REMEDIAL INVESTIGATION WORK PLAN

52 DEPEW STREET
PLEASANTVILLE, NEW YORK
BROWNFIELD CLEANUP PROGRAM SITE #C360178

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February 7, 2019
revised: March 29, 2019

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1 INTRODUCTION

In June 2018, Lighthouse Living, LLC (volunteer) applied to the New York State Department of Environmental Conservation's (NYSDEC's) Brownfield Cleanup Program (BCP) for an approximately 0.88-acre site located at 52 Depew Street in Pleasantville, New York (the "Site"; see **Figure 1**). The Site consists of two adjoining tax properties, currently comprised of a former automobile repair facility and associated parking areas.

On June 4, 2018, the volunteer submitted the BCP Application to the NYSDEC. The Site is referred to as "52 Depew Street" and has been assigned BCP Site No. C360178 and was accepted into the BCP on October 23, 2018.

The volunteer plans to redevelop the Site as a residential and commercial/retail facility along with associated above grade and below grade parking areas. HydroEnvironmental Solutions, Inc. (HES) has prepared this Remedial Investigation Work Plan (RIWP) for investigation of the Site in accordance with the NYSDEC BCP Requirements in the BCP law, regulations and pursuant to guidance document DER-10.

1.1 Site History

The Site, located at 52 Depew Street, consists of two parcels identified by the Village of Pleasantville Tax Map Section 106.05, Block 2, Lots 1 (0.23-acre) and 2 (0.65-acre). The Site is approximately 0.88 acres in size and is zoned for commercial and residential use. The Site was recently an automobile repair facility, with an approximately 2,600 square foot structure and surrounding open parking areas. The Site is paved on the southern parking areas and is a combination of paved and gravel parking areas on the northern half. The site is currently provided municipal sewer and water connections.

Historically, the Site was used for commercial and industrial operations. Around the early 1920s the Site was used as a coal yard for the adjacent railroad. An elevated railroad spur with coal bins was located on the northeastern portion of the site. According to historical documents, in 1927, the site was also used as a hay, feed and grain storehouse. By the mid-1940s, the site was used as an auto fueling station and petroleum bulk storage facility. Bulk storage of coal and petroleum operations ceased sometime starting in the early to late 1970s. Between 1998 and 2000, eight (8) USTs were removed from the site and multiple NYSDEC Spill Numbers were assigned to the property (0001843, 0003454, 9807021).

In 2000, the current owner purchased the Site (Total Automotive of Westchester, LLC) and began using it for automobile repair and parking. Until December 2018, the Site was an active automobile repair facility called LaDuca's Auto Service.

1.2 Previous Investigations

Phase I and II Environmental Site Assessments (ESAs) were completed for the Site and one subsurface soil investigation (SI) was conducted on the Site, which reports are summarized below.

1.2.1 Phase I ESA

A Phase I ESA was completed by HRP Engineering, P.C. (HRP) of Clifton Park, New York in February 2017 for the Site. The Phase I ESA identified Recognized Environmental Conditions (RECs) at the Site. The RECs found during the ESA are listed below:

- "Environmentally high-risk operations occurred on-site including coal storage from the 1920s to 1940s, and the use of the site as a gasoline fueling station from at least the 1940s to 1998. Gasoline and other petroleum products were stored in large quantities in USTs during this time-period."

A copy of the Phase I ESA is provided on a compact disc (CD) in **Appendix 1**.

1.2.2 Phase II ESA

A baseline Phase II ESA was completed by HRP at the Site in December 2017 to evaluate Site subsurface conditions. The Phase II ESA consisted of drilling six (6) test borings and installation of three (3) temporary groundwater wells using a Geoprobe® and the direct-push drilling method. Soil and groundwater samples were collected from all of the test borings and temporary wells. The soil and groundwater samples were analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs).

Soil samples collected from test boring locations SB-2, SB-3, and SB-4 during the Phase II ESA contained SVOCs and VOCs as well as staining and free-phase product at these locations at the groundwater table interface. Laboratory analytical results indicated that VOCs were detected above NYSDEC Unrestricted Use Soil Cleanup Objectives (UUSCOSs) at SB-2, SB-4 and SB-5.

During the Phase II ESA, groundwater samples were collected from the three (3) temporary monitor wells. Groundwater samples collected from these wells contained VOCs and SVOCs above NYSDEC Ambient Water Quality Standards (AWQS).

Based on the findings of the Phase I and II ESAs, the historic operations at the Site including the railroad coal depot and petroleum bulk storage were the likely sources of VOC and SVOC impacts to the soil and groundwater beneath the Site. Considering the findings of the Phase II ESA, and the presence of documented free-phase product, a fourth NYSDEC Spill number was issued to the site (Spill No. 1708038) on November 22, 2017.

Copies of the Phase II ESA along with the locations of all test boring and monitor well locations are included on the CD in **Appendix 1**.

1.2.3 Subsurface Investigation

In February 2018, HES conducted a subsurface investigation (SI) at the subject site. The purpose of the SI was to delineate the extent of petroleum hydrocarbon impacts to the soil and groundwater beneath the site. The SI included the installation of thirteen test borings (GB-1 through GB-13) and five temporary monitor wells (GB-1 GW, GB-4 GW, GB-7 GW, GB-10 GW, and GB-12 GW).

The results of soil sampling indicated that VOCs and SVOCs were present in all of the soil samples collected. Elevated PID reading (as high as 982 ppm) and free-phase product were observed at numerous locations across the site. Additionally, VOCs were detected above NYSDEC-UUSCOs in four of the eight soil samples analyzed. The results of groundwater sampling indicated that VOCs and SVOCs exceeded AWQS at all five locations sampled. Free-phase product was observed during soil screening activities at sampling locations GB-4, GB-5 and GB-12. A copy of the SI is included on the CD in **Appendix 1**.

The Phase II ESA and SI provided additional data for better characterization of the physical and chemical nature of the subsurface soil and groundwater at the Site. As shown on the figures provided in the prior environmental reports (**Appendix 1)**, a total of nineteen (19) borings were drilled and discrete soil samples were collected based on PID screening results coupled with visual and olfactory observations. Additionally, a total of eight (8) temporary monitor wells were installed at the Site. The wells were sampled to evaluate the impacts of the historic operations to the groundwater beneath the Site.

In summary, field screening of soils confirmed elevated PID readings and the presence of free-phase petroleum hydrocarbons and analytical results of the soil and groundwater testing identified elevated levels of VOCs and SVOCs above NYSDEC-UUSCOs and AWQS. The historic land use at the Site adversely impacted these two media and the impacts are extensive both horizontally and vertically.

1.3 Site Development Plan

The proposed future development plan for the Site will include a three-story residential and commercial development with two lower-level below grade parking areas and some at grade parking. The residential development will consist of one and two-bedroom apartments on levels one through three and approximately 4,500 square feet of commercial office space on the ground floor. The project will require no zoning changes or variances from the Village of Pleasantville and is presently under preliminary review by the Village.

This Remedial Investigation (RI) Work Plan was designed to further characterize the nature and extent of the Site's contamination based on the proposed residential and commercial development in accordance with the requirements of the BCP. Based on the historical use of the Site and documented characterization results, HES developed a work scope to further delineate subsurface conditions. This RI Work Plan details specific tasks that will facilitate Site characterization and compliance with the NYSDEC-BCP Requirements. Specifically, when used in conjunction with results of previous investigations, the findings of the Remedial Investigation will be used to:

- Describe the amount, concentration, persistence, mobility, form (e.g., solid, liquid or soil vapor), and other significant characteristics of the contaminants present.
- Define hydrogeological factors (e.g., depth to saturated zone, hydraulic gradients, and proximity to wetlands).
- Define the horizontal and vertical extent of the contaminants at the Site.
- If applicable, define the extent to which the contaminants of concern have the potential to migrate, and whether potential future migration may pose a threat to human health or the environment.
- Assess the extent to which contaminant levels pose an unacceptable risk to public health and the environment.
- Provide sufficient information to allow for the identification of potentially feasible remedial alternatives to address the contamination for the proposed Site use.

The results of the RI will be summarized in a RI Report (RIR), which will include Remedial Action Objectives (RAOs) for the Site based on the contaminant characterization results, exposure pathways, and risk evaluation data. Based on our knowledge of potential Site issues to date, the RAOs for the Site may require implementation of remedial actions designed to remove impacted soil and monitor and sample groundwater and soil vapor after the impacted soil is removed.

1.4 Hydrogeologic Setting

The subject site consists of a relatively flat parcel. The area to the east of the site slopes steeply upward away from the property, and the area to the west gently slopes toward the Saw Mill River, which is located approximately 300 feet to the west of the site, across the Saw Mill River Parkway which is located along the site. The groundwater flow direction was not calculated during previous subsurface investigations, although groundwater flow likely mimics topography and flows to the west toward the Saw Mill River.

The unconsolidated material beneath the site is composed of sand and clay, with varying amounts of silt and gravel (till). A highly weathered bedrock layer was encountered below the unconsolidated sediments at approximately 8 to 9 feet below grade (ftbg). According to the Surficial Geologic Map of New York, the native material beneath the site consists of a glacial till, variable in texture, usually poorly sorted diamict of variable clasts (Cadwell, 1986). According to the Geologic Map of New York, the bedrock beneath the site is the Manhattan Formation, consisting of pelitic schists and amphibolite (Fisher, 1970).

The Saw Mill River, which parallels the site is the nearest water body/wetland in the surrounding area. No other wetlands of significance are in close proximity to the site.

1.5 Surrounding Land Use and Current Site Use

The surrounding land use consists of mostly residential properties on all sides of the site and across the Saw Mill River Parkway. The Metro North Railroad is located immediately east of the site. Currently, the site is occupied by an auto repair garage that is housed in an approximately 3,000 ft^2 building with several garage repair bays and an office area. The remainder of the site is used for parking cars and trucks (**Figure 2**). The facility is provided water from a municipal source provided by the Town of Pleasantville, and the sewer service is also municipal. The facility does not contain any floor drains and stormwater is discharged onto the ground surface from the roof drainage system.

2 INVESTIGATION SCOPE OF WORK

Completion of the Phase I and II ESAs and the SI provided preliminary documentation of impacts to the subsurface soil/fill and groundwater at selected areas at the potential BCP Site. These areas and others not yet investigated will be further characterized to determine the nature and extent of potential and known contaminant impacts.

The proposed RI will fill in data gaps to characterize areas of the Site where sampling has not been performed. Samples will be collected from the surface and subsurface soil/fill, soil gas, and groundwater. Data collected during the RI will be used to identify potential health risks and to evaluate remedial alternatives as they relate to future proposed development of the Site.

The investigation will include installation of eight (8) soil vapor points, twenty (20) test borings, and six (6) permanent groundwater monitoring wells. A total of ten (10) surface soil samples will also be collected using a hand auger as part of the RI. Completion of the sampling points will allow for Site-wide characterization of subsurface media.

Following NYSDEC approval of the Remedial Investigation Work Plan (RIWP), Citizens Participation Plan (CPP), and a site-specific Health and Safety Plan (HASP) (**Appendix 2** and **3**, respectively) and requisite public comment period, HES will initiate the remedial investigation and prepare a report of the findings. The major tasks and elements

associated with this Work Plan are described in detail within this section. **Table 1** provides a summary of samples to be collected during the RI.

2.1 Soil/Fill Characterization

2.1.1 Surface Soil Sampling Program

To better characterize surface soils within the BCP Site boundaries, the uppermost two inches of soil/fill below the vegetative cover will be collected (after any vegetative cover is removed) at ten (10) sampling locations randomly spaced across the Site. All surface soil samples will be collected using a clean hand auger in accordance with industry accepted practices. This will include placing the samples in a large stainless steel bowl, homogenizing the sample (except for VOC analysis), and placing the sample in the appropriate labeled laboratory container. Following each sample collection, the sampling and mixing equipment will be decontaminated using an Alconox and water solution and scrub brush followed by a thorough rinse using potable tap water. The samples will be analyzed for Target Compound List (TCL) VOCs (8260B), SVOCs (8270C), Pesticides (8081A), PCBs (8082), target analyte list (TAL) metals plus cyanide (6010/9010), and per-and-polyfluoroalkyl substances (PFAS; modified 537) for all sampling locations.

TABLE 1
Analytical Program Summary
Remedial Investigation
52 Depew Street
Pleasantville, New York

Sample Media	Number of Samples				Analyses
	Field Samples	Duplicates	MS/MSD Samples	Field and Trip Blanks	
Surface Soil Samples (10 from hand auger soil borings)	10	1	1/1	2	TCL VOCs (8260B), SVOCs (8270C), PCBs, TAL Metals + cyanide, TCL Pesticides, PFAS (modified 537)
Subsurface Soil/Fill (40 from test borings)	40	2	2/2	4	TCL VOCs (8260B), SVOCs (8270C), PCBs, TAL Metals + cyanide, TCL Pesticides, PFAS (modified 537)
Groundwater (up to 6 new permanent monitoring wells)*	6	1	1/1	2	TCL VOCs (8260B), SVOCs (8270C), PCBs, TAL Metals + cyanide, TCL Pesticides, PFAS (modified 537), 1,4-dioxane
Soil Vapor (11sample points)	11	1	0	0	TO-15 VOCs

Notes:
MS = matrix spike
MSD = matrix spike duplicate
SVOCs = semi-volatile organic compounds
TAL = target analyte list
TCL= target compound list
TO15 = Analytical method for VOCs in air
VOCs = volatile organic compounds
*ELAP laboratory certified for PFAS sampling and will provide PFC-free water for field blanks

As shown on **Figure 2**, surface soil samples will be collected in the unpaved/undeveloped areas of the property such that surface soil quality across the property is adequately evaluated. All surface soil samples will be collected in pre-cleaned and pre-preserved laboratory sample bottles in accordance with protocols for analysis shown on Table 1. Appropriate QA/QC samples will be collected for the surface sampling

event including one field and trip blank, one Matrix Spike (MS), one Matrix Spike Duplicate (MSD), and one field duplicate sample. Subsequent to sample collection, all surface soil samples will be placed on ice and shipped under chain of custody to the selected New York State certified analytical laboratory.

2.2 Subsurface Investigation

Subsurface soil/fill samples collected at the BCP Site during the 2017 Phase II investigations and the February 2018 SI contained elevated concentrations of VOCs and select metals above NYSDEC-UUSCOs for unrestricted residential use. Thus, a subsurface investigation is proposed to further delineate the horizontal and vertical extent of contaminants beneath the site.

2.2.1 Test Boring Program

The soil sampling program will include the installation of up to twenty (20) test borings to characterize the BCP Site. Proposed test boring locations are depicted on **Figure 2** but may be adjusted in the field based on Site conditions, accessibility, or other logistical concerns.

Test borings will be drilled to a depth 15 to 20 ftbg or to refusal, whichever comes first. It is anticipated that test boring depths will vary from 10 to 20 ftbg. The selected drill rig used for the test borings will be capable of efficiently drilling through the subsurface material as necessary. Based on past investigations, the drilling method will likely be the hollow stem auger drilling method.

HES anticipates that all test borings that are not converted into monitoring wells will be completed and grouted with a bentonite and Portland cement slurry to grade. During a five (5) to ten (10) day work period, soil/fill samples will be collected from the test borings shown on **Figure 2** using a 2-inch split spoon sampler based on screening criteria described below. For budgeting purposes, it is assumed that a total of forty (40) subsurface soil/fill samples will be collected and analyzed from the test borings; two soil samples at each location.

2.2.2 Subsurface Soil Sampling

A drill rig capable of advancing a borehole using the hollow stem auger drilling method will be used to advance twenty (20) soil borings through the soil/fill and a minimum of two feet into the underlying native soil, or to refusal on bedrock. Based on the subsurface data collected from the Phase II and SI investigation borings within the Site, the depth of the native soil material in the proposed areas of investigation is anticipated to range from approximately 4 ftbg to approximately 8 ftbg. During drilling, soil samples will be collected continuously, with a 2-foot long, 2-inch diameter split spoon sampler. The collected soil

samples will be logged in the field by the on-site hydrogeologist and will be screened for the presence of VOCs using a calibrated photoionization detector (PID) and the headspace method. The total depth of the borings will vary across the Site depending on boring location and depth to native soil. Subsurface soil samples will be collected for chemical analysis as warranted at the boring locations shown on **Figure 2**. The depth from which samples are collected will be determined based on the results of visual and olfactory observations and PID headspace screening measurements. The 0 to 2-foot interval will be selected for sampling at several borings to provide representative samples and characterize this layer based on the proposed development for the site. Samples will be collected from the discrete depth interval that displays the greatest evidence of contamination, if present, and/or at the water table interface. Subsurface fill/soil samples will be analyzed for TCL VOCs and SVOCs, Pesticides, PCBs, TAL metals including cyanide, and PFAS.

During drilling activities, all non-dedicated sampling equipment will be decontaminated between soil boring locations in accordance with accepted drilling practices using a high-pressure hot water "steam" cleaner or scrubbed using Alconox and a hot water wash followed by clean potable water rinse. Subsequent to borehole advancement, permanent monitoring wells will be installed at six (6) boring locations where saturated conditions are identified. Borings with no permanent monitoring well installed will be grouted from total depth to grade level with a grout mixture of 95% cement and 5% bentonite. All Investigation Derived Waste (soil cuttings) will be placed in drums for proper off-site disposal.

All subsurface soil samples will be collected in pre-cleaned and pre-preserved laboratory sample bottles in accordance with protocols for analysis shown on **Table 1**. Appropriate QA/QC samples will be collected for the surface sampling event including two field blanks and two trip blanks, two Matrix Spike (MS), two Matrix Spike Duplicate (MSD), and two field duplicate samples. Subsequent to sample collection, all subsurface soil samples will be placed on ice and shipped under chain of custody to the selected New York State certified analytical laboratory. The proposed soil analyses (surface and subsurface), as well as the proposed method reporting limits, are provided in **Appendix 4**.

2.3 Groundwater Monitoring Well Installation and Sampling

2.3.1 Site Hydrogeologic Conditions

To date, a total of nineteen (19) soil borings were drilled during the Phase II and SI investigations at the Site. The borings provide sufficient information to facilitate an understanding of the shallow hydrogeologic conditions across the Site. The Phase II and SI borings were advanced to depths ranging from 1.5 to 12 ftbg. As described above, the uppermost soil/fill material identified at each drilling location generally consisted of disturbed sand with silt and clay intermixed with non-native sandy fill material. The soil/fill thickness across the Site varied from a minimum of 1.5 feet to greater than 12 ftbg as is indicated by the test boring results from the Phase II ESA and SI conducted at the Site.

The native material beneath the Site is composed of fine sand and silt overlying fractured and weathered marble bedrock (Inwood Marble). Given the information obtained to date about Site subsurface conditions, a bedrock investigation is not proposed at this time. However, if the proposed investigation results show a threat to bedrock groundwater quality, supplemental bedrock drilling will be proposed. The depth to the observed groundwater table was 3 to 4 ftbg as noted in temporary monitor wells installed during the Phase II ESA and SI completed at the Site. Groundwater beneath the Site is presumed to flow to the west toward the Saw Mill River. The hydraulic gradient and actual groundwater flow direction will be calculated as part of the RI.

2.3.2 Monitor Well Installation

Six (6) soil borings will be drilled and completed as 2-inch PVC monitor wells to be used for measuring water levels and collecting groundwater samples. The proposed well locations are shown on **Figure 2** but will also depend on the presence of saturated soils at the proposed monitoring well locations. The monitor wells will be installed after soil sampling has confirmed the presence of saturated conditions (and any soil samples have been collected from the selected borings). The depth of saturated conditions has not varied significantly during the previous investigations to date. The wells will be screened in the saturated overburden soils with the well screens set at a minimum of two feet above the documented seasonal high-water table. The wells will be constructed of 20-slot well screen and the annular space around the well screen will be backfilled using a No. 2 sand pack. A two-foot bentonite seal will be placed atop the sand pack and the remaining annular space around the well will be grouted to grade using a Portland cement bentonite grout. The total depth of the wells is expected to be within 10 to 15 feet of ground surface. Following their installation and development, groundwater samples will be collected from each of the monitor wells using low flow sampling methods. For budgeting purposes, it is assumed that a total of six (6) groundwater samples will be collected from the new monitoring wells. At each groundwater sampling location, field parameters including temperature, specific conductivity, pH, and turbidity will be measured before sampling.

2.3.1.1.1 Well Development

The newly installed monitoring wells will be developed no sooner than 24 hours after installation has been completed. The development procedure will require purging of the groundwater and periodically surging the water in the well to loosen and remove suspended fine sediment from the well screen and sand pack. Measurements of the water volume removed and water quality parameters including temperature, conductivity, pH, and turbidity will be recorded at regular intervals throughout the development process. The wells will be developed using a submersible pump. Development will continue until water quality measurements stabilize to within 10% of the previous measurement. All Investigation Derived Waste (purged groundwater) will be placed in drums for proper off-site disposal.

2.3.1.1.2 Groundwater Sample Collection

Groundwater samples will be collected from each proposed monitor well using low-flow sampling techniques and dedicated HDPE tubing and a suitable pump. If low-flow sampling is not feasible due to an insufficient groundwater recharge rate, new and dedicated disposable HDPE bailers may be used to collect the groundwater samples. Each well will be sampled for TCL VOCs (8260B), SVOCs (8270C), TCL Pesticides (8081A), TCL PCBs (8082), TAL Metals including cyanide (6010/9010), PFAS, and 1,4-dioxane (8270-SIM).

Groundwater field parameters will be monitored during well purging and prior to sampling, including pH, specific conductivity, temperature, turbidity, and dissolved oxygen.

All groundwater samples will be collected in pre-cleaned and pre-preserved laboratory sample bottles in accordance with protocols for analyses shown on **Table 1**. Appropriate QA/QC samples will be collected for the groundwater sampling event including one field and trip blank, one Matrix Spike (MS), one Matrix Spike Duplicate (MSD), and one field duplicate sample. Subsequent to sample collection, all groundwater samples will be placed on ice and shipped under chain of custody to the selected New York State certified analytical laboratory. The proposed groundwater analyses, as well as the proposed method reporting limits, are provided in **Appendix 4**.

2.4 Soil Vapor Quality Characterization

Based on the results of the Phase II ESA and SI conducted at the Site, subsurface soil/fill material on Site has been shown to contain VOCs and SVOCs. A potential pathway exists whereby these compounds in the vapor phase may migrate from the soil and could affect air quality during future remediation work and the proposed development for the Site. To evaluate the potential for intrusion of vapor originating from soil underlying the proposed building as well as the existing building, HES will collect and analyze ten (10) soil vapor samples from beneath the Site (eight site-wide and two from beneath the existing building). The indoor air inside the building will also be sampled as part of the vapor intrusion study. The indoor air samples will be collected in the same manner as the background air samples using summa canisters and the TO-15 laboratory analytical method. The proposed soil vapor sampling locations are shown on **Figure 2**.

The soil vapor samples will be collected by advancing a small (~2”) diameter borehole to a maximum depth of 6 feet below grade (ftbg) to allow for the installation of the soil vapor sampling points. The soil vapor sampling points must be installed above the groundwater table interface. A 2-foot stainless steel vapor sampling well point (screen) will be inserted in the borehole, packed with glass beads and sealed with a hydrated bentonite seal above the glass pack and vapor point screen. The well point will be connected to Teflon-lined tubing sealed in a gasket at the top of the vapor point casing. The Teflon lined tubing will be carried to a minimum of two feet above grade and labelled for future soil vapor sampling.

The same soil vapor sampling procedures will be followed inside the building after the concrete floor slab is cored.

As required by the NYSDOH, a tracer gas will be used to validate the performance of the sample point seal. Helium tracer-gas testing will be conducted at each sample point to ensure that an effective seal has been established at grade. The helium tracer gas test will be conducted as follows:

1. A small plastic bucket or container will be placed over the sampling point. The container will have three drilled holes for; helium introduction, ambient air release, and passage of the sample probe tubing.
2. The container will be filled with laboratory grade helium which will be measured using a helium detector to ensure greater than 90% concentration of helium in the container.
3. Using sampling tubing, a 3-way valve, and a disposable syringe, approximately 1 liter of air/vapor will be purged from the sample point to a Tedlar® bag at a consistent flow rate of less than or equal to 0.2 liters per minute.
4. The Tedlar® bag will be tested outdoors using the helium detector capable of reading to PPM (parts per million) and percent levels and all meter readings will be recorded.
5. If concentrations of tracer gas greater than 10% are observed in the Tedlar® bag, the probe seal will be enhanced to reduce the infiltration of air and the seal retested as described above.

Prior to sample collection, a peristaltic pump capable of producing a vacuum of at least 20 inches of mercury will be used to purge air from the vapor sampling points. Soil vapor will be purged at a rate not greater than 0.2 liters per minute for 15 minutes.

Following purging, a grab sample will be collected in a 6-liter Summa Canister fitted with a one-hour regulator (using a sampling rate of 0.1 liters per minute) resulting in a sample collection period of one hour per sample.

The subsurface and sub-slab soil vapor samples will be collected from eleven (11) sampling points spaced equidistant across the Site and analyzed for VOCs using US EPA Method TO-15. The lists of compounds analyzed by method TO-15 as well as the proposed method reporting limits are provided in **Appendix 4**, and the proposed vapor point sampling locations are shown on **Figure 2**.

