
Remedial Investigation Report White Plains Housing Authority Building No. 33 White Plains, New York

November 29, 2016

**Prepared for: White Plains Housing Authority
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Executive Summary

First Environment, Inc. (First Environment), on behalf of the White Plains Housing Authority (WPHA), conducted a Remedial Investigation (RI) on April 28-29, 2015 and December 11-18, 2015 at portions of the WPHA property that are adjacent to an active British Petroleum (BP) gasoline service station, located at 34 East Post Road, White Plains, New York, including an area between the BP station and the WPHA's Building at 33 Fisher Court. The area investigated is referred to as "the Site" hereafter. The 33 Fisher Court Building is, in turn, approximately 200 feet east of WPHA's Building at 159 South Lexington Avenue.¹

The objective of the RI activities included the following tasks:

- to determine the location of subsurface utilities and/or potential anomalies adjacent to the areas of concern (AOCs), which may impede the completion of the remedial investigation;
- to confirm and evaluate the current and potential future status of Site contamination originating from the BP station; and
- to obtain additional data regarding soil and groundwater impacts necessary to develop a remedial strategy.

These tasks included the completion of soil boring installations, soil sampling, permanent monitoring well installations, and two groundwater sampling events.

A review of the soil analytical results collected from the soil boreholes revealed volatile organic compounds (VOCs) at concentrations above their respective New York State Department of Environmental Conservation (NYSDEC) Soil Cleanup Levels (SCL) for Gasoline Contaminated Soils pursuant to CP-51 guidance document in select soil boring locations. The analytical results for the groundwater sampling conducted revealed the presence of petroleum-related VOCs above the NYSDEC Ambient Water Quality Standards (AWQS) in two of the five monitoring wells installed and sampled in December 2015 and August 2016, as well as previously existing MW-106 sampled during the December 2015 event. First Environment, on behalf of the WPHA, is summarizing the activities completed to address the WPHA's concerns that contamination is migrating onto its property from the BP station.

¹ The Building 159 area and its parking lot have been the subject of a prior investigation due to a discharge from a former Getty service station on the other side of Brookfield Street at 26 East Post Road, White Plains, NY.

This Remedial Investigation Report (RIR) has been prepared in accordance with Section 3 of the NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, dated May 3, 2010, and details the RI activities completed in December 2015 and August 2016 as part of a split-groundwater sampling event conducted with the Antea Group (Antea), who is the consultant for Getty Corporation investigating the Getty related gasoline plume (Spill Case No. 97-13110).

Introduction

In November and December 2014, Tyree Environmental, as part of its investigation of the former Getty Station, installed two temporary wells at the sidewalk of Brookfield Street, immediately adjacent (approximately five feet) to the existing BP station. The groundwater samples obtained from those temporary wells showed elevated levels of gasoline related compounds in excess of the applicable NYSDEC AWQS. Subsequently, First Environment was asked by the WPHA to investigate the potential contamination migrating from the BP station. This Remedial Investigation Report (RIR) contains the results and findings of this investigation, which was performed on April 28-29, 2015, December 11-18, 2015, and August 1, 2016 on portions of the WPHA property identified as Building No. 33 area.

Figure 1 depicts the United States Geologic Survey (USGS) topographic map for the Site location. A Site Plan, consisting of all sampling locations utilized during this investigation, is provided in Figure 2.

The following objectives were developed as part of the RI activities:

- to determine the location of subsurface utilities and/or potential anomalies adjacent to the areas under investigation, which may impede the completion of the remedial investigation;
- to confirm and evaluate the current and future migration pathways and magnitude of Site contamination originating from the BP station; and
- to obtain additional data necessary to develop a remedial action (RA) strategy for the portions of the WPHA property.

The RI activities conducted included soil boring installations, soil sampling, permanent monitoring well installations, and two groundwater sampling events within the general vicinity of WPHA's Building No. 33.

Site Description and History

Physical Setting

The area investigated is located generally to the north of the BP station and south of Building No. 33, including a portion of the basketball court and a playground area located between Building Nos. 159 and 33, and the WPHA parking lot associated with Building No. 33. A site plan layout depicting pertinent features is included as Figure 2.

Site Ownership and Operational History

Adjacent to and south of the WPHA's Building 33 is a gasoline fuel station property currently operated as a British Petroleum (BP) gasoline service station. This site is owned by Marianina Oil Corporation and is believed to be leased to others. Historically, dating back to at least 1936, the property has been used for automobile fueling services. As indicated in Appendix A, Chain of Title for 34 E. Post Road, the property has changed ownership several times with each consecutive owner dealing with the oil and fuel industry. Additionally, Sanborn Fire Insurance Maps reviewed have also confirmed that the property has been identified as a fueling station from current times dating back to prior to 1940. This is noteworthy for this report due to the petroleum contamination found both in soil and groundwater in the vicinity of Building 33 located immediately to the north of the 34 E. Post Road property.

According to the title search results, the BP property was owned by the following entities:

- Deed made by The County Trust Company to Sinclair Refining Company dated 8/20/1936 recorded 8/24/1936 in Liber 3534 Page 183;
- Deed made by Atlantic Richfield Company to BP Oil Corporation dated 3/4/1969 recorded 10/14/1970 in Liber 6952 Page 678;
- Deed made by BP Oil Corporation to BP Oil Inc. dated 12/21/1973 recorded 7/18/1974 in Liber 7209 Page 180;
- Deed made by BP Oil Inc. to Northville Gasoline Corp. dated 10/5/1983 recorded 11/18/1983 in Liber 7878 Page 533; and
- Deed made by Northville Gasoline Corp. to Marianina Oil Corp. dated 6/24/1987 recorded 7/20/1987 in Liber 8893 Page 17.

Site Topography

The ground surface at the Site is generally flat, sloping upwards to the south and southwest towards Brookfield Street. During rainfall events, overland flow is directed towards stormwater catch basins located on Brookfield Street, as well as in the aforementioned

parking lot and basketball court area. The surface elevation at the Site is approximately 206 feet above mean sea level (msl).

Local Land Use

The surrounding area of the Site is highly developed consisting of mixed-use commercial, industrial, and residential properties.

Soils

Soils in this area are classified as Urban Land. Urban Land is typically found in densely developed areas where the soils and foundation material are highly variable. Most areas have been paved or graded, and the original soil materials have been disturbed, filled, or otherwise destroyed prior to construction.

The soils observed at the Site consisted of dark brown, dry to moist, non-cohesive, non-plastic, dense, medium to fine grained, well graded sand with silt from approximately 0.5 feet to approximately 5.0 feet below ground surface (bgs). Soils encountered at a depth greater than 5.0 feet bgs generally consisted of dark brown, wet, non-cohesive, non-plastic, medium density, coarse to fine grained, well graded sand. Soil boring description logs are included with this report as Appendix B.

Surface Water

No surface water bodies were observed on or adjacent to the Site. The nearest surface water body is Bloomingdale Pond, which is located approximately 3,630 feet east-northeast of the Site.

Wetlands and Floodplains

No evidence of wetland vegetation was observed on or adjacent to the Site during the site inspection. As previously stated, soils in this region are classified as Urban Land, which are not considered hydric. A review of the available wetland maps for this area indicate that the Site is not located on or directly adjacent to state and/or federal wetlands.

Site Geology and Hydrogeology

According to the New York State Geological Survey, surficial geology for this region is classified as glacial till deposits. The till is of variable texture, usually poorly sorted diamict deposition beneath glacier ice, relatively impermeable, variable clast content, ranging from

abundant well-rounded diverse lithology in valley tills to relatively angular more limited lithology in upland tills, and tends to be sandy in areas underlain by gneiss or sandstone.

Surficial soils in the vicinity of the Site are predominately silty sands underlain by a thin clay layer. Weathered bedrock is generally encountered around 8.0 feet bgs with competent rock around 9.0 feet bgs. Previous remedial investigations conducted in the vicinity of Building Nos. 159 and No. 33 has determined that groundwater flow in the area is generally to the north and northwest direction. Groundwater level measurements taken as part of this RI confirm that groundwater flow is in a northwesterly direction emanating from the BP Service Station, which is both topographically and hydraulically upgradient and adjacent to Building No. 33 to the south.

Table 2A summarizes the groundwater gauging data collected as part of this investigation. Figure 3 depicts the groundwater elevation contours and the flow direction based on the data collected in August 2016 investigation.

Technical Overview

To evaluate the conditions on the WPHA property downgradient of the BP station, representative soil and groundwater samples were collected in accordance with the Technical Guidance for Site Investigation and Remediation (NYSDEC DER-10, May 2010). All samples were placed in laboratory coolers that were chilled to 4°C with a completed chain-of-custody. Laboratory analyses were performed by Hampton Clark-Veritech (HCV) of Fairfield, New Jersey, a New York State Department of Health ELAP-certified laboratory (Certification No. 11408), using accepted and current United States Environmental Protection Agency (USEPA) analytical methods, as appropriate. Samples were handled and analyzed in compliance with sample holding times, method detection limits, and precision and accuracy criteria for the analytical method. No significant events or seasonal variations occurred that may have influenced sampling procedures or analytical results. A summary of Site sampling from the areas of concerns (AOCs) is provided as Table 1.

Standards, Criteria, and Guidance

The primary NYSDEC Standards, Criteria, and Guidance (SCGs) applicable to the Site are the Soil Cleanup Levels (SCL) for Gasoline Contaminated Soils established in NYSDEC Policy CP-51: Soil Cleanup Guidance, and the Technical and Operational Guidance Series

(TOGS) Ambient Water Quality Standards (AWQS). The SCLs are maximum concentrations that may exist in Site soils. Minimum requirements for the investigation and remediation of the Site, including sampling requirements, are established in DER-10.

The SCLs applicable to the Site were developed based on the Soil Cleanup Objectives for Gasoline Contaminated Soils established in Table 2 of the Supplemental Soil Cleanup Objectives (SSCOs) established in NYSDEC guidance CP-51. Laboratory analytical data for the soil samples collected during the remedial investigation activities have been compared to the CP-51 SCLs.

Quality Assurance/Quality Control

The Quality Assurance/Quality Control (QA/QC) procedures were conducted as described in the Quality Assurance Project Plan (QAPP) provided as Appendix C.

Health and Safety Plan

A site-specific health and safety plan (HASP) is provided as Appendix D of this report.

Community Air Monitoring Plan

A site-specific Community Air Monitoring Plan (CAMP) is provided as Appendix E. The CAMP outlines air-monitoring requirements for Site activities with the potential to introduce particulates and vapors to the atmosphere, and provides action levels for adjusting or ceasing work practices. The CAMP was implemented during all intrusive remedial action activities.

Remedial Investigation Activities

Soil Sampling – April 2015

First Environment, with Environmental Test Boring, Inc. (ETB) of Butler, New Jersey, initiated a soil investigation at the Site on April 28-29, 2015 to investigate the possible contamination of gasoline related impacts in soil and groundwater in relation to the BP station located adjacent to the south of WPHA's Building 33. ETB utilized Geoprobe® direct push drill rig to install a total of six soil borings, TWB-1 through TWB-6, to depths ranging from 8.0 to 15.0 feet below ground surface (bgs). The investigation activities mainly focused on the areas generally to the north and downgradient of BP station, as well as in the southern portion of the Building 33 parking lot.

All recovered soils were field-screened using a properly calibrated photoionization detector (PID) and field observations (i.e., staining, odor) were noted. A complete soil profile was recorded for each boring and soils were classified according to the Unified Soil Classification System (USCS). Soils below the Site generally consisted of dark brown to greenish brown sand with some crushed rocks from surface grade to approximately 5.0 feet bgs, and brown to stained gray sand with some crushed rocks from 5.0 to 15.0 feet bgs. Saturated soils were observed between approximately 5.5 and 6.5 feet bgs, which correspond to the depth-to-groundwater in the on-site monitoring wells. Soil boring description logs are included with this report as Appendix B.

According to the field observations noted during the investigation event, TWB-2 and TWB-4 exhibited the greatest likelihood for impact due to the presence of elevated PID readings, strong petroleum-hydrocarbon odor, and staining from approximately 5.0 to 15.0 feet bgs. The PID readings for these soil borings were detected at concentrations of 15,000 parts per million (ppm) at 6.0 to 10.0 feet bgs in borings TWB-2 and TWB-4, which corresponds to the most visually impacted depth interval.

Furthermore, TWB-3, TWB-5, and TWB-6 each exhibited elevated PID readings and moderate petroleum-hydrocarbon odors; however, minimal staining was observed in these borings and the highest recorded PID readings ranged from 8.8 ppm to 491 ppm. The depth of impact observed in these borings ranged from approximately 10.0 to 12.0 feet bgs. No evidence of impact was observed in boring TWB-1.

In accordance with DER-10 requirements, soil samples were collected from the depth intervals exhibiting the greatest potential for impact in each boring. In addition, a second soil sample was collected from the six-inch interval directly above the perceived groundwater table, or at an interval that would confirm the horizontal extent of impact identified in an adjacent boring.

Appropriate field blanks were also collected in accordance with DER-10 requirements to satisfy QA/QC protocols. Subsequent to collection, all samples were placed in laboratory-supplied jars and stored in a laboratory cooler that was chilled to 4°C with a completed chain-of-custody. All samples were submitted to HCV for analysis for New York STARS volatile organic compounds (VOC) (STARS VO list 2 - EPA Method 8260C) and lead (metal – EPA Method 6010C).

Figure 2 depicts the sampling locations.

Analytical Results

The laboratory analytical results revealed the presence of 1,2,4-trimethylbenzene, ethylbenzene, and total xylenes at concentrations above their respective NYSDEC SCL in the following samples (depth interval provided in feet bgs): TWB-2 (6.0'-6.5') and TWB-5 (9.5'-10.0'). Additionally, 1,2,4-trimethylbenzene was detected at minimal concentrations (below the NYS SCL of 3.6 ppm) in samples TWB-4 (10.5'-11.0') and TWB-5 (9.5'-10.0'). Laboratory analytical results for the remaining soil samples revealed VOC concentrations below the NYS SCL.

Temporary Well Installation – April 2015

To evaluate groundwater conditions below the Site, ETB, under the direct supervision of First Environment, utilized hollow-stem auger drilling techniques to install five temporary monitoring wells (TWB-2 through TWB-6) at the Site on April 28-29, 2015. All temporary wells were installed to an approximate depth of 15.0 feet bgs and were constructed with 5 feet of two-inch PVC casing and 10 feet of 0.020-inch slotted PVC screen; with the exception of TWP-2 which was installed to approximately 10.0 feet bgs with only 10 feet of 0.020-inch slotted PVC screen. A No. 2 sand filter was placed from approximately 2.0 feet to the installed depth of the wells, with a bentonite and cement mixture from 3.0 feet bgs to

surface grade. Bedrock was not encountered during the monitoring well installation process to a depth of 15.0 feet bgs for TWP-3 through TWP-6. However, bedrock was encountered at approximately 8.0 feet bgs in TWP-1 and at 10.0 feet bgs in TWP-2. TWP-1 soils were observed to be dry during boring installation; therefore, a temporary well was not installed in this location. TWP-2 soils were wet at the 6.0 feet bgs interval; therefore, a temporary well was installed in this location.

Figure 2 depicts the sampling locations.

Temporary Well Groundwater Sampling – April 2015

Prior to sampling, all five temporary wells were surged using a whale pump – a process which removes fine silts and soils from the slotted PVC screen allowing groundwater to freely enter the well. Temporary wells TWP-2 through TWP-6 were sampled using the three-volume purge method in accordance with procedures outlined in the NYSDEC DER-10. Prior to initiating the sampling activities, the headspace of each well was monitored using a properly calibrated PID and depth-to-water measurements were recorded for each well using the top-of-casing (TOC) as a reference point. No free-phase floating product was encountered; however, TWP-2 and TWP-4 did exhibit an oily sheen on the surface of the groundwater as it was purged.

Following the recording of water level measurements, First Environment utilized pre-cleaned, dedicated Teflon tubing to properly purge each temporary well of the required three volumes. Once wells were properly purged, groundwater samples were collected directly from dedicated Teflon bailers, and then, using that bailer, the sample was discharged directly into containers provided by the laboratory.

Appropriate field blanks were also collected in accordance with DER-10 requirements to satisfy QA/QC protocols. Subsequent to collection, all samples were stored in a laboratory cooler that was chilled to 4°C with a completed chain-of-custody. All samples were submitted to HCV for analysis for New York STARS volatile organic compounds (VOC) (STARS VO list 2 - EPA Method 8260C), and lead (metal – EPA Method 6010A).

Analytical Results

The laboratory analytical results revealed the presence of 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, benzene, toluene, ethylbenzene, and total xylenes (BTEX) at concentrations above their respective NYSDEC Ambient Groundwater Quality Standards (AWQS) in the following samples: TWB-2, TWB-3, TWB-4, TWB-5, TWB-6, and MW-106.

The details and the results of April 2015 investigations outlined above were submitted to the NYSDEC in October 2015 in a Site Investigation/Remedial Investigation Report. Figure 4 depicts the history of total BTEX concentrations.

Geophysical Survey – December 2015

On December 11, 2015, the remedial investigation activities were initiated with the completion of a geophysical survey of the Site. GPROneCall of Somerville, New Jersey, under the direct supervision of a First Environment on-site representative, utilized a combination of geophysical methods (e.g., metal detection, ground penetrating radar (GPR), and radio frequency) in an attempt to identify the location of any subsurface anomalies (e.g., gas, water, and sewer pipes). The geophysical survey did reveal the presence of near-surface anomalies. Furthermore, the geophysical survey was conducted for only a portion of the whole WPHA property in order to identify any subsurface utilities that may impede the completion of the subsequent soil boring and monitoring well installation activities. Early identification of potential utilities and other anomalies also reduced the potential for encountering unexpected conditions during the proposed soil drilling activities.

A summary of the findings are presented below:

- A subsurface electrical conduit was detected along the eastern and northern fence boundaries of the property, separating Building No. 159 from Building No. 33.
- A subsurface water pipe and steam pipes were detected running primarily east-west between the two aforementioned addresses across the current basketball courts.
- A subsurface sewer pipe was detected running northeast (from the 159 S. Lexington parking lot) through the basketball courts.
- A subsurface gas pipe was detected on the southwestern portion of Building No. 33 in its southern parking lot area.

Based on the results of the geophysical survey, subsurface anomalies were identified within or adjacent to the investigation area; therefore, due to the presence of the subsurface

conduit and pipes, proper care was taken to address these utilities prior to the implementation of the proposed soil boring installation activities. As such, the proposed locations of the soil borings/monitoring wells were adjusted and moved a selected safe distance from the anomalies before installation activities began.

Soil Investigation – December 2015

First Environment, with Environmental Test Boring, Inc. (ETB) of Butler, New Jersey, initiated a soil investigation at the Site on December 11, 2015 to investigate the possible contamination of gasoline related impacts in soil and groundwater in relation to the BP station located adjacent to the south of WPHA's Building No. 33. Soil investigation activities continued on December 14, 2015. ETB utilized a Geoprobe® direct push drill rig to install a total of five soil borings, SB-201 through SB-205, to depths ranging from 10.0 to 20.0 feet bgs. The investigation activities mainly focused on the areas generally to the north and downgradient of the BP station, as well as in the southern portion of the Building No. 33 parking lot, and expanded upon the soil investigation activities conducted in this area in April 2015.

All recovered soils were field-screened using a properly calibrated photoionization detector (PID) and field observations (i.e., staining, odor) were noted. A complete soil profile was recorded for each boring and soils were classified according to the Unified Soil Classification System (USCS). Soils below the Site generally consisted of dark brown to greenish brown sand with some crushed rocks from surface grade to approximately 5.0 feet bgs, and brown to stained gray sand with some crushed rocks from 5.0 to 15.0 feet bgs. Saturated soils were observed between approximately 5.5 and 6.5 feet bgs, which correspond to the depth-to-groundwater in the on-site monitoring wells. Soil boring description logs are included with this report as Appendix B.

According to the field observations noted during the investigation event, SB-201 and SB-203 exhibited the greatest likelihood for impact due to the presence of elevated PID readings, strong petroleum-hydrocarbon odor, and staining from approximately 5.0 to 15.0 feet bgs. The PID readings for these soil borings were detected at concentrations of 1,200 parts per million (ppm) in boring SB-201 and 537 ppm in SB-203, which corresponds to the most visually impacted depth interval of approximately 6.0 to 8.0 feet bgs.

Furthermore, SB-202 and SB-205 did not exhibit any detectable PID readings and no petroleum-hydrocarbon odors. Therefore, no evidence of impact was observed in these soil borings. SB-204 exhibited minimal PID readings (under 5 ppm); however, with no petroleum hydrocarbon odors as well.

In accordance with DER-10 requirements, soil samples were collected from the depth intervals exhibiting the greatest potential for impact in each boring based on PID readings, detection of odors, and observations. A second soil sample was not collected from each borehole as the soil in this area was previously classified during the April 2015 site investigation activities, and soil samples were collected vertically to delineate the highest impacted zone. If the soil borehole did not exhibit any elevated PID readings or showed signs of contamination, then a soil sample was collected from the six-inch interval above the groundwater level zone.

Appropriate field blanks were also collected in accordance with DER-10 requirements to satisfy QA/QC protocols. Subsequent to collection, all samples were placed in laboratory-supplied jars and stored in a laboratory cooler that was chilled to 4°C with a completed chain-of-custody. All samples were submitted to HCV for analysis for targeted compound list volatile organic compounds plus a forward library search (TCL VO+15, which included NY STARS VO list 2 - EPA Method 8260C), and lead (metal – EPA Method 6010C).

Analytical Results

The laboratory analytical results revealed the presence of 1,2,4-trimethylbenzene, ethylbenzene, n-propylbenzene, and total xylenes at concentrations above their respective NYSDEC SCL in the following sample (depth interval provided in feet bgs): SB-201 (6.0-6.5) at concentrations of 37, 3.4, 5, and 8.7 ppm. Additionally, 1,2,4-trimethylbenzene was detected below the NYS SCL of 3.6 ppm in sample SB-203 (7.0-7.5) at 2.4 ppm. Laboratory analytical results for the remaining soil samples revealed VOC concentrations below the NYS SCL.

The laboratory soil analytical results are summarized in Table 3. Figure 2 depicts the sampling locations.

Permanent Monitoring Well Installation and Groundwater Sampling – December 2015

To evaluate groundwater conditions below the Site, ETB, under the direct supervision of First Environment, utilized hollow-stem auger drilling techniques to install five permanent monitoring wells (MW-201 through MW-205) at the Site on December 11, 14, and 18, 2015. The monitoring wells, the locations of which are depicted in Figure 2, were installed directly at the five previously installed soil boring locations from December 11, 2015. All monitoring wells were installed to depths ranging between 10.0 and 20.0 feet bgs and were constructed of 2 to 5 feet of two-inch PVC casing and 8 to 15 feet of 0.020-inch slotted PVC screen dependent on the depth of the initial soil borehole. A No. 2 sand filter was placed from approximately 3.0 feet to the installed depth of the wells, with a bentonite and cement mixture from 3.0 feet bgs to surface grade. Bedrock was encountered during the monitoring well installation process at varying depths ranging from approximately 5.0 to 15.0 feet bgs for MW-201, MW-203, and MW-205. However, bedrock was not encountered to a depth of 20.0 feet bgs in MW-202 and MW-204.

Groundwater Gauging & Flow Direction Determination

Previous remedial investigations conducted at the WPHA property, including those conducted in the vicinity of Building Nos. 159 and No. 33, have determined that groundwater flow in the area is generally to the north and northwest direction. Groundwater level measurements collected as part of this RI confirm that groundwater flow is in a northwesterly direction emanating from the BP Service Station, which is both topographically and hydraulically upgradient and adjacent to Building No. 33 to the south. As part of this process, each monitoring well was individually gauged utilizing an electronic Solinst multi-phase (product-water) level indicator probe to measure the depth-to-product (if any) and depth-to-water. No free-phase product was observed in any of the monitoring wells. Additionally, each monitoring well was surveyed by a licensed land surveyor to determine its location (coordinates in state plane coordinate system in feet) and casing elevation in feet above mean sea level (MSL). With this information and the depth-to-groundwater measurement from each well, the groundwater elevation was calculated for each location. Using groundwater elevations and a software package (i.e., Surfer), groundwater elevation contours (equipotential lines) were developed utilizing Kriging spatial interpolation routine. The groundwater flow direction was determined based on the

groundwater elevation contour lines. Figure 3 depicts the groundwater elevation contours and the flow in the northwest direction based on December 2015 well gauging results.

Groundwater Sampling – December 22, 2015

As part of the groundwater sampling event, First Environment sampled the newly installed monitoring wells, MW-201 through MW-205, as well as previously installed MW-106. Prior to sampling, all five monitoring wells were surged using a whale pump – a process which removes fine silts and soils from the slotted PVC screen allowing groundwater to freely enter the well. Monitoring wells MW-201 through MW-205 and MW-106 were sampled using the low-flow purge method in accordance with procedures outlined in the NYSDEC DER-10. Prior to initiating the sampling activities, the headspace of each well was monitored using a properly calibrated PID and depth-to-water measurements were recorded for each well using the top-of-casing (TOC) as a reference point. No free-phase floating product was encountered and none of the monitoring wells exhibited an oily sheen on the surface of the groundwater as it was purged.

The monitoring wells were surveyed as part of investigation activities; therefore, along with depth-to-water measurements collected prior to sampling, groundwater flow was derived to be flowing in a northerly to north-northwest pattern (Figure 3). Following the recording of water-level measurements, First Environment utilized pre-cleaned, dedicated Teflon tubing and Teflon bladder with bladder pump to properly purge each monitoring well until water quality parameters (pH, dissolved oxygen, specific conductivity, temperature, and turbidity) achieved three consecutive stable readings, recorded every five minutes. All water quality parameters were measured with a properly calibrated Horiba U-50 Series Water Quality Monitoring System. Water quality parameter results obtained during well purging, and at the time of well sampling, are summarized in Tables 3A through 3C. Once wells were properly purged, groundwater samples were collected directly from dedicated Teflon bailers; and then using that bailer to discharge the sample directly into containers provided by the laboratory.

Appropriate field blanks were also collected in accordance with DER-10 requirements to satisfy QA/QC protocols. Subsequent to collection, all samples were stored in a laboratory cooler that was chilled to 4°C with a completed chain-of-custody. All samples were

submitted to HCV for analysis for New York STARS volatile organic compounds (VOC) (STARS VO list 2 - EPA Method 8260C), and lead (metal – EPA Method 6010A).

Groundwater sampling logs are provided in Appendix F.

Analytical Results

The laboratory analytical results revealed the presence of 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; benzene; toluene; ethylbenzene; total xylenes (BTEX); chloroform; naphthalene; and n-propylbenzene at concentrations above their respective NYSDEC Ambient Groundwater Quality Standards (AWQS) in samples MW-201 and MW-203. Benzene was detected over the AWQS in the MW-106 sample, while m&p xylenes were detected over the AWQS in the MW-205 sample. Additionally, the analysis of the groundwater sample from MW-204 identified the presence of chlorinated solvents; specifically, tetrachloroethene (PCE), trichloroethene (TCE), and cis-1,2-dichloroethene (DCE), all above their respective AWQS. The presence of gasoline related compounds (i.e., BTEX) was not detected in the MW-204 sample.

The laboratory analytical results are summarized in Table 4. A comparison of the December 2015 groundwater analytical results to the April 2015 groundwater analytical results (initially presented in an October 2015 Site Investigation/Remedial Investigation Report) is presented in Table 5. Figure 4 summarizes the history of total BTEX concentrations.

Groundwater Sampling – August 2016

As part of the split-groundwater sampling event conducted on August 1, 2016 with Antea Group (Antea), which is the current consultant for Getty Corporation investigating the Getty related gasoline plume,² First Environment sampled monitoring wells MW-201 through MW-205 associated with Building No. 33. Prior to sampling, all five monitoring wells were opened and allowed to equilibrate and stabilize under ambient air conditions. Monitoring wells MW-201 through MW-205 and MW-106 were sampled using the three-volume purge method in accordance with procedures outlined in the NYSDEC DER-10. No free-phase

² The August 2016 sampling event was conducted concurrently with Antea's groundwater monitoring event of all current monitoring wells located on the Former Getty station, WPHA property, and adjacent commercial property. The Former Getty station is involved in an on-going remediation under Spill Case No. 97-13110 and in pending litigation.

floating product was encountered and none of the monitoring wells exhibited an oily sheen on the surface of the groundwater as it was purged.

Following the recording of water level measurements, pre-cleaned, dedicated Teflon bailers were utilized to properly purge each monitoring well. Once wells were properly purged, groundwater samples were collected directly from dedicated Teflon bailers; and then using that bailer to discharge the sample directly into containers provided by the laboratory.

Appropriate field blanks were also collected in accordance with DER-10 requirements to satisfy QA/QC protocols. Subsequent to collection, all samples were stored in a laboratory cooler that was chilled to 4°C with a completed chain-of-custody. All samples were submitted to HCV for analysis for New York STARS volatile organic compounds (VOC) (STARS VO list 2 - EPA Method 8260C).

Analytical Results

The laboratory analytical results revealed the presence of 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; benzene; toluene; ethylbenzene; total xylenes (BTEX); chloroform; naphthalene; and n-propylbenzene; as well as additional petroleum-related contaminants, at concentrations above their respective NYSDEC Ambient Groundwater Quality Standards (AWQS) in samples MW-201 and MW-203. Methyl-t-butyl-ether (MTBE) was identified in MW-204; however, no standard exists for this compound. The presence of gasoline related compounds (i.e., BTEX) was not detected in samples MW-202 and MW-205.

The laboratory analytical results are summarized in Table 6. A comparison of the August 2016 groundwater analytical results collected by First Environment to the August 2016 groundwater analytical results collected by Antea is presented in Table 7. It should be noted that for the split-groundwater sampling event conducted in August 2016, monitoring wells MW-201 through MW-205 were temporarily renamed MW-201-33 through MW-205-33 due to additional wells located on the WPHA property with similar identifications. Figure 4 depicts the history of total BTEX concentrations.

Former Getty Station and BP Station Plumes

Remedial investigation and remedial action reports have been previously submitted that have documented the extent of the former Getty station plume. The reports, submitted by

both Tyree Environmental, Inc. (Tyree), consultant to Getty, and First Environment discussed both soil and groundwater investigation activities conducted on the WPHA property to determine the extent of the former Getty station plume. As discussed above, First Environment conducted this remedial investigation to determine the extent of a plume migrating from the current BP station property.

To a reasonable degree of scientific certainty, the location of the two plumes and sampling performed between Buildings Nos. 159 and 33 show that: (1) the BP station and former Getty station plumes are not comingled; (2) the groundwater contaminant plume from the former Getty station is separate and distinct from the groundwater contaminant plume from the BP station; (3) the BP plume has impacted the Building 33 area; and (4) the BP plume has not impacted Building 159 area.

The basis for these conclusions is as follows. The site investigation conducted in 2015 by First Environment identified and delineated the extent of a groundwater contaminant plume migrating from the BP station onto WPHA property in the general location of Building No. 33. Sidewall soil samples (EX-20, EX-21, and EX-23, EX-27, EX-28, and EX-30) were collected on the WPHA Building No. 159 parking lot adjacent to the basketball courts by Tyree in January 8, 2015 as part of the excavation activities. These samples were non-detect for all SVOCs tested except naphthalene, which was detected in two samples (EX-20 and EX-23) below NYSDEC SCL. These soil samples were collected at depths near or below the groundwater table. The location and depth of these samples indicate a zone of clean soil and groundwater between the groundwater contamination from the former Getty station and the BP station. Further, modeling of the groundwater plume from the BP station, based on the April 2015 investigation by First Environment, depicts that the groundwater contamination plume in the Building 33 area from the BP station is not near the areas impacted by operations at the former Getty station.

