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June 18, 2025

Mr. Jared Donaldson
New York State Department
of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7015

Re: **SSDS/Excavation Work Plan**
Former Elka Chemical Corp.
340 West Hoffman Ave.
Lindenhurst, Suffolk County, New York
NYSDEC Project No. 152239

Dear Mr. Donaldson:

As per your request, Dermody Consulting is providing this Excavation Work Plan (EWP) and Sub-Slab Depressurization System (SSDS) Installation Work Plan for the above-referenced property (see Figure 1 for the property layout).

For the EWP, it is proposed that soil be excavated and disposed from four locations on the western portion of the Site. For the SSDS Installation Work Plan, a system will be installed in the on-Site building to address the issue of potential soil vapor intrusion. The western portion of the Site is an unpaved area used for parking vehicles for a landscaping company.

The Remedial Investigation Report (2023) for the Site showed that the groundwater upgradient and on the Site contained volatile organic compounds (VOCs) and semi-

volatile organic compounds. The VOC compounds may have off-gassed from the water table surface (which occurs at approximately 5 feet below grade) or traveled through the vadose zone as the result of soil contamination. Due to the presence of VOC vapors in the vadose zone at the Site, there is the potential for soil vapor intrusion at the 80-by-50 foot Site building. Therefore, an SSDS will be installed in the building to address this issue. The Site building was previously occupied by a church but is now vacant and unoccupied.

Soil Excavation

The soil excavation on the western portion of the Site will be performed as follows:

- Notifications of the date of the excavations will be provided to the New York State Department of Environmental Conservation (NYSDEC) at least 15 days prior to the commencement of the work.

- Prior to performing the excavation, a utility markout will be requested 10 days prior to performing the work. The New York State one-call center (New York 811) will be requested to perform the

markout in the area of the western excavations.

- The excavation work is estimated to require one to two days to complete.
- A health and safety plan (HASP) and community air monitoring plan (CAMP) (see Appendix A) will be followed throughout the period of on-Site work. All Site work will be performed in compliance with the Excavation Work Plan (EWP) (see Appendix B for additional components of the EWP) and 29 CFR 1910.120.
- The excavation contractor will provide the disposal facilities for the waste streams as well as sources for backfill, along with all required chemical testing results.

Prior to, during, and after the completion of the excavation work, soil screening will be performed that will include visual, olfactory, and photoionization detector (PID) readings of all known and potentially-contaminated soil. The soil at the Site contains volatile and semi-volatile organic compounds (VOCs and SVOCs) and metals.

The locations to be excavated include sampling locations SB-1, SB-2, GP-6, and the fourth location will be at the location of former sampling locations SB-9 and GP-8 (which were obtained at the same location as shown in Figure 2).

The soil will be excavated with a backhoe and shovels. The excavated soil will be placed on appropriately anchored tarps or plastic sheeting at the end of each day. Samples of the excavated materials to be disposed off-Site will be obtained for waste characterization. All transport of materials will be performed by licensed haulers in accordance with local, state, and federal regulations including 6 NYCRR Part 364.

The excavations will be performed to a depth of one foot at locations SB-1, SB-2, and SB-9/GP-8. GP-6 will be excavated to a depth of two inches. The excavations will be performed in a generally circular pattern with a diameter of 8 feet around the sampling locations. The total amount of excavated soil was calculated to be approximately 5 to 8 cubic yards (including the soil for the SSDS [approximately 1.5 cubic yards]).

Following the excavations, two end sample (the samples will be four feet apart about the center of the excavation) will be obtained from the base of each excavation (a total of 8 primary samples) placed in laboratory-supplied glassware, labeled, and placed in a cooler with ice for transport to the laboratory (York Analytical Laboratories) for the analysis of SVOCs by Method 8270 with the exception of SB-2, which will be sampled only for copper. Samples will be analyzed with Category B deliverables and a Data Usability Summary Report (DUSR) will be prepared. All soil samples will include a trip blank, an equipment blank, a duplicate sample, and a matrix spike and a matrix spike duplicate.

All excavated materials to be disposed off-Site will be sampled in accordance with DER-10 Table 5.4(e)10 and will include per-and polyfluoroalkyl substances (PFAS) and 1,4-dioxane. No fill material will be brought on-Site without submission, and NYSDEC approval, of a request-to-import form. In addition, excavated materials that may be used as cover soils will require analysis at a frequency prescribed in DER-10. A report of all excavation procedures, sampling results, and disposal receipts will be prepared for submittal to the NYSDEC.

A report of all installation procedures, sampling results, and disposal receipts will prepared for submittal to the NYSDEC.

SSDS Design and Installation

The design and installation of the SSDS was and will be performed in consultation with Ravi Korlipara, PE, PhD. Dr. Korlipara is providing oversight for all aspects of the project and the design figures and the report will be stamped by the engineer. The vacant church building at the Site is of slab-on-grade construction and no basement is present. SSDS units are proposed to be installed for the Site building. Indoor air, sub-slab air samples, and an outdoor air sample were obtained in 2022 for the Site building. The previous sampling locations are provided in Figure 3 and the results are found in Table 1. The results showed no exceedances of the New York State Department of Health Indoor Air Guideline Values. Minor exceedances of the EPA 95th percentile values for the indoor air were detected for trichlorofluoromethane (Freon 11). Trichlorofluoromethane was also detected at a low concentration in the outdoor air. For the sub-slab vapor, elevated concentrations of several VOCs including tetrachlorethylene and trichloroethylene were detected, however, there are no standards or guidelines for sub-slab vapors.

The SSDS will consist of the installation of four suction wells (see Figure 4 for the proposed layout of the SSDS units and the estimated radii of influence [ROIs]). See Figure 5 for the schematic diagram of the system components. See Figure 6 for the vertical exhaust piping layout). Each suction well will be installed by using a concrete saw to create a 16 by 16-inch hole in the concrete. Upon removal of the concrete, the soil beneath the concrete will be removed to a depth of approximately 24 inches, and laterally to a diameter of a minimum of 24 inches. A 20-inch length of Schedule 40, three-inch-diameter, 0.020-inch slotted PVC screen with a bottom cap will be installed with a three-inch-diameter PVC riser pipe extending above the level of the concrete. The PVC screen will be placed in the center of the excavated hole and No. 2 Morie-sized gravel will be placed in the excavation around the screen to a level equal to the base of the concrete. Then, a 16 by 16 inch-diameter square of plastic sheeting with a three-inch hole in its center will be placed on the gravel (to reduce "bleeding" of the wet cement into the underlying gravel). The opening in the concrete around the pipe will then be concreted to match the existing grade. Exhaust piping will be attached to the sub-surface screened portion of the piping. A section of three-inch Schedule 40 PVC piping will be attached to the screen to a height of approximately six feet.

PVC glue will be applied to the upper exterior of the six-foot pipe and then a RadonAway GP-501 two-inch fan will placed on the six-foot-long pipe and glued in place. The fans will be connected to a dedicated electrical circuit. Piping will then be added above the fan to a height near the ceiling of the building. A three-inch horizontal hole will be created in the upper portion of the building's wall. PVC 90 degree elbows will be used to direct the piping through, and then up, the exterior wall. The horizontal pipe that will be placed through the hole and will be sealed in the wall with concrete. The exterior PVC piping will be affixed to the exterior wall with galvanized clamps and the piping will run vertically upwards to a height of approximately one to two feet above the roofline. A t-coupling will be placed on the top of the exhaust piping. The piping exhaust points for all units will not be placed within 10 feet of any vent or air intake that may be present on the roof. An as-built PE-stamped drawing will be provided in the SSDS report following installation.

As shown on Figure 4, the radius of influence for each SSDS is anticipated to be a minimum of 40 feet. However, since it is anticipated that there will be significant intersection of the radii of influence for the four SSDS units, the radii of influence for each suction well will be significantly increased. It is estimated that the flow rate will be between 40 and 70 cubic feet per minute (cfm) based on the RadonAway GP-501 specifications (see Appendix C) and the relatively permeable sand and gravel vadose zone known to be present at the Site based on previous Site borings. Liquid tube cuir will be placed at a height of approximately five feet above the floor level. The manometers will be installed by drilling holes in the PVC at each SSDS location and placing the manometer tubes into the interior of the SSDS pipe and sealing the entry point of the PVC pipe with PVC glue. The exterior portion of the manometers will be affixed to

the exterior of the pipes with PVC glue. The manometers will be used to provide visual evidence that there is airflow within the exhaust piping.

The volume of excavated soil from the four SSDS points is expected to be a total of approximately 1.5 cubic yards. The soil will be stockpiled on-Site with the soil derived from the western excavations on secured plastic sheeting, top and bottom. Sampling of the soil to be disposed will be performed in accordance with DER-10 Table 5.4 (e) 10 including VOCs, SVOCs, copper, PFAS, and 1,4-dioxane.

Vacuum Monitoring

Vacuum monitoring points will be installed at 5 locations including 4 points within three feet of each corner and, also, the center of the building floor (see Figure 3). The vacuum monitoring points will be installed by drilling a one-inch hole in the concrete at each location using a rotary hammer. The holes will be drilled to a depth of two inches into the soil underlying the concrete and a vacuum monitoring insert will be sealed into the hole.

With the SSDS operating, vacuum monitoring will be performed to determine the vacuum and the approximate area of influence of the SSDSs. The goal of the vacuum monitoring is to determine the approximate radius of influence of the array of the suction wells and determine if the vacuum points have achieved a minimum vacuum goal of 0.004 inches of water throughout the floor area of the building.

Vacuum readings will be obtained by connecting tubing at the vacuum point insert to an Infiltec Digital Micromanometer Model DM-1 that provides vacuum readings to the nearest 0.001 inches of water.

A figure showing the vacuum results will be provided in the SSDS Installation Report to demonstrate that vacuum is adequate throughout the building.

After the SSDS has been in operation for at least 30 days, two indoor air samples will be obtained (the building is 50 by 80 feet), one outdoor air sample, and one duplicate sample will be obtained with Summa Canisters with flow controllers set to obtain samples over an eight-hour period.

For the indoor and outdoor (ambient) samples, the samples will be obtained from the locations that were shown in Figure 3. Analysis for VOCs by EPA method TO-15 with trichloroethylene, cis-1,2-dichloroethylene, 1,1-dichloroethene, carbon tetrachloride, and vinyl chloride will require a minimum laboratory reporting limit of 0.20 micrograms per liter or less. Therefore, the sample analysis will be performed by USEPA Method TO-15 with SIM for these VOCs.

Effluent Sampling

A hole will be drilled in each suction well at a height of approximately four feet above grade and a brass valve will be installed in the pipe. PVC cement will be added to the threads of the valve before it is installed.

The brass valve will be used during effluent sampling which will be performed after the system is operating for a minimum of 30 days. The samples will be obtained from each of the four suction wells with six-liter Summa Canisters. The samples will be obtained over an approximately two-minute period. Food-grade polyethylene tubing will be used to connect the sampling valve to the Summa Canister. The canisters will then be sent to a NYSDOH Environmental Laboratory Approval Program (ELAP) approved laboratory for the analysis of VOCs by USEPA Method TO-15. Trichloroethylene, cis-1,2-dichloroethylene, 1,1-dichloroethene, carbon tetrachloride, and with Selected Ion Monitoring. These samples will be analyzed with Category B deliverables and a Data Usability Summary Report will be prepared.

A Quality Assurance Project Plan (QAPP) is provided in Appendix D.

System Testing

Upon completion of the system, the SSDS units will commence operation. After the system is operating, the readings at the vacuum monitoring points will be obtained to determine the radius of influence of the vacuum.

Upon the incorporation of your comments, and your approval, a final copy will be sent that will include a certification page and P.E. stamps for the report and the schematic drawings of the SSDS.

Should you have any questions, please feel free to contact me.