2.5 Site Survey

A topographic base map of the Site will be prepared by a New York State licensed surveyor at a scale of no larger than one-inch equals 40 feet, with a one-foot contour interval. The map will be used to locate the Site boundary and pertinent Site features

including fences, paved and concrete areas, tree lines, known utilities, existing structures, monitoring wells, soil vapor sampling points, and soil sample locations.

The base map will be prepared by a New York State licensed surveyor as a subcontractor to HES. All mapping will conform to specifications for size, distribution and content as established by the USGS National Mapping division. Digital mapping will be supplied on an AutoCAD drawing. The surveyor will establish the horizontal location and vertical elevations using the New York State Plane Coordinate System and most recent vertical datum. Elevations of the ground surface and top of PVC riser will be measured and recorded for each monitoring well.

3 SITE SAFETY AND MONITORING

A Site Specific Health and Safety Plan (HASP) was prepared as part of the RIWP and will be implemented during the RI and can be found in **Appendix 3**. Air within the breathing zone will be monitored for volatile organic vapors using a PID and for airborne dust using dust monitoring stations both at the work Site and downwind. The work site will be surrounded by construction fencing as needed. During the RI, appropriate warning signage to notify the public about potential physical hazards of the work site will be placed around the Site perimeter, as required.

3.1 Qualitative Human Health Risk Assessment

A qualitative human health risk assessment will be conducted to evaluate whether the presence and concentrations of chemicals in the environmental media at the Site pose potential human health concerns. The assessment will encompass both on-Site and off-Site risks with the results of the exposure analysis used as one of the criteria to select the most appropriate future actions at the Site. These may range from no further action, to additional data collection, to quantitative health risk assessment and the establishment of risk-based action levels. The assessment will begin with the construction of a conceptual Site model, a graphic illustration that outlines chemical source areas, possible chemical release mechanisms, environmental media that currently show or may show in the future the presence of chemicals, possible exposure pathways, possible points of exposure for human receptors, possible exposure routes, and possible human receptors.

The conceptual model will be based on current Site conditions and surrounding land use as well as the planned future Site and surrounding land uses. For environmental media that may be of concern, qualitative evaluations will be made for the four components that typically comprise a health risk assessment: data evaluation; exposure assessment; toxicity assessment; and risk characterization/uncertainty analysis. In the data evaluation, chemical concentrations in the various media will be compared to appropriate NYSDEC and NYSDOH risk-based standards and criteria (e.g., NYSDEC Soil Cleanup Objectives and Cleanup Levels, Water Quality Standards, etc.). Chemicals detected in concentrations greater than these Standards and Criteria will be identified as chemicals of potential

concern. In the exposure assessment, an evaluation will be made of the likelihood and magnitude of exposure to the chemicals of potential concern in environmental media of concern. This will involve outlining possible exposure routes and plausible exposure times, frequencies, and durations. In the toxicity assessment, the toxicity of the chemicals of concern will be outlined. This will include identifying known or suspected carcinogens and/or the target organ/system of concern for non-carcinogenic effects. In the risk characterization, information from the three components will be integrated, to estimate the likelihood and magnitude of possible health risks.

Fact sheets documenting the goals and progress of the project will be prepared at milestones of the project and distributed to those on the Site contact mailing list. The Site contact list will be included in the final CPP (in **Appendix 2)** once the site is accepted into the BCP.

3.1.2 Fish and Wildlife Resource Exposure Assessment

As per Section 3.10 of DER-10, based on the sampling results for soil and groundwater near the site boundaries, a qualitative Fish and Wildlife Exposure Assessment may need to be completed. The RI results will be reviewed to determine the need to assess this exposure pathway, and if deemed necessary, one will be completed.

4 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

4.1 Analytical Methods

All samples collected during the RI will be analyzed using EPA-approved analytical methods that follow the most recent edition of the EPA's "Test Methods for Evaluating Solid Waste" (SW-846), Methods for Chemical Analysis of Water and Wastes" (EPA 600/4-79-020), and Standard Methods for Examination of Water and Wastewater" (prepared and published jointly by the American Public Health Association, American Waterworks Association, and Water Pollution Control Federation).

4.1.1 Laboratory

The subcontracted laboratory will be certified by the New York State Department of Health to perform Contract Laboratory Program (CLP) analysis on all media to be sampled during this investigation. The laboratory will perform the sample analysis in accordance with the most recent NYSDEC Analytical Services Protocol (ASP).

4.1.2 Data Submittal

Analytical data will be submitted in complete ASP category B data packs (EQuiS format for all submittals). Procedures for chain of custody, laboratory instrumentation calibration, laboratory analyses, reporting of data, internal quality control, and corrective

actions shall be followed as per SW-846 and as per the laboratory's Quality Assurance Plan. Where appropriate, trip blanks, field blanks, field duplicates, matrix spike, and matrix spike duplicate samples shall be performed at a rate of 5% per total number of samples collected and will be used to assess the quality of the data. The laboratory's in-house QA/QC limits will be utilized whenever they are more stringent than those suggested by the EPA methods.

4.1.3 Data Usability Summary Report

The data package will be sent to a qualified, independent, data validation specialist for evaluation of the accuracy and precision of the analytical results. A Data Usability Summary Report (DUSR) will be prepared to describe the compliance of the analyses with the analytical method protocols detailed in the NYSDEC-ASP. The DUSR will provide a determination of whether the data meets the project-specific criteria for data quality and data use. The validation effort will be completed in accordance with NYSDEC Division of Environmental Remediation DUSR Guidelines. All data will be submitted to the NYSDEC Environmental Information Management System (EIMS).

4.2 Health and Safety

Field tasks will be performed using industry standard health and safety procedures. A site-specific HASP was prepared for use by the field team during all field activities. This plan details known and potential hazards of the Site and field tasks as well as air monitoring and emergency procedures. The HASP is presented in **Appendix 3.**

5 COMMUNITY AIR MONITORING

All of the planned RI work will be completed outdoors on the property. Where intrusive drilling or excavation operations are planned, community air monitoring will be performed to protect the downwind community. A HES representative will continually monitor the breathing air in the vicinity of the immediate work area using a PID capable of measuring total VOCs in air at concentrations as low as 1 PPM. The air in the work zone will also will be visually monitored for dust generation. Two air monitoring stations will be located on-site; one located between the work zone and the nearest occupied building and one located downwind of the work zone. If sustained VOC measurements are detected above 5 PPM, or visible dust generation is observed, the intrusive work will be temporarily halted and a more rigorous monitoring of VOCs and dust using recordable meters will be implemented.

All monitoring activities will be conducted in accordance with the NYSDOH Generic Community Air Monitoring Plan (CAMP). All CAMP data will be provided weekly to the NYSDEC to verify that site activities did not result in the off-site migration of contaminants in air or dust at levels of concern. A copy of the CAMP is provided with the HASP in **Appendix 3**.

6 PROJECT ORGANIZATION

HES has established a project team for the 52 Depew Street BCP Site whose collective qualifications and experience are well suited for successful completion of the project. The proposed responsibilities of the key staff are summarized below:

William A. Canavan, PG, LSRP, will be the Project Manager for the work. In this capacity Mr. Canavan will be responsible for the successful completion of each task including coordination and supervision of hydrogeologists and scientists, and adherence to the work plan, schedule and budget.

Jonathan B. Ashley, P.E., of D&K Consulting Engineers PC, will be the Project Engineer for the work. In this capacity Mr. Ashley will be responsible for the implementation of the investigation according to the approved work plan and BCP Requirements. Mr. Ashley will also certify the RI report as the NYS-licensed Professional Engineer.

Steven Verdibello, will be the Quality Leader, responsible for the development of the work plan, coordination of subcontractors, direction of the field program including maintaining quality assurance policies that pertain to all aspects of sampling, well drilling and development.

Michael Scott and Patrick Montouri, will be the field geologists responsible for implementing the field effort. Responsibilities will include sample collection, well development, and directing HES's drilling subcontractors, and ensuring the successful completion of all field activities.

Dylan Schuck, will be the Quality Assurance Officer (QAO). Mr. Schuck will assist the project manager in the development of the work plan, interface with the laboratory to make requests and resolve problems and interface with the data validator during development of Data Usability Summary Reports.

Resumes for the above outlined individuals are included in **Appendix 5**.

7 REPORTING

Following receipt of the validated analytical results, HES will prepare a comprehensive Rl Report and a Remedial Action Work Plan (RAWP) with an attached Soil/Fill Management Plan (S/FMP). Preparation of the report will entail a summary of fieldwork performed to date, data collected, and will include appropriate summary data tables, soil boring and well construction logs, analytical results, photos, and maps. The RI report will include a Qualitative Human Health Risk Assessment. If additional investigation is required, the Qualitative Human Health Risk Assessment will be completed following the receipt of validated results of the additional characterization.

The RAWP will include an evaluation of remedial alternatives. Data obtained during previous investigations will be utilized along with the planned end use to identify, select, and evaluate remedial action alternatives for the Site. Potential Site constituents and migration pathways will be categorized as follows:

- Indoor Air and airborne dust.
- Soil/Fill.
- Groundwater.

Once the degree of contamination associated with these media and other Site characteristics are quantified, alternatives for Site Remediation will be summarized. The alternatives that will be considered will include the "no action" measure as a baseline against other remedial measures, and the Track 1 unrestricted use alternative as required by the BCP.

The RAWP will also include a Soil/Fill Management Plan, which will describe a plan for characterization and handling of excavated soil/fill based on NYSDEC Soil Cleanup Objectives as specified in 6 NYCRR Subpart 375-6.

8 PROJECT SCHEDULE

A schedule showing the planned remedial investigation activities and assessment of remedial alternatives is included in **Figure 3**.

9 REFERENCES

Program Policy DER-10, Technical Guidance for Site Investigation and Remediation. New York State Department of Environmental Conservation. May 3, 2010.

Phase I Environmental Site Assessment Report, HRP Engineering, PC. March 7, 2017.

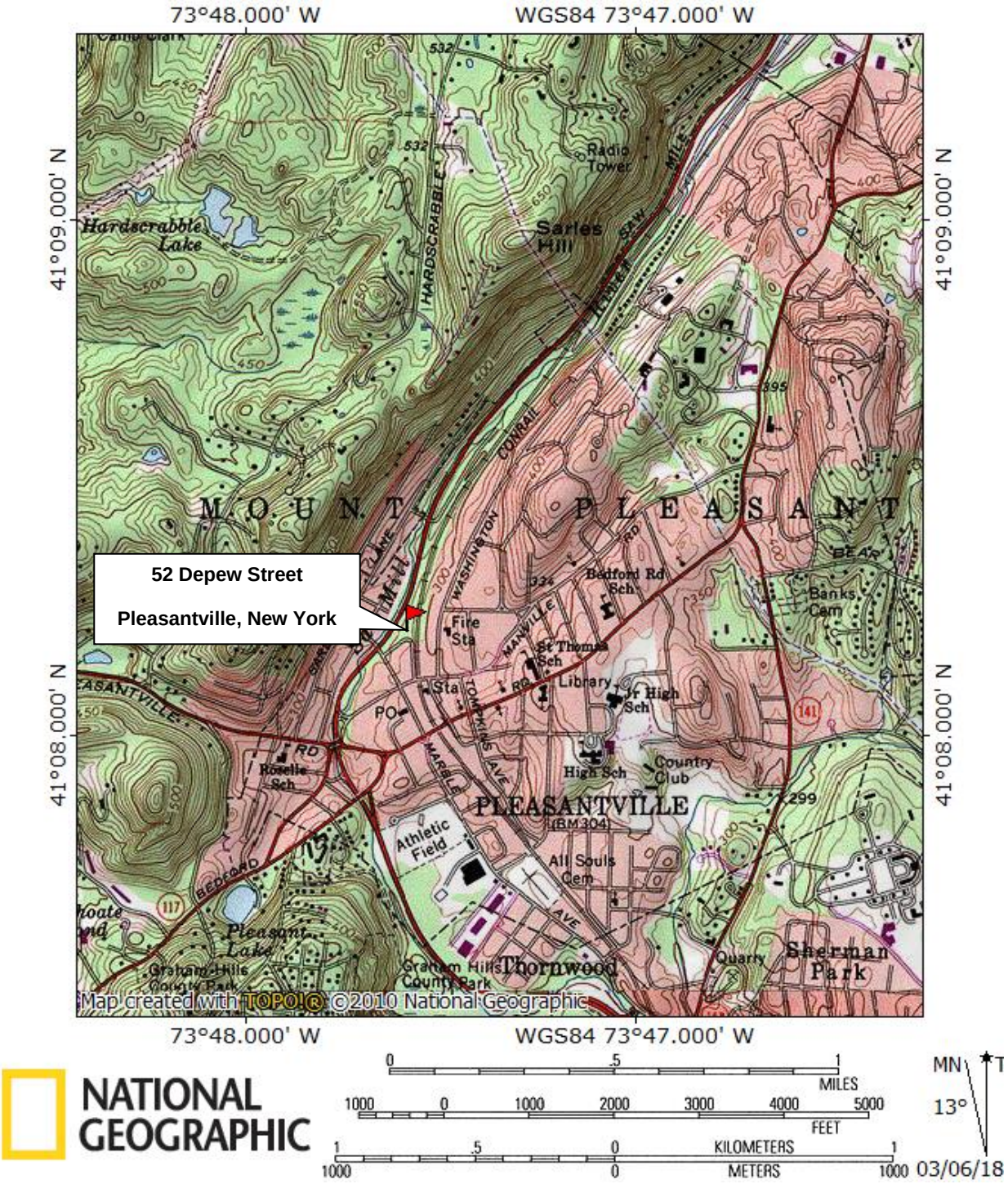
Phase II Environmental Site Assessment, HRP Engineering, PC. December 19, 2017.

Subsurface Investigation Report, HydroEnvironmental Solutions, Inc. March 9, 2018.

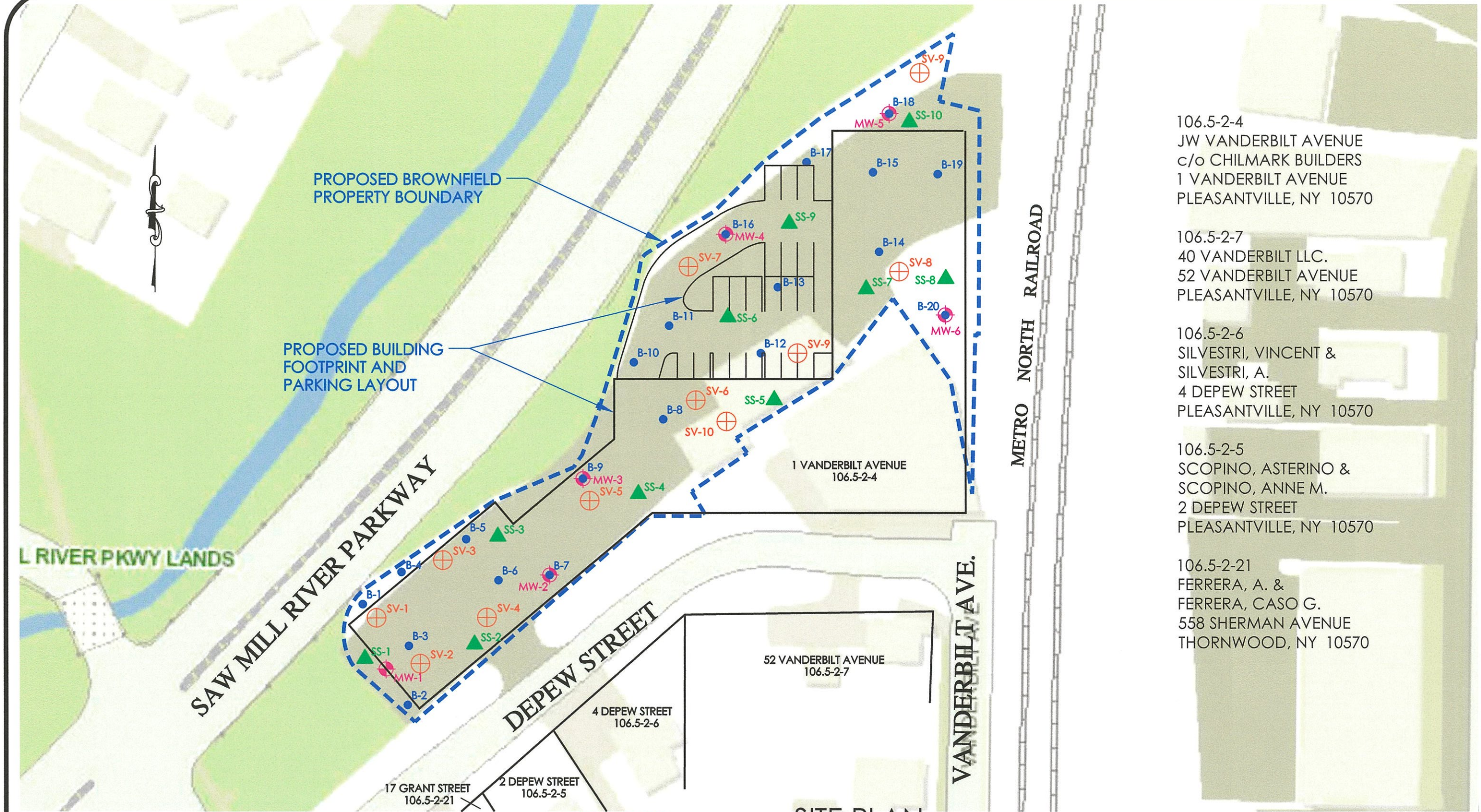
FIGURES

FIGURE 1

Site Location Map



NATIONAL GEOGRAPHIC



SITE PLAN
SCALE: 1" = 50'

106.5-2-4
JW VANDERBILT AVENUE
c/o CHILMARK BUILDERS
1 VANDERBILT AVENUE
PLEASANTVILLE, NY 10570

106.5-2-7
40 VANDERBILT LLC.
52 VANDERBILT AVENUE
PLEASANTVILLE, NY 10570

106.5-2-6
SILVESTRI, VINCENT &
SILVESTRI, A.
4 DEPEW STREET
PLEASANTVILLE, NY 10570

106.5-2-5
SCOPINO, ASTERINO &
SCOPINO, ANNE M.
2 DEPEW STREET
PLEASANTVILLE, NY 10570

106.5-2-21
FERRERA, A. &
FERRERA, CASO G.
558 SHERMAN AVENUE
THORNWOOD, NY 10570

52 DEPEW STREET
PLEASANTVILLE, NEW YORK

SITE PLAN

FIGURE 2

HydroEnvironmental
SOLUTIONS, INC.
One Deans Bridge Road
Somers, New York 10589

FIGURE 3

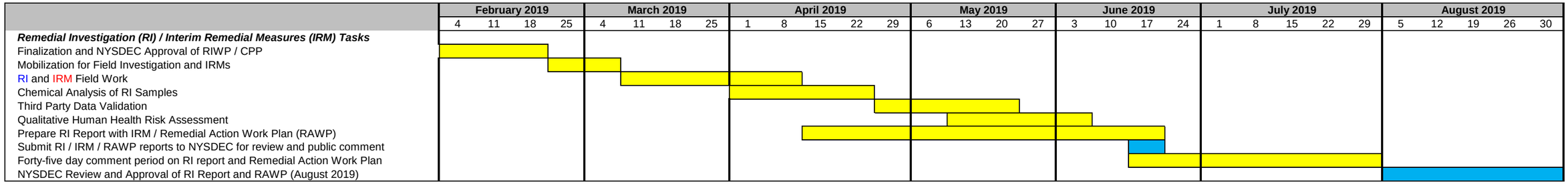
SCHEDULE OF PLANNED REMEDIAL INVESTIGATION/INTERIM REMEDIAL MEASURES ACTIVITIES

52 DEPEW STREET

PLEASANTVILLE, NEW YORK

BCP REMEDIAL INVESTIGATION

BROWNFIELD CLEANUP PROGRAM SITE # C360178



APPENDICES

APPENDIX 1:

Prior Environmental Reports

(Included in separate PDF)

APPENDIX 2:

Citizens Participation Plan

New York State Department of Environmental Conservation

Brownfield Cleanup Program

Citizen Participation Plan

For

52 Depew Street

Pleasantville, NY 10570

Site No. C360178

February 2019

Contents

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Appendix B - Site Contact List	14
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Appendix D - Brownfield Cleanup Program Process	16

* * * * *

Note: The information presented in this Citizen Participation Plan was current as of the date of its approval by the New York State Department of Environmental Conservation. Portions of this Citizen Participation Plan may be revised during the Site's investigation and cleanup process.

Applicant: **Lighthouse Living LLC**
Site Name: **52 Depew Street ("Site")**
Site Address: **52 Depew Street Pleasantville, NY 10570**
Site County: **Westchester**
Site Number: **C360178**

1. What is New York's Brownfield Cleanup Program?

New York's Brownfield Cleanup Program (BCP) works with private developers to encourage the voluntary cleanup of contaminated properties known as "brownfields" so that they can be reused and developed. These uses include recreation, housing, and business.

A *brownfield* is any real property that is difficult to reuse or redevelop because of the presence or potential presence of contamination. A brownfield typically is a former industrial or commercial property where operations may have resulted in environmental contamination. A brownfield can pose environmental, legal, and financial burdens on a community. If a brownfield is not addressed, it can reduce property values in the area and affect economic development of nearby properties.

The BCP is administered by the New York State Department of Environmental Conservation (NYSDEC), which oversees Applicants that conduct brownfield site investigation and cleanup activities. An Applicant is a person who has requested to participate in the BCP and has been accepted by NYSDEC. The BCP contains investigation and cleanup requirements, ensuring that cleanups protect public health and the environment. When NYSDEC certifies that these requirements have been met, the property can be reused or redeveloped for the intended use.

For more information about the BCP, go online at: http://www.dec.ny.gov/chemical/8450.html.

2. Citizen Participation Activities:

Why NYSDEC Involves the Public and Why It Is Important

NYSDEC involves the public to improve the process of investigating and cleaning up contaminated sites, and to enable citizens to participate more fully in decisions that affect their health, environment, and social well being. NYSDEC provides opportunities for citizen involvement and encourages early two-way communication with citizens before decision makers form or adopt final positions.

Involving citizens affected and interest in site investigation and cleanup programs is important for many reasons. These include:

- Promoting the development of timely, effective site investigation and cleanup programs that protect public health and the environment;

- Improving public access to, and understanding of, issues and information related to a particular site and that site's investigation and cleanup process;

- Providing citizens with early and continuing opportunities to participate in NYSDEC's site investigation and cleanup process;

- Ensuring that NYSDEC makes site investigation and cleanup decisions that benefit from input that reflects the interests and perspectives found within the affected community; and

- Encouraging dialogue to promote the exchange of information among the affected/interested public, State agencies, and other interested parties that strengthens trust among the parties, increases understanding of site and community issues and concerns, and improves decision making.

This Citizen Participation (CP) Plan provides information about how NYSDEC will inform and involve the public during the investigation and cleanup of the Site identified above. The public information and involvement program will be carried out with assistance, as appropriate, from the Applicant.

Project Contacts

Appendix A identifies NYSDEC project contact(s) to whom the public should address questions or request information about the site's investigation and cleanup program. The public's suggestions about this CP Plan and the CP program for the Site are always welcome. Interested people are encouraged to share their ideas and suggestions with the project contacts at any time.

Locations of Reports and Information

The locations of the reports and information related to the Site's investigation and cleanup program also are identified in Appendix A. These locations provide convenient access to important project documents for public review and comment. Some documents may be placed on the NYSDEC website. If this occurs, NYSDEC will inform the public in fact sheets distributed about the Site and by other means, as appropriate.

Site Contact List

Appendix B contains the Site contact list. This list has been developed to keep the community informed about, and involved in, the Site's investigation and cleanup process. The Site contact list will be used periodically to distribute fact sheets that provide updates about the status of the Project. These will include notifications of upcoming activities at the Site (such as fieldwork), as well as availability of project documents and announcements about public comment periods. The Site contact list includes, at a minimum:

- Chief executive officer and planning board chairperson of each county, city, town and village in which the Site is located;
- Residents, owners, and occupants of the Site and properties adjacent to the Site;
- The public water supplier which services the area in which the Site is located;
- Any person who has requested to be placed on the Site contact list;
- The administrator of any school or day care facility located on or near the Site for purposes of posting and/or dissemination of information at the facility; and
- Location(s) of reports and information.

The Site contact list will be reviewed periodically and updated as appropriate. Individuals and organizations will be added to the Site contact list upon request. Such requests should be submitted to the NYSDEC project contact(s) identified in Appendix A. Other additions to the Site contact list may be made at the discretion of the NYSDEC project manager, in consultation with other NYSDEC staff as appropriate.

CP Activities

The table at the end of this section identifies the CP activities, at a minimum, that have been and will be conducted during the Site's investigation and cleanup program. The flowchart in Appendix D shows how these CP activities integrate with the Site investigation and cleanup process. The public is informed about these CP activities through fact sheets and notices distributed at significant points during the program. Elements of the investigation and cleanup process that match up with the CP activities are explained briefly in Section 5.

- **Notices and fact sheets** help the interested and affected public to understand contamination issues related to a site, and the nature and progress of efforts to investigate and clean up a site.

- **Public forums, comment periods and contact with project managers** provide opportunities for the public to contribute information, opinions and perspectives that have potential to influence decisions about a site's investigation and cleanup.

