Home Depot - Rego Park

REGO PARK - GLENDALE, NEW YORK

Remedial Optimization Work Plan

NYSDEC Site Number: V00095

Prepared for:

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CERTIFICATION

I, Michelle Lapin, certify that I am currently a New York State registered Professional Engineer as defined in 6 NYCRR Part 375 and that this Remedial Optimization Work Plan (ROWP) was prepared in accordance with all applicable statues and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10). I have primary direct responsibility for implementation of the Remedial Optimization program for the Home Depot – Rego Park Site (NYSDEC Site No. V00095).

I certify that this ROWP has a plan for transport and disposal of material removed from the property under this Plan, and that all transport and disposal will be performed in accordance with all local, State and Federal laws and requirements. All exported material will be taken to facilities licensed to accept this material in full compliance with all Federal, State and local laws.

I certify that this ROWP has a plan for import of all soils and other material from off-site and that all activities of this type will be in accordance with all local, State and Federal laws and requirements.

I certify that that this ROWP has a plan for nuisance control during the Remedial Optimization work, including a dust and odor suppression plan and that such plan is sufficient to control dust and odors and will prevent nuisances from occurring.

I certify that all information and statements in this certification are true. I understand that a false statement made herein is punishable as Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

It is a violation of Article 130 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 130, New York State Education Law.

NYS Professional Engineer #073934-1	1-31-17	
	Date	Signature

LIST OF ACRONYMS

AKRF – AKRF Engineering, P.C. or AKRF, Inc.

C&D – Construction and Demolition

CAMP – Community Air Monitoring Plan

CFM – Cubic feet per minute

CFR – Code of Federal Regulations

CQAP – Construction Quality Assurance Plan

DCE – Dichloroethene

DER – Department of Environmental Remediation

DUSR – Data Usability Summary Report

ECs – Engineering controls

ECL – Environmental Conservation Law

ELAP – Environmental Laboratory Accreditation Program

EPA – United States Environmental Protection Agency

FER – Final Engineering Report

g/cm^3 – grams per cubic centimeter

GAC – Granular activated carbon

HASP – Health and Safety Plan

HVAC – Heating, Ventilation and Air Conditioning

IC – Institutional controls

inH_2O – Inches of water column

IRM – Interim Remedial Measure

mg/kg – milligrams per kilogram

mg/l – milligrams per liter

MASP – MFR activated sodium persulfate

MFR – Modified Fenton's Reagent

NYC – New York City

NYCDOT – New York City Department of Transportation

NYCRR – New York Code of Rules and Regulations

NYSDEC – New York State Department of Environmental Conservation

NYSDOH – New York State Department of Health

OSHA – Occupational Safety and Health Administration

P&ID – Process and Instrumentation Diagram

PCBs – Polychlorinated biphenyls

PCE - Tetrachloroethene

PID – Photoionization detector

PPB – Parts per billion

PPE – Personal protective equipment

PM_{10} – Particulate matter less than 10 micrometers in size

PPM – Parts per million

PVC – Polyvinyl chloride

QAPP – Quality Assurance Project Plan

QA/QC – Quality Assurance/Quality Control

RAWP – Remedial Action Work Plan

RI – Remedial Investigation

ROI – Radius of influence

ROOs – Remedial Optimization Objectives

SCGs – Standards, Criteria, and Guidance

SCOs – Soil Cleanup Objectives

SEQRA – State Environmental Quality Review Act

SMP – Site Management Plan

SVE – Soil Vapor Extraction

SVOCs – Semivolatile organic compounds

SWPPP – Storm Water Pollution Prevention Plan

TCE – Trichloroethene

TCL – Target Compound List

µg/l – Micrograms per liter

$\mu g/m^3$ – Micrograms per cubic meter

µg/kg – Micrograms per kilogram

USGS – United States Geological Survey

UST – Underground storage tank

VOCs – Volatile organic compounds

1.0 INTRODUCTION

This Remedial Optimization Work Plan (ROWP) was prepared by AKRF Engineering P.C. (AKRF) for Home Depot – Rego Park, located in Rego Park - Glendale, New York (hereinafter referred to as the "Site") under the Voluntary Cleanup Program (VCP). A Site location map is provided as Figure 1. The Site is referred to as "Home Depot in Woodhaven Blvd & Metropol" in the New York State Department of Environmental Conservation (NYSDEC) information system. Allborough Distributors, Inc. (ADI) and Glendale Holding Corp. (Glendale) entered into a Voluntary Cleanup Agreement (VCA) with NYSDEC in July 1997 (amended on October 15, 2008), to investigate and remediate a 6.196-acre property located in Rego Park, Borough of Queens, Queens County, New York. Home Depot U.S.A., Inc. (Home Depot) was added as a Volunteer in October 2008. The VCA was further amended in February 2012 to include an additional 0.228 acres.

Remedial investigations conducted between 1996 and 2006 determined that soil and groundwater in portions of the Site were contaminated with tetrachloroethene (PCE). Source areas were identified in the western and southwestern portions of the Site, as shown on Figure 2. Remedial activities, including shallow soil removal and installation of an air sparge/soil vapor extraction (AS/SVE) system to treat groundwater contamination, were performed between 1998 and 2010. A *Final Engineering Report* (FER) detailing Site remedial activities was submitted to NYSDEC on December 21, 2012. NYSDEC approved the FER on July 16, 2013 with the Release and Covenant Not to Sue. The AS/SVE system (the Site Engineering Control) continues to operate. Ongoing Site management activities are being performed in accordance with the NYSDEC-approved *Site Management Plan* (SMP) dated May 2012.

Following the review and approval of the 2015 Periodic Review Report (PRR), NYSDEC issued a PRR approval notice along with a request for remedial optimization to address persistent PCE concentrations at two monitoring wells, AMW-3 and AMW-4, located hydraulically downgradient of the western PCE source area. In consultation with NYSDEC, the selected Remedial Optimization technologies include in-situ chemical oxidation and expansion of the SVE system in the two PCE source areas.

The tasks detailed in this ROWP comprise bench and pilot scale testing for in-situ chemical injection, and pilot scale testing for soil vapor extraction (SVE) system expansion. The ROWP tasks are being conducted pursuant to the 2016 New York State Department of Environmental Conservation (NYSDEC) request for Remedial Optimization. Following the completion of the bench and pilot scale testing but prior to the completion of the remainder of the Remedial Optimization work, a ROWP Update will be issued to present bench and pilot scale test results and to finalize chemical injection and SVE expansion design parameters. Following approval of the ROWP Update, the balance of the Remedial Optimization field work, comprising full scale chemical injection and SVE expansion, will be completed and a Remedial Optimization Summary Report will be issued, summarizing all Remedial Optimization field work and related findings.

The complete Remedial Optimization scope comprises the following tasks:

- **AS/SVE System Optimization**
    - Pilot Scale SVE Expansion (SVE Zone 13, southwestern source area)
        - Installation and performance monitoring of two additional SVE wells (SVE-13A, and SVE-13B).
        - Design of a new SVE system to control six (6) new SVE wells (including SVE Zone 13, and SVE Zones 11 and 12, discussed further below).

  - Reporting to NYSDEC of SVE system expansion design, including blower selection and vapor treatment design.
- o Full Scale SVE Expansion (SVE Zones 11 and 12, western source area)
  - Installation of SVE Zones 11 and 12 in the western source area.
  - Receipt and installation of new SVE system equipment and associated subgrade piping.
  - Startup and performance monitoring of the new SVE system.

- **Modifications to Existing AS/SVE System**
  - o Decommissioning of the Initial AS/SVE System (Zones 1 through 6)
    - Disconnection, shutdown, and disposal of Initial AS/SVE System equipment.
  - o Continued Operation of Expanded AS/SVE System (Zones 7 through 10)
    - Optimization of Expanded AS/SVE System cycling to increase contaminated vapor extraction efficiency.
- **In-Situ Chemical Oxidation**
  - o Bench Scale Testing (southwestern source area)
    - Baseline soil and groundwater sample collection to finalize Pilot Scale injection design.
    - Permeability testing to assess the potential for direct chemical injection.
    - Reporting to NYSDEC of any modifications to injection design prior to implementation of Full Scale injection program, if necessary (interim update).
  - o Pilot Scale Injection (southwestern source area)
    - One round of chemical injection at four locations, with two injection intervals at each location.
    - Performance monitoring to determine the effectiveness of the injection design.
    - Reporting to NYSDEC of any modifications to injection design prior to implementation of Full Scale injection program (ROWP Update).
  - o Full Scale Injection (western source area)
    - Two rounds of injection at approximately forty-two (42) locations, with two injection intervals at each location.
- **Remedial Optimization Summary Report**
    - Reporting to NYSDEC of all completed work and findings from the Remedial Optimization.

The Remedial Optimization work described in this document is consistent with the procedures defined in DER-10 and complies with all applicable standards, criteria and guidance, as well as the Site management requirements set forth in the FER and SMP. Remedial optimization design elements are presented in this ROWP. The Remedial Optimization described in this document also complies with all applicable Federal, State and local laws, regulations and requirements.

1.1 SITE LOCATION AND DESCRIPTION

The Site is located in the County of Queens, New York. 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" along the Woodhaven Boulevard service road on the western part of the Site at 76-01 Woodhaven Boulevard, and Lot 74 was a 5.276-acre parcel known as the "Glendale Parcel" on the remainder of the Site" at 75-11 Woodhaven Boulevard. The VCP Site boundary was amended on February 28, 2012 to reflect the inclusion of a strip of land that previously separated the ADI and Glendale Parcels (the 0.228-acre parcel, formerly a portion of Lot 450). Former Lots 46, 74, and 450 were merged, as part of Site development, into Block 3886, Lot 74. The Site now comprises 6.196 acres and is known as Block 3886, a portion of Lot 74. A Site location map is provided as Figure 1 and the Site layout is depicted on the Site Plan provided as Figure 2. The boundaries of the Site are fully described in Appendix A: Survey Map, Metes and Bounds.

1.2 CONTEMPLATED SITE USE

The Site was remediated and developed for commercial use as a retail store and is currently used as an active Home Depot store. The Remedial Optimization to be performed under this ROWP is intended to better address residual contamination and is not being conducted to alter the use of the Site. No significant demolition and/or re-development are currently planned for the Site. For the purposes of this ROWP, reasonable foreseeable future land uses are limited to those that would be permitted (without variances or waivers) under the Site's current zoning, approvals, and the Deed Restriction, which include commercial uses only.

1.3 DESCRIPTION OF SURROUNDING PROPERTY

The Site is bounded by the remainder of the Home Depot parking lot and commercial properties to the north, former railroad tracks and a public school to the east, Long Island Rail Road tracks and a park to the south, and Woodhaven Boulevard and a service road to the west.

1.4 SITE HISTORY

Before it was acquired by Home Depot in 1997, the Site comprised two parcels: the ADI Parcel, and the Glendale Properties parcel. 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, 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 Home Depot 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.

1.5 GEOLOGICAL CONDITIONS

A geologic cross-section is shown on Figure 3. 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 ground surface (bgs). The sand is underlain by a dark gray clay.

Depth to groundwater on the Site ranges between 50 feet and 56 feet bgs. 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. The historic groundwater elevations 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. The latest monitoring well gauging event was conducted in September 2016 and the depths to water and water table elevations are included in Table 1. 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 bgs at the Site and the surface of the Gardiners Clay is approximately 150 feet bgs. 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.

2.0 DESCRIPTION OF REMEDIAL INVESTIGATION FINDINGS

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

1. Voluntary Cleanup Program Site Assessment Report, Home Depot Rego Park, New York, AKRF, Inc., May 1996;

2. Voluntary Cleanup, Supplementary Sampling Program Report, Home Depot Rego Park, New York, AKRF, Inc., October 1996;
3. Site Assessment Report, ADI and Glendale Properties, Rego Park, Queens, New York, AKRF, Inc., April 1997;
4. Soil Remediation Report, ADI Property, Rego Park, Queens, New York, AKRF, Inc., March 1999;
5. Phase II Investigative Report, Glendale Property, Rego Park, Queens, New York, AKRF, Inc., February 2000;
6. Supplemental Groundwater Investigation Report, Home Depot Rego Park, Queens, New York, AKRF, Inc., May 2005; and
7. Progress Report – Home Depot Woodhaven Boulevard, Rego Park, New York, AKRF, Inc., July 2006.

Digital copies of the above reports are provided in Appendix B (Previous Key Environmental Reports). Generally, the investigations determined that soil and groundwater in portions of the Site were found to have been contaminated by PCE. Two PCE source areas were identified underneath the former ADI building, as shown on Figure 2. Elevated groundwater PCE concentrations were identified underneath both the former ADI and Glendale buildings.

2.1 SOIL

PCE releases were identified in soil under the former building at the ADI Parcel. PCE concentrations were detected in soil samples of up to 8,000 parts per million (ppm), identified in the October 1996 Voluntary Cleanup, Supplementary Sampling Program Report. This concentration was identified under the building floor slab of the northern portion of the ADI building, and would lead to the identification of the northern PCE source area, outlined in Figure 2. A second PCE detection of 18 ppm was identified in the southern portion of the building, and would lead to the identification of the southern PCE source area outlined in Figure 2. 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 bgs on the former ADI Parcel. Soil samples collected from between 10 feet bgs and the groundwater table contained much lower PCE concentrations (0.080 ppm or less). Based on these results, the scope of contaminated soil excavation in the Remedial Work Plan (RWP) was limited to shallow soils up to 10 feet bgs. As no PCE concentrations above the Technical and Administrative Guidance Memorandum (TAGM) #4046 Recommended Soil Cleanup Objectives (RSCO) were identified in soil samples collected from depths of up to 10 feet bgs underneath the former Glendale building, no remedial excavation was conducted on this parcel other than as part of the tank removal. Note that although now obsolete, TAGM #4046 RSCOs were the appropriate cleanup standard at the time of Site remedial excavation.

No other VOCs were identified in the soil samples. Though previous studies had identified elevated metals concentrations in soil samples, 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 of concern.

2.2 GROUNDWATER

Historic on-site groundwater studies indicated the overall groundwater flow direction was identified as towards the southeast.

Groundwater sample concentrations were found to exceed the Class GA (Drinking Water) Ambient Water Quality Standards and Guidelines in 6 NYCRR Section 703.5. Note that the Class GA Standards are used for comparison purposes; however, groundwater is not currently a potable source in Queens. Historic on-site groundwater samples contained PCE at concentrations of up to 24,000 parts per billion (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 monitoring well SMW-6, a groundwater sample collected from 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 bgs) east-adjacent to the ADI building in 1996, indicating that PCE contamination was significantly greater in 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. No other significant VOC concentrations were identified in the groundwater samples beneath the Glendale building. The metals arsenic, chromium and lead, detected in groundwater, were concluded to have been related to suspended solids in the aqueous samples.

Groundwater PCE concentrations continue to be elevated within and east-adjacent to the ADI Parcel source areas; however, at levels lower than pre-remedial concentrations. PCE was detected in groundwater samples collected over the past year at concentrations of up to 3,300 ppb in the southwestern source area (P-1R, March 2016) and 5,400 ppb (AMW-3, September 2016) in the northern source area, whereas concentrations prior to remediation were 22,000 to 24,000 ppb, respectively, in the source areas.

Monitoring well construction details are provided in Table 2. A summary of groundwater PCE concentrations from groundwater samples collected from January 2001 through September 2016 is provided in Table 3 and is shown on Figure 4.

3.0 SUMMARY OF PAST REMEDIAL ACTIONS

The Site was remediated in accordance with the NYSDEC-approved RWP and the Revised AS/SVE Expansion Work Plan, 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 B.

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

1. Excavation of soil exceeding TAGM 4046 RSCOs to depths of approximately 6 feet bgs underneath the eastern and southern portions of the ADI Parcel and to depths of 2 and 4 feet bgs underneath the northern and northwestern portions of the ADI Parcel.

2. Design and installation of Zones 1 through 5 of an 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. Zones 1 through 6 are collectively referred to as the Initial AS/SVE System.
4. Design and installation of Zones 7 through 10 of the AS/SVE system (Expanded 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 (ICs/ECs), (2) monitoring, (3) operation and maintenance and (4) reporting.
7. Periodic certification of the institutional and engineering controls listed above.

Following the completion of Site remediation, the Deed Restriction was recorded on April 30, 2012. A complete summary of the Site remedial history is provided in the FER.

3.1 REMEDIAL OPTIMIZATION OBJECTIVES

Based on reviews of post-remediation monitoring data and consultations with NYSDEC, the following Remedial Optimization Objectives (ROOs) were identified for this Site.

3.1.1 Groundwater ROOs

ROOs for Public Health Protection

- Reduce groundwater PCE concentrations in monitoring wells downgradient of source areas (i.e., monitoring wells AMW-2, AMW-3, AMW-4, P-2, and P-3).
- Prevent ingestion of groundwater containing contaminant levels exceeding drinking water standards.
- Prevent contact with volatiles emanating from contaminated groundwater.

ROOs for Environmental Protection

- Restore groundwater aquifer, to the extent practicable, to pre-disposal/pre-release conditions.
- Remove the source of groundwater contamination, to the extent practicable.

4.0 DESCRIPTION OF REMEDIAL OPTIMIZATION ALTERNATIVES

The work described herein is related to the environmental services necessary to implement and respond to the February 2016 NYSDEC request to optimize the Site Engineering Control to better treat remaining contamination throughout the Site, including within the western and southwestern source areas.

4.1 EVALUATION OF REMEDIAL OPTIMIZATION ALTERNATIVES

Remedial optimization alternatives were considered, with the analysis of the following factors:

- Protection of human health and the environment;
- Compliance with standards, criteria, and guidelines (SCGs);
- Short-term effectiveness and impacts;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume of contaminated material;
- Implementability;
- Cost effectiveness;
- Community acceptance; and
- Land use.

Based on the ROOs presented in Sections 3.1, a range of Remedial Optimization technologies were evaluated. The alternatives assessed included excavation and off-site disposal, pumping and treatment of groundwater, SVE expansion, and in-situ chemical oxidation.

Excavation and Off-Site Disposal

Excavation would provide overall protection of public health and the environment and compliance with SCGs through the removal of contaminated soil. However, due to the depth of affected soil (greater than 50 feet below grade), it is unlikely that soil removal efforts would be capable of addressing a significant portion of the contaminated soil. The ability to advance the excavation would also be limited by the presence of the active store building, foundation elements, and utilities in the western source area, and the AS/SVE system equipment sheds, utilities, and the Woodhaven Boulevard service road and Long Island Rail Road tracks in the vicinity of the southwestern source area. Soil removal would not directly address groundwater contamination, but would remove a contamination source. While soil removal would be expected to lead to attenuation of groundwater contaminant concentrations over time, SCGs might not be attained in groundwater contamination for many years. Site controls [e.g., Health and Safety Plan (HASP)] would need to be in place to prevent unacceptable exposure during Remedial Optimization activities.

Pump and Treat

Pumping and treatment of groundwater was considered, but would be expected to have limited effectiveness in long term reduction of contaminant levels, as contaminated soil (complete removal of which is infeasible) would remain following implementation of this technology. Pumping and treatment equipment would also need to remain in place for multiple years until performance monitoring confirmed attenuation of groundwater contaminant concentrations in the source areas and downgradient monitoring wells. Pumping and treating is generally effective as a containment technique, but generally unsuccessful in effectively treating source areas in groundwater.

In-Situ Chemical Oxidation

In-situ treatment for soil and groundwater would be achieved through the injection of a chemical oxidation product into the deep vadose and shallow saturated zones, where the contaminant concentrations are greatest, to enhance in-situ oxidizing conditions. Though implementation

involves disruptions to Site operations, the impacts would likely be less significant than those caused by soil excavation and/or pumping and treating contaminated groundwater, while providing a higher likelihood of contaminant reduction. Treatment of vadose zone soil can be challenging due to limitations in fully saturating the soil column (above the water table) with the injection fluids. Post-injection groundwater monitoring would be conducted to assess whether groundwater contaminant concentrations are attenuating or if additional rounds of injection may be warranted.

Source Area SVE System Expansion

The SVE system would be expanded in the two source areas to treat the contaminated vadose zone soil. The SVE system would also be effective in preventing the off-site migration of PCE and breakdown products in soil vapor. SVE expansion could also serve as a supplement to the in-situ chemical oxidation alternative, as any potential off-gassing caused by the chemical injection would be mitigated, in part, by SVE operation. The VOC-contaminated air extracted from the SVE wells would be treated using activated carbon (or other air treatment as applicable). SVE expansion would require some shallow soil excavation/trenching, which would result in lesser impacts to store operations compared to the soil source excavation alternative.

Green remediation principles and techniques would be implemented to the extent feasible in the design, implementation, and Site management of the Remedial Optimization as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedial optimization stewardship over the long term;
- Reducing direct and indirect greenhouse gas and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the Remedial Optimization with the end use where possible and encouraging green and sustainable re-development.

4.2 SELECTED REMEDIAL OPTIMIZATION TECHNOLOGIES

Following discussions with NYSDEC, a combination of in-situ chemical injection and expansion of the SVE System in the source areas were selected as the Remedial Optimization technologies. An in-situ chemical oxidation and SVE Bench Scale and Pilot Scale Program will be implemented in the southwestern source area to develop and finalize the in-situ chemical oxidation and SVE expansion design parameters[1]. The Bench and Pilot Scale work and findings, including final

[1] To better accommodate ongoing Store operations during the Remedial Optimization work, portions of the Full Scale Remedial Optimization field work in the Garden Center, including SVE well and trenched piping installation for Zones 11 and 12, will be conducted in conjunction with the Bench and Pilot Scale Program field work mobilization, as discussed further in Section 5.

reagent concentrations for Full Scale in-situ chemical oxidation, and system design parameters for SVE expansion, will be summarized in a ROWP Update, which will be prepared and submitted to NYSDEC for approval under separate cover.

Following field implementation and NYSDEC approval of the updated ROWP, a Remedial Optimization Summary Report, detailing the completion of and findings from the Remedial Optimization work, will be prepared and submitted to NYSDEC. In addition, the SMP will be updated to reflect the augmentation of the AS/SVE system. Operation of the Site Engineering Controls will continue until significant reductions in Site-wide groundwater concentrations are noted, or until the ROOs are achieved or NYSDEC determines that continued operation is impracticable or infeasible. Post-Remedial Optimization reporting and the conditions for the termination of Site ICs/ECs are discussed further in Section 8.0.

5.0 REMEDIAL OPTIMIZATION SCOPE

Per NYSDEC's February 2016 request, it was determined that the Site Engineering Controls required optimization to further address residual groundwater contaminant concentrations in monitoring wells AMW-3 and AMW-4, located hydraulically downgradient from the western source area. The proposed Remedial Optimization measures are described further below.

5.1 PROPOSED SVE EXPANSION

A Site plan showing the existing AS/SVE system (Initial and Expanded AS/SVE System) is shown on Figure 5. 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. Zones 1 through 6 of the AS/SVE system (the Initial AS/SVE System) includes 35 AS wells and 21 SVE wells, and Zones 7 through 10 (the Expanded AS/SVE System) includes 28 AS wells and 8 SVE wells.

The proposed expansion to the SVE system comprises the addition of three new SVE Zones (Zones 11 and 12 in the western source area, and Zone 13 in the southwestern source area) to enhance vadose zone treatment in the two source areas. SVE expansion is also considered complimentary to the proposed in-situ chemical oxidation (as discussed further in Section 5.2), as any potential off-gassing caused by the injection work would be mitigated by the vacuum applied by the expanded SVE system. The use of SVE wells to address off-gassing caused by in-situ chemical injection is discussed further in Section 5.2.4.

5.1.1 SVE Treatment Area

The target areas for the SVE system expansion are the vadose zone soils in the western source area (SVE Zones 11 and 12 in an approximately 15,000-square foot area) and in the southwestern source area (SVE Zone 13 in an approximately 2,500-square foot area). The SVE wells installed as part of this expansion will be connected through a network of piping to a regenerative blower, which will apply a vacuum to draw off contaminated vapors through the well screens, reducing the potential for off-site migration of contaminated soil vapor. The extracted vapors will be directed through a vapor treatment system, comprising granular activated carbon (GAC), and subsequently discharged to the atmosphere.

5.1.2 Pilot Scale SVE Test

An SVE Pilot Scale test will be conducted prior to finalization of the SVE expansion design based on the design parameters from the 2010 SVE expansion. Two SVE wells (SVE-13A,

and SVE-13B) will be installed to depths of 37 and 52 feet below grade, respectively, in the southwestern portion of the Site. The shallow SVE well will be constructed with 4-inch diameter PVC piping, screened with 4-inch diameter, 0.020-inch slotted PVC screen from 5 feet to 25 feet below grade, and a solid riser to grade. The deep SVE well will be constructed with 4-inch diameter PVC piping, screened with 4-inch diameter, 0.020-inch slotted PVC screen from 25 feet to 45 feet below grade, and a solid riser to grade. The wells will be finished at grade with flush-mount manholes. Typical SVE well construction details are provided as Figure 6.

The Zone 13 SVE wells will be temporarily connected to on-site SVE equipment, which will apply vacuum to the subsurface treatment areas. The SVE Pilot Test will consist of a step test conducted at each SVE well, where fixed vacuum will be applied to the SVE wells while induced vacuum is measured at monitoring wells located at varying distances from the SVE wells. The applied vacuum will then be increased by approximate increments of 10 inches of water (inH_2O) and the induced vacuum monitoring will be repeated. Applied vacuum will typically range from 10 to 40 inH_2O. A minimum induced vacuum measurement of 0.1 inH_2O will be used to determine the lateral extent of an SVE well's radii of influence (ROIs). Confirmatory operations data will also be collected to evaluate appropriate blower sizing (i.e., applied vacuum and air flow rate) and effluent treatment.

5.1.3 SVE System Design

The proposed SVE expansion layout is shown in its entirety on Figure 7. Based on the 2010 SVE expansion work, it is presumed that Remedial Optimization SVE Pilot Testing will result in an SVE ROI for any given SVE well of approximately 50 feet, at an applied vacuum of approximately 25 inH2O and applied air flow rate of approximately 110 cubic feet per minute (CFM). Notwithstanding, actual Pilot Test results will be used to confirm the new SVE system design parameters and will be reported to NYSDEC in the Full Scale Remedial Optimization Work Plan.

Preliminary Full Scale SVE Expansion System Equipment Design

Based on the 2010 AS/SVE expansion, the Remedial Optimization SVE blower will be capable of operating simultaneously on a minimum of six (6) SVE wells at a total air flow rate of approximately 660 CFM (110 CFM per SVE well).

The SVE system will operate continuously on all three zones. Cycled operation of the SVE system may be considered, as this will result in a pulsing effect, while also reducing the blower sizing requirements. Actual SVE system expansion design parameters will be revisited after the completion of the Pilot Test and will be provided in the updated ROWP.

5.1.4 System Location and Components

A conceptual process and instrumentation diagram (P&ID), detailing the SVE system components, is provided as Figure 7. Each SVE well will be connected to the SVE system with dedicated piping. Pressure and vacuum gauges, throttling valves and sample ports will be installed on the individual lines prior to connection to the SVE blower, allowing for adjustments and monitoring of individual SVE wells. Though the system is intended to operate continuously on all six lines, each SVE zone will also be fitted with a motorized butterfly valve to provide the ability to automatically cycle operation of SVE zones. The

motorized valves will be connected to a control panel and system clock, which can be programmed to cycle the SVE system through three SVE zones.

The individual SVE lines in each zone will then be manifolded into single line for each of the three proposed SVE zones. These three lines will be manifolded again into a single line inlet line, leading into a moisture separator tank (approximately 120 gallons), with associated transfer pump and 55-gallon drum with high level alarm. The outlet of the moisture separator tank will be connected to a particulate filter, and dilution valve with fresh air intake, followed by the SVE blower with variable frequency drive (VFD). The VFD would be used to throttle the blower during system balancing. Pre- and post-blower pressure gauges will be installed to monitor strain across the blower. The outlet of the SVE blower will lead directly to the influent port of the carbon treatment system. The proposed SVE system will also include a remote telemetry system and automated shutdown conditions to prevent equipment breakdown.

The carbon treatment system will comprise two 2,000-pound (lb.) GAC units, connected in series. Influent, intermediate, and effluent sample ports and pressure gauges will be installed on the carbon system for monitoring purposes. The outlet of the second GAC unit in series will lead to an effluent stack, with a final discharge point located a minimum of 12 feet above grade and at a minimum of 10 feet from any operable windows, adjoining or adjacent buildings, HVAC intakes, or supply registers.

5.1.5 System Operations and Maintenance

Details for the on-site receipt, installation, startup testing and long-term operation of the Remedial Optimization SVE system will be provided in the updated ROWP.

It is anticipated that confirmatory extracted vapor sampling will be conducted following startup as part of a reassessment of VOC emissions calculations under full scale operating conditions. Confirmatory sampling will comprise grab vapor samples from individual SVE lines.

Following successful startup, the SVE system will be inspected a minimum of once a week for the first month of operation with monthly inspections thereafter to ensure proper operation. System checks will consist of gauge readings, sample port VOC screenings, and system alarm checks. The sample ports on the carbon treatment systems will be used to monitor carbon treatment efficacy and determine the need for carbon changeout.

5.1.6 Modifications To The Existing AS/SVE System

Following completion of the Pilot Scale SVE test, but prior to the installation of the new SVE system equipment, the aboveground equipment for the Initial AS/SVE System (Zones 1 through 6) will be disconnected and removed. All Initial System AS and SVE piping will be cut and capped at grade, and all above-grade system equipment, excluding the two (2) 2,000-lb. GAC vessels and associated piping manifold, will be dismantled and disposed of properly. Following confirmatory vapor sampling conducted by AKRF, all spent carbon from the Initial System GAC vessels will be characterized and disposed of off-site and replaced with virgin carbon. The GAC vessels will be maintained for reuse as part of the new SVE system.

5.2 IN-SITU SOIL AND GROUNDWATER TREATMENT

In-situ chemical injection utilizing extra free radical enhanced modified Fenton's reagent (MFR) and MFR-activated sodium persulfate (MASP) will be conducted to treat contaminated vadose

zone soil and contaminated groundwater and saturated soils at the Site. In accordance with the requirements of the USEPA Underground Injection Control Program 40 CFR Part 144, USEPA will be notified at least 30 days prior to any injections.

5.2.1 Technology Overview

The MFR process combines proprietary chelated iron complex catalysts, mobility control agents, oxidizers, and stabilizers and employs Site-specific delivery systems to ensure destruction of the targeted contaminants of concern and is capable of oxidizing and desorbing soil-bound contaminant mass. The process generates free radicals when the catalyst reacts with hydrogen peroxide, which includes hydroxyl radicals, superoxide radicals and hydroperoxide anions, which can be effective in treating a wide range of organic contaminants, including PCE and its breakdown products.

The MASP activated sodium persulfate process utilizes sodium persulfate (S_2O_8) oxidant activated using various methods to produce sulfate free radicals. The activators include a proprietary chelated iron catalyst, alkali [e.g., sodium hydroxide (NaOH)], heat, hydrogen peroxide or combinations of each. Persulfate reagents are designed for both solo use or in combination with other reagents (e.g., MFR). The MASP component provides a stabilizing effect on the MFR process to help mitigate potential surfacing.

MFR and MASP will result in free radical production via three mechanisms of persulfate activation – i.e., hydrogen peroxide, iron catalyst and heat generated from the exothermic Fenton's reaction. The co-existing oxidation-reduction reactions associated with the MFR and MASP processes promote enhanced desorption and degradation of recalcitrant compounds such as PCE.

Residual sulfate is likely to survive from as few as three months to up to a year following injection. Eventual dilution from groundwater will gradually reduce the concentrations over time. However, groundwater in Queens is not used as a potable water source, and the nearest body of water is 300 feet from the Site. Based upon experience of the Remedial Optimization contractor, sulfate is not expected to migrate more than 50 to 75 feet from the injection area. The monitoring program will include monitoring for sulfate to ensure that it does not significantly affect the surrounding area.

The proposed reagents will be injected in a stabilized form, used at controlled concentrations, and injected in a controlled manner to reduce the possibility of subsequent migration. Caution will be exercised while injecting reagents, as the mounding effect created will raise the groundwater elevation. Site monitoring wells in the vicinity of the injection will be monitored throughout the injection process, in addition to baseline and post-treatment monitoring. Additional measures, including injecting at low pressures or gravity feeding the reagent, decreasing oxidant concentration, reducing injection flow rates, or increasing the number of injection points and decreasing the amount of reagent injected at each point, will be evaluated as part of the injection monitoring process. In addition, sorbent pads, spill containment berms, sorbents and vacuums will be maintained on-site to contain the reagents. The third-party contractor's Bench and Pilot Scale Work Plan is provided as Appendix C.

5.2.2 Treatment Areas

The proposed treatment areas include the Bench and Pilot Scale test area in the southwestern portion of the Site (approximately 2,500 square feet) and the Full Scale injection area in the western portion of the store building (approximately 25,000 square feet), as shown on Figure

5. The vertical treatment zones in both injection areas include the shallow injection zone starting at approximately 55 to 65 feet below grade (shallow saturated zone soils and shallow groundwater), and the deep injection zone of approximately 65 to 75 feet below grade (shallow saturated zone soils and shallow to intermediate groundwater).

5.2.3 Bench Scale Test

Samples of Site soil and groundwater will be collected for a laboratory treatability study to evaluate the effectiveness of the anticipated injection products and determine the catalyst/oxidant mixture and Site-specific stoichiometry. The laboratory results will be used to develop the details for the Pilot Scale chemical injection program. A summary of the results and details regarding any adjustments to the design will be provided in a Bench Scale Study Report submitted to NYSDEC within 30 days after receipt of the bench scale study results from the third-party contractor.

As part of this mobilization, permeability testing will be conducted to assess whether or not chemical injection can be conducted without the use of PVC injection wells from the interval of 55 to 75 feet below grade. At two of the Bench Scale soil boring locations, a fixed amount of fresh water will also be introduced into the subsurface at 75 feet below grade (via the drilling rods). A water level indicator will be used to measure the rate at which the freshwater filters into the formation. If the permeability rate is sufficiently high, it is presumed that chemical injection can be conducted through drilling rods, eliminating the time required to set temporary or permanent PVC injection wells. Though not a substantive issue for Pilot Scale injection, this determination could significantly impact the duration of Full Scale injection work.

Also as part of this mobilization, baseline groundwater sampling will be conducted in the injection area and downgradient monitoring wells (AMW-1RA, AMW-5, P-1R, P-21, P-22, P-2R and P-3). Groundwater samples (using low-flow sampling techniques) will be analyzed for TCL VOCs by EPA Method 8260 and monitored natural attenuation (MNA) parameters.

5.2.4 Pilot Scale Injection Program

The Pilot Scale treatment program will comprise one round of injection at both injection zones at four locations within the Pilot Scale treatment area, as shown on Figure 5. Notwithstanding, the Bench Scale test results may be used to modify the injection program. In addition, the field program may be refined based on in-situ observations.

It is anticipated that the Pilot Scale injection can be conducted without the use of temporary or permanent injection wells. If necessary, injection points will be installed as temporary Geoprobe direct-push injection points with 1-inch diameter, 2-foot long, 0.020-inch slotted stainless steel screens. The temporary injection points will be grouted after the predetermined reagent dose has been injected through the direct push rods and screen, and the rods would be moved to a different location to install a new injection point.

Based on the soil/fill type observed in previous soil borings, a treatment ROI of approximately 10 feet is assumed, resulting in an injection point spacing of approximately 20 feet. At this spacing, it is currently estimated that approximately four injection points will be installed for the Pilot Scale injection. General assumptions used and the design of the treatment program is as follows:

- The vertical impacted zone requiring treatment is from 50 to 75 feet bgs. A total of 4 injection points with two treatment intervals per location are anticipated for treatment. These specific injection depths will be achieved by conducting the injection in steps, beginning with the maximum injection depth and proceeding to the shallower injection depths. The injection screen will be exposed specifically at the discrete injection depth and then shuttered until the probe is retracted to the shallower injection depth. In the event that this method is infeasible, permanent injection wells will be installed in clusters, with dedicated wells installed with a 1 inch diameter, 10-foot long stainless steel screen for each injection depth interval (55 to 65 feet and 65 to 75 feet below grade). The varying injection depths will ensure the treatment targets a variety of depth intervals to achieve the desired "flooding" of the treatment zones. Additional points may be attempted if some of the original points cannot be utilized (due to refusal, surfacing issues, clogged injection screens, etc.).
- The oxidants will be delivered into the subsurface under constant low to moderate pressure (0 to 40 psi) in an effort to distribute materials in a homogeneous fashion throughout the injection interval. Assumed reagent flow rate is 1 to 2 gallons per minute (gpm) per injection point into the subsurface. Higher injection pressures and concentrations may be required and will be evaluated during the treatment program. The proposed reagents will be injected in a stabilized form, used at low concentrations, and injected in a controlled manner to reduce the possibility of surface breakout or subsequent migration. Caution will be exercised while injecting reagents.
- The rate at which the oxidant flow can be injected into the subsurface is initially determined by the soil/aquifer characteristics. Field decisions regarding injection volumes will be based on the subsurface intake, radial effects noted during injection, and the distance of the injection point from the nearest monitoring point. If it becomes impossible to inject the proposed volume, reagent concentrations may be increased, with volumes decreasing, to meet treatment goals. The extent of chemical oxidation is preliminary during the initial injections and may vary plus/minus pending site subsurface characteristics.
- Treatment volume reagent requirements are approximately 3,750 gallons per injection location per injection interval. Reagent volume will be applied in a 1:1:1 volumetric ratio of chelated iron catalyst, 10% sodium persulfate and 10% stabilized hydrogen peroxide. Volumes are based on calculations of expected permeability and contaminant mass determined from remedial investigation and experience of the third-party contractor consulted for design. The injection program may be adjusted following results obtained from the Bench Scale test, which would be presented in a Bench Scale Test Report, to be submitted to NYSDEC for review and approval.
- The treatment program will be performed over two (2) primary injection events spaced 4 to 6 weeks apart to allow for complete oxidant consumption and aquifer equilibration between injection intervals. The interval between events will also help reduce the potential for super saturation, which will in turn limit oxidant waste and allow for additional groundwater monitoring, assessment, and adjustment of the reagent volumes and injection rates.

- The direct push injection point location for each subsequent injection event will be laterally and centrally offset from previous injection event locations to achieve better overlapping effect and minimize missed impacts, unless permanent injection points are necessary.
- Wells within the treatment area will be monitored periodically during injection activities and between injection events for process parameters to assess the injection ROI and adjust the injection design for the Full Scale injection program. Monitored parameters will include water/fluid level, pressure (as appropriate), pH, total dissolved solids (TDS), conductivity, redox potential (ORP), temperature, hydrogen peroxide (H_2O_2), persulfate sulfate, and iron. The parameters measured, and frequency of monitoring, may be adjusted based on the observed results.
- Work zone and community air monitoring will be performed during injection in accordance with the HASP and CAMP (attached as Appendix D).
- Post-treatment monitoring of treatment effectiveness will be performed as outlined in Section 5.2.5.
- Any SVE wells that are in close proximity to injection locations will be connected directly from the wellhead to carbon drums to passively vent the injection area and treat vented vapors. No blowers or fans will be operated due to the potential for injected reagents to flood extraction system components.

5.2.5 Post-Treatment Monitoring

About two weeks after the Pilot Scale injection, groundwater samples will be collected to evaluate the effectiveness of chemical oxidation treatment. Groundwater samples will be collected from seven Site groundwater monitoring wells within and downgradient of the Pilot Scale area (monitoring wells AMW-1RA, AMW-5, P-1, P-2, P-3, P-21, and P-22). Groundwater samples will be collected using low-flow sampling techniques and analyzed for TCL VOCs by EPA Method 8260 and natural attenuation parameters (sulfide, sulfate, chloride, ferrous iron, manganese, and pH). Groundwater may also be field-screened for process parameters including water/fluid level, pressure (as appropriate), pH, TDS, conductivity, ORP, temperature, H_2O_2, persulfate sulfate, and iron. Based on post-treatment analytical results, the details of the Full Scale injection program will be finalized and detailed in the updated ROWP, to be provided under a separate cover in 2017.

5.2.6 Full Scale Injection Program

It is projected that Full Scale chemical injection will occur at approximately forty-two (42) locations within and downgradient of the western source area. Notwithstanding, the injection methodology, quantity, locations, spacing, and ROIs will be verified and reevaluated based on process monitoring conducted during the Pilot and Full Scale injection activities. The complete scope for Full Scale injection will be discussed in the updated ROWP, to be provided under separate cover in 2017.

6.0 REMEDIAL OPTIMIZATION PROGRAM

6.1 GOVERNING DOCUMENTS

All Remedial Optimization work performed under this ROWP will adhere to the following governing documents to maintain the protection of Remedial Optimization workers and the public, to provide for Quality Assurance (QA), maintain Quality Control (QC), properly handle, stage and dispose of removed materials, and to keep the surrounding community informed of Remedial Optimization activities conducted under the ROWP.

6.1.1 Site Specific Health & Safety Plan (HASP)

A HASP for the work proposed under this ROWP is provided as Appendix D. All Remedial Optimization work performed under this plan will be in full compliance with governmental requirements, including Site and worker safety requirements mandated by Federal OSHA.