Very truly yours,

Peter Dermody, C.P.G.
Principal Hydrogeologist

cc: James Mulvey
Michael Flynn
Barry Cohen, Esq.
Robert Corcoran
Renata Ockerby, NYSDOH
Stephanie Selmer, NYSDOH
Ravi Korlipara, P.E., PhD

Figures

SCALE: 1" = 40'

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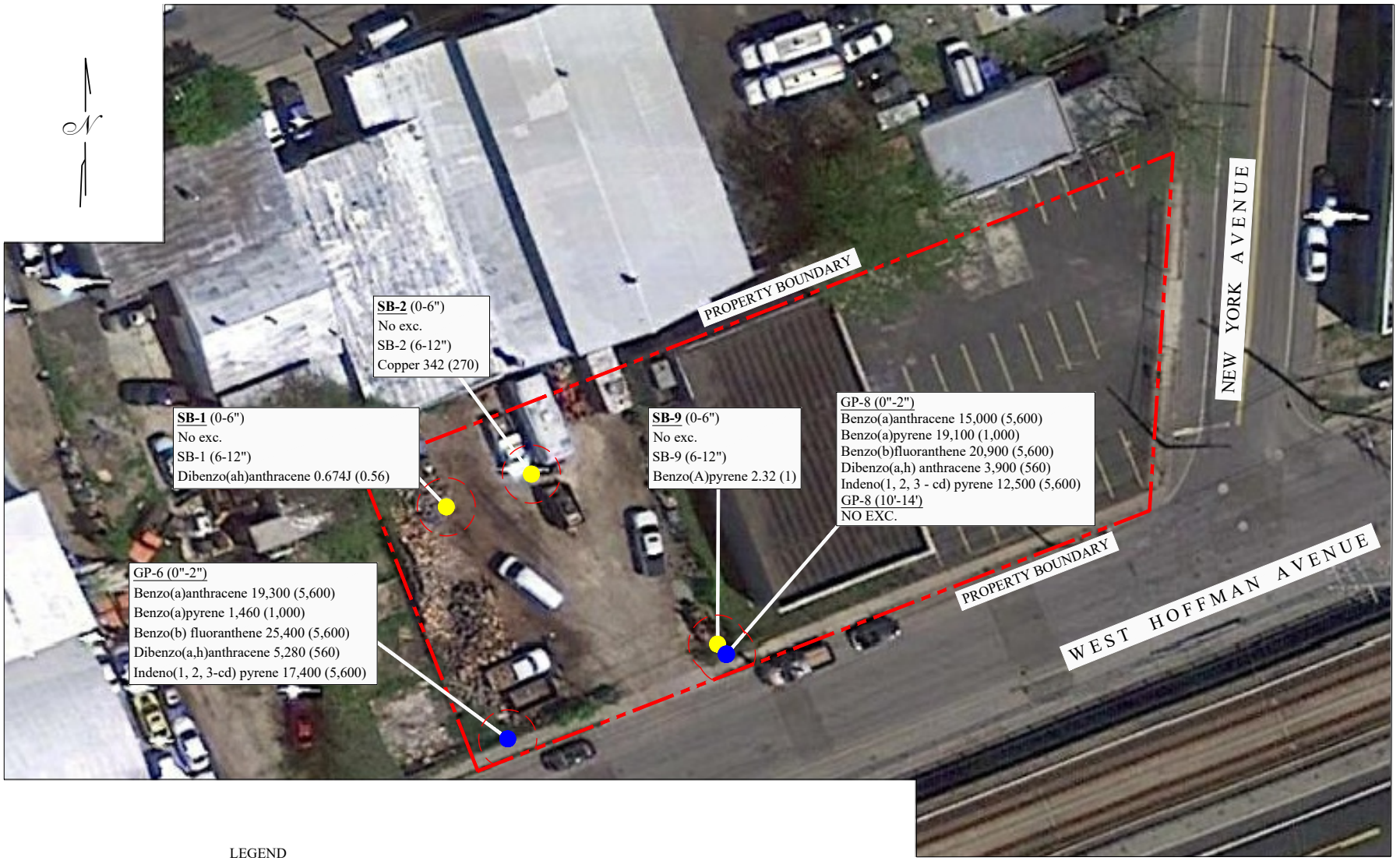
FIGURE 1
SITE LAYOUT

340 WEST HOFFMAN AVENUE
LINDENHURST, NEW YORK



LEGEND

SB-1 — ON-SITE SOIL SAMPLING LOCATION AND DETECTED COMPOUNDS. (1) GUIDELINE LIMITS ARE SHOWN IN PARENTHESES.

GP-1 (0"-2") NO EXC. — SOIL SAMPLING LOCATION AND SVOC EXCEEDANCES OF SOIL CLEANUP OBJECTIVES. SOIL CLEANUP OBJECTIVE VALUES ARE SHOWN IN PARENTHESIS. ALL VALUES SHOWN ARE IN mcg / Kg.

AREAS OF PROPOSED SOIL EXCAVATION (8 FOOT DIAMETER).

SCALE: 1" = 40'

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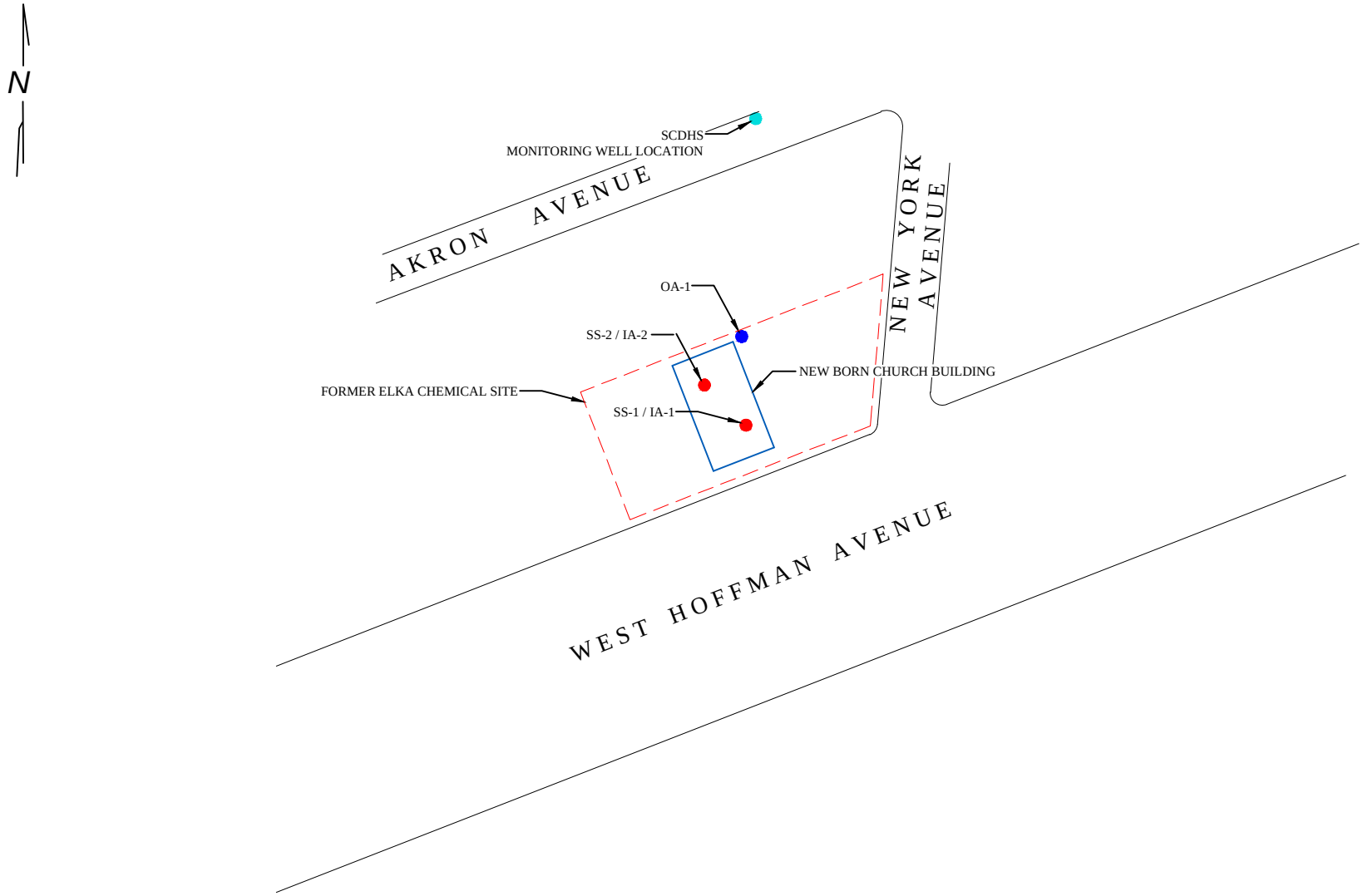
FIGURE 2

PROPOSED SOIL
EXCAVATION AREAS

340 WEST HOFFMAN AVENUE
LINDENHURST, NEW YORK



SCALE: 1" = 116'

LEGEND

SS-1 / IA-1	SUB-SLAB/ INDOOR AIR SAMPLING LOCATION
OA-1	OUTDOOR AIR SAMPLING LOCATION
SCDHS	SUFFOLK COUNTY DERPARTMENT OF HEALTH SERVICES MONITORING WELL LOCATION

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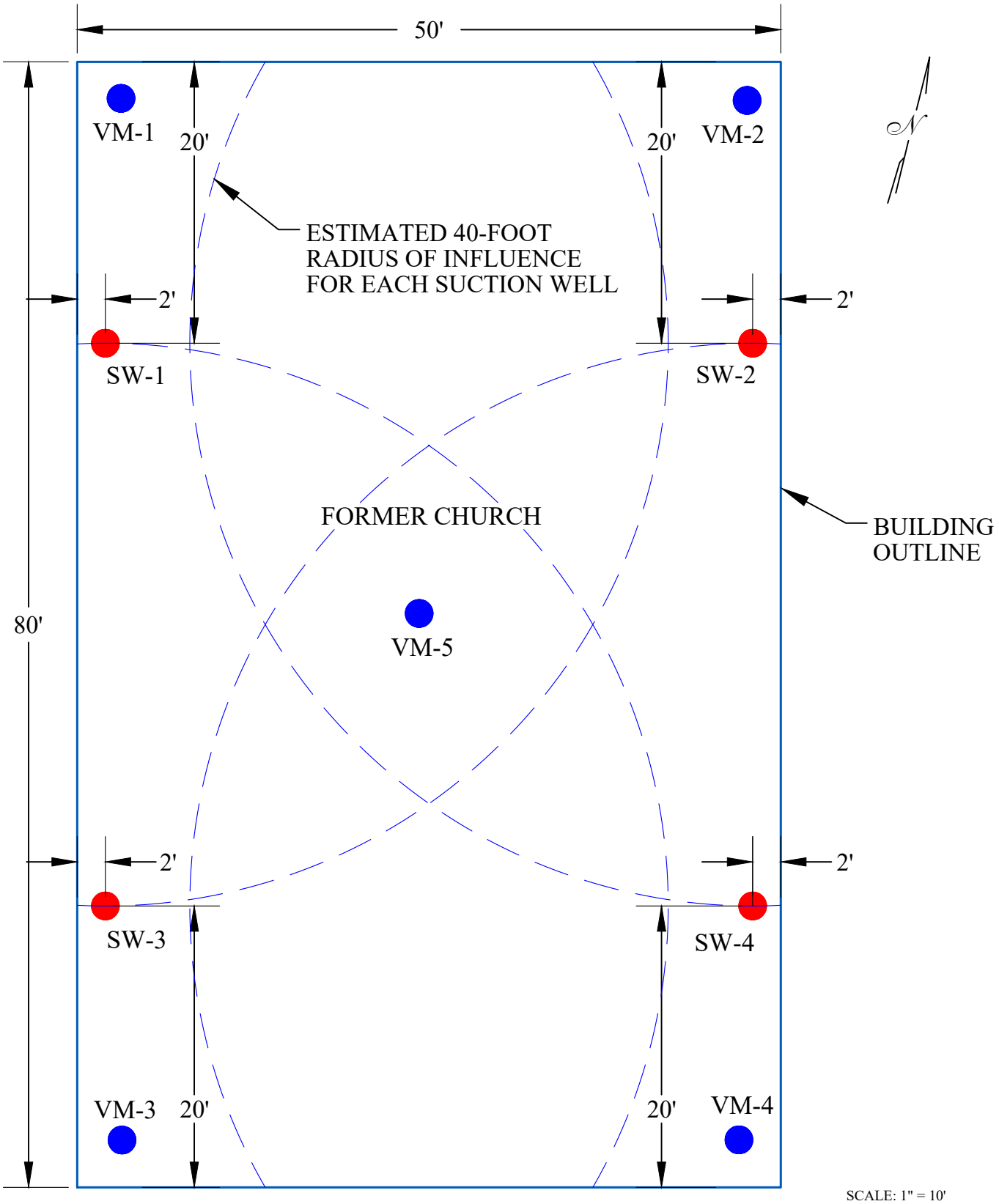
Center Moriches, New York

FIGURE 3

SOIL VAPOR INTRUSION

SAMPLING LOCATIONS

340 WEST HOFFMAN AVENUE
LINDENHURST, NEW YORK



SCALE: 1" = 10'

