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September 28, 2007

Mr. Shaminder Chawla
New York State Department of Environmental Conservation – Region 2
Division of Environmental Remediation
47-40 21st Street
Long Island City, New York 11101

Re: Off-Site Investigation Work Plan
West 61st Street Site
New York, NY 10023
BCP ID: C231043/C231059

Dear Mr. Chawla:

AKRF, Inc. (AKRF) is pleased to present the attached Work Plan for the off-site investigation of the West 61st Street Site. The investigation is intended to determine the nature and extent of soil and groundwater contamination in adjacent off-site locations.

Please call me at (646) 388-9520 with any questions or comments.

Sincerely,
AKRF, Inc.

Michelle Lapin, P.E.
Senior Vice President

cc: Bennet Schonfeld, Algin Management Co., LLC
David Freeman and Jesse Hiney, Paul, Hastings, Janofsky & Walker, LLP
Bridget K. Callaghan, New York State Department of Health

West 61st Street Site

NEW YORK, NEW YORK

Off-Site Investigation Work Plan

AKRF Project Number: 10321

BCP IDs: C231043 / C231059

Prepared for:

Algin Management Co., LLC
64-35 Yellowstone Blvd.
Forest Hills, NY 11375

Prepared by:

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New York, NY 10016
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SEPTEMBER 2007

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1.0 INTRODUCTION

The West 61st Street Site (Site) consists of approximately 1.44 acres located on West 60th and 61st Streets between West End Avenue and Amsterdam Avenue in Manhattan, New York (Figure 1). Specifically, the Site consists of Block 1152, former Lots 5, 8, 10, 11, 12, 13, 52, 53, 55, and part of former Lot 43. The lots associated with the project Site have been consolidated into Lots 8 and 13 (Figure 2). Residential, institutional (school) and commercial properties are present in the surrounding neighborhood.

In April 2005, a Brownfield Cleanup Agreement (BCA) was entered into between the New York State Department of Environmental Conservation (NYSDEC) and Algin Management Co., LLC. Pursuant to an amendment to the BCA and the execution of a new BCA, the Site was bifurcated for the purposes of conducting a dual track cleanup on May 23, 2007. Approximately 1.09 acres of the Site, consisting of Lot 8 and the western portion of Lot 13, was approved for Track 1 cleanup (BCP Site No. C231043). The remaining portion, consisting of approximately 0.35 acres, located within the northeastern part of Lot 13, was approved for Track 4 cleanup (BCP Site No. C231059). These agreements included the investigation and remediation of the entire 1.44-acre Site, for which the on-site remedial activities are nearing completion.

This Off-Site Investigation Work Plan is intended to delineate any soil or groundwater contamination which may be present in off-site locations adjacent to the Site. All work will be performed in accordance with the Quality Assurance Project Plan (QAPP) (Appendix A) the site specific Health and Safety Plan (Appendix B), and the Community Air Monitoring and Odor and Vapor Control Plan (Appendix C).

2.0 SITE DESCRIPTION

2.1 Site Location

Figure 1 depicts the Site location on a United States Geological Survey (USGS) topographical quadrangle map. The Track 1 area is situated on the western portion of the Site bounded by West 61st Street to the north, West 60th Street to the south, the Track 4 portion of the Site and a residential building to the east, and residential buildings, a school, and a commercial automobile parking garage to the west. The Track 4 area is situated on the northeastern portion of the Site bounded by West 61st Street to the north, a residential building to the south, a public school to the east, and the Track 1 portion of the Site to the west. Figure 2 illustrates the locations of the adjacent properties and the bounds of the Track 1 and Track 4 areas.

Off-site areas in this investigation will include locations along the northern sidewalk of West 60th Street and the southern sidewalk of West 61st Street between West End Avenue and Amsterdam Avenue.

2.2 Site and Vicinity Characteristics

During the June 2003 Phase I Environmental Site Assessment (ESA) inspection, buildings were present on seven of the ten former Site lots. Since that time, the buildings have been demolished and the Site was graded with on-site construction and demolition debris to match the surrounding surface elevation. Remedial work began under the NYSDEC Brownfield Cleanup Program (IDs C231043 and C231059) in July 2006 and is nearing completion. Currently, the Site is under construction for the proposed end use (discussed in Section 2.7).

The Site is located in an area currently going through a transformation from residential, industrial and commercial establishments to schools and residential buildings containing first floor retail.

Areas of public concern include residences and schools in close proximity to the Site. Residences, two schools, (The Beacon School and The American Musical and Dramatic Academy) and a commercial building are located across West 61st Street. A public school (PS 191 Amsterdam) is located adjacent to former Lot 13, along West 61st Street, at the intersection of West 61st Street and Amsterdam Avenue. A residential building with a college (Touro College for Women) occupying the first five floors is adjacent to former Lot 13, along West 60th Street. A New York City Department of Parks and Recreation pool is located south of the Site across West 60th Street. A private school (The Abraham Joshua Heschel High School) is located on West 60th Street adjacent to former Lot 8. There is presently new building construction at the southeastern corner of the intersection of West 60th Street and West End Avenue and on the west side of West End Avenue between West 60th Street and West 61st Street. The Hudson River is located approximately 500 feet west of the Site.

2.3 Site Geology, Hydrogeology and Subsurface Characteristics

Prior to remedial activities at the Site, the surface topography and the surrounding area sloped downward from east to west towards the Hudson River. Based on a Site survey by True North Surveyors, Inc. completed during the remedial investigation (RI), the Site was at an elevation of approximately 61 feet at its highest point, sloping westerly to an elevation of approximately 32 feet at its lowest point. All bedrock, groundwater and Site elevations referenced in this Off-Site Investigation Work Plan are based on the Borough of Manhattan Datum (approximately 2.75 feet above mean sea level).

Prior to remediation, the overburden soil at the Site, excluding the northeastern area located along West 61st Street, consisted of two distinct layers. The upper layer was urban fill material consisting of rock, brick, silt, wood, and glass, with ash and slag and ranged from approximately 3 to 16 feet thick. The lower layer was native soil comprising sand and silt with some gravel. The overburden in the northeastern corner of the site consisted of urban fill placed directly on the bedrock; no native soil was located in this area. Geotechnical engineering borings performed by RA Consultants in February 2005, prior to the remedial investigation, indicated that the bedrock surface was variable and ranged from elevation 40.8 in the northeastern corner of the Site to elevation 0 at a point along West 61st Street near the northwestern corner. Depth to bedrock varied from 9.5 to 45 feet below the ground surface. Based on the geotechnical borings, the bedrock consisted of mainly slightly to moderately-weathered and fractured gneiss and schist that is part of the Manhattan Formation.

The information gathered from the overburden and bedrock groundwater monitoring wells identified groundwater at depths of approximately 10-16 feet below pre-remediation grade. In the bedrock aquifer, the groundwater ranged from elevation 51 in the northeastern corner of the Site to elevation 31 in the southeastern corner. The estimated flow direction in the bedrock aquifer appeared to be slightly towards the southwest. A significant dip in the bedrock along West 61st Street, where bedrock dropped from elevation 40 to elevation 0, indicated that the bedrock aquifer discharged into the overburden aquifer. The exact flow direction of the groundwater in the bedrock aquifer in the center and western areas of the Site was not ascertainable from this data, although the groundwater will ultimately flow west towards the Hudson River. In the overburden aquifer, the groundwater in the central portion to the western perimeter of the Site ranged from elevation 30 to elevation 15. Groundwater in the overburden aquifer appeared to flow from the northeast to the southwest, ultimately discharging into the Hudson River. The groundwater flow at the Site is likely affected by one or more factors, which may include current and past pumping of groundwater; past filling activities; underground utilities and other subsurface openings or

obstructions such as basements or underground parking garages; bedrock geology; and other factors. Groundwater in New York County is not used as a source of potable water.

2.4 Site History

The regulatory databases, Fire Department records, electronic Buildings Department records, historical land-use maps, and visual inspections indicated that the subject block was developed prior to 1907 for residential use. By the 1950's, the subject block had transitioned to commercial and industrial uses from primarily residential, and has remained mostly commercial until a recent transformation to schools and residential buildings. Past uses of the former lots on the Site included an apartment building, an auto repair shop, metal works, iron works, and chemical storage. During the June 2003 Phase I ESA inspection, buildings were present on seven of the ten Site lots. Subsequently, remediation activities were conducted in accordance with the Remedial Work Plan (RWP) (and addenda) prepared by AKRF in March 2006. Additionally, closure and removal of 26 aboveground storage tanks (ASTs) and underground storage tanks (USTs) encountered during demolition, excavation, and remediation were completed.

2.5 Off-Site History

The area around the Site contained tenement houses and some commercial establishments, such as an auto repair shop, a parking garage with gasoline tanks, a gasoline station, a brewing company, a junk yard, a bakery, and a public bathhouse. In subsequent years, two public schools were constructed on West 61st Street and a charter school was constructed on West 60th Street. From 1926 to approximately June 2003, Emsig Manufacturing, a factory that produced buttons and fabrics, operated adjacent to former Lot 13. Emsig Manufacturing, listed as a hazardous waste generator, used acetone and styrene in their manufacturing process, generating wastes such as ignitable, corrosive, solvents, plating wastes, and metals including barium and chromium. The property contained two 3,000-gallon fuel oil storage tanks. The original structure was demolished and the property has been developed as an apartment building.

2.6 Previous Studies

2.6.1 Phase I Environmental Site Assessment

A Phase I ESA was performed by AKRF, Inc. (AKRF) on the project Site in June 2003. The ESA report included the findings of a site inspection, the evaluation of available historical information, and the interpretation of relevant federal and state environmental databases. All buildings discussed in this section were demolished prior to or during the Remedial Investigation.

Former Lot Uses:

The building on former Lot 5 was constructed prior to 1926 and had a partial basement used to house a fuel storage tank and a furnace. The most recent use of this structure was as a garage for the repair and maintenance of taxis. The most recent inspection prior to the remedial investigation identified three 275-gallon tanks on the first floor used to store engine oil, transmission fluid, and used engine oil. A 1,080-gallon vaulted aboveground storage tank was observed in the basement.

Former Lot 8 was occupied by two, four-story brick residential buildings with basements. In 1926, the building was identified as containing one 550-gallon underground storage tank. In 1940, NYC Building's Department records indicated the installation of a gasoline tank, but Site interviews did not confirm the presence of an underground storage tank. In 1961, a City permit for a fuel oil burner was issued and a 1,050-gallon tank was

verified by a previous Site inspection. The building also contained one 55-gallon drum and eight empty 55-gallon drums.

Former Lot 10 was occupied by a vacant one-story building constructed between 1926 and 1951. Historically, this parcel was initially occupied by a four-story residential building, followed by an auto repair shop, a one-story packing case manufacturer, and then by unknown occupants. During the Site visit, one 275-gallon waste oil aboveground storage tank was observed. The building contained piles of debris consisting of auto parts, garbage, and construction debris. Buildings Department records indicated that a permit application was filed in 1950 to install a gasoline tank. It is unknown whether this gasoline tank was installed and whether it was present at the time of the inspection.

Former Lot 11 contained a two-story brick building constructed between 1926 and 1951 and was occupied by N&P Auto Repair on the first floor with an employee break room on the second floor. Historically, this parcel was occupied by a four-story residential building, then residences and manufacturing, then a two-story auto repair shop, and finally, by unknown occupants. During the Site visit, the first floor garage contained small containers of spray paint, cases of motor oil, two hydraulic lifts with external hydraulic oil canisters, a small solvent degreasing station, and a radiator fluid wash bath. The floor was observed to be stained with automobile fluids and the shop was observed to practice general poor housekeeping. The building reportedly had a crawl space, but it was inaccessible at the time of the inspection.

Former Lot 12 was occupied by a two-story brick building at the time of the inspection that contained an electrical contractor's office constructed between 1926 and 1951. Historically, this parcel was occupied by a four-story factory with residences on the fourth floor, followed by a one-story iron works factory, and finally by unknown occupants. There was no evidence of on-site storage tanks during the Site investigation.

Former Lot 13 was occupied by a gravel parking lot used for taxi cab parking and a small elevated office in the rear of the lot. Historically, this parcel was occupied by four separate four-story, store-fronted residential buildings. The lot was then used for two separate periods as a two-story auto repair shop and became a vacant lot in 2001. The 1926 historical Sanborn map indicated that a 1,000-gallon gasoline underground storage tank was located on this lot. This parcel was listed for three 550-gallon diesel underground storage tanks installed in 1969 on the regulatory database. Their registration expired in 1993. Records maintained by the Fire Department revealed that a permit for three 550-gallon tanks filed in 1984 expired in 1989. These are likely the same tanks listed in the regulatory database. It is unknown whether these tanks had been removed or remained on the parcel at the time of the Site inspection. During the Site visit, no evidence of on-site tanks, such as fill caps or vent pipes, was observed. The Phase I ESA noted the presence of a manufacturer directly upgradient and adjacent to this lot. The Phase I concluded that discharges from this adjacent off-site property, the former Emsig Manufacturing, may have affected on-site conditions.

Historically, Former Lot 43 was occupied by nine five-story residential buildings until 1926. The lot was then used for parking and as a gasoline station with a small one-story office. It was then a vacant lot from 1976 to 1986, at which time it became a commercial parking lot. NYC Buildings Department records indicated that an unspecified number of gasoline tank installation permits were applied for in 1947. These permits are most likely

associated with the former on-site gasoline station noted on the 1951 Sanborn map. The Phase I ESA stated that these tanks apparently remained in place.

Former Lot 52 contained a one-story concrete block and brick building used by 3G Studio Corporation for sound stage and set building activities. This building was constructed sometime between 1907 and 1926. There was no evidence to indicate the presence of petroleum or chemical storage tanks on-site. Historically, this parcel was occupied by a one-to two-story building with a storefront, then a one-story auto repair shop, followed by a metal works factory (c. 1951), and then a one-story building with unknown occupants just prior to its most recent use by 3G Studios. Storage tanks may have been in use on-site in the past, but there were no records to indicate any such tanks.

Former Lot 53 contained a one-story brick building with a basement. It was attached to the building on former Lot 52 and was most recently used by 3G Studio Corporation for sound stage and set building activities. This building was constructed between 1926 and 1951 and was occupied by two, five-story residential buildings, followed by a one- to two-story garage, and finally the one- to two-story sound stage. New York City Buildings Department records indicated that a gasoline tank installation permit was applied for in 1950. Site interviews indicated that there were no active gasoline tanks on-site. The Phase I ESA was unable to ascertain whether this tank was installed, and if so, whether it was subsequently removed.

Former Lot 55 was most recently occupied by an unpaved (gravel) and paved lot used by the east-adjacent 3G Studio Corporation for parking trucks and cars. There was no evidence to suggest the presence of chemical or petroleum storage tanks. Historically, this parcel was occupied by a five-story residential building and then a parking lot. The former residential building may have utilized a fuel oil storage tank; however, no records indicated such usage.

The following table summarizes the tanks identified in the Phase I ESA:

On-Site Petroleum Storage Tanks Identified in The Phase I ESA

Former Lot No.	Source	Date	Capacity (gallons)	Contents	UST/AST
5	Sanborn Maps	1926	550	GT	UST
	Site Visit, Fire/ Bldg Dept	1940	1,080	FO	AST
	Site Visit	* * *	275 275 275	Motor Oil Waste Oil Transmission Oil	AST AST AST
8	Sanborn Maps	1926	550	GT	UST
	Bldg Dept	1940	*	GT Permit	*
	Site Visit, Bldg Dept	1961	1,050	Fuel Oil	AST (Vaulted)
10	Site Visit	*	275	Waste Oil	AST
	Bldg Dept	1950	*	GT Permit	*
11	No Evidence of Tanks				
12	No Evidence of Tanks				

Former Lot No.	Source	Date	Capacity (gallons)	Contents	UST/AST
13	Sanborn Maps	1926	1,000	GT	UST
	Fire Dept, Regulatory Database	1969	3 (550)	Diesel	UST
Part 43	Sanborn Maps	1951	*	Gasoline Station	*
	Bldg Dept	1947	*	GT Permit	*
52	No Evidence of Tanks				
53	Bldg Dept	1950	*	GT Permit	*
55	No Evidence of Tanks				

Notes: AST = Aboveground Storage Tank
UST = Underground Storage Tank
* = Unknown
FO = Fuel Oil
GT = Gasoline Tank

During demolition, excavation, and remediation of the Site, a total of 26 aboveground and underground storage tanks were encountered. Details are available in the September 13, 2007 *Tank Closure Report* prepared by AKRF.

2.6.2 Geotechnical Investigation

A geotechnical investigation was undertaken at the Site in February 2005 by RA Consultants. Sixteen borings were advanced to bedrock at various locations throughout the Site. Petroleum odors were noted in three of the boring logs and the report narrative. The petroleum odors were noted in borings completed on the southern portion of the Site.

2.6.3 Remedial Investigation

As part of the Brownfield Cleanup Program, a Remedial Investigation (RI) was completed at the Site. The RI activities began in the late summer of 2005 and were completed in early November 2005. RI activities at the Site, completed by and/or under the supervision of AKRF, included:

- An electromagnetic survey across the Site, (excluding former Lot 5 and former Lot 53, which were, at the time, covered with a concrete floor slab);
- Investigation of all geophysical anomalies using ground penetrating radar;
- Installation of eighteen soil borings across the project Site, including the collection of at least two soil samples for laboratory analysis from each soil boring;
- Installation of nine shallow and one deep groundwater monitoring wells at ten of eighteen soil boring locations, including collection of groundwater samples for laboratory analysis from each the wells;
- Installation of seven soil vapor probes and collection of soil-gas samples for laboratory analysis;
- Collection of liquid samples from one underground storage tank on former Lot 53;
- Excavation of trenches across former Lot 8 to investigate the possible presence of a former fuel oil tank in the basement; and
- Completion of a Site survey to establish horizontal and vertical control of sampling locations and identified geophysical anomalies.