In addition to the AKRF HASP, the contractor performing the fieldwork work will be responsible for the preparation of a Site-specific HASP, and for the appropriate performance of work according to that plan, the AKRF HASP, and all applicable local, state, and federal laws.

Work areas may include the following: inside the store building within the Garden Center, outside of the store building by the loading dock, outside of the store building in the southwestern corner of the Site, and/or any stockpile/staging areas. Confined space entry, if necessary, will comply with all OSHA requirements to address the potential risk posed by combustible and toxic gasses.

HASP air monitoring will comprise continuous field-screening for VOCs and particulate matter using dedicated equipment, and visual and olfactory signs of contamination in all work areas. VOC and particulate monitoring equipment will consist of a PID capable of detecting total VOC concentrations in real-time and real-time aerosol or particulate monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM_{10}). VOC monitoring equipment will be calibrated and the particulate monitoring equipment zeroed on a daily basis and documented in a dedicated field log book. Both VOC and particulate monitoring equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the prescribed action levels, which define the threshold values which will require an increase in PPE level or stoppage of work.

6.1.2 Community Air Monitoring Plan (CAMP)

Community air monitoring, also comprising field screening for VOCs, particulate matter, and visual and olfactory signs of contamination, will be performed as necessary at the perimeter of the work area(s) during intrusive work, as detailed in the CAMP for the work proposed under this ROWP which is provided as Appendix D. Since continuous work zone monitoring under the HASP will be performed, community air monitoring will be performed periodically (at a minimum once per hour) on a roving basis around any active work area(s). Frequency of community air monitoring will be increased if persistent elevated readings are recorded in the work zone.

If VOC monitoring results in ambient air concentrations of total organic vapors in excess of 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily

decreases below 5 ppm over background, work activities can resume with measures taken to reduce vapors and continue monitoring. If total organic vapor levels persist at levels in excess of 5 ppm over background, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. If the organic vapor level is repeatedly over 25 ppm above background, activities will be shut down and the mitigation controls and the Site work plan re-evaluated.

If particulate monitoring results in a 15-minute average concentration measurement that is between 100 µg/m^3 and 150 µg/m^3 above the background level, additional dust suppression techniques will be implemented to reduce the generation of fugitive dust and corrective action taken to protect Site personnel and reduce the potential for contaminant migration. If dust suppression measures do not sufficiently lower particulates to an acceptable level (e.g., below 150 µg/m^3 above the background level, and no visible dust from the work area), work will be suspended until appropriate corrective measures are implemented to remedy the situation. Exceedances observed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers and included in the Weekly Report discussed in Section 6.5.1.

The use of engineering controls will also be considered in consultation with NYSDEC if field findings indicate that the work is impacting the community.

6.1.3 Odor, Dust and Nuisance Control Plan

6.1.3.1. Odor Control Plan

The odor control plan is capable of controlling emissions of nuisance odors off-site. Specific odor control methods to be used on a routine basis will include periodic walk-around monitoring to observe perceptible odor that may be a nuisance to nearby sensitive receptors. If nuisance odors are identified, 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 all other complaints about the project. Implementation of all odor controls, including the halt of work, will be the responsibility of the Owner's Remedial Engineer.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) wetting removed material. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances may include: (d) direct load-out of excavated material 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; or (h) using foams to cover exposed odorous materials.

6.1.3.2. Dust Control Plan

Due to the Site work being limited to shallow excavations or localize soil boring work areas, opportunities for dust generation are expected to be limited. A dust suppression plan that addresses dust management during invasive on-site work, will include, at a minimum, the use of an on-site water source as a dust suppression measure.

6.1.4 Quality Assurance Project Plan (QAPP)

The Quality Assurance Project Plan (QAPP) has been attached as Appendix E and includes the well installation methodology and details for sampling (frequency, analytical methods and collection methods).

6.1.5 Construction Quality Assurance Plan (CQAP)

The Construction Quality Assurance Plan (CQAP) is provided as Appendix F. The CQAP provides a detailed description of the observation and testing activities that will be used to monitor construction quality and confirm that Remedial Optimization work is conducted in conformance with the Remedial Optimization objectives and specifications. The CQAP includes:

- Responsibilities and authorities of the organizations and key personnel involved in the design and construction of the Remedial Optimization.
- Qualifications of the quality assurance personnel that demonstrate that they possess the proper training and experience necessary to fulfill project-specific responsibilities.
- The observations and tests that will be used to monitor construction and the frequency of performance of such activities.
- The sampling activities, sample size, sample locations, frequency of testing, acceptance and rejection criteria, and plans for implementing corrective measures as addressed in the plans and specifications.
- Requirements for project coordination meetings between the Owner and its representatives, the Remedial Optimization or environmental Contractors, and other involved parties.
- Description of the documentation and reporting requirements for quality assurance activities including such items as weekly summary reports, schedule of data submissions, inspection data sheets, problem identification and corrective measures documentation, and final documentation.
- Description of the final documentation retention provisions.

6.1.6 Materials Management Plan

A Materials Management Plan is provided as Section 6.4 of this ROWP and includes detailed plans for managing all soils/materials that are disturbed at the Site, including excavation, handling, storage, transport, and disposal. It includes controls that will be applied to these efforts to assure effective, nuisance-free performance in compliance with all applicable Federal, State and local laws and regulations.

6.1.7 Stormwater Pollution Prevention Plan (SWPPP)

As there is less than one acre of disturbance, coverage under the SPDES General Permit for Stormwater Discharges from Construction Activity is not required. Therefore, a Notice of Intent and SWPPP are not required. However, in the event of exposed soil or material staging outdoors, erosion and sediment controls will be implemented as necessary in conformance with requirements presented in the New York State Guidelines for Urban Erosion and Sediment Control. Outdoor material storage will be 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 will be made immediately.

6.1.8 Contractor Submittals

The Remedial Engineer will review all plans and submittals for this Remedial Optimization project (including those listed above, as well as contractor and sub-contractor document submittals) and will confirm that they are in compliance with this ROWP.

6.1.9 Specifications

Remedial Optimization elements identified in this ROWP will be further detailed in a set of biddable quality plans and specifications. Following completion of the field work in conformance with the ROWP and the specifications, an as-built drawing will be produced, showing the locations and details of the completed work, which will be signed and stamped by a NYS-licensed professional engineer.

6.1.10 Contingency Plan

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. These findings will be also included in weekly and periodic electronic media reports.

As part of the performance monitoring requirements set forth in this ROWP, AKRF, in consultation with NYSDEC, will determine the efficacy of the Remedial Optimization measures. In the event that performance monitoring establishes that the Remedial Optimization measures did not significantly address residual contamination conditions, the following additional measures may be implemented:

- Additional chemical injection; and
- Modified operation (i.e., alterations to pulsed or cycled operation) of AS/SVE System.

6.2 GENERAL REMEDIAL OPTIMIZATION CONSTRUCTION INFORMATION

6.2.1 Project Organization

The staff responsible for Remedial Optimization work is detailed in the following subsections. A contact list with names and phone numbers of project personnel is provided as Table 4. Resumes of key personnel involved in the Remedial Optimization are included in Appendix G.

6.2.1.1. Remedial Engineer

The Remedial Engineer for this project will be Michelle Lapin P.E. The Remedial Engineer is a registered professional engineer licensed by the State of New York. The

Remedial Engineer will have primary direct responsibility for overseeing the implementation of the Remedial Optimization program for the Site. The Remedial Engineer will ensure that the Remedial Optimization work was observed by qualified environmental professionals under their supervision and that the Remedial Optimization requirements set forth in the ROWP and any other relevant provisions of ECL 27-1419 have been achieved in full conformance with that Plan.

The Remedial Engineer and qualified environmental professionals under their supervision will coordinate the work of other contractors and subcontractors involved in all aspects of Remedial Optimization construction, including soil excavation, stockpiling, characterization, removal and disposal, air monitoring, emergency spill response services, import of backfill material, and management of waste transport and disposal. The Remedial Engineer will be responsible for all appropriate communication with NYSDEC and NYSDOH.

The Remedial Engineer will review all pre-Remedial Optimization plans submitted by contractors for compliance with this ROWP.

6.2.1.2. Project Director

Marc Godick will serve as the project director for the ROWP activities. 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, NYSDEC, and the Owner to ensure a smooth flow of information between involved parties.

6.2.1.3. Project Manager

Eric Park will serve as the project manager for the ROWP activities. The project manager will be responsible for directing and coordinating all elements of the RAWP. He will prepare reports and participate in meetings with the Owner and/or the NYSDEC.

6.2.1.4. Field Team Leader

The field team leader will be responsible for supervising the daily sampling and health and safety activities in the field and will ensure adherence to the ROWP and HASP, including the community air monitoring. He/she will report to the project manager on a regular basis regarding weekly progress and any deviations from the work plan.

The field team leader will be qualified to perform soil screening activities (e.g., be able to detect petroleum or chemical odors and chemical staining and be proficient in the use of monitoring equipment such as a PIDs and particulate monitor) and to make the distinction between potentially contaminated and non-contaminated soil based on observations made during soil screening activities.

The field team leader responsibilities will be assigned to appropriate AKRF personnel and will be established when implementation of the work is near. Field team leaders may include Gregory Baird and Stephen Grens, Jr.

6.2.1.5. Project Quality Assurance/Quality Control Officer

Marcus Simons will serve as the QA/QC officer for the work under this ROWP. The QA/QC Officer will be responsible for adherence to the QAPP. The QA/QC Officer will

work with the Project Manager in reviewing the procedures with all personnel prior to commencing any fieldwork and may conduct periodic Site visits to assess implementation of the procedures. The QA/QC officer will also be responsible for interface with the third party data validator if problems arise and review the Data Usability Summary Report (DUSR), if required.

6.2.2 Work Hours

Work hours are anticipated to be Monday through Friday from 7:00 a.m. to 5:00 p.m., aside from interior work, which will be conducted during overnight hours (Monday through Friday, approximately 10:30 p.m. to 5:00 a.m.) to minimize disturbances to ongoing store operations.

6.2.3 Site Security

Building personnel are present 24 hours a day, 7 days a week. During the intrusive Remedial Optimization work performed under this ROWP, the work area and staging area(s) will be cordoned off from public access using cones, signage, or other appropriate barriers.

6.2.4 Traffic Control

Although not anticipated, if vehicle traffic control is necessary, these activities will take place in accordance with a NYCDOT-approved Maintenance and Protection of Traffic (MPT) plan and will be managed by a flag-person, as needed.

6.2.5 Contingency Plan

A contingency plan for this work proposed under this ROWP is provided as Section 6.1.10.

6.2.6 Worker Training and Monitoring

Worker training, medical monitoring, and protection will be performed as outlined in the HASP (Appendix D) and QAPP (Appendix E).

6.2.7 Permits and Agency Approvals

There are no anticipated State Environmental Quality Review Act (SEQRA) requirements for this project. All permits or government approvals required for Remedial Optimization construction have been, or will be, obtained prior to the start of Remedial Optimization construction.

A complete list of all local, regional and national governmental permits, certificates or other approvals or authorizations required to perform the Remedial Optimization work will be provided in the Remedial Optimization Summary Report. This list will include a citation of the law, statute or code to be complied with, the originating agency, and a contact name and phone number in that agency if readily available.

No Remedial Optimization work performed under this ROWP is in regulated wetlands and adjacent areas; therefore, no approvals from NYSDEC Division of Natural Resources are necessary.

In accordance with the requirements of the USEPA Underground Injection Control Program 40 CFR Part 144, USEPA will be notified at least 30 days prior to any injections.

6.2.8 Pre-Remedial Optimization Meeting with NYSDEC

If necessary, a meeting with representatives of NYSDEC, AKRF, and the contractor performing the work will be arranged prior to the start of major construction activities. In accordance with the SMP, NYSDEC will be notified a minimum 15 days prior to the start of excavation work.

6.2.9 Emergency Contact Information

An emergency contact sheet with names and phone numbers is included in Table 4. That document will define the specific project contacts for use by NYSDEC and NYSDOH in the case of a day or night emergency.

6.2.10 Remedial Optimization Costs

The total estimated cost for the portion of the Remedial Optimization presented in this ROWP is $1,600,000. An itemized and detailed summary of estimated costs for all Remedial Optimization will be provided based on actual costs and submitted as an appendix to the Remedial Optimization Summary Report.

6.3 SITE PREPARATION

6.3.1 Utility Marker and Easements Layout

The Owner and its contractors will be responsible for the identification of utilities that might be affected by work under the ROWP and implementation of all required, appropriate, or necessary health and safety measures during performance of work under this ROWP. The Owner and its contractors will be responsible for safe execution of all invasive and other work performed under this ROWP.

The presence of utilities and easements in the vicinity of work areas will be investigated and may include additional geophysical surveys or hand digging in certain areas.

6.3.2 Sheeting and Shoring

No sheeting or shoring is anticipated as part of the planned work. However, appropriate management of the structural stability of on-site or off-site structures during on-site activities is the responsibility of the Owner and its contractors. The Owner and its contractors will be responsible for safe execution of all invasive and other work performed under this Plan.

6.3.3 Equipment and Material Staging and Disposal

Designated staging areas will be determined by AKRF personnel and the contractor and will be cordoned off from building occupants using signage, cones, or other barriers as appropriate. All excavated or otherwise exhumed material will be containerized immediately following generation in NYSDOT-approved rolloff containers or 55-gallon drums. If necessary, temporary material staging areas will be constructed using a 6-mil plastic sheeting underlying layer, a watertight secondary containment berm, and additional 6-mil plastic sheeting used to cover the material. Material staging areas will be inspected at a minimum once each work day. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC.

The material containers will be covered at the end of each work day. Storage containers will be labeled with the date, the source/type of waste (i.e., trench spoils, drill cuttings, decontamination water) and the name of an AKRF point-of-contact. Previous sample results

may be used for waste characterization of soils as applicable; additional waste characterization soil samples will be collected, if warranted. All waste will be disposed of or treated according to applicable local, State and Federal regulations.

6.3.4 Decontamination Area

A decontamination area will be established, where needed, adjacent to the work areas. The floor of the decontamination area will be covered with 6-mil plastic sheeting as necessary and bermed to prevent spreading of decontamination fluids or potential discharge to the ground surface.

All equipment in direct contact with known or potentially contaminated material will be either dedicated or decontaminated prior to handling less contaminated material or removal from the Site. All liquids used in the decontamination procedure will be collected, stored and disposed of in accordance with federal, state and local regulations. Personnel performing this task will wear the proper personal protective equipment (PPE) as prescribed in the HASP.

6.3.5 Site Fencing

The planned work areas will be small in nature. Additional Site fencing will not be constructed; however, each individual work area will be cordoned off as discussed in Section 6.2.3.

6.3.6 Demobilization

Restoration of the excavation will include replacement of surficial concrete to match existing surfaces. Upon completion of the work, the waste materials (such as general refuse or drill cuttings), and decontamination pad will be removed from the Site and properly disposed of.

6.4 MATERIALS MANAGEMENT PLAN

The purpose of the materials management plan is to establish a protocol outlining the handling of Site soils and other subsurface materials during removal, screening, staging/storage, loading, and off-site disposal. Although no excavation removal action is included with this ROWP, Remedial Optimization activities will include other activities which will involve intrusive work (such as drilling and installation of subgrade piping). All backfill to be imported to the Site for ROWP activities will comprise virgin stone. Intrusive construction work will be conducted in accordance with the procedures defined in the HASP and CAMP, attached as Appendix D.

6.4.1 Materials Load Out

The personnel under the supervision of the Remedial Engineer or a qualified environmental professional will oversee all invasive work and the load-out of all removed material. The Owner and its contractors will be responsible for safe execution of all invasive and other work performed under this ROWP.

The presence of utilities and easements on the Site will be investigated by the Remedial Engineer prior to intrusive activities. It will be determined whether a risk or impediment to the planned work under this ROWP is posed by utilities or easements on the Site.

Loaded vehicles leaving the Site will be appropriately covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

The Owner and associated parties preparing the Remedial Optimization documents submitted to the State, and parties performing this work, are responsible for the safe performance of all invasive work, the structural integrity of excavations, and for structures that may be affected by excavations (such as building foundations and bridge footings) to the extent practicable.

Mechanical processing of historical fill and contaminated soil on-site is prohibited.

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.

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. Queuing of trucks will be performed on-site to minimize off-site disturbance. Off-site queuing will be prohibited.

Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site Remedial Optimization.

Since there is no planned excavation other than trenching, the generated trench spoils will be staged in roll-off containers. As such, a truck wash will not be constructed. Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site Remedial Optimization.

Materials Disposal Off-Site

Disposal locations will be established at a later date and will be reported to the NYSDEC Project Manager prior to removal of material from the Site.

Waste streams expected to be disposed off-site as part of this ROWP may include soil generated from drill cuttings and soil from excavation/trenching of subgrade pipe runs. All soil/fill/solid waste excavated and removed from the Site will be treated as contaminated and regulated material and will be disposed of off-site in accordance with all local, State (including 6NYCRR Part 360), and Federal regulations. If disposal of soil/fill from this Site is proposed for unregulated disposal (i.e., clean soil removed for development purposes), a formal request with an associated plan will be made to NYSDEC's Project Manager. Unregulated off-site management of materials from this Site is prohibited without formal NYSDEC approval.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Historical fill and contaminated soils from the Site are prohibited from being disposed at Part 360-16

Registration Facilities (also known as Soil Recycling Facilities). Material that does not meet Unrestricted Use SCOs is prohibited from being taken to a 6NYCRR Part 360-16 New York State recycling facility. Hazardous waste generated during on-site work will be stored, transported, and disposed of in full compliance with applicable local, State, and Federal regulations.

The following documentation will be obtained and reported by the Remedial Engineer for each disposal location used in this project to fully demonstrate and document that the disposal of material derived from the Site conforms with all applicable laws: (1) a letter from the Remedial Engineer or Owner to the receiving facility describing the material to be disposed and requesting formal written acceptance of the material. This letter will state that material to be disposed is contaminated material generated at a Remedial Optimization Site in New York State. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported (including Site Characterization data); and (2) a letter from all receiving facilities stating it is in receipt of the correspondence (above) and is approved to accept the material. These documents will be included in the Remedial Optimization Summary Report.

Soils that are contaminated but non-hazardous and are being removed from the Site are considered by the Division of Solid & Hazardous Materials (DSHM) in NYSDEC to be Construction and Demolition (C&D) materials with contamination not typical of virgin soils. These soils may be sent to a permitted Part 360 landfill. They may be sent to a permitted C&D processing facility without permit modifications only upon prior notification of NYSDEC Region 2 DSHM. This material is prohibited from being sent or redirected to a Part 360-16 Registration Facility. In this case, as dictated by DSHM, special procedures will include, at a minimum, a letter to the C&D facility that provides a detailed explanation that the material is derived from a DER Remedial Optimization Site, that the soil material is contaminated and that it must not be redirected to on-site or off-site Soil Recycling Facilities. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported.

Appropriately licensed haulers will be used for material removed from this Site and will be in full compliance with all applicable local, State and Federal regulations.

A bill of lading system, or equivalent, will be used for off-site movement of non-hazardous wastes and contaminated soils. This information will be reported in the Remedial Optimization Summary Report.

The Remedial Optimization Summary Report will include an accounting of the destination of all material removed from the Site during these Remedial Optimization activities, including excavated soil, contaminated soil, historic fill, solid waste, hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of all material will include records and approvals for receipt of the material. This information will also be presented in a tabulated form.

6.4.2 Materials Reuse On-Site

Material proposed for reuse on-site shall be sampled in accordance with this section and must meet the lesser of the Commercial or Protection of Groundwater Part 375 SCOs, as listed in

Table 5. The Remedial Engineer will ensure that procedures defined for materials reuse in this ROWP are followed and that unacceptable material will not remain on-site. In compliance with the SMP, contaminated on-site material, including historic fill and contaminated soil, removed for grading or other purposes will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the Site is prohibited for reuse on-site.

Soil or fill material proposed for reuse will be sampled in a manner consistent with DER-10 Section 5.4(e)10. At a minimum, the sampling will be conducted at a frequency of one discrete VOC sample for every 2,000 cubic yards. Acceptable demolition material proposed for reuse on-site, if any, will be sampled for asbestos.

Concrete crushing or processing on-site is prohibited. Note that NYSDEC will consider the use of specially designed devices that are self-contained and capable of providing misting for dust control. DEC approval must be obtained. If dust-free operations are not achieved with such devices, this exception will be revoked.

6.4.3 Fluids Management

All liquids to be removed from the Site will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Liquids discharged into the New York City sewer system will be addressed through approval by NYCDEP.

Discharge of water generated during Remedial Optimization to surface waters (i.e. a local pond, stream or river) is prohibited without a SPDES permit.

6.5 REPORTING

Laboratory analytical data generated as part of this ROWP will be submitted to NYSDEC in electronic format using the EQuIS electronic data deliverable (EDD) format. Copies of all weekly and monthly reports, as discussed further below, will be included in the Remedial Optimization Summary Report.

6.5.1 Weekly Reports

Weekly reports will be submitted to NYSDEC and NYSDOH Project Managers by the end of each week of Remedial Optimization work and will include:

- Work force and visitors to the Site;
- An update of progress made during the reporting day;
- Locations of work and quantities of material imported and exported from the Site;
- References to alpha-numeric grid map for Site activities;
- A summary of any and all complaints with relevant details (names, phone numbers);
- A summary of CAMP findings, including excursions;
- Apparent deviations from this ROWP;
- Weather conditions; and
- An explanation of notable Site conditions.

Weekly reports are not intended to be the mode of communication for notification to the NYSDEC of emergencies (accident, spill), requests for changes to the ROWP, or other sensitive or time critical information. However, such conditions will also be included in the weekly reports. Emergency conditions and changes to the ROWP will be addressed directly to the NYSDEC Project Manager via personal communication (i.e., either e-mail or telephone call).

Weekly reports will include a description of activities keyed to an alpha-numeric grid map for the Site to identify specific work areas (see Figure 8). These reports will include a summary of air sampling results, odor and dust problems and corrective actions, and all complaints received from the public.

The NYSDEC assigned project number (VCP Site Number: V00095) will appear on all reports.

6.5.2 Monthly Reports

Monthly reports will be submitted to NYSDEC and NYSDOH Project Managers within one week following the end of the month of the reporting period and will include:

- Activities relative to the Site during the previous reporting period and those anticipated for the next reporting period, including a quantitative presentation of work performed (i.e. tons of material exported and imported, etc.);
- Description of approved activity modifications, including changes of work scope and/or schedule;
- Sampling results received following internal data review and validation, as applicable; and,
- An update of the Remedial Optimization schedule including the percentage of project completion, unresolved delays encountered or anticipated that may affect the future schedule, and efforts made to mitigate such delays.

6.5.3 Other Reporting

Photographs will be taken of all Remedial Optimization activities and submitted to NYSDEC in digital (JPEG) format. Photos will illustrate all Remedial Optimization program elements and will be of acceptable quality. Representative photos of the Site prior to any Remedial Optimization activities will be provided. Representative photos will be provided of each work area, and Site structures before, during and after Remedial Optimization. Photos will be submitted to NYSDEC on CD or other acceptable electronic media and will be sent to NYSDEC's Project Manager (2 copies) and to NYSDOH's Project Manager (1 copy). CDs will have a label and a general file inventory structure that separates photos into directories and sub-directories according to logical Remedial Optimization components. A photo log keyed to photo file ID numbers will be prepared to provide explanation for all representative photos. Photos will be submitted on a monthly basis or another agreed upon time interval.

Job-site record keeping for all Remedial Optimization work will be appropriately documented. These records will be maintained on-site at all times during the project and be available for inspection by NYSDEC and NYSDOH staff.

6.5.4 Complaint Management Plan

Complaints from the public regarding Site Remedial Optimization activities will be communicated to NYSDEC Project Manager immediately. The response action to the complaint will be coordinated in conjunction with NYSDEC and NYSDOH input, as appropriate.

6.5.5 Deviations from the Remedial Optimization Work Plan

Any material deviations from the NYSDEC-approved ROWP will be communicated to NYSDEC Project Manager in writing, including:

- Reasons for deviating from the approved ROWP; and
- Effect of the deviations on overall Remedial Optimization.

NYSDEC approval will be sought prior to proceeding with work deviating materially from the ROWP. In the event of an emergency change to the work plan, NYSDEC Project Manager will be consulted immediately. All deviations will be summarized in the Remedial Optimization Summary Report.

7.0 RESIDUAL CONTAMINATION AND ENGINEERING CONTROLS

It is anticipated that some residual contaminated soil and groundwater will remain on Site following the completion of Remedial Optimization. To protect against residual contamination, ICs/ECs were executed under the Site-specific SMP and are required to remain in place to protect human health and the environment. These ECs and ICs are described hereafter.

ECs protect public health and the environment by appropriately managing residual contamination. The Controlled Property (the Site) has two primary EC systems to manage residual contamination. These are: (1) a composite cover system consisting of asphalt covered roads, concrete covered sidewalks, and concrete building slabs; and (2) an AS/SVE system.

7.1 COMPOSITE COVER SYSTEM

A composite cover system is currently in place across the entire Site and composed of asphalt pavement, concrete-covered sidewalks, concrete building slabs and driveways, and soil in discrete landscaped areas of the parking lot. The composite cover system constituents are not expected to be materially altered as part of the Remedial Optimization work, which consists of drilling or excavating through the concrete to install soil borings, injection wells, and SVE wells and associated piping. The surficial concrete will be restored using minimum 6-inch thick concrete.

An Excavation Work Plan was included with the SMP, which outlines the procedures required in the event the cover system and/or underlying soil, including potential residual contaminated material, are disturbed. All excavation procedures will comply with the Excavation Work Plan

During construction of the Home Depot building, a polyethylene moisture/vapor barrier consisting of polyethylene sheeting was installed below the concrete slab- on-grade to reduce the potential for soil vapor intrusion. During excavation of test pits inside the building as part of the 2010 AS/SVE expansion, polyethylene sheeting with an estimated thickness of 6 mils was observed below the main store building slab. All vapor barriers encountered during the work will be restored in kind.

7.2 AS/SVE SYSTEM

The existing AS/SVE system comprises underground AS and SVE wells installed in each of the two source areas (the western source area, underneath the Garden Center, and the southwestern source area in the southwestern corner of the Site), presumed downgradient regions (directly east and south of the source areas), and along the presumed downgradient boundaries of the Site (the retaining walls at the southern and eastern perimeters of the Site). The AS/SVE wells are connected via piping/tubing to abovegrade AS/SVE system 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, and Zones 7 through 10 are controlled by two SVE blowers and two AS compressors. Effluent vapors from all SVE zones are filtered through activated carbon prior to discharge.

Following the approval of the Remedial Optimization Summary Report, the SMP will be modified to reflect the changes to the AS/SVE system. The AS/SVE system description in the SMP will be modified to remove/discontinue operation of the Initial AS/SVE System (Zones 1 through 6), and add three additional SVE zones, as discussed in Section 5. Routine monitoring, maintenance, and sampling requirements will also be modified to account for the additional SVE zones and removal of the Initial AS/SVE system, as discussed in Section 5.

8.0 CRITERIA FOR COMPLETION OF REMEDIATION AND TERMINATION OF ENGINEERING CONTROLS

8.1.1 Composite Cover System

The composite cover system is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in perpetuity.

8.1.2 Air Sparge and Soil Vapor Extraction System

The AS/SVE system, inclusive of the Remedial Optimization SVE expansion, will not be discontinued without written approval by NYSDEC and NYSDOH. A proposal to discontinue the system may be submitted by the property owner after residual groundwater contamination concentrations: (1) are cleaned up to levels below NYSDEC standards, (2) have become asymptotic over an extended period of time as mandated by the NYSDEC and the NYSDOH, or (3) if 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 NYSDEC and NYSDOH. These sampling/monitoring activities will adhere to stipulations outlined in the Monitoring Plan section of the SMP.

8.1.2.1. Monitored Natural Attenuation

Groundwater monitoring activities to assess natural attenuation following implementation of the remedy will be performed under the SMP, as determined by NYSDOH and NYSDEC, until residual groundwater concentrations are found to be below NYSDEC standards or have become asymptotic over an extended period. Monitoring will continue

until permission to discontinue is granted in writing by NYSDEC and NYSDOH. Monitoring activities are outlined in the Monitoring Plan of the SMP.

9.0 INSTITUTIONAL CONTROLS

Two Institutional Controls (ICs) were established to ensure continual and proper management of residual contamination in perpetuity: a Deed Restriction, and a SMP. ICs provide restrictions on Site usage and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. The Site-specific Deed Restriction has been recorded with Queens County to provide an enforceable means of ensuring the continual and proper management of residual contamination and protection of public health and the environment in perpetuity or until released in writing by NYSDEC. The SMP describes appropriate methods and procedures to ensure compliance with all ECs and ICs that are required by the Deed Restriction. After the Remedial Optimization work is complete, the Site will have residual contamination remaining in place. ECs for the residual contamination will continue to be maintained to render the overall Site remedy protective of public health and the environment. The SMP requires that the grantor of the Deed Restriction and the grantor's successors and assigns adhere to all ECs/ICs placed on this Site by this NYSDEC.

9.1 DEED RESTRICTION

A Deed Restriction was instituted at the Site to restrict land use and prevent future exposure to any contamination remaining at the Site. The Deed Restriction was established as part of the FER and was recorded with the Queens County Clerk in February 2009. A series of ICs are required to implement, maintain and monitor these EC systems, prevent future exposure to residual contamination by controlling disturbances of the subsurface soil and restricting the use of the Site to the uses specified. These ICs are requirements or restrictions placed on the Site that are listed in, and required by, the Deed Restriction. ICs can, generally, be subdivided between controls that support ECs, and those that place general restrictions on Site usage or other requirements. ICs in both of these groups are closely integrated with the SMP, which provides all of the methods and procedures to be followed during all Site work.

The proposed Remedial Optimization work is not expected to impact any Site ICs, as listed below.

The ICs that support ECs are:

- Compliance with the Deed Restriction and the SMP by the Grantee and the Grantee's successors and assigns;
- All ECs must be operated and maintained as specified in the SMP;
- A composite cover system consisting of asphalt covered driveways, concrete covered sidewalks, and concrete building slabs must be inspected, certified and maintained as required in the SMP;
- All ECs on the Controlled Property (Site) must be inspected and certified 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 the SMP;

- Data and information pertinent to Site Management for the Controlled Property must be reported at the frequency and in a manner defined in the SMP; and
- ICs/ECs may not be discontinued without an amendment or extinguishment of the Deed Restriction.

Adherence to these ICs for the Site is mandated by the Deed Restriction and implemented under the SMP (discussed in the following section). The Controlled Property has a series of ICs in the form of Site restrictions and requirements. The 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.

9.2 SITE MANAGEMENT PLAN

Site Management is the last phase of Site remediation and began with the approval of the FER and issuance of the Certificate of Completion (COC) for the Remedial Action, and continues with the proposed Remedial Optimization work. Site Management will continue in perpetuity or until released in writing by NYSDEC. The property owner is responsible to ensure that all Site Management responsibilities defined in the Deed Restriction and the SMP are performed.

The SMP provides a detailed description of the procedures required to manage residual contamination left in place at the Site following completion of the Remedial Action in accordance with the consent order with the NYSDEC. This includes: (1) development, implementation, and management of all ECs/ICs; (2) development and implementation of monitoring systems and a Monitoring Plan; (3) development of a plan to operate and maintain any treatment, collection,

containment, or recovery systems (including, where appropriate, preparation of an Operation and Maintenance Manual); (4) submittal of Periodic Review Reports, performance of inspections and certification of results, and demonstration of proper communication of Site information to NYSDEC; and (5) defining criteria for termination of treatment system operation.

To address these needs, this SMP includes four plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) an Operation and Maintenance Plan for implementation of remedial collection, containment, treatment, and recovery systems; and (4) a Site Management Reporting Plan for submittal of data, information, recommendations, and certifications to NYSDEC. The SMP has been prepared in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, dated May 2010, and the guidelines provided by NYSDEC.

Following completion of the Remedial Optimization work, the SMP will be updated to modify the description of the AS/SVE system to include the three proposed new SVE zones and discontinued operation of the Initial AS/SVE System (Zones 1 through 6), and routine monitoring requirements, including modified groundwater monitoring requirements to continue post-injection monitoring, and modified AS/SVE system monitoring and maintenance requirements to account for the proposed new SVE zones.

10.0 SCHEDULE

Estimated dates for performance of Remedial Optimization work and deliverables are provided below:

Description	**Approximate Duration**
Specification and Contractor Procurement	1 month
Site Preparation	1 month
Injection Bench Scale Test	1 month
Injection and SVE Pilot Scale Test	1 month
ROWP Update Submitted to NYSDEC for Approval	2 months
Full Scale Remedial Optimization Field Work	
(2 rounds of injection, installation of SVE Zones 11 through 13)	6 months
Remedial Optimization Summary Report	2 months

The actual schedule may differ depending on such factors as contractor availability and sequencing, Site constraints, complexity of data collected, and access coordination. The NYSDEC Project Manager will be notified of significant changes to the schedule.

TABLES

Table 1
Home Depot - Rego Park, NY
Groundwater Elevations

Well Number	Total Depth (Ft. below top of casing)	Casing Elevation	Groundwater Depth Feet below top of casing															
			Mar-99	May-00	Sep-00	Nov-00	Jan-01	Mar-01	Apr-01	Aug-01	Nov-01	Mar-02	Jul-02	Nov-02	Feb-03	Sep-03	Aug-05	Feb-08
AMW-1	109.30	67.68	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	51.69
AMW-1R	111.50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AMW-1RA	109.24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AMW-2	57.30	65.67	54.00	NA	NA	53.75	53.92	53.20	53.80	53.50	53.60	54.15	NA	NA	ND	51.61	NA	49.38
AMW-3	63.56	65.51	53.07	53.70	54.25	NA	ND	54.25	53.60	53.10	53.40	54.10	54.35	53.96	53.11	NA	50.17	48.28
AMW-4	64.00	65.58	54.40	54.25	NA	49.80	54.10	ND	ND	ND	NA	54.30	NA	NA	53.48	ND	50.18	49.39
AMW-5	78.00	67.92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	51.92
AMW-6	78.70	65.39	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	49.43
P-1/P-1R	64.10	67.17	NA	56.35	56.35	56.30	56.25	56.80	55.15	51.05	55.90	NA	NA	NA	56.14	NA	53.05	52.22
P-2/P-2R	65.10	64.95	NA	53.50	53.85	53.30	53.35	53.40	53.20	47.20	51.95	NA	53.90	53.85	51.77	50.99	50.03	48.88
P-3	65.20	65.74	NA	54.35	53.90	54.10	54.16	53.40	54.05	51.20	52.20	54.30	54.70	54.40	53.72	51.85	50.72	49.69
P-4	64.00	65.51	NA	54.10	53.90	53.80	54.00	54.30	53.80	53.00	53.40	54.10	54.50	54.30	53.51	51.90	50.78	49.49
P-5	62.20	65.64	NA	54.25	53.90	54.00	54.20	54.35	54.50	52.35	53.60	54.30	55.85	54.50	53.82	51.75	50.58	49.45
P-7	64.90	63.71	NA	49.66	49.40	49.70	50.00	50.05	49.65	49.25	49.50	50.35	50.70	50.50	50.10	48.07	47.00	45.61
P-8	62.25	64.17	NA	51.95	51.75	51.75	51.85	51.95	51.60	51.05	51.25	51.90	52.50	52.30	51.72	NA	47.00	46.87
P-8R	75.00	63.83	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-9	65.21	62.68	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-10	56.83	62.17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-11	60.99	61.43	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-12	53.16	61.31	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-13	84.73	65.32	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-14	59.25	65.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-15	84.98	65.89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-16	59.40	65.57	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-17	110	65.52	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-18	137	65.56	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-19	105	65.84	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-20	134	65.60	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-21	130	67.81	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-22	146	67.63	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 1
Home Depot - Rego Park, NY
Groundwater Elevations

Well Number	Total Depth (Ft. below top of casing)	Casing Elevation	Groundwater Depth Feet below top of casing																
			May-08	Dec-08	Jan-10	May-10	Jul-10	Aug-10	Dec-10	Mar-11	Jun-11	Sep-11	Dec-11	Mar-12	Sep-12	Dec-12	Mar-13	Jun-13	Sep-13
AMW-1	109.30	67.68	51.56	52.19	49.18	49.18	50.80	52.24	51.91	52.31	67.68	51.41	50.70	51.20	51.81	52.00	52.11	52.44	51.95
AMW-1R	111.50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AMW-1RA	109.24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AMW-2	57.30	65.67	49.32	50.15	50.32	48.94	48.40	49.10	49.72	50.11	65.67	49.12	48.66	48.86	49.27	49.70	49.92	50.25	50.10
AMW-3	63.56	65.51	49.15	50.12	49.87	49.21	48.11	48.94	49.66	49.96	65.51	49.11	48.41	48.90	49.34	49.00	49.99	50.00	49.95
AMW-4	64.00	65.58	49.33	50.02	42.00	40.00	38.30	38.00	NA	49.25	65.58	54.81	50.00	50.00	28.23	NA	NA	49.97	49.30
AMW-5	78.00	67.92	51.75	52.53	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AMW-6	78.70	65.39	49.26	50.14	50.03	49.24	48.25	48.81	49.45	49.78	65.39	49.17	48.53	48.85	49.21	49.50	49.97	50.05	49.50
P-1/P-1R	64.10	67.17	51.80	52.65	51.31	51.60	51.18	50.85	52.32	52.59	67.17	51.18	50.66	51.10	51.74	51.50	52.51	52.84	51.70
P-2/P-2R	65.10	64.95	48.71	49.59	47.18	48.38	51.18	48.45	49.18	49.53	64.95	NA	48.15	48.11	49.17	49.10	NA	49.77	49.46
P-3	65.20	65.74	49.60	50.38	50.40	49.28	48.68	49.22	50.02	50.21	65.74	49.28	48.30	49.00	49.48	50.05	50.28	50.45	50.40
P-4	64.00	65.51	49.43	50.25	50.15	49.28	48.25	47.80	56.55	48.51	65.51	49.25	48.51	49.00	49.29	49.54	50.22	50.20	50.05
P-5	62.20	65.64	49.49	50.17	50.33	49.23	48.89	48.96	49.57	50.16	65.64	49.36	48.44	48.91	49.37	49.63	50.03	NA	50.10
P-7	64.90	63.71	45.80	46.26	46.53	45.73	48.40	45.60	46.00	46.34	63.71	45.56	45.05	45.36	45.57	45.95	46.10	NA	46.80
P-8	62.25	64.17	47.10	47.39	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-8R	75.00	63.83	NA	NA	48.38	47.43	46.75	47.15	47.76	48.19	63.71	47.36	46.55	46.87	47.58	47.80	48.00	48.26	48.85
P-9	65.21	62.68	NA	47.29	NA	46.40	45.73	46.16	46.75	47.19	63.71	46.38	45.76	45.70	NA	NA	47.15	NA	NA
P-10	56.83	62.17	NA	46.81	46.80	45.71	45.25	45.62	52.19	45.99	63.71	44.78	NA	52.17	29.22	NA	NA	46.72	46.75
P-11	60.99	61.43	NA	46.16	NA	45.13	44.56	44.90	45.57	45.91	63.71	49.12	44.58	44.59	NA	NA	NA	NA	NA
P-12	53.16	61.31	NA	46.01	46.61	45.17	44.43	45.90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-13	84.73	65.32	NA	50.16	49.97	49.16	48.51	48.91	49.61	49.99	63.71	49.18	48.66	48.90	49.14	49.48	49.93	49.95	50.00
P-14	59.25	65.37	NA	50.04	50.09	49.20	48.66	48.31	49.00	49.99	63.71	49.26	48.35	48.75	NA	NA	49.12	NA	NA
P-15	84.98	65.89	NA	50.39	50.64	49.62	48.78	49.42	49.76	50.46	63.71	49.54	48.96	49.22	NA	NA	50.30	NA	NA
P-16	59.40	65.57	NA	49.75	50.02	49.24	48.81	48.90	49.19	49.97	63.71	49.24	48.42	48.73	NA	NA	NA	NA	NA
P-17	110	65.52	NA	NA	50.33	49.37	48.60	49.02	49.70	50.29	63.71	49.32	48.78	48.94	49.28	49.60	50.01	NA	50.10
P-18	137	65.56	NA	NA	50.38	49.48	48.50	48.80	49.60	50.11	63.71	49.29	48.72	49.00	NA	NA	NA	NA	NA
P-19	105	65.84	NA	NA	50.48	49.54	48.31	48.86	49.77	50.26	63.71	49.42	48.88	49.16	NA	NA	50.51	NA	NA
P-20	134	65.60	NA	NA	50.23	49.14	48.67	48.21	49.75	50.01	63.71	49.26	48.65	48.94	49.49	49.92	50.40	50.33	50.25
P-21	130	67.81	NA	NA	52.69	51.77	51.23	51.45	52.34	52.71	63.71	51.81	51.17	51.41	NA	NA	52.75	NA	NA
P-22	146	67.63	NA	NA	52.38	51.4	50.9	51.01	51.89	52.28	63.71	51.36	50.72	51.2	NA	NA	52.00	NA	NA

