloroform	300	0.6 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Chloromethane	--	0.8 U	0.9 U	0.8 U	0.9 U	0.9 U	1 U	0.9 U
cis-1 2-Dichloroethene	--	0.5 U	0.6 U	0.5 U	0.6 U	0.5 U	0.6 U	0.5 U
cis-1 3-Dichloropropene	--	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U	0.4 U
Dibromochloromethane	--	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U	0.4 U
Ethylbenzene	5,500	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U	0.9 J
Methylene chloride	100	2 JB	3 JB	2 JB	2 JB	2 JB	4 JB	2 JB
Styrene	--	0.5 U	0.6 U	0.5 U	0.6 U	0.5 U	0.6 U	0.5 U
Tetrachloroethene	1,400	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U	0.4 U
Toluene	1,500	0.4 U	1 J	0.4 U	0.5 J	0.4 U	0.5 U	3 J
trans-1 2-Dichloroethene	300	0.5 U	0.6 U	0.5 U	0.6 U	0.5 U	0.6 U	0.5 U
trans-1 3-Dichloropropene	--	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U	0.4 U
Trichloroethene	700	0.5 U	0.6 U	0.5 U	0.6 U	0.5 U	0.6 U	0.5 U
Vinyl acetate	AES needs to chec	3 U	3 U	3 U	3 U	3 U	4 U	3 U
Vinyl chloride	200	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U	0.4 U
Xylenes (total)	1,200	1 U	1 U	1 U	1 U	1 U	1 U	3 J
TOTAL VOCs		**14**	**114**	**10**	**12.5**	**18**	**26**	**91.9**

TABLE 2: Volatile Organic Compounds In Soil Samples

Client ID	TAGM	WB-A10 (44-46)	WB-A12 (2-3)	WB-AA (2-3)	WB-A12 (43-44)	WB-A13 (2-3)	WB-A13 (42-43)	WB-A14 (4-5)
Lab Sample ID		203335-013	203335-003	203335-004	203335-005	203391-005	203391-006	203391-007
Date Sampled		3/28/2003	3/26/2003	3/26/2003	3/26/2003	4/1/2003	4/1/2003	4/4/2003
Units	µg/kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Volatile Organic Compounds								
1 1 1-Trichloroethane	800	0.5 U	0.6 U	0.5 U	0.5 U	0.6 U	0.5 U	0.6 U
1 1 2 2-Tetrachloroethane	600	0.9 U	1 U	1 U	0.9 U	1 U	0.9 U	1 U
1 1 2-Trichloroethane	--	0.5 U	0.6 U	0.5 U	0.5 U	0.6 U	0.5 U	0.6 U
1 1-Dichloroethane	200	0.5 U	0.6 U	0.5 U	0.5 U	0.6 U	0.5 U	0.6 U
1 1-Dichloroethene	400	0.5 U	0.6 U	0.5 U	0.5 U	0.6 U	0.5 U	0.6 U
1 2-Dichloroethane	100	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U
1 2-Dichloropropane	--	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U
2-Butanone (MEK)	300	3 U	3 U	3 U	3 U	3 U	3 U	3 U
2-Hexanone	--	4 U	4 U	4 U	4 U	4 U	4 U	4 U
4-Methyl-2-pentanone (MIBK)	1,000	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Acetone	200	39	6 UB	6 UB	170 B	6 U	48	18
Benzene	60	0.5 U	0.6 U	0.5 U	0.5 U	3 J	0.5 U	2 J
Bromodichloromethane	--	0.5 U	0.6 U	0.5 U	0.5 U	0.6 U	0.5 U	0.6 U
Bromoform	--	0.6 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U
Bromomethane	--	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Carbon disulfide	2,700	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Carbon tetrachloride	600	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U
Chlorobenzene	1,700	0.5 U	0.6 U	0.5 U	0.5 U	0.6 U	0.5 U	0.6 U
Chloroethane	1,900	0.7 U	0.8 U	0.8 U	0.7 U	0.8 U	0.7 U	0.8 U
Chloroform	300	0.6 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U
Chloromethane	--	0.8 U	0.9 U	0.9 U	0.8 U	0.9 U	0.8 U	1 U
cis-1 2-Dichloroethene	--	0.5 U	0.6 U	0.5 U	0.5 U	0.6 U	0.5 U	0.6 U
cis-1 3-Dichloropropene	--	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U
Dibromochloromethane	--	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U
Ethylbenzene	5,500	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U
Methylene chloride	100	2 JB	3 JB	2 JB	3 JB	4 JB	3 JB	2 JB
Styrene	--	0.5 U	0.6 U	0.5 U	0.5 U	0.6 U	0.5 U	0.6 U
Tetrachloroethene	1,400	0.4 U	0.4 U	0.4 U	1 J	0.7 J	0.4 U	0.5 U
Toluene	1,500	0.4 U	0.4 U	0.4 U	0.4 U	2 J	0.4 U	1 J
trans-1 2-Dichloroethene	300	0.5 U	0.6 U	0.5 U	0.5 U	0.6 U	0.5 U	0.6 U
trans-1 3-Dichloropropene	--	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U
Trichloroethene	700	0.5 U	0.6 U	0.5 U	0.5 U	0.6 U	0.5 U	0.6 U
Vinyl acetate	AES needs to chec	3 U	3 U	3 U	3 U	3 U	3 U	4 U
Vinyl chloride	200	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U
Xylenes (total)	1,200	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL VOCs		**41**	**3**	**2**	**174**	**9.7**	**51**	**23**

TABLE 2: Volatile Organic Compounds In Soil Samples

Client ID	TAGM	WB-A14 (42-43)	WB-A15 (4-5)	WB-A15 (43-44)	WB-A16 (1-2)	WB-A16 (42-43)	WB-A18 (1-2)	WB-A18 (41-42)
Lab Sample ID		203391-008	203391-011	203391-012	203335-006	203335-007	203391-001	203391-002
Date Sampled		4/4/2003	4/3/2003	4/3/2003	3/28/2003	3/28/2003	4/2/2003	4/2/2003
Units	µg/kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Volatile Organic Compounds								
1 1 1-Trichloroethane	800	0.5 U	0.6 U	0.5 U	0.5 U	0.5 U	0.6 U	0.5 U
1 1 2 2-Tetrachloroethane	600	0.9 U	1 U	0.9 U	1 U	0.9 U	1 U	0.9 U
1 1 2-Trichloroethane	--	0.5 U	0.6 U	0.5 U	0.5 U	0.5 U	0.6 U	0.5 U
1 1-Dichloroethane	200	0.5 U	0.6 U	0.5 U	0.5 U	0.5 U	0.6 U	0.5 U
1 1-Dichloroethene	400	0.5 U	0.6 U	0.5 U	0.5 U	0.5 U	0.6 U	0.5 U
1 2-Dichloroethane	100	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U	0.5 U	0.4 U
1 2-Dichloropropane	--	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U	0.5 U	0.4 U
2-Butanone (MEK)	300	3 U	3 U	3 U	3 U	3 U	3 U	3 U
2-Hexanone	--	4 U	4 U	4 U	4 U	4 U	4 U	4 U
4-Methyl-2-pentanone (MIBK)	1,000	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Acetone	200	20	120	5 U	10 JB	72 B	27	10 J
Benzene	60	0.5 U	6 J	0.5 U	0.5 U	0.5 U	12	0.5 U
Bromodichloromethane	--	0.5 U	0.6 U	0.5 U	0.5 U	0.5 U	0.6 U	0.5 U
Bromoform	--	0.6 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.6 U
Bromomethane	--	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Carbon disulfide	2,700	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	4 J	0.2 U
Carbon tetrachloride	600	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U	0.5 U	0.4 U
Chlorobenzene	1,700	0.5 U	0.6 U	0.5 U	0.5 U	0.5 U	0.6 U	0.5 U
Chloroethane	1,900	0.7 U	0.8 U	0.7 U	0.8 U	0.7 U	0.8 U	0.7 U
Chloroform	300	0.6 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.6 U
Chloromethane	--	0.8 U	0.9 U	0.8 U	0.9 U	0.8 U	0.9 U	0.8 U
cis-1 2-Dichloroethene	--	0.5 U	0.6 U	0.5 U	0.5 U	0.5 U	0.6 U	0.5 U
cis-1 3-Dichloropropene	--	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U	0.5 U	0.4 U
Dibromochloromethane	--	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U	0.5 U	0.4 U
Ethylbenzene	5,500	0.4 U	1 J	0.4 U	0.4 U	0.4 U	2 J	0.4 U
Methylene chloride	100	2 JB	4 JB	2 JB	3 JB	2 JB	4 JB	2 JB
Styrene	--	0.5 U	0.6 U	0.5 U	0.5 U	0.5 U	2 J	0.5 U
Tetrachloroethene	1,400	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U	0.5 U	0.4 U
Toluene	1,500	0.4 U	4 J	0.4 U	0.4 U	0.4 U	10	0.5 J
trans-1 2-Dichloroethene	300	0.5 U	0.6 U	0.5 U	0.5 U	0.5 U	0.6 U	0.5 U
trans-1 3-Dichloropropene	--	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U	0.5 U	0.4 U
Trichloroethene	700	0.5 U	0.6 U	0.5 U	0.5 U	0.5 U	0.6 U	0.5 U
Vinyl acetate	AES needs to chec	3 U	4 U	3 U	3 U	3 U	3 U	3 U
Vinyl chloride	200	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U	0.5 U	0.4 U
Xylenes (total)	1,200	1 U	2 J	1 U	1 U	1 U	4 J	1 U
TOTAL VOCs		**22**	**137**	**2**	**13**	**74**	**65**	**12.5**

