



Environment

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Construction Completion Report
Farmingdale Plaza Cleaners Site
Soil Vapor Extraction Interim Remedial
Measure
Farmingdale, New York
NYSDEC Site No. 130107

FINAL

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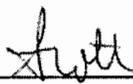
1,2-DCE	cis-1,2-Dichloroethene
AMSL	Above Mean sea Level
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
Bgs	Below Ground Surface
CAMP	Community Air Monitoring Plan
CCR	Construction Completion Report
COC	Contaminant of Concern
DER	Department of Environmental Remediation
EAR	Environmental Assessment and Remediation
FS	Feasibility Study
HASP	Health and Safety Plan
Hp	Horse Power
IRM	Interim Remedial Measure
IWC	Inches of Water Column
Lbs	pounds
LIFS	Liberty Industrial Finishing Site
LS	Lump Sum
MP	Monitoring Point
NDG	Nuclear Density Gauge
NES	National Environmental Systems
NPL	National Priority List
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OSHA	Occupational Safety and Health Act
PCE	Tetrachloroethene
PCO	Proposed Change Order
PID	Photo Ionization Detector
P&ID	Process and Instrumental Diagram
PPE	Personal Protective Equipment
Ppm	Parts Per Million
PVC	Poly Vinyl Chloride
QAPP	Quality Assurance Project Plan

RAWP	Remedial Action Work Plan
RFI	Request For Information
RI	Remedial Investigation
ROI	Radius of Influence
RSCO	Recommended Soil Cleanup Objective
SCFM	Standard Cubic Feet per Minute
SI	Site Investigation
SMP	Site Management Plan
SSDS	Sub-Slab Depressurization System
SVE	Soil Vapor Extraction
SVI	Soil Vapor Intrusion
SVOC	Semi-Volatile Organic Compound
TAGM	Technical and Administrative Guidance Memorandum
TCE	Trichloroethene
THA	Task Hazard Analysis
TWA	Time Weighted Average
Ug	Microgram
USEPA	United States Environmental Protection Agency
VFD	Variable Frequency Drive
VOC	Volatile Organic Compound

Engineering Certification

I, Scott Underhill, certify that I am currently a New York State registered professional engineer, I had primary direct responsibility for the implementation of the subject construction program, and I certify that the Remedial Work Plan and Specifications were implemented and that all construction activities were completed in substantial conformance with the DEC-approved Remedial Work Plan and Specifications.

Respectfully submitted,
AECOM Technical Services Northeast, Inc.

Scott A. Underhill
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January 31, 2012

Date

1.0 Introduction

This Construction Completion Report (CCR) summarizes the Soil Vapor Extraction (SVE) Interim Remedial Measure (IRM) performed at the Farmingdale Plaza Cleaners Site ("Site"), Site Number 130107, Village of Farmingdale, Nassau County, Long Island, New York. The Site location is shown in Drawing 1. This CCR was prepared by AECOM Technical Services Northeast, Inc. (AECOM), for New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation (DER) under Work Assignment D004456-28.

The CCR summarizes the installation and startup of the SVE system and provides documentation that the site preparation, well installation, monitoring point installation, trenching, pipe installation, system construction, connection and system start up activities associated with the remediation were performed in substantial conformance with the Design Specifications, Contract Documents (AECOM, 2011), NYSDEC guidelines, and accepted standards of practice.

Included with this report are as-built drawings, cut-sheets for treatment system components, transporter and disposal manifests for waste removed during the well installation and trenching, analytical data for verification samples, and other information detailing system installation and startup.

1.1 Background and Site History

The Site is located at 480 Main Street in the Village of Farmingdale, Town of Oyster Bay, Nassau County, New York. The Farmingdale Plaza Cleaners was part of the Farmingdale Plaza, a one-story masonry structure of approximately 33,000 square feet that includes (from north to south): Waldbaum's Supermarket, Farmingdale Plaza Cleaners, Lucky House Chinese Restaurant, and Main Street Cards and Gifts. The tenant's spaces for Waldbaum's and Farmingdale Plaza Cleaners are now vacant. The Plaza is situated on an approximately 4-acre parcel consisting of Lots 245, 350 and 269 in Block 102 of Section 49 as identified by the Village of Farmingdale Assessor's office. The Site is located in a mixed neighborhood of apartments, restaurants, and retail business. The topography of the Site and the surrounding properties is relatively level, sloping gently to the south from about 60 feet above mean seal level (AMSL) at the Site to the South Bay.

Farmingdale Plaza was constructed in 1983, at which time the Farmingdale Plaza Cleaners began operation. Environmental investigations near the Site began in the late 1990s as a result of a nearby National Priority List (NPL) site, known as the Liberty Industrial Finishing NPL Site (LIFS), located approximately 1,000 feet south (downgradient) of the Plaza. A groundwater plume of tetrachloroethene (PCE) was identified at the LIFS as coming from an upgradient source and was found to be originating from the Site during 1999 investigation.

The Site was listed as a Class 2 Inactive Hazardous Waste Site in December 2002. Following the listing, the property owner (A&P, Inc.) retained Whitestone Associates to conduct additional on-site investigation in 2003 and 2004, during which, PCE was detected in soil, groundwater, and soil vapor at the Site. In January 2005, NYSDEC referred the Farmingdale Plaza Cleaners Site for funding by the State Superfund for implementation of a remedial investigation/feasibility study (RI/FS). Following the 2007 RI (O'Brien & Gere, 2007), an SVE system was selected as an interim remedy to prevent exposure to contaminated soil vapors and treat residual soil contamination. A SVE pilot test was performed by Yu & Associates (subcontractor of AECOM) in February 2009. The results of the pilot

study were used to design a full-scale SVE system (AECOM, 2011). Environmental Assessment and Remediation (EAR) was selected to install the SVE system following a request for proposals (RFP) to the existing NYSDEC standby remedial contractors.

1.2 Project Related Documentation

The following is a summary of project related documents prepared prior to the Contract Documents for the Farmingdale Plaza Cleaners Site for Installation of SVE system:

- Supplemental Remedial Investigation Summary Report, Farmingdale Plaza Site (Whitestone Associates, Inc., September 2004);
- Final Remedial Investigation Report, Farmingdale Plaza, Cleaners Site (O'Brien & Gere, August, 2007);
- Work Plan for Interim remedial Design of SVE and sub-slab depressurization system (SSDS), Farmingdale Plaza Cleaners, (Earth Tech, February 2009);
- Interim Remedial Measure Bid package, Farmingdale Plaza Cleaners Site (AECOM, June 2011); and
- Interim Remedial Measure RFP Addendum Number 2, Farmingdale Plaza Cleaners Site, (AECOM, June 2011).

1.3 Summary of Contamination

In 2000 during an investigation of the LIFS site, two contaminated plumes were identified: Plume A originating at the LIFS and Plume B migrating beneath the LIFS from an off-site source in the vicinity of the Farmingdale Plaza. A 2001 SI did not detect any VOCs in soil above Technical and Administrative Guidance Memorandum (TAGM) and only benzene in groundwater at concentrations exceeding the NYSDEC Class GA Standards. The report concluded the contaminants were related to off-site sources and that the property had not impacted environmental conditions at the LIFS. The 2001 SI performed by Whitestone Associates also found no VOCs in site soils above TAGM. This investigation also identified widespread PCE and related degradation products (i.e. TCE, 1,2-DEC) to be widespread in the groundwater, with PCE concentrations exceeding the groundwater standards. The 2003 Whitestone Associates investigations also found no VOC in soils above TAGM, and the groundwater contamination to be regional and not related to Site activities.

A 2004 Earth Tech, Inc. hydrogeologic investigation found highest concentrations of VOCs (PCE and degradation products) in the Upper Glacial Aquifer in the well located southwest of the Farmingdale plaza in an effort to assess the source of the LIFS plume. USEPA also conducted a soil vapor survey at the Site and adjacent properties, which indicated an area of elevated soil vapor PCE concentrations adjacent to the Farmingdale Plaza Cleaners, extending beneath a storage area of the Waldbaum's Supermarket. Elevated soil vapor PCE levels were also found to the southeast of the Cleaners, and in the parking lot. The SRI conducted by Whitestone Associates in 2004 found soils marginally exceeding TAGM in the upper portion of the vadose zone, approximately 12 to 13 feet above the groundwater interface.

O'Brien & Gere conducted soil vapor intrusion (SVI) investigation for each business in Farmingdale Plaza in March 2006 and for surrounding properties in January 2007. The investigation included pre-sampling survey, indoor air sampling, sub-slab soil vapor sampling, soil vapor sampling, and ambient air sampling. No contaminants of concern (COCs) were detected in indoor air samples at concentrations exceeding the NYSDOH guidance values. Results of the sub-slab soil vapor sampling

indicated that COCs were detected at each of the eight structures and the highest soil gas concentrations were found under the Farmingdale Plaza Cleaners. Both subsurface soil vapor samples were detected with VOCs, with elevated concentrations of PCE in the sample collected along northwest side of the Milestone Apartments. PCE was detected at concentrations of 0.5 ug/m³ and 1.1 ug/m³ in two of four outdoor ambient air samples collected at the northeast side of the Farmingdale Plaza and near Windsor Apartments. Based on the SVI investigation results and NYSDOH decision matrix, six of the tenant spaces (Farmingdale Plaza Cleaners, Waldbaum's Supermarket, Lucky House Chinese Restaurant, Main Street Cards and Gifts, Garden Apartments, and McDonald's Restaurant) matched the criteria for mitigation of soil vapors.