Table 1
Home Depot - Rego Park, NY
Groundwater Elevations

Well Number	Total Depth (Ft. below top of casing)	Casing Elevation	Groundwater Depth Feet below top of casing												
			Dec-13	Mar-14	Jun-14	Sep-14	Dec-14	Mar-15	June-15	Sep-15	Dec-15	Mar-16	Jun-16	Sep-16	Dec-16
AMW-1	109.30	67.68	52.75	52.96	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AMW-1R	111.50	NA	NA	NA	NA	NA	NA	54.51	NA	NA	NA	NA	NA	NA	NA
AMW-1RA	109.24	NA	NA	NA	NA	NA	NA	NA	52.04	NA	52.69	52.51	53.26	52.96	52.96
AMW-2	57.30	65.67	50.20	50.90	50.50	49.75	50.30	50.02	49.86	50.03	50.38	51.03	51.08	51.08	51.08
AMW-3	63.56	65.51	50.90	50.40	50.50	49.50	50.10	49.72	49.77	49.94	50.71	50.97	50.92	51.54	51.54
AMW-4	64.00	65.58	50.20	50.60	50.30	49.60	41.60	55.79	53.37	53.30	50.10	50.15	53.81	53.95	51.95
AMW-5	78.00	67.92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AMW-6	78.70	65.39	51.10	50.65	50.55	49.80	50.20	50.00	49.76	50.14	50.42	50.72	50.11	51.21	51.21
P-1/P-1R	64.10	67.17	53.50	52.65	52.65	51.20	51.15	51.23	50.89	51.21	52.23	51.34	51.87	51.88	51.88
P-2/P-2R	65.10	64.95	50.90	50.32	49.80	49.30	49.35	49.52	49.54	49.76	50.19	50.44	50.85	51.88	51.88
P-3	65.20	65.74	50.90	51.00	51.65	50.10	50.60	50.44	50.12	50.43	50.36	50.55	51.04	51.47	51.47
P-4	64.00	65.51	50.65	49.80	50.50	49.70	50.30	49.98	49.82	50.14	50.53	50.82	50.07	51.16	51.16
P-5	62.20	65.64	51.60	50.80	50.30	49.75	50.20	50.11	49.91	51.50	50.52	50.77	50.95	51.31	51.31
P-7	64.90	63.71	46.82	46.54	46.50	46.10	46.05	46.16	46.01	46.26	46.60	46.76	47.11	47.31	47.31
P-8	62.25	64.17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-8R	75.00	63.83	49.50	48.45	48.90	48.00	47.35	48.11	47.97	48.30	48.59	48.96	49.15	49.43	49.43
P-9	65.21	62.68	NA	47.88	NA	NA	NA	NA	47.08	NA	NA	NA	NA	NA	NA
P-10	56.83	62.17	47.16	56.76	47.00	46.50	45.70	43.81	46.91	46.78	47.28	47.18	41.39	45.66	45.66
P-11	60.99	61.43	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-12	53.16	61.31	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-13	84.73	65.32	51.10	50.60	50.50	49.55	49.95	50.02	49.72	51.00	50.41	50.42	50.69	51.23	51.23
P-14	59.25	65.37	NA	50.65	NA	NA	NA	NA	49.40	NA	NA	NA	NA	NA	NA
P-15	84.98	65.89	NA	NA	NA	NA	NA	NA	50.02	NA	NA	NA	NA	NA	NA
P-16	59.40	65.57	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-17	110	65.52	49.20	50.80	50.40	49.75	50.10	50.09	49.87	52.10	50.52	50.58	50.91	51.43	51.43
P-18	137	65.56	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-19	105	65.84	NA	50.92	NA	NA	NA	NA	49.92	NA	NA	NA	NA	NA	NA
P-20	134	65.60	50.85	51.11	50.25	49.90	50.35	50.24	50.04	50.20	50.59	51.02	51.32	51.51	51.51
P-21	130	67.81	NA	53.30	53.00	52.25	52.90	NA	52.63	NA	NA	NA	NA	NA	NA
P-22	146	67.63	NA	53.05	NA	NA	NA	NA	52.23	NA	NA	NA	NA	NA	NA

Table 1
Home Depot - Rego Park, NY
Groundwater Elevations

Well Number	Total Depth (Ft. below top of casing)	Casing Elevation	Groundwater Elevation Feet below top of casing						
			Mar-99	May-00	Sep-00	Nov-00	Jan-01	Mar-01	Apr-01
AMW-1	109.30	67.68	NA	NA	NA	NA	NA	NA	NA
AMW-1R	111.50	NA	NA	NA	NA	NA	NA	NA	NA
AMW-1RA	109.24	NA	NA	NA	NA	NA	NA	NA	NA
AMW-2	57.30	65.67	11.67	NA	NA	11.92	11.75	12.47	11.87
AMW-3	63.56	65.51	12.44	11.81	11.26	NA	ND	11.26	11.91
AMW-4	64.00	65.58	11.18	11.33	NA	15.78	11.48	ND	ND
AMW-5	78.00	67.92	NA	NA	NA	NA	NA	NA	NA
AMW-6	78.70	65.39	NA	NA	NA	NA	NA	NA	NA
P-1/P-1R	64.10	67.17	NA	10.82	10.82	10.87	10.92	10.37	12.02
P-2/P-2R	65.10	64.95	NA	11.45	11.10	11.65	11.60	11.55	11.75
P-3	65.20	65.74	NA	11.39	11.84	11.64	11.58	12.34	11.69
P-4	64.00	65.51	NA	11.41	11.61	11.71	11.51	11.21	11.71
P-5	62.20	65.64	NA	11.39	11.74	11.64	11.44	11.29	11.14
P-7	64.90	63.71	NA	14.05	14.31	14.01	13.71	13.66	14.06
P-8	62.25	64.17	NA	12.22	12.42	12.42	12.32	12.22	12.57
P-8R	75.00	63.83	NA	NA	NA	NA	NA	NA	NA
P-9	65.21	62.68	NA	NA	NA	NA	NA	NA	NA
P-10	56.83	62.17	NA	NA	NA	NA	NA	NA	NA
P-11	60.99	61.43	NA	NA	NA	NA	NA	NA	NA
P-12	53.16	61.31	NA	NA	NA	NA	NA	NA	NA
P-13	84.73	65.32	NA	NA	NA	NA	NA	NA	NA
P-14	59.25	65.37	NA	NA	NA	NA	NA	NA	NA
P-15	84.98	65.89	NA	NA	NA	NA	NA	NA	NA
P-16	59.40	65.57	NA	NA	NA	NA	NA	NA	NA
P-17	110	65.52	NA	NA	NA	NA	NA	NA	NA
P-18	137	65.56	NA	NA	NA	NA	NA	NA	NA
P-19	105	65.84	NA	NA	NA	NA	NA	NA	NA
P-20	134	65.60	NA	NA	NA	NA	NA	NA	NA
P-21	130	67.81	NA	NA	NA	NA	NA	NA	NA
P-22	146	67.63	NA	NA	NA	NA	NA	NA	NA

Table 1
Home Depot - Rego Park, NY
Groundwater Elevations

Well Number	Total Depth (Ft. below top of casing)	Casing Elevation	Groundwater Elevation																
			Aug-01	Nov-01	Mar-02	Jul-02	Nov-02	Feb-03	Sep-03	Aug-05	Feb-08	May-08	Dec-08	Jan-10	Apr-10	Jul-10	Aug-10	Dec-10	Mar-11
AMW-1	109.30	67.68	NA	NA	NA	NA	NA	NA	NA	NA	15.99	16.12	15.49	18.50	18.50	16.88	15.44	15.77	15.37
AMW-1R	111.50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AMW-1RA	109.24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AMW-2	57.30	65.67	12.17	12.07	11.52	NA	NA	ND	14.06	NA	16.29	16.35	15.52	15.35	16.73	17.27	16.57	15.95	15.56
AMW-3	63.56	65.51	12.41	12.11	11.41	11.16	11.55	12.40	NA	15.34	17.23	16.36	15.39	15.64	16.30	17.40	16.57	15.85	15.55
AMW-4	64.00	65.58	ND	NA	11.28	NA	NA	12.10	ND	15.40	16.19	16.25	15.56	23.58	25.58	27.28	27.58	NA	16.33
AMW-5	78.00	67.92	NA	NA	NA	NA	NA	NA	NA	NA	16.00	16.17	15.39	NA	NA	NA	NA	NA	NA
AMW-6	78.70	65.39	NA	NA	NA	NA	NA	NA	NA	NA	15.96	16.13	15.25	15.36	16.15	17.14	16.58	15.94	15.61
P-1/P-1R	64.10	67.17	16.12	11.27	NA	NA	NA	11.03	NA	14.12	14.95	15.37	14.52	15.86	15.57	15.99	16.32	14.85	14.58
P-2/P-2R	65.10	64.95	17.75	13.00	NA	11.05	11.10	13.18	13.96	14.92	16.07	16.24	15.36	17.77	16.57	13.77	16.50	15.77	15.42
P-3	65.20	65.74	14.54	13.54	11.44	11.04	11.34	12.02	13.89	15.02	16.05	16.14	15.36	15.34	16.46	17.06	16.52	#REF!	15.53
P-4	64.00	65.51	12.51	12.11	11.41	11.01	11.21	12.00	13.61	14.73	16.02	16.08	15.26	15.36	16.23	17.26	17.71	8.96	17.00
P-5	62.20	65.64	13.29	12.04	11.34	9.79	11.14	11.82	13.89	15.06	16.19	16.15	15.47	15.31	16.41	16.75	16.68	16.07	15.48
P-7	64.90	63.71	14.46	14.21	13.36	13.01	13.21	13.61	15.64	16.71	18.10	17.91	17.45	17.18	17.98	15.31	18.11	17.71	17.37
P-8	62.25	64.17	13.12	12.92	12.27	11.67	11.87	12.45	NA	17.17	17.30	17.07	16.78	NA	NA	NA	NA	NA	NA
P-8R	75.00	63.83	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15.45	16.40	17.08	16.68	16.07	15.64
P-9	65.21	62.68	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15.39	NA	16.28	16.95	16.52	15.93	15.49
P-10	56.83	62.17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15.36	15.37	16.46	16.92	16.55	9.98	16.18
P-11	60.99	61.43	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15.27	NA	16.30	16.87	16.53	15.86	15.52
P-12	53.16	61.31	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15.30	14.70	16.14	16.88	15.41	NA	NA
P-13	84.73	65.32	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15.16	15.35	16.16	16.81	16.41	15.71	15.33
P-14	59.25	65.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15.33	15.28	16.17	16.71	17.06	16.37	15.38
P-15	84.98	65.89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15.50	15.25	16.27	17.11	16.47	16.13	15.43
P-16	59.40	65.57	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15.82	15.55	16.33	16.76	16.67	16.38	15.60
P-17	110	65.52	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15.19	16.15	16.92	16.50	15.82	15.23
P-18	137	65.56	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15.18	16.08	17.06	16.76	15.96	15.45
P-19	105	65.84	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15.36	16.30	17.53	16.98	16.07	15.58
P-20	134	65.60	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15.37	16.46	16.93	17.39	15.85	15.59
P-21	130	67.81	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15.12	16.04	16.58	16.36	15.47	15.10
P-22	146	67.63	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15.25	16.23	16.73	16.62	15.74	15.35

Table 1
Home Depot - Rego Park, NY
Groundwater Elevations

Well Number	Total Depth (Ft. below top of casing)	Casing Elevation	Groundwater Elevation																
			Jun-11	Sep-11	Dec-11	Mar-12	Sep-12	Dec-12	Mar-13	Jun-13	Sep-13	Dec-13	Mar-14	Jun-14	Sep-14	Dec-14	Mar-15	Jun-15	Sep-15
AMW-1	109.30	67.68	0.00	16.27	16.98	16.48	15.87	15.68	15.57	15.24	15.73	14.93	14.72	NA	NA	NA	NA	NA	NA
AMW-1R	111.50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AMW-1RA	109.24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AMW-2	57.30	65.67	0.00	16.55	17.01	16.81	16.40	15.97	15.75	15.42	15.57	15.47	14.77	15.17	15.92	15.37	15.65	15.81	15.64
AMW-3	63.56	65.51	0.00	16.40	17.10	16.61	16.17	16.51	15.52	15.51	15.56	14.61	15.11	15.01	16.01	15.41	15.79	15.74	15.57
AMW-4	64.00	65.58	0.00	10.77	15.58	15.58	37.35	NA	NA	15.61	16.28	15.38	14.98	15.28	15.98	23.98	9.79	12.21	12.28
AMW-5	78.00	67.92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AMW-6	78.70	65.39	0.00	16.22	16.86	16.54	16.18	15.89	15.42	15.34	15.89	14.29	14.74	14.84	15.59	15.19	15.39	15.63	15.25
P-1/P-1R	64.10	67.17	0.00	15.99	16.51	16.07	15.43	15.67	14.66	12.55	13.69	11.89	12.74	14.52	15.97	16.02	15.94	16.28	15.96
P-2/P-2R	65.10	64.95	0.00	NA	16.80	16.84	15.78	15.85	NA	15.18	15.49	14.05	14.63	15.15	15.65	15.60	15.43	15.41	15.19
P-3	65.20	65.74	0.00	16.46	17.44	16.74	16.26	15.69	15.46	15.29	15.34	14.84	14.74	14.09	15.64	15.14	15.30	15.62	15.31
P-4	64.00	65.51	0.00	16.26	17.00	16.51	16.22	15.97	15.29	15.31	15.46	14.86	15.71	15.01	15.81	15.21	15.53	15.69	15.37
P-5	62.20	65.64	0.00	16.28	17.20	16.73	16.27	16.01	15.61	NA	15.54	14.04	14.84	15.34	15.89	15.44	15.53	15.73	14.14
P-7	64.90	63.71	0.00	18.15	18.66	18.35	18.14	17.76	17.61	NA	16.91	16.89	17.17	17.21	17.61	17.66	17.55	17.70	17.45
P-8	62.25	64.17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-8R	75.00	63.83	0.12	16.47	17.28	16.96	16.25	16.03	15.83	15.57	14.98	14.33	15.38	14.93	15.83	16.48	15.72	15.86	15.53
P-9	65.21	62.68	-1.03	16.30	16.92	16.98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-10	56.83	62.17	-1.54	17.39	NA	NA	NA	NA	NA	15.45	15.42	15.01	5.41	15.17	15.67	16.47	18.36	15.26	15.39
P-11	60.99	61.43	-2.28	12.31	16.85	16.84	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-12	53.16	61.31	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-13	84.73	65.32	1.61	16.14	16.66	16.42	16.18	15.84	15.39	15.37	15.32	14.22	NA	14.82	15.77	15.37	15.30	15.60	14.32
P-14	59.25	65.37	1.66	16.11	17.02	16.62	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-15	84.98	65.89	2.18	16.35	16.93	16.67	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-16	59.40	65.57	1.86	16.33	17.15	16.84	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-17	110	65.52	1.81	16.20	16.74	16.58	16.24	15.92	15.51	NA	15.42	16.32	NA	15.12	15.77	15.42	15.43	15.65	13.42
P-18	137	65.56	1.85	16.27	16.84	16.56	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-19	105	65.84	2.13	16.42	16.96	16.68	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-20	134	65.60	1.89	16.34	16.95	16.66	16.11	15.68	15.20	15.27	15.35	14.75	NA	15.35	15.70	15.25	15.36	15.56	15.40
P-21	130	67.81	4.10	16.00	16.64	16.40	NA	NA	NA	NA	NA	NA	NA	14.81	15.56	14.91	NA	NA	NA
P-22	146	67.63	3.92	16.27	16.91	16.43	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 1
Home Depot - Rego Park, NY
Groundwater Elevations

Well Number	Total Depth (Ft. below op of casing)	Casing Elevation	Groundwater Elevation				
			Dec-15	Mar-16	Jun-16	Sep-16	Dec-16
AMW-1	109.30	67.68	NA	NA	NA	NA	NA
AMW-1R	111.50	NA	NA	NA	NA	NA	NA
AMW-1RA	109.24	NA	NA	NA	NA	NA	NA
AMW-2	57.30	65.67	15.29	14.64	14.59	14.59	14.59
AMW-3	63.56	65.51	14.80	14.54	14.59	13.97	13.97
AMW-4	64.00	65.58	15.48	15.43	11.77	11.63	13.63
AMW-5	78.00	67.92	NA	NA	NA	NA	NA
AMW-6	78.70	65.39	14.97	14.67	15.28	14.18	14.18
P-1/P-1R	64.10	67.17	14.94	15.83	15.30	15.29	15.29
P-2/P-2R	65.10	64.95	14.76	14.51	14.10	13.07	13.07
P-3	65.20	65.74	15.38	15.19	14.70	14.27	14.27
P-4	64.00	65.51	14.98	14.69	15.44	14.35	14.35
P-5	62.20	65.64	15.12	14.87	14.69	14.33	14.33
P-7	64.90	63.71	17.11	16.95	16.60	16.40	16.40
P-8	62.25	64.17	NA	NA	NA	NA	NA
P-8R	75.00	63.83	15.24	14.87	14.68	14.40	14.40
P-9	65.21	62.68	NA	NA	NA	NA	NA
P-10	56.83	62.17	14.89	14.99	20.78	16.51	16.51
P-11	60.99	61.43	NA	NA	NA	NA	NA
P-12	53.16	61.31	NA	NA	NA	NA	NA
P-13	84.73	65.32	14.91	14.90	14.63	14.09	14.09
P-14	59.25	65.37	NA	NA	NA	NA	NA
P-15	84.98	65.89	NA	NA	NA	NA	NA
P-16	59.40	65.57	NA	NA	NA	NA	NA
P-17	110	65.52	15.00	14.94	14.61	14.09	14.09
P-18	137	65.56	NA	NA	NA	NA	NA
P-19	105	65.84	NA	NA	NA	NA	NA
P-20	134	65.60	15.01	14.58	14.28	14.09	14.09
P-21	130	67.81	NA	NA	NA	NA	NA
P-22	146	67.63	NA	NA	NA	NA	NA

Table 2
Home Depot - Rego Park, NY
Well Construction Details

Well Designation	Screened Interval (Ft. below grade)
AMW-1RA	105-110
AMW-2	49-64
AMW-3	49-64
AMW-4	68-78
AMW-5	70-80
AMW-6	70-80
P-1R	54-64
P-2	55-65
P-3	55-65
P-4	55-65
P-5	58-63
P-7	55-65
P-8R	65-75
P-9	61-66
P-10	52-57
P-11	57-62
P-12	47-52
P-13	75-85
P-14	50-60
P-15	75-85
P-16	50-60
P-17	100-110
P-18	127-137
P-19	95-105
P-20	124-134
P-21	120-130
P-22	136-146

Table 3
Home Depot - Rego Park, NY
Historic Groundwater PCE Concentrations

Tetrachloroethene (in µg/L)	Wells screened across the groundwater surface (about 50' below grade)									Wells screened across the groundwater surface (about 50' below grade)		
Sample ID	**P-1**	**P-1R**	**P-2**	**P-2R**	**P-3**	**P-4**	**P-5**	**P-7**	**P-8**	**P-10**	**P-12**	**P-14**
Jan-01	24,000	NA	760	NA	2200	170	3	41	19	NA	NA	NA
Mar-01	18,000	NA	660	NA	390	460	3	51	6	NA	NA	NA
Apr-01	26,000	NA	220	NA	2000	170	2	20	10	NA	NA	NA
Aug-01	17,000	NA	600	NA	26	130	13	19	6	NA	NA	NA
Nov-01	14,000	NA	1500	NA	70	160	4	15	5	NA	NA	NA
Mar-02	23,000	NA	1000	NA	1400	220	1	13	4	NA	NA	NA
Jul-02	22,000	NA	1,600	NA	3,700	1,700	2	34	10	NA	NA	NA
Nov-02	7,700	NA	99	NA	1,300 D	180 D	2 J	6	2 J	NA	NA	NA
Feb-03	15,000 B	NA	380 B	NA	820 B	160 B	2 JB	7 B	3 JB	NA	NA	NA
Sep-03	20,000	NA	18	NA	1,200	930	3	14	6	NA	NA	NA
Feb-04	5,200	NA	100	NA	1,700	1,000	3	13	5	NA	NA	NA
Feb-06	5,300	NA	8.1	NA	1,200	580	1.6 J	16	1.4 J	NA	NA	NA
Jun-06	6,700	NA	7.8	NA	1,300	560	1.2 J	21	1.6 J	NA	NA	NA
Sep-06	5,100	NA	52	NA	1,300	510	0.84 J	10	6.1	NA	NA	NA
Jan-07	6,500	NA	9.4	NA	1,400	480 B	2.3 J	9.2 B	8.4 B	NA	NA	NA
Apr-07	3,500	NA	7.5	NA	1,200	350	1.5 J	6.5	110	NA	NA	NA
Jul-07	2,200	NA	600	NA	1,200	330	3.1 J	5.5	220	NA	NA	NA
Oct-07	3,400	NA	4.6 J	NA	690	330	2.9 J	4.1 J	760	NA	NA	NA
May-08	4,500	NA	5.9	NA	660	260	3.7 J	6.6	210	NA	NA	NA
Sep-08	5,900	NA	8.7	NA	750	760	7	3.4 J	49	NA	NA	NA
Dec-08	4600 H	NA	7.9	NA	780	360 H	2.2 J H	9.2	77 H	2,400 H	2,700 H	8
Jan/Feb-09	5,100	NA	12	NA	620	290	3.9 J	2.2 J	240	NA	NA	NA
Mar/Apr-09	6400	NA	9	NA	630	510	2.3 J	6.2	42	1,300	6,900	6.6
Jun-09	4500	NA	8.9	NA	740	590	5.5	6.3	NA	1,900	5,300	7.8
Sep-09	47,000	NA	6.9	NA	550	610	5.2	7.8	NA	2,500	4,300	8.4
Jan-10	2,600	NA	36	NA	550	400	6.8	3.1 J	NA	6,100	250	4.3 J
Apr-10	15,000	NA	3.1 J	NA	390	350	5.6	5.3	NA	320	1,100	7.9
Jul-10	14,000	NA	370	NA	530	250	7.5	3.4 J	NA	800	1,000	5
Aug-10	3,900	NA	NA	NA	1,100	16	3 J	4.6 J	NA	110	830	3.7 J
Dec-10	6,400	NA	NA	NA	730	12	2 J	7.6	NA	1,400	NA	0.81 U
Apr-11	9,300	NA	NA	NA	960	59	2 J	7.6	NA	1,200	NA	0.81 U
Jun-11	3,000	NA	NA	NA	NS	150	2.2	2.6	NA	890	NA	0.89
Sep-12	2,000	NA	NA	NA	480	4.1 J	2.8 J	4.8 J	NA	760	NA	1.2 J
Dec-12	4,300	NA	NA	120	520	210	3	1.9	NA	130	NA	0.51 J
Mar-12	3,500	NA	NA	350	740	430	1.6	4.7	NA	170	NA	0.9 J
Jun-12	4,500	NA	NA	130	130	230	3.3	4.7	NA	97	NA	88
Sep-12	1,600	NA	NA	190	490	35	2.3	4	NA	62	NA	NA
Dec-12	660	NA	NA	110	350	20	2.1	3.3	NA	37	NA	NA
Mar-13	2,000	NA	NA	130	250	26	2.5	4.7	NA	38	NA	0.61 J
Jun-13	5,000 J**	NA	NA	310 J**	350 J**	30 J**	1.9 J**	5.2 J**	NA	84 J**	NA	NA
Sep-13	1400	NA	NA	190	340	67	1.1	4.7	NA	53	NA	NA
Dec-13	5,200	NA	NA	100	370	83	17	5.7	NA	15	NA	NA
Mar-14	1200	NA	NA	390	400	88	0.98 J	2.8	NA	67	NA	NA
Jun-14	NA	680	NA	410	470	130	0.61 J	2.4	NA	40	NA	NA
Sep-14	NA	520	NA	180	560	170	1.2	3.1	NA	160	NA	NA
Dec-14	NA	1,400	NA	78	680	4.4	1.0	3.1	NA	14	NA	NA
Mar-15	NA	1,700	NA	26	460	7.5	1.2	1.8	NA	19	NA	NA
Jun-15	NA	1,400	NA	78	680	4.4	1	3.1	NA	39	NA	0.12 U
Sep-15	NA	770	NA	70	480	65	1	2.7	NA	75	NA	NA
Dec-15	NA	520	NA	23	600	6.4	0.79 J	2.9	NA	220	NA	NA
Mar-16	NA	3,300	NA	150	150	47	1.4	1.3	NA	6.9	NA	NA
Jun-16	NA	2,800	NA	120	410 J	51	1.6	32	NA	15	NA	0.12
Sep-16	NA	2,600	NA	100	440	65	1.2	2.7	NA	13	NA	NA

Table 3
Home Depot - Rego Park, NY
Historic Groundwater PCE Concentrations

Tetrachloroethene (in µg/L)	Wells screened across the groundwater surface (about 50' below grade)				Wells screened 10' below groundwater surface (about 60' below grade)		Wells screened 20' below groundwater surface (about 70' below grade)			Wells screened 30' below groundwater surface (about 80' below grade)	
Sample ID	**P-16**	**AMW-2**	**AMW-3**	**AMW-4**	**P-9**	**P-11**	**P-8R**	**AMW-5**	**AMW-6**	**P-13**	**P-15**
Jan-01	NA	3100	9400	5900	NA	NA	NA	NA	NA	NA	NA
Mar-01	NA	4300	4300	5800	NA	NA	NA	NA	NA	NA	NA
Apr-01	NA	4700	7100	5400	NA	NA	NA	NA	NA	NA	NA
Aug-01	NA	4000	9400	3800	NA	NA	NA	NA	NA	NA	NA
Nov-01	NA	4300	4300	600	NA	NA	NA	NA	NA	NA	NA
Mar-02	NA	2100	12000	3500	NA	NA	NA	NA	NA	NA	NA
Jul-02	NA	2,200	6,200	6,600	NA	NA	NA	NA	NA	NA	NA
Nov-02	NA	2,800 D	3,600 D	3,800 D	NA	NA	NA	NA	NA	NA	NA
Feb-03	NA	3,800	4,400	2,800	NA	NA	NA	NA	NA	NA	NA
Sep-03	NA	1,800	3,800	7,900	NA	NA	NA	NA	NA	NA	NA
Feb-04	NA	2,000	6,500	2,600	NA	NA	NA	2,800	730	NA	NA
Feb-06	NA	250	3,600	1,700	NA	NA	NA	340	680	NA	NA
Jun-06	NA	160	4,600	6,900	NA	NA	NA	3,000	720	NA	NA
Sep-06	NA	930	2,500	3,700	NA	NA	NA	3,000	490	NA	NA
Jan-07	NA	710	1,100	2,000 B	NA	NA	NA	8,700 B	NA	NA	NA
Apr-07	NA	480	3,400	830	NA	NA	NA	3,000	300	NA	NA
Jul-07	NA	770	2,900	1,400	NA	NA	NA	15,000	240	NA	NA
Oct-07	NA	550	2,900	1,600	NA	NA	NA	5,500	230	NA	NA
May-08	NA	200	3,400	1,900	NA	NA	NA	5,400	320	NA	NA
Sep-08	NA	120	4,000	2,600	NA	NA	NA	3,900	870	NA	NA
Dec-08	3 J	79 H	3,700 H	2,800 H	660 H	160	NA	410 H	1,400 H	320 H	190
Jan/Feb-09	NA	270	3,500	1,000	NA	NA	NA	7600	250	NA	NA
Mar/Apr-09	2 J	210	3,400	3,900	790	110	NA	440	420	68	33
Jun-09	6.7	NA	3,700	3,600	370	180	NA	2,000	1,000	220	150
Sep-09	6.6	650	3,700	2,600	210	110	170	NA	1,000	200	230
Jan-10	4.4 J	80	2,000	680	1,200	150	39	NA	730	280	120
Apr-10	8	600	4,000	1,700	160	84	82	NA	820	2.9 J	240
Jul-10	6.3	750	4,900	760	190	71	32	NA	610	160	59
Aug-10	1.9 J	370	7,500	310	330	85	40	NA	320	40	24
Dec-10	1.9 J	300	5,900	730	2,400	160	150	NA	670	130	48
Apr-11	1.4 J	280	5,500	950	780	70	81	NA	380	200	39
Jun-11	3.8	530	4,600	790	320	54	26	NA	170	130	38
Sep-12	3.8 J	590	3,800	620	360	290	44	NA	270	26	39
Dec-12	3.7	550	3,300	680	110	450	96	NA	430	290	8.7
Mar-12	5.5	580	4,800	620	110	500	55	NA	330	9.1	5.4
Jun-12	2	470	3,600	760	81	45	89	NA	36	0.3 J	28
Sep-12	NA	220	3,100	670	NA	NA	110	NA	6.1	11	NA
Dec-12	NA	90	4,300	440	NA	NA	69	NA	3.9	9.2	NA
Mar-13	NA	48	3,600	450	29	NA	64	NA	7.6	0.45 J	16
Jun-13	NA	59 J**	2,500 J**	400 J**	NA	NA	41 J**	NA	140 J**	0.7 J	NA
Sep-13	NA	77	2,400	300	NA	NA	31	NA	130	100	NA
Dec-13	NA	140 J**	3,500	370	NA	NA	29	NA	130	100	NA
Mar-14	NA	340	2,500	150	NA	NA	6.8	NA	230	0.66	NA
Jun-14	NA	1,000	2,400	280	NA	NA	15	NA	90	33	NA
Sep-14	NA	410	1,800	340	NA	NA	45 J-	NA	170	28	NA
Dec-14	NA	120	1,800	490	NA	NA	21	NA	3.6	19	NA
Mar-15	NA	230	4,000	1,300	NA	NA	10	NA	9.4	5.3	NA
Jun-15	NA	350	6,600	1,800	13	NA	6.2	NA	98	5	3.8
Sep-15	NA	99	3,200	1,500	NA	NA	15	NA	99	14	NA
Dec-15	NA	100	5,200	1,600	NA	NA	6.7	NA	160	2.1	NA
Mar-16	NA	520	3,700	1,800	NA	NA	4.9	NA	28	29	NA
Jun-16	NA	750	4,600	1,300	23	NA	6.8	NA	6.5	11	14
Sep-16	NA	580	5,400	1,200	NA	NA	7.5	NA	16	18	NA

Table 3
Home Depot - Rego Park, NY
Historic Groundwater PCE Concentrations

Tetrachloroethene (in µg/L)	Wells screened 50' below groundwater surface (about 100' below grade)				Well screened 70' below groundwater surface (about 120' below grade)	Wells screened just above the clay confining layer (identified about 134' to 146' below grade)		
Sample ID	**AMW-1**	**AMW-1RA**	**P-17**	**P-19**	**P-21**	**P-18**	**P-20**	**P-22**
Jan-01	NA	NA	NA	NA	NA	NA	NA	NA
Mar-01	NA	NA	NA	NA	NA	NA	NA	NA
Apr-01	NA	NA	NA	NA	NA	NA	NA	NA
Aug-01	NA	NA	NA	NA	NA	NA	NA	NA
Nov-01	NA	NA	NA	NA	NA	NA	NA	NA
Mar-02	NA	NA	NA	NA	NA	NA	NA	NA
Jul-02	NA	NA	NA	NA	NA	NA	NA	NA
Nov-02	NA	NA	NA	NA	NA	NA	NA	NA
Feb-03	NA	NA	NA	NA	NA	NA	NA	NA
Sep-03	NA	NA	NA	NA	NA	NA	NA	NA
Feb-04	310	NA	NA	NA	NA	NA	NA	NA
Feb-06	240	NA	NA	NA	NA	NA	NA	NA
Jun-06	120	NA	NA	NA	NA	NA	NA	NA
Sep-06	92	NA	NA	NA	NA	NA	NA	NA
Jan-07	85	NA	0.74	NA	NA	NA	NA	NA
Apr-07	27	NA	NA	NA	NA	NA	NA	NA
Jul-07	54	NA	NA	NA	NA	NA	NA	NA
Oct-07	52	NA	NA	NA	NA	NA	NA	NA
May-08	43	NA	NA	NA	NA	NA	NA	NA
Sep-08	49	NA	NA	NA	NA	NA	NA	NA
Dec-08	54	NA	NA	NA	NA	NA	NA	NA
Jan/Feb-09	52	NA	NA	NA	NA	NA	NA	NA
Mar/Apr-09	34	NA	NA	NA	NA	NA	NA	NA
Jun-09	44	NA	NA	NA	NA	NA	NA	NA
Sep-09	54	NA	99	350	1,000	0.95 J	4.8 J	100
Jan-10	69	NA	0.81 U	0.81 J	68	1.4 J	400	38
Apr-10	180	NA	30	220	150	8.1 U	0.81 U	75
Jul-10	2,500	NA	110	300	90	0.99 J	0.93 J	28
Aug-10	4,700	NA	66	190	51	0.81 U	3.4 J	98
Dec-10	1,700	NA	88	4.3 J	160	0.81 U	160	280
Apr-11	4,900	NA	35	0.81 U	110	0.81 U	130	190
Jun-11	3,600	NA	89	11	130	0.81 U	66	52
Sep-12	330	NA	16	0.81 U	110	1.2 J	110	3.3 J
Dec-12	88	NA	59	2.6	46	0.2 U	98	1.7
Mar-12	120	NA	36	1.8	5.8	0.34 J	44	1.2
Jun-12	370	NA	88	140	210	0.4 J	130	16
Sep-12	3,300	NA	20	NA	NA	NA	78	NA
Dec-12	220	NA	35	NA	NA	NA	1 U	NA
Mar-13	1,800	NA	88	67	56	NA	1.1	17
Jun-13	740 J**	NA	NA	NA	NA	NA	1.9 J**	NA
Sep-13	440	NA	84	NA	NA	NA	0.98 J	NA
Dec-13	1,800	NA	86	NA	NA	NA	1.6	NA
Mar-14	770	NA	66	NA	NA	NA	3.3	NA
Jun-14	NA	NA	26	NA	3	NA	0.4	NA
Sep-14	NA	NA	3.2	NA	100	NA	16	NA
Dec-14	NA	NA	62	NA	130	NA	0.2 J	NA
Mar-15	NA	NA	46	NA	NA	NA	0.36	NA
Jun-15	NA	3.8	36	66	20	NA	0.12 U	3.6
Sep-15	NA	1	8.9	NA	NA	NA	0.3 J	NA
Dec-15	NA	4.8	8.9	NA	NA	NA	1.1	NA
Mar-16	NA	0.65	8.9	NA	NA	NA	0.38 J	NA
Jun-16	NA	1.8	1.5	51	24	NA	0.37 J	11
Sep-16	NA	10	6.3	NA	NA	NA	0.47 J	NA

Table 4
Home Depot - Rego Park, NY
Emergency Contact List

Company	Individual Name	Title	Contact Number
AKRF	Marc Godick	Project Director	914-922-2356 (office)
	Eric Park	Project Manager	646-388-9532 (office) 646-752-5332 (cell)
	Steve Grens	Field Team Leader, SSO	914-922-2371 (office) 203-210-6513 (cell)
Home Depot	Terri Brophy	Client Representative	781-956-7785 (cell)
NYSDEC	Sadique Ahmed	Project Manager	518-402-9656
NYSDOH	To Be Determined	Project Manager	
Driller	To Be Determined		
Excavator	To Be Determined		
Ambulance, Fire Department & Police Department			911
NYSDEC Spill Hotline			800-457-7362

Table 5
Home Depot - Rego Park, NY
Proposed Backfill Analysis/Reuse Criteria

	CAS #	NYSDEC Part 375 Commercial SCO mg/kg	NYSDEC Part 375 Protection of Groundwater SCO mg/kg	NYSDEC Part 375 Lower Commercial Protection GW SCO mg/kg
Volatile organic compounds				
1,1,1-Trichloroethane	71-55-6	**500**	**0.68**	**0.68**
1,1,2,2-Tetrachloroethylene	127-18-4	**150**	**1.3**	**1.3**
1,1-Dichloroethane	75-34-3	**240**	**0.27**	**0.27**
1,1-Dichloroethene	75-35-4	**500**	**0.33**	**0.33**
1,2,4-Trimethylbenzene	95-63-6	**190**	**3.6**	**3.6**
1,2-Dichlorobenzene	95-50-1	**500**	**1.1**	**1.1**
1,2-Dichloroethane	107-06-2	**30**	**0.02**	**0.02**
1,3,5-Trimethylbenzene	108-67-8	**190**	**8.4**	**8.4**
1,3-Dichlorobenzene	541-73-1	**280**	**2.4**	**2.4**
1,4-Dichlorobenzene	106-46-7	**130**	**1.8**	**1.8**
1,4-Dioxane	123-91-1	**130**	**0.1**	**0.1**
2-Butanone	78-93-3	**500**	**0.12**	**0.12**
Acetone	67-64-1	**500**	**0.05**	**0.05**
Benzene	71-43-2	**44**	**0.06**	**0.06**
Carbon tetrachloride	56-23-5	**22**	**0.76**	**0.76**
Chlorobenzene	108-90-7	**500**	**1.1**	**1.1**
Chloroform	67-66-3	**350**	**0.37**	**0.37**
cis-1,2-Dichloroethene	156-59-2	**500**	**0.25**	**0.25**
Ethylbenzene	100-41-4	**390**	**1**	**1**
Hexachlorobenzene	118-74-1	**6**	**3.2**	**3.2**
Methyl ethyl ketone	78-93-3	**500**	**0.12**	**0.12**
Methyl tert-butyl ether	1634-04-4	**500**	**0.93**	**0.93**
Methylene chloride	75-09-2	**500**	**0.05**	**0.05**
m-Xylene	108-38-3	**500 TS**	**1.6 TS**	**1.6TS**
Naphthalene	91-20-3	**500**	**12**	**12**
n-Butylbenzene	104-51-8	**500**	**12**	**12**
n-Propylbenzene	103-65-1	**500**	**3.9**	**3.9**
o-Xylene	95-47-6	**500 TS**	**1.6 TS**	**1.6TS**
p/m-Xylene	179601-23-1	**500 TS**	**1.6 TS**	**1.6TS**
p-Xylene	106-42-3	**500 TS**	**1.6 TS**	**1.6TS**
sec-Butylbenzene	135-98-8	**500**	**11**	**11**
tert-Butylbenzene	98-06-6	**500**	**5.9**	**5.9**
Tetrachloroethene	127-18-4	**150**	**1.3**	**1.3**
Toluene	108-88-3	**500**	**0.7**	**0.7**
trans-1,2-Dichloroethene	156-60-5	**500**	**0.19**	**0.19**
Trichloroethene	79-01-6	**200**	**0.47**	**0.47**
Vinyl chloride	75-01-4	**13**	**0.02**	**0.02**
Xylene (Total)	1330-20-7	**500**	**1.6**	**1.6**

Table 5
Home Depot - Rego Park, NY
Proposed Backfill Analysis/Reuse Criteria

	CAS #	NYSDEC Part 375 Commercial SCO mg/kg	NYSDEC Part 375 Protection of Groundwater SCO mg/kg	NYSDEC Part 375 Lower Commercial Protection GW SCO mg/kg
Semivolatile organic compounds				
1,2-Dichlorobenzene	95-50-1	**500**	**1.1**	**1.1**
1,3-Dichlorobenzene	541-73-1	**280**	**2.4**	**2.4**
1,4-Dichlorobenzene	106-46-7	**130**	**1.8**	**1.8**
2-Methylphenol	95-48-7	**500**	**0.33**	**0.33**
Acenaphthene	83-32-9	**500**	**98**	**98**
Acenapthylene	208-96-8	**500**	**107**	**107**
Anthracene	120-12-7	**500**	**1,000**	**500**
Benz(a)anthracene	56-55-3	**5.6**	**1**	**1**
Benzo(a)pyrene	50-32-8	**1**	**22**	**1**
Benzo(b)fluoranthene	205-99-2	**5.6**	**1.7**	**1.7**
Benzo(g,h,i)perylene	191-24-2	**500**	**1,000**	**500**
Benzo(k)fluoranthene	207-08-9	**56**	**1.7**	**1.7**
Chrysene	218-01-9	**56**	**1**	**1**
Dibenz(a,h)anthracene	53-70-3	**0.56**	**1,000**	**0.56**
Dibenzofuran	132-64-9	**350**	**210**	**210**
Fluoranthene	206-44-0	**500**	**1,000**	**500**
Fluorene	86-73-7	**500**	**386**	**386**
Hexachlorobenzene	118-74-1	**6**	**3.2**	**3.2**
Indeno(1,2,3-cd)pyrene	193-39-5	**5.6**	**8.2**	**5.6**
m+pMethylphenol	65794-96-9	**500**	**0.33**	**0.33**
m-Cresol	108-39-4	**500**	**0.33**	**0.33**
Naphthalene	91-20-3	**500**	**12**	**12**
o-Cresol	95-48-7	**500**	**0.33**	**0.33**
p-Cresol	106-44-5	**500**	**0.33**	**0.33**
Pentachlorophenol	87-86-5	**6.7**	**0.8**	**0.8**
Phenanthrene	85-01-8	**500**	**1,000**	**500**
Phenol	108-95-2	**500**	**0.33**	**0.33**
Pyrene	129-00-0	**500**	**1,000**	**500**

Table 5
Home Depot - Rego Park, NY
Proposed Backfill Analysis/Reuse Criteria

	CAS #	NYSDEC Part 375 Commercial SCO mg/kg	NYSDEC Part 375 Protection of Groundwater SCO mg/kg	NYSDEC Part 375 Lower Commercial Protection GW SCO mg/kg
Metals				
Arsenic	7440-38-2	**16**	**16**	**16**
Barium	7440-39-3	**400**	**820**	**400**
Beryllium	7440-41-7	**590**	**47**	**47**
Cadmium	7440-43-9	**9.3**	**7.5**	**7.5**
Chromium, hexavalent	18540-29-9	**400**	**19**	**19**
Chromium, trivalent	16065-83-1	**1,500**	**NS**	**1500 (NS)**
Copper	7440-50-8	**270**	**1,720**	**270**
Cyanide	57-12-5	**27**	**40**	**27**
Lead	7439-92-1	**1,000**	**450**	**450**
Manganese	7439-96-5	**10,000**	**2,000**	**2000**
Mercury	7439-97-6	**2.8**	**0.73**	**0.73**
Nickel	7440-02-0	**310**	**130**	**130**
Selenium	7782-49-2	**1,500**	**4**	**4**
Silver	7440-22-4	**1,500**	**8.3**	**8.3**
Zinc	7440-66-6	**10,000**	**2,480**	**2480**
PCBs/Pesticides				
2,4,5-TP Acid (Silvex)	93-72-1	**500**	**3.8**	**3.8**
4,4'-DDD	72-54-8	**92**	**14**	**14**
4,4'-DDE	72-55-9	**62**	**17**	**17**
4,4'-DDT	50-29-3	**47**	**136**	**47**
Aldrin	309-00-2	**0.68**	**0.19**	**0.19**
alpha-BHC	319-84-6	**3.4**	**0.02**	**0.02**
beta-BHC	319-85-7	**3**	**0.09**	**0.09**
Chlordane (alpha)	5103-71-9	**24**	**2.9**	**2.9**
delta-BHC	319-86-8	**500**	**0.25**	**0.25**
Dibenzofuran	132-64-9	**350**	**210**	**210**
Dieldrin	60-57-1	**1.4**	**0.1**	**0.1**
Endosulfan I	959-98-8	**200 TS**	**102 TS**	**102TS**
Endosulfan II	33213-65-9	**200 TS**	**102 TS**	**102TS**
Endosulfan I and Endosulfan II (alpha	115-29-7	**200 TS**	**102 TS**	**102TS**
Endosulfan sulfate	1031-07-8	**200 TS**	**1000 TS**	**200TS**
Endrin	72-20-8	**89**	**0.06**	**0.06**
Heptachlor	76-44-8	**15**	**0.38**	**0.38**
Lindane	58-89-9	**9.2**	**0.1**	**0.1**
Polychlorinated biphenyls (Total)	1336-36-3	**1**	**3.2**	**1**

Tables 1-5
Home Dept - Rego Park, NY
Notes

GENERAL

NS : No standard listed

ND : No Detect

NA : Not analyzed

U : The analyte was not detected at the indicated concentration

SB : Site Background

J : Estimated Value, below quantification limit

B : Compound found in the blank

D : Value from sample run at a secondary dilution

M : Manually intergrated compound

M1 : Matrix interference due to coelution with a non-target compound; results may be biased high.