TABLE 3: Volatile Organic Compounds In Groundwater Samples

Client ID	GA	A-01	A-02	A-03	A-04	A-05	A-06	A-07	A-08	A-09	A-10
Lab Sample ID	Groundwater	203634-001	203724-001	203724-002	203724-003	203724-004	203724-005	203724-006	203724-007	203724-008	203724-009
Date Sampled	Standards	5/9/2003	5/19/2003	5/19/2003	5/19/2003	5/19/2003	5/19/2003	5/19/2003	5/19/2003	5/19/2003	5/19/2003
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Volatile Organic Compounds											
Chloromethane	--	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
Vinyl chloride	2	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
Bromomethane	5	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
Chloroethane	5	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
1 1-Dichloroethene	--	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
Carbon disulfide	--	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
Acetone	50*	10 U	10 U	10 U	20 U	20 U	500 U	200 U	500 U	200 U	50 U
Methylene chloride	5	5 UB	5 U	5 U	10 UB	10 UB	250 UB	13 JB	250 UB	15 JB	25 UB
trans-1 2-Dichloroethene	--	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
1 1-Dichloroethane	5	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
Vinyl acetate	--	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
cis-1 2-Dichloroethene	5	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
2-Butanone (MEK)	--	10 U	10 U	10 U	20 U	20 U	500 U	200 U	500 U	200 U	50 U
Chloroform	7	3 J	13	9	2 J	2 J	250 U	100 U	250 U	100 U	25 U
1 1 1-Trichloroethane	5	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
Carbon tetrachloride	5	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
Benzene	0.7	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
1 2-Dichloroethane	5	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
Trichloroethene	--	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
1 2-Dichloropropane	5	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
Bromodichloromethane	5	5 U	1 J	0.8 J	10 U	10 U	250 U	100 U	250 U	100 U	25 U
cis-1 3-Dichloropropene	5	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
4-Methyl-2-pentanone (MIBK)	--	10 U	10 U	10 U	20 U	20 U	500 U	200 U	500 U	200 U	50 U
Toluene	5	5 U	5 U	0.3 J	10 U	10 U	250 U	100 U	250 U	100 U	25 U
trans-1 3-Dichloropropene	5	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
1 1 2-Trichloroethane	5	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
Tetrachloroethene	5	2 J	51	17	310	330	8000	1600	8500	2600	630
2-Hexanone	50*	10 U	10 U	10 U	20 U	20 U	500 U	200 U	500 U	200 U	50 U
Dibromochloromethane	5	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
Chlorobenzene	5	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
Ethylbenzene	5	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
Styrene	5	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
Bromoform	50*	5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
1 1 2 2-Tetrachloroethane	5	5 U	5 U	5 U	10 U	10 U	250 U	18 J	250 U	100 U	25 U
Xylenes (total)		5 U	5 U	5 U	10 U	10 U	250 U	100 U	250 U	100 U	25 U
Methyl Tert-Butyl Ether (MTBE)	--	5 U	510	2	2	10 U	130	100 U	3500	100 U	980
TOTAL VOCs (excluding MTBE)		**5**	**65**	**27.1**	**312**	**332**	**8000**	**1631**	**8500**	**2615**	**630**

NOTES: -- = No Water Quality Standard is given for this parameter., *= Guidance Value. No Standard is given for this parameter.

NOTE: Dilution factors vary from 1 to 50.

A: Target compound detected, but quantitated amount exceeded maximum amount.

U: Not detected at the limit given.

TABLE 3: Volatile Organic Compounds In Groundwater Samples

Prob 108

Client ID	GA	BLIND	A-11	A-12	A-13	A-14	A-15	A-16	A-17	A-18	MW-54
Lab Sample ID	Groundwater	203724-011	203633-006	203633-012	203634-002	203676-014	203676-015	203676-001	203676-002	203676-005	203676-003
Date Sampled	Standards	5/19/2003	5/8/2003	5/7/2003	5/9/2003	5/12/2003	5/12/2003	5/12/2003	5/12/2003	5/12/2003	5/12/2003
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Volatile Organic Compounds											
Chloromethane	--	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
Vinyl chloride	2	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
Bromomethane	5	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
Chloroethane	5	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
1 1-Dichloroethene	--	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
Carbon disulfide	--	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
Acetone	50*	20 U	10 U	200 U	100 U	50 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	5	10 UB	5 UB	9 JB	50 UB	5 JB	5 UB	5 UB	5 UB	5 UB	5 UB
trans-1 2-Dichloroethene	--	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
1 1-Dichloroethane	5	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
Vinyl acetate	--	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
cis-1 2-Dichloroethene	5	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
2-Butanone (MEK)	--	20 U	14	200 U	100 U	50 U	10 U	10 U	43	10 U	10 U
Chloroform	7	2 J	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
1 1 1-Trichloroethane	5	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
Carbon tetrachloride	5	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
Benzene	0.7	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
1 2-Dichloroethane	5	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	--	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
1 2-Dichloropropane	5	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane	5	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
cis-1 3-Dichloropropene	5	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone (MIBK)	--	20 U	10 U	200 U	100 U	50 U	10 U	10 U	10 U	10 U	10 U
Toluene	5	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
trans-1 3-Dichloropropene	5	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
1 1 2-Trichloroethane	5	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	5.	340	5	1900	2000	400	40	0.6 J	0.5 J	5 U	6
2-Hexanone	50*	20 U	10 U	200 U	100 U	50 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	5	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	5	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	5	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
Styrene	5	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
Bromoform	50*	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
1 1 2 2-Tetrachloroethane	5	10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
Xylenes (total)		10 U	5 U	100 U	50 U	25 U	5 U	5 U	5 U	5 U	5 U
Methyl Tert-Butyl Ether (MTBE)	--	2	13	3400	930	19	2	5 U	5 U	5 U	5 U
TOTAL VOCs (excluding MTBE)		**342**	**19**	**1909**	**2000**	**405**	**40**	**0.6**	**43.5**	**ND**	**6**

NOTES: -- = No Water Quality Standard is given for this pa
NOTE: Dilution factors vary from 1 to 50.
A: Target compound detected, but quantitated amount exce
U: Not detected at the limit given.

TABLE 3: Volatile Organic Compounds In Groundwater Samples

Rob 109

Rob MW-110

Client ID	GA	MW-84	MW-103	MW-104	MW-105	MW-106	BLIND	MW-107	MW-108	MW-108D	MW-112
Lab Sample ID	Groundwater	203676-004	203676-012	203676-011	203676-008	203676-009	203676-010	203633-005	203676-006	203676-007	203676-013
Date Sampled	Standards	5/12/2003	5/12/2003	5/12/2003	5/12/2003	5/12/2003	5/12/2003	5/7/2003	5/12/2003	5/12/2003	5/12/2003
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Volatile Organic Compounds											
Chloromethane	--	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
Vinyl chloride	2	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
Bromomethane	5	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
Chloroethane	5	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
1 1-Dichloroethene	--	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
Carbon disulfide	--	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
Acetone	50*	10 U	20 U	10 U	10 U	250 U	250 U	10 U	10 U	10 U	10 U
Methylene chloride	5	5 UB	2 JB	5 UB	5 UB	27 JB	34 JB	5 UB	5 UB	5 UB	5 UB
trans-1 2-Dichloroethene	--	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
1 1-Dichloroethane	5	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
Vinyl acetate	--	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
cis-1 2-Dichloroethene	5	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
2-Butanone (MEK)	--	10 U	20 U	10 U	10 U	250 U	250 U	10 U	10 U	10 U	10 U
Chloroform	7	5 U	10	7	0.6 J	120 U	120 U	5 U	5 U	5 U	5 U
1 1 1-Trichloroethane	5	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
Carbon tetrachloride	5	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
Benzene	0.7	5 U	10 U	5 U	5 U	120 U	120 U	2 J	5 U	5 U	5 U
1 2-Dichloroethane	5	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
Trichloroethene	--	5 U	10 U	0.8 J	5 U	120 U	120 U	5 U	5 U	5 U	5 U
1 2-Dichloropropane	5	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
Bromodichloromethane	5	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
cis-1 3-Dichloropropene	5	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone (MIBK)	--	10 U	20 U	10 U	10 U	250 U	250 U	10 U	10 U	10 U	10 U
Toluene	5	5 U	10 U	5 U	5 U	120 U	120 U	0.7 J	5 U	5 U	5 U
trans-1 3-Dichloropropene	5	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
1 1 2-Trichloroethane	5	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
Tetrachloroethene	5	5 J	190	120	100	2200	2200	14	5 U	5 U	72
2-Hexanone	50*	10 U	20 U	10 U	10 U	250 U	250 U	10 U	10 U	10 U	10 U
Dibromochloromethane	5	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
Chlorobenzene	5	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
Ethylbenzene	5	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
Styrene	5	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
Bromoform	50*	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
1 1 2 2-Tetrachloroethane	5	5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
Xylenes (total)		5 U	10 U	5 U	5 U	120 U	120 U	5 U	5 U	5 U	5 U
Methyl Tert-Butyl Ether (MTBE)	--	5 U	1300 A	1000 A	30	120 U	120 U	53	5 U	5 U	1.3
TOTAL VOCs (excluding MTBE)		**5**	**202**	**127.8**	**100.6**	**2227**	**2234**	**16.7**	**ND**	**ND**	**72**

NOTES: -- = No Water Quality Standard is given for this pa

NOTE: Dilution factors vary from 1 to 50.