The public is encouraged to contact project staff at any time during the Site's investigation and cleanup process with questions, comments, or requests for information.

This CP Plan may be revised due to changes in major issues of public concern identified in Section 3 or in the nature and scope of investigation and cleanup activities. Modifications may include additions to the Site contact list and changes in planned citizen participation activities
Technical Assistance Grant

NYSDEC must determine if the Site poses a significant threat to public health or the environment. This determination generally is made using information developed during the investigation of the Site, as described in Section 5.

If the Site is determined to be a significant threat, a qualifying community group may apply for a Technical Assistance Grant (TAG). The purpose of a TAG is to provide funds to the qualifying group to obtain independent technical assistance. This assistance helps the TAG recipient to interpret and understand existing environmental information about the nature and extent of contamination related to the Site and the development/implementation of a remedy.

An eligible community group must certify that its membership represents the interests of the community affected by the Site, and that its members' health, economic well-being or enjoyment of the environment may be affected by a release or threatened release of contamination at the Site.

For more information about TAGs, go online at http://www.dec.ny.gov/regulations/2590.html.

Note: The table identifying the citizen participation activities related to the Site's investigation and cleanup program follows on the next page:

Citizen Participation Requirements (Activities)	Timing of CP Activity(ies)
Application Process:	
• Prepare site contact list • Establish document repositories	At time of preparation of application to participate in the BCP.
• Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day public comment period • Publish above ENB content in local newspaper • Mail above ENB content to site contact list • Conduct 30-day public comment period	When NYSDEC determines that BCP application is complete. The 30-day public comment period begins on date of publication of notice in ENB. End date of public comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice, and notice to the site contact list should be provided to the public at the same time.
After Execution of Brownfield Site Cleanup Agreement:	
• Prepare Citizen Participation (CP) Plan	Before start of Remedial Investigation
Before NYSDEC Approves Remedial Investigation (RI) Work Plan:	
• Distribute fact sheet to site contact list about proposed RI activities and announcing 30-day public comment period about draft RI Work Plan • Conduct 30-day public comment period	Before NYSDEC approves RI Work Plan. If RI Work Plan is submitted with application, public comment periods will be combined and public notice will include fact sheet. Thirty-day public comment period begins/ends as per dates identified in fact sheet.
After Applicant Completes Remedial Investigation:	
• Distribute fact sheet to site contact list that describes RI results	Before NYSDEC approves RI Report
Before NYSDEC Approves Remedial Work Plan (RWP):	
• Distribute fact sheet to site contact list about proposed RWP and announcing 45-day public comment period • Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager) • Conduct 45-day public comment period	Before NYSDEC approves RWP. Forty-five day public comment period begins/ends as per dates identified in fact sheet. Public meeting would be held within the 45-day public comment period.
Before Applicant Starts Cleanup Action:	
• Distribute fact sheet to site contact list that describes upcoming cleanup action	Before the start of cleanup action.
After Applicant Completes Cleanup Action:	
• Distribute fact sheet to site contact list that announces that cleanup action has been completed and that summarizes the Final Engineering Report • Distribute fact sheet to site contact list announcing issuance of Certificate of Completion (COC)	At the time NYSDEC approves Final Engineering Report. These two fact sheets are combined if possible if there is not a delay in issuing the COC.

3. Major Issues of Public Concern

This section of the CP Plan identifies major issues of public concern that relate to the Site. There are no known issues of public concern at this time. However, once the remediation commences, there may be concerns regarding odors, noise or truck traffic coming from the Site.

Additional major issues of public concern may be identified during the course of the Site's investigation and cleanup process.

4. Site Information

The approximately 0.88 acre "Site," which is the subject of this application, consists of two adjacent tax parcels (106.05-2-1 and 106.05-2-2) with a collective property address of 52 Depew Street, Pleasantville, New York. *See* Exhibits C, Site Location Map, 1000 Square Foot Radius Maps and Exhibit D Tax Map. Although these parcels share an address, they are in fact separate parcels.

Section	Block	Lot	Official Address	Acreage
106.05	2	1	52 Depew Street	0.23
106.05	2	2	52 Depew Street	0.65
			Project Site Total	0.88 acres

See attached Site Location Map. The Site is located adjacent to the following properties:

Compass Direction	Adjacent Properties
West	Saw Mill River Parkway, residential properties
North	Tree line, vacant land, Saw Mill River Parkway, Saw Mill River
East	Tree line, railroad tracks, commercial properties
South	Chilmark Builders Warehouse, Depew Street, Vanderbilt Avenue, residential properties

The Site is presently an active automobile repair facility, with an approximately 2,600 square foot structure and surrounding open parking areas. The Site is paved on the southern parking areas and is partially paved and composed of gravel parking areas on the northern half. The site is currently provided municipal sewer and water connections.

History of Site Use, Investigation, and Cleanup

Historically, the Site was used for commercial and industrial operations. Around the early 1920s the Site was used as a coal yard for the adjacent railroad. An elevated railroad spur with coal bins was located on the northeastern portion of the site. According to historical documents, in 1927, the site was also used as a hay, feed and grain storehouse. By the mid-1940s, the site was

used as an auto fueling station and petroleum bulk storage facility. Bulk storage of coal and petroleum operations ceased sometime starting in the early to late 1970s. Between 1998 and 2000, eight (8) USTs were removed from the site and multiple NYSDEC Spill Numbers were assigned to the property (0001843, 0003454, 9807021).

In 2000, the current owner purchased the Site (Total Automotive of Westchester, LLC) and began using it for automobile repair and parking. The site is currently an active automobile repair facility called LaDuca's Auto Service.

5. Investigation and Cleanup Process

Application

The Applicant has applied for and been accepted into New York's BCP as a Volunteer. This means that the Applicant was not responsible for the disposal or discharge of the contaminants or whose ownership or operation of the Site took place after the discharge or disposal of the contaminants. The Volunteer has agreed to fully characterize the nature and extent of contamination on-site, remediate the Site and conduct a "qualitative exposure assessment" a process that characterizes the actual or potential exposures of people, fish and wildlife to contaminants on the site and to contamination that has migrated from the site.

To achieve this goal, the Applicant will conduct any remaining investigation and cleanup activities at the Site with oversight provided by NYSDEC and the NYS Department of Health. . The Brownfield Cleanup Agreement executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting these activities at the Site.

Investigation
The Applicant will be conducting an investigation of the Site officially called a "remedial investigation" (RI). This investigation will be performed with NYSDEC oversight. The Applicant has developed a remedial investigation work plan, which will be reviewed by the NYSDEC and Health Department and then implemented. The remedial investigation work plan, is subject to public comment.

The Site investigation has several goals:

1) Define the nature and extent of contamination in soil, surface water, groundwater and any other parts of the environment that may be affected;
2) Identify the source(s) of the contamination;
3) Assess the impact of the contamination on public health and the environment; and
4) Provide information to support the development of a proposed remedy to address the contamination or the determination that cleanup is not necessary.

When the investigation is complete, the Applicant will prepare and submit a report that summarizes the results, which is called a Final Remedial Investigation Report. This report also will recommend whether cleanup action is needed to address site-related contamination. The

investigation report is subject to review and approval by NYSDEC.

NYSDEC will use the information in the investigation report to determine if the Site poses a significant threat to public health or the environment. If the Site is a "significant threat," it must be cleaned up using a remedy selected by NYSDEC from an analysis of alternatives prepared by the Applicant and approved by NYSDEC. If the Site does not pose a significant threat, the Applicant may select the remedy from the approved analysis of alternatives.

Remedy Selection

When the investigation of the Site has been determined to be complete, the project likely would proceed in one of two directions:

1. The Applicant may recommend in its investigation report that no action is necessary at the Site. In this case, NYSDEC would make the investigation report available for public comment for 45 days. NYSDEC then would complete its review, make any necessary revisions, and, if appropriate, approve the investigation report. NYSDEC would then issue a "Certificate of Completion" or "COC" (described below) to the Applicant.

or

2. The Applicant may recommend in its investigation report that action needs to be taken to address Site contamination. After NYSDEC approves the investigation report, the Applicant may then develop a cleanup plan, officially called a "Remedial Action Work Plan". The Remedial Action Work Plan describes the Applicant's proposed remedy for addressing contamination related to the Site.
When the Applicant submits a proposed Remedial Action Work Plan for approval, NYSDEC would announce the availability of the proposed plan for public review during a 45-day public comment period.

Cleanup Action

NYSDEC will consider public comments, and revise the draft Remedial Action Work Plan if necessary, before approving the proposed remedy. The State Health Department must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy.

The Applicant may then design and perform the cleanup action to address the Site contamination. NYSDEC and State Health oversee the activities. When the Applicant completes cleanup activities, it will prepare a Final Engineering Report (FER) that certifies that cleanup requirements have been achieved or will be achieved within a specific time frame. NYSDEC will review the report to be certain that the cleanup is protective of public health and the environment for the intended use of the Site.

Certificate of Completion

When NYSDEC is satisfied that cleanup requirements have been achieved or will be achieved for the Site, it will approve the FER. NYSDEC then will issue a Certificate of Completion ("COC") to the Applicant. The COC states that cleanup goals have been achieved, and relieves the Applicant from future liability for site-related contamination, subject to certain conditions. The Applicant would be eligible to redevelop the Site after it receives a COC.

Site Management

Site management is the last phase of the site cleanup program. This phase begins when the COC is issued. Site management may be conducted by the Applicant under NYSDEC oversight, if contamination will remain in place. Site management incorporates any institutional and engineering controls required to ensure that the remedy implemented for the Site remains protective of public health and the environment. All significant activities are detailed in a Site Management Plan.

An institutional control is a non-physical restriction on use of the Site, such as a deed restriction that would prevent or restrict certain uses of the property. An institutional control may be used when the cleanup action leaves some contamination that makes the Site suitable for some, but not all uses.

An engineering control is a physical barrier or method to manage contamination. Examples include: caps, covers, barriers, fences, and treatment of water supplies. Site management also may include the operation and maintenance of a component of the remedy, such as a system that is pumping and treating groundwater. Site management continues until NYSDEC determines that it is no longer needed.

Appendix A
Project Contacts and Locations of Reports and Information

Project Contacts

For information about the Site's investigation and cleanup program, the public may contact any of the following project staff:

New York State Department of Environmental Conservation (NYSDEC):

Rosalie Rusinko, Esq.
NYS Dept. of Environmental Conservation
Office of General Counsel
100 Hillside Avenue, Suite 1 W
White Plains, NY 10603-2860
Email: rosalie.rusinko@dec.ny.gov

Justin Starr, Project Manager
NYS Dept. of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau C, Section D
625 Broadway, 11th Floor
Albany, NY 12233-7014
Email: Justin.Starr@dec.state.ny.us

New York State Department of Health (NYSDOH):

Email: beei@health.ny.gov

Locations of Reports and Information:
The facilities identified below are being used to provide the public with convenient access to important project documents:

New York State Department of
Environmental Conservation
Region 3 Office
21 South Putt Corners Road
New Paltz, New York 12561-1696
(845) 256-3154
Call for appointment

John Fearon, Director
Mount Pleasant Public Library

350 Bedford Road
Pleasantville, NY 10570
director@mountpleasantlibrary.org
Phone: (914) 769-0548 ext.5

52 Depew Street
Pleasantville, New York

Contact List Information

1. The Chief Executive Officers:

Peter Scherer, Mayor
Village Hall
80 Wheeler Avenue
Pleasantville, NY 10570
Phone: (914) 769-1900

George Latimer, County Executive
Westchester County
900 Michaelian Building
148 Martine Ave.
White Plains, NY 10601
Phone: (914) 995-2900
ce@westchestergov.com

2. a. The Village Planning and Zoning Boards:

Planning Commission
80 Wheeler Avenue
Pleasantville, NY 10570
Phone: (914) 769-1926

b. The County Zoning Bureau:

Susan Konig, Chair
Westchester County Department of Planning
148 Martine Ave. Room 432
White Plains, NY 10601
Phone: (914) 995-2900

3. Residents, owners, and occupants of the Site and properties adjacent to the Site:

- Site: Total Automotive
  52 Depew Street, Pleasantville, NY

- Adjacent Properties:

Owner: JW Vanderbilt Group LLC
Occupant: Chilmark Builders
1 Vanderbilt Avenue, Pleasantville, NY

Saw Mill River Parkway
Westchester County Tax I.D. 106.5-2-73

Midtown Trackage Ventures
Westchester County Tax I.D. 99.18 1-42

40 Vanderbilt LLC
52 Vanderbilt Avenue, Pleasantville, NY

Vincent Silvestri
4 Depew Street, Pleasantville, NY

Asterio Scopino
2 Depew Street, Pleasantville, NY

Graziella Caso
17 Grant Street, Pleasantville, NY

4. Local news media from which the community typically obtains information:

The Journal News
1 Gannet Drive
White Plains, New York 10604
(914) 694-9300

5. The public water supplier that services the area where the Site is located:

JoAnn Gray-Rizzuti, Department Contact
John Lynch, Water Foreman
Village of Pleasantville, Department of Public Works
1 Village Lane
Pleasantville, NY 10570
(914) 769-1690

6. Any person who has requested to be placed on the Site contact list:

No one has requested to be put on the list to date. However, we intend to voluntarily send information regarding this project to the adjacent property owners listed in Section 3.

7. The administrator of any school or day care facility located on or near the Site:

Peggy Galotti - Principal
Bedford Road School
289 Bedford Road
Pleasantville, New York 10570
Phone: 914-741-1440

Donald Marra - Principal
Pleasantville Middle School
40 Romer Avenue
Pleasantville, New York 10570
Phone: 914-741-1450

Joe Palumbo
40 Romer Avenue
Pleasantville, New York 10570
Phone: 914-741-1450

8. The location of a document repository for the project (e.g., local library):

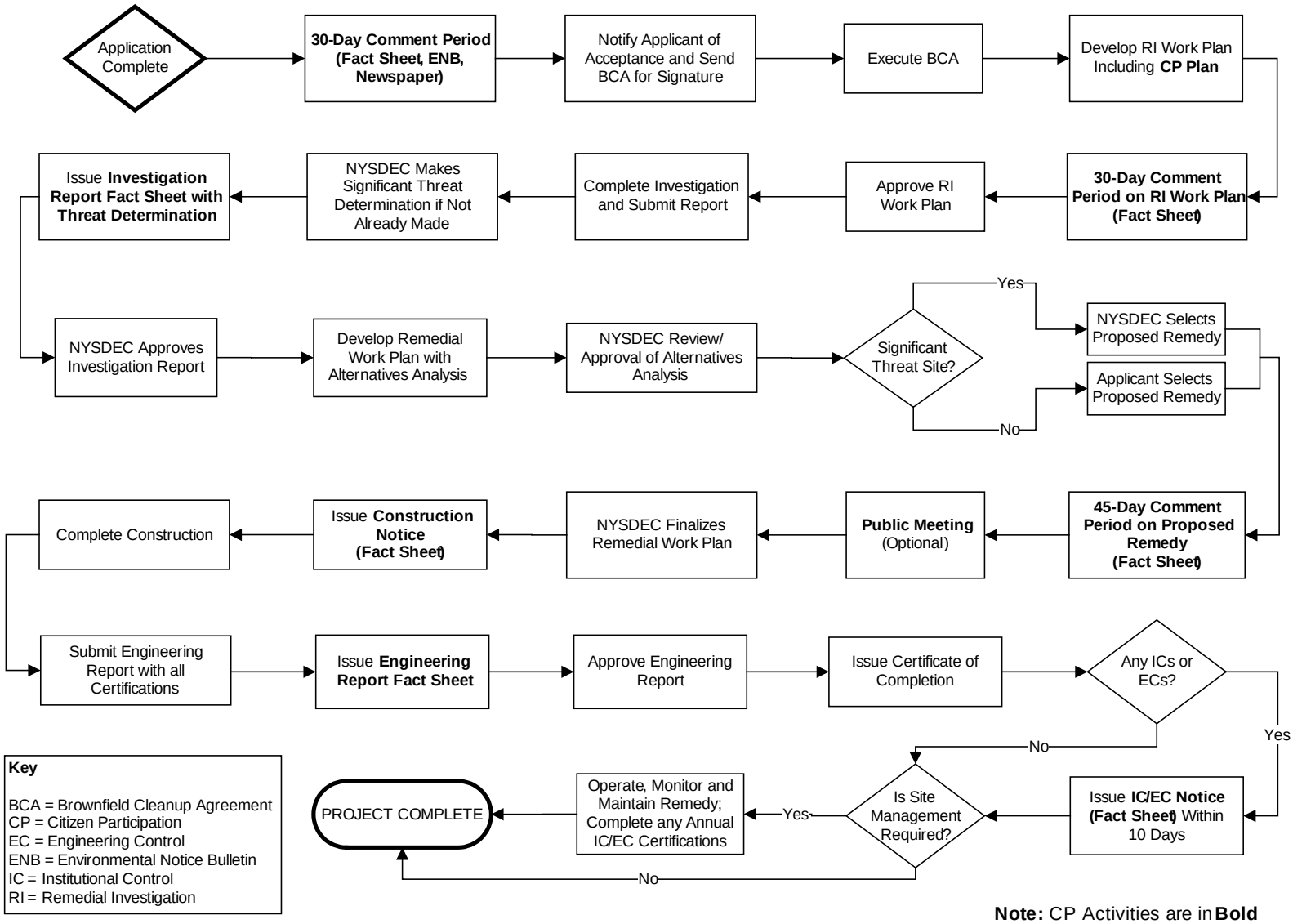
John Fearon, Director
Mount Pleasant Public Library

350 Bedford Road
Pleasantville, NY 10570
director@mountpleasantlibrary.org
Phone: (914) 769-0548 ext.5

Hours: Monday, Tuesday, Thursday (10:00AM-9:00PM); Wednesday (10:00AM-6:00PM);

Friday, Saturday (10:00AM-5:00PM); Sunday (1:00PM-5:00PM)

Appendix D– Brownfield Cleanup Program Process



Key

BCA = Brownfield Cleanup Agreement
CP = Citizen Participation
EC = Engineering Control
ENB = Environmental Notice Bulletin
IC = Institutional Control
RI = Remedial Investigation

Note: CP Activities are in **Bold**

APPENDIX 3:

Health and Safety Plan

DIAL 911 FOR ANY POLICE, FIRE, OR MEDICAL EMERGENCY!!!

June 5, 2018

SITE SPECIFIC HEALTH & SAFETY PLAN

Brownfield Cleanup Program #TBD
Site Activities at

52 Depew Street
Pleasantville, New York

Prepared by:

William A. Canavan, PG, LSRP
HydroEnvironmental Solutions, Inc.
One Deans Bridge Road
Somers, New York 10589

DIAL 911 FOR ANY POLICE, FIRE, OR MEDICAL EMERGENCY!!!

1.0 INTRODUCTION

This site-specific Health & Safety Plan (HASP) was prepared by HydroEnvironmental Solutions, Inc. (HES) on behalf of Lighthouse Living, LLC for work to be completed at the Brownfield Cleanup Program (BCP) Site located at 52 Depew Street in Pleasantville, New York. The site currently consists of two adjoining tax properties comprised of an active automobile repair facility and associated parking areas. This plan outlines the following:

- The work to be completed by HydroEnvironmental Solutions, Inc. (HES),
- Key personnel involved in the project including a clear chain-of-command,
- The level of training necessary to complete the outlined work,
- A summary of HES's Medical Surveillance program,
- Results of a hazard analysis,
- Site Access,
- Established work zones to be used during the project,
- Action Levels,
- The required levels of personal protective equipment (PPE),
- Decontamination procedures,
- Important notes on safe work practices,
- Air monitoring,
- Confined Space Entry Program,
- An emergency/contingency plan, and
- A spill containment program.

This HASP is based on requirements of the Occupational Safety & Health Administration (OSHA) including, 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response (HAZWOPER) and 29 CFR 1910.134. This site is under the jurisdiction of the New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation and the NYSDOH.

This HASP was developed with the express purpose of informing site workers of site specific hazards that may be encountered during the project. These procedures were developed to ensure a safe work place, and to provide guidance on how to respond effectively in case of an emergency. This HASP is intended as a 'living document' to be modified and updated as the project work requires or as new hazards are identified.

2.0 KEY PERSONNEL AND CHAIN OF COMMAND

2.1 HES Project Manager

The HES Project Manager will have direct authority to issue the necessary 'work orders' for personnel to enter the property for purposes of completing the aforementioned project. The Project Manager will also be responsible for issuing a 'stop work' order if it becomes necessary because of logistics.

The name and contact information of the Project Manager in direct charge of this project is listed below:

Mr. William A. Canavan, PG, LSRP
HydroEnvironmental Solutions, Inc.
One Deans Bridge Road
Somers, New York 10589
(914) 276-2560 (office)
(914) 774-3084 (cell)
(914) 276-2664 (fax)

2.2 HES Safety Officer

While the Project Manager will have authority to issue 'work orders' and 'stop work' orders, he will not be responsible for the implementation of this HASP. This responsibility will fall to the HES Safety Officer. It will be the Safety Officer's job to maintain this HASP during the project, insuring that it is modified as necessary. It is also the responsibility of the Safety Officer to disseminate the HASP to all HES personnel and subcontractors involved with the project. Additionally, the safety officer will keep the HES Project Manager, HES staff (air monitoring service), and the HES field staff performing the work informed. A project level organizational chart showing the relationship between the Safety Officer and all other HES staff is attached as **Table 1**.

The HES Safety Officer's contact information is provided below:

Mr. Dylan K. Schuck
Safety Officer
HydroEnvironmental Solutions, Inc.
One Deans Bridge Road
Somers, New York 10589
(914) 276-2560 (office)
(914) 772-0451 (cell phone)
(914) 774-3084 (24 hr. Emergency Number – William Canavan)

2.3 HES Field Staff

Field staff will be responsible for implementing the field work plans.

The contact information for HES is as follows:

Mr. William A. Canavan, PG, LSRP
HydroEnvironmental Solutions, Inc.
One Deans Bridge Road
Somers, New York 10589
(914) 276-2560 (office)
(914) 774-3084 (cell)
(914) 276-2664 (fax)

All field staff will be familiar with, and conform to, the provisions outlined in the HASP, ensure that they are well informed of the potential hazards in the work place, report any accidents or hazardous conditions to the on-site safety officer, and have complete familiarity with their job and the health and safety procedures involved. A project level organizational chart showing the relationship between field staff and all other HES staff is attached as **Table 1**.

The following HES field staff will be involved with the project:

1.	Mr. Steven M. Verdibello	(914) 224-2162 (cell phone)
2.	Mr. Michael J. Scott	(914) 224-6060 (cell phone)
3.	Mr. Patrick W. Montuori	(914) 774-7346 (cell phone)
4.	Mr. Dylan K. Schuck	(914) 772-0451 (cell phone)
5.	Mr. Jonathan B. Ashley	(802) 349-8855 (cell phone)

3.0 SITE CHARACTERIZATION WORK SCOPE

As per the proposed Specifications for the BCP Site Development (BCP #TBD) provided by HES of Somers, New York, the following general work tasks are identified within this site-specific HASP include, but are not limited to:

- Source area soil removal
- Regrade, cut and fill slope across the site
- Excavation and construction of sub-terrain parking facility
- Excavation and installation of subsurface storm water systems
- Excavation and installation of utilities, including electric, water and sewer
- Installation of apartment foundation
- Installation of site wide vegetative and asphalt caps

The location of the Site is depicted on **Figure 1**.

The following sections of this HASP discuss the hazards associated with each work task, the recommended personal protective equipment (PPE) necessary to perform each task, and other pertinent health and safety related issues.

4.0 HAZARD ANALYSIS

Despite the previous remediation activities implemented at the site, chemical, biological, and mechanical hazards may potentially be present during each phase of this work. In this regard, attached **Table 2** includes the identified hazards associated with performing each project task.

4.1 Chemical Hazards

Chemical hazards that have been identified at the site include gasoline and No. 2 fuel oil.

4.1.1 Gasoline

Chemical Compounds of significant concern present in gasoline, which may have been previously stored at the property include:

- benzene
- ethanol
- ethyl benzene
- n-hexane
- hexane, mixed isomers
- methyl-tertiary butyl ether (MTBE)
- tertiary-amyl methyl ether (TAME)
- toluene
- 1,2,4-trimethylbenzene
- xylene, mixed isomers

The above-mentioned compounds represent an inhalation hazard, and a potential dermal hazard which will be minimized with personal protective equipment.

The constituents with the greatest concern in gasoline are benzene and toluene. The lowest STEL and TWA exposure concentration is 1 ppm and 0.1 ppm for benzene and 300 ppm and 200 ppm for toluene, respectively.

Hazard communication data on each of the listed compounds is provided in **Table 3** presented below. A copy of an SDS for gasoline is attached in **Appendix A**.

Table 3 – Gasoline Constituents Hazard Data

Chemical Compound	% in Gasoline	Short Term Exposure Limit (STEL)(15 Min) (ppm)	8 Hour Time Weighted Average (ppm)
Benzene	**0.1 to 4.9**	**1**	**0.1**
Ethanol	0 to 10	-	1000
Ethylbenzene	< 3	125	100*
n-Hexane	0.5 to 4	-	50*
Hexane (other)	5 to 25	1,000	500
MTBE	0 to 15	-	50
TAME	0 to 17.2	-	20
Toluene	**1 to 25**	**300****	**200**
1,2,4-trimethylbenzene	< 6	-	25
Xylene	1 to 15	150	100

Bold = potential human carcinogen
*=10 hour TWA
**=Ceiling limit for 10 minutes

The flammable limit of gasoline vapor is between 1.4% and 7.6%.

