

Matthew M. Carroll, PE
&



121 West 27th Street, 303
New York, NY 10001
(646) 606-2332

March 26, 2025

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 2
47- 40 21st Street
Long Island City, NY 11101

Attn: Yildiz Palumbo, Professional Engineer 1

Re: Soil Vapor Extraction (SVE) Remedial Design Document
Teitelbaum Dry Cleaners
35-45 35th Street, Queens, New York
NYSDEC BCP Site No. C241149

Dear Yildiz:

In accordance with the approved February 2021 Remedial Action Work Plan (RAWP) prepared by Matthew M. Carroll, PE and Tenen Environmental, LLC (Tenen), the remedy includes the completion of a pilot test to design a soil vapor extraction (SVE) system as well as the installation and operation under a Design Document. Implementation of SVE includes applying a vacuum to induce removal of volatile organic compounds (VOCs) from unsaturated soils. A pilot test was completed to determine the radius of influence (ROI) within the existing soils to treat chlorinated VOCs (cVOCs) in soil.

Background

As documented in Tenen's November 2018 Remedial Investigation Report (RIR), cVOCs were detected in the soil above their respective Part 375 Protection of Groundwater soil cleanup objectives (SCOs) in the northwest portion (source area) of the Site.

The highest concentrations of cVOCs, specifically tetrachloroethene (PCE) and trichloroethene (TCE) were detected in on-site soil boring SB-19, located south of the underground storage tank (UST) located inside the loading