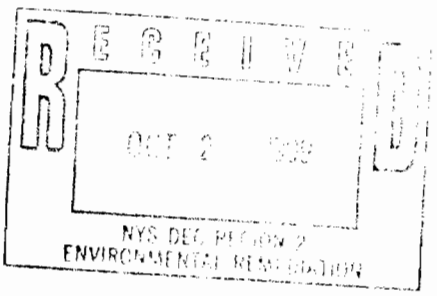
REMEDIAL WORK PLAN
132-20 MERRICK BOULEVARD
SPRINGFIELD GARDENS
QUEENS, NEW YORK



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1. INTRODUCTION

The Voluntary Cleanup site is located at 132-20 Merrick Boulevard in Springfield Gardens, Queens (see site location and vicinity map, Figures 1 and 2). This Remedial Work Plan presents the conceptual plan for remediation of the site. Further submissions will be made to DEC as described below. The goal of the remediation is to remove solvent contamination from the shallow upper glacial aquifer unit so the groundwater is not adversely affected by on-site conditions.

1.1 Site Description

The site consists of approximately 8.56 acres. An approximately 189,000 square-foot, vacant warehouse, along with paved parking areas, occupies nearly the entire project site. The subject property is designated as Block 12999, Lot 44. The project site is bounded on the north by Merrick Boulevard, on the south by 137th Avenue, on the east by Belknap Street, and on the west by the Long Island Railroad tracks.

The site is located in a light industrial area, which includes commercial and residential uses. To the north, along Merrick Boulevard, and to the east, opposite the Long Island Railroad tracks, along Springfield Avenue, are commercial properties. Residential areas are located to the south of the site, along Belknap Street. A public school is located approximately 1,000 feet to the southeast of the project site, on the west side of Belknap.

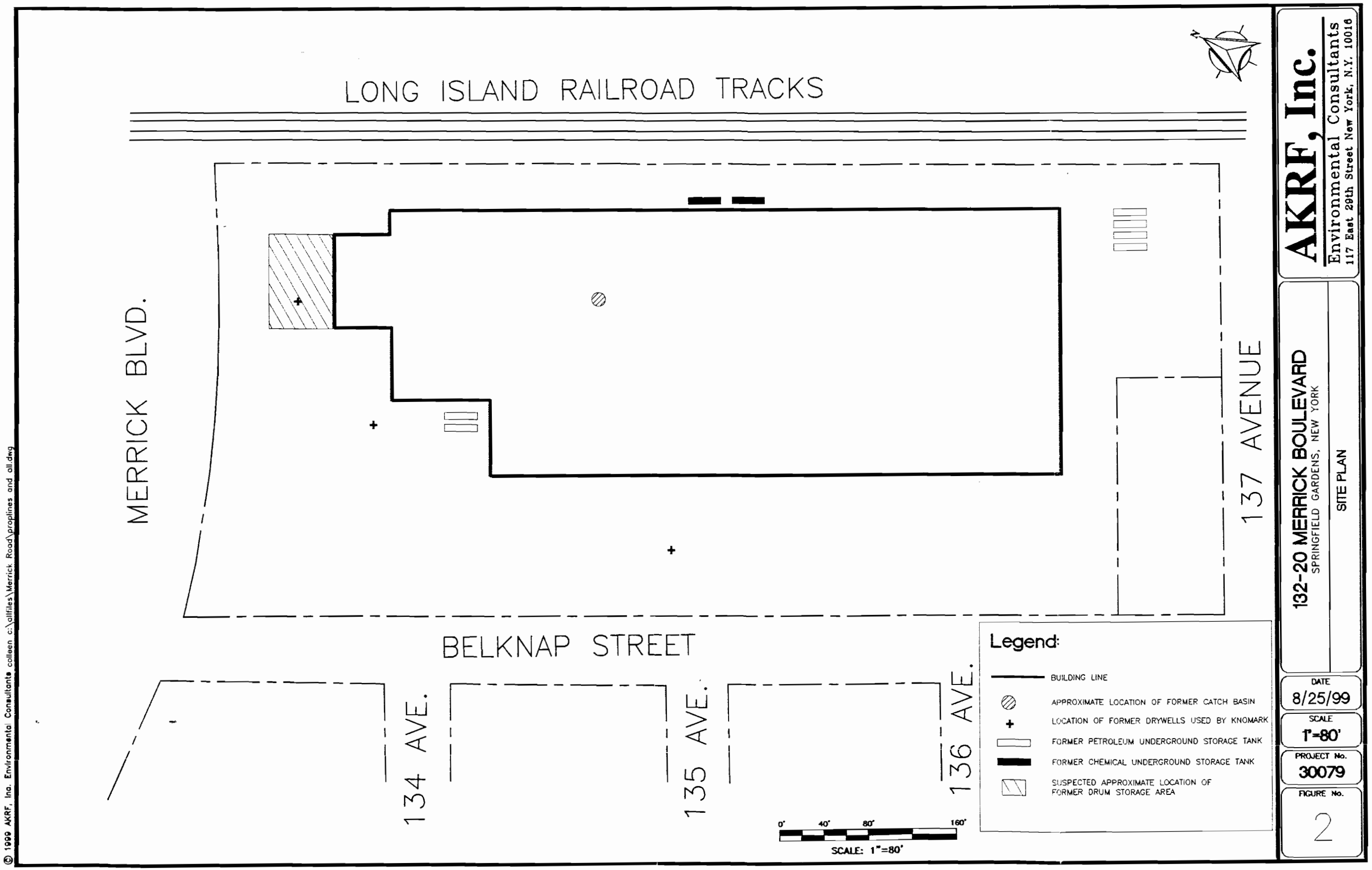
Water wells belonging to the New York City Department of Environmental Protection (DEP), formerly of the Jamaica Water Company, are situated approximately 3,000 feet to the northeast, at 90-42 Springfield Boulevard, and 4,000 feet to the east, at 222nd Street and 134th Road.

The following table provides further information about the nearest wells in the area, and is based upon data published by the former Jamaica Water Supply Company and conversations with the current owner of these wells, the New York City Department of Environmental Protection (DEP).

DEC Well No.	Location/distance from project site	Aquifer	Well depth/ Production rate	Remarks
Q3029	Springfield Blvd. & Lucas Street/ 3,000 ft. NE of project site	M	445 feet 1.87 M.G.D.	Active well used as potable drinking water source. Upgradient of project site.

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

FIGURE No. 1	PROJECT No. 30079	SCALE	DATE 8/25/99	132-20 MERRICK BOULEVARD SPRINGFIELD GARDENS, NEW YORK PROJECT SITE LOCATION CLOSEST WELLS TO SITE	AKRF, Inc. Environmental Consultants 117 East 29th Street New York, N.Y. 10016



DEC Well No.	Location/distance from project site	Aquifer	Well depth/ Production rate	Remarks
Q2955	222nd Street and 134th road/ 4,000 ft. E of project site.	M	417 feet 1.87 M.G.D.	Active well used as potable drinking water source. Cross-gradient of project site.

Key: M = Magothy wells; M.G.D. = Millions of Gallons per Day

1.2 Geology and Hydrogeology

The hydrogeologic units in Queens County, New York consist of unconsolidated sediments underlain by crystalline bedrock. The aquifer system underlying the project site is designated by the U.S. Environmental Protection Agency as a "sole source aquifer" for drinking water supply.

The principal hydrological units on the project site are upper Pleistocene glacial deposits, the Gardiners Clay, and the Magothy Formation. Boring logs and geophysical logs of the three Magothy wells at the site (MW-9M, MW-14M, and MW-17M) reveal the presence of a six to eight foot clay layer at approximately 55-60 feet that is continuous throughout the site. This unit is referred to as the "Gardiners Clay" in the Roux Report. Below the "Gardiners Clay" is another clay layer, at approximately 140 feet, that is less continuous, as discussed in the Roux Associates Report. Well design drawings indicate that the wells in the Magothy were properly installed, thereby avoiding cross-contamination between the upper glacial units and the underlying Magothy. (Note: well construction drawings show that the Magothy wells had been screened 60 feet below the "Gardiners Clay", have a 5-foot bentonite seal above the well screen, and had a cement/bentonite grout around the PVC well casing.) Thus, the Gardiners Clay restricts flow between the upper Pleistocene deposits and the underlying Magothy Formation.

On site monitoring wells revealed an approximate depth to groundwater of 17 feet in the shallow upper Pleistocene glacial deposits and 88 feet in the Magothy Unit (Note: on-site wells in the aquifers have been screened at various depths, and therefore have been described as a shallow upper glacial, deep upper glacial, shallow Magothy, and deep Magothy). Based upon surveyed groundwater elevations, the direction of groundwater flow is to the southeast for the upper glacial aquifer units and to the southwest for the Magothy. Prior to 1986, the regional groundwater flow in the area had been to the north, towards the former Jamaica Water Company well field at 90-42 Springfield Boulevard. A pump test showed the groundwater flow rate of the upper Pleistocene glacial deposits to be 1 foot per day, and of the Magothy to be 0.1-0.2 foot per day.

1.3 Prior Site Usage

Below is a brief summary of the site history based on the Phase I Environmental Assessment Report prepared by Eder Associates on behalf of the current property owner dated July 1998, and

the Phase I Environmental Site Assessment Report prepared by EMCON on behalf of the United States Postal Service.

Prior to 1957:

Historical Sanborn maps for 1926 and 1949 show no industrial usage of the site for this period. According to the 1926 map, only a private residence occupied the northwest corner of the site, with the remainder of the site being undeveloped. By 1949, the site was labeled as "Sherwood Oval" and appeared to be playing fields.

1957-1988:

Knomark Inc constructed the current on-site building in 1957. This firm manufactured various products, including fabric softeners, toilet bowl cleaners, fabric dyes and shoe polish from 1957 to 1988. By the early 1960s the current property owner had purchased the property from Knomark, which continued to occupy the site until 1988 as a tenant.

Knomark's manufacturing process used the solvent tetrachloroethene (PCE) and mineral oil spirits. The company had stored each of these chemicals in two 5,000-gallon underground storage tank (USTs) on the property. Other chemicals used by Knomark included 1,1,1-trichloroethene, methylene chloride and methyl ethyl ketone. The key manufacturing process involved the use of batch mixing tanks (for mixing of volatile chemicals) and kettles (for nonvolatile chemicals). Sludge from Knomark's manufacturing process settled out into an above-ground catch basin and was disposed of off-site by a private waste contractor. After the sludge had settled out into the catch basin, the wastewater from the facility was discharged into New York City's sewer lines. See Roux Associates Inc. report titled "Environmental Audit", dated 1988 for a detailed description of Knomark's manufacturing processes

1988-1999

After Knomark left the site, United Parcel Service (UPS) leased the property between 1988 and 1998 as a processing and distribution center for shipped packages. UPS also installed petroleum USTs for fueling of its vehicles. UPS vacated the site during 1995, and the property has remained vacant since that year.

1.4 Previous Environmental Studies and Remediation

Numerous soil and groundwater investigations have been conducted on the project. A brief overview of the previous testing and remediation work is presented below. The reports, test results and other documentation cited have previously been submitted to DEC.

Existing site conditions prior to site cleanup, by Roux Associates: "Environmental Audit of Toxic and Hazardous Waste Management and Disposal at Knomark, Inc. (1988)

Roux Associates ("Roux") was retained by the law firm, Shea and Gould, representing the property owner, to conduct an environmental audit when the facility was still occupied by its tenant Knomark. The purpose of Roux's audit was to evaluate environmental conditions existing at the site in order to determine Knomark's responsibility for cleanup at the termination of its lease.

Significant findings of Roux's 1988 audit are as follows:

- Knomark used volatile chemicals, including tetrachloroethylene, 1,1,1-trichloroethane, methylene chloride, and methyl ethyl ketone, in its manufacturing process. The manufacturing of dyes account for most of these chemicals used at the facility.
- All wastewater from the building led to an indoor, above-ground catch basin (for settling and sludge collection) which then discharged into the city sewer lines. Knomark generated approximately 6,000 kilograms of sludge per month, which was pumped out regularly from the aboveground catch basin and carted off-site by Liberty Ash of Elmont, New York. Air emissions by Knomark generally complied with permits from the City of New York Department of Environmental Protection.
- Several potential sources of groundwater contamination were identified and included a drum storage outside the building, at the north end of the site, lacked a drum storage pad or bermed area, underground chemical storage and petroleum storage tanks, and spills or leaks onto the ground, which could migrate into on-site drywells in the parking areas
- Soil samples taken from a drywell near the exterior drum storage area and in the back of the building had elevated levels of solvents (See following section and discussion of TRC Environmental Consultants Report).

Site Cleanup by Knomark (1988)

In 1988, Knomark retained H2M Group to conduct site activities relating to the closure of its site operations, including overseeing the surficial cleaning of stained building surfaces, removal of the chemical storage and fuel oil USTs (one 10,000-gallon and one 20,000-gallon tank), and removal of two drywells and associated contaminated soil. The remediation firm, Marine Pollution Control of Patchague, New York performed the

excavation of contaminated soil surrounding storm drains, as reported by Roux Associates (See Roux Associates Report dated 1989). Documentation indicating the scope of the soil removal is not available at this time.

H2M oversaw removal of the chemical storage tanks, the drywells and associated contaminated soil. The building owner retained Roux Associates, which completed the surficial cleaning of the building and removal of the fuel oil USTs (See Roux Associates Reports titled "Results of the Building Decontamination" and "Removal of Underground Fuel Oil Tanks").

H2M prepared no closure report documenting the removal of the dry wells, contaminated soil, and chemical storage USTs. A subsurface investigation conducted at the time of H2M cleanup documented the excavation of two drywells and associated contaminated soil (See TRC Environmental Consultants Report). Results of screening soil for volatile contamination in the area previously occupied by the chemical tanks indicated no contaminated soil in these areas. These results were forwarded to the New York State Department of Environmental Conservation (DEC). See letter to the DEC from Shea & Gould, along with head-space measurements by H2M, indicating no remaining contamination from the chemical tanks.

Subsurface Investigation by TRC: "Environmental Investigation of Subsurface Conditions", (1988)

TRC Environmental Consultants (TRC) was retained by United Parcel Service (UPS) to assess potential groundwater contamination at the site prior to UPS's lease. To meet this objective, TRC installed one (1) downgradient monitoring well and six (6) monitoring wells within the immediate vicinity of the underground fuel oil USTs, the former chemical USTs, and the dry wells north of the building. In addition, TRC sampled blue-stained soil from excavated areas formerly occupied by drywells and the northeast corner of the building. Groundwater samples were analyzed for volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs), total petroleum hydrocarbons, and RCRA metals. Soil samples were analyzed for VOCs and RCRA metals.

The significant findings of TRC's report were:

- No VOCs were found in blue-stained soil from areas near the drywells removed during Knomark's cleanup of the site.
- Solvents were found in all but one of the wells. TRC attributed the groundwater contamination to past usage of the property. However, the highest levels of VOCs were found in a well at the upgradient end of the site, and further testing indicated an off-site source of solvent contamination (See Roux, 1990 Report).
- All drywells and soil contaminated by solvents were excavated from the property.

Site Cleanup by Roux Associates: "Results of Building Decontamination", (1989)

The property owner retained Roux Associates to complete the site cleanup. Roux oversaw the decontamination of the building, which was performed by O.H. Materials, and documented this cleanup in its report dated March 21, 1989. A total of 25 concrete chip samples from the first floor and 15 concrete chip samples from the second floor were collected and analyzed for EP Toxicity for metals using EPA method 1310.