During the O'Brien & Gere investigation, chlorinated VOCs related to dry-cleaning operations were detected in the subsurface soil samples collected along the eastern portion, central portion, and northern portion of the Farmingdale Plaza Cleaners. The sub-slab soil sample collected from the northern portion of the Farmingdale Plaza was detected with PCE at concentration exceeding TAGM. No VOCs were detected above TAGM, and no noticeable odors or stains were observed in subsurface soil samples collected around the perimeter of the building or in the utility boring soil samples collected from south of the building.

During the O'Brien & Gere investigation, no primary groundwater COCs (PCE, TCE, and cis-1,2-DCE) were detected above groundwater standards at one of two vertical profile screening location; however, toluene was detected above groundwater standards in the samples collected from the 40 feet and 80 feet intervals. PCE was detected above groundwater standards in the second vertical profile screening location at 20-, 40-, and 60-foot intervals. PCE and TCE were detected at concentrations above groundwater standards in the samples collected from EPA-MW-4A and EPA-MW-5B during the February 2006 sampling event. During February 2007 sampling event, concentrations of PCE, TCE and cis-1,2-DCE were detected above groundwater standards at eight monitoring wells. PCE (62 ug/L) and TCE (17 ug/L) were detected at concentrations exceeding the groundwater standards at EPA-MW-4A, located just south of the Farmingdale Plaza. Concentrations of PCE were also detected above groundwater standards at DEC-MW-5 (12 ug/L), DEC-MW-6 (21 ug/L), and DEC-MW-7 (14 ug/L). Further downgradient at MW-22A, PCE (160 ug/L), TCE (29 ug/L) and cis-1,2-DCE (55 ug/L) were also detected above groundwater standards. Upgradient of the Site, concentrations of PCE were detected above groundwater standards at EPA-MW-5A (20 ug/L), DEC-MW-2 (12 ug/L), and DEC-MW-3 (170 ug/L). TCE (38 ug/L) and cis-1,2-DCE (5.8 ug/L) were detected above groundwater standard at DEC-MW-3 and DEC-MW-2, respectively.

1.4 Summary of Historical Remedial Activities

A pilot study was performed in early 2009 at four SVE wells (SVE-1 through SVE-4). Locations of these wells are shown on Drawing 2. The pilot study was summarized in the 30% design document and was included with design specifications as part of the bid package for remedial construction. High flow rates (85 to 300 scfm) were applied on these four SVE wells and corresponding radius of influence (ROI) varied from 35 feet to 110 feet. In 2011, an IRM work plan was prepared for design and installation of the SVE system at the Farmingdale Plaza, and SSDS at Garden Apartments and McDonalds. The SSDS was planned to be designed after installation of the SVE system if needed.

The RFP was sent to NYSDEC standby remedial contractors. EAR was selected by a bidding process as a Contractor to construct, install, and startup the system.

2.0 Construction Contract, Oversight, and Permitting

2.1 Remedial Construction Oversight

The project design and remedial construction oversight services for the SVE system were provided by AECOM under contract with the NYSDEC. Tasks performed by AECOM relative to the remedial construction oversight included:

- Preparation of Remedial Design/Remedial Action Work Plan/Health and Safety Plan/Task Hazard Analysis sheets (THAs);
- Attendance at Project Meetings;
- Review of Contractor's Submittals;
- Baseline Sampling;
- Remedial Construction Oversight ;
- Well Installation Oversight;
- System Start-up Oversight;
- Review and Preparation of Field Orders and Change Orders;
- Construction Record Keeping and Reporting; and
- Project Administration.

Throughout the IRM activities, an AECOM engineer was on-site to oversee the remedial construction operations, including well installation, trenching, pipe installation, treatment system installation, start-up and initial influent and effluent sample collection.

2.2 Construction Contract

Construction Plans and Specifications for the Farmingdale Plaza Cleaners Remediation Project were prepared by AECOM, based on the NYSDEC approved Remedial Design Remedial Action Work Plan (February 2009). A pre-selected list of qualified NYSDEC Standby Remedial Contractors was invited to bid on IRM construction in May 2011. NYSDEC request for proposals along with addendum is included in Appendix A. After a site-walk with NYSDEC, AECOM and Standby Contractors, an addendum to the contract documents was prepared to address comments and answer Contractor's questions.

Bids were received from the four selected NYSDEC Standby Contractors in early July 2011. The apparent low bidder, EAR, was awarded the contract to install the SVE system at the Site and perform startup and initial O&M activities. EAR submitted hard copy of the bid directly to NYSDEC. EAR's bid breakdown was compared to the Engineer's cost estimate prepared by AECOM. These cost estimates are included in Appendix B.

The scope of the remedial construction work under the terms of the Contract included the following tasks:

- Submit a Remedial Action Work Plan (RAWP), Health and Safety Plan (HASP), Quality Assurance Project Plan (QAPP), Sampling Plan, and Project Schedule prior to commencing construction work in accordance with the approved plans.
- Mobilize and site preparation: including utilities, site support facilities, equipment and material staging and storage areas, personal decontamination and hygiene facilities, access and site controls, decontamination pad, utility mark outs.
- SVE well and soil vapor monitoring points installation in accordance with the design specifications and approved RAWP.
- Trenching, pipe layout, and backfilling – for manifold piping to connect SVE wells and SVE system. The bid would also include alternate item with sub-surface SVE pipe installation from the SVE well in Farmingdale Plaza Cleaners to the SVE system. Scope of work and price of this item was compared to partial piping through roof and rest of the piping underground.
- Site Survey – initial and as-built.
- SVE System Installation – prefabricated off-site by a qualified vendor following submission and approval of the submittal package, system transportation, placement on the paved site area, and final connections.
- Startup and Operation – to ensure continuous operation of the SVE system and achieving the objective of extracting and treating the soil gas containing VOCs. The Contractor was responsible for operating the system for six months following the three week startup period.
- Transportation and disposal of regulated wastes at permitted off-site disposal facilities in accordance with all applicable regulations and requirements.
- Provide personal protective equipment (PPE) and perform Community Air Monitoring (CAMP).
- Restoration of the affected area and demobilization.
- Periodic sample collection during construction, startup and operation.

NYSDEC retained EAR under a prior callout to provide a new separately metered, overhead, 100 amp, 3 phase 208 VAC electrical service for the system.

The Contract was modified to include installation of soil vapor monitoring points near Milestone Apartments and inside the Garden Apartments.

The remedial action was performed in accordance with the following documents:

- DER-10 (NYSDEC, May 2010);
- Bid-Package and Addendum prepared by AECOM and NYSDEC (June-July 2011) (A);
- Work Plan and HASP prepared by EAR (July 2011) (EAR Submittals - Appendix C); and
- O&M Plan prepared by EAR (September 2011) (EAR Submittals - Appendix C).

2.3 Permits and Access Agreements

EAR and NYSDEC applied for the following permits for construction and SVE system installation at the site. All permits were issued by the Village of Farmingdale and are included in Appendix D.

1. Building Permit
Permit No. DB 11-94
Issued 8/22/11 for the installation of packaged SVE system and related subsurface piping
2. Fence Permit
Permit No. FP 11-14
Issued 8/25/11 for erection of fencing around equipment compound/system
3. Fence Permit
Permit No. FP 11-19
Issued 10/24/11 for erection of fencing around electrical meter/service pole
4. Sign Permit
Permit No. SP 11-31
Issued 9/13/11 for installation of NYS Superfund Program Sign
5. Hydrant Permit
Issued for local water source for non-impacted water as needed for equipment decontamination and construction

An electrical permit was not required by the Long Island Power Authority for this project. An air Discharge permit was also not required since the remediation was being performed within the NYSDEC superfund program. Access was secured by the NYSDEC to perform the IRM at the Farmingdale Plaza and to install the sub-slab monitoring points at the Garden Apartments. However, access could not be secured with the Milestone Apartments to install the sub-slab vapor monitoring point, resulting in installation of two soil vapor monitoring points in the parking lot of the Farmingdale Plaza, close to the Milestone Apartments.

3.0 Remediation Activities

3.1 Introduction

The objective of the SVE IRM to mitigate the contamination and effects of the chlorinated solvent discharge associated with the former Farmingdale Plaza Cleaners. The SVE system was designed to mitigate the soil vapors impacted with chlorinated VOCs (mainly PCE) and to remediate any VOC contaminated soils below the former dry cleaners.

The SVE system was installed in the parking lot of the Farmingdale plaza as shown on Drawing 3. The system was connected to the new SVE well installed inside the plaza (SVE-5) and an existing SVE well (SVE-1 from the pilot study) located in the parking lot, just outside the Farmingdale Plaza Cleaners building. The SVE system was installed with carbon canisters to remove VOCs from the extracted soil vapors. Well Installation, trench excavation, pipe layout, system installation and start up were documented by EAR in their field sheets and by AECOM in their daily reports.

Sub-slab monitoring points were installed in Garden Apartments to monitor soil gas below the slab at that location. This will allow for monitoring of conditions and alert NYSDEC of the need to take additional action if necessary. NYSDEC and NYSDOH also requested installation of sub-slab monitoring points in the Milestone Apartments, but access could not be secured. As a result, two soil-vapor monitoring points were installed in the Farmingdale Plaza parking lot, adjacent to the Milestone Apartments.

3.2 Pre-Construction Meeting

A pre-construction meeting was held at the Site on July 20, 2011. The meeting was attended by representatives of the Contractor, AECOM, and NYSDEC. The purpose of the meeting was to introduce team members from each party, review the project schedule, and discuss the execution plan, work approach, and project health and safety.