A: Target compound detected, but quantitated amount exce

U: Not detected at the limit given.

TABLE 3: Volatile Organic Compounds In Groundwater Samples

Client ID	GA	ME-1	ME-2	ME-4	ME-5	ME-6	ME-7	ME-8	ME-9	ME-10	ME-11
Lab Sample ID	Groundwater	203633-010	203633-008	203634-003	203633-002	203633-015	203633-013	203633-001	203633-009	203633-007	203633-003
Date Sampled	Standards	5/7/2003	5/8/2003	5/9/2003	5/8/2003	5/8/2003	5/7/2003	5/8/2003	5/7/2003	5/8/2003	5/7/2003
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Volatile Organic Compounds											
Chloromethane	--	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
Vinyl chloride	2	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
Bromomethane	5	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
Chloroethane	5	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
1 1-Dichloroethene	--	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
Carbon disulfide	--	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
Acetone	50*	50 U	10 U	10 U	10 U	10 U	50 U	250 U	50 U	10 U	50 U
Methylene chloride	5	25 UB	1 J	5 UB	5 UB	5 U	25 UB	16 JB	25 UB	0.8 JB	25 UB
trans-1 2-Dichloroethene	--	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
1 1-Dichloroethane	5	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
Vinyl acetate	--	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
cis-1 2-Dichloroethene	5	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
2-Butanone (MEK)	--	50 U	10 U	10 U	10 U	10 U	50 U	250 U	50 U	10 U	50 U
Chloroform	7	25 U	3 J	5 U	20	13	25 U	120 U	3 J	5 U	25 U
1 1 1-Trichloroethane	5	25 U	5 U	4 J	5 U	5 U	25 U	120 U	25 U	5 U	25 U
Carbon tetrachloride	5	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
Benzene	0.7	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
1 2-Dichloroethane	5	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
Trichloroethene	--	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
1 2-Dichloropropane	5	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
Bromodichloromethane	5	25 U	5 U	5 U	2 J	1 J	25 U	120 U	25 U	5 U	25 U
cis-1 3-Dichloropropene	5	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
4-Methyl-2-pentanone (MIBK)	--	50 U	10 U	10 U	10 U	10 U	50 U	250 U	50 U	10 U	50 U
Toluene	5	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
trans-1 3-Dichloropropene	5	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
1 1 2-Trichloroethane	5	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
Tetrachloroethene	5	440	1 J	5 U	1 J	6	50	2200	510	1 J	810
2-Hexanone	50*	50 U	10 U	10 U	10 U	10 U	50 U	250 U	50 U	10 U	50 U
Dibromochloromethane	5	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
Chlorobenzene	5	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
Ethylbenzene	5	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
Styrene	5	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
Bromoform	50*	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
1 1 2 2-Tetrachloroethane	5	25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
Xylenes (total)		25 U	5 U	5 U	5 U	5 U	25 U	120 U	25 U	5 U	25 U
Methyl Tert-Butyl Ether (MTBE)	--	5	5 U	5 U	5 U	5 U	25 U	120 U	5000 A	5 U	12
TOTAL VOCs (excluding MTBE)		**440**	**5**	**4**	**23**	**20**	**50**	**2216**	**513**	**1.8**	**810**

NOTES: -- = No Water Quality Standard is given for this pa
NOTE: Dilution factors vary from 1 to 50.
A: Target compound detected, but quantitated amount exce
U: Not detected at the limit given.

TABLE 3: Volatile Organic Compounds In Groundwater Samples

Client ID	GA	ME-12	ME-13	ME-14	ME-15	ME-16	ME-16D	BLIND
Lab Sample ID	Groundwater	203633-016	203633-017	203633-011	203633-004	203633-014	203633-018	203633-019
Date Sampled	Standards	5/8/2003	5/8/2003	5/7/2003	5/7/2003	5/8/2003	5/8/2003	5/8/2003
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Volatile Organic Compounds								
Chloromethane	--	5 U	120 U	10 U	50 U	5 U	5 U	5 U
Vinyl chloride	2	5 U	120 U	10 U	50 U	5 U	5 U	5 U
Bromomethane	5	5 U	120 U	10 U	50 U	5 U	5 U	5 U
Chloroethane	5	5 U	120 U	10 U	50 U	5 U	5 U	5 U
1 1-Dichloroethene	--	5 U	120 U	10 U	50 U	5 U	5 U	5 U
Carbon disulfide	--	5 U	120 U	10 U	50 U	5 U	5 U	5 U
Acetone	50*	10 U	250 U	20 U	100 U	10 U	10 U	10 U
Methylene chloride	5	1 J	59 JB	10 UB	4 JB	5 UB	0.5 J	5 U
trans-1 2-Dichloroethene	--	5 U	120 U	10 U	50 U	5 U	5 U	5 U
1 1-Dichloroethane	5	5 U	120 U	10 U	50 U	5 U	5 U	5 U
Vinyl acetate	--	5 U	120 U	10 U	50 U	5 U	5 U	5 U
cis-1 2-Dichloroethene	5	5 U	120 U	10 U	50 U	5 U	5 U	5 U
2-Butanone (MEK)	--	10 U	250 U	20 U	100 U	10 U	10 U	10 U
Chloroform	7	8	120 U	10 U	50 U	1 J	2 J	13
1 1 1-Trichloroethane	5	5 U	120 U	10 U	50 U	5 U	5 U	5 U
Carbon tetrachloride	5	5 U	120 U	10 U	50 U	5 U	5 U	5 U
Benzene	0.7	5 U	120 U	10 U	50 U	5 U	5 U	5 U
1 2-Dichloroethane	5	5 U	120 U	10 U	50 U	5 U	5 U	5 U
Trichloroethene	--	5 U	120 U	10 U	50 U	5 U	5 U	5 U
1 2-Dichloropropane	5	5 U	120 U	10 U	50 U	5 U	5 U	5 U
Bromodichloromethane	5	0.9 J	120 U	10 U	50 U	5 U	5 U	1 J
cis-1 3-Dichloropropene	5	5 U	120 U	10 U	50 U	5 U	5 U	5 U
4-Methyl-2-pentanone (MIBK)	--	10 U	250 U	20 U	100 U	10 U	10 U	10 U
Toluene	5	5 U	120 U	10 U	50 U	5 U	5 U	5 U
trans-1 3-Dichloropropene	5	5 U	120 U	10 U	50 U	5 U	5 U	5 U
1 1 2-Trichloroethane	5	5 U	120 U	10 U	50 U	5 U	5 U	5 U
Tetrachloroethene	5	1 J	2700	230	1100	16	20	5 J
2-Hexanone	50*	10 U	250 U	20 U	100 U	10 U	10 U	10 U
Dibromochloromethane	5	5 U	120 U	10 U	50 U	5 U	5 U	5 U
Chlorobenzene	5	5 U	120 U	10 U	50 U	5 U	5 U	5 U
Ethylbenzene	5	5 U	120 U	10 U	50 U	5 U	5 U	5 U
Styrene	5	5 U	120 U	10 U	50 U	5 U	5 U	5 U
Bromoform	50*	5 U	120 U	10 U	50 U	5 U	5 U	5 U
1 1 2 2-Tetrachloroethane	5	5 U	120 U	10 U	50 U	5 U	5 U	5 U
Xylenes (total)		5 U	120 U	10 U	50 U	5 U	5 U	5 U
Methyl Tert-Butyl Ether (MTBE)	--	1	120 U	3	11	100	210 A	5 U
TOTAL VOCs (excluding MTBE)		**10.9**	**2759**	**230**	**1104**	**16**	**22.5**	**19**

NOTES: -- = No Water Quality Standard is given for this pa
NOTE: Dilution factors vary from 1 to 50.
A: Target compound detected, but quantitated amount exce
U: Not detected at the limit given.

AKRF, Inc.