E : Estimated value because of interference

H : Sample was analyzed after specified hold time

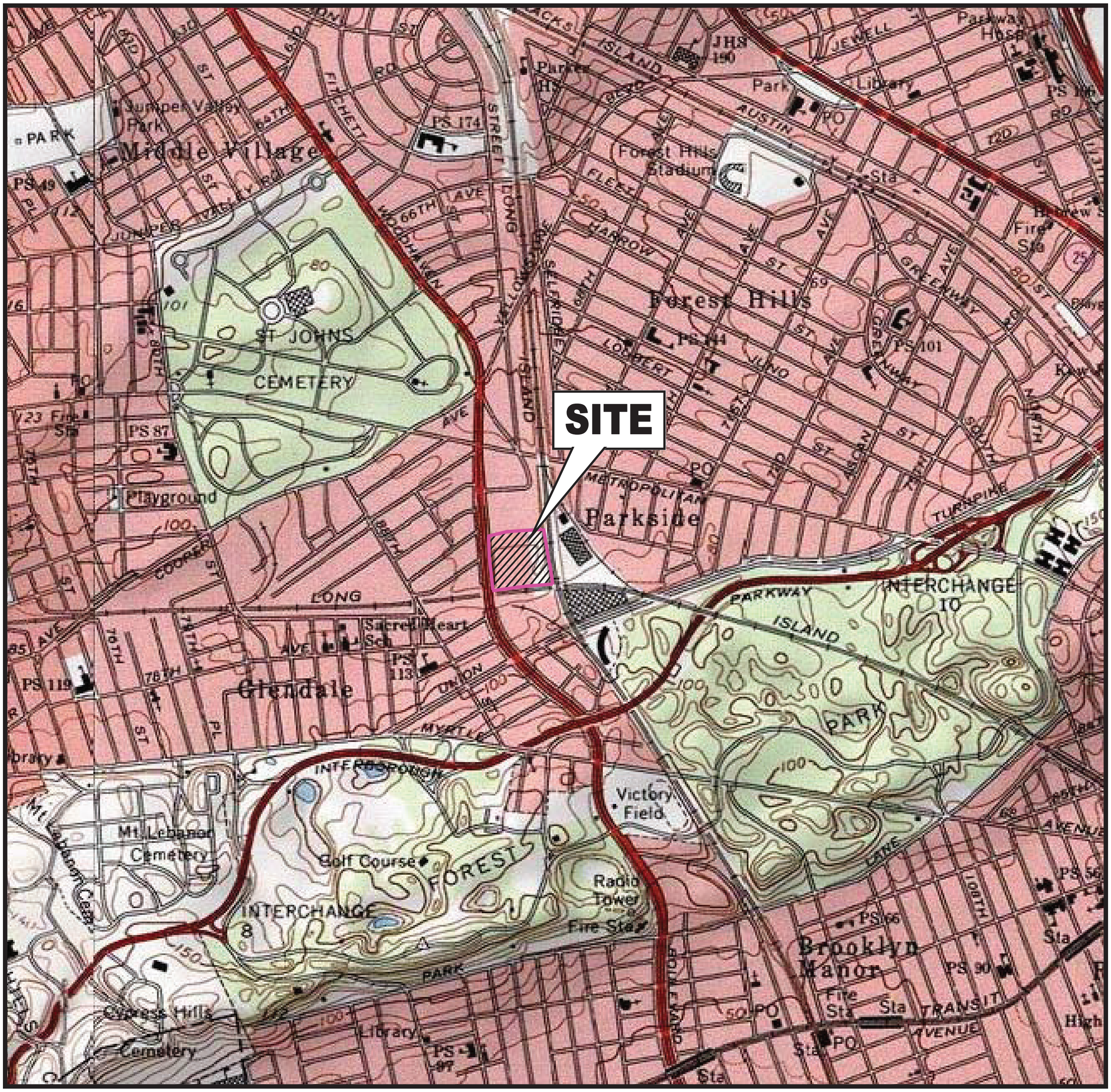
b.g.s. : Below ground surface

SOIL

NYSDEC Part 375 SCOs Soil Cleanup Objectives (SCOs) for unrestricted use listed in New York State Department of Environmental Conservation (NYSDEC) Subpart 375-6.5

mg/kg : milligrams per kilogram = parts per million (ppm)

FIGURES



SCALE IN FEET

0' 1000' 2000' 4000'

SCALE: 1"=2000'

QUADRANGLE

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

N

HOME DEPOT—REGO PARK
Rego Park, New York

SITE LOCATION MAP

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

DATE	PROJECT No.	FIGURE No.
05.01.04	03399	1

FORMER OUTPARCEL
ADDED TO VCP IN 2012

GLENDALE PARCEL

ADI
PARCEL

0' 50' 100' 200'
SCALE IN FEET

LEGEND:

PCE SOURCE AREAS

Source: 2010 New York Statewide Digital Orthoimagery

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AKRF
Engineering, P.C.
440 Park Avenue South, New York, NY 10016

HOME DEPOT
REGO PARK - GLENDALE, NEW YORK

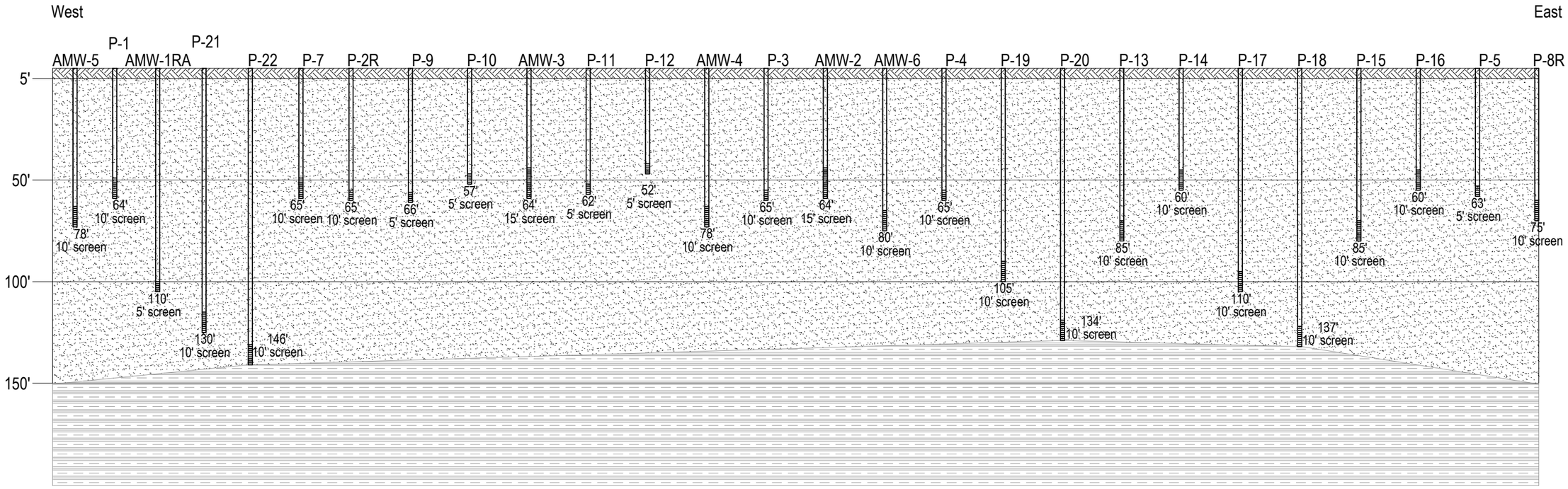
SITE PLAN WITH SOURCE AREAS

DATE
6.7.2016

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 > 130 FEET

AKRF
Engineering, P.C.
440 Park Avenue South, New York, NY 10016

HOME DEPOT, REGO PARK - GLENDALE, NEW YORK

GEOLOGIC CROSS SECTION WITH GROUNDWATER MONITORING WELLS

DATE
12.22.2016

PROJECT NO.
03399

SCALE
nts

FIGURE
3

SITE PLAN WITH HISTORIC PCE CONCENTRATIONS

HOME DEPOT, REGO PARK - GLENDALE, NEW YORK

DATE **9/27/2016**

SCALE **as shown**

PROJECT No. **03399**

FIGURE No. **4**

AKRF
Engineering, P.C.
440 Park Avenue South, New York, N.Y. 10016

Sample ID number
(µg/l) - PCE Concentration in Groundwater (micrograms per liter)
Screen depth relative to water table
NA - Not applicable - monitoring well not sampled
Not detected - PCE analyzed for but not detected

LEGEND

EXISTING MONITORING WELL

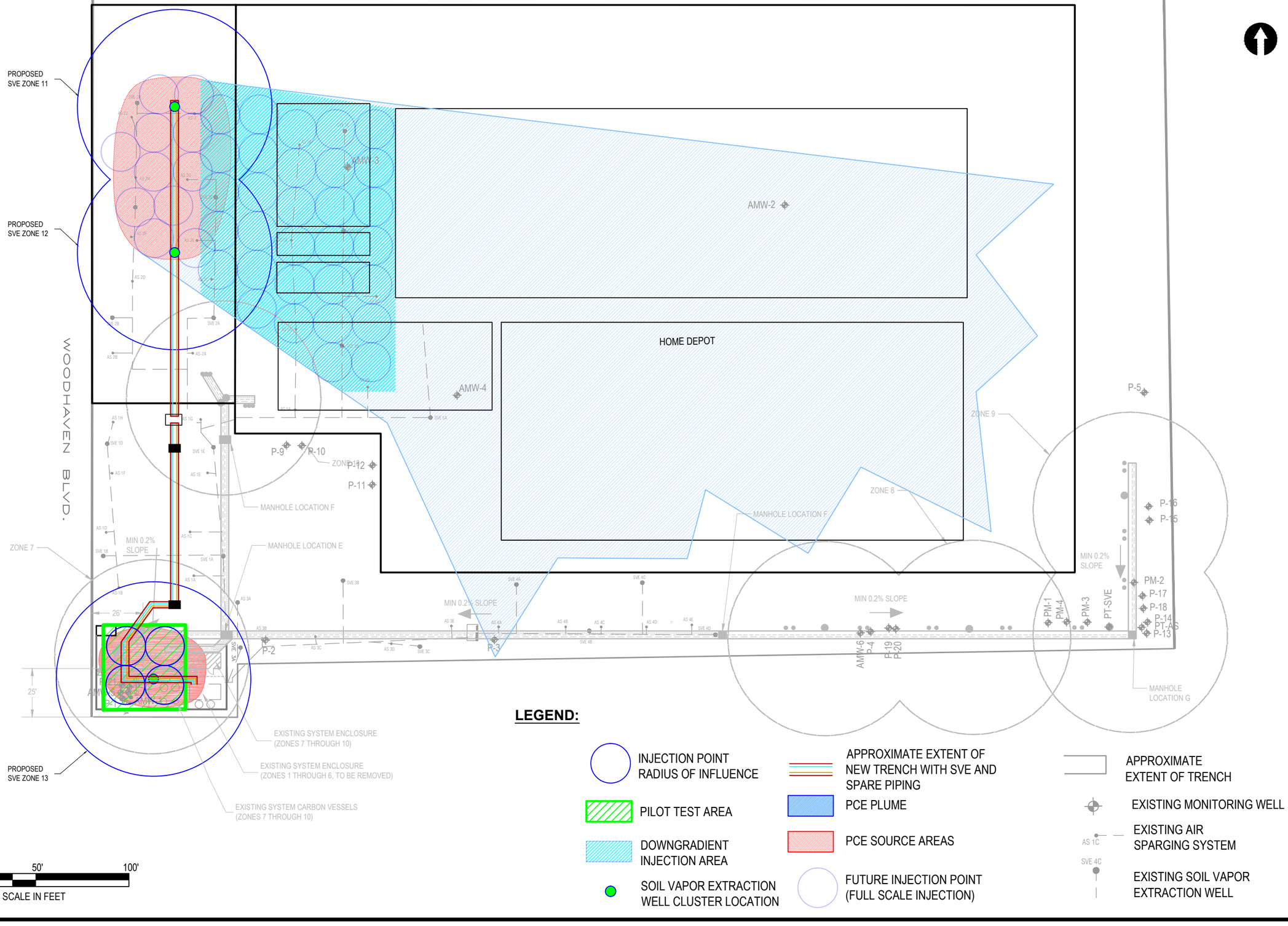
PCE TETRACHLOROETHENE

SCALE IN FEET

CONCRETE CURB

WOODHAVEN BLVD.

P-1/P-1R, P-2/P-2R, P-3, P-4, P-5, P-7, P-8/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-1R, AMW-1RA, AMW-2, AMW-3, AMW-4, AMW-5, AMW-6



LEGEND:

- INJECTION POINT RADIUS OF INFLUENCE
- PILOT TEST AREA
- DOWNGRADIENT INJECTION AREA
- SOIL VAPOR EXTRACTION WELL CLUSTER LOCATION
- APPROXIMATE EXTENT OF NEW TRENCH WITH SVE AND SPARE PIPING
- PCE PLUME
- PCE SOURCE AREAS
- FUTURE INJECTION POINT (FULL SCALE INJECTION)
- APPROXIMATE EXTENT OF TRENCH
- EXISTING MONITORING WELL
- AS 1C — EXISTING AIR SPARGING SYSTEM
- SVE 4C — EXISTING SOIL VAPOR EXTRACTION WELL

AKRF Engineering, P.C.
440 Park Avenue South, New York, NY 10016

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

REMEDIAL OPTIMIZATION CONCEPTUAL SITE PLAN

DATE
12/21/2016

PROJECT NO.
03399

SCALE
as shown

FIGURE
5

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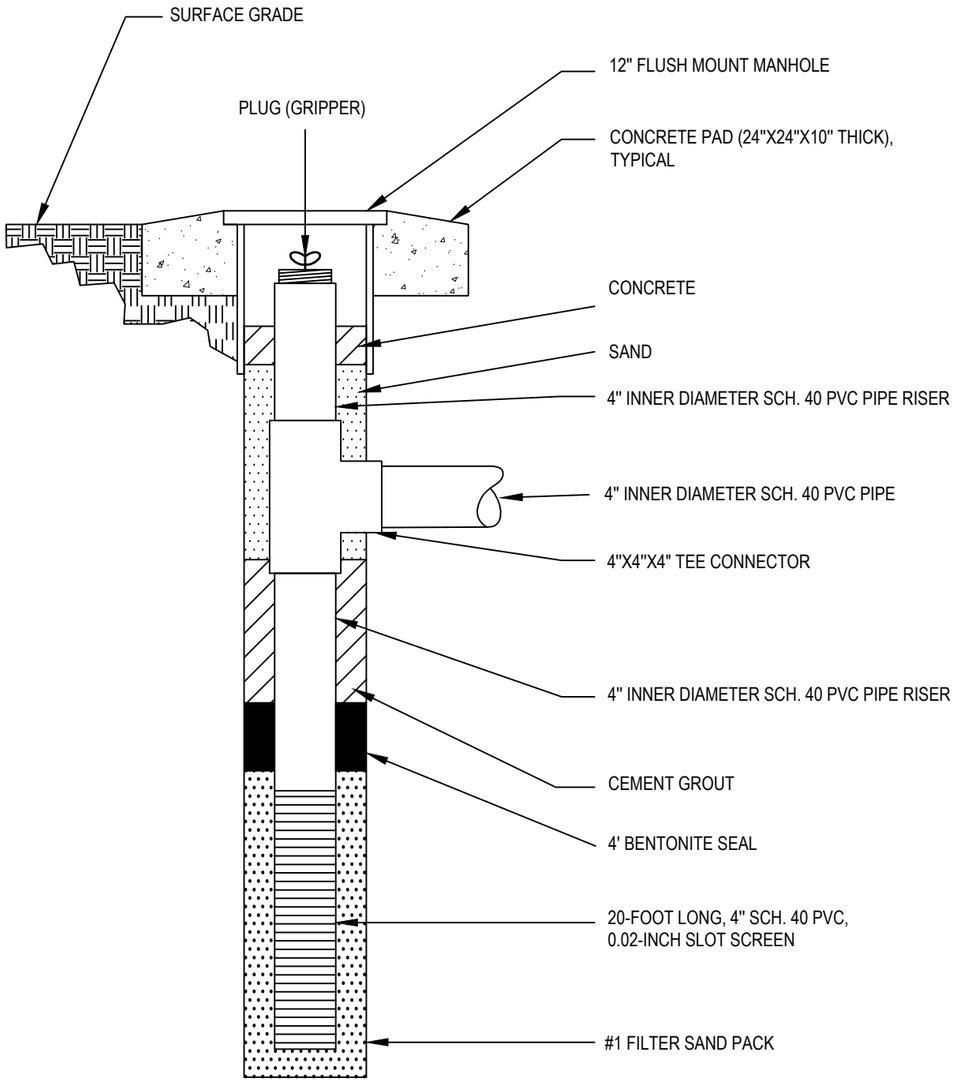

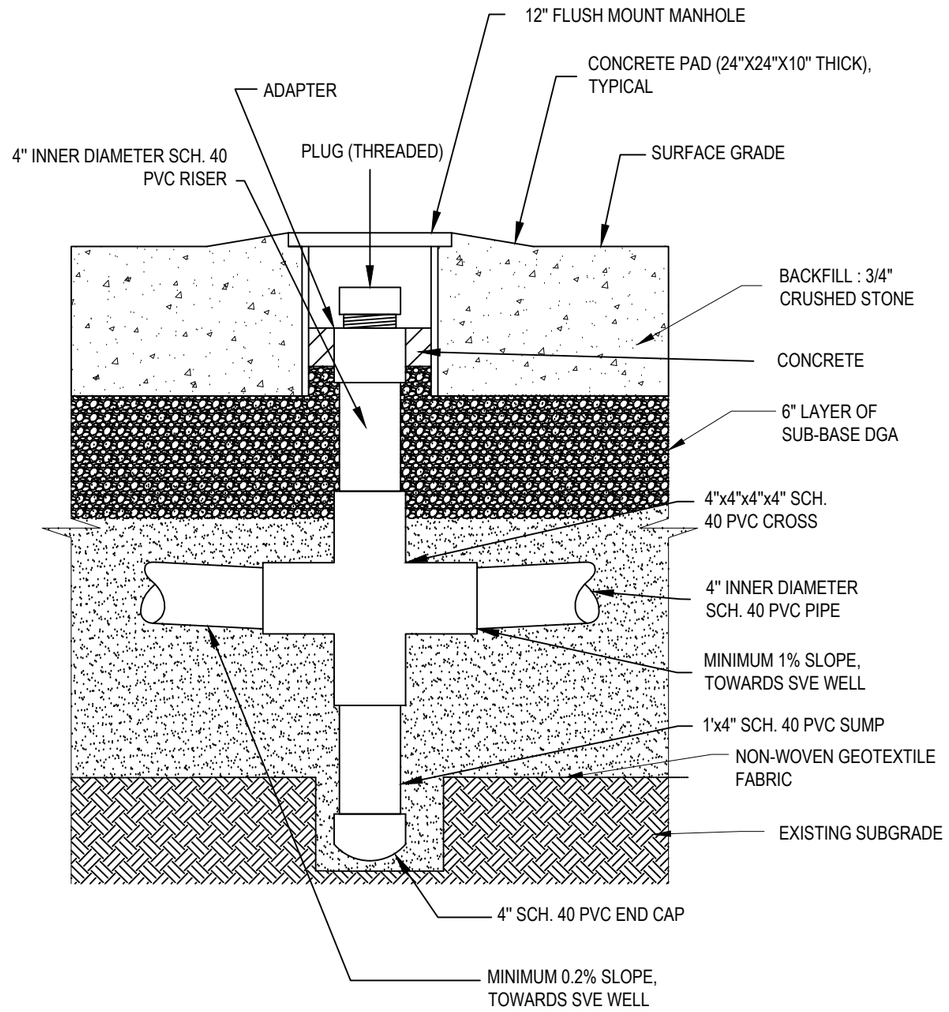

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440 Park Avenue South, New York, NY 10016

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

TYPICAL SVE WELL AND SVE SUMP CONSTRUCTION

DATE
12.21.2016

PROJECT NO.
03399

SCALE
nts

FIGURE
6

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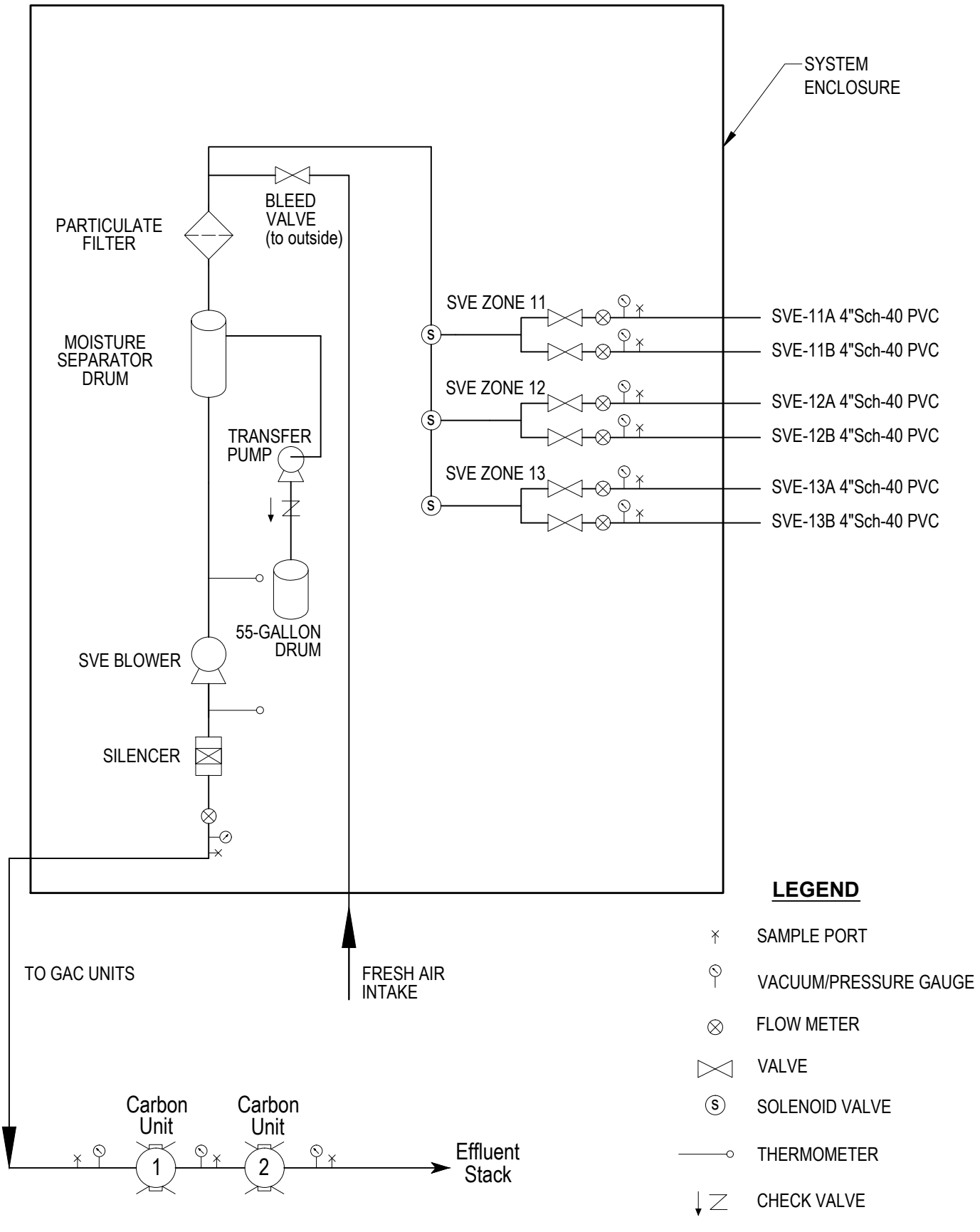


HOME DEPOT - REGO PARK

Rego Park - Glendale, New York

REMEDIAL OPTIMIZATION SVE EXPANSION CONCEPTUAL PROCESS AND INSTRUMENTATION DIAGRAM

AKRF Engineering, PC

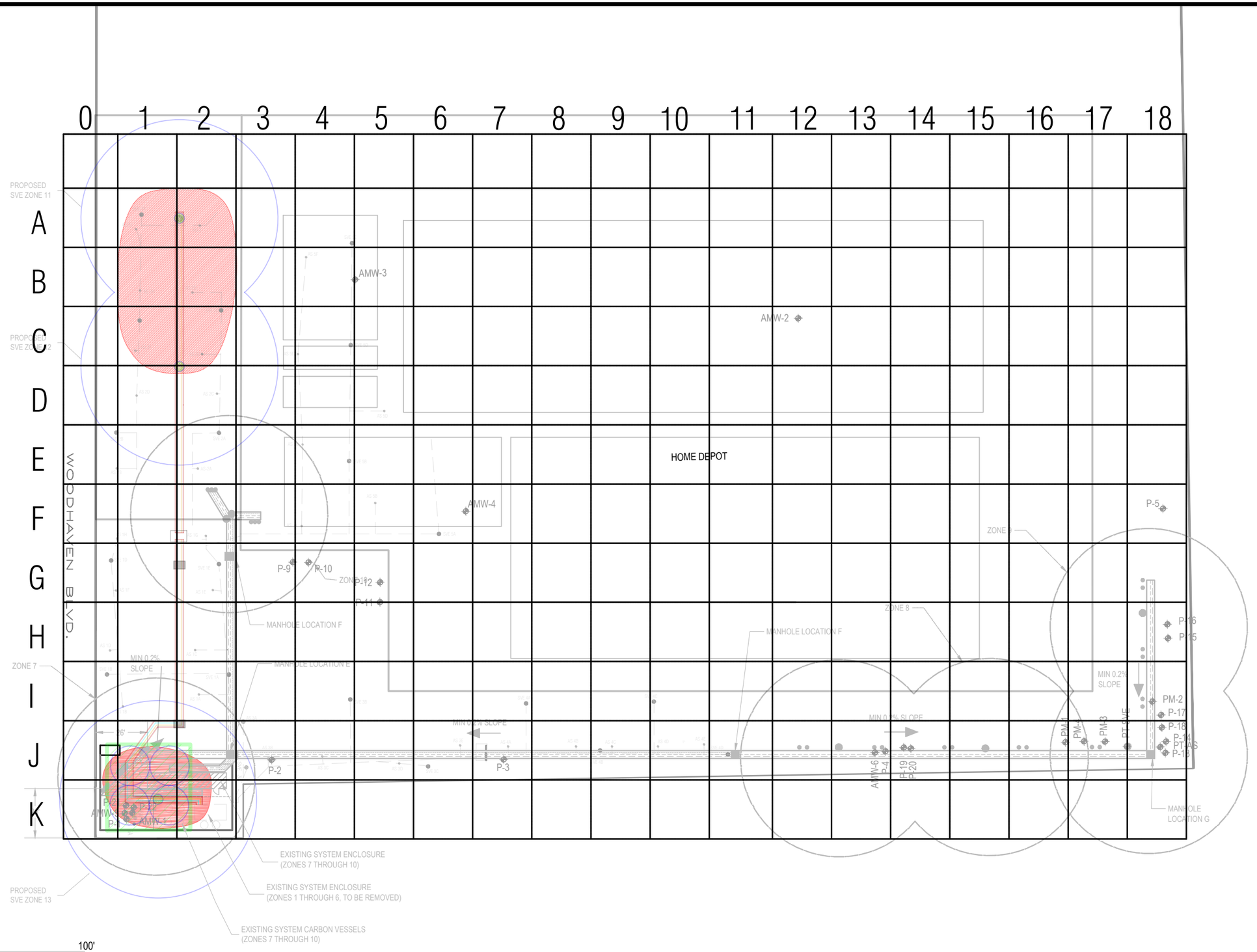
440 Park Avenue South, New York, N.Y. 10016

DATE **1/9/2017**

PROJECT NO. **03399**

FIGURE **7**

M:\AKRF Project Files\03399 & 08009 - Home Depot - Rego Park\Figures\2016\03399 Figure 3.dwg last save: epark 1/9/2017 7:11 PM



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AKRF Engineering, P.C.
440 Park Avenue South, New York, NY 10016

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

ALPHANUMERIC SITE MAP

DATE
12/21/2016

PROJECT NO.
03399

SCALE
as shown

FIGURE
8

APPENDIX A

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 WEST, 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 MINUTES – 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.~~

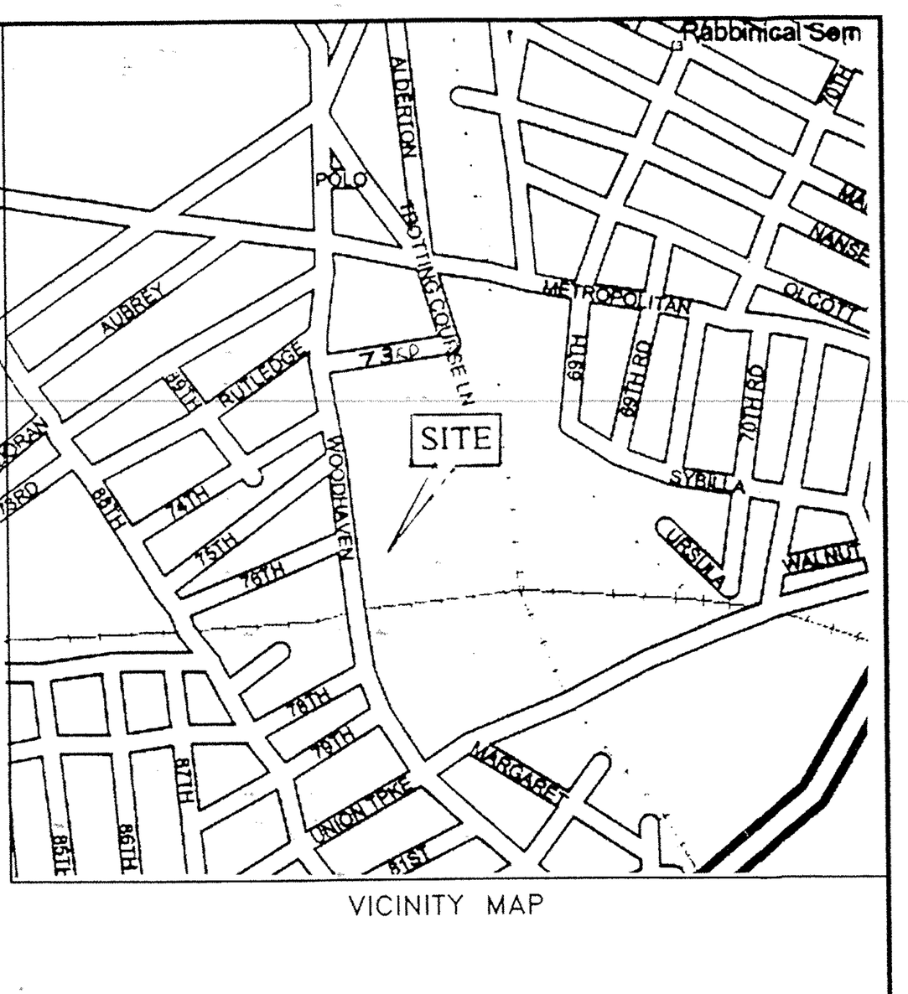
METES AND BOUNDS DESCRIPTION
LOT 46, BLOCK 3886, SECTION 20-3
BOROUGH AND COUNTY OF QUEENS
CITY AND STATE OF NEW YORK

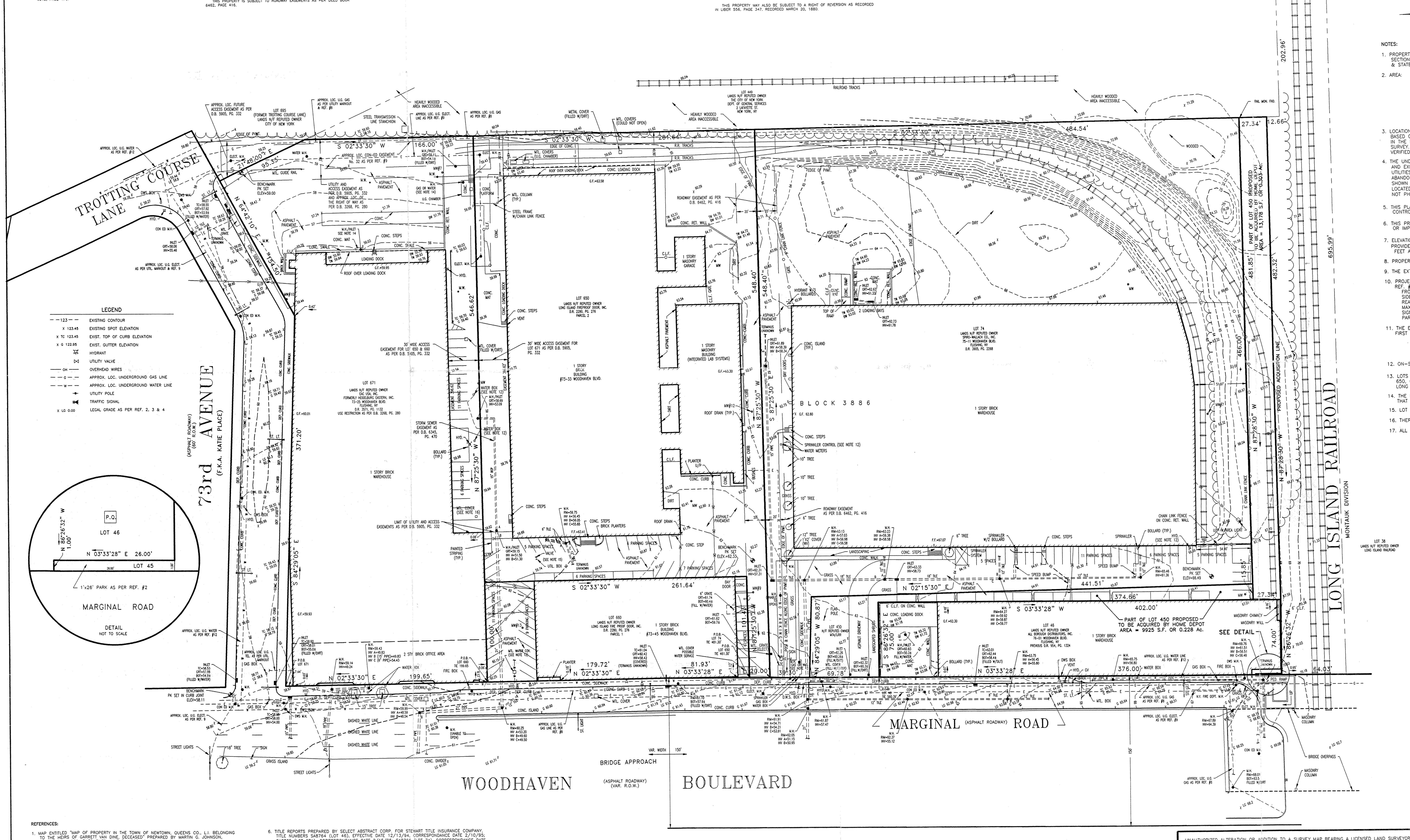
BEGINNING AT A POINT ON THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD (150 FEET WIDE) SAID POINT BEING DISTANT SOUTHERLY 590.39 FEET ALONG THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD FROM THE INTERSECTION OF THE EASTERLY SIDELINE OF WOODHAVEN BOULEVARD (VARIABLE WIDTH) WITH THE SOUTHERLY SIDELINE OF 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. 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.





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 STYSTEMS 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 FILED JUNE 7, 1882 AS MAP No. 58
2. MAP ENTITLED "CITY OF NEW YORK, BOROUGH OF QUEENS, OFFICE OF THE PRESIDENT, TOPO GRAPHICAL BUREAU, MAP No. 4143 SHOWING A CHANGE IN THE STREET SYSTEM HERETOFORE LAID OUT ALONG WOODHAVEN BOULEVARD BETWEEN METROPOLITAN AVENUE AND UNION TURN-PIKE" 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 HERE-TOFORE 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, BOORUGH 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

GREGORY S. GALLAS
NEW YORK PROFESSIONAL LAND SURVEYOR #50124

7/2/97
DATE

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

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

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

APPENDIX B

PREVIOUS KEY ENVIRONMENTAL REPORTS

APPENDIX C

DRAFT CHEMICAL INJECTION WORK PLAN

DRAFT TREATMENT PROGRAM PROPOSAL

HOME DEPOT SITE
75-09 WOODHAVEN BOULEVARD
REGO PARK, NEW YORK

DECEMBER 14, 2016

PREPARED FOR

AKRF ENVIRONMENTAL CONSULTANTS
440 PARK AVENUE SOUTH, 7TH FLOOR
NEW YORK, NY 10016

ISOTEC PROPOSAL NO. 802124

In-Situ Oxidative Technologies, Inc.
11 Princess Road, Suite A
Lawrenceville, New Jersey 08648
Phone: (609) 275-8500,
Fax: (609) 275-9608
www.insituoxidation.com

SBA Certified Small Business

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FIGURES

TABLES

ATTACHMENTS

1.0 INTRODUCTION

In-Situ Oxidative Technologies, Inc., (ISOTEC) is pleased to offer this *Treatment Program Proposal* to AKRF Environmental Consultants (AKRF) for in-situ chemical oxidation (ISCO) remediation services at the Home Depot Site located at 75-09 Woodhaven Boulevard in Rego Park, New York. The scope of work for the ISCO treatment program will be pursuant to the *Request for Proposal for In-Situ Chemical Oxidation (RFP)* submitted by AKRF via email to ISOTEC on December 7, 2016 with clarifications and/or exceptions as noted within this proposal. ISOTEC proposes to implement ISCO using our patented modified Fenton's reagent (MFR) and MFR activated sodium persulfate process (MASP). The MFR process generates hydroxyl radicals, superoxide radicals and hydroperoxide anions when the catalyst reacts with the oxidants, which promote enhanced desorption and rapid degradation of recalcitrant compounds. The end products of the reaction are carbon dioxide, oxygen and water. The MASP process also generates sulfate free-radicals and has the advantage of a sustained oxidation reaction. Treatment program activities will be governed by the New York State Department of Environmental Conservation (NYSDEC).