3.3 Submittals

In accordance with the Design Specifications EAR prepared the following submittals and submitted them to NYSDEC and AECOM for approval prior to commencing on site construction activities on August 2, 2011:

- Project Schedule;
- SVE Submittal package;
- Technical Submittal Schedule;
- Health and Safety Plan;
- Traffic Safety Plan;
- Work Plan;
- Bid Breakdown;
- Contingency Plan;

- Materials Handling Plan;
- Project Sign;
- Boring & Well Installation Plan;
- Community Air Monitoring Plan;
- Excavation Methods and Proposed Equipment;
- Quality Assurance Project Plan;
- Trench Piping Material Data;
- Elevations along Trench Run;
- Common Fill Acceptance Testing Results;
- Drilling Logs, Initial Site Survey;
- Concrete Sand Acceptance Testing Data;
- SVE Shop Testing Pictures;
- Motor Starter Contractor Data;
- Asphalt Mix Formula Certification;
- Drawing of Final Distribution Panel;
- SVE Startup Plan; and
- Operation & Maintenance Manual.

These submittals and AECOM approvals are included in Appendix C. Change orders and request for information (RFI) during the remedial construction activities were reviewed and approved by AECOM. These change orders and approvals are included in Appendix E.

3.4 Mobilization and Site Preparation

Subsurface utilities were marked out at the locations selected by AECOM for SVE well and monitoring point installation and along the trench run prior to mobilization. Utility poles were installed on July 25, 2011. Fencing was installed by EAR around the predetermined SVE system location prior to commencement of construction activities to provide additional space for equipment storage and hygiene facilities. The chain-link fence was 30 feet in length and 20 feet in width. Initially planned 6 feet height of the fence was increased to 8 feet upon the Village of Farmingdale's request for better aesthetics.

A hollow stem auger drill rig was mobilized to the Site on August 2, 2011 to install the SVE well (SVE-5), vacuum monitoring points (MP1-1 through MP-1-5), and sub-slab vapor monitoring points (B01-SS1 through B01-SS3) on site. A track mounted hollow stem auger drill rig was utilized to complete installation of the monitoring points and the SVE well inside the plaza on August 3, 2011. During this time, the Village of Farmingdale was contacted to obtain necessary permits.

Upon receipt of the Fire Hydrant permit a second mobilization was completed on August 22, 2011 to prepare for trenching and piping installation. Saw cutting of asphalt was performed on August 22 and 23, 2011. No soils were generated during this task, and the water was discharged directly on the paved parking lot.

Mobilization for trenching and piping installation was completed on August 31, 2011. Trenching, piping, and restoration were conducted between August 31, 2011 and September 19, 2011. Soils from trenching were screened with PID, and stockpiled on-site for reuse and/or disposal as non-hazardous soil waste.

At the request of NYSDEC and NYSDOH, additional drilling activities associated with the installation of two additional soil vapor monitoring points (B04-SV1 and B04-SV2) in the Farmingdale Plaza parking lot near the Milestone Apartments was completed on September 2, 2011.

EAR used their subcontractor, Clear Water Drilling, for drilling and installation of SVE well, soil vapor monitoring points, and vacuum monitoring points. X-Ray Location Services was used for utility mark outs; Soil Mechanics was used to perform on-site compaction testing of the trench bedding and backfill material; and Pave Master was used for asphalt paving.

3.5 Temporary Facilities

A fence was installed around the SVE system location and was used as a temporary staging and storage area during the project. A portable restroom was temporarily placed within the fenced in enclosure throughout the course of construction activities. The former dry cleaners building was used to store drums and excess soils until scheduled pickup for off-site disposal. Traffic cones, signs, and caution tape along with road plates were utilized as necessary during construction to mark the work zone.

3.6 Equipment

The following equipment was utilized by EAR and its sub-contractors to perform the remedial activities:

- Drill rigs;
- Saw;
- Excavator;
- Compactor;
- Bob-cat;
- Shovels;
- Road plates;
- Traffic cones and Signs;
- PID;
- Leveler;
- Piping;
- Compressor/Blower for pressure testing; and
- Nuclear Density Gauge (NDG) to measure soil compaction.

3.7 Well Installation

Clear Water Drilling installed five vacuum monitoring points, one SVE well, three sub-slab vapor monitoring points, and two soil vapor monitoring points in conformance with the Boring and Well Installation Plan (EAR, 2011). Two soil vapor monitoring wells were added to the initial plan based on NYSDEC and NYSDOH's request to monitor soil vapor conditions near the Mile Stone Apartments. Locations of the monitoring points and SVE well are shown on Drawing 3.

The new SVE well (SVE-5) was installed inside the former dry cleaning facility as shown on the Drawing 3. The 4-inch diameter schedule 40 PVC well was screened from 6.9-16.9 feet below ground surface (ft-bgs). A #2 sand filterpack was installed from 5-17.5 ft-bgs followed by bentonite from 3-5 ft-bgs. PID readings in the soil boring varied from 0.5-1.7 ppm, with the highest reading from 2-6 ft-bgs. The well was completed with an expandable gripper cap and encased at grade within water tight, H-20 rated 8-inch diameter steel road box.

The vacuum monitoring points (MP1-1 through MP1-5) were 1-inch PVC wells with 5 feet of screen installed from 7-12 ft-bgs. #2 sand filterpack was installed around the wells from approximately 6-12.5 ft-bgs and a bentonite seal from 4-6 ft-bgs. These points were each completed with 1-inch PUC dome caps and encased at grade within water tight, H-20 rated 8-inch diameter steel road boxes.

Three sub-slab vapor monitoring points (B01-SS1 through B01-SS3) were also installed inside the Farmingdale Plaza building using a Concrete Hammer Drill. Two points were installed inside the former Waldbaum area and one in the former dry cleaners. These points were installed to completion depths 6-inches below the slab using ¼-inch perforated copper tube. The annulus around each point was completed with #2 filterpack followed by 1-inch thick layer of bentonite, and concrete to match pre-existing grade conditions. Each point was finished with a threaded copper cap and secured at grade within a 3-inch by 6-inch bold-down road box. The two additional sub-slab vapor monitoring points (B03-SS1 and B03-SS2) located in the Garden Apartments were completed by AECOM in an identical manner except they were completed with brass caps and without road boxes.

PID readings from the soil cores varied from 0.4 ppm to 3.0 ppm. Highest PID reading of 3 ppm was recorded at MP-1-2 and MP-1-5 from 5-10 ft-bgs. The geology was mostly fine to medium or medium to coarse sand with gravel and clayey fines at some locations. The drilling logs are included in Appendix F.

Two soil vapor monitoring points (B04-SV1 and B04-SV2) installed near the Milestone Apartments were constructed with six-inch screen installed at 8 ft-bgs. Teflon tubing was used as the riser and wells were secured at grade within 8- by 12- inch steel bolt-down road boxes.

3.8 Excavation and Piping

Saw cutting for trenching and pipe installation began on August 22, 2011 after receiving the hydrant permit from the Village of Farmingdale. Saw cutting lasted two days. The locations were marked for utilities by X-Ray Location Services prior to commencement of excavation. Vertical inserts were also inserted in the fence during this time.

Excavation began on August 31, 2011 near the fence. Excavation was performed in sections of 20 feet to avoid disruption of local traffic and prevent dewatering open excavation in case of heavy rain. An excavator was used to excavate approximately 2.5 feet wide trench. The depth of the trench varied from the fence line to the SVE well location to maintain a gentle slope towards the well (SVE-5) for moisture drainage. Excavation depths were determined based on the site's surface elevation, a need

to maintain at least 9-inches of soil cover, and the design requirement to maintain a piping pitch from the SVE system back to the SVE wells. As shown on the as-built site survey (Appendix G), the elevation of the inverse of the pipe varied from 64.04 feet above mean sea level (AMSL) near the fence to 63.41 feet AMSL near the SVE well SVE-5.

Excavated soils were screened visually and/or with PID for VOCs. The excavated soils were moved using a front loader and were used as backfill material after screening. After excavation, the trench bed was compacted using a hand held and mechanical compactor. The bed was checked for level using a leveler. 20 feet sections of three 4-inch Schedule 80 PVC pipes were placed inside the trench. Two pipes were connected to extraction wells SVE-1 and SVE-5, and one was terminated and capped inside the Farmingdale Plaza Cleaner's building.

After each 20 feet section of piping, all three pipes were tested for vacuum maintenance in accordance with the design specifications. Two 45-degree connectors were used wherever 90 degree turn was required. A blower assembly was brought onsite by EAR to generate vacuum and was operated using a portable generator. The blower was connected to the pipes using a manifold and the readings were collected from the gauges in the manifold. Pictures of the assembly are included in the Daily logs in Appendix H. The connections were tightened if the pipes were unable to maintain at least -4.5 inches of Hg vacuum for 15 minutes.

Once all pipes were tested successfully, bedding material was placed around the pipes and compacted manually. The bedding material was obtained from the pre-approved source – Global Land Materials in Brookhaven, NY. The on-site backfill material was placed on top of the pipe bed in 6-inch lifts and compacted using a mechanical compactor. Compaction testing was performed at least once every 100 feet of the pipe run and inside the plaza. Soil Mechanics, subcontractor of EAR performed all compaction testing using nuclear density gauge. If 95% compaction was not achieved, the soils were further compacted until the compaction criterion was met. Backfill material did not have excess moisture for better compaction. The trench was backfilled to the ground surface to maintain safe traffic conditions until the asphalt paving and restoration was done.

Bedding material and excess soil were stockpiled in the area next to the fence and covered with tarp after every work day to prevent dust particles due to wind or washing from rain.