TABLE 4: Volatile Organic Compounds In Soil Samples from Suspected Source Area

90-30 Metropolitan Avenue, Rego Park, Queens

Client ID	TAGM	GP-2 (35'-36')	GP-3 (36'-38')	GP-7(9'-10')	GP-7 (9'-10') RE	GP-17 (32'-36')	GP-20 (1'-4')
Lab Sample ID		204327-002	204327-001	204435-001	204435-001	204327-003	204377-003
Date Sampled		7/22/2003	7/25/2003	8/6/2003	8/6/2003	7/25/2003	7/29/2003
Units	µg/kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Volatile Organic Compounds							
1 1 1-Trichloroethane	800	5 U	5 U	5 U	5 U	5 U	6 U
1 1 2 2-Tetrachloroethane	600	5 U	5 U	5 U	5 U	5 U	6 U
1 1 2-Trichloroethane	--	5 U	5 U	5 U	5 U	5 U	6 U
1 1-Dichloroethane	200	5 U	5 U	5 U	5 U	5 U	6 U
1 1-Dichloroethene	400	5 U	5 U	5 U	5 U	5 U	6 U
1 2-Dichloroethane	100	5 U	5 U	5 U	5 U	5 U	6 U
1 2-Dichloropropane	--	5 U	5 U	5 U	5 U	5 U	6 U
2-Butanone (MEK)	300	10 U	10 U	11 U	11 U	10 U	11 U
2-Hexanone	--	10 U	10 U	11 UB	11 U	10 U	11 U
4-Methyl-2-pentanone (MIBK)	1,000	10 U	10 U	11 UB	11 U	10 U	11 U
Acetone	200	8 JB	6 JB	27 B	18 B	8 JB	11 U
Benzene	60	5 U	5 U	2 J	2 J	5 U	6 U
Bromodichloromethane	--	5 U	5 U	5 U	5 U	5 U	6 U
Bromoform	--	5 U	5 U	5 U	5 U	5 U	6 U
Bromomethane	--	5 U	5 U	5 U	5 U	5 U	6 U
Carbon disulfide	2,700	5 U	5 U	5 U	5 U	5 U	6 U
Carbon tetrachloride	600	5 U	5 U	5 U	5 U	5 U	6 U
Chlorobenzene	1,700	5 U	5 U	5 U	5 U	5 U	6 U
Chloroethane	1,900	5 U	5 U	5 U	5 U	5 U	6 U
Chloroform	300	5 U	5 U	5 U	5 U	5 U	6 U
Chloromethane	--	5 U	5 U	5 U	5 U	5 U	6 U
cis-1 2-Dichloroethene	--	5 U	5 U	5 U	5 U	5 U	6 U
cis-1 3-Dichloropropene	--	5 U	5 U	5 U	5 U	5 U	6 U
Dibromochloromethane	--	5 U	5 U	5 U	5 U	5 U	6 U
Ethylbenzene	5,500	5 U	5 U	5 U	5 U	5 U	6 U
Methylene chloride	100	5 UB	5 UB	5 JB	4 JB	5 UB	3 JB
Styrene	--	5 U	5 U	5 U	5 U	5 U	6 U
Tetrachloroethene	1,400	5 U	5 U	55	49	5 U	6 U
Toluene	1,500	5 U	5 U	5 U	5 U	5 U	6 U
trans-1 2-Dichloroethene	300	5 U	5 U	5 U	5 U	5 U	6 U
trans-1 3-Dichloropropene	--	5 U	5 U	5 U	5 U	5 U	6 U
Trichloroethene	700	5 U	5 U	5 U	5 U	5 U	6 U
Vinyl acetate		5 U	5 U	5 U	5 U	5 U	6 U
Vinyl chloride	200	5 U	5 U	5 U	5 U	5 U	6 U
Xylenes (total)	1,200	5 U	5 U	5 U	5 U	5 U	6 U
TOTAL VOCs		**8**	**6**	**87**	**71**	**0**	**3**

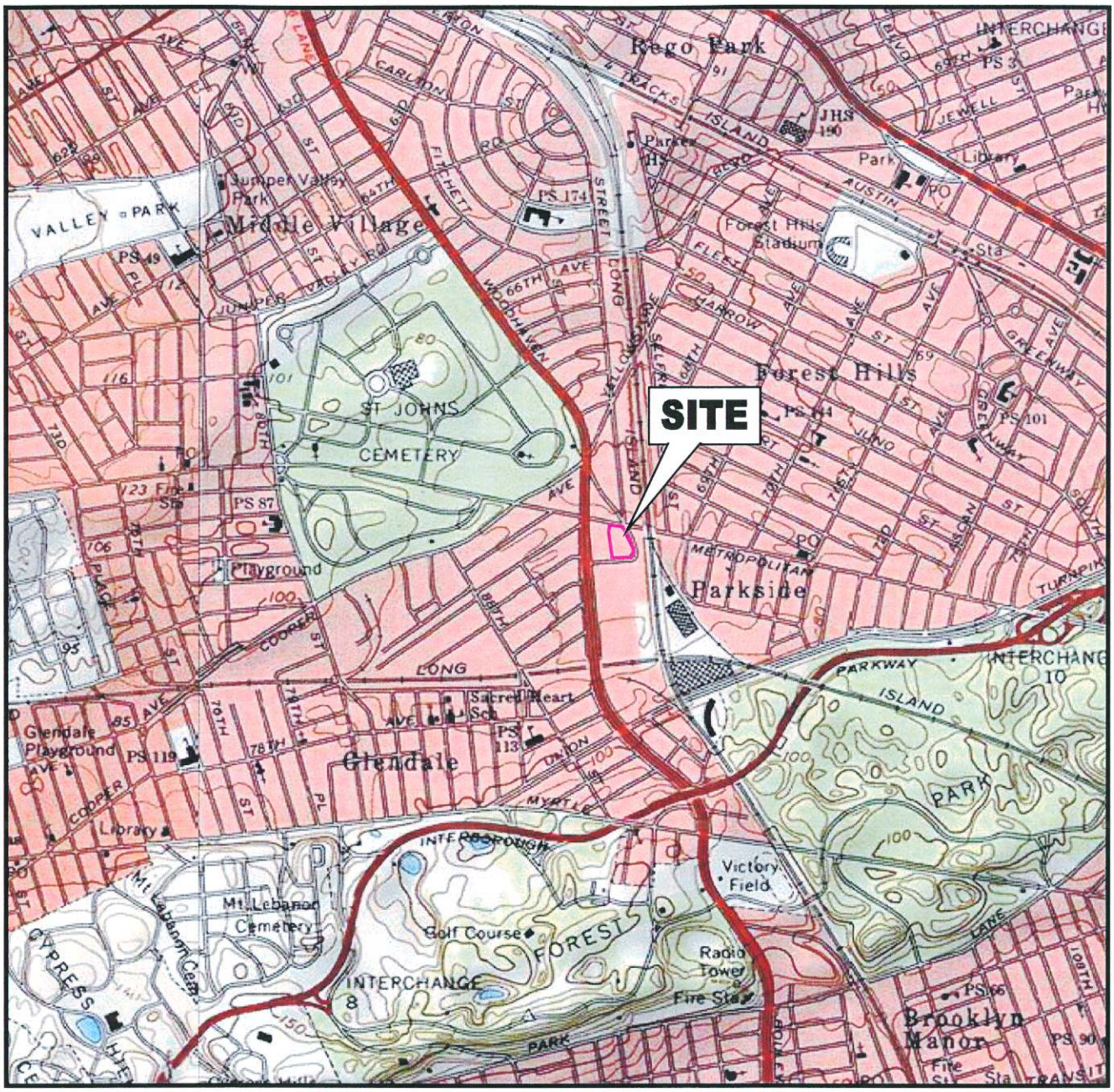
AKRF, Inc.

TABLE 4: Volatile Organic Compounds In Soil Samples from Suspected Source Area

90-30 Metropolitan Avenue, Rego Park, Queens

Client ID	TAGM	GP-22 (34'-36')	GP-23 (2'-4')	FB	TB
Lab Sample ID		204377-002	204377-001	204327-004	204327-005
Date Sampled		7/31/2003	7/31/2003	7/25/2003	7/25/2003
Units	µg/kg	ug/Kg	ug/Kg	ug/L	ug/L
Volatile Organic Compounds					
1 1 1-Trichloroethane	800	5 U	5 U	5 U	5 U
1 1 2 2-Tetrachloroethane	600	5 U	5 U	5 U	5 U
1 1 2-Trichloroethane	--	5 U	5 U	5 U	5 U
1 1-Dichloroethane	200	5 U	5 U	5 U	5 U
1 1-Dichloroethene	400	5 U	5 U	5 U	5 U
1 2-Dichloroethane	100	5 U	5 U	5 U	5 U
1 2-Dichloropropane	--	5 U	5 U	5 U	5 U
2-Butanone (MEK)	300	10 U	11 U	10 U	10 U
2-Hexanone	--	10 U	11 U	10 U	10 U
4-Methyl-2-pentanone (MIBK)	1,000	10 U	11 U	10 U	10 U
Acetone	200	10 U	18	10 U	10 U
Benzene	60	5 U	5 U	5 U	5 U
Bromodichloromethane	--	5 U	5 U	5 U	5 U
Bromoform	--	5 U	5 U	5 U	5 U
Bromomethane	--	5 U	5 U	5 U	5 U
Carbon disulfide	2,700	5 U	5 U	5 U	5 U
Carbon tetrachloride	600	5 U	5 U	5 U	5 U
Chlorobenzene	1,700	5 U	5 U	5 U	5 U
Chloroethane	1,900	5 U	5 U	5 U	5 U
Chloroform	300	5 U	5 U	5 U	5 U
Chloromethane	--	5 U	5 U	5 U	5 U
cis-1 2-Dichloroethene	--	5 U	5 U	5 U	5 U
cis-1 3-Dichloropropene	--	5 U	5 U	5 U	5 U
Dibromochloromethane	--	5 U	5 U	5 U	5 U
Ethylbenzene	5,500	5 U	5 U	5 U	5 U
Methylene chloride	100	2 JB	3 JB	1 JB	1 JB
Styrene	--	5 U	5 U	5 U	5 U
Tetrachloroethene	1,400	5 U	5 U	5 U	5 U
Toluene	1,500	5 U	5 U	5 U	5 U
trans-1 2-Dichloroethene	300	5 U	5 U	5 U	5 U
trans-1 3-Dichloropropene	--	5 U	5 U	5 U	5 U
Trichloroethene	700	5 U	5 U	5 U	5 U
Vinyl acetate		5 U	5 U	5 U	5 U
Vinyl chloride	200	5 U	5 U	5 U	5 U
Xylenes (total)	1,200	5 U	5 U	5 U	5 U
TOTAL VOCs		**2**	**21**	**1**	**1**