Conclusions

Based on the investigation activities conducted on December 11, 14, and 18, 2015 and the additional sampling event conducted on August 1, 2016, the horizontal and vertical extent of VOC impacts at the Site have been delineated. The results of the field investigation indicate a larger area of impact than previously believed. Overall, and as to be expected for light-phase contamination, the most impacted interval (7.0 – 8.0 feet bgs) was identified at the groundwater table interface on the Building No. 33 property; however, petroleum-hydrocarbon impact was also identified at shallower and deeper depths ranging from approximately 6.0 to 15.0 feet bgs. This finding supports the presence of a smear zone generated by the seasonal fluctuations in groundwater surface. Therefore, based on the Site geology, horizontal and vertical extent of petroleum impacts in soil and groundwater, the fact that the area is adjacent to and downgradient from the BP station, and the location of the monitoring well network on Building No. 33 property, with a reasonable degree of scientific certainty, the area investigated via wells MW-201 and MW-203 has been impacted by the BP station.

TABLES

**TABLE 1
AOC Sample Summary**

**White Plains Housing Authority
White Plains, New York**

AOC	Sample ID	Date Sampled	Laboratory	Medium	Sample Depths (feet bgs)	Analytical Parameters	Sampling Method
Soil	SB-201 through SB-205	12/11/2015	Hampton Clark-Veritech	Soil	0-6" above Water Table; Highest PID 0-6" Interval	TCL VO+15 (incl. STARS), Lead	4-oz jar
Groundwater	MW-106, MW-201 through MW-205	12/22/2015, 8/1/2015	Hampton Clark-Veritech	Groundwater	Water Table	TCL VO+15 (incl. STARS), Lead	Teflon Bailer (three volume purge)
Groundwater	MW-106, MW-201 through MW-205	8/1/2016	Hampton Clark-Veritech	Groundwater	Water Table	VOC STARS	Teflon Bailer (three volume purge)

Notes:

TCL: Targeted Compound List

VOC: Volatile Organic Compounds

BN: Base Neutral / Semi-volatile Organic Compounds

**TABLE 2A
Groundwater Elevations Summary
December 2015 August 2016**

**White Plains Housing Authority
White Plains, New York**

WELL NO.	DEPTH OF (1) WELL (FT)	REFERENCE (1) ELEVATION (FT)	Northing	Easting	DATE	HEAD SPACE READING (PPM)	DEPTH TO (1) WATER (FT)	DEPTH TO PRODUCT (FT)	PRODUCT THICKNESS (FT)	CORRECTED WATER LEVEL ELEVATION (FT)
MW-106	18.3	200.04	799870.83	693440.71	12/22/2015	NR	6.10	NE	0.0	193.94
					8/1/2016	NR	6.49	NE	0.0	193.55
MW-201	9.7	202.42	799803.89	693525.27	12/22/2015	653.0	5.52	NE	0.0	196.90
					8/1/2016	NR	5.94	NE	0.0	196.48
MW-202	20.3	202.09	799905.36	693603.56	12/22/2015	1.2	7.02	NE	0.0	195.07
					8/1/2016	NR	7.50	NE	0.0	194.59
MW-203	15.0	202.51	799868.61	693530.89	12/22/2015	55.5	7.45	NE	0.0	195.06
					8/1/2016	NR	7.88	NE	0.0	194.63
MW-204	20.4	199.17	800010.93	693445.87	12/22/2015	12.1	7.40	NE	0.0	191.77
					8/1/2016	NR	7.37	NE	0.0	191.80
MW-205	14.3	200.99	799802.50	693449.34	12/22/2015	NR	5.78	NE	0.0	195.21
					8/1/2016	NR	6.06	NE	0.0	194.93

NOTES:

(1) = Reference point is northside of top of casings; elevations are reported relative to mean sea level.
 NM - Well not measured due to blockage
 NE - Not Encountered
 NR - Not Recorded

TABLE 2B
Water Quality Field Parameters
December 22, 2015

White Plains Housing Authority
White Plains, New York

WELL NO.	FIELD PARAMETERS BEFORE PURGING						FIELD PARAMETERS AFTER PURGING					
	DTW (feet)	TEMP (°C)	SPECIFIC			ORP (mV)	DTW (feet)	TEMP (°C)	SPECIFIC			ORP (mV)
			pH	COND. (uS/cm)	DO (ppm)				pH	COND. (uS/cm)	DO (ppm)	
MW-106	6.4	14.75	6.75	2.520	1.64	-51	6.42	14.92	6.64	2.510	0.83	-55
MW-201	5.56	15.21	6.34	2.490	1.18	-77	5.57	14.05	6.47	4.920	0.54	-84
MW-202	7.02	15.74	7.89	0.415	1.28	101	7.02	15.87	7.82	0.395	0.00	94
MW-203	7.45	16.34	7.09	1.930	0.00	-76	7.45	16.08	7.12	1.920	0.00	-78
MW-204	7.4	14.54	7.50	2.110	5.81	137	7.40	14.86	7.45	2.160	4.57	107
MW-205	5.81	13.75	6.85	1.570	2.63	102	5.90	15.66	6.81	1.490	2.09	106

TABLE 2C
Field Sampling Data
December 22, 2015

White Plains Housing Authority
White Plains, New York

WELL NO.	DATE & TIME OF SAMPLING	DEPTH TO WATER IN FEET BEFORE SAMPLING	SAMPLING METHOD	FIELD PARAMETERS AT SAMPLING				
				pH	TEMP (°C)	DO (ppm)	SPEC. COND. (mS/cm)	ORP (mV)
MW-106	12/22/2015; 11:15	6.42	1.5" Teflon Bailer	6.9	16.36	5.96	2.11	-95
MW-201	12/22/2015; 09:00	5.57	1.5" Teflon Bailer	6.47	14.05	0.54	4.92	-84
MW-202	12/22/2015; 09:30	7.02	1.5" Teflon Bailer	7.82	15.87	0	0.395	94
MW-203	12/22/2015; 08:35	7.45	1.5" Teflon Bailer	7.12	16.08	0	1.92	-78
MW-204	12/22/2015; 10:30	7.40	1.5" Teflon Bailer	7.45	14.86	4.57	2.16	107
MW-205	12/22/2015; 10:10	5.90	1.5" Teflon Bailer	6.81	15.66	2.09	1.49	106

Notes:

ppm - parts per million

mS/cm - millisemen per centimeter

TABLE 3
Soil Analytical Results
December 2015

White Plains Housing Authority
White Plains, New York

COLLECTION DATE: SAMPLE MATRIX: SAMPLE UNITS: LAB ID: CONSULTANT:	CLIENT ID:					SB-201 (6.0 - 6.5)		SB-202 (15.0 - 15.5)		SB-203 (7.0-7.5)		SB-204 (11.0-11.5)		SB-205 (5.5 - 6.0)	
						12/11/2015		12/11/2015		12/11/2015		12/11/2015		12/14/2015	
						Soil		Soil		Soil		Soil		Soil	
						mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
					AC88731-001		AC88731-002		AC88731-003		AC88731-004		AC88731-005		
					First Environment		First Environment		First Environment		First Environment		First Environment		
					Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	
Metals															
Lead		63	400	63	1000	ND	5.6	5.8	5.7	ND	6	ND	5.5	ND	5.7
Volatiles (TCL VO+15 incl. VOC STARS)															
1,1,1-Trichloroethane	0.8	0.68	100	0.68	500	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
1,1,2,2-Tetrachloroethane	0.6	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
1,1,1,2-Trichloro-1,2,2-trifluoroethane	6	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
1,1-Dichloroethane	0.2	0.27	26	0.27	240	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
1,1-Dichloroethene	0.4	0.33	100	0.33	500	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
1,2,3-Trichlorobenzene	NA	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
1,2,4-Trichlorobenzene	3.4	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
1,2,4-Trimethylbenzene	NA	3.6	NA	NA	190	37	0.11	0.0017	0.0012	2.4	0.0056	ND	0.0011	0.0013	0.0011
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
1,2-Dibromoethane	NA	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
1,2-Dichlorobenzene	7.9	1.1	100	1.1	500	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
1,2-Dichloroethane	0.1	0.02	3.1	0.02	30	ND	0.057	ND	0.0012	ND	0.0056	ND	0.0011	ND	0.0011
1,2-Dichloropropane	NA	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
1,3,5-Trimethylbenzene	NA	8.4	52	8.4	190	7.1	0.11	ND	0.0012	0.82	0.0056	ND	0.0011	ND	0.0011
1,3-Dichlorobenzene	1.6	2.4	49	2.4	280	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
1,4-Dichlorobenzene	8.5	1.8	13	1.8	130	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
1,4-Dioxane	NA	0.1	13	0.1	130	ND	5.7	ND	0.12	ND	0.56	ND	0.11	ND	0.11
2-Butanone	0.3	0.12	100	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
2-Hexanone	NA	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
4-Isopropyltoluene	NA	NA	NA	NA	NA	0.37	0.11	ND	0.0012	0.068	0.0056	ND	0.0011	ND	0.0011
4-Methyl-2-pentanone	1	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Acetone	0.2	0.05	100	0.05	500	ND	0.57	ND	0.012	ND	0.056	ND	0.011	ND	0.011
Benzene	0.06	0.06	4.8	0.06	44	ND	0.057	ND	0.0012	ND	0.0056	ND	0.0011	ND	0.0011
Bromochloromethane	NA	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Bromodichloromethane	NA	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Bromoforn	NA	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Bromomethane	NA	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Carbon disulfide	2.7	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Carbon tetrachloride	0.6	0.76	2.4	0.76	22	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Chlorobenzene	1.7	1.1	100	1.1	500	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Chloroethane	1.9	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Chloroform	0.3	0.37	49	0.37	350	0.17	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Chloromethane	NA	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
cis-1,2-Dichloroethene	NA	0.25	100	0.25	500	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
cis-1,3-Dichloropropene	NA	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Cyclohexane	NA	NA	NA	NA	NA	4	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Dibromochloromethane	NA	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Dichlorodifluoromethane	NA	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Ethylbenzene	5.5	1	41	1	390	3.4	0.11	ND	0.0012	0.041	0.0056	ND	0.0011	ND	0.0011
Isopropylbenzene	NA	NA	NA	NA	NA	1.4	0.11	ND	0.0012	0.13	0.0056	ND	0.0011	ND	0.0011
m&p-Xylenes	1.2	0.26	NA	NA	NA	7.4	0.11	ND	0.0012	0.043	0.0056	ND	0.0011	ND	0.0011
Methyl Acetate	NA	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Methylcyclohexane	NA	NA	NA	NA	NA	3.4	0.11	ND	0.0023	0.059	0.011	ND	0.0022	ND	0.0023
Methylene chloride	0.1	0.05	NA	0.05	500	ND	0.11	0.0028	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Methyl-t-butyl ether	NA	0.93	100	0.93	500	ND	0.057	ND	0.0012	ND	0.0056	0.0015	ND	0.0011	0.0011
Naphthalene	13	12	100	12	500	5	0.11	ND	0.0012	0.44	0.0056	ND	0.0011	0.0027	0.0011
n-Butylbenzene	NA	12	100	12	NA	1.6	0.11	ND	0.0012	0.22	0.0056	ND	0.0011	ND	0.0011
n-Propylbenzene	NA	3.9	100	3.9	500	5	0.11	ND	0.0012	0.62	0.0056	ND	0.0011	ND	0.0011
o-Xylene	1.2	0.26	NA	0.26	NA	1.3	0.11	ND	0.0012	0.015	0.0056	ND	0.0011	ND	0.0011
sec-Butylbenzene	NA	11	100	11	500	0.85	0.11	ND	0.0012	0.1	0.0056	ND	0.0011	ND	0.0011
Styrene	NA	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
t-Butylbenzene	NA	NA	100	5.9	500	ND	0.11	ND	0.0012	ND	0.0056	ND	0.0011	ND	0.0011
Tetrachloroethene	1.4	1.3	19	1.3	150	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Toluene	1.5	0.7	100	0.7	500	ND	0.11	ND	0.0012	ND	0.0056	ND	0.0011	ND	0.0011
trans-1,2-Dichloroethene	0.3	0.19	100	0.19	500	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
trans-1,3-Dichloropropene	NA	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Trichloroethene	0.7	0.47	21	0.47	200	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Trichlorofluoromethane	NA	NA	NA	NA	NA	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Vinyl chloride	0.2	0.02	0.9	0.02	13	ND	0.11	ND	0.0023	ND	0.011	ND	0.0022	ND	0.0023
Xylenes (Total)	NA	NA	100	0.26	500	8.7	0.11	ND	0.0012	0.058	0.0056	ND	0.0011	ND	0.0011
Total Volatile TICS	NA	NA	NA	NA	NA	54	J	NA	ND	NA	18	J	NA	ND	NA

NA No criterion derived for this contaminant.
 ND Not Detected at or above the Laboratory Reporting Limit (RL)
 840 Concentration exceeds the most stringent NYS SCC.

TABLE 4
Groundwater Analytical Results
December 2015

White Plains Housing Authority
 White Plains, New York

CLIENT ID: COLLECTION DATE: SAMPLE MATRIX: SAMPLE UNITS: LAB ID: CONSULTANT:				MW-106		MW-201		MW-202		MW-203		MW-204		MW-205		FB		TB	
	NY Water TAGM ug/L	NY TOGS WaterEffluent Tagm ug/L	NY TOGS WaterQualStds ug/L	12/22/2015		12/22/2015		12/22/2015		12/22/2015		12/22/2015		12/22/2015		12/22/2015		12/22/2015	
				Aqueous		Aqueous		Aqueous		Aqueous		Aqueous		Aqueous		Aqueous			
				ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L			
First Environment		First Environment		First Environment		First Environment		First Environment		First Environment		First Environment		First Environment		First Environment			
Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Metals																			
Lead	NA	50	25	9.9	3	11	3	17	3	6.6	3	28	3	6.8	3	ND	3		
Volatiles (TCL VO+15 incl. VOC STARS)																			
1,1,1-Trichloroethane	5	NA	5	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
1,1,2,2-Tetrachloroethane	5	NA	5	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
1,1,2-Trichloro-1,2,2-trifluoroethane	5	NA	5	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
1,1,2-Trichloroethane	NA	1	1	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
1,1-Dichloroethane	5	NA	5	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
1,1-Dichloroethane	5	NA	5	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
1,2,3-Trichlorobenzene	NA	NA	NA	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
1,2,4-Trichlorobenzene	5	NA	5	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
1,2,4-Trimethylbenzene	5	NA	5	3.5	1	2100	10	1.9	1	1400	10	ND	10	3.1	1	ND	1	ND	1
1,2-Dibromo-3-chloropropane	NA	NA	NA	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
1,2-Dibromoethane	NA	NA	NA	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
1,2-Dichlorobenzene	4.7	3	3	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
1,2-Dichloroethane	5	0.6	0.6	ND	0.5	ND	5	ND	0.5	ND	5	ND	5	ND	0.5	ND	0.5	ND	0.5
1,2-Dichloropropane	NA	1	1	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
1,3,5-Trimethylbenzene	5	NA	5	ND	1	540	10	ND	1	320	10	ND	10	ND	1	ND	1	ND	1
1,3-Dichlorobenzene	5	3	3	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
1,4-Dichlorobenzene	5	3	3	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
1,4-Dioxane	NA	NA	NA	ND	50	ND	500	ND	50	ND	500	ND	500	ND	50	ND	50	ND	50
2-Butanone	50	NA	NA	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
2-Hexanone	NA	NA	NA	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
4-Isopropyltoluene	5	NA	5	ND	1	10	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
4-Methyl-2-pentanone	50	NA	NA	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
Acetone	50	NA	NA	5	ND	50	ND	5	ND	50	ND	50	ND	5	ND	5	ND	5	5
Benzene	0.7	1	1	2.1	0.5	59	5	ND	0.5	ND	5	ND	5	ND	0.5	ND	0.5	ND	0.5
Bromochloromethane	NA	NA	NA	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
Bromodichloromethane	NA	NA	NA	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
Bromoform	NA	NA	NA	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
Bromomethane	NA	NA	5	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
Carbon disulfide	50	120	60	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
Carbon tetrachloride	5	5	5	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
Chlorobenzene	5	NA	5	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
Chloroethane	50	NA	5	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
Chloroform	7	7	7	ND	1	14	10	ND	1	10	10	ND	10	ND	1	ND	1	ND	1
Chloromethane	NA	NA	5	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
cis-1,2-Dichloroethene	NA	NA	5	ND	1	ND	10	ND	1	ND	10	20	10	ND	1	ND	1	ND	1
cis-1,3-Dichloropropene	NA	NA	NA	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
Cyclohexane	NA	NA	NA	9	1	170	10	ND	1	58	10	ND	10	ND	1	ND	1	ND	1
Dibromochloromethane	50	NA	NA	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
Dichlorodifluoromethane	NA	NA	5	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
Ethylbenzene	5	NA	5	ND	1	1000	10	ND	1	120	10	ND	10	1.2	1	ND	1	ND	1
Isopropylbenzene	NA	NA	5	ND	1	150	10	ND	1	91	10	ND	10	ND	1	ND	1	ND	1
m&p-Xylenes	5	NA	5	2.7	1	2200	10	ND	1	160	10	ND	10	5.1	1	ND	1	ND	1
Methyl Acetate	NA	NA	NA	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
Methylcyclohexane	NA	NA	NA	1	1	110	10	ND	1	96	10	ND	10	ND	1	ND	1	ND	1
Methylene chloride	5	NA	5	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1
Methyl-t-butyl ether	NA	NA	NA	0.99	0.5	ND	5	ND	0.5	ND	5	47	5	ND	0.5	ND	0.5	ND	0.5
Naphthalene	10	NA	NA	ND	1	450	10	ND	1	220	10	ND	10	ND	1	ND	1	ND	1
n-Butylbenzene	NA	NA	5	ND	1	37	10	ND	1	15	10	ND	10	ND	1	ND	1	ND	1
n-Propylbenzene	NA	NA	5	ND	1	430	10	ND	1	280	10	ND	10	ND	1	ND	1	ND	1

TABLE 4
Groundwater Analytical Results
December 2015

White Plains Housing Authority
 White Plains, New York

CLIENT ID: COLLECTION DATE: SAMPLE MATRIX: SAMPLE UNITS: LAB ID: CONSULTANT:				MW-106		MW-201		MW-202		MW-203		MW-204		MW-205		FB		TB			
	NY Water TAGM	NY TOGS WaterEffluent Tagm	NY TOGS WaterQualStds	12/22/2015		12/22/2015		12/22/2015		12/22/2015		12/22/2015		12/22/2015		12/22/2015		12/22/2015			
				Aqueous		Aqueous		Aqueous		Aqueous		Aqueous		Aqueous		Aqueous		Aqueous			
				ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L			
First Environment		First Environment		First Environment		First Environment		First Environment		First Environment		First Environment		First Environment		First Environment					
ug/L	ug/L	ug/L	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	
o-Xylene	5	NA	5	ND	1	480	10	ND	1	38	10	ND	10	ND	1	ND	1	ND	1	ND	1
sec-Butylbenzene	NA	NA	5	ND	1	27	10	ND	1	22	10	ND	10	ND	1	ND	1	ND	1	ND	1
Styrene	NA	5	5	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1	ND	1
t-Butylbenzene	NA	NA	NA	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1	ND	1
Tetrachloroethene	5	NA	5	ND	1	ND	10	ND	1	ND	10	960	10	ND	1	ND	1	ND	1	ND	1
Toluene	5	NA	5	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1	ND	1
trans-1,2-Dichloroethene	5	NA	5	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1	ND	1
trans-1,3-Dichloropropene	NA	NA	NA	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1	ND	1
Trichloroethene	5	5	5	ND	1	ND	10	ND	1	ND	10	56	10	ND	1	ND	1	ND	1	ND	1
Trichlorofluoromethane	NA	NA	5	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1	ND	1
Vinyl chloride	2	2	2	ND	1	ND	10	ND	1	ND	10	ND	10	ND	1	ND	1	ND	1	ND	1
Xylenes (Total)	5	NA	5	2.7	1	2650	10	ND	1	380		ND	10	5.1	1	ND	1	ND	1	ND	1
Total Volatile TICS	NA	NA	NA	23	J NA	6100	J NA	ND	NA	4000	J NA	ND	NA	ND	NA	ND	NA	ND	NA	ND	NA

NA

ND

840

Table 5
Groundwater Analytical Results Comparison for Eastern Building 159 and Building 33 Areas
January 2016

White Plains Housing Authority
White Plains, New York

CLIENT ID: COLLECTION DATE: SAMPLE MATRIX: SAMPLE UNITS: CONSULTANT:				MW-106		MW-106		TWB-2		MW-201	
	NY Water TAGM ug/L	NY TOGS WaterEffluent Tagm ug/L	NY TOGS WaterQualStds ug/L	4/28/2015		12/22/2015		4/29/2015		12/22/2015	
				Aqueous		Aqueous		Aqueous		Aqueous	
				ug/L		ug/L		ug/L		ug/L	
				First Environment		First Environment		First Environment		First Environment	
				Result	RL	Result	RL	Result	RL	Result	RL
Metals											
Lead	NA	50	25	39	3	9.9	3	7.4	3	11	3
Volatiles (TCL VO+15 incl. VOC STARS)											
1,2,4-Trimethylbenzene	5	NA	5	3	1	3.5	1	2,600	10	2100	10
1,3,5-Trimethylbenzene	5	NA	5	1.7	1	ND	1	680	10	540	10
4-Isopropyltoluene	5	NA	5	5.5	1	ND	1	19	10	10	10
Benzene	0.7	1	1	28	0.5	2.1	0.5	30	5	59	5
Chloroform	7	7	7	----	----	ND	1	----	----	14	10
cis-1,2-Dichloroethene	NA	NA	5	----	----	ND	1	----	----	ND	10
Cyclohexane	NA	NA	NA	----	----	9	1	----	----	170	10
Ethylbenzene	5	NA	5	3	1	ND	1	1,200	10	1000	10
Isopropylbenzene	NA	NA	5	17	1	ND	1	170	10	150	10
m&p-Xylenes	5	NA	5	6.8	1	2.7	1	2,700	10	2200	10
Methylcyclohexane	NA	NA	NA	----	----	1	1	----	----	110	10
Methyl-t-butyl ether	NA	NA	NA	1.8	0.5	0.99	0.5	ND	5	ND	5
Naphthalene	10	NA	NA	16	1	ND	1	220	10	450	10
n-Butylbenzene	NA	NA	5	2.5	1	ND	1	30	10	37	10
n-Propylbenzene	NA	NA	5	13	1	ND	1	450	10	430	10
o-Xylene	5	NA	5	ND	1	ND	1	600	10	480	10
sec-Butylbenzene	NA	NA	5	6.3	1	ND	1	26	10	27	10
t-Butylbenzene	NA	NA	NA	ND	1	ND	1	ND	10	ND	10
Tetrachloroethene	5	NA	5	----	----	ND	1	----	----	ND	10
Toluene	5	NA	5	ND	1	ND	1	ND	10	ND	10
Trichloroethene	5	5	5	----	----	ND	1	----	----	ND	10
Xylenes (Total)	5	NA	5	6.8	1	2.7	1	3,300	10	2680	10
Total Volatile TICS	NA	NA	NA	----	----	23	J NA	----	----	6100	J NA

No Criteria developed for this standard. NA
Concentration was not detectable by instrument. ND
Compound was not analyzed for. ----
Compound was detected, however did not exceed any standard. 3
Concentration exceeded the most stringent NYSDEC AWQS. 840

Table 5
Groundwater Analytical Results Comparison for Eastern Building 159 and Building 33 Areas
January 2016

White Plains Housing Authority
White Plains, New York

CLIENT ID: COLLECTION DATE: SAMPLE MATRIX: SAMPLE UNITS: CONSULTANT:				MW-202		TWB-3		TWB-4		TWB-5	
	NY Water TAGM ug/L	NY TOGS WaterEffluent Tagm ug/L	NY TOGS WaterQualStds ug/L	12/22/2015		4/29/2015		4/29/2015		4/28/2015	
				Aqueous		Aqueous		Aqueous		Aqueous	
				ug/L		ug/L		ug/L		ug/L	
				First Environment		First Environment		First Environment		First Environment	
				Result	RL	Result	RL	Result	RL	Result	RL
Metals											
Lead	NA	50	25	17	3	51	3	ND	3	95	3
Volatiles (TCL VO+15 incl. VOC STARS)											
1,2,4-Trimethylbenzene	5	NA	5	1.9	1	6	1	27	1	2,900	20
1,3,5-Trimethylbenzene	5	NA	5	ND	1	1.8	1	7.6	1	730	20
4-Isopropyltoluene	5	NA	5	ND	1	ND	1	2.1	1	22	20
Benzene	0.7	1	1	ND	0.5	ND	0.5	0.56	0.5	ND	10
Chloroform	7	7	7	ND	1	----	----	----	----	----	----
cis-1,2-Dichloroethene	NA	NA	5	ND	1	----	----	----	----	----	----
Cyclohexane	NA	NA	NA	ND	1	----	----	----	----	----	----
Ethylbenzene	5	NA	5	ND	1	6.3	1	15	1	1,700	20
Isopropylbenzene	NA	NA	5	ND	1	1.1	1	4.2	1	150	20
m&p-Xylenes	5	NA	5	ND	1	13	1	31	1	5,100	20
Methylcyclohexane	NA	NA	NA	ND	1	----	----	----	----	----	----
Methyl-t-butyl ether	NA	NA	NA	ND	0.5	ND	0.5	0.63	0.5	ND	10
Naphthalene	10	NA	NA	ND	1	1.3	1	17	1	410	20
n-Butylbenzene	NA	NA	5	ND	1	ND	1	11	1	39	20
n-Propylbenzene	NA	NA	5	ND	1	3	1	12	1	460	20
o-Xylene	5	NA	5	ND	1	2.9	1	5.6	1	980	20
sec-Butylbenzene	NA	NA	5	ND	1	1.4	1	4.3	1	39	20
t-Butylbenzene	NA	NA	NA	ND	1	ND	1	ND	1	ND	20
Tetrachloroethene	5	NA	5	ND	1	----	----	----	----	----	----
Toluene	5	NA	5	ND	1	ND	1	ND	1	ND	20
Trichloroethene	5	5	5	ND	1	----	----	----	----	----	----
Xylenes (Total)	5	NA	5	ND	1	15.9	1	36.6	1	6,080	20
Total Volatile TICS	NA	NA	NA	ND	NA	----	----	----	----	----	----

No Criteria developed for this standard. NA
Concentration was not detectable by instrument. ND
Compound was not analyzed for. ----
Compound was detected, however did not exceed any standard. 3
Concentration exceeded the most stringent NYSDEC AWQS. 840

Table 5
Groundwater Analytical Results Comparison for Eastern Building 159 and Building 33 Areas
January 2016

White Plains Housing Authority
White Plains, New York

CLIENT ID: COLLECTION DATE: SAMPLE MATRIX: SAMPLE UNITS: CONSULTANT:				MW-203		MW-204		TWB-6		MW-205	
				12/22/2015		12/22/2015		4/28/2015		12/22/2015	
		NY TOGS	NY TOGS	Aqueous		Aqueous		Aqueous		Aqueous	
	NY Water	WaterEffluent	NY TOGS	ug/L		ug/L		ug/L		ug/L	
TAGM	Tagm	WaterQualStds	First Environment		First Environment		First Environment		First Environment		
ug/L	ug/L	ug/L	Result	RL	Result	RL	Result	RL	Result	RL	
Metals											
Lead	NA	50	25	6.6	3	28	3	270	3	6.8	3
Volatiles (TCL VO+15 incl. VOC STARS)											
1,2,4-Trimethylbenzene	5	NA	5	1400	10	ND	10	15	1	3.1	1
1,3,5-Trimethylbenzene	5	NA	5	320	10	ND	10	2.8	1	ND	1
4-Isopropyltoluene	5	NA	5	ND	10	ND	10	ND	1	ND	1
Benzene	0.7	1	1	ND	5	ND	5	10	0.5	ND	0.5
Chloroform	7	7	7	10	10	ND	10			ND	1
cis-1,2-Dichloroethene	NA	NA	5	ND	10	20	10			ND	1
Cyclohexane	NA	NA	NA	58	10	ND	10			ND	1
Ethylbenzene	5	NA	5	120	10	ND	10	13	1	1.2	1
Isopropylbenzene	NA	NA	5	91	10	ND	10	2.5	1	ND	1
m&p-Xylenes	5	NA	5	160	10	ND	10	44	1	5.1	1
Methylcyclohexane	NA	NA	NA	96	10	ND	10			ND	1
Methyl-t-butyl ether	NA	NA	NA	ND	5	47	5	1	0.5	ND	0.5
Naphthalene	10	NA	NA	220	10	ND	10	2.3	1	ND	1
n-Butylbenzene	NA	NA	5	15	10	ND	10	ND	1	ND	1
n-Propylbenzene	NA	NA	5	280	10	ND	10	4	1	ND	1
o-Xylene	5	NA	5	38	10	ND	10	8.3	1	ND	1
sec-Butylbenzene	NA	NA	5	22	10	ND	10	ND	1	ND	1
t-Butylbenzene	NA	NA	NA	ND	10	ND	10	ND	1	ND	1
Tetrachloroethene	5	NA	5	ND	10	960	10			ND	1
Toluene	5	NA	5	ND	10	ND	10	ND	1	ND	1
Trichloroethene	5	5	5	ND	10	56	10			ND	1
Xylenes (Total)	5	NA	5	198	10	ND	10	52.3	1	5.1	1
Total Volatile TICs	NA	NA	NA	4000	J NA	ND	NA	----	----	ND	NA

No Criteria developed for this standard. NA
Concentration was not detectable by instrument. ND
Compound was not analyzed for. ----
Compound was detected, however did not exceed any standard. 3
Concentration exceeded the most stringent NYSDEC AWQS. 840

TABLE 6
Building 33
Groundwater Analytical Results
August 2016

White Plains Housing Authority
WPHA001

CLIENT ID: COLLECTION DATE: SAMPLE MATRIX: SAMPLE UNITS: LAB ID: CONSULTANT:				MW-201-33	MW-202-33	MW-203-33	MW-204-33	MW-205-33	MW-106	FB 8116							
	NY Water TAGM ug/L	NY TOGS WaterEffluent Tagm ug/L	NY TOGS WaterQual Stds ug/L	8/1/2016 Aqueous ug/L	8/1/2016 Aqueous ug/L	8/1/2016 Aqueous ug/L	8/1/2016 Aqueous ug/L	8/1/2016 Aqueous ug/L	8/1/2016 Aqueous ug/L	8/1/2016 Aqueous ug/L							
				AC92722-015	AC92722-014	AC92722-013	AC92722-012	AC92722-011	AC92722-010	AC92722-016							
	First Environment	First Environment	First Environment	First Environment	First Environment	First Environment	First Environment										
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	
Volatiles (TCL VO+15 incl. VOC STARS)																	
1,2,4-Trimethylbenzene	5	NA	5	1,100	5	ND	1	2600	10	ND	1	ND	1	ND	1	ND	1
1,3,5-Trimethylbenzene	5	NA	5	430	5	ND	1	650	10	ND	1	ND	1	ND	1	ND	1
4-Isopropyltoluene	5	NA	5	9.5	5	ND	1	21	10	ND	1	ND	1	ND	1	ND	1
Benzene	0.7	1	1	16	2.5	ND	0.5	ND	5	ND	0.5	ND	0.5	ND	0.5	ND	0.5
Ethylbenzene	5	NA	5	750	5	ND	1	270	10	ND	1	ND	1	ND	1	ND	1
Isopropylbenzene	NA	NA	5	120	5	ND	1	170	10	ND	1	ND	1	ND	1	ND	1
m&p-Xylenes	5	NA	5	1,000	5	ND	1	260	10	ND	1	ND	1	ND	1	ND	1
Methyl-t-butyl ether	NA	NA	NA	ND	2.5	ND	0.5	ND	5	39	0.5	ND	0.5	ND	0.5	ND	0.5
Naphthalene	10	NA	NA	380	5	ND	1	470	10	ND	1	ND	1	ND	1	ND	1
n-Butylbenzene	NA	NA	5	32	5	ND	1	ND	10	ND	1	ND	1	ND	1	ND	1
n-Propylbenzene	NA	NA	5	290	5	ND	1	500	10	ND	1	ND	1	ND	1	ND	1
o-Xylene	5	NA	5	150	5	ND	1	61	10	ND	1	ND	1	ND	1	ND	1
sec-Butylbenzene	NA	NA	5	28	5	ND	1	44	10	ND	1	ND	1	ND	1	ND	1
t-Butylbenzene	NA	NA	NA	ND	5	ND	1	ND	10	ND	1	ND	1	ND	1	ND	1
Toluene	5	NA	5	ND	5	ND	1	ND	10	ND	1	ND	1	ND	1	ND	1
Xylenes (Total)	NA	NA	NA	1,200	5	ND	1	320	10	ND	1	ND	1	ND	1	ND	1