Concrete sidewalk and slab were removed using a jack hammer and excavator. A narrow trench was excavated inside the building. Building foundation was found to be deeper than the depth of pipes and had to be cored through for pipes to penetrate. One pipe was connected to SVE-1 located outside the building, and the second one was connected to SVE-5, inside the building. The third pipe was terminated and capped inside the building after passing through the building foundation. The vacuum testing was performed for each 20-ft section of piping. Compaction of the backfill material was difficult inside the building in the narrow trench. A plate compactor (jumping Jack) was brought on-site to achieve 95% compaction of the soils below slab.

3.9 HASP, CAMP, and QAPP Implementation

The HASP, CAMP, and QAPP were completed in accordance with the Design Specifications and in conformance with regulatory requirements (EAR, 2011). The Submittals were approved by the Engineer. The on-site activities were performed in accordance with the Work Plan. The HASP, CAMP, and QAPP were followed during execution.

EAR health and safety officer ensured that the on-site personnel wore appropriate level of personal protective equipments (PPE) and traffic control measures were placed and maintained for the duration of the construction activities. Traffic control measures such as traffic cones, reflective drums, caution tape, signs, flags, and road plates were used to direct traffic and pedestrians away from the excavation and heavy machinery. The road and parking lot were not completely closed. Sections were kept open to allow traffic without causing safety hazard for the workers or to passer bys.

Efforts were made to backfill excavations on the same day, but excavation near the sidewalk had to remain open overnight as foundation coring was required to install pipe. Open exaction was covered with metal road plates, and was well marked by traffic cones, caution tapes and traffic signs. The materials and equipments were secured in chain linked fence or inside the Farmingdale Plaza Cleaners building at the end of each day to avoid theft or accident.

Community air monitoring was performed while handling soils and during excavation. Upwind and downwind dust and VOC levels were continuously monitored using dust meters and PID. The meters were calibrated at beginning of each work day. No unusually high levels of dust or VOCs were recorded during excavation except for one occasion. On September 12, 2011 dust was recorded to be 750 ug/m³ (peak) and 350 ug/m³ (time weighted average TWA over 15 minutes) when sidewalk concrete was being cut for trenching. The work was halted for 15 minutes until the dust level decreased to TWA readings below 150 ug/m³. The air monitoring logs are included in Appendix I.

Material was checked and logged before being used to ensure conformance with the Design Specifications. The bedding material was tested prior to being brought onsite and only suitable material and source were chosen. Slope of the pipes was periodically checked. Connections were checked by vacuum retention testing after installation of every 20 feet of piping. Backfill soils were screened visually and using a PID before being placed in the trench. The backfill material was placed in 6-inch lifts and compaction was tested every 100-linear feet of the trench run and inside the building slab until it met the specification requirements.

3.10 Site Restoration

The parking lot along the trench was paved after pipe installation, satisfactory compaction and vacuum testing. Pavemaster Asphalt & Sealing retained by EAR repaired the asphalt parking lot along the trench. The trench was backfilled to the top and compacted to facilitate traffic during construction. On September 16, 2011 top 6 inches of backfill material was re-excavated by Pave Masters for the base material for pavement and asphalt. The excavated soils were stockpiled near the system fence.

The trench was re-compacted before poring 4-inch base material in accordance with the Design Specifications. A 2-inch layer of asphalt was placed over the 4-inch thick base. The asphalt was cooled and leveled to the surface of the parking lot. The asphalt paving was done in two sections to keep the parking lot open to traffic. Pictures of the restoration work can be found in the daily reports included in Appendix H.

The concrete sidewalk was restored by EAR by pouring 4-inch thick layer of concrete. Backfill compaction inside the building was difficult to achieve. A small plate compactor (jumping jack) was brought on-site and greater than 95% compaction was achieved under the slab. Reinforcement was installed in the trench before pouring the concrete as shown in the photo log of September 19, 2011. The slab inside the building was restored with reinforced concrete in accordance with the Design

Specifications. However the tiles inside the building were not restored with permission of the owner since the building renovation was already planned.

At the end of the work, all temporary facilities and traffic signs were removed, and the site was restored without obstructions. The vehicular and pedestrian traffic was restored.

3.11 Waste Streams, Transportation and Disposal

The soil cuttings generated during the well installation were stored in 55-gallon drums inside the Farmingdale Plaza Cleaners building. Excess soil excavated during construction in the parking lot was stockpiled near the fence of the system and was covered with tarp during construction. Excess soil generated from excavation inside the building was stockpiled inside the cleaner's building. Soil with elevated PID readings or visual staining was not used to backfill the trenches. Boulders and debris were also separated by hands during backfilling to the extent possible.

Big pieces of asphalt pavement, concrete and rocks along with other demolition debris from the building were stored in a dumpster near the fence. The dumpster for the construction debris was provided by Maggio's M&P Carting Service, Inc. (Medford, NY) and the contents went into a municipal waste stream.

Soil cuttings and unused excavated soils were sampled for waste characterization, in accordance with the Specifications, and requirements of the disposal facilities. Approximately 21.27 tons of excess soil was transported by Fenley & Nicol Environmental, Inc. to their Deer Park, NY facility for disposal as non-hazardous waste. Additional 11 drums of non-hazardous drill cuttings, and one drum of non-hazardous purge water and decontamination water were also transported by Fenley & Nicol Environmental, Inc to their facility on November 2, 2011. The transportation and disposal was performed in accordance with local, state, and federal regulations. The waste manifests are included as Appendix J.

3.12 Demobilization

After excavation, pipe installation, backfilling, and site restoration, equipment and machines were removed from the site. Other temporary storage and hygiene facilities were also demobilized upon completion of the construction activities. The drums were picked up and sent off-site for disposal. Debris was kept in a dumpster for pick-up. Any garbage or remaining tools were also cleared from the site upon completion of the construction activities. Demobilization activities were completed on September 19, 2011.

3.13 SVE System Installation

The SVE system was pre-fabricated in a cargo container by National Environmental Systems (NES). The cargo container was placed on wooden planks for leveling in the fenced area in the parking lot (Drawing 3). The system layout in the cargo container is depicted on the NES drawing in Drawing 4.

The system was constructed off-site in NES's facility in Massachusetts to meet requirements of the Design Specifications. The system submittal package was approved by the Engineer. The system was tested in the shop in presence of AECOM engineer and EAR personnel prior to shipment. The off-site inspection report is included in Appendix K. The system was delivered to the site on September 23, 2011.

The system consists of influent piping manifold which allows each of three SVE wells (SVE-1, SVE-5, and future) to be individual controlled with a valve for applied vacuum and resultant flow rate, a 10-hp SVE blower, a 60-gallon moisture separator, a 0.5-hp moisture transfer pump, and two vapor phase carbon drums. The system container is also equipped with an exhaust fan, fan thermostat, lights, and a heater. The system layout and process and instrumentation diagram (P&ID) are included as Drawing 4 and 5. Electrical and control panel components of the system include panel enclosure, EOS programmable logic controller, Sansaphone autodialer, autodialer cellular interface, SVE blower motor hour meter, SVE blower timer, 100 amp distribution panel, fused disconnect, and a variable frequency drive (VFD). The SVE system also contains moisture separator level switch, inline filter for air, dilution filter, vacuum relief valve, 4-inch influent pitot tubes, 3-inch discharge pitot tubes, pitot tube magnehelic gauges, flow transmitters, influent vacuum transmitter, and discharge temperature transmitter. The SVE submittal package containing details of the SVE system components and electrical one-line diagram is included in Appendix L.

The manifold within the cargo container is connected to the buried pipes via flexible hose.

3.14 SVE System Startup

The SVE system was started on November 1, 2011 and operated continuously for two week through November 14, 2011 on SVE-5. EAR personnel, AECOM and NES engineers were present on-site on November 1, and 2, 2011 for initial start-up per the Start-Up Plan (EAR, 2011).

Prior to system testing and startup, all mechanical and electrical components were visually inspected and tested to ensure proper installation, functionality, and operation. Before visual testing it was made sure that the power was off and the system was not energized. EAR electrician checked all electrical circuit breakers for the process equipment and locked them. All process equipments and manifold were properly installed and were labeled on-site.

The initial system testing was done with ambient air using auxiliary line, while SVE-1 and SVE-5 remained closed. The dilution valve was adjusted as necessary. SVE blower was operated in hand position for 5-10 minutes and vacuum, pressure and airflow rates were recorded in the checklist by EAR.

Following SVE blower, moisture separator transfer pump was tested in hand position for less than one minute since the separator tank was dry. The motor started and the pump turned without any problem.

Prior to connection to the SVE wells and system startup, the system was operated in order to demonstrate that all equipment, sensors, controls, and programming were properly installed and confirmed to perform satisfactorily, with the system operating, all gauges were checked including, auxiliary line vacuum gauge, system influent vacuum gauge, moisture separator vacuum gauge, SVE blower vacuum gauge, SVE blower effluent gauge, system influent temperature gauge, SVE blower effluent temperature gauge, carbon influent air flow gauge, and SVE blower air flow gauge. All gauges registered a response reading within their respective ranges. EAR recorded the readings in the checklist.

The system contains an EOS Protocol (EOS) programmable logic control system that allows users to access and view system status as well as select operational data, in addition to alerting designated parties of alarm conditions. To check the EOS, alarm conditions were manually triggered with system operating. Following each alarm condition simulation and confirmation of proper response, the system was reset and restarted prior to the next alarm condition simulation.

Critical system alarms including the moisture separator high level condition, low vacuum level condition, high discharge temperature condition, VFD fault condition, and emergency stop activation, were tested. At each alarm condition the system automatically shutdown, a panel indicator light was turned on, and the autodialer called the EAR project manager's programmed number.