Significant findings of Roux Associates Report were:

- All floors and walls of the second floor and production areas of the first floor underwent the following surficial cleanup,
  a. power washing,
  b. removal of chemically deteriorated concrete,
  c. collection of any standing water for off-site disposal,
  d. sandblasting of cleaned surfaces,
  e. confirmatory concrete chip sampling after completion of surficial cleaning, and
  f. epoxy coating of cleaned surfaces.
- Laboratory results indicated that metal levels were 10 percent or less of the Toxic Characteristic Leaching Procedure (TCLP) standards,
- Building decontamination resulted in the accumulation of 60 cubic yards of hazardous waste, which was incinerated off-site as per applicable regulations.

Removal of Underground Fuel Oil Tanks by Roux Associates: "Removal of Underground Fuel Oil Tanks" (1989)

Roux Associates was retained by the building owner to oversee the removal of two underground fuel oil tanks (a 10,000-gallon and a 20,000-gallon tank). The 10,000-gallon tank had stored number two fuel oil and the 20,000-gallon tanks had stored number four fuel oil. The tanks were being removed because the new tenant, United Parcel Service, was converting the heating system to natural gas.

Significant findings of Roux's report were:

- The tanks had been tightness tested prior to removal, and after repairs to the feed line of the 10,000 gallon UST, both tanks passed the test,
- Soil borings in the UST areas showed petroleum contaminated soil at 8-10 feet within the vicinity of the repaired feed line, and
- The NYDEC representative, Randy Austin, was present during the removal of the tanks, and directed the removal of 10 cubic yards of petroleum contaminated soil along the previously repaired feeder line.

Subsurface Investigation by Roux Associates, "Evaluation of Soil and Ground-water Quality" (1989)

Roux performed a comprehensive soil and groundwater sampling program on behalf of the property owner in response to TRC's report that the site had impacted groundwater conditions. The study included installation of 18 monitoring wells and 20 soil borings. Groundwater samples were collected from both the upper glacial unit and the Magothy Formation. These two separate aquifers were screened at four depth intervals: shallow upper glacial unit (18-28 feet below grade), deep upper glacial unit (50-60 feet), Magothy (90-100 feet), and deep Magothy (130-140 feet).

Significant findings of Roux's 1989 study were:

- No significant contamination was detected in soil above the groundwater table.
- Groundwater flow in the shallow and intermediate aquifers is to the southeast. Groundwater flow in the deep aquifer is to the southwest.
- Prior site usage had caused a limited impact to groundwater conditions on the property, and was mainly attributed to releases that had occurred in the former drum storage area outside the building.

Ground Water Sampling Report by Roux Associates: "Results of the April 1990 Groundwater Sampling" (1990)

Roux resampled all groundwater monitoring wells in response to a meeting between the property owner and the DEC. New wells were installed to replace damaged existing wells. A total of 22 on-site monitoring wells were sampled.

Significant findings of Roux's 1990 groundwater study were:

- Groundwater contamination on the site was attributed to an off-site source. Highest levels of solvents were detected in the groundwater wells at the upgradient end of the property, which is to the north.
- Roux concluded that no further action was warranted for the site since an off-site source was responsible for the groundwater contamination.

Tank Closure Report by Leggette, Brashears & Graham, Inc.: "Underground Storage Tank Closure" (1998)

UPS retained Leggette, Brashears & Graham Inc. (LBG) to conduct environmental monitoring during the removal of its petroleum USTs and aboveground storage tanks (ASTs). The closure activities included the removal of four 4,000-gallon gasoline USTs, two dispenser islands and associated piping, and removal of two 275 gallon ASTs used for the storage of anti-freeze and used-oil.

Significant findings of LBG's report were:

- A visual inspection of the gasoline USTs showed that the tanks were in excellent condition,
- Post-excavation sampling results from the gasoline USTs areas indicated no impact to surrounding soil conditions,
- Post-excavation sampling results from the dispenser islands and associated piping indicated no impact to surrounding soil conditions, and
- A visual inspection of the two 275-gallon ASTs showed that the tanks to be in excellent condition.

Phase II Study by Malcolm Pirnie Inc.: Analytical Results Only (1998)

Malcolm Pirnie performed soil and groundwater sampling on behalf of a prospective buyer. The sampling consisted of collecting and analyzing 14 soil samples and resampling groundwater from existing wells.

Significant findings of Malcolm Pirnie's investigation were:

- No solvents were detected in any of the soil samples,
- No pesticides, semivolatile organic compounds (SVOCs) or polychlorinated biphenyls (PCBs) were detected in the groundwater wells, and
- Low levels of solvents were detected in the existing wells. They were similar to the levels detected by Roux in its 1990 groundwater sampling.

Dry well sampling cleanup of drywells by Malcolm Pirnie/Corrective Action by Eder Associates: Letter Report by Eder (1998)

Malcolm Pirnie and Eder sampled the sediment found inside the current on-site drywells. Analytical results identified no VOCs in the samples. Eder also removed the drywell sediment and disposed of it as a petroleum-contaminated waste.

Subsurface Investigation by AKRF Inc.: Phase II Environmental Assessment (1999)

Forest City Ratner Companies, a prospective purchaser, retained AKRF to implement a comprehensive soil and groundwater investigation as well as to sample building materials for asbestos. The overall objectives of the study were:

1. Confirm the current direction of groundwater flow and groundwater quality,
2. Sample soil and groundwater underneath the building since no previous testing had evaluated subsurface conditions at this location,
3. Sample soil and groundwater in the areas of the former chemical tanks and dry wells to verify that these areas of environmental concern had been remediated,
4. Perform an asbestos survey to identify, locate and quantify asbestos-containing

building materials.

AKRF sampled all 18 existing monitoring wells, collected 8 soil samples and 6 groundwater samples under the building, and collected 8 soil samples from the former locations of chemical USTs and drywells.

Significant findings of AKRF's Phase II Environmental Assessment were:

- Laboratory analysis showed only trace amounts of VOCs in the soil. The levels detected were well below DEC recommended cleanup objectives for soil at inactive hazardous waste sites and DEC guidance values for petroleum spills (Stars Memorandum #1). Thus, past remedial actions, as documented in prior studies, were effective in removing solvent and gasoline contamination from the vadose zone.

- Solvent levels, in particular tetrachloroethene, exceeded DEC Class GA water quality standards at most groundwater sampling locations in the shallow upper glacial aquifer. The highest tetrachloroethene levels were found downgradient or within the immediate vicinity of former chemical drum storage area, drywells (removed), and chemical storage tanks. This finding suggests that prior site usage contributed to the impact to the site's groundwater quality. The presence of tetrachloroethene in upgradient wells suggests that an off-site source is also present.

- Solvent levels in the deep upper glacial aquifer did not exceed DEC class GA standards. Historic levels of tetrachloroethene showed a noticeable decrease in all wells installed in the deep upper glacial aquifer. The higher levels of solvents detected in the Magothy wells most likely reflect a regional groundwater problem. The former Jamaica Water Supply Company operated wells in the Magothy throughout southeastern Queens, New York. As of 1990, groundwater quality data showed that nearly half of their Magothy wells had solvent levels greater than 5 ppb or pumped to a VOC removal treatment plant. The current owner of the Jamaica Water Supply Company wells, the NYCDEP, reports a similar widespread contamination of the Magothy in the area at this time. Furthermore, groundwater sampling on the site showed the presence of tetrachloroethene at the upgradient Magothy well MW-14 (well is located at the north end of the site). This finding lends further support that the PCE detected in the Magothy wells reflects the regional groundwater quality.

- The asbestos survey identified no asbestos-containing materials (ACMs) within the interior and exterior of the building.

Supplemental Soil/Groundwater Sampling by AKRF Inc.: Results Only (1999)

At the time of AKRF's Phase II investigation, AKRF was unable to locate monitoring well MW-12 installed by Roux Associates at the northwest corner of the site is no longer

present. Consequently, AKRF installed a replacement well in the shallow upper glacial aquifer at this location. The purpose of installing this well was to determine groundwater conditions at the upgradient end of the site, to verify the groundwater flow direction to the southeast, and to identify any potential on-site sources of contamination at this location. During the installation of the replacement well, MW-12 was found. Consequently, the replacement well, MW-18S, was offset to the south in order to optimize site coverage.

During installation of the monitoring well, soil samples were collected every two feet until the groundwater table. Based upon field measurements or observations, soil samples exhibiting evidence of contamination were submitted to a state certified laboratory and analyzed for TCL-VOCs. Sampling and analytical methodology complied with applicable DEC and New York State Department of Health (DOH) protocol.

Significant findings of AKRF's supplemental testing were:

- Soil sampling found no tetrachloroethene in the soil above the groundwater at MW-18S (Results are included in Appendix C).

Supplemental Indoor Air Quality Study by AKRF Inc.:

AKRF performed an indoor air monitoring survey of the existing on-site building located at 132-20 Merrick Boulevard in the Springfield Gardens neighborhood of Queens, New York. The purpose of this air sampling was to determine whether nearby groundwater contamination by tetrachloroethene (PCE) had impacted the ambient atmosphere within the on-site building. All sampling and analysis was conducted in accordance with New York State Department of Health protocol.

Significant findings of AKRF's supplemental indoor air quality study were:

- Levels of airborne volatile organic compounds inside the building were comparable to background levels measured outside the building and to levels measured at the NYSDEC monitoring station in Brooklyn, which is considered typical of urban background levels.
- All PCE levels were less than 1 part per billion (Results are included in Appendix D).

1.5 Evaluation of Environmental Contamination

Extensive sampling has occurred on the project site. Figure 3 shows all soil sampling locations except those by Malcolm Pirnie, which are unavailable, and by Leggette, Brashears & Graham, Inc., which correspond only to the former gasoline tank area. Figure 4 shows all groundwater sampling locations.

LONG ISLAND RAILROAD TRACKS

MERRICK BLVD.

137 AVENUE

BELKNAP STREET

134 AVE.

135 AVE.

136 AVE.

GP-11 GP-10 GP-17 SB-1 GP-6 SB-16 SB-18 GP-1 SB-12 GP-12 SB-13 SB-2 GP-4 GP-3 GP-5 SB-19 GP-9 GP-13 SB-11 SB-3 GP-15 SB-14 GP-2 GP-7 SB-10 GP-16 SB-20 GP-14 SB-15 GP-8 SB-4 SB-8 SB-7 SB-6 SB-5 SB-9

0' 40' 80' 160'

SCALE: 1"=80'

Legend:

- BUILDING LINE
- GEOPROBE SOIL SAMPLING BY AKRF
- SOIL SAMPLING BY ROUX ASSOCIATES
- SOIL SAMPLING BY TRC
- APPROXIMATE LOCATION OF FORMER CATCH BASIN
- LOCATION OF FORMER DRYWELLS USED BY KNOMARK
- FORMER PETROLEUM UNDERGROUND STORAGE TANK
- FORMER CHEMICAL UNDERGROUND STORAGE TANK
- SUSPECTED APPROXIMATE LOCATION OF FORMER DRUM STORAGE AREA

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132-20 MERRICK BOULEVARD
SPRINGFIELD GARDENS, NEW YORK

SOIL SAMPLING LOCATIONS

DATE 8/25/99

SCALE 1"=80'

PROJECT No. 30079

FIGURE No. 3

LONG ISLAND RAILROAD TRACKS

MERRICK BLVD.

137 AVENUE

MW-4
MW-15 PCE 440 ppb
MW-16 PCE 870 ppb
MW-5S PCE 710 ppb
MW-6 PCE 120 ppb
MW-17S PCE 74
MW-17I
MW-17M
GP-6 PCE 4 ppb
GP-4 PCE 8 ppb
GP-5 PCE 8 ppb
MW-1
MW-14S PCE 82 ppb
MW-14I
MW-14M
MW-14D
MW-3 PCE 240 ppb
GP-9 PCE 290 ppb
MW-2 PCE 43 ppb
GP-2 PCE ND ppb
MW-7I
MW-7 PCE ND ppb
GP-8 PCE ND ppb
MW-13 PCE 5 ppb
MW-18s
MW-125
MW-11 PCE 2 ppb
MW-10
MW-9

BELKNAP STREET

134 AVE.
135 AVE.
136 AVE.

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

Legend:

- APPROXIMATE EXTENT OF CONTAMINATION IN SHALLOW UPPER GLACIAL UNIT
- BUILDING LINE
- SHALLOW UPPER GLACIAL — Monitoring wells (shallow) MW-# (NO LETTERS) OR (LETTER S)
- DEEP UPPER GLACIAL — MW-# (W/ LETTER I) Geoprobe Sample Location
- MAGOTHY AQUIFER — MW-# (W/ LETTER M OR O)
- WELL NOT FOUND

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132-20 MERRICK BOULEVARD
SPRINGFIELD GARDENS, NEW YORK

GROUNDWATER SAMPLING LOCATIONS

DATE 8/25/99
SCALE 1"=80'
PROJECT No. 30079
FIGURE No. 4

Based upon the results of this extensive soil and groundwater testing, the tetrachloroethene levels in the shallow upper glacial unit represent the only environmental contamination requiring remediation. As explained previously, the low levels of solvent contamination in the deeper Magothy can be attributed to off-site sources.

An evaluation of other environmental issues is presented below.

Contaminated soil above the water table

Soil sampling at over 40 locations (3 by TRC, 20 by Roux Associates, 16 by AKRF Inc., and 7 by Malcolm Pirnie) showed no elevated levels of VOCs in the soil. Soil sampling by TRC Consultants and Roux Associates at over 20 locations (3 by TRC, 20 by Roux Associates) detected no elevated levels of metals in the soil.

VOC Levels in the soil gas

Subsurface investigations by Roux Associates (1989) and AKRF (1999) evaluated VOC levels in the soil gas. In both studies, the method used to measure VOC levels in the soil gas consisted of collecting soil samples, then taking head-space readings with appropriate field instrumentation (organic vapor meter). Headspace readings showed no elevated levels of VOCs in the soil gas due to solvent contamination. In nearly all borings, VOC levels in the soil gas ranged from nondetected to ten parts per million (Note: elevated VOC levels were found within the immediate vicinity of a former fuel oil tank. As documented by Roux Associates Tank Closure Report, the petroleum impacted soil was removed from the site.)

This finding coincides with the soil sampling results, which showed VOC levels in the soil to be well below New York State cleanup objectives, as per Technical Guidance Memorandum 4046 (See Table 2 in AKRF Report and Table 10 of Roux 1989 report), and documentation indicating the removal of contaminated soil above the groundwater table. Other than installation of subsurface utilities during site development, no significant disturbance of the site soils is planned.

PCBs:

The original Knomark facility potentially had PCB-containing capacitors and step-up transformers inside the building (See Roux Environmental Audit Report). This equipment was removed prior to tenant occupancy by UPS. All stained floor and wall surfaces were removed during building decontamination activities (See Roux Environmental Audit Report). AKRF's soil borings revealed no oil-stained soil beneath the building slab. Groundwater sampling by Malcolm Pirnie identified no PCBs in the wells tested.

Petroleum Bulk Storage Tanks:

All petroleum USTs and ASTs have been removed from the property. Post-excavation sampling results showed that the gasoline USTs and associated piping caused no impact to soil

conditions. Roux Associates documented that the DEC oversaw the removal of the 10,000- and 20,000-gallon fuel oil USTs and any petroleum contaminated soil.

Asbestos-containing materials (ACMs):

AKRF's asbestos survey identified no ACMs within the interior and exterior of the building. These findings coincide with a letter from Hygeia Inc., dated March 17, 1989, stating that ACMs have been removed from the building.