A summary of the findings included in the Remedial Investigation Report (RIR) is as follows:

- The borings and soil analysis indicated the presence of urban fill and construction and demolition debris throughout the Site. The waste appeared to have been placed on the bedrock in the Track 4 area and on the existing native soil in the Track 1 area. Metals and semi-volatile organic compounds (SVOCs) were detected in a number of surficial and subsurface samples. A sample collected in the parking lot area, analyzed by EPA Method 1311, Toxic Characteristic Leaching Procedure (TCLP), exceeded the EPA Hazardous Waste Regulatory Level for lead. Boring and groundwater sampling indicated the presence of petroleum contamination in the southern portion of the Site along West 60th Street. One soil sample contained acetone above the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046 Recommended Soil Cleanup Objective (RSCO).
- Groundwater at the downgradient end of the Site exceeded the Division of Water Technical and Operational Guidance Series (TOGS) No. 1.1.1. Class GA groundwater standards for benzene and the pesticide 4-4'- DDD. Concentrations of metals that exceeded standards for both total and dissolved metals included iron, magnesium, manganese, nickel, selenium, sodium and thallium.
- The geophysical investigation and subsurface soil sampling program identified seven on-site Areas of Concern (AOC).
- The on-site and off-site health impacts were evaluated in the Health Assessment. It was determined that the Site did not pose a significant threat to public health or the environment. Contamination at the Site was removed during construction and remedial activities to NYSDEC/New York State Department of Health standards, and any remaining contaminants in the Track 4 area do not pose a future off-site environmental or health threat.

A Remediation Work Plan (RWP) under the BCP was prepared for the Site with the following proposed remedial actions:

- Remove Areas of Concern (AOCs) by excavating known or suspected underground storage tanks, petroleum-contaminated soil around the tanks, lead-contaminated soil, and acetone-contaminated soil;
- Remove all of the non-petroleum-contaminated fill material;
- Remove the petroleum-contaminated fill material and native soil along West 60th Street, whose benzene, toluene, ethylbenzene, xylene (BTEX); naphthalene; volatile organic compounds (VOCs); and semivolatile organic compounds (SVOCs) concentrations exceed TAGM #4046 RSCOs for the Track 1 area or Site Specific Action Levels (SSALs) for the Track 4 area;
- Remove any on-site native soil or fill material with VOC, SVOC, pesticide, or PCB concentrations exceeding TAGM #4046 RSCOs for the Track 1 area or SSALs for the Track 4 area;
- Prevent future on-site re-contamination by preventing and/or minimizing the inflow of contaminated groundwater into the Site through the construction and waterproofing (with a vapor barrier) of footings, sub-cellar walls, and cellar walls;

- Prevent on-site reuse of historic fill or native soil with VOC, SVOC, pesticide, or PCB concentrations exceeding TAGM #4046 RSCOs in the Track 1 area or SSALs in the Track 4 area;
- Prevent inhalation of contaminant vapors and dust;
- Prevent direct contact with contaminants in soil and groundwater; and
- Prevent storm water runoff during soil disturbing activities.

2.6.4 Remedial Activities

Remedial actions were performed at the site in accordance with the RWP and under the supervision of the NYSDEC. Remedial activities are nearing completion at the Site and a Final Engineering Report is currently being prepared.

During the remediation phase, 20 soil borings were advanced in off-site locations as shown in Figure 2. Soil samples were initially advanced to complete sidewall sampling requirements at the Site; however, these borings were placed outside the property boundary beyond the foundation wall, and as such, are considered off-site locations. AKRF will incorporate this field and laboratory analytical data in conjunction with the soil borings proposed herein for the off-site investigation.

2.7 Description of Contemplated Site Use

The Site is currently under construction. The proposed redevelopment plan and end use is a multi-tenant residential complex with low-rise and high-rise structures located on the Track 1 area of the Site between West 60th and 61st Streets. Specifically, three buildings will be located on the Track 1 area, including parking and mechanical spaces at the cellar and subcellar levels; retail, residential, and community use on the first floor; and residential use (rental and condominium) from the second floor up. Building "A" will comprise nine floors, Building "B" will comprise 14 floors, and Building "C" will comprise 29 floors with a two-level underground parking garage situated beneath Buildings "B" and "C". A landscaped area, referred to as a courtyard, will be developed west of the buildings. A recreation area, consisting of a tennis court and landscaped grounds, will be constructed on the Track 4 area of the Site, situated along West 60th Street.

3.0 FIELD PROGRAM

3.1 Field Program Summary

The objectives of the field-sampling program are to determine the nature and extent of soil and groundwater contamination in off-site locations adjacent to the Site. Five new soil borings/monitoring wells will be installed at the locations shown on Figure 2.

3.2 Soil Sampling

Five soil borings will be advanced to characterize subsurface soil and to collect soil samples for laboratory analysis. Analytical data collected from the soil borings advanced during the remediation activities (see Section 2.6.4) will be used in conjunction with the five proposed soil borings. Figure 2 depicts soil boring locations OSB (off-site boring)-1 through OSB-5. The borings will be advanced to bedrock. Depending on location, the approximate depth to bedrock is expected from 10 to 30 feet below sidewalk grade.

The soil borings will be advanced using a hollow-stem auger rotary rig. Soil samples will be collected on a continuous basis using a 2-foot long, 2-inch diameter, split-spoon sampler. Each sample will be split lengthwise and logged by AKRF field personnel. Logging will consist of: describing the soil according to the modified Burmister Classification System; describing any evidence of contamination (e.g. staining, sheens, odors); and screening for organic vapors using a photoionization detector (PID).

Two soil samples from each boring will be selected for laboratory analysis based on PID response and visual and olfactory indications of contamination. The depth intervals of samples collected will be determined based on trends observed in the field (i.e., contamination limited to vadose/saturated zone, no contamination observed, contamination observed in a particular depth layer). In the absence of contamination, one sample will be collected from the surface (0-2') and one sample will be collected from the groundwater interface.

The soil samples slated for analysis will be collected into laboratory-supplied containers, sealed and labeled, as described in the QAPP (Appendix A), and placed in a chilled cooler. The samples will be analyzed in a laboratory following NYSDEC Analytical Services Protocol (ASP) Category B deliverables. Samples will be analyzed for volatile organic compounds (VOCs) by EPA Method 8260, SVOCs by EPA Method 8270, polychlorinated biphenyls by EPA Method 8081, pesticides by EPA Method 8082 and target analyte list (TAL) metals.

All sampling equipment (spilt-spoons, etc.) will be decontaminated between sampling locations. The decontamination procedure will be as follows:

1. Scrub using tap water/Simple Green® mixture and bristle brush.
2. Rinse with tap water.
3. Scrub again with tap water/ Simple Green® and bristle brush.
4. Rinse with tap water.
5. Rinse with distilled water.
6. Air-dry the equipment.

Decontamination will be conducted on plastic sheeting (or equivalent) that is bermed to prevent discharge to the ground. All drill cuttings and decontamination water will be containerized in 55-gallon drums and handled as described in Section 3.6. Each boring will be pressure grouted with bentonite-cement slurry upon completion.

3.3 Monitoring Well Installation

Monitoring wells will be installed in each of the new soil boring locations described in the previous section. Locations of the proposed wells (OSB/MW-1 through OSB/MW-5) are shown on Figure 2.

The wells will be constructed with two-inch diameter PVC, with ten feet of 0.02 slotted screens installed with approximately four feet of screen above and six feet of screen below the top of the water table. The annular space around the well screen will be backfilled with sand filter pack extending from the bottom of the well to one to two feet above the screen. The annular space around the well riser will be sealed with bentonite extending one to two feet above the sand filter pack and completed with a non-shrinking cement mixture to approximately one foot below grade. Monitoring wells will be completed using locking, flush-with-grade gate boxes. A concrete apron will be set around the gate box or steel casing to prevent drainage of surface runoff toward the well.

Following installation, each monitoring well will be developed via over-pumping, or surging and pumping, or until at least three well volumes have been evacuated. The purge water will be monitored for turbidity and water quality indicators (i.e., pH, dissolved oxygen, oxidation-reduction potential, temperature, and specific conductivity) with measurements collected approximately every five minutes. Development will continue until turbidity is less than 50 nephelometric turbidity units (NTUs) for three successive readings or until water quality indicators have stabilized, whichever occurs first. The criteria for stabilization will be three successive readings within 10% for pH, temperature and specific conductivity.

All sampling equipment will be decontaminated between monitor well locations using the same procedure described for soil borings in the previous section.

3.4 Surveying

At the completion of sampling activities, all newly-installed monitoring wells will be surveyed by a New York State-licensed surveyor. Three elevation measurements will be taken at each well location: the elevation of the ground beside the well; the elevation on the rim of the gate box or protective casing; and the elevation of the top of PVC casing.

3.5 Groundwater Sampling

Monitoring wells will not be sampled until at least one week following initial development. Prior to collecting the samples, the depth to groundwater and light non-aqueous phase liquid (LNAPL) (if present) will be measured in the wells using an electronic oil/water interface probe attached to a measuring tape accurate to 0.01 feet. The probe will be lowered to the bottom of each well to check for the presence of dense non-aqueous phase liquid (DNAPL). Monitor wells containing measurable LNAPL or DNAPL would be indicative of dissolved phase contaminant concentrations beyond their respective saturation points. Consequently, groundwater from wells containing LNAPL or DNAPL will not be sampled. Samples of the separate phase product however, would be sampled and fingerprinted to determine their composition.

The water level data, well diameter and depth will be used to calculate the volume of water in each well. The wells will then be purged using low-flow purging techniques, as described in the QAPP. Groundwater samples will be collected using dedicated pump tubing and placed directly into laboratory-supplied sample bottles. The samples will be analyzed in a laboratory following NYSDEC ASP Category B deliverables. Samples will be analyzed for TCL VOCs by EPA Method 8260 and TCL SVOCs by EPA Method 8270. All non-dedicated sampling equipment (e.g., submersible pumps and oil/water interface probe) will be decontaminated between sampling locations using a similar procedure described in Section 3.2. All decontamination water will be placed in 55-gallon drums and handled as described in Section 3.6.

3.6 Management of Investigation-Derived Waste

All investigation-derived waste (IDW) will be containerized in Department Of Transportation-(DOT) approved 55-gallon drums. The drums will be sealed at the end of each work day and labeled with the date, the well or boring number(s), the type of waste (i.e., drill cuttings, development water or purge water) and the name of an AKRF point-of-contact. Soil samples collected from soil borings and monitoring well installation activities will be used for waste characterization of soil, since such data would be biased towards areas which are expected to be most contaminated. Notwithstanding, additional waste characterization soil samples will be collected, if warranted. Grab samples would be collected from drums containing well development and purge water for waste characterization of liquids, if required by the intended receiving facility. Typical analyses include VOCs, SVOCs, lead using TCLP, PCBs, total

petroleum hydrocarbons, ignitability, corrosivity, reactivity, and total cyanide. All drums will be labeled "pending analysis" until laboratory data is available. All IDW will be disposed of or treated according to applicable local, state and federal regulations.

3.7 Citizen Participation

Assistance will be provided to NYSDEC in performing Citizen Participation activities. These activities will include preparing a Fact Sheet that will describe the Site, provide a summary of the purpose and goals of the investigation, include a project schedule and milestones, and list sources of additional information. The Fact Sheet will be sent to persons on a mailing list, including adjacent property owners, elected officials, relevant community groups, and local media, before the start of field work. The mailing list is attached as Appendix E.

4.0 REPORTING REQUIREMENTS

4.1 Off-Site Investigation Report

Upon completion of all field work and receipt of laboratory analytical results, an Off-Site Investigation Report will be prepared that will: document field activities; present field and laboratory data; evaluate exposure and risks to human health; and discuss conclusions and recommendations drawn from the results of the investigation.

4.1.1 Description of Field Activities

This chapter of the Off-Site Investigation Report will describe the field methods used to characterize the Site conditions, including: sampling techniques; field screening equipment; drilling and excavation equipment; monitoring well installation procedures; and management of investigation-derived waste.

4.1.2 Soil Quality

The Off-Site Investigation Report will include a chapter on soil quality that presents field and laboratory data from the soil boring survey. The chapter will include a description of soil characteristics. Field and laboratory analytical results will be presented and compared with regulatory standards and/or guidance values. Figures will be provided that illustrate soil boring locations along with corresponding contaminant concentrations. Soil boring logs and laboratory analytical reports will be provided as attachments.

4.1.3 Groundwater Quality

This chapter will present groundwater monitoring results. Well survey data and water level measurements will be used to create a groundwater contour map and determine groundwater flow direction. Groundwater analytical results will be presented in the body of the report and on figures, and the detected concentrations will be compared to regulatory standards and/or guidance values. Groundwater sampling logs and laboratory analytical reports will be provided as attachments.

4.1.4 Qualitative Human Health Exposure Assessment

The Off-Site Investigation Report will include a Qualitative Human Health Exposure Assessment.

4.2 Schedule of Work

A tentative schedule for implementing the Off-Site Investigation Work Plan is provided below:

Off-Site Investigation Schedule

Week after start-up	Activity
1	Hollow-stem auger soil borings advancement and installation of monitoring wells; development of monitoring wells.
2	Sampling of monitoring wells.

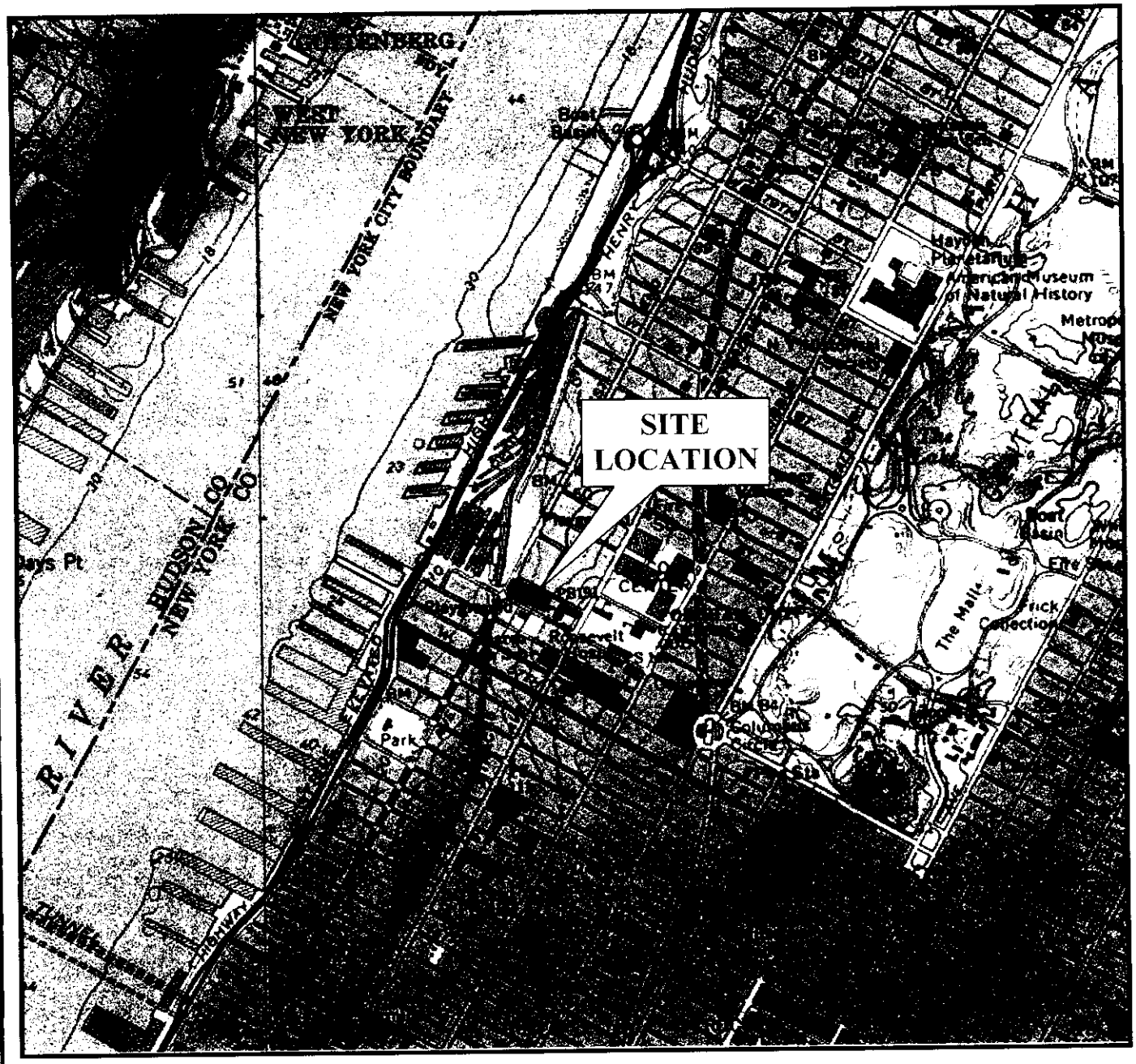
REFERENCES

1. AKRF Inc.; *Phase I Environmental Assessment, Algin Properties*, West 61st Street Project, New York, New York; June 2003.

2. RA Consultants; *Geotechnical Investigation*, West 61st Street Project, New York, New York; February 2005.

3. AKRF, Inc.; *Remedial Investigation Report*, West 61st Street Site, New York, New York; January 2006.

FIGURES



SCALE IN FEET

0' 1000' 2000' 4000'

SCALE: 1"=2000'

N

SOURCE:

7.5 MINUTE SERIES USGS TOPOGRAPHIC MAP
QUADRANGLE: CENTRAL PARK, NY 1995

WEST 61st STREET SITE
NEW YORK, NEW YORK

PROJECT SITE LOCATION

AKRF

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

DATE	6.18.07
PROJECT No.	10321
SCALE	AS SHOWN
FIGURE	1

RESIDENTIAL

PUBLIC SCHOOL

OFFICE

SCHOOL

N

WEST 61st STREET

WEST END AVENUE

OSB/MW-4

SW-29

SW-28B

SW-28A

SW-27C

SW-27B

SW-27A

SW-26B

SW-26A

OSB/MW-5

SW-23A

SW-23B

SW-20B

SW-20A

55

53

52

43

COMMERCIAL

RESIDENTIAL

TRACK 1

TRACK 4

LOT 13

PUBLIC SCHOOL

PLAYGROUND

5

8

10

11

12

13

CHARTER SCHOOL

LOT 8

RESIDENTIAL

SW-52B

SW-50B

OSB/MW-1

SW-52A

SW51A

OSB/MW-2

SW-50A

SW-49A

SW-48A

SW-47A

OSB/MW-3

WEST 60th STREET

SIDEWALK

APARTMENT BUILDING UNDER CONSTRUCTION

APARTMENT BUILDING UNDER CONSTRUCTION

(BLOCK 1151)

NYC PARKS

NYC PARKS

POOL

0 25 50 100 (FEET)

Legend:

- CLEANUP TRACK 1 BOUNDARY
- CLEANUP TRACK 4 BOUNDARY
- LOT LINE
- LCT 5 LOT NUMBERS
- FORMER LOT BOUNDARY
- 13 FORMER LOT NUMBER
- PROPOSED OFF-SITE SOIL BORING / MONITORING WELL
- SOIL BORING COMPLETED DURING REMEDIATION PHASE

AKRF

Environmental Consultants

440 Park Avenue South, New York, NY 10016

West 61st Street Site

New York, New York

PROPOSED OFF-SITE SAMPLING LOCATION MAP

DATE

09.10.07

APPROX SCALE

As Shown

PROJECT No.