TABLE 6
Building 33
Groundwater Analytical Results
August 2016

White Plains Housing Authority
WPHA001

CLIENT ID: COLLECTION DATE: SAMPLE MATRIX: SAMPLE UNITS: LAB ID: CONSULTANT:				TB		
	NY Water TAGM ug/L	NY TOGS WaterEffluent Tagm ug/L	NY TOGS WaterQual Stds ug/L	8/1/2016 Aqueous ug/L		
				AC92722-017		
				First Environment		
			Result		RL	
Volatiles (TCL VO+15 incl. VOC STARS)						
1,2,4-Trimethylbenzene	5	NA	5	ND		1
1,3,5-Trimethylbenzene	5	NA	5	ND		1
4-Isopropyltoluene	5	NA	5	ND		1
Benzene	0.7	1	1	ND		0.5
Ethylbenzene	5	NA	5	ND		1
Isopropylbenzene	NA	NA	5	ND		1
m&p-Xylenes	5	NA	5	ND		1
Methyl-t-butyl ether	NA	NA	NA	ND		0.5
Naphthalene	10	NA	NA	ND		1
n-Butylbenzene	NA	NA	5	ND		1
n-Propylbenzene	NA	NA	5	ND		1
o-Xylene	5	NA	5	ND		1
sec-Butylbenzene	NA	NA	5	ND		1
t-Butylbenzene	NA	NA	NA	ND		1
Toluene	5	NA	5	ND		1
Xylenes (Total)	NA	NA	NA	ND		1

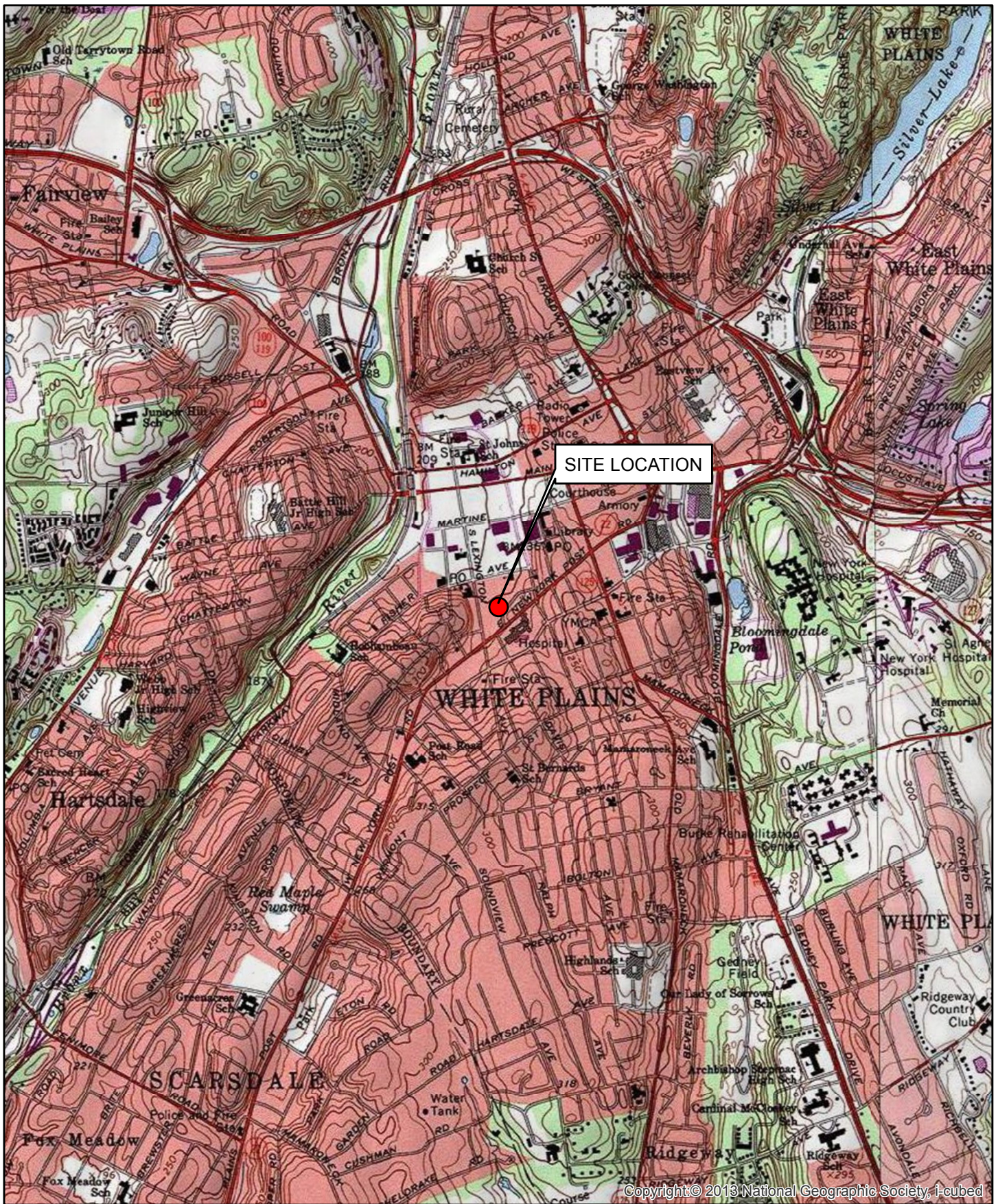
TABLE 7
Building 33 Split-Sampling
Groundwater Analytical Results Comparison
August 2016

White Plains Housing Authority
WPHA001

CLIENT ID: COLLECTION DATE: SAMPLE MATRIX: SAMPLE UNITS: LAB ID: CONSULTANT:				MW-106				MW-201-33				MW-202-33				MW-203-33				MW-204-33				MW-205-33				FB 8116		TB									
	NY Water TAGM ug/L	NY TOGS WaterEffluent Tagm ug/L	NY TOGS WaterQualStds ug/L	8/1/2016 Aqueous ug/L				8/1/2016 Aqueous ug/L				8/1/2016 Aqueous ug/L				8/1/2016 Aqueous ug/L				8/1/2016 Aqueous ug/L				8/1/2016 Aqueous ug/L		8/1/2016 Aqueous ug/L													
				AC92722-010		Antea Group		AC92722-015		Antea Group		AC92722-014		Antea Group		AC92722-013		Antea Group		AC92722-012		Antea Group		AC92722-011		Antea Group		AC92722-016		Antea Group									
				Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL						
Volatiles (TCL VO-15 incl. VOC STARS)																																							
1,2,4-Trimethylbenzene	5	NA	5	ND	1	ND	1	1,100	5	750	20	ND	1	ND	1	2600	10	2,100	50	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
1,3,5-Trimethylbenzene	5	NA	5	ND	1	ND	1	430	5	190	20	ND	1	ND	1	650	10	360	50	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
4-Isopropyltoluene	5	NA	5	ND	1	ND	1	9.5	5	ND	20	ND	1	ND	1	21	10	ND	50	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Benzene	0.7	1	1	ND	0.5	ND	1	16	2.5	ND	20	ND	0.5	ND	1	ND	5	ND	50	ND	0.5	ND	1	ND	0.5	ND	1	ND	0.5	ND	1	ND	0.5	ND	1	ND	0.5	ND	1
Ethylbenzene	5	NA	5	ND	1	ND	1	750	5	450	20	ND	1	ND	1	270	10	220	50	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Isopropylbenzene	NA	NA	5	ND	1	ND	1	120	5	89	20	ND	1	ND	1	170	10	160	50	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
m&p-Xylenes	5	NA	5	ND	1	ND	2	1,000	5	540	40	ND	1	ND	2	260	10	160	100	ND	1	ND	2	ND	1	ND	2	ND	1	ND	2	ND	1	ND	1	ND	1	ND	1
Methyl-t-butyl ether	NA	NA	NA	ND	0.5	ND	1	ND	2.5	ND	20	ND	0.5	ND	1	ND	5	ND	50	39	0.5	41	1	ND	0.5	ND	1	ND	0.5	ND	1	ND	0.5	ND	1	ND	0.5	ND	1
Naphthalene	10	NA	NA	ND	1	ND	2	380	5	400	40	ND	1	ND	2	470	10	530	100	ND	1	ND	2	ND	1	ND	2	ND	1	ND	2	ND	1	ND	1	ND	1	ND	1
n-Butylbenzene	NA	NA	5	ND	1	ND	1	32	5	32	20	ND	1	ND	1	ND	10	52	50	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
n-Propylbenzene	NA	NA	5	ND	1	ND	1	290	5	200	20	ND	1	ND	1	500	10	400	50	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
o-Xylene	5	NA	5	ND	1	ND	1	150	5	83	20	ND	1	ND	1	61	10	ND	50	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
sec-Butylbenzene	NA	NA	5	ND	1	ND	1	28	5	ND	20	ND	1	ND	1	44	10	ND	50	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
t-Butylbenzene	NA	NA	NA	ND	1	ND	1	ND	5	ND	20	ND	1	ND	1	ND	10	ND	50	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Toluene	5	NA	5	ND	1	ND	1	ND	5	ND	20	ND	1	ND	1	ND	10	ND	50	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Xylenes (Total)	NA	NA	NA	ND	1	ND		1,200	5	623		ND	1	ND		320	10	160		ND	1	ND		ND	1	ND		ND	1	ND		ND	1	ND		ND	1	ND	

** Certain contaminants are not detected by Antea's laboratory due to the high Reporting Limit's (RLs) of that laboratory. First Environment's laboratory utilized lower RLs, and therefore detected these contaminants.

FIGURES



Copyright © 2013 National Geographic Society, i-cubed



1 inch = 2,000 feet

FIRST ENVIRONMENT

91 Fulton Street
Boonton, New Jersey 07005

WHITE PLAINS HOUSING AUTHORITY
26 EAST POST ROAD
WHITE PLAINS, WESTCHESTER COUNTY, NY

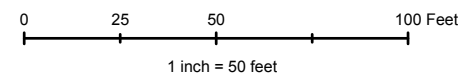
FIGURE 1
SITE LOCATION MAP

Revised	Drawn	Checked	Approved	Date
	SW	KNF	TCB	10/08/15

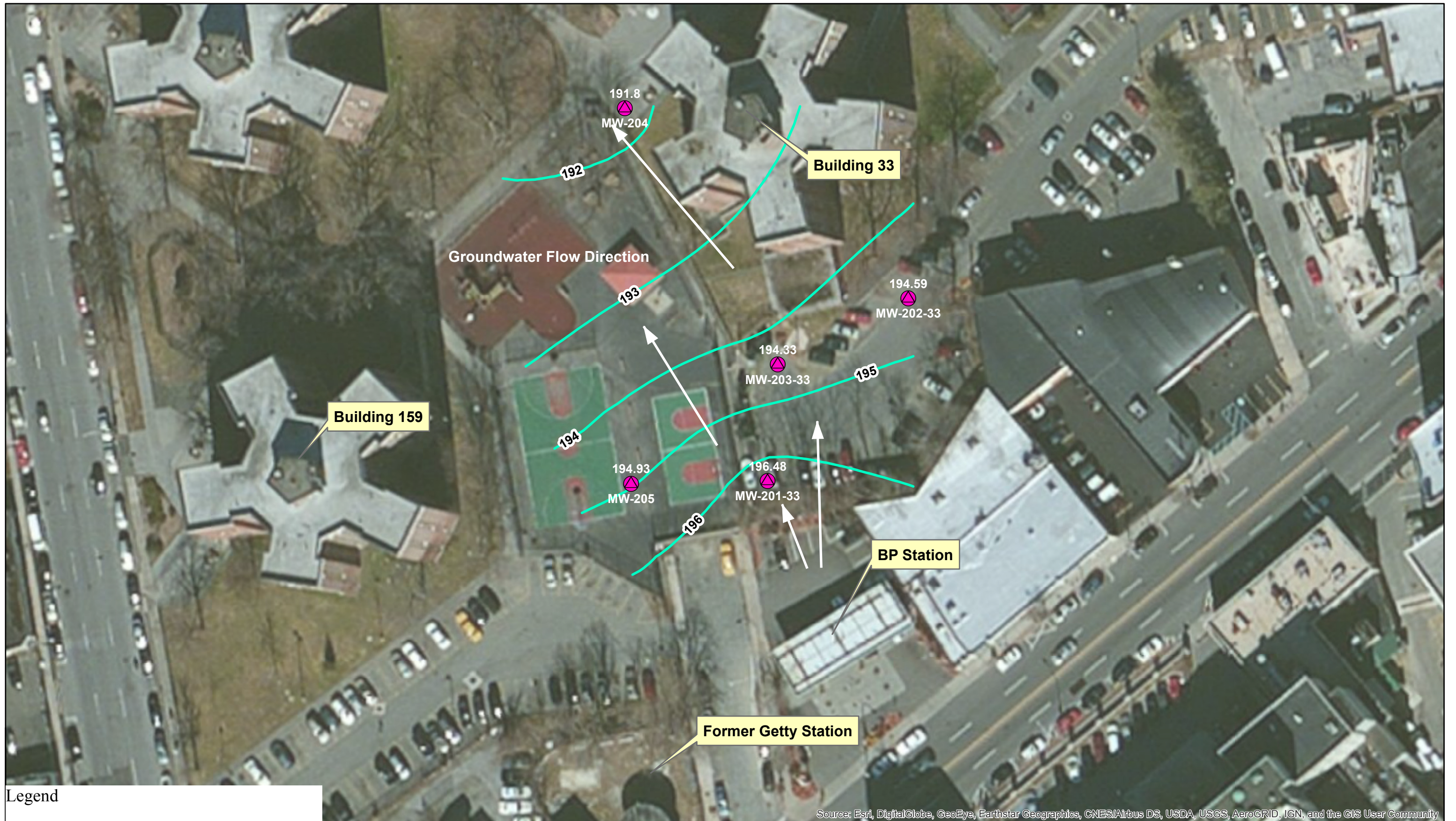


Legend

- ▲ Temporary Well Points Installed in September 2014
- ▲ Temporary Well Points Installed in April 2015
- Permanent Monitoring Wells Installed in December 2015





	WHITE PLAINS HOUSING AUTHORITY Building 33 White Plains, New York FIGURE 2 SITE PLAN			
	91 Fulton Street Boonton, New Jersey 07005	Revised	Drawn NMT	Checked Approved

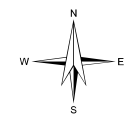
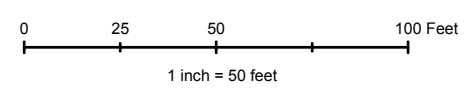


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

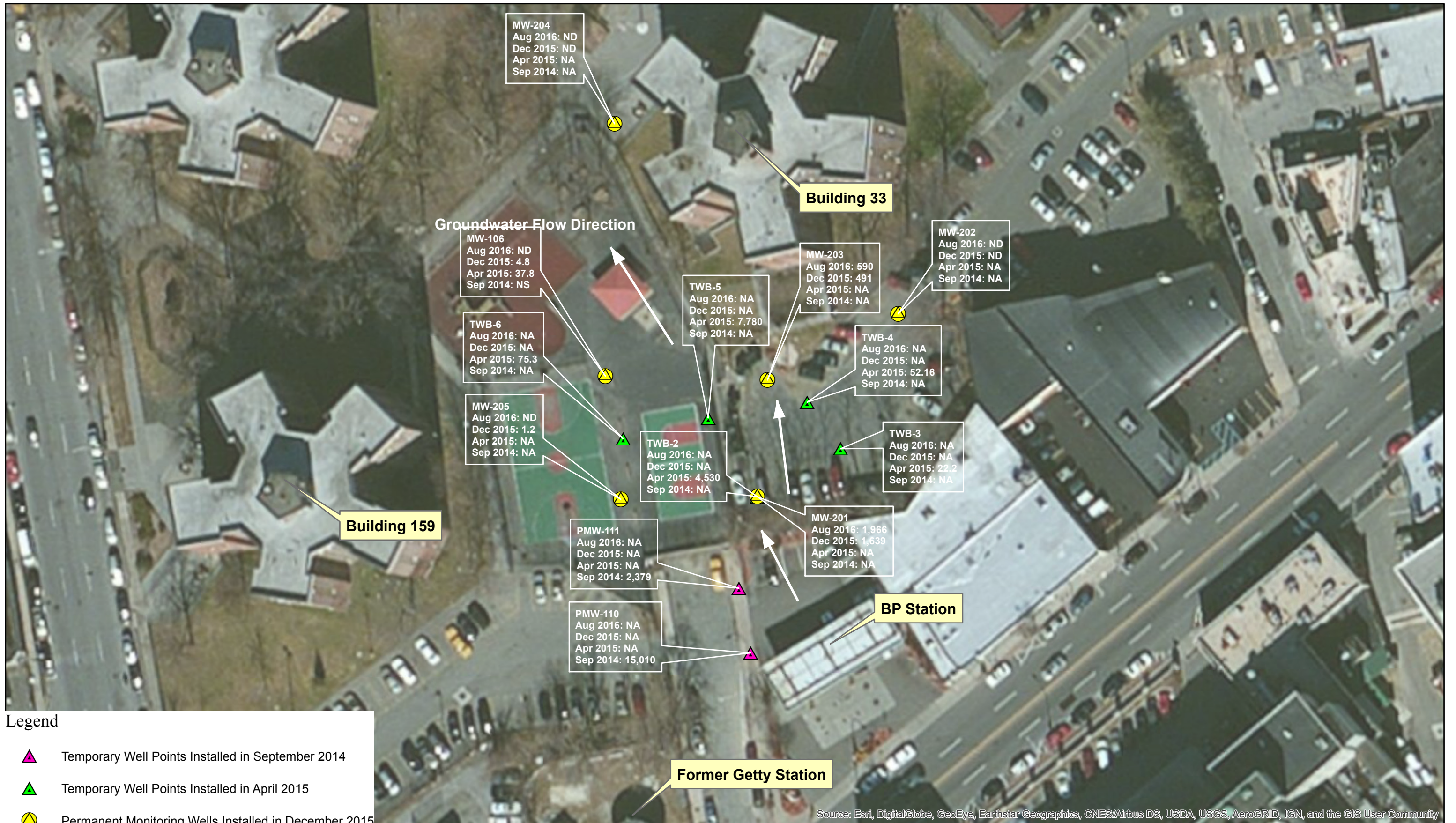
Legend

-  Monitoring Wells Installed by First Environment
-  Groundwater Elevation Contours (ft, MSL)

196.48 Groundwater Elevation as of August 2016 (ft, MSL)



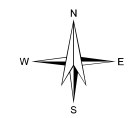
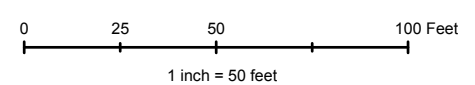
FIRST ENVIRONMENT	WHITE PLAINS HOUSING AUTHORITY Building 33 White Plains, New York FIGURE 3 GROUNDWATER ELEVATION CONTOUR MAP			
	91 Fulton Street Boonton, New Jersey 07005	Revised	Drawn NMT	Checked Approved
				Date 11/7/2016



Legend

- ▲ Temporary Well Points Installed in September 2014
- ▲ Temporary Well Points Installed in April 2015
- Permanent Monitoring Wells Installed in December 2015

NA: Not Available
 ND: Not Detected above Laboratory Reported Detection Limits



FIRST ENVIRONMENT	WHITE PLAINS HOUSING AUTHORITY Building 33 White Plains, New York			
	FIGURE 4 TOTAL BTEX CONCENTRATIONS IN GROUNDWATER (ug/L)			
91 Fulton Street Boonton, New Jersey 07005	Revised	Drawn NMT	Checked	Approved
				Date 11/4/2016

APPENDIX A



**First American Title Insurance Company National
Commercial Services
633 Third Avenue
New York, NY 10017
(800)437-1234 - Fax (212)922-0881**

December 05, 2014

N.W. Bernstein & Associates, LLC
800 Westchester Avenue, n319
Rye Brook, NY 10573
Attn: Lowell D. Willinger

RE: Title No.: 3020-703022NY1
Premises: 34 East Post Road,
White Plains, New York
Block: 2
Lot: 4
Owner: Marianina Oil Corp.

Dear Mr. Willinger,

As per your request, we have searched the Westchester County Clerk's Office for the 75 year deed chain of record against the above mentioned premises and have found the following:

Deed made by The County Trust Company to Sinclair Refining Company dated 8/20/1936 recorded 8/24/1936 in Liber 3534 Page 183.

Deed made by Atlantic Richfield Company to BP Oil Corporation dated 3/4/1969 recorded 10/14/1970 in Liber 6952 Page 678.

Deed made by BP Oil Corporation to BP Oil Inc. dated 12/21/1973 recorded 7/18/1974 in Liber 7209 Page 180.

Deed made by BP Oil Inc. to Northville Gasoline Corp. dated 10/5/1983 recorded 11/18/1983 in Liber 7878 Page 533.

Deed made by Northville Gasoline Corp. to Marianina Oil Corp. dated 6/24/1987 recorded 7/20/1987 in Liber 8893 Page 17.

This report is not an insured product or service or a representation of the condition of title to real property. It is not an abstract, legal opinion, opinion of title, title insurance commitment or preliminary report, or any form of title insurance or guaranty. This report is issued exclusively for the benefit of the applicant therefore, and may not be used or relied upon by any other person. This report may not be reproduced in any manner without First American's prior written consent. First American does not represent or warrant that the information herein is complete or free from error, and the information herein is provided without any warranties of any kind, as-is, and with all faults. As a material part of the consideration given in exchange for the issuance of this report, recipient agrees that First American's sole liability for any loss or damage caused by an error or omission due to inaccurate information or negligence in preparing this report shall be limited to the fee charged for the report. Recipient accepts this report with this limitation and agrees that First American would not have issued this report but for the limitation of liability described above. First American makes no representation or warranty as to the legality or propriety of recipient's use of the information herein.

If we can be of any further assistance, please feel free to call.

Very truly yours,

A handwritten signature in cursive script that reads "Veronica Kearney". The signature is written in black ink and is positioned to the right of the typed name.

Veronica Kearney
Special Services

VK/VK

...no stamps attached

This Indenture,

Made the 20th day of August, nineteen hundred and thirty-six

Between THE COUNTY TRUST COMPANY, a domestic banking

a corporation organized under the laws of New York State, having its principal place of business at No. 159 Main Street, White Plains, New York,

, party of the first part, and

SINCLAIR REFINING COMPANY, a corporation organized under the Laws of the State of Maine, having its principal place of business at No. 630 Fifth Avenue, New York City, New York,

, party of the second part,

Witnesseth, that the party of the first part, in consideration of

----- ONE HUNDRED (\$100) ----- Dollars,

lawful money of the United States, and other good and valuable

consideration paid by the party of the second part,

does hereby grant and release unto the party of the second part,

its successors and assigns forever,

PARCEL I

All that certain lot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the City of White Plains, County of Westchester and State of New York, being parts of Lots Nos. 1 and 2 as shown on a certain map entitled, "Map of lots belonging to Richard Manney in the City of White Plains, Westchester County, New York" made by J. Henry Carpenter, C.E., October 17th, 1884, and filed in the office of the Register of Westchester County on December 24th, 1885, in Volume 6 of Maps at page 57, which parts of said lots, when taken together, are more particularly bounded and described as follows:

BEGINNING at a point on the easterly side of Brookfield Street at the northerly end of a curve having a radius of eight feet connecting said easterly side of Brookfield Street with the northerly side of the New York Post Road; running thence North 0 degrees 51' West along said easterly side of Brookfield Street 134 feet to the northerly boundary line of land conveyed by Philip Ryan to Sarah M. Jarvis by deed dated March 29th, 1876, and recorded in the office of the Register of Westchester County in Liber 1050 of conveyances at page 250; running thence easterly along the northerly boundary line of land conveyed by the last mentioned deed 65.50 feet more or less to the easterly boundary line of land conveyed to William S. Sterling by Richard Manney by deed dated February 14th, 1885, and recorded in the office of the Register of Westchester County in Liber 1057 of conveyances at page 429; running thence along the said easterly boundary line of land conveyed by the last mentioned deed south 23 degrees 15' East 87 feet more or less to the easterly side of land conveyed by Philip Ryan to Sarah M. Jarvis by deed dated March 29th, 1876, and recorded in the office of the Register of Westchester County in Liber 1050 of conveyances at page 250; running thence southerly along the said easterly boundary line of land conveyed



by the last mentioned deed 16 feet more or less to the northerly side of the New York Post Road; running thence along the northerly side of the New York Post Road South 58 degrees 39' West 100.50 feet to the southerly end of a curve connecting said northerly side of New York Post Road with the easterly side of Brookfield Street; running thence northwesterly along said curve to the right having a radius of 8 feet a distance of 16.82 feet to the easterly side of Brookfield Street at the point or place of beginning.

PARCEL II

ALSO a strip of land adjoining the premises above described on the north, more particularly bounded and described as follows:

BEGINNING at a point on the easterly side of Brookfield Street distant 134 feet northerly as measured along the same from the northerly end of a curve having a radius of 8 feet connecting said easterly side of Brookfield Street with the northerly side of New York Post Road, said point of beginning being also where the northerly boundary line of land conveyed by Philip Ryan to Sarah M. Jarvis by deed dated March 29th, 1876, and recorded in the office of the Register of Westchester County in Liber 1050 of conveyances at page 250 intersects said easterly side of Brookfield Street; and running thence easterly along the northerly boundary line of said premises conveyed by the last mentioned deed 65.50 feet more or less to the easterly boundary line of land conveyed by Richard Manney to William S. Sterling by deed dated February 14th, 1885, and recorded in the office of the Register of Westchester County in Liber 1057 of conveyances at page 429; running thence along said easterly boundary line of land conveyed by the last mentioned deed North 23 degrees 15' West 5.71 feet more or less to land now or formerly of Jacob Farrington; thence running along the last mentioned land South 89 degrees 09' West 63.47 feet to the easterly side of Brookfield Street; and running thence southerly along the easterly side of Brookfield Street 12 feet more or less to the point or place of beginning.

PARCEL III

ALSO a gore of land adjoining the premises described as Parcel I on the east, more particularly bounded and described as follows:

BEGINNING at a point on the northerly side of New York Post Road distant 100.50 feet easterly as measured along the same from the southerly end of a curve connecting the said northerly side of New York Post Road with the easterly side of Brookfield Street, said point of beginning being also where the easterly boundary line of premises conveyed by Philip Ryan to Sarah M. Jarvis by deed dated March 29th, 1876, and recorded in the office of the Register of Westchester County in Liber 1050 of conveyances at Page 250 intersects the said northerly side of New York Post Road; running thence northerly along the said easterly boundary line of land conveyed by the last mentioned deed 16 feet more or less to the easterly line of land conveyed by Richard Manney to William S. Sterling by deed dated February 14th, 1885, and recorded in the Office of the Register of Westchester County in Liber 1057 of conveyances at page 429; running thence along the said easterly line of land conveyed by the last mentioned deed South 23 degrees 15' East 11 feet more or less to the northerly side of the New York Post Road; running thence along the northerly side of the New York Post Road South 58 degrees 39' West 6.35 feet more or less to the point and place of beginning.

TOGETHER with all the right, title and interest of the party of the first part in and to the streets lying in front of and adjoining said premises to the center lines thereof.

Together with the appurtenances and all the estate and rights of the party of the first part in and to said premises.

To have and to hold the premises herein granted unto the party of the second part, its successors and assigns forever

If any improvements, repairs or alterations have been commenced and have not been completed at least four months before the recording of this deed, the grantor will receive the consideration for this conveyance as a trust fund to be applied first for the purpose of paying the cost of improvements and that it will apply the same first to the payment of the cost of the improvement before using any part of the total of the same for any other purpose.

And the party of the first part covenants as follows:

First. That the party of the first part is seized of the said premises in fee simple, and has good right to convey the same;

Second. That the party of the second part shall quietly enjoy the said premises;

Third. That the said premises are free from incumbrances;

Fourth. That the party of the first part will execute or procure any further necessary assurance of the title to said premises;

Fifth. That the party of the first part will forever warrant the title to the said premises.

In Witness Whereof, the party of the first part has caused its corporate seal to be hereunto affixed and these presents to be signed by its duly authorized officer the day and year first above written.

ATTEST:

[Signature]
Secretary

THE COUNTY TRUST COMPANY

By

[Signature]
Vice President

State of NEW YORK

County of WESTCHESTER

} ss:

On the 20th day of August nineteen hundred and thirty-six, before me came JOHN O. BLINN, JR.,

to me known, who, being by me duly sworn, did depose and say that he resides in at 60 Rosband Avenue, White Plains, New York,

that he is the Vice President of

THE COUNTY TRUST COMPANY

the corporation described in, and which executed, the foregoing instrument; that

he knows the seal of said corporation; that the seal affixed to said instrument

is such corporate seal; that it was so affixed by order of the board of directors

of said corporation; and that he signed his name thereto

by like order.

Waris Cox
Notary Public, Westchester County

The foregoing instrument was endorsed for record as follows: The property affected by this instrument is situate in the CITY OF WHITE PLAINS County of Westchester, N. Y. A true copy of the original DEED at request of N. Y. T. INS. CO. RECORDED AUG. 24, 1936, at 11:26 AM

FEE: \$ 3.85

No. 16857

WILLIAM F. CONDON, Register.

W 12631

DEED

THE COUNTY TRUST COMP

AUG 24 1936

TO

SINGLAIR RETAINING COM

Dated, August 20th

The property affected by this Deed is situate in the City of White Plains in County of Westchester

Record & Return to NEW YORK TITLE INSURANCE COMPANY

~~CHARLES C. FENAKO ATTORNEY AT LAW WHITE PLAINS, N. Y.~~

REMARKS THIS SPACE FOR USE OF RECORDING OFFICE
3.85 B - CPa 60022 B-24-36
Postage
Taxes
Towns



006970287

STAMPS
9/31/45

1686
LIBER 1052 PAGE 118
Standard Form No. 1, U. S. Form 2007 a Rev. 10-24-44 - Bargain and Sale Deed, with Covenant against Grantor's Act - Individual or Corporation
CONSULT YOUR LAWYER BEFORE SIGNING THIS INSTRUMENT - THIS INSTRUMENT SHOULD BE USED BY LAWYERS ONLY.

THIS INDENTURE, made the 4th day of March, sixteen hundred and sixty-nine
BETWEEN ATLANTIC RICHFIELD COMPANY, a Pennsylvania corporation, having a business office at 717 Fifth Avenue, New York, New York.

party of the first part, and
BP OIL CORPORATION, a Delaware corporation, having a business office at 620 Fifth Avenue, New York, New York,

party of the second part,
WITNESSETH, that the party of the first part, in consideration of TEN -----
----- (\$10.00) dollars,
lawful money of the United States, and other valuable consideration paid
by the party of the second part, does hereby grant and release unto the party of the second part, the heirs or successors and assigns of the party of the second part forever.