1.6 Further testing

As previously discussed, AKRF was unable to locate monitoring well MW-12 during our Phase II Investigation. Consequently, a replacement well, MW-18S, was installed in the shallow upper glacial aquifer at the northwest end of the site. In addition, an off-site well to the north of the project site, along Merrick Boulevard, will be installed. The purpose of sampling MW-18S, MW-12 and the new off-site well is to determine groundwater conditions at the upgradient end of the site, to verify the groundwater flow direction to the southeast, and to identify any potential on-site sources of contamination at this location. To accomplish this objective, MW-18S and the off-site well will be surveyed to the same benchmark as the other on-site wells, then depths to water levels of the wells in the shallow upper glacial aquifer will be measured. After purging of the wells, MW-12, MW-18S, and the off-site well will be sampled for Target Compound List Volatile Organic Compounds (TCL-VOCs). Sampling and analytical methodology will comply with applicable DEC and New York State Department of Health (DOH) protocol.

Other than sampling of MW-12, MW-18S and an off-site monitoring well and sampling required for the design of the groundwater remediation system, this remedial work plan proposes no further testing to characterize the contamination on the project site. Extensive soil and groundwater sampling has been performed throughout the project site, and samples were analyzed for contaminants of concern based upon detailed knowledge of the past industrial usage on the site (See Roux Associates Environmental Audit). The groundwater contamination found at the site reflects the past usage of the site as well as possible off-site sources.

Any new data shall meet the Department's Quality Assurance/Quality Control (QA/QC) requirements, including a Data Usability Summary Report (DUSR).

1.7 On-site and Off-site Exposure Assessment

Contamination Source:

The groundwater of the shallow upper glacial unit (18-28 feet) has levels of tetrachloroethene that exceed DEC Class GA water quality standards. Extensive sampling has discovered no other on-site contamination sources. The deeper Magothy Unit also contains tetra-chloroethene levels exceeding GA standards; however, the contamination of this deeper aquifer can be attributed to off-site sources and generally reflects regional groundwater quality.

Pathway/Receptor Analysis:

There are no on-site and no known off-site usages of the shallow upper glacial unit within a 1-mile radius of the project site. The nearest production wells rely upon the Magothy formation as their source of water. According to the DEP, quarterly groundwater sampling results show that these wells currently meet DEC Class GA water quality standards.

Other pathways than direct water consumption would be volatile organic compounds (VOCs) off-gassing from the groundwater and direct contact or inhalation of VOCs during dewatering for construction. To evaluate the potential for VOCs off-gassing from the groundwater, the indoor air of the building was tested for volatile organic compounds. The testing was performed in accordance with the sampling and analytical procedures established by the New York State Department of Health. Test results indicated that all Tetrachloroethene levels within the indoor air were less than one part per billion (ppb) and were comparable to background levels outside the building and to levels at the nearest NYSDEC monitoring station in Brooklyn, New York. Thus, off-gassing of VOCs from the groundwater would unlikely pose a significant risk to future building occupants.

Similarly, no impact from this pathway would be expected to off-site receptors since air testing on the project site, where the highest levels of PCE in the groundwater were present, showed no impact to receptors. Nonetheless, a quantitative exposure assessment was performed to evaluate the impact of VOC off-gassing upon the nearest potential, residential off-site receptor. The assessment is presented in Appendix B and is based upon the Emergency Standard Guide for Risk-Based Corrective Action (RBCA) issued by the American Society for Testing Material (ASTM). The analysis indicates that no such impacts would occur from the levels of VOCs in the shallow upper glacial unit. Direct contact or inhalation of VOCs during construction will be avoided by implementation of the work plan's health & safety plan.

2. OVERVIEW OF REMEDIATION PLAN

Groundwater on portions of the site has been found to be contaminated by tetrachloroethene (PCE). As shown in Figure 4, the shallow upper glacial unit has PCE levels exceeding Class GA standards in the northeast and east areas of the project side building. These areas correspond approximately to the location of a former chemical bulk storage tank system and drum storage area. The proposed remediation will consist of an air sparging system working in conjunction with an soil vapor extraction (SVE) system to remove PCE from the saturated zone (See Figure 5).

Construction of the proposed project will not conflict with the installation and operation of the remediation system.

The project organization for this project will be:

Project Manager	William Silveri
Project Engineer	Colleen Birnstiel
Quality Assurance Officer	Andrew Rudko
Field Manager	Mohamed Ahmed

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

LONG ISLAND RAILROAD TRACKS

MERRICK BLVD.

137 AVENUE

SECTION OF BUILDING TO BE REMOVED.

BELKNAP STREET

134 AVE.

135 AVE.

136 AVE.

0' 40' 80' 160'

SCALE: 1"=80'

Legend:

- BUILDING LINE
- EQUIPMENT ENCLOSURE BLDG
- AIR SPARGING WELL
- SOIL VAPOR EXTRACTION WELL

AKRF, Inc.
Environmental Consultants
117 East 29th Street New York, N.Y. 10016

132-20 MERRICK BOULEVARD
SPRINGFIELD GARDENS, NEW YORK

CONCEPTUAL DESIGN - REMEDIATION WELL LOCATIONS

DATE
8/25/99

SCALE
1"=80'

PROJECT No.
30079

FIGURE No.
5

3. GROUNDWATER REMEDIATION PLAN

3.1 Pilot Study

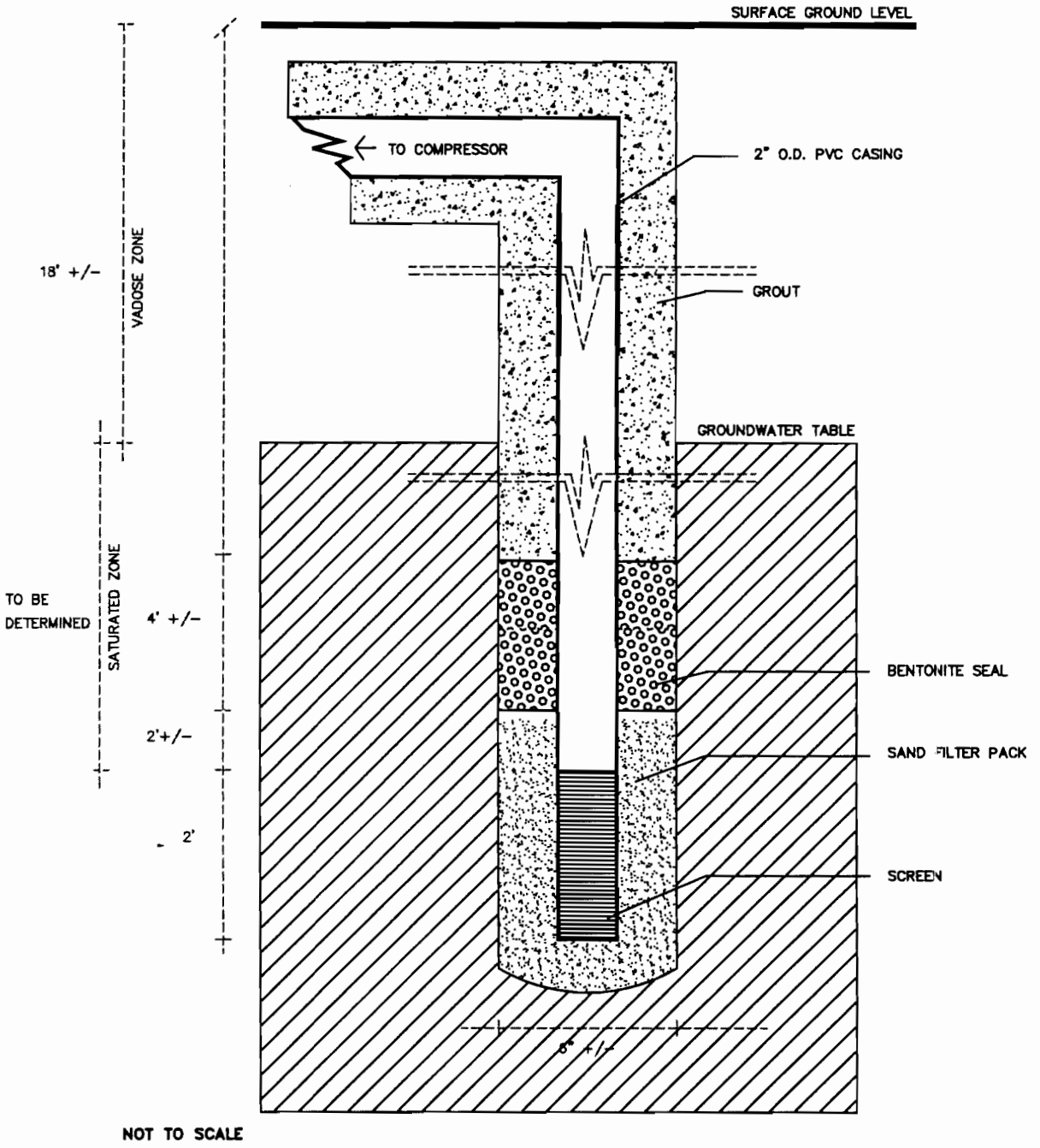
The groundwater remediation will be performed using an in situ air sparging system which will operate simultaneously with an SVE system. Off-gas from the SVE system will be treated with an activated carbon adsorption system. Pilot tests for both systems will be conducted prior to the final design and installation of the full-scale system. The goals of the pilot study are to determine the feasibility of the SVE and air sparging approach and to estimate parameters needed for system design, including soil permeability, zone of influence for the SVE and air sparging wells, anticipated vapor concentrations in the off-gas, vacuum and flow rates necessary to adequately affect the subsurface soil, and the depth at which the air sparging well screens will be located.

In the SVE pilot test, soil gas will be extracted from an SVE well while vacuum measurements are made at monitoring wells that will be located at varying distances and directions from the extraction well. The blower flow rate and vacuum will be varied to determine its effect on pressures in the soil by measuring the vacuum response at the monitoring wells.

Similarly, the air sparging pilot test will consist of injecting air into the groundwater from an air sparging well, and taking pressure measurements at monitoring wells that will be installed at varying distances and directions from the air sparging well. The blower flow rate will be varied to determine its effect on pressures in the soil by measuring the pressure response at the monitoring wells. In addition, levels of dissolved oxygen and groundwater elevations will be measured at existing monitoring wells MW-3, MW-4 and MW-14S to determine the air sparging system's zone of influence.

The pilot test for the SVE system will occur first, followed by the test for the air sparging test. The SVE pilot test will then be repeated to remove any volatile contaminants from the vadose zone created by the air sparging test. Diagrams of the SVE and air sparging wells are shown in Figures 6 and 7, respectively. Figure 8 presents a plan view of the pilot tests showing the location of the air sparging and SVE wells with monitoring points spaced approximately 15, 30, 45 and 60 feet in one direction and 10 feet in other directions from the air sparging and extraction wells. A pressure gauge will be attached to the top of each monitoring point.

The well used for the SVE pilot test will consist of two-inch O.D. PVC casing with a five-foot screen. The bottom of the screen will be placed about five feet above the groundwater table. The well used for the air sparging pilot test constructed of two-inch O.D. PVC casing with a two-foot screen. The depth of the screen will be based upon depth of contamination determined by soil borings advanced into the shallow upper glacial unit (see description below). The monitoring wells will consist of one-inch or two-inch PVC pipes, with appropriate screens. The pilot tests will be conducted using a regenerative blower driven by a 5 HP motor, with power supplied by a generator or electricity from the on-site building. Two-inch diameter vacuum hose or PVC pipe will be used to connect the blower to the extraction and injection wells, with a moisture trap installed between