FIGURES



QUADRANGLE

SCALE IN FEET

0' 1000' 2000' 4000'

SCALE: 1"=2000'

N

SOURCE:

USGS TOPOGRAPHIC MAP - JAMAICA, N.Y.
QUADRANGLE - DATED 1966, PHOTOREVISED 1979

90-30 METROPOLITAN AVENUE
Queens, New York

PROJECT SITE LOCATION

AKRF

Environmental Consultants
116 East 27th Street, New York, N.Y. 10016

DATE
04.16.04

PROJECT No.
80038

FIGURE No.
1

2-STORY BRICK APARTMENT

CONCRETE SIDEWALK

2-STORY BRICK APARTMENT

CONCRETE SIDEWALK

WOODHAVEN BOULEVARD

CONCRETE SIDEWALK

SPORTS AUTHORITY

ASPHALT PAVED
PARKING AREA

73rd AVENUE

WOODHAVEN LANES
BOWLING ALLEY

1-STORY
GAS STATION

CONCRETE SIDEWALK

ASPHALT PAVED
PARKING AREA

METROPOLITAN AVENUE

ASPHALT PAVED
PARKING AREA

90-30 METROPOLITAN AVENUE

GRASS

CONCRETE SIDEWALK

ASPHALT PAVED
PARKING AREA

TROTTING COURSE LANE

CAR WASH

SCALE IN FEET
0' 40' 80' 160'
SCALE: 1"=80'

Legend:

STUDY SITE BOUNDARY

BUILDING LINE

AKRF
Environmental Consultants
116 East 27th Street, New York, N.Y. 10016

90-30 METROPOLITAN AVENUE
Queens, New York

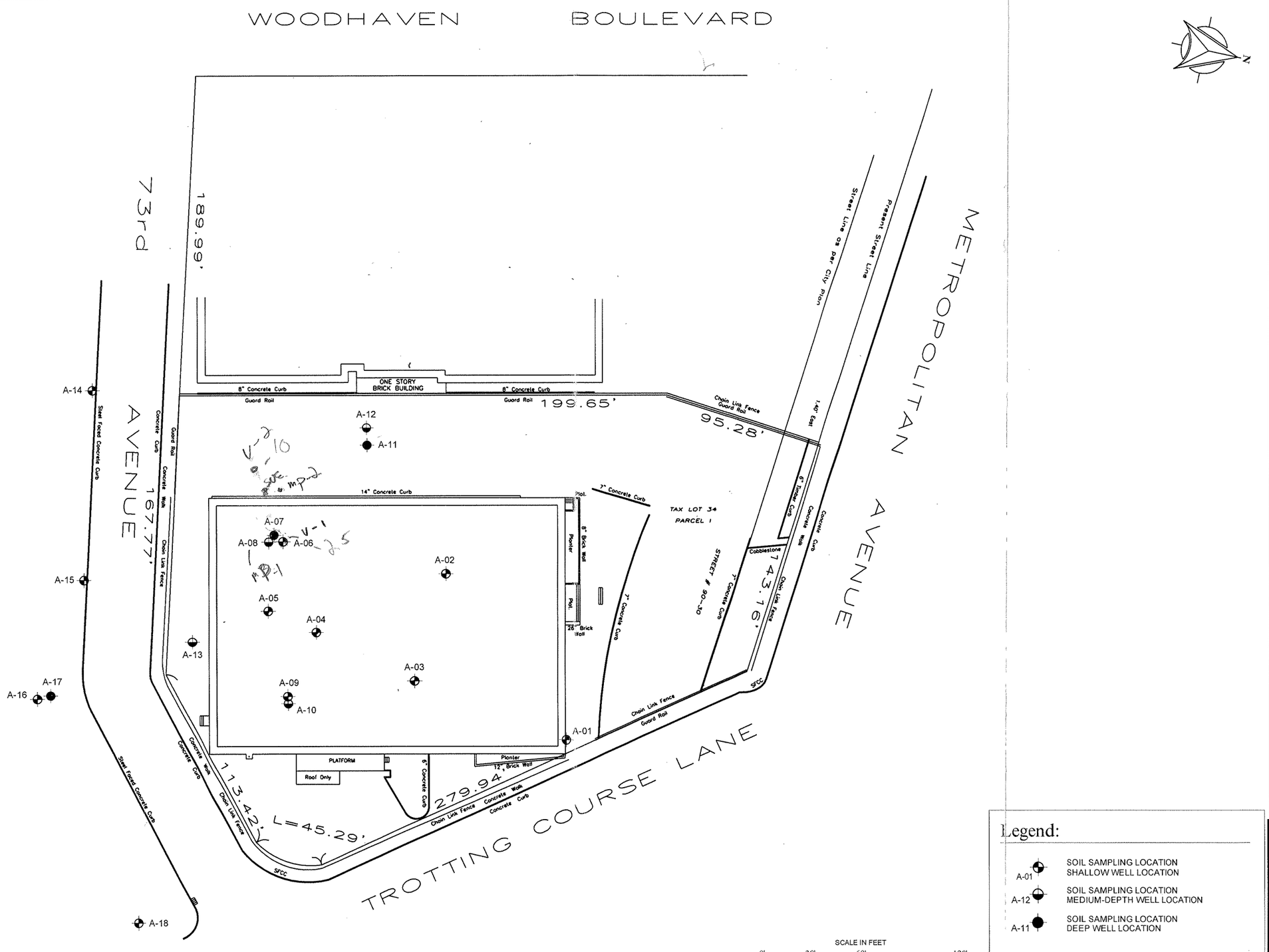
SITE SURROUNDINGS

DATE
04.16.04

SCALE
1"=80'

PROJECT No.
80038

FIGURE No.
2



Legend:

- A-01 — SOIL SAMPLING LOCATION SHALLOW WELL LOCATION
- A-12 — SOIL SAMPLING LOCATION MEDIUM-DEPTH WELL LOCATION
- A-11 — SOIL SAMPLING LOCATION DEEP WELL LOCATION

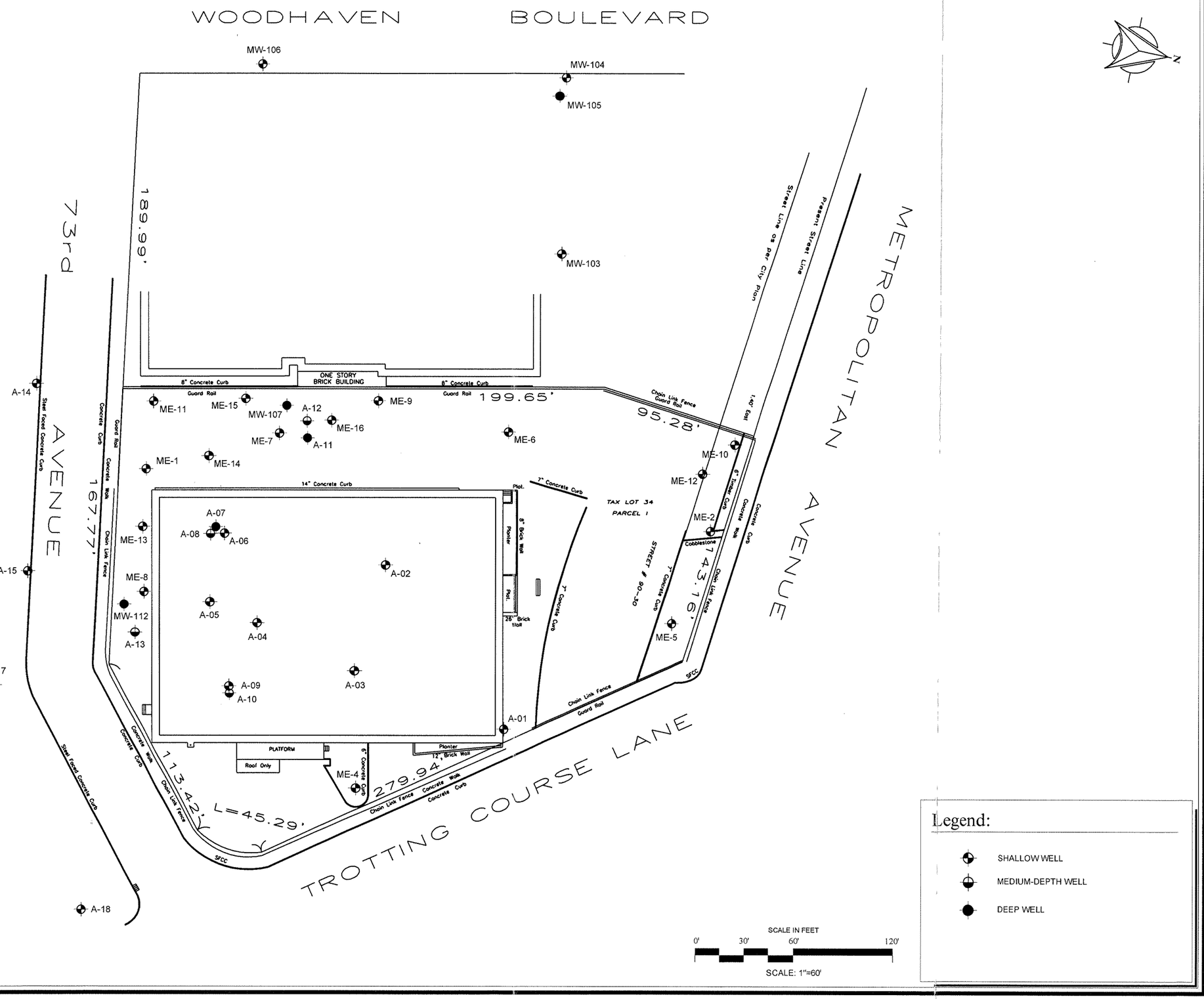
SCALE IN FEET
0' 30' 60' 120'
SCALE: 1"=60'