ALL that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the City of White Plains, County of Westchester and State of New York, being parts of Lots Nos. 1 and 2 as shown on a certain map entitled, "Map of lots belonging to Richard Manney in the City of White Plains, Westchester County, New York" made by J. Henry Carpenter, C.E., October 17th, 1884, and filed in the office of the Register of Westchester County on December 24th, 1885, in Volume 6 of Maps at page 57, which parts of said lots, when taken together, are more particularly bounded and described as follows:

BEGINNING at a point on the easterly side of Brookfield Street at the northerly end of a curve having a radius of eight feet connecting said easterly side of Brookfield Street with the northerly side of the New York Post Road; running thence North 0 degrees 51' West along said easterly side of Brookfield Street 134 feet to the northerly boundary line of land conveyed by Philip Ryan to Sarah M. Jarvis by deed dated March 29th, 1876, and recorded in the office of the Register of Westchester County in Liber 1050 of conveyances at page 250; running thence easterly along the northerly boundary line of land conveyed by the last mentioned deed 65.50 feet more or less to the easterly boundary line of land conveyed to William S. Sterling by Richard Manney by deed dated February 14th, 1885, and recorded in the office of the Register of Westchester County in Liber 1057 of conveyances at page 429; running thence along the said easterly boundary line of land conveyed by the last mentioned deed south 23 degrees 15' East 87 feet more or less to the easterly side of land conveyed by Philip Ryan to Sarah M. Jarvis by deed dated March 29th, 1876, and recorded in the office of the Register of Westchester County in Liber 1050 of conveyances at page 250; running thence southerly along the said easterly boundary line of land conveyed by the last mentioned deed 16 feet more or less to the northerly side of the New York Post Road; running thence along the northerly side of the New York Post Road South 58 degrees 39' West 100.50 feet to the southerly end of a curve connecting said northerly side

13822

TAX STAMPS
ATTACHED #10/14 OCT 14 1970

of New York Post Road with the easterly side of Brookfield Street; running thence northwesterly along said curve to the right having a radius of 8 feet a distance of 16.82 feet to the easterly side of Brookfield Street at the point or place of beginning.

PARCEL II

ALSO a strip of land adjoining the premises above described on the north, more particularly bounded and described as follows:

BEGINNING at a point on the easterly side of Brookfield Street distant 134 feet northerly as measured along the same from the northerly end of a curve having a radius of 8 feet connecting said easterly side of Brookfield Street with the northerly side of New York Post Road, said point of beginning being also where the northerly boundary line of land conveyed by Philip Ryan to Sarah M. Jarvis by deed dated March 29th, 1876, and recorded in the office of the Register of Westchester County in Liber 1050 of conveyances at page 250 intersects said easterly side of Brookfield Street; and running thence easterly along the northerly boundary line of said premises conveyed by the last mentioned deed 65.50 feet more or less to the easterly boundary line of land conveyed by Richard Manney to William S. Sterling by deed dated February 14th, 1885, and recorded in the office of the Register of Westchester County in Liber 1057 of conveyances at page 429; running thence along said easterly boundary line of land conveyed by the last mentioned deed North 23 degrees 15' West 5.71 feet more or less to land now or formerly of Jacob Farrington; thence running along the last mentioned land South 89 degrees 09' West 63.47 feet to the easterly side of Brookfield Street; and running thence southerly along the easterly side of Brookfield Street 12 feet more or less to the point or place of beginning.

PARCEL III

ALSO a gore of land adjoining the premises described as Parcel I on the east, more particularly bounded and described as follows:

BEGINNING at a point on the northerly side of New York Post Road distant 100.50 feet easterly as measured along the same from the southerly end of a curve connecting the said northerly side of New York Post Road with the easterly side of Brookfield Street, said point of beginning being also where the easterly boundary line of premises conveyed by Philip Ryan to Sarah M. Jarvis by deed dated March 29th, 1876, and recorded in the office of the Register of Westchester County in Liber 1050 of conveyances at page 250 intersects the said northerly side of New York Post Road; running thence northerly along the said easterly boundary line of land conveyed by the last mentioned deed 16 feet more or less to the easterly line of land conveyed by Richard Manney to William S. Sterling by deed dated February 14th, 1885, and recorded in the Office of the Register of Westchester County in Liber 1057 of conveyances at page 429; running thence along the said easterly line of land conveyed by the last mentioned deed South 23 degrees 15' East 11 feet more or less to the northerly side of the New York Post Road; running thence along the northerly side of the New York Post Road South 58 degrees 39' West 6.35 feet more or less to the point and place of beginning.

TOGETHER with all the right, title and interest of the party of the first part in and to the streets lying in front of and adjoining said premises to the center lines thereof.

BEING the same premises conveyed to Sinclair Refining Company by deed dated August 20, 1936 from The County Trust Company and recorded in the Westchester County Clerk's Office on August 24, 1936 in Liber 3534 of Deeds page 183. Also known as Section Ward 3, Block 19, Lot 1 on Tax Map.

Sinclair Refining Company, by Agreement of Merger, effective September 30, 1968, was merged into Sinclair Oil Corporation and by Agreement of Merger, effective March 4, 1969, Sinclair Oil Corporation, a domestic corporation, was merged into Atlantic Richfield Company, Party of the First Part herein.

This conveyance is of premises which do not constitute all or substantially all of the assets of the Party of the First Part and the consent of the stockholders of the sale of the aforesaid property is not required by the Certificate of Incorporation of the Party of the First Part.

TOGETHER with all right, title and interest, if any, of the party of the first part in and to any streets and roads abutting the above described premises to the center lines thereof,

TOGETHER with the appurtenances and all the estate and rights of the party of the first part in and to said premises,

TO HAVE AND TO HOLD the premises herein granted unto the party of the second part, the heirs or successors and assigns of the party of the second part forever.

AND the party of the first part covenants that the party of the first part has not done or suffered anything whereby the said premises have been incumbered in any way whatever, except as aforesaid.

AND the party of the first part, in compliance with Section 13 of the Lien Law, covenants that the party of the first part will receive the consideration for this conveyance and will hold the right to receive such consideration as a trust fund to be applied first for the purpose of paying the cost of the improvement and will apply the same first to the payment of the cost of the improvement before using any part of the total of the same for any other purpose.

The word "party" shall be construed as if it read "parties" whenever the sense of this indenture so requires.

IN WITNESS WHEREOF, the party of the first part has duly executed this deed the day and year first above written.

(IN PRESENCE OF)

ATTEST:

W.M. Douglas
Secretary

ATLANTIC RICHFIELD COMPANY

W.H. Crook
Vice President



REAL ESTATE TAX STATE OF NEW YORK
 TRANSFER TAX
 Dep. of Taxation OCT 14 1970
 & Finance
 131.45
 PB. 10227

LIBR 6352 REC 681

STATE OF NEW YORK, COUNTY OF NEW YORK

On the 14th day of August, 1969, before me personally came R. M. Cooper to me known, who, being by me duly sworn, did depose and say that he resides at No. 59 Echo Drive, North Darien, Connecticut, that he is the Vice President of ATLANTIC RICHFIELD COMPANY, the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the board of directors of said corporation, and that he signed his name thereto by like order.

STATE OF NEW YORK COUNTY OF WESTCHESTER

On the 14th day of August, 1969, before me personally came R. M. Cooper to me known, who, being by me duly sworn, did depose and say that he resides at No. 59 Echo Drive, North Darien, Connecticut, that he is the Vice President of ATLANTIC RICHFIELD COMPANY, the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the board of directors of said corporation, and that he signed his name thereto by like order.

Notary Public
 ALBERT V. NOLAN
 Notary Public, State of New York
 #300132660 - Cash, in Payment Co.
 Cert. Filed with N.Y. Ct. Clerk
 Term Expires March 30, 1970

Margain and Sale Deed
 WITH COVENANT AGAINST GRANTEE'S ACTS
 TITLE NO. A-3-1111

SECTION ward 3
 BLOCK 19
 LOT 1
 COUNTY OR TOWN City of White Plains,
 County of Westchester, State of
 New York

ATLANTIC RICHFIELD COMPANY
 TO
 BP OIL CORPORATION

Record and Return To:

Security Title & Guaranty Company
 630 Fifth Avenue
 New York, New York 10020
 Attn: C Schwerdel, V.P.



850 R - CPs 00259 1014-70

RESERVE THIS SPACE FOR USE OF RECORDING OFFICE

RECEIVED WESTCHESTER COUNTY N.Y.	1970 OCT 14 PM 12:58
Slavery Cert.	
Rank & Cert.	
Filing Cert.	
Cons. Returns	
Out. R. 41	
Index	
Trans.	
#	50710
Returned	

DEPARTMENT OF TAXATION
 DIVISION OF LAND RECORDS
 WESTCHESTER COUNTY CLERK'S OFFICE

The foregoing instrument was endorsed for record as follows: The property affected by this instrument is situated in the CITY OF WHITE PLAINS County of Westchester, N. Y. A true copy of the original DEED recorded OCT. 14, 1970 at 12:58 PM

EDWARD N. VETRANO, County Clerk.



006274199

LIBER 7269 PAGE 180

09412

THIS INDENTURE, made the 21st day of December, nineteen hundred and seventy-three between BP OIL CORPORATION, a Delaware corporation, having a business office at One Rollins Plaza, Wilmington, Delaware 19803, party of the first part, and BP OIL INC., an Ohio corporation, having a business office at One Rollins Plaza, Wilmington, Delaware 19803, party of the second part;

WITNESSETH, that the party of the first part, in consideration of TEN AND NO/100 (\$10.00) DOLLARS and other valuable consideration paid by the party of the second part, does hereby grant and release unto the party of the second part, the successors and assigns of the party of the second part forever, effective as of the close of business on December 31, 1973, all that certain plot, piece or parcel of land with the buildings and improvements thereon erected, more particularly described in "Schedule A" attached hereto and incorporated herein by reference;

09412

SCHEDULE A

All that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the City of White Plains, County of Westchester and State of New York, being parts of Lots Nos. 1 and 2 as shown on a certain map entitled, "Map of lots belonging to Richard Manney in the City of White Plains, Westchester County, New York" made by J. Henry Carpenter, C. E., October 17th, 1884, and filed in the office of the Register of Westchester County on December 24th, 1885, in Volume 6 of Maps at Page 57, which parts of said lots, when taken together, are more particularly bounded and described as follows:

BEGINNING at a point on the easterly side of Brookfield Street at the northerly end of a curve having a radius of eight feet connecting said easterly side of Brookfield Street with the northerly side of the New York Post Road; running thence North 0 degrees 51' West along said easterly side of Brookfield Street 134 feet to the northerly boundary line of land conveyed by Philip Ryan to Sarah M. Jarvis by deed dated March 29th, 1876, and recorded in the office of the Register of Westchester County in Liber 1050 of conveyances at Page 250; running thence easterly along the northerly boundary line of land conveyed by the last mentioned deed 65.50 feet more or less to the easterly boundary line of land conveyed to William S. Sterling by Richard Manney by deed dated February 14th, 1885, and recorded in the office of the Register of Westchester County in Liber 1057 of conveyances at Page 429; running thence along the said easterly boundary line of land conveyed by the last mentioned deed south 23 degrees 13' East 87 feet more or less to the easterly side of land conveyed by Philip Ryan to Sarah M. Jarvis by deed dated March 29th, 1876, and recorded in the office of the Register of Westchester County in Liber 1050 of conveyances at Page 250; running thence southerly along the said easterly boundary line of land conveyed by the last mentioned deed 16 feet more or less to the northerly side of the New York Post Road; running thence along the northerly side of the New York Post Road South 58 degrees 39' West 100.50 feet to the southerly end of a curve connecting said northerly side of New York Post Road with the easterly side of Brookfield Street; running thence northwesterly along said curve to the right having a radius of 8 feet a distance of 16.82 feet to the easterly side of Brookfield Street at the point or place of beginning.

PARCEL II

ALSO a strip of land adjoining the premises above described on the north, more particularly bounded and described as follows:

BEGINNING at a point on the easterly side of Brookfield Street distant 134 feet northerly as measured along the same from the northerly end of a curve having a radius of 8 feet connecting said easterly side of Brookfield Street with the northerly side of New York Post Road, said point of beginning being also where the northerly boundary line of land conveyed by Philip Ryan to Sarah M. Jarvis by deed dated March 29th, 1876, and recorded in the office of the Register of Westchester County in Liber 1050 of conveyances at Page 250 intersects said easterly side of Brookfield Street; and running thence easterly along the northerly boundary line of said premises conveyed by the last mentioned deed 65.50 feet more or less to the easterly boundary line of land conveyed by Richard Manney to William S. Sterling

(Continued on Page 2 of Schedule A)

LIBER 7209 PAGE 182
80163

Page 2 of Schedule A

by deed dated February 14th, 1885, and recorded in the office of the Register of Westchester County in Liber 1057 of conveyances at Page 429; running thence along said easterly boundary line of land conveyed by the last mentioned deed North 23 degrees 15' West 5.71 feet more or less to land now or formerly of Jacob Farrington; thence running along the last mentioned land South 89 degrees 09' West 63.47 feet to the easterly side of Brookfield Street; and running thence southerly along the easterly side of Brookfield Street 12 feet more or less to the point or place of beginning.

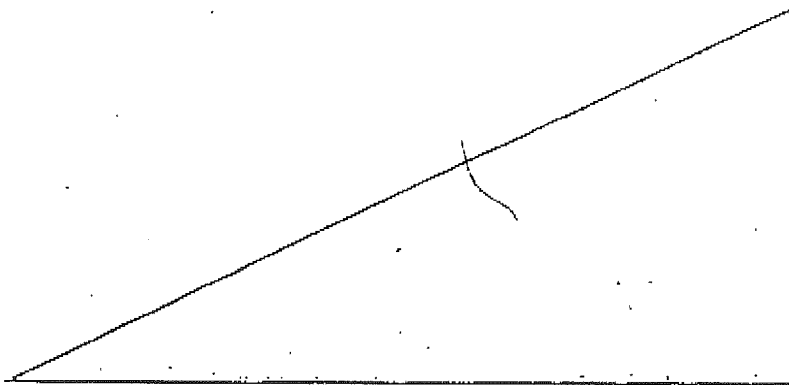
PARCEL III

ALSO a gore of land adjoining the premises described as Parcel I on the east, more particularly bounded and described as follows:

BEGINNING at a point on the northerly side of New York Post Road distant 100.50 feet easterly as measured along the same from the southerly end of a curve connecting the said northerly side of New York Post Road with the easterly side of Brookfield Street, said point of beginning being also where the easterly boundary line of premises conveyed by Philip Ryan to Sarah M. Jarvis by deed dated March 29th, 1876, and recorded in the office of the Register of Westchester County in Liber 1050 of conveyances at Page 250 intersects the said northerly side of New York Post Road; running thence northerly along the said easterly boundary line of land conveyed by the last mentioned deed 16 feet more or less to the easterly line of land conveyed by Richard Manney to William S. Sterling by deed dated February 14th 1885, and recorded in the Office of the Register of Westchester County in Liber 1057 of conveyances at Page 429; running thence along the said easterly line of land conveyed by the last mentioned deed South 23 degrees 15' East 11 feet more or less to the northerly side of the New York Post Road; running thence along the northerly side of the New York Post Road South 58 degrees 39' West 6.35 feet more or less to the point and place of beginning.

TOGETHER with all the right, title and interest of the party of the first part in and to the streets lying in front of and adjoining said premises to the center lines thereof.

BEING the same property conveyed by Deed dated March 4, 1969, executed by Atlantic Richfield Company, a Pennsylvania Corporation, to BP Oil Corporation, a Delaware Corporation, recorded in Deed Book 6952, Page 678, Public Records of Westchester County, New York.



THIS conveyance is of premises which do not constitute all or substantially all of the assets of the Party of the First Part and the consent of the stockholders of the sale of the aforesaid property is not required by the Certificate of Incorporation of the Party of the First Part.

TOGETHER with all right, title and interest, if any, of the party of the first part in and to any streets and roads abutting the above described premises to the center lines thereof; TOGETHER with the appurtenances and all the estate and rights of the party of the first part in and to said premises; TO HAVE AND TO HOLD the premises herein granted unto the party of the second part, the successors and assigns of the party of the second part forever.

AND the party of the first part covenants that the party of the first part has not done or suffered anything whereby the said premises have been encumbered in any way whatever, excepting from said covenants the lien of taxes and assessments not yet due and payable, zoning ordinances, if any, and easements, conditions, limitations and restrictions of any kind.

AND the party of the first part, in compliance with Section 13 of the Lien Law, covenants that the party of the first part will receive the consideration for this conveyance and will hold the right to receive such consideration as a trust fund to be applied first for the purpose of paying the cost of the improvement and will apply the same first to the payment of the cost of the improvement before using any part of the total of the same for any other purpose.

IN WITNESS WHEREOF, the party of the first part has duly executed this deed the day and year first above written.

IN PRESENCE OF:

Jacquelyn E. Jones
Diana E. Lane

BP OIL CORPORATION (SEAL)

By Chas. H. King
Vice President

ATTEST:

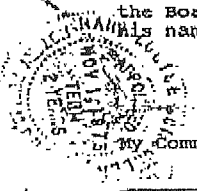
D.H. Prince
D.H. Prince,
Assistant Secretary

STATE OF NEW YORK
REAL ESTATE TRANSFER TAX
Dept. of Taxation & Finance
125.95
JUL 12 1974
69-10027

6071

STATE OF DELAWARE)
COUNTY OF NEW CASTLE) SS.

On this, the 21 day of December, 1973, before me personally came Chas. H. King, to me known, who, being by me duly sworn, did depose and say that he resides at No. 1107 Allerton Road, West Chester, Pennsylvania 19380, that he is the Vice President of BP Oil Corporation, the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation, and that he signed his name thereto by like order.



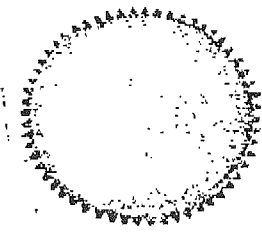
Mary Louise Schuchler
Notary Public

My Commission Expires: _____

This Deed was prepared by D.H. Prince, Esq., One Rollins Plaza, Wilmington, Delaware 19803.

SECTION: Ward 3
BLOCK: 19
LOT: 1
COUNTY OR TOWN: City of White Plains,
County of Westchester, State
of New York.

State of Delaware,)
New Castle County,) ss.



I, PAUL E. NEILL, Prothonotary of the Superior Court of the State of Delaware, do and for New Castle County, which Court is a Court of Record, DO HEREBY

CERTIFY, THAT *Mary Louise Schuchler* by whom the foregoing affidavit or acknowledgment is certified, now is and was at the date of said affidavit or acknowledgment a Notary Public for the State of Delaware residing in New Castle County, and duly commissioned and qualified as such to take acknowledgments to all deeds and instruments in writing and administering oaths and take affidavits within said State, that I am well acquainted with the handwriting of said Notary Public and verily believe that the signature to said certificate of proof or acknowledgment is genuine.

IN TESTIMONY WHEREOF, I have hereto set my hand and affixed the seal of said Court, the 2nd day of July, 1974

Paul E. Neill
Prothonotary of the Superior Court.

DL

DEED
BP OIL CORPORATION
TO
BP OIL INC.

BP property situated by this instrument
is situated in the City of *White Plains*
in the County of Westchester, N. Y.

RECORD AND RETURN TO:
BP OIL INC
ONE ROLLINS PLAZA
WILMINGTON, DELAWARE 19803

10.00 B - CPs 00097 7-18-74

RECEIVED
WESTCHESTER COUNTY
JUL 18 11:07 AM '74

SEARCHED	INDEXED
SERIALIZED	FILED
JUL 18 11:07 AM '74	
WESTCHESTER COUNTY	

The foregoing instrument was endorsed for record as follows: The property affected by this instrument is situated in the CITY OF WHITE PLAINS County of Westchester, N. Y. A true copy of the original DEED recorded JULY 18, 1974 at 11:07 AM

GEORGE H. MORROW, County Clerk.



R07983322

LINE 7878 PAGE 533

WYSIT
12, 778

THIS INSTRUMENT, made the 5th day of October, 1983 BETWEEN

BP Oil Inc., an Ohio corporation, having its principal offices in the Midland Building, Cleveland, Ohio 44115, Grantor (the Grantor herein being an Ohio corporation; and being the same corporate entity which acquired the fee interest being conveyed herein.), and

NORTHVILLE GASOLINE CORP., whose tax mailing address is 35 Pinelawn Road, P. O. Box 937, Melville, NY 11747, Grantee,

WITNESSETH, that Grantor, in consideration of Ten Dollars and other valuable consideration paid by Grantee, does hereby grant and release unto Grantee, the heirs or successors and assigns of Grantee, forever,

ALL those certain plots, pieces, or parcels of land, with the buildings and improvements thereon erected, situate, lying and being in the County of Westchester, State of New York, which are individually described on attached Riders numbered 1 through 7.

NOV 18 1983
TAX SALES
ATTACHED # 12, 778

RECEIVED
12, 778
REAL ESTATE
NOV 18 1983
TRANSFER TAX
WESTCHESTER
COUNTY

05618a

1047878 INC. 534

TOGETHER with all right, title and interest, if any, of Grantor in and to any streets and roads abutting the above described premises to the center lines thereof,

TOGETHER with the appurtenances and all the estate and rights of Grantor in and to said premises,

TO HAVE AND TO HOLD the premises herein granted unto Grantee, the heirs or successors and assigns of Grantee forever.

AND said Grantor does for itself, its successors and assigns, covenant with the Grantee, and the heirs, executors, administrators, successors and assigns of Grantee as the case may be, that at and until the ensueing of these presents, Grantor is well seized of the Premises as a good and indefeasible estate in FEE SIMPLE, and has good right to bargain and sell the same in manner and form as above written, but subject to: (a) Taxes and assessments (both general and special), not then due and payable; (b) building and zoning ordinances, laws, regulations and restrictions by municipal or other governmental authority applicable to and enforceable against the property; (c) any and all leases, easements and rights of way, and to all valid and existing encumbrances, conditions, covenants, restrictions, reservations and exceptions of record, if any, and (d) any state of facts that an accurate survey and personal inspection of the Premises would disclose.

AND the Grantor, for itself, its successors and assigns will warrant and defend the Premises, with the appurtenances thereunto belonging, to the said Grantee, and the heirs, executors, administrators, successors and assigns of Grantee, as the case may be, against all lawful claims and demands of all persons claiming by, from, through or under the Grantor, except as above noted.

AND Grantor covenants that Grantor has not done or suffered anything whereby the said premises have been encumbered in any way whatever, except as aforesaid.

AND, Grantor, in compliance with Section 13 of the Lien Law, covenants that Grantor will receive the consideration for this conveyance and will hold the right to receive such consideration as a trust fund to be applied first for the purpose of paying the cost of the improvement and will apply the same first to the payment of the cost of the improvement before using any part of the total of the same for any other purpose.

IN WITNESS WHEREOF, the said BP OIL INC., has hereunto set its hand and corporate seal, by its duly authorized officers, this 7th day of November, 1983

Signed and acknowledged in the presence of:

L.J. Siebart
L.J. Siebart
E.M. Svatos
E.M. Svatos

BP OIL INC.
By H.D. Hanna
H.D. Hanna, Vice President, Retail Marketing
And J.E. Zislin
J.E. Zislin, Assistant Secretary

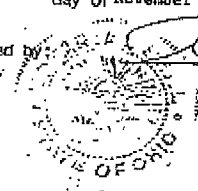
STATE OF OHIO)
CUYAHOGA COUNTY) ss:

BEFORE ME, a Notary Public in and for said County and State, personally appeared the above-named BP OIL INC., By H.D. Hanna its Vice President, Retail Marketing and J.E. Zislin its Assistant Secretary, who are personally known to me and who acknowledged that they did sign the foregoing instrument and that the same is the free act and deed of said corporation and the free act and deed of each of them personally and as such officers, who reside respectively at 615 W. SUPERIOR AVE. & 101 PERSPECT AVE, CLEVELAND OHIO

IN TESTIMONY WHEREOF, I have hereunto set my hand and official seal at Cleveland, Ohio, this 8th day of November, 1983

This instrument was prepared by R. C. MacKinnon

BP OIL INC.
Midland Building
Cleveland, Ohio 44115



Notary Public

R. W. THOMPSON
Notary Public, State of Ohio, CUYA. Civ.
My Commission Expires Nov. 25, 1987

RIDER NO. 1

#106 White Plains
Brookfield & N.Y. Post

LEN 7878
MR 535

ALL that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the City of White Plains, County of Westchester, and State of New York, being part of lots 1 and 2 as shown on a certain map entitled, "Map of lots belonging to Richard Manney in the City of White Plains," as filed in the Office of the Register for the County of Westchester on 12/24/1883 in Vol. 6 of Maps at page 57; which said parts of lots when taken together are bounded and described as follows:

BEGINNING at a point on the easterly side of Brookfield Street at the northerly end of the arc of the curve which connects the easterly side of Brookfield Street with the northwesterly side of the New York Post Road;

Running thence North 0 degrees 51 minutes 00 seconds West, along the easterly side of Brookfield Street, 146.00 feet;

Thence North 89 degrees 09 minutes 00 seconds East, 63.47 feet;

Thence South 23 degrees 15 minutes 00 seconds East, 106.71 feet to the northwesterly side of the New York Post Road;

Thence South 58 degrees 39 minutes 00 seconds West along the said northwesterly side of the New York Post Road, 106.83 feet to the easterly end of the curve, first above mentioned;

Thence southwesterly, westerly, northwesterly and northerly along the arc of said curve, bearing to the right, having a radius of 8.40 feet; a distance of 16.82 feet to the northerly end thereof, to the point or place of BEGINNING.

1308H/5a

INDEX 7878 PAGE 536

RIDER NO. 2

#109 Mamaroneck
Boston Post & Dillon

ALL that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the Town of Mamaroneck, County of Westchester and State of New York, being shown as lots 62, 63, 64 and portions of lots 65 and 66 on a certain map entitled, "Map of Dillon Park in the Town of Mamaroneck and City of New Rochelle, Westchester County, New York, subdivision number 1 filed in the Westchester County Clerk's Office, Division of Land Records on February 28, 1904 as Map Number 1245, said lots being more particularly bounded and described as follows:

✓ BEGINNING at the corner formed by the intersection of the southeasterly side of Boston Post Road with the southwesterly side of Dillon Road (formerly Premium River Road);

Running thence along said southwesterly side of Dillon Road, South 71 degrees, 59 minutes 30 seconds East, 120.00 feet;

Running thence along the northerly line land now or formerly "Picnic and Baseball Grounds," South 46 degrees 17 minutes 30 seconds West, 168.14 feet;

Running thence along the easterly line of land now or formerly of William R. Collins, North 52 degrees 53 minutes 13 seconds West, 103.64 feet to the southeasterly side of Boston Post Road;

Running thence along said southeasterly side of Boston Post Road North 48 degrees 17 minutes 30 seconds East, 128.11 feet to the point or place of BEGINNING.

13084/60

RIDER NO. 3

#503 Scarsdale
Central Park & Mt. Joy

All that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the Town of Greenburgh, Westchester County, New York, bounded and described as follows:

BEGINNING at the southwesterly end of the line which connects the northwesterly side of Central Park Avenue with the southwesterly side of Edgemont Highway, as shown on map entitled, "Edgemont Hills, Section I" amended and filed in the Office of the Register of the County of Westchester as Map #3280;

Running thence along the northwesterly side of Central Park Avenue South 45 degrees 08 minutes West, 137.32 feet to a monument set in the ground, and to land now or formerly of Earl P. & Mildred Yapple

Thence along land now or formerly of Earl P. & Mildred Yapple, North 56 degrees 49 minutes 40 seconds West, 102.22 feet to a stake set in the ground and to land now or formerly of Max Held Realty Corporation;

Thence along land now or formerly of Max Held Realty Corporation, North 45 degrees 08 minutes East, 143.32 feet to the southwesterly side of Edgemont Highway;

Thence along the southwesterly side of Edgemont Highway South 56 degrees 49 minutes 40 seconds East, 95.72 feet to the northeasterly end of the connecting line first above mentioned;

Thence South 08 degrees 40 minutes 23 seconds East along said connecting line, 7.88 feet to the northwesterly side of Central Park Avenue, to the point or place of BEGINNING.

13084/7n

RIDER NO. 4

#614 Yonkers
Yonkers & Walnut

ALL that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the City of Yonkers, County of Westchester and State of New York, bounded and described as follows:

BEGINNING at the corner formed by the intersection of the southerly side of Yonkers Avenue, as widened, with the easterly side of Walnut Street;

Running thence South 81 degrees 27 minutes 19 seconds East along the said southerly side of Yonkers Avenue, 233.85 feet to land conveyed by B^P Oil, Inc. to Ann Charka and recorded in Liber 7483 Cp 716;

Running thence South 13 degrees 08 minutes 20 seconds East, along said land of Charka, 94.90 feet;

Running thence South 26 degrees 22 minutes 40 seconds West, 100.00 feet;

Running thence North 45 degrees 47 minutes 20 seconds West, 160.76 feet;

Running thence North 46 degrees 18 minutes 20 seconds West, 137.29 feet to the easterly side of Walnut Street; and

Thence North 31 degrees 50 minutes 40 seconds East, along the easterly side of Walnut street, 11.54 feet to the corner first above mentioned, the point or place of BEGINNING.

RIDER NO. 5

#630 Mamaroneck
Hoyt & Mamaroneck

ALL that certain plot, piece or parcel of land in the Incorporated Village and Town of Mamaroneck, County of Westchester and State of New York, bounded and described as follows:

BEGINNING at the westerly end of the arc of the curve which connects the southwesterly side of Mamaroneck Avenue with the northwesterly side of Hoyt Street;

Running thence North 39 degrees 10 minutes 20 seconds West, along the southwesterly side of Mamaroneck Avenue, 178.73 feet;

Thence South 43 degrees 25 minutes 38 seconds West, 108.50 feet;

Thence South 42 degrees 08 minutes 30 seconds East, 148.68 feet to the northwesterly side of Hoyt Street;

Thence North 48 degrees 10 minutes 00 seconds East, along the northwesterly side of Hoyt Street, 80.91 feet to the southerly end of the curve first above mentioned; and

Thence northwesterly along the arc of said curve, bearing to the left and having a radius of 20.0 feet, a distance of 30.49 feet, more or less, feet to the point or place of BEGINNING.

LIBER 7878 PAGE 540

RIDER NO. 6

#635 Eastchester
755 White Plains Rd.

ALL that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the Town of Eastchester, County of Westchester and State of New York, bounded and described as follows:

BEGINNING at a point marked by a stake on the northwesterly side of White Plains Road, distant 200 feet northeasterly from Maple Street (formerly called Old Road), as both originally existed;

Thence running North 40 degrees 02 minutes 17 seconds West the distance of 174.32 feet to the northwesterly corner of land now or formerly of Albert Meyer;

Running thence in a northwesterly direction and on a line parallel with Maple Street, and always 200 feet therefrom, North 35 degrees 10 minutes 07 Seconds West the distance of 150.83 feet to a point in line of lands now or formerly of Thomas Gallagher;

Running thence North 46 degrees 53 minutes 48 seconds east along said land of Thomas Gallagher the distance of 75.51 feet to a point;

Running thence South 46 degrees 54 minutes 40 seconds East along line of lands now or formerly of George D. Ferris the distance of 300.05 feet to a point marked by a stake on the said northwesterly side of White Plains Road;

Running thence South 36 degrees 03 minutes 00 seconds West along said northwesterly side of White Plains Road the distance of 127.90 feet to the point or place of BEGINNING.

1308H/10n

RIDER NO. 7

LIBEX 7878 PAGE 541

#688 New Rochelle
North & Brookside

ALL that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the City of New Rochelle, County of Westchester, State of New York;

BEGINNING at a point formed by the intersection of the southerly side of Brookside Place with the easterly side of North Avenue;

Running thence along the southerly side of Brookside Place, North 74 degrees 47 minutes 10 seconds East, 100 feet to an angle point, which point is also distant 25 feet westerly when measured along said southerly side of Brookside Place from the westerly side of lot #4 on a certain map entitled, "Map of Halcyon Park (North Addition) property of Howard S. Moighan, Esq., New Rochelle, New York" made by W. L. Hayes, Surveyor, dated December 4, 1902 and filed in the Office of the Register of the County of Westchester on the 20th day of December, 1902, in Vol. 13 of Maps, page 37;

Running thence along land now or formerly of Molly C. DeKlyn South 13 degrees 12 minutes 50 seconds East, 100 feet to the northerly line of land now or formerly of John H. Trenor, shown on a certain map entitled, "Map of land of John H. Trenor, New Rochelle, N. Y., 564, A. made by W. L. Hayes, Surveyor, being commonly known as Halcyon Park, and filed in the Office of the Register of the County of Westchester on the 11th day of November, 1902, in Vol. 2 of Maps, page 34;

Running thence along land now or formerly of John H. Trenor, aforesaid, South 74 degrees 47 minutes 10 seconds West, 168.98 feet to the easterly side of North Avenue;

Running thence along said easterly side of North Avenue the following two (2) courses and distances:

- (1) North 24 degrees 01 minutes 40 seconds east, 51.78 feet to a point of curve;
- (2) on a curve to the left, having a radius of 249 feet, a distance of 70.23 feet when measured on the arc of said curve, to the southerly side of Brookside Place, at the point or place of BEGINNING.

1308H/11n

LIBER 7878 PAGE 542

STATE OF NEW YORK, COUNTY OF ... On the ... day of ... 19 ... before me ... to me known to be the individual ... described in and who executed the foregoing instrument, and acknowledged that executed the same.

STATE OF NEW YORK, COUNTY OF ... On the ... day of ... 19 ... before me ... to one known to be the individual ... described in and who executed the foregoing instrument, and acknowledged that executed the same.

STATE OF NEW YORK, COUNTY OF ... On the ... day of ... 19 ... before me ... to me known, who, being by me duly sworn, did depose and say that he resides at No. ... that he is the ... of ... the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation, and that he signed his name thereto by like order.

STATE OF NEW YORK, COUNTY OF ... On the ... day of ... 19 ... before me ... personally came ... the subscribing witness to the foregoing instrument, with whom I am personally acquainted, who, being by me duly sworn, did depose and say that he resides at No. ... that he knows ... to be the individual described in and who executed the foregoing instrument; that he, said subscribing witness, was present and saw execute the same; and that he, said witness, at the same time, subscribed his name as witness thereto.

Title No. 8-717 763
B.P.
TO
MONTVILLE

SECTION 5 W-3 | 5 | Vol 1 | 8 | 654/3
BLOCK 19 | 504 | 54 41 | 447 | 223 | 1 948
LOT 1 | 101 | 101 | 00468 | 87 | 24 | 23
COUNTY OF WESTCHESTER
Towns of Castle Point, Greenburgh & Mamaroneck
Cherry Hill, White Plains, Yorkville
Recorded by T.P.S. Abstract Corporation
Return To:

T.P.S. ABSTRACT CORPORATION
350 OLD COUNTRY ROAD,
GARDEN CITY, NEW YORK 11530
Nassau - 248-8550 Suffolk - 273-8000

6 Towns

MONTVILLE GASOLINE CAMP
35 PINE LAWN ROAD
MELVILLE N.Y. 11747
ATT: ART SILKEN Esq

11378001 11/18/83CPA 34.50
66709
WESTCHESTER COUNTY CLERK'S OFFICE
DIVISION OF LAND RECORDS
NOV 18 2 51 PM '83
RECEIVED
WESTCHESTER COUNTY CLERK
NOV 18 2 51 PM '83
SUNNY DAY
PLANTING
FLYING
CROSS REFERENCE
DEED/RECORD
TOWNS
RECORDED

The foregoing instrument was endorsed for record as follows:
The property affected by this instrument is situated in the
TOWNS OF EASTCHESTER, GREENBURGH &
MAMARONECK & CITIES OF NEW ROCHELLE
WHITE PLAINS & YORKVILLE
County of Westchester, N. Y. A True copy of the original
DEED
recorded in the Division of Land Records of the County Clerk's
Office of Westchester County on NOV. 18, 1983
at 2:51 P M in Liber 7878 Page 533 of Deeds.
Witness my hand and Official Seal
Andrew I. Spano
County Clerk

PLEASE USE THIS SPACE FOR USE OF RECORDING OFFICE

APPENDIX B

First Environment

91 Fulton Street, Boonton, New Jersey 07005

LOG OF SOIL BORING SB-201

Client: White Plains Housing Authority		Depth-to-Water (ft. from measuring pt.)		Site Elevation Datum
Site Name: White Plains Housing Authority		Address:		Ground Elevation
Drilling Company: ETB		Geoprobe		Not Surveyed
Date Started: 12/11/2015	Date Completed: 12/11/2015	Date 12/11/2015	DTW 6.50	Measuring Point Elevation
Completion Depth: 10.5 feet		Geologist/Engineer Garry McClurkin		Permit #: NA

SOIL BORING (Not To Scale)	DEPTH (ft. below grade)	SAMPLES		
		Recover. (%)	PID	
	0	70	0	0'-5' Dark brown to stained sand with some crushed rock, coarse, dry, non-cohesive, no plasticity.
	0			
	1			
	0			
	2			
	0			
	3			
	0			
	4			
	0			
	5	60	0	5'-8' Dark Brown to Light sand with some crushed rock, coarse, wet, non-cohesive, no plasticity. Groundwater at 6.5 ft bgs. Sampled SB-201 (6.0-6.5)
	0			
	6			
	0			
	8	60	0	8'-10.5' Brown, heavily stained, sand with some crushed rock, coarse, wet non-cohesive, no plasticity. Refusal at 10.5 ft bgs.
	0			
	9			
	0			
	10		0	

Legend	
	Asphalt/Concrete
	Clay
	Silt
	Sand

First Environment

91 Fulton Street, Boonton, New Jersey 07005

LOG OF SOIL BORING SB-202

Client: White Plains Housing Authority		Depth-to-Water (ft. from measuring pt.)		Site Elevation Datum	
Site Name: White Plains Housing Authority		Address:		Ground Elevation	
Drilling Company: ETB		Geoprobe		Not Surveyed	
Date Started: 12/11/2015		Date Completed: 12/11/2015		Measuring Point Elevation	
Completion Depth: 20.0 feet		Geologist/Engineer Garry McClurkin		Permit #: NA	

SOIL BORING (Not To Scale)	DEPTH (ft. below grade)	SAMPLES		
		Recover. (%)	PID	
	0	90	0	0'-5' Dark brown sand, coarse, dry to moist, non-cohesive, no plasticity.
	0			
	1			
	0			
	2			
	3	90	0	5'-10' Dark brown sand, coarse, dry to moist, non-cohesive, no plasticity.
	0			
	4			
	0			
	5			
	6	90	0	11'-15' Light to Dark brown sand, fine to coarse, dry to moist, non-cohesive, no plasticity, some ssmall boulders
	0			
	7			
	0			
	8			
	9	100	0	15'-20' Dark brown sand, coarse, wet, non-cohesive, no plasticity. Groundwater at 16 ft bgs. Sampled SB-202 (15.5 - 16.0)
	0			
	10			
	0			
11				
12	100	0		
0				
13				
0				
14				
15	100	0		
0				
16				
0				
17				
18	100	0		
19		0		

Legend	
	Asphalt/Concrete
	Clay
	Silt
	Sand

First Environment

91 Fulton Street, Boonton, New Jersey 07005

LOG OF SOIL BORING SB-203

Client: White Plains Housing Authority		Depth-to-Water (ft. from measuring pt.)		Site Elevation Datum	
Site Name: White Plains Housing Authority		Address:		Ground Elevation	
Drilling Company: ETB		Geoprobe		Not Surveyed	
Date Started: 12/11/2015		Date Completed: 12/11/2015		Measuring Point Elevation	
Completion Depth: 15 feet		Geologist/Engineer Garry McClurkin		Permit #: NA	

SOIL BORING (Not To Scale)	DEPTH (ft. below grade)	SAMPLES		
		Recover. (%)	PID	
	0	85	0	0'-5' Dark brown to light brown sand, stained, coarse, dry, non-cohesive, no plasticity.
	0			
	1			
	0			
	2			
	0			
	3			
	0.1			
	4			
	0			
	0			
	5	100	537	5'-10' Light brown, heavily stained gray sand, coarse, non-cohesive, no plasticity. Heavy odor and staining. Sampled SB-203 (7.0-7.5)
	6			
	7			
8				
9	100	386	10'-15' Brown to heavily stained gray sand, coarse, saturated, non-cohesive, no plasticity. Groundwater at 14 ft bgs. Refusal at 15 ft bgs.	
10				
11				
12				
13				
14				

Legend	
	Asphalt/Concrete
	Clay
	Silt
	Sand

First Environment

91 Fulton Street, Boonton, New Jersey 07005

LOG OF SOIL BORING SB-204

Client: White Plains Housing Authority		Depth-to-Water (ft. from measuring pt.)		Site Elevation Datum	
Site Name: White Plains Housing Authority		Address:		Ground Elevation	
Drilling Company: ETB		Geoprobe		Not Surveyed	
Date Started: 12/11/2015		Date Completed: 12/11/2015		Measuring Point Elevation	
Completion Depth: 20 feet		Geologist/Engineer Garry McClurkin		Permit #: NA	

SOIL BORING (Not To Scale)	DEPTH (ft. below grade)	SAMPLES		
		Recover. (%)	PID	
	0	70	0	0'-5' Dark brown to light brown sand, coarse, dry, non-cohesive, no plasticity.
	0			
	1			
	0			
	2			
	0	90	0	5'-10' Dark brown to light brown sand, coarse, damp, non-cohesive, no plasticity.
	0			
	3			
	0			
	4			
	0	75	0	10'-15' Dark brown to light brown sand, coarse, moist non-cohesive, no plasticity. Sampled SB 204 (11.0-11.5)
	0			
	5			
	0			
	6			
	0	75	20	15'-20' Dark brown to light brown sand, coarse, wet, non-cohesive, no plasticity. Groundwater at 17 ft bgs.
	0			
	7			
	0			
8				
0		0		
0		0		
0		0		
0		0		
0		0		
0		0		
0		0		
0		0		
0		0		
0		0		
0		0		
0		0		

Legend	
	Asphalt/Concrete
	Clay
	Silt
	Sand

First Environment

91 Fulton Street, Boonton, New Jersey 07005

LOG OF SOIL BORING SB-205

Client: White Plains Housing Authority		Depth-to-Water (ft. from measuring pt.)		Site Elevation Datum	
Site Name: White Plains Housing Authority		Address:		Ground Elevation	
Drilling Company: ETB		Geoprobe		Not Surveyed	
Date Started: 12/14/2015		Date Completed: 12/14/2015		Measuring Point Elevation	
Completion Depth: 15 feet		Geologist/Engineer Kenneth Farah		Permit #: NA	

SOIL BORING (Not To Scale)	DEPTH (ft. below grade)	SAMPLES		
		Recover. (%)	PID	
	0	80	0	0'-5' Dark brown to light grey, fine to medium, sand, trace gravel, non-cohesive, no plasticity.
	0			
	1			
	0			
	2			
	0			
	3			
	0			
	4	95	0	5'-10' Light brown to tan-brown sand, fine to coarse, moist at 7' bgs, non-cohesive, no plasticity. Sampled SB-205 (5.5-6.0)
	0			
	5			
	0			
	6			
	0			
7	100	0	10'-15' Brown to tan-brown sand, fine to coarse, non-cohesive, no plasticity, damp, large boulder at 12 ft bgs, some gravel	
0				
8				
0				
9				
0				
10				
0				
11	100	0		
0				
12				
0				
13	100	0		
0				
14	100	0		

Legend	
	Asphalt/Concrete
	Clay
	Silt
	Sand

Client White Plains Housing Authority
 Site White Plains Housing Authority, White Plains, NY
 Date Started 12/14/2015
 Elevation (TC)
 Hole Diameter 8" drill with 4" casing hole

Date Completed 12/14/2015
 (GS)
 Boring Method Air Rotary

Project No. WPHA001
 Development Method

Permit No.
 Sheet 1 of 1

Surge & Purge

Elev. (ft.)	Depth (ft.)	Description	Strata Column	Sample	Moisture Content	Blows on Sampler				Sample No.	Recovery	Instrument Reading	Water Level (Data)	Well Construction
						0"	6"	12"	18"					
0													8" Flush-mount lock-able cap bentonite 2" PVC riser sand pack 4" macro-core hole 2" PVC 0.010 Screen	
2														
4														
6														
8														
10														

- | | | | |
|-------------------------------------|------------------------------|---------------------------|-------------------------------|
| <input checked="" type="checkbox"/> | <u>Sampler Type</u> | <u>Development Method</u> | <u>Boring Method</u> |
| <input type="checkbox"/> | Driven Split Spoon | AL - Air Lift | HSA - Hollow Stem Auger |
| <input type="checkbox"/> | Pressed Shelby Tube or Macro | P - Pumping | CFA - Continuous Flight Auger |
| <input type="checkbox"/> | Rock Core | J - Jetting | DC - Driving Casing |
| <input type="checkbox"/> | No Recovery | SB - Surge Block | MD - Mud Drilling |

Client White Plains Housing Authority Project No. WPHA001 Permit No.
 Site White Plains Housing Authority, White Plains, NY Sheet 1 of 1
 Date Started 12/11/2015 Date Completed 12/11/2015
 Elevation (TC) (GS)
 Hole Diameter 8" drill with 4" casing hole Boring Method Air Rotary Development Method Surge & Purge

Elev. (ft.)	Depth (ft.)	Description	Strata Column	Sample	Moisture Content	Blows on Sampler				Sample No.	Recovery	Instrument Reading	Water Level (Data)	Well Construction
						0"	6"	12"	18"					
0														
5														
10														
15														
20														

- | | | | |
|-------------------------------------|------------------------------|---------------------------|-------------------------------|
| <input checked="" type="checkbox"/> | <u>Sampler Type</u> | <u>Development Method</u> | <u>Boring Method</u> |
| <input type="checkbox"/> | Driven Split Spoon | AL - Air Lift | HSA - Hollow Stem Auger |
| <input type="checkbox"/> | Pressed Shelby Tube or Macro | P - Pumping | CFA - Continuous Flight Auger |
| <input type="checkbox"/> | Rock Core | J - Jetting | DC - Driving Casing |
| <input type="checkbox"/> | No Recovery | SB - Surge Block | MD - Mud Drilling |

Client White Plains Housing Authority
 Site White Plains Housing Authority, White Plains, NY
 Date Started 12/14/2015 Date Completed 12/14/2015
 Elevation (TC) (GS)

Project No. WPHA001 Permit No. Sheet 1 of 1

Hole Diameter 8" drill with 4" casing hole Boring Method Air Rotary Development Method Surge & Purge

Elev. (ft.)	Depth (ft.)	Description	Strata Column	Sample	Moisture Content	Blows on Sampler				Sample No.	Recovery	Instrument Reading	Water Level (Data)	Well Construction
						0"	6"	12"	18"					
0														
5														
10														
15														

- | | | | |
|-------------------------------------|------------------------------|---------------------------|-------------------------------|
| <input checked="" type="checkbox"/> | <u>Sampler Type</u> | <u>Development Method</u> | <u>Boring Method</u> |
| <input type="checkbox"/> | Driven Split Spoon | AL - Air Lift | HSA - Hollow Stem Auger |
| <input type="checkbox"/> | Pressed Shelby Tube or Macro | P - Pumping | CFA - Continuous Flight Auger |
| <input type="checkbox"/> | Rock Core | J - Jetting | DC - Driving Casing |
| <input type="checkbox"/> | No Recovery | SB - Surge Block | MD - Mud Drilling |

Client White Plains Housing Authority Project No. WPHA001 Permit No.
 Site White Plains Housing Authority, White Plains, NY Sheet 1 of 1
 Date Started 12/18/2015 Date Completed 12/18/2015
 Elevation (TC) (GS)
 Hole Diameter 8" drill with 4" casing hole Boring Method Air Rotary Development Method Surge & Purge

Elev. (ft.)	Depth (ft.)	Description	Strata Column	Sample	Moisture Content	Blows on Sampler				Sample No.	Recovery	Instrument Reading	Water Level (Data)	Well Construction
						0"	6"	12"	18"					
0														
5														
10														
15														
20														

- | | | | |
|-------------------------------------|------------------------------|---------------------------|-------------------------------|
| <input checked="" type="checkbox"/> | <u>Sampler Type</u> | <u>Development Method</u> | <u>Boring Method</u> |
| <input type="checkbox"/> | Driven Split Spoon | AL - Air Lift | HSA - Hollow Stem Auger |
| <input type="checkbox"/> | Pressed Shelby Tube or Macro | P - Pumping | CFA - Continuous Flight Auger |
| <input type="checkbox"/> | Rock Core | J - Jetting | DC - Driving Casing |
| <input type="checkbox"/> | No Recovery | SB - Surge Block | MD - Mud Drilling |

Client White Plains Housing Authority Project No. WPHA001 Permit No.
 Site White Plains Housing Authority, White Plains, NY Sheet 1 of 1
 Date Started 12/14/2015 Date Completed 12/14/2015
 Elevation (TC) (GS)
 Hole Diameter 8" drill with 4" casing hole Boring Method Air Rotary Development Method Surge & Purge

Elev. (ft.)	Depth (ft.)	Description	Strata Column	Sample	Moisture Content	Blows on Sampler				Sample No.	Recovery	Instrument Reading	Water Level (Data)	Well Construction
						0"	6"	12"	18"					
0														
5														
10														
15														

- | | | | |
|--|------------------------------|---------------------------|-------------------------------|
| | <u>Sampler Type</u> | <u>Development Method</u> | <u>Boring Method</u> |
| | Driven Split Spoon | AL - Air Lift | HSA - Hollow Stem Auger |
| | Pressed Shelby Tube or Macro | P - Pumping | CFA - Continuous Flight Auger |
| | Rock Core | J - Jetting | DC - Driving Casing |
| | No Recovery | SB - Surge Block | MD - Mud Drilling |

APPENDIX C

**Quality Assurance Project Plan
White Plains Housing Authority
159 S. Lexington Avenue &
33 Fisher Court
White Plains, New York**

November 29, 2016

Prepared for: White Plains Housing Authority
223 Dr. Martin Luther King Jr. Blvd.
White Plains, New York 10601

Prepared by: First Environment, Inc.
91 Fulton Street
Boonton, New Jersey 07005



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Introduction

This Quality Assurance Project Plan (QAPP) has been developed as part of the Site Investigation / Remedial Investigation Report (SI/RIR) that has been prepared on behalf of the White Plains Housing Authority (WPHA) for the properties located at 159 S. Lexington Avenue and 33 Fisher Court, White Plains, New York (the Site).

Purpose

The purpose of this QAPP is to indicate the prime responsibilities of WPHA and its contractors and subcontractors during the implementation of the SI/RI activities. This QAPP also describes the policy, organization, and specific Quality Assurance (QA) and Quality Control (QC) elements necessary to achieve data quality objectives and fulfill NYSDEC requirements. The QAPP also provides detailed descriptions of the field procedures that will be used during the Site Remediation.

In general, there are 10 elements to be addressed in a QAPP to ensure safe, efficient, and effective practices are implemented at remediation sites. These elements include:

1. The project's scope and complexity and how the project relates to the overall site remediation strategy.
2. The data quality objectives specific to the site and sampling event.
3. Project organization, including the name and telephone number of each of the individuals responsible for overall project coordination, sampling activities, and laboratory analyses.
4. An "Analytical Methods/Quality Assurance Summary Table" (combination of Table 2 and Table 4).
5. A detailed description of the site-specific sampling methods, sample storage in the field, and sampling holding times requirements.
6. A detailed description of all calibration and preventative maintenance procedures for all field instrumentation.
7. A detailed description of the criteria and procedures to obtain duplicate and split samples.
8. A detailed description of the chain-of-custody procedures to be utilized in the field and the laboratory.
9. A detailed description of sample storage procedures to be utilized by the laboratory.
10. Laboratory data deliverable formats to be used.

Scope and Goals Relation to Remediation Strategy

The scope of the project involves addressing:

- Volatile Organic Compounds (VOCs) and Lead impacts in soil and groundwater.

The goals of the remediation are:

- the protection of human health and the environment;
- the reduction of residual VOC in soil and groundwater;
- prevent on-site migration of VOC impacted groundwater from off site; and
- monitor groundwater conditions.

The strategy for conducting the remediation will involve:

- the installation of approximately five monitoring wells located along the western, southern, and eastern property boundaries of the two addressed locations;
- continuance of on-site monitoring program on an as needed basis until concentrations meet NYS groundwater quality objectives, or an active remedial strategy is selected.

Data Quality Objectives

In order to ensure that data generated during any sampling component of the Site Investigation / Remedial Investigation is of the highest quality, the analytical results of such sampling will be compared to appropriate data quality indicators. These indicators include precision, accuracy, representativeness, completeness, and comparability. Each of these indicators is described below:

1. Precision is the agreement or reproducibility among individual measurements on the same property, usually made under the same conditions.
2. Accuracy is the degree of agreement of a measurement with the true or accepted value.
3. Representativeness is the degree to which a measurement accurately and precisely represents a characteristic of a population, parameter, variations at a sampling point, a process condition, or an environmental condition.
4. Completeness is a measure of the amount of valid data obtained from a measurements' system compared with the amount that was expected to be obtained under correct and normal conditions.
5. Comparability is an expression of the confidence with which one data set can be compared with another data set with regard to the same parameter.

The data quality objectives (DQO) vary according to the specific objectives of each task that is being undertaken. For example, accuracy, precision, and representativeness of data are functions of sample origin, analytical procedures, and specific sample matrices. Quality control practices for the evaluation of these data quality indicators include the use of accepted analytical procedures, adherence to holding times, and the analysis of QC samples (blanks, duplicates, spikes, calibration standards, and reference standards).

Completeness is a function of the number of valid data results generated compared to the number of data results planned. Completeness can be less than 100 percent due to poor sample recovery, sample damage, or disqualification of results due to results being outside of laboratory control limits. Completeness is documented by including sufficient information in field logs and laboratory reports to allow the data user to assess the quality of the results. The overall completeness goal for each task is difficult to determine prior to data acquisition. However, all reasonable attempts will be made for this project to attain a completeness of 85 percent or better. The completeness goal for the analytical laboratory will be 90 percent or greater.

Comparability is a function of the analytical and field methodologies used. Ensuring comparable data will be accomplished by using standard and accepted methodologies; using methods traceable to the National Institute of Standards and Technologies (NIST), NYSDEC sources or USEPA sources; using appropriate levels of quality control; reporting results in consistent standard units of measure; and participating in studies designed to evaluate laboratory performance.

Table 1 identifies the different levels of quality assurance that are being assigned to each task that will be implemented during the Site Remediation.

TABLE 1: Levels of Quality Assurance

DQO LEVEL	DESCRIPTION	ASSOCIATED ACTIVITY
I	Level I is the lowest quality data but provides the fastest and least expensive results. Field screening or analysis provides Level I data. The generated data can indicate the presence or absence of certain constituents and is generally qualitative rather than quantitative.	<ul style="list-style-type: none"> • Health and Safety Monitoring (PID)
II	Level II data are generated by field laboratory analysis using more sophisticated portable laboratory instruments or a mobile laboratory on site. This provides fast results and better-quality data than in Level I.	<ul style="list-style-type: none"> • Field analyses (pH, specific conductance, temperature, dissolved oxygen)
III	Level III data may be obtained by a commercial laboratory with or without CLP procedures. The analysis does not usually use the validation or documentation procedures required of CLP (Level IV) analysis. The analyzed parameters are relevant to site characterization, risk assessment, and design and implementation of the remedial action.	<ul style="list-style-type: none"> • Ongoing Groundwater sampling
IV	Level IV data are typically used for risk assessment, engineering design, and cost-recovery documentation. All analyses are performed in a CLP analytical laboratory and follow CLP procedures. Level IV is characterized by rigorous QC protocols, documentation, and detection limits.	<ul style="list-style-type: none"> • Final Groundwater sampling
V	Level V data are those obtained by non-standard analytical procedures. Method development or modification may be required for specific constituents or detection limits.	<ul style="list-style-type: none"> • Not Applicable
VI	Other methodologies not described above.	<ul style="list-style-type: none"> • Water level measurements • Aquifer tests

Project Organization and Responsibilities

First Environment and a qualified team of subcontractors will perform the work activities for this SI/RIR under the direction of representatives from WPHA. The lead regulatory agency for this project is the NYSDEC with the New York State Department of Health (NYSDOH) providing additional regulatory oversight. First Environment is the primary contractor.

All of WPHA's, First Environment's, and other appropriate project personnel and their respective roles are described below. The project organization chart for the Remedial Investigation is shown in Figure 1.

NYSDEC Project Manager

The NYSDEC Project Manager assigned to this project is Raphael Ketani. Mr. Ketani is to be contacted using the following:

New York State Department of Environmental Conservation
Remediation New York State Department of Environmental Conservation
47-40 21st Street
Long Island City, NY 11101
Phone: (718) 482-4634
Fax: (718) 482-6390
E-mail: rvketani@gw.dec.state.ny.us

White Plains Housing Authority

WPHA has the overall responsibility for achieving all project objectives. WPHA will be responsible for initiating project activities; monitoring and adjusting efforts and resources as needed to assure that established schedules, work programs, and costs are maintained; and interfacing with NYSDEC on administrative matters.

WPHA's primary project contact, business address, and telephone number are:

Mr. Al Pio
Superintendent
White Plains Housing Authority
223 Dr. Martin Luther King, Jr. Boulevard
White Plains, New York 10601

First Environment, Inc.

First Environment, Inc. will be the prime contractor implementing the Site Remediation. The project responsibilities of First Environment personnel shall be as follows:

Nazmi “Mete” Talimcioglu, Ph.D., P.E. is a professional engineer who will assist in the design and layout specifications of the proposed remedial investigation and remedial action activities at the Site. Mr. Talimcioglu will affix his New York state engineering seal to approved design plans and drawings. He will act as the primary liaison between WPHA’s attorney and First Environment.

Bernard T. Delaney, Ph.D., P.E., BCEE will serve as the Expert Witness and provide Project Quality Assurance for the project. Dr. Delaney will provide further data evaluation and assessment for any submittals for the project.

Mr. Kenneth Farah, Jr., E.I.T. is a Project Engineer at First Environment and will act as the Project Manager. Mr. Farah will be responsible for the preparation and review of the project documents including, but not withstanding, any remedial investigation and remedial action (RI/RA) reports, the Quality Assurance Project Plan, and any related official submittals to the NYSDEC and WPHA.

Mr. David DeGhetto is First Environment’s Field Technician who will assist with work being performed in the field.

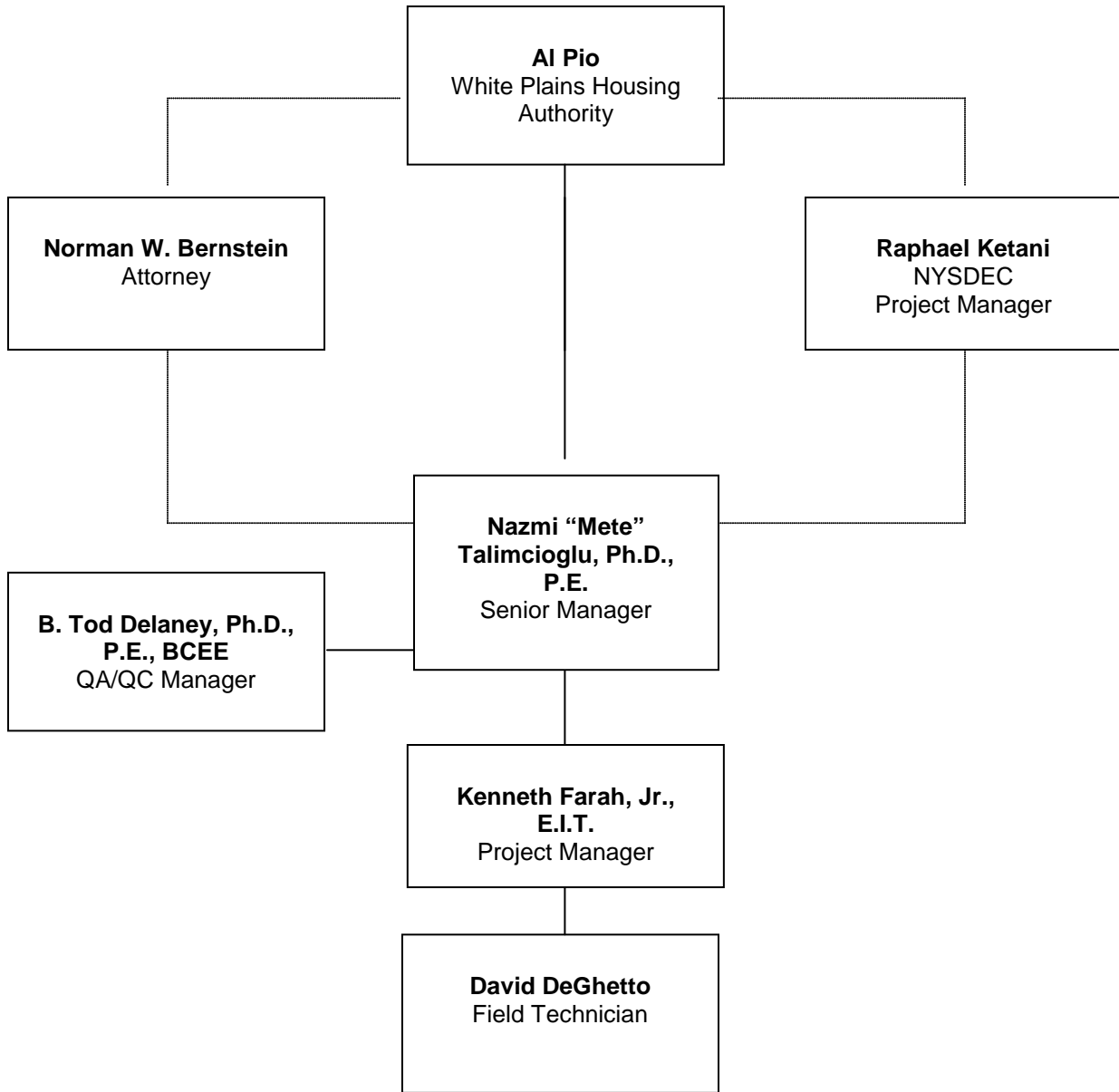
All of the First Environment employees can be contacted at:

First Environment, Inc.
91 Fulton Street
Boonton, New Jersey 07005
Phone: (973) 334-0003
Fax: (973) 334-0928

First Environment will be responsible for retaining a NYSDOH certified Environmental Laboratory Approval Program (ELAP) and Contract Laboratory Program (CLP) laboratory. All samples will be submitted to the chosen laboratory under the chain-of-custody procedures discussed below. In addition, First Environment will be responsible for retaining an appropriately licensed and certified waste transporter and disposal subcontractor for disposal of

all Remediation-derived wastes. All wastes generated at the Site will be disposed of in accordance with NYSDEC requirements.

Figure 1: Organization Chart



Subcontractors

First Environment has utilized the following subcontractors to perform the various duties associated with the Investigation at the Site. To date, the following Subcontractors have been contracted with and approved by the NYSDEC:

Environmental Test Boring
P.O. Box 743
Butler, New Jersey 07405
Phone: (888) 433-4877

Hampton Clark-Veritech Laboratories
175 U.S. 46
Fairfield, New Jersey 07004
Phone: (973) 224-9770

GPROneCall
92 East Main Street, Suite 407
Somerville, New Jersey 08876
Phone: (908) 725-1444

Analytical Procedures

Method references for the analyses to be performed during the Site Remediation are summarized in Table 2.

TABLE 2: Method References, Holding Times and Preservation Requirements

Parameters	Matrix	Method Reference	Holding Time	Preservation	Sample Volume	DQO Level
VOC	Aqueous	USEPA 8260	14 days	4° C, HCl	40 ml glass vial	III/IV
VOC	Soil	USEPA 8260	14 days	4° C	4 oz glass jar	III/IV
Metals	Aqueous	3010	6 months	4° C, HNO3	250 ml PE jar	III/IV
Metals	Soil	6010/7471A	180 days, 28 days**	N/A	4 oz glass jar	III/IV
Dissolved Oxygen	Aqueous	Electrode	Immediate	N/A	N/A	II
Temperature	Aqueous	Thermometer	Immediate	N/A	N/A	II
Turbidity	Aqueous	Electrode	Immediate	N/A	N/A	II
Specific Conductivity	Aqueous	Electrode	Immediate	N/A	N/A	II
Organic Vapor	Air	PID or FID	Immediate	N/A	N/A	I
PH	Aqueous	Electrode	Immediate	N/A	N/A	I

* If sample is not collected using an EnCore™ sampling device

** For Mercury samples only

*** Sample to be collected via Summa canister

Field Procedures

The accuracy of the data is dependent upon well-conceived and carefully implemented sampling and analysis procedures. This section presents the procedures with which samples will be collected or measurements made during the execution of this project.

Changes in Procedure

Field conditions may require changes to the QAPP. Significant changes to the sampling procedures specified in the QAPP that become necessary as a result of unanticipated field conditions will be identified to and discussed with the First Environment Project Manager prior to the implementation of any revised procedure. The First Environment Project Manager or Senior Manager will in turn discuss the needed changes in procedure with the NYSDEC Project Manager. Changes in sampling procedures cannot be implemented unless approval is received from the NYSDEC Project Manager. Minor changes may be made with the concurrence of the First Environment Senior Project Manager but must be documented in the field logbook and/or interoffice memoranda. Any and all changes in sampling procedures will also be documented in the associated report submittal.

Acquisition of Samples

Figure 2 shows a site map of the on-site groundwater temporary well and soil boring locations where samples were collected, and proposed monitoring well locations. All samples will be adequately marked for identification from the time of collection and packaging through handling and storage. Marking for sample identification shall be on a sample label attached to each sample container. Sample identification will include, at a minimum, the following:

- sample identification number;
- analysis required;
- sample date and time; and
- initials of the individual performing the sampling.

A description of the sample will be included in the field logbook.

Alphanumeric codes will be used to identify sample locations. The coding for sample identification numbers should be consistent, identify a single sample location, and unless otherwise directed, use the following naming convention:

TABLE 3: Sample Identification Naming Conventions

MW-XX	Shallow-depth Overburden Monitoring Well
MW-XXI	Intermediate-depth Overburden Monitoring Well
MW-XXD	Deep Overburden Monitoring Well
TWP-XX	Temporary well point
RW-XX	Recovery Well
B-XX	Test Boring
TP-XX	Test Pit
SB-XX	Geoprobe soil boring
S-XX	Surface soil sample location
EX-SXX	Post Excavation Sidewall
EX-BXX	Post Excavation Base
SW-XX	Surface water sampling location
W-XX	Wipe sample
WCS-XX	Soils Waste Classification
WCW-XX	Water Waste Classification
IA-BXX	Indoor Air at Building XX
OA-UW or DW	Outdoor Air upwind or downwind
SS-BXX	Sub Slab Vapor at Building XX
SV-XX	Soil Vapor
INJ-XX	Injection Well

Where XX is a numerical value and Y is coordinate such as Northwest.

The methods and references for collecting groundwater samples are provided in the RAWP; methods and references for collecting soil samples will be provided in the RDR. The laboratory will provide appropriately cleaned and prepared sample containers. Reagents, preservation procedures, and analytical holding times will be in accordance with the published analytical methods.

The specific requirements for sample container preparation, sample preservation, holding times, and any special handling requirements are listed in Table 2. Sample containers will be kept closed until the time each set of sample containers is to be filled. After filling, the sample containers will be securely closed, residue wiped from the sides of the containers, sample identification marked on the container label, and the container immediately placed in a cooler

that contains ice. Samples will be kept chilled and delivered to or picked up by the laboratory. Samples of dissimilar matrices will be shipped in separate coolers whenever possible. All reasonable effort will be used to limit the time the sample containers are on the Site to no more than two calendar days.

Calibration Procedures

Laboratory calibration procedures and frequency of calibration will be completed in accordance with the NYSDOH ELAP CLP criteria. These criteria represent accepted techniques to ensure accurate sampling, monitoring, testing, and documentation as per QA/QC standards. Field instruments such as pH meters, dissolved oxygen meters, and specific conductivity meters will be standardized in accordance with the manufacturer's recommendations against National Institute of Standards and Technology (NIST) traceable standards, where appropriate. During sampling, calibration will be performed at the beginning of each day of use. Appropriate calibration records will be maintained in field logbooks.

Samples that do not contain concentrations of target analytes that exceed instrument calibration range, absent of matrix interference, will be analyzed so as to achieve the lowest practical quantitation limits. Samples that do contain concentrations of target analytes that exceed the instrument calibration range will be diluted in accordance with approved methodologies and good laboratory practice.

Field Sampling Procedures

The field sampling activities are divided into two categories: field screening and subsurface characterization. Field screening will be used to obtain immediate Site data that can be used to ensure the health and safety of Site workers and/or assist in the selection of soil and groundwater sampling locations and depths. Subsurface characterization involves the collection of samples for analysis by the laboratory. The results generated from these sample analyses will be used to characterize and monitor site conditions. The components of the Site Investigation include:

- on-site soil sampling; and
- on-site groundwater monitoring.

Groundwater Level Measurements

Groundwater levels will be measured during the Remedial Investigations. Synoptic (instantaneous) groundwater level measurements will be collected from all accessible wells and piezometers concurrently with all on-site groundwater sampling events. Groundwater level measurements will be made using a Slope Indicator electronic water level meter or equivalent. The water level meter will be field decontaminated prior to use and between measurements at each well location. Measurements to the depth-of-water will be made to the nearest 0.01-foot relative to the northernmost point at the top of the casing elevation. This measurement will be converted to a groundwater elevation based upon the surveyed casing elevation.

If non-aqueous phase liquids are observed, then thickness measurements will be made using an oil/water interface probe, indicator paste, or other appropriate methods.

Groundwater Sampling

Groundwater sampling of any one monitoring well will be performed no sooner than one week following the development of that monitoring well unless otherwise approved by the NYSDEC. Groundwater sampling for any one sampling event will consist of determining the casing volume, purging, and sample collection. These procedures are described below:

Determination of Casing Volume

Casing volume will be determined by measuring the water level in each monitoring well and by utilizing well construction information to calculate the volume of standing water in the well. An electronic water level indicator will be used to measure the depth from the top of the innermost casing to the water table to the nearest 0.01 feet. The water level indicator will be decontaminated using phosphate-free detergent and distilled or deionized water prior to its use in any one monitoring well. The depth to the bottom of the monitoring well will be determined during the first sampling event to confirm well construction details. The measurement will be taken with a field-decontaminated electronic water level indicator and recorded to the nearest 0.01 feet.

Purging

One of two groundwater purge techniques may be applied at this Site. The first method is low-flow purge method. This method minimizes data quality interference by suspended solids by

purging groundwater at such a low rate so as not to cause sediment in the well to become suspended. To ensure that pore water and not casing water is sampled upon completion of purging, groundwater is purged until several indicator parameters become stable. This technique is described in detail by Puls and Barcelona ("Low-flow (minimal drawdown) groundwater sampling procedures." EPA/540/S-95/504; April 1996).

If a low-flow purging technique is used, then groundwater will be extracted at a rate that is equal to or less than one liter per minute. Water level will be checked periodically during purging to monitor drawdown and to guide flow rate adjustment. The flow rate will be adjusted to achieve a minimal drawdown that does not exceed 0.1 meters (four inches).

If necessary, in-line water quality will be monitored during purging using a flow-through cell. The water quality indicator parameters that will be monitored will include pH, conductivity, dissolved oxygen (DO), and turbidity. Measurements will be taken every three to five minutes until water quality has stabilized. Stabilization is achieved when three successive readings are within ± 0.1 for pH, ± 3 percent for conductivity, and ± 10 percent for turbidity and DO.

If the low-flow purge technique is not used, then three casing volumes of water will be purged from the monitoring wells. The wells will be purged using positive displacement pumps such as a submersible pump. A bottom-filled bailer may also be used to purge a well. If a submersible pump is used, then the pump and power cord will be decontaminated prior to each use using the methods described later in this document. New ASTM drinking water grade polyethylene tubing will be attached to the submersible pump to discharge water from the monitoring well. The tubing will be discarded after use at a monitoring well.

If well or piezometer diameter is such that a positive displacement pump is not used, a peristaltic pump with dedicated thin plastic tubing will be used to purge the required volume.

The field parameters pH, specific conductance, temperature, and DO will be measured and recorded prior to purging the monitoring well. During purging, all reasonable effort must be made to keep the purging rate low and to avoid pumping the well to dryness. Monitoring well purging rates will not exceed five gpm. In some cases, the evacuation of three casing volumes may not be practical due to slow recovery. If a monitoring well is pumped to near dryness at a rate less than 0.5 gpm, then the monitoring well will be allowed to recover to a volume sufficient

for sampling. Sampling will occur within two hours of purging as long as the well has sufficiently recovered. It may be necessary to allow all such monitoring wells to recover sufficiently for sampling. Details of the monitoring well's recovery rate will be noted on the field form.

The following monitoring well purge data will be recorded on the field form for each monitoring well sampled whenever the "3 to 5 volume" purge method is used:

Before Purging:

- date, time, and whether conditions;
- monitoring well identification number;
- PID measurements taken from the monitoring well immediately after the cap is removed;
- pH, DO, temperature, and specific conductivity;
- total monitoring well depth and depth-to-water from the top of the innermost casing; and
- water volume within the monitoring well.

After Purging

- start and end time of purging;
- purge method;
- purge rate;
- total volume purged; and
- pH, DO, temperature and specific conductivity.

After Sampling

- start and end time of sampling;
- pH, DO, temperature, and specific conductivity;
- sampling method;
- pertinent observations regarding sample characteristics (e.g., turbidity, color, odor).

Sampling

If the low-flow purge method is used, then sampling will involve disconnecting the intake hose from the flow-through cell and then using that hose to discharge the sample directly into containers provided by the laboratory.

If the “3 volume” purge method is used, monitoring well sampling will be performed within two hours of purging unless, as stated earlier, a monitoring well recovers at too slow a rate. Sampling will be performed with a dedicated clean Teflon bailer with a single check valve at the bottom.

To obtain a sample, the bailer will be slowly lowered into the well using the leader and rope until it is submerged and slowly brought back to the surface after filling. The contents of the bailer will then be slowly poured into the sampling containers provided by the laboratory.

The preferred order of sample collection is as follows:

- VOCs;
- metals (if necessary); and
- field measurements (temperature, DO, pH, and specific conductance).

Following sample collection, the sample containers will be securely closed, residue will be wiped from the sides of the containers, the containers will be properly labeled, and the containers will be immediately placed in a cooler. Samples will be kept chilled at a temperature of 4°C and shipped on the day of sample collection under a chain-of-custody to the analytical laboratory. Samples of dissimilar matrices will be shipped in separate coolers whenever possible.

Soil Sampling

Soil samples collected for VOC and lead analyses will be collected with a properly decontaminated soil coring device or waste pile sampler from a 0 to 6 inches depth corresponding to the highest detected PID reading, as well as a sample collected from 0 to 6 inches above the perceived groundwater interface zone. If no groundwater is encountered, then a sample will be collected 0 to 6 inches from the corresponding depth of the soil borehole. A sub-sample will be collected from the soil coring device or waste pile sampler using either an Encore® sampler or a disposable dedicated plastic syringe. Sub-samples collected using the dedicated plastic syringe will be transferred to a 4-oz glass jar container lined with a Teflon lid. No samples collected for VOC analysis will be composited, unless required by a disposal facility, to prevent loss of VOCs.

Samples to be collected for waste classification will be composited on site prior to shipment to the laboratory, except cases in which the samples are expected to be hazardous, in which case

samples will be composited at the laboratory. All sample containers will consist of laboratory-cleaned bottles that, once filled with sample, are to be properly labeled and then placed into coolers and chilled to 4°C.

Sampling locations shall be noted on a site map and measured from a set location, such as a monitoring well. The soil texture at each post-excavation soil sampling location shall be logged in accordance with the Unified Soil Classification System (USCS). Waste classification and post-treatment soil samples will not be logged for texture.

Decontamination Procedures

Decontamination of equipment and other materials will be conducted at a designated on-site decontamination area. Thus, if gross contamination is observed on field sampling equipment, decontamination will involve the following steps:

1. non-phosphate detergent plus tap water wash;
2. tap water rinse;
3. distilled/deionized water rinse;
4. 10 percent nitric acid solution rinse;¹
5. distilled/Deionized water rinse;²
6. Alconox rinse;³
7. distilled/deionized water rinse.⁴

If gross contamination is not observed, the field sampling equipment may be field-decontaminated utilizing the following procedure:

1. non-phosphate detergent and tap water scrub to remove residual particles;
2. generous potable water rinse;
3. distilled/deionized water rinse.

Decontamination of submersible pumps used for monitoring well purging and sampling will use the following procedures:

1. non-phosphate detergent and tap water wash to remove residual particles from the pump casing, hose,⁵ and cables;

¹ Apply this step only if the sample is to be analyzed for metals.

² Apply this step only if the sample is to be analyzed for metals.

³ Apply this step only if the sample is to be analyzed for organic compounds.

⁴ Apply this step only if the sample is to be analyzed for organic compounds.

2. distilled/deionized water rinse;
3. flush a minimum of one gallon of potable water through the pump.

New ASTM drinking grade polyethylene tubing will be used for each well and discarded after use. The submersible pump, associated tubing, and other sampling equipment will be placed on clean polyethylene sheeting prior to use in order to avoid contact with the ground surface.

Waste Handling Procedures

Decontamination water and purged groundwater will be generated during the implementation of the aforementioned activities. If product, a sheen, or heavy odors are observed associated with this water, it will be collected and containerized and the containers staged on site until the waste can be characterized properly for disposal. Collection, storage, and disposal of all waste material generated during the Site Investigation activities will be coordinated with the City. All wastes will be disposed of in accordance with NYSDEC requirements.

⁵ Steam cleaning of pump casing, hose and cables may be conducted instead of applying the detergent and tap water rinse.

Field Quality Control Procedures

Field Duplicates

Field Duplicate samples are collected to evaluate the laboratory's performance by comparing two separate samples that were collected from the same location. The frequency of duplicate sample collection will be five percent or one for every 20 samples, or part thereof, per matrix. If less than 20 samples are collected for a particular matrix, then one duplicate will be collected.

The collection of a duplicate groundwater sample will be obtained by alternately filling sample containers from the same sampling device for each parameter. The sample locations that require VOC analysis should have all the VOC sample containers filled from a single sampling device, whenever possible.

Field Blanks

Field Blanks will be collected as a mechanism of control on sample equipment handling, preparation, storage, and shipment. Field Blanks will be collected for all sampling events involving the collection of groundwater. Field Blanks will be collected for sampling events involving the collection of non-aqueous samples only if the samples are to be analyzed for VOCs.

Field Blanks will be collected at a frequency of one per day during aqueous sampling events. They will be analyzed for any and all parameters analyzed during a particular sampling event on that day of sampling.

Field Blanks for non-aqueous samples will only be collected when environmental samples are to be analyzed for VOCs, and then only for those VOCs targeted for analysis in the corresponding environmental samples. In such cases, Field Blanks will be collected at a frequency of five percent of the total number of non-aqueous samples collected over the duration of the sampling event. However, the number of Field Blanks collected will not exceed one per day even if the number of samples collected on a given day exceeds 20.

For one-day non-aqueous sampling events, one Field Blank will be collected.

Field Blank water will be analyte free water provided by the analytical laboratory. The Field Blank water will be transported to the field in bottles that are of the same type as that which is used to contain the Field Blank sample. All Field Blank and sample containers will be transported to and from the field and handled in a manner that is identical, in every practical aspect, to the manner in which environmental samples and sample containers are handled.

Trip Blanks

A Trip Blank will accompany each environmental sample container (cooler) carrying aqueous samples that are to be analyzed for VOCs. The Trip Blanks will be analyzed for any and all VOC parameters that are targeted for analysis in any particular sample shipment. Trip Blanks are not required for non-aqueous sampling events.

Trip Blanks will be prepared by the analytical laboratory using analyte-free water. The Trip Blanks will be marked by the laboratory with the date and time of preparation. This date and time will represent the sampling date and time for the Trip Blank that is to be entered into the field logbooks and chain-of-custody forms.

Trip Blanks will accompany the coolers and environmental samples during transport to and from the field. Every practical step should be taken to expose the Trip Blanks to the same conditions as the environmental samples and coolers.

TABLE 4: Quality Assurance Sample Frequency

QA Sample Type	Aqueous	Soil
Duplicate	5%	5%
Field Blank	Daily	5% (VOCs only) ⁶
Trip Blank	1 per Cooler (VOCs only)	Not Required

⁶ This frequency is for a multi-day sampling event. If the sampling event is only one day in duration, then one field blank is required no matter how many samples are collected on that day. For multi-day sampling events where more than 20 samples are collected in a single day, one field blank per day is permitted.

Chain-of-Custody Procedures and Sample Storage

Chain-of-custody procedures have been established to ensure sample traceability from the time of collection through the completion of analyses. The National Enforcement Investigation/ Remediation Center (NEIC) of the USEPA considers a sample to be in custody under the following conditions:

- it is in your possession; or
- it is in your view after being in your possession; or
- it was in your possession and you secured it with a lock; or
- it is in a designated secure area.

All environmental samples will be handled under strict chain-of-custody procedures beginning in the field. The First Environment Field Team Leader will be the Field Sample Custodian and will be responsible for ensuring that the procedures outlined in the applicable work plan and this QAPP will be followed. Sample custody for field activities will include the use of chain-of-custody forms, sample labels, and field logbooks. Dedicated field logbooks will be used throughout the project to document field activities.

Once samples are transported to the laboratory, custodial responsibility is transferred to the Laboratory Sample Manager to ensure that the appropriate procedures and methods are followed.

Data Reduction, Evaluation, and Reporting

The laboratory will submit analytical reports to First Environment. Precision, accuracy, representativeness, comparability, and completeness of the laboratory data will be evaluated based upon adherence to sample holding times and the analysis of QA/QC samples (i.e., duplicates, spikes, and blanks). Data validation of non-CLP reduced deliverables (Category A) will be based upon method-specific QC criteria similar to the criteria of Section 8 of the USEPA 600 series methods provided in 40 CFR Part 136. The overall responsibility for reporting laboratory data lies with the laboratory director. Professional judgment will be used to determine data usability with respect to the Data Quality Objectives. Data validation of CLP deliverables (Category B) will be performed by a third-party verifier and be reported in a Data Usability Summary Report (DUSR), as specified in the NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation dated December 2002.

In accordance with Section 502 of the Public Health Law, data upon which decisions impacting human health are based will be analyzed by an ELAP certified lab and documented by Category B deliverables. The following types of samples fall under this category:

- initial groundwater sampling (including both on-site and off-site sampling);
- soil to remain at the site (waste classification for reuse);
- post-excavation sampling; and
- air sampling, including outdoor air, indoor air, sub-slab vapor, and soil vapor samples.

Assessment of accuracy, precision, and completeness of both field and laboratory measurements is based upon obtaining acceptable results from QA/QC samples. Where appropriate, these may include blanks, duplicate samples, laboratory control spikes, or matrix spike/matrix spike duplicate samples. At least one physical set of Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples will be collected and analyzed per 20 samples for each matrix. Duplicates and MS/MSDs will be collected at least once during each major analytical event.

Method blanks, field blanks, and trip blanks are expected not to contain any targeted analytes with concentrations greater than the reported detection limit, with the possible exception of common laboratory contaminants (e.g., methylene chloride).

Field and laboratory duplicate results will be assessed based upon the relative percent difference (RPD) between values, using the following equation:

$$\text{RPD} = \frac{(D1-D2)}{(D1+D2)/2} \times 100$$

where, D1 = Primary sample result; and
D2 = Duplicate sample result.

Laboratory Control Samples will be assessed based upon the percent recovery of spiked analytes. The percent recovery will be calculated using the following equation:

$$\text{Percent Recovery} = \frac{X}{TV} \times 100$$

where, X = observed value of measurement; and
TV = "true" value of spiked analyte.

Matix Spike/Matrix Spike Duplicate (MS/MSD) data will be assessed based upon the percent recovery of spiked analytes using the following equation:

$$\text{Percent Recovery} = \frac{(SSR - SR)}{SA} \times 100$$

where, SSA = Spiked sample result for analyte x;
SR = Sample result for analyte x;
SA = Spike of analyte x added.

Laboratory completeness will be assessed based upon the amount of valid data obtained from a particular measurement system. It may be quantitatively expressed using the following equation:

$$\text{Laboratory Completeness} = \frac{N1}{N2} \times 100$$

where, N1 = Number of valid measurements obtained; and
N2 = Number of measurements validated.

Project Data completeness will be assessed based upon the amount of valid data obtained from field sampling and laboratory analyses. It may be quantitatively expressed using the following equation:

$$\text{Project Completeness} = \frac{N1}{N2} \times 100$$

where, N1 = Number of valid measurements obtained; and
N2 = Number of measurements anticipated in the RAWP.

The laboratory will assess all QC data with regard to precision and accuracy. Individuals making field measurements will determine whether or not field QC criteria were met. A First Environment data validator will examine laboratory analytical data and field data to determine the usability of this data as well as the data's consistency with Analytical Data Quality Objectives.

Corrective Actions

The need for corrective action will be based upon predetermined limits for acceptability for all aspects of sample collection and analysis. Predetermined limits for acceptability may include, but are not limited to, historical data and precision, accuracy, representativeness, consistency, and completeness criteria.

Laboratory Corrective Actions are described in the laboratory's Quality Assurance Manual. Laboratory personnel will assess laboratory QC samples, and if applicable, re-analyze samples that do not meet Quality Assurance requirements prior to expirations of holding times. Other corrective actions may include collection and analysis of additional samples from the Site. Problems that cannot be resolved by the laboratory's managers or QA officers will be brought to the attention of the First Environment Project Manager. The Project Manager, following consulting with NYSDEC, will determine the corrective action to be taken, if any.

The detection of system and performance problems during field activities and the implementation of any resulting corrective actions will be documented in the field logbook and placed in the project file. System and performance problems may include, but not be limited to, field equipment failure, limited or no site access, and unanticipated field conditions. The First Environment Project Manager will be notified of all system and performance problems immediately after field personnel discover them. The Project Manager may consult with the NYSDEC and WPHA, if necessary, to determine the corrective action to be taken, if any.

APPENDIX D

Site Health and Safety Plan¹

Section 1: General Information

Overall Haz Eval:	Low	Project Manager:	Nazmi M. Talimcioglu
Site Name:	Former Getty Service Station No. 369	Site Emer Contact:	Nazmi M. Talimcioglu
Project Name:	Former Getty Service Station No. 369	Site Emer Contact #:	(917) 257-6976
Project Number:	WPHA001	HASP Revision #:	00
Project Location:	29 E. Post Road, White Plains NY	HASP Approval Date:	5/28/2014
Client Name:	Bernstein & Associates	HASP Effective Date:	5/28/2014
Site Contact:	Norm Bernstein		
Contact #:	646-413-8992		

Section 2: Emergency Contact Information

Local Service Contact Numbers

Ambulance:	911	Poison Control:	800-462-6642
Fire:	911	Fire (non-emergency):	914 422-6400
Police:	911	Police (non-emergency):	914-422-6111

Spill Response Information

DOT HazMat Info:	202-366-4488	CHEMTREC	800-424-9300
National Response Center Hotline:	800-424-8802	CMA Chemical Referral Center:	800-262-8200
State Spill Response Hotline Name	NA	Emergency Response Contractor Name:	NA
State Spill Response Hotline number:	NA	Emergency Response Contractor Number:	NA

First Environment Contact Information

Project Manager:	Nazmi M. Talimcioglu	FE Office Number:	973-334-0003
Cell Phone:	(917) 257-6976	Alternate FE Contact:	Tom Bambrick
Home Phone:	--	Cell Phone:	973-224-9962
FE Medical Consultant:	Jeffrey Liva, M.D.	FE Human Resources Dir:	Scott Kymer
FE Medical Consultant #:	201-444-3060	Cell Phone:	973-632-6741

Hospital Information (Do NOT attempt to transport anyone for anything other than a minor injury in which the individual is ambulatory. Call 911 for an ambulance instead.)

Name:	White Plains Hospital		
Address:	41 E Post Rd White Plains, NY 10601		
Non-Emerg. Phone:	914-681-0600	Hours of Operation:	24/7
Verified by:	Kenneth Farah Jr.	Date:	5/28/2014

¹ Note: This Health and Safety Plan has been written for the use of First Environment, Inc. and its employees. The plan is written for specific trained personnel who are under medical surveillance. The plan is applicable for the specific purposes and objectives stated and is representative of conditions believed to exist at the time of its preparation. First Environment, Inc. claims no responsibility for its use by others
 Form Effective Date: 5/12/10
 Form Location: <http://www.firstenvironment.com/html/emsforms.html> Page 1 of 19

Section 3: Map to Hospital

This page reserved for a map and directions to the hospital.

Suggested routes

E Post Rd 33 ft, 1 sec
● In current traffic: 1 sec

Or Walk 0 secs

Driving directions to 41 E Post Rd, White Plains, NY 10601 3D ▶

A 29 E Post Rd
White Plains, NY 10601

1. Head northeast on E Post Rd toward Winchester St

B 41 E Post Rd
White Plains, NY 10601

33 ft

Save to My Maps

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2013 Google



Section 4: Site Description

Field Effort Objectives

Initial Assessment

Delineate contamination	X
Remediate contamination	X
Other (list below)	

Site Characteristics (check all that apply)

First Entry		Hazardous (CERCLA/State Superfund)
Previously Characterized	X	Hazardous (RCRA)
Active	X	HAZWOPER
Inactive		Sanitary or C and D Landfill
UST/LUST	X	Secure
Manufacturing		Other (list below)
Construction		

Project History

Tyree Environmental Corp. (Tyree), on behalf of Getty Properties Corp. (Getty) conducted a Remedial Investigation (RI) at the former Getty Service Station immediately adjacent and upgradient of the Site. Tyree prepared a Subsurface Investigation Work Plan (SIWP) to propose additional plume delineation for the Site to determine if the groundwater contamination has migrated to the vicinity of an off-site apartment building. This workplan consists of installation of seven (7) soil borings and six (6) monitoring wells out of the six (6) soil borings installed. In addition, existing wells GP-14 and GP-19 will be over drilled and finished as two-inch wells. Representative soil and groundwater samples will be collected at each location and submitted for laboratory analysis.

First Environment is continuing Site Investigation activities on behalf of Client to determine the extent of soil and groundwater contamination at the Site. Site activities will include soil coring and sampling, as well as temporary and possibly permanent monitoring well installation and groundwater sampling.

Site Security and Control Measures

None by First Environment

Section 5 Work Description

If multiple tasks with different hazard profiles and risk controls are planned, copy Sections 5, 6, and 7 and fill out for each task with different hazards requiring different controls.

Tasks to be performed by First Environment

Tasks: Oversight of Tyree's investigation as outlined above in Project History Section and collecting split samples.

Tasks: Oversight of soil coring operations, soil and groundwater sampling

Tasks to be performed by First Environment Contractors²

² Site characteristics to the best of First Environment's knowledge are included in this HASP. Per the subcontractor agreement, each subcontractor must assess hazards associated with their site activities and have a site-specific health and safety plan covering their work on site.

TASKS: Soil Coring & Temp Well Installations

Contractor: Environmental Test Boring, Inc.

Tasks: Ground Penetrating Radar Mark-out

Contractor: GPR OneCall

Tasks:

Contractor:

Section 6: Hazard Assessment

Potential Chemical Hazards

Identify suspected compounds and levels if known. If levels are unknown, indicate unknown. If compounds are not present or not suspected to be present indicate with NA. If a class of compounds (in bold) is not present at the site, indicate NA for the class, it is then not necessary to fill in NA for compounds within the class.

Unknown or partially characterized			
Compounds	Levels		Symptoms of Acute Exposure
	Soil (mg/kg)	W/GW (µg/L)	
Nonchlorinated VOCs			
Benzene	0.52	500	Irritation: Eyes, Skin, Respiratory System
2-Butanone (MEK)			
Ethylbenzene	12	290	
Hexone (MIBK)			
Methyl-t-butyl Ether (MTBE)	ND	2.2	
Toluene	0.62	120	
Xylene (total)	32	486	
Other(specify)			
Chlorinated VOCs	NA	NA	
Carbon tetrachloride			
Chlorobenzene			
1,2-Dichloroethane			
1,1 Dichloroethylene (1,1-DCE)			Irritation: Eyes, Skin, Throat; Dizziness; Headache; Nausea, Breathing Difficulty
Tetrachloroethylene (PCE)			Irritation; Eyes, Skin, Nose; Throat, Respiratory System; Nausea; Flush Face and Neck; Dizziness; Lack of Coordination; Headache; Drowsiness
1,1,1-Trichloroethane (TCA)			Irritation; Eyes, Skin; Headache; Weakness; Exhaustion
Trichloroethylene (TCE)			Irritation: Eyes, Skin; Headache
Vinyl Chloride			Weakness; Abdominal Pain
Other (specify)			
Semi-Volatile Organics		NA	
Naphthalene	8.1	310	
PAHs			
Other (specify)			

Compounds	Levels		Symptoms of Acute Exposure
	Soil (mg/kg)	W/GW (µg/L)	
Petroleum Products	NA	NA	
Gasoline			
Fuel Oil #2			Irritation: Eyes, Skin, Mucous Membrane
Fuel Oil #6			
Petroleum Distillates			
Other (specify)			
Metals	NA	NA	
Arsenic			
Cadmium			
Chromium			
Lead			
Mercury			
Other(specify)			
PCBs	NA	NA	Irritation: Eyes; Chloroacne (acne-like skin irritation)
	NA	NA	
Coal/MGP Tar			
Pesticides	NA	NA	
Asbestos	NA	NA	
Fiberglass	NA	NA	
Other (specify)			

Chemicals Brought On-Site by FE

Alconox

Other (specify)

Dilute Hydrochloric Acid

Dilute Nitric Acid

Dilute Sulfuric Acid

Is there a high potential for a chemical release beyond an incidental release?
If yes, explain:

Potential Physical Hazards

Check all that apply.

- Unknown/Partially Characterized
- Cold Exposure
- Electrical (other than lines)
- Explosion*
- Fire
- Toxic Gases

X

- Heat Stress
- Stored Energy
- Confined Space*
- Heavy Machinery
- Slippery Surfaces
- Fall Potential

X

Oxygen Deficiency*
 Pinch Points
 Uneven Terrain
 Noise
 Traffic **X**
 Venomous Snakes
 Mosquitoes, Ticks or other Biting
 Insects
 Poor Visibility/Inadequate Light
 Ionizing Radiation*

Poisonous Plants
 Venomous Spiders
 Wild Animals
 Utility Lines **X**
 Biological Waste (specify)
 Flying or Falling Material
 Pump Winch
 Other (specify)

Overall Hazard Evaluation

Overall: High Medium Low **X** Unknown
 Justification:

Section 7 Risk Control

Utilities

Utility Markout

Utility	Req.	Company Name	Telephone #	Markout Ticket Confirmation #	Date
One Call					
Gas:					
Electric:					
Water:					
Sewer:					
Telephone:					
Cable:					

Activity modifications to address onsite utility lines:

Not Applicable; Tyree responsible for coordination

PPE

Primary protective equipment to be worn during this task

Level C Level D **X** Level D Modified

If PPE beyond Level D is required, consult the Project Manager or Senior Management

* If this risk is identified, Senior Management must approve the HASP.

Equipment	Primary	Conting**
<u>Respiratory</u>		
Respirator (full)		X
Respirator (half)		
Cartridge type:		
P100		
Combo		
Other		
Dust Mask		
Not Needed		
<u>Head and Eye</u>		
Safety Glasses	X	X
Face Shield		
Goggles		
Hard Hat	X	X
Not Needed		
<u>Ears</u>		
Hearing Protection	X	X

Equipment	Primary	Conting**
<u>Feet</u>		
Steel Toe Safety Boots	X	X
Overboots		
Workboots		
No Special Reqts.		
<u>Hands</u>		
Nitrile Gloves	X	X
Overgloves		
Not Needed		
<u>Body</u>		
Tyvek Coverall		
Polycoated Tyvek		
Cold Weather Gear (carhart)		
Rain Gear		X
Safety Vest	X	
Not Needed		

Other PPE Requirements:

Trigger for Contingency Requirements:**

Other Equipment and Supplies:

Lighting	
Potable Water	
Insect Repellent	
Fire Extinguisher (2.5 lb)	X
Fire Extinguisher (5 lb)	
Fire Extinguisher (10 lb)	
Eyewash Kit	
Spill Kit	X
First Aid Kit	X
Other (specify):	

Restroom Facilities Location:

If equipment at the facility is to be relied on; list the equipment and location:

Equipment	Location

Operational Control Procedures:

Decontamination Procedures: None.

Follow the Field Decontamination Procedure. List any differences or additions below.

Discharge Control Measures: None.

Discharge Control Measures:

** If contingency is necessary, move from work area and consult the Project Manager or other Senior Personnel prior to upgrading.

Waste Disposal Practices:

Specify Waste Disposal Practices:

Waste Type	Sample	Containerize	Dispose of off Site	Return to Site	Dispose in FE Solid Waste
Drill Cuttings				X	
Purge Water	X			X	
Soil	X				
PPE and other field related waste					X
Other (Specify)					

Additional waste handling instructions:

None.

Additional discharge control instructions:

None.

General Safe Work Practices:

To ensure the safety of First Environment personnel and the public at a site where fieldwork is being conducted, the Safe Work Practices listed below will be followed.

- Good housekeeping practices are to be maintained.
- A "buddy system" in which another worker is close enough to render immediate aid will be in effect when specified in the HASP.
- In the event of treacherous weather-related working conditions field tasks will be suspended until conditions improve or appropriate protection from the elements is provided.
- Smoking, eating, chewing gum or tobacco, or drinking are forbidden except in clean or designated area.
- Ignition of flammable liquids within or through improvised heating devices is forbidden.
- Contact with samples, excavated materials, or other contaminated materials must be minimized.
- Use of contact lenses is not advisable.
- If drilling equipment is involved, know where the 'kill switch' is.
- All electrical equipment used in outside locations, wet area or near water must be plugged into ground fault circuit interrupter protected outlets.
- Illumination - Work in the early morning or at dusk may require site lighting.

List any differences or additions below:

None.

Buddy System required? No.

If yes, describe circumstances:

Lockout – Tagout:

Is lockout – tagout required? **No.**

Specify equipment to be locked out:

Follow the Lockout - Tagout procedure. List any differences or additions below:

Exclusion Zones:

Will exclusion zones be used at the site? **No.**

If yes, zones indicated on the site map?

Emergency Response Procedures

Field Emergency Response: None.

Follow the Field Emergency Response Procedure. List any differences or additions below

Spill Response:

Follow the Field Spill Response Procedure. List any differences or additions below.

None.

Is a stand-by external emergency response contractor required?

Date Contacted: NA

Contacted by: NA

H&S Monitoring and Measurement:

H&S Field Monitoring Required? N/A

If so, follow the Health and Safety Monitoring Table below.

Corrective/Preventive Action

In the event that corrective action becomes necessary and is taken in the field or a necessary preventive action is identified, the Field Team must ensure the notification of the PM so that appropriate modifications can be made to the HASP and fieldwork activities. In the event that a corrective or preventive action has application beyond the immediate project and work being performed, a PCAN must be filed.

Audits

As part of First Environment's ISO 14001 EMS, the HASP and its implementation are subject to internal audit and audit by our third party auditor. Findings are addressed through the PCAN Process.

This page reserved for a site map showing work locations, staging areas, exclusion zones as appropriate, emergency response equipment locations as appropriate, and the evacuation route and muster point.

H&S Monitoring

Type of Meter/Monitoring	Monitors	Check if to be Used/ Done	Surveillance Methodology (select one)		Monitoring Locations	Guidance Action Levels*	Site Action Levels**
			Determined by FTL Based on Site Conditions	Specified Frequency			
Photoionization Detector (PID) 9.8eV 10.2eV 10.6 eV 11.7eV	Total Volatile Organics levels X			Continuous	At all soil boring and monitoring well points	5 ppm above background - evacuate and notify	
Flame Ionization Detector (FID)	Total Volatile Organics levels					5 ppm above background - evacuate and notify	
Multi-gas meters	Oxygen Combustible Gas CO H2S Other Gas (Specify)					< 21% - notify < 19.5% - evacuate 10-20% - notify >20% - evacuate >9 ppm - notify >10 ppm - notify	
Other equipment (specify)							

* For notify action levels, move off worksite and contact PM to take corrective action or upgrade PPE. For evacuation move off worksite and contact PM for further instructions.

**If site levels are different from guidance levels specify reason:

Section 8 Plan Approval

Plan Prepared by: Date:

Plan Reviewed/Approved by: Date:

Project Manager: Date:

If modifications are made to the plan, it must be reviewed and approved again. The revision number and approval date on the first page must be changed.

Section 9 FE Personnel Acknowledgement

First Environment employees assigned to work on-site have attended 40-hour HAZWOPER training and annual refreshers, as applicable, per 29 CFR 1910.120, and have been certified medically fit by a qualified occupational physician to work on hazardous sites and to wear a respirator. Medical and training records are maintained by Human Resources.

By signing below, First Environment employees acknowledge that they:

- have read and understand this Site Health and Safety Plan
- meet the training and medical fitness requirements
- understand the process of continual improvement and will use the PCAN process.

The effectiveness of this Health and Safety Plan is determined through periodic auditing as part of our ISO 14001 Environmental Management System.

If review of the plan at the site indicates changes to the HASP are necessary, provide the specifics on the last page of this HASP (Make changes in the HASP and initial the changes).

	Name	Responsibilities	Site Task	Signature	Subcontractors			Date
					Sub HASP ³	Guide R&A ⁴	N/A ⁵	
1		FTL / FT / FHSO			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2		FTL / FT / FHSO			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3		FTL / FT / FHSO			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4		FTL / FT / FHSO			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5		FTL / FT / FHSO			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6		FTL / FT / FHSO			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7		FTL / FT / FHSO			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

³ Subcontractor is using HASP onsite and has reviewed it with employees

⁴ Subcontractor has received our Guide for Subcontractors and Vendors and has signed the Read and Acknowledge Form

⁵ Not applicable – No subcontractor present

8	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

³ Subcontractor is using HASP onsite and has reviewed it with employees
⁴ Subcontractor has received our Guide for Subcontractors and Vendors and has signed the Read and Acknowledge Form
⁵ Not applicable – No subcontractor present

24	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30	FTL / FT / FHSO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If review of the plan at the site indicates changes to the HASP are necessary, provide the specifics below (Make changes in the HASP and initial the changes).

Date: _____ FTL: _____

³ Subcontractor is using HASP onsite and has reviewed it with employees
⁴ Subcontractor has received our Guide for Subcontractors and Vendors and has signed the Read and Acknowledge Form
⁵ Not applicable – No subcontractor present

Section 10
Attach MSDSs.

MSDS Number: A2052 * * * * * Effective Date: 02/16/06 * * * * * Supercedes: 05/14/03



From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865



24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. And Canada
Chemtec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

ALCONOX®

1. Product Identification

Synonyms: Proprietary blend of sodium linear alkylaryl sulfonate, alcohol sulfate, phosphates, and carbonates.

CAS No.: Not applicable.

Molecular Weight: Not applicable to mixtures.

Chemical Formula: Not applicable to mixtures.

Product Codes: A461

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Alconox® proprietary detergent mixture	N/A	90 - 100%	Yes

3. Hazards Identification

Emergency Overview

CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO EYES AND RESPIRATORY TRACT.

J.T. Baker SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 1 - Slight

Flammability Rating: 0 - None

Reactivity Rating: 1 - Slight

Contact Rating: 2 - Moderate

Lab Protective Equip: GOGGLES; LAB COAT

Storage Color Code: Orange (General Storage)

Potential Health Effects

Inhalation:

May cause irritation to the respiratory tract. Symptoms may include coughing and shortness of breath.

Ingestion:

May cause irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea.

Skin Contact:

No adverse effects expected.

Eye Contact:

May cause irritation, redness and pain.

Chronic Exposure:

No information found.

Aggravation of Pre-existing Conditions:

No information found.

4. First Aid Measures

Inhalation:

Remove to fresh air. Get medical attention for any breathing difficulty.

Ingestion:

If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention.

Skin Contact:

Wash exposed area with soap and water. Get medical advice if irritation develops.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Not expected to be a fire hazard.

Explosion:

No information found.

Fire Extinguishing Media:

Dry chemical, foam, water or carbon dioxide.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. When mixed with water, material foams profusely. Small amounts of residue may be flushed to sewer with plenty of water.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Moisture may cause material to cake. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

None established.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear protective gloves and clean body-covering clothing.

Eye Protection:

Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

White powder interspersed with cream colored flakes.

Odor:

No information found.

Solubility:

Moderate (1-10%)

Specific Gravity:

No information found.

pH:

No information found.

% Volatiles by volume @ 21C (70F):

0

Boiling Point:

No information found.

Melting Point:

No information found.

Vapor Density (Air=1):

No information found.

Vapor Pressure (mm Hg):

No information found.

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

Carbon dioxide and carbon monoxide may form when heated to decomposition.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

No information found.

Conditions to Avoid:

No information found.

11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

-----\Cancer Lists\-----			
Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Alconox® proprietary detergent mixture	No	No	None

12. Ecological Information

Environmental Fate:

This product is biodegradable.

Environmental Toxicity:

No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----				
Ingredient	TSCA	EC	Japan	Australia
Alconox® proprietary detergent mixture	Yes	No	No	No

-----\Chemical Inventory Status - Part 2\-----				
Ingredient	Korea	--Canada--		Phil.
		DSL	NDSL	
Alconox® proprietary detergent mixture	No	No	Yes	No

-----\Federal, State & International Regulations - Part 1\-----	
	-SARA 302- -----SARA 313-----

Ingredient	RQ	TPQ	List	Chemical Catg.
Alconox® proprietary detergent mixture	No	No	No	No
-----\Federal, State & International Regulations - Part 2\-----				
Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8 (d)	
Alconox® proprietary detergent mixture	No	No	No	

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
 SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
 Reactivity: No (Pure / Solid)

Australian Hazchem Code: None allocated.

Poison Schedule: None allocated.

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 0 Flammability: 0 Reactivity: 0

Label Hazard Warning:

CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO EYES AND RESPIRATORY TRACT.

Label Precautions:

Avoid contact with eyes.
 Keep container closed.
 Use with adequate ventilation.
 Avoid breathing dust.
 Wash thoroughly after handling.

Label First Aid:

If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. In all cases, get medical attention.

Product Use:

Laboratory Reagent.

Revision Information:

No Changes.

Disclaimer:

Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

Section 1 - Chemical Product and Company Identification

54/60

Material Name: Hydrochloric Acid **CAS Number:** 7647-01-0
Chemical Formula: ClH
Structural Chemical Formula: HCl
EINECS Number: 231-595-7
ACX Number: X1002202-3

Synonyms: 4-D BOWL SANITIZER; ACIDE CHLORHYDRIQUE; ACIDO CLORHIDRICO; ACIDO CLORIDRICO; ANHYDROUS HYDROCHLORIC ACID; ANHYDROUS HYDROGEN CHLORIDE; AQUEOUS HYDROGEN CHLORIDE; BOWL CLEANER; CHLOORWATERSTOF; CHLOROHYDRIC ACID; CHLOROWODOR; CHLORURE D'HYDROGENE; CHLORURE D'HYDROGENE ANHYDRE; CHLORURO DE HIDROGENO; CHLORWASSERSTOFF; CLORURO DE HIDROGENO ANHIDRO; EMULSION BOWL CLEANER; EPA PESTICIDE CHEMICAL CODE 045901; HYDROCHLORIC ACID; HYDROCHLORIC ACID GAS; HYDROCHLORIDE; HYDROGEN CHLORIDE; HYDROGEN CHLORIDE (HCL); HYGEIA CREME MAGIC BOWL CLEANER; MURIATIC ACID; MURIATIC ACID); NOW SOUTH SAFTI-SOL BRAND CONCENTRATED BOWL CLEANSE WITHMAGIC ACTIO; PERCLEEN BOWL AND URINAL CLEANER; SPIRITS OF SALT; VARLEY'S OCEAN BLUE SCENTED TOILET BOWL CLEANER; VARLEY POLY-PAK BOWL CREME; WHITE EMULSION BOWL CLEANER; WUEST BOWL CLEANER SUPER CONCENTRATED

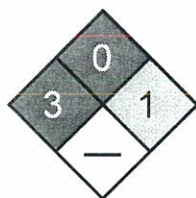
General Use: Hydrogen chloride is used to produce pharmaceutical hydrochlorides; vinyl chloride from acetylene; alkyl chlorides from olefins and arsenious chloride from arsenious oxide; electronic grade for etching semiconductor crystals. Used in the chlorination of rubber; in organic reactions involving isomerization, polymerization and alkylation; as a catalyst and condensing agent; for making chlorine where economical; in the separation of cotton from wool and cotton de-linting; as flux in the babbitt type of metal alloy; etching semi-conductor crystals. Hydrochloric acid is used for pickling and heavy duty cleaning of metal parts; rust and scale removal. The production of chlorides; neutralizing bases; a laboratory reagent. For hydrolyzing starch and proteins in preparations for food. As a catalyst and solvent in organic synthesis. As "spirits of salts" for cleaning of lime and masonry from new brickwork. As flux or flux component for soldering; manufacture of "killed spirits".

Section 2 - Composition / Information on Ingredients

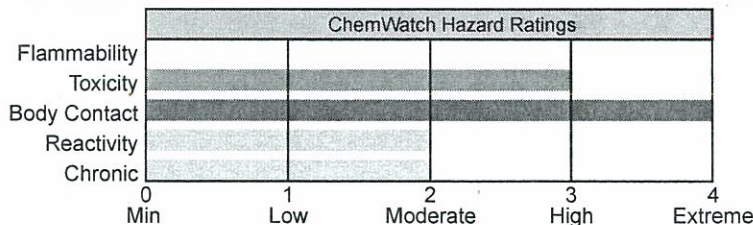
Name	CAS	%
hydrogen chloride	7647-01-0	> 99.0

OSHA PEL Ceiling: 5 ppm, 7 mg/m ³ .	NIOSH REL Ceiling: 5 ppm, 7 mg/m ³ .	DFG (Germany) MAK TWA: 5 ppm; PEAK: 5 ppm.
ACGIH TLV Ceiling: 2 ppm.	IDLH Level 50 ppm.	

Section 3 - Hazards Identification



Fire Diamond



HMIS	
2	Health
0	Flammability
0	Reactivity

ANSI Signal Word
Danger!



Corrosive Compressed Gas

☆☆☆☆☆ **Emergency Overview** ☆☆☆☆☆

Colorless gas; characteristic suffocating, pungent odor. Corrosive. Stored as compressed gas which may cause frostbite. Chronic Effects: erosion of teeth.

Potential Health Effects

Target Organs: eyes, skin, respiratory system, liver (in animals)

Primary Entry Routes: inhalation, skin contact, eye contact

Acute Effects

Inhalation: The vapor is extremely discomforting to the upper respiratory tract, may cause severe mucous membrane damage and may be harmful if inhaled.

Inhalation of quantities of liquid mist may be extremely hazardous, even lethal due to spasm, extreme irritation of larynx and bronchi, chemical pneumonitis and pulmonary edema.

A single severe exposure may cause coughing and choking; bleeding of nose, inflammation and occasionally ulceration of the nose, throat and larynx. Fluid on the lungs followed by generalized lung damage may follow.

Breathing of vapor may aggravate asthma and inflammatory or fibrotic pulmonary disease.

High concentrations cause necrosis of the tracheal and bronchial epithelium, pulmonary edema, atelectasis and emphysema and damage to the pulmonary blood vessels and liver.

Inhalation hazard is increased at higher temperatures.

The vapor from heated material is extremely discomforting to the upper respiratory tract and lungs if inhaled.

Continued severe exposure can result in pulmonary edema and corrosion of tissues in the nose and throat.

Eye: Hydrogen Chloride: The vapor is extremely discomforting to the eyes and is capable of causing pain and severe conjunctivitis. Corneal injury may develop, with possible permanent impairment of vision, if not promptly and adequately treated.

The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

Hydrochloric Acid: Eye contact is extremely painful and may cause rapid corneal damage. The liquid is extremely corrosive to the eyes and is capable of causing severe damage with loss of sight.

The vapor is highly discomforting and may be corrosive to the eyes. The vapor from heated material is extremely discomforting to the eyes.

Skin: The material is corrosive to the skin and may cause chemical burns.

Toxic effects may result from skin absorption. Bare unprotected skin should not be exposed to this material. The material may accentuate any pre-existing skin condition.

The vapor is discomforting to the skin.

Ingestion: Considered an unlikely route of entry in commercial/industrial environments.

The liquid is extremely corrosive if swallowed and is capable of causing burns to mouth, throat, esophagus, with extreme discomfort, pain and may be fatal if swallowed in quantity. Ingestion may result in nausea, abdominal irritation, pain and vomiting.

Carcinogenicity: NTP - Not listed; IARC - Group 3, Not classifiable as to carcinogenicity to humans; OSHA - Not listed; NIOSH - Not listed; ACGIH - Not listed; EPA - Not listed; MAK - Not listed.

Chronic Effects: Chronic exposure may cause discoloration or erosion of the teeth, bleeding of the nose and gums; and ulceration of the nasal mucous membranes.

Repeated exposures of animals to concentrations of about 34 ppm produced no immediate toxic effects.

Workers exposed to hydrochloric acid suffered from gastritis and a number of cases of chronic bronchitis have also been reported.

Repeated or prolonged exposure to dilute solutions may cause dermatitis. Repeated exposure to low vapor concentrations can cause skin tenderness, bleeding of the nose and gums, chronic bronchitis, gastritis.

Section 4 - First Aid Measures

Inhalation: Remove to fresh air.

Lay patient down. Keep warm and rested.

If breathing is shallow or has stopped, ensure clear airway and apply resuscitation. Transport to hospital or doctor.

Eye Contact: Immediately hold the eyes open and flush continuously for at least 15 minutes with fresh running water. Ensure irrigation under eyelids by occasionally lifting the upper and lower lids.

Transport to hospital or doctor without delay. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Skin Contact: Immediately flush body and clothes with large amounts of water, using safety shower if available. Quickly remove all contaminated clothing, including footwear.

Wash affected areas with water (and soap if available) for at least 15 minutes. Transport to hospital or doctor.

Ingestion: Contact a Poison Control Center. Rinse mouth out with plenty of water. Do NOT induce vomiting. Give a glass of water.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Note to Physicians: For acute or short-term repeated exposures to strong acids:

1. Airway problems may arise from laryngeal edema and inhalation exposure.

Treat with 100% oxygen initially.

2. Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling.

See
DOT
ERG

3. Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
4. Strong acids produce a coagulation necrosis characterized by formation of a coagulum (eschar) as a result of the desiccating action of the acid on proteins in specific tissues.

INGESTION:

1. Immediate dilution (milk or water) within 30 minutes post-ingestion is recommended.
2. Do not attempt to neutralize the acid since exothermic reaction may extend the corrosive injury.
3. Be careful to avoid further vomiting since re-exposure of the mucosa to the acid is harmful. Limit fluids to one or two glasses in an adult.
4. Charcoal has no place in acid management.
5. Some authors suggest the use of lavage within 1 hour of ingestion.

SKIN:

1. Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping.
2. Deep second-degree burns may benefit from topical silver sulfadiazine.

EYE:

1. Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjunctival cul-de-sacs. Irrigation should last at least 20-30 minutes. Do not use neutralizing agents or any other additives. Several liters of saline are required.
2. Cycloplegic drops (1% cyclopentolate for short-term use or 5% homatropine for longer term use), antibiotic drops, vasoconstrictive agents, or artificial tears may be indicated dependent on the severity of the injury.
3. Steroid eye drops should only be administered with the approval of a consulting ophthalmologist.

Section 5 - Fire-Fighting Measures

Flash Point: Nonflammable

Autoignition Temperature: Not applicable

LEL: Not applicable

UEL: Not applicable

Extinguishing Media: Water spray or fog; foam; Bromochlorodifluoromethane (BCF) (where regulations permit); Dry agent; Carbon dioxide.

General Fire Hazards/Hazardous Combustion Products: Noncombustible liquid. Will not burn, but heat produces highly toxic fumes/vapors.

Heating may cause expansion or decomposition leading to violent rupture of containers.

Decomposes on heating and produces toxic fumes of hydrogen chloride. Decomposition may produce toxic fumes of chlorine.

Reacts with metals producing flammable/explosive hydrogen gas. Contact with moisture or water may generate heat causing ignition. Reacts vigorously with alkalis. Moderate fire hazard when in contact with reducing agents.

Fire Incompatibility: Reacts with metals producing flammable/explosive hydrogen gas.

Avoid reactions with metals, metal oxides, hydroxides, amines, carbonates, alkaline materials, acetic anhydride, cyanides, sulphides, sulphites, phosphides, acetylides, borides, carbides, silicides, vinyl acetate, formaldehyde and potassium permanganate, unsaturated organics, metal acetylides, sulphuric acid.

Note: Compatibility with plastics should be confirmed prior to use.

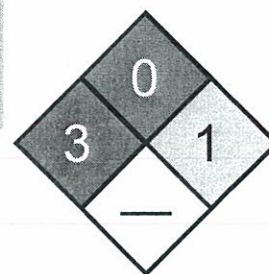
Fire-Fighting Instructions: Contact fire department and tell them location and nature of hazard.

Wear full body protective clothing with breathing apparatus. Prevent, by any means available, spillage from entering drains or waterways. Consider evacuation. Cool fire-exposed containers with water spray from a protected location.

If safe to do so, remove containers from path of fire. Equipment should be thoroughly decontaminated after use.

Water spray or fog may be used to disperse vapor. Do not approach cylinders suspected to be hot. If safe to do so, stop flow of gas.

See
DOT
ERG



Fire Diamond

Section 6 - Accidental Release Measures

Small Spills: DO NOT touch the spill material. Clean up all spills immediately. Wear fully protective PVC clothing and breathing apparatus. Contain and absorb spill with sand, earth, inert material or vermiculite. Use soda ash or slaked lime to neutralize. Collect residues and place in labeled plastic containers with vented lids. Clear area of personnel and move upwind. Avoid breathing vapors and contact with skin and eyes. Do not exert excessive pressure on valve; do not attempt to operate damaged valve. Water spray or fog may be used to disperse vapor.

Large Spills: Contact fire department and tell them location and nature of hazard. Clear area of personnel and move upwind. Wear full body protective clothing with breathing apparatus. Prevent, by any means available, spillage from entering drains or waterways. Consider evacuation. Stop leak if safe to do so. Remove leaking cylinders to a safe place if possible. Release pressure under safe, controlled conditions by opening the valve. Do not exert excessive pressure on valve; do not attempt to operate damaged valve. Shut off all possible sources of ignition and increase ventilation. Water spray or fog may be used to disperse vapor. Use soda ash or slaked lime to neutralize. Collect and seal in labeled drums for disposal. Wash spill area with large quantities of water. If contamination of

See
DOT
ERG

drains or waterways occurs, advise emergency services. After clean-up operations, decontaminate and launder all protective clothing and equipment before storing and reusing. DO NOT touch the spill material. Contain and absorb spill with sand, earth, inert material or vermiculite.

DO NOT USE WATER OR NEUTRALIZING AGENTS INDISCRIMINATELY ON LARGE SPILLS.

Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Avoid generating and breathing mist and vapor, breathing vapors and contact with skin and eyes.

Avoid physical damage to containers. Use in a well-ventilated area. Wear protective clothing and gloves when handling containers. Handle and open container with care.

WARNING: To avoid violent reaction, ALWAYS add material to water and NEVER water to material. When handling, DO NOT eat, drink or smoke. Always wash hands with soap and water after handling. Work clothes should be laundered separately. Use good occupational work practices. Observe manufacturer's storing and handling recommendations.

Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

Local exhaust ventilation may be required for safe working, i.e. to keep exposures below required standards; otherwise, PPE is required.

Keep dry. Reacts violently with water.

Transport containers on a trolley. Avoid sources of heat. DO NOT transfer gas from one cylinder to another.

Recommended Storage Methods: Packaging as recommended by manufacturer. Check that containers are clearly labeled.

Cylinder. Ensure the use of equipment rated for cylinder pressure. Ensure the use of compatible materials of construction. Valve protection cap to be in place until cylinder is secured, connected. Cylinder must be properly secured either in use or in storage. Cylinder valve must be closed when not in use or when empty. Segregate full from empty cylinders. **WARNING:** Suckback into cylinder may result in rupture. Use back-flow preventive device in piping.

Hydrochloric acid: Packs of 2.5 litres or less require a child-resistant closure. Glass container or Plastic carboy or Polylined drum.

Regulatory Requirements: Follow applicable OSHA regulations.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: If risk of overexposure exists, wear air supplied breathing apparatus. Provide adequate ventilation in warehouse or closed storage areas. Use in a well-ventilated area. Local exhaust ventilation may be required for safe working, i. e. , to keep exposures below required standards; otherwise, PPE is required.

If risk of inhalation or overexposure exists, wear NIOSH-approved respirator or work in fume hood. Hydrogen chloride vapors will not be adequately absorbed by organic vapor respirators.

Personal Protective Clothing/Equipment:

Eyes: Chemical goggles. Full face shield.

DO NOT wear contact lenses. Contact lenses pose a special hazard; soft contact lenses may absorb irritants and all lenses concentrate them.

Hands/Feet: Neoprene gloves; rubber gloves. Nitrile gloves.

Safety footwear. Rubber boots.

Hydrochloric acid: Barrier cream and Neoprene gloves or Elbow length PVC gloves. Nitrile gloves.

PVC boots or PVC safety gumboots.

Respiratory Protection:

Exposure Range >5 to <50 ppm: Air Purifying, Negative Pressure, Half Mask

Exposure Range 50 to unlimited ppm: Self-contained Breathing Apparatus, Pressure Demand, Full Face

Cartridge Color: white

Other: Ensure there is ready access to a safety shower; Eyewash unit.

Acid-resistant overalls. Full protective suit. Operators should be trained in procedures for safe use of this material.

Glove Selection Index:

BUTYL Best selection

BUTYL/NEOPRENE Best selection

HYPALON Best selection

NEOPRENE..... Best selection

NEOPRENE/NATURAL..... Best selection

NITRILE+PVC Best selection

PE/EVAL/PE Best selection

SARANEX-23 Best selection

VITON/NEOPRENE Best selection

PVC..... Best selection

NITRILE	Best selection
NATURAL RUBBER.....	Satisfactory; may degrade after 4 hours continuous immersion
NATURAL+NEOPRENE.....	Satisfactory; may degrade after 4 hours continuous immersion
NAT+NEOPR+NITRILE	Poor to dangerous choice for other than short-term immersion

Section 9 - Physical and Chemical Properties

Appearance/General Info: Hydrogen chloride: Colorless, corrosive gas. Pungent suffocating odor. White fumes in moist air. Soluble in methanol, ethanol, ether and benzene.

Hydrochloric acid: Clear to light yellow (orange tint for inhibited grades) fuming corrosive liquid with sharp, suffocating odor.

Physical State: Hydrogen chloride: Compressed gas;
Hydrochloric acid: Liquid

pH: Hydrochloric acid: < 1

Boiling Point: -85 °C (-121 °F)

Vapor Pressure (kPa): < 24.8 at 25 °C

Freezing/Melting Point: -114.44 °C (-173.992 °F)

Vapor Density (Air=1): 1.268 at 20 °C

Volatile Component (% Vol): 100

Formula Weight: 36.461

Decomposition Temperature (°C): Not applicable

Specific Gravity (H₂O=1, at 4 °C): < 1.19 at 20 °C

Water Solubility: 56.1 g/100 cc hot water at 60 °C

Evaporation Rate: Slow

Section 10 - Stability and Reactivity

Stability/Polymerization/Conditions to Avoid: Decomposes in the presence of moisture to produce corrosive acid. May generate sufficient heat to ignite combustible materials. Presence of heat source and direct sunlight (ultra-violet radiation). Product is considered stable under normal handling conditions. Hazardous polymerization will not occur.

Storage Incompatibilities: Hydrogen chloride: Segregate from most common metals and their alloys, alkalis, unsaturated organics, fluorine, metal carbides, metal acetylides, potassium permanganate and sulfuric acid.

Compatibility with plastics should be confirmed prior to use.

Hydrochloric acid: Segregate from alkalis, oxidizing agents and chemicals readily decomposed by acids, i.e.

cyanides, sulfides, carbonates. Avoid storage with metals, metal oxides, hydroxides, amines, carbonates, alkaline materials, acetic anhydride, cyanides, sulphides, sulphites, phosphides, acetylides, borides, carbides, silicides, vinyl acetate, formaldehyde and potassium permanganate. Reacts with zinc, brass, galvanized iron, aluminum, copper and copper alloys.

Section 11 - Toxicological Information

Toxicity

Inhalation (human) LC₁₀: 1300 ppm/30 m

Inhalation (human) LC₁₀: 3000 ppm/5 m

Inhalation (rat) LC₅₀: 3124 ppm/60 m

Inhalation (rat) LC₅₀: 4701 ppm/30 m

Oral (rat) LD₅₀: 900 mg/kg

Irritation

Eye (rabbit): 5 mg/30 s - mild

See RTECS MW 4025000, for additional data.

Section 12 - Ecological Information

Environmental Fate: No data found.

Ecotoxicity: TL_m Gambusia affinis (mosquito fish) 282 ppm/96 hr (fresh water) /Conditions of bioassay not specified; Lethal Lepomis macrochirus (bluegill sunfish) 3.6 mg/l/48 hr /Conditions of bioassay not specified; LC₅₀ Cockle 330 to 1,000 mg/l/48 hr /Conditions of bioassay not specified; LC₅₀ Carassius auratus (goldfish) 178 mg/l (1 to 2 hr survival time) /Conditions of bioassay not specified; LC₅₀ Shore crab 240 mg/l/48 hr /Conditions of bioassay not specified; LC₅₀ Shrimp 100 to 330 ppm/48 hr (salt water) /Conditions of bioassay not specified; LC₁₀₀ Trout 10 mg/l 24 hr /Conditions of bioassay not specified

Biochemical Oxygen Demand (BOD): none

Section 13 - Disposal Considerations

Disposal: Recycle wherever possible. Consult manufacturer for recycling options. Treat and neutralize at an effluent treatment plant. Bury residue in an authorized landfill. Decontaminate empty containers with a lime slurry. Return empty containers to supplier or bury empty containers at an authorized landfill.

Return empty cylinders to supplier.

Section 14 - Transport Information

DOT Hazardous Materials Table Data (49 CFR 172.101):

Note: This material has multiple possible HMT entries. Choose the appropriate one based on state and condition of specific material when shipped.

Shipping Name and Description: Hydrogen chloride, anhydrous

ID: UN1050

Hazard Class: 2.3 - Poisonous gas

Packing Group:

Symbols:

Label Codes: 2.3 - Poison Gas, 8 - Corrosive

Special Provisions: 3

Packaging: Exceptions: None **Non-bulk:** 304 **Bulk:** None

Quantity Limitations: Passenger aircraft/rail: Forbidden **Cargo aircraft only:** Forbidden

Vessel Stowage: Location: D **Other:** 40



Shipping Name and Description: Hydrochloric acid

ID: UN1789

Hazard Class: 8 - Corrosive material

Packing Group: II - Medium Danger

Symbols:

Label Codes: 8 - Corrosive

Special Provisions: A3, A6, B3, B15, IB2, N41, T8, TP2, TP12

Packaging: Exceptions: 154 **Non-bulk:** 202 **Bulk:** 242

Quantity Limitations: Passenger aircraft/rail: 1 L **Cargo aircraft only:** 30 L

Vessel Stowage: Location: C **Other:**



Shipping Name and Description: Hydrochloric acid

ID: UN1789

Hazard Class: 8 - Corrosive material

Packing Group: III - Minor Danger

Symbols:

Label Codes: 8 - Corrosive

Special Provisions: IB3, T4, TP1, TP12

Packaging: Exceptions: 154 **Non-bulk:** 203 **Bulk:** 241

Quantity Limitations: Passenger aircraft/rail: 5 L **Cargo aircraft only:** 60 L

Vessel Stowage: Location: C **Other:**



Section 15 - Regulatory Information

EPA Regulations:

RCRA 40 CFR: Not listed

CERCLA 40 CFR 302.4: Listed per CWA Section 311(b)(4) 5000 lb (2268 kg)

SARA 40 CFR 372.65: Listed

SARA EHS 40 CFR 355: Listed

RQ: 5000 lb

TPQ: 500 lb

TSCA: Listed

Section 16 - Other Information

Disclaimer: Judgments as to the suitability of information herein for the purchaser's purposes are necessarily the purchaser's responsibility. Although reasonable care has been taken in the preparation of such information, Genium Group, Inc. extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for application to the purchaser's intended purpose or for consequences of its use.

Material Safety Data Sheet

Benzene

ACC# 02610

Section 1 - Chemical Product and Company Identification

MSDS Name: Benzene

Catalog Numbers: AC167660000, AC167660010, AC167660025, AC167660250, AC167665000, AC168650250, AC295330000, AC295330010, AC295330025, AC295330250, AC296880000, AC296880010, AC296880025, AC296880250, AC610230010, AC610231000, AC611001000, B243-4, B245-4, B245-500, B411-1, B411-4, B412-1, S79920ACS

Synonyms: Benzol; Cyclohexatriene; Phenyl hydride.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
71-43-2	Benzene	> 99	200-753-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear colorless liquid. Flash Point: -11 deg C.

Danger! Extremely flammable liquid and vapor. Vapor may cause flash fire. Harmful if swallowed, inhaled, or absorbed through the skin. Causes eye, skin, and respiratory tract irritation. Contains benzene. Benzene can cause cancer. Aspiration hazard if swallowed. Can enter lungs and cause damage. May cause blood abnormalities. May cause central nervous system effects.

Target Organs: Blood, central nervous system, respiratory system, eyes, bone marrow, immune system, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. Harmful if absorbed through the skin. Prolonged and/or repeated contact may cause defatting of the skin and dermatitis.

Ingestion: May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. May cause effects similar to those for inhalation exposure. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal.

Inhalation: Causes respiratory tract irritation. May cause drowsiness, unconsciousness, and central nervous system depression. Exposure may lead to irreversible bone marrow injury. Exposure may lead to aplastic anemia. Potential symptoms of overexposure by inhalation are dizziness, headache, vomiting, visual disturbances, staggering gait, hilarity, fatigue, and other symptoms of CNS depression.

Chronic: May cause bone marrow abnormalities with damage to blood forming tissues. May cause anemia and other blood cell abnormalities. Chronic exposure to benzene has been associated with an increased incidence of

leukemia and multiple myeloma (tumor composed of cells of the type normally found in the bone marrow). Immunodepressive effects have been reported. This substance has caused adverse reproductive and fetal effects in laboratory animals.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: Potential for aspiration if swallowed. Get medical aid immediately. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If vomiting occurs naturally, have victim lean forward.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Use water spray to keep fire-exposed containers cool. Extremely flammable liquid and vapor. Vapor may cause flash fire. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas. This liquid floats on water and may travel to a source of ignition and spread fire. May accumulate static electricity.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: -11 deg C (12.20 deg F)

Autoignition Temperature: 498 deg C (928.40 deg F)

Explosion Limits, Lower: 1.3 vol %

Upper: 7.1 vol %

NFPA Rating: (estimated) Health: 2; Flammability: 3; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Remove all sources of ignition. Provide ventilation. Approach spill from upwind. Use water spray to cool and disperse vapors, protect personnel, and dilute spills to form nonflammable mixtures.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Take precautionary measures against static discharges. Keep container tightly closed. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat, sparks and flame. Avoid breathing vapor.

Storage: Keep away from sources of ignition. Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. See 29CFR 1910.1028 for the regulatory requirements for the control of employee exposure to benzene.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Benzene	0.5 ppm TWA; 2.5 ppm STEL; Skin - potential significant contribution to overall exposure by the cutaneous route	0.1 ppm TWA 500 ppm IDLH	1 ppm TWA; 10 ppm TWA (applies to industry segments exempt from the benzene standard at 29 CFR 1910.1028); 25 ppm Ceiling (applies to industry segments exempt from the 1 ppm TWA and 5 ppm STEL of the benzene standard); 0.5 ppm Action Level; 1 ppm TWA; 5 ppm STEL (Cancer hazard, Flammable - see 29 CFR 1910.1028)

OSHA Vacated PELs: Benzene: 10 ppm TWA (unless specified in 1910.1028)

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: clear colorless

Odor: sweetish odor - aromatic odor

pH: Not applicable.

Vapor Pressure: 75 mm Hg @ 20 deg C

Vapor Density: 2.8 (air=1)

Evaporation Rate: Not available.

Viscosity: 0.647mPa @ 20 deg C

Boiling Point: 80.1 deg C

Freezing/Melting Point: 5.5 deg C

Decomposition Temperature: Not available.

Solubility: 0.180 g/100 ml @ 25°C

Specific Gravity/Density: 0.8765 @ 20°C

Molecular Formula: C₆H₆

Molecular Weight: 78.11

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Ignition sources, excess heat, confined spaces.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 71-43-2: CY1400000

LD50/LC50:

CAS# 71-43-2:

Dermal, guinea pig: LD50 = >9400 uL/kg;

Draize test, rabbit, eye: 88 mg Moderate;

Draize test, rabbit, eye: 2 mg/24H Severe;

Draize test, rabbit, skin: 20 mg/24H Moderate;

Inhalation, mouse: LC50 = 9980 ppm;

Inhalation, mouse: LC50 = 24 mL/kg/2H;

Inhalation, rat: LC50 = 10000 ppm/7H;

Inhalation, rat: LC50 = 34 mL/kg/2H;

Inhalation, rat: LC50 = 6.5 mL/kg/4H;

Oral, mouse: LD50 = 4700 mg/kg;

Oral, rat: LD50 = 930 mg/kg;

Oral, rat: LD50 = 1 mL/kg;

Oral, rat: LD50 = 1800 Benzene is considered very toxic; probable human oral lethal dose would be 50-500 mg/kg. Human inhalation of approximately 20,000 ppm (2% in air) was fatal in 5-10 minutes. While percutaneous absorption of liquid benzene through intact human skin can be limited (e.g., 0.05% of the applied dose), the absorbed dose via direct dermal contact combined with that received from body surface exposure to benzene in workplace air is such that a substantial fraction (20-40%) of the total exposure is due to skin absorption.

Carcinogenicity:

CAS# 71-43-2:

- **ACGIH:** A1 - Confirmed Human Carcinogen
- **California:** carcinogen, initial date 2/27/87
- **NTP:** Known carcinogen
- **IARC:** Group 1 carcinogen

Epidemiology: IARC has concluded that epidemiological studies have established the relationship between benzene exposure and the development of acute myelogenous leukemia, and that there is sufficient evidence that benzene is carcinogenic to humans.

Teratogenicity: Inhalation, rat: TCLO = 50 ppm/24H (female 7-14 day(s) after conception) Effects on Embryo or Fetus - extra-embryonic structures (e.g., placenta, umbilical cord) and Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus.); Inhalation, mouse: TCLO = 5 ppm (female 6-15 day(s) after conception) Effects on Embryo or Fetus - cytological changes (including somatic cell genetic material) and Specific Developmental Abnormalities - blood and lymphatic systems (including spleen and marrow).

Reproductive Effects: Inhalation, rat: TCLO = 670 mg/m³/24H (female 15 day(s) pre-mating and female 1-22 day(s) after conception) female fertility index (e.g. # females pregnant per # sperm positive females; # females pregnant per # females mated).; Oral, mouse: TDLo = 12 gm/kg (female 6-15 day(s) after conception) Fertility - post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants).

Mutagenicity: DNA Inhibition: Human, Leukocyte = 2200 umol/L.; DNA Inhibition: Human, HeLa cell = 2200 umol/L.; Mutation Test Systems - not otherwise specified: Human, Lymphocyte = 5 umol/L.; Cytogenetic Analysis: Inhalation, Human = 125 ppm/1Y.; Cytogenetic Analysis: Human, Leukocyte = 1 mmol/L/72H.; Cytogenetic Analysis: Human, Lymphocyte = 1 mg/L.

Neurotoxicity: See actual entry in RTECS for complete information.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Mosquito Fish: TLm = 395 mg/L; 24 Hr; Unspecified Fish: Goldfish: LC50 = 46 mg/L; 24 Hr; Modified ASTM D 1345 Fish: Fathead Minnow: LC50 = 15.1 mg/L; 96 Hr; Flow-through at 25°C (pH 7.9-8.0) Fish: Rainbow trout: LC50 = 5.3 mg/L; 96 Hr; Flow-through at 25°C (pH 7.9-8.0) Fish: Bluegill/Sunfish: LD50 = 20 mg/L; 24-48 Hr; Unspecified If benzene is released to soil, it will be subject to rapid volatilization near the surface and that which does not evaporate will be highly to very highly mobile in the soil and may leach to groundwater. If benzene is released to water, it will be subject to rapid volatilization. It will not be expected to significantly adsorb to sediment, bioconcentrate in aquatic organisms or hydrolyze. It may be subject to biodegradation.

Environmental: If benzene is released to the atmosphere, it will exist predominantly in the vapor phase. Gas-phase benzene will not be subject to direct photolysis but it will react with photochemically produced hydroxyl radicals with a half-life of 13.4 days. The reaction time in polluted atmospheres which contain nitrogen oxides or sulfur dioxide is accelerated with the half-life being reported as 4-6 hours. Benzene is fairly soluble in water and is removed from the atmosphere in rain.

Physical: Products of photooxidation include phenol, nitrophenols, nitrobenzene, formic acid, and peroxyacetyl nitrate.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series:

CAS# 71-43-2: waste number U019 (Ignitable waste, Toxic waste).

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	BENZENE	BENZENE
Hazard Class:	3	3
UN Number:	UN1114	UN1114
Packing Group:	II	II
Additional Info:		FLASHPOINT -11 C

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 71-43-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 71-43-2: 10 lb final RQ (received an adjusted RQ of 10 lbs based on potential carcinogeni

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 71-43-2: immediate, delayed, fire.

Section 313

This material contains Benzene (CAS# 71-43-2, > 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 71-43-2 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 71-43-2 is listed as a Hazardous Substance under the CWA. CAS# 71-43-2 is listed as a Priority Pollutant under the Clean Water Act. CAS# 71-43-2 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 71-43-2 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Benzene, a chemical known to the state of California to cause cancer. WARNING:

This product contains Benzene, a chemical known to the state of California to cause male reproductive toxicity.

California No Significant Risk Level: CAS# 71-43-2: 6.4 æg/day NSRL (oral); 13 æg/day NSRL (inhalation)

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T F

Risk Phrases:

R 11 Highly flammable.

R 36/38 Irritating to eyes and skin.

R 45 May cause cancer.

R 46 May cause heritable genetic damage.

R 48/23/24/25 Toxic : danger of serious damage to health by prolonged exposure through inhalation, contact with skin and if swallowed.

R 65 Harmful: may cause lung damage if swallowed.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

WGK (Water Danger/Protection)

CAS# 71-43-2: 3

Canada - DSL/NDSL

CAS# 71-43-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, D2A, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 71-43-2 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 6/11/1999

Revision #8 Date: 9/11/2008

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users

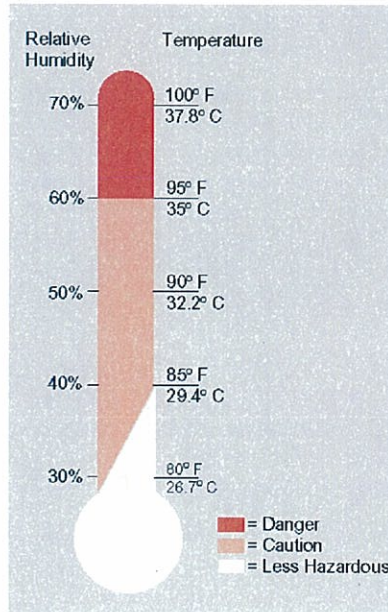
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THE HEAT EQUATION

**HIGH TEMPERATURE + HIGH HUMIDITY + PHYSICAL WORK
= HEAT ILLNESS**

When the body is unable to cool itself through sweating, **serious** heat illnesses may occur. The most severe heat-induced illnesses are **heat exhaustion** and **heat stroke**. If actions are not taken to treat heat exhaustion, the illness could progress to heat stroke and possible **death**.



HEAT EXHAUSTION

What Happens to the Body:

HEADACHES, DIZZINESS/LIGHT HEADEDNESS, WEAKNESS, MOOD CHANGES (irritable, or confused/can't think straight), FEELING SICK TO YOUR STOMACH, VOMITING/THROWING UP, DECREASED and DARK COLORED URINE, FAINTING/PASSING OUT, and PALE CLAMMY SKIN.

What Should Be Done:

- Move the person to a cool shaded area to rest. Don't leave the person alone. If the person is dizzy or light headed, lay them on their back and raise their legs about 6-8 inches. If the person is sick to their stomach lay them on their side.
- Loosen and remove any heavy clothing.
- Have the person drink some cool water (a small cup every 15 minutes) if they are not feeling sick to their stomach.
- Try to cool the person by fanning them. Cool the skin with a cool spray mist of water or wet cloth.
- If the person does not feel better in a few minutes call for emergency help (Ambulance or Call 911).

(If heat exhaustion is not treated, the illness may advance to heat stroke.)

HEAT STROKE—A MEDICAL EMERGENCY

What Happens to the Body:

DRY PALE SKIN (no sweating), HOT RED SKIN (looks like a sunburn), MOOD CHANGES (irritable, confused/not making any sense), SEIZURES/FITS, and COLLAPSE/PASSED OUT (will not respond).

What Should Be Done:

- Call for emergency help (Ambulance or Call 911).
- Move the person to a cool shaded area. Don't leave the person alone. Lay them on their back and if the person is having seizures/fits remove any objects close to them so they won't strike against them. If the person is sick to their stomach lay them on their side.
- Remove any heavy and outer clothing.
- Have the person drink some cool water (a small cup every 15 minutes) if they are alert enough to drink anything and not feeling sick to their stomach.
- Try to cool the person by fanning them. Cool the skin with a cool spray mist of water, wet cloth, or wet sheet.
- If ice is available, place ice packs under the arm pits and groin area.

How to Protect Workers

- Learn the signs and symptoms of heat-induced illnesses and what to do to help the worker.
- Train the workforce about heat-induced illnesses.
- Perform the heaviest work in the coolest part of the day.
- Slowly build up tolerance to the heat and the work activity (usually takes up to 2 weeks).
- Use the buddy system (work in pairs).
- Drink plenty of cool water (one small cup every 15-20 minutes)
- Wear light, loose-fitting, breathable (like cotton) clothing.
- Take frequent short breaks in cool shaded areas (allow your body to cool down).
- Avoid eating large meals before working in hot environments.
- Avoid caffeine and alcoholic beverages (these beverages make the body lose water and increase the risk for heat illnesses).

Workers Are at Increased Risk When

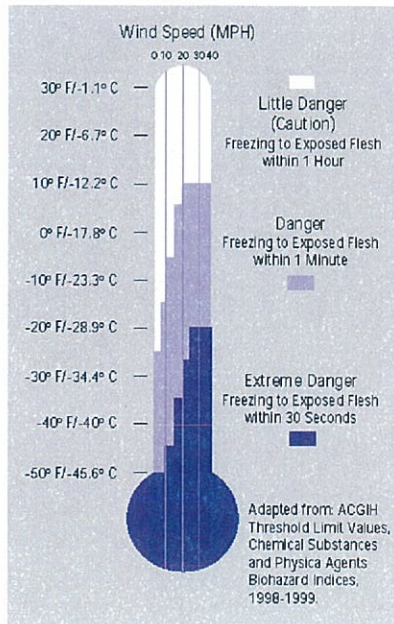
- They take certain medication (check with your doctor, nurse, or pharmacy and ask if any medicines you are taking affect you when working in hot environments).
- They have had a heat-induced illness in the past.
- They wear personal protective equipment (like respirators or suits).



THE COLD STRESS EQUATION

LOW TEMPERATURE + WIND SPEED + WETNESS
= INJURIES & ILLNESS

When the body is unable to warm itself, serious cold-related illnesses and injuries may occur, and permanent tissue damage and death may result. Hypothermia can occur when *land temperatures are above freezing or water temperatures are below 98.6°F/37°C*. Cold-related illnesses can slowly overcome a person who has been chilled by low temperatures, brisk winds, or wet clothing.



FROST BITE

What Happens to the Body:

FREEZING IN DEEP LAYERS OF SKIN AND TISSUE; PALE, WAXY-WHITE SKIN COLOR; SKIN BECOMES HARD and NUMB; USUALLY AFFECTS THE FINGERS, HANDS, TOES, FEET, EARS, and NOSE.

What Should Be Done: (land temperatures)

- Move the person to a warm dry area. Don't leave the person alone.
- Remove any wet or tight clothing that may cut off blood flow to the affected area.
- **DO NOT** rub the affected area, because rubbing causes damage to the skin and tissue.
- **Gently** place the affected area in a warm (105°F) water bath and monitor the water temperature to **slowly** warm the tissue. Don't pour warm water directly on the affected area because it will warm the tissue too fast causing tissue damage. Warming takes about 25-40 minutes.
- After the affected area has been warmed, it may become puffy and blister. The affected area may have a burning feeling or numbness. When normal feeling, movement, and skin color have returned, the affected area should be dried and wrapped to keep it warm. **Note:** If there is a chance the affected area may get cold again, do not warm the skin. If the skin is warmed and then becomes cold again, it will cause severe tissue damage.
- Seek medical attention as soon as possible.

HYPOTHERMIA - (Medical Emergency)

What Happens to the Body:

NORMAL BODY TEMPERATURE (98.6°F/37°C) DROPS TO OR BELOW 95°F (35°C); FATIGUE OR DROWSINESS; UNCONTROLLED SHIVERING; COOL BLuish SKIN; SLURRED SPEECH; CLUMSY MOVEMENTS; IRRITABLE, IRRATIONAL OR CONFUSED BEHAVIOR.

What Should Be Done: (land temperatures)

- Call for emergency help (i.e., Ambulance or Call 911).
- Move the person to a warm, dry area. Don't leave the person alone. Remove any wet clothing and replace with warm, dry clothing or wrap the person in blankets.
- Have the person drink warm, sweet drinks (sugar water or sports-type drinks) if they are alert. **Avoid drinks with caffeine** (coffee, tea, or hot chocolate) or alcohol.
- Have the person move their arms and legs to create muscle heat. If they are unable to do this, place warm bottles or hot packs in the arm pits, groin, neck, and head areas. **DO NOT** rub the person's body or place them in warm water bath. This may stop their heart.

What Should Be Done: (water temperatures)

- Call for emergency help (Ambulance or Call 911). Body heat is lost up to 25 times faster in water.
- **DO NOT** remove any clothing. Button, buckle, zip, and tighten any collars, cuffs, shoes, and hoods because the layer of trapped water closest to the body provides a layer of insulation that slows the loss of heat. Keep the head out of the water and put on a hat or hood.
- Get out of the water as quickly as possible or climb on anything floating. **DO NOT** attempt to swim unless a floating object or another person can be reached because swimming or other physical activity uses the body's heat and reduces survival time by about 50 percent.
- If getting out of the water is not possible, wait quietly and conserve body heat by folding arms across the chest, keeping thighs together, bending knees, and crossing ankles. If another person is in the water, huddle together with chests held closely.

How to Protect Workers

- Recognize the environmental and workplace conditions that lead to potential cold-induced illnesses and injuries.
- Learn the signs and symptoms of cold-induced illnesses/injuries and what to do to help the worker.
- Train the workforce about cold-induced illnesses and injuries.
- Select proper clothing for cold, wet, and windy conditions. Layer clothing to adjust to changing environmental temperatures. Wear a hat and gloves, in addition to underwear that will keep water away from the skin (polypropylene).
- Take frequent short breaks in warm dry shelters to allow the body to warm up.
- Perform work during the warmest part of the day.
- Avoid exhaustion or fatigue because energy is needed to keep muscles warm.
- Use the buddy system (work in pairs).
- Drink warm, sweet beverages (sugar water, sports-type drinks). Avoid drinks with caffeine (coffee, tea, or hot chocolate) or alcohol.
- Eat warm, high-calorie foods like hot pasta dishes.

Workers Are at Increased Risk When...

- They have predisposing health conditions such as cardiovascular disease, diabetes, and hypertension.
- They take certain medication (check with your doctor, nurse, or pharmacy and ask if any medicines you are taking affect you while working in cold environments).
- They are in poor physical condition, have a poor diet, or are older.

APPENDIX E

**Community Air Monitoring Plan (CAMP)
White Plains Housing Authority
159 S. Lexington Avenue &
33 Fisher Court
White Plains, New York**

November 29, 2016

Prepared for: White Plains Housing Authority
223 Dr. Martin Luther King Jr. Blvd.
White Plains, New York 10601

Prepared by: First Environment, Inc.
91 Fulton Street
Boonton, New Jersey 07005



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Introduction

In addition to precautions outlined in the Health and Safety Plan, the following measures will be taken to evaluate and control, as necessary, potential fugitive particulates and volatile organic compounds (VOC) generated during both ground intrusive and non-intrusive activities. The following Community Air Monitoring Plan (CAMP) was developed using the New York State Department of Health Generic Community Air Monitoring Plan in combination with site-specific information and proposed activities.

Depending on the type of activity, levels of airborne particulates and/or VOCs will be monitored and recorded in real-time at both the upwind and downwind perimeters of the immediate work area. The purpose of the CAMP is to protect the downwind community from potential release of contaminants to the air generated during the activities. The action levels developed by the NYSDOH will be followed as part of the CAMP.

If the recorded levels approach the pre-established action level or if airborne particulates are visually observed migrating off site or towards sensitive receptors, suppression measures will be implemented immediately. Suppression measures may include misting the particulate source with water, use of particulate suppression materials, wetting the work area prior to initiating the activities, or stopping work activities until recorded levels fall below the action level.

Scope-of-Work

This CAMP addresses three basic remedial activities that will occur at the White Plains Housing Authority properties located at 159 S. Lexington Avenue and 33 Fisher Court, White Plains, New York:

1. soil boring installation;
2. soil sampling;
3. installation of on-site monitoring wells; and
4. collection of groundwater samples.

Groundwater sampling conducted pre- and post-remedial investigation will also be addressed in this CAMP.

Continuous monitoring will be required for those activities considered ground intrusive.

Intrusive activities at the Site include soil boring installation and installation of on-site monitoring wells, and collection of groundwater samples. Continuous air monitoring will be conducted to ensure public health and safety from any airborne particulates or odors that might result from the installation of soil borings and monitoring wells.

Periodic monitoring for volatile organic compounds (VOCs) will be required during non-intrusive activities. Non-intrusive activities at the Site will include the collection of soil samples from the soil boreholes and collection of groundwater samples from existing and proposed on-site monitoring wells. "Periodic" monitoring may consist of taking a reading upon arrival at a sample location, during monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location.

Table 1 presents a summary of the various tasks during the course of remediation and the associated monitoring requirements.

TABLE 1 - Tasks Requiring CAMP

TASK NO.	TASK DESCRIPTION	ACTIVITY TYPE	MONITORING FREQUENCY
1	Soils Boring Installation	Ground Intrusive	Continuous for Particulates and VOCs
2	Soil Sampling	Non-Ground Intrusive	N/A for Particulates; Periodic for VOCs
3	Monitoring Well Installation	Ground Intrusive	Continuous for Particulates and VOCs
4	Groundwater Sampling	Non-Ground Intrusive	N/A for Particulates; Periodic for VOCs

Air Monitoring Procedures

Intrusive Activities

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the Site at temporary particulate monitoring stations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 microns in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level (Thermo MIE pDR-1000 or equivalent). The equipment will include an audible alarm or other means of alerting the operator to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities.

- If the downwind PM-10 level is 100 micrograms per cubic meter (mcg/m³) greater than background (upwind perimeter) for the 15-minute period, or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 levels do not exceed 150 mcg/m³ above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 levels are greater than 150 mcg/m³ above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 concentration to within 150 mcg/m³ of the upwind level and in preventing visible dust migration.

All readings will be recorded and be available for State (DEC and DOH) personnel to review.

VOC Monitoring, Response Levels, and Actions

The VOC monitoring for intrusive activities will be conducted on a continuous basis and will follow the same response levels and actions for VOCs as outlined below. The measurements will be collected from the immediate work area using a MiniRAE 2000 photoionization detector or equivalent.

VOCs will be continuously monitored at the downwind perimeter of the work area, or exclusion zone, during soil boring installation and the injection of chemical oxidants using a MiniRAE 2000 photoionization detector or equivalent. Upwind measurements will also be collected prior to the

start of work each day and periodically throughout the day at locations away from the work areas to establish background conditions. A minimum of three background measurements will be collected daily. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated at least daily against a standard VOC calibrations gas appropriate for the contaminants of concern and for concentrations which will be comparable to the levels specified below. The monitoring, response levels, and actions for VOCs are as follows:

- If the ambient air concentration of total organic vapors in the work area exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.
- If total organic vapor levels in the work area persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the Site or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less – but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shut down.

Non-intrusive Activities

Based on the tasks requiring a CAMP presented in Table 1 above, the only non-intrusive activities to be performed are soil and groundwater sampling which will not require particulate monitoring. Periodic monitoring for VOCs will be conducted during groundwater sampling activities.

VOC Monitoring, Response Levels, and Actions

The VOC monitoring for non-intrusive activities will be conducted on a periodic basis and will follow the same response levels and equipment for VOCs as outlined above. The measurements will be collected from the exclusion zone using a MiniRAE 2000 photoionization detector or equivalent.

Periodic VOC monitoring will consist of taking readings prior to the initiation of work at each well location, during bailing and purging activities, and prior to leaving each monitoring well location. Upwind concentrations will also be measured at the start of each workday and periodically

thereafter to establish background conditions. The equipment will be calibrated at least daily against a standard VOC calibrations gas appropriate for the contaminants of concern and for concentrations which will be comparable to the levels specified below. The monitoring, response levels, and actions for VOCs are as follows:

- If the ambient air concentration of total organic vapors in the work area exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.
- If total organic vapor levels in the work area persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the Site or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less – but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shut down.

Weather Monitoring

In order to identify the specific upgradient and downgradient sampling locations, meteorological data will be collected three times daily from a Davis Remote weather station, or equivalent, for barometric pressure, temperature, humidity, rainfall, and wind speed and direction.

APPENDIX F

FIRST ENVIRONMENT, INC.
LOW FLOW PURGING / SAMPLING LOG

Project Number: WPHA 001 Client Name: _____
 Location: White Stone NY Date: 12/22/15
 Field Team: GMC, DED

Sampling Information Sample / Well Number: MW-201 Total Well Depth (ft) 9.7
 Location: Parking Lot
Low Flow Purge Data (WELLS ONLY)
 Date / Time: 12/22/15 Pump Type: Bladder Init. Water Level: 5.52
 Well Casing: Stick-up / Flush Mount Measuring Point (MP): TOC Tubing Depth (from MP): 7.0

Sampling Data: Date: 12/22/15 Time: 0900 Parameters: _____ Sample Id: MW-201
 Field Observations: PIB = 653 PPM

Time	pH (+/-0.1)	SC (+/-3%)	Turb (+/-10%)	DO (+/-10%)	Temp (+/-3%)	ORP (+/- 10mV)	DTW (Δ<0.3ft)	Notes: CPM/PSI
0820	6.34	2.49	437	1.18	15.21	-77	5.56	CPM/PSI 15
0825	6.41	2.49	392	1.19	14.75	-73	5.56	
0830	6.44	2.47	400	1.26	14.78	-74	5.57	
0835	6.45	2.40	509	1.20	14.56	-76	5.57	
0840	6.45	2.37	674	0.86	14.35	-74	5.57	
0845	6.58	4.80	598	0.89	14.16	-81	5.57	
0850	6.49	4.81	576	0.73	14.10	-83	5.57	
0855	6.47	4.92	4.35	0.54	14.05	-84	5.57	

Signature: _____

Page _____ of _____

FIRST ENVIRONMENT, INC.
LOW FLOW PURGING / SAMPLING LOG

Project Number: WPHA001 Client Name: Bernstein + Ass
 Location: White Plains, NY Date: 12/22/15
 Field Team: GMC/AED

Sampling Information Sample / Well Number: MW-202 Total Well Depth (ft) 20.3
 Location: Parking Lot
Low Flow Purge Data (WELLS ONLY)
 Date / Time: 12/22/15 Pump Type: Bladder Init. Water Level: 7.02
 Well Casing: Stick-up / Flush Mount Measuring Point (MP): TOC Tubing Depth (from MP): 18.0

Sampling Data: Date: 12/22/15 Time: 0930 Parameters: UPT 15 Pb, Spec Pb Sample Id: MW-202
 Field Observations: _____

Time	pH (+/-0.1)	SC (+/-3%)	Turb (+/-10%)	DO (+/-10%)	Temp (+/-3%)	ORP (+/- 10mV)	DTW (Δ<0.3ft)	Notes: CPM/PSI
0907	7.89	0.415	0.0	1.28	15.74	101	7.02	CPM 1 / PSI 30
0912	7.86	0.402	0.0	0.11	15.68	100	7.02	" "
0917	7.85	0.396	0.0	0.0	15.87	97	7.02	" "
0922	7.83	0.395	0.0	0.0	15.84	91	7.02	" "
0927	7.82	0.395	0.0	0.0	15.87	94	7.02	" "

Signature: [Handwritten Signature] Page 1 of 1

FIRST ENVIRONMENT, INC.
LOW FLOW PURGING / SAMPLING LOG

Project Number: WPH 1700 Client Name: Fox Bernstein + Ass.
 Location: White Plains, NY Date: 12/22/15
 Field Team: GMC/DEF

Sampling Information Sample / Well Number: MW-203 Total Well Depth (ft): 15.0
 Location: Parking Lot
Low Flow Purge Data (WELLS ONLY)
 Date / Time: 12/22/15 Pump Type: Bladder Init. Water Level: 7.45
 Well Casing: Stick-up / Flush Mount Measuring Point (MP): TA Tubing Depth (from MP): 13.0

Sampling Data: Date: 12/22/15 Time: 0835 Parameters: Pb, Vols, 50 Pb Sample Id: MW 203
 Field Observations: _____

Time	pH (+/-0.1)	SC (+/-3%)	Turb (+/-10%)	DO (+/-10%)	Temp (+/-3%)	ORP (+/- 10mV)	DTW (Δ<0.3ft)	Notes: CPM/PSI
0817	7.09	1.93	0.0	0.0	16.34	-76	7.45	CPM 1 / PSI 3
0822	7.10	1.93	0.0	0.0	16.23	-78	7.45	" "
0827	7.11	1.92	0.0	0.0	16.06	-79	7.45	" "
0832	7.12	1.92	0.0	0.0	16.08	-78	7.45	" "

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FIRST ENVIRONMENT, INC.
LOW FLOW PURGING / SAMPLING LOG

Project Number: WPHAP01 Client Name: Bernstein + Assoc.
 Location: White Plains, NY Date: 12/22/15
 Field Team: GMC/DED

Sampling Information Sample / Well Number: MW-204 Total Well Depth (ft) 20.35
 Location: _____
Low Flow Purge Data (WELLS ONLY)
 Date / Time: 12/22/15 Pump Type: Bladder Init. Water Level: 7.4
 Well Casing: Stick-up / Flush Mount Measuring Point (MP): TOC Tubing Depth (from MP): 18.30

Sampling Data: Date: 12/22/15 Time: 1030 Parameters: 20⁺15 Pb, Spec Pb Sample Id: MW-204
 Field Observations: _____

Time	pH (+/-0.1)	SC (+/-3%)	Turb (+/-10%)	DO (+/-10%)	Temp (+/-3%)	ORP (+/- 10mV)	DTW (Δ<0.3ft)	Notes: CPM/PSI
1005	7.50	2.11	0.0	5.81	14.54	137	7.4	CPM1/PST30
1010	7.46	2.19	0.0	5.13	14.73	106	7.4	" "
1015	7.46	2.18	0.0	4.79	14.86	104	7.4	" "
1020	7.45	2.16	0.0	4.74	14.83	105	7.4	" "
1025	7.45	2.16	0.0	4.57	14.86	107	7.4	" "

Signature: Wade DeGroot Page 1 of 1