2.0 SITE CHARACTERISTICS

Based on information and site figures provided by AKRF, the site is currently occupied as an active Home Depot store. Two main source areas exist as shown in **Figure 1** including the smaller isolated area surrounding monitoring well location P-1/P-1R (proposed pilot study area), and the larger plume area encompassing AMW-3 (proposed full scale area). Contaminant of concern (COC) at the Home Depot Site is primarily tetrachloroethene (PCE). During the most recent groundwater sampling event conducted in September 2016, PCE was detected at concentrations of 2,600 micrograms per liter (ug/l) in P-1/P-1R and 5,400 ug/l in AMW-3. Historical concentrations of PCE detected at the site have been as high as 47,000 ug/l in P-1/P-1R. No saturated soil data was provided. Soils at the site consist primarily of sands down to approximately 150 feet (ft) below ground surface (bgs). Groundwater is typically encountered at approximately 50 ft bgs across the site.

2.1 Treatment Areas

Per the RFP, AKRF has estimated the extent of PCE groundwater impacted areas requiring treatment by ISCO (**Figure 2**). The estimated impacted groundwater pilot study area is approximately 1,256 square feet (ft^2) and the estimated impacted groundwater full-scale treatment area is approximately 13,188 ft^2. Proposed pilot study area is located on an exterior portion of the site in the vicinity of P-1/P-1R and consists of 4 separate locations. Proposed full-scale treatment area is located within the active Home Depot store footprint and encompasses AMW-3. Proposed target vertical treatment interval for both treatment areas is from 40-50 feet bgs targeting the lower portion of the unsaturated/vadose zone; and from 55-65 ft bgs targeting the upper portion of the saturated/groundwater zone. ISCO treatment utilizing MASP technology (described below in section 3.0) will be applied to treat the unsaturated soils, saturated soils and groundwater at the Home Depot site.

3.0 TECHNOLOGY OVERVIEW

ISOTEC has over 21 years experience offering multiple ISCO solutions including our patented *modified Fenton's reagent (MFR), activated sodium persulfate* and *potassium/ sodium permanganate*.

The MFR process combines proprietary chelated iron complex catalysts[1], mobility control agents, oxidizers, and stabilizers in an optimal chemical formulation over a wide range of pH conditions, including the circum-neutral pH conditions, and employs site-specific delivery systems to ensure complete destruction of the targeted COCs. The process generates powerful free radicals when the catalyst reacts with hydrogen peroxide which include hydroxyl radicals, superoxide radicals and hydroperoxide anions, which are very effective in treating a wide range of organic contaminants. The principal chemical reactions associated with the MFR process are provided below.

$H_2O_2 + Fe^{2+} \rightarrow OH\bullet + OH^- + Fe^{3+}$

$H_2O_2 + OH\bullet \rightarrow HO_2\bullet + H_2O$

$HO_2\bullet \rightarrow H^+ + O_2\bullet^-$

$HO_2\bullet + O_2\bullet^- \rightarrow HO_2^- + O_2$

Where

H_2O_2 = Hydrogen Peroxide; Fe^{2+} = Ferrous Ion;

Fe^{3+} = Ferric Ion; and $OH\bullet$ = Hydroxyl Radicals

$O_2\bullet^-$ = Superoxide Radicals; HO_2^- = Hydroperoxide Anion; and $HO_2\bullet$ = Perhydroxyl Radical

The co-existing redox reactions associated with a modified Fenton's process promote enhanced desorption and degradation of recalcitrant compounds. These include compounds such as carbon tetrachloride and chloroform, which were previously considered untreatable by Fenton's chemistry.

The MFR activated sodium persulfate process utilizes sodium persulfate ($Na_2S_2O_8$) oxidant activated using various methods to produce sulfate free radicals. The activators include a proprietary chelated iron catalyst[1], alkali (e.g. sodium hydroxide NaOH), heat, hydrogen peroxide or combinations of each. Persulfate reagents are designed for both solo use or in combination with other ISOTEC reagents (e.g. modified Fenton's reagent, Permanganate reagent). The reaction mechanism associated with the activated sodium persulfate process is shown below.

$S_2O_8^{2-} + Activator \leftrightarrow 2SO_4^{\bullet-}$

$S_2O_8^{2-}$ = Sodium persulfate

$SO_4^{\bullet-}$ = Sulfate free radical

Activator = Chelated Iron catalyst or Hydrogen Peroxide

[1] ISOTEC catalysts consist of proprietary chelated iron complexes, which remain soluble under a range of pH conditions including neutral pH.

MASP will result in free radical production via three mechanisms of persulfate activation – i.e. hydrogen peroxide, iron catalyst as well as heat generated from the exothermic Fenton's reaction. The co-existing oxidation-reduction reactions associated with the MASP process promotes enhanced desorption, treatment of NAPL and degradation of recalcitrant compounds. These include compounds such as carbon tetrachloride and chloroform, which were previously considered untreatable by ISCO.

Based on the site characteristics and the type of COCs present (i.e. PCE) as both dissolved and adsorbed phase, which will need to be completely desorbed and degraded, individual concentrations of PCE greater than 5,400 ug/l and distribution of contamination, ISOTEC is proposing MASP as the selected ISCO technology for the Home Depot site. The MASP technology includes all of the benefits of the MFR process that are necessary when treating adsorbed soil mass but include the addition of the ASP component which provides for a longer more persistent treatment in-situ that can last potentially for weeks at a time.

Table 1: MASP Technology

Primary Technology	Reagent Components	Reactive Species Formed
MASP	Sodium Persulfate	Sulfate Radicals, Hydroxyl Radicals, Superoxide Radicals, Hydroperoxide Anions
	Hydrogen Peroxide	
	Chelated Iron Catalyst	
	Sodium Hydroxide	
	Stabilizing Agents	

3.1 ISOTEC's Typical Treatment Approach

ISOTEC's chem-ox processes treat organic contaminants within the subsurface by utilizing our proprietary blends of catalysts, oxidizers, viscosity enhancers and mobility control agents. ISOTEC compounds are injected through a site-specific delivery system providing sufficient distribution to selectively treat the contaminants around an area of concern. A specific stoichiometry is typically determined through a lab study, with preliminary treatment quantities calculated. Application is next tested in the field during a pilot program to determine the efficiency and extent of treatment, which varies depending on the site's subsurface characteristics. Based upon a successful lab study and remedial pilot treatment program, design and implementation of full-scale remediation is proposed (if required). The ISOTEC approach works via the in-situ destruction of contaminants, while creating minimal disturbance to site operations. ISOTEC's chem-ox processes are most effective in areas with no ongoing sources of contamination.

4.0 ISCO TREATMENT PROGRAM

4.1 Project Objectives

The overall objective of the ISCO treatment program is to reduce groundwater PCE concentrations in the 2 noted source areas at the site

The objective of the ISCO pilot program is to:

- Evaluate safe application of MASP at the Home Depot site and collect design data for a potential full-scale treatment program.
- Evaluate application of MASP via pre-constructed fixed nested injection wells as shown in **Figure 3**. Alternatively, AKRF may choose to procure a Geoprobe 8040 rig or similar to install temporary direct push technology (DPT) injection points as shown in **Figure 4**. For the DPT scenario, the objective will be to evaluate whether or not temporary direct-push injection techniques can be applied at the site and if the direct-push rig can consistently drill down to the desired depth (i.e. 65 feet bgs) in an efficient manner. DPT injections will also need to evaluate whether or not heaving sands will be an issue when exposing the injection screens at such deep depths in a sandy formation. For DPT injection, ISOTEC will utilize its custom-made, proprietary laser-cut injection screens.
- Determine the amount of reagent that can be safely injected per injection point without encountering any issues (i.e. surfacing of reagents through preferential pathways and/or excess back pressure from the reactions) related to the subsurface media.

4.2 Bench-Scale Study

ISOTEC recommends a soil-slurry bench scale laboratory study for each site area to determine the optimal reagent loading for the field treatment program. General procedures and sample collection requirements for the bench-scale studies are provided in **Attachment A**. The bench scale study will evaluate the MASP process using a combination of sodium persulfate activated by MFR.

4.3 Pilot Treatment Program

An initial pilot treatment program is proposed prior to commencing a full-scale treatment program at the site. Pilot programs are beneficial to confirm assumptions regarding bench-scale study reagent volume calculations and to verify if they can be injected in a safe and timely manner; to gather radius of influence (ROI) and design data that can be used to more accurately design a potential full-scale treatment program and to test and verify the proposed injection method for the site. For the Home Depot site, the biggest concerns to be evaluated during the pilot study are how effective the proposed method of injection (i.e. if DPT is selected) will be, given the uncertainty in drilling down do deep depth intervals ranging between 40-65 ft bgs; and to verify how

much volume can be injected into each injection point before any problems with injection screen fouling (heaving sands) are encountered.

Field activities for the pilot treatment program will be performed over one injection event. Utility verification and marking is assumed to be AKRF's responsibility. Injection pathways may consist of fixed, nested injection wells (as shown in **Figure 3**) or temporary DPT points (as shown in **Figure 4**). *Feasibility of DPT via 8040 rig or similar will be evaluated by AKRF during soil and groundwater sample collection activities for the bench-scale study well before start of the pilot study. If possible, water injections may also be evaluated during this time to verify proof of concept, screen clogging, injection pressures, and utilization of DPT installation for the pilot study injections. Information gathered from this test may help in providing a final injection point installation design for the ISCO pilot program.*

If it is determined that DPT is not practical due to problems associated with installing the locations at such deep depths, then fixed nested PVC injection wells will be installed (fixed wells typically allow for more efficient daily volumes to be injected as the points are readily available upon our arrival at the site). Temporary DPT points allow for flexibility in choosing injection point locations from one event to the next which allows for more complete coverage of the targeted treatment areas (use of DPT injection points may require additional injection days due to the deep depths of the proposed treatment at the site, compared to pre-installed permanent wells). The injection points would be placed in the area to be treated and screened to a depth corresponding with the contamination. ISOTEC has developed custom stainless steel screens for ISCO injections in collaboration with a custom screen manufacturer and Geoprobe. The temporary injection points are grouted after the predetermined reagent dose has been injected through the direct push rods and screen, and the rods are moved to a different location to install a new injection point.

For the Home Depot site, the target vertical treatment zone covers the unsaturated/vadose zone from 40-50 ft bgs and the saturated/groundwater zone from 55-65 ft bgs, within a portion of the site on the southwestern corner of the property in the vicinity of P-1/P-1R. The injection points will be restricted to an exterior portion of the property to minimize disturbance of active Home Depot operations. Target treatment area for the pilot study is an approximately 1,256 ft^2 area covering the unsaturated soil/saturated soil/groundwater zones. For the purpose of this proposal, a treatment ROI of 10 ft is assumed, resulting in an injection point spacing of 20 ft or each injection point will cover an approximately 314 ft^2 treatment area. At this spacing, it is currently estimated that approximately (1,256 ft^2 /314 ft^2) = 4 injection locations will be installed during the pilot treatment program, targeting 2 separate 10 ft thick intervals. General assumptions used and the design of the pilot program is as follows:

- Assumed reagent flow rate is 1 to 5 gallons per minute (gpm) per injection point into the subsurface.

- The vertical impacted zone requiring treatment will be from 40-50 ft bgs in the unsaturated/vadose zone and from 55-65 ft bgs in the saturated/groundwater zone. A total of 4 injection points with two (2) separate 10 ft thick treatment intervals per location will be treated in the pilot test cell area. Initial plan will be to target each 10 ft thick interval using a single injection screen. If time allows, two (2) smaller 5 ft thick treatment intervals per location can be attempted to try and isolate smaller vertical zones but this may add in the overall time and cost of the project. If two (2) treatment intervals are attempted, bottom-up injections will be utilized. **A minimum of 240 feet of injection rods will be required in order to have all 4 locations installed simultaneously.** If required, any concrete coring or pre-clearing activities needed for the site to access the injection point locations should be completed prior to ISOTEC mobilizing to the site to eliminate any unnecessary down time.
- If it is determined during the bench study sampling activities that the direct push drilling capabilities are not an effective technique, then fixed PVC nested injection points will need to be installed by AKRF prior to ISOTEC mobilizing to the site. Construction details of a nested injection well are shown in Figure 3. Fixed wells typically allow for more efficient daily volumes to be injected as the points are readily available upon our arrival at the site.
- Treatment volume reagent requirements are approximately 3,750 gallons per injection location consisting of chelated iron catalyst, ~8-12% sodium persulfate and 6-10% stabilized hydrogen peroxide. Proposed volume to be injected during the pilot study is approximately 15,000 gallons, or approximately 20% effective pore volume.
- The pilot program will be performed over a single injection event estimated to be 6 days long. A second injection event, if performed, will use the same injection pathways as the first event for fixed, nested wells. However, if DPT method is used, the injection points will be laterally and centrally offset from previous event locations.
- ISOTEC personnel will monitor any wells within the treatment area periodically during injection activities for process parameters including pH, total dissolved solids (TDS), conductivity, redox potential (ORP), temperature, hydrogen peroxide (H_2O_2), persulfate and iron (grab samples will need to be collected by AKRF for field analysis by ISOTEC personnel, who will provide sampling assistance as time allows). Baseline, interim and post-treatment samples (both soil and groundwater) for VOC and other process parameter analysis is assumed to be AKRF's responsibility. Any additional parameters or air monitoring conducted during the treatment program is assumed to be AKRF's responsibility.
- The proposed reagent volume per location is presented below.

Table 2: Pilot Program Design Summary

Area (ft^2)	Vertical Interval (ft bgs)	ROI (ft)	No. of IPs (intervals)	Reagent Volume per Event (gal)*	Reagent Volume per Injection Point/Event (gal)*	No. of Proposed Injection Events	Duration per event (days)
~1,256	Unsaturated (40-50 ft bgs)	10	4 (1)	7,500	1,875	1	6
	Saturated (55-65 ft bgs)	10	4 (1)	7,500	1,875		
Totals			4 (8)	15,000			6

NOTE:

1. Reagent to consist of 8-12% sodium persulfate, 6-10% stabilized hydrogen peroxide and chelated iron catalyst. A small volume of 25% sodium hydroxide is mixed in with persulfate solutions to provide a slightly elevated pH for corrosive protection of the stainless steel DPT rods and equipment.
2. Duration per event assumes injection of 2,500 gallons per day into 4 points simultaneously.
3. If additional days are required due to DPT installation/injection problems, they will be billed as indicated in Section 7.0.

4.4 Full-Scale Treatment Program

Upon successful completion of the pilot program, a full-scale treatment program may be implemented at the site to help achieve remedial goals. Full-scale treatment programs use lessons learned from any pilot study injection events to fine tune injection techniques and procedures to be utilized on a larger scale targeting the entire impacted area of the site.

The field activities for the full-scale treatment program will be performed over two (2) primary injection events as indicated in the RFP. Utility verification and marking is assumed to be AKRF's responsibility. Injection points will be installed as either temporary direct-push injection points or as temporary of permanent fixed PVC injection wells (to be determined during the pilot study). Injection points would be placed in the area to be treated and screened to a depth corresponding with the contamination. ISOTEC has developed custom stainless screens for ISCO injections in collaboration with a custom screen manufacturer and Geoprobe. The temporary injection points are grouted after the predetermined reagent dose has been injected through the direct push rods and screen, and the rods are moved to a different location

to install a new injection point. If direct push injection points are utilized, AKRF should request the driller to provide the same drill rig used during the pilot study or an acceptable replacement.

For the full-scale treatment program, the target vertical treatment zone covers the unsaturated zone from 40-50 ft bgs and the saturated/groundwater zone from 55-65 ft bgs, within an active portion of the building footprint. Target treatment area is approximately 13,188 ft^2 area covering the unsaturated soil/saturated soil/groundwater zones. For the purpose of this proposal, a treatment ROI of 10 ft is assumed, resulting in an injection point spacing of 20 ft or each injection point will cover an approximately 314 ft^2 treatment area. At this spacing, it is currently estimated that approximately (13,188 ft^2 /314 ft^2) = 42 injection locations will be installed during the pilot treatment program, targeting 2 separate 10 ft thick intervals. General assumptions used and the design of the pilot program is as follows:

- Assumed reagent flow rate is 1 to 5 gallons per minute (gpm) per injection point into the subsurface.
- The vertical impacted zone requiring treatment will be from 40-50 ft bgs in the unsaturated zone and from 55-65 ft bgs in the saturated/groundwater zone. A total of 42 injection points with two (2) separate 10 ft thick treatment intervals per location will be treated during the full-scale treatment program. Initial plan will be to target each 10 ft thick interval using a single injection screen. If time allows, two (2) smaller 5 ft thick treatment intervals per location can be attempted to try and isolate smaller vertical zones but this may add in the overall time and cost of the project. If two (2) treatment intervals are attempted, bottom-up injections will be utilized. **A minimum of 400 feet of injection rod will be required to have 6-8 points installed simultaneously.**
- If it is determined during the bench study sampling activities and/or pilot study that the direct push drilling capabilities are not an effective technique, then fixed PVC nested injection points will need to be installed by AKRF prior to ISOTEC mobilizing to the site. Construction details of a nested injection well are shown in **Figure 3**. Fixed wells typically allow for more efficient daily volumes to be injected as the points are readily available upon our arrival at the site.
- Treatment volume reagent requirements are approximately 3,750 gallons per injection location consisting of chelated iron catalyst, ~8-12% sodium persulfate and 6-10% stabilized hydrogen peroxide. Proposed volume to be injected during the full-scale treatment program is approximately 157,500 gallons per event, or approximately 20% effective pore volume. ***Volumes may be adjusted following results obtained from the bench-scale study and pilot treatment program results.***
- The full-scale treatment program will be performed over two injection events estimated to be 40 days long per event. Subsequent events will be spaced approximately 4-6 weeks after each event.

- If direct push technology is utilized at the site, the direct push injection point location for each subsequent injection event will be laterally and centrally offset from previous injection event locations to achieve good overlapping effect and minimize missed impacts.
- ISOTEC personnel will monitor any wells within the treatment area periodically during injection activities for process parameters including pH, TDS, conductivity, ORP, temperature, hydrogen peroxide (H_2O_2), persulfate and iron. Samples will need to be collected by AKRF and provided to ISOTEC field personnel, who will provide sampling assistance as time allows. Baseline, interim and post-treatment samples (both soil and groundwater) for VOC and other process parameter analysis is assumed to be AKRF's responsibility. Any additional parameters or air monitoring conducted during the treatment program is assumed to be AKRF's responsibility.
- If required, any concrete coring or pre-clearing activities needed for the site to access the injection point locations should be completed prior to ISOTEC mobilizing to the site to eliminate any unnecessary down time.
- The proposed reagent volume per location is presented below.

Table 3: Full-Scale Treatment Program Design Summary

Area (ft^2)	Vertical Interval (ft bgs)	ROI (ft)	No. of IPs (intervals)	Reagent Volume per Event (gal)*	Reagent Volume per Injection Point/Event (gal)*	No. of Proposed Injection Events	Duration per event (days)
~13,188	Unsaturated (40-50 ft bgs)	10	42 (42)	78,750	1,875	2	40
	Saturated (55-65 ft bgs)	10	42 (42)	78,750	1,875		
Totals			42 (84)	157,500			40

NOTE:

1. Reagent to consist of 8-12% sodium persulfate, 6-10% stabilized hydrogen peroxide and chelated iron catalyst. A small volume of 25% sodium hydroxide is mixed in with persulfate solutions to provide a slightly elevated pH for corrosive protection of the stainless steel DPT rods and equipment.
2. Duration per event assumes injection of 4,000 gallons per day into 6-8 points simultaneously.
3. If additional days are required due to DPT installation/injection problems, they will be billed as indicated in Section 7.0.

4.5 Injection Method

The oxidants will be delivered into the subsurface under constant low to moderate pressure (0 to 60 psi) in an effort to distribute materials in a homogeneous fashion throughout the injection interval. This method has proven to be efficient but in some cases have noted the formation of a preferred pathway, with the majority of reagents following these fissures. A design flow rate of ~1 to 5 gpm is proposed for field delivery of oxidant into the subsurface. Higher injection pressures and concentrations may be required and will be evaluated during the treatment program.

In-situ chem-ox injection rates and volume of discharge are interrelated to the reaction rates with the contaminants, the contaminant distribution coefficients in the subsurface systems, and the rate of oxidant decomposition within the subsurface. The rate at which the oxidant flow can be injected into the subsurface is initially determined by the soil/aquifer characteristics, or possible premature stoppage due to oxidant material seeping up from monitoring well seals or injection points. Field decisions regarding injection volumes will be based on the subsurface intake, radial effects noted during injection, and the distance of the injection point from the nearest monitoring point. If it becomes impossible to inject the proposed volume, reagent concentrations may be increased, with volumes decreasing, to meet treatment goals. The extent of remediation is preliminary during the initial injections and may vary plus/minus pending site subsurface characteristics.

4.6 Monitoring

ISOTEC personnel will monitor any wells within the treatment area periodically during injection activities for process parameters including pH, TDS, conductivity, ORP, temperature, hydrogen peroxide (H_2O_2), persulfate and iron. Samples will need to be collected by AKRF and provided to ISOTEC field personnel. Baseline, interim and post-treatment samples (both soil and groundwater) for VOC and other process parameter analysis is assumed to be AKRF's responsibility. Any additional parameters or air monitoring conducted during the treatment program is assumed to be AKRF's responsibility.

Baseline, interim and post-treatment performance monitoring is assumed to be AKRF's responsibility. A representative number of both soil and groundwater samples should be collected during baseline and post-treatment sampling events to evaluate contaminant mass removal. The post-treatment locations should remain within ± 1 feet horizontally and vertically from baseline locations during each sampling event for comparison purposes. ISOTEC will prepare a detailed treatment program report at the end of the treatment program including injection volumes, flow rates, field procedures, results analysis, and recommendations.

4.7 Health and Safety

ISOTEC processes were created based on numerous years of both academic and private research in the chemical oxidation field. ISOTEC processes are one of the safest chem-ox processes due to the use of stabilized reagents injected in a controlled manner to reduce the possibility of any hazard occurring. The processes have been designed with health and safety as a prime consideration. Most negative effects noted with in-situ oxidation (including well fouling, vapor generation, explosive conditions, etc.) occur with aggressive oxidation reactions utilizing high concentration reagents under high-pressure conditions. These conditions can create a significant temperature rise and an enormous amount of carbon dioxide and/or oxygen off-gas, which can mobilize contaminants within the subsurface through volatilization. ISOTEC processes do not utilize this approach. Reagents utilized are stabilized, used at low concentrations, and injected in a controlled manner to reduce the possibility of surface breakout or subsequent migration. Furthermore, based on sites with shallow groundwater, extreme caution must be exercised while injecting reagents as the mounding effect created can raise the groundwater elevation to close proximity of the surface. Again, the stabilized reagents utilized along with control of the injection process limit these concerns. ISOTEC personnel understand the potential dangers associated with the chemical reaction they are creating, and have completed extensive safety training. As with any activity, by applying safety measures, plus understanding how a process works, limits the potential for any misfortune. **ISOTEC has not had a significant health and safety incident in over 21 years of field application**.

A site-specific health and safety plan will be prepared prior to field mobilization, which will discuss material handling and storage procedures and other requirements specified within the RFP including spill control, personal protective equipment (PPE), safety monitoring, site restoration, etc. All members of the injection team have completed health and safety training consistent with the Occupational Safety and Health Act (Title 29 of the Code of Federal Regulations 1910.120) with current certificates. The site supervisor has completed an additional eight hours of OSHA training. In addition, all members of the injection team have completed Loss Prevention System (LPS) training and most members have completed cardiopulmonary resuscitation (CPR) training. All employees receive an annual physical, drug screening and 8-hour safety refresher course.

4.8 Reporting

Following award of contract, a health and safety plan will be issued prior to conducting the field pilot study. Following the bench-scale testing a detailed treatability report will be prepared along with the pilot study treatment program work plan. Following completion of the pilot study treatment program, a detailed pilot study treatment program report will be issued along with recommendations for any additional treatment events that may be required as part of the full-scale treatment program work plan.

5.0 EXPERIENCE

5.1 Company Qualifications

Since inception in 1995, ISOTEC has revolutionized soil and groundwater remediation through its proprietary in-situ chemical oxidation technologies. Our unique processes destroy contaminants in soil and groundwater in a timely and cost-effective manner and with minimal site disruption. ISOTEC holds multiple patents on the use of ISCO and is a recognized leader in full-service chemical oxidation. ISOTEC's reagents have been developed and refined over the last decade through both in house research as well as collaborative research with *academic* institutions. Over the last 21 years, ISOTEC's ISCO technologies have been successfully implemented in over 1,000 field-scale applications throughout the United States without a major safety incident. These projects have included U.S. Air Force Facilities, Naval Air Stations, Superfund Sites, NASA Facilities, MGP Sites and industrial facilities. ISOTEC treatment programs have been implemented in a wide range of geological situations including confined aquifers, fractured bedrock aquifers, surficial aquifers and vadose zones. Injection pathways have included temporary direct push points, permanent wells, fractured bedrock wells with inflatable packers, segmented wells with K-packers, infiltration galleries and trenches.

ISOTEC projects are ongoing or have been completed in majority of the continental USA and Hawaii. ISOTEC projects have also been applied internationally in Japan, Canada, Caribbean, Denmark, Holland, Germany and Australia. Further information about ISOTEC can be found at our web site www.insituoxidation.com.

5.2 Project Personnel

The project will be managed by Prasad Kakarla, P.E., Technical Director and Mike Temple, Senior Project Manager both with more than 15 years of experience designing, conducting and managing ISCO injection applications. The project field manager will be Kevin O'Neal, Tom Musser or Mark Ratner, all with 5-15 years experience managing field operations. Several injection specialists will support the project field manager during field implementation. All members of the injection team have completed health and safety training consistent with the Occupational Safety and Health Act (Title 29 of the Code of Federal Regulations 1910.120) with current certificates. The site field manager has completed an additional eight hours of OSHA supervisor training and CPR training. All members have also completed Loss Prevention System (LPS) training. All employees receive an annual physical, drug screening and 8-hour safety refresher course. A daily health and safety tailgate safety briefing will be conducted at the site each day prior to initiating field activities.

5.3 Project Field Staffing Plan

The project will be implemented by a 2-3 person crew with one project field manager and 1-2 injection specialists. The following duties will be assigned to the field personnel.

Project Field Manager. The project field manager will oversee all aspects associated with ISCO field implementation, record keeping, provide daily reports and attend all meetings related to the project implementation.

Injection Specialist 1. The injection specialists 1 will implement all aspects associated with injections including pump and flow rate management, injection pressure management, off gas treatment and record keeping.

Injection Specialist 2. The injection specialist 2 will mix the reagent chemicals, assist with all aspects associated with injections including pump and flow rate management, injection pressure management, off gas treatment and record keeping. The injection specialist 2 will also assist with performance monitoring.

5.4 List of Proposed Subcontractors

For the purpose of this proposal, ISOTEC is assuming that AKRF will subcontract the drilling contractor directly for injection point installation.

5.5 List of Major Equipment

ISOTEC treatment trailer will be equipped with the following major equipment required to complete the scope of work.

- Dual diaphragm pumps with regulators
- Electric drum pumps
- Gas powered air compressor and generator
- Bulk industrial tanks and drums (HDPE)
- Quick disconnect chemical-resistant hoses and ball valves rated for the injection pressures
- Industrial mixer motors and propellers
- Sample kits and equipment
- Injection well heads
- Secondary containment (for concentrated oxidants)
- First aid kit, fire extinguisher and eye wash station
- Spill kit materials

6.0 PROJECT SCHEDULE

ISOTEC tentatively proposes to implement the pilot study over a single event lasting approximately 6 days, and the full-scale treatment program over two (2) primary injection events, lasting approximately 40 days per event. Work hours are assumed to be during normal business hours Monday through Friday. Full-scale injection events should be spaced minimum 4-6 weeks apart.

ISOTEC will assist AKRF with procurement of any required regulatory permits. Clients should be aware that general freezing temperature delays occur during the winter months and that project (event) duration could vary by several days/weeks. Working with ISCO processes in any type of cold or freezing weather is a potential safety hazard, as the injection equipment freezes and/or becomes stiff and brittle with a greater chance of malfunctioning. As a company policy, ISOTEC will not jeopardize personnel safety to complete a proposed schedule.

7.0 PROJECT COSTS

Project costs are listed below.

Table 4: Estimated Project Costs

Bench Scale Study	
Bench Scale Treatability Study (Two Soil/GW Samples) • Includes testing of MASP reagents on 2 soil/groundwater samples provided by AKRF.	**$10,500.00**
Water Injection Pilot Test (Optional Item) • Includes injection of water into 1-2 DPT locations using ISOTEC laser cut screens to evaluate injection pressures, screen clogging, flow rates, etc during sampling for bench scale study. Determine if DPT is appropriate for pilot study. AKRF to provide DPT rig, water supply and bench study sampling.	**$2,500.00**
Pilot Program	
Injection Point Installation • Injection points can be installed as temporary direct push points or as fixed PVC points with a direct push drill-rig. Fixed PVC injection points can be installed if feasible before ISOTEC mobilizes to the site. If temporary direct-push points are utilized, the driller will work concurrently during the same schedule as ISOTEC. Any concrete coring/pre-clearing should be completed before ISOTEC mobilizes to the site to prevent any delays in the injection treatment. Estimate 6 days of direct push services per event, with an additional day(s) budgeted in case of drilling problems. Driller will need 250 ft of injection rod in order to pump on 4 points simultaneously. **Monitoring** • Baseline and Post-treatment performance monitoring; both soil and groundwater sampling.	**AKRF**
Pilot Treatment Program • Costs include mobilization/demobilization, reagent chemicals, labor (3 man crew), equipment, daily field monitoring, reporting (Pilot Summary Report and Full-Scale Work Plan) and project management. • One injection event is proposed over 6 days for injection of ~15,000 gallons of MASP into 4 injection point locations (8 intervals).	**$63,500.00 per Event**
Total Bench Study + Pilot Program Cost	***$74,000.00***
Additional Days (if Required)	***$4,300.00/day***
Full-Scale Treatment Program	
Injection Point Installation • Injection points can be installed as temporary direct push points or as fixed PVC points with a direct push drill-rig depending on information gathered from the pilot study. Any concrete coring/pre-clearing should be completed before ISOTEC mobilizes to the site to prevent any delays in the injection treatment. Estimate 40 days of direct push services per event, if utilized. Driller will need 400-500 ft of injection rod in order to pump on 4-6 points simultaneously. **Monitoring** • Post-treatment performance monitoring; both soil and groundwater sampling.	**AKRF**
Full-ScaleTreatment Program • Costs include mobilization/demobilization, reagent chemicals, labor (4 man crew), equipment, daily field monitoring, reporting (Full-Scale Summary Report) and project management. • Two injection events are proposed for injection of ~157,500 gallons of MASP into 42 injection point locations (84 intervals) per event	**$462,500.00 per Event**
Total Full-Scale Program Cost (2 Primary Events)	**$925,000.00**
Additional Days (if Required)	***$5,250.00/day***

7.1 Standard Notes & Conditions

1. The above quote is not a guaranteed price to clean up the contamination noted at the referenced site but has been designed for the performance criterion stated in the proposal. The number of ISOTEC treatments will be dependent on the amount of contamination and site geology. The higher the concentration of contamination and the tighter the geology, the greater the number of necessary treatments.
2. A typical ISOTEC treatment program is performed over multiple injection events to allow for (a) any desorbed contamination or converted product from the first injection event to be readily attacked during the second injection event, and (b) make changes to the reagent stoichiometry and/or injection approach based on lessons learned from previous events.
3. Treatment program reagent volumes and concentrations presented within this proposal are based on information provided within the RFP. Alternative reagent volumes and concentrations will require a change order.
4. Scheduling is based on a first come first serve basis, with an authorized proposal (or subcontract) being the primary basis for scheduling, followed by payment history. ISOTEC will not schedule fieldwork without an authorized proposal (or subcontract), or outstanding receivables over 30 days.
5. Work to be performed in modified Level D personal protective equipment (PPE). Higher-level PPE requires a change order for additional costs associated with such.
6. Regulatory approval will be the responsibility of Client.
7. Monitor well installation, site monitoring and pre and post treatment sampling will be the responsibility of Client.
8. Cancellation of a scheduled treatment program within 3 weeks of authorized program start will be subject to a $7,500 cancellation fee.
9. ISOTEC will require an on-site source (within 200 feet) of water supply (15 gpm minimum) to perform treatment program activities. Access and costs associated with this request will be provided/ incurred by the Client and/or Property Owner.
10. ISOTEC will require adequate and secure staging areas for chemical preparation and storage.
11. Traffic control, if required will be the responsibility of Client.
12. Work performed will be completed during regular business hours between 8 AM and 5 PM. Alternative scheduling will require a change order.
13. Disposal of hazardous wastes collected will be invoiced on a time and materials basis.
14. Invoices will be submitted monthly proportional to the amount of work performed. Payment terms are net 30 days, 1.5% interest per month will be added to any outstanding balances that exceed 60 days. Price quotations are valid for 90 days. Any legal or other costs incurred in collecting delinquent amounts shall be incurred by the Client.
15. Information included within this proposal is to be considered confidential and for Client use only without written authorization by ISOTEC.

16. Without the prior consent of ISOTEC, Client and any affiliated or related companies will not for a period of 2 years from the date of this proposal and/or signed contract, directly or indirectly solicit for employment or engage as a consultant any person who is now employed by ISOTEC.

FIGURES

FORMER OUTPARCEL
ADDED TO VCP IN 2012

GLENDALE PARCEL

ADI
PARCEL

0' 50' 100' 200'
SCALE IN FEET

LEGEND:

PCE SOURCE AREAS

Source: 2010 New York Statewide Digital Orthoimagery

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

HOME DEPOT
REGO PARK - GLENDALE, NEW YORK

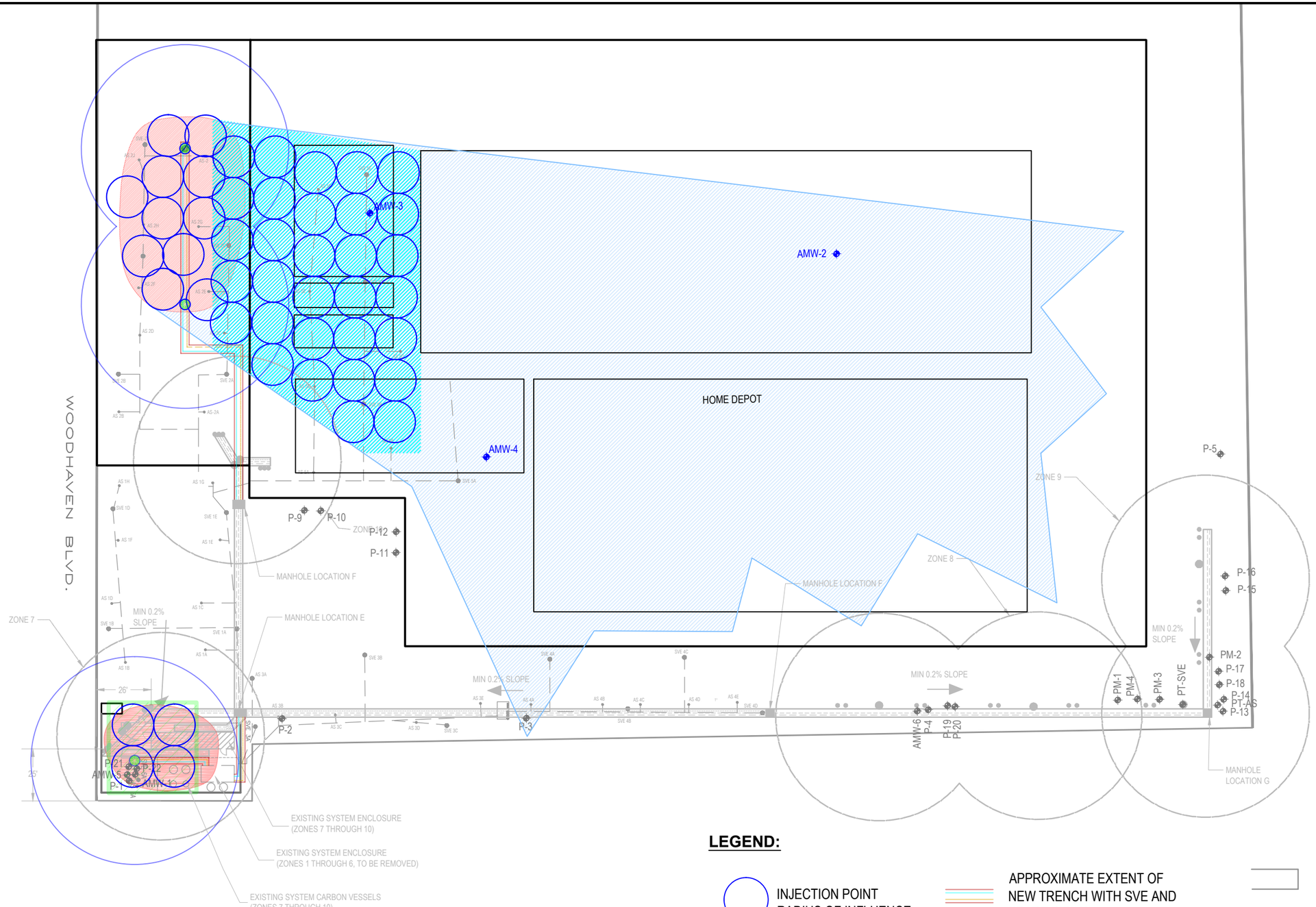
SITE PLAN

DATE
7.11.2012

PROJECT NO.
03399

SCALE
as shown

Figure 1



LEGEND:

- INJECTION POINT RADIUS OF INFLUENCE
- PILOT TEST AREA
- DOWNGRADIENT INJECTION AREA
- APPROXIMATE EXTENT OF NEW TRENCH WITH SVE AND SPARE PIPING
- PCE PLUME
- PCE SOURCE AREAS
- APPROXIMATE SOIL VAPOR EXTRACTION WELL CLUSTER LOCATION
- APPROXIMATE EXTENT OF TRENCH
- EXISTING MONITORING WELL
- AS 1C — EXISTING AIR SPARGING SYSTEM
- SVE 4C — EXISTING SOIL VAPOR EXTRACTION WELL

0' 25' 50' 100'
SCALE IN FEET

M:\AKRF Project Files\03399 & 08009 - Home Depot - Rego Park\Figures\AS-SVE Figures 1-29-10\Site plan and DOB permit_041310.dwg

AKRF Engineering, P.C.
440 Park Avenue South, New York, NY 10016

HOME DEPOT-REGO PARK
REGO PARK - GLENDALE, NEW YORK
IN-SITU TREATMENT CONCEPTUAL DESIGN

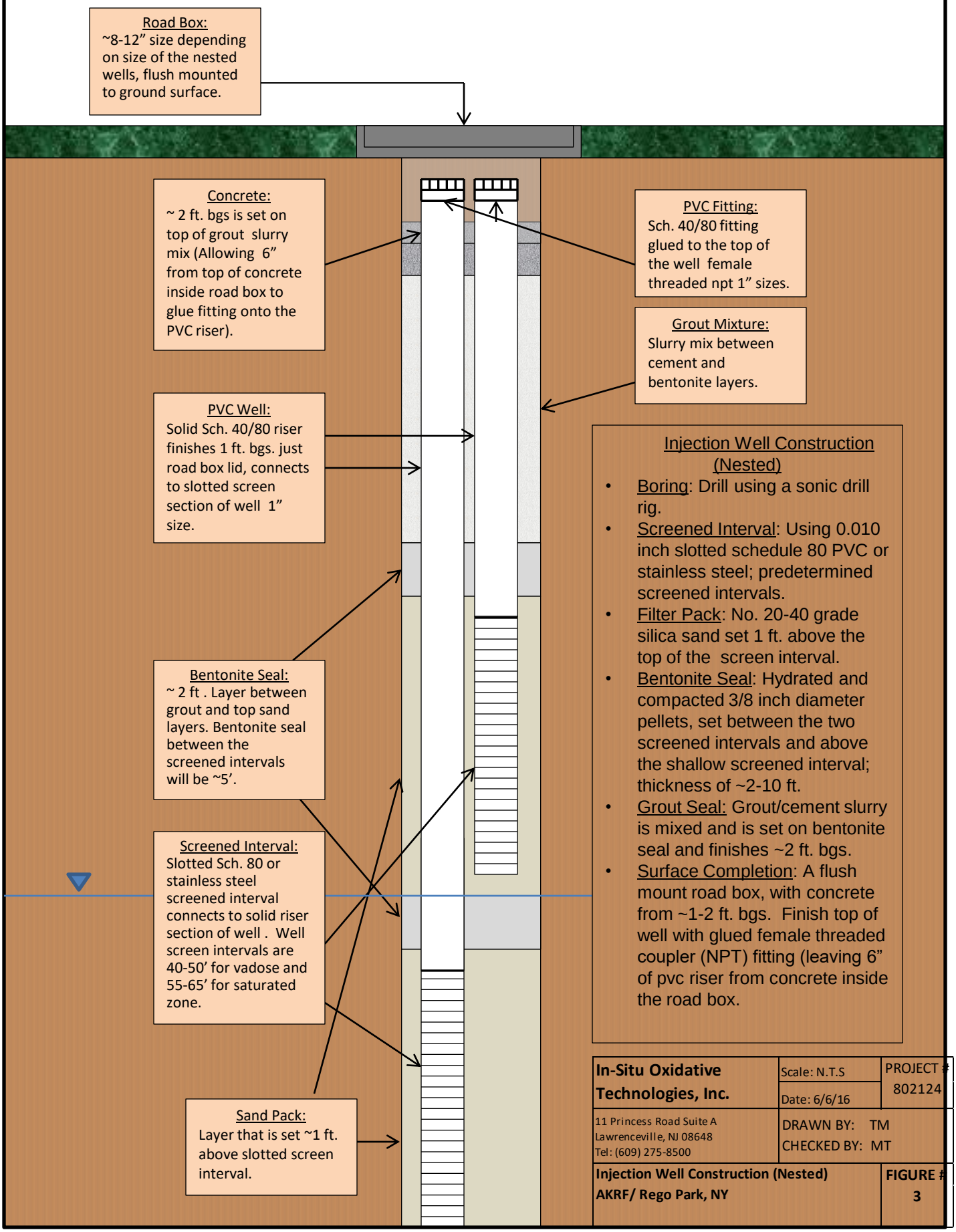
DATE
11/22/2016

PROJECT NO.
990416

SCALE
as shown

Figure 2

Injection Well Construction (Nested) Diagram

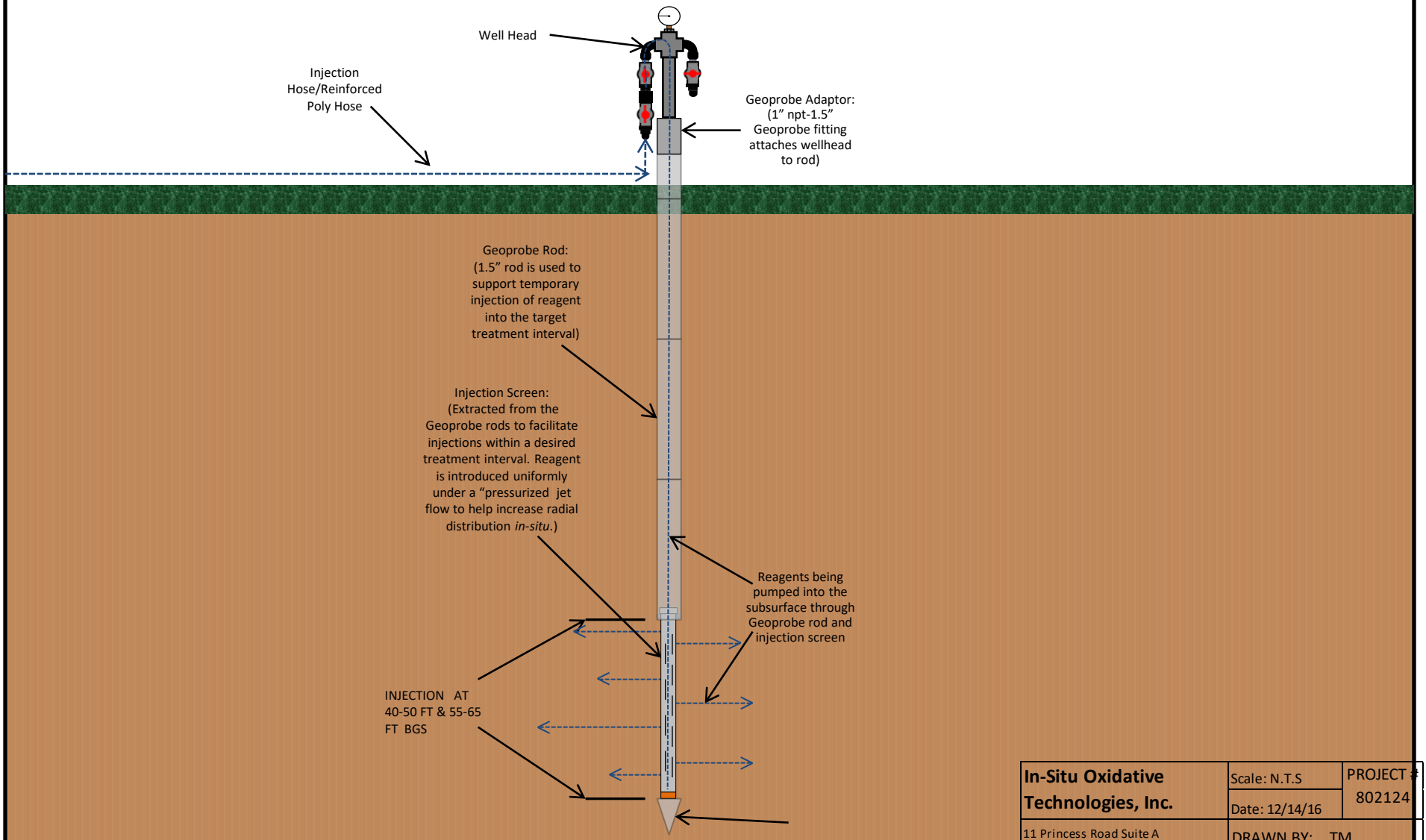


Injection Well Construction (Nested)

- Boring: Drill using a sonic drill rig.
- Screened Interval: Using 0.010 inch slotted schedule 80 PVC or stainless steel; predetermined screened intervals.
- Filter Pack: No. 20-40 grade silica sand set 1 ft. above the top of the screen interval.
- Bentonite Seal: Hydrated and compacted 3/8 inch diameter pellets, set between the two screened intervals and above the shallow screened interval; thickness of ~2-10 ft.
- Grout Seal: Grout/cement slurry is mixed and is set on bentonite seal and finishes ~2 ft. bgs.
- Surface Completion: A flush mount road box, with concrete from ~1-2 ft. bgs. Finish top of well with glued female threaded coupler (NPT) fitting (leaving 6" of pvc riser from concrete inside the road box.