Exposure/over exposure symptoms include:

"Nasal and respiratory tract irritation, central nervous system effects including excitation, euphoria, contracted eye pupils, dizziness, drowsiness, blurred vision, fatigue, nausea, headache, loss of reflexes, tremors, convulsions, seizures, loss of consciousness, coma, respiratory arrest or sudden death could occur as a result of long term and/or high concentration exposure to vapors. May also cause anemia and irregular heart rhythm (Valero SDS, Appendix A)"

An SDS for gasoline is attached in **Appendix A**.

Section 10.0 includes the necessary PPE for each work task outlined in **Table 2**.

4.1.2 No. 2 Fuel Oil

Chemical compounds of significant concern present in No. 2 Fuel Oil (Diesel Fuel) which may have been previously stored at the property include:

- naphthalene,
- nonane,
- hexane,
- n-heptane,
- octane,
- ethylbenzene,
- cylcohexane,
- hydrogen sulfide,
- toluene,
- xylene, and
- benzene.

These compounds represent a risk to workers as an inhalation hazard and a potential dermal hazard which will have to be minimized with personal protective equipment.

The constituent of greatest concentration and concern in fuel oil at the site is naphthalene. The lowest short-term exposure limit (STEL) and time weighted average (TWA) exposure concentration is 1 part per million (ppm) and 0.1 ppm for benzene, respectively. However, benzene does not make up more than 0.5% of fuel oils. Naphthalene, toluene, and benzene are also known as potential human carcinogens.

Hazard communication data on each of the listed compounds is provided in **Table 4** below. A copy of a safety data sheet (SDS) for No. 2 fuel oil is attached in **Appendix A**.

Table 4 – Fuel Oil Constituent Hazard Data

Chemical Compound	% in Fuel Oil	Short Term Exposure Limit (STEL)(15 Min) (ppm)	8 Hour Time Weighted Average (ppm)
Naphthalene	**0 to 3**	**15**	**10***
Nonane	0 to 3	-	200*
Hexane (other)	0 to 3	1,000	500
n-Hexane	0 to 2	-	50*
n-Heptane	0 to 2	500	400
Octane	0 to 1	385**	300
Ethylbenzene	0 to 1	125	100*

Cycohexane	0 to 1	-	300*
Hydrogen sulfide	0 to 1	15	10
Toluene	**0 to 1**	**300****	**200**
Xylene	0 to 1	150	100
Benzene	**0 to 0.5**	**1**	**0.1**

Bold = potential human carcinogen
*=10 hour TWA
**=Ceiling limit for 10 minutes

The flammable limit of fuel oil vapor is between 0.4% and 8% gas.

Exposure/over exposure symptoms for fuel oil include:

"Nasal and respiratory tract irritation, central nervous system effects including excitation, euphoria, contracted eye pupils, dizziness, drowsiness, blurred vision, fatigue, nausea, headache, loss of reflexes, tremors, convulsions, seizures, loss of consciousness, coma, respiratory arrest or sudden death could occur as a result of long term and/or high concentration exposure to vapors. May also cause anemia and irregular heart rhythm (Valero SDS, Appendix A)"

5.0 SITE ACCESS

The site is accessed from Depew Street in Pleasantville, New York.

6.0 ESTABLISHMENT OF WORK ZONES

The Safety Officer will establish and clearly mark the following areas with consultation and input from HES Project Manager(s):

- ✓ **Exclusion Zone (EZ)**

This will be any area so designated by the site Safety Officer where it has been determined that there is the potential for hazards for which added PPE and higher level OSHA training for worker safety are required. Access to the EZ will be limited to employees, subcontractors and visitors who have 40-Hour Health and Safety Training, protective equipment and responsibilities for work in this area. The entry of unauthorized personnel into the EZ will be prohibited.

✓ **Contamination Reduction Zone (CRZ)**

The area between the established EZ and the Support Zone, described below, will be established to facilitate employee and equipment decontamination, protective equipment storage and supply, and employee rest areas. The CRZ will correspondingly be a limited area established immediately adjacent to the EZ. It will exist to permit easy decontamination of equipment and PPE.

✓ **Support Zone (SZ)**

A clearly marked area free from any potential contamination will be identified where administrative and other support functions (i.e. those not requiring entrance to the EZ or CRZ) can be performed. The actual siting of the SZ will be established by the Safety Officer. It is anticipated that this area will consist of all areas outside the EZ or CRZ.

6.1 Exclusion Zone Entry

All personnel working in the EZ will enter their names on the site log, which will be maintained by the Safety Officer. Personnel will only enter an EZ after meeting with the Safety Officer to sign-in. Before engaging in *any* site work, all personnel involved in such work will be briefed on the following:

- The identity of the Safety Officer,
- The identity of project managers on-site,
- The boundary and exit point of the EZ,
- Decontamination procedure in the CRZ,
- Current state of chemical and physical hazards in the EZ,
- Levels of chemical contaminants (and oxygen) in air that will constitute a Warning Condition,
- Levels of chemical contaminants (and oxygen) in air that will constitute a Hazardous Condition,
- Location of first aid and emergency equipment,
- Procedures for site evaluation and contacting emergency response personnel,
- Location of emergency meeting point,
- Cold and/or Heat Stress symptoms, and
- PPE requirements.

A morning site safety meeting will be held so that the Safety Officer can describe the expected hazards, the engineering controls in-place to reduce the hazards, and to go over the steps to take in the event of an emergency.

7.0 ACTION LEVELS

In order to protect site workers, particularly those workers in the EZ, the following established action levels shown below shall be adhered to:

TABLE 5 – ACTION LEVELS

Chemical/Hazard	Action Level for Warning Condition	Action to be Taken for Warning	Action Level for Hazardous Condition	Action to be Taken for Hazardous Condition
Fugitive Dust	Visible Dust Cloud	Alter pace of activities	150 ug/m^3	-Stop work -Apply water to problem areas -Record all pertinent information
VOC Vapors**	5 PPM	Mandate frequent breaks**	25 PPM	-Stop work, -Upgrade to Level C for all EZ personnel not already in Level C, or -Institute Engineering control to reduce levels.
Oxygen Content	--	--	Less than 19.5% or greater than 23.5%	-Stop work -Notify appropriate personnel*, -Notify all personnel to evacuate EZ,

*Air monitoring specialist is to notify all on-site personnel.

**Continuous breathing zone reading w/o respirators.

SDS sheets for known chemical hazards that have been detected at the site are attached as **Appendix A**.

8.0 LEVEL OF TRAINING REQUIRED

The specific level of training necessary to complete work as described is outlined in OSHA 29 CFR 1910.120(e)(3–4). In this regard, the necessary training required for each class of site worker on this project is outlined in one of the three quoted OSHA training regulations below:

OSHA 29 CFR 1910.120(e)(3)(i)

"Workers on site only occasionally for a specific limited task (such as, but not limited to, ground water monitoring, land surveying, or geophysical surveying) and who are unlikely to be exposed over permissible exposure limits and published exposure limits shall receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor." Or,

OSHA 29 CFR 1910.120(e)(3)(ii)

"Workers regularly on site who work in areas which have been monitored and fully characterized indicating that exposures are under permissible exposure limits and published exposure limits where respirators are not necessary, and the characterization indicates that there are no health hazards or the possibility of an emergency developing, shall receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor." Or,

OSHA 29 CFR 1910.120(e)(3)(iii)

"General site workers (such as equipment operators, general laborers and supervisory personnel) engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances and health hazards shall receive a minimum of 40 hours of instruction off the site, and a minimum of three days actual field experience under the direct supervision of a trained experienced supervisor."

Based on this requirement, the minimum required safety training to participate in this project is 24 hours (and 1 day of field experience) for all field staff, unless they are to be in jobs that engage in hazardous substance removal or other activities that may potentially expose them to hazardous substances in which case the requirement is 40 hours (and 3 days of field experience) of initial training. Supervisors are required to have at least 8 hours of supplemental training on such topics as employer's safety and health program, the associated employee training program, PPE program, spill containment program, and health hazard monitoring procedures and techniques. In accordance with OSHA 29 CFR 1910.120(e)(4), the minimum required amount of safety training for supervisors (project managers and/or safety officers) for this project is 48 hours because they will be managing both 24 hour and 40 hour trained staff.

Training certificates demonstrating that each site worker listed in **Section 2.1, 2.2** and **2.3** has met the above referenced OSHA 29 CFR 1910.120(e)(3) are attached in **Appendix B**.

8.1 Permit Required Confined Space Entry and Work Program

No portion of this project will involve work in permit required confined spaces as defined in OSHA 1910.146. Thus, site specific confined space entry procedures have not been developed.

9.0 MEDICAL SURVEILLANCE PROGRAM

HES has an in-place medical surveillance program in accordance with OSHA 29 CFR 1910.120(f)(1) which states the following:

> "*Employees engaged in operations specified in paragraphs(a)(1)(i) through (a)(1)(iv) of this section and not covered by (a)(2)(iii) exceptions and employers of employees specified in paragraph (q)(9) shall institute a medical surveillance program in accordance with this paragraph."*

The HES medical surveillance program provides for the following:

- ✓ All employees that are or may be exposed to hazardous substances or health hazards at or above the established permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year, or are required to wear respirators for more than 30 days a year have medical surveillance every 12 months or more frequently, as deemed medically necessary.

- ✓ Some employees that do not meet the exposure or respirator criteria above must undergo medical surveillance just prior to assignment where they may be exposed to substances or health hazards at or above the established permissible exposure limit (without regard to the use of respirators) or must wear a respirator for assignment (more than 30 days).

- ✓ All medical surveillance testing of employees that may wear respirators incorporates pulmonary testing as the first measure of approval to don a respirator.

10.0 PERSONAL PROTECTIVE EQUIPMENT

All on-site personnel shall be issued appropriate personal safety equipment and protective clothing in accordance with this Health and Safety Plan. All safety equipment is to be used properly and protective clothing is to be kept clean and well maintained. If there is a need to address inhalation chemical hazards the Safety Officer shall do so using established "action levels". Upgraded action level may require upgraded PPE. The Safety Officer has the authority to require the use of additional equipment if he believes it is necessary for specific operations.

All personal protective equipment worn on-site shall be decontaminated before being reissued. Disposable equipment shall be properly disposed of as contaminated solid waste at the end of each work day or as needed. Disposed

material shall be contained within a secured area daily, on-site, prior to disposal.

Standing orders for all HES site workers and its subcontractors includes the use of the following important safety gear:

- **All prescription eyeglasses used on-site shall be safety glass** (the Safety Officer will ensure that all eye and face protection shall conform to OSHA 1910.133).
- **A hard hat shall be worn by all personnel** (the Safety Officer will ensure that all head protection shall conform to the requirements in OSHA 1910.135).
- **Steel toe/shank safety boots** (conforming to OSHA 1910.136).

There is no discussion of Level A, Level B or Level C PPE below because it is not anticipated as a part of this site-specific work. If it is required, the practice will be added to this HASP in the form of an addendum.

10.1 Modified Level D

The PPE level required for the planned site activities is a modified level D for all job tasks outlined on **Table 2** and will be used when the atmosphere contains no hazard.

Modified Level D PPE consists of:

- Nitrile Gloves
- Hard hat,
- Steel toed/steel shank boots,
- Safety glasses.

11.0 EXPOSURE MONITORING

11.1 General Information

Air monitoring will be conducted under the supervision of the Safety Officer for the express purpose of safeguarding the health and welfare of site workers. The air monitoring program herein conforms to pertinent OSHA rules.

The company that will be providing the air monitoring is listed below:

Mr. Dylan K. Schuck
HydroEnvironmental Solutions, Inc.
One Deans Bridge Road
Somers, New York, 10589
(914) 276-2560 (office)
(914) 772-0451 (cell phone)
(914) 774-3084 (24 hr. Emergency Number – William Canavan)

The HES project manager responsible for this project is Mr. William Canavan, PG, LSRP.

11.2 Air Monitoring Responsibilities

HES will provide the following air monitoring services:

- Perform a site reconnaissance to become familiar with the area and surrounding areas and review general potentially hazardous conditions in the work area.
- Air monitoring to determine the level of oxygen and combustible gas (in percent) in the EZ, CRZ and SZ.
- The air monitoring representative will be on-site in advance of work startup in order to have ample time to set-up, calibrate the equipment, and screen all accessible areas. This time will also allow the proper reporting and/or notifications (see below) to be completed before work begins each day.
- Provide all workers with verification that safe conditions exist in all work zones each day before work is scheduled to occur in those zones. This work will be done upon completion of daily instrument calibration.
- Provide continuous monitoring of the EZ, CRZ and SZ with logging of data hourly. An emphasis will be placed on those areas where a hazardous condition is most likely to occur. Verbal, and, if necessary, written verification, will be made throughout each day as to the condition of each area (i.e. safe, Warning Condition, or Hazardous Condition).
- Determine and articulate to all personnel the conditions necessary to render a given area safe to work.
- Notify all personnel at the beginning of each day which work areas are safe and which are not (from an air monitoring perspective).
- If HES detects the presence of petroleum vapors at or exceeding the criteria listed below a WARNING condition shall be declared.

Constituents	Minimum levels for a WARNING Condition
VOC Vapors	10% of the LEL

- If HES detects the presence of petroleum vapors at or exceeding the criteria listed below, a HAZARDOUS Condition shall be declared, and a portable air horn will be sounded to warn all of the condition. All field personnel will be notified and instructed to discontinue work in the zone until an expert in fire and explosions has assessed the condition and developed a plan to return the zone to below the trigger condition(s).

Constituents	Minimum levels for HAZARDOUS Condition
VOC Vapors	20% of the LEL
Oxygen	Less than 19.5% or greater than 23.5 %

- HES will provide all gas detection equipment required for the project in sufficient quantities. The following will be provided:
  - One Gas Tech Model No. GX-82A (or equivalent) portable meter capable of measuring combustible gases, hydrogen sulfide, carbon monoxide, methane and percent of oxygen,
  - One MiniRae Model 3000 photoionization detector (PID),
  - Calibration kits for all meters, and all necessary sampling lines.
  - HES will be responsible for providing or making available to Site personnel all pertinent safety gear for the project to meet the Modified Level D PPE.

Fugitive Dust

Description

According to the proposed Remedial Investigation Work Plan, fugitive dust could be generated during drilling activities. The site is adjacent to the Saw Mill River Parkway and Metro North Railway as well as residential properties. Based on the limited disturbance associated with the planned investigation activities, it is unlikely that wind erosion and fugitive dust will have an effect on the air quality at the site and surrounding properties. No roadwork is expected on the adjacent paved roadway during development activities at the site.

Fugitive Dust Control Plan

If fugitive dust is observed/monitored, the Site safety control personnel will halt activities until the problem area/areas can be properly suppressed by the

application of clean water. The frequency of application of water, if deemed necessary, will be determined by the on-site safety control personnel. The height of the temporary clean material stockpiles will be limited as well as the amount of disturbance to the stockpiles.

Fugitive Dust Monitoring and Recording

During site activities, the site will be monitored visually for any signs of fugitive dust. The safety control personnel will record all dust control activities, if required. The date, time, control method and weather information will each be recorded to evaluate the success of the fugitive dust suppression methods.

11.3 Air Monitoring Reporting

As per the requirement of the NYSDEC, HES will report findings of work in one of three ways:

1. **Daily Log Reports** - This report will be prepared hourly and will be submitted to the NYSDEC and the Westchester County Department of Health (WCDOH) at the end of each week. The log will include the findings of the air monitoring, a summary of the conditions encountered each day, and will detail if any WARNING or HAZARDOUS Conditions were noted and where. Other site-specific information (i.e. daily site figure showing location of monitoring stations; wind direction; work zone areas; 15-minute instrument averages) will be incorporated into the weekly report.

2. **Notice of Unsafe Atmosphere** – The notice will be prepared immediately following all verbal notifications are completed. The notice will provide detail regarding the detection of the unsafe atmosphere (i.e. concentration(s) of gas(es) detected, the nature of the gas hazard, and the specifics of the detection). The NYSDEC and NYSDOH Project Managers will be notified of any CAMP exceedances and corrective actions in a timely manner. All exceedances and corrective actions will be documented in the weekly report mentioned above.

3. **Notice of Safe Atmosphere** – When a previously determined HAZARDOUS Condition has been eliminated, and immediately after completing the notifications required above, HES will prepare and deliver a Notice of Safe Atmosphere to Site personnel; the report will detail why the HAZARDOUS Condition was eliminated.

HES will provide as many report copies as required by the NYSDEC and the WCDOH. Templates of the above referenced notices can be found in **Appendix C**

11.3.1 Community Air Monitoring Plan

In addition to the above outlined air monitoring program, HES will complete a Community Air Monitoring Plan (CAMP) for potential air contaminants including VOCs and particulate levels at the perimeter of the work area in accordance with NYSDEC Requirements. VOC and particulate monitoring will be conducted at several locations, i.e. downwind and also between the work zone and the nearest occupied structure. It is anticipated that these CAMP locations will change throughout the investigation based on wind direction and work zone activities. The NYSDOH Generic Community Air Monitoring Plan is included in **Appendix D**. Based on Site history, the following CAMP is proposed:

Continuous Monitoring will be completed during all ground intrusive activities at the subject Site. Ground intrusive activities include but are not limited to soil excavation and handling, test pitting or trenching, and the installation of soil borings or monitor wells.

Periodic Monitoring for VOCs will be required at the subject Site during non-intrusive activities such as collection of soil and sediment samples or groundwater samples from existing monitor wells. This monitoring will consist of taking a reading upon arrival to the sampling location, monitoring during sampling, and collecting a reading upon departure from the specific sampling location. Continuous monitoring may be required depending on the location of the sample point (i.e.: urban sidewalk) and the duration of exposure at the sampling point.

<u>VOC Monitoring, Response Levels and Actions</u>

VOCs will be monitored at the downwind perimeter of the exclusion zone (EZ) on a continuous basis. Upwind air concentrations will be monitored at the start of each work day and periodically thereafter to establish site specific background air concentrations. The monitoring will be completed using a calibrated PID. The PID will be calibrated on a daily basis. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the exclusion zone (EZ) exceeds 5 ppm above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases below 5 ppm over background, work activities can resume.

2. If total organic vapor levels at the downwind perimeter of the work area or EZ persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of the vapors identified, corrective actions taken to abate the vapors, and monitoring

continued. After these steps are implemented, work activities can resume provided total organic vapor level 200 feet downwind of the EZ 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.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for NYSDEC and WCDOH personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the EZ at temporary particulate monitoring stations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a 15-minute period for comparison to airborne particulate action level. The equipment will have an audible alarm to indicate exceedance of the action level. Additionally, fugitive dust will be visually assessed during all work activities.

1. If the downwind PM-10 particulate is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that the downwind PM-10 particulate concentration is within 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings will be recorded and available for NYSDEC and WCDOH personnel to review.

12.0 SPILL CONTAINMENT PROGRAM

The procedures defined in this section comprise the spill containment program in place for activities at the site.

All containers used during this work shall meet the appropriate Department of Transportation (DOT), OSHA, and EPA regulations for the waste that they will contain. Containers shall be inspected and their integrity assured prior to being moved. Containers that cannot be inspected before being moved because of storage condition shall be positioned in an accessible location and inspected prior to further handling.

Operations on-site will be organized so as to minimize the amount of drum, tank or container movement.

Employees involved in drum, tank or container operations shall be warned of the hazards associated with the containers.

In areas where spills, leaks or ruptures may occur, adequate quantities of spill containment equipment (absorbent pillows, etc.) will be stationed. The spill containment program must be sufficient to contain and isolate the entire volume of hazardous substances being transferred.

Fire extinguishing equipment meeting OSHA 29 CFR part 1910 shall be on hand and ready for use to control fires. Equipment shall be located in the construction storage box as well as at the Contamination Reduction Corridor.

13.0 DECONTAMINATION PROCEDURES

To minimize contact with contaminated substances and reduce the potential for contamination, the following will be adhered to during all phases of site entry and evacuation:

- Personnel shall make every effort not to walk through any areas of obvious contamination.
- Personnel shall not kneel or sit on the ground in the Exclusion Zone and/or in the Contamination Reduction Zone.

13.1 Personnel Decontamination

A decontamination area shall be constructed in accordance with OSHA 29CFR 1926.58(J). At this site, the decontamination area will be located in the CRZ, which will be established between the EZ, where work is being performed, and the SZ. A soap (detergent) and water wash/rinse shall be used for all protective equipment, unless it is placed directly into a trash bag. A waterless

hand cleaner and paper towels may be used for hands, arms and any other skin surfaces potentially in contact with contaminated material. Any contaminated protective equipment and decontamination supplies shall be disposed of in designated receptacles. All personnel must decontaminate upon exiting the EZ or CRZ.

All personnel protective equipment worn on-site shall be decontaminated before being reissued. Disposable equipment shall be properly disposed of as contaminated solid waste at the end of each work day or as needed. Disposed material shall be contained within a secure area daily, on-site, prior to disposal.

13.2 Emergency Decontamination

Decontamination will be delayed if immediate medical treatment is required to save a life. Decontamination will be initiated after the victim is stabilized when it can be performed without interfering with medical treatment. If a worker has been contaminated with an extremely toxic or corrosive material which could cause additional injury or loss of life, decontamination will be performed immediately.

When decontamination cannot be done, the victim will be wrapped in a chemical protective barrier (clothing or sheeting) to reduce contamination of other personnel. Emergency and off-site medical personnel shall be informed of potential contamination and shall be instructed about specific decontamination procedures. When the victim is transported off the site personnel knowledgeable of the incident, the site, and decontamination procedure shall accompany the victim; a MSDS shall also accompany the victim.

13.3 Equipment Decontamination

The decontamination area for all equipment used in the EZ will be set up in close proximity to the EZ. A wash and rinse or adsorbent pad wipe down will be done on all equipment surfaces that come in contact with contaminants. Contaminated equipment will be kept out of clean areas until they have been decontaminated.

14.0 EMERGENCY/CONTINGENCY PLAN

This section deals with emergency planning and procedures in the event of an emergency. See **Appendix E** for the list of Emergency Contact Numbers.

14.1 Emergencies within the EZ

The Safety Officer will monitor all operations and assist any emergency personnel responding to an emergency within the various work zones.

In the event of an emergency requiring off-site emergency response agencies, the appropriate emergency service will be notified with the following information:

A. Location of emergency **– 52 Depew Street in Pleasantville, New York**

B. Nature of emergency:

1. Fire. if so of what kind and what equipment is involved - **CALL 911**;

2. In the event of an emergency medical incident – **CALL 911**;

   a) Communication shall include:
      - Number of injured people.
      - Nature of injuries.
      - If Project Field Team Members cannot handle injuries with its resources, what emergency medical services are needed.

   b) If off-site emergency personnel must enter the site, hazards will be communicated to those people, and they shall be supervised by the Safety Officer or designee.

   c) In the event that a team member wearing protective equipment in the Exclusion Zone becomes injured, the Safety Officer shall do whatever decontamination is necessary in accordance with **Section 13.1**.

   d) Any emergency treatment information dealing with the injury shall accompany the injured party so that those treating personnel will have any and all information.

3. **Request for Police** – **CALL 911**. If any person(s) entering the site who does not belong there becomes a problem, the police shall be notified. In addition, HES shall also be notified by radio or plant telephone that if a person(s) endangers the Field Team Members or himself, the Safety Officer shall suspend all work until that person(s) can be removed.

C. If workers must evacuate the site due to any other emergency – **CALL 911**.

14.1.1 Safety Officer Responsibilities

In all emergency situations, it shall be the responsibility of the Safety Officer, or his designee, to ensure that proper procedures are carried out and that all Project Field Team Members are accounted for.

14.2 Exposures

14.2.1 Personnel Exposures

The emergency procedures to be used in the event of acute exposure (eyes, skin contact, inhalation, or physical injury) are:

Eye Exposure - Treat by immediate flushing with distilled water (portable eyewash). Transport for examination and treatment.

Skin Exposure - Remove contaminated clothing and treat by washing with waterless hand cleaner and paper towels followed by soap and water.

Inhalation - If a person inhales a large amount of organic vapor, the person will be removed from the work area to fresh air and artificial respiration will be administered if breathing has ceased. The affected person will be transported to the hospital if overexposure to lungs has occurred. A map depicting the route to the hospitals is included in **Appendix E**

Physical Injuries - In case of physical injury, the victim may receive emergency first aid at the site, as appropriate, and, if necessary, will be transported by ambulance or emergency vehicle to the Hospital. An accident form must be completed for any accident or occupation exposure. Precautions shall be taken to eliminate any direct contact by the first aider to the injured person's blood, sputum, or other body fluids. PPE must be used by the responder.

14.3 Site Evacuation

If conditions warrant evacuation, project field team members shall assemble near the entrance of the site. Fire/Police Departments shall be notified in the event of fire, explosion or their potential. Depending on the cause and magnitude of the conditions requiring evacuation, three stages have been designated.