NOT TO SCALE

132-20 MERRICK BOULEVARD
SPRINGFIELD GARDENS, NEW YORK

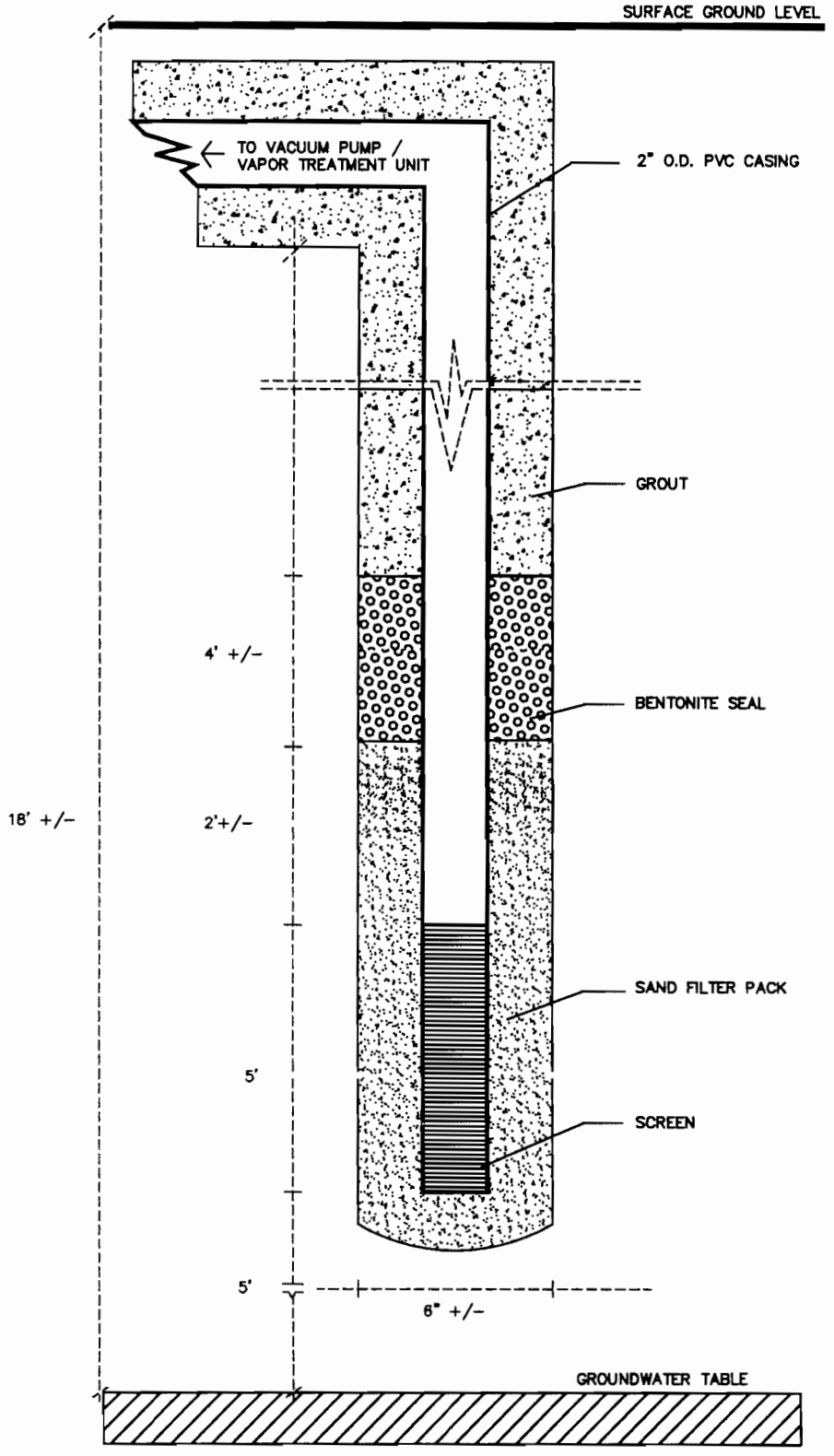
AIR SPARGING WELL

AKRF, Inc.
Environmental Consultants
117 East 29 Street New York, N.Y. 10016

DATE 10/18/99

PROJECT No. 30079

FIGURE No. 6

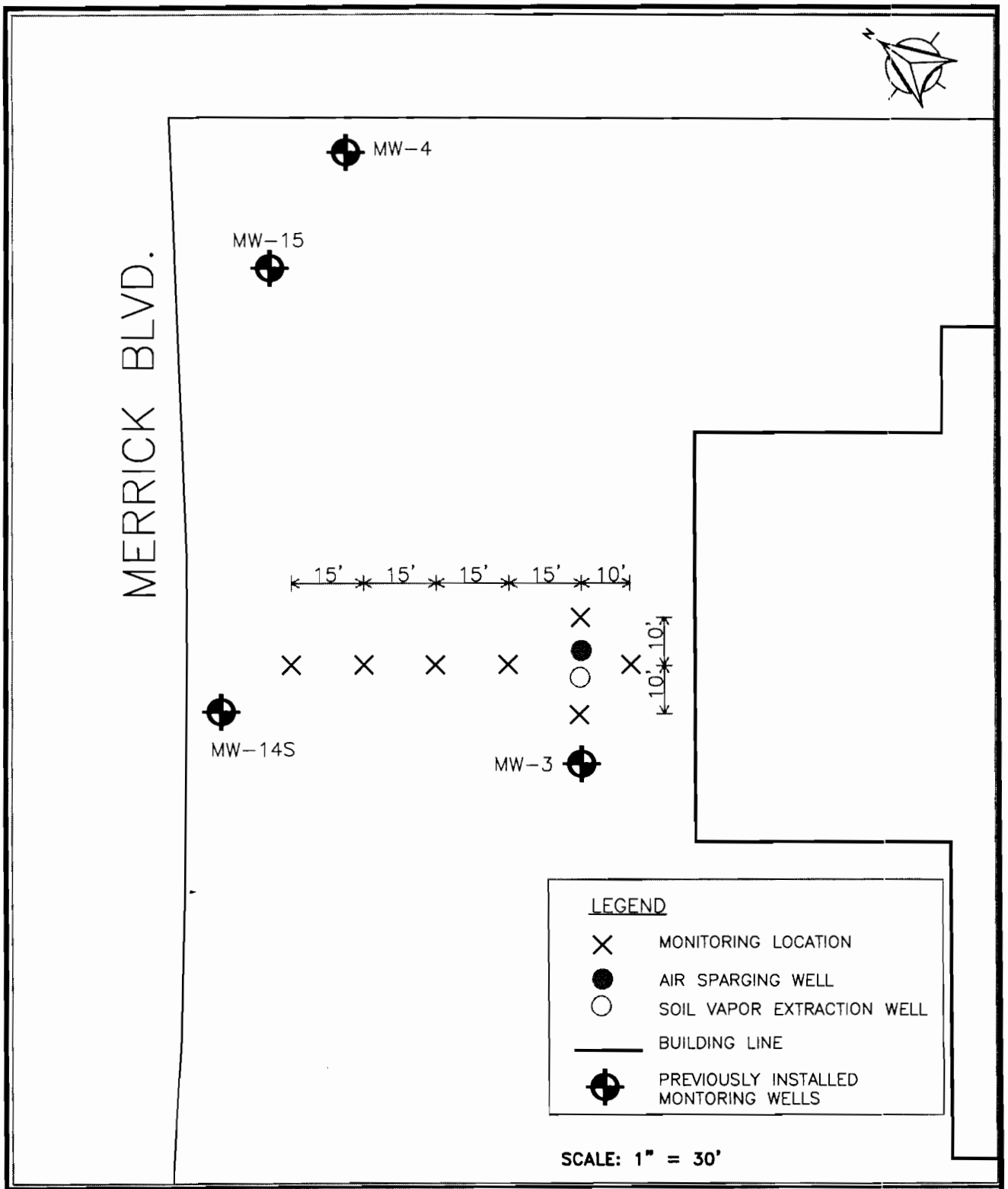


132-20 MERRICK BOULEVARD
SPRINGFIELD GARDENS, NEW YORK

SOIL VAPOR EXTRACTION WELL

AKRF, Inc.
Environmental Consultants
117 East 29 Street New York, N.Y. 10016

DATE 10/18/99
PROJECT No. 30079
FIGURE No. 7



132-20 MERRICK BOULEVARD
SPRINGFIELD GARDENS, NEW YORK

LAYOUT OF PILOT TEST
FOR SVE / AIR SPARGING

AKRF, Inc.
Environmental Consultants
117 East 29 Street New York, N.Y. 10016

DATE 10/18/99
PROJECT No. 30079
FIGURE No. 8

the extraction point and the blower. The system will be installed so that it is air-tight. Output from the blower will be routed to an activated carbon cannister.

The PCE concentrations in the soil gas being extracted by the SVE system will be measured both before and after entrance into the carbon cannister. These concentrations will be necessary to size the carbon system in the full-scale design. Concentrations of PCE in the blower output before the activate carbon collector will be determined by collecting and analyzing bag samples and utilizing a photoionization detector (PID) calibrated for PCE. These samples will be collected during various phase of the pilot test: shortly after start-up of the SVE test, following removal of vapors in the vadose zone and influence of the system has been established at nearby monitoring wells, and after operation of the air sparging pilot test following removal of vapors in the vadose zone.

In order to determine the depth of penetration of PCE below the groundwater surface, soil borings will be advanced at locations within the area of contamination. This sampling will occur prior to the SVE/air sparging pilot test. Soil sampling will be performed at two-foot intervals starting just above the groundwater surface. Soil samples will be obtained by a steel, 24-inch long, 2-inch in diameter split-spoon sampler that will be driven through the subsurface soils ahead of a hollow-stem (4.25-inch inside diameter) auger that bores into the soil to just above the desired sampling depth. Each sample will be field-screened by headspace analysis using a photoionization detector calibrated to PCE. Sampling will continue until two successive samples show headspace readings at background levels.

All soil samples will be analyzed for volatile organic compounds in accordance with NYSDEC ASP Category B 95-1. All samples will be containerized and stored in accordance with NYSDEC sampling protocols. Each container will be properly sealed, labeled, and placed in a refrigeration unit for transport to the laboratory. A record of each sample, including notation of any odors, color, or sample matrix, will be kept in the sampler's field log book. A chain of custody will be maintained throughout the field sampling, transport of samples to the laboratory, and during lab analysis.

3.2 Conceptual Design

Based on previous groundwater and soil sampling and soil boring logs performed on the site, the soil permeability and the aerial extent of plume contamination in the groundwater was approximated. From this information, a preliminary layout for the SVE and air sparging system was prepared and is shown on Figure 5. The results from the pilot study will be used to determine the actual number and spacing of SVE and air sparging wells, the location of the wells, the size of the pumps and motors, and the type and size of the off-gas treatment. The appropriate vacuum and vapor treatment technologies can then be selected, and a conceptual layout design and specifications for the SVE system and air sparging system can then be prepared. A pilot test report and draft/conceptual design will be submitted to the DEC prior to the project going out to bid.

In this system air will be pumped into the saturated zone through a series of air injection

wells in the approximate locations as shown on the plan. Dissolved, sorbed, and free phase PCE will volatilize and be transported by the buoyancy effect into the vadose zone. Vapor extraction wells, also in the approximate locations as shown on the plan, will collect the vapors for treatment.

At this time, it is anticipated that the SVE wells will be constructed of two-inch O.D. PVC casing with a five-foot screen. The bottom of the screen will be placed about five feet above the groundwater table to accommodate possible variations in the groundwater level, including the possible rise in the groundwater level resulting from reducing the pressure in the vadose zone. To prevent atmospheric air from leaking into the well, the area above the filter pack will be sealed with about four feet of bentonite, and then grouted up to the ground surface.

It is anticipated that the air injection wells will be constructed of two-inch O.D. PVC casing with a two-foot screen. The depth of the screen will be determined from the pilot test since it will include soil sampling in the saturated zone to determine the vertical profile of PCE contamination. The screen will be located at a depth sufficient to provide a maximum dispersion of air in the contaminated area. To prevent injected air from "short circuiting" up the well casing, the area above the filter pack will be sealed with about four feet of bentonite, and then grouted up to the ground surface. A spacing of 30 feet between injection wells is planned. See Figure 6 for a cross-sectional view of an air sparging well.

3.3 Preparation of Specifications and Bid Package

AKRF will develop a set of specifications to be combined with the conceptual design plan. The design plan will contain the number and location of wells, the piping distribution layout, the vacuum and air sparging system arrangement and footprints, location and specifications for available utilities such as electric power, lighting, and telephone if necessary.

Generic specifications for material categories such as piping, valves, instrumentation and controls, wiring, motors, pumps, off-gas treatment, moisture separator, electrical power, etc. will be written and attached to a bid package. The bid packages will be sent to vendors for quotations. Vendors will furnish their bids with engineering drawings that will show general arrangement of equipment including description, size and location of all connections and footprints, a bill of materials, list of recommended spare parts, electrical requirements, diagram of major process components, interconnecting piping, and instrumentation and controls, dimensions of all components. Also, vendors will include costs of the parts and installation/delivery charges. Operation and maintenance manuals shall also be provided.

3.4 Final Design Plan

After the vendor packages are received, AKRF will incorporate the necessary changes to complete the final design. The final Design Plan will contain the following information:

1. Detailed information regarding the pilot test
2. Engineering drawings and details
3. Finalized Engineering Specifications
4. Operation and Maintenance Plan for the system
5. Monitoring and recordkeeping
6. Project Schedule and Organization

The Design Plan will be reviewed, signed, and sealed by a New York Registered Professional Engineer. AKRF will meet with the NYSDEC to present and discuss the Design Plan. NYSDEC's review comments will be incorporated into the Plan.

3.5 System Installation, Start-up and Operation

After a vendor is selected and a contractor is selected for the installation and construction of the system, AKRF will oversee the installation, start-up, and operation of the remediation system. Conformance to specifications and performance criteria will be confirmed by AKRF. After installation is complete, the system shall be leak tested and any leaks will be repaired by the contractor. During start-up, the vendor and contractor will perform tests and train personnel on the operation and maintenance of the system. As-built drawings will be prepared.

3.6 Remediation Groundwater Monitoring

During the operation of the groundwater remediation system, groundwater monitoring will be performed in the existing upper glacial aquifer wells. Sampling will be performed at 30-day intervals after the start-up of the remediation system. All groundwater samples will be analyzed for volatile organic compounds (VOCs) by NYSDEC ASP Method 95-1 by a New York State Department of Health ELAP-certified laboratory. A report will be submitted to DEC every 30 days giving the results of the groundwater analyses and a report on the operation of the remediation system. If the month-to-month sampling results stabilize, DEC will be asked for permission to extend the sampling interval.

The remediation system will operate in a manner that maximizes the contaminant mass removal rate. This would include such actions as increasing the air injection volumes to areas where

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

3.7 Post-Remediation Groundwater Monitoring

Groundwater will be sampled at all existing monitoring wells on the site immediately following the suspension of operations of the groundwater remediation system (as described in Section 3.6 above), and repeated on a semiannual basis for one and a half years. All groundwater samples will be analyzed for volatile organic compounds in accordance with NYSDEC ASP Category B 95-1.

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

3.8 Progress Reports

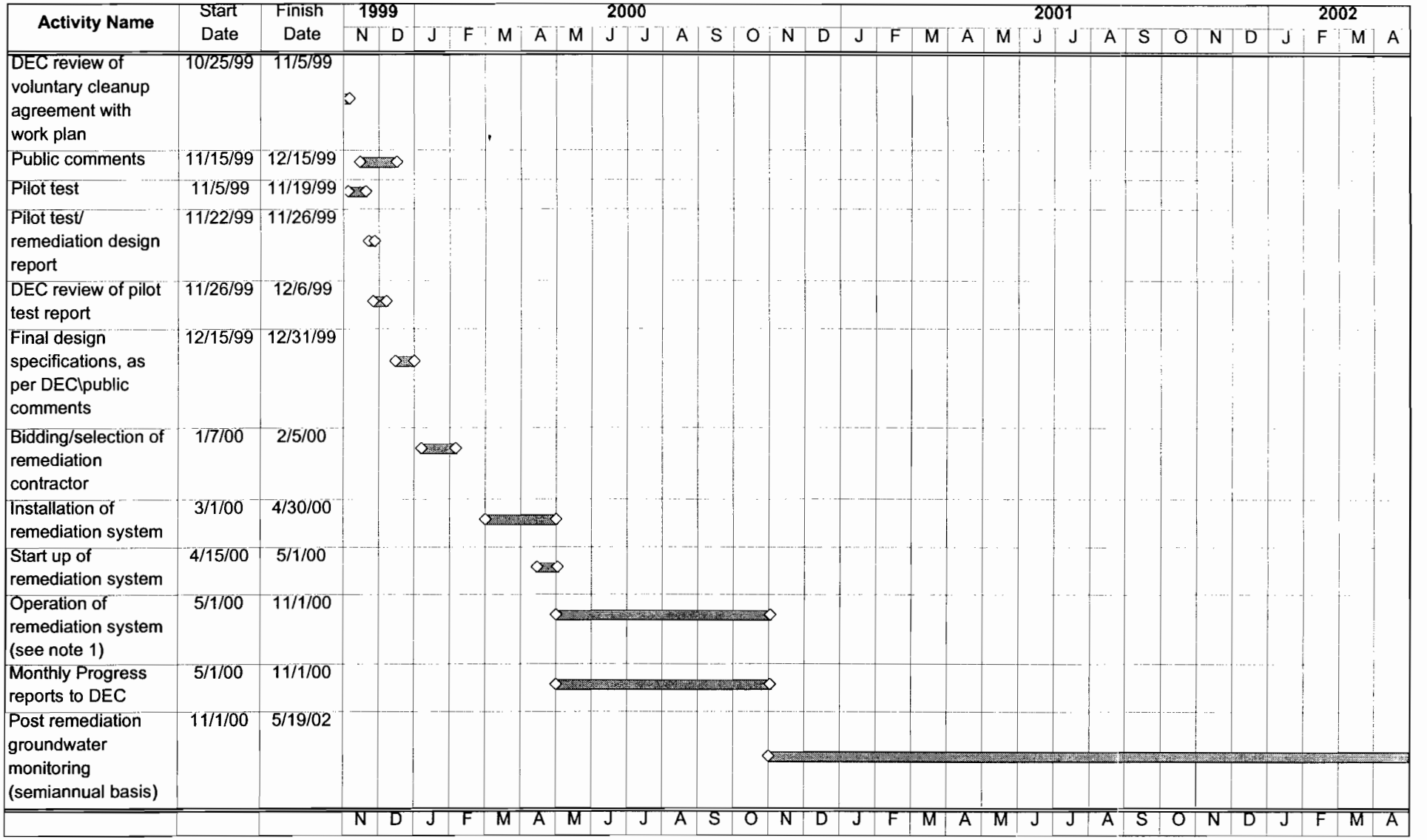
Progress reports will be submitted to the NYSDEC on a monthly basis. Report items will include:

1. A narrative section describing all remedial activities on site
2. A copy of the daily activity log book
3. Copies of the laboratory data for all sample analyses
4. Hazardous waste material tracking and manifests
5. Non-hazardous waste material tracking and bills-of-lading
6. Tracking of mass removal of contaminants, both unit removal in a given time and cumulative.

3.9 Schedule

A proposed schedule for the remediation program is presented in Figure 9.

Figure 9: Proposed Remediation Schedule, 132-20 Merrick Boulevard, Queens, NY



Note 1: Actual duration will depend upon performance of remediation system.

Health and Safety Plan

132-20 Merrick Boulevard Property
Queens, New York

Prepared By:

AKRF Engineering, P.C.
117 East 29th Street
New York, New York 10016
(212) 696-0670

August 1999

TABLE OF CONTENTS

Page Number

1. INTRODUCTION

The site is located site is located at 132-20 Merrick Boulevard in Jamaica, Queens. The project site is bounded to north by Merrick Boulevard, to south by 137th Avenue, to the east by Belknap Street, and to the west by Long Island Railroad tracks.