10321

FIGURE No.

2

APPENDIX A
QUALITY ASSURANCE PROJECT PLAN

West 61st Street Site
Off-Site Investigation Work Plan
New York State BCP No. C231043/C231059
NEW YORK, NEW YORK

Quality Assurance Project Plan

AKRF Project Number: 10321

Prepared for:

Algin Management Co., LLC
64-35 Yellowstone Blvd.
Forest Hills, NY 11375

Prepared by:

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

SEPTEMBER 2007

TABLE OF CONTENTS

TABLES

ATTACHMENTS

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) describes the protocols and procedures that will be followed during implementation of the Off-Site Investigation Work Plan for the West 61st Street Site in New York, New York. The objective of the QAPP is to provide for Quality Assurance (QA) and maintain Quality Control (QC) of environmental investigative, sampling and remedial activities conducted under the Work Plan. Adherence to the QAPP will ensure that defensible data will be obtained during the investigation and remediation.

2.0 PROJECT TEAM

The project team will be drawn from AKRF professional and technical personnel and AKRF's subcontractors. All field personnel and subcontractors will have completed a 40-hour training course and updated 8-hour refresher course that meet the Occupational Safety and Health Administration (OSHA) requirements of 29 CFR Part 1910. The following sections describe the key project personnel and their responsibilities.

2.1 PROJECT DIRECTOR

The project director will be responsible for the general oversight of all aspects of the project, including scheduling, budgeting, data management and decision-making regarding the field program. The project director will communicate regularly with all members of the AKRF project team, the New York State Department of Environmental Conservation (NYSDEC), and Algin Management Co. LLC (Algin) to ensure a smooth flow of information between involved parties. Michelle Lapin, P.E. will serve as the project director for the Off-Site Investigation. Ms. Lapin's resume is included in Attachment A.

2.2 PROJECT MANAGER

The project manager will be responsible for directing and coordinating all elements of the Off-Site Investigation. She will prepare reports and participate in meetings with Algin and/or the NYSDEC. Kerry Gallagher will serve as the project manager for the Off-Site Investigation. Ms. Gallagher'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). She 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. Chad Ondrusek will be the field team leader for the Off-Site Investigation. Mr. Ondrusek's resume is included in Attachment A.

2.4 PROJECT QUALITY ASSURANCE/QUALITY CONTROL OFFICER

The Quality Assurance/Quality Control (QA/QC) Officer will be responsible for adherence to the QAPP. She will review the procedures with all personnel prior to commencing any fieldwork and will conduct periodic site visits to assess implementation of the procedures. The QA/QC officer will also be responsible for preparing a Data Usability Summary Report (DUSR) for soil, soil gas and groundwater analytical results, as described in Section 5.0 of this QAPP. Andrew D. Rudko PhD. will serve as the QA/QC officer for the Off-Site Investigation. Dr. Rudko's resume is included in Attachment A.

2.5 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL OFFICER

The laboratory QA/QC officer will be responsible for quality control procedures and checks in the laboratory and ensuring adherence to laboratory protocols. He/she will track the movement of samples from the time they are checked in at the laboratory to the time that analytical results are issued. He/she will conduct a final check on the analytical calculations and sign off on the laboratory reports. The laboratory QA/QC officer will be a representative of Chemtech, located in Mountainside, New Jersey where all samples will be analyzed.

3.0 STANDARD OPERATING PROCEDURES

The following sections describe the standard operating procedures (SOPs) for the remedial and investigative activities included in the Off-Site Investigation. 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 SOIL SAMPLING

Five soil borings will be advanced to characterize subsurface soil and to collect soil samples for laboratory analysis. Analytical data collected from the soil borings advanced during the remediation activities (see Section 2.6.4) will be used in conjunction with the five proposed soil borings. Figure 2 depicts soil boring locations OSB (off-site boring)-1 through OSB-5. The borings will be advanced to bedrock. Depending on location, the approximate depth to bedrock is expected from 10 to 30 feet below sidewalk grade.

The soil borings will be advanced using a hollow-stem auger rotary rig. Soil samples will be collected on a continuous basis using a 2-foot long, 2-inch diameter, split-spoon sampler. Each sample will be split lengthwise and logged by AKRF field personnel. Logging will consist of: describing the soil according to the modified Burmister Classification System; describing any evidence of contamination (e.g. staining, sheens, odors); and screening for organic vapors using a photoionization detector (PID).

Two soil samples from each boring will be selected for laboratory analysis based on PID response and visual and olfactory indications of contamination. The depth intervals of samples collected will be determined based on trends observed in the field (i.e., contamination limited to vadose/saturated zone, no contamination observed, contamination observed in a particular depth layer). In the absence of contamination, one sample will be collected from the surface (0-2') and one sample will be collected from the groundwater interface.

The soil samples slated for analysis will be collected into laboratory-supplied containers, sealed and labeled, as described in the QAPP (Appendix A), and placed in a chilled cooler. The samples will be analyzed in a laboratory following NYSDEC Analytical Services Protocol (ASP) Category B deliverables. Samples will be analyzed for volatile organic compounds (VOCs) by EPA Method 8260, SVOCs by EPA Method 8270, polychlorinated biphenyls by EPA Method 8081, pesticides by EPA Method 8082 and target analyte list (TAL) metals.

All sampling equipment (spilt-spoons, etc.) will be decontaminated as described in Section 3.3.

3.2 GROUNDWATER MONITORING WELL INSTALLATION AND DEVELOPMENT

Monitoring wells will be installed in each of the new soil boring locations described in the previous section. The monitoring wells will be installed to delineate potential groundwater

contamination. Locations of the proposed wells, OSB/MW-1 through OSB/MW-5, are depicted on Figure 2.

Wells will be installed according to the following procedure:

- Measure the depth to water in the open hole using a Solinst® Water Table Meter – Model 101 or equivalent (Section 3.5 of the QAPP).
- Place PVC riser with a ten-foot length of PVC 0.02-slotted screen at the bottom of the borehole. In determining the amount of screen that will be located beneath the water table, the elevation of the seasonal water table will be considered. The well screen will be situated to provide sufficient water in the well for sampling at all times and to limit sample collection close to the base of the well. It is anticipated that at least five feet of screen will be placed below the water table for each well.
- Install sand filter pack around the well screen to a depth of one to two feet above the top of the screen.
- Install a bentonite seal to a depth of one to two feet above the filter pack.
- Backfill the remainder of the annular space using a bentonite-cement grout.
- Complete the well with a locking cap flush-with-grade curb box set in concrete. Provide a concrete apron around the curb box to direct run-off away from the well.
- Decontaminate the augers prior to and following installation of each well as described in Section 3.3 of this QAPP.
- Document well installation data (location, depth, construction details, water level measurements) in the field logbook or on field data sheets
- Following well installation, the four new wells will be developed according to the following procedure:
    - Measure the depth to water using an oil/water interface probe and the total depth of the well using a weighted tape. Use these measurements to calculate the length of the water column. Calculate the volume of water in the well using 0.163 volumes per foot of water column (gallons) as the conversion factors for a 2-inch diameter well.
    - 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.
    - 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.
    - 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.
    - 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.

- Document the volume of water removed and any other observations made during well development in the field logbook or on field data sheets.

All sampling equipment (spilt-spoons, etc.) will be decontaminated as described in Section 3.3. All monitor well drill cuttings, well development water, decontamination water, and purge water will be containerized in 55-gallon steel drums and handled as described in Section 3.4.

3.3 DECONTAMINATION OF SAMPLING EQUIPMENT

All sampling equipment will be either dedicated or decontaminated between sampling locations. The decontamination procedure will be as follows:

1. Scrub using tap water/Simple Green® mixture and bristle brush.
2. Rinse with tap water.
3. Scrub again with tap water/ Simple Green® and bristle brush.
4. Rinse with tap water.
5. Rinse with distilled water.
6. Air-dry the equipment, if possible.

Decontamination will be conducted on plastic sheeting (or equivalent) that is bermed to prevent discharge to the ground. Management of Investigation Derived Waste

3.4 MANAGEMENT OF INVESTIGATION DERIVED WASTE

All investigation-derived waste (IDW) will be containerized in DOT-approved 55-gallon drums. The drums will be sealed at the end of each work day and labeled with the date, the well or boring number(s), the type of waste (i.e., drill cuttings, development water or purge water) and the name of an AKRF point-of-contact. Soil samples collected from soil boring will be used for waste characterization of soils, since such data would be biased towards areas which are expected to be most contaminated. Notwithstanding, additional waste characterization soil samples will be collected, if warranted. Grab samples will be collected from drums containing well development and purge water for waste characterization of liquids. The samples will be analyzed for VOCs, SVOCs, and lead using TCLP, PCBs, total petroleum hydrocarbons (TPH), ignitability, corrosivity, reactivity, and total cyanide. All drums will be labeled "pending analysis" until laboratory data is available. All IDW will be disposed of or treated according to applicable local, state and federal regulations.

3.5 SURVEYING AND WATER TABLE READINGS

The five borings installed as groundwater monitoring wells will be surveyed by a New York State-licensed surveyor. Three elevation measurements will be taken at each well location: the elevation of the ground beside the well; the elevation on the rim of the gate box or protective casing; and the elevation of the top of PVC casing.

Water table readings will be taken in the four groundwater monitoring wells using a Solinst® Water Table Meter - Model 101 or equivalent. The gate boxes will be unlocked and opened at each well location. The Solinst® Water Table Meter will be turned on and sound tested. The probe of the meter will be inserted into the PVC casing. The probe will be lowered down the casing until the meter alarm indicates the probe is at the water table. A reading of the depth from the top of the top of the PVC casing to the groundwater table will be recorded in the field notebook.

4.0 SAMPLING AND LABORATORY PROCEDURES

4.1 SOIL SAMPLE COLLECTION

Soil sampling will be conducted according to the following procedures:

- Characterize the sample according to the modified Burmister soil classification system.
- If advancing soil borings, collect an aliquot of soil from each sampling location and place in labeled sealable plastic bags. Place the plastic bags in a chilled cooler to await selection of samples for laboratory analysis.
- 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 4.5 of this QAPP and place in an ice-filled cooler.
- Decontaminate any 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.

4.2 MONITORING WELL SAMPLING

Groundwater samples will be collected at least one week following well development. Low flow sampling techniques will be used, as described in U.S. EPA's Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers [EPA 542-S-02-001, May 2002]. 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 cover.
- Remove the locking cap and measure the vapor concentrations in the well with a PID.
- Measure the depth to water and total well depth, 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. Measure the thickness of NAPL, if any, and record in field book and well log. Collect a sample of NAPL using a disposable plastic weighted bailer or similar collection device. Groundwater samples will not be collected from wells containing measurable NAPL.
- Use the water level and total well depth measurements to calculate the length of the mid-point of the water column within the screened interval. For example, for a shallow well where the total depth is 15 feet, screened interval is 5 to 15 feet, and depth to water is 7 feet, the mid-point of the water column within the screened interval would be 11 feet. Similarly for a deep well where the total depth is 40 feet, screened interval is 30 to 40 feet, and depth to water is 15 feet, the mid-point of the water column within the screened interval would be 35 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 the water column within the screened interval of the well. Connect the discharge end of the tubing to the flow-through cell of a Hydrolab Quanta multi-parameter (or equivalent) meter. Connect tubing to the output of the cell and place the discharge end of the tubing in a five-gallon bucket.

- 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 rate and so as not to produce excessive turbulence in the well. The expected targeted purge rate will be around 500 milliliters/minute and will be no greater than 3.8 liters/minute.
- Transfer discharged water from the 5-gallon buckets to 55-gallons drums designated for well-purge water.
- During purging, collect periodic samples and analyze for water quality indicators (e.g., turbidity, pH, temperature, dissolved oxygen, reduction-oxidation potential, and specific conductivity) with measurements collected approximately every five minutes.
- Continue purging the well until turbidity is less than 50 NTU and water quality indicators have stabilized to the extent practicable. The criteria for stabilization will be three successive readings for the following parameters and criteria:

Table 1
Stabilization Criteria

Parameter	Stabilization Criteria
PH	+/- 0.1 pH units
Specific Conductance	+/- 3% mS/cm
ORP/Eh	+/- 10mV
Turbidity	<50 NTU
Dissolved Oxygen	+/- 0.3 mg/l

Notes: mS/cm = millisievert per centimeter
mV = millivolts
NTU = nephthalometric turbidity units
mg/l = milligrams per liter

- If the water quality parameters do not stabilize and/or turbidity is greater than 50 NTU within two hours, purging may be discontinued. Efforts to stabilize the water quality for the well must be recorded in the field book, and samples may then be collected as described herein.
- After purging, disconnect the tubing to the inlet of the flow-through cell. Collect groundwater samples directly from the discharge end of the tubing and place into the required sample containers as described in Section 4.3 of this QAPP. Label the containers as described in Section 4.5 of this QAPP and place in a chilled cooler. Samples should be collected first for VOCs, then SVOCs, PCBs, and the remaining inorganic analyses.
- Unless the sample is to be filtered at the laboratory, for the dissolved metals sample, collect the water into the plastic filter chamber and seal. Attach a hand pump outfitted with a disposable filter to the chamber and pump the water through filter into the appropriate sample container.
- Collect one final field sample and analyze for turbidity and water quality parameters (pH, temperature, dissolved oxygen, reduction-oxidation potential, and specific conductivity).

- Once sampling is complete, remove the pump and tubing from the well. Disconnect the tubing and place it back in the well for reuse during the next sampling event. Dispose of the sample filter in a 55-gallon drum designated for disposable sampling materials and PPE.
- Decontaminate the pump, oil/water interface probe, flow-through cell, and plastic filter chamber as described in Section 3.3 of this QAPP.
- Record all measurements (depth to water, depth to NAPL, water quality parameters, turbidity), calculations (well volume) and observations in the project logbook and field data sheet, if applicable.

4.3 LABORATORY METHODS

Table 2 summarizes the laboratory methods that will be used to analyze field samples as well as the sample container type, preservation, and applicable holding times. An ELAP Certified laboratory will be used for all chemical analyses in accordance with DER-10 2.1(b) and 2.1(f), i.e., Category B Deliverables and CLP ELAP Certification will be required for all samples.

Table 2
Laboratory Analytical Methods for Analysis Groups

ANALYSIS GROUP	MATRIX	PARAMETER	EPA METHOD	SAMPLE CONTAINERS	PRESERVATION	HOLDING TIMES
SOIL ANALYSIS PARAMETERS	solid	TCL VOCs	8260	2 oz. clear glass Septum	4°C	14 days
		TCL SVOCs	8270 BN*	8 oz. clear glass	4°C	14 days
		Pesticides	8082	8 oz. clear glass	4°C	6 months (28 days for Hg)
		PCBs	8081	8 oz. clear glass	4°C	14 days
		TAL Metals	1311/6010B/7470A	8 oz. clear glass	4°C	14 days
GROUNDWATER ANALYSIS PARAMETERS	liquid	TCL VOCs	8260	(2) 40 ml clear glass vial	HCl, 4°C	14 days
		TCL SVOCs	8270 BN *	3L amber glass	4°C	7 days

4.4 QUALITY CONTROL SAMPLING

In addition to the laboratory analysis of the investigative and remedial soil and groundwater samples, additional analysis will be included for quality control measures, as required by the Category B sampling techniques. These samples may include equipment rinsate blanks, trip blanks, matrix spike/matrix spike duplicates (MS/MSD) and of duplicate/blind duplicate samples. Equipment blank, MS/MSD and duplicate samples will be analyzed for the same parameter set for which the samples will be analyzed. If the requested parameters include VOCs, a trip blank will be analyzed for volatile organic compounds only.

4.5 SAMPLE HANDLING

4.5.1 Sample Identification

All samples will be consistently identified in all field documentation, chain-of-custody (COC) documents, and laboratory reports using an alpha-numeric code. All samples will be identified with a prefix of "OS" to designate these samples as part of the Off-Site Investigation. Groundwater samples will be identified by the monitoring well number, and soil boring samples will be identified by the soil boring number followed by the sample depth interval (in parentheses). Waste characterization samples collected from the 55-gallon drums will be identified by the drum number (e.g., D-1 or D-2) followed by

a sample type designation (e.g., "LQ" for liquid and "SD" for solid). Waste characterization samples collected from soil stockpiles will be identified by the pile number (e.g., SP-1 or SP-2). Air samples will be labeled with "AS," followed by the date in parentheses.

The designation "MS" will be added at the end of the designation for matrix spike/matrix spike duplicate samples. The field duplicate samples will be labeled with a dummy sample location to ensure that they are submitted as blind samples to the laboratory. The dummy identification will consist of the sample type followed by a letter. For duplicate soil boring samples, the sample depth will be the actual sample depth interval. Trip blanks and field blanks will be identified with "TB" and "FB," respectively.

Table 3 provides examples of the sampling identification scheme.

Table 3
Examples of Sample Names

Sample Description	Sample Designation
Soil sample collected from five to seven feet at SB-2	OSB-2 (5'-7')
Groundwater sample collected from monitoring well MW-2	OSB/MW-2
MS/MSD sample from MW-2	OSB/MW-2-MS
Duplicate sample from 12 to 14 feet at SB-3	OSB-B (12'-14')

4.5.2 Sample Labeling and Shipping

All sample containers will be provided with labels containing the following information:

- Project identification
- Sample identification
- Date and time of collection
- Analysis(es) to be performed
- Sampler's initials

Once the 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. Soil gas samples will be placed in coolers that do not contain ice. Soil and groundwater samples will be shipped to the laboratory at the end of each workday. At the start and end of each workday, field personnel will add ice to the coolers as needed.