Withdrawal to a Safe On-site Location - withdraw to an on-site safe upwind (if possible) location if:

- Air quality concentration contains excessive concentrations of volatile organics or oxygen percentage above or below safe levels for the level of protection being worn.
- A minor accident occurs. The victim shall undergo decontamination procedures and be transported to a safe area outside the EZ. Field operations shall resume after first aid and/or decontamination procedures have been administered to the affected individual.
- Protective clothing malfunction.

The field team shall withdraw to an on-site safe upwind location. The Safety Officer shall determine the location and articulate it to the field personnel as conditions dictate.

Withdrawal from the Site – if:

- Explosive levels of combustible gas(es), dangerous levels of toxic gas(es), and/or volatile organics are measured,
- A major accident or injury occurs,
- Fire and/or explosion occurs, or
- Ordered by HES.

The field team shall withdraw to a safe predetermined location. The Safety Officer shall determine the location and articulate the location at the initial site safety meeting.

Evacuation of Nearby Populations - a continuous release of toxic, flammable, or explosive vapors from the site could affect people off-site. If a significant release occurs, the Safety Officer shall be responsible for monitoring air quality downwind of the source of the release to assess the situation. The Safety Officer, or his on-site designee, is responsible for determining if circumstances exist for any level of off-site contamination warranting concern for people off-site. He should always assume worst case conditions until proven otherwise. If conditions are marginal, evacuation should be conducted until acceptable conditions resume. Key personnel identified in the HASP should be contacted when evacuation of nearby populations becomes necessary.

Site Control - during emergency conditions, the Safety Officer or designee shall prohibit any personnel or visitors from entering the affected area (Restricted Zone). The Safety Officer or designee shall assure that emergency equipment is available for use by authorized personnel and that

all ignition sources are shutdown within his sphere of control. The Safety Officer or designee shall gain the assistance of personnel authorized to shut down other potential ignition sources.

14.4 Emergency Response Training

Training on the emergency response plan shall be initiated prior to start up of actual operations.

14.5 Directions to the Hospital

Phelps Hospital is located within 4.7 miles of the site.

IF EMERGENCY CALL 911 otherwise contact information for these hospitals can be found in **Appendix E**. Directions to the hospital can also be found in **Appendix E**.

14.6 Additional Safety Related Items

The following additional safety items are considered essential equipment for the project. They include:

1. First Aid Kit (for minor injuries).
2. Disposable Eye Wash (1 liter or more) with a minimum of two additional bottles of eye wash solution.

14.7 Accident Reports

In the event of an injury or illness, work will cease until the Safety Officer and Project Manager have examined the cause of the incident and have taken the appropriate action. Any injury or illness, regardless of extent, is to be reported on the Accident Report Form.

14.8 Emergency Signals

In most cases, field personnel will carry cell phones for communication with the other field staff. Should an emergency occur the information should be transmitted immediately. For workers not within the vicinity of personnel equipped with cell phones, air horn signals will be used. In some cases emergency hand signals will be utilized.

EMERGENCY AIR HORN SIGNALS

HELP =	Three short horn blasts
Evacuation =	Three long horn blasts
All Clear =	Alternating long and short blasts

EMERGENCY HAND SIGNALS

Out of air =	Hand(s) gripping throat
Leave area immediately =	Grip partners wrist
Need Assistance =	Hands on top of head
Okay! I am alright =	Thumb(s) up
No! Negative =	Thumb(s) down

15.0 Standard Operating Procedures

Workers are expected to adhere to established safe work practices for their respective specialties (i.e. equipment operations, project management, field staff, etc.). The need to exercise caution in the performance of specific work tasks is made more acute due to:

- Physical, chemical, and toxicological properties of contaminated material possibly present;
- Other types of hazards present, such as heavy equipment, falling objects, loss of balance or tripping;
- Weather conditions;
- Restricted mobility and reduced peripheral vision caused by the protective equipment itself; and
- The need to maintain the integrity of the protective gear.

Work on-site shall be conducted according to established protocols and guidelines for the safety and health of all involved.

15.1 General Considerations

The exhaust of all combustion engine equipment used inside any small spaces will be properly vented to a safe outside location.

An appropriately sized fire extinguisher will be a required piece of equipment on this project.

In any unknown situation, the worst conditions must always be assumed and operations must be planned accordingly.

Because no personal protective equipment is 100 percent effective, all personnel must *minimize* contact with contaminated materials.

Work areas, decontamination areas, and procedures must be effectively planned.

Smoking, eating, chewing (gum or tobacco), or drinking in the CRZ and EZ shall be prohibited. Oral ingestion of contaminants is the second most common route introducing toxic substances into the body (inhalation is the first).

Heat and other work stresses related to wearing protective gear shall be avoided. Work breaks should be planned to prevent stress related accidents or fatigue.

Entry into the EZ will conform to the 'buddy" system at all times.

Work zones may require modification based upon air contaminants measured at the perimeter of the CRZ.

Medicine and alcohol can mask or increase the effects from exposure to toxic chemicals and heat stress. Personnel taking prescription drugs shall not be permitted to work in the CRZ or EZ, unless approval has been given by a physician. Alcoholic beverage consumption is prohibited on the site.

Personnel must be observant of not only one's own immediate surroundings, but also those of others. Everyone will be working under constraints; therefore, a team effort is needed to warn of impending dangerous situations.

Extra precaution is necessary when working near equipment while utilizing personal gear because vision, hearing and communication may be restricted.

Personnel must be aware that chemical contaminants may mimic or enhance symptoms of other illnesses or intoxication. Avoid use of alcohol or working while ill during the duration of task assignment.

The Safety Officer will maintain records pertaining to daily activities, meetings, incidents, results of heat/cold stress monitoring, weekly first aid kit inspections/inventory. The records will remain on-site for the duration of the project so that other safety and health personnel may add information, thereby maintaining continuity. These daily records will become part of the permanent project file.

15.2 Site Personnel

Daily Site and EZ entry/exit logs will be prepared and maintained. All personnel on-site shall sign in and sign out. The daily log sheets will be made part of the permanent site record.

No matches or lighters of any kind will be allowed in the CRZ or EZ unless specified by the Safety Officer.

All personnel will have their "buddy" with them when the "buddy" system is in effect

All personnel will notify the Safety Officer of any unusual occurrences which might affect the overall safe operation of the Site.

Any time a fire extinguisher is used, personnel shall notify the Safety Officer of what took place.

All injuries and accidents shall be immediately reported to the Safety Officer and the appropriate reports shall be filed.

All safety equipment shall be located with additional equipment, such as a fire extinguisher and an eyewash station, located at the Contamination Reduction Corridor.

15.3 Traffic Safety Rules

All personnel will park vehicles and meet outside the EZ at the beginning of each workday throughout the project.

Any vehicles that will not be involved in the site operations shall be secured and left in a designated parking area.

All local traffic and parking rules will be followed by HES personnel and their subcontractors working on the site.

16.0 CONFINED SPACE ENTRY PROGRAM

Confined space entry is not required by the outlined work for this site. Thus, site specific confined space entry procedures have not been developed.

17.0 IMPORTANT ACRONYMS

HASP - Health and Safety Plan
OSHA - Occupational Safety and Health Administration
PPE - Personal Protective Equipment
MSDS – Material Safety Data Sheet
EZ - Exclusion Zone
CRZ - Contaminant Reduction Zone
SZ – Support Zone
TWA - Time Weighted Average
STEL - Short Term Exposure Limit
EPA - Environmental Protection Agency

TABLES

Table 1

HASP
52 Depew Street
Pleasantville, New York
Brownfield Cleanup Program #TBD

Project Organizational Chart

William Canavan	Project Manager
Jon Ashley	Project Engineer

Steven Verdibello	Quality Leader
Dylan Schuck	Safety Officer

Michael Scott	Field Geologist/Hydrogeologist
Patrick Montuori	Field Geologist/Hydrogeologist

Table 2

HASP
52 Depew Street
Pleasantville, New York
Brownfield Cleanup Program #TBD

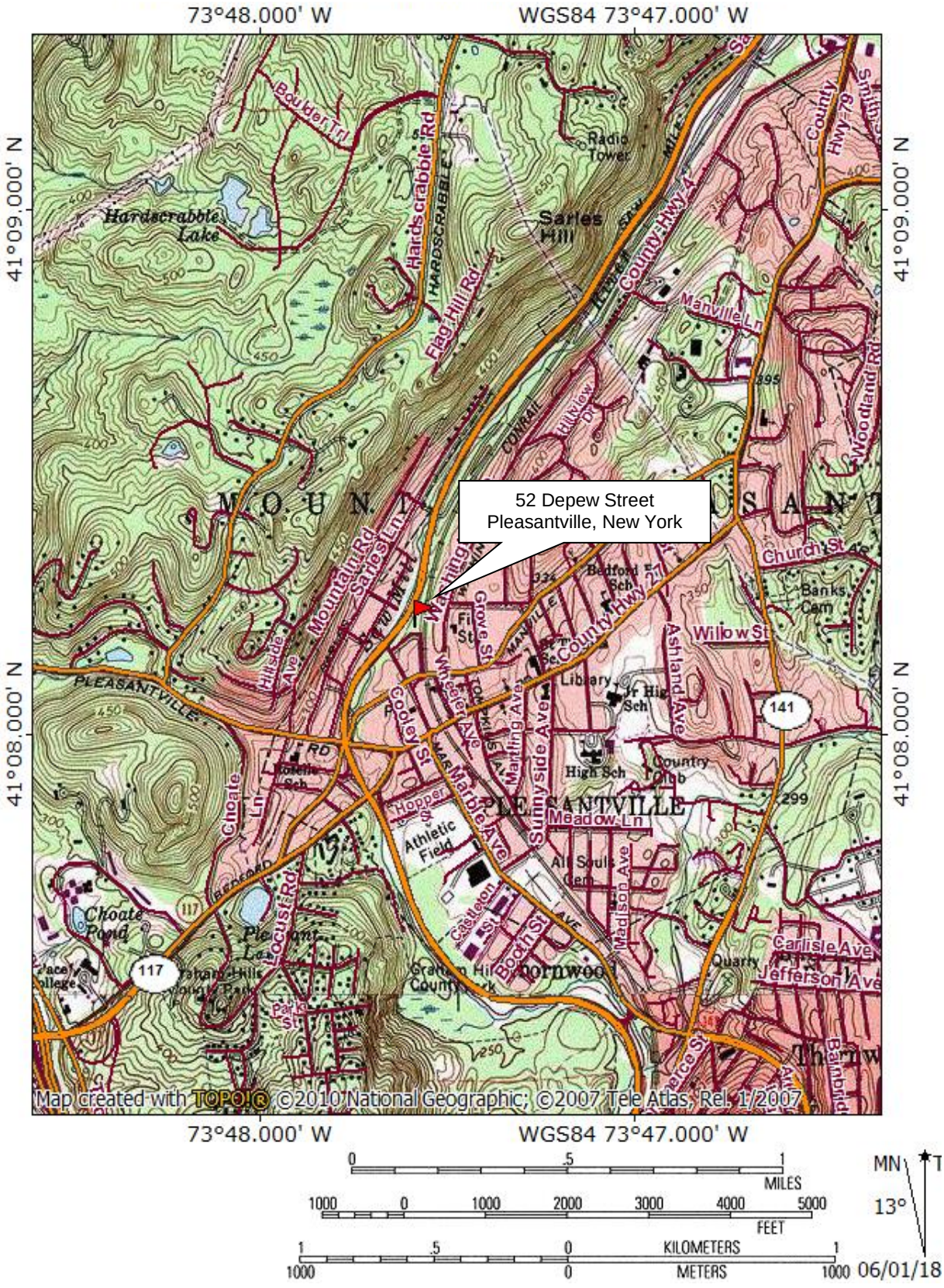
Identified Hazards Associated with Each Task

Task	Daily Hours Performing Task (hrs)	Confined Space Entry (Yes or No)	Identified Hazards
Field Staff	8	No	-Cold Stress/Heat Stress and Exposure -Slip/trip -Noise -Chemical Gas Inhalation
Air Monitoring	8	No	- Cold Stress/Heat Stress and Exposure -Slip/trip -Noise -Chemical Gas Inhalation
Project Management/ Oversight	8	No	- Cold Stress/Heat Stress and Exposure -Slip/trip -Noise -Chemical Gas Inhalation

*See Section on Confined Space Entry in HASP

FIGURES

FIGURE 1
SITE LOCATION MAP



APPENDICES

APPENDIX A:

Safety Data Sheets

Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950
US GHS

Synonyms: Hess Conventional (Oxygenated and Non-oxygenated) Gasoline; Reformulated Gasoline (RFG); Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB); Unleaded Motor or Automotive Gasoline

* * * Section 1 - Product and Company Identification * * *

Manufacturer Information

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

Phone: 732-750-6000 Corporate EHS
Emergency # 800-424-9300 CHEMTREC
www.hess.com (Environment, Health, Safety Internet Website)

* * * Section 2 - Hazards Identification * * *

GHS Classification:

Flammable Liquid - Category 2
Skin Corrosion/Irritation - Category 2
Germ Cell Mutagenicity - Category 1B
Carcinogenicity - Category 1B
Toxic to Reproduction - Category 1A
Specific Target Organ Toxicity (Single Exposure) - Category 3 (respiratory irritation, narcosis)
Specific Target Organ Toxicity (Repeat Exposure) - Category 1 (liver, kidneys, bladder, blood, bone marrow, nervous system)
Aspiration Hazard - Category 1
Hazardous to the Aquatic Environment – Acute Hazard - Category 3

GHS LABEL ELEMENTS

Symbol(s)

Signal Word

DANGER

Hazard Statements

Highly flammable liquid and vapour.
Causes skin irritation.
May cause genetic defects.
May cause cancer.
May damage fertility or the unborn child.
May cause respiratory irritation.
May cause drowsiness or dizziness.
Causes damage to organs (liver, kidneys, bladder, blood, bone marrow, nervous system) through prolonged or repeated exposure.
May be fatal if swallowed and enters airways.
Harmful to aquatic life.

Precautionary Statements

Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash hands and forearms thoroughly after handling.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe mist/vapours/spray.
Use only outdoors or in well-ventilated area.
Do not eat, drink or smoke when using this product.
Avoid release to the environment.

Response

In case of fire: Use water spray, fog, dry chemical fire extinguishers or hand held fire extinguisher.
IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing and wash before reuse. If skin irritation occurs, get medical advice/attention.
IF exposed or concerned: Get medical advice/attention.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a poison center or doctor/physician if you feel unwell.
Get medical advice/attention if you feel unwell.
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do not induce vomiting.

Storage

Store in a well-ventilated place.
Keep cool. Keep container tightly closed.
Store locked up.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
86290-81-5	Gasoline, motor fuel	100
108-88-3	Toluene	1-25
106-97-8	Butane	<10
1330-20-7	Xylenes (o-, m-, p- isomers)	1-15
95-63-6	Benzene, 1,2,4-trimethyl-	<6
64-17-5	Ethyl alcohol	0-10
100-41-4	Ethylbenzene	<3
71-43-2	Benzene	0.1-4.9

110-54-3	Hexane	0.5-4

A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol). Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

First Aid: Skin

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops.

First Aid: Ingestion

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

First Aid: Inhalation

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

See Section 9 for Flammability Properties.

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

Hazardous Combustion Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, or gaseous extinguishing agent.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration.

Unsuitable Extinguishing Media

None

Fire Fighting Equipment/Instructions

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment. Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

* * * Section 6 - Accidental Release Measures * * *

Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

Materials and Methods for Clean-Up

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Caution, flammable vapors may accumulate in closed containers.

Emergency Measures

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

Environmental Precautions

Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Prevention of Secondary Hazards

None

* * * Section 7 - Handling and Storage * * *

Handling Procedures

USE ONLY AS A MOTOR FUEL.
DO NOT SIPHON BY MOUTH

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

Storage Procedures

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

Incompatibilities

Keep away from strong oxidizers.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Component Exposure Limits

Gasoline, motor fuel (86290-81-5)

ACGIH: 300 ppm TWA
500 ppm STEL

Toluene (108-88-3)

ACGIH: 20 ppm TWA
OSHA: 200 ppm TWA; 375 mg/m3 TWA
150 ppm STEL; 560 mg/m3 STEL
NIOSH: 100 ppm TWA; 375 mg/m3 TWA
150 ppm STEL; 560 mg/m3 STEL

Butane (106-97-8)

ACGIH: 1000 ppm TWA (listed under Aliphatic hydrocarbon gases: Alkane C1-4)
OSHA: 800 ppm TWA; 1900 mg/m3 TWA
NIOSH: 800 ppm TWA; 1900 mg/m3 TWA

Xylenes (o-, m-, p- isomers) (1330-20-7)

ACGIH: 100 ppm TWA
150 ppm STEL
OSHA: 100 ppm TWA; 435 mg/m3 TWA
150 ppm STEL; 655 mg/m3 STEL

Benzene, 1,2,4-trimethyl- (95-63-6)

NIOSH: 25 ppm TWA; 125 mg/m3 TWA

Ethyl alcohol (64-17-5)

ACGIH: 1000 ppm STEL
OSHA: 1000 ppm TWA; 1900 mg/m3 TWA
NIOSH: 1000 ppm TWA; 1900 mg/m3 TWA

Ethylbenzene (100-41-4)

ACGIH: 20 ppm TWA
OSHA: 100 ppm TWA; 435 mg/m3 TWA
125 ppm STEL; 545 mg/m3 STEL
NIOSH: 100 ppm TWA; 435 mg/m3 TWA
125 ppm STEL; 545 mg/m3 STEL

Benzene (71-43-2)

ACGIH: 0.5 ppm TWA
2.5 ppm STEL
Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA: 5 ppm STEL (Cancer hazard, Flammable, See 29 CFR 1910.1028, 15 min); 0.5 ppm Action Level; 1 ppm TWA
NIOSH: 0.1 ppm TWA
1 ppm STEL

Hexane (110-54-3)

ACGIH: 50 ppm TWA
Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA: 500 ppm TWA; 1800 mg/m3 TWA
NIOSH: 50 ppm TWA; 180 mg/m3 TWA

Engineering Measures

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

Personal Protective Equipment: Respiratory

A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

Personal Protective Equipment: Hands

Gloves constructed of nitrile, neoprene, or PVC are recommended.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

Personal Protective Equipment: Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

* * * Section 9 - Physical & Chemical Properties * * *

Appearance:	Translucent, straw-colored or light yellow	**Odor:**	Strong, characteristic aromatic hydrocarbon odor. Sweet-ether like
Physical State:	Liquid	**pH:**	ND
Vapor Pressure:	6.4 - 15 RVP @ 100 °F (38 °C) (275-475 mm Hg @ 68 °F (20 °C)	**Vapor Density:**	AP 3-4
Boiling Point:	85-437 °F (39-200 °C)	**Melting Point:**	ND
Solubility (H2O):	Negligible to Slight	**Specific Gravity:**	0.70-0.78
Evaporation Rate:	10-11	**VOC:**	ND
Percent Volatile:	100%	**Octanol/H2O Coeff.:**	ND
Flash Point:	-45 °F (-43 °C)	**Flash Point Method:**	PMCC
Upper Flammability Limit (UFL):	7.6%	**Lower Flammability Limit (LFL):**	1.4%
Burning Rate:	ND	**Auto Ignition:**	>530°F (>280°C)

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

Incompatible Products

Keep away from strong oxidizers.

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

A: General Product Information

Harmful if swallowed.

B: Component Analysis - LD50/LC50

Gasoline, motor fuel (86290-81-5)

Inhalation LC50 Rat >5.2 mg/L 4 h; Oral LD50 Rat 14000 mg/kg; Dermal LD50 Rabbit >2000 mg/kg

Toluene (108-88-3)

Inhalation LC50 Rat 12.5 mg/L 4 h; Inhalation LC50 Rat >26700 ppm 1 h; Oral LD50 Rat 636 mg/kg; Dermal LD50 Rabbit 8390 mg/kg; Dermal LD50 Rat 12124 mg/kg

Butane (106-97-8)

Inhalation LC50 Rat 658 mg/L 4 h

Xylenes (o-, m-, p- isomers) (1330-20-7)
Inhalation LC50 Rat 5000 ppm 4 h; Inhalation LC50 Rat 47635 mg/L 4 h; Oral LD50 Rat 4300 mg/kg; Dermal LD50 Rabbit >1700 mg/kg

Benzene, 1,2,4-trimethyl- (95-63-6)
Inhalation LC50 Rat 18 g/m3 4 h; Oral LD50 Rat 3400 mg/kg; Dermal LD50 Rabbit >3160 mg/kg

Ethyl alcohol (64-17-5)
Oral LD50 Rat 7060 mg/kg; Inhalation LC50 Rat 124.7 mg/L 4 h

Ethylbenzene (100-41-4)
Inhalation LC50 Rat 17.2 mg/L 4 h; Oral LD50 Rat 3500 mg/kg; Dermal LD50 Rabbit 15354 mg/kg

Benzene (71-43-2)
Inhalation LC50 Rat 13050-14380 ppm 4 h; Oral LD50 Rat 1800 mg/kg

Hexane (110-54-3)
Inhalation LC50 Rat 48000 ppm 4 h; Oral LD50 Rat 25 g/kg; Dermal LD50 Rabbit 3000 mg/kg

Potential Health Effects: Skin Corrosion Property/Stimulativeness

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

Potential Health Effects: Eye Critical Damage/ Stimulativeness

Moderate irritant. Contact with liquid or vapor may cause irritation.

Potential Health Effects: Ingestion

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

Potential Health Effects: Inhalation

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

Generative Cell Mutagenicity

This product may cause genetic defects.

Carcinogenicity

A: General Product Information

May cause cancer.

IARC has determined that gasoline and gasoline exhaust are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. The U.S. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.

B: Component Carcinogenicity

Gasoline, motor fuel (86290-81-5)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

Toluene (108-88-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 71 [1999]; Monograph 47 [1989] (Group 3 (not classifiable))

Xylenes (o-, m-, p- isomers) (1330-20-7)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 71 [1999]; Monograph 47 [1989] (Group 3 (not classifiable))

Ethyl alcohol (64-17-5)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
IARC: Monograph 100E [in preparation] (in alcoholic beverages); Monograph 96 [2010] (in alcoholic beverages) (Group 1 (carcinogenic to humans))

Ethylbenzene (100-41-4)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
IARC: Monograph 77 [2000] (Group 2B (possibly carcinogenic to humans))

Benzene (71-43-2)

ACGIH: A1 - Confirmed Human Carcinogen
OSHA: 5 ppm STEL (Cancer hazard, Flammable, See 29 CFR 1910.1028, 15 min); 0.5 ppm Action Level; 1 ppm TWA
NIOSH: potential occupational carcinogen
NTP: Known Human Carcinogen (Select Carcinogen)
IARC: Monograph 100F [in preparation]; Supplement 7 [1987]; Monograph 29 [1982] (Group 1 (carcinogenic to humans))

Reproductive Toxicity

This product is suspected of damaging fertility or the unborn child.

Specified Target Organ General Toxicity: Single Exposure

This product may cause drowsiness or dizziness.

Specified Target Organ General Toxicity: Repeated Exposure

This product causes damage to organs through prolonged or repeated exposure.