AKRF
Environmental Consultants
116 East 27th Street, New York, N.Y. 10016

90-30 METROPOLITAN AVENUE
Queens, New York

SOIL SAMPLING LOCATIONS

DATE **04.16.04**
SCALE **1"=60'**
PROJECT No. **80038**
FIGURE No. **3**



SCALE IN FEET
0' 30' 60' 120'
SCALE: 1"=60'

Legend:

- SHALLOW WELL
- MEDIUM-DEPTH WELL
- DEEP WELL

AKRF
Environmental Consultants
116 East 27th Street, New York, N.Y. 10016

90-30 METROPOLITAN AVENUE
Queens, New York

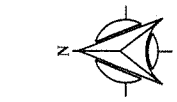
NEW AND EXISTING MONITORING WELLS

DATE
04.16.04

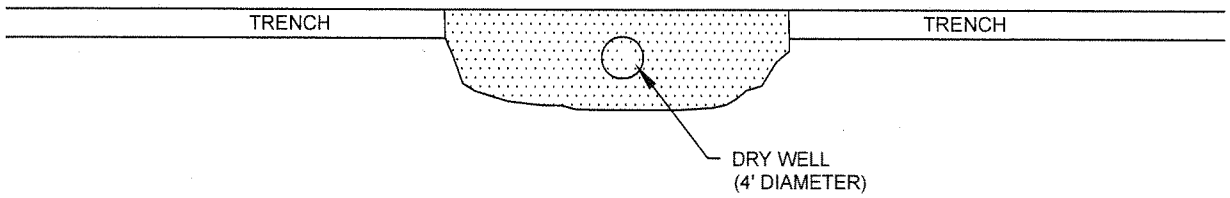
SCALE
1"=60'

PROJECT No.
80038

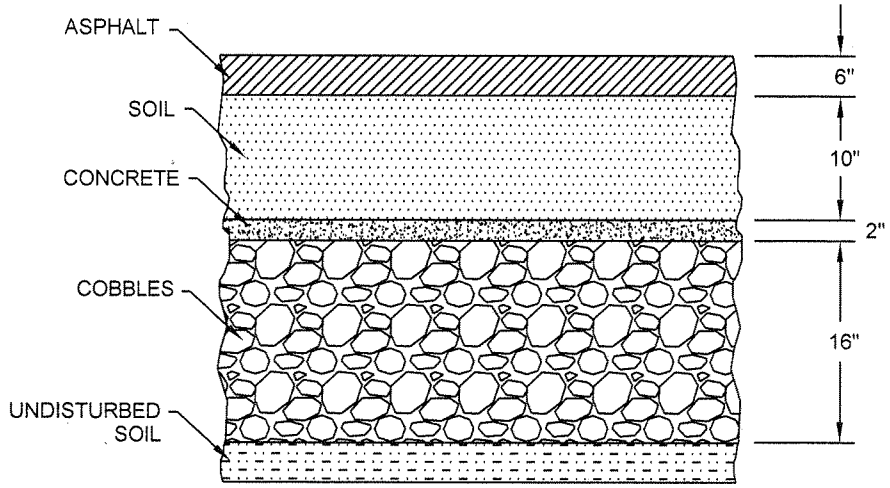
FIGURE No.
4



METROPOLITAN AVENUE
BUILDING



SITE DETAIL PLAN
Scale: 1"=20'



CROSS SECTION
Scale: as noted

90-30 METROPOLITAN AVENUE
Queens, New York

EXPLORATORY TRENCH

AKRF
Environmental Consultants
116 East 27th Street, New York, N.Y. 10016

DATE
04.16.04
PROJECT No.
80038
FIGURE No.
5

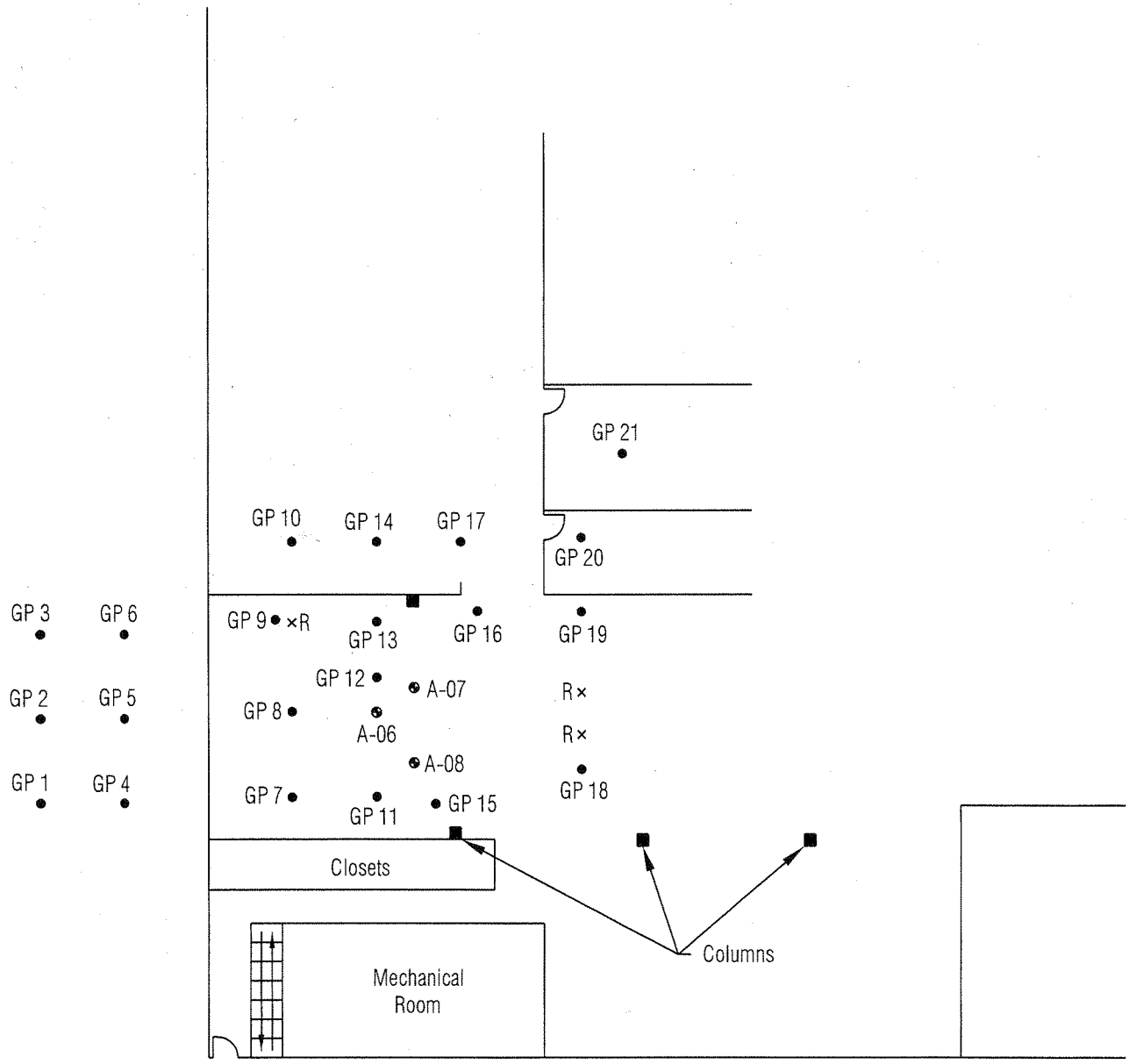
Exploratory Trench Photographs

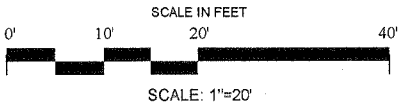
April 21, 2003

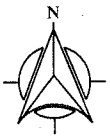
Photograph 1: Cross section through subsurface structure. Note thin concrete slab with layer of cobbles below.

Photograph 2: In this area, cobbles extend down to about eight feet below grade.