Prior testing programs on the site have shown that Groundwater on portions of the site have been contaminated by tetrachloroethene (PCE). The shallow upper glacial unit (18-28 feet below the existing grade) has PCE levels exceeding Class GA standards at the northeast and east sides of the project side building. These areas approximately correspond to past spills and a former chemical bulk storage tank system.

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

2. HEALTH AND SAFETY GUIDELINES AND PROCEDURES

A. HAZARD EVALUATION

PCE levels ranging from non-detected to 870 parts per billion (ppb) were detected in the shallow upper glacial aquifer unit.

B. DESIGNATED PERSONNEL

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

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

C. TRAINING

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

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

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

D. MEDICAL SURVEILLANCE PROCEDURE

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

E. SITE WORK ZONES

During any activities involving drilling or other subsurface disturbance, the work area must be divided into various zones to prevent the spread of contamination, ensure that proper protective equipment is donned, and provide an area for decontamination.

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

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

F. AIR MONITORING

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

Work Zone Air Monitoring

Real time air monitoring will be done, with the OVM, whenever drilling and well installation are being performed. Measurements will be taken prior to commencement of work and for at least 1 minute every 60 minutes during the work. These measurements will be made as close to the workers as practical and at the breathing height of the workers. The HSO shall set up the equipment and confirm that it is working properly. His/her designee may oversee the air measurements during the day. The initial measurement for the day will be performed before the start of work and will establish the background level for that day. The final measurement for the day will be performed after the end of work. The action levels and required responses are listed below.

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

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

Air Monitoring

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

The action levels and required responses are listed below.

ACTION LEVEL	RESPONSE ACTION
Less than 10 ppm above background *	Continue work
More than 10 ppm above background	Stop work until source of vapors is abated and readings are less than 10 ppm above background

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

Response Actions

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

G. PERSONAL PROTECTION EQUIPMENT

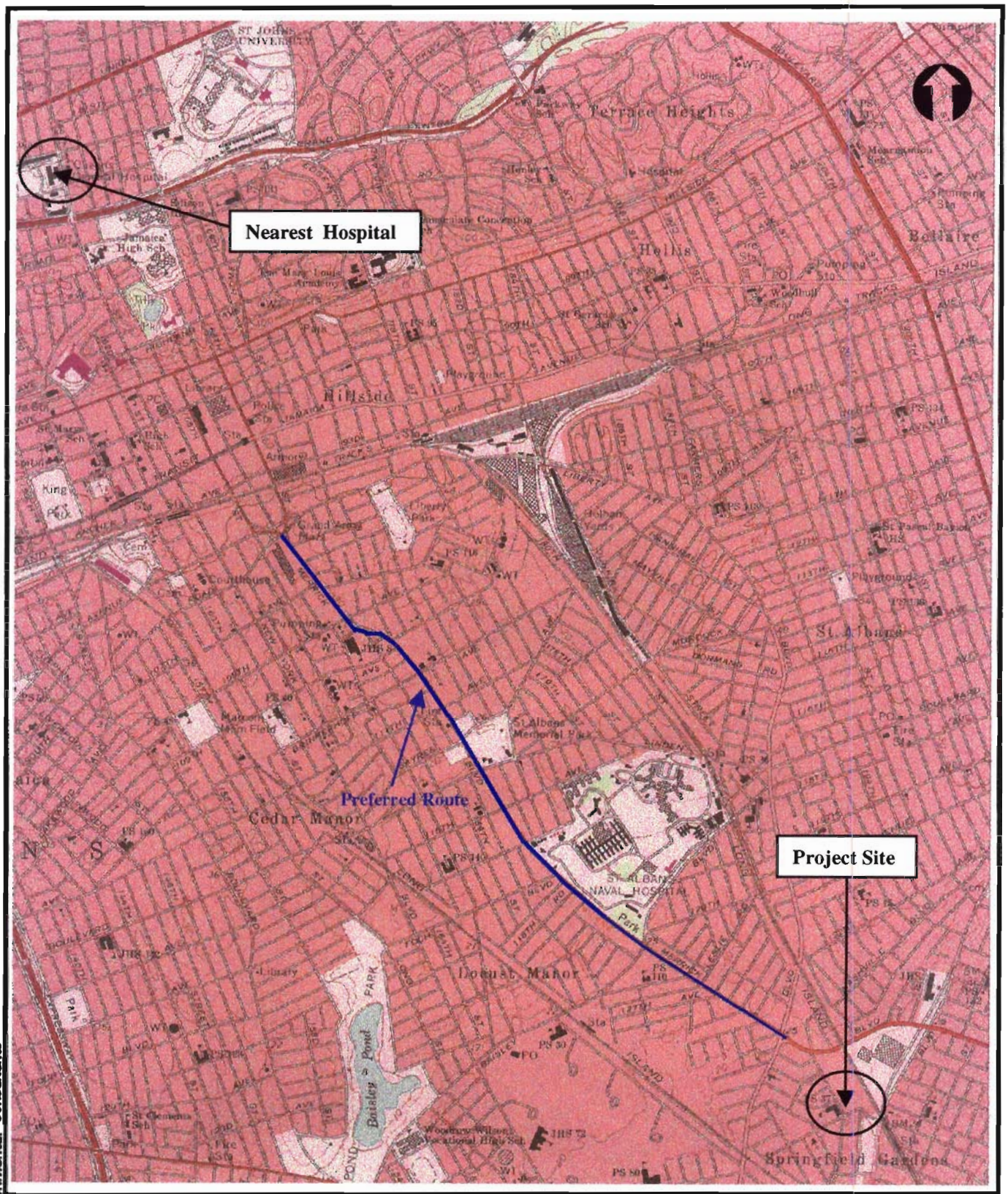
The personal protection equipment required for various kinds of site investigation tasks are based on 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response, Appendix B, "General Description and Discussion of the Levels of Protection and Protective Gear."

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

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

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

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



Location of Queens General Hospital relative to Project Site

132-20 Merrick Boulevard
SpringfieldGardens, New York

AKRF, Inc.

Environmental Consultants

117 East 29 Street New York, New York 10016

DATE 10/21/99
DRAWING No.
PROJECT No.
FIGURE No. 1

H. GENERAL WORK PRACTICES

To protect the health and safety of the field personnel, all 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 HSO.
- -- Workers must wash their hands and face thoroughly on leaving the work area and before eating, drinking, or any other such activity. The workers should shower as soon as possible after leaving the site.
- -- Contact with contaminated or suspected surfaces should be avoided.
- -- Contact lenses should not be worn on-site.
- -- The buddy system should always be used; each buddy should watch for signs of fatigue, exposure, and heat stress.

I. EMERGENCY PROCEDURES AND EMERGENCY RESPONSE PLAN

The field crew will be equipped with emergency equipment, such as a first aid kit and disposable eye washes. In the case of a medical emergency, the HSO will determine the nature of the emergency and he/she will have someone call for an ambulance, if needed. If the nature of the injury is not serious—i.e., the person can be moved without expert emergency medical personnel—he/she should be driven to a hospital by on-site personnel. There will be an on-site field phone. The location of the nearest hospital with an emergency room, Queens Hospital Center, is 3.81 miles northwest of the site at 82-68 164th Street. The location and preferred route to this hospital is shown in Figure 1. The telephone number for the hospital is: (718)990-2425

2Ambulance 911
Police 113th Precinct ..... (718) 712-7733
Owners representative ..... John Cournoyer (718) 722-3500
NYS DEC Project Manager ..... (718) 482-4905
NYS DEC Spill Hotline ..... (800) 457-7362

3. ACKNOWLEDGMENTS OF HASP

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 HSO.

AFFIDAVIT

I, _____ (name), of _____ (company name), have read the Health and Safety Plan (HASP) for 132-20 Merrick Boulevard in Jamaica, Queens, New York. 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: _____ Date: _____

Quantitative Exposure Assessment for Nearest Residential Receptor in Basement

Highest VOC concentration at a downgradient end of the site (MW-5S):

710 parts per billion (ppb)

Distance to nearest off-site residential receptor (SE of site, east side of Springfield Blvd):

1,160 feet

Concentration in groundwater at off-site receptor:

710 ppb x 503 (dilution factor) [1] = 1.41 ppb

Equation to evaluate risk posed by VOCs in groundwater [2]:

$\mathbf{RBSL_w} = \mathbf{RBSL_a} \div \mathbf{VF_{wesp}}$
where:
$\mathbf{RBSL_w}$ = Risk-based screening level in water (mg/L - H_2O),
$\mathbf{RBSL_a}$ = Risk-based screening level in air, which, as per New York State Department of Health, is 15 ppb per m^3 for residential receptors or 0.1335 mg/m^3
$\mathbf{VF_{wesp}}$ = Volatization factor from groundwater to ambient air ($mg/M^3 \div mg/l$ - H_2O), and accounts for volatization from groundwater to enclosed space and is calculated as:

Solve for $\mathbf{RBSL_w}$ as per equation in 4. Unknown term is $\mathbf{VF_{wesp}}$

$\mathbf{VF_{wesp}} = (H * [\mathbf{D}^{eff/ws}/\mathbf{L_{GW}} \div \mathbf{ER} * \mathbf{L_B}] \div 1 + [\mathbf{D}^{eff/ws}/\mathbf{L_{GW}} \div \mathbf{ER} * \mathbf{L_B}] + [\mathbf{D}^{eff/ws}/\mathbf{L_{GW}} \div D_{eff\ crack}/L_{crack)n}]) * 10^3$
H = Henry Law's constant for PERC = 0.5
$\mathbf{L_{GW}}$ = Depth to groundwater in a residential basement (18-10 feet) = 8 feet = 243.84 centimeters
$\mathbf{D}^{eff/ws}$ = Effective diffusion coefficient between groundwater and soil surface (Cm^2/s) : See Equation 5.1
ER = Enclosed space air exchange: 0.00014 [3]
$\mathbf{L_B}$ = Enclosed space volume/infiltration area ratio: 0.00014 [3]
$D_{eff\ crack}$ = Effective diffusion coefficient through foundation cracks: See equation 5.2
L_{crack} = Enclosed space foundation area/wall thickness: 15 [3]

Equation 5.1 $\mathbf{D}^{eff/ws} = (h_{cap} + h_v) * [hcap/D_{eff/cap} + hv/D_{eff/s}]^{-}$ where:

$\mathbf{D}^{eff/ws}$ is effective diffusion coefficient between groundwater and soil surface,

h_{cap} = thickness of capillary fringe (cm):
24.6 centimeters [4]

h_v = thickness of vadose zone = 8 feet (18 feet to groundwater - 10 feet for basement):
243.84 centimeters

$D_{eff/cap}$= effective diffusion through capillary fringe (cm^2/s): $[D^a * \theta^{3.3}_{acap}/\theta T^2] + [D^w * 1/H * \theta^{3.33}_{wcap}/\theta T^2]$:
D^a = Diffusion coefficient in air (cm^2/s) for perc: 0.00720 [5]
θ_{acap} = Volumetric air content in capillary fringe soils: 0.038 [3]
θT = Total soil porosity (cm^3/cm^3-soil): 0.38 [3]
D^w = Diffusion coefficient in water for perc: 0.000000820 [5]
θ_{wcap} = Volumetric water content in capillary fringe soils: 0.342 [3]

$D_{eff/s}$ = effective diffusion through vadose zone (cm^2/s): $[D^a * \theta^{3.3}_{as}/\theta^{2.0}_{T}] + [D^w * 1/H * \theta^{3.33}_{ws}/\theta^{2.0}_{T}]$:
θ_{acap} = Volumetric air content in vadose zone soils: 0.26 [3]
θ_{ws} = Volumetric water content in vadose zone soils: 0.12 [3]

Based upon Equation 5.1 $\mathbf{D}^{eff/ws} = 1.21 \times 10^{-5}$

Equation 5.2 $\mathbf{D}^{eff\text{-}crack} = (Da \times (\theta acrack^{3.3}/\theta T^2) + (Dw*1/H*(\theta wcrack^{3.3}/\theta^{2.0}_{T})$, where

$\mathbf{D}^{eff\text{-}crack}$ is the effective diffusion coefficient through foundation cracks of residential building,

Da = Diffusion factor of perc in air = 0.0072 [5],
Dw = Diffusion factor of perc in water = 0.000000820 [5],
θacrack = volumetric air content in foundation wall cracks(cm^3-air/cm^3) = 0.038,
θwcrack = volumeteric water content in foundation wall cracks (cm^3-water/cm^3 = 0.12
H = Henry's Law Constant for Perc = 0.5

Based upon Equation 5.2 $\mathbf{D}^{eff\text{-}crack} = 5.62 \times 10^{-4}$

Solving for $\mathbf{VF}_{wesp} = 5.3 \times 10^{-5}$

Solving for **RBSLw** = 131 ppm of Perc

Predicted levels of Perc in groundwater at residential receptor is 1.41 ppb
Highest levels of Perc in groundwater at downgradient end of site is 710 ppb.

References:

[1] Dilution factor based upon DEC steady-state dilution attenuation factors in the saturate zone assuming no chemical decay, as presented in the Department's Interim Procedures for

Inactivation of Petroleum-impacted Sites and The Emergency Standard Guide for Risk-Based Corrective Action (RBCA) issued by the American Society of Testing and Materials (ASTM)

[2] Equation is based upon Department's Interim Procedures for Inactivation of Petroleum-impacted Sites and The Emergency Standard Guide for Risk-Based Corrective Action (RBCA) issued by the American Society of Testing and Materials (ASTM).

[3] Tier 1 Default Fate and Transport Parameters, as per DEC Interim Procedures for Inactivation of Petroleum-impacted Sites.

[4] Thickness of capillary fringe for site based upon published data in C.W. Fetter for the average grain size of the site soil (medium sand), Contaminant Hydrogeology, 1993, pg 218.

[5] Diffusion coefficients in air and water for perc were obtained from the US EPA publication titled *Soil Screening Guidance: User's Guide*, Second Edition, 1996

Committed To *Your* Success

September 28, 1999

Severn Trent Laboratories
200 Monroe Turnpike
Monroe, Connecticut 06468

Tel: (203) 261-4458
Fax: (203) 261-5346
www.stl-inc.com

Mr. William Silveri
AKRF, INC.- NYC
117 East 29Th Street
New York, NY 10016

Dear Mr. Silveri :

Please find enclosed the analytical results of 7 sample(s) received at our laboratory on September 13, 1999. This report contains sections addressing the following information at a minimum:

- sample summary
- analytical methodology
- state certifications
- definition of data qualifiers and terminology
- analytical results
- chain-of-custody

STL Report #7099-2297A	
Project ID: UPS-Merrick Boulevard	

Copies of this analytical report and supporting data are maintained in our files for a minimum of five years unless special arrangements have been made. Unless specifically indicated, all analytical testing was performed at this laboratory location and no portion of the testing was subcontracted.

We appreciate your selection of our services and welcome any questions or suggestions you may have relative to this report. Please contact your customer service representative at (203) 261-4458 for any additional information. Thank you for utilizing our services; we hope you will consider us for your future analytical needs.

I have reviewed and approved the enclosed data for final release.

Very truly yours,

Jeffrey C. Curran
Laboratory Manager

JCC

7099-2297A
AKRF, INC. - NYC

Case Narrative

Volatile Organics - Volatile organics were determined by purge and trap GC/MS using guidance provided in Method 5030B/8260B. The instrumentation used was a Tekmar Model 2000/2016 Concentrator interfaced with a Hewlett-Packard Model 5970A GC/MS/DS.

No problems were encountered.

TABLE VO-1.0
7099-2297A
AKRF, INC.- NYC
TCL VOLATILE ORGANICS

Aqueous

All values are ug/L.