Aspiration Respiratory Organs Hazard

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

Very toxic to aquatic life with long lasting effects. Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Gasoline, motor fuel (86290-81-5)

Test & Species		Conditions
96 Hr LC50 Alburnus alburnus	119 mg/L [static]	
96 Hr LC50 Cyprinodon variegatus	82 mg/L [static]	
72 Hr EC50 Pseudokirchneriella subcapitata	56 mg/L	
24 Hr EC50 Daphnia magna	170 mg/L	

Toluene (108-88-3)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	15.22-19.05 mg/L [flow-through]	1 day old
96 Hr LC50 Pimephales promelas	12.6 mg/L [static]	
96 Hr LC50 Oncorhynchus mykiss	5.89-7.81 mg/L [flow-through]	
96 Hr LC50 Oncorhynchus mykiss	14.1-17.16 mg/L [static]	
96 Hr LC50 Oncorhynchus mykiss	5.8 mg/L [semi-static]	
96 Hr LC50 Lepomis macrochirus	11.0-15.0 mg/L [static]	
96 Hr LC50 Oryzias latipes	54 mg/L [static]	
96 Hr LC50 Poecilia reticulata	28.2 mg/L [semi-static]	
96 Hr LC50 Poecilia reticulata	50.87-70.34 mg/L [static]	
96 Hr EC50 Pseudokirchneriella subcapitata	>433 mg/L	
72 Hr EC50 Pseudokirchneriella subcapitata	12.5 mg/L [static]	
48 Hr EC50 Daphnia magna	5.46 - 9.83 mg/L [Static]	
48 Hr EC50 Daphnia magna	11.5 mg/L	

Xylenes (o-, m-, p- isomers) (1330-20-7)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	13.4 mg/L [flow-through]	

96 Hr LC50 Oncorhynchus mykiss	2.661-4.093 mg/L [static]
96 Hr LC50 Oncorhynchus mykiss	13.5-17.3 mg/L
96 Hr LC50 Lepomis macrochirus	13.1-16.5 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	19 mg/L
96 Hr LC50 Lepomis macrochirus	7.711-9.591 mg/L [static]
96 Hr LC50 Pimephales promelas	23.53-29.97 mg/L [static]
96 Hr LC50 Cyprinus carpio	780 mg/L [semi-static]
96 Hr LC50 Cyprinus carpio	>780 mg/L
96 Hr LC50 Poecilia reticulata	30.26-40.75 mg/L [static]
48 Hr EC50 water flea	3.82 mg/L
48 Hr LC50 Gammarus lacustris	0.6 mg/L

Benzene, 1,2,4-trimethyl- (95-63-6)

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	7.19-8.28 mg/L [flow-through]
48 Hr EC50 Daphnia magna	6.14 mg/L

Ethyl alcohol (64-17-5)

Test & Species	Conditions
96 Hr LC50 Oncorhynchus mykiss	12.0 - 16.0 mL/L [static]
96 Hr LC50 Pimephales promelas	>100 mg/L [static]
96 Hr LC50 Pimephales promelas	13400 - 15100 mg/L [flow-through]
48 Hr LC50 Daphnia magna	9268 - 14221 mg/L
24 Hr EC50 Daphnia magna	10800 mg/L
48 Hr EC50 Daphnia magna	2 mg/L [Static]

Ethylbenzene (100-41-4)

Test & Species	Conditions
96 Hr LC50 Oncorhynchus mykiss	11.0-18.0 mg/L [static]
96 Hr LC50 Oncorhynchus mykiss	4.2 mg/L [semi-static]
96 Hr LC50 Pimephales promelas	7.55-11 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	32 mg/L [static]
96 Hr LC50 Pimephales promelas	9.1-15.6 mg/L [static]
96 Hr LC50 Poecilia reticulata	9.6 mg/L [static]
72 Hr EC50 Pseudokirchneriella subcapitata	4.6 mg/L
96 Hr EC50 Pseudokirchneriella subcapitata	>438 mg/L
72 Hr EC50 Pseudokirchneriella subcapitata	2.6 - 11.3 mg/L [static]

96 Hr EC50 Pseudokirchneriella subcapitata	1.7 - 7.6 mg/L [static]
48 Hr EC50 Daphnia magna	1.8 - 2.4 mg/L

Benzene (71-43-2)

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	10.7-14.7 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	5.3 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	22.49 mg/L [static]
96 Hr LC50 Poecilia reticulata	28.6 mg/L [static]
96 Hr LC50 Pimephales promelas	22330-41160 µg/L [static]
96 Hr LC50 Lepomis macrochirus	70000-142000 µg/L [static]
72 Hr EC50 Pseudokirchneriella subcapitata	29 mg/L
48 Hr EC50 Daphnia magna	8.76 - 15.6 mg/L [Static]
48 Hr EC50 Daphnia magna	10 mg/L

Hexane (110-54-3)

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	2.1-2.98 mg/L [flow-through]
24 Hr EC50 Daphnia magna	>1000 mg/L

Persistence/Degradability

No information available.

Bioaccumulation

No information available.

Mobility in Soil

No information available.

* * * Section 13 - Disposal Considerations * * *

Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

Disposal of Contaminated Containers or Packaging

Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 14 - Transportation Information * * *

Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Gasoline, motor fuel	86290-81-5	DOT regulated marine pollutant

DOT Information

Shipping Name: Gasoline
UN #: 1203 **Hazard Class:** 3 **Packing Group:** II
Placard:

* * * Section 15 - Regulatory Information * * *

Regulatory Information

A: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Toluene (108-88-3)
SARA 313: 1.0 % de minimis concentration
CERCLA: 1000 lb final RQ; 454 kg final RQ

Xylenes (o-, m-, p- isomers) (1330-20-7)
SARA 313: 1.0 % de minimis concentration
CERCLA: 100 lb final RQ; 45.4 kg final RQ

Benzene, 1,2,4-trimethyl- (95-63-6)
SARA 313: 1.0 % de minimis concentration

Ethylbenzene (100-41-4)
SARA 313: 0.1 % de minimis concentration
CERCLA: 1000 lb final RQ; 454 kg final RQ

Benzene (71-43-2)
SARA 313: 0.1 % de minimis concentration
CERCLA: 10 lb final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule); 4.54 kg final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule)

Hexane (110-54-3)

SARA 313: 1.0 % de minimis concentration
CERCLA: 5000 lb final RQ; 2270 kg final RQ

SARA Section 311/312 – Hazard Classes

Acute Health	Chronic Health	Fire	Sudden Release of Pressure	Reactive
X	X	X	--	--

Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Gasoline, motor fuel	86290-81-5	DOT regulated marine pollutant

State Regulations

Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	**CAS**	**CA**	**MA**	**MN**	**NJ**	**PA**	**RI**
Gasoline, motor fuel	86290-81-5	No	No	No	No	Yes	No
Toluene	108-88-3	Yes	Yes	Yes	Yes	Yes	No
Butane	106-97-8	Yes	Yes	Yes	Yes	Yes	No
Xylenes (o-, m-, p- isomers)	1330-20-7	Yes	Yes	Yes	Yes	Yes	No
Benzene, 1,2,4-trimethyl-	95-63-6	No	Yes	Yes	Yes	Yes	No
Ethyl alcohol	64-17-5	Yes	Yes	Yes	Yes	Yes	No
Ethylbenzene	100-41-4	Yes	Yes	Yes	Yes	Yes	No
Benzene	71-43-2	Yes	Yes	Yes	Yes	Yes	No
Hexane	110-54-3	No	Yes	Yes	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.
WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Toluene	108-88-3	1 %
Butane	106-97-8	1 %
Benzene, 1,2,4-trimethyl-	95-63-6	0.1 %
Ethyl alcohol	64-17-5	0.1 %
Ethylbenzene	100-41-4	0.1 %
Benzene	71-43-2	0.1 %
Hexane	110-54-3	1 %

Additional Regulatory Information

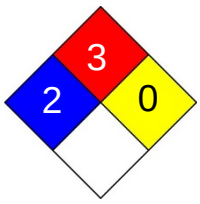
Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Gasoline, motor fuel	86290-81-5	No	DSL	EINECS
Toluene	108-88-3	Yes	DSL	EINECS
Butane	106-97-8	Yes	DSL	EINECS
Xylenes (o-, m-, p- isomers)	1330-20-7	Yes	DSL	EINECS
Benzene, 1,2,4-trimethyl-	95-63-6	Yes	DSL	EINECS
Ethyl alcohol	64-17-5	Yes	DSL	EINECS
Ethylbenzene	100-41-4	Yes	DSL	EINECS
Benzene	71-43-2	Yes	DSL	EINECS
Hexane	110-54-3	Yes	DSL	EINECS

* * * Section 16 - Other Information * * *

NFPA® Hazard Rating

Health	2
Fire	3
Reactivity	0



HMIS® Hazard Rating

Health	2	Moderate
Fire	3	Serious
Physical	0	Minimal
		*Chronic

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration., NJTSR = New Jersey Trade Secret Registry.

Literature References

None

Other Information

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

End of Sheet

Safety Data Sheet

Material Name: Fuel Oil No. 2

SDS No. 0088
EU/CLP GHS

Synonyms: #2 Heating Oil; 2 Oil; Off-road Diesel Fuel

* * * Section 1 - Product and Company Identification * * *

Manufacturer Information

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

Phone: 732-750-6000 Corporate EHS
Emergency # 800-424-9300 CHEMTREC
www.hess.com (Environment, Health, Safety Internet Website)

* * * Section 2 - Hazards Identification * * *

GHS Classification:

Flammable Liquids - Category 3
Acute Toxicity, Inhalation - Category 4
Skin Corrosion/Irritation – Category 2
Eye Damage/Irritation – Category 2
Carcinogenicity - Category 2
Specific Target Organ Toxicity (Single Exposure) – Category 3 (respiratory irritation, narcosis)
Aspiration Hazard – Category 1
Hazardous to the Aquatic Environment, Acute Hazard – Category 3

GHS LABEL ELEMENTS

Symbol(s)

Signal Word

DANGER

Hazard Statements

Flammable liquid and vapor.
Harmful if inhaled.
Causes skin irritation.
Causes eye irritation.
Suspected of causing cancer.
Suspected of causing genetic defects.
May cause respiratory irritation.
May cause drowsiness or dizziness.
May be fatal if swallowed and enters airways.
Harmful to aquatic life.

Precautionary Statements

Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Wear protective gloves/protective clothing/eye protection/face protection.
Avoid breathing fume/mist/vapors/spray.
Use only outdoors or in a well-ventilated area.
Wash hands and forearms thoroughly after handling.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Avoid release to the environment.

Response

In case of fire: Use water spray, fog or foam.
If on skin (or hair): Wash with plenty of soap and water. Take off immediately all contaminated clothing and wash it before reuse. If skin irritation occurs, get medical advice/attention.
If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center or doctor if you feel unwell.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
If exposed or concerned: Get medical advice/attention.
If swallowed: Immediately all a poison center or doctor/physician if you feel unwell. Do NOT induce vomiting.

Storage

Store in a well ventilated place.
Keep cool. Keep container tightly closed.
Store locked up.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
68476-30-2	Fuel oil No. 2	100
91-20-3	Naphthalene	<0.1

A complex combination of hydrocarbons with carbon numbers in the range C9 and higher produced from the distillation of petroleum crude oil.

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

First Aid: Skin

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops.

First Aid: Ingestion

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

First Aid: Inhalation

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

See Section 9 for Flammability Properties.

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

Hazardous Combustion Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, or gaseous extinguishing agent.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

Unsuitable Extinguishing Media

None

Fire Fighting Equipment/Instructions

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment. Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

* * * Section 6 - Accidental Release Measures * * *

Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

Materials and Methods for Clean-Up

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal.

Emergency Measures

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

Environmental Precautions

Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Prevention of Secondary Hazards

None

* * * Section 7 - Handling and Storage * * *

Handling Procedures

Handle as a combustible liquid. Keep away from heat, sparks, excessive temperatures and open flame! No smoking or open flame in storage, use or handling areas. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when this product is loaded into tanks previously containing low flash point products (such as gasoline) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

Storage Procedures

Keep containers closed and clearly labeled. Use approved vented storage containers. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks."

Incompatibilities

Keep away from strong oxidizers; Fluorel ®

* * * Section 8 - Exposure Controls / Personal Protection * * *

Component Exposure Limits

Fuel oil No. 2 (270-671-4)

ACGIH: 100 mg/m3 TWA (inhalable fraction and vapor, as total hydrocarbons, listed under Diesel fuel)
Skin - potential significant contribution to overall exposure by the cutaneous route (listed under Diesel fuel)

Belgium: 100 mg/m3 TWA (as total hydrocarbon, aerosol and vapor)
Skin (listed under Gas oil)

Portugal: 100 mg/m3 TWA [VLE-MP] (aerosol and vapor, as total Hydrocarbons, listed under Fuel diesel)

Naphthalene (202-049-5)

ACGIH: 15 ppm STEL
10 ppm TWA
Skin - potential significant contribution to overall exposure by the cutaneous route

Austria: 10 ppm TWA [TMW]; 50 mg/m3 TWA [TMW]
skin notation

Belgium: 15 ppm STEL; 80 mg/m3 STEL
10 ppm TWA; 53 mg/m3 TWA
Skin

Denmark: 10 ppm TWA; 50 mg/m3 TWA

Finland: 2 ppm STEL; 10 mg/m3 STEL
1 ppm TWA; 5 mg/m3 TWA

France: 10 ppm TWA [VME]; 50 mg/m3 TWA [VME]

Germany: 0.1 ppm TWA AGW (The risk of damage to the embryo or fetus can be excluded when MAK and BAT values are observed, inhalable fraction, exposure factor 1); 0.5 mg/m3 TWA AGW (The risk of damage to the embryo or fetus can be excluded when MAK and BAT values are observed, inhalable fraction, exposure factor 1)

Greece: 10 ppm TWA; 50 mg/m3 TWA

Ireland: 15 ppm STEL; 75 mg/m3 STEL
10 ppm TWA; 50 mg/m3 TWA

Netherlands: 80 mg/m3 STEL
50 mg/m3 TWA

Portugal: 10 ppm TWA [VLE-MP]

Spain: 15 ppm STEL [VLA-EC]; 80 mg/m3 STEL [VLA-EC]
10 ppm TWA [VLA-ED]; 53 mg/m3 TWA [VLA-ED]
skin - potential for cutaneous exposure

Sweden: 10 ppm LLV; 50 mg/m3 LLV
15 ppm STV; 80 mg/m3 STV

Engineering Measures

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

Personal Protective Equipment: Respiratory

A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

Personal Protective Equipment: Hands

Gloves constructed of nitrile, neoprene, or PVC are recommended.

Personal Protective Equipment: Eyes

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

Personal Protective Equipment: Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

* * * Section 9 - Physical & Chemical Properties * * *

Appearance:	Red or reddish/orange colored (dyed)	**Odor:**	Mild, petroleum distillate odor
Physical State:	Liquid	**pH:**	ND
Vapor Pressure:	0.009 psia @ 70 °F (21 °C)	**Vapor Density:**	>1.0
Boiling Point:	340 to 700 °F (171 to 371 °C)	**Melting Point:**	ND
Solubility (H2O):	Negligible	**Specific Gravity:**	AP 0.823-0871
Evaporation Rate:	Slow; varies with conditions	**VOC:**	ND
Octanol/H2O Coeff.:	ND	**Flash Point:**	100 °F (38 °C) minimum
Flash Point Method:	PMCC	**Upper Flammability Limit (UFL):**	7.5
Lower Flammability Limit (LFL):	0.6	**Burning Rate:**	ND
Auto Ignition:	494°F (257°C)		

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

Incompatible Products

Keep away from strong oxidizers; Fluorel ®

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

A: General Product Information

Harmful if swallowed.

B: Component Analysis - LD50/LC50

Fuel oil No. 2 (68476-30-2)

Oral LD50 Rat 12 g/kg; Dermal LD50 Rabbit 4720 µL/kg; Dermal LD50 Rabbit >2000 mg/kg; Inhalation LC50 Rat 4.6 mg/L 4 h

Naphthalene (91-20-3)

Inhalation LC50 Rat >340 mg/m3 1 h; Oral LD50 Rat 490 mg/kg; Dermal LD50 Rat >2500 mg/kg; Dermal LD50 Rabbit >20 g/kg

Product Mixture

Oral LD50 Rat 14.5 ml/kg; Dermal LD50 Rabbit >5 mL/kg; Guinea Pig Sensitization: negative; Primary dermal irritation: moderately irritating (Draize mean irritation score - 3.98 rabbits); Draize eye irritation: mildly irritating (Draize score, 48 hours, unwashed - 2.0 rabbits)

Potential Health Effects: Skin Corrosion Property/Stimulativeness

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

Potential Health Effects: Eye Critical Damage/ Stimulativeness

Contact with eyes may cause mild irritation.

Potential Health Effects: Ingestion

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

Potential Health Effects: Inhalation

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

Generative Cell Mutagenicity

This product is not reported to have any mutagenic effects. Material of similar composition has been positive in a mutagenicity study.

Carcinogenicity

A: General Product Information

Suspected of causing cancer.

Dermal carcinogenicity: positive - mice

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

This product is similar to Diesel Fuel. IARC classifies whole diesel fuel exhaust particulates as probably carcinogenic to humans (Group 2A) and NIOSH regards it as a potential cause of occupational lung cancer based on animal studies and limited evidence in humans.

B: Component Carcinogenicity

Fuel oil No. 2 (68476-30-2)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed under Diesel fuel)

Naphthalene (91-20-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)
IARC: Monograph 82 [2002] (Group 2B (possibly carcinogenic to humans))

Reproductive Toxicity

This product is not reported to have any reproductive toxicity effects.

Specified Target Organ General Toxicity: Single Exposure

This product is not reported to have any specific target organ general toxicity single exposure effects.

Specified Target Organ General Toxicity: Repeated Exposure

This product is not reported to have any specific target organ general toxicity repeat exposure effects.

Aspiration Respiratory Organs Hazard

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

Very toxic to aquatic life with long lasting effects. Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Fuel oil No. 2 (68476-30-2)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	35 mg/L [flow-through]	

Naphthalene (91-20-3)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	5.74-6.44 mg/L [flow-through]	
96 Hr LC50 Oncorhynchus mykiss	1.6 mg/L [flow-through]	

96 Hr LC50 Oncorhynchus mykiss	0.91-2.82 mg/L [static]
96 Hr LC50 Pimephales promelas	1.99 mg/L [static]
96 Hr LC50 Lepomis macrochirus	31.0265 mg/L [static]
72 Hr EC50 Skeletonema costatum	0.4 mg/L
48 Hr LC50 Daphnia magna	2.16 mg/L
48 Hr EC50 Daphnia magna	1.96 mg/L [Flow through]
48 Hr EC50 Daphnia magna	1.09 - 3.4 mg/L [Static]

Persistence/Degradability
No information available.

Bioaccumulation
No information available.

Mobility in Soil
No information available.

* * * Section 13 - Disposal Considerations * * *

Waste Disposal Instructions
See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

Disposal of Contaminated Containers or Packaging
Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 14 - Transportation Information * * *

IATA Information
Shipping Name: Heating oil, light
UN #: 1202 **Hazard Class:** 3 **Packing Group:** III

ICAO Information
Shipping Name: Heating oil, light
UN #: 1202 **Hazard Class:** 3 **Packing Group:** III

IMDG Information
Shipping Name: Heating oil, light
UN #: 1202 **Hazard Class:** 3 **Packing Group:** III

* * * Section 15 - Regulatory Information * * *

Regulatory Information

Component Analysis – Inventory

Component/CAS	EC #	EEC	CAN	TSCA
Fuel oil No. 2 68476-30-2	270-671-4	EINECS	DSL	Yes
Naphthalene 91-20-3	202-049-5	EINECS	DSL	Yes

* * * Section 16 - Other Information * * *

Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; ADG = Australian Code for the Transport of Dangerous Goods by Road and Rail; ADR/RID = European Agreement of Dangerous Goods by Road/Rail; AS = Standards Australia; DFG = Deutsche Forschungsgemeinschaft; DOT = Department of Transportation; DSL = Domestic Substances List; EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; ELINCS = European List of Notified Chemical Substances; EU = European Union; HMIS = Hazardous Materials Identification System; IARC = International Agency for Research on Cancer; IMO = International Maritime Organization; IATA = International Air Transport Association; MAK = Maximum Concentration Value in the Workplace; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NOHSC = National Occupational Health & Safety Commission; NTP = National Toxicology Program; STEL = Short-term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average

Literature References

None

Other Information

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

End of Sheet

APPENDIX B:

Training Certificates

Certificate of Completion

This is to certify that

William Canavan

Has completed

HAZWOPER 8 hr Annual Refresher

Completion Date: 05/03/2018

Course Duration: 8.0

360training.com

6801 N Capital of Texas Hwy, Suite 150 ♦ Austin, TX 78731 ♦ 877.881.2235 ♦ www.360training.com

ISHM Institute for Safety and Health Management

360training.com

This certifies that the person named below successfully completed a

ISHM

William Canavan

HAZWOPER 8 hr Annual Refresher

Matthew Lumen — Trainer Name

05/03/2018 — Completed

(FOLD)

This is your pocket card which may be used for proof of completion of your training. This training is intended to provide supervisor awareness for recognizing and preventing hazards on a construction site. Workers must receive additional training as required for the specific hazards of their job or federal, state, and local requirements.

ISHM

Questions? Visit www.oshacampus.com

safety@oshacampus.com

877.881.2235

(CUT HERE)

NATIONAL ENVIRONMENTAL TRAINERS

Certificate of Completion

Jonathan Ashley

has satisfactorily passed an exam and completed an 8-hour annual refresher training course entitled

Hazardous Waste Operations and Emergency Response

meeting the requirements identified in Title 29 CFR 1910.120.

This course has been awarded 1.34 Industrial Hygiene CM Points by the American Board of Industrial Hygiene-Approval Number 13334. This course is also eligible for .66 Continuance of Certification (COC) points from the Board of Certified Safety Professionals.

Signature of Instructor

NATIONAL ENVIRONMENTAL TRAINERS Inc.®

07/27/2017

Certificate Number: 832155

www.nationalenvironmentaltrainers.com

Clay A. Bednarz, MS, RPIH

The Official Site of Environmental Health & Safety Training®

USF HEALTH

OSHA TRAINING INSTITUTE EDUCATION CENTER

STEVEN VERDIBELLO

has diligently and with merit completed training in

Hazwoper 8hr Refresher Course

on **1/22/2018** from the USF OTI Education Center.

Deborah Sutherland, PhD

Deborah Sutherland, PhD
Associate Vice President USF Health
Associate Dean College of Medicine
Continuing Professional Development

Robert E. Nesbit

Robert E. Nesbit, CWCP
Program Manager
USF OTI Education Center

USF HEALTH

OSHA TRAINING INSTITUTE EDUCATION CENTER

PATRICK MONTUORI

has diligently and with merit completed training in

Hazwoper 8hr Refresher Course

on 1/4/2018 from the USF OTI Education Center.

Deborah Sutherland, PhD

Deborah Sutherland, PhD
Associate Vice President USF Health
Associate Dean College of Medicine
Continuing Professional Development

Robert E. Nesbit

Robert E. Nesbit, CWCP
Program Manager
USF OTI Education Center

USF HEALTH

OSHA TRAINING INSTITUTE EDUCATION CENTER

MICHAEL SCOTT

has diligently and with merit completed training in

Hazwoper 8hr Refresher Course

on **1/22/2018** from the USF OTI Education Center.

Deborah Sutherland, PhD

Deborah Sutherland, PhD
Associate Vice President USF Health
Associate Dean College of Medicine
Continuing Professional Development

Robert E Nesbit

Robert E. Nesbit, CWCP
Program Manager
USF OTI Education Center

USF HEALTH

OSHA TRAINING INSTITUTE EDUCATION CENTER

DYLAN SCHUCK

has diligently and with merit completed training in

Hazwoper 8hr Refresher Course

on 1/4/2018 from the USF OTI Education Center.

Deborah Sutherland, PhD

Deborah Sutherland, PhD
Associate Vice President USF Health
Associate Dean College of Medicine
Continuing Professional Development

Robert E. Nesbit

Robert E. Nesbit, CWCP
Program Manager
USF OTI Education Center

APPENDIX C:

Notice of Safe Atmosphere
Air Monitoring Daily Report

NOTICE OF SAFE ATMOSPHERE

Date:_____

Time of Report:_____

Prepared By:_____

This notice is to be provided to any requesting oversight party to track the on-site air monitoring services.

During today's activities, the air monitoring services noted an unsafe atmosphere related to the following:

_____
_____

After the notice of unsafe atmosphere, the following actions were instituted to return the noted airspace to "safe" conditions:

_____
_____

The following monitoring data shows the impacted air is now safe:

Monitored Constituent	EZ	CRZ	SZ
Oxygen (ppm)			
% LEL			
VOCs (ppm)			
Dust			

_____ _____
William A. Canavan, HES Date

_____ _____
Steven M. Verdibello Date

AIR MONITORING DAILY REPORT

Date:_____

Time of Report:_____

Prepared By:_____

This notice is to be provided to any requesting oversight party to track the on-site air monitoring services.

During today's activities, air monitoring services monitored the airspace in the support zone (SZ), contaminant reduction zone (CRZ) and the exclusion zone (EZ).

During today's activities, the following conditions were noted:

_____

_____

The data in the table below is the summary of the finding of the air monitoring that was performed:

0600 hrs:

Monitored Constituent	EZ	CRZ	SZ
Oxygen (ppm)			
% LEL			
VOCs (ppm)			
Dust			

0700 hrs:

Monitored Constituent	EZ	CRZ	SZ
Oxygen (ppm)			
% LEL			
VOCs (ppm)			
Dust			

0800 hrs:

Monitored Constituent	EZ	CRZ	SZ
Oxygen (ppm)			
% LEL			
VOCs (ppm)			
Dust			

0900 hrs:

Monitored Constituent	EZ	CRZ	SZ
Oxygen (ppm)			
% LEL			
VOCs (ppm)			
Dust			

1000 hrs:

Monitored Constituent	EZ	CRZ	SZ
Oxygen (ppm)			
% LEL			
VOCs (ppm)			
Dust			

1100 hrs:

Monitored Constituent	EZ	CRZ	SZ
Oxygen (ppm)			
% LEL			
VOCs (ppm)			
Dust			

1200 hrs:

Monitored Constituent	EZ	CRZ	SZ
Oxygen (ppm)			
% LEL			
VOCs (ppm)			
Dust			

1300 hrs:

Monitored Constituent	EZ	CRZ	SZ
Oxygen (ppm)			
% LEL			
VOCs (ppm)			
Dust			

1400 hrs:

Monitored Constituent	EZ	CRZ	SZ
Oxygen (ppm)			
% LEL			
VOCs (ppm)			
Dust			

1500 hrs:

Monitored Constituent	EZ	CRZ	SZ
Oxygen (ppm)			
% LEL			
VOCs (ppm)			
Dust			

1600 hrs:

Monitored Constituent	EZ	CRZ	SZ
Oxygen (ppm)			
% LEL			
VOCs (ppm)			
Dust			

1700 hrs:

Monitored Constituent	EZ	CRZ	SZ
Oxygen (ppm)			
% LEL			
VOCs (ppm)			
Dust			

The following air monitoring equipment problems were noted today:

_____

_____

_____ _____

William A. Canavan, HES Date

_____ _____

Steven M. Verdibello Date

APPENDIX D:

NYSDOH Generic
Community Air Monitoring Plan

New York State Department of Health
Generic Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical-specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate NYSDEC/NYSDOH staff.