In-Situ Oxidative Technologies, Inc.	Scale: N.T.S Date: 6/6/16	PROJECT # 802124
11 Princess Road Suite A Lawrenceville, NJ 08648 Tel: (609) 275-8500	DRAWN BY: TM CHECKED BY: MT	
Injection Well Construction (Nested) **AKRF/ Rego Park, NY**		**FIGURE # 3**

Direct Push Technology Diagram



In-Situ Oxidative Technologies, Inc.	Scale: N.T.S Date: 12/14/16	PROJECT # 802124
11 Princess Road Suite A Lawrenceville, NJ 08648 Tel: (609) 275-8500	DRAWN BY: TM CHECKED BY: MT	
Direct Push Technology Diagram **Home Depot Site, Rego Park, NY**		**FIGURE # 4**

ATTACHMENT A

BENCH-SCALE TREATABILITY STUDY PROCEDURES

Procedure for the Laboratory Treatability Study

ISOTEC[SM] performs a bench-scale laboratory treatability study to achieve the following objectives:

- Evaluate the effectiveness of the ISOTEC[SM] oxidative process on a representative site-specific soil-slurry sample (Soil-slurry test). The soil-slurry sample is prepared by combining composited soil samples with site groundwater samples in a 2:1 ratio or 1:1 ratio.
- For each ISOTEC catalyst under evaluation, determine the amount of catalyst/oxidant mix (reagent total oxidant demand, TOD) required to oxidize the measured site contaminants (i.e. site-specific stoichiometry per catalyst);

Typical bench scale study procedures are outlined below. The study consists of establishing initial conditions, setting up experimental control, conducting the experiments through application of various catalysts and oxidants, and then submitting the treated samples for analysis. **Please note that this bench study includes VOC analysis for all test samples and total organic carbon (TOC), iron and manganese analysis for initial samples. If analysis for other parameters is required (such as PAHs, TPH or TAL metals), it can be performed at an additional cost.**

Initial Conditions

Initial untreated/baseline conditions of soil, soil-slurry, and groundwater are established prior to initiating the experiment. Initial groundwater samples are analyzed for iron and manganese. Initial soil samples are analyzed for iron, manganese and total organic carbon (TOC). The initial soil-slurry samples are analyzed for VOCs.

Experimental Control

Experimental control samples (Control) are set up the same way as all other experimental samples during the study to document the following:

- reduction in contaminant concentrations due to sample dilution by reagent volumes injected, and
- reduction in contaminant concentrations due to volatilization caused by room temperature test conditions.

Control sample is set up in a treatment reactor but is injected with distilled water instead of reagents. The volume of distilled water injected is identical to the volumes of reagent injected into treatment reactors. Control sample will remain at and is subject to the same conditions as all other treatment and monitoring reactors.

Soil-Slurry Test Experimental Setup

ISOTEC[SM] soil-slurry test is designed to simulate the condition of saturated/ unsaturated zones at the site. Because contaminants tend to bind to aquifer matrix in the subsurface, they are not as readily degradable as the dissolved phase contaminants in groundwater. Furthermore, soil organic matter tends to impart a scavenging effect on the oxidizing agent leading to competition. However, an increase in the amount of reagent supply into the treated samples overcomes the solid binding force and achieves significant contaminant destruction.

Soil-slurry test experiment is performed in multiple pairs of 120 ml sealed batch reactors. Soil-slurry mix is prepared from a two to one ratio by weight (2:1 or 1:1 w/w) of soil and groundwater. Soil-slurry is introduced into each reactor, leaving enough headspace for predetermined reagent volumes to be injected. The reactors are sealed with screw-top caps fitted with Teflon®-lined rubber septa to facilitate reagent injections.

Each pair receives a different volume of the reagent to test low, medium and high dosages. Similar to groundwater test, one reactor of each pair serves as the "treatment reactor" while the other serves as the "monitoring reactor". Both reactors of each pair will receive identical reagent doses. Treatment reactor is not opened or sampled until the end of the experiment. Monitoring reactor is used to monitor the extent of the oxidation reaction of the pair, by periodically extracting small samples for oxidizer analysis. Distilled water is used to equalize the total volume of reagent used between multiple reactors pairs. The reactor pair which receives only distilled water will serve as control.

Experimental Quenching

Following the last application of reagent, all reactors remain undisturbed at room temperature for a minimum of 24 hours (2 weeks for persulfate) or until the oxidizer is completely consumed as determined by laboratory analysis. Treatment effectiveness is evaluated by calculating the percent VOC/ PAH reduction in each treatment reactor relative to the control reactors.

Sample Collection and Analysis

Oxidant concentration and pH monitoring is performed periodically througout the experiment. Following sample quenching, final values of oxidant and pH are determined from the monitoring reactors. Samples are submitted to a New Jersey certified laboratory for contaminant analysis. Samples will be analyzed using EPA 624/8260 for VOCs, EPA 6010/6020/200.8/7000 series for iron and manganese, and EPA 415.1 for TOC, and ISOTEC internal methods for TOD. The samples will include:

- "Initial" groundwater samples for iron, and manganese analysis.
- "Initial" soil samples for iron, manganese, and TOC analysis.
- "Initial" soil-slurry samples for VOC analysis.
- "Control" soil-slurry samples for VOC and total oxidant demand (TOD) analysis.
- "Treatment" low, medium and high dosage soil-slurry samples for VOC and TOD analysis.

ISOTEC[SM] Laboratory Study Sample Collection

In order to perform an ISOTEC lab study, a representative soil and/or groundwater sample must be collected from an area of concern at the site exhibiting the highest detected levels of contaminants.

Please purge the well prior to groundwater sampling. Field and trip blanks are not required. For soil samples, please collect a representative soil sample or a composite. A summary of the sample containers required for the laboratory study is provided below. **Please contact ISOTEC for sample requirements other than those listed below.**

*****Please ensure zero head space in 1 liter jars *****

Container Type	No.	Matrix	Preservative
1 liter, amber glass*	3	Groundwater	Ice only
Zip lock bags placed in clean paint cans	1 (10 lbs)	Soil	Ice only

For testing both modified Fenton's as well as catalyzed persulfate, double the above sample volumes for each analyte.

Lab study samples are requested to be collected on a Monday/Tuesday and received by ISOTEC on Tuesday/Wednesday. Samples should be packaged in a cooler (with ice) and shipped overnight (AM) delivery to the following address:

In-Situ Oxidative Technologies, Inc.
11 Princess Road, Suite A
Lawrenceville, New Jersey 08648
Attn: Yan Chin

If you should need to be supplied with sample containers and/or a sample shuttle, please contact ISOTEC. Please enclose a standard chain-of-custody with the samples. **In addition, please enclose contaminant information by including latest laboratory analytical data on the above samples collected.**

ISOTEC must be notified **at least 48 hours** prior to sample shipment to prepare for lab study.

If you should have any questions concerning the sampling event, please do not hesitate to contact Prasad Kakarla at (609) 275-8500 (ext. 111).

APPENDIX D

HEALTH AND SAFETY PLAN
AND
COMMUNITY AIR MONITORING PLAN

Home Depot – Rego Park

REGO PARK - GLENDALE, NEW YORK

Health and Safety Plan

And

Community Air Monitoring 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, Inc.
440 Park Avenue South, 7th Floor
New York, NY 10016
212-696-0670

JANUARY 2017

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FIGURES

APPENDICES

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, and a public school. Commercial properties are located north-adjacent to the Site. Across the railroad tracks to the south of the Site is a baseball field with associated parking area and concession stand; further to the south are residential areas.

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 through 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 *Remedial Optimization Work Plan* (ROWP), which details the activities associated with remedial optimization 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 & SVOCs					

2.1.4 Chemicals of Concern

Chemicals	REL/PEL/STEL (ppm[1])	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: [1] = parts per million 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; and 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 Zone is the 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 the 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 feet from Borehole	25 feet from Borehole	As Needed
Trench Excavation and Pipe Installation	10 feet from Open Excavation	25 feet 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.

A 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 parts per million (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 PID 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. The SSOs 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.

Instrument	Task to be Monitored	Work Zone Action Levels (15-minute 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
		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 200 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 < 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: 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 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 background air monitoring levels are re-established. 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.

Instrument	Task to be Monitored	CAMP Action Levels (15-minute time-weighted averages)	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) 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	**Stop work**. 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 0.15 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: 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) Hard Hat (within 25 ft of drill rig/excavator) (x) Work Gloves	(x) Safety Glasses ( ) Face Shield (x) Ear Plugs (within 25 ft of drill rig/excavator) (x) Latex Gloves	Potential contact with suspected contaminated materials
Level D – Modified ***(in addition to Level D)*** (x) Tyvek Coveralls ( ) Saranex Coveralls	(x) Nitrile Gloves ( ) Overboots	Potential contact with soil with elevated PCE or NAPL
Level C ***(in addition to Level D – Modified)*** ( ) Half-Face Respirator (x) Full-Face Respirator ( ) Full-Face PAPR	( ) Particulate Cartridge ( ) Organic Cartridge (x) Dual Organic/Particulate Cartridge	If PID > 5 ppm or particulate > 5 mg/m^3 in breathing zone
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 they 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), they 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 LIJ 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. MERGE onto *Yellowstone Boulevard* 4. TURN LEFT to stay on *Yellowstone Boulevard* 5. TURN LEFT onto *66th Road* 6. 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)
	Eric Park	Project Manger	646-388-9532 (office)
	Steve Grens	SSO	203-810-6513 (cell)
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: _____

Signed: _____ Company: _____ Date: _____

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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: _________

Signed: ___________________________ Company: ________________________ Date: _________

Signed: ___________________________ Company: ________________________ Date: _________

Signed: ___________________________ Company: ________________________ Date: _________

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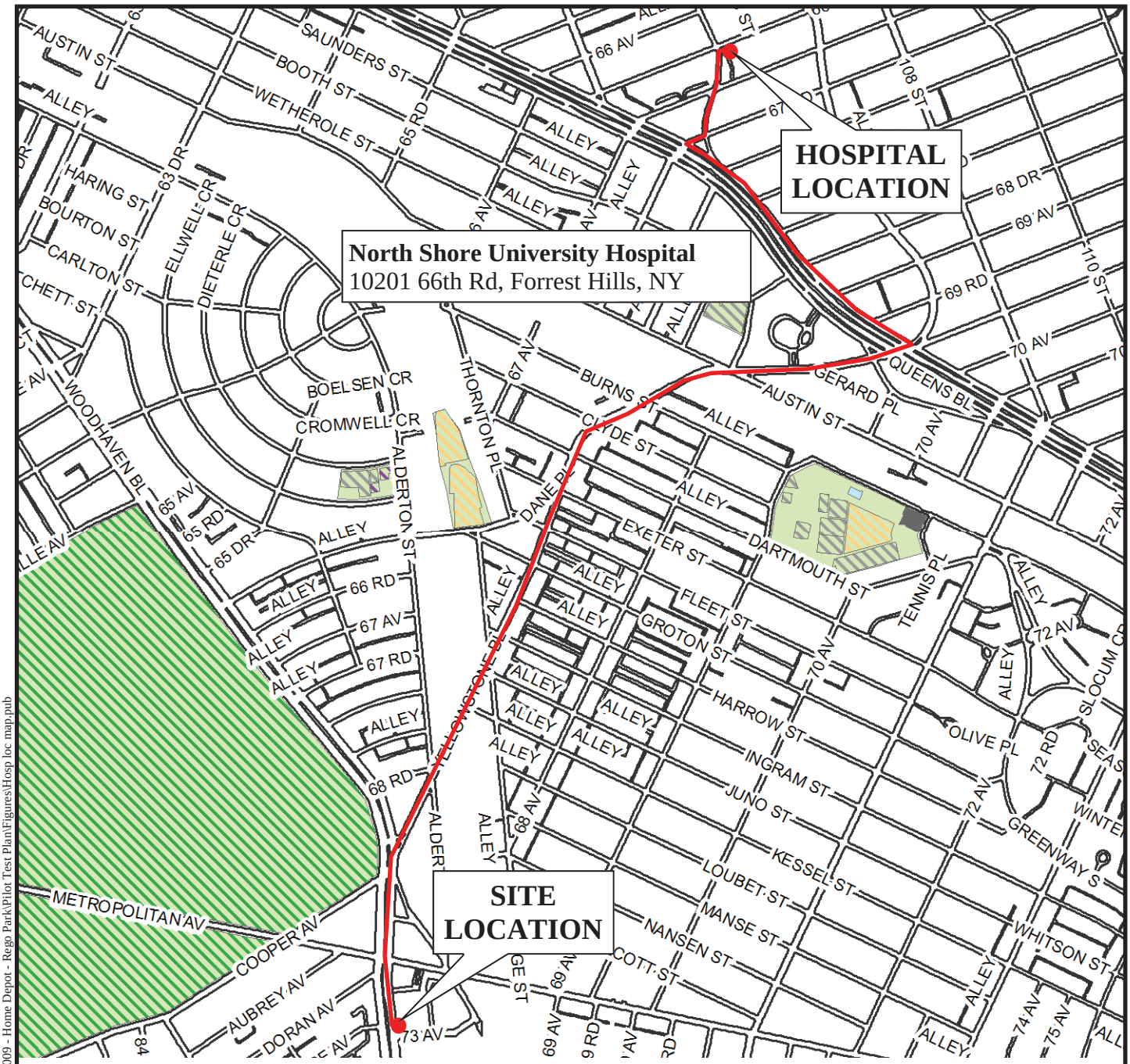
Signed: ___________________________ Company: ________________________ Date: _________

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

M:\AKRF Project Files\03399 & 08009 - Home Depot - Rego Park\Pilot Test Plan\Figures\Hosp loc map.pub

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 E

QUALITY ASSURANCE PROJECT PLAN

Home Depot – Rego Park

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:

AKRF, Inc.
440 Park Avenue South, 7th Floor
New York, NY 10016
212-696-0670

JANUARY 2017

TABLE OF CONTENTS

TABLES (IN TEXT)

ATTACHMENTS

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) describes the protocols and procedures that will be followed during implementation of the Remedial Optimization Work Plan (ROWP) at Home Depot – Rego Park, Rego Park - Glendale, New York in the Borough of Queens, New York, New York (hereinafter referred to as the "Site"). The Site is referred to as "Home Depot in Woodhaven Blvd & Metropol" in the New York State Department of Environmental Conservation (NYSDEC) information system. The remedial optimization work consists of:

- **AS/SVE System Optimization**
  - Pilot Scale SVE Testing (southwestern source area)
    - Installation and performance monitoring of two additional SVE wells (SVE Zone 13).
    - Design of a new SVE system to operate on SVE Zone 13, as well as SVE Zones 11 and 12, to be installed in the western source area.
    - Reporting to NYSDEC of final SVE system design, including blower selection and vapor treatment design.
  - Full Scale SVE Installation
    - Installation of SVE Zones 11 and 12 in the western source area.
    - Installation of new SVE system equipment and associated subgrade piping.
    - Startup and performance monitoring of the new SVE system.
- **Modifications to Existing AS/SVE System**
  - Decommissioning of the Initial AS/SVE System (Zones 1 through 6)
    - Disconnection, shutdown, and disposal of Initial AS/SVE System equipment.
  - Continued Operation of Expanded AS/SVE System (Zones 7 through 10)
    - Adjustments to cycle timing of Expanded AS/SVE System to optimize operation.
- **In-Situ Chemical Oxidation**
  - Bench Scale Testing (southwestern source area)
    - Baseline soil and groundwater sample collection to finalize Pilot Scale injection design.
    - Permeability testing to assess the potential for direct chemical injection.
    - Reporting to NYSDEC of any modifications to injection design prior to implementation of Full Scale injection program (Bench Scale Test Report).
  - Pilot Scale Injection (southwestern source area)
    - One round of chemical injection at four locations, with two injection intervals at each location.
    - Performance monitoring to determine the effectiveness of the injection design.
    - Reporting to NYSDEC of any modifications to injection design prior to implementation of Full Scale injection program (Full Scale Remedial Optimization Work Plan).

- Full Scale Injection (western source area)
  - Two rounds of injection at approximately forty-two (42) locations, with two injection intervals at each location.

- **Remedial Optimization Summary Report**
  - Reporting to NYSDEC of all completed work and findings from the Remedial Optimization.

The objective of the QAPP is to provide for Quality Assurance (QA) and maintain Quality Control (QC) of environmental sampling and remedial optimization activities conducted under the ROWP. Adherence to the QAPP will ensure that defensible data will be obtained during 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 NYSDEC, and Home Depot to ensure a smooth flow of information between involved parties. Marc S. Godick, LEP, will serve as the project director. 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 work under the ROWP. The project manager will prepare reports and participate in meetings with Home Depot and/or the NYSDEC. Eric Park will serve as the project manager. Mr. Park's resume is included in Attachment A.

2.3 Field Team Leader

The field team leader will be responsible for supervising the daily sampling and health and safety activities in the field and will ensure adherence to the work plan and Health and Safety Plan (HASP). They 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. The field team leader responsibilities will be assigned to appropriate AKRF personnel who will be established when implementation of the work is near. Field team leaders may include Gregory Baird and Stephen Grens, Jr. Mr. Baird's and Mr. Grens' resumes are 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.

Marcus Simons will serve as the QA/QC officer for the ROWP. 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. They will track the movement of samples from the time they are checked in at the laboratory to the time that analytical results are issued. They 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 for the ROWP.

3.0 STANDARD OPERATING PROCEDURES

The following sections describe the standard operating procedures (SOPs) for the activities included in the ROWP. During these operations, safety monitoring will be performed as described in the project HASP and all field personnel will wear appropriate personal protective equipment.

3.1 SVE Well Installation

Soil vapor extraction (SVE) wells will be installed using a hollow stem auger (HSA) rig are described below.

1. Core through any existing asphalt or concrete surface.
2. Advance borings using a sonic rig with minimum 6.25-inch inside diameter hollow-stem augers.
3. Construct wells with 4-inch diameter Schedule 40 PVC, a 20-foot segment of 0.020-inch slotted well screen, followed by a solid PVC riser to bring the pipe to just below grade. SVE wells will be constructed with the bottom of the well above the water table.
4. Fill annular space with No. 1 sand filter pack extending from bottom of the well to 6 inches above the screen. The remaining annular space will be sealed with a 2-foot layer of hydrated bentonite followed by concrete grout to grade.
5. Grout borehole with bentonite-cement slurry upon completion.
6. Complete well with a locking, flush-with-grade gate box, with a cement apron set around to prevent drainage of surface runoff into the well.
7. Decontaminate all non-dedicated sampling equipment between samples, and prior to and following each soil boring location, as described in Section 3.3 of this QAPP.
8. Containerize and handle drill cuttings and decontamination water as described in Section 3.4 of this QAPP.

A direct-push probe (DPP) rig may also be used with prepack wells of equivalent construction.

3.2 Injection Well Installation (If necessary)

In-situ chemical injection wells may be installed as part of the chemical oxidation work. If necessary, injection wells will be installed using a DPP rig as described below:

1. Core through any existing asphalt or concrete surface.

2. Advance borings using a DPP rig.
3. Construct wells with 1 inch diameter Schedule 40 PVC, a 10-foot segment of 0.020-inch slotted stainless steel well screen, followed by a solid PVC riser to bring the pipe to just below grade.
4. Fill annular space with No. 1 sand filter pack extending from bottom of the well to 6 inches above the screen. The remaining annular space will be sealed with a 10-foot layer of hydrated bentonite followed by concrete grout to grade.
5. Grout borehole with bentonite-cement slurry upon completion.
6. Complete well with a locking, flush-with-grade gate box, with a cement apron set around to prevent drainage of surface runoff into the well.
7. Decontaminate all non-dedicated sampling equipment between samples, and prior to and following each soil boring location, as described in Section 3.3 of this QAPP.
8. Containerize and handle drill cuttings and decontamination water as described in Section 3.4 of this QAPP.

Following well installation, the SVE wells (and injection wells, if necessary) will be developed according to the following procedure:

1. 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 0.653 volumes per foot of water column (gallons) as the conversion factors for a 4-inch diameter well.
2. For the first five minutes of well development, develop the well using a submersible pump and re-circulate 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.
3. After the first five minutes of well development, develop the well using a submersible pump and discharge the water to five-gallon buckets. Transfer water from the buckets to 55-gallon drums designated for well development water.
4. During development, collect periodic samples and analyze for turbidity and water quality indicators (pH, temperature, dissolved oxygen, reduction-oxidation potential, and specific conductivity) with measurements collected approximately every five minutes.
5. Continue developing the well until turbidity is less than 50 nephelometric turbidity units (NTUs) for three successive readings and until water quality indicators have stabilized to within 10% for pH, temperature and specific conductivity for three successive readings, or until three well volumes have been purged from the well.
6. Document the volume of water removed and any other observations made during well development in the field logbook or on field data sheets.
7. Decontaminate the equipment prior to and following development at each well location as described in Sections 3.2 and 3.3 of this QAPP. All well development water, decontamination, and purge water will be containerized in 55-gallon drums and handled as described in Section 3.4 of this QAPP.

3.3 Decontamination of Sampling Equipment

All sampling equipment will be either dedicated or decontaminated between sampling intervals or 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 Heavy Equipment Decontamination

Decontamination of contaminated heavy equipment will be accomplished using high-pressure steam or dry decontamination with brushes and shovels. Decontamination will take place on a decontamination pad and all liquids used in the decontamination procedure will be collected. Vehicles or equipment brought into an exclusion zone will be treated as contaminated, and will be decontaminated prior to removal. All liquids used in the decontamination procedure will be collected, stored and disposed of in accordance with Federal, State and local regulations. Personnel performing this task will wear the proper PPE as prescribed in the Site-Specific HASP.

A decontamination area will be established around the planned work areas. The floor of the decontamination area will be covered with 6-mil plastic sheeting, as necessary, and bermed to prevent spreading of decontamination fluids or potential discharge to the ground surface.

3.5 Management of Investigation Derived Waste

All investigation-derived waste (IDW) will be containerized in Department of Transportation (DOT)-approved 55-gallon drums, rolloff containers, or other appropriate containers. The containers will be covered at the end of each work day and labeled with the date, the material location, the type of waste (e.g., drill cuttings, development water or purge water), and the name of an AKRF point-of-contact. Waste characterization samples will be collected, as required by the disposal facility. All containers will be labeled "pending analysis" until laboratory data is available. All IDW will be handled and disposed of or treated according to applicable local, State and Federal regulations.

4.0 SAMPLING AND LABORATORY PROCEDURES

4.1 Sample Collection Methodology

Where appropriate, trip blank and blind duplicate samples will be collected for quality control purposes, as described in Section 4.3. 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 Backfill/Reuse Sampling

Prior to reuse as backfill, excavated material (such as material removed as part of piping installation for SVE system) will be evaluated using the criteria below:

1. Material proposed for reuse will be sampled at a minimum frequency of one discrete VOC sample for every 50 cubic yards and one composite sample to be analyzed for SVOCs, TAL metals, and PCBs/Pesticides for every 300 cubic yards. An additional two VOC samples and one composite sample will be collected and analyzed for each additional 1,000 cubic yards of like material. The composite samples will comprise a composite of three to five grab samples.
2. Samples will be collected into laboratory-supplied containers.
3. Samples will be kept in an ice-filled cooler or refrigerator until receipt by the laboratory.
4. Decontaminate all sampling equipment between sampling locations as described in Sections 3.3 of this QAPP.

4.1.2 In-Situ Treatment Testing

A Bench Scale laboratory treatability study will be performed using soil and groundwater samples to evaluate the effectiveness of the planned oxidation technology. Post-injection performance monitoring soil and groundwater sampling will also be performed to evaluate the effectiveness of treatment.

4.1.2.1 Soil Sampling

Soil sampling will be conducted in accordance with the following procedures:

- Characterize the sample according to the modified Burmister soil classification system.
- Collect an aliquot of soil from each sampling location and place in labeled sealable plastic bags. The bag should be labeled with the soil boring number and the depth the sample was collected. Place the plastic bags in a chilled cooler to await selection of samples for laboratory analysis, if needed.
- After selecting which samples will be analyzed in the laboratory, fill the required laboratory-supplied sample jars with the soil from the selected sampling location or labeled sealable plastic bags. Seal and label the sample jars as described in Section 4.4 of this QAPP and place in an ice-filled cooler.
- Decontaminate any non-dedicated soil sampling equipment between sample locations as described in Section 3.3 of this QAPP.
- Record boring number, sample depth and sample observations (evidence of contamination, PID readings, soil classification) in field log book and boring log data sheet, if applicable.

4.1.2.2 Groundwater Sampling

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:

- 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, and 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 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 Horiba U22 multi-parameter meter or equivalent. Connect tubing to the output of the cell and place the discharge end of the tubing in a 5-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 to not 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:

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

- If the water quality parameters do not stabilize within two hours, purging may be discontinued, and samples will be collected as described below. 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 SVE System Confirmatory Sampling

Confirmatory extracted vapor sampling will be conducted following startup as part of a reassessment of VOC emissions calculations according to the following procedure:

- Confirmatory sampling will comprise grab vapor samples from SVE piping, as appropriate.
- Connect the tubing leading from the designated sampling port to the inlet of a labeled 6-liter Summa canister fitted with a 6-hour laboratory-supplied regulator. Record the vacuum reading from the vacuum gauge on the canister at the beginning of the sampling period. Open the valve of the canister and record the time in the field book.
- At the end of the sampling period and prior to the vacuum gauge returning to ambient pressure, close valve, remove flow-rate controllers and vacuum gauges, install caps on canisters, and record time.
- Place canisters in shipping containers for transportation to laboratory.
- Samples will be collected in accordance with the QAPP and analyzed for VOCs by EPA Method TO-15.
- Decontaminate all non-dedicated sampling equipment between sampling locations as described in Section 3.3 of this QAPP.

4.2 Laboratory Methods

Samples will be analyzed by an environmental laboratory approved in conformance with the National Environmental Laboratory Accreditation Conference Standards (2003). Category B Deliverables will be required for confirmatory (post remediation) samples and final delineation samples. Sampling analyses are expected to be performed by TestAmerica Laboratories of Edison, NJ, or other equivalently qualified New York State-certified laboratory. 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.

Samples will be analyzed using the following methods and within the following holding times:

Table 1 - Sample Analysis Methods and Holding Times

Matrix	Sample Analysis	EPA Method	Bottle Type	Preservative	Holding Time*
Soil - Reuse	TCL VOC	8260	EnCore or Terracore sampler	4˚C	2 days
	TCL SVOCs	8270	8 oz. clear glass	4˚C	14 days
	PCBs	8082	8 oz. clear glass	4˚C	14 days
	Pesticides	8081	8 oz. clear glass	4˚C	14 days
	TAL Metals	6010/7470	8 oz. clear glass	4˚C	14 days
Soil - Bench Scale Test and Performance Monitoring	VOCs	8260	EnCore or Terracore sampler	4˚C	2 days
	Sulfide, chloride, ferrous iron, manganese	4500, 6010	Glass 4 oz. jar	4˚C	180 days
	Sulfate	3500	200 ml plastic	4˚C	28 days
Groundwater - Bench Scale Test and Post-Injection Monitoring	VOCs	8260	40 mL glass vial, septa top	4˚C, HCl	14 days
	Sulfide, chloride, ferrous iron, manganese	4500, 6010	500 ml plastic	HNO_3	180 days
	Sulfate	3500	200 ml plastic	4˚C	28 days
Air - SVE System Sampling	VOCs	TO-15	6-liter Summa canister	None	14 days

*Holding times are from time of sample collection.

4.3 Quality Control Sampling

In addition to the laboratory analysis of the collected samples, additional analysis will be included for quality control measures, as required by the Category B sampling techniques. These samples may include ambient air sample and blind duplicate samples. QC samples will be analyzed for the same parameter set for which the other samples will be analyzed. Quality control samples will be collected at a frequency of one sample for every 20 field samples. Quality control sampling will be performed when collecting samples for disposal characterization in accordance with the disposal facility requirements. QA/QC Sampling requirements are presented in Table 2 below.

Table 2 - QA/QC Sample Requirements

Sample Type	Parameters	EPA Analytical Method	QC Samples			
			Trip Blank	Blind Duplicate	MS/MSD[1]	Equipment Blank
Soil for Reuse	TCL VOC	8260	1 per 20 samples	1 per 20 samples	1 per 20 samples	1 per 20 samples
	SVOCs	8270				
	TAL Metals	6010/7470				
	PCBs	8082				
	Pesticides	8081				
Groundwater – Injection monitoring	TCL VOC	8260	1 per 20 samples	1 per 20 samples	1 per 20 samples	1 per 20 samples
	Sulfide, chloride, ferrous iron, manganese	4500, 6010				
	Sulfate	3500				
Air - SVE System Sampling	VOCs	TO-15	1 per 20 samples	1 per 20 samples	1 per 20 samples	1 per 20 samples

No QA samples are anticipated as part of the bench scale testing for in-situ treatment.

4.4 Sample Handling

4.4.1 Sample Identification

All samples will be consistently identified in all field documentation, chain-of-custody documents and laboratory reports using an alpha-numeric code. Soil samples will be identified by the location number followed by the sample depth interval (in parenthesis), followed by the date. Waste characterization samples collected from 55-gallon drums will be identified by the drum number (e.g., D-1 or D-2), followed by the date.

Table 3 provides examples of the sampling identification scheme.

Table 3 - Examples of Sample Names

Sample Description	Sample Designation
Groundwater sample from monitoring well P-3	P-3-20170131
Influent Sample from extraction well SVE-11A	SVE-11A-INF-20170131

4.4.2 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

Each sample container and the chain-of-custody form will be placed in a shipping container with bubble wrap or packing materials, as appropriate to prevent damage/breakage.

If appropriate based on analyses, freezer packs and/or fresh ice in sealable plastic bags will be added. Once the 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.

Samples will be shipped overnight (e.g., Federal Express) or transported by a laboratory courier. All containers shipped to the laboratory will be sealed with mailing tape and a chain-of-custody (COC) seal to ensure that the containers remain sealed during delivery.

4.4.3 Sample Custody

Field personnel will be responsible for maintaining the samples 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.

4.5 Field Instrumentation

Field personnel will be trained in the proper operation of all field instruments at the start of the field program. For longer duration work, instruction manuals for the equipment will be available 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. Calibration will be logged to record the date of each calibration, any failure to calibrate and corrective actions taken. The PID will be calibrated each day using ppm isobutylene standard gas.

ATTACHMENT A

RESUMES OF PROJECT QA/QC OFFICER, PROJECT DIRECTOR, AND PROJECT MANAGER

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.

Landfill Closure & Compost Facility Application, White Plains, NY

Mr. Godick is currently managing the closure of a formal ash landfill, which is currently being utilized as a leaf and yard waste compost facility by the City of White Plains. The landfill closure requires additional assessment to define the extent of methane and solvent contamination, which will affect the design of the landfill cap and any additional remediation. Mr. Godick also managed the preparation of the compost facility permit application, which required modification to the facility's operations necessary to close the landfill and address other regulatory requirements.

Landfill Redevelopment – RD Management, Orangeburg, NY

Mr. Godick is currently managing the remediation of the former Orangeburg Pipe site under the Voluntary Cleanup Program. The site contains widespread fill material, which has fragments of Orangeburg pipe that is impregnated with asbestos and coal tar. The site is currently being redeveloped for retail use. The closure plan for the site provides for reuse of all fill material on-site. The fill management activities will include dust and sediment control measures and air monitoring to prevent airborne dust in accordance with a closure plan, stormwater pollution prevention plan (SWPPP), and construction health and safety plan (CHASP). In pervious areas, the site cap will consist of 2 feet of clean fill and a liner in larger areas. The site will be redeveloped for hotel and retail use.

Shaws Supermarket Redevelopment Project, New Fairfield, CT

Mr. Godick was the LEP of Record for the remediation of a shopping center site that was contaminated by on-site releases from former dry cleaning operations and off-site gasoline spills. A remediation plan was prepared and approved within one year to enable redevelopment work for a new supermarket and shopping center. The remediation was complicated by the use of groundwater as a potable source at the site and surrounding area. The remediation plan included the removal of contaminated soil and installation of a multi-well pump and treat system for the recovery of non-aqueous and dissolved phase contamination from two of the three aquifers. The soil removal activities and treatment system installation have been completed, and system operation, maintenance, and monitoring are ongoing.

National Grid – Halesite Manufactured Gas Plant Site, Town of Huntington, NY

Mr. Godick is managing the remedial design and engineering work associated with remediation of National Grid's former manufactured gas plant (MGP) located in the Town of Huntington. The site is situated in a sensitive location along the waterfront, surrounded by commercial and residential properties, and half the property where the remediation will be conducted is a steep slope. The remedy consists of soil removal, oxygen injection, and non-aqueous phase liquid recovery. Mr. Godick is responsible for the development of the remedial work plans, design/construction documents, landscape architecture, confirmatory sampling, air monitoring, supervision, and preparation of close-out documentation in accordance with NYSDEC requirements. Work is anticipated to be completed in 2009.

Site Investigation & Remediation–Former Manufactured Gas Plant (MGP), Confidential Client, Westchester County, NY

The site is currently an active retail shopping center. Previously, the site had been utilized as a large former MGP. The project entailed the implementation of a large-scale remedial investigation that addressed the assessment and remediation of occupied buildings, as well as the potential of future redevelopment of the site. Future remediation will consist of hot spot removal, product recovery, and groundwater containment measures. Other engineering and institution controls will also be implemented.

Underground Storage Tank Closure and Site Remediation–Program Management, Con Edison, New York, NY

Mr. Godick provided technical assistance to Con Edison in developing technical submittals and budgets associated with tank closures at over 50 facilities. Technical summaries were prepared for submittal of contractor-prepared

closure reports to the NYSDEC. The summaries included a review of historic pre-closure assessments, tank closure data, and provided recommendations for additional assessment, remediation or closure. Subsequently, a three-year program budget was developed for implementation of the UST investigation/remedial program, which Con Edison utilized for internal budgeting purposes.

Site Investigation–Over 20 Facilities, Con Edison, New York, NY

Mr. Godick managed site investigations associated with petroleum, dielectric fluid, and PCB releases at over 20 Con Edison facilities including service centers, substations, generating stations, and underground transmission and distribution systems. Site investigations have included due diligence site reviews, soil boring installation, monitoring well installation, hydrogeologic testing, and water quality sampling. Risk-based closures have been proposed for several sites.

Site Investigation–7 World Trade Center Substation, Con Edison, New York, NY

Mr. Godick managed the site investigation at the former 7 World Trade Center Substation in an effort to delineate and recover approximately 140,000 gallons of transformer and feeder oil following the collapse of the building. The project involved coordination with several crews, Con Edison, and other site personnel.

Site Investigation–Former Manufactured Gas Plant (MGP) Facilities, Con Edison, New York, NY

Mr. Godick managed site investigations at four former MGP facilities. The investigations at three of the four sites were completed at a Con Edison substation, flush pit facility, and service center, respectively. The details associated with the fourth site are confidential. Site characterizations at the substation and flush pit facility were conducted in preparation of expansion at these locations. The findings from these characterizations were used by Con Edison to make appropriate changes to the design specifications and to plan for appropriate handling of impacted materials and health and safety protocols during future construction activities.

Ground Water Monitoring–Over 20 Facilities, Con Edison, New York, NY

Mr. Godick managed a multi-site contract for ground water monitoring at over 20 facilities throughout Con Edison's footprint at service centers, substations, generating stations, transmission/distribution, and major oil storage facilities (MOSF) sites.

Verizon, Investigation & Remediation, Various Locations, NY, PA and DE

Mr. Godick managed over 50 geologic/hydrogeologic assessments and site remediation projects related to petroleum releases at various facilities. Responsibilities included annual budgeting, day-to-day project management, development and implementation of soil and ground water investigation workplans, ground water modeling, risk evaluation, remedial action work plans, remedial design, system installation, waste disposal, well abandonment, and operation and maintenance. Many of the assessment and remedial projects followed a risk-based approach. Remedial technologies implemented included air sparging, soil vapor extraction, bioremediation, pump and treat, soil excavation, and natural attenuation.