The samples will be prepared for shipment by placing each sample in a sealable plastic bag, then wrapping each container in bubble wrap to prevent breakage, adding freezer packs and/or fresh ice in sealable plastic bags and the chain-of-custody form. Samples will be shipped overnight (e.g., Federal Express) or transported by a laboratory courier. All coolers shipped to the laboratory will be sealed with mailing tape and a COC seal to ensure that the coolers remain sealed during delivery.

4.5.3 Sample Custody

Field personnel will be responsible for maintaining the sample coolers in a secured location until they are picked up and/or sent to the laboratory. The record of possession of samples from the time they are obtained in the field to the time they are delivered to the laboratory or shipped off-site will be documented on chain-of-custody (COC) forms. The COC forms will contain the following information: project name; names of sampling personnel; sample number; date and time of collection and matrix; and signatures of individuals involved in sample transfer, and the dates and times of transfers. Laboratory personnel will note the condition of the custody seal and sample containers at sample check-in.

4.6 FIELD INSTRUMENTATION

Field personnel will be trained in the proper operation of all field instruments at the start of the field program. Instruction manuals for the equipment will be on file at the site for referencing proper operation, maintenance and calibration procedures. The equipment will be calibrated according to manufacturer specifications at the start of each day of fieldwork, if applicable. If an instrument fails calibration, the project manager or QA/QC officer will be contacted immediately to obtain a replacement instrument. A calibration log will be maintained to record the date of each calibration, any failure to calibrate and corrective actions taken. The PID will be calibrated each day using 100 parts per million (ppm) isobutylene standard gas.

5.0 DATA REVIEW

The QA/QC officer will conduct a review of all analytical data and prepare a Data Usability Summary Report (DUSR) to assess the quality of the data and determine its usability. To assess the data, the QA/QC officer will:

- Ensure the data package is complete as defined under the requirements for the NYSDEC ASP Category B deliverables and that all data were generated using established and agreed upon protocols.
- Check that all holding times were met.
- Check that all QC data (blanks, instrument tunings, calibration standards, calibration verifications, surrogate recoveries, spike recoveries, replicate analyses, laboratory controls and sample data) fall within the protocol required limits and specifications.
- Compare raw data with results provided in the data summary sheets and quality control verification forms.
- Check that correct data qualifiers were used.
- Evaluate the raw data and confirm the results provided in the data summary sheets and quality control verification forms.

Any Quality Control exceedances will be specified in the DUSR, and the corresponding data package QC summary sheet identifying the exceedances will be attached. The DUSR will identify any data deficiencies, analytical protocol deviations and quality control problems and discuss their effect on the data. Recommendations for resampling and/or reanalysis will be made.

ATTACHMENT A

RESUME OF PROJECT QA/QC OFFICER, PROJECT DIRECTOR, PROJECT MANAGER AND FIELD TEAM LEADER

ANDREW D. RUDKO, PH.D.

SENIOR VICE PRESIDENT

Andrew D. Rudko, Ph.D., is a senior vice president of AKRF, with more than 25 years of experience in environmental analysis and management, with particular emphasis on hazardous materials, environmental site assessments and audits, and soil and groundwater remediation. Dr. Rudko's current and recent experience includes management of several projects involving Voluntary Cleanup Agreements and Brownfields Cleanup Agreements for assessment and remediation of soil and groundwater contamination problems on major development sites. These include the Queens West Development site, a New York State-sponsored development which extends for three quarters of a mile along the East River waterfront in Queens, New York. The site, which formerly contained an oil refinery, gas plant, paint and varnish factories, and railroad yards, is being redeveloped for residential and commercial uses. Dr. Rudko is also managing the assessment of soil and groundwater on the site of Brooklyn Bridge Park, which is being developed on a stretch of Brooklyn waterfront with a long history or industrial uses.

Dr. Rudko has managed cleanups of many **petroleum and solvent spills.** He is managing ongoing remediation work for chlorinated solvent releases to the groundwater for sites in Harlem, Rego Park, and Springfield Gardens. Some recent spill cleanup sites include a former gasoline station in Downtown Brooklyn, a portion of the Fordham University campus in the Bronx, the Tribeca Hotel site developed by Hartz Mountain Industries in Lower Manhattan, retail sites in Maspeth and Long Island City developed by Forest City Ratner Companies, a site in the Bronx developed by Triangle Equities for the Department of Motor Vehicles, the Rivergate Apartments on East 34th Street in Manhattan, the Tate apartment building on West 23rd Street in Manhattan, and a residential development on Sixth Avenue and 26th Street in Manhattan.

He has been responsible for assessing **impacts on public health** for a number of projects involving the use of hazardous chemicals, biohazards, and radioactive materials. These projects include an engineering and physics research center on the campus of Columbia University, a new laboratory building for biomedical research at Rockefeller University, a new research center for Memorial Sloan Kettering Medical Center and the Audubon Research Park in upper Manhattan.

Dr. Rudko has managed a number of site assessments for New York City Department of Environmental Protection sewer improvement projects. These include the installation of new sewers in the Meadowmere and Warnerville sections of southeastern Queens, the Avenue V Pump Station and associated force mains in Brooklyn, new facilities at the 26th Ward wastewater treatment plant in Brooklyn, and combined sewer outfall abatement projects in Queens and Staten Island.

Dr. Rudko was project director for the site assessment work the firm performed for the New York City School Construction Authority, directing assessments on school sites in the Bronx, Brooklyn, and Queens. Sites included a former gas station, a truck salvage yard, and a former plastics factory. Testing programs were recommended, developed, and implemented for these sites, and remedial actions were recommended where necessary. At the former plastics factory site, the testing program included soil and groundwater sampling, testing of building floors for PCB contamination, and location and removal of old underground gasoline and oil tanks, with screening of surrounding soil for possible petroleum contamination.

BACKGROUND

Education

B.S., Biochemistry, Cornell University, 1965

Ph.D., Biochemistry, Columbia University, 1972

Years of Experience

Year started in company: 1985

Year started in industry: 1979

RELEVANT EXPERIENCE

26th Ward Water Pollution Control Plant, Brooklyn, NY

As a subcontractor to Hazen and Sawyer, AKRF has been providing hazardous materials testing and consulting services in connection with the construction of upgraded facilities at the 26th Ward WPCP in Brooklyn. Dr. Rudko has been managing this work, which includes developing testing protocols for proposed construction areas and performing soil and groundwater testing. AKRF has also been reviewing contractor submissions regarding testing and disposal of excavated soil, lead paint and asbestos abatement, and underground storage tank removals.

South Richmond Drainage Plan, Staten Island, NY

Dr. Rudko was responsible for hazardous materials studies performed as part of the design and implementation of the South Richmond Drainage Plan. This innovative plan developed by NYCDEP utilizes South Richmond's natural drainage system of streams, ponds, marshes, and wetlands to the greatest extent possible to manage stormwater. AKRF identified areas of proposed construction within drainage basins where there was potential soil or groundwater contamination. Phase I Environmental Site Assessments were prepared for properties NYCDEP was acquiring, and, where necessary, soil and groundwater testing protocols were prepared and implemented.

Avenue V Pumping Station, Brooklyn, NY

Dr. Rudko was responsible for hazardous materials studies performed as part of the environmental review for the rehabilitation and upgrade of the Avenue V Pumping Station in Brooklyn, and the construction of two new force mains to convey wastewater to the Owls Head WPCP. After preliminary studies to identify potential sources of contamination along the force main routes, soil and groundwater sampling was performed along both routes.

Port Richmond Throttling Facility, Staten Island, NY

AKRF worked with Hazen and Sawyer to provide environmental studies for the proposed throttling facility, which would regulate flows into the Port Richmond WPCP in Staten Island and thus reduce combined sewer overflows. Dr. Rudko managed the soil and groundwater testing program at the site.

Jamaica Tributaries CSO Facilities Plan, Queens, NY

Dr. Rudko oversaw hazardous materials studies performed as a subcontractor to Hazen and Sawyer for construction of new facilities as part of the plan to reduce water quality impacts on Jamaica Bay, a designated federal recreation area. Part of this effort involved construction of new sewers and a pumping station to serve Meadowmere and Warnerville, small communities in southeast Queens. AKRF prepared testing protocols and performed soil and groundwater testing at the proposed pumping station site and along the entire route of new sewer construction. AKRF also performed soil testing at the Shellbank Basin site, where new facilities are being constructed to reduce the impact of wastewater discharges.

Gowanus Canal Clean-Up, Brooklyn, NY

Dr. Rudko managed the investigation and remedial design of a former manufactured gas plant site on the Gowanus Canal in Brooklyn. The subsurface remains of three large gasholders filled with coal tar-contaminated soil and debris were cleaned up prior to development of the property.

Queens West Development Project, Long Island City, NY

For over 20 years, AKRF has played a key role in advancing the Queens West development, which promises to transform an underused industrial waterfront property into one of largest and most vibrant mixed-use communities just across the East River from the United Nations. AKRF has prepared an EIS that examines issues pertaining to air quality, land use and community character, economic impacts, historic and archaeological resources, and infrastructure. As part of the project, AKRF also undertook the largest remediation venture completed to date under the Brownfields Cleanup Program (BCP). Dr. Rudko directed the site assessment work on the project. Former uses on the site include oil refineries, paint manufacturers, and railyards. AKRF developed and implemented extensive soil and groundwater testing programs, and developed remediation plans which have been incorporated into four separate Voluntary Cleanup Agreements.

Brooklyn Bridge Park, Brooklyn, NY

Dr. Rudko is responsible for the site assessment work being performed on this waterfront site which is being developed as a park by New York State and New York City. The site, which stretches from Brooklyn Heights under the Brooklyn Bridge to the Manhattan Bridge, has a long history of industrial uses.

Shea Stadium Redevelopment, Flushing, NY

Dr. Rudko is directing the site assessment work being performed on the proposed site of a new stadium adjacent to the existing Shea Stadium in Flushing, Queens. The area was formerly used as a landfill for the disposal of ash and other wastes. Dr. Rudko previously directed the soil and groundwater testing on the site of the adjacent National Tennis Center.

Home Depot, New Rochelle, NY

Dr. Rudko directed the assessment and remediation work on a 14-acre parcel in New Rochelle, New York that was being developed by Home Depot USA. After extensive review and discussions with the New York State Department of Environmental Conservation (DEC), a remediation agreement was developed and approved that became the model for New York State=s Voluntary Cleanup Program. AKRF supervised the implementation of the remediation measures, which included removal of underground storage tanks and associated contaminated soil, and construction of an impermeable cap with a gas venting system for areas with lead contamination.

Home Depot, Rego Park, NY

On another retail site, serious solvent contamination was unexpectedly encountered on a property being developed in Queens, New York. Dr. Rudko managed the design and execution of a testing program, planned a remediation program that would permit development of the site, and assisted in the negotiation of a Voluntary Cleanup Agreement with DEC. Development of the property is now continuing while a groundwater remediation system designed by AKRF's Engineering division is installed as part of the building construction.

18-30 Whitestone Expressway Clean-Up, College Point, NY

Dr. Rudko directed a Voluntary Clean-Up involving the delineation and removal of PCB-contaminated soil from a site in College Point. DEC issued a release letter following the successful completion of this project.

Laundry/Dry Cleaning Plant, New York, NY

Dr. Rudko has been managing the assessment and cleanup of the only listed hazardous waste site in Manhattan, a former laundry/dry cleaning plant on Fifth Avenue in Harlem. Remediation has included the removal of

contaminated building materials and operation of an innovative sub-slab vapor extraction system. Installation of this system required the development of special techniques for horizontal drilling under the floor of the building.

Jamaica Water Company, Queens, NY

For the New York City Department of Environmental Protection, Dr. Rudko directed fast-track site assessments of 17 properties acquired from the Jamaica Water Company. The assessments, all of which were completed within 2 months, included soil and groundwater testing, asbestos and lead paint surveys, and testing of buildings for mercury contamination.

Columbia University Properties, New York, NY

Dr. Rudko has directed site assessments on many properties being acquired by Columbia University. He managed Phase I, Phase II and remediation work on an old garage at a location on Broadway where Columbia developed a new dormitory. He has managed Phase I site assessments on over twenty properties in the area of Manhattanville where the University is developing a new campus.

Home Depot, Various Locations, NY

Dr. Rudko has been providing environmental consulting services to Home Depot, Inc. in connection with their development of major retail facilities at locations throughout the New York metropolitan area. Many of these locations are former industrial properties that have required remedial actions prior to redevelopment.

New York Times, New York, NY

He directed Phase I and Phase II assessments for the New York Times in preparation for the development of its major new printing facility in New York City. Assessments were prepared for three alternative sites: a former railyard in the Bronx later used as an illegal landfill for demolition debris; a site in Queens comprising six industrial properties, several with multiple tenants; and a large city-owned site in Queens.

Medical Facilities

Medical Care Facilities Finance Agency (MCFFA), New York, NY

Dr. Rudko directed Phase I environmental assessments of several major medical facilities in connection with new financing through bonds issued by MCFFA. Facilities include Presbyterian Hospital, Mt. Sinai Medical Center, St. Lukes/Roosevelt Hospital Center, Brooklyn Hospital, and Syosset Hospital. The firm performed preliminary investigations, including Phase I site assessments, and Phase II assessments if necessary. The firm identified potential environmental liabilities and suggested remediation. For example, for the New York Presbyterian Hospital, AKRF identified several underground tanks remaining on the site, then designed and implemented a remediation plan. For the Syosset Hospital on Long Island, AKRF identified floor drains in basement areas that discharged into old dry wells as a potential environmental liability.

Audubon Research Park, New York, NY

Dr. Rudko directed the hazardous materials assessment for the EIS for a 5.5-acre development that includes the Mary Woodard Lasker Biomedical Research Building, which houses the Audubon Business and Technology Center, and the Russ Berrie Medical Science Pavilion. The Berrie Pavilion houses a community health facility, a comprehensive diabetes center, genetics research and a research program in pediatrics. The Irving Center will house research on cancer, genetics, and cell biology. Dr. Rudko led the analysis of medical waste disposal procedures and potential health concerns associated with chemicals used in the proposed research laboratories.

Memorial Sloan-Kettering Cancer Center (MSKCC), New York, NY
AKRF prepared a comprehensive EIS for the expansion of MSKCC, a state-of-the-art cancer treatment and research center located on the Upper East Side in Manhattan. Dr. Rudko directed the hazardous materials study, which included analyses of radioactive and toxic materials used in the cancer research and treatment facility

Mount Sinai School of Medicine, New York, NY
Dr. Rudko directed a hazardous materials assessment in connection with the EIS for a multi-use building for the Mount Sinai School of Medicine. The site, formerly used for parking, is on the east side of Madison Avenue between 98th and 99th Streets opposite the main portion of the Mount Sinai Medical Center. The 740,000-gross-square-foot structure will contain research labs, clinical labs, psychiatric care beds, administrative offices, an auditorium, a seminar room, a cafeteria, faculty offices, a vivarium, and approximately 300 accessory parking spaces.

Columbia University Center for Engineering and Physical Science Research, New York, NY
Dr. Rudko directed the preparation of an EIS for Columbia University's Center for Engineering and Physical Science Research, located on the south side of 120th Street in Manhattan. The project serves as a center for university, government, and industry partnership in high-technology research. The approximately 200,000-square-foot building contains an auditorium, seminar rooms, laboratories, and offices for research activities in four general areas: telecommunications, microelectronics and electronic materials, intelligent systems and robotics, and parallel and distributed computer systems. In addition, a new central boiler facility and power plant for the campus are located in the lower level of the new building.

The Rockefeller University, New York, NY

Dr. Rudko led the analysis of hazardous materials for an Environmental Assessment Statement (EAS) and supplemental studies in connection with a new laboratory building. The proposed building would include approximately chemistry and biomedical research laboratories, an auditorium, office and meeting space, underground parking for approximately 180 cars, a glass wash facility, and truck loading and receiving space. Significant issues for environmental review included hazardous materials and air quality, including the potential effects of a spill within a laboratory on pollutant levels at adjacent buildings and receptor locations.

MICHELLE LAPIN, P.E.

SENIOR VICE PRESIDENT

Michelle Lapin is a senior vice president with 20 years of experience in the assessment and remediation of hazardous waste issues. She leads the firm's Hazardous Materials group and offers more than a decade of experience providing strategic planning and management for clients. Ms. Lapin has been responsible for the administration of technical solutions to contaminated soil, groundwater, 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 performing groundwater investigations, and formulation and administration of groundwater monitoring programs in New York, New Jersey, Connecticut, New Hampshire, Massachusetts, Rhode Island, Virginia, and Maryland. Her experience with groundwater contamination includes Level B hazardous waste site investigations; execution of leaking underground storage tank studies, including hazardous soil removal and disposal; soil and water sampling; soil gas surveys; and wetlands issues. Ms. Lapin is experienced in coordinating and monitoring field programs concerning hazardous waste cell closures. She has directed numerous Phase I, Phase II, and Phase III investigations, 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

B.S., Civil Engineering, Clarkson University, 1983

M.S., Civil Engineering, Syracuse University, 1985

Professional Registrations

New York State P.E.

State of Connecticut P.E.

Professional Memberships

Member, American Society of Professional Engineers (ASPE), 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

Years of Experience

Year started in company: 1994

Year started in industry: 1986

RELEVANT EXPERIENCE

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. AKRF was retained by the Algin Management Co. to prepare an 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 proposed action

would rezone the western half of the block, thus facilitating 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 proposed building would contain up to 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 include 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 is overseeing the adherence to the Construction Health and Safety Plan (HASP), which was submitted to and approved by the NYSDEC, and monitoring the waste streams, to ensure that the different types of waste are being disposed of at the correct receiving facilities. This oversight also includes confirmation and characteristic soil sampling for the receiving facilities and NYSDEC. Daily field logs are e-mailed to NYSDEC to comply with the BCP agreement.

Hudson River Park, New York, NY

Ms. Lapin is directing AKRF's hazardous materials work during construction of Hudson River Park, a 5-mile linear park along Manhattan's West Side. As the Hudson River Park Trust's (HRPT's) environmental consultant, AKRF is overseeing preparation and implementation of additional soil and groundwater investigations (working with both NYSDEC and NYCDEP), all health and safety activities, 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, as well as 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.