FIGURE 6







Legend:

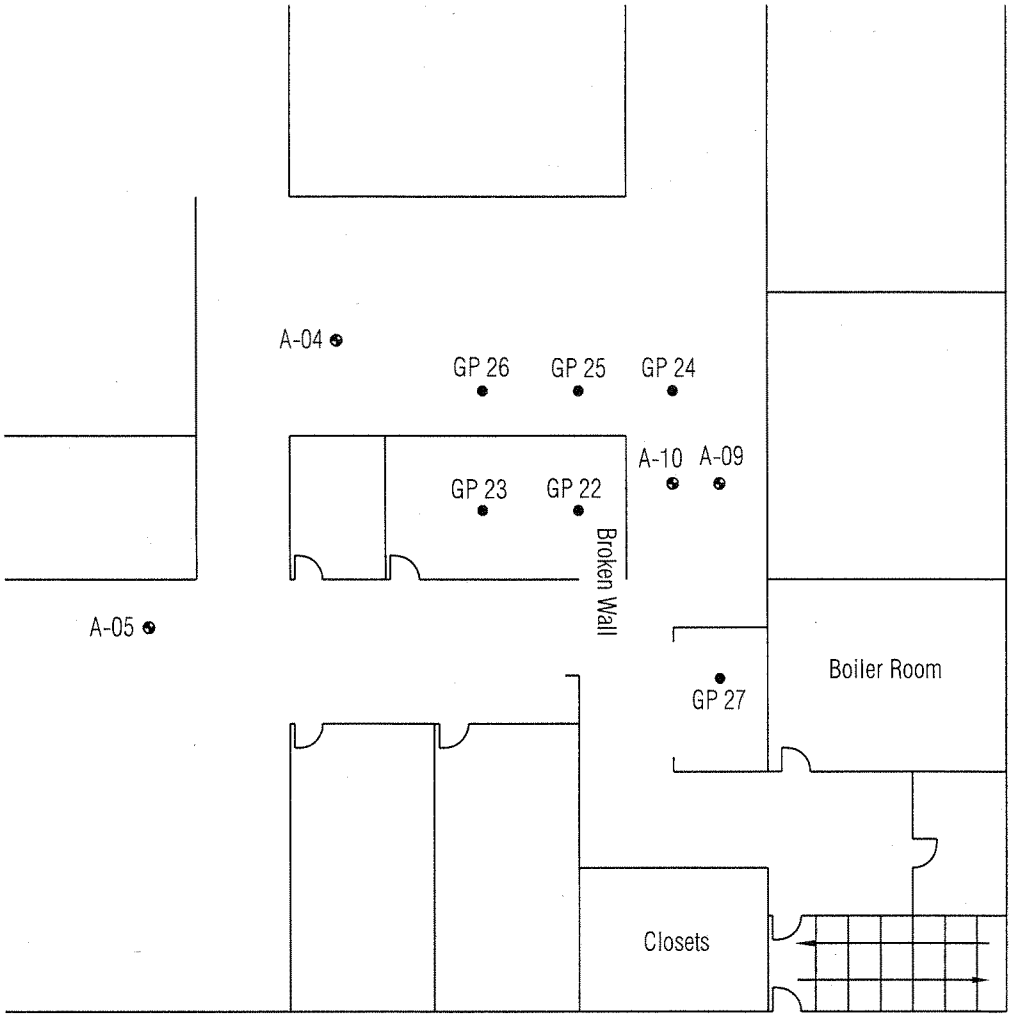
- ● GeoProbe Soil Sampling Location
- ◒ Monitoring Well
- R× REFUSAL

90-30 METROPOLITAN AVENUE
Queens, New York

SUPPLEMENTAL SOIL SAMPLING LOCATIONS

AKRF
Environmental Consultants
116 East 27th Street, New York, N.Y. 10016

DATE 04.16.04
PROJECT No. 80038
FIGURE No. 7



SCALE IN FEET
0' 10' 20' 40'
SCALE: 1"=20'

N

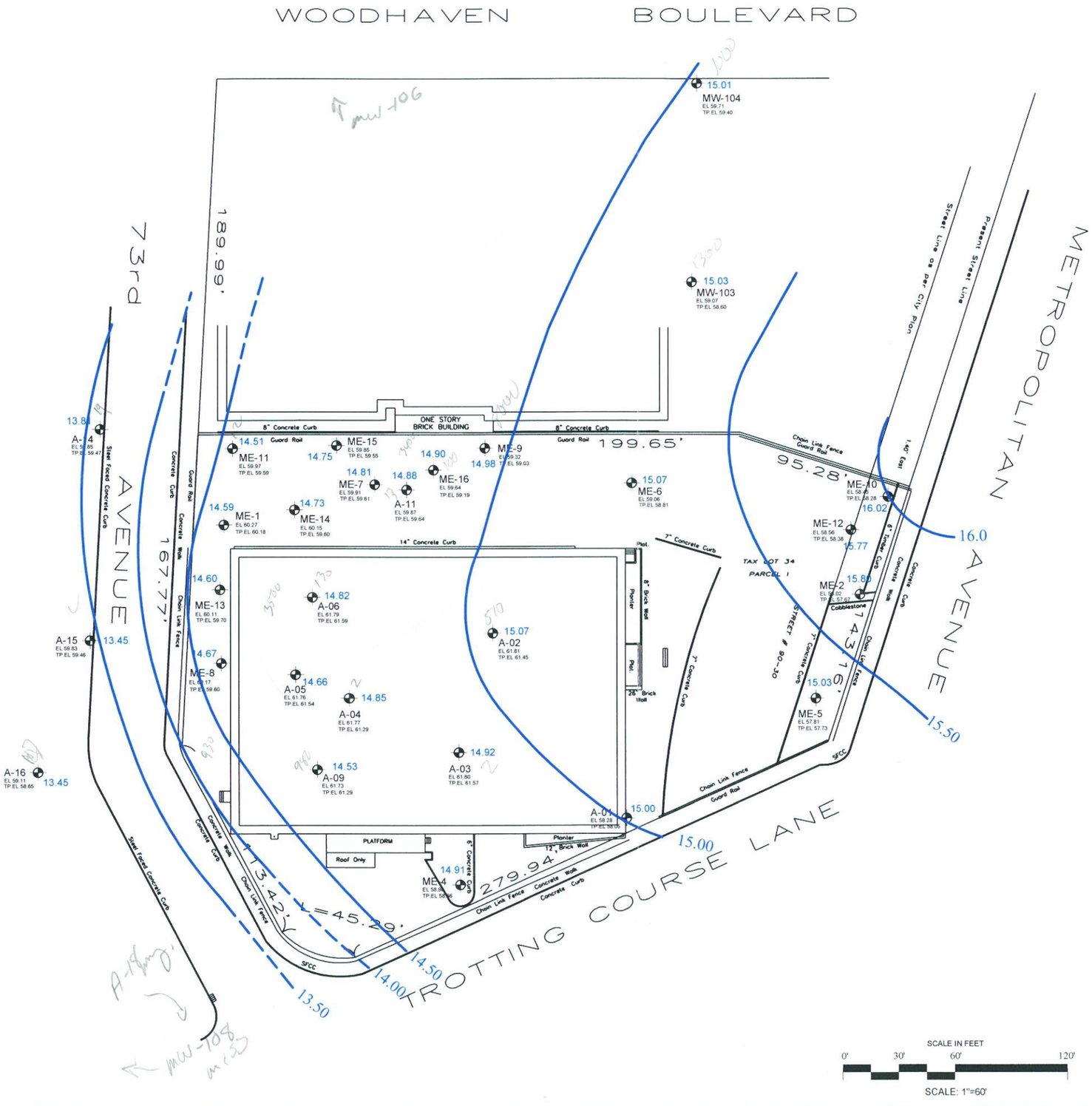
Legend:
- GeoProbe Soil Sampling Location
- Monitoring Well

90-30 METROPOLITAN AVENUE
Queens, New York

SUPPLEMENTAL SOIL SAMPLING LOCATIONS

AKRF
Environmental Consultants
116 East 27th Street, New York, N.Y. 10016

DATE 04.16.04
PROJECT No. 80038
FIGURE No. 8



Legend:

2200	GROUNDWATER ELEVATION (FEET) SHALLOW WELL
TP	TOP OF CASING ELEVATION
EL	MANHOLE ELEVATION

Note:

ELEVATIONS AND SHOWN HEREON REFER TO THE BOROUGH OF QUEENS TOPOGRAPHICAL BUREAU DATUM WHICH IS 2.725 FEET ABOVE MEAN SEA LEVEL DATUM AT SANDY HOOK N.J. 1929

AKRF
Environmental Consultants
116 East 27th Street, New York, N.Y. 10016

90-30 METROPOLITAN AVENUE
Queens, New York

GROUNDWATER SURFACE ELEVATION

DATE
04.16.04

SCALE
1"=60'

PROJECT No.
80038

FIGURE No.
9

SCALE IN FEET
0' 30' 60' 120'
SCALE: 1"=60'

Legend:

2200 PCE CONCENTRATIONS IN GROUNDWATER SHALLOW WELL (PARTS PER BILLION).

PCE CONCENTRATION ISOPLETH

Note:

ELEVATIONS AND SHOWN HEREON REFER TO THE BOROUGH OF QUEENS TOPOGRAPHICAL BUREAU DATUM WHICH IS 2.725 FEET ABOVE MEAN SEA LEVEL DATUM AT SANDY HOOK N.J. 1929