Site Investigation, Risk Assessment and Remediation, Thermadyne Holding Company, Danvers, MA

Mr. Godick managed a remedial investigation and ground water remediation program for a former manufacturing facility in Massachusetts. The project included the design and installation of a ground water remedial system for chlorinated solvent impact within a complex fractured bedrock aquifer. Responsibilities included the review of historic data, collection of extensive new groundwater data, completion of pump testing, computer modeling of the bedrock aquifer, remedial system pilot testing, system design, O&M, waste disposal, and preparation of all necessary reports to the State. To facilitate the closure of the site, a Risk Characterization Report was prepared under the Massachusetts Contingency Plan.

Groundwater and Soil Remediation, BP Oil Company, Various Locations, NJ and PA

Mr. Godick provided support to environmental activities for BP Oil Company in Pennsylvania and New Jersey. Responsibilities included completion of remedial investigations, preparation of remedial action plans, quarterly ground water sampling, and reporting.

Multimedia Compliance and Remediation, Greenburgh Central School District No. 7, Hartsdale, NY

Mr. Godick implemented a multimedia program to address regulatory compliance and remediation at the transportation yard and other facilities. The compliance program included development of an environmental management system including periodic auditing, standard operating procedures, release reporting, and training. Designed and implemented engineering controls and monitoring to satisfy stormwater requirements. Remediation was conducted to address petroleum and solvent contamination from former underground storage tanks and dry wells, which included source removal and natural attenuation of groundwater. Provided support in connection with litigation from the adjoining property owner.

Preliminary Impact Assessment, Proposed Wildlife Refuge and Ecology Center, BASF Corporation, Kearny, NJ

Mr. Godick managed a preliminary environmental impact assessment at the location of a former BASF facility. Adjacent to the property is an expanse of mudflats that contained heavy metals, PAHs, PCBs, dioxins and other contaminants originating from numerous point and non-point sources. BASF proposed to cap these mudflats with clean sediments, and to develop a salt marsh wildlife refuge having an area of approximately 180 acres on the remediated portion. A workplan was developed and implemented, which included fish and benthic testing to evaluate whether winter flounder used the mudflat as a spawning area, and to evaluate whether winter flounder or summer flounder may utilize the mudflat as a juvenile rearing area. The benthic invertebrate and fish sampling data indicated that significant winter and summer flounder were not present at the subject site.

Environmental Assessment, Confidential Client, Flexible Packaging Division, Various Locations

Mr. Godick conducted Phase I ESAs and compliance reviews for a major international chemical company, which was divesting their flexible polyethylene packaging division. This program was completed by the seller to provide accurate and appropriate assessment information to a number of potential purchasers. All assessments were completed on a confidential basis with a completed report provided to the client within three weeks from the date of the first site visit.

Environmental Assessment, Polyurethane Foam Manufacturing Company, Various Locations

Mr. Godick conducted Phase I ESAs and compliance reviews at a major polyurethane and polystyrene foam manufacturer with locations throughout the U.S. The program evaluated all environmental aspects of the operation with a summary of potential and material liabilities provided to the client prior to the acquisition. Issues addressed, with estimates as to operational and remedial costs provided, included air emissions, regulatory compliance with historic consent orders, projected plant upgrades required for future compliance, and potential liabilities associated with identified environmental contamination.

Environmental Assessment, Copper Wire Manufacturer, Various Locations

Mr. Godick conducted Phase I ESAs and compliance reviews at multiple wire manufacturing sites, which were evaluated as part of an acquisition by an international manufacturing company. A comprehensive evaluation of each plant was performed with plant sizes ranging from 100,000 to 800,000 square feet. Final reports were delivered to the client within 30 days following the initial site visit.

Litigation Support & Remediation, Former Service Station, Brooklyn, New York

Mr. Godick took over management of remediation of an inactive service station (formerly conducted by another firm). His approach outlined additional characterization and remediation efforts which resulted in successful closure of the spill by NYSDEC within two years. Mr. Godick testified as an expert witness at a hearing in the New York State Supreme Court of Kings County to determine the adequacy of the remediation efforts.

Litigation Support & Remediation, Residential Heating Oil Spill, Cranford, New Jersey

Mr. Godick took over management of remediation of a heating oil spill in the basement of a single family residence on behalf of the insurance company. Up until Mr. Godick taking over the remediation, several hundred thousand dollars had been spent on remediation with no resolution of the spill with the NJDEP and homeowners. His approach outlined additional characterization and remediation efforts to expeditiously and cost-effectively resolve the spill.

Litigation Support, Cost Recovery Action, Town of Carmel, New York

Mr. Godick served as an expert witness representing the owner of a property in a landlord-tenant dispute, which was used as a gasoline station and oil change facility. Mr. Godick prepared exhibits, testified, and participated in meetings with NYSDEC to support the landlord's claim that the oil change tenant's practices were poor and were adversely affecting the environment and the overall facility systems at the site.

Litigation Support, Cost Recovery Action, New York State Superfund Site

Mr. Godick provided technical support for the former owner of a New York State Superfund site in upstate New York. Current owner of the property brought a cost recovery action against client as a potential responsibility party. Completed technical review of draft Remedial Investigation/Feasibility Study prepared by opposing party's consultant to develop more cost effective remedial strategy and to better position the client for liability allocation as part of future settlement negotiations. Developed cost allocation paper and model for settlement negotiations. Participated in mediation process.

Litigation Support, Cost Recovery Action, New York State Petroleum Spill Site, New York, NY

Mr. Godick provided technical support for the former owner of a New York City multi-unit residential apartment building. The State of New York brought a cost recovery action against our client as a result of a previous spill from a former underground storage tank. Reviewed invoices and project documentation to dispute work performed by the NYSDEC, which provided the basis for settlement at a fraction of the initial claim.

Cost Analysis, Environmental Insurance Claims, Various Locations

Mr. Godick provided technical support for cost analyses completed for a large national insurance company related to several former MGP and other industrial sites. Responsibilities included evaluation and development of cost-effective remedial strategies, as well as compilation of detailed costs for remedial action implementation and closure.

Litigation Support, Class Action Lawsuit, Confidential Client, NJ

Mr. Godick provided technical support for a class action suit involving a petroleum-impacted community water supply in southern New Jersey. The technical assistance included analysis of expert testimony and coordination with legal counsel in preparing for cross-examination of the opposing party's lead expert witness.

Storage Tank Management, Verizon, Various Locations, NY, PA, DE, and MA

Mr. Godick managed the removal and replacement of underground and aboveground storage tank systems for Verizon in New York, Pennsylvania, Delaware, and Massachusetts. Responsibilities included the management of design, preparation of specifications, contractor bidding, construction oversight, project budget, and documentation. For selected AST sites, managed the development of Spill Control, Contingency and Countermeasures (SPCC) plans.

Storage Tank Management, Citibank, N.A., New York, NY

Mr. Godick managed a storage tank replacement project for a facility located on Wall Street in New York City. The existing underground storage tank was closed in place and replaced with a field-constructed AST system within the building. The project required zero tolerance for service interruptions, disruptions to building operations, or disturbance to occupants of the office space neighboring the new tank location. Responsibilities included the

management of design, preparation of specifications, contractor bidding, construction inspections, site assessment for closed-in-place UST, SPCC plan preparation, and responsibility for project budget and documentation.

ERIC PARK

ENVIRONMENTAL ENGINEER

BACKGROUND

Working in the Hazardous Materials department, Mr. Park has served as environmental consultant and project manager to clients remediating and developing their properties. Services provided include remediation system design, bid and technical specification preparation, remediation design, submittal review, contractor negotiations, construction and remediation oversight and management, and Site closure coordination with regulatory agencies. Mr. Park has worked extensively on projects involving tetrachloroethylene (PCE) contamination and with remedial technologies including sub-slab depressurization systems (SSDS), and oxygen injection and air sparge (AS)/soil vapor extraction (SVE).

Education

B.S. Engineering, Cooper Union Albert Nerken School of Engineering, 2006

Licenses/Certifications

40-hour OSHA Certified

Order of the Engineer

Professional Memberships

Years of Experience

Year started in industry and company: 2006

RELEVANT EXPERIENCE

2350 Fifth Avenue, New York, NY

Mr. Park has been involved in the remediation at this privately owned, former-commercial facility with historic PCE contamination. The Site was investigated and remediated as part of the New York State Inactive Hazardous Waste Site Registry (State Superfund) Program, and included multiple rounds of remedial investigation and remediation implementation prior to receiving approval for Site closure from NYSDEC and NYSDOH. The Site remediation tasks included the retro-fitting of an SSDS and SVE system across the majority of the 1.58-acre Site, in-situ chemical oxidation, and contaminant source removal. Mr. Park co-lead the remediation technology design and management of field tasks during implementation of the remedy. Site closure was approved in January 2015.

145 West Street, Greenpoint, NY

Mr. Park has managed the design and implementation of remediation at the former Huxley Envelope site in Greenpoint, Brooklyn. The project is primarily overseen by NYSDEC as part of the Brownfield Cleanup Program (BCP) but is also under NYCOER jurisdiction as multiple E-Designations, including for Hazardous Materials, were applied to the Site during the Greenpoint-Williamsburg Rezoning. Remediation of the Site included removal of underground storage tanks; installation of permanent sheeting; excavation of nearly 100,000 tons of contaminated soil; installation and maintenance of a vapor mitigation system consisting of a vapor barrier and sub-

slab depressurization system (SSDS); construction and maintenance of a Site cover system. Mr. Park is managing the remediation efforts and interfaces with owners, counsel, consultants, and contractors to address construction concerns through completion of the project.

Home Depot, Queens, NY

Mr. Park co-managed remediation implementation at a Home Depot site in Queens, New York as part of the NYSDEC BCP. Remediation of the Site included the design, installation, startup, and maintenance of an AS/SVE system to address PCE contamination in the aquifer. Tasks have included pilot testing, designing the system expansion, writing bid specifications and workplans, and coorinating with the client, contractors and regulatory agencies. Mr. Park was involved in project management through closure of the Site and is currently overseeing ongoing Site management tasks as required by NYSDEC and the Site Management Plan.

Brooklyn Bridge Park, Brooklyn, NY

Mr. Park has been involved in the application for the Department of Sanitation of New York (DSNY) Fill Materials Operation (FMO) permit. He has been working with project consultants and architects to complete the requirements necessary to obtain the FMO. The DSNY permit will allow for the import of gross amounts of approved fill to be used on-site for the construction of noise mitigating hills at the proposed park.

East Side Access, Long Island City, NY

Mr. Park has been working with the New York Metropolitan Transit Authority (MTA) in continued dust concentration analysis related to the East Side Access underground tunnel drilling operation. Mr. Park has been working with MTA and its subcontractors to ascertain the source of particulate in the local ambient air and mitigate all sources.

Queens West Remediation, Long Island City, NY

Mr. Park has been involved in the on-going post-remediation activities at various sites in the Queens West development community. Queens West has a long history of contaminated sites, mostly caused by coal tar-related industrial facilities that were located in the vicinity in the past. Working with other consultants, Mr. Park has taken part in groundwater, soil and soil gas sampling and has been involved in the post investigation documentation.

Halesite MGP RFP, Halesite, NY

Mr. Park was involved in the response to a Request for Proposal regarding the in-situ remediation of a former manufactured gas plant. Mr. Park researched the relevant current in-situ groundwater remediation technologies including Chemox and air sparging. Groundwater and soil beneath the property have been affected by MGP related contaminants such as coal tar. Mr. Park was involved in coordination meeting with in-house marketing and sub-contractors working in conjunction with AKRF for the submission of the proposal.

Flushing Industrial Park, Flushing, NY

Mr. Park was involved in the remedial activities at the Brownfield site in Flushing, New York. Mr. Park assisted in the installation and sampling of post-remediation groundwater monitoring wells. Mr. Park has also been involved in the preparation of the Site Management Plan and Final Engineering Report, detailing the on-site remedial activities to date.

Columbia University Manhattanville Academic Mixed-Use Development, New York, NY

Mr. Park was involved in the preparation of the Remedial Action Plan / Construction Health and Safety Plan for the redevelopment of Columbia University. Due to the scope and scale of the intended development, many issues

concerning hazardous materials (auto-industry related facilities, historic MGP sites) were addressed in conjunction with issues from the associated Environmental Impact Statement.

AvalonBay Gold Street, Brooklyn, NY

Mr. Park was involved in subsurface investigations at the proposed AvalonBay development site. The work entailed collecting soil samples for waste characterization and groundwater data. The site work was used as part of the ongoing pre-construction phase activities.

AvalonBay Willoughby West, Brooklyn, NY

Mr. Park has conducted Phase I Site Assessment and Phase II subsurface investigations at the proposed AvalonBay development in Downtown Brooklyn. Working closely with the landowner and AvalonBay, Mr. Park has been evaluating subsurface conditions at the site concerning a known fuel oil spill and potential solvent and gasoline contamination plumes within the site.

Paragon Paint, Long Island City, NY

Mr. Park oversaw the installation of ten soil borings at the abandoned Paragon Paint facility. Soil, soil vapor, and groundwater samples were collected to determine the severity of the contamination associated with ten on site underground storage tanks as well as the paint operations formerly conducted on site.

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 2012

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

Domino Sugar, Brooklyn, NY

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. 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, Orangeburg, NY

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.

Queens West Development Project, Long Island City, NY

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.

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.

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.

Memorial Sloan Kettering Cancer Center, New York, NY

Mr. Grens has performed numerous noise impact studies on the east side of midtown Manhattan to assist in the determination of the various project scenarios within each site's respective EIS. Mr. Grens' tasks included collecting relevant noise data at numerous locations during morning, afternoon, and evening rush hours to determine real time noise levels utilizing a Larsen Davis decibel level indicator.

Columbia University Manhattanville Academic Mixed-Use Development, New York, NY

Mr. Grens performed numerous Phase I Environmental Site Assessments for the Columbia Manhattanville re-zoning project. Phase II activities included the installation of soil borings and groundwater monitoring wells and the collection of soil and groundwater samples.

St. Agnes Hospital Redevelopment, White Plains, NY

AKRF is currently working for North Street Community, LLC on the former St. Agnes Hospital campus in White Plains, New York. The project involves redeveloping the property into an assisted living and nursing home facility. Some of the existing buildings and uses will remain and several new buildings will be built for the new facility. AKRF's assignment includes preparing the site plan package to accompany the Draft Environmental Impact Statement (DEIS) for the project. Mr. Grens performed a Phase I Environmental Site Assessments of the numerous structures located on the property.

MARCUS SIMONS

SENIOR VICE PRESIDENT

General Introduction

Marcus Simons is a Senior Vice President of AKRF with more than 18 years of experience in environmental consulting. He specializes in the assessment and cleanup of contaminated sites, including federal and state superfund, Resource Conservation and Recovery Act (RCRA) and Toxic Substances Control Act (TSCA) sites, brownfield, voluntary cleanup and spill sites. His expertise includes health risk assessment, development of sampling plans, economic evaluations of remedial alternatives, and regulatory analysis. 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 manages much of the environmental due diligence activity at AKRF (most 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 also manages preparation of the contaminated-materials portions of AKRF's Environmental Impact Statements and Environmental Assessments.

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 being constructed; 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). These projects involved extensive multi-year negotiations with federal, state and city regulatory agencies. Mr. Simons has experience with federal and state superfund programs, state brownfield and voluntary cleanup programs, spill programs and investigation/cleanup under New York SEQRA/CEQR and NYCDEP E-designation programs.

Mr. Simons also has extensive experience in the evaluation of contaminated materials issues for environmental assessments (EAs) and environmental impact statements (EISs) under NEPA, SEQRA and CEQR, including 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 (Times Square, School Construction Authority, Queens West)

Before joining AKRF, Mr. Simons worked for Woodward Clyde Consultants (now URS Corporation) in Wayne, New Jersey, where he was responsible for risk assessment, environmental impact analysis, and regulatory analysis for both public and private clients. His responsibilities included projects primarily located in New York and New Jersey. His risk assessment work included a study for the decommissioning and cleanup of a Canadian elemental phosphorus production facility (the first such plant in the world to be systematically decommissioned).

BACKGROUND

Education

M.A. and B.A. (Honors), Engineering/Management Science, Cambridge University, England, 1986

M.S., Engineering and Public Policy, Carnegie-Mellon University, 1988

Years of Experience

Year started in company: 1995

Year started in industry: 1988

RELEVANT EXPERIENCE

Pelham Bay Landfill, Bronx, NY

For the NYCDEP, Mr. Simons prepared a Human Health Risk Assessment for the Pelham Bay Landfill Inactive Hazardous Waste Disposal Site in Bronx, NY. The Assessment was performed in accordance with both US EPA Superfund Guidelines and site-specific exposure factors and other procedures agreed to with NYSDEC and NYSDOH. The Assessment included analysis of soil, groundwater, surface water, sediment, fish/shellfish and air data and incorporated complex comparisons with background contaminant levels in the various media and innovative approaches, following the data validation, to handling extensive non-detect and estimated-value laboratory data .

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.

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.

Long Island City Rezoning, Queens, NY

As part of the preparation of an Environmental Impact Statement for NYC Department of City Planning, Mr. Simons managed the hazardous materials assessment of a multi-block industrial 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 is managing the investigation and remediation of an old factory complex where large volumes of creosote were spilled. The investigations and interim remedial measures (IRMs) are taking place under the state's Voluntary Cleanup Program (VCP).

Pelham Plaza Shopping Center, Pelham Manor, Bronx, NY

Mr. Simons was responsible for the investigation of a former Con Edison manufactured gas facility on the Hutchinson River on the border between Westchester County and the Bronx. He oversaw the complex investigation of the existing shopping center at the site, and proposed a remediation approach to allow the expansion of the shopping center.

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 F

CONSTRUCTION QUALITY ASSURANCE PLAN

Home Depot – Rego Park

REGO PARK - GLENDALE, NEW YORK

Construction Quality Assurance 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, Inc.
440 Park Avenue South, 7th Floor
New York, NY 10016
212-696-0670

JANUARY 2017

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LIST OF ACRONYMS AND ABBREVIATIONS

CQAP	Construction Quality Assurance Plan
NYSDEC	New York State Department of Environmental Conservation
QAPP	Quality Assurance Project Plan
QA	Quality Assurance
QC	Quality Control
ROWP	Remedial Optimization Work Plan
SVE	Soil Vapor Extraction

1.0 INTRODUCTION

This Construction Quality Assurance Plan (CQAP) has been prepared for remedial optimization activities performed under the Remedial Optimization Work Plan (ROWP) that will be performed for Home Depot – Rego Park, Rego Park - Glendale, New York (hereinafter referred to as the "Site"). The Site is referred to as "Home Depot in Woodhaven Blvd & Metropol" in the New York State Department of Environmental Conservation (NYSDEC) information system. The Site is identified as Block 3886, Lots 46 and 74 on the Borough of Queens Tax Maps. This CQAP supplements the ROWP and provides monitoring, inspection, testing, and documentation protocols and procedures.

The following information is provided:

1. **Responsibility, Authority, and Qualifications** – The responsibility, authority, and qualifications of the key personnel involved in the project.
2. **Inspection and Testing Activities** - Inspections and tests that will be used to verify that construction activities meet or exceed all design criteria and federal, state, and local regulations and requirements.
3. **Meetings** - The requirements for project coordination meetings between the Owner and its representatives, the remedial or environmental Contractors, and other involved parties.
4. **Documentation and Reporting** – Field documentation and reporting requirements.

2.0 RESPONSIBILITY AND AUTHORITY

Measures will be implemented to ensure that a functional quality control (QC) organization is active during the project and to provide support for the construction QC system in conducting inspections, tests and retesting (in the event of failure of any item of work). This includes oversight of subcontractors and compliance with contract provisions. Construction QC includes, but is not limited to, the inspections and tests required in the ROWP and approved submittals and will cover all project operations. A Site consultant is hired by the Owner will manage field activities and coordinate the contractor's activities.

2.1 Owner

The Home Depot USA, Inc. is the Site Owner, responsible for coordinating the project, including activities of the Site consultant, contractor(s) and subcontractor(s), in order to comply with the requirements of the ROWP and regulatory agencies. The Owner is also responsible for completing and submitting documentation required by the ROWP, the CQAP, and the Quality Assurance Project Plan (QAPP) and has the authority to accept or reject the materials and workmanship of any subcontractors at the Site.

2.2 Construction Quality Assurance (QA) Officer (Consultant)

The Construction QA Officer will be an employee of the consultant hired by the Owner and will perform activities that are necessary to assure the quality of construction. They will be on-site as required during construction activities and will have the authority to take any action necessary to maintain compliance with the ROWP and approved submittals and to monitor construction quality.

Specific responsibilities of the Construction QA Officer include:

- Supporting the Owner and the consultant's field staff;

- Evaluating construction activities and activities of the field staff;
- Verifying that remedial optimization activities are performed in accordance with the ROWP, approved submittals, and with federal, state, and local regulations and requirements;
- Verifying that data are properly recorded, validated, reduced, summarized, and inspected;
- Evaluating sampling and monitoring activities;
- Educating the field staff on construction QC requirements and procedures; and
- Scheduling and coordinating inspections.

2.3 Field Team Leader (Consultant)

The Field Team Leader will be an employee of the consultant and will be on-site during construction activities. They will have authority to take any action necessary to maintain compliance with the ROWP and approved submittals and to maintain construction quality. The Field Team Leader will also manage the field staff discussed in this CQAP.

Specific responsibilities of the Field Team Leader include:

- Reviewing the ROWP for clarity and completeness so that the construction activities can be effectively implemented;
- Verifying that the contractor's work is in accordance with the ROWP, the approved submittals, and this CQAP;
- Performing on-site inspection of the work in progress to assess compliance with the ROWP, approved submittals, and this CQAP;
- Scheduling and coordinating inspections;
- Reporting the results of all observations and tests as the work progresses and modifying materials and work to comply with the ROWP and approved submittals as noted below:
    1. Providing weekly reports on field construction, material shipments, and inspection results;
    2. Review and interpretation of all data, drawings, and reports;
    3. Identification of all work that should be accepted, rejected, or uncovered for observation, or that may require special testing, inspection, or approval;
    4. Rejection of defective work and verification that corrective measures are implemented;
    5. Making observations and records that will aid in the preparation of a report on remedial activities.
- Inspecting each delivery of materials and/or equipment;
- Reporting to the Construction QA Officer the results of all inspections, including work that is not of acceptable quality or that fails to meet the requirements of the ROWP, approved submittals, and this CQAP;
- Verifying that testing equipment meets established requirements for the tests are conducted according to the proper standardized procedures;

- Confirming that testing equipment, personnel, and procedures do not change over time, or making sure that any changes do not adversely impact the inspection process;
- Confirming that regular calibration of testing equipment occurs and is properly recorded; and
- Confirming that waste disposal is performed in accordance with applicable Federal, State, and local laws and regulations.

2.4 Site Technician (Consultant)

A qualified scientist, geologist or engineer (supplemented by additional personnel, if necessary) will be on-site during remedial optimization documenting Site personnel, equipment, samples collected, contamination observations and any other observations of field activities. Specific responsibilities include:

- Calibration, operation, and maintenance of air monitoring instrumentation in accordance with the ROWP and approved submittals.
- Collecting, packaging, and shipping of environmental samples in accordance with the ROWP and QAPP.
- Documenting sample collection in a field notebook and identifying all sample locations in a field notebook or Site drawing.
- Preparing and logging manifests for transportation of any non-hazardous and hazardous materials.
- Informing the Site Project Coordinator when (if) the concentrations of air contaminants exceed action levels specified in the Health and Safety Plan, which is included as Appendix D in ROWP.
- Maintaining and organizing the field equipment and supply storage area.

3.0 FIELD QUALITY CONTROL INSPECTIONS, TESTING, AND SAMPLING

The definable features of work are described in Section 5 of the ROWP. This section describes the anticipated inspection, testing, and sampling requirements associated with these definable features of work.

3.1 Mobilization

Inspections will be performed to assure that Site laydown areas, support facilities, surface water controls, and air monitoring systems are established in accordance with the ROWP and approved submittals. In addition, the stakeout of existing utilities in work areas and the maintenance of Site security will be verified. There are no testing and sampling requirements associated with mobilization of the contractor(s).

Each delivery of materials and/or equipment will be inspected relative to approved submittals. Approved materials and/or equipment will be stored at a designated area of the Site.

Equipment will be set-up and tested in accordance with the ROWP and approved submittals.

3.2 Bench Scale Soil and Groundwater Sampling, and Hydraulic Permeability Testing

Continuous inspection will be performed during soil and groundwater sampling, and hydraulic permeability testing to document sampling and testing activities. The Site Technician will document the sampling depths, monitoring parameters, testing results, and other details.

3.3 Injection for In-Situ Treatment of Soil and Groundwater

Continuous inspection will be performed during in-situ treatment to document injection activities. The Site Technician will document the products used, volumes and mixing ratios of each and other details of the injection.

3.4 Installation of SVE Wells

Continuous inspection will be performed during drilling and installation of the soil vapor extraction (SVE) wells. Recovered samples from each soil boring will be inspected to identify soil type, location of geologic boundaries, depth to the water table, and contamination (if present). Each well construction will be observed to document the date of installation, materials used, casing and screen sizes, installation depths, and ground surface and well casing elevations.

3.5 Trenching and Installation of SVE Piping

Inspections will be performed during trenching and installation of the SVE piping, including observations of compaction testing, pressure testing of all subgrade vacuum piping, and inspection of piping installation prior to backfilling. Any breaches in the piping will be repaired or replaced, as needed. The Site Technician will confirm the installed system components are those specified in the ROWP or are equivalent.

3.6 SVE System Installation and Startup

Inspections will be performed during the existing SVE system blower decommissioning and installation of the new SVE system blower, including observation of system startup, operations parameters reading, and collection of post-startup vapor samples. The Site Technician will confirm the installed system components are those specified in the ROWP or are equivalent.

3.7 Loading of Waste Material for Transportation

Inspections will be conducted to verify that material removed from the Site is properly loaded for transfer to a permitted treatment/disposal facility. Manifest or bills of lading will be maintained.

3.8 Site Restoration

Site restoration will be observed and recorded to verify compliance with the ROWP and approved submittals. Any openings in the Site cover will be repaired in kind with original conditions or in accordance with Owner's requirements. All surfaces must be restored to the Owner's satisfaction prior to demobilization from the Site.

4.0 MEETINGS

A pre-construction meeting will be held with representatives of NYSDEC (if necessary), consultant and contractor(s) performing the work prior to the start of major construction activities. Additional meetings will be called as necessary if work conditions change or deviations are necessary.

Project personnel and visitors will be given health and safety briefings periodically by the Site Technician or Field Team Leader to assist Site personnel in safely conducting their work activities. The safety

briefings will include information on new operations to be conducted, changes in work practices or changes in the Site's environmental conditions, as well as periodic reinforcement of previously discussed topics.

5.0 DOCUMENTATION AND REPORTING REQUIREMENTS FOR CQAP

The completion of CQAP tasks will be documented throughout the field implementation of the work and in the Remedial Optimization Summary Report. The inspectors will use data sheets, field reports, log forms, schedules and checklists to document Site work and verify compliance with the ROWP and approved submittals. Documentation will involve, at a minimum, the following reports and information:

- • Weekly and monthly field construction reports;
- • Photographs;
- • Sampling chains of custody;
- • Material disposition logs; and
- • Variances to the ROWP and approved submittals.

5.1 Weekly Report

The Site Technician or Field Team Leader will prepare a Weekly Report that identifies the following:

- Work force and visitors to the Site;
- An update of progress made during the reporting period;
- Locations of work and quantities of material imported and exported from the Site;
- References to alpha-numeric grid map for Site activities;
- A summary of any and all complaints with relevant details (names, phone numbers);
- A summary of CAMP findings, including excursions;
- Apparent deviations from the ROWP;
- Weather conditions; and
- An explanation of notable Site conditions.

5.2 Photographic Log

The photo log will be kept to document construction activities by still photographs. The photographic log may also be used to record activities recorded in other routine reports.

5.3 Sampling Documentation

The project field book will be used to document all sampling activities and how they correspond to the ROWP. All observations, field and/or laboratory tests will be recorded in the project field book or on separate logs. Recorded field observations may take the form of notes, charts, sketches, or photographs.

5.4 Material Disposition Tracking

All materials that are taken off-site for disposal will be tracked and final disposition confirmed. Copies of all waste manifests and bills of lading will be maintained by the Project Manager and provided as part of the Remedial Optimization Summary Report.

5.5 Variances to Work Plan

Required changes to the ROWP will be documented as construction proceeds. Any material deviations from the NYSDEC-approved ROWP will be communicated to NYSDEC Project Manager. NYSDEC approval will be sought prior to proceeding with work deviating materially from the ROWP. In the event of an emergency change to the work plan, NYSDEC Project Manager will be consulted immediately.

5.6 Remedial Optimization Summary Report

At the completion of the project (Bench Scale, Pilot Scale, and Full Scale) the consultant/construction manager will prepare a Remedial Optimization Summary Report. This report will describe the implementation of the field work and will include a summary of the field work, as-built drawings for constructed elements, disposal manifests, bills of lading, test results demonstrating that all mitigation and remedial systems are functioning properly and photographic documentation. The Remedial Optimization Summary Report will also include a description of the changes in the remedy from the elements provided in the ROWP and associated design documents

5.7 Document Storage

The Field Team Leader will maintain the current field book and all original field paperwork during the performance of work. The Project Manager will maintain the field paperwork after completion of each phase and will maintain all submittal document files.

APPENDIX G

RESUMES OF KEY PERSONNEL

MICHELLE LAPIN, P.E.

SENIOR VICE PRESIDENT

Michelle Lapin is a Senior Vice President with more than 25 years of experience in the assessment and remediation of hazardous waste issues. She leads the firm's Hazardous Materials group and offers extensive experience providing strategic planning and management for clients. Ms. Lapin has been responsible for the administration of technical solutions to contaminated soil, groundwater, air and geotechnical problems. Her other duties have included technical and report review, proposal writing, scheduling, budgeting, and acting as liaison between clients and regulatory agencies, and project coordination with federal, state, and local authorities.

Ms. Lapin's hydrogeologic experience includes groundwater investigations, formulation and administration of groundwater monitoring programs and remediation throughout the Northeast. Her experience with groundwater contamination includes Level B hazardous waste site investigations; leaking underground storage tank studies, including hazardous soil removal and disposal and associated soil and water issues; soil gas/vapor intrusion surveys; and wetlands issues. Ms. Lapin is experienced in coordinating and monitoring field programs concerning hazardous waste cell closures. She has directed hundreds of Phase I, Phase II, and Phase III investigations and remediations, many of them in conjunction with developers, law firms, lending institutions, and national retail chains. She is also experienced in the cleanup of contaminated properties under Brownfield Cleanup Program (BCP) regulations.

BACKGROUND

Education

M.S., Civil Engineering, Syracuse University, 1985
B.S., Civil Engineering, Clarkson University, 1983

Professional Licenses/Certifications

New York State P.E.
State of Connecticut P.E.

Professional Memberships

Member, National Society of Professional Engineers (NSPE), National and CT Chapters
Member, American Society of Civil Engineers (ASCE), National and CT Chapters
Member, Connecticut Business & Industry Association (CBIA), CBIA Environmental Policies Council (EPC)
Member, Environmental Professionals' Organization of Connecticut (EPOC)
Board Member, New York City Brownfield Partnership
Member, NAIOP, a Commercial Real Estate Development Association

Years of Experience

Year started in company: 1994
Year started in industry: 1986

RELEVANT EXPERIENCE

Memorial Sloan Kettering Cancer Center-CUNY 74th Street EIS, New York, NY

AKRF was engaged by Memorial Sloan-Kettering Cancer Center (MSK) and CUNY-Hunter College (CUNY) to prepare an EIS for a proposed joint facility located on a New York City-owned parcel located between East 73rd Street and East 74th Street adjacent to the FDR Drive in Manhattan. The proposed facility was formerly occupied by the Department of Sanitation, and had included over 41 underground storage tanks, will include an ambulatory medical care center for MSK and educational and medical research facilities for CUNY.

Ms. Lapin is leading the hazardous materials work which includes the preparation of the Phase I and II environmental site assessments, remedial action work plans (RAWPs), and construction health and safety plans (CHASPs) for submission to the New York City Office of Environmental Remediation (OER) for the Voluntary Cleanup Program (VCP) and to the New York State Department of Environmental Conservation (NYSDEC) for remediation of a petroleum spill. The RAWPs and CHASPs included provisions for excavation of contaminated soil and rock, removal of tanks and environmental monitoring during the construction activities. AKRF also performed a pre-demolition asbestos survey of the remaining concrete foundation structures and prepared specifications for asbestos abatement, soil management and underground storage tank removal and disposal.

Brooklyn Bridge Park, Brooklyn, NY

AKRF prepared an Environmental Impact Statement (EIS) and is continuing to provide technical and planning support services for Brooklyn Bridge Park, which revitalizing the 1.3-mile stretch of the East River waterfront between Jay Street on the north and Atlantic Avenue on the south. The new park, allows public access to the water's edge, allowing people to enjoy the spectacular views of the Manhattan skyline and New York Harbor. It also provides an array of passive and active recreational opportunities, including lawns, pavilions, and a marina. As with many waterfront sites around New York City, the lands along the Brooklyn waterfront have a long history of industrial activities. Some of these industries used dangerous chemicals and generated toxic by-products that could have entered the soil and groundwater. In addition, landfilling activities along the shoreline also used ash and other waste materials from industrial processes. Based on site inspections, historical maps, government records, and other sources, AKRF has been investigating the potential for the presence for hazardous materials in the park. This information was compiled into a Phase 1 Environmental Site Assessment report. AKRF has also provided and continues to support to the design team related to designing the project to minimize costs related to remediating hazardous materials where possible. Ms. Lapin is serving as senior manager for the hazardous materials investigations.

Columbia University Manhattanville Academic Mixed-Use Development, New York, NY

Ms. Lapin served as Hazardous Materials Task Leader on this Environmental Impact Statement (EIS) for approximately 4 million square feet of new academic, research and neighborhood uses to be constructed north of Columbia University's existing Morningside campus. The work included Phase I Environmental Site Assessments for the properties within the site boundaries, and estimates for a Subsurface (Phase II) Investigation of the entire development area. The firm's Hazardous Materials group performed over 30 individual Phase I Environmental Site Assessments for properties within the development area. In addition, a Preliminary Environmental Site Assessment (PESA) was completed in conjunction with the Environmental Impact Statement (EIS). Based on the Phase I studies, AKRF conducted a subsurface (Phase II) investigation in accordance with a New York City Department of Environmental Protection (NYCDEP) approved investigative work plan and health and safety plan. Subsurface activities included the advancement of soil borings, groundwater monitor wells, and the collection of soil and groundwater samples for laboratory analysis. This study was used to estimate costs to remediate contaminated soil and groundwater, and underground storage tanks and hazardous building materials, including lead-based paint and asbestos-containing materials.

Albert Einstein College of Medicine Center for Genetic and Translational Medicine, Bronx, NY

Ms. Lapin directed the firm's hazardous materials work in connection with the construction a new Center for Genetics and Translational Medicine (CGTM) building on the Bronx campus of the Albert Einstein College of Medicine of Yeshiva University. AKRF prepared an Environmental Assessment Statement (EAS) that examined such issues as land use, zoning, air quality, urban design and visual resources, hazardous materials, traffic, noise, and air quality. Ms. Lapin's work included analysis of the existing conditions and potential impacts that the construction could cause to the environment and human health.

West 61st Street Rezoning/Residential Development, New York, NY

Ms. Lapin is directing the firm's hazardous materials work for this mixed-use development in Manhattan. The Algin Management Company hired AKRF to prepare an environmental impact statement (EIS) for the proposed rezoning of the western portion of the block between West 60th and 61st Streets, between Amsterdam and West End Avenues. The purpose of the proposed action was to facilitate the development of two 30-story residential towers with accessory parking spaces, and landscaped open space. The EIS examined a "worst case" condition for rezoning the block, which allowed Algin to build a residential building of approximately 375,000 square feet at their site. The building now contains 475 apartments, 200 accessory parking spaces, a health club, and community facility space. This site, with the services of AKRF, entered into New York State's Brownfield Cleanup Program (BCP). On-site issues included underground storage tanks remaining from previous on-site buildings, petroleum contamination from these tanks and possibly from off-site sources, and other soil contaminants (metals, semi-volatile organic compounds, etc.) from fill materials and previous on-site buildings. AKRF oversaw the adherence to the Construction Health and Safety Plan (HASP), which was submitted to and approved by the New York State Department of Environmental Conservation (NYSDEC), and monitored the waste streams, to ensure that the different types of waste were disposed of at the correct receiving facilities. This oversight also included confirmation and characteristic soil sampling for the receiving facilities and NYSDEC. A "Track 1" Clean up of the majority of the property (the portion including the buildings) was completed and the final Engineering Report was approved by the NYSDEC. AKRF has also completed a smaller portion of the property as a "Track 4" cleanup, which includes a tennis court and landscaped areas. Ms. Lapin continues to manage the annual inspections for the property owner in accordance with the Brownfield Cleanup Agreement.

Hudson River Park, New York, NY

Ms. Lapin is directing AKRF's hazardous materials work during construction of Hudson River Park, a five-mile linear park along Manhattan's West Side. As the Hudson River Park Trust's (HRPT's) environmental consultant, AKRF has overseen preparation and implementation of additional soil and groundwater investigations [working with both the New York State Department of Environmental Conservation (NYSDEC) and the New York City Department of Environmental Protection (NYCDEP)], all health and safety activities, and removal of both known underground storage tanks and those encountered during construction. Previously, the firm performed hazardous materials assessments as part of the Environmental Impact Statement (EIS) process, including extensive database and historical research, and soil and groundwater investigations. Ms. Lapin has been the senior consultant for the soil and groundwater investigations and remediation, and the asbestos investigations and abatement oversight.

Roosevelt Union Free School District – District-wide Improvement Program, Roosevelt, NY

Ms. Lapin managed the hazardous materials investigation for the Draft and Final Environmental Impact Statements (EIS) for the improvement program, which included the demolition of three existing elementary schools and portions of the junior-senior high school, and the reconstruction of three replacement elementary schools, a separate replacement middle school, and renovations to the high school. Following the EIS, additional hazardous materials investigations were completed, including comprehensive asbestos and lead surveys; Phase I and Phase II Environmental Site Assessments; the preparation of asbestos, lead, hazardous materials and

demolition specifications; and obtaining site-specific variances from the New York State Department of Labor (NYSDOL). The middle school remediation was conducted through coordination with the New York State Department of Environmental Conservation (NYSDEC), the New York State Department of Health (NYSDOH), the New York State Education Department (NYSED) and the local school district. The project was approved, and construction/renovation for the new middle school completed such that the school opened for the Fall 2008 semester as planned.

Fiterman Hall Deconstruction and Decontamination Project, New York, NY

The 15-story Fiterman Hall building, located at 30 West Broadway between Barclay and Murray Streets, originally constructed as an office building in the 1950s, had served as an extension of the City University of New York (CUNY) Borough of Manhattan Community College (BMCC) since 1993. The building was severely damaged during the September 11, 2001, attack on the World Trade Center (WTC) when 7 WTC collapsed and struck the south façade of the building, resulting in the partial collapse of the southwest corner of the structure. The building was subsequently stabilized, with breaches closed and major debris removed, however, extensive mold and WTC dust contaminants remain within the building, which must be taken down. The project required the preparation of two Environmental Assessment Statements (EASs) for the redevelopment of Fiterman Hall—one for the deconstruction and decontamination of the building and one for the construction of a replacement building on the site. AKRF prepared the EAS for the Deconstruction and Decontamination project, which included the decontamination of the interior and exterior of the building, the removal and disposal of all building contents, and the deconstruction of the existing, approximately 377,000-gross-square-foot partially collapsed structure. Ms. Lapin reviewed the deconstruction and decontamination plans for the EAS. The cleanup plan was submitted to the United States Environmental Protection Agency (USEPA).

Yonkers Waterfront Redevelopment Project, Yonkers, NY

For this redevelopment along Yonkers' Hudson River waterfront, Ms. Lapin headed the remedial investigation and remediation work that included Phase I Environmental Site Assessments of 12 parcels, investigations of underground storage tank removals and associated soil remediation, remedial alternatives reports, and remedial work plans for multiple parcels. Several of the city-owned parcels were remediated under a Voluntary Cleanup Agreement; others were administered with state Brownfields grants. Hazardous waste remediation was completed on both brownfield and voluntary clean-up parcels, which enabled construction of mixed-use retail, residential development, and parking.

Davids Island Site Investigations, New Rochelle, NY

Ms. Lapin managed the hazardous materials investigation of Davids Island, the largest undeveloped island on the Long Island Sound in Westchester County. The 80-acre island features pre- and post-Civil War military buildings and parade grounds, and is viewed as a major heritage, tourism, and recreational amenity. The island, formerly known as Fort Slocum, was used by the U.S. military, beginning in the 19th century, as an Army base, hospital, and training center. The island was planned for county park purposes. The investigation included a Phase I Environmental Site Assessment, with historical research going back to the 17th century, a Phase II (Subsurface) Investigation, underground storage tank investigations, asbestos surveys, and conditions surveys of all remaining structures. Cost estimates were submitted to Westchester County for soil remediation, asbestos abatement, and building demolition.