LEGEND

- SW-1 SUCTION WELL LOCATION
- VM-1 VACUUM MONITORING WELL LOCATION

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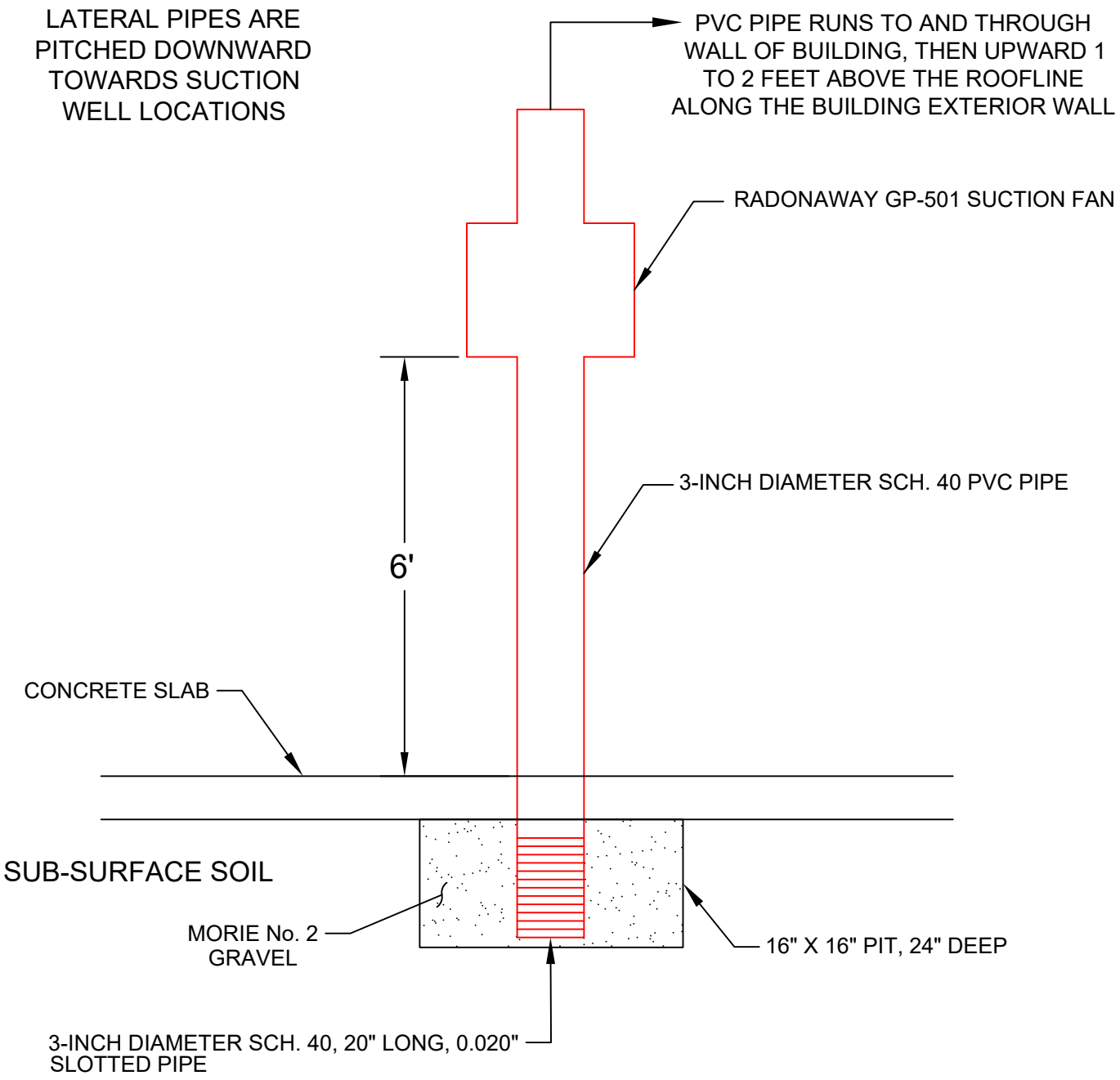
FIGURE 4
PROPOSED SUCTION WELLS, VACUUM MONITORING WELLS, AND ESTIMATED ROIs FOR SUCTION WELLS



DRAWING NOT TO SCALE

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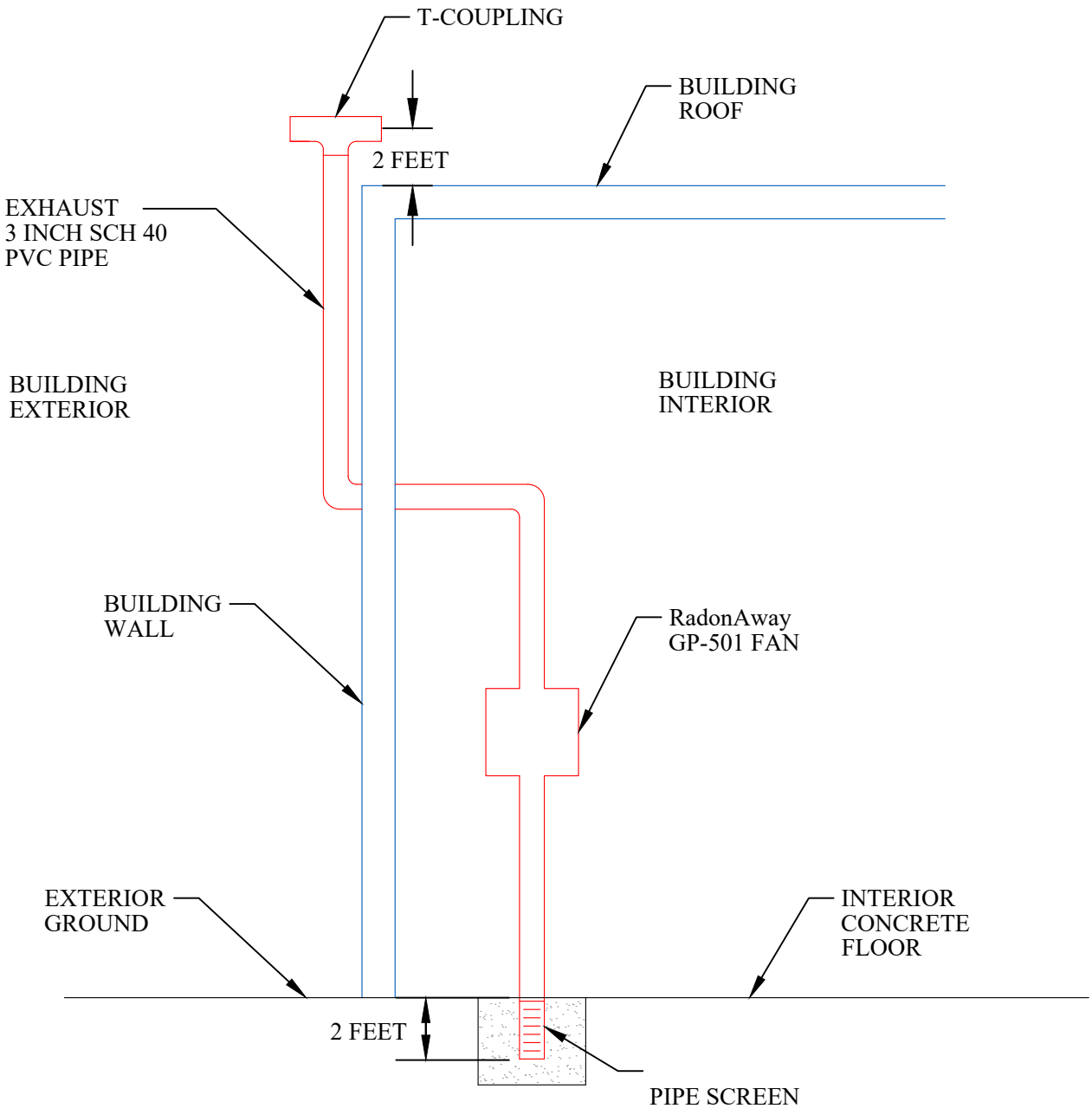
FIGURE 5

SCHEMATIC DIAGRAM FOR SSDS UNITS



DRAWING NOT TO SCALE

DERMODY CONSULTING
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FIGURE 6
DIAGRAM OF
SSDS AND
EXHAUST PIPING

Tables

Table 1
Soil Vapor Intrusion Chemical Analytical Results
New Born Church, Former Elka Chemical Site
340 W. Hoffman Avenue, Lindenhurst, New York

Sample ID	SS-1	SS-2	IA-1	IA-2	OA-1	USEPA Building Survey 95th Percentile Values
Volatile Organic Compounds *(ug/m³)*						
Sample Date	**03-21-2020**	**03-21-2020**	**03-21-2020**	**03-21-2020**	**03-21-2020**	
1,1,1-Trichloroethane	320	99	ND	ND	ND	-
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	ND	ND	0.63	ND	-
1,2,4-Trimethylbenzene	4.5	4.3	4.1	3.9	ND	12
1,3,5-Trimethylbenzene	ND	ND	1.5	1.5	ND	-
2-Butanone	8.1	9.2	2.0	2.2	0.68	7.8
4-Methyl-2-pentanone	5.2	5.3	4.4	4.9	ND	-
Acetone	18	130	10	10	3.4	110
Benzene	4.1	ND	2.3	2.8	0.41	9.1
Carbon Disulfide	ND	ND	0.31	0.41	ND	-
Carbon tetrachloride	ND	ND	0.45	0.52	0.54	-
Chloroform	38	4.2	ND	ND	ND	-
Chloromethane	ND	ND	1.1	1.1	1.2	4.3
cis-1,2-Dichloroethylene	12	2.1	ND	ND	ND	-
Cyclohexane	ND	5.4	2.5	2.9	ND	-
Dichlorodifluoromethane	ND	ND	1.9	2.0	2.0	-
Ethyl acetate	13	14	ND	ND	ND	7.5
Ethyl Benzene	4.4	24	2.3	2.6	ND	6.2
Isopropanol	6.5	19	5.2	5.1	0.67	-
Methyl Methacrylate	ND	ND	ND	ND	0.35	-
Methylene chloride	8.5	6.0	2.0	2.0	2.3	60*
n-Heptane	ND	29	4.9	5.5	ND	-
n-Hexane	8.3	7.6	8.9	11	ND	12
o-Xylene	5.5	20	3.2	3.6	ND	8.2

Table 1
Soil Vapor Intrusion Chemical Analytical Results
New Born Church, Former Elka Chemical Site
340 W. Hoffman Avenue, Lindenhurst, New York

Sample ID	SS-1	SS-2	IA-1	IA-2	OA-1	USEPA Building Survey 95th Percentile Values
Volatile Organic Compounds *(ug/m³)*						
Sample Date	**03-21-2020**	**03-21-2020**	**03-21-2020**	**03-21-2020**	**03-21-2020**	
p- & m-Xylenes	14	59	8.1	9.0	ND	24
p-Ethyltoluene	ND	5.1	3.1	3.3	ND	-
Tetrachloroethylene	810	860	4.3	5.2	ND	30*
Toluene	24	44	11	13	0.65	39
Trichloroethylene	490	210	0.48	0.57	ND	2*
Trichlorofluoromethane (Freon 11)	6.1	ND	**23**	**27**	1.3	19

* NYSDOH Indoor Air Guideline Value
- No concentration established
ND- not detected
Bold values for indoor air indicate an exceedance of the 95th percentile values from the EPA Building Survey or the NYSDOH Air Guideline Values.
There are no standards for sub-slab (SS) samples.

Appendix A
HASP/CAMP

Health and Safety Plan
(with Community Air Monitoring Plan)
for
The Former Elka Chemical Corporation Site
340 West Hoffman Avenue
Lindenhurst, New York

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TABLE OF CONTENTS *(CONTINUED)*

LIST OF TABLES

LIST OF ATTACHMENTS

SECTION 1.0
INTRODUCTION

This Health and Safety Plan (HASP) has been written for compliance with "OSHA Hazardous Waste Operations Standards (29 CFR 1910.120)", the guidance documents, "Standard Operating Safety Guidelines (Office of Solid Waste and Emergency Response, 1988)" and the "Occupational Safety and Health Guidance Manual for Hazardous Waste Activities" (U.S. Department of Health and Human Services, 1985).

1.1 Scope and Applicability of the HASP

This HASP is designed to be applicable to locations where soil and groundwater may be encountered at the Former Elka Chemical Corporation property (the Site) located at 340 West Hoffman Avenue, Lindenhurst, New York by all parties that either perform or witness the activities on Site. This HASP may also be modified or amended to meet specific needs of the work proposed. This HASP will detail the Site safety procedures, Site background, and safety monitoring. Contractors will be required to adopt this HASP in full.

The Health and Safety Officer (HSO) will be present at the Site to inspect the implementation of the HASP, however, it is the sole responsibility of the contractor(s) to comply with the HASP.

The HASP has been formulated as a guide to complement professional judgment and experience. The appropriateness of the information presented should always be evaluated with respect to unforeseen Site conditions which may arise.

1.2 Site Work Zone and Visitors

The Site work zone (a.k.a. exclusion zone) during well installations will be a 30-foot radius about the work location. This work zone may be extended if, in the judgment of the HSO, Site conditions warrant a larger work zone.

No visitors will be permitted within the work zone without the consent of the HSO. All visitors will be required to be familiar with, and comply with the HASP. The HSO will deny access to those whose presence within the work zone is unnecessary or those who are deemed by the HSO to be in non-compliance with the HASP.

All Site workers, including the contractors, will be required to have 40-hour hazardous material training (eight-hour refresher courses annually) and respirator fit test certification as stated in 29 CFR 1910.120. Copies of documentation certifying the above-listed requirements will be kept at the Site in the possession of the HSO.

The HSO will also give an on-Site health and safety discussion to all Site personnel, including the contractors, prior to initiating the Site work. Workers not in attendance during the health and safety talk will be required to have the discussion with the HSO prior to entering the work zone.

Emergency telephone numbers and directions to the nearest hospital are found in Attachment A.

SECTION 2.0
KEY PERSONNEL

The co-project managers for this project are Peter Dermody, C.P.G. and James Mulvey. Mr. Mulvey will also act as HSO.

SECTION 3.0
SITE BACKGROUND

3.1 Site History and Known Chemical Constituents at the Site

The Site is located at 340 West Hoffman Avenue, Lindenhurst. The Site is developed with a an industrial/commercial building. Topography at the Site is essentially flat. The primary chemicals known to be present at the Site are non-chlorinated VOCs, primarily BTEX and other petroleum constituents.

TABLE 3.1.1
PRIMARY CHEMICALS DETECTED AT THE SITE WITH THRESHOLD LIMIT VALUES

CONTAMINANT	SHORT TERM EXPOSURE LIMIT (STEL) 15 MINUTES	TIME-WEIGHTED AVERAGE 8 HOUR EXPOSURE LIMIT
Xylene	150 ppm	100 ppm
1,2,4-trimethylbenzene	125 ppm	100 ppm
Trimethylbenzenes (mixed isomers)	Not listed	25 ppm

ppm: parts per million

SECTION 4.0
TASK/OPERATION HEALTH AND SAFETY ANALYSIS

This section will present health and safety analyses.

4.1 Safety Analysis

The tasks will include the installation of components of the remediation system. In general, one to two consultants will be present at the Site along with environmental drilling personnel. No other site operations will be conducted by contractors without the presence of the HSO or assistant HSO on-Site.

Based on the Site history, it has been determined that known potential chemical concerns consist of petroleum-related VOCs in the soil, soil vapor, and groundwater at the Site.