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 requires the preparation of two 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 is currently preparing the EAS for the Deconstruction and Decontamination project, which includes 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 was the reviewer for the deconstruction and decontamination plans for the EAS. The cleanup plan is due to be submitted shortly to the U.S. Environmental Protection Agency; once approved, remediation work will begin, followed by the deconstruction and rebuilding of Fiterman.

Brooklyn Bridge Park, Brooklyn, NY

AKRF is preparing an EIS and providing technical and planning support services for Brooklyn Bridge Park, which will revitalize 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, to be completed by 2010, would allow public access to the water's edge, allowing people to enjoy the spectacular views of the Manhattan skyline and New York Harbor. It would also provide 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 made use of ash

and other waste materials from industrial processes. Based on site inspections and historical maps, government records, and other sources, AKRF is in the process of investigating the potential for the presence for hazardous materials in the park. This information will be compiled into a Phase 1 Environmental Site Assessment report. AKRF will also provide 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, including procuring a Beneficial Use Determination (BUD) from the New York State Department of Environmental Conservation (NYSDEC) for the acceptance of fill materials to the site.

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

Ms. Lapin is serving as hazardous materials task leader on this 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 has included Phase I Environmental Site Assessments for the properties within the site boundaries and estimates for upcoming investigation and remediation.

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. The building is expected to be opened by 2006. 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.

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 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, and construction is underway for 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 is planned for county park purposes. The investigation included a Phase I site assessment, with historical research going back to the 17th century, a Phase II subsurface investigation, underground storage tank investigations, and asbestos 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 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 (NYSDOT), 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 was responsible for managing the asbestos investigations at eight bridges and wetland delineation along the entire corridor, as well as writing the scope of work and general management of the project.

Shaw's Supermarket Redevelopment, New Fairfield, CT

AKRF is providing consulting services to the developer and owner of a 9-acre site included 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 within a year to enable redevelopment work for a new supermarket and shopping center. The RAWP included the remediation of soils 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, and are continuing to provide environmental consulting support for the development of the site. Site development has been completed and a groundwater remediation system was installed during site development. The remediation system is successfully operating. The next phase of work includes and off-site study to determine whether the contamination plume has migrated from the site since area residents use groundwater as a source of drinking water. Ms. Lapin will continue to manage the project through the study and remediation phases.

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 is currently completing an off-site study to determine impacts to groundwater in downgradient locations.

Former Macy's Site, White Plains, NY

Ms. Lapin managed the pre-demolition work for Tishman Speyer. Work 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 from 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 and Phase II subsurface investigations, underground storage tank removals and associated remediation, asbestos surveys and abatement oversight, and contaminated soil removal and remediation for multiple sites in the Bronx, Brooklyn, Manhattan, Westchester County, and Long Island.

Home Depot, Various Locations, NY

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 and II 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 is managing 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. The remediation will be conducted in conjunction with the development plan.

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

Following the preparation of the GEIS for the Belt Parkway Bridges Project, the firm was retained for supplemental work during the final design phase of the project. This included NEPA and 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 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 eletromagnetic (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). The study also included an assessment for lead-based paint and asbestos on the platform structures.

KERRY-CATHLIN GALLAGHER

ENVIRONMENTAL SCIENTIST

Ms. Gallagher is an environmental scientist with 3 years of professional experience in assessment and remediation of soil and groundwater contamination. Her field experience includes soil and groundwater investigation, drilling supervision, vapor intrusion and community air monitoring, hazardous soil removal and disposal, supervision of remedial activities and project coordination. Her technical project experience includes site investigation, delineation and evaluation of contamination plumes, remedial actions and closure reporting. She has been responsible for project scheduling, initiation, and progression requiring correspondence and negotiation between clients, property owners, subcontractors, and regulatory agencies. Furthermore, she has experience with landfill geology, environmental soil chemistry, limnology, wetlands science, and statistical analysis.

Prior to joining AKRF, Ms. Gallagher most recently worked as an environmental scientist for a small environmental consulting firm in Indianapolis, IN specializing in Brownfield redevelopment and environmental remediation of petroleum facilities, dry cleaning services, industrial operations, and landfills. There, she has directed Phase I and II environmental site assessments, managed impacted soil and groundwater remediation, UST system removals, and oversaw pilot studies, HRC/ORC injections, and vacuum enhanced product recovery.

BACKGROUND

Education

B.S., Natural Resources and Environmental Science/Political Science, Purdue University, 2004

Certifications

OSHA Hazardous Waste Site Operator (HAZWOPER), September 2005

8 Hour Refresher Certification, July 2007

Years of Experience

Year started in company: 2006

Year started in industry: 2004

RELEVANT EXPERIENCE

Algin West 60th Street, New York, NY

This mixed use development in Manhattan, with the services of AKRF, entered into New York State's Brownfield Cleanup Program (BCP). On-site issues include underground storage tanks (USTs) 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. Ms. Gallagher oversees remedial activities performed on-site and supervises field staff. Field staff members monitor waste streams and dewatering activities, perform confirmation and characteristic soil sampling, and document UST removals. Ms. Gallagher's additional responsibilities include approving change orders and invoices for various services, equipment management, report preparation, and correspondence with client and agency officials to progress the remediation in a timely and accurate manner.

Northstar Realty, Millwood, NY

Northstar Realty, is a retail petroleum facility, quarterly groundwater sampling was performed by Ms. Gallagher with a subsequent report of findings. She compiled previous results illustrating site history and attenuation.

Mott Haven, Bronx, NY

On behalf of the NYC School Construction Authority, AKRF has been retained to set up and implement a Community Air Monitoring Plan (CAMP) as well as work zone air monitoring for the entire site during all remediation activities. The site, designated in the Brownfield Cleanup Program (BCP), was formerly used as a Manufactured Gas Plant (MGP) site as well as a facility run by Metro-North. Ms. Gallagher conducted air monitoring at the site. She monitors volatile organic compound levels and dust particulate levels in both the work zone and community area.

McFarland Properties, Seattle, WA

Prior to joining AKRF, Ms. Gallagher served as project manager for removing hazardous waste material from a property proposed for redevelopment under the Washington State Department of Ecology Voluntary Cleanup Program. She performed waste characterization sampling, coordination of disposal facilities, attained required permits and preparation of the remedial action plan. Upon removal, Ms. Gallagher confirmed the complete removal of the material and subsequently prepared a report to attain a No Further Action determination. She also coordinated with land owners, development agencies, and city and state governments to approve the property for redevelopment.

Hoover Service Station, Reynolds, IN

Prior to joining AKRF, Ms. Gallagher served as an environmental scientist and on-site field technician during long term remediation at this retail petroleum facility. The site was scheduled to undergo in-situ remediation utilizing air sparging and soil vapor extraction technologies. Ms. Gallagher determined dissolved and vapor phase plume migration, radius of influence and subsequently configured and installed vertical and horizontal wells and monitoring points, prepared technical reports, and oversaw the pilot study. Additionally, Ms. Gallagher evaluated the effectiveness of the system, oversaw UST removals prior to remedial technology installation, and performed soil and groundwater sampling. This project also required a controlled community air monitoring program for which she coordinated air sampling and reporting to the owners, city and state government.

CHAD ONDRUSEK

ENVIRONMENTAL SCIENTIST

Chad Ondrusek is an Environmental Scientist with over two years of experience in this industry. He has expertise preparing a wide variety of technical reports, including Phase I and IIs, Transaction Screenings, IRM/RI/RA work plans and reports, Landfill Closure and Post-Closure Monitoring Plans, HASPs, SAPs, and SWPPPs and SPDESs. Mr. Ondrusek also has experience with Title V permitting, FER reviewing, QA/QC plans, CAD, NYCRR 6 Part 360 landfill closure and wetland delineation.

Prior to joining AKRF, Mr. Ondrusek worked as an Assistant Brownfield Project Manager for JM Associates, Inc. in Bedford Hills, NY.

BACKGROUND

Education

B.S., Environmental Science, SUNY-Oneonta, 2004

Coursework at SUNY-Purchase; pre-requisite for M.S. in Environmental Engineering

Certifications

HAZWOPER 40-hour

NYDOL Asbestos Project Monitor

Certificate of Attendance (CEU) – Brownfields 2006, Boston, MA

RELEVANT EXPERIENCE

Assistant Brownfield Project Manager, Multiple Projects, NY

While at another firm, Mr. Ondrusek served as a team member involved in developing IRM and RI work plans and oversight of IRMS and RAs. He was responsible for coordinating a site analytical plan (SAP) with field technicians, drafting monthly reports and memoranda to the NYSDEC, maintaining correspondence with local municipalities and other involved parties, determining accurate financial cost estimates based on work to be performed and timeline, hiring of sub-contractors and price negotiations, and maintaining all records. In his capacity as Assistant Brownfield Project Manager, Mr. Ondrusek was involved in every aspect of each job from start to finish.

Environmental Claim Consultant Services, Various Locations, NY

Mr. Ondrusek worked as an Environmental Claim Representative handling environmental claims and insurance defense for State Farm Fire and Casualty Co. He managed residential claims pertaining to leaking USTs, coordinated with sub-contractors and homeowners to perform remediation work, performed contractor oversight and acted as liaison to the homeowner. Additionally, Mr. Ondrusek used innovative technologies to assess and determine various remediation methods for impacted groundwater and obtained all necessary samples and prepared spill closure reports with the NYSDEC.

Environmental Field Technician Services, Various Locations, NY

While at another firm, Mr. Ondrusek provided Environmental Field Technician services on multiple projects. He conducted environment tests, including groundwater, surface water, soil, historical fill, air, soil vapor, and sub-slab sampling tests. He was also responsible for basic report preparation, following QA/QC measures, and recording and interpreting logs for Geoprobe® borings and well installations.

APPENDIX B
HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN

WEST 61ST STREET SITE

NYSDEC BCP No. C231043/C231059

NEW YORK, NEW YORK

AKRF Project Number: 10321

Prepared by:

AKRF

440 Park Avenue South, 7th Floor
New York, NY 10016
(212) 696-0670

Prepared for:

Algin Management Co., LLC
64-35 Yellowstone Blvd.
Forest Hills, NY 11375

SEPTEMBER 2007

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1.0 INTRODUCTION

The West 61st Street Site (the project Site or Site) consists of approximately 62,500 square feet located on West 60th and 61st Streets between West End Avenue and Amsterdam Avenue in Manhattan, New York (Figure 1). Specifically, the project Site consists of Block 1152, former Lots 5, 8, 10, 11, 12, 13, 52, 53, 55, and part of former Lot 43. The lots associated with the project Site have been consolidated into Lots 8 and 13. The Site is currently under construction. The proposed redevelopment plan and end use is a multi-tenant residential complex with low-rise and high-rise structures, located between West 60th and 61st Streets. One undeveloped portion west of the buildings will become a landscaped area, referred to as a courtyard and a recreation area, consisting of a tennis court will be constructed along West 60th Street.

Specifically, three buildings will be constructed, including parking and mechanical spaces at the cellar and subcellar levels; retail, residential, and community use on the first floor; and residential use (rental and condominium) from the second floor up. Building "A" will comprise nine floors, Building "B" will comprise 14 floors, and Building "C" will comprise 29 floors with a two-level underground parking garage situated beneath Buildings "B" and "C". The development consisted of excavation of all portions of the Site to the bedrock surface, which varied from a depth of 10.5 to 40 feet below grade. Residential, industrial, and commercial properties are present in the surrounding neighborhood.

A Phase I Environmental Site Assessment performed by AKRF, Inc. (AKRF) in June 2003 identified recognized environmental concerns for the Site, including potential underground storage tanks. Based upon historic operations, the recognized environmental concerns for the Site have the potential to impact off-site soil and/or groundwater. Historically, the area around the Site contained tenement houses and some commercial establishments, such as an auto repair shop, a parking garage with gasoline tanks, a gasoline station, a brewing company, a junk yard, a bakery, and a public bathhouse. In subsequent years, two public schools were constructed on West 61st Street and a charter school was constructed on West 60th Street. From 1926 to circa June 2003, Emsig Manufacturing, a factory that produced buttons and fabrics, operated adjacent to Lot 13. Emsig Manufacturing, listed as a hazardous waste generator, used acetone and styrene in their manufacturing process, generating wastes such as ignitable, corrosive, solvents, plating wastes, and metals including barium and chromium. The property contained two 3,000-gallon fuel oil storage tanks. The original structure was demolished and the property was developed as an apartment building.

The Off-Site Investigation will include a subsurface investigation, including soil and groundwater sampling and analysis, to characterize off-site soil and groundwater.

This environmental Health and Safety Plan (HASP) has been developed for implementation of Site investigation 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 and 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	(x) Inorganic Chemicals	( ) Radiological
( ) Biological	( ) Explosive/Flammable	( ) Oxygen Deficient Atmosphere
(x) Heat Stress	(x) Cold Stress	( ) Other
Comments: No personnel are permitted to enter permit confined spaces		

2.1.2 Physical Characteristics

Check all that apply		
(x) Liquid	(x) Solid	(x) Sludge
(x) Vapors	( ) Unknown	( ) Other
Comments:		

2.1.3 Hazardous Materials

Check all that apply					
Chemicals	**Solids**	**Sludges**	**Solvents**	**Oils**	**Other**
( ) Acids	(x) Ash	( ) Paints	( ) Halogens	(x) Transformer	( ) Lab
( ) Caustics	( ) Asbestos	( ) Metals	( ) Petroleum	( ) Other DF	( ) Pharm
( ) Pesticides	( ) Tailings	( ) POTW	( ) Other	(x) Motor or Hydraulic Oil	( ) Hospital
(x) Petroleum	( ) Other	( ) Other		( ) Other	( ) Rad
( ) Inks		( ) Petroleum sludge in tanks			( ) MGP
(x) PCBs					( ) Mold
(x) Metals					( ) Other
(x)Other: VOCs & SVOCs					

2.1.4 Chemicals of Concern

Chemicals	REL/PEL/STEL (ppm)	Health Hazards
Benzene	REL = 0.1 ppm PEL = 1 ppm STEL = 5 ppm	Irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude, dermatitis; bone marrow depression, potential occupational carcinogen.
Toluene	REL = 100 ppm PEL = 200 ppm STEL = 300 ppm	Irritation eyes, nose; lassitude, confusion, euphoria, dizziness, headache; dilated pupils, lacrimation (discharge of tears); anxiety, muscle fatigue, insomnia; paresthesia; dermatitis; liver, kidney damage.
Ethylbenzene	REL = 100 ppm PEL = 100 ppm	Irritation eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma
Xylenes	REL = 100 ppm PEL = 100 ppm	Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis.
Naphthalene	REL = 10 ppm PEL = 10 ppm	Irritation eyes; headache, confusion, excitement, malaise; nausea, vomiting, abdominal pain; irritation bladder; profuse sweating; jaundice; hematuria (blood in the urine), renal shutdown; dermatitis, optical neuritis, corneal damage.
Lead	REL=0.1 mg/m^3 PEL=0.05 mg/m^3	Weak, lassitude, insomnia; facial pallor, pale eye, anorexia, low-weight, malnutrition, constipation, abdominal pain, colic; anemia; gingival lead line; tremors, paralysis writs and ankles; encephalopathy; kidney disease; irritation eyes; hypotension.
PCBs	REL = 0.001 mg/m^3 PEL = 0.5 mg/m^3	Irritation eyes, chloracne [skin]; liver damage; reproductive effects; [potential occupational carcinogen].
Particulate	PEL = 15 mg/m^3 (total) PEL = 5 mg/m^3 (respirable)	Irritation eyes, skin, throat, upper respiratory system.
Comments: REL = NIOSH Recommended Exposure Limit PEL = OSHA Permissible Exposure Limit STEL = OSHA Short Term Exposure Limit		

2.2 Designated Personnel

AKRF will appoint one of its on-site personnel as the Site Safety Officer (SSO). This individual will be responsible for the implementation of the HASP. The SSO will have a 4-year college degree in occupational safety or a related science/engineering field, and 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. All personnel shall also have up to date 8-hour refresher training. The training shall

allow personnel to recognize and understand the potential hazards to health and safety. All field personnel must attend a training program, whose purpose is to:

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

Each member of the field crew will be instructed in the above 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 will 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 will be divided into various zones to prevent the spread of contamination, ensure that proper protective equipment is donned, and provide an area for decontamination.

The Exclusion Zone is defined as the area where exposure to impacted media could be encountered. The Contamination Reduction Zone (CRZ) is the area where decontamination procedures take place and is located next to the Exclusion Zone. The Support is the zone area where support facilities such as vehicles, fire extinguisher, and first aid supplies are located. The emergency staging area (part of the Support Zone) is the area where all workers on-site would assemble in the event of an emergency. A summary of these areas is provided below. These zones may changed by SSO, depending on that day's activities. All field personnel will be informed of the location of these zones before work begins.

Task	Exclusion Zone	CRZ	Support Zone
Soil Borings	10 ft from drill rig	25 ft from drill rig	As needed
Groundwater Sampling	10 ft from monitoring well	As needed	As needed
Comments: Control measures such as "caution tape" and/or traffic cones will be placed around the perimeter of the work area when work is being done in a public area.			

2.6 Work Zone Air Monitoring

Real time air monitoring will be performed with the PID and particulate monitor during contaminated soil disturbance activities. Measurements will be taken prior to commencement of work and continuously during the work. Measurements will be made as close to the workers as practicable and at the breathing height of the workers. The SSO shall set up the equipment and confirm that it is working properly. His/her designee may oversee the air measurements during the day. The initial measurement for the day will be performed before the start of work and will establish the background level for that day. The final measurement for the day will be performed after the end of work. The action levels and required responses are listed in the table Section 2.6.3.

2.6.1 Volatile Organic Compounds

A photoionization detector (PID) will be used to perform air monitoring during soil and groundwater sampling and soil disturbance activities conducted at the site to determine airborne levels of total VOCs. The PID will be calibrated daily with a 100 ppm isobutylene standard. The PID will be capable of calculating 15-minute running average concentrations and will be equipped with an audible alarm to indicate the exceedance of an action level. The VOC work zone action levels and required responses are listed in the table below.

2.6.2 Dust Particulates

A particulate monitor will be used to measure airborne levels of respirable particulates (less than 10 microns) during soil disturbing activities. The particulate monitor will be used in accordance with the manufacturer's specifications. The dust particulate work zone action levels and required responses are listed in the table in Section 2.6.3.