Client Sample I.D.	Method Blank	TB	FB	Quant. Limits with no Dilution
Lab Sample I.D.	VBLKKT	992297A-06	992297A-07	
Method Blank I.D.	VBLKKT	VBLKKT	VBLKKT	
Quant. Factor	1.00	1.00	1.00	
Chloromethane	U	U	U	10
Bromomethane	U	U	U	10
Vinyl Chloride	U	U	U	10
Chloroethane	U	U	U	10
Methylene Chloride	U	U	U	5.0
Acetone	U	U	U	10
Carbon Disulfide	U	U	U	5.0
Vinyl Acetate	U	U	U	10
1,1-Dichloroethene	U	U	U	5.0
1,1-Dichloroethane	U	U	U	5.0
cis-1,2-Dichloroethene	U	U	U	5.0
trans-1,2-Dichloroethene	U	U	U	5.0
Chloroform	U	U	U	5.0
1,2-Dichloroethane	U	U	U	5.0
2-Butanone	U	U	U	10
1,1,1-Trichloroethane	U	U	U	5.0
Carbon Tetrachloride	U	U	U	5.0
Bromodichloromethane	U	U	U	5.0
1,2-Dichloropropane	U	U	U	5.0
cis-1,3-Dichloropropene	U	U	U	5.0
Trichloroethene	U	U	U	5.0
Dibromochloromethane	U	U	U	5.0
1,1,2-Trichloroethane	U	U	U	5.0
Benzene	U	U	U	5.0
trans-1,3-Dichloropropene	U	U	U	5.0
Bromoform	U	U	U	5.0
4-Methyl-2-Pentanone	U	U	U	10
2-Hexanone	U	U	U	10
Tetrachloroethene	U	U	U	5.0
Toluene	U	U	U	5.0
1,1,2,2-Tetrachloroethane	U	U	U	5.0
Chlorobenzene	U	U	U	5.0
Ethylbenzene	U	U	U	5.0
Styrene	U	U	U	5.0
Xylene (total)	U	U	U	5.0
Date Received		09/13/99	09/13/99	
Date Extracted	N/A	N/A	N/A	
Date Analyzed	09/14/99	09/15/99	09/15/99	

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE VO-1.1
7099-2297A
AKRF, INC.- NYC
TCL VOLATILE ORGANICS

Soil

All values are ug/Kg dry weight basis.

Client Sample I.D.	Method Blank	S-1	S-3	Quant. Limits with no Dilution
Lab Sample I.D.	VBLKKR	992297A-01	992297A-02	
Method Blank I.D.	VBLKKR	VBLKKR	VBLKKR	
Quant. Factor	1.00	1.14	1.03	
Chloromethane	U	U	U	10
Bromomethane	U	U	U	10
Vinyl Chloride	U	U	U	10
Chloroethane	U	U	U	10
Methylene Chloride	U	1J	1J	5.0
Acetone	2J	10JB	6JB	10
Carbon Disulfide	U	3J	.4J	5.0
Vinyl Acetate	U	U	U	10
1,1-Dichloroethene	U	U	U	5.0
1,1-Dichloroethane	U	U	U	5.0
cis-1,2-Dichloroethene	U	U	U	5.0
trans-1,2-Dichloroethene	U	U	U	5.0
Chloroform	U	U	U	5.0
1,2-Dichloroethane	U	U	U	5.0
2-Butanone	U	3J	U	10
1,1,1-Trichloroethane	U	U	U	5.0
Carbon Tetrachloride	U	U	U	5.0
Bromodichloromethane	U	U	U	5.0
1,2-Dichloropropane	U	U	U	5.0
cis-1,3-Dichloropropene	U	U	U	5.0
Trichloroethene	U	U	U	5.0
Dibromochloromethane	U	U	U	5.0
1,1,2-Trichloroethane	U	U	U	5.0
Benzene	U	U	U	5.0
trans-1,3-Dichloropropene	U	U	U	5.0
Bromoform	U	U	U	5.0
4-Methyl-2-Pentanone	U	U	U	10
2-Hexanone	U	U	U	10
Tetrachloroethene	U	U	U	5.0
Toluene	U	U	U	5.0
1,1,2,2-Tetrachloroethane	U	U	U	5.0
Chlorobenzene	U	U	U	5.0
Ethylbenzene	U	U	U	5.0
Styrene	U	U	U	5.0
Xylene (total)	U	U	U	5.0
Date Received		09/13/99	09/13/99	
Date Extracted	N/A	N/A	N/A	
Date Analyzed	09/13/99	09/13/99	09/13/99	

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE VO-1.2
7099-2297A
AKRF, INC.- NYC
TCL VOLATILE ORGANICS

Soil

All values are ug/Kg dry weight basis.

Client Sample I.D.	Method Blank	S-7	S-9	Quant. Limits with no Dilution
Lab Sample I.D.	VBLKKS	992297A-04	992297A-05	
Method Blank I.D.	VBLKKS	VBLKKS	VBLKKS	
Quant. Factor	1.00	1.04	1.06	
Chloromethane	U	U	U	10
Bromomethane	U	U	U	10
Vinyl Chloride	U	U	U	10
Chloroethane	U	U	U	10
Methylene Chloride	U	.6J	.8J	5.0
Acetone	3J	6JB	2JB	10
Carbon Disulfide	U	U	.6J	5.0
Vinyl Acetate	U	U	U	10
1,1-Dichloroethene	U	U	U	5.0
1,1-Dichloroethane	U	U	U	5.0
cis-1,2-Dichloroethene	U	U	U	5.0
trans-1,2-Dichloroethene	U	U	U	5.0
Chloroform	U	U	U	5.0
1,2-Dichloroethane	U	U	U	5.0
2-Butanone	U	U	U	10
1,1,1-Trichloroethane	U	U	U	5.0
Carbon Tetrachloride	U	U	U	5.0
Bromodichloromethane	U	U	U	5.0
1,2-Dichloropropane	U	U	U	5.0
cis-1,3-Dichloropropene	U	U	U	5.0
Trichloroethene	U	U	U	5.0
Dibromochloromethane	U	U	"	5.0
1,1,2-Trichloroethane	U	U	U	5.0
Benzene	U	U	U	5.0
trans-1,3-Dichloropropene	U	U	U	5.0
Bromoform	U	U	.5J	5.0
4-Methyl-2-Pentanone	U	U	U	10
2-Hexanone	U	U	U	10
Tetrachloroethene	U	U	U	5.0
Toluene	U	U	U	5.0
1,1,2,2-Tetrachloroethane	U	U	U	5.0
Chlorobenzene	U	U	U	5.0
Ethylbenzene	U	U	U	5.0
Styrene	U	U	U	5.0
Xylene (total)	U	U	U	5.0
Date Received		09/13/99	09/13/99	
Date Extracted	N/A	N/A	N/A	
Date Analyzed	09/14/99	09/14/99	09/14/99	

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE VO-1.3
7099-2297A
AKRF, INC.- NYC
TCL VOLATILE ORGANICS

All values are ug/Kg dry weight basis.

Client Sample I.D.	Method Blank	S-5		Quant. Limits with no Dilution
Lab Sample I.D.	VBLKKX	992297A-03		
Method Blank I.D.	VBLKKX	VBLKKX		
Quant. Factor	1.00	1.10		
Chloromethane	U	U		10
Bromomethane	U	U		10
Vinyl Chloride	U	U		10
Chloroethane	U	U		10
Methylene Chloride	.4J	.8JB		5.0
Acetone	3J	8JB		10
Carbon Disulfide	U	.5J		5.0
Vinyl Acetate	U	U		10
1,1-Dichloroethene	U	U		5.0
1,1-Dichloroethane	U	U		5.0
cis-1,2-Dichloroethene	U	U		5.0
trans-1,2-Dichloroethene	U	U		5.0
Chloroform	U	U		5.0
1,2-Dichloroethane	U	U		5.0
2-Butanone	U	2J		10
1,1,1-Trichloroethane	U	U		5.0
Carbon Tetrachloride	U	U		5.0
Bromodichloromethane	U	U		5.0
1,2-Dichloropropane	U	U		5.0
cis-1,3-Dichloropropene	U	U		5.0
Trichloroethene	U	U		5.0
Dibromochloromethane	U	U		5.0
1,1,2-Trichloroethane	U	U		5.0
Benzene	U	U		5.0
trans-1,3-Dichloropropene	U	U		5.0
Bromoform	U	.6J		5.0
4-Methyl-2-Pentanone	U	U		10
2-Hexanone	U	U		10
Tetrachloroethene	U	U		5.0
Toluene	U	U		5.0
1,1,2,2-Tetrachloroethane	U	U		5.0
Chlorobenzene	U	U		5.0
Ethylbenzene	U	U		5.0
Styrene	U	U		5.0
Xylene (total)	U	U		5.0
Date Received		09/13/99		
Date Extracted	N/A	N/A		
Date Analyzed	09/16/99	09/16/99		

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

ORGANICS APPENDIX

U - Indicates that the compound was analyzed for but not detected.

J - Indicates that the compound was analyzed for and determined to be present in the sample. The mass spectrum of the compound meets the identification criteria of the method. The concentration listed is an estimated value, which is less than the specified minimum detection limit but is greater than zero.

B - This flag is used when the analyte is found in the blanks as well as the sample. It indicates possible sample contamination and warns the data user to use caution when applying the results of this analyte.

N - Indicates that the compound was analyzed for but not requested as an analyte. Value will not be listed on tabular result sheet.

S - Estimated due to surrogate outliers.

X - Matrix spike compound.

(1) - Cannot be separated.

(2) - Decomposes to azobenzene. Measured and calibrated as azobenzene.

A - This flag indicates that a TIC is a suspected aldol condensation product.

E - Indicates that it exceeds calibration curve range.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C - Confirmed by GC/MS.

T - Compound present in TCLP blank

P - This flag is used for a pesticide/aroclor target analyte when there is a greater than 25 percent difference for detected concentrations between the two GC columns (see Form X).

STATE CERTIFICATIONS

In some instances it may be necessary for environmental data to be reported to a regulatory authority with reference to a certified laboratory. For your convenience, the laboratory identification numbers for Severn Trent Laboratories-Connecticut are provided in the following table. Many states certify laboratories for specific parameters or tests within a category (i.e. method 325.2 for wastewater). The information in the following table indicates the lab is certified in a general category of testing such as drinking water or wastewater analysis. The laboratory should be contacted directly if parameter-specific certification information is required.

Severn Trent-Connecticut
Certification Summary (as of March 1999)

State	Responsible Agency	Certification	Lab Number
Connecticut	Department of Health Services	Drinking Water, Wastewater	PH-0497
Kansas	Department of Health and Environment	Drinking Water, Wastewater/Solid, Hazardous Waste	E-10210
Maine	Department of Human Services	Wastewater	CT023
Massachusetts	Department of Environmental Protection	Potable/Non-Potable Water	CT023
New Hampshire	Department of Environmental Services	Drinking Water, Wastewater	2528
New Jersey	Department of Environmental Protection	Drinking Water, Wastewater	46410
New York	Department of Health	CLP, Drinking Water, Wastewater, Solid/ Hazardous Waste	10602
North Carolina	Division of Environmental Management	Wastewater Hazardous Waste	388
Oklahoma	Department of Environmental Quality	General Water Quality/ Sludge Testing	9614
Rhode Island	Department of Health	Chemistry - Non-Potable Water and Wastewater	A43
Washington	Department of Ecology	Wastewater/ Hazardous Waste	C231
Wisconsin	Department of Natural Resources	Wastewater/ Hazardous Waste	998357[illegible]

7099-2297A
AKRF, INC.- NYC
SAMPLE SUMMARY

CLIENT ID	LAB ID	MATRIX	DATE COLLECTED	DATE RECEIVED
S-1	992297A-01	SOIL	09/10/99	09/13/99
S-3	992297A-02	SOIL	09/10/99	09/13/99
S-5	992297A-03	SOIL	09/10/99	09/13/99
S-7	992297A-04	SOIL	09/10/99	09/13/99
S-9	992297A-05	SOIL	09/10/99	09/13/99
B	992297A-06	WATER	09/10/99	09/13/99
FB	992297A-07	WATER	09/10/99	09/13/99

IEA-CT ANALYTICAL SUMMARY

Client ID: FB, S-1, S-3, S-5, S-7, S-9, TB
Job Number: 7099-2297A

Date: 9/28/99

Qty	Matrix	Analysis	Description
5	SOIL	VOA-8260B-TCL	TCL Volatile Organic
2	WATER	VOA-8260B-TCL	TCL Volatile Organic

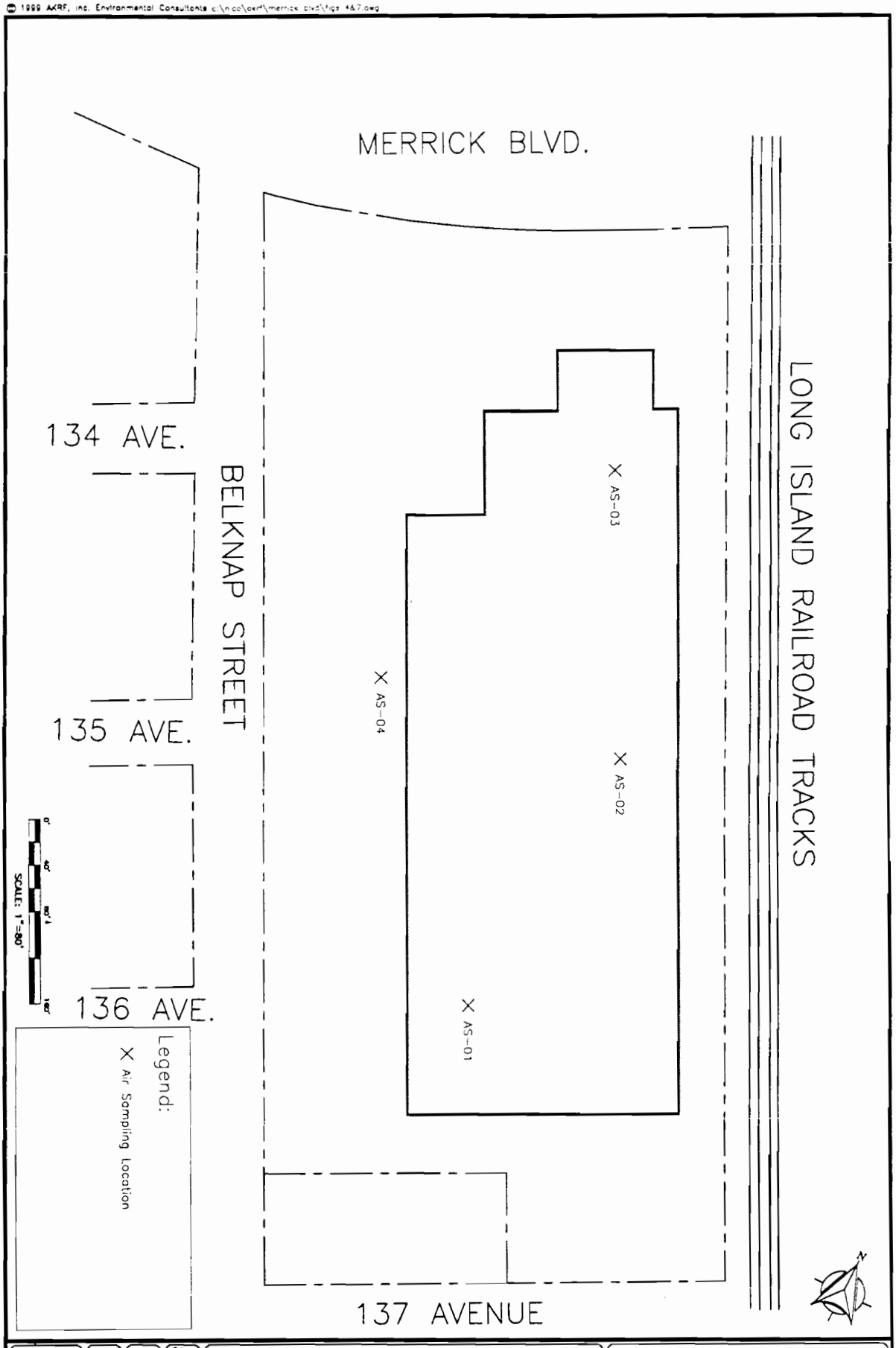


FIGURE No.	PROJECT No.	SCALE	DATE
4	30079	1"=80'	8/25/99

132-20 MERRICK BOULEVARD
SPRINGFIELD GARDENS, NEW YORK

AMBIENT AIR SAMPLING LOCATIONS

AKRF, Inc.
Environmental Consultants
117 East 29th Street New York, N.Y. 10016

Air Monitoring Results
(results in parts per billion)