Organic vapor concentrations will be monitored in the work zone by utilizing a MiniRae photoionization detector (PID) or similar. The PID will be calibrated according to its manufacturer's instructions. Background organic vapor concentrations will then be established in the work zone prior to drilling and recorded in the HSO field book. Upon commencement of drilling or trenching, PID readings will be obtained in the workers' breathing zone. A PID reading will also be obtained approximately 15 minute intervals during drilling or boring, including readings immediately following breakthrough to the subsurface. At the discretion of the HSO, PID readings may be obtained more frequently. All readings and observations will be recorded in the HSO field book.

Steady-state PID readings greater than five ppm in the worker's breathing zone will require upgrading to Level C personal protective equipment. Steady-state readings, for this purpose, will be defined as readings exceeding five ppm above background for a minimum of ten seconds. Readings will be obtained at points approximately three foot above the borehole. These points will define the worker's breathing zone.

Upon encountering PID levels greater than five ppm above background in the worker's breathing zone, all personnel will be evacuated from the work zone in the upwind direction (if discernable).

Specific evacuation routes will be discussed prior to commencement of work at each location based on work location and wind direction. In addition, an evacuation meeting place will be determined. Level C personal protection will be implemented including full-face air-purifying respirators with dust and organic vapor cartridges (personal protective equipment will be described in greater detail in Section 7.0). All personnel and contractors must be properly trained and fit tested prior to donning respirators. If, at any time, PID readings exceed steady-state levels greater than 25 ppm above background, or any conditions exist which the HSO determines will require Level B personal protective equipment, all work at the Site will cease immediately and all personnel will evacuate the work zone. Evacuation will occur in the upwind direction if discernable. Level B conditions are not anticipated to be encountered; however, if level B conditions arise, no further Site work will be performed, and a complete evaluation of the operation will be performed and this HASP will be modified.

All drilling personnel will be required to wear chemical-resistant gloves (such as butyl or nitrile) when the potential for dermal contact with soil is possible. Dermal contact with soils removed from the ground will be avoided.

4.2 Other Safety Considerations

4.2.1 Noise

During any operation which may generate potentially harmful levels of noise, the HSO may monitor noise levels with a Realistic^{tm} (or similar) hand-held sound level meter. Noise levels will be monitored in decibels (dBs) in the A-weighted, slow-response mode. Noise level readings which exceed the 29 CFR 1910.95 permissible noise exposure limits will require hearing protection (see Table 4.2.1.1 for permissible noise exposures).

TABLE 4.2.1.1
PERMISSIBLE NOISE EXPOSURES*

Duration Per Day Hours	Sound Level dBA Slow Response
8	90
6	92
4	95
3	97
2	100
12	102
1	105
2	110
3 or less	115

NOTES: When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions: $C_1/T_1+C_2/T_2$ C_6/T_6 exceed unity, then, the mixed exposure should be considered to exceed the limit value. Cn indicates the total time of exposure at a specified noise level, and Tn indicates the total time of exposure permitted at that level.

Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

* Standards derived from 29 CFR 1910.95

Hearing protection will be available to all Site workers. The hearing protection will consist of foam, expansion-fit earplugs (or other approvable hearing protection) with an Environmental Protection Agency noise reduction rating of at least 29 dB. Hearing protection must alleviate worker exposure to noise to an eight-hour time-weighted average of 85 dB or below. In the event that the hearing protection is inadequate, work will cease until a higher level of hearing protection can be incorporated.

4.2.2 Slip/Trip/Fall Preventative Measures

To reduce the potential for slipping, tripping, or falling, the work zone will be kept clear of unnecessary equipment. All Site workers will be required to wear work boots with adequate tread to reduce the potential for slipping (work boots must be leather or chemical-resistant and contain steel toes and steel shanks).

4.2.3 Heat/Cold Stress

Heat stress may become a concern especially if protective clothing is donned which will decrease natural ventilation. To assist in reducing heat stress the following measures will be taken:

- An adequate supply of water or other liquids will be brought on Site. To prevent dehydration, personnel will be encouraged to drink generous amounts of water even if not thirsty.
- A shady rest area will be designated to provide shelter during sunny days.
- In hot weather, workers wearing protective clothing may be rotated.

When the temperature is over 70 degrees Fahrenheit and personnel are wearing protective clothing, heat stress monitoring may be implemented as follows:

- Heart rate may be measured by counting the radial pulse for 30 seconds at the beginning of the rest period. The heart rate should not exceed 110 beats per minute. If the rate is higher, the next work period will be shortened by ten minutes (or 33%). If the pulse rate is 100 beats per minute at the beginning of the next rest period, the following work cycle will be shortened by 33%. The HSO will decide on the length of work periods and rest periods based on Site conditions.

- Body temperature may be measured, if deemed necessary, at the beginning of the rest period. Oral temperature should not exceed 99 degrees Fahrenheit. If it does, the next work period will be shortened by ten minutes (or 33%). However, if the oral temperature exceeds 99.7 degrees Fahrenheit at the beginning of the next period, the following work cycle will be further shortened by 33%. Work will not re-commence until the worker's body temperature has dropped below 99 degrees Fahrenheit.

Indications of heat stress range from mild (fatigue, irritability, anxiety, decreased concentration, dexterity or movement) to fatal. Medical help will be obtained for serious conditions.

Heat-related problems are caused by:

Prolonged Exposure: continuous exposure to heat and humid air, which can be aggravated by chafing clothes. Decreases ability to tolerate heat as well as being a nuisance.

Heat cramps: caused by profuse perspiration with inadequate fluid intake and chemical replacement (especially salts). Signs of heat cramps include muscle spasm and pain in the extremities and abdomen.

Heat exhaustion: caused by increased stress on various organs to meet increased demands to cool the body. Signs of heat exhaustion include shallow breathing; pale, cool, moist skin; profuse sweating; dizziness, and lassitude.

Heat stroke: the most severe form of heat stress, which can be fatal. Medical help must be obtained immediately. Body must be cooled immediately to prevent severe injury and/or death. Signs of heat stroke include red, hot, dry skin; no perspiration; nausea; dizziness and confusion; strong, rapid pulse; coma.

Cold stress is a concern if work is conducted during cold weather or marginally cold weather during precipitation periods or moderate to high wind velocity periods. To assist in reducing cold exposure the following measures will be taken:

- All personnel will be required to wear adequate and appropriate clothing. This will include head gear to prevent the high percentage loss of heat that occurs in this area (thermal liners for hard hats if hard hats are required).
- Provide a readily available warm shelter near each work zone.
- Carefully schedule work and rest periods to account for the current temperature and wind velocity conditions.
- Monitor work patterns and physical condition of workers and rotate personnel, as necessary.

Indications of cold exposure range from shivering, dizziness, numbness, confusion, weakness, impaired judgment, impaired vision to drowsiness. Medical help will be obtained for serious conditions if they occur.

Cold exposure related problems are:

Frost bite: Ice crystal formation in body tissues. The restricted blood flow to the injured part results in local tissue destruction.

Hypothermia: Severe exposure to cold temperature resulting in the body losing heat at a rate faster than the body can generate heat. The stages of hypothermia are shivering, apathy, loss of consciousness, decreasing pulse rate and breathing rate, and death.

Signs and symptoms of heat and cold stress are listed in Table 4.2.3.

4.2.4 Potential Electrical Hazards

Potential electric hazards consist mainly of underground power lines. Underground potential electrical hazards will be minimized by having a utility mark-out performed for the Site. In addition, available as-built Site blueprints will be used to avoid contact with subsurface utility lines or structures. As a final precaution, prior to drilling at any location, post-hole digging or hand augering will be performed by the drillers to a depth of three to four feet to check for the existence of subsurface utility lines or structures.

TABLE 4.2.3
SIGNS AND SYMPTOMS OF HEAT AND COLD STRESS

Type of Heat Stress	Signs and Symptoms
Heat Exhaustion	Clammy skin Confusion Dizziness Fainting Fatigue Heat rash Light-headedness Nausea Profuse sweating Slurred speech Weak pulse
Heat Stroke (may be fatal)	Confusion Convulsions Hot skin, high temperature (yet may feel chilled) Incoherent speech Staggering gait Sweating stops (yet residual sweat may be present) Unconsciousness
Type of Cold Stress	**Signs and Symptoms**
Frost bite	Pain or prickling progressing to numbness Pale, hard, cold skin with waxy appearance Flushing of skin subsequent to re-warming Burning sensation and swelling that may persist for weeks Blisters
Hypothermia (may be fatal)	Shivering Apathy Loss of consciousness Decreasing pulse rate and breathing rate

4.2.5 The Buddy System

All activities in contaminated or potentially contaminated areas will be conducted by pairing off the Site workers in groups of two (or three if necessary). Each person (buddy) will be able to:

- Provide his or her partner with assistance.
- Observe his or her partner for signs of chemical or heat or cold exposure.
- Periodically check the integrity of his or her partner's protective clothing.
- Notify the HSO or others if emergency help is needed.

The buddy system will be instituted at the beginning of each work day. If new workers arrive on Site, a buddy will be chosen prior to the new worker entering the work zone.

4.2.6 Site Communications

Two sets of communication systems will be established at the Site: internal communication among personnel on-Site, and external communication between on-Site and off-Site personnel.

Internal communication will be used to:

- Alert team members to emergencies.
- Pass along safety information such as heat stress check, protective clothing check, etc.
- Communicate changes in the work to be accomplished.
- Maintain Site control.

Due to ambient noise, verbal communications may be difficult at times. If necessary, the HSO will carry a whistle (or compressed air horn if respirators are donned) to signal Site workers. A single whistle blast will be the signal to immediately evacuate the work zone through the access control point. This signal will be discussed with all Site workers prior to commencement of work.

An external communication system between on-Site and off-Site personnel will be established to:

- Coordinate emergency response.
- Report to the Project Manager.
- Maintain contact with essential off-Site personnel.

4.2.7 General Safe Work Practices

Standing orders which will be applicable during Site operations are as follows:

- No smoking, eating, drinking, or application of cosmetics in the work zone.
- No matches or lighters in the work zone.
- All Site workers will enter/exit the work zone through the Site access point.
- Any signs of contamination, radioactivity, explosivity, or unusual condition such as dead animals will require evacuating the Site immediately and reporting the information to the HSO.
- Loose fitting clothing or loose long hair will be prohibited in the work zone during drilling operations.
- A signal person will direct the backing of work vehicles.
- Equipment operators will be instructed to check equipment for abnormalities such as oozing liquids, frayed cables, unusual odors, etc.

SECTION 5.0
PERSONNEL TRAINING REQUIREMENTS

All Dermody Consulting personnel and contractor personnel will receive adequate training prior to entering the Site. Site personnel will, at a minimum, have completed OSHA-approved, 40-hour hazardous materials Site safety training and OSHA-approved, eight-hour safety refresher course within one year prior to commencing field work. In addition, each worker must have a minimum of three days field experience under the direct supervision of a trained, experienced supervisor.

Prior to Site field work, the HSO will conduct an in-house review of the project with respect to health and safety with all Dermody Consulting personnel who will be involved with field work at the Site. The review will include discussions of signs and symptoms of chemical exposure and heat stress that indicate potential medical emergencies presented in Table 5.1. In addition, if necessary, review of personal protective equipment will be conducted to include the proper use of air-purifying respirators.

TABLE 5.1
SIGNS AND SYMPTOMS OF EXPOSURE TO CHEMICALS

Type of Hazard	Signs and Symptoms
~~Chemical Hazard~~	~~Behavioral changes~~
	Breathing difficulties
	~~Changes in complexion of skin color~~
	Confusion
	Coordination difficulties
	Coughing
	Depression
	Dermatitis
	Dilated Pupils
	Dizziness
	Euphoria
	Fatigue and/or weakness
	Flushed face and/or neck
	Insomnia
	Irregular heartbeat
	Irritability
	Irritation of eyes, nose, respiratory tract, skin or throat
	Headache
	Lacrimation
	Light-Headedness
	Muscle Fatigue
	Nausea
	Nervousness
	Numbness in limbs
	Paresthesia
	Sleepiness
	Tingling
	Tremors
	Vertigo
	Visual disturbance
	Vomiting

SECTION 6.0
PERSONAL PROTECTIVE EQUIPMENT

6.1 General Considerations

The two basic objectives of the personal protective equipment (PPE) are to protect the wearer from safety and health hazards, and to prevent the wearer from incorrect use and/or malfunction of the PPE.

All work is expected to be performed during daylight hours and workdays, and in general, are expected to be eight to ten hours in duration. Any work performed beyond daylight hours will require the permission of the HSO. This decision will be based on the adequacy of artificial illumination and the type and necessity of the task being performed.

Personal protection levels for the Site activities, based on past investigations, are anticipated to be Level D with the possibility of upgrading to Level C. The equipment included for each level of protection is provided as follows:

Level C Protection

Personnel protective equipment:

- Air-purifying respirator, full-face.
- Chemical-resistant clothing includes: Tyvek^{tm} (spun bonded olefin fibers) for particulate and limited splash protection or Saranex^{tm} (plastic film-laminated Tyvek) for permeation resistance to solvents.
- Coveralls*, or
- Long cotton underwear.*
- Gloves (outer), chemical-resistant.
- Gloves (inner), chemical-resistant.
- Boots (outer), leather or chemical-resistant, steel toe and shank.

- Boot covers (outer), chemical-resistant (disposable).*
- Hard hat (face shield).*
- Escape mask.*
- 2-way radio communications (inherently safe).*

(*) optional

Criteria for Selection of Level C Protection

Meeting all of these criteria permits use of Level C Protection:

- Oxygen concentrations are not less than 19.5% by volume.
- Measured air concentrations of identified substances will be reduced by the respirator to concentrations below the substance's threshold limit value (TLV).
- Atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect any body area left unprotected by chemical-resistant clothing.
- Job functions do not require self-contained breathing apparatus.
- Direct readings are below 50 ppm on the PID.

Level D Protection

Personnel protective equipment:

- Coveralls.
- Gloves.*
- Boots/shoes, leather or chemical-resistant, steel toe and shank.
- Safety glasses or chemical splash goggles.*
- Hard hat (face shield*).
- Escape mask.*

(*) optional

Criteria for Selection of Level D Protection

Meeting any of these criteria allows use of Level D Protection:

- No contaminant levels above 5 ppm organic vapors or dusty conditions are present.

- Work functions preclude splashes, immersion, or the reasonable potential for unexpected inhalation of any chemicals above the TLV.

Additional Considerations for Selecting Levels of Protection

Another factor which will be considered in selecting the appropriate level of protection is heat and physical stress. The use of protective clothing and respirators increases physical stress, in particular, heat stress on the wearer. Chemical protective clothing greatly reduces natural ventilation and diminishes the body's ability to regulate its temperature. Even in moderate ambient temperatures, the diminished capacity of the body to dissipate heat can result in one or more heat-related problems.

All chemical protective garments can be a contributing factor to heat stress. Greater susceptibility to heat stress occurs when protective clothing requires the use of a tightly fitted hood against the respirator face piece, or when gloves or boots are taped to the suit. As more body area is covered, less cooling takes place, increasing the probability of heat stress.

Wearing protective equipment also increases the risk of accidents. It is heavy, cumbersome, decreases dexterity, agility, interferes with vision, and is fatiguing to wear. These factors all increase physical stress and the potential for accidents. In particular, the necessity of selecting a level of protection will be balanced against the increased probability of heat stress and accidents.

6.2 Donning and Doffing Ensembles

Donning an Ensemble

A routine will be established and practiced periodically for donning a Level C ensemble. Assistance may be provided for donning and doffing since these operations are difficult to perform alone.

Table 6.2.1 lists sample procedures for donning a Level C ensemble. These procedures should be modified depending on the particular type of suit and/or when extra gloves and/or boots are used.

TABLE 6.2.1
SAMPLE DONNING PROCEDURES

---

1. Inspect the clothing and respiratory equipment before donning (see Inspection in subsection 7.4).

2. Adjust hard hat or headpiece if worn, to fit user's head.

3. Standing or sitting, step into the legs of the suit; ensure proper placement of the feet within the suit; then gather the suit around the waist.

4. Put on chemical-resistant safety boots over the feet of the suit. Tape the leg cuff over the tops of the boots.

5. Don the respirator and adjust it to be secure, but comfortable.

6. Perform negative and positive respirator facepiece seal test procedures.

   - To conduct a negative-pressure test, close the inlet part with the palm of the hand or squeeze the breathing tube so it does not pass air, and gently inhale for about 10 seconds. Any inward rushing of air indicates a poor fit. Note that a leaking facepiece may be drawn tightly to the face to form a good seal, giving a false indication of adequate fit.

   - To conduct a positive-pressure test, gently exhale while covering the exhalation valve to ensure that a positive pressure can be built up. Failure to build a positive pressure indicates a poor fit.

7. Depending on type of suit:

   - Put on inner gloves (surgical gloves).

   - Additional over gloves, worn over attached suit gloves, may be donned later.

8. Put on hard hat

9. Have assistant observe the wearer for a period of time to ensure that the wearer is comfortable, psychologically stable, and that the equipment is functioning properly

Doffing an Ensemble

Exact procedures for removing Level C ensembles must be established and followed to prevent contaminant migration from the work area and transfer of contaminants to the wearer's body, the doffing assistant, and others.

Doffing procedures are provided in Table 6.2.2. These procedures should be performed only after decontamination of the suited worker. They require a suitably attired assistant. Throughout the procedures, both worker and assistant should avoid any direct contact with the outside surface of the suit.

6.3 Respirator Fit Testing

The fit or integrity of the facepiece-to-face seal of a respirator affects its performance. Most facepieces fit only a certain percentage of the population; thus each facepiece must be tested on the potential wearer in order to ensure a tight seal. Facial features such as scars, hollow temples, very prominent cheekbones, deep skin creases, dentures or missing teeth, and the chewing of gum and tobacco may interfere with the respirator-to-face seal. A respirator shall not be worn when such conditions prevent a good seal. The worker's diligence in observing these factors shall be evaluated by periodic checks. Fit testing will comply with 29 CFR 1910.1025 regulations.

6.4 Inspection

The PPE inspection program will entail five different inspections:

- Inspection and operational testing of equipment received from the factory or distributor.
- Inspection of equipment as it is issued to workers.
- Inspection after use.
- Periodic inspection of stored equipment.
- Periodic inspection when a question arises concerning the appropriateness of the selected equipment, or when problems with similar equipment arise.

TABLE 6.2.2
DOFFING PROCEDURES

---

1. Remove any extraneous or disposable clothing, boot covers, outer gloves, and tape.

2. Remove respirator by loosening straps and pulling straps over the top of the head and move mask away from head. Do not pull mask over the top of the head.

3. Remove arms, one at a time, from suit, avoiding any contact between the outside surface of the suit and wearer's body and lay the suit out flat behind the wearer. Leave internal gloves on, if any.

4. Sitting, if possible, remove both legs from the suit.

5. After suit is removed, remove internal gloves by rolling them off the hand, inside out.

The inspection checklist is provided in Table 6.4.1. Records will be kept of all inspection procedures. Individual identification numbers will be assigned to all reusable pieces of equipment and records should be maintained by that number. At a minimum, each inspection should record the ID number, date, inspector, and any unusual conditions or findings. Periodic review of these records may indicate an item or type of item with excessive maintenance costs or a particularly high level of down-time.

6.5 Storage

Clothing and respirators will be stored properly to prevent damage or malfunction due to exposure to dust, moisture, sunlight, damaging chemicals, extreme temperatures, and impact. Storage procedures are as follows:

Clothing:

- Potentially contaminated clothing will be stored in an area separate from street clothing.
- Potentially contaminated clothing will be stored in a well-ventilated area, with good air flow around each item, if possible.
- Different types and material of clothing and gloves will be stored separately to prevent issuing the wrong material by mistake.
- Protective clothing will be folded or hung in accordance with manufacturer's recommendations.

Respirators:

- Air-purifying respirators should be dismantled, washed, and placed in sealed plastic bags.

6.6 Maintenance

Specialized maintenance will be performed only by the factory or an authorized repair person. Routine maintenance, such as cleaning, will be performed by the personnel to whom the equipment is

TABLE 6.4.1
PPE INSPECTION CHECKLIST

CLOTHING

Before use:

! Determine that the clothing material is correct for the specified task at hand.

! Visually inspect for:

! imperfect seams
! non-uniform coatings
! tears
! malfunctioning closures

! Hold up to light and check for pinholes.

! Flex product:

! Observe for cracks
! Observe for other signs of shelf deterioration

! If the product has been used previously, inspect inside and out for signs of chemical attack:

! discoloration
! swelling
! stiffness

During the work task, periodically inspect for:

! Evidence of chemical attack such as discoloration, swelling, stiffening, and softening. Keep in mind, however, that chemical permeation can occur without any visible effects.

! Closure failure

! Tears

! Punctures

! Seam discontinuities

TABLE 6.4.1 - *CONTINUED*
PPE INSPECTION CHECKLIST

GLOVES

Before use:

Pressurize glove to check for pinholes. Blow into the glove then roll gauntlet toward fingers, or inflate glove and hold under water. In either case, no air should escape.

AIR-PURIFYING RESPIRATORS

Inspect air-purifying respirators:

before each use to be sure they have been adequately cleaned

Check material conditions for:

signs of pliability
signs of deterioration
signs of distortion

Examine cartridges to ensure that:

they are the proper type for the intended use
the expiration date has not been passed
they have not been opened or used previously

Check faceshields and lenses for:

cracks
fogginess

Air purifying respirators will be stored individually in resealable plastic bags.

assigned. Respirators will be cleaned at the end of each day with alcohol pads or, preferably, by washing with warm soapy water.

6.7 Decontamination Methods

All personnel, clothing, equipment, and samples leaving the contaminated (work zone) area of the Site must be decontaminated to remove any harmful chemicals or infectious organisms that may have adhered to them. Decontamination methods either (1) physically remove contaminants, (2) inactivate contaminants by chemical detoxification or disinfection/sterilization, or (3) remove contaminants by a combination of both physical and chemical means. In many cases, gross contamination can be removed by physical means involving dislodging/displacement, rinsing, wiping off, and evaporation. Contaminants that can be removed by physical means include dust, vapors, and volatile liquids. All reusable equipment will be decontaminated by rinsing in a bath of detergent and water (respirators, gloves to be reused). Monitoring equipment will be decontaminated by wiping with paper towels and water.

All used PPE to be discarded will be placed in a 55-gallon drum and stored in a secure place at the Site while awaiting final disposition.

The effectiveness of the decontamination will be evaluated near the beginning of Site activities and will be modified if determined to be ineffective. Visual observation will be used for this purpose. The HSO will inspect decontaminated materials for discoloration, stains, corrosive effects, visible dirt, or other signs of possible residual contamination.

SECTION 7.0
CALIBRATION PROCEDURES, FREQUENCIES, AND MAINTENANCE

This section will present the calibration procedures, frequencies, and maintenance for the health and safety field monitoring instruments.

The use of the monitoring equipment is presented as follows (the manufacturer's owner's manuals for all equipment used will be present at the Site):

1. MiniRae PID - this instrument is a photoionization detector that measures the concentration of airborne ionizable gases and vapors. The MiniRae does not distinguish between individual compounds and will not read methane. The calibration will be performed with a cylinder of "zero gas" (hydrocarbon free air) to "zero" the instrument and a 100 ppm cylinder of isobutylene to calibrate the span.

The calibration procedures and frequencies for each instrument are presented as follows:

MiniRae PID

Isobutylene at 100 ppm in air will be used as Span Gas. A commercial zero grade gas will be used as the zero gas. Calibrate the instrument as follows:

1. Connect the supplied regulator to the Span Gas cylinder. Hand tighten the fittings.
2. Open the valve on the gas bag by turning the valve stem fully counter clockwise.
3. Attach the gas bag adapter nut to the regulator. Hand tighten the fittings.
4. Turn the regulator knob counter clockwise about half turn to start the flow of gas.
5. Fill the gas bag about half full and then close the regulator fully clockwise to turn off the flow of gas.
6. Disconnect the bag from the adapter and empty it. Flush the bag a few times with the Span Gas and then fill it.
7. Close the gas bag by turning the valve clockwise.

8. Hold down the power and N/- button to get to the password screen.

9. Press the select button for Zero Calibration.

10. Apply the “zero” gas and allow the MiniRae to calibrate for 30 seconds.

11. Press the select button for Span Gas Calibration.

12. Apply the span gas and allow the MiniRae to calibrate for 30 seconds.

The instrument will be calibrated prior to the commencement of each day's work. The instrument will be charged overnight prior to each day's work.

SECTION 8.0
EMERGENCY RESPONSE PLAN

This section will present the Emergency Response Plan (ERP) for the Site. Pre-emergency planning will consist of reviewing the ERP with all workers at the Site prior to initiation of work.

Personnel Roles

Should an emergency situation arise at the Site, the HSO will assume control and decision-making. The HSO will also resolve all dispute concerning health and safety requirements and precautions. The HSO will also:

- Be authorized to seek and purchase supplies as necessary.
- Have control over activities of everyone entering the Site.

The HSO will communicate, by field telephone or other, with off-Site personnel to include the Project Manager to evaluate data and assist in the decision-making process. Phone numbers for the fire department, police, ambulance, poison control center, New York State Department of Health, and NYS Department of Environmental Conservation Spill Response Department are listed on the next-to-last page of this document. The hospital which will be utilized during an emergency will be Brookdale University Hospital and Medical Center. The directions to the hospital, along with the hospital's emergency room phone number are presented on the last page of this document.

Copies of the last page of this document will be available at the Site and will be placed in all vehicles of personnel involved in activities at the Site.

Internal communications will consist of a single whistle (or compressed air horn if Level C is donned) blast. This blast will signal all workers to evacuate the work zone by the nearest exit.

Response Follow-Up

Following an emergency, or incident, a detailed report will be generated by the HSO. All equipment will be restored to pre-emergency conditions. The HASP will be reviewed following an

emergency to determine if it provides adequate information to assist in dealing with the emergency. The HASP may be revised to incorporate additional information as needed.

Emergency Recognition and Prevention

Before daily work assignments begin, each day a brief on-Site meeting will be held by the HSO which will address health and safety issues related to the day's work. Prior to initiation of work, a detailed on-Site health and safety meeting will be held to review all potential hazards, contingencies, and safety measures.

Safe Distances and Places of Refuge

The main potential cause of work zone evacuation is a significant vapor release. Vapor release evacuation will be discussed prior to work at each location and in general will be in the upwind direction. Wind direction will be monitored at each work location and all workers will be notified of the direction of evacuation prior to commencement of work. Safe distances will be discussed at each location and determined by the HSO. The PID will be used to determine if workers have evacuated a sufficient distance.

At all times, vehicles which may be utilized in an emergency for transport to the hospital (or other destination) will have clear access to leave the Site. The HSO will assure that an emergency vehicle does not become blocked-in by other vehicles.

Site Security and Control

The HSO will control entry of personnel into the work zone. No unnecessary person shall be permitted in the work zone.

Decontamination Procedures During Emergencies

In the event of a medical emergency, decontamination will be performed if it does not interfere with essential treatment. Decontamination will be performed by washing, rinsing, and/or cutting off protective clothing and equipment.

If decontamination cannot be performed, the victim will be wrapped in plastic to reduce contamination to other personnel. Emergency and off-Site medical personnel will be alerted to the potential contamination.

Emergency Medical Treatment and First Aid

Medical emergencies will be treated, in general, by medical experts by transporting the victim to the nearby hospital.

A first aid kit will be present on-Site for minor medical treatment.

SECTION 9.0
COMMUNITY AIR MONITORING PLAN

This section includes procedures to address potential community health and safety issues associated with investigation and remediation at the Site.

Air Monitoring

A Community Air Monitoring Plan (CAMP) will be implemented at the Site during investigation and remediation activities including the Pilot Test and the Full-Scale Injection activities. Under the CAMP, organic vapor concentrations will be monitored at the downwind edge of the immediate work area at the Site. Daily Field Reports will include CAMP readings at 15-minute intervals, a figure showing the work areas and locations of CAMP monitors and wind direction. CAMP exceedances and corrective measures taken will be reported to the NYSDEC and NYSDOH project managers within one business day. . It will be the responsibility of the HSO to implement the plan and to ensure that proper action is taken in the event that any of the established action levels are exceeded.

To monitor organic vapors, a PID will be used. Calibration of the PID will be performed according to manufacturer's instructions. Background levels of organic vapors will be measured at the Site prior to beginning work and upwind of the work area periodically using a PID.

PID readings will be recorded in the field logbook for both background and work area perimeter. Logbook recordings will include the time, location, and PID readings.

Periodic monitoring for VOCs will be performed during non-intrusive activities such as the collection of soil samples. Periodic monitoring during sample collection will generally consist of taking a reading upon arrival at a sample location, monitoring while overturning soil, and taking a reading prior to leaving a sample location.

VOC Monitoring, Response Levels, and Actions

VOCs will be monitored at the downward perimeter of the immediate work area on a continuous

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 will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.
- If total organic vapor levels 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 will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the 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 shut down.

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

Particulate Monitoring, Response Levels, and Actions

If activities are performed that have the potential to generate significant particulate concentrations, the air will be monitored at the upwind and downwind perimeters of the exclusion zone

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 period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities.

- If the downwind PM-10 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 will be employed. Work will 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 will 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 will be recorded and be available for State regulatory personnel to review.

Noise Monitoring

Due to the use of heavy equipment at the Site during the investigation and remediation, there is the potential for noise to impact the Site workers and the surrounding community.

Since the facility is occasionally occupied, there is a potential that Site employees will be impacted by noise. In addition, work will be performed only during daytime hours. If appropriate, the HSO may periodically monitor noise levels at the work zone boundary and the closest property

boundary with a Realistic[tm] hand-held sound level meter (or similar). Noise levels will be monitored in dBs in the A-weighted, slow-response mode. If noise level readings exceed an eight-hour time-weighted average of 85 dB at the closest property boundary or noise complaints are received, the HSO will take appropriate measures to reduce noise exposure beyond these boundaries.

ATTACHMENT A

EMERGENCY TELEPHONE NUMBERS, CONTACT PERSONNEL, AND DIRECTIONS FROM THE SITE TO THE HOSPITAL

TABLE A.1

Emergency Telephone Numbers

Suffolk County Police Department	911
Ambulance	911
Poison Control Center Hotline	1-800-222-1222
New York State Department of Health	1-800-458-1158
N.Y.S. Department of Environmental Conservation Spill Hotline	1-800-457-7362

Contact Personnel

James Mulvey (cell) 631 745-7581
Peter Dermody (cell) 631 905-4868
Eastern Environmental Solutions, Inc. 631 727-2700

Directions to Brunswick Hospital

Brunswick Hospital is located at 81 Louden Avenue, Amityville (at the northwest corner of Route 110 and Louden Ave. The phone number is 631-789-7421. A map and Mapquest directions to the hospital are included in the following page.

Appendix B
Excavation Work Plan

APPENDIX I

EXCAVATION WORK PLAN (EWP)

NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the Site owner or their representative will notify the NYSDEC. Table 1 includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information.

Table 1: Notifications*

Jared Donaldson, Project Manager	Phone 518 402-9176 Jared.Donaldson@dec.ny.gov
Peter Dermody CPG Dermody Consulting	Phone: 631 905-4868 pdermody@dm-consulting.net
Barry Cohen Certilman Balin	Phone: 516 296-7044 bcohen@certilmanbalin.com

* Note: Notifications are subject to change and will be updated as necessary.

This notifications will include:

- A detailed description of the work to be performed, including the location and areal extent of excavation, plans/drawings for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control;
- A summary of environmental conditions anticipated to be encountered in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work;
- A summary of the applicable components of this EWP;
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120;
- A copy of the contractor's health and safety plan (HASP), in electronic format, if it differs from the HASP provided in this SMP;
- Identification of disposal facilities for potential waste streams; and
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

SOIL SCREENING METHODS

Soil screening methodology methods should be described here. The following text should be included in this section:

Visual, olfactory and instrument-based (e.g. photoionization detector) soil screening will be performed by a qualified environmental professional during all excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed when invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal and material that requires testing to determine if the material can be reused on-site as soil beneath a cover or if the material can be used as cover soil.

SOIL STAGING METHODS

This section should provide details describing erosion and sedimentation controls for stockpiles. This section should be consistent with the Stormwater Pollution Prevention of this Appendix. The staging methods will include the following:

- Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

- Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

- Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC.

MATERIALS EXCAVATION AND LOAD-OUT

This section should describe all methods to be followed for materials loading and on-site management prior to leaving the site. The following will be included:

- A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

- The owner of the property and remedial party (if applicable) and its contractors are responsible for safe execution of all invasive and other work performed under this Plan.

- The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the site.

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

- A truck wash will be operated on-site, as appropriate. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the site. Truck wash waters will be collected and disposed of off-site in an appropriate manner.

- Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking.

- The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

MATERIALS TRANSPORT OFF-SITE

This section should describe all methods to be followed for materials management while in transport off-site. The following will be included:

- All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

- Material transported by trucks exiting the site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

- Truck transport routes will be provided. All trucks loaded with site materials will exit the vicinity of the site using only these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

- Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

- Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development.

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

MATERIALS DISPOSAL OFF-SITE

This section will describe all methods to be followed for materials disposal off-site. The following will be included:

- All material excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all

local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of material from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

- Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

- Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

MATERIALS REUSE ON-SITE

This section provides all details for methods to be followed for materials reuse on-site. 'Reuse on-site' means reuse on-site of material that originates at the site and which does not leave the site during the excavation. Material reuse on-site will comply with the requirements of NYSDEC DER-10 Section 5.4(e)4. The following text will be included:

- The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

- Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

FLUIDS MANAGEMENT

The following text will be included:

- All liquids to be removed from the site, including but not limited to, excavation dewatering, decontamination waters and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, and will be managed off-site, unless prior approval is obtained from NYSDEC.

- Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

BACKFILL FROM OFF-SITE SOURCES

This section describes all methods to be followed for the import, handling and placement of backfill material from off-site. The requirements for backfill used at the site should be consistent with the backfill requirements provided in DER-10 (e.g., Appendix 5).The following topics will be covered:

- Source area approval process
  - Sources of backfill material
- Source area background check
- DOT Certification
  - Chemical sampling
- Analytes
- Frequency

    - Imported Soil Chemical Quality Standards
- Applicability of protection of groundwater SCOs
- Applicability of protection of ecological resources SCOs
- Stockpile procedures for imported backfill material
    - Size of stockpiles, cover, etc.

The following text will be included:

- All materials proposed for import onto the site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the site. A Request to Import/Reuse Fill or Soil form, which can be found at http://www.dec.ny.gov/regulations/67386.html, will be prepared and submitted to the NYSDEC project manager allowing a minimum of 5 business days for review.

- Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site.

- All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards. Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. Solid waste will not be imported onto the site.

- Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

STORMWATER POLLUTION PREVENTION

For large excavations, but less than 1 acre, procedures for stormwater pollution prevention will be specified in the EWP. For construction projects exceeding 1 acre, this is required. A

summary of the Stormwater Pollution Prevention Plan that conforms to the requirements of the NYSDEC Division of Water guidelines and NYS regulations should be included here. The plan itself may be included as an Appendix to the EWP. The following text will appear in this section:

- Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC. All necessary repairs shall be made immediately.

- Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

- All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

- Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

- Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

- Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

EXCAVATION CONTINGENCY PLAN

Describe the procedures to be followed upon discovery of an unknown source of contamination that may require remediation (USTs, stained soil, drums, etc.). This should include procedures for

suspending excavation work, pumping fluids from tanks or containers, and reporting to the spill hotline. The following text will be included:

- If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

- Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

- Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the Periodic Review Report.

COMMUNITY AIR MONITORING PLAN

In the event of the need of excavation, the Health and Safety Plan (HASP)/Community Air Monitoring Plan (CAMP) presented in Appendix H will be consulted. Additional information may be incorporated into the CAMP including information obtained in Appendix 1A of DER-10, Generic Community Air Monitoring Plan. Also, at a minimum, this section will include:

- Details of the perimeter air monitoring program;
- Action levels to be used;
- Methods for air monitoring ;
- Analytes measured and instrumentation to be used;

- A figure of the location(s) of all air monitoring instrumentation. A figure showing specific locations must be presented for monitoring stations based on generally prevailing wind conditions, with a note that the exact locations to be monitored on a given day will be established based on the daily wind direction.
  The following text should be included in this section:
- A figure showing the location of air sampling stations based on generally prevailing wind conditions will be prepared if an area that requires excavation is found . These locations will be adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at least two downwind monitoring stations. If a sensitive receptor, such as a school, day care or residential area is adjacent to the site, a fixed monitoring station should be located at that site perimeter, regardless of wind direction, and discussed in the text.
- Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers on the day of exceedance. All data is to be reported in the final report for the excavation activity.

ODOR CONTROL PLAN

The following text will be included as part of this section:

- This odor control plan is capable of controlling emissions of nuisance odors on- and off-site. Specific odor control methods to be used on a routine basis will include limiting . If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events within one day of the odor event and notified of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the remedial party's Remediation Engineer, and any measures that are implemented will be discussed in the Excavation Activities Report.
- All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations

and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils.. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

- If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.
- If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

DUST CONTROL PLAN

The following text will be included in this section:

- A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.

- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

OTHER NUISANCES

The following items may be necessary depending on the type of wastes present, the location of the site and other site-specific concerns. These plans are generally not required for submission to the NYSDEC.

- A plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all remedial work.

- A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

REPORTING

A report is to be submitted to the NYSDEC within 90 days of completion of the activities performed under this EWP. This report shall contain a summary of the activities performed; a summary of all data gathered and results; information about any media that was removed from the site: volume, contamination levels, area from which removed; and any other information that may be indicate a change to the "remaining contamination" that is at the site. Such changes may require revision of the SMP.

Appendix C
RadonAway Fan Specifications

IMPORTANT INSTRUCTIONS TO INSTALLER

ect the RadonAway® RPc, GPc, XPc and XR Series Radon Fan for shipping damage within 15 days of receipt.
fy RadonAway of any damages immediately. RadonAway is not responsible for damages incurred during
ping. However, for your benefit, RadonAway does insure shipments.
re are no user serviceable parts inside the fan. Do not attempt to open the housing. Return unit to factory.
Warranty below).
all the RPc, GPc, XPc and XR Series Radon Fan in accordance with all EPA, ANSI/AARST standard practices,
state and local building codes and regulations.
vide a copy of this instruction or comparable radon system and testing information to the building occupants
r completing system installation.

Warranty

adonAway® warrants that the RPc, GPc, XPc and XR Series Radon Fan (the "Fan") will be free from defects in materials and
orkmanship for a period of 12 months from the date of purchase or 18 months from the date of manufacture, whichever occurs
e ("Warranty Term").

adonAway® will replace any fan which fails due to defects in materials or workmanship during the Warranty Term. The Warranty
s contingent on installation of the fan in accordance with the instructions provided. This Warranty does not apply where any repair,
alteration, have been made or attempted by others, or if the unit has been abused or misused. Warranty does not cover damage
incurred unless the damage is due to the negligence of RadonAway®.

n Fan must be returned (at Owner's cost) to the RadonAway® factory. Any Fan returned to the factory will be discretionarily
aced. This warranty provides specific instructions along with the Fan when it is returned regardless of whether or not the Fan is originally replaced
der this warranty. Proof of purchase must be supplied upon request for service under this Warranty.

YEAR EXTENDED WARRANTY WITH PROFESSIONAL INSTALLATION.

adonAway® will extend the Warranty Term of the fan to 96 months (8 years) from date of purchase or 66 months from date of
nufacture, whichever occurs, provided that the Fan is installed by a professional radon mitigation contractor. Proof of purchase
d/or proof of professional installation may be required for service under this warranty. No extended warranty is offered outside the
ntinental United States and Canada. Beyond the standard 12 months from the date of purchase or 18 months from the date of
nufacture, whichever occurs.

adonAway® is not responsible for installation, removal or delivery costs associated with this Warranty.

LIMITATION OF WARRANTY

XCEPT AS STATED ABOVE, THE RPc, GPc, XPc and XR SERIES RADON FANS ARE PROVIDED WITHOUT WARRANTY OF ANY IND, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY ND FITNESS FOR A PARTICULAR PURPOSE.

S NO EVENT SHALL RADONAWAY BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL AMAGES ARISING OUT OF, OR RELATING TO, THE FAN OR THE PERFORMANCE THEREOF. RADONAWAY'S AGGREGATE ABILITY HEREUNDER SHALL NOT IN ANY EVENT EXCEED THE AMOUNT OF THE PURCHASE PRICE OF SAID PRODUCT. HE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT, O THE EXTENT THE SAME DOES NOT MEET WITH RADONAWAY'S WARRANTY AS PROVIDED ABOVE.

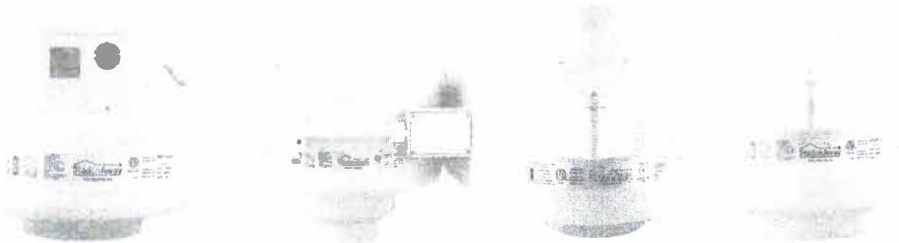
or service under this Warranty, contact RadonAway for a Return Material Authorization (RMA) number and shipping information.
o returns can be accepted without an RMA. If factory return is required, the customer assumes all shipping costs, including
surance, to and from factory.

RadonAway 3 Saber Way
Ward Hill, MA 01835 USA TEL (978) 521-1703
FAX (978) 521-3964
E-mail to: Returns@RadonAway.com

e the following information for your records:

rial Number: _____ Purchase Date: _____

RadonAway



RPc, GPc, XPc, XR Series Installation Instructions

CONDENSATION & DRAINAGE

ensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. can occur at points where the system piping goes through unheated space such as an attic, garage or outside. system design must provide a means for water to drain back to a slab hole to remove the condensation. RPc, GPc, XPc and XR Series Radon Fan MUST be mounted vertically plumb and level, with the outlet pointing r proper drainage through the fan. Avoid mounting the fan in any orientation that will allow water to accumulate e the fan housing. The RPc, GPc, XPc and XR Series Radon Fans are NOT suitable for underground burial.

Pc, GPc, XPc and XR Series Radon Fan piping, the following table provides the minimum recommended pipe eter and pitch under several system conditions.

Pipe Diameter	Minimum Rise per Ft of Run*		
	@25 CFM	@50 CFM	@100 CFM
4"	1/8"	1/4"	3/8"
3"	1/4"	3/8"	1 1/2"

. 7 for detailed specifications.

SYSTEM MONITOR & LABEL

tem Monitor, such as a manometer (P/N 50017) or audible alarm (P/N 28535, 28001-2, 28001-4 or 28421), uired to notify the occupants of a fan system malfunction. A System Label (provided with Manometer P/N 7) with instructions for contacting the installing contractor for service and identifying the necessity for regular tests to be conducted by the building occupants must be conspicuously placed in a location where ccupants frequent and can see the label.

ELECTRICAL WIRING

RPc, GPc, XPc and XR Series Radon Fans operate on standard 120V, 60Hz AC. All wiring must be performed cordance with National Fire Protection (NFPA) National Electrical Code, Standard #70, current edition, for all nercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and ed electrician. Outdoor installations require the use of a UL Listed watertight conduit. Ensure that all exterior ical boxes are outdoor rated and properly sealed to prevent water penetration into the box. A means, such as p hole, is recommended to drain the box.

3-WIRE FAN WIRING DIAGRAM

120 VAC	BLACK
COMMON	WHITE
GROUND	GRN/YLW

2-WIRE FAN WIRING DIAGRAM

120 VAC	BLACK
COMMON	WHITE

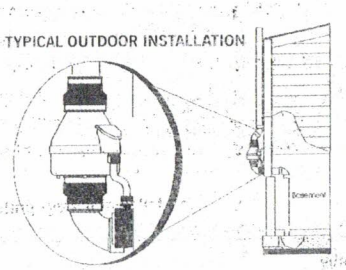
SPEED CONTROLS

RPc, GPc, XPc and XR Series Radon Fans are rated for use with electronic speed controls; however, speed ols are generally not recommended. If used, the recommended speed control is Pass & Seymour Solid State d Control (Cat. No. 94601-1).

2.0 INSTALLATION

The RPc, GPc, XPc and XR Series Radon Fans can be mounted indoors or outdoors. (It is suggested that EPA and radon mitigation standards recommendations be followed in choosing the fan location.)
The GPc Radon Fans have an integrated mounting bracket; RPc, XPc and XR Series Radon Fans may be mounted directly on the system piping or fastened to a supporting structure by means of an optional mounting bracket.
The ducting from the fan to the outside of the building has a strong effect on noise and fan energy use. Use the shortest, straightest duct routing possible for best performance, and avoid installing the fan with smaller ducts than recommended. Insulation around the ducts can reduce energy loss and inhibit mold growth. Fans installed with existing ducts may not achieve their rated airflow.

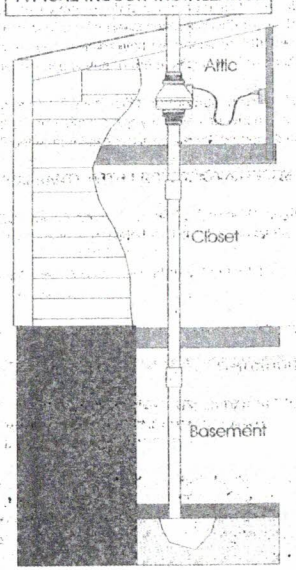
TYPICAL OUTDOOR INSTALLATION



2.1 MOUNTING

Mount the RPc, GPc, XPc and XR Series Radon Fan vertically with outlet up. Ensure the unit is plumb and level. When mounting directly on the system piping assure that the fan does not contact any building surface to avoid vibration noise.

TYPICAL INDOOR INSTALLATION



2.2 MOUNTING BRACKET (optional)

The RPc, XPc and XR Series Radon Fans may be optionally secured with the RadonAway Fan Mounting Bracket (P/N 25007). Foam or rubber grommets may also be used between the bracket and mounting surface for vibration isolation.

2.3 SYSTEM PIPING

Complete piping run, using flexible couplings as a means of disconnect for servicing the unit and for vibration isolation. As the fan is typically outside of the building thermal boundary and is venting to the outside, installation of insulation around the fan is not required.

2.4 ELECTRICAL CONNECTION

Connect wiring with wire nuts provided, observing proper connections (See Section 1.9). Note that the fan is not intended for connection to rigid metal conduit.

2.5 VENT MUFFLER (optional)

Install the muffler assembly in the selected location in the outlet ducting. Solvent weld all connections. The muffler is normally installed at the end of the vent pipe.

2.6 OPERATION CHECKS & ANNUAL SYSTEM MAINTENANCE

____ **Verify** all connections are tight and **leak-free.**

____ **Ensure** the RPc, GPc, XPc and XR Series Radon Fan and all ducting are **secure and vibration-free.**

____ **Verify system vacuum pressure** with manometer. **Ensure** vacuum pressure is within normal operating range and **less than** the maximum recommended operating pressure.

(Based on sea-level operation, at higher altitudes reduce by about 4% per 1000 feet)
(Further reduce Maximum Operating Pressure by 10% for High Temperature environments.)
See Product Specifications. If this is exceeded, increase the number of suction points.

____ **Verify Radon levels** by testing to EPA Protocol and applicable testing standards.

CONDENSATION & DRAINAGE

densation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. can occur at points where the system piping goes through unheated space such as an attic, garage or outside. system design must provide a means for water to drain back to a slab hole to remove the condensation. RPc, GPc, XPc and XR Series Radon Fan MUST be mounted vertically plumb and level, with the outlet pointing or proper drainage through the fan. Avoid mounting the fan in any orientation that will allow water to accumulate le the fan housing. The RPc, GPc, XPc and XR Series Radon Fans are NOT suitable for underground burial.

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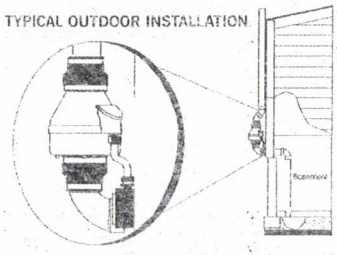
The GPc Radon Fans have an integrated mounting bracket; RPc, XPc and XR Series Radon Fans may be mounted directly on the system piping or fastened to a supporting structure by means of an optional mounting bracket.
The ducting from the fan to the outside of the building has a strong effect on noise and fan energy use. Use the shortest, straightest duct routing possible for best performance, and avoid installing the fan with smaller ducts than recommended. Insulation around the ducts can reduce energy loss and inhibit mold growth. Fans installed with existing ducts may not achieve their rated airflow.

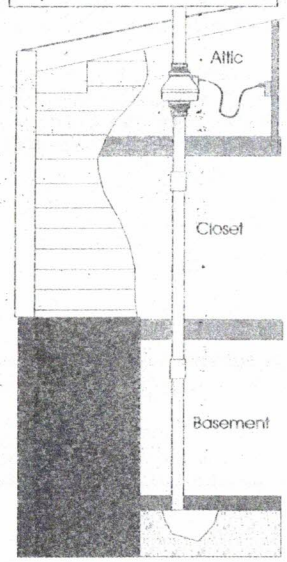
TYPICAL OUTDOOR INSTALLATION



2.1 MOUNTING

Mount the RPc, GPc, XPc and XR Series Radon Fan vertically with outlet up. Ensure the unit is plumb and level. When mounting directly on the system piping assure that the fan does not contact any building surface to avoid vibration noise.

TYPICAL INDOOR INSTALLATION



2.2 MOUNTING BRACKET (optional)

The RPc, XPc and XR Series Radon Fans may be optionally secured with the RadonAway Fan Mounting Bracket (P/N 25007). Foam or rubber grommets may also be used between the bracket and mounting surface for vibration isolation.

2.3 SYSTEM PIPING

Complete piping run, using flexible couplings as a means of disconnect for servicing the unit and for vibration isolation. As the fan is typically outside of the building thermal boundary and is venting to the outside, installation of insulation around the fan is not required.

2.4 ELECTRICAL CONNECTION

Connect wiring with wire nuts provided, observing proper connections (See Section 1.9). Note that the fan is not intended for connection to rigid metal conduit.

2.5 VENT MUFFLER (optional)

Install the muffler assembly in the selected location in the outlet ducting. Solvent weld all connections. The muffler is normally installed at the end of the vent pipe.

2.6 OPERATION CHECKS & ANNUAL SYSTEM MAINTENANCE

____ Verify all connections are tight and leak-free.

____ Ensure the RPc, GPc, XPc and XR Series Radon Fan and all ducting are **secure and vibration-free**.

____ **Verify system vacuum pressure** with manometer. **Ensure** vacuum pressure is within normal operating range and **less than** the maximum recommended operating pressure.
(Based on sea-level operation, at higher altitudes reduce by about 4% per 1000 feet)
(Further reduce Maximum Operating Pressure by 10% for High Temperature environments.)
See Product Specifications. If this is exceeded, increase the number of suction points.

____ Verify Radon levels by testing to EPA Protocol and applicable testing standards.

FOLLOWING CHARTS SHOW THE PERFORMANCE OF THE RPc, GPc, XPc AND XR SERIES RADON FANS

RPc Series Product Specifications

	Typical CFM Vs. Static Pressure "WC								
Model	0"	.2"	.5"	.75"	1.0"	1.25"	1.5"	1.75"	2.0"
RP140c	152	120*	64*	-	-	-	-	-	
RP145c	168	150*	123*	105	84*	64	44	20	3
RP260c	251	210*	157	117	70	26	-	-	-
RP265c	326	290*	241*	207	174*	143	118	89	60

*Denotes HVI Certified Values.

Model	Power Consumption 120VAC, 60Hz, 1.5 Amp Maximum	Maximum Recommended Operation Pressure* (Sea Level Operation)**
RP140c	14 - 19 watts	0.6" WC
RP145c	46 - 72 watts	1.7" WC
RP260c	47- 65 watts	1.3" WC
RP265c	86 - 122 watts	2.2" WC

*Reduce by 10% for High Temperature Operation. **Reduce by 4% per 1000 ft. of altitude.

Model	Size	Weight	Inlet/Outlet	L.2
RP140c	8.5"H x 9.7" Dia.	5.5 lbs	4.5"OD (4.0" PVC Sched 40 size compatible)	25
RP145c	8.5"H x 9.7" Dia.	5.5 lbs	4.5" OD	15
RP260c	8.6"H x 11.75" Dia.	5.5 lbs	6.0" OD	48
RP265c	8.6"H x 11.75" Dia.	6.5 lbs	6.0" OD	30

Estimated Equivalent Length of Rigid Metal Ducting resulting in .2" WC pressure loss for Duct Size listed. Longer Equivalent Lengths accommodated at Flows Lower than that at .2" WC pressure loss (see CFM Vs Static Pressure "WC Table).

XPc and XR Series Product Specifications

	Typical CFM Vs. Static Pressure "WC					
	0"	.5"	1.0"	1.5"	1.75"	2.0"
XP201c	112	95	70	40	-	-
XR261	217	149	87	27	-	-

Model	Power Consumption 120VAC, 60Hz, 1.5 Amp Maximum	Maximum Recommended Operation Pressure* (Sea Level Operation)**
XP201c	45 - 66 watts	1.7" WC
XR261	67 - 117 watts	1.6" WC

*Reduce by 10% for High Temperature Operation. **Reduce by 4% per 1000 ft. of altitude.

Model	Size	Weight	Inlet/Outlet
XP201c	9.5"H x 8.5" Dia.	6 lbs	4.5" OD
XR261	9.5"H x 8.5" Dia.	7 lbs	6" OD

GPc Series Product Specifications

	Typical CFM Vs. Static Pressure "WC						
	1.0"	1.5"	2.0"	2.5"	3.0"	3.5"	4.0"
GP301c	64	54	41	4	-	-	-
GP501c	-	-	66	58	50	27	4

Model	Power Consumption 120VAC, 60Hz, 1.5 Amp Maximum	Maximum Recommended Operation Pressure* (Sea Level Operation)**
GP301c	56-100 watts	2.3" WC
GP501c	68 - 146 watts	3.8" WC

*Reduce by 10% for High Temperature Operation. **Reduce by 4% per 1000 ft. of altitude

Model	Size	Weight	Inlet/Outlet
GP301c	13"H x 12.5" Dia.	12 lbs	3.5" OD
GP501c	13"H x 12.5" Dia.	12 lbs	3.5" OD

RPc, XPc, XR and GPc Series Additional Specifications

Model	Recommended Duct	PVC Pipe Mounting	Thermal Cutout	Insulation Class
RP140c	3" or 4" Schedule 20/40 PVC	Mount on the duct pipe or with optional mounting bracket. For Ventilation; 4", 6" or 8" Rigid or Flexible Ducting	130°C/266°F	Class B Insulation
RP145c			130°C/266°F	
RP260c			150°C/302°F	Class F Insulation
RP265c			150°C/302°F	
XP201c	3" or 4" Schedule 20/40 PVC	Fan may be mounted on the duct pipe or with integral flanges.	120°C/248°F	Class B Insulation
XR261				
GP301c	3" or 4" Schedule 20/40 PVC	Fan may be mounted on the duct pipe or with integral flanges.	120°C/248°F	Class B Insulation
GP501c				

Continuous Duty
3000 RPM
Thermally Protected
RPc, GPc Residential and Commercial
XPc, XR Residential Only
Rated for Indoor or Outdoor Use

ENERGY STAR
RP140c Only

LISTED
Electric Fan

Intertek
77728

Conforms to UL STD. 507
Certified to CAN/CSA STD. C22.2 No.113

Appendix D
Quality Assurance Project Plan

TABLE OF CONTENTS

QUALITY ASSURANCE PROJECT PLAN

1.0 PROJECT SCOPE AND GOALS

This Quality Assurance Project Plan (QAPP) has been prepared in accordance with DER-10 to provide procedures to be followed during the course of the sampling and analytical portions of the project related to the former Elka Chemical Corp. located at 340 West Hoffman Ave., Lindenhurst, New York.

The remediation at the Site will commence with the remediation of soil on the western portion of the site and the installation of a Sub-Slab Depressurization System (SSDS) in the building at the site.

The project goals are remove surface oil from four area on the western portion of the site and to operate the SSDS until the concentrations of subsurface soil vapors decrease to concentrations that the NYSDEC determines that no further post-remediation is required.

1.1 Project Organization

The project manager and Quality Assurance Officer (QAO) is Peter Dermody, CPG, who will be working under the supervision of Ravi Korlipara, PE, PhD.

1.2 Indoor Air Monitoring Procedures

Indoor air monitoring will be performed following the installation of the SSDS. One indoor and one outdoor air sample will be obtained from the on-site building (the former church).

1.3 SSDS Effluent Air

For each of the four SSDS units, laboratory-provided clean 6-liter Summa Canisters will be connected to dedicated food-grade polyethylene tubing. The tubing will be placed in the sampling port on the effluent side of the exhaust fan and a vapor sample will be obtained over a period of approximately one minute. The Summa Canister valve will then be closed and all canisters will be submitted to the laboratory for analysis of VOCs by USEPA Method TO-15 with Category B deliverables by an ELAP-certified laboratory. The canisters will be transferred to the custody of the laboratory within 48 hours (although the holding time for Summa Canisters is 30 days).

The following table provides the analytical methods/ Quality Assurance Summary Table:

Location	Matrix	Laboratory Analysis	Sample Containers	Sample Holding Time	Number of Samples
SSDS Effluent	Sub-Slab Soil Vapor	TO-15	6-Liter Summa Canister	48 hours	6

2.0 QUALITY ASSURANCE PROJECT PLAN OBJECTIVES

2.1 Overview

Overall project goals are defined through the development of Data Quality Objectives (DQOs), which are qualitative and quantitative Statements that specify the quality of the data required to support decisions; DQOs, as described in this section, are based on the end uses of the data as described in the work plan.

In this plan, Quality Assurance and Quality Control are defined as follows:

- Quality Assurance - The overall integrated program for assuring reliability of monitoring and measurement data.

- Quality Control - The routine application of procedures for obtaining prescribed standards of performance in the monitoring and measurement process.

2.2 QA/QC Requirements for Analytical Laboratory

Samples will be analyzed by a New York State Department of Health (NYSDOH) certified laboratory. Data generated from the laboratory will be used to evaluate volatile organic compounds (VOCs). The QA requirements for all subcontracted analytical laboratory work performed on this project are described below. QA elements to be evaluated include accuracy, precision, representativeness, and completeness. The data generated by the analytical laboratory for this project are required to achieve detection levels low enough to meet required quantification limits as specified in NYSDEC Analytical Services Protocol (ASP). The analytical results meeting the required quantification limits will provide data that meets the data quality objectives of this remedial program as described in the work plan. The QC elements that are important to this project are completeness of field data, sample custody, sample holding times, sample preservation, sample storage, instrument calibration and blank contamination.

2.3 Instrument Calibration

Calibration curves will be developed for each of the compounds to be analyzed. Standard concentrations and a blank will be used to produce the initial curves. The development of calibration curves and initial calibration response factors must be consistent with method requirements presented in the most recent version of NYSDEC ASP 07/2005).

2.3.1 Continuing Instrument Calibration

The initial calibration curve will be verified every 12 hours by analyzing one calibration standard. The standard concentration will be the midpoint concentration of the initial calibration curve. The calibration check compound must come within 25% relative percent difference (RPD) of the average response factor obtained during initial calibration. If the RPD is greater than 25%, then corrective action must be taken as provided in the specific methodology.

2.4 Accuracy

Accuracy is defined as the nearness of a real or the mean (x) of a set of results to the true value. Accuracy is assessed by means of reference samples and percent recoveries. Accuracy includes both precision and recovery and is expressed as percent recovery (% REC). The MS sample is used to determine the percent recovery. The matrix spike percent recovery (% REC) is calculated by the following equation:

$$\%REC = \frac{SSR - SR}{SA} \times 100$$

Where:
SSR = spike sample results
SR = sample results
SA = spike added from spiking mix

2.5 Precision

Precision is defined as the measurement of agreement of a set of replicate results among themselves without a Precision is defined as the measurement of agreement of a set of replicate results among themselves without assumption of any prior information as to the true result. Precision is assessed by means of duplicate/replicate sample analyses.

Analytical precision is expressed in terms of RPD. The RPD is calculated using the following formula:

$$RPD = \frac{D^1 - D^2}{(D^1 - D^2)/2} \times 100$$

Where:
RPD = relative percent difference
D^1 = first sample value
D^2 = second sample value (duplicate)

2.6 Sensitivity

The sensitivity objectives for this plan require that data generated by the analytical laboratory achieve quantification levels low enough to meet the required detection limits specified by NYSDEC ASP and to meet all site-specific standards, criteria and guidance values (SGCs) established for this project.

2.7 Representativeness

Representativeness is a measure of the relationship of an individual sample taken from a particular site to the remainder of that site and the relationship of a small aliquot of the sample (i.e., the one used in the actual analysis) to the sample remaining on site. The representativeness of samples is assured by adherence to sampling procedures described in the Remedial Investigation Work Plan.

2.8 Completeness

Completeness is a measure of the quantity of data obtained from a measurement system as compared to the amount of data expected from the measurement system. Completeness is defined as the percentage of all results that are not affected by failing QC qualifiers and should be between 70 and 100% of all analyses performed. The objective of completeness in laboratory reporting is to provide a thorough data support package. The laboratory data package provides documentation of sample analysis and results in the form of summaries, QC data, and raw analytical data. The laboratory will be required to submit data packages that follow NYSDEC ASP reporting format which, at a minimum, will include the following components:

1. All sample chain-of-custody forms.
2. The case narrative(s) presenting a discussion of any problems and/or procedural changes required during analyses. Also presented in the case narrative are sample summary forms.
3. Documentation demonstrating the laboratory's ability to attain the contract specified detection limits for all target analytes in all required matrices.
4. Tabulated target compound results and tentatively identified compounds.
5. Surrogate spike analysis results (organics).
6. Matrix spike/matrix spike duplicate/matrix spike blank results.
7. QC check sample and standard recovery results
8. Blank results (field, trip, and method).
9. Internal standard area and RT summary.

2.9 Laboratory Custody Procedures

The following elements are important for maintaining the field custody of samples:

- Sample identification
- Sample labels
- Chain-of-Custody records

Sample tags will be attached to all Summa Canister and each tag will contain an identifying sample number. The number, type of sample, and sample identification will be entered into the field logbook. A chain-of-custody form, initiated at the analytical laboratory will accompany the Summa Canisters from the laboratory into the field. Upon receipt of the Summa Canisters, the sampler will sign and date the first received blank space. After each sample is collected and appropriately identified, entries will be made on the chain-of-custody form that will include:

- Site name and address
- Samplers' names and signatures

3.0 ANALYTICAL PROCEDURES

3.1 Laboratory Analysis

Samples will be analyzed by the NYSDOH ELAP laboratory for one or more of the following parameters: VOCs in air by USEPA Method TO15.

If any modifications or additions to the standard procedures are anticipated. and if any nonstandard sample preparation or analytical protocol is to be used, the modifications and the nonstandard protocol will be explicitly defined and documented.

4.0 DATA REDUCTION, REVIEW, AND REPORTING

4.1 Overview

The process of data reduction, review, and reporting ensures the assessments or a conclusion based on the final data accurately reflects actual site conditions. This plan presents the specific procedures, methods, and format that will be employed for data reduction, review and reporting of each measurement parameter determined in the laboratory and field. Also described in this section is the process by which all data, reports, and work plans are proofed and checked for technical and numerical errors prior to final submission.

4.2 Data Reduction

Standard methods and references will be used as guidelines for data handling, reduction, validation, and reporting. All data for the project will be compiled and summarized with an independent verification at each step in the process to prevent transcription/typographical errors. Any computerized entry of data will also undergo verification review.

Sample analysis will be provided by a New York State certified environmental laboratory. Laboratory reports will include ASP category B deliverables for use in the preparation of a data usability summary

report (DUSR). All results will be provided in accordance with the NYSDEC Environmental Information Management System (EIMS) electronic data deliverable (EDD) format. Analytical results shall be presented on standard NYSDEC ASP-B forms or equivalents, and include the dates the samples were received and analyzed, and the actual methodology used. Note that if waste characterization samples are analyzed they will be in results only format and will not be evaluated in the DUSR.

Laboratory QA/QC information required by the method protocols will be compiled, including the application of data QA/QC qualifiers as appropriate. In addition, laboratory worksheets, laboratory notebooks, chains-of-custody, instrument logs, standards records, calibration records, and maintenance records, as applicable, will be provided in the laboratory data packages to determine the validity of data. Specifics on internal laboratory data reduction protocols are identified in the laboratory's SOPs.

Following receipt of the laboratory analytical results by EBC, the data results will be compiled and presented in an appropriate tabular form. Where appropriate, the impacts of QA/QC qualifiers resulting from laboratory or external validation reviews will be assessed in terms of data usability.

4.3 Laboratory Data Reporting

All sample data packages submitted by the analytical laboratory will be required to be reported in conformance to the NYSDEC ASP, Category B data deliverable requirements as applicable to the method utilized. All results will be provided in accordance with the NYSDEC Environmental Information Management System (EIMS) electronic data deliverable (EDD) format.

4.4 Data Usability Summary Report

A Data Usability Summary Report (DUSR) will be prepared that will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.

5.0 CORRECTIVE ACTION

Review and implementation of systems and procedures may result in recommendations for corrective action. Any deviations from the specified procedures within approved project plans due to unexpected site-specific conditions shall warrant corrective action.

Procedures have been established to ensure that conditions adverse to data quality are promptly investigated, evaluated and corrected. These procedures for review and implementation of a change are as follows:

- Define the problem.
- Investigate the cause of the problem.
- Develop a corrective action to eliminate the problem, in consultation with the personnel who defined the problem and who will implement the change.
- Complete the required form describing the change and its rationale (see below for form requirements).
- Obtain all required written approvals.

- Implement the corrective action.
- Verify that the change has eliminated the problem.

During the field investigation, all changes to the sampling program will be documented in field logs/sheets and the EBC PM advised.

If any problems occur with the laboratory or analyses, the laboratory must immediately notify the PM, who will consult with other project staff. All approved corrective actions shall be controlled and documented.

All corrective action documentation shall include an explanation of the problem and a proposed solution which will be maintained in the project file or associated logs. Each report must be approved by the necessary personnel (e.g., the PM) before implementation of the change occurs. The PM shall be responsible for controlling, tracking, implementing and distributing identified changes.