2.6.3 Work Zone Action Levels and Response Actions

Instrument	Task to be monitored	Action Level (Note 1)	Response Action
PID	Soil borings/monitoring well installation, soil and groundwater sampling	Less than 10 ppm in breathing zone.	Level D or D-Modified
		Between 10 and 500 ppm	Level C
		More than 500 ppm	Stop work. Resume work when readings are less than 500 ppm.
Particulate monitor	Soil borings/monitoring well installation, soil and groundwater sampling	Less than 5 mg/m^3	Level D
		Between 5 mg/m^3 and 125 mg/m^3	Level C. Apply dust suppression measures. If < 2.5 mg/m^3, resume work using Level D. Otherwise, use Level C.
		Above 125 mg/m^3	Stop work. Apply additional dust suppression measures. Resume work when less than 125 mg/m^3.

Notes:
1 - 15-minute time-weighted average except for CGI, which is instantaneous reading.

ppm – parts per million
mg/m^3 – milligrams per cubic meter

2.7 Community Air Monitoring

Perimeter community air monitoring for VOCs and dust particulates will be conducted during soil disturbance activities. Community air monitoring will be conducted in accordance with the Community Air Monitoring and Vapor Control Plan.

2.8 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 will wear, at a minimum, Level D personal protective equipment (PPE). The protection will be based on the air monitoring described in Section 2.6 of this HASP.

LEVEL OF PROTECTION and PPE		Soil Boring
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 10 ft of drill rig/excavator) (x) Nitrile Gloves	Yes
Level C *(in addition to Level D)* ( ) Half-Face Respirator (x) Full Face Respirator ( ) Full-Face PAPR	( ) Particulate Cartridge ( ) Organic Cartridge (x) Dual Organic/Particulate Cartridge	If PID > 10 ppm (breathing zone)
Comments: Cartridges to be changed out at least once per shift unless warranted beforehand (e.g., more difficult to breath or any odors detected).		

2.9 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 and face thoroughly on leaving the work area and before eating, drinking, or any other such activity.
- The workers should shower as soon as possible after leaving the site. Contact with contaminated or suspected surfaces should be avoided.
- The buddy system should always be used; each buddy should watch for signs of fatigue, exposure, and heat/cold stress.

3.0 EMERGENCY PROCEDURES AND EMERGENCY RESPONSE PLAN

The field crew will be equipped with emergency equipment, such as a first aid kit and disposable eye washes. In the case of a medical emergency, the SSO will determine the nature of the emergency and he/she will have someone call for an ambulance, if needed. If the nature of the injury is not serious, i.e., the person can be moved without expert emergency medical personnel, he/she should be driven to a hospital by on-site personnel. Directions to the hospital are provided below, and a hospital route map is attached.

3.1 Hospital Directions

Hospital Name:	St. Luke's Roosevelt Hospital
Phone Number:	(212) 523-4000
Address/Location:	1000 10th Avenue, New York, NY The entrance to the Emergency Room is on West 59th Street between 10th Avenue (Amsterdam Avenue) and 11th Avenue (West End Avenue).
Directions:	Go EAST on West 60th Street Turn RIGHT onto Columbus Avenue (9th Avenue) Turn RIGHT onto West 59th Street

3.2 Emergency Contacts

Company	Individual Name	Title	Contact Number
AKRF	Michelle Lapin	Project Director	646-388-9520 (office)
	Kerry Gallagher	Project Manager	646-388-9537 (office) 646-483-7332 (cell)
	Chad Ondrusek	SSO	646-522-5227 (cell)
Algin Management	Bennet Schonfeld	Client	718-896-9600
(subcontractors: driller, tank removal, etc.)	Paragon Environmental Construction	Driller	315-699-0840
Ambulance, Fire Department & Police Department	-	-	911
NYS DEC Spill Hotline	-	-	800-457-7362

4.0 APPROVAL & ACKNOWLEDGMENTS 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 Algin Properties/ West 60th Street 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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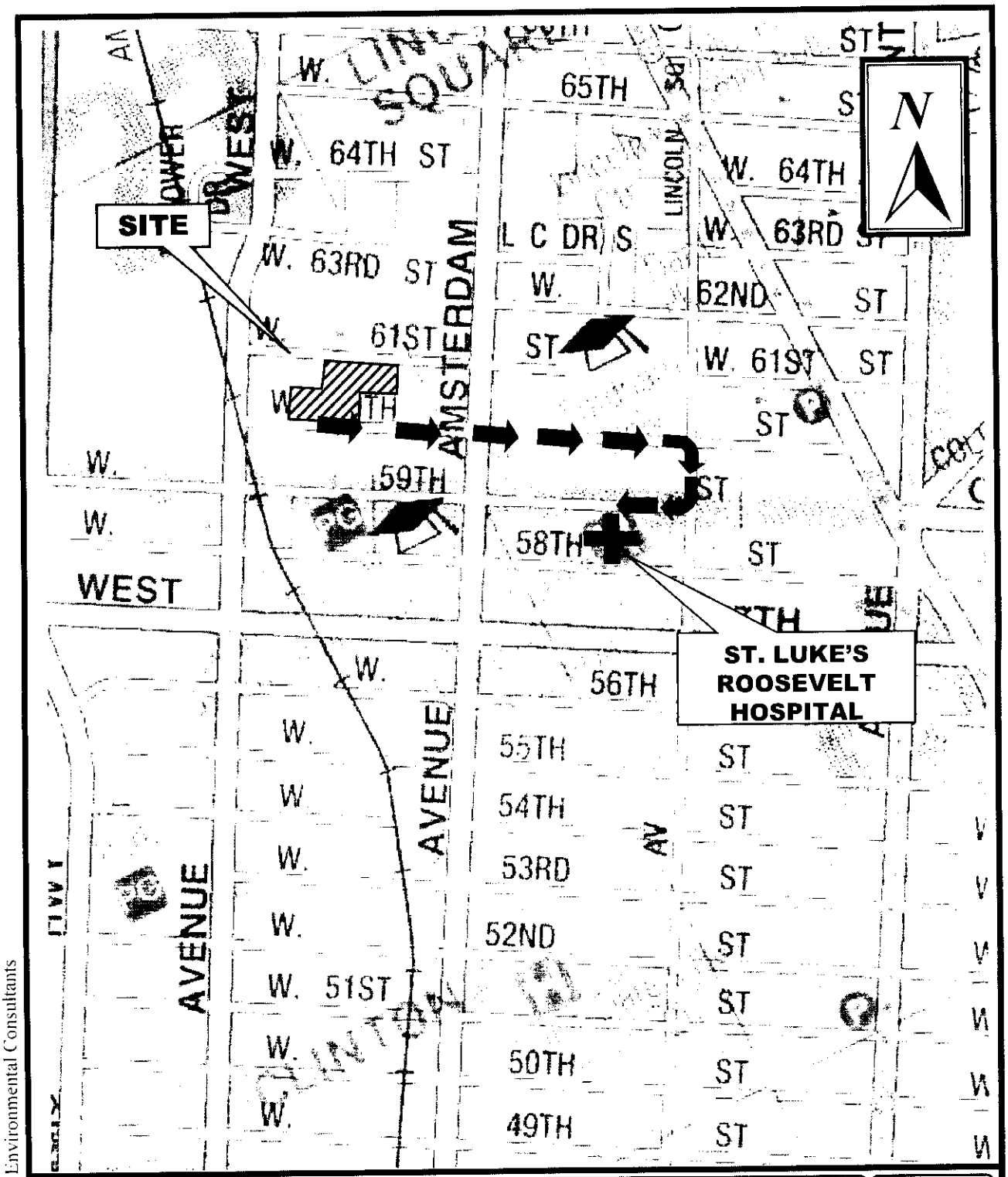
FIGURES



West 61st Street Site
New York, New York

PROJECT SITE MAP
AND NEAREST HOSPITAL

AKRF, Inc.
Environmental Consultants
440 Park Avenue S., New York, New York 10016

DATE: April 2005
DRAWING No:
PROJECT No: 10321
FIGURE No: 1

APPENDIX A

POTENTIAL HEALTH EFFECTS FROM ON-SITE CONTAMINANTS

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

BENZENE
CAS # 71-43-2

Agency for Toxic Substances and Disease Registry ToxFAQs **September 1997**

This fact sheet answers the most frequently asked health questions (FAQs) about benzene. 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: Benzene is a widely used chemical formed from both natural processes and human activities. Breathing benzene can cause drowsiness, dizziness, and unconsciousness; long-term benzene exposure causes effects on the bone marrow and can cause anemia and leukemia. Benzene has been found in at least 813 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is benzene?

(Pronounced bĕn′zēn′)

Benzene is a colorless liquid with a sweet odor. It evaporates into the air very quickly and dissolves slightly in water. It is highly flammable and is formed from both natural processes and human activities.

Benzene is widely used in the United States; it ranks in the top 20 chemicals for production volume. Some industries use benzene to make other chemicals which are used to make plastics, resins, and nylon and synthetic fibers. Benzene is also used to make some types of rubbers, lubricants, dyes, detergents, drugs, and pesticides. Natural sources of benzene include volcanoes and forest fires. Benzene is also a natural part of crude oil, gasoline, and cigarette smoke.

What happens to benzene when it enters the environment?

- Industrial processes are the main source of benzene in the environment.
- Benzene can pass into the air from water and soil.
- It reacts with other chemicals in the air and breaks down within a few days.
- Benzene in the air can attach to rain or snow and be carried back down to the ground.
- It breaks down more slowly in water and soil, and can pass through the soil into underground water.
- Benzene does not build up in plants or animals.

How might I be exposed to benzene?

- Outdoor air contains low levels of benzene from tobacco smoke, automobile service stations, exhaust from motor vehicles, and industrial emissions.
- Indoor air generally contains higher levels of benzene from products that contain it such as glues, paints, furniture wax, and detergents.
- Air around hazardous waste sites or gas stations will contain higher levels of benzene.
- Leakage from underground storage tanks or from hazardous waste sites containing benzene can result in benzene contamination of well water.
- People working in industries that make or use benzene may be exposed to the highest levels of it.
- A major source of benzene exposures is tobacco smoke.

How can benzene affect my health?

Breathing very high levels of benzene can result in death, while high levels can cause drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, and unconsciousness. Eating or drinking foods containing high levels of benzene can cause vomiting, irritation of the stomach, dizziness, sleepiness, convulsions, rapid heart rate, and death.

The major effect of benzene from long-term (365 days or longer) exposure is on the blood. Benzene causes harmful effects on the bone marrow and can cause a decrease in red blood cells leading to anemia. It can also cause excessive bleeding and can affect the immune system, increasing the chance for infection.

Some women who breathed high levels of benzene for many months had irregular menstrual periods and a decrease in the size of their ovaries. It is not known whether benzene exposure affects the developing fetus in pregnant women or fertility in men.

Animal studies have shown low birth weights, delayed bone formation, and bone marrow damage when pregnant animals breathed benzene.

How likely is benzene to cause cancer?

The Department of Health and Human Services (DHHS) has determined that benzene is a known human carcinogen. Long-term exposure to high levels of benzene in the air can cause leukemia, cancer of the blood-forming organs.

Is there a medical test to show whether I've been exposed to benzene?

Several tests can show if you have been exposed to benzene. There is test for measuring benzene in the breath; this test must be done shortly after exposure. Benzene can also be measured in the blood, however, since benzene disappears rapidly from the blood, measurements are accurate only for recent exposures.

In the body, benzene is converted to products called metabolites. Certain metabolites can be measured in the urine. However, this test must be done shortly after exposure and is not a reliable indicator of how much benzene you have been exposed to, since the metabolites may be present in urine from other sources.

Has the federal government made recommendations to protect human health?

The EPA has set the maximum permissible level of benzene in drinking water at 0.005 milligrams per liter (0.005 mgL). The EPA requires that spills or accidental releases into the environment of 10 pounds or more of benzene be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) has set a permissible exposure limit of 1 part of benzene per million parts of air (1 ppm) in the workplace during an 8-hour workday, 40-hour workweek.

Glossary

Anemia: A decreased ability of the blood to transport oxygen.

Carcinogen: A substance with the ability to cause cancer.

CAS: Chemical Abstracts Service.

Chromosomes: Parts of the cells responsible for the development of hereditary characteristics.

Metabolites: Breakdown products of chemicals.

Milligram (mg): One thousandth of a gram.

Pesticide: A substance that kills pests.

References

This ToxFAQs information is taken from the 1997 Toxicological Profile for Benzene (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 E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-498-0093. 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

TOLUENE
CAS # 108-88-3

Division of Toxicology ToxFAQs™ **February 2001**

This fact sheet answers the most frequently asked health questions (FAQs) about toluene. 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: Exposure to toluene occurs from breathing contaminated workplace air, in automobile exhaust, some consumer products paints, paint thinners, fingernail polish, lacquers, and adhesives. Toluene affects the nervous system. Toluene has been found at 959 of the 1,591 National Priority List sites identified by the Environmental Protection Agency

What is toluene?

Toluene is a clear, colorless liquid with a distinctive smell. Toluene occurs naturally in crude oil and in the tolu tree. It is also produced in the process of making gasoline and other fuels from crude oil and making coke from coal.

Toluene is used in making paints, paint thinners, fingernail polish, lacquers, adhesives, and rubber and in some printing and leather tanning processes.

What happens to toluene when it enters the environment?

❑ Toluene enters the environment when you use materials that contain it. It can also enter surface water and groundwater from spills of solvents and petrolieum products as well as from leasking underground storage tanks at gasoline stations and other facilities.

❑ When toluene-containing products are placed in landfills or waste disposal sites, the toluene can enter the soil or water near the waste site.

❑ Toluene does not usually stay in the environment long.

❑ Toluene does not concentrate or buildup to high levels in animals.

How might I be exposed to toluene?

❑ Breathing contaminated workplace air or automobile exhaust.

❑ Working with gasoline, kerosene, heating oil, paints, and lacquers.

❑ Drinking contaminated well-water.

❑ Living near uncontrolled hazardous waste sites containing toluene products.

How can toluene affect my health?

Toluene may affect the nervous system. Low to moderate levles can cause tiredness, confusion, weakness, drunken-type actions, memory loss, nausea, loss of appetite, and

hearing and color vision loss. These symptoms usually disappear when exposure is stopped.

Inhaling High levels of toluene in a short time can make you feel light-headed, dizzy, or sleepy. It can also cause unconsciousness, and even death.

High levels of toluene may affect your kidneys.

How likely is toluene to cause cancer?

Studies in humans and animals generally indicate that toluene does not cause cancer.

The EPA has determined that the carcinogenicity of toluene can not be classified.

How can toluene affect children?

It is likely that health effects seen in children exposed to toluene will be similar to the effects seen in adults. Some studies in animals suggest that babies may be more sensitive than adults.

Breathing very high levels of toluene during pregnancy can result in children with birth defects and retard mental abilities, and growth. We do not know if toluene harms the unborn child if the mother is exposed to low levels of toluene during pregnancy.

How can families reduce the risk of exposure to toluene?

❑ Use toluene-containing products in well-ventilated areas.

❑ When not in use, toluene-containing products should be tightly covered to prevent evaporation into the air.

Is there a medical test to show whether I've been exposed to toluene?

There are tests to measure the level of toluene or its breakdown products in exhaled air, urine, and blood. To determine if you have been exposed to toluene, your urine or blood must be checked within 12 hours of exposure. Several other chemicals are also changed into the same breakdown products as toluene, so some of these tests are not specific for toluene.

Has the federal government made recommendations to protect human health?

EPA has set a limit of 1 milligram per liter of drinking water (1 mg/L).

Discharges, releases, or spills of more than 1,000 pounds of toluene must be reported to the National Response Center.

The Occupational Safety and Health Administration has set a limit of 200 parts toluene per million of workplace air (200 ppm).

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological Profile for Toluene. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

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.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

ETHYLBENZENE
CAS # 100-41-4

This fact sheet answers the most frequently asked health questions (FAQs) about ethylbenzene. 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: Ethylbenzene is a colorless liquid found in a number of products including gasoline and paints. Breathing very high levels can cause dizziness and throat and eye irritation. Ethylbenzene has been found in at least 731 of the 1,467 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is ethylbenzene?

(Pronounced ĕth′ əl bĕn′ zēn′)

Ethylbenzene is a colorless, flammable liquid that smells like gasoline. It is found in natural products such as coal tar and petroleum and is also found in manufactured products such as inks, insecticides, and paints.

Ethylbenzene is used primarily to make another chemical, styrene. Other uses include as a solvent, in fuels, and to make other chemicals.

What happens to ethylbenzene when it enters the environment?

- Ethylbenzene moves easily into the air from water and soil.
- It takes about 3 days for ethylbenzene to be broken down in air into other chemicals.
- Ethylbenzene may be released to water from industrial discharges or leaking underground storage tanks.
- In surface water, ethylbenzene breaks down by reacting with other chemicals found naturally in water.
- In soil, it is broken down by soil bacteria.

How might I be exposed to ethylbenzene?

- Breathing air containing ethylbenzene, particularly in areas near factories or highways.
- Drinking contaminated tap water.
- Working in an industry where ethylbenzene is used or made.
- Using products containing it, such as gasoline, carpet glues, varnishes, and paints.

How can ethylbenzene affect my health?

Limited information is available on the effects of ethylbenzene on people's health. The available information shows dizziness, throat and eye irritation, tightening of the chest, and a burning sensation in the eyes of people exposed to high levels of ethylbenzene in air.

Animals studies have shown effects on the nervous system, liver, kidneys, and eyes from breathing ethylbenzene in air.

How likely is ethylbenzene to cause cancer?

The EPA has determined that ethylbenzene is not classifiable as to human carcinogenicity.

ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html

No studies in people have shown that ethylbenzene exposure can result in cancer. Two available animal studies suggest that ethylbenzene may cause tumors.

How can ethylbenzene affect children?

Children may be exposed to ethylbenzene through inhalation of consumer products, including gasoline, paints, inks, pesticides, and carpet glue. We do not know whether children are more sensitive to the effects of ethylbenzene than adults.

It is not known whether ethylbenzene can affect the development of the human fetus. Animal studies have shown that when pregnant animals were exposed to ethylbenzene in air, their babies had an increased number of birth defects.

How can families reduce the risk of exposure to ethylbenzene?

Exposure to ethylbenzene vapors from household products and newly installed carpeting can be minimized by using adequate ventilation.

Household chemicals should be stored out of reach of children to prevent accidental poisoning. Always store household chemicals in their original containers; never store them in containers children would find attractive to eat or drink from, such as old soda bottles. Gasoline should be stored in a gasoline can with a locked cap.

Sometimes older children sniff household chemicals, including ethylbenzene, in an attempt to get high. Talk with your children about the dangers of sniffing chemicals.

Is there a medical test to show whether I've been exposed to ethylbenzene?

Ethylbenzene is found in the blood, urine, breath, and some body tissues of exposed people. The most common way to test for ethylbenzene is in the urine. This test measures substances formed by the breakdown of ethylbenzene. This test needs to be done within a few hours after exposure occurs, because the substances leave the body very quickly.

These tests can show you were exposed to ethylbenzene, but cannot predict the kind of health effects that might occur.

Has the federal government made recommendations to protect human health?

The EPA has set a maximum contaminant level of 0.7 milligrams of ethylbenzene per liter of drinking water (0.7 mg/L).

The EPA requires that spills or accidental releases into the environment of 1,000 pounds or more of ethylbenzene be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) has set an occupational exposure limit of 100 parts of ethylbenzene per million parts of air (100 ppm) for an 8-hour workday, 40-hour workweek.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for ethylbenzene. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

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

XYLENE
CAS # 1330-20-7

Agency for Toxic Substances and Disease Registry ToxFAQs **September 1996**

This fact sheet answers the most frequently asked health questions (FAQs) about xylene. 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.

SUMMARY: Exposure to xylene occurs in the workplace and when you use paint, gasoline, paint thinners and other products that contain it. People who breathe high levels may have dizziness, confusion, and a change in their sense of balance. This substance has been found in at least 658 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is xylene?

(Pronounced zī′lēn)

Xylene is a colorless, sweet-smelling liquid that catches on fire easily. It occurs naturally in petroleum and coal tar and is formed during forest fires. You can smell xylene in air at 0.08–3.7 parts of xylene per million parts of air (ppm) and begin to taste it in water at 0.53–1.8 ppm.

Chemical industries produce xylene from petroleum. It's one of the top 30 chemicals produced in the United States in terms of volume.

Xylene is used as a solvent and in the printing, rubber, and leather industries. It is also used as a cleaning agent, a thinner for paint, and in paints and varnishes. It is found in small amounts in airplane fuel and gasoline.

What happens to xylene when it enters the environment?

- Xylene has been found in waste sites and landfills when discarded as used solvent, or in varnish, paint, or paint thinners.
- It evaporates quickly from the soil and surface water into the air.
- In the air, it is broken down by sunlight into other less harmful chemicals.
- It is broken down by microorganisms in soil and water.
- Only a small amount of it builds up in fish, shellfish, plants, and animals living in xylene-contaminated water.

How might I be exposed to xylene?

- Breathing xylene in workplace air or in automobile exhaust.
- Breathing contaminated air.
- Touching gasoline, paint, paint removers, varnish, shellac, and rust preventatives that contain it.
- Breathing cigarette smoke that has small amounts of xylene in it.
- Drinking contaminated water or breathing air near waste sites and landfills that contain xylene.
- The amount of xylene in food is likely to be low.

How can xylene affect my health?

Xylene affects the brain. High levels from exposure for short periods (14 days or less) or long periods (more than 1 year) can cause headaches, lack of muscle coordination, dizziness, confusion, and changes in one's sense of balance. Exposure of

people to high levels of xylene for short periods can also cause irritation of the skin, eyes, nose, and throat; difficulty in breathing; problems with the lungs; delayed reaction time; memory difficulties; stomach discomfort; and possibly changes in the liver and kidneys. It can cause unconsciousness and even death at very high levels.

Studies of unborn animals indicate that high concentrations of xylene may cause increased numbers of deaths, and delayed growth and development. In many instances, these same concentrations also cause damage to the mothers. We do not know if xylene harms the unborn child if the mother is exposed to low levels of xylene during pregnancy.

How likely is xylene to cause cancer?

The International Agency for Research on Cancer (IARC) has determined that xylene is not classifiable as to its carcinogenicity in humans.

Human and animal studies have not shown xylene to be carcinogenic, but these studies are not conclusive and do not provide enough information to conclude that xylene does not cause cancer.

Is there a medical test to show whether I've been exposed to xylene?

Laboratory tests can detect xylene or its breakdown products in exhaled air, blood, or urine. There is a high degree of agreement between the levels of exposure to xylene and the levels of xylene breakdown products in the urine. However, a urine sample must be provided very soon after exposure ends because xylene quickly leaves the body. These tests are not routinely available at your doctor's office.

Has the federal government made recommendations to protect human health?

The EPA has set a limit of 10 ppm of xylene in drinking water.

The EPA requires that spills or accidental releases of xylenes into the environment of 1,000 pounds or more must be reported.

The Occupational Safety and Health Administration (OSHA) has set a maximum level of 100 ppm xylene in workplace air for an 8-hour workday, 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) and the American Conference of Governmental Industrial Hygienists (ACGIH) also recommend exposure limits of 100 ppm in workplace air.

NIOSH has recommended that 900 ppm of xylene be considered immediately dangerous to life or health. This is the exposure level of a chemical that is likely to cause permanent health problems or death.

Glossary

Evaporate: To change from a liquid into a vapor or a gas.

Carcinogenic: Having the ability to cause cancer.

CAS: Chemical Abstracts Service.

ppm: Parts per million.

Solvent: A liquid that can dissolve other substances.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for xylenes (update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

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 E-29, Atlanta, GA 30333. Phone:1-888-422-8737, FAX: 404-498-0093. 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.

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AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

NAPHTHALENE
CAS # 91-20-3

1-METHYLNAPHTHALENE
CAS # 90-12-0

2-METHYLNAPHTHALENE
CAS # 91-57-6

Division of Toxicology ToxFAQs™ **August 2005**

This fact sheet answers the most frequently asked health questions (FAQs) about naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene. 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 is important you understand this information because these substances 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: Exposure to naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene happens mostly from breathing air contaminated from the burning of wood, tobacco, or fossil fuels, industrial discharges, or moth repellents. Exposure to large amounts of naphthalene may damage or destroy some of your red blood cells. Naphthalene has caused cancer in animals. Naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene have been found in at least 687, 36, and 412, respectively, of the 1,662 National Priority List sites identified by the Environmental Protection Agency (EPA).

What are naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene?

Naphthalene is a white solid that evaporates easily. Fuels such as petroleum and coal contain naphthalene. It is also called white tar, and tar camphor, and has been used in mothballs and moth flakes. Burning tobacco or wood produces naphthalene. It has a strong, but not unpleasant smell. The major commercial use of naphthalene is in the manufacture of polyvinyl chloride (PVC) plastics. Its major consumer use is in moth repellents and toilet deodorant blocks.

1-Methylnaphthalene and 2-methylnaphthalene are naphthalene-related compounds. 1-Methylnaphthalene is a clear liquid and 2-methylnaphthalene is a solid; both can be smelled in air and in water at very low concentrations.

1-Methylnaphthalene and 2-methylnaphthalene are used to make other chemicals such as dyes and resins. 2-Methylnaphthalene is also used to make vitamin K.

What happens to naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene when they enter the environment?

- Naphthalene enters the environment from industrial and domestic sources, and from accidental spills.
- Naphthalene can dissolve in water to a limited degree and may be present in drinking water from wells close to hazardous waste sites and landfills.
- Naphthalene can become weakly attached to soil or pass through soil into underground water.
- In air, moisture and sunlight break it down within 1 day. In water, bacteria break it down or it evaporates into the air.
- Naphthalene does not accumulate in the flesh of animals or fish that you might eat.
- 1-Methylnaphthalene and 2-methylnaphthalene are expected to act like naphthalene in air, water, or soil because they have similar chemical and physical properties.

How might I be exposed to naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene?

- Breathing low levels in outdoor air.
- Breathing air contaminated from industrial discharges or smoke from burning wood, tobacco, or fossil fuels.
- Using or making moth repellents, coal tar products, dyes or inks could expose you to these chemicals in the air.
- Drinking water from contaminated wells.
- Touching fabrics that are treated with moth repellents containing naphthalene.
- Exposure to naphthalene, 1-methylnaphthalene and 2-methylnaphthalene from eating foods or drinking beverages is unlikely.

How can naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene affect my health?

Exposure to large amounts of naphthalene may damage or destroy some of your red blood cells. This could cause you to have too few red blood cells until your body replaces the destroyed cells. This condition is called hemolytic anemia. Some symptoms of hemolytic anemia are fatigue, lack of appetite, restlessness, and pale skin. Exposure to large amounts of naphthalene may also cause nausea, vomiting, diarrhea, blood in the urine, and a yellow color to the skin. Animals sometimes develop cloudiness in their eyes after swallowing high amounts of naphthalene. It is not clear whether this also develops in people. Rats and mice that breathed naphthalene vapors daily for a lifetime developed irritation and inflammation of their nose and lungs. It is unclear if naphthalene

causes reproductive effects in animals; most evidence says it does not.

There are no studies of humans exposed to 1-methylnaphthalene or 2-methylnaphthalene.

Mice fed food containing 1-methylnaphthalene and 2-methylnaphthalene for most of their lives had part of their lungs filled with an abnormal material.

How likely are naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene to cause cancer?

There is no direct evidence in humans that naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene cause cancer. However, cancer from naphthalene exposure has been seen in animal studies. Some female mice that breathed naphthalene vapors daily for a lifetime developed lung tumors. Some male and female rats exposed to naphthalene in a similar manner also developed nose tumors.

Based on the results from animal studies, the Department of Health and Humans Services (DHHS) concluded that naphthalene is reasonably anticipated to be a human carcinogen. The International Agency for Research on Cancer (IARC) concluded that naphthalene is possibly carcinogenic to humans. The EPA determined that naphthalene is a possible human carcinogen (Group C) and that the data are inadequate to assess the human carcinogenic potential of 2-methylnaphthalene.

How can naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene affect children?

Hospitals have reported many cases of hemolytic anemia in children, including newborns and infants, who either ate naphthalene mothballs or deodorants cakes or who were in close contact with clothing or blankets stored in naphthalene mothballs. Naphthalene can move from a pregnant woman's blood to the unborn baby's blood. Naphthalene has been detected in some samples of breast milk from the general U.S. population, but not at levels that are expected to be of concern.

There is no information on whether naphthalene has affected development in humans. No developmental abnormalities were observed in the offspring from rats, mice, and rabbits fed naphthalene during pregnancy.

We do not have any information on possible health effects of 1-methylnaphthalene or 2-methylnaphthalene on children.

How can families reduce the risks of exposure to naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene?

❑ Families can reduce the risks of exposure to naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene by avoiding smoking tobacco, generating smoke during cooking, or using fireplaces or heating appliances in the their homes.

❑ If families use naphthalene-containing moth repellents, the material should be enclosed in containers that prevent vapors from escaping, and kept out of the reach from children.

❑ Blankets and clothing stored with naphthalene moth repellents should be aired outdoors to remove naphthalene odors and washed before they are used.

❑ Families should inform themselves of the contents of air deodorizers that are used in their homes and refrain from using deodorizers with naphthalene.

Is there a medical test to determine whether I've been exposed to naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene?

Tests are available that measure levels of these chemicals and their breakdown products in samples of urine, feces, blood, maternal milk, or body fat. These tests are not routinely available in a doctor's office because they require special equipment, but samples can be sent to special testing laboratories. These tests cannot determine exactly how much naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene you were exposed to or predict whether harmful effects will occur. If the samples are collected within a day or two of exposure, then the tests can show if you were exposed to a large or small amount of naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene.

Has the federal government made recommendations to protect human health?

The EPA recommends that children not drink water with over 0.5 parts per million (0.5 ppm) naphthalene for more than 10 days or over 0.4 ppm for any longer than 7 years. Adults should not drink water with more than 1 ppm for more than 7 years. For water consumed over a lifetime (70 years), the EPA suggests that it contain no more than 0.1 ppm naphthalene.

The Occupational Safety and Health Administration (OSHA) set a limit of 10 ppm for the level of naphthalene in workplace air during an 8-hour workday, 40-hour workweek. The National Institute for Occupational Safety and Health (NIOSH) considers more than 500 ppm of naphthalene in air to be immediately dangerous to life or health. This is the exposure level of a chemical that is likely to impair a worker's ability to leave a contaminate area and therefore, results in permanent health problems or death.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2005. Toxicological Profile for Naphthalene, 1-Methylnaphthalene, and 2-Methylnaphthalene (Update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

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.

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AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

LEAD
CAS # 7439-92-1

Agency for Toxic Substances and Disease Registry ToxFAQs **June 1999**

This fact sheet answers the most frequently asked health questions (FAQs) about lead. 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: Exposure to lead can happen from breathing workplace air or dust, eating contaminated foods, or drinking contaminated water. Children can be exposed from eating lead-based paint chips or playing in contaminated soil. Lead can damage the nervous system, kidneys, and reproductive system. Lead has been found in at least 1,026 of 1,467 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is lead?

(Pronounced lĕd)

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of our environment. Much of it comes from human activities including burning fossil fuels, mining, and manufacturing.

Lead has many different uses. It is used in the production of batteries, ammunition, metal products (solder and pipes), and devices to shield X-rays.

Because of health concerns, lead from gasoline, paints and ceramic products, caulking, and pipe solder has been dramatically reduced in recent years.

What happens to lead when it enters the environment?

- Lead itself does not break down, but lead compounds are changed by sunlight, air, and water.
- When lead is released to the air, it may travel long distances before settling to the ground.
- Once lead falls onto soil, it usually sticks to soil particles.
- Movement of lead from soil into groundwater will depend on the type of lead compound and the characteristics of the soil.
- Much of the lead in inner-city soils comes from old houses painted with lead-based paint.

How might I be exposed to lead?

- Eating food or drinking water that contains lead.
- Spending time in areas where lead-based paints have been used and are deteriorating.
- Working in a job where lead is used.
- Using health-care products or folk remedies that contain lead.
- Engaging in certain hobbies in which lead is used (for example, stained glass).

How can lead affect my health?

Lead can affect almost every organ and system in your body. The most sensitive is the central nervous system, particularly in children. Lead also damages kidneys and the reproductive system. The effects are the same whether it is breathed or swallowed.

At high levels, lead may decrease reaction time, cause weakness in fingers, wrists, or ankles, and possibly affect the memory. Lead may cause anemia, a disorder of the blood. It can also damage the male reproductive system. The connection between these effects and exposure to low levels of lead is uncertain.

How likely is lead to cause cancer?

The Department of Health and Human Services has determined that lead acetate and lead phosphate may reasonably

ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html

be anticipated to be carcinogens based on studies in animals. There is inadequate evidence to clearly determine lead's carcinogenicity in people.

How can lead affect children?

Small children can be exposed by eating lead-based paint chips, chewing on objects painted with lead-based paint, or swallowing house dust or soil that contains lead.

Children are more vulnerable to lead poisoning than adults. A child who swallows large amounts of lead may develop blood anemia, severe stomachache, muscle weakness, and brain damage. A large amount of lead might get into a child's body if the child ate small pieces of old paint that contained large amounts of lead. If a child swallows smaller amounts of lead, much less severe effects on blood and brain function may occur. Even at much lower levels of exposure, lead can affect a child's mental and physical growth.

Exposure to lead is more dangerous for young and unborn children. Unborn children can be exposed to lead through their mothers. Harmful effects include premature births, smaller babies, decreased mental ability in the infant, learning difficulties, and reduced growth in young children. These effects are more common if the mother or baby was exposed to high levels of lead.

How can families reduce the risk of exposure to lead?

Avoid exposure to sources of lead. Do not allow children to chew or mouth painted surfaces that may have been painted with lead-based paint (homes built before 1978). Run your water for 15 to 30 seconds before drinking or cooking with it. This will get rid of lead that may have leached out of pipes. Some types of paints and pigments that are used as make-up or hair coloring contain lead. Keep these kinds of products away from children. Wash children's hands and faces often to remove lead dusts and soil, and regularly clean the house of dust and tracked in soil.

Is there a medical test to show whether I've been exposed to lead?

A blood test is available to measure the amount of lead in your blood and to estimate the amount of your exposure to lead. Blood tests are commonly used to screen children for lead poisoning. Lead in teeth and bones can be measured with X-rays, but this test is not as readily available. Medical treatment may be necessary in children if the lead concentration in blood is higher than 45 micrograms per deciliter (45 µg/dL).

Has the federal government made recommendations to protect human health?

The Centers for Disease Control and Prevention (CDC) recommends that children ages 1 and 2 be screened for lead poisoning. Children who are 3 to 6 years old should be tested for lead if they have never been tested for lead before and if they receive services from public assistance programs; if they live in or regularly visit a building built before 1950; if they live in or visit a home built before 1978 that is being remodeled; or if they have a brother, sister, or playmate who has had lead poisoning. CDC considers children to have an elevated level of lead if the amount in the blood is 10 µg/dL.

The EPA requires lead in air not to exceed 1.5 micrograms per cubic meter (1.5 $\mu g/m^3$) averaged over 3 months. EPA limits lead in drinking water to 15 µg per liter.

The Occupational Health and Safety Administration (OSHA) develops regulations for workers exposed to lead. The Clean Air Act Amendments of 1990 banned the sale of leaded gasoline. The Federal Hazardous Substance Act bans children's products that contain hazardous amounts of lead.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for lead. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

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 E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-498-0093. 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.

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POLYCHLORINATED BIPHENYLS

Division of Toxicology ToxFAQs™ February 2001

This fact sheet answers the most frequently asked health questions (FAQs) about polychlorinated biphenyls. 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: Polychlorinated biphenyls (PCBs) are a mixture of individual chemicals which are no longer produced in the United States, but are still found in the environment. Health effects that have been associated with exposure to PCBs include acne-like skin conditions in adults and neurobehavioral and immunological changes in children. PCBs are known to cause cancer in animals. PCBs have been found in at least 500 of the 1,598 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What are polychlorinated biphenyls?

Polychlorinated biphenyls are mixtures of up to 209 individual chlorinated compounds (known as congeners). There are no known natural sources of PCBs. PCBs are either oily liquids or solids that are colorless to light yellow. Some PCBs can exist as a vapor in air. PCBs have no known smell or taste. Many commercial PCB mixtures are known in the U.S. by the trade name Aroclor.