Compound	AS - 01	AS - 02	AS - 03	AS - 04	Background (1)
Chloromethane	1.2	1.6	1.5	1.5	NA
Acetone	2.8	4.2	3.1	5.5	NA
Trichlorofluoromethane	1.0	0.90	0.93	0.37	0.05
Methylene chloride	0.36	0.46	0.43	0.52	0.84
Trichlorotrifluoroethane	0.20	0.22	0.22	0.20	NA
Carbon disulfide	0.37	ND	ND	0.47	NA
Methyl tert-butyl ether	1.7	2.0	1.9	2.0	NA
2-Butanone	0.77	0.61	0.49	1.3	NA
1,1,1-Trichloroethane	0.20	0.23	0.27	ND	0.81
Benzene	0.66	0.69	0.67	0.64	0.85
1,2-Dichloropropane	0.16TR	0.24	0.24	ND	NA
Trichloroethene	0.55	0.77	0.72	ND	NA
4-Methyl-2-pentanone	ND	ND	0.26	ND	NA
Toluene	1.9	1.7	1.6	1.9	2.76
2-Hexanone	ND	ND	ND	ND	NA
Tetrachloroethene	0.44	0.51	0.72	0.28	0.93
Ethylbenzene	0.29	0.27	0.29	0.27	0.55
m,p-Xylenes	0.95	0.94	0.99	0.91	1.14
o-Xylene	0.39	0.40	0.47	0.31	0.43
1,4-Dichlorobenzene	0.12TR	ND	0.14TR	ND	0.03

(1) 1993 Average Background at NYSDEC Air Monitoring Station, Eastern District High School, Brooklyn
TR - Detected below the indicated reporting limit.
ND - Not detected
NA -Not analyzed

ANALYSIS OF RESULTS

The volatile organic compounds detected within the building were comparable to background levels outside the building and to urban background levels as measured at the NYSDEC monitoring station at Eastern District High School, Brooklyn.

Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

2665 Park Center Drive, Suite D
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Chain of Custody Record
Analytical Services Request

Client / Address	Phone / Fax	ANALYSES	PAI Project No.
AKRF INC 117 E 29th ST. NEW YORK, NY 10016	800-899-2573		P990801
Client Project Name / Location: 132-20 MERRICK AVE, QUEENS, NY	Client Project No.: 30079		
Contact: William Silvani	Sampler (Signature): Kevin B. Reilly	P. O. No.	

Client Sample ID	Date Collected	Time Collected	Lab Sample No.	Type of Sample	Container ID (Serial#)	Regulator ID (Serial#)	EPA TO-14	Expected Turnaround Time	Remarks
AS-01	9-10-99	4:15pm	-001		01145	01043	+		PLEASE CALL CONTACT TO CONFIRM TURNAROUND TIME AND ANALYSIS.
AS-02	9-10-99	4:15pm	-002		01125	01056	+		
AS-03	9-10-99	4:15pm	-003		01133	01020	+		
AS-04	9-10-99	4:15pm	-004		00582	01050	+		

Relinquished by : (Signature)	Date	Time	Received by : (Signature)	Date	Time
Kevin B. Reilly	9-10-99	1800	[signature]	9/13/99	0930
Relinquished by : (Signature)	Date	Time	Received by : (Signature)	Date	Time
Relinquished by : (Signature)	Date	Time	Received by : (Signature)	Date	Time

White Copy : Accompanies Sampler Yellow Copy : Sampler

Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

RESULTS OF ANALYSIS

Client : AKRF, Inc.

Client Sample ID : AS-01
PAI Sample ID : P9901801-001

Test Code : GC/MS EPA TO-14
Analyst : Chris Casteel
Instrument : HP 5973/Entech 7000
Matrix : Summa Canister

Date Sampled : 09/10/99
Date Received : 09/13/99
Date Analyzed : 09/13/99
Volume(s) Analyzed : 1.000 Liter(s)

Pi 1 = -1.1
Pf 1 = 3.5

D.F. = 1.34

CAS #	COMPOUND	RESULT µg/M³	REPORTING LIMIT µg/M³	RESULT ppb	REPORTING LIMIT ppb
74-87-3	Chloromethane	2.5	1.0	1.2	0.49
75-01-4	Vinyl Chloride	ND	1.0	ND	0.39
75-00-3	Chloroethane	ND	1.0	ND	0.38
74-83-9	Bromomethane	ND	1.0	ND	0.26
67-64-1	Acetone	6.6	1.0	2.8	0.42
75-69-4	Trichlorofluoromethane	5.5	1.0	1.00	0.18
75-35-4	1,1-Dichloroethene	ND	1.0	ND	0.25
75-09-2	Methylene chloride	1.2	1.0	0.36	0.29
75-15-0	Carbon Disulfide	1.1	1.0	0.37	0.32
76-13-1	Trichlorotrifluoroethane	1.5	1.0	0.20	0.13
156-60-5	trans-1,2-Dichloroethene	ND	1.0	ND	0.25
156-59-2	cis-1,2-Dichloroethene	ND	1.0	ND	0.25
75-34-3	1,1-Dichloroethane	ND	1.0	ND	0.25
1634-04-4	Methyl tert-Butyl Ether	6.0	1.0	1.7	0.28
108-05-4	Vinyl Acetate	ND	1.0	ND	0.28
78-93-3	2-Butanone	2.3	1.0	0.77	0.34
67-66-3	Chloroform	ND	1.0	ND	0.21
107-06-2	1,2-Dichloroethane	ND	1.0	ND	0.25
71-55-6	1,1,1-Trichloroethane	1.1	1.0	0.20	0.19
71-43-2	Benzene	2.1	1.0	0.66	0.31
56-23-5	Carbon Tetrachloride	0.90 TR	1.0	0.14 TR	0.16
78-87-5	1,2-Dichloropropane	0.72 TR	1.0	0.16 TR	0.22

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified by : RG

Date : 9/14/99

Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc
An Employee Owned Company

RESULTS OF ANALYSIS

Client : AKRF, Inc.

Client Sample ID : AS-01
PAI Sample ID : P9901801-001

Test Code : GC/MS EPA TO-14
Analyst : Chris Casteel
Instrument : HP 5973/Entech 7000
Matrix : Summa Canister

Date Sampled : 09/10/99
Date Received : 09/13/99
Date Analyzed : 09/13/99
Volume(s) Analyzed : 1.000 Liter(s)

Pi 1 = -1.1
Pf 1 = 3.5
D.F. = 1.34

CAS #	COMPOUND	RESULT µg/M³	REPORTING LIMIT µg/M³	RESULT ppb	REPORTING LIMIT ppb
75-27-4	Bromodichloromethane	ND	1.0	ND	0.15
79-01-6	Trichloroethene	2.9	1.0	0.55	0.19
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ND	0.22
108-10-1	4-Methyl-2-pentanone	ND	1.0	ND	0.24
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ND	0.22
79-00-5	1,1,2-Trichloroethane	ND	1.0	ND	0.19
108-88-3	Toluene	7.0	1.0	1.9	0.27
124-48-1	Dibromochloromethane	ND	1.0	ND	0.12
591-78-6	2-Hexanone	ND	1.0	ND	0.24
106-93-4	1,2-Dibromoethane	ND	1.0	ND	0.13
127-18-4	Tetrachloroethene	2.9	1.0	0.44	0.15
108-90-7	Chlorobenzene	ND	1.0	ND	0.22
100-41-4	Ethylbenzene	1.3	1.0	0.29	0.23
75-25-2	Bromoform	ND	1.0	ND	0.10
100-42-5	Styrene	ND	1.0	ND	0.24
1330-20-7	m,p-Xylenes	4.1	1.0	0.95	0.23
95-47-6	o-Xylene	1.7	1.0	0.39	0.23
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ND	0.15
541-73-1	1,3-Dichlorobenzene	ND	1.0	ND	0.17
106-46-7	1,4-Dichlorobenzene	0.71 TR	1.0	0.12 TR	0.17
95-50-1	1,2-Dichlorobenzene	ND	1.0	ND	0.17

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified by : PC

Date : 9/14/99

Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

RESULTS OF ANALYSIS

Client : AKRF, Inc.

Client Sample ID : AS-02
PAI Sample ID : P9901801-002

Test Code : GC/MS EPA TO-14
Analyst : Chris Casteel
Instrument : HP 5973/Entech 7000
Matrix : Summa Canister

Date Sampled : 09/10/99
Date Received : 09/13/99
Date Analyzed : 09/13/99
Volume(s) Analyzed : 1.000 Liter(s)

Pi 1 = -3.7
Pf 1 = 3.5

D.F. = 1.65

CAS #	COMPOUND	RESULT µg/M³	REPORTING LIMIT µg/M³	RESULT ppb	REPORTING LIMIT ppb
74-87-3	Chloromethane	3.3	1.0	1.6	0.49
75-01-4	Vinyl Chloride	ND	1.0	ND	0.39
75-00-3	Chloroethane	ND	1.0	ND	0.38
74-83-9	Bromomethane	ND	1.0	ND	0.26
67-64-1	Acetone	9.9	1.0	4.2	0.42
75-69-4	Trichlorofluoromethane	5.0	1.0	0.90	0.18
75-35-4	1,1-Dichloroethene	ND	1.0	ND	0.25
75-09-2	Methylene chloride	1.6	1.0	0.46	0.29
75-15-0	Carbon Disulfide	ND	1.0	ND	0.32
76-13-1	Trichlorotrifluoroethane	1.7	1.0	0.22	0.13
156-60-5	trans-1,2-Dichloroethene	ND	1.0	ND	0.25
156-59-2	cis-1,2-Dichloroethene	ND	1.0	ND	0.25
75-34-3	1,1-Dichloroethane	ND	1.0	ND	0.25
1634-04-4	Methyl tert-Butyl Ether	7.1	1.0	2.0	0.28
108-05-4	Vinyl Acetate	ND	1.0	ND	0.28
78-93-3	2-Butanone	1.8	1.0	0.61	0.34
67-66-3	Chloroform	ND	1.0	ND	0.21
107-06-2	1,2-Dichloroethane	ND	1.0	ND	0.25
71-55-6	1,1,1-Trichloroethane	1.3	1.0	0.23	0.19
71-43-2	Benzene	2.2	1.0	0.69	0.31
56-23-5	Carbon Tetrachloride	0.92 TR	1.0	0.15 TR	0.16
78-87-5	1,2-Dichloropropane	1.1	1.0	0.24	0.22

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified by : RG

Date : 9/14/99

Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

RESULTS OF ANALYSIS

Client : AKRF, Inc.

Client Sample ID : AS-02
PAI Sample ID : P9901801-002

Test Code : GC/MS EPA TO-14
Analyst : Chris Casteel
Instrument : HP 5973/Entech 7000
Matrix : Summa Canister

Date Sampled : 09/10/99
Date Received : 09/13/99
Date Analyzed : 09/13/99
Volume(s) Analyzed : 1.000 Liter(s)

Pi 1 = -3.7
Pf 1 = 3.5

D.F. = 1.65

CAS #	COMPOUND	RESULT µg/M³	REPORTING LIMIT µg/M³	RESULT ppb	REPORTING LIMIT ppb
75-27-4	Bromodichloromethane	ND	1.0	ND	0.15
79-01-6	Trichloroethene	4.1	1.0	0.77	0.19
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ND	0.22
108-10-1	4-Methyl-2-pentanone	ND	1.0	ND	0.24
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ND	0.22
79-00-5	1,1,2-Trichloroethane	ND	1.0	ND	0.19
108-88-3	Toluene	6.5	1.0	1.7	0.27
124-48-1	Dibromochloromethane	ND	1.0	ND	0.12
591-78-6	2-Hexanone	ND	1.0	ND	0.24
106-93-4	1,2-Dibromoethane	ND	1.0	ND	0.13
127-18-4	Tetrachloroethene	3.4	1.0	0.51	0.15
108-90-7	Chlorobenzene	ND	1.0	ND	0.22
100-41-4	Ethylbenzene	1.2	1.0	0.27	0.23
75-25-2	Bromoform	ND	1.0	ND	0.10
100-42-5	Styrene	ND	1.0	ND	0.24
1330-20-7	m,p-Xylenes	4.1	1.0	0.94	0.23
95-47-6	o-Xylene	1.7	1.0	0.40	0.23
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ND	0.15
541-73-1	1,3-Dichlorobenzene	ND	1.0	ND	0.17
106-46-7	1,4-Dichlorobenzene	ND	1.0	ND	0.17
95-50-1	1,2-Dichlorobenzene	ND	1.0	ND	0.17

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified by : RG

Date : 9/14/99

Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

RESULTS OF ANALYSIS

Client : AKRF, Inc.

Client Sample ID : AS-03
PAI Sample ID : P9901801-001

Test Code : GC/MS EPA TO-14
Analyst : Chris Casteel
Instrument : HP 5973/Entech 7000
Matrix : Summa Canister

Date Sampled : 09/10/99
Date Received : 09/13/99
Date Analyzed : 09/13/99
Volume(s) Analyzed : 1.000 Liter(s)

Pi l = -2.5
Pf l = 3.5
D.F. = 1.49

CAS #	COMPOUND	RESULT µg/M³	REPORTING LIMIT µg/M³	RESULT ppb	REPORTING LIMIT ppb
74-87-3	Chloromethane	3.0	1.0	1.5	0.49
75-01-4	Vinyl Chloride	ND	1.0	ND	0.39
75-00-3	Chloroethane	ND	1.0	ND	0.38
74-83-9	Bromomethane	ND	1.0	ND	0.26
67-64-1	Acetone	7.4	1.0	3.1	0.42
75-69-4	Trichlorofluoromethane	5.2	1.0	0.93	0.18
75-35-4	1,1-Dichloroethene	ND	1.0	ND	0.25
75-09-2	Methylene chloride	1.5	1.0	0.43	0.29
75-15-0	Carbon Disulfide	ND	1.0	ND	0.32
76-13-1	Trichlorotrifluoroethane	1.6	1.0	0.22	0.13
156-60-5	trans-1,2-Dichloroethene	ND	1.0	ND	0.25
156-59-2	cis-1,2-Dichloroethene	ND	1.0	ND	0.25
75-34-3	1,1-Dichloroethane	ND	1.0	ND	0.25
1634-04-4	Methyl tert-Butyl Ether	7.0	1.0	1.9	0.28
108-05-4	Vinyl Acetate	ND	1.0	ND	0.28
78-93-3	2-Butanone	1.4	1.0	0.49	0.34
67-66-3	Chloroform	ND	1.0	ND	0.21
107-06-2	1,2-Dichloroethane	ND	1.0	ND	0.25
71-55-6	1,1,1-Trichloroethane	1.5	1.0	0.27	0.19
71-43-2	Benzene	2.1	1.0	0.67	0.31
56-23-5	Carbon Tetrachloride	ND	1.0	ND	0.16
78-87-5	1,2-Dichloropropane	1.1	1.0	0.24	0.22

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified by : RG

Date : 9/14/99

Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

RESULTS OF ANALYSIS

Client : AKRF, Inc.