AKRF, Inc.
Environmental Consultants
116 East 27th Street New York, N.Y. 10016

90-30 METROPOLITAN AVENUE
Queens, New York

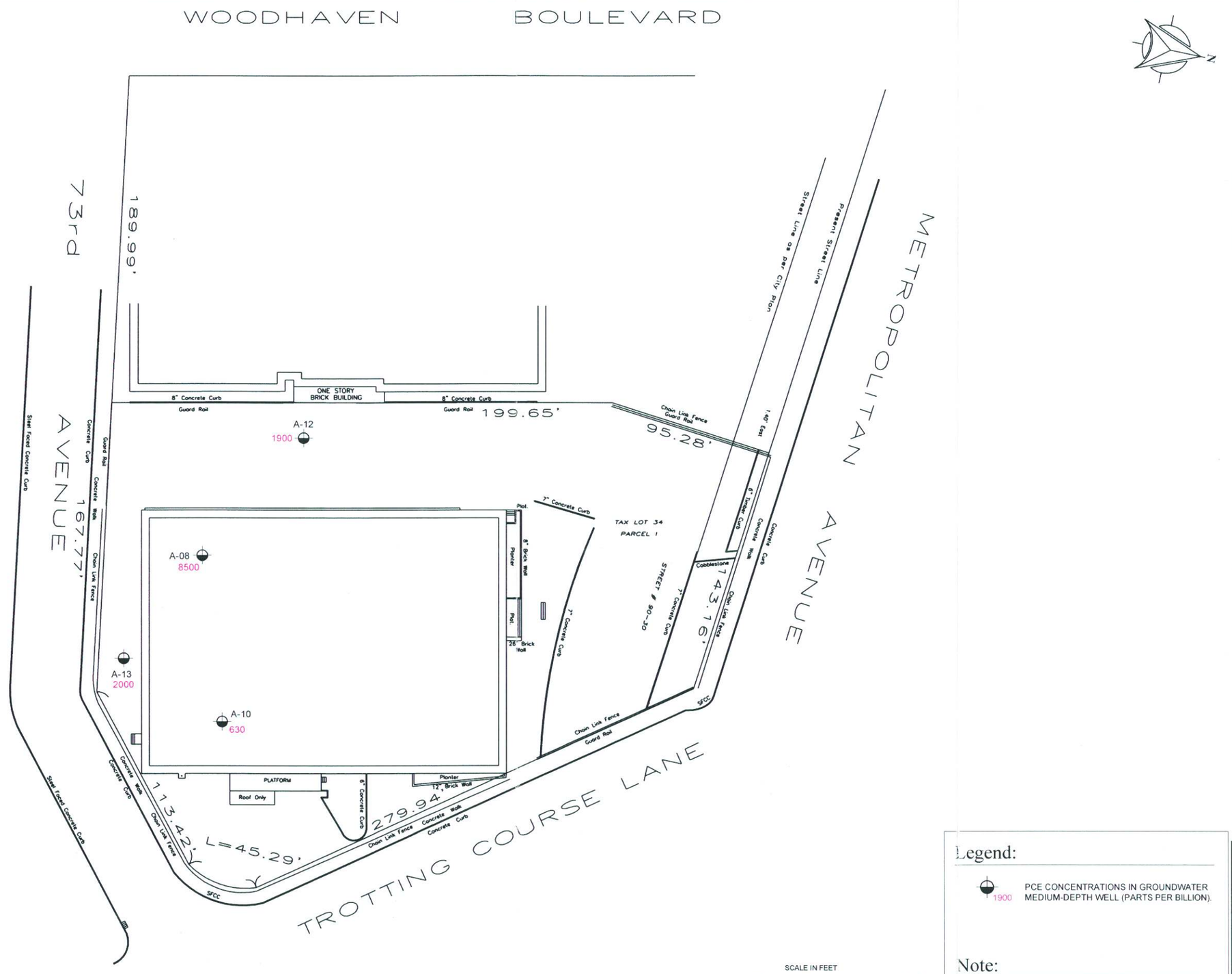
PCE CONCENTRATIONS IN GROUNDWATER-SHILLOW WELLS

DATE
04.16.04

SCALE
1"=60'

PROJECT No.
80038

FIGURE No.
10



Legend:

1900 PCE CONCENTRATIONS IN GROUNDWATER MEDIUM-DEPTH WELL (PARTS PER BILLION).

Note:

ELEVATIONS AND SHOWN HEREON REFER TO THE BOROUGH OF QUEENS TOPOGRAPHICAL BUREAU DATUM WHICH IS 2.725 FEET ABOVE MEAN SEA LEVEL DATUM AT SANDY HOOK N.J. 1929

AKRF
Environmental Consultants
116 East 27th Street, New York, N.Y. 10016

90-30 METROPOLITAN AVENUE
Queens, New York

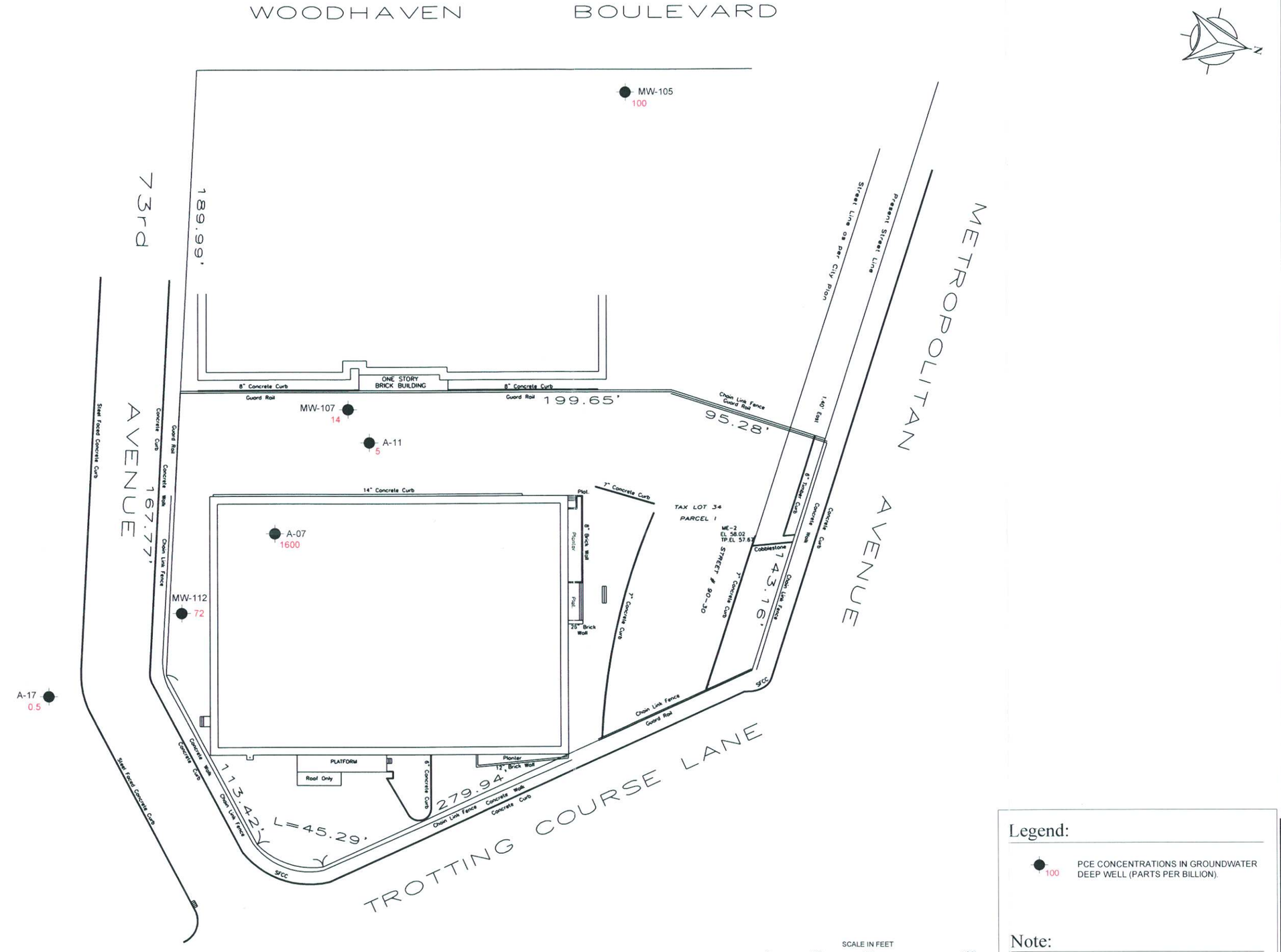
PCE CONCENTRATIONS IN GROUNDWATER-MEDIUM-DEPTH WELLS

DATE
04.16.04

SCALE
1"=60'

PROJECT No.
80038

FIGURE No.
11



Legend:

100 PCE CONCENTRATIONS IN GROUNDWATER DEEP WELL (PARTS PER BILLION).

Note:

ELEVATIONS AND SHOWN HEREON REFER TO THE BOROUGH OF QUEENS TOPOGRAPHICAL BUREAU DATUM WHICH IS 2.725 FEET ABOVE MEAN SEA LEVEL DATUM AT SANDY HOOK N.J. 1929

AKRF, Inc.
Environmental Consultants
116 East 27th Street New York, N.Y. 10016

90-30 METROPOLITAN AVENUE

Queens, New York

PCE CONCENTRATIONS IN GROUNDWATER DEEP WELLS

DATE
04.16.04

SCALE
1"=60'

PROJECT No.
80038

FIGURE No.
12