Continuous monitoring will be required for all <u>ground intrusive</u> activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a **continuous** basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone 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 shutdown.

All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored **continuously** at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 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 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

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

June 20, 2000

C:\Documents and Settings\ajd03\Desktop\BEEI-info\GCAMPR1.DOC

APPENDIX E:

Emergency Telephone Numbers Listing

Routes to the Hospitals

EMERGENCY TELEPHONE NUMBERS

DIAL 911 FOR ANY POLICE, FIRE, OR MEDICAL EMERGENCY!!!

THE FOLLOWING TELEPHONE NUMBERS ARE TO BE USED AS A SECONDARY SOURCE

POLICE DEPARTMENTS:

Pleasantville Police: (914) 769-1500
(80 Wheeler Ave, Pleasantville, NY)

State Police: (914) 769-2600
(200 Bradhurst Avenue, Hawthorne NY)

FIRE DEPARTMENTS & AMBULANCE CALLS:

Pleasantville Fire Headquarters: (914) 769-9741
(75 Washington Ave, Pleasantville, NY)

Pleasantville Ambulance Corps.: (914) 769-9299 (non-emergency)
(30 Gramercy Pl, Pleasantville, NY)

HOSPITAL (SEE DRIVING DIRECTIONS ATTACHED):

Phelps Hospital (914) 366-3000 (Main Switchboard)
701 North Broadway
Sleepy Hollow, NY 10591

FOR SPILLS OR HAZARDOUS MATERIALS INCIDENTS USE THESE NUMBERS

REGULATORY AGENCIES:

NYSDEC (800) 457-7362
(Spill Hotline)

Westchester County Health Department (914) 813-5000
(General #)

Driving Directions to
Phelps Hospital
Sleepy Hollow, New York

(914) 366-3000

Start: 52 Depew Street
Pleasantville, New York 10570

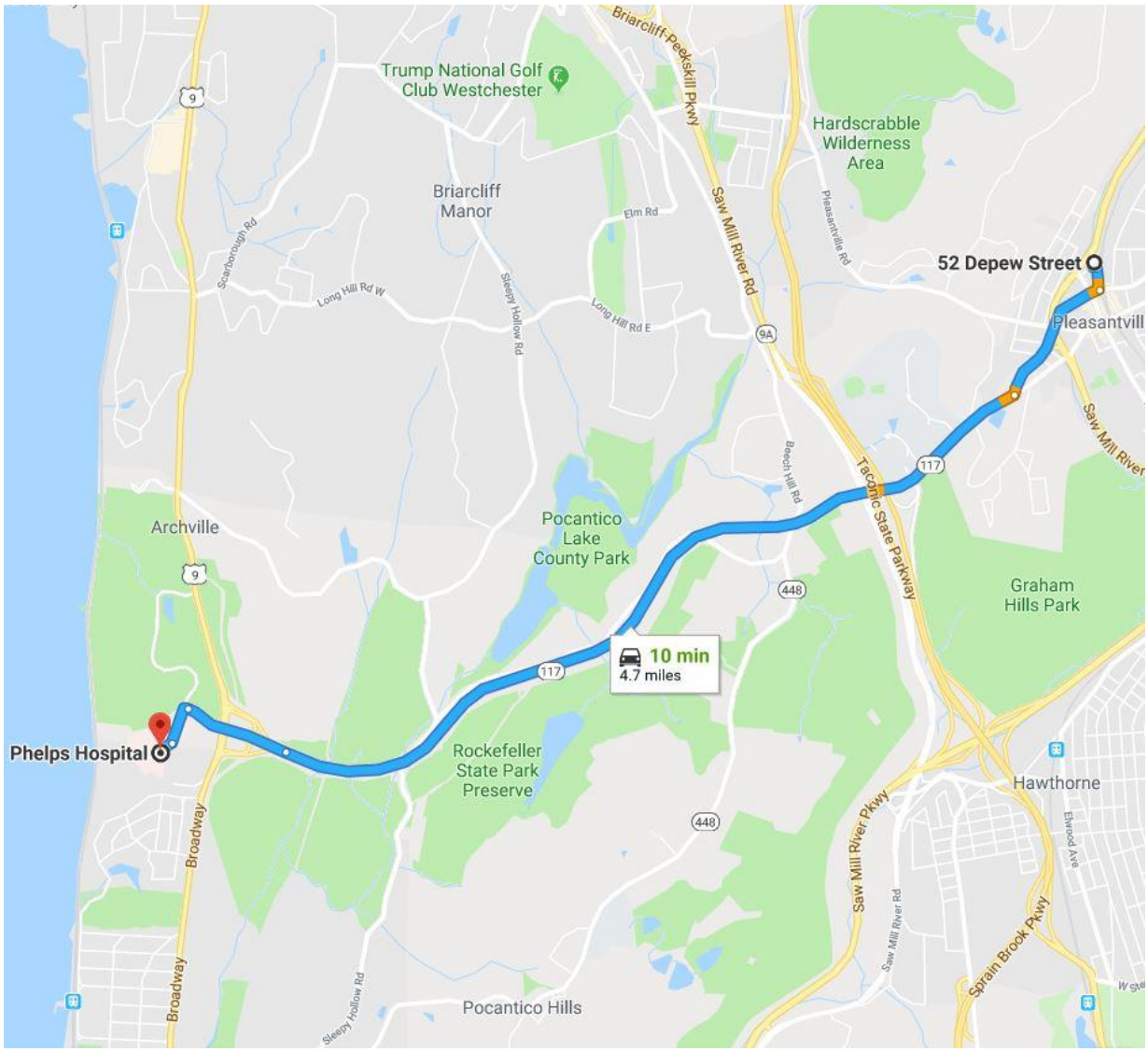
End: 701 North Broadway
Sleepy Hollow, New York 10591

	Directions	Distance
1.	Head East on Depew St. toward Vanderbilt Ave.	85 ft.
2	Depew Street turns right and becomes Vanderbilt Ave.	469 feet
3.	Turn right onto NY-117 S/Manville Rd.	0.6 miles
4.	Turn right onto NY-117 S	3.4 miles
5.	Keep left to continue on Phelps Way	0.4 miles
6.	Turn left onto Hospital Access Road	0.2 miles
7.	Turn right	72 feet

Total Estimated Time: 10 minutes Total Distance: 4.7 miles

HydroEnvironmental
SOLUTIONS, INC.
One Deans Bridge Road Somers, New York 10589
(914) 276 - 2560 Fax: (914) 276 - 2664

Travel Route Map from Site to Hospital



HydroEnvironmental SOLUTIONS, INC.
One Deans Bridge Road Somers, New York 10589
(914) 276 - 2560 Fax: (914) 276 - 2664

APPENDIX 4:

Summary Tables of Proposed Analyses

52 Depew Street
Pleasantville, New York
BCP Site No. C360178

Summary of Soil Laboratory Analytical Methods

Sample ID York ID Sampling Date Client Matrix Compound	NYSDEC Part 375 Unrestricted Use Soil Cleanup Objectives	Proposed Reporting Limit (mg/Kg)
Volatile Organics, 8260 List	mg/Kg	mg/Kg
1,1,1,2-Tetrachloroethane	~	0.00280
1,1,1-Trichloroethane	0.68	0.00280
1,1,2,2-Tetrachloroethane	~	0.00280
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	~	0.00280
1,1,2-Trichloroethane	~	0.00280
1,1-Dichloroethane	0.27	0.00280
1,1-Dichloroethylene	0.33	0.00280
1,1-Dichloropropylene	~	0.00280
1,2,3-Trichlorobenzene	~	0.00280
1,2,3-Trichloropropane	~	0.00280
1,2,4-Trichlorobenzene	3.6	0.00280
1,2,4-Trimethylbenzene	~	0.00280
1,2-Dibromo-3-chloropropane	~	0.00280
1,2-Dibromoethane	~	0.00280
1,2-Dichlorobenzene	1.1	0.00280
1,2-Dichloroethane	0.02	0.00280
1,2-Dichloropropane	~	0.00280
1,3,5-Trimethylbenzene	8.4	0.00280
1,3-Dichlorobenzene	2.4	0.00280
1,3-Dichloropropane	~	0.00280
1,4-Dichlorobenzene	1.8	0.00280
1,4-Dioxane	0.1	0.0550
2,2-Dichloropropane	~	0.00280
2-Butanone	0.12	0.00280
2-Chlorotoluene	~	0.00280
4-Chlorotoluene	~	0.00280
Acetone	0.05	0.00550
Allyl chloride	~	0.00280
Benzene	~	0.00280
Bromobenzene	~	0.00280
Bromochloromethane	~	0.00280
Bromodichloromethane	~	0.00280
Bromoform	~	0.00280
Bromomethane	~	0.00280
Carbon tetrachloride	0.76	0.00280
Chlorobenzene	1.1	0.00280
Chloroethane	~	0.00280
Chloroform	0.37	0.00280
Chloromethane	~	0.00280
cis-1,2-Dichloroethylene	0.25	0.00280
cis-1,3-Dichloropropylene	~	0.00280
Dibromochloromethane	~	0.00280
Dibromomethane	~	0.00280
Dichlorodifluoromethane	~	0.00280

Summary of Soil Laboratory Analytical Methods

Sample ID York ID Sampling Date Client Matrix **Compound**	NYSDEC Part 375 Unrestricted Use Soil Cleanup Objectives	Proposed Reporting Limit (mg/Kg)
Ethyl Benzene	1	0.00280
Hexachlorobutadiene	~	0.00280
Isopropylbenzene	~	0.00280
Methyl tert-butyl ether (MTBE)	0.93	0.00280
Methylene chloride	0.05	0.00550
Naphthalene	~	0.00280
n-Butylbenzene	12	0.00280
n-Propylbenzene	3.9	0.00280
o-Xylene	~	0.00280
p- & m- Xylenes	~	0.00550
p-Isopropyltoluene	~	0.00280
sec-Butylbenzene	11	0.00280
Styrene	~	0.00280
tert-Butylbenzene	~	0.00280
Tetrachloroethylene	1.3	0.00280
Toluene	0.7	0.00280
trans-1,2-Dichloroethylene	0.19	0.00280
trans-1,3-Dichloropropylene	~	0.00280
Trichloroethylene	0.47	0.00280
Trichlorofluoromethane	~	0.00280
Vinyl acetate	~	0.00280
Vinyl Chloride	0.02	0.00280
Xylenes, Total	0.26	0.00830
Semi-Volatiles, 8270 Target List	mg/Kg	mg/Kg
1,2,4-Trichlorobenzene	~	0.0463
1,2-Dichlorobenzene	~	0.0463
1,3-Dichlorobenzene	2.4	0.0463
1,4-Dichlorobenzene	1.8	0.0463
2,4,5-Trichlorophenol	~	0.0463
2,4,6-Trichlorophenol	~	0.0463
2,4-Dichlorophenol	~	0.0463
2,4-Dimethylphenol	~	0.0463
2,4-Dinitrophenol	~	0.0924
2,4-Dinitrotoluene	~	0.0463
2,6-Dinitrotoluene	~	0.0463
2-Chloronaphthalene	~	0.0463
2-Chlorophenol	~	0.0463
2-Methylnaphthalene	~	0.0463
2-Methylphenol	0.33	0.0463
2-Nitroaniline	~	0.0924
2-Nitrophenol	~	0.0463
3- & 4-Methylphenols	~	0.0463
3,3-Dichlorobenzidine	~	0.0463
3-Nitroaniline	~	0.0924
4,6-Dinitro-2-methylphenol	~	0.0924

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Summary of Soil Laboratory Analytical Methods

Sample ID York ID Sampling Date Client Matrix Compound	NYSDEC Part 375 Unrestricted Use Soil Cleanup Objectives	Proposed Reporting Limit (mg/Kg)
4-Bromophenyl phenyl ether	~	0.0463
4-Chloro-3-methylphenol	~	0.0463
4-Chloroaniline	~	0.0463
4-Chlorophenyl phenyl ether	~	0.0463
4-Nitroaniline	~	0.0924
4-Nitrophenol	~	0.0924
Acenaphthene	20	0.0463
Acenaphthylene	100	0.0463
Aniline	~	0.185
Anthracene	~	0.0463
Benzo(a)anthracene	1	0.232
Benzo(a)pyrene	1	0.0463
Benzo(b)fluoranthene	1	0.232
Benzo(g,h,i)perylene	100	0.0463
Benzo(k)fluoranthene	0.8	0.232
Benzyl alcohol	~	0.0463
Benzyl butyl phthalate	~	0.0463
Bis(2-chloroethoxy)methane	~	0.0463
Bis(2-chloroethyl)ether	~	0.0463
Bis(2-chloroisopropyl)ether	~	0.0463
Bis(2-ethylhexyl)phthalate	~	0.0463
Chrysene	1	0.232
Dibenzo(a,h)anthracene	0.33	0.0463
Dibenzofuran	7	0.0463
Diethyl phthalate	~	0.0463
Dimethyl phthalate	~	0.0463
Di-n-butyl phthalate	~	0.0463
Di-n-octyl phthalate	~	0.0463
Fluoranthene	100	0.232
Fluorene	30	0.0463
Hexachlorobenzene	0.33	0.0463
Hexachlorobutadiene	~	0.0463
Hexachlorocyclopentadiene	~	0.0463
Hexachloroethane	~	0.0463
Indeno(1,2,3-cd)pyrene	0.5	0.0463
Isophorone	~	0.0463
Naphthalene	12	0.0463
Nitrobenzene	~	0.0463
N-Nitrosodimethylamine	~	0.0463
N-nitroso-di-n-propylamine	~	0.0463
N-Nitrosodiphenylamine	~	0.0463
Pentachlorophenol	0.8	0.0463
Phenanthrene	100	0.232
Phenol	0.33	0.0463
Pyrene	100	7.700

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Summary of Soil Laboratory Analytical Methods

Sample ID York ID Sampling Date Client Matrix **Compound**	**NYSDEC Part 375 Unrestricted Use Soil Cleanup Objectives**	**Proposed Reporting Limit (mg/Kg)**
Pyridine	~	0.185
Pesticides, 8081 target list	mg/Kg	mg/Kg
4,4'-DDD	0.0033	0.00183
4,4'-DDE	0.0033	0.00183
4,4'-DDT	0.0033	0.00183
Aldrin	0.005	0.00183
alpha-BHC	0.02	0.00183
alpha-Chlordane	0.094	0.00183
beta-BHC	0.036	0.00183
Chlordane, total	~	0.0366
delta-BHC	0.04	0.00183
Dieldrin	0.005	0.00183
Endosulfan I	2.4	0.00183
Endosulfan II	2.4	0.00183
Endosulfan sulfate	2.4	0.00183
Endrin	0.014	0.00183
Endrin aldehyde	~	0.00183
Endrin ketone	~	0.00183
gamma-BHC (Lindane)	0.1	0.00183
gamma-Chlordane	~	0.00183
Heptachlor	0.042	0.00183
Heptachlor epoxide	~	0.00183
Methoxychlor	~	0.00914
Toxaphene	~	0.0925
Metals, Target Analyte	mg/Kg	mg/Kg
Aluminum	~	5.54
Antimony	~	0.554
Arsenic	13	1.110
Barium	350	1.110
Beryllium	~	0.111
Cadmium	2.5	0.332
Calcium	~	5.54
Chromium	30	0.554
Cobalt	~	0.554
Copper	~	0.554
Iron	~	2.22
Lead	63	0.332
Magnesium	~	5.54
Manganese	~	0.554
Nickel	~	0.554
Potassium	~	5.54
Selenium	3.9	1.110
Silver	2	0.554
Sodium	~	11.1
Thallium	~	1.110

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Sample ID York ID Sampling Date Client Matrix Compound	NYSDEC Part 375 Unrestricted Use Soil Cleanup Objectives	Proposed Reporting Limit (mg/Kg)
Vanadium	~	1.110
Zinc	~	1.110
Mercury by 7473	mg/Kg	mg/Kg
Mercury	0.18	0.033
Herbicides, Target List	mg/Kg	mg/Kg
2,4,5-T	~	0.0222
2,4,5-TP (Silvex)	3.8	0.0222
2,4-D	~	0.0222
Polychlorinated Biphenyls (PCB)	mg/Kg	mg/Kg
Aroclor 1016	~	0.0185
Aroclor 1221	~	0.0185
Aroclor 1232	~	0.0185
Aroclor 1242	~	0.0185
Aroclor 1248	~	0.0185
Aroclor 1254	~	0.0185
Aroclor 1260	~	0.0185
Total PCBs	0.1	0.0185
PFAS	µg/Kg	µg/Kg
PFAS	~	1

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Summary of Groundwater Laboratory Analytical Methods

Compound	CAS Number	Proposed Reporting Limit (ug/L)	NYSDEC-TOGS (ug/L)
Volatile Organics, 8260 List - Low Level			
1,1,1,2-Tetrachloroethane	630-20-6	0.200	5
1,1,1-Trichloroethane	71-55-6	0.200	5
1,1,2,2-Tetrachloroethane	79-34-5	0.200	5
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113	76-13-1	0.200	5
1,1,2-Trichloroethane	79-00-5	0.200	1
1,1-Dichloroethane	75-34-3	0.200	5
1,1-Dichloroethylene	75-35-4	0.200	5
1,1-Dichloropropylene	563-58-6	0.200	5
1,2,3-Trichlorobenzene	87-61-6	0.200	5
1,2,3-Trichloropropane	96-18-4	0.200	0.04
1,2,4,5-Tetramethylbenzene	95-93-2	4.300	~
1,2,4-Trichlorobenzene	120-82-1	0.200	5
1,2,4-Trimethylbenzene	95-63-6	0.480	5
1,2-Dibromo-3-chloropropane	96-12-8	0.200	0.04
1,2-Dibromoethane	106-93-4	0.200	0.0006
1,2-Dichlorobenzene	95-50-1	0.200	3
1,2-Dichloroethane	107-06-2	0.200	0.6
1,2-Dichloropropane	78-87-5	0.200	1
1,3,5-Trimethylbenzene	108-67-8	0.200	5
1,3-Dichlorobenzene	541-73-1	0.200	3
1,3-Dichloropropane	142-28-9	0.200	5
1,4-Dichlorobenzene	106-46-7	0.200	3
2,2-Dichloropropane	594-20-7	0.200	5
2-Butanone	78-93-3	0.470	50
2-Chlorotoluene	95-49-8	0.200	5
2-Hexanone	591-78-6	0.200	50
4-Chlorotoluene	106-43-4	0.200	5
4-Methyl-2-pentanone	108-10-1	0.200	~
Acetone	67-64-1	7.300	50
Benzene	71-43-2	0.200	1
Bromobenzene	108-86-1	0.200	5
Bromochloromethane	74-97-5	0.200	5
Bromodichloromethane	75-27-4	0.200	50
Bromoform	75-25-2	0.200	50
Bromomethane	74-83-9	0.200	5
Carbon disulfide	75-15-0	0.200	~
Carbon tetrachloride	56-23-5	0.200	5
Chlorobenzene	108-90-7	0.200	5
Chloroethane	75-00-3	0.200	5
Chloroform	67-66-3	0.200	7
Chloromethane	74-87-3	0.200	5
cis-1,2-Dichloroethylene	156-59-2	0.260	5
cis-1,3-Dichloropropylene	10061-01-5	0.200	0.4
Dibromochloromethane	124-48-1	0.200	50
Dibromomethane	74-95-3	0.200	~
Dichlorodifluoromethane	75-71-8	16	5
Ethyl Benzene	100-41-4	0.200	5

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Compound	CAS Number	Proposed Reporting Limit (ug/L)	NYSDEC-TOGS (ug/L)
Hexachlorobutadiene	87-68-3	0.200	0.5
Isopropylbenzene	98-82-8	0.730	5
Methyl tert-butyl ether (MTBE)	1634-04-4	0.200	10
Methylene chloride	75-09-2	1	5
Naphthalene	91-20-3	1	10
n-Butylbenzene	104-51-8	0.200	5
n-Propylbenzene	103-65-1	0.200	5
o-Xylene	95-47-6	0.200	5
p- & m- Xylenes	179601-23-1	0.500	5
p-Diethylbenzene	105-05-5	4.700	~
p-Ethyltoluene	622-96-8	0.350	~
p-Isopropyltoluene	99-87-6	0.200	5
sec-Butylbenzene	135-98-8	1.300	5
Styrene	100-42-5	0.200	5
tert-Butylbenzene	98-06-6	0.200	5
Tetrachloroethylene	127-18-4	0.200	5
Toluene	108-88-3	0.200	5
trans-1,2-Dichloroethylene	156-60-5	0.200	5
trans-1,3-Dichloropropylene	10061-02-6	0.200	0.4
Trichloroethylene	79-01-6	0.200	5
Trichlorofluoromethane	75-69-4	0.200	5
Vinyl Chloride	75-01-4	0.240	2
Xylenes, Total	1330-20-7	0.600	5
Semi-Volatiles, 8270 List - low level		**ug/L**	**ug/L**
1,2,4-Trichlorobenzene	120-82-1	2.500	5
1,2-Dichlorobenzene	95-50-1	2.500	3
1,3-Dichlorobenzene	541-73-1	2.500	3
1,4-Dichlorobenzene	106-46-7	2.500	3
2,4,5-Trichlorophenol	95-95-4	2.500	1
2,4,6-Trichlorophenol	88-06-2	2.500	1
2,4-Dichlorophenol	120-83-2	2.500	5
2,4-Dimethylphenol	105-67-9	2.500	50
2,4-Dinitrophenol	51-28-5	2.500	10
2,4-Dinitrotoluene	121-14-2	2.500	5
2,6-Dinitrotoluene	606-20-2	2.500	5
2-Chloronaphthalene	91-58-7	2.500	10
2-Chlorophenol	95-57-8	2.500	1
2-Methylnaphthalene	91-57-6	2.500	~
2-Methylphenol	95-48-7	2.500	1
2-Nitroaniline	88-74-4	2.500	5
2-Nitrophenol	88-75-5	2.500	1
3- & 4-Methylphenols	65794-96-9	2.500	~
3,3-Dichlorobenzidine	91-94-1	2.500	5
3-Nitroaniline	99-09-2	2.500	5
4,6-Dinitro-2-methylphenol	534-52-1	2.500	~
4-Bromophenyl phenyl ether	101-55-3	2.500	~
4-Chloro-3-methylphenol	59-50-7	2.500	1
4-Chloroaniline	106-47-8	2.500	5

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Compound	CAS Number	Proposed Reporting Limit (ug/L)	NYSDEC-TOGS (ug/L)
4-Chlorophenyl phenyl ether	7005-72-3	2.500	~
4-Nitroaniline	100-01-6	2.500	5
4-Nitrophenol	100-02-7	2.500	1
Acenaphthene	83-32-9	0.130	20
Acenaphthylene	208-96-8	0.0500	~
Aniline	62-53-3	2.500	5
Anthracene	120-12-7	0.0800	50
Benzo(a)anthracene	56-55-3	0.0500	0.002
Benzo(a)pyrene	50-32-8	0.0500	0.002
Benzo(b)fluoranthene	205-99-2	0.0500	0.002
Benzo(g,h,i)perylene	191-24-2	0.0500	~
Benzo(k)fluoranthene	207-08-9	0.0500	0.002
Benzyl alcohol	100-51-6	2.500	~
Benzyl butyl phthalate	85-68-7	2.500	50
Bis(2-chloroethoxy)methane	111-91-1	2.500	5
Bis(2-chloroethyl)ether	111-44-4	2.500	1
Bis(2-chloroisopropyl)ether	108-60-1	2.500	5
Bis(2-ethylhexyl)phthalate	117-81-7	0.500	5
Chrysene	218-01-9	0.0500	0.002
Dibenzo(a,h)anthracene	53-70-3	0.0500	~
Dibenzofuran	132-64-9	2.500	~
Diethyl phthalate	84-66-2	2.500	50
Dimethyl phthalate	131-11-3	2.500	50
Di-n-butyl phthalate	84-74-2	2.500	50
Di-n-octyl phthalate	117-84-0	2.500	50
Fluoranthene	206-44-0	0.170	50
Fluorene	86-73-7	0.170	50
Hexachlorobenzene	118-74-1	0.0200	0.04
Hexachlorobutadiene	87-68-3	0.500	0.5
Hexachlorocyclopentadiene	77-47-4	2.500	5
Hexachloroethane	67-72-1	0.500	5
Indeno(1,2,3-cd)pyrene	193-39-5	0.0500	0.002
Isophorone	78-59-1	2.500	50
Naphthalene	91-20-3	0.0500	10
Nitrobenzene	98-95-3	0.250	0.4
N-Nitrosodimethylamine	62-75-9	0.500	~
N-nitroso-di-n-propylamine	621-64-7	2.500	~
N-Nitrosodiphenylamine	86-30-6	2.500	50
Pentachlorophenol	87-86-5	0.250	1
Phenanthrene	85-01-8	0.0500	50
Phenol	108-95-2	2.500	1
Pyrene	129-00-0	0.110	50
Pyridine	110-86-1	2.500	50
1,4-dioxane	123-91-1	0.350	~