Client Sample ID : AS-03
PAI Sample ID : P9901801-001

Test Code : GC/MS EPA TO-14
Analyst : Chris Casteel
Instrument : HP 5973/Entech 7000
Matrix : Summa Canister

Date Sampled : 09/10/99
Date Received : 09/13/99
Date Analyzed : 09/13/99
Volume(s) Analyzed : 1.000 Liter(s)

Pi 1 = -2.5
Pf 1 = 3.5
D.F. = 1.49

CAS #	COMPOUND	RESULT µg/M³	REPORTING LIMIT µg/M³	RESULT ppb	REPORTING LIMIT ppb
75-27-4	Bromodichloromethane	ND	1.0	ND	0.15
79-01-6	Trichloroethene	3.8	1.0	0.72	0.19
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ND	0.22
108-10-1	4-Methyl-2-pentanone	1.1	1.0	0.26	0.24
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ND	0.22
79-00-5	1,1,2-Trichloroethane	ND	1.0	ND	0.19
108-88-3	Toluene	5.9	1.0	1.6	0.27
124-48-1	Dibromochloromethane	ND	1.0	ND	0.12
591-78-6	2-Hexanone	ND	1.0	ND	0.24
106-93-4	1,2-Dibromoethane	ND	1.0	ND	0.13
127-18-4	Tetrachloroethene	4.8	1.0	0.72	0.15
108-90-7	Chlorobenzene	ND	1.0	ND	0.22
100-41-4	Ethylbenzene	1.2	1.0	0.29	0.23
75-25-2	Bromoform	ND	1.0	ND	0.10
100-42-5	Styrene	ND	1.0	ND	0.24
1330-20-7	m,p-Xylenes	4.3	1.0	0.99	0.23
95-47-6	o-Xylene	2.0	1.0	0.47	0.23
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ND	0.15
541-73-1	1,3-Dichlorobenzene	ND	1.0	ND	0.17
106-46-7	1,4-Dichlorobenzene	0.85 TR	1.0	0.14 TR	0.17
95-50-1	1,2-Dichlorobenzene	ND	1.0	ND	0.17

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified by : RG

Date : 9/14/99

Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

RESULTS OF ANALYSIS

Client : AKRF, Inc.

Client Sample ID : AS-04
PAI Sample ID : P9901801-004

Test Code : GC/MS EPA TO-14
Analyst : Chris Casteel
Instrument : HP 5973/Entech 7000
Matrix : Summa Canister

Date Sampled : 09/10/99
Date Received : 09/13/99
Date Analyzed : 09/13/99
Volume(s) Analyzed : 1.000 Liter(s)

Pi 1 = -2.9
Pf 1 = 3.5

D.F. = 1.54

CAS #	COMPOUND	RESULT µg/M³	REPORTING LIMIT µg/M³	RESULT ppb	REPORTING LIMIT ppb
74-87-3	Chloromethane	3.0	1.0	1.5	0.49
75-01-4	Vinyl Chloride	ND	1.0	ND	0.39
75-00-3	Chloroethane	ND	1.0	ND	0.38
74-83-9	Bromomethane	ND	1.0	ND	0.26
67-64-1	Acetone	13	1.0	5.5	0.42
75-69-4	Trichlorofluoromethane	2.1	1.0	0.37	0.18
75-35-4	1,1-Dichloroethene	ND	1.0	ND	0.25
75-09-2	Methylene chloride	1.8	1.0	0.52	0.29
75-15-0	Carbon Disulfide	1.5	1.0	0.47	0.32
76-13-1	Trichlorotrifluoroethane	1.5	1.0	0.20	0.13
156-60-5	trans-1,2-Dichloroethene	ND	1.0	ND	0.25
156-59-2	-cis-1,2-Dichloroethene	ND	1.0	ND	0.25
75-34-3	1,1-Dichloroethane	ND	1.0	ND	0.25
1634-04-4	Methyl tert-Butyl Ether	7.2	1.0	2.0	0.28
108-05-4	Vinyl Acetate	ND	1.0	ND	0.28
78-93-3	2-Butanone	3.7	1.0	1.3	0.34
67-66-3	Chloroform	ND	1.0	ND	0.21
107-06-2	1,2-Dichloroethane	ND	1.0	ND	0.25
71-55-6	1,1,1-Trichloroethane	ND	1.0	ND	0.19
71-43-2	Benzene	2.0	1.0	0.64	0.31
56-23-5	Carbon Tetrachloride	0.85 TR	1.0	0.14 TR	0.16
78-87-5	1,2-Dichloropropane	ND	1.0	ND	0.22

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified by : RC

Date : 9/14/99

Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

RESULTS OF ANALYSIS

Client : AKRF, Inc.

Client Sample ID : AS-04
PAI Sample ID : P9901801-004

Test Code : GC/MS EPA TO-14
Analyst : Chris Casteel
Instrument : HP 5973/Entech 7000
Matrix : Summa Canister

Date Sampled : 09/10/99
Date Received : 09/13/99
Date Analyzed : 09/13/99
Volume(s) Analyzed : 1.000 Liter(s)

Pi 1 = -2.9
Pf 1 = 3.5

D.F. = 1.54

CAS #	COMPOUND	RESULT µg/M³	REPORTING LIMIT µg/M³	RESULT ppb	REPORTING LIMIT ppb
75-27-4	Bromodichloromethane	ND	1.0	ND	0.15
79-01-6	Trichloroethene	ND	1.0	ND	0.19
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ND	0.22
108-10-1	4-Methyl-2-pentanone	ND	1.0	ND	0.24
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ND	0.22
79-00-5	1,1,2-Trichloroethane	ND	1.0	ND	0.19
108-88-3	Toluene	7.3	1.0	1.9	0.27
124-48-1	Dibromochloromethane	ND	1.0	ND	0.12
591-78-6	2-Hexanone	ND	1.0	ND	0.24
106-93-4	1,2-Dibromoethane	ND	1.0	ND	0.13
127-18-4	Tetrachloroethene	1.9	1.0	0.28	0.15
108-90-7	Chlorobenzene	ND	1.0	ND	0.22
100-41-4	Ethylbenzene	1.2	1.0	0.27	0.23
75-25-2	Bromoform	ND	1.0	ND	0.10
100-42-5	Styrene	ND	1.0	ND	0.24
1330-20-7	m,p-Xylenes	3.9	1.0	0.91	0.23
95-47-6	o-Xylene	1.3	1.0	0.31	0.23
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ND	0.15
541-73-1	1,3-Dichlorobenzene	ND	1.0	ND	0.17
106-46-7	1,4-Dichlorobenzene	ND	1.0	ND	0.17
95-50-1	1,2-Dichlorobenzene	0.99 TR	1.0	0.17 TR	0.17

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified by : RC

Date : 9/14/99

Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

RESULTS OF ANALYSIS

Client : AKRF, Inc.

Client Sample ID : AS-04
PAI Sample ID : P9901801-004 Dup

Test Code : GC/MS EPA TO-14
Analyst : Chris Casteel
Instrument : HP 5973/Entech 7000
Matrix : Summa Canister

Date Sampled : 09/10/99
Date Received : 09/13/99
Date Analyzed : 09/13/99
Volume(s) Analyzed : 1.000 Liter(s)

Pi 1 = -2.9
Pf 1 = 3.5
D.F. = 1.54

CAS #	COMPOUND	RESULT µg/M^3	REPORTING LIMIT µg/M^3	RESULT ppb	REPORTING LIMIT ppb
74-87-3	Chloromethane	3.1	1.0	1.5	0.49
75-01-4	Vinyl Chloride	ND	1.0	ND	0.39
75-00-3	Chloroethane	ND	1.0	ND	0.38
74-83-9	Bromomethane	ND	1.0	ND	0.26
67-64-1	Acetone	13	1.0	5.6	0.42
75-69-4	Trichlorofluoromethane	2.2	1.0	0.40	0.18
75-35-4	1,1-Dichloroethene	ND	1.0	ND	0.25
75-09-2	Methylene chloride	1.8	1.0	0.54	0.29
75-15-0	Carbon Disulfide	1.5	1.0	0.50	0.32
76-13-1	Trichlorotrifluoroethane	1.7	1.0	0.23	0.13
156-60-5	trans-1,2-Dichloroethene	ND	1.0	ND	0.25
156-59-2	cis-1,2-Dichloroethene	ND	1.0	ND	0.25
75-34-3	1,1-Dichloroethane	ND	1.0	ND	0.25
1634-04-4	Methyl tert-Butyl Ether	7.1	1.0	2.0	0.28
108-05-4	Vinyl Acetate	ND	1.0	ND	0.28
78-93-3	2-Butanone	3.8	1.0	1.3	0.34
67-66-3	Chloroform	ND	1.0	ND	0.21
107-06-2	1,2-Dichloroethane	ND	1.0	ND	0.25
71-55-6	1,1,1-Trichloroethane	ND	1.0	ND	0.19
71-43-2	Benzene	2.0	1.0	0.64	0.31
56-23-5	Carbon Tetrachloride	0.92 TR	1.0	0.15 TR	0.16
78-87-5	1,2-Dichloropropane	ND	1.0	ND	0.22

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified by : RG

Date : 9/14/99

Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

RESULTS OF ANALYSIS

Client : AKRF, Inc.

Client Sample ID : AS-04
PAI Sample ID : P9901801-004 Dup

Test Code : GC/MS EPA TO-14
Analyst : Chris Casteel
Instrument : HP 5973/Entech 7000
Matrix : Summa Canister

Date Sampled : 09/10/99
Date Received : 09/13/99
Date Analyzed : 09/13/99
Volume(s) Analyzed : 1.000 Liter(s)

Pi 1 = -2.9
Pf 1 = 3.5
D.F. = 1.54

CAS #	COMPOUND	RESULT µg/M^3	REPORTING LIMIT µg/M^3	RESULT ppb	REPORTING LIMIT ppb
75-27-4	Bromodichloromethane	ND	1.0	ND	0.15
79-01-6	Trichloroethene	ND	1.0	ND	0.19
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ND	0.22
108-10-1	4-Methyl-2-pentanone	ND	1.0	ND	0.24
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ND	0.22
79-00-5	1,1,2-Trichloroethane	ND	1.0	ND	0.19
108-88-3	Toluene	7.1	1.0	1.9	0.27
124-48-1	Dibromochloromethane	ND	1.0	ND	0.12
591-78-6	2-Hexanone	ND	1.0	ND	0.24
106-93-4	1,2-Dibromoethane	ND	1.0	ND	0.13
127-18-4	Tetrachloroethene	1.8	1.0	0.28	0.15
108-90-7	Chlorobenzene	ND	1.0	ND	0.22
100-41-4	Ethylbenzene	1.2	1.0	0.28	0.23
75-25-2	Bromoform	ND	1.0	ND	0.10
100-42-5	Styrene	ND	1.0	ND	0.24
1330-20-7	m,p-Xylenes	4.0	1.0	0.93	0.23
95-47-6	o-Xylene	1.4	1.0	0.32	0.23
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ND	0.15
541-73-1	1,3-Dichlorobenzene	ND	1.0	ND	0.17
106-46-7	1,4-Dichlorobenzene	ND	1.0	ND	0.17
95-50-1	1,2-Dichlorobenzene	0.92 TR	1.0	0.15 TR	0.17

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified by : RC

Date : 9/14/99

Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

RESULTS OF ANALYSIS

Client : AKRF, Inc.

Client Sample ID : N/A
PAI Sample ID : Method Blank

Test Code : GC/MS EPA TO-14
Analyst : Chris Casteel
Instrument : HP 5973/Entech 7000
Matrix : Summa Canister

Date Sampled : N/A
Date Received : N/A
Date Analyzed : 09/13/99
Volume(s) Analyzed : 1.000 Liter(s)

Pi l = 0.0
Pf l = 0.0

D.F. = 1.00

CAS #	COMPOUND	RESULT µg/M³	REPORTING LIMIT µg/M³	RESULT ppb	REPORTING LIMIT ppb
74-87-3	Chloromethane	ND	1.0	ND	0.49
75-01-4	Vinyl Chloride	ND	1.0	ND	0.39
75-00-3	Chloroethane	ND	1.0	ND	0.38
74-83-9	Bromomethane	ND	1.0	ND	0.26
67-64-1	Acetone	ND	1.0	ND	0.42
75-69-4	Trichlorofluoromethane	ND	1.0	ND	0.18
75-35-4	1,1-Dichloroethene	ND	1.0	ND	0.25
75-09-2	Methylene chloride	ND	1.0	ND	0.29
75-15-0	Carbon Disulfide	ND	1.0	ND	0.32
76-13-1	Trichlorotrifluoroethane	ND	1.0	ND	0.13
156-60-5	trans-1,2-Dichloroethene	ND	1.0	ND	0.25
156-59-2	cis-1,2-Dichloroethene	ND	1.0	ND	0.25
75-34-3	1,1-Dichloroethane	ND	1.0	ND	0.25
1634-04-4	Methyl tert-Butyl Ether	ND	1.0	ND	0.28
108-05-4	Vinyl Acetate	ND	1.0	ND	0.28
78-93-3	2-Butanone	ND	1.0	ND	0.34
67-66-3	Chloroform	ND	1.0	ND	0.21
107-06-2	1,2-Dichloroethane	ND	1.0	ND	0.25
71-55-6	1,1,1-Trichloroethane	ND	1.0	ND	0.19
71-43-2	Benzene	ND	1.0	ND	0.31
56-23-5	Carbon Tetrachloride	ND	1.0	ND	0.16
78-87-5	1,2-Dichloropropane	ND	1.0	ND	0.22

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified by : RG

Date : 9/14/99

Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

RESULTS OF ANALYSIS

Client : AKRF, Inc.

Client Sample ID : N/A
PAI Sample ID : Method Blank

Test Code : GC/MS EPA TO-14
Analyst : Chris Casteel
Instrument : HP 5973/Entech 7000
Matrix : Summa Canister

Date Sampled : N/A
Date Received : N/A
Date Analyzed : 09/13/99
Volume(s) Analyzed : 1.000 Liter(s)

Pi 1 = 0.0
Pf 1 = 0.0

D.F. = 1.00

CAS #	COMPOUND	RESULT µg/M³	REPORTING LIMIT µg/M³	RESULT ppb	REPORTING LIMIT ppb
75-27-4	Bromodichloromethane	ND	1.0	ND	0.15
79-01-6	Trichloroethene	ND	1.0	ND	0.19
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ND	0.22
108-10-1	4-Methyl-2-pentanone	ND	1.0	ND	0.24
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ND	0.22
79-00-5	1,1,2-Trichloroethane	ND	1.0	ND	0.19
108-88-3	Toluene	ND	1.0	ND	0.27
124-48-1	Dibromochloromethane	ND	1.0	ND	0.12
591-78-6	2-Hexanone	ND	1.0	ND	0.24
106-93-4	1,2-Dibromoethane	ND	1.0	ND	0.13
127-18-4	Tetrachloroethene	ND	1.0	ND	0.15
108-90-7	Chlorobenzene	ND	1.0	ND	0.22
100-41-4	Ethylbenzene	ND	1.0	ND	0.23
75-25-2	Bromoform	ND	1.0	ND	0.10
100-42-5	Styrene	ND	1.0	ND	0.24
1330-20-7	m,p-Xylenes	ND	1.0	ND	0.23
95-47-6	o-Xylene	ND	1.0	ND	0.23
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ND	0.15
541-73-1	1,3-Dichlorobenzene	ND	1.0	ND	0.17
106-46-7	1,4-Dichlorobenzene	ND	1.0	ND	0.17
95-50-1	1,2-Dichlorobenzene	ND	1.0	ND	0.17

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Verified by : RG

Date : 9/14/99