Site Selection and Installation of 11 Turbine Generators, New York and Long Island, NY

AKRF was retained by the New York Power Authority (NYPA) to assist in the State Environmental Quality Review Act (SEQRA) review of the proposed siting, construction, and operation of 11 single-cycle gas turbine generators in the New York metropolitan area. Ms. Lapin managed the hazardous materials investigation of the sites. The work has included Phase I Environmental Site Assessments, subsurface investigations, and construction health and safety plans.

Cross Westchester (I-287) Expressway Phases V and VI, Westchester County, NY

For the New York State Department of Transportation's (NYSDOT) I-287 reconstruction project, Ms. Lapin served as Project Manager and was responsible for directing the contaminated materials aspect of the final design effort for the reconstruction of Westchester County's major east-west artery. As part of her duties, Ms. Lapin managed the asbestos investigations at eight bridges and wetland delineation along the entire corridor and wrote the scope of work and provided general management of the project.

Supermarket Redevelopment, New Fairfield, CT

AKRF provided consulting services to the developer and owner of a nine-acre site, including conducting a remedial investigation and remediation of a site contaminated from former dry cleaning operations and off-site gasoline spills. The investigation included the installation of monitoring wells in three distinct aquifers, geophysical logging, pump tests, and associated data analysis. Ms. Lapin presented the environmental issues and planned remediation to local and state officials during the early stages of the planning process to incorporate their comments into the final remedial design. A remedial action work plan (RAWP) was completed and approved by the Connecticut Department of Environmental Protection (CTDEP) within a year to enable redevelopment work for a new supermarket and shopping center. The RAWP included the remediation of soil within the source area and a multi-well pump and treat system for the recovery of non-aqueous and dissolved phase contamination in groundwater. The design of the recovery well system included extensive groundwater modeling to ensure capture of the contaminant plume and the appropriate quantity and spacing of the wells. Ms. Lapin directed the soil removal remedial activities and monitoring for additional potential contamination during construction. In addition, AKRF performed comprehensive pre-demolition asbestos and lead-based paint surveys of the former site structures, conducted abatement, air monitoring and oversight, and provided environmental consulting support for the development of the site. The groundwater remediation system was installed during site development and began operation once development was complete.

Broad Street, Stamford, CT [former Project name: Target Stamford)

AKRF originally completed a Phase I Environmental Site Assessment (ESA) for a developer of this property, located at southeastern corner of Broad Street and Washington Boulevard in downtown Stamford, Connecticut, for a proposed residential development. Four years later, an update of this Phase I ESA was conducted for a proposed Target retail development. The study area included the current Target site and the west-adjacent site which was subsequently developed as a luxury residential tower. Following the Phase I report, a subsurface (Phase II) investigation was conducted, which included soil borings, groundwater monitor wells, soil and groundwater sample collection and analysis. The results of the Phase II investigation were used to develop a remediation strategy. An additional Phase I/Phase II investigation was conducted of the adjacent former transmission repair facility, which included a site inspection, review of local and state records, an underground storage tank markout survey, advancement of soil borings, and collection of soil samples for laboratory analysis. AKRF also conducted asbestos surveys prior to abatement and demolition of the former Broad Street and Washington Boulevard buildings.

EPA Brownfields Assessment Program, Naugatuck, CT

Ms. Lapin is currently serving as the Principal-in-Charge for a USEPA Brownfields Assessment program project in Naugatuck, Connecticut. She is overseeing the assessment and investigation of key development parcels, including

Work Plan and QAPP preparation, and conducting community outreach tasks to communicate site risks and the project process. Mr. Stefaniak plays the lead role in administering the USEPA Cooperative Agreement on behalf of the Borough.

East 75th/East 76th Street Site, New York, NY

Ms. Lapin served as Senior Manager for this project that encompassed coordination and direct remediation efforts of this former dry cleaning facility and parking garage prior to the sale of the property and its ultimate redevelopment for use as a private school. A preliminary site investigation identified 20 current and former petroleum and solvent tanks on the property. A soil and groundwater testing program was designed and implemented to identify the presence and extent of contamination resulting from potential tank spills. This investigation confirmed the presence of subsurface petroleum contamination in the soil and solvent contamination from former dry cleaning activities in the bedrock. AKRF completed oversight of the remediation under the State's Voluntary Cleanup Program. Remediation, consisting of tank removals and excavation of contaminated soil and the removal of solvent-contaminated bedrock down to 30 feet below grade, has been completed. AKRF completed oversight of the pre-treatment of groundwater prior to discharge to the municipal sewer system and an off-site study to determine impacts to groundwater in downgradient locations.

Former Macy's Site, White Plains, NY

While assisting Tishman Speyer with plans to redevelop this site, Ms. Lapin managed the pre-demolition work, which included a Phase I site assessment; subsurface investigation (Phase II), including the analysis of soil and groundwater samples for contamination; a comprehensive asbestos, lead paint, and PCB investigation; radon analysis; and coordination and oversight of the removal of hazardous materials left within the building by previous tenants. Work also included asbestos abatement specifications and specifications for the removal of two 10,000-gallon vaulted fuel-oil underground storage tanks.

Storage Deluxe, Various Locations, NY

Ms. Lapin manages the firm's ongoing work with Storage Deluxe, which includes Phase I Environmental Site Assessments and Phase II Subsurface Investigations, underground storage tank removals and associated remediation, asbestos surveys and abatement oversight, and contaminated soil removal and remediation for sites in Connecticut, the Bronx, Brooklyn, Manhattan, Westchester County, and Long Island.

Home Depot, Various Locations, NY and CT

Ms. Lapin, serving as either Project Manager or Senior Manager, has managed the investigations and remediation at multiple Home Depot sites in the five boroughs, Long Island, and Connecticut. The investigations have included Phase I, II, and III site assessments, asbestos and lead paint surveys, abatement specifications and oversight, and soil and groundwater remediation.

Avalon on the Sound, New Rochelle, NY

For Avalon Bay Communities, Ms. Lapin managed the investigations and remediation of two phases of this residential development, including two luxury residential towers and an associated parking garage. Remediation of the first phase of development (the first residential tower and the parking garage) included gasoline contamination from a former taxi facility, fuel oil contamination from multiple residential underground storage tanks, and chemical contamination from former on-site manufacturing facilities. The remediation and closure of the tank spills was coordinated with the New York State Department of Environmental Conservation (NYSDEC). The initial investigation of the Phase II development—an additional high-rise luxury residential building—detected petroleum contamination. A second investigation was conducted to delineate the extent of the contamination and estimate the costs for remediation. AKRF oversaw the remediation and conducted the Health and Safety monitoring. The remediation was completed with closure and approvals of the NYSDEC.

Mill Basin, Gerritsen Inlet, and Paerdegat Basin Bridges, Final Design, Shore Parkway, Brooklyn, NY

Following the preparation of the Generic Environmental Impact Statement (GEIS) for the Belt Parkway Bridges Project, the firm was retained for supplemental work during the final design phase of the project. This included National Environmental Policy Act (NEPA) and State Environmental Quality Review Act (SEQRA) documentation for three of the bridges—Mill Basin, Gerritsen Inlet, and Paerdegat Basin—which will be federally funded. Ms. Lapin managed the contaminated materials investigation that included a detailed subsurface contaminated materials assessment, both subaqueous and along the upland approaches.

NYSDOT Transportation Management Center (TMC), Hawthorne, NY

AKRF conducted environmental studies for the New York State Department of Transportation (NYSDOT) at the current troopers' headquarters in Hawthorne, NY. The property is the proposed site of a new Transportation Management Center. AKRF completed a comprehensive asbestos survey of the on-site building and prepared asbestos abatement specifications; performed a Phase I site assessment; conducted an electromagnetic (EM) survey that located two fuel oil underground storage tanks, and developed removal specifications for the two underground storage tanks and an aboveground storage tank.

Metro-North Railroad Poughkeepsie Intermodal Station/Parking Improvement Project, Poughkeepsie, NY

Ms. Lapin served as Project Manager of the hazardous materials investigation in connection with AKRF's provision of planning and environmental services for parking improvement projects at this station along the Hudson Line. The project included an approximately 600-space garage, additional surface parking, and an intermodal station to facilitate bus, taxi, and kiss-and-ride movements. Ms. Lapin conducted Phase I and II contaminated materials assessments and worked with the archaeologists to locate an historical roundhouse/turntable.

Metro-North Railroad Golden's Bridge Station Parking Project, Westchester County, New York

For Metro-North Railroad, Ms. Lapin managed a Phase I Environmental Site Assessment of a property that has since become the new parking area, used by the existing Golden's Bridge train station. Ms. Lapin also conducted a subsurface (Phase II) investigation of the original parking area, track area, and existing platform for the potential impact of moving tracks in the siding area to extend the existing parking area and adding an access from a proposed overhead walkway (connecting the train station to the new parking area over a highway). The study also included an assessment for lead-based paint and asbestos on the platform structures.

East River Science Park, New York, NY

Originally, New York University School of Medicine (NYUSOM) retained the firm to prepare a full Environmental Impact Statement (EIS) for its proposed East River Science Park (ERSP). The proposed complex was to occupy an underutilized portion of the Bellevue Hospital campus between East 30th Street and approximately East 28th Street, immediately south of NYU's campus. As originally contemplated, Phase I was to include 618,000 square feet of development, including a clinical practice and research building, a biotech center, 220 housing units for post-doctorate staff, a child care center, and a conference center. This phase would include reuse of the former Bellevue Psychiatric Building, a historic structure on East 30th Street east of First Avenue. Phase II was to include a second biotech building with a library to serve NYU and Bellevue at the eastern end of the block between 29th and 30th Streets. Phase III was to include a third biotech building and parking. The project's EIS considered a full range of issues, including land use, socioeconomics, shadows, historic resources, open space, traffic and transportation, air quality, noise, and construction. The firm also prepared all of the traffic and transportation studies for the urban design and master planning efforts. Ms. Lapin managed the Phase I Environmental Site Assessment and other hazardous materials-related issues.

Events relating to September 11, 2001 put a hold on the project for a number of years. When the project resurfaced, it had a new developer and a decreased scope. Ms. Lapin updated the hazardous materials issues for the

new developer and consulted with them regarding remediation strategies and involvement of regulatory agencies. For the actual remediation/development, the city requested oversight by AKRF to represent its interests (the city is retaining ownership of the land). Ms. Lapin completed directing the remediation oversight on behalf of the City of New York for the remediation of the former psychiatric hospital building, laundry building and parking areas associated with Bellevue Hospital. The new development includes a biotechnology center (Commercial Life Science Research and Office Park) comprising two buildings (combined 550,000 square feet), street level retail, and an elevated plaza.

68, 76 and 78 Forest Street and 96-98 Grove Street, Stamford, CT

Ms. Lapin led this project, for which AKRF was retained to complete a Phase I Environmental Site Assessment (ESA) of five residential properties, and asbestos surveys and lead-based paint surveys of the five multi-family residential structures prior to a real estate transaction. The investigations were completed to allow demolition of the residential structures and prepare the properties for development into the Highgrove high rise condominium complex. AKRF represented the purchaser and site developer during the due diligence process, identified areas of environmental concern, and completed underground storage tank closure activities prior to initiating site development. In addition, AKRF conducted a Phase I ESA of a property on Summer Street that was being used by the developer as a "temporary" office building and a parking area utilized as a sales center and apartment model for the Highgrove residential development.

Shelton Storage Deluxe, Shelton, CT

AKRF completed Phase I, Phase II and Tank Removal/Remediation services for a storage facility in Shelton, Connecticut. Based on this information from the Phase I ESA, AKRF conducted a Phase II study that revealed groundwater impact (gasoline), possibly from an off-site source. Additional testing was then conducted to determine the source of the gasoline contamination. Testing of a wood block floor revealed concentrations of volatile and semivolatile organic compounds and total petroleum hydrocarbons; therefore, disposal of this material had to be as a petroleum-contaminated waste. The additional testing included upstream and downstream surface water samples, and on-site detention pond water and sediment samples. Subsequent to the Phase II testing, a 4,000-gallon on-site underground storage tank was removed. Upon removal, contaminated soil and groundwater were observed and a spill was called into the Connecticut Department of Environmental Protection (CTDEP). Following completion of remedial activities and submission of a closure report, the spill was closed by the CTDEP. Ms. Lapin directed the firm's efforts to complete this project.

DPR Soundview Park Playgrounds and Open Space, Bronx, NY

AKRF is part of a team working on the reconstruction of this 212-acre NYCDPR public park located along the Bronx River in the Bronx, New York. The park was identified as an underutilized park and is being improved in accordance with the goals of PlaNYC. Ms. Lapin is overseeing AKRF's hazardous materials investigations including environmental and remediation-related work. AKRF prepared the Environmental Assessment Statement (EAS) and the project has moved into the design and construction phase. The remediation/construction of multiple phases of the development is currently underway.

164 Kent Avenue, Brooklyn, NY (AKA Northside Piers and 1 North 4th Place)

The project was a multi-phase development consisting of a large waterfront block in the Williamsburg Rezoning Area. The project site has been developed with a mixed-use residential-commercial high rise towers with an esplanade and a pier along the East River. AKRF provided acquisition and development support, including performing Phase I and II environmental site assessments, and preparation of Remedial Action Plans (RAPs) and Construction Health and Safety Plan (CHASPs) for approval by DEP and OER. AKRF provided assistance with construction oversight during soil handling activities and managing the Community Air Monitoring Plan (CAMP) activities. To date, closure reports have been prepared and occupancy achieved for three of the four buildings. Ms. Lapin is the Professional Engineer (P.E.) of record for the DEP and OER RAPs, CHASPs and Remedial Closure Reports (RCRs).

Rego Park Home Depot, Queens, NY

Solvent contamination was encountered during retail development of a former industrial property in Rego Park, Queens, New York. The site work included an extensive investigation and a multi-phase remediation performed under the NYSDEC Voluntary Cleanup Program (BCP). Remediation included removal of aboveground and underground storage tanks (ASTs and USTs) and hotspot soil removal. An Air Sparging/Soil Vapor Extraction (AS/SVE) groundwater remediation system designed by AKRF was installed as part of the building construction. Continued remediation work included upgrading and expanding the AS/SVE system after the store was opened. AKRF prepared the Final Engineering Report and obtained closure with a Release and Covenant Not to Sue issued by NYSDEC in 2013. AKRF continues operations, maintenance, and monitoring under the NYSDEC-approved Site Management Plan. Ms. Lapin is the Professional Engineer (P.E.) of record for the remediation design and implementation in accordance with the NYSDEC Brownfield Cleanup Program (BCP).

250 North 10th Street, LLC., Residential Redevelopment Site, Brooklyn, NY

AKRF was retained to investigate and remediate this former industrial property in the Williamsburg section of Brooklyn, New York in connection with site redevelopment. The site is approximately 50,000 square feet, and redevelopment included a six story residential building and parking garage. The work was completed to satisfy the requirements of the NYC E-designation Program and NYC Voluntary Cleanup Program (NYC VCP). AKRF completed a Remedial Investigation (RI) to evaluate the nature and extent of site contamination, and developed a Remedial Action Work Plan (RAWP) to properly address site contamination during redevelopment. Remediation included removal of underground storage tanks, more than 7,500 tons of contaminated soil, and installation of a vapor barrier and site cap across the entire property. The remediation was completed under oversight of the NYC Office of Environmental Remediation (OER), and in a manner that has rendered the Site protective of public health and the environment consistent with residential use of the property. Ms. Lapin is the Professional Engineer (P.E.) of record for the remedial effort in accordance with the OER Voluntary Cleanup Program (VCP).

AP-Williamsburg, LLC, 50 North 5th Street Development, Brooklyn, NY

AKRF directed the remedial program at a 55,000-square foot site located in the Williamsburg section of Brooklyn, New York. The site had an industrial and manufacturing history for over 100 years that included a barrel making factory, use of kilns, and a carpet and flooring materials warehouse. AKRF completed a Remedial Investigation (RI) to evaluate the nature and extent of site contamination, and developed a Remedial Action Work Plan (RAWP) to properly address site contamination during redevelopment. Remediation included removal of more than 5,000 tons of contaminated soil, and installation of a vapor barrier and sub-slab depressurization system (SSDS) beneath the site building. The remediation was completed in a manner that has rendered the Site protective of public health and the environment consistent with commercial and residential use of the property, and in accordance with the requirements of the NYC OER E-designation program. The site includes a seven story residential apartment building with street level retail space and a parking garage. Ms. Lapin is the Professional Engineer (P.E.) of record for the NYC OER RAWP and Remedial Closure Report (RCR).

New York City School Construction Authority (SCA), Environmental Consulting Hazardous Materials Services

The SCA was established by the New York State government to construct school facilities to reduce overcrowding and to provide new schools in growing neighborhoods. Focusing on the environmental consulting services, dating back to the 1980s and the days of the New York City Board of Education, the firm continues to provide broad support to SCA's effort, including environmental assessments in meeting the requirements of the State Environmental Quality Review Act (SEQRA), and site selection and property acquisition support for potential new sites. AKRF is currently serving under three individual on-call contracts for site acquisition and environmental consulting services, hazardous materials consulting services, and architectural and engineering services.

AKRF has undertaken various assignments under two consecutive hazardous materials on-call contract, including environmental assessment, remedial design, and plumbing disinfection consulting tasks. For potential new school sites, assignments include initial due diligence, Phase I environmental site assessments (ESAs) and multi-media subsurface investigation of soil, groundwater, and soil vapor to determine the suitability of a site for development as a school, likely remediation requirements, and associated costs. For sites undergoing design and development, assignments include preparation of remediation plans, design of sub-slab depressurization systems (SSDS) and contract specifications, and construction oversight. The work has also included conducting Phase I ESAs and indoor air quality testing, preparation of specifications, supervision of storage tank removals, and investigation and remediation of spills for existing schools. Due to the sensitivity of school sites, work under this contract is often conducted on short notice and during non-school hours. Ms. Lapin is the QA/QC officer for all of the SCA hazardous materials assignments and the Professional Engineer (P.E.) of record for the various remediation systems, including sub-slab depressurization systems (SSDS).

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.

Landfill Closure & Compost Facility Application, White Plains, NY

Mr. Godick is currently managing the closure of a formal ash landfill, which is currently being utilized as a leaf and yard waste compost facility by the City of White Plains. The landfill closure requires additional assessment to define the extent of methane and solvent contamination, which will affect the design of the landfill cap and any additional remediation. Mr. Godick also managed the preparation of the compost facility permit application, which required modification to the facility's operations necessary to close the landfill and address other regulatory requirements.

Landfill Redevelopment – RD Management, Orangeburg, NY

Mr. Godick is currently managing the remediation of the former Orangeburg Pipe site under the Voluntary Cleanup Program. The site contains widespread fill material, which has fragments of Orangeburg pipe that is impregnated with asbestos and coal tar. The site is currently being redeveloped for retail use. The closure plan for the site provides for reuse of all fill material on-site. The fill management activities will include dust and sediment control measures and air monitoring to prevent airborne dust in accordance with a closure plan, stormwater pollution prevention plan (SWPPP), and construction health and safety plan (CHASP). In pervious areas, the site cap will consist of 2 feet of clean fill and a liner in larger areas. The site will be redeveloped for hotel and retail use.

Shaws Supermarket Redevelopment Project, New Fairfield, CT

Mr. Godick was the LEP of Record for the remediation of a shopping center site that was contaminated by on-site releases from former dry cleaning operations and off-site gasoline spills. A remediation plan was prepared and approved within one year to enable redevelopment work for a new supermarket and shopping center. The remediation was complicated by the use of groundwater as a potable source at the site and surrounding area. The remediation plan included the removal of contaminated soil and installation of a multi-well pump and treat system for the recovery of non-aqueous and dissolved phase contamination from two of the three aquifers. The soil removal activities and treatment system installation have been completed, and system operation, maintenance, and monitoring are ongoing.

National Grid – Halesite Manufactured Gas Plant Site, Town of Huntington, NY

Mr. Godick is managing the remedial design and engineering work associated with remediation of National Grid's former manufactured gas plant (MGP) located in the Town of Huntington. The site is situated in a sensitive location along the waterfront, surrounded by commercial and residential properties, and half the property where the remediation will be conducted is a steep slope. The remedy consists of soil removal, oxygen injection, and non-aqueous phase liquid recovery. Mr. Godick is responsible for the development of the remedial work plans, design/construction documents, landscape architecture, confirmatory sampling, air monitoring, supervision, and preparation of close-out documentation in accordance with NYSDEC requirements. Work is anticipated to be completed in 2009.

Site Investigation & Remediation–Former Manufactured Gas Plant (MGP), Confidential Client, Westchester County, NY

The site is currently an active retail shopping center. Previously, the site had been utilized as a large former MGP. The project entailed the implementation of a large-scale remedial investigation that addressed the assessment and remediation of occupied buildings, as well as the potential of future redevelopment of the site. Future remediation will consist of hot spot removal, product recovery, and groundwater containment measures. Other engineering and institution controls will also be implemented.

Underground Storage Tank Closure and Site Remediation–Program Management, Con Edison, New York, NY

Mr. Godick provided technical assistance to Con Edison in developing technical submittals and budgets associated with tank closures at over 50 facilities. Technical summaries were prepared for submittal of contractor-prepared

closure reports to the NYSDEC. The summaries included a review of historic pre-closure assessments, tank closure data, and provided recommendations for additional assessment, remediation or closure. Subsequently, a three-year program budget was developed for implementation of the UST investigation/remedial program, which Con Edison utilized for internal budgeting purposes.

Site Investigation–Over 20 Facilities, Con Edison, New York, NY

Mr. Godick managed site investigations associated with petroleum, dielectric fluid, and PCB releases at over 20 Con Edison facilities including service centers, substations, generating stations, and underground transmission and distribution systems. Site investigations have included due diligence site reviews, soil boring installation, monitoring well installation, hydrogeologic testing, and water quality sampling. Risk-based closures have been proposed for several sites.

Site Investigation–7 World Trade Center Substation, Con Edison, New York, NY

Mr. Godick managed the site investigation at the former 7 World Trade Center Substation in an effort to delineate and recover approximately 140,000 gallons of transformer and feeder oil following the collapse of the building. The project involved coordination with several crews, Con Edison, and other site personnel.

Site Investigation–Former Manufactured Gas Plant (MGP) Facilities, Con Edison, New York, NY

Mr. Godick managed site investigations at four former MGP facilities. The investigations at three of the four sites were completed at a Con Edison substation, flush pit facility, and service center, respectively. The details associated with the fourth site are confidential. Site characterizations at the substation and flush pit facility were conducted in preparation of expansion at these locations. The findings from these characterizations were used by Con Edison to make appropriate changes to the design specifications and to plan for appropriate handling of impacted materials and health and safety protocols during future construction activities.

Ground Water Monitoring–Over 20 Facilities, Con Edison, New York, NY

Mr. Godick managed a multi-site contract for ground water monitoring at over 20 facilities throughout Con Edison's footprint at service centers, substations, generating stations, transmission/distribution, and major oil storage facilities (MOSF) sites.

Verizon, Investigation & Remediation, Various Locations, NY, PA and DE

Mr. Godick managed over 50 geologic/hydrogeologic assessments and site remediation projects related to petroleum releases at various facilities. Responsibilities included annual budgeting, day-to-day project management, development and implementation of soil and ground water investigation workplans, ground water modeling, risk evaluation, remedial action work plans, remedial design, system installation, waste disposal, well abandonment, and operation and maintenance. Many of the assessment and remedial projects followed a risk-based approach. Remedial technologies implemented included air sparging, soil vapor extraction, bioremediation, pump and treat, soil excavation, and natural attenuation.

Site Investigation, Risk Assessment and Remediation, Thermadyne Holding Company, Danvers, MA

Mr. Godick managed a remedial investigation and ground water remediation program for a former manufacturing facility in Massachusetts. The project included the design and installation of a ground water remedial system for chlorinated solvent impact within a complex fractured bedrock aquifer. Responsibilities included the review of historic data, collection of extensive new groundwater data, completion of pump testing, computer modeling of the bedrock aquifer, remedial system pilot testing, system design, O&M, waste disposal, and preparation of all necessary reports to the State. To facilitate the closure of the site, a Risk Characterization Report was prepared under the Massachusetts Contingency Plan.

Groundwater and Soil Remediation, BP Oil Company, Various Locations, NJ and PA

Mr. Godick provided support to environmental activities for BP Oil Company in Pennsylvania and New Jersey. Responsibilities included completion of remedial investigations, preparation of remedial action plans, quarterly ground water sampling, and reporting.

Multimedia Compliance and Remediation, Greenburgh Central School District No. 7, Hartsdale, NY

Mr. Godick implemented a multimedia program to address regulatory compliance and remediation at the transportation yard and other facilities. The compliance program included development of an environmental management system including periodic auditing, standard operating procedures, release reporting, and training. Designed and implemented engineering controls and monitoring to satisfy stormwater requirements. Remediation was conducted to address petroleum and solvent contamination from former underground storage tanks and dry wells, which included source removal and natural attenuation of groundwater. Provided support in connection with litigation from the adjoining property owner.

Preliminary Impact Assessment, Proposed Wildlife Refuge and Ecology Center, BASF Corporation, Kearny, NJ

Mr. Godick managed a preliminary environmental impact assessment at the location of a former BASF facility. Adjacent to the property is an expanse of mudflats that contained heavy metals, PAHs, PCBs, dioxins and other contaminants originating from numerous point and non-point sources. BASF proposed to cap these mudflats with clean sediments, and to develop a salt marsh wildlife refuge having an area of approximately 180 acres on the remediated portion. A workplan was developed and implemented, which included fish and benthic testing to evaluate whether winter flounder used the mudflat as a spawning area, and to evaluate whether winter flounder or summer flounder may utilize the mudflat as a juvenile rearing area. The benthic invertebrate and fish sampling data indicated that significant winter and summer flounder were not present at the subject site.

Environmental Assessment, Confidential Client, Flexible Packaging Division, Various Locations

Mr. Godick conducted Phase I ESAs and compliance reviews for a major international chemical company, which was divesting their flexible polyethylene packaging division. This program was completed by the seller to provide accurate and appropriate assessment information to a number of potential purchasers. All assessments were completed on a confidential basis with a completed report provided to the client within three weeks from the date of the first site visit.

Environmental Assessment, Polyurethane Foam Manufacturing Company, Various Locations

Mr. Godick conducted Phase I ESAs and compliance reviews at a major polyurethane and polystyrene foam manufacturer with locations throughout the U.S. The program evaluated all environmental aspects of the operation with a summary of potential and material liabilities provided to the client prior to the acquisition. Issues addressed, with estimates as to operational and remedial costs provided, included air emissions, regulatory compliance with historic consent orders, projected plant upgrades required for future compliance, and potential liabilities associated with identified environmental contamination.

Environmental Assessment, Copper Wire Manufacturer, Various Locations

Mr. Godick conducted Phase I ESAs and compliance reviews at multiple wire manufacturing sites, which were evaluated as part of an acquisition by an international manufacturing company. A comprehensive evaluation of each plant was performed with plant sizes ranging from 100,000 to 800,000 square feet. Final reports were delivered to the client within 30 days following the initial site visit.

Litigation Support & Remediation, Former Service Station, Brooklyn, New York

Mr. Godick took over management of remediation of an inactive service station (formerly conducted by another firm). His approach outlined additional characterization and remediation efforts which resulted in successful closure of the spill by NYSDEC within two years. Mr. Godick testified as an expert witness at a hearing in the New York State Supreme Court of Kings County to determine the adequacy of the remediation efforts.

Litigation Support & Remediation, Residential Heating Oil Spill, Cranford, New Jersey

Mr. Godick took over management of remediation of a heating oil spill in the basement of a single family residence on behalf of the insurance company. Up until Mr. Godick taking over the remediation, several hundred thousand dollars had been spent on remediation with no resolution of the spill with the NJDEP and homeowners. His approach outlined additional characterization and remediation efforts to expeditiously and cost-effectively resolve the spill.

Litigation Support, Cost Recovery Action, Town of Carmel, New York

Mr. Godick served as an expert witness representing the owner of a property in a landlord-tenant dispute, which was used as a gasoline station and oil change facility. Mr. Godick prepared exhibits, testified, and participated in meetings with NYSDEC to support the landlord's claim that the oil change tenant's practices were poor and were adversely affecting the environment and the overall facility systems at the site.

Litigation Support, Cost Recovery Action, New York State Superfund Site

Mr. Godick provided technical support for the former owner of a New York State Superfund site in upstate New York. Current owner of the property brought a cost recovery action against client as a potential responsibility party. Completed technical review of draft Remedial Investigation/Feasibility Study prepared by opposing party's consultant to develop more cost effective remedial strategy and to better position the client for liability allocation as part of future settlement negotiations. Developed cost allocation paper and model for settlement negotiations. Participated in mediation process.

Litigation Support, Cost Recovery Action, New York State Petroleum Spill Site, New York, NY

Mr. Godick provided technical support for the former owner of a New York City multi-unit residential apartment building. The State of New York brought a cost recovery action against our client as a result of a previous spill from a former underground storage tank. Reviewed invoices and project documentation to dispute work performed by the NYSDEC, which provided the basis for settlement at a fraction of the initial claim.

Cost Analysis, Environmental Insurance Claims, Various Locations

Mr. Godick provided technical support for cost analyses completed for a large national insurance company related to several former MGP and other industrial sites. Responsibilities included evaluation and development of cost-effective remedial strategies, as well as compilation of detailed costs for remedial action implementation and closure.

Litigation Support, Class Action Lawsuit, Confidential Client, NJ

Mr. Godick provided technical support for a class action suit involving a petroleum-impacted community water supply in southern New Jersey. The technical assistance included analysis of expert testimony and coordination with legal counsel in preparing for cross-examination of the opposing party's lead expert witness.

Storage Tank Management, Verizon, Various Locations, NY, PA, DE, and MA

Mr. Godick managed the removal and replacement of underground and aboveground storage tank systems for Verizon in New York, Pennsylvania, Delaware, and Massachusetts. Responsibilities included the management of design, preparation of specifications, contractor bidding, construction oversight, project budget, and documentation. For selected AST sites, managed the development of Spill Control, Contingency and Countermeasures (SPCC) plans.

Storage Tank Management, Citibank, N.A., New York, NY

Mr. Godick managed a storage tank replacement project for a facility located on Wall Street in New York City. The existing underground storage tank was closed in place and replaced with a field-constructed AST system within the building. The project required zero tolerance for service interruptions, disruptions to building operations, or disturbance to occupants of the office space neighboring the new tank location. Responsibilities included the

management of design, preparation of specifications, contractor bidding, construction inspections, site assessment for closed-in-place UST, SPCC plan preparation, and responsibility for project budget and documentation.

ERIC PARK

ENVIRONMENTAL ENGINEER

BACKGROUND

Working in the Hazardous Materials department, Mr. Park has served as environmental consultant and project manager to clients remediating and developing their properties. Services provided include remediation system design, bid and technical specification preparation, remediation design, submittal review, contractor negotiations, construction and remediation oversight and management, and Site closure coordination with regulatory agencies. Mr. Park has worked extensively on projects involving tetrachloroethylene (PCE) contamination and with remedial technologies including sub-slab depressurization systems (SSDS), and oxygen injection and air sparge (AS)/soil vapor extraction (SVE).

Education

B.S. Engineering, Cooper Union Albert Nerken School of Engineering, 2006

Licenses/Certifications

40-hour OSHA Certified

Order of the Engineer

Professional Memberships

Years of Experience

Year started in industry and company: 2006

RELEVANT EXPERIENCE

2350 Fifth Avenue, New York, NY

Mr. Park has been involved in the remediation at this privately owned, former-commercial facility with historic PCE contamination. The Site was investigated and remediated as part of the New York State Inactive Hazardous Waste Site Registry (State Superfund) Program, and included multiple rounds of remedial investigation and remediation implementation prior to receiving approval for Site closure from NYSDEC and NYSDOH. The Site remediation tasks included the retro-fitting of an SSDS and SVE system across the majority of the 1.58-acre Site, in-situ chemical oxidation, and contaminant source removal. Mr. Park co-lead the remediation technology design and management of field tasks during implementation of the remedy. Site closure was approved in January 2015.

145 West Street, Greenpoint, NY

Mr. Park has managed the design and implementation of remediation at the former Huxley Envelope site in Greenpoint, Brooklyn. The project is primarily overseen by NYSDEC as part of the Brownfield Cleanup Program (BCP) but is also under NYCOER jurisdiction as multiple E-Designations, including for Hazardous Materials, were applied to the Site during the Greenpoint-Williamsburg Rezoning. Remediation of the Site included removal of underground storage tanks; installation of permanent sheeting; excavation of nearly 100,000 tons of contaminated soil; installation and maintenance of a vapor mitigation system consisting of a vapor barrier and sub-

slab depressurization system (SSDS); construction and maintenance of a Site cover system. Mr. Park is managing the remediation efforts and interfaces with owners, counsel, consultants, and contractors to address construction concerns through completion of the project.

Home Depot, Queens, NY

Mr. Park co-managed remediation implementation at a Home Depot site in Queens, New York as part of the NYSDEC BCP. Remediation of the Site included the design, installation, startup, and maintenance of an AS/SVE system to address PCE contamination in the aquifer. Tasks have included pilot testing, designing the system expansion, writing bid specifications and workplans, and coorinating with the client, contractors and regulatory agencies. Mr. Park was involved in project management through closure of the Site and is currently overseeing ongoing Site management tasks as required by NYSDEC and the Site Management Plan.

Brooklyn Bridge Park, Brooklyn, NY

Mr. Park has been involved in the application for the Department of Sanitation of New York (DSNY) Fill Materials Operation (FMO) permit. He has been working with project consultants and architects to complete the requirements necessary to obtain the FMO. The DSNY permit will allow for the import of gross amounts of approved fill to be used on-site for the construction of noise mitigating hills at the proposed park.

East Side Access, Long Island City, NY

Mr. Park has been working with the New York Metropolitan Transit Authority (MTA) in continued dust concentration analysis related to the East Side Access underground tunnel drilling operation. Mr. Park has been working with MTA and its subcontractors to ascertain the source of particulate in the local ambient air and mitigate all sources.

Queens West Remediation, Long Island City, NY

Mr. Park has been involved in the on-going post-remediation activities at various sites in the Queens West development community. Queens West has a long history of contaminated sites, mostly caused by coal tar-related industrial facilities that were located in the vicinity in the past. Working with other consultants, Mr. Park has taken part in groundwater, soil and soil gas sampling and has been involved in the post investigation documentation.

Halesite MGP RFP, Halesite, NY

Mr. Park was involved in the response to a Request for Proposal regarding the in-situ remediation of a former manufactured gas plant. Mr. Park researched the relevant current in-situ groundwater remediation technologies including Chemox and air sparging. Groundwater and soil beneath the property have been affected by MGP related contaminants such as coal tar. Mr. Park was involved in coordination meeting with in-house marketing and sub-contractors working in conjunction with AKRF for the submission of the proposal.

Flushing Industrial Park, Flushing, NY

Mr. Park was involved in the remedial activities at the Brownfield site in Flushing, New York. Mr. Park assisted in the installation and sampling of post-remediation groundwater monitoring wells. Mr. Park has also been involved in the preparation of the Site Management Plan and Final Engineering Report, detailing the on-site remedial activities to date.

Columbia University Manhattanville Academic Mixed-Use Development, New York, NY

Mr. Park was involved in the preparation of the Remedial Action Plan / Construction Health and Safety Plan for the redevelopment of Columbia University. Due to the scope and scale of the intended development, many issues

concerning hazardous materials (auto-industry related facilities, historic MGP sites) were addressed in conjunction with issues from the associated Environmental Impact Statement.

AvalonBay Gold Street, Brooklyn, NY

Mr. Park was involved in subsurface investigations at the proposed AvalonBay development site. The work entailed collecting soil samples for waste characterization and groundwater data. The site work was used as part of the ongoing pre-construction phase activities.

AvalonBay Willoughby West, Brooklyn, NY

Mr. Park has conducted Phase I Site Assessment and Phase II subsurface investigations at the proposed AvalonBay development in Downtown Brooklyn. Working closely with the landowner and AvalonBay, Mr. Park has been evaluating subsurface conditions at the site concerning a known fuel oil spill and potential solvent and gasoline contamination plumes within the site.

Paragon Paint, Long Island City, NY

Mr. Park oversaw the installation of ten soil borings at the abandoned Paragon Paint facility. Soil, soil vapor, and groundwater samples were collected to determine the severity of the contamination associated with ten on site underground storage tanks as well as the paint operations formerly conducted on site.

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 2012

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

Domino Sugar, Brooklyn, NY

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. 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, Orangeburg, NY

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.

Queens West Development Project, Long Island City, NY

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.

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.

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.

Memorial Sloan Kettering Cancer Center, New York, NY

Mr. Grens has performed numerous noise impact studies on the east side of midtown Manhattan to assist in the determination of the various project scenarios within each site's respective EIS. Mr. Grens' tasks included collecting relevant noise data at numerous locations during morning, afternoon, and evening rush hours to determine real time noise levels utilizing a Larsen Davis decibel level indicator.

Columbia University Manhattanville Academic Mixed-Use Development, New York, NY

Mr. Grens performed numerous Phase I Environmental Site Assessments for the Columbia Manhattanville re-zoning project. Phase II activities included the installation of soil borings and groundwater monitoring wells and the collection of soil and groundwater samples.

St. Agnes Hospital Redevelopment, White Plains, NY

AKRF is currently working for North Street Community, LLC on the former St. Agnes Hospital campus in White Plains, New York. The project involves redeveloping the property into an assisted living and nursing home facility. Some of the existing buildings and uses will remain and several new buildings will be built for the new facility. AKRF's assignment includes preparing the site plan package to accompany the Draft Environmental Impact Statement (DEIS) for the project. Mr. Grens performed a Phase I Environmental Site Assessments of the numerous structures located on the property.

MARCUS SIMONS

SENIOR VICE PRESIDENT

General Introduction

Marcus Simons is a Senior Vice President of AKRF with more than 18 years of experience in environmental consulting. He specializes in the assessment and cleanup of contaminated sites, including federal and state superfund, Resource Conservation and Recovery Act (RCRA) and Toxic Substances Control Act (TSCA) sites, brownfield, voluntary cleanup and spill sites. His expertise includes health risk assessment, development of sampling plans, economic evaluations of remedial alternatives, and regulatory analysis. 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 manages much of the environmental due diligence activity at AKRF (most 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 also manages preparation of the contaminated-materials portions of AKRF's Environmental Impact Statements and Environmental Assessments.

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 being constructed; 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). These projects involved extensive multi-year negotiations with federal, state and city regulatory agencies. Mr. Simons has experience with federal and state superfund programs, state brownfield and voluntary cleanup programs, spill programs and investigation/cleanup under New York SEQRA/CEQR and NYCDEP E-designation programs.

Mr. Simons also has extensive experience in the evaluation of contaminated materials issues for environmental assessments (EAs) and environmental impact statements (EISs) under NEPA, SEQRA and CEQR, including 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 (Times Square, School Construction Authority, Queens West)

Before joining AKRF, Mr. Simons worked for Woodward Clyde Consultants (now URS Corporation) in Wayne, New Jersey, where he was responsible for risk assessment, environmental impact analysis, and regulatory analysis for both public and private clients. His responsibilities included projects primarily located in New York and New Jersey. His risk assessment work included a study for the decommissioning and cleanup of a Canadian elemental phosphorus production facility (the first such plant in the world to be systematically decommissioned).

BACKGROUND

Education

M.A. and B.A. (Honors), Engineering/Management Science, Cambridge University, England, 1986

M.S., Engineering and Public Policy, Carnegie-Mellon University, 1988

Years of Experience

Year started in company: 1995

Year started in industry: 1988

RELEVANT EXPERIENCE

Pelham Bay Landfill, Bronx, NY

For the NYCDEP, Mr. Simons prepared a Human Health Risk Assessment for the Pelham Bay Landfill Inactive Hazardous Waste Disposal Site in Bronx, NY. The Assessment was performed in accordance with both US EPA Superfund Guidelines and site-specific exposure factors and other procedures agreed to with NYSDEC and NYSDOH. The Assessment included analysis of soil, groundwater, surface water, sediment, fish/shellfish and air data and incorporated complex comparisons with background contaminant levels in the various media and innovative approaches, following the data validation, to handling extensive non-detect and estimated-value laboratory data .

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.

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.

Long Island City Rezoning, Queens, NY

As part of the preparation of an Environmental Impact Statement for NYC Department of City Planning, Mr. Simons managed the hazardous materials assessment of a multi-block industrial 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 is managing the investigation and remediation of an old factory complex where large volumes of creosote were spilled. The investigations and interim remedial measures (IRMs) are taking place under the state's Voluntary Cleanup Program (VCP).

Pelham Plaza Shopping Center, Pelham Manor, Bronx, NY

Mr. Simons was responsible for the investigation of a former Con Edison manufactured gas facility on the Hutchinson River on the border between Westchester County and the Bronx. He oversaw the complex investigation of the existing shopping center at the site, and proposed a remediation approach to allow the expansion of the shopping center.

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.