PCBs have been used as coolants and lubricants in transformers, capacitors, and other electrical equipment because they don't burn easily and are good insulators. The manufacture of PCBs was stopped in the U.S. in 1977 because of evidence they build up in the environment and can cause harmful health effects. Products made before 1977 that may contain PCBs include old fluorescent lighting fixtures and electrical devices containing PCB capacitors, and old microscope and hydraulic oils.

What happens to PCBs when they enter the environment?

❑ PCBs entered the air, water, and soil during their manufacture, use, and disposal; from accidental spills and leaks during their transport; and from leaks or fires in products containing PCBs.

❑ PCBs can still be released to the environment from hazardous waste sites; illegal or improper disposal of industrial wastes and consumer products; leaks from old electrical transformers containing PCBs; and burning of some wastes in incinerators.

❑ PCBs do not readily break down in the environment and thus may remain there for very long periods of time. PCBs can travel long distances in the air and be deposited in areas far away from where they were released. In water, a small amount of PCBs may remain dissolved, but most stick to organic particles and bottom sediments. PCBs also bind strongly to soil.

❑ PCBs are taken up by small organisms and fish in water. They are also taken up by other animals that eat these aquatic animals as food. PCBs accumulate in fish and marine mammals, reaching levels that may be many thousands of times higher than in water.

How might I be exposed to PCBs?

❑ Using old fluorescent lighting fixtures and electrical devices and appliances, such as television sets and refrigerators, that were made 30 or more years ago. These items may leak small amounts of PCBs into the air when they get hot during operation, and could be a source of skin exposure.

❑ Eating contaminated food. The main dietary sources of PCBs are fish (especially sportfish caught in contaminated lakes or rivers), meat, and dairy products.

❑ Breathing air near hazardous waste sites and drinking contaminated well water.

❑ In the workplace during repair and maintenance of PCB transformers; accidents, fires or spills involving transformers, fluorescent lights, and other old electrical devices; and disposal of PCB materials.

How can PCBs affect my health?

The most commonly observed health effects in people exposed to large amounts of PCBs are skin conditions such as acne and rashes. Studies in exposed workers have shown changes in blood and urine that may indicate liver damage. PCB exposures in the general population are not likely to result in skin and liver effects. Most of the studies of health effects of PCBs in the general population examined children of mothers who were exposed to PCBs.

Animals that ate food containing large amounts of PCBs for short periods of time had mild liver damage and some died. Animals that ate smaller amounts of PCBs in food over several weeks or months developed various kinds of health effects, including anemia; acne-like skin conditions; and liver, stomach, and thyroid gland injuries. Other effects

of PCBs in animals include changes in the immune system, behavioral alterations, and impaired reproduction. PCBs are not known to cause birth defects.

How likely are PCBs to cause cancer?

Few studies of workers indicate that PCBs were associated with certain kinds of cancer in humans, such as cancer of the liver and biliary tract. Rats that ate food containing high levels of PCBs for two years developed liver cancer. The Department of Health and Human Services (DHHS) has concluded that PCBs may reasonably be anticipated to be carcinogens. The EPA and the International Agency for Research on Cancer (IARC) have determined that PCBs are probably carcinogenic to humans.

How can PCBs affect children?

Women who were exposed to relatively high levels of PCBs in the workplace or ate large amounts of fish contaminated with PCBs had babies that weighed slightly less than babies from women who did not have these exposures. Babies born to women who ate PCB-contaminated fish also showed abnormal responses in tests of infant behavior. Some of these behaviors, such as problems with motor skills and a decrease in short-term memory, lasted for several years. Other studies suggest that the immune system was affected in children born to and nursed by mothers exposed to increased levels of PCBs. There are no reports of structural birth defects caused by exposure to PCBs or of health effects of PCBs in older children. The most likely way infants will be exposed to PCBs is from breast milk. Transplacental transfers of PCBs were also reported In most cases, the benefits of breast-feeding outweigh any risks from exposure to PCBs in mother's milk.

How can families reduce the risk of exposure to PCBs?

❑ You and your children may be exposed to PCBs by eating fish or wildlife caught from contaminated locations. Certain states, Native American tribes, and U.S. territories have issued advisories to warn people about PCB-contaminated fish and fish-eating wildlife. You can reduce your family's exposure to PCBs by obeying these advisories.

❑ Children should be told not play with old appliances, electrical equipment, or transformers, since they may contain PCBs.

❑ Children should be discouraged from playing in the dirt near hazardous waste sites and in areas where there was a transformer fire. Children should also be discouraged from eating dirt and putting dirty hands, toys or other objects in their mouths, and should wash hands frequently.

❑ If you are exposed to PCBs in the workplace it is possible to carry them home on your clothes, body, or tools. If this is the case, you should shower and change clothing before leaving work, and your work clothes should be kept separate from other clothes and laundered separately.

Is there a medical test to show whether I've been exposed to PCBs?

Tests exist to measure levels of PCBs in your blood, body fat, and breast milk, but these are not routinely conducted. Most people normally have low levels of PCBs in their body because nearly everyone has been environmentally exposed to PCBs. The tests can show if your PCB levels are elevated, which would indicate past exposure to above-normal levels of PCBs, but cannot determine when or how long you were exposed or whether you will develop health effects.

Has the federal government made recommendations to protect human health?

The EPA has set a limit of 0.0005 milligrams of PCBs per liter of drinking water (0.0005 mg/L). Discharges, spills or accidental releases of 1 pound or more of PCBs into the environment must be reported to the EPA. The Food and Drug Administration (FDA) requires that infant foods, eggs, milk and other dairy products, fish and shellfish, poultry and red meat contain no more than 0.2-3 parts of PCBs per million parts (0.2-3 ppm) of food. Many states have established fish and wildlife consumption advisories for PCBs.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological profile for polychlorinated biphenyls (PCBs). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

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 E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-498-0093. 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

WEST NILE VIRUS/ST. LOUIS ENCEPHALITIS PREVENTION

WEST NILE VIRUS/ST. LOUIS ENCEPHALITIS PREVENTION

The following section is based upon information provided by the CDC Division of Vector-Borne Infectious Diseases. Symptoms of West Nile Virus include fever, headache, and body aches, occasionally with skin rash and swollen lymph glands, with most infections being mild. More severe infection may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and, rarely, death. Most infections of St. Louis encephalitis are mild without apparent symptoms other than fever with headache. More severe infection is marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, occasional convulsions (especially infants) and spastic (but rarely flaccid) paralysis. The only way to avoid infection of West Nile Virus and St. Louis encephalitis is to avoid mosquito bites. To reduce the chance of mosquito contact:

Stay indoors at dawn, dusk, and in the early evening.

Wear long-sleeved shirts and long pants whenever you are outdoors.

Spray clothing with repellents containing permethrin or DEET (N, N-diethyl-meta-toluamide), since mosquitoes may bite through thin clothing.

Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35% DEET. DEET in high concentrations (greater than 35%) provides no additional protection.

Repellents may irritate the eyes and mouth.

Whenever you use an insecticide or insect repellent, be sure to read and follow the manufacturer's directions for use, as printed on the product.

APPENDIX C
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: _____

Phone No.: _____

Name _____ Company: _____

Address: _____

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 D
EMERGENCY HAND SIGNALS

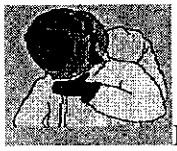
EMERGENCY SIGNALS

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!

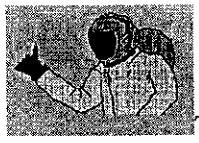
(No Picture) Grip partner's wrist or place both hands around waist

NEED ASSISTANCE!

Hands on top of head

OKAY! – I'M ALL RIGHT!

- I UNDERSTAND!



Thumbs up

NO! - NEGATIVE!

Thumbs down

APPENDIX C

COMMUNITY AIR MONITORING AND VAPOR CONTROL PLAN

West 61st Street Site
Offsite Investigation Work Plan
NYSDEC BCP No. C231043/C231059
NEW YORK, NEW YORK

Community Air Monitoring and Vapor Control Plan

AKRF Project Number: 10321

Prepared for:

Algin Management Co., LLC
64-35 Yellowstone Blvd.
Forest Hills, NY 11375

Prepared by:

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

SEPTEMBER 2007

TABLE OF CONTENTS

1.0 INTRODUCTION

This Community Air Monitoring and Odor and Vapor Control Plan specifies:

- The procedures to be implemented to control emissions of vapors, particulate matter, or odors resulting from operations on the site;
- The procedures for monitoring to detect any emissions from operations on the site which may impact the surrounding community; and
- The response measures to be implemented if such emissions are detected.

This Plan shall be implemented during all ground-disturbing activities, which includes soil borings and monitoring well installations. Procedures intended to detect and respond to conditions which may affect on-site personnel are specified in the Health and Safety Plan for this site.

2.0 DUST, ODOR, AND VAPOR SUPPRESSION

2.1 Dust, Odor and Vapor Control Measures

Emissions of odors and vapors will be controlled by minimizing, to the extent possible, the exposure of contaminated soil to the atmosphere. No excavations or test pits are planned as part of the West 61st Street Site Off-Site Investigation. Specific measures that will be implemented during the soil borings, monitoring well installations, and groundwater sampling include promptly containerizing investigation-derived wastes. An adequate supply of DOT-approved 55-gallon drums will be available on the Site so investigation-derived wastes may be immediately containerized.

3.0 PERIMETER MONITORING

Perimeter air monitoring will be performed for volatile organic compounds (VOCs) and particulate matter. Monitoring locations will be at the upwind and downwind boundaries of the exclusion zone. An on-site wind sock will be used to monitor the wind direction.

3.1 Perimeter Monitoring – Volatile Organic Compounds

3.1.1 Monitoring Procedure

Perimeter monitoring for VOCs will be conducted using an organic vapor meter (OVM) equipped with a photoionization detector (PID). The OVM will be capable of calculating 15-minute running average concentrations and equipped with an audible alarm to indicate the exceedance of an action level. Monitoring for VOCs at the upwind station will be conducted at the start of each workday and every time the wind direction changes to establish background conditions. Monitoring for VOCs at the downwind station will be conducted at a minimum frequency of once every two hours during soil boring and monitoring well installation. Background readings and any readings that trigger response actions will be recorded in the project logbook, which will be available on site for NYSDEC/NYSDOH review.

3.1.2 Response Actions

If the ambient (breathing zone) air concentration of VOCs at the Site perimeter exceeds 5 parts per million (ppm) over a 15-minute time weighted running average, but does not exceed 25 ppm, then invasive work activities will be temporarily halted. If VOC levels readily return to below 5 ppm, then work may resume with continued monitoring. If VOC levels do not readily return to below 5 ppm, then

work will be halted and NYSDEC and NYSDOH will be notified immediately. The source of the VOC emissions will be identified and corrective actions taken to reduce emissions. Work will not resume until VOC levels are below 5 ppm.

If the ambient (breathing zone) air concentration of VOCs at the site perimeter exceeds 25 ppm over a 15-minute time weighted running average then work will be halted and NYSDEC and NYSDOH will be notified immediately. Confirmatory air samples will be collected at the upwind and downwind site perimeters for laboratory analysis. Samples will be collected over a half-hour period in six-liter SUMMA canisters using flow controllers set at a rate of 0.2 liters per minute. The air samples will be analyzed for VOCs including tentatively identified compounds (TICs) be EPA Method TO-15. The source of the VOC emissions will be identified and corrective actions taken to reduce emissions. Work will not resume until VOC levels are below 5 ppm and the start-up is approved by NYSDEC and NYSDOH.

3.2 Perimeter Monitoring – Particulates

3.2.1 Monitoring Procedure

Community air monitoring for dust particulates will be conducted using a real time particulate monitor that measures the concentration of airborne respirable particulates less than 10 micrometers in size (PM10). The monitor will be capable of calculating 15-minute running average concentrations and equipped with an audible alarm to indicate exceedance of action levels. Monitoring for particulates at the upwind location will be conducted at the start of each workday and every time the wind direction changes to establish background conditions. Monitoring at the downwind station will be conducted at a minimum frequency of once every two hours. Background readings and any readings that trigger response actions will be recorded in the project logbook, which will be available on site for NYSDEC/NYSDOH review.

3.2.2 Response Actions

If downwind PM10 concentrations exceed 100 micrograms per cubic meter ($\mu g/m^3$) above background for a 15-minute time-weighted average, then invasive work activities will be temporarily halted and resume only after the source of the dust has been identified, dust-suppression measures have been implemented, and the downwind PM10 level is less than 100 $\mu g/m^3$ above background for a 15-minute time-weighted average.

4.0 ODOR AND VAPOR CONTROL CONTINGENCY

If the odor and vapor control measures described in Section 2.0 are not adequate to prevent repeated exceedances of perimeter monitoring action levels, or to prevent off-site impacts as detected by the neighborhood odor and vapor monitoring program, then the invasive activities that resulted in the exceedences will be suspended and following contingency measures will be implemented:

- NYSDEC and NYSDOH will be notified.
- A revised plan for dust, vapor and odor control with alternative work practices and control measures will be submitted to NYSDEC and NYSDOH.
- The suspended activities will not be resumed until the revised dust, vapor and odor control plan is approved by NYSDEC and NYSDOH, and the alternative work practices and control measures are implemented.

APPENDIX D
GLOSSARY OF TERMS

LIST OF ACRONYMS

AKRF – AKRF, Inc.

ASP – Analytical Services Protocol

AST – aboveground storage tank

BCP – Brownfield Cleanup Program

DNAPL – dense non-aqueous phase liquid

DOT – Department of Transportation

EPA – United States Environmental Protection Agency

ESA – Environmental Site Assessment

IDW – investigation-derived waste

LNAPL – light non-aqueous phase liquid

NTU -- nephelometric turbidity units

NYSDEC – New York State Department of Environmental Conservation

NYSDOH – New York State Department of Health

PCB – polychlorinated biphenyls

PID – photoionization detector

QAPP – Quality Assurance Project Plan

RI – remedial investigation

RIR – Remedial Investigation Report

RSCO – Recommended Soil Cleanup Objective

RWP – Remediation Work Plan

SVOC – semivolatile organic compound

TAGM – Technical and Administrative Guidance Memorandum

TAL – target analyte list

TCLP – Toxic Characteristic Leaching Procedure

TOGS – Technical and Operational Guidance Series

TPH – total petroleum hydrocarbons

USGS – United States Geological Society

UST – underground storage tank

VOC – volatile organic compound

APPENDIX E
PROJECT MAILING LIST

PUBLIC NOTIFICATION CONTACT LIST (UPDATED 7/06/06)

West 61st Street Site, New York, NY
BCP ID: C231043/C231059

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Paul Hastings Janofsky & Walker, LLP
75 East 55th Street
New York, New York 10022

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City Hall
New York, NY 10007

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State Senator
757 Third Avenue, Suite 17-02
New York, NY 10017

Honorable Hillary Clinton
State Senator
780 Third Avenue, Suite 2601
New York, NY 10017

Honorable Jerrold Nadler
Congressman -- 8th Congressional District
201 Varick Street Suite 669
New York, NY 10014

Honorable Scott Stringer
Assemblyman -- 67th Assembly District
230 West 72nd Street
New York, NY 10023

Honorable Richard N. Gottfried
Assemblyman – 75th Assembly District
242 West 27th Street
New York, NY 10023

Ms. C. Virginia Fields
Manhattan Borough President
1 Centre Street 19th Floor
New York, NY 10007

Mr. Shaun Donovan
Commisioner of Dept. of Housing Preservation and Development
100 Gold Street
New York, NY 10038

Ms. Hope Cohen
Chair, Community Board 7
1865 Broadway
New York, NY 10023

Mr. Robert Kulikowski, PhD, Director
New York City Office of Environmental Coordination
100 Gold Street, Second Floor
New York, NY 10038

Ms. Amanda M. Burden, AICP
Chair of the City Planning Commission and
Director of Department of City Planning
NYC Department of City Planning
22 Reade Street
New York, NY 10007-1216

Commissioner Emily Lloyd
NYC Department of Environmental Protection
59-17 Junction Boulevard
Corona, NY 11368-5107

Michael Lesser
Division of Environmental Enforcement
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233

Mr. Daniel Walsh
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 2
47-40 21st Street
Long Island City, N.Y. 11101-5407

Mr. Shaminder Chawla
New York State Department of Environmental Conservation
47-40 21st Street
Long Island City, NY 11101

West 60th Street Associates, LLC; West End Enterprises, LLC
Bennet Schonfeld, Esq., c/o Algin Management Co., LLC
64-35 Yellowstone Boulevard
Forest Hills, NY 11375

Seventh Frogmouth Corp., Cohen 101
3900 Galt Ocean Dr.
Fort Lauderdale, FL 33308-6631

250 West 61ST Street
35 Longvue Ave.
New Rochelle, NY 10804-4118

AJH 61 Corp.
270 West 89th St.
New York, NY 10024-1705

225-227 West 60TH Street
575 Lexington Ave.
New York, NY 10022-6102

NYC Department of Education
1 Centre St, 19th Fl.
New York, NY 10007-1602

Hasko Utilities Co., Inc.
80 Main St.
Mineola, NY 11501

240 West 60TH Street, C/O Louis DeStephanis
P.O. Box 400
Southampton, NY 11969-0400

Parks and Recreation-Arsenal West
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New York, NY 10023-7604

Paul Alpuche
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Blauvelt, NY 10913-1204

Bancamerica Comm. CRP
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San Francisco, CA 94104-1502

211 W. 61st St. Associates, LP
187 Millburn Ave. Suite 6
Millburn, NJ 07041-1845

Resident
242 West 61st St.
New York, NY 10023

Resident
244 West 61st St.
New York, NY 10023

Occupant
246 West 61st St.
New York, NY 10023

Occupant
34 West End Ave.
New York, NY 10023

Occupant
20 West End Ave.
New York, NY 10023

Occupant
225 West 60th St.
New York, NY 10023

P.S. 191
210 West 61st St.
New York, NY 10023

Occupant
555 West 59th St.
New York, NY 10019

Occupant
240 West 60th St.
New York, NY 10023

Occupant
533 West 59th St.
New York, NY 10023

Occupant
236 West 60th St.
New York, NY 10023

Occupant
238 West 60st St.
New York, NY 10023

Resident
227 West 61st St.
New York, NY 10023

Resident
211 West 61st St.
New York, NY 10023

Daily News
220 East 42nd Street
New York, NY 10017

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59-17 Junction Boulevard, 10th Floor
Elmhurst, New York 11373

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