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Compound	CAS Number	Proposed Reporting Limit (ug/L)	NYSDEC-TOGS (ug/L)
Pesticides, 8081 target list			
4,4'-DDD	72-54-8	0.00457	0.3
4,4'-DDE	72-55-9	0.00457	0.2
4,4'-DDT	50-29-3	0.00457	0.2
Aldrin	309-00-2	0.00457	~
alpha-BHC	319-84-6	0.00457	0.01
alpha-Chlordane	5103-71-9	0.00457	~
beta-BHC	319-85-7	0.00457	0.04
Chlordane, total	57-74-9	0.0229	0.05
delta-BHC	319-86-8	0.00457	0.04
Dieldrin	60-57-1	0.00229	0.004
Endosulfan I	959-98-8	0.00457	~
Endosulfan II	33213-65-9	0.00457	~
Endosulfan sulfate	1031-07-8	0.00457	~
Endrin	72-20-8	0.00457	~
Endrin aldehyde	7421-93-4	0.0114	5
Endrin ketone	53494-70-5	0.0601	5
gamma-BHC (Lindane)	58-89-9	0.00457	0.05
gamma-Chlordane	5566-34-7	0.0114	~
Heptachlor	76-44-8	0.00457	0.04
Heptachlor epoxide	1024-57-3	0.00457	0.03
Methoxychlor	72-43-5	0.00457	35
Toxaphene	8001-35-2	0.114	0.06
Metals, Target Analyte, ICP		**ug/L**	**ug/L**
Aluminum	7429-90-5	61	~
Barium	7440-39-3	237	1000
Calcium	7440-70-2	208,000	~
Chromium	7440-47-3	5.680	50
Cobalt	7440-48-4	5	~
Copper	7440-50-8	10.300	200
Iron	7439-89-6	27,000	~
Lead	7439-92-1	5.390	25
Magnesium	7439-95-4	45,000	35000
Manganese	7439-96-5	1,180	300
Nickel	7440-02-0	5	100
Potassium	7440-09-7	17,300	~
Silver	7440-22-4	5	50
Sodium	7440-23-5	136,000	20000
Vanadium	7440-62-2	10	~
Zinc	7440-66-6	83.500	2000
Metals, Target Analyte, ICPMS		**ug/L**	**ug/L**
Antimony	7440-36-0	1	3
Arsenic	7440-38-2	1	25
Beryllium	7440-41-7	1	3
Cadmium	7440-43-9	1	5
Selenium	7782-49-2	1	10
Thallium	7440-28-0	1	~

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Summary of Groundwater Laboratory Analytical Methods

Compound	CAS Number	Proposed Reporting Limit (ug/L)	NYSDEC-TOGS (ug/L)
Mercury by 7473			
Mercury	7439-97-6	0.200	0.7
Herbicides, Target List			
2,4,5-T	93-76-5	5	35
2,4,5-TP (Silvex)	93-72-1	5	0.26
2,4-D	94-75-7	5	50
Polychlorinated Biphenyls (PCB)		**ug/L**	**ug/L**
Aroclor 1016	12674-11-2	0.0571	~
Aroclor 1221	11104-28-2	0.0571	~
Aroclor 1232	11141-16-5	0.0571	~
Aroclor 1242	53469-21-9	0.0571	~
Aroclor 1248	12672-29-6	0.0571	~
Aroclor 1254	11097-69-1	0.0571	~
Aroclor 1260	11096-82-5	0.0571	~
Total PCBs	1336-36-3	0.0571	0.09
PFAS		**ng/L**	**ng/L**
PFAS	~	2	~

TO-15 Target Compounds[1] Remedial Investigation
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Compound	CAS Number	Proposed RL ug/m³	Full TO-15
Acetone (2-propanone)	67-64-1	0.24	X
Benzene	71-43-2	0.32	X
Bromodichloromethane	75-27-4	0.63	X
Bromoethene	593-60-2	0.39	X
Bromoform	75-25-2	1.05	X
Bromomethane (Methyl bromide)	74-83-9	0.39	X
1,3-Butadiene	106-99-0	0.44	X
2-Butanone (methyl ethyl ketone)	78-93-3	0.30	X
Carbon disulfide	75-15-0	0.32	X
Carbon tetrachloride	56-23-5	0.16	X
Chlorobenzene	108-90-7	0.47	X
Chloroethane	75-00-3	0.27	X
Chloroform	87-66-3	0.50	X
Chloromethane (methyl chloride)	74-87-3	0.21	X
Cyclohexane	110-82-7	0.35	X
Dibromochloromethane	124-48-1	0.50	X
1,2-dibromoethane	106-93-4	0.78	X
1,2-dichlorobenzene	95-50-1	0.61	X
1,3-dichlorobenzene	541-73-1	0.61	X
1,4-dichlorobenzene	106-46-7	0.61	X
Dichlorodifluoromethane	75-71-8	0.50	X
1,1-dichloroethane	75-34-3	0.41	X
1,2-dichlorethane	107-06-2	0.41	X
1,2-dichloroethene (cis)	155-59-2	0.40	X
1,2-dichloroethene (trans)	156-605	0.40	X
1,2-dichloropropane	78-87-5	0.40	X
Cis-1,3-dichloropropene	10061-01-5	0.46	X
Trans-1,3-dichloropropene	10061-02-6	0.46	X
1,2-dichlorotetrafluoroethane (Freon 114)	76-14-2	0.71	X
Ethylbenzene	100-41-4	0.44	X
4-Ethyltoluene (p-ethyltoluene)	622-96-8	0.50	X
n-heptane	142-82-5	0.42	X
Hexachlorobutadiene	87-68-3	1.08	X
n-hexane	110-54-3	0.36	X
methylene chloride	75-09-2	0.71	X
4-methyl-2-pentanone (MIBK)	108-10-1	0.42	X
MTBE (methyl tert-butyl ether)	1634-04-4	0.37	X
Styrene	100-42-5	0.43	X
1,1,2,2-tetrachloroethane	79-34-5	0.70	X
Tetrachloroethene (PCE)	127-18-4	0.17	X
Toluene	108-88-3	0.38	X
1,2,4-trichlorobenzene	120-82-1	0.75	X
1,1,1-trichloroethane	71-55-6	0.55	X
1,1,2-trichloroethane	79-00-5	0.55	X
1,1,2-trichloro-1,2,2-trifluoroethane (Freon TF)	76-13-1	0.78	X
Trichloroethene (TCE)	79-01-6	0.14	X
Trichlorofluoromethane (Freon 11)	75-69-4	0.57	X
1,2,4-trimethylbenzene	95-63-6	0.50	X
1,3,5-trimethylbenzene	108-67-8	0.50	X
Vinyl chloride	75-01-4	0.06	X
Xylenes (m&p)	1330-20-7	0.88	X
Xylenes (o)	95-47-6	0.44	X
1,2-dichlorethene (total)	540-59-0	0.41	X
Methyl methacrylate	80-62-6	0.42	X
Tetrahydrofuran	109-99-9	0.30	X

[1]RL = Reporting limit. RL based on undiluted sample without matrix interference

APPENDIX 5:

Resumes

Summary Resume: **WILLIAM A. CANAVAN**

Education:

1989 - Southern Illinois University, Carbondale, IL
M.S. Geology
1986 - Franklin & Marshall College, Lancaster, PA
B.A. Geology

Certifications/Seminars:

Certified Professional Geologist; CPG #9036
Licensed Geologist: New York, New Hampshire
NJDEP Licensed Site Remediation Professional (LSRP): License No. 594633
NJDEP Subsurface Evaluator; License No. 220983
NYS Asbestos Site Inspector; Cert. No. 05-12451
CT Asbestos Consultant – Inspector; License No. 000773
OSHA Certification (29 CFR, 1910.120); Personal and Supervisor with Annual Refresher Certification
NGWA Introduction to Groundwater Chemistry
ASTM Risk Based Corrective Action Application Training
Lead Mitigation at Shooting Ranges – Conference Sponsored by the National Rifle Association
Princeton Remediation Course
NGWA Conference on Petroleum Hydrocarbons in Groundwater (attended 3 times)
American Water Resources Association National Conference-Hydrology and Groundwater
NJDEP Site Remediation Basics Seminar
Wetlands Delineation Certification
Radon Testing, Indoor Air Quality Testing
NGWA Member

Professional Experience:

1998 – Present	President, HydroEnvironmental Solutions, Inc., Somers, NY
1996 – 1998	Hydrogeologist/Regional Manager, Lincoln Applied Geology, Inc., Somers, NY
1992 – 1996	Senior Hydrogeologist, Leggette, Brashears & Graham, White Plains, NY
1989 – 1992	Hydrogeologist, Leggette, Brashears & Graham, Wilton, CT
1988 – 1989	Hydrogeologist, Lincoln Applied Geology, Inc., Lincoln, VT
1987 (summer)	Hydrogeologist, Lincoln Applied Geology, Inc., Lincoln, VT
1986 (summer)	Hydrogeologist, Malcolm Pirnie, Inc., Hamden, CT
1984 (summer)	Geologist, The Army Corps of Engineers, New York, NY

Sample Project Assignments:

- Comprehensive work scope and report writing, client correspondence and liaison to State Agencies in Vermont, New York, New Jersey, Massachusetts and Connecticut.
- Principal investigator of a water supply development project for a major ski area in central Vermont including well location and development, testing and final permitting.
- Conducted site investigations/remedial investigation work plans for projects in New Jersey under the current Licensed Site Remediation Professional (LSRP) regulations to expedite Response Action Outcome (RAO) status.
- Principal investigator for a comprehensive feasibility analysis for developing a groundwater based high yield golf course irrigation system including very low frequency geophysical surveys; Rockaway, NJ.
- Project Hydrogeologist for the design, implementation and construction of a comprehensive trench and well based groundwater recovery component of an in situ coal tar contamination bioremediation system; Barre, VT.
- Project Hydrogeologist responsible for the redevelopment of a multi-well recovery system to improve recovery of spilled gasoline from groundwater at a petroleum storage facility including multiple well step-drawdown and long-term pump tests to determine system influence on contaminated confined and unconfined regional aquifers.
- Project Hydrogeologist responsible for determining and remediating the areal and vertical extent of petroleum contamination in a shallow aquifer on Long Island Sound including installation of a 17 well monitoring network, well development and sampling, pump testing to determine capture zones affected by tidal fluctuation and aquifer characteristics and soil venting remedial system design, implementation, operation and monitoring.
- Project Hydrogeologist responsible for comprehensive groundwater monitoring and sampling programs to determine magnitude and extent of contamination problems at fuel storage facilities in New York, New Jersey, Minnesota, Nebraska, South Dakota, Connecticut and Vermont.
- Principle investigator for multiple phased environmental site assessments of commercial, industrial, and manufacturing sites in New York, Vermont, New Jersey and Connecticut.

- Principal investigator coordinating and conducting a comprehensive investigation of multiple contaminant sources in downtown Schenectady, NY resulting in the identification of a single responsible party on behalf of the New York State Department of Environmental Conservation.
- Project Hydrogeologist responsible for the investigation of an industrial waste disposal site owned by a major chemical and munitions manufacturer including the design and implementation of a subsurface testing program for determining the extent and volume of buried waste and negotiations with the client and Connecticut Department of Environmental Protection.
- Project Hydrogeologist for the design of a USGS gaging station on an Adirondack river to determine the relationship of rainfall and downstream gages to privately held watershed. Work completed on behalf of legal counsel for private club as part of pending litigation over river navigability.
- Environmental oversight during remedial actions related to commercial and residential underground storage tanks (USTs) at numerous sites in New York and New Jersey.

Publications:

Canavan, W.A., Verdibello, S. 2015, Construction Dewatering: Investigation Methods and Approach in New York City in Abstracts and Programs, American Institute of Professional Geologists, Santa Fe, NM

Canavan, W.A., 2001, “Creation of Groundwater Resource Maps for Planning Future Development”, in Abstracts and Programs, American Water Resources Conference.

Canavan, W.A., Vandenberg, R., Revell, S., 1997, A Risk Based Corrective Action Approach at Urban Leaking Underground Storage Tank Sites, in Groundwater in the Urban Environment-Volume I, Problems, Processes and Management, Edited by John Chilton, et al. Pages 377-393.

Canavan, W.A., 1990, Statistical Applications to Channel Morphology for a Bedrock Stream, in Geological Society of America Abstracts with programs.

Canavan, W.A, 1989, The Fluvial Geomorphology of a Northern Appalachian Bedrock Stream, New Haven River, Central Vermont, M.S. Thesis Southern Illinois University at Carbondale, 141 p.

Orbach-Miller, S.; W.A. Canavan, and R. C. Kockel, 1987, Assessment of Landslide Potential Along Route 3 in Southern Illinois, in Proceedings of the 38th Annual Highway Geology Symposium, Engineers Society of Western Pennsylvania.

HydroEnvironmental SOLUTIONS, INC.
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(914) 276 - 2560 Fax: (914) 276 - 2664

Summary Resume: **JONATHAN B. ASHLEY**

Education:
1992 – Rensselaer Polytechnic Institute, Troy, NY
B.S. Environmental Engineering
M.S. Courses: Wastewater Treatment Engineering, Open Channel Hydraulics, Physical and Chemical Hydrogeology

Certifications/Seminars:
Licensed Professional Engineer: Massachusetts, New York and Vermont
EPA Certified Asbestos Inspector, Management Planner and Project Designer
Licensed Asbestos Inspector and Project Designer-Maine
OSHA Certification (29 CFR 1910.120 (e)) Personal and Supervisor Training

Professional Experience:

2000-Present	Engineer, HydroEnvironmental Solutions, Inc., Somers, NY
1997 – 2000	Professional Engineer, Lincoln Applied Geology, Inc., Bristol, VT
1996 – 1997	Project Engineer/Project Manager, Rust Environment & Infrastructure, Burlington, VT
1993 – 1996	Project Engineer/Project Manager, ERM-Northeast, Farmington, CT
1992 – 1993	Environmental Technician, Diversified Environmental Corp., Norwell, MA
1990 -1992	Field Technician, Professional Service Industries, Albany, NY

Sample Project Assignments:

- Project Manager; designed soil vapor extraction and air sparging system for treatment of gasoline-contaminated soil and groundwater. Completed air sparging pilot test and hydraulic conductivity test. Also evaluated potential use of dual-phase extraction treatment for the site.
- Project Manager; designed, operated and installed a product recovery system to recover #2 fuel oil under the Massachusetts Contingency Plan (MCP).
- Responsible for designing soil vapor extraction system at an EPA Superfund site to remediate soils and waste disposal areas contaminated with solvents containing chlorinated VOCs. Project included conceptual design, 60% design, SVE pilot test and 100% design submittals.

- Project Manager responsible for developing Release Abatement Measure (RAM) Plan for cleanup of a No.4 fuel oil release. Investigated feasibility of product recovery and total fluids recovery treatment systems. Developed life cycle cost estimates for treatment options. Designed and installed system to recover Non-Aqueous Phase Liquid (NAPL).
- Project Engineer and Project Manager responsible for installation, startup and operation of remediation systems used to treat groundwater contaminated with petroleum hydrocarbons. Installed and operated systems to recover Non-Aqueous Phase Liquid (NAPL) petroleum products including gasoline and kerosene and treat groundwater containing dissolved-phase Volatile Organic Compounds (VOCs). Installed and operated systems to remediate soils and groundwater using combinations of groundwater pump and treat and soil vapor extraction. Developed and implemented system monitoring plans. Evaluated and optimized system performance, reported remedial progress to regulatory agencies and clients.
- Conducted a complete Phase I/II/III site assessment at an automobile dealership to assess petroleum contamination at the site. Assessment also included a pre-demolition asbestos inspection, abatement project design and oversight of asbestos removal.
- Conducted well redevelopment program for a petroleum release assessment. Conducted bail down testing of wells to determine hydraulic conductivity.
- Conducted soil gas surveying to investigate releases of chlorinated solvents at a manufacturing plant in the vicinity of sinks and catch basins.
  Project Manager; wrote wastewater discharge permit applications to process wastewater from industrial facilities and leachate and dewatering systems for a hazardous waste landfill. Evaluated industrial wastewater discharges for potential pollutants, waste minimization and needed process modifications. Implemented sampling and flow monitoring programs.
- Project Manager; conducted facility-wide air emissions compliance evaluation. Reviewed processes for needed equipment modifications. Wrote air emissions permit applications to construct and operate new sources.
- Wrote and implemented plans for RCRA Closure of hazardous waste storage pads. Wrote spill prevention control and countermeasures plan for industrial facilities with above-ground storage tanks (ASTs) and storage areas. Wrote and implemented storm water pollution prevention plans for industrial facilities.
- Reviewed existing asbestos inspection and sampling records for manufacturing facilities and paper mills. Collected confirmatory bulk samples. Provided budgetary cost estimates for removal of asbestos-containing materials for property transfer negotiations.

One Deans Bridge Road ● Somers NY 10589

1275 Bloomfield Avenue ● Bldg 6 ● Unit 35 ● Fairfield NJ 07004

- Project Manager responsible for a facility-wide asbestos inspection at a 460,000+ square foot manufacturing facility, leading a team of five inspectors. Provided recommendations for appropriate abatement actions based on hazard assessments. Developed a comprehensive asbestos management plan for active production areas, facilities, support rooms, warehouses, laboratories and offices.
- Designed specifications, bid documents and contract drawings; conducted pre-bid walks. Managed project schedule to complete asbestos abatement during active operations and scheduled shutdowns.
- Responsible for a facility-wide asbestos survey at a 650,000+ square foot former manufacturing facility, leading a team of six inspectors on a fast-track, five day schedule. Provided expedited turn around and field data entry during the inspection. Provided recommendations for appropriate abatement actions based on hazard assessments. Estimated costs for total abatement as compared to managing the materials in place.
- Implemented OSHA Asbestos Compliance Program for a 21/2 year asbestos abatement project at a 25-story high rise building. Conducted area and personal air sampling programs to verify containment integrity and OSHA compliance. Analyzed air samples using Phase Contrast Microscopy.

One Deans Bridge Road ● Somers NY 10589

1275 Bloomfield Avenue ● Bldg 6 ● Unit 35 ● Fairfield NJ 07004

Summary Resume: **STEVEN M. VERDIBELLO**

Education:

2010 – The Ohio State University, Columbus, OH
B.S. Geology
2012 – Wright State University, Dayton, OH
M.S. Geology

Certifications/Seminars:

- New York State Professional Geologist (PG)
- OSHA HAZWOPER Certification (29 CFR 1910.120) & Annual Refresher Certification
- OSHA Site Supervisor Certification
- NYS Asbestos Site Inspector; Cert. No. 13-22273
- OSHA 10-Hour Construction Certification
- NJDEP Regulatory Training in Underground Storage Tanks
- National Groundwater Association (NGWA) Member

Professional Experience:

October 2012 – Present Geologist/Hydrogeologist, HydroEnvironmental Solutions, Inc., Somers, NY

Sample Project Assignments:

- Environmental oversight during the removal of residential and commercial underground storage tanks (USTs) and soil excavation for petroleum storage at numerous sites. Duties have included achieving closure of spills in accordance with NYSDEC environmental regulations and within estimated costs.
- Environmental oversight and direction during the installation of test borings and groundwater monitoring wells at petroleum spill sites.
- Operation of Geoprobe drill rig, environmental oversight and direction during the installation of soil borings and groundwater monitoring wells at petroleum spills and dewatering sites in New York.
- Completed oversight and monitoring during Vacuum Enhanced Fluid Recovery (VEFR) remedial operations to reduce soil and groundwater contamination at numerous fuel oil impacted sites.
- Conducted groundwater monitoring and sampling.

- Developed a groundwater fate and transport model using MODFLOW to determine the impacts of a proposed gasoline fueling station at a retail location.
- Construction Dewatering system designs and associated NYCDEP discharge permitting.
- Conducted multiple phased environmental site assessments of commercial and industrial sites in New York, New Jersey and Connecticut.

Summary Resume: **MICHAEL J. SCOTT**

Education:

2015 - Plattsburgh State University of New York**,** Plattsburgh, NY
Bachelors of Science in Geology;
Minor in Hydrogeology

2009 - Dutchess Community College, Poughkeepsie, NY
Associates of Science in Biology

Certifications/Seminars:

OSHA 40-hour HAZWOPER (29 CFR 1910.120)
OSHA 8-hour Refresher (annually)
OSHA 10 Hour Construction Safety and Health
National Groundwater Association (NGWA) Member

Professional Experience:

November 2015 – Present Geologist/Hydrogeologist, HydroEnvironmental Solutions, Inc., Somers, NY

May – November 2015 Quality Control Technician, Tilcon Inc., Poughkeepsie, NY

Sample Project Assignments:

- Environmental oversight during the removal of residential underground storage tanks (USTs) and soil excavation for petroleum storage at numerous sites. Duties have included achieving closure of spills in accordance with NYSDEC environmental regulations and within estimated costs.
- Environmental oversight and direction during the installation of test borings and groundwater monitoring wells at petroleum spill sites.
- Completed oversight and monitoring during Vacuum Enhanced Fluid Recovery (VEFR) remedial operations to reduce soil and groundwater contamination at numerous fuel oil impacted sites.
- Conducted groundwater monitoring and sampling.
- Conducted oversight during Brownfield Cleanup Program remediation including oversight and sampling during installation of test borings.
- Conducted hand-held Geoprobe® borings along with hand-auger borings at residential homes to delineate the extent of a suspected fuel oil leak.
- Operation of Geoprobe® drill rig, environmental oversight and direction during the installation of soil borings and groundwater monitoring wells at petroleum spill sites in New York, Connecticut and New Jersey.

- Conducted Phase I and II Environmental Site Assessments to assess the environmental status for commercial lending institutions and prospective buyers in New York, Connecticut and New Jersey.
- Conducted Soil Vapor Extraction (SVE) pilot test to assess soil porosity within the vadose zone to determine the design and implementation of SVE treatment systems.
- Conducted oversight and monitoring of 8-hour and 12-hour pump tests and slug tests to determine subsurface aquifer characteristics for the design and implementation of dewatering systems for the construction of mid-rise building(s).
- Conducted wetland delineations and wetland functionality assessments for real-estate and/or development projects in New York based on the USACOE Wetlands Delineation Manual.

Summary Resume: **PATRICK W. MONTUORI**

Education: 2016 - Plattsburgh State University of New York**,** Plattsburgh, NY
Bachelors of Science in Geology;
Bachelors of Science in Environmental Science

Certifications/Seminars: OSHA Certification (29 CFR 1910.120)
OSHA 10 Hour Construction Safety and Health
NJDEP Regulatory Training in Underground Storage Tanks

Professional Experience:

November 2016 – Present Geologist/Hydrogeologist, HydroEnvironmental Solutions, Inc., Somers, NY

Sample Project Assignments:

- Environmental oversight during the removal of residential underground storage tanks (USTs) and petroleum impacted soil. Duties have included achieving closure of spills in accordance with state environmental regulations and within estimated costs.
- Conducted oversight during Brownfield Cleanup Program (BCP) remediation. Performed soil sampling as well as groundwater and soil vapor monitoring and sampling at BCP sties.
- Facilitated pumping tests on newly installed water supply wells in order to determine the ability of the well to meet project demands and to monitor potential impacts to bedrock aquifer.
- Conducted Phase I Environmental Site Assessments to assess the environmental status for commercial lending institutions and prospective buyers.
- Conducted oversight and direction during the installation of test borings and groundwater monitoring wells at environmental remediation sites.
- Completed oversight and monitoring during Vacuum Enhanced Fluid Recovery (VEFR) remedial operations to reduce soil and groundwater contamination at fuel oil impacted sites.
- Installed hand-held Geoprobe® borings along with hand-auger borings at residential homes to delineate the extent of a suspected fuel oil leak.

Summary Resume: **DYLAN K. SCHUCK**

Education: 2014 - Union College, Schenectady, NY
B.S. Environmental Science, Environmental Engineering, Classical Civilization

Certifications/Seminars:

- OSHA HAZWOPER Certification (29 CFR 1910.120) & Annual Refresher
- OSHA 10 Hour Construction Safety and Health
- NYS Licensed Mold Assessor
- NJDEP Regulatory Training in Underground Storage Tanks
- National Groundwater Association (NGWA) Member

Professional Experience:

January 2015 – Present Environmental Scientist, HydroEnvironmental Solutions, Inc., Somers, NY

Sample Project Assignments:

- Environmental oversight during the removal of residential underground storage tanks (USTs) and soil excavation for petroleum storage at numerous sites. Duties have included achieving closure of spills in accordance with NYSDEC environmental regulations and within estimated costs.
- Environmental oversight and direction during the installation of test borings and groundwater monitoring wells at petroleum spill sites.
- Completed oversight and monitoring during Vacuum Enhanced Fluid Recovery (VEFR) remedial operations to reduce soil and groundwater contamination at numerous fuel oil impacted sites.
- Conducted groundwater monitoring and sampling.
- Conducted oversight during Brownfield Cleanup Program remediation including oversight and sampling during installation of test borings.
- Conducted hand-held Geoprobe® borings along with hand-auger borings at residential homes to delineate the extent of a suspected fuel oil leak.
- Operation of Geoprobe® drill rig, environmental oversight and direction during the installation of soil borings and groundwater monitoring wells at petroleum spill sites in New York, Connecticut and New Jersey.
- Environmental oversight and maintenance of dewatering projects including pump and system maintenance in the greater New York City area.
- Conducted Phase I and II Environmental Site Assessments to assess the environmental status for commercial lending institutions and prospective buyers in New York, Connecticut and New Jersey.