Following testing of the controls, the EAR project manager attempted to remotely access the EOS system data as per the instructions provided by NES. Once the access id established, the system data including system influent airflow, system influent vacuum, SVE blower effluent airflow, and blower discharge temperature could be logged/displayed. However, due to proximity of the telephone box, noise was not allowing successful remote access. NES tried to troubleshoot, but decided to move the telephone line to resolve the issue. This was accomplished on December 1, 2011 by relocating local laptop access jack at the control panel to eliminate electromagnetic noise.

The startup phase began with the system operation using extraction well SVE-5, located inside the Farmingdale Plaza building. System influent vacuum and airflow were checked and recorded in the checklist by EAR. The blower operation was adjusted to produce a vacuum of 40"WC at the system influent by adjusting operating frequency (Hz) at the VFD. Incoming, mid-carbon, and effluent air stream was sampled using tedlar bags and PID to measure VOC concentrations. All system parameters including temperatures and influent and effluent VOC readings were recorded in the checklist by EAR.

The procedure was repeated for the existing SVE well SVE-1 and system data was recorded in the checklist. All system components were tested to be operating as designed. Air samples were collected using 6-liter passive Summa canisters from influent, mid-carbon, and effluent sample ports to analyze for VOCs. The samples collected on the first and second day of system startup were expedited to receive results within 48 hours and avoid violation. Pre-carbon PID reading was 20.5 ppm and post-treatment PID reading of the air-stream was 3.5 on the first day. The pre- and post-carbon PID measurements were 4.1 ppm and 3.7 ppm, respectively on the second day.

The system operated at approximately 180 scfm and 38 IWC at the end of the first day. The flowrate of the system was adjusted slightly the next day and has been steady between 180 and 195 scfm during the month of November.

Vacuum was monitored at the vacuum monitoring points surrounding the SVE wells and at the sub-slab vapor monitoring points. These points were monitored for vacuum using Digimano 2000 digital manometer on November 2, and 3, 2011. The following table provides summary of the measurements.

Vacuum Measurements from Monitoring Points

Well ID	Linear Distance from SVE-5 (ft)	Vacuum (IWC)
MP-1-1	29.95	-1.13
MP-1-2	69.14	-0.32
MP-1-3	69.58	-0.44
MP-1-4	84.23	-0.29
MP-1-5	65.69	-0.16
B01-SS1	21.81	-0.57
B01-SS2	153.60	0.00
B01-SS3	220.61	0.00
B03-SS1	210	0.00
B03-SS2	285	0.00
B04-SV1	317.97	0.00
B04-SV2	244.25	0.00

Using the vacuum readings given in the table above, the radius of influence (ROI) for SVE-5 was calculated to be 95 feet at an extraction flow rate of 180 cfm. The letter report summarizing SVE system radius of influence testing is included in Appendix M. The mass removal and effluent emissions were recorded during Site visits for two weeks following system start up and are summarized in the table below. All emissions are below the NYSDEC Division of Air Resources (DAR) Air Guide-1 discharge criteria of maximum allowable emission rate of 0.01269 lbs/hr for PCE, 0.00444 lbs/hr for TCE, and 24.14 lbs/hr for 1,2-DCE, which were calculated for system airflow of 300 cfm, actual stack height of 18-feet, and stack inner diameter of 3.83-inches. Additional information regarding the mass removal and effluent emissions can be found in Appendix N.

Cumulative Mass Removal/Effluent Emissions in SVE-5 During Startup (lbs)

Compound	Mass Removal	Effluent Emissions
Tetrachloroethene	1.851	0.000
Trichloroethene	0.015	0.000
1,2-Dichloroethene	0.008	0.000
1,2-Dichloroethane	0.000	0.000
Total BTEX	0.000	0.000
Total VOCs	1.996	0.035

3.15 Sub-Slab Vapor Monitoring Results

Soil vapor samples were collected at the sub-slab vapor monitoring points, including soil vapor monitoring points installed in the parking lot near Milestone Apartments. Initial sampling was

conducted on September 22, 2011, before the system startup to establish baseline contaminant concentrations in the soil vapors. Results of this sampling event are included in Appendix O.

Sample collected from the sub-slab monitoring point B01-SS1, located inside the Farmingdale Plaza Cleaners building, was detected with elevated levels of PCE (23,000 ug/m³), TCE (16 ug/m³), and 1,1,1-TCA (11 ug/m³). Sample collected from BB01-SS2, located inside the former Waldbaum's, was also detected with elevated concentrations of PCE (380 ug/m³). Sample collected from BB03-SS1, located in the Garden Apartments, was also detected with elevated concentrations of PCE (340 ug/m³). Soil vapor samples from B04-SV2 located in the parking lot near Milestone Apartments was detected with elevated concentrations of PCE (550 ug/m³), TCE (36 ug/m³), and 1,1,1-TCA (66 ug/m³).

Second sampling event was conducted in the first week of January 2012 to analyze effect of the SVE system by comparing concentration of COCs in soil vapors before and after system startup. The results of these samples were not available at the time this CCR was certified.

3.16 Site Survey

Reddan Survey of Bayport, NY conducted an initial site survey before starting the construction activities. The trench bedding depth was recorded every few feet to determine the elevation of the pipe and to ensure that the pipe gently slopes back towards the SVE well. Trench location, SVE well location, newly installed vacuum monitoring point locations, sub-slab vapor monitoring point locations, soil vapor monitoring point locations, fence location, and SVE system location were surveyed by a licensed surveyor of Reddan Survey on November 8, 2011. The As-built survey map is included as Drawing 3.

3.17 Changes in the Work

Initially only one SVE well was designed to connect to the SVE system. During the bid-walk, the existing SVE well located just outside the Farmingdale Plaza building, SVE-1, was also determined to be included in the design for connection to the SVE system. Also, a third auxiliary line was installed and terminated inside the Plaza building for potential future use.

Two additional soil vapor monitoring points were added to the scope of work upon NYSDOH and NYSDEC request to monitor soil vapor quality beneath the Milestone Apartments. The monitoring points could not be installed inside the Apartments due to lack of access agreement and were installed in the parking lot of Farmingdale Plaza, near the Milestone Apartments.

Additional deviations included:

- Locating SVE-5 2-ft from the original location due to overhead sprinkler system.
- 9-inches of backfill material on top of the buried SVE line were acceptable, including 6-inches of asphalt and base.
- The vacuum test on pipes will be accepted if they maintain vacuum of -4.5IWC for 15 minutes. Building foundation was encountered during trench excavation and was approximately 12-inches thick.
- Expedited turnaround time for the results of the vapor samples collected from system effluent was added to the scope to prevent potential effluent discharge violation.

NYSDEC, AECOM, and EAR representatives participated in weekly conference calls during IRM activities to discuss progress of the project and any deviation from the work plan. The conference call minutes were distributed to all participants, and are included in Appendix P.

4.0 Costs

AECOM's estimate for construction and operating the SVE system was \$185,125 (includes cost for Alt LS-4) and the lowest bid was \$199,894 (includes cost for Alt LS-4) submitted by EAR. Approved change orders included the install two additional vapor monitoring points in the parking lot near the Milestone Apartments; expedited effluent results from were requested during the first two days of startup of the SVE system; and survey of the existing SVE wells from the pilot test and the sub-slab vapor monitoring points installed inside the Garden Apartments. The final cost including change orders was \$230,819 broken out as follows:

Payment Item No.	Bid Item Description	QTY	Units	Unit Price Cost	Bid Item Total
UC-1	Vacuum Monitoring Point Installation	5	Each	\$2,020	\$10,100
UC-2	Soil Vapor Monitoring Points	3	Each	\$419	\$1,257
UC-3	Operation and Maintenance	6	Months	\$3,621	\$21,726
UC-4	Carbon Change Out	3	Each	\$1,484	\$4,452
LS-1	Mobilization/Demobilization and Site Services	1	LS	\$43,161	\$43,161
LS-2	SVE Well and Pipe Installation	1	LS	\$14,813	\$14,813
LS-3	SVE System Installation and Startup	1	LS	\$76,238	\$76,238
Alt LS-4	SVE Piping Installation	1	LS	\$43,147	\$43,147
Base Bid Total					\$214,894
CO 1	Install Two Soil Vapor Monitoring Points	1	LS	\$5,091	\$5,091
CO 2	Fence Around Electrical Meter Service	1	LS	\$4,540	\$4,540
CO 3	SVE System Modification for Condensate Blowback	1	LS	\$885	\$885
CO 4	Raised Height of Fence to 8'	1	LS	\$1,924	\$1,924
CO 5	Expedited Air Sample Results	1	LS	\$1,329	\$1,320
CO 6	Additional Survey	1	LS	\$2,165	\$2,165
Change Order Subtotal					\$15,925
SVE IRM Total					\$230,819

5.0 Conclusions

The SVE IRM completed at the Site were conducted in accordance with the NYSDEC-approved IRM Bid Package (AECOM 2011) for the Farmingdale Plaza site. The installed SVE system has been connected to the existing extraction well SVE-1 along with newly installed extraction well SVE-5, located within the former dry cleaner building. The installation occurred in August and September 2011. The SVE system was started on November 2, 2011 and after a three week period of continuous operation, began long-term operation. Based on readings from the vacuum monitoring points, a flow rate of 180 cfm at SVE-5 and vacuum of 31.5 IWC resulted in ROI of approximately 95 feet, which met the design criteria. During the three week startup period, approximately 2.0 pounds of contaminants (primarily PCE) were removed. Effluent sampling indicated 0.035 pounds of contaminants were discharged; the carbon units removal efficiency was 98%. No exceedences of the discharge criteria were observed.

Site management of the SVE system will continue by EAR until June 2, 2012. The necessity for future SVE operation will be evaluated by the NYSDEC at that time.

6.0 References

Whitestone Associates, Inc., 2004. Supplemental Remedial Investigation Summary Report. Farmingdale Plaza. September.

O'Brien & Gere, 2007. Final Remedial Investigation Report. Farmingdale Plaza Cleaner Site. August.

Earth Tech, Inc., 2009. Work Plan for Interim Remedial Design of SVE and Sub-Slab Depressurization System. Farmingdale Plaza Cleaners Site. February.

NYSDEC, 2010. DER-10. May.

AECOM, 2011. Interim Remedial Measure Bid Package. Farmingdale Plaza Cleaner Site. June.

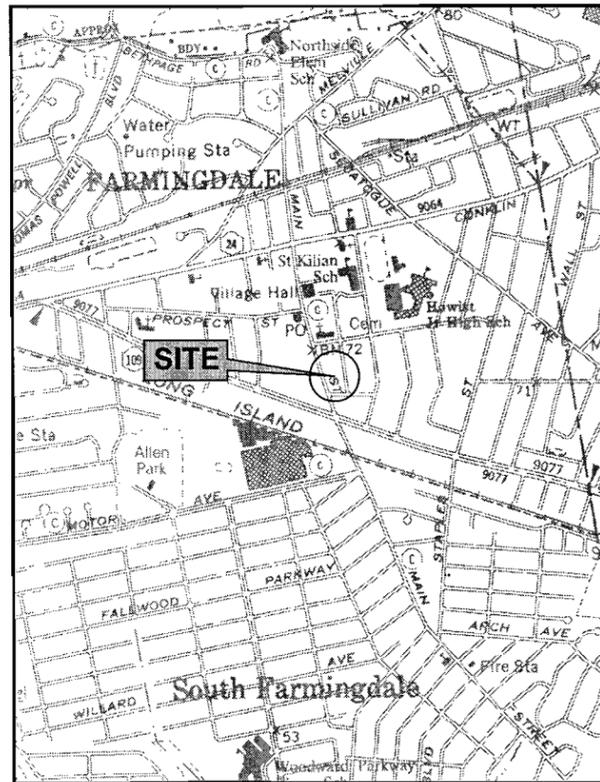
AECOM, 2011. Interim Remedial Measure RFP Addendum Number 2. Farmingdale Plaza Cleaner Site. June.

EAR, 2011. Work Plan and HASP. Farmingdale Plaza Cleaners. July.

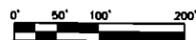
Drawings

FARMINGDALE PLAZA CLEANERS SITE SOIL VAPOR EXTRACTION IRM NYSDEC SITE ID 1-30-107 Town of Farmingdale, Nassau County New York

DECEMBER 2011



SITE LOCATION MAP



PROJECT LOCATION
NASSAU COUNTY, NY

INDEX TO DRAWINGS

DRAWING No.

COVER	1
SITE LAYOUT	2
AS BUILT SITE MAP	3
SVE SYSTEM LAYOUT	4
P&ID	5



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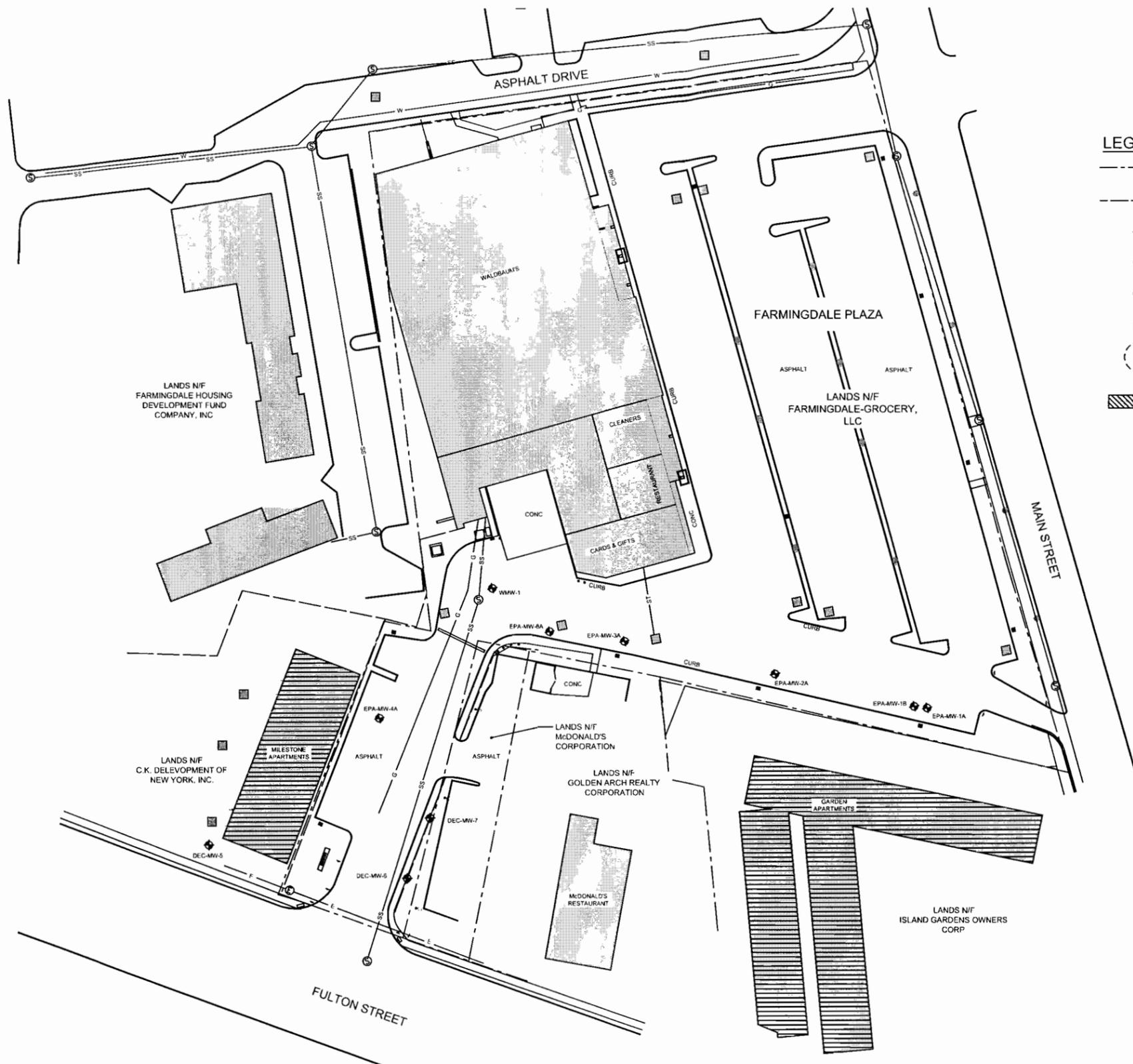
SCOTT A. UNDERHILL, P.E.
NYSPE LICENSE NO. 075332



NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION

AECOM

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LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- FENCE
- ◆ MONITORING WELL
- ⊙ SANITARY SEWER MANHOLE
- ⊙ ELECTRIC MANHOLE
- CATCH BASIN (DRY WELL)
- AREA OF SVE TREATMENT
- ▨ AREA OF POTENTIAL SUB-SLAB DEPRESSURIZATION SYSTEM TREATMENT

MAP REFERENCE:

BASE MAPPING INFORMATION SHOWN IN THIS PLAN SET DIGITIZED FROM VARIOUS SOURCES INCLUDING:

- 1) PLAN TITLED GEOPHYSICAL SURVEY & UTILITY SURVEY MAP, FROM FINAL REPORT, REMEDIAL INVESTIGATION, FARMINGDALE PLAZA CLEANERS SITE, FARMINGDALE, NEW YORK, BY O'BRIEN & GERE, DATED AUGUST 2007.
- 2) ALTA/ACSN LAND TITLE SURVEY WALDBAUM'S, STORE #28-838, 450 EAST MAIN STREET, LOTS 245, 250, & 269, BLOCK 102, SECTION 49, INCORPORATED VILLAGE OF FARMINGDALE, TOWN OF OYSTER BAY, NASSAU COUNTY, NEW YORK, BY CONTROL POINTS ASSOCIATES, INC., LAST REVISED 9-29-05, INCLUDING ALL NOTE AND REFERENCES THEREIN.



APPROXIMATE SCALE

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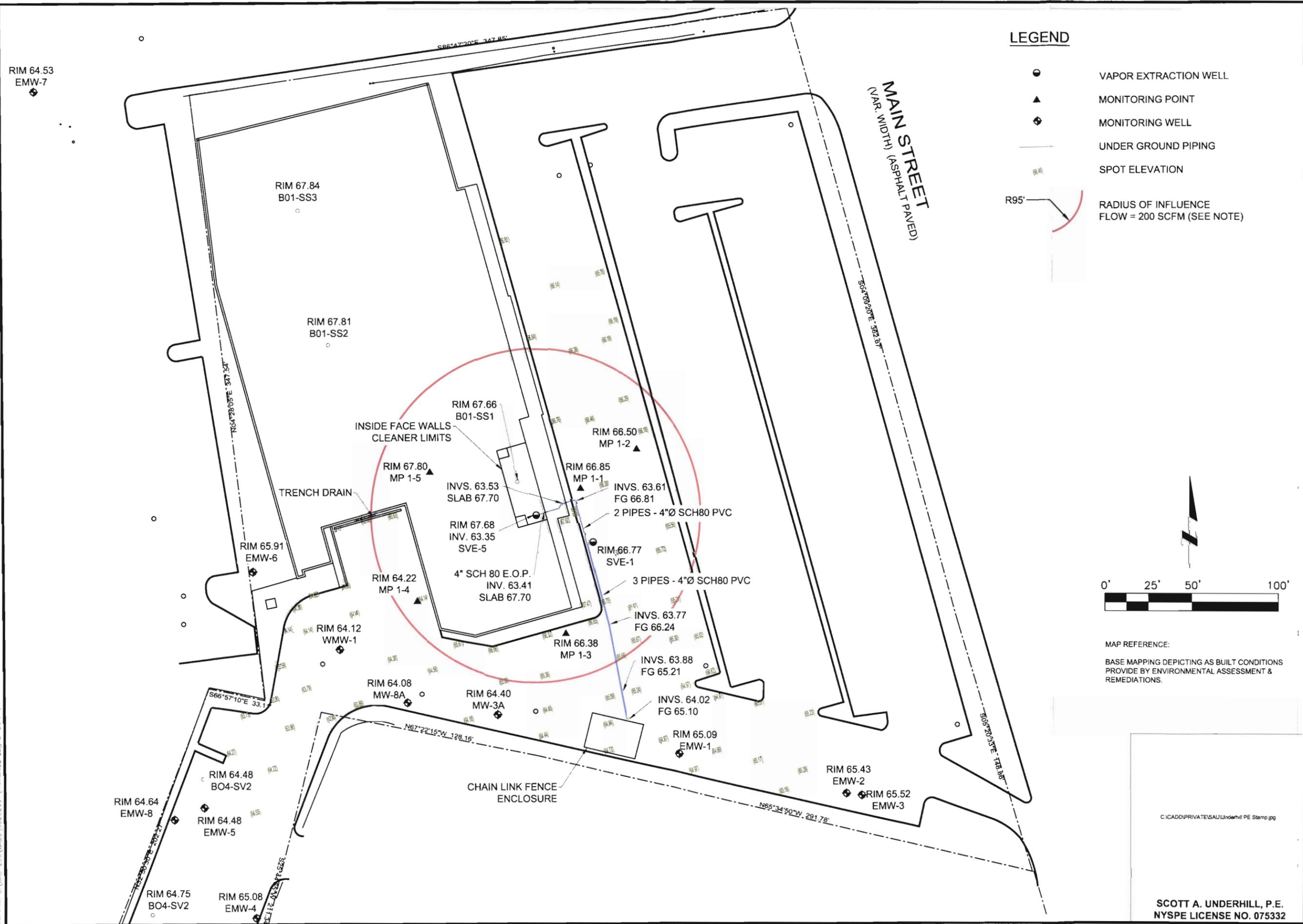
DRN BY:	SAU
APP BY:	SAU
CHK BY:	SAU
RID:	
DES BY:	
KAM:	

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**SOIL VAPOR EXTRACTION IRM
 NYSDEC SITE NO.: 1-30-107
 FARMINGDALE PLAZA CLEANERS
 SITE LAYOUT**

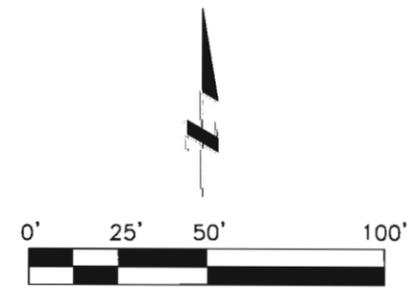
PROJECT START DATE (M/Y)	DECEMBER 2011
PROJECT NO	60134071
FILENAME	
SHEET NO	2
DRAWING NO	2

Plotted By: versionb
 Plot File Date Created: Dec/17/2011 1:55 PM
 Layout Sheet Name: 3
 Filename: J:\CAD\115\CA03\115\CAD\115\CA03\6022236\ARMINGDALE_AS-BU1.DWG



LEGEND

- VAPOR EXTRACTION WELL
- ▲ MONITORING POINT
- ◆ MONITORING WELL
- UNDER GROUND PIPING
- SPOT ELEVATION
- R95' RADIUS OF INFLUENCE FLOW = 200 SCFM (SEE NOTE)

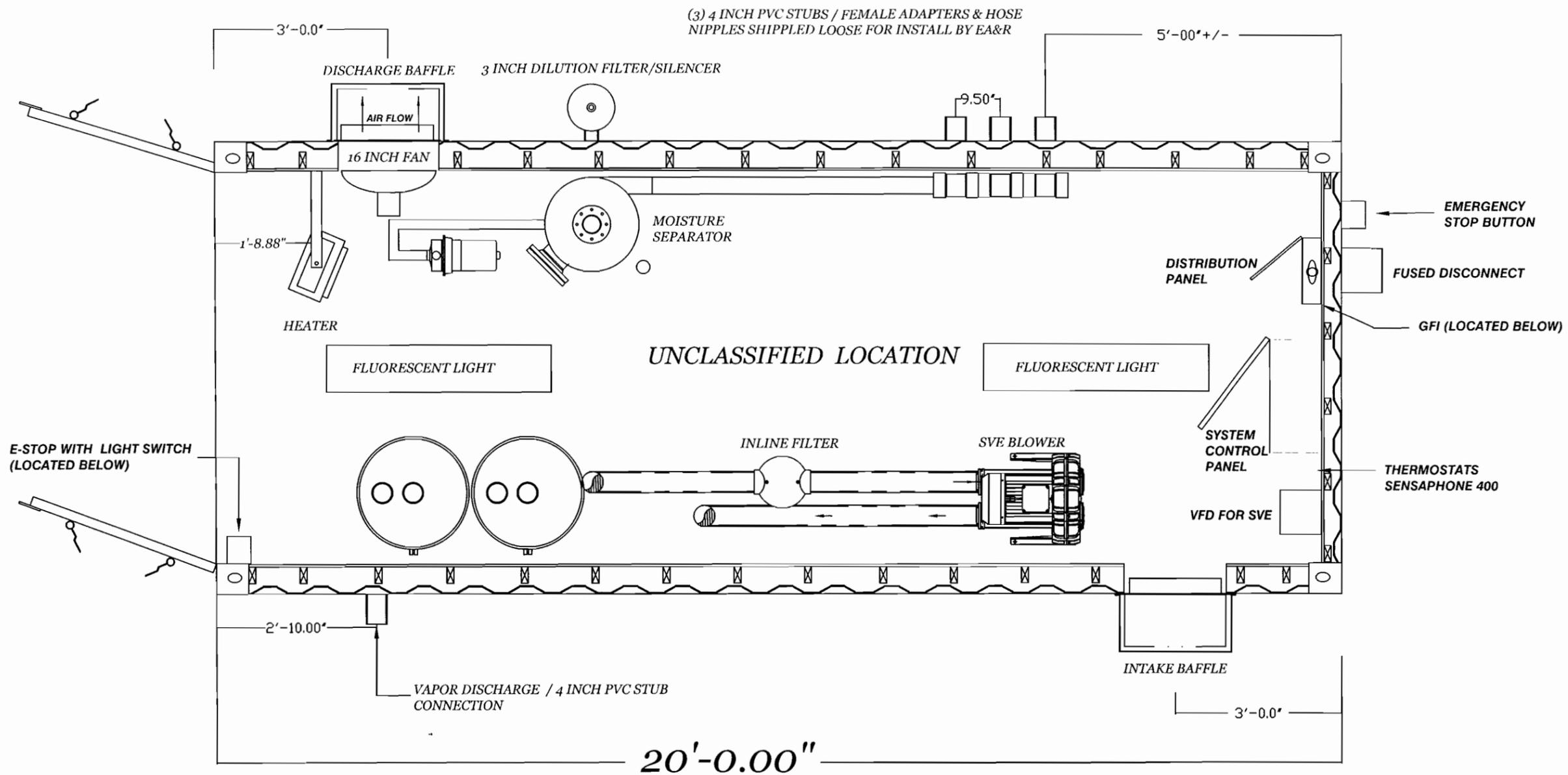


MAP REFERENCE:
 BASE MAPPING DEPICTING AS BUILT CONDITIONS PROVIDE BY ENVIRONMENTAL ASSESSMENT & REMEDIATIONS.

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<p>AECOM 40 British American Blvd Littleton, CO 80120 T 303.951.2200 F 303.951.2300 WWW.AECOM.COM</p>	
<p>SOIL VAPOR EXTRACTION IRM NYSDEC SITE NO.: 1-30-107 FARMINGDALE PLAZA CLEANERS</p>	
<p>AS BUILT SITE MAP</p>	
<p>PROJECT START DATE (M/Y) DECEMBER 2011</p>	<p>PROJECT NO. 60134071</p>
<p>FILENAME</p>	
<p>SHEET NO. 3</p>	
<p>DRAWING NO. 3</p>	



CONSTRUCTION NOTES:

1. EXTERIOR COLOR - GRAY.
2. ALL PENETRATIONS DISCHARGE THROUGH THE CONTAINER SIDE WALLS.
3. DRAWING DEPICTS PRELIMINARY LAYOUT ONLY AND IS SUBJECT TO CHANGES DURING CONSTRUCTION. ANY MAJOR CHANGES WILL BE BROUGHT TO THE ATTENTION OF EA&R.
4. SYSTEM INTERIOR IS CLASSIFIED AS A NON HAZARDOUS LOCATION.
5. SOUND HOODS WILL REQUIRE FIELD INSTALLATION BY EA&R.
6. NES RECOMMENDS THAT TO ENSURE PROPER DOOR OPERATION THAT A SOLID LEVEL BASE BE PROVIDED FOR THE SYSTEM ENCLOSURE.



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NYSPE LICENSE NO. 075332

1-INCH = 1'-0" (VERIFY SCALE IF PLAN SHEET IS REDUCED)		DRN	CHK	DATE (M/D/Y)
DRN BY: KAM	DES BY: RD	REV	DESCRIPTION	
CHK BY: SAU	APP BY: SAU			
AECOM				
40 British American Blvd. Latham, New York 12110 T 518.951.2200 F 518.951.2300 WWW.AECOM.COM				
SOIL VAPOR EXTRACTION IRM				
NYSDEC SITE NO.: 1-30-107				
FARMINGDALE PLAZA CLEANERS				
SVE SYSTEM LAYOUT				
PROJECT START DATE (M/Y): DECEMBER 2011				
PROJECT NO.: 60134071				
FILENAME:				
SHEET NO:				
DRAWING NO:				
4				

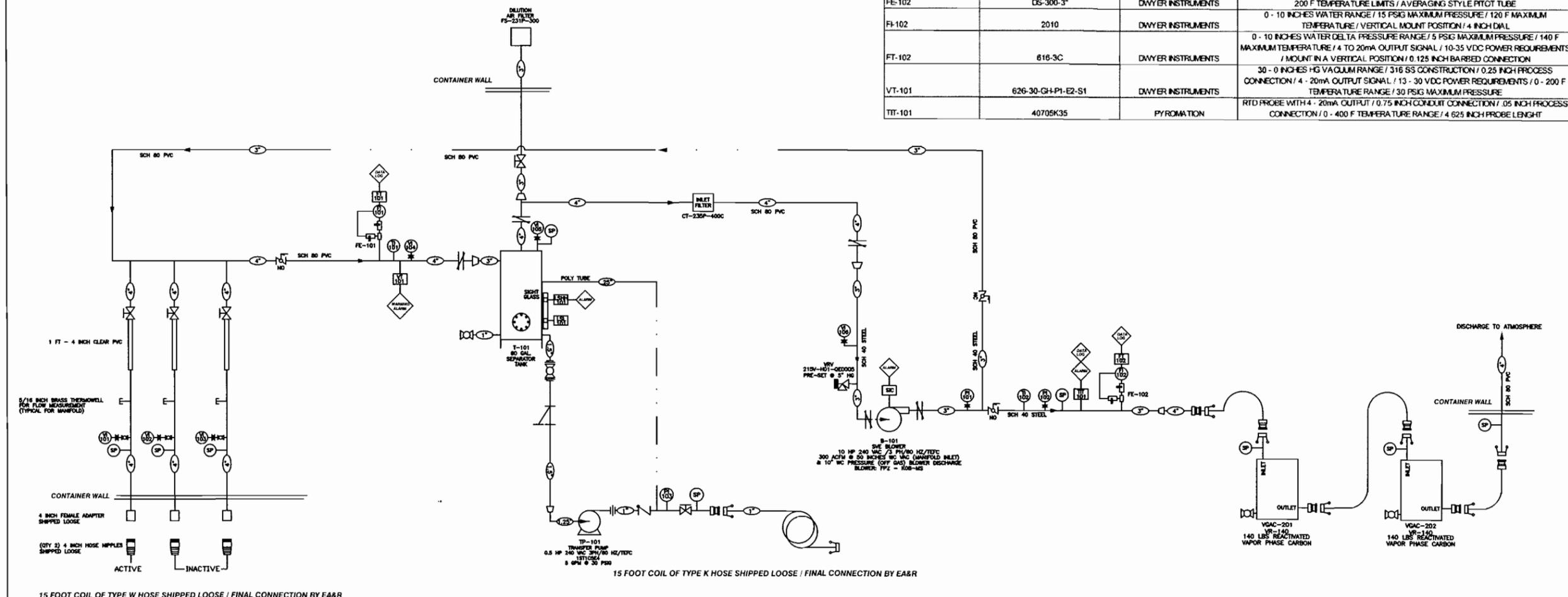
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ALARMS

MOISTURE SEPARATOR - HIGH/HIGH LEVEL	(LSHH-101)	SYSTEM SHUTDOWN - RESET TO PUMP DOWN AND RESTART
SVE BLOWER - HIGH DISCHARGE TEMPERATURE	(TIT-101)	SYSTEM SHUTDOWN
SVE BLOWER - LOW VACUUM	(VT-101)	WARNING ONLY
VFD - GENERAL FAULT		SYSTEM SHUTDOWN
EMERGENCY STOP ENGAGED		SYSTEM SHUTDOWN



ITEM	MODEL	MANUFACTURER	SPEC
VH-101 / VH-106	82510124	MARSHALL TOWN	0 - 100 INCHES WATER VACUUM RANGE / 2.5 INCH STEEL CASE / BRASS WETTED PARTS / 0.25 INCH BOTTOM MOUNT CONNECTION / EQUIPPED WITH SAMBER VALVE
LSHH-101	P-500-010	NATIONAL ENVIRONMENTAL SYSTEMS	BRASS CONSTRUCTION / 2 INCH NPT TOP CONNECTION / (1) 1 INCH BUNA-N FLOAT FOR HIGH-HIGH LEVEL DETECTION / NORMALLY CLOSED
PI-101	82523313	MARSHALL TOWN	0 - 160 INCHES WATER RANGE / 2.5 INCH STEEL CASE / BRASS WETTED PARTS / 0.25 INCH BOTTOM MOUNT CONNECTION
PI-102	82510102	MARSHALL TOWN	0 - 30 INCHES WATER RANGE / 2.5 INCH STEEL CASE / BRASS WETTED PARTS / 0.25 INCH BOTTOM MOUNT CONNECTION
PI-103	98152409	MARSHALL TOWN	0 - 60 PSIG RANGE / 2.5 INCH STAINLESS STEEL CASE / BRASS WETTED PARTS / LIQUID FILLED / 0.25 INCH BOTTOM MOUNT CONNECTION
TI-101	1NFY8	GRAINGER	(-)20 TO 120 F RANGE / 4 INCH STEM LENGTH / 3 INCH DIAL / 0.5 INCH BACK MOUNT CONNECTION / STAINLESS STEEL CONSTRUCTION
TI-102	1NFY4	GRAINGER	0 - 250 F RANGE / 2.5 INCH STEM LENGTH / 3 INCH DIAL / 0.5 INCH BACK MOUNT CONNECTION / STAINLESS STEEL CONSTRUCTION
FE-101	DS-300-4	DAVYER INSTRUMENTS	4 INCH LINE LINE / STAINLESS STEEL CONSTRUCTION WITH BRASS ISOLATION VALVE / 0 - 200 F TEMPERATURE LIMITS / AVERAGING STYLE PITOT TUBE
FI-101	2010	DAVYER INSTRUMENTS	0 - 10 INCHES WATER RANGE / 15 PSIG MAXIMUM PRESSURE / 120 F MAXIMUM TEMPERATURE / VERTICAL MOUNT POSITION / 4 INCH DIAL
FT-101	616-3C	DAVYER INSTRUMENTS	0 - 10 INCHES WATER DELTA PRESSURE RANGE / 5 PSIG MAXIMUM PRESSURE / 140 F MAXIMUM TEMPERATURE / 4 TO 20mA OUTPUT SIGNAL / 10-35 VDC POWER REQUIREMENTS / MOUNT IN A VERTICAL POSITION / 0.125 INCH BARBED CONNECTION
FE-102	DS-300-3"	DAVYER INSTRUMENTS	3 INCH LINE LINE / STAINLESS STEEL CONSTRUCTION WITH BRASS ISOLATION VALVE / 0 - 200 F TEMPERATURE LIMITS / AVERAGING STYLE PITOT TUBE
FI-102	2010	DAVYER INSTRUMENTS	0 - 10 INCHES WATER RANGE / 15 PSIG MAXIMUM PRESSURE / 120 F MAXIMUM TEMPERATURE / VERTICAL MOUNT POSITION / 4 INCH DIAL
FT-102	616-3C	DAVYER INSTRUMENTS	0 - 10 INCHES WATER DELTA PRESSURE RANGE / 5 PSIG MAXIMUM PRESSURE / 140 F MAXIMUM TEMPERATURE / 4 TO 20mA OUTPUT SIGNAL / 10-35 VDC POWER REQUIREMENTS / MOUNT IN A VERTICAL POSITION / 0.125 INCH BARBED CONNECTION
VT-101	626-30-GH-P1-E2-S1	DAVYER INSTRUMENTS	30 - 0 INCHES HG VACUUM RANGE / 316 SS CONSTRUCTION / 0.25 INCH PROCESS CONNECTION / 4 - 20mA OUTPUT SIGNAL / 13 - 30 VDC POWER REQUIREMENTS / 0 - 200 F TEMPERATURE RANGE / 30 PSIG MAXIMUM PRESSURE
TIT-101	40705K35	PYROMAT	RTD PROBE WITH 4 - 20mA OUTPUT / 0.75 INCH CONDUIT CONNECTION / 0.5 INCH PROCESS CONNECTION / 0 - 400 F TEMPERATURE RANGE / 4.625 INCH PROBE LENGTH



1 INCH	VERIFY SCALE IF PLAN SHEET IS REDUCED
DRN	CHK DATE (M/D/Y)
REV	DESCRIPTION

AECOM
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 Latham, New York 12110
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 WWW.AECOM.COM

**SOIL VAPOR EXTRACTION IRM
 NYSDEC SITE NO.: 1-30-107
 FARMINGDALE PLAZA CLEANERS**

**SOIL AND VAPOR EXTRACTION SYSTEM
 PIPING AND INSTRUMENTATION DIAGRAM**

PROJECT START DATE (M / Y)	DECEMBER 2011
PROJECT NO	60134071
FILENAME	
SHEET NO	
DRAWING NO.	

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SCOTT A. UNDERHILL, P.E.
 NYSPE LICENSE NO. 075332

Drawn by: [unclear]
 Date: 11/28/11
 Project: Farmingdale Plaza Cleaners
 Drawing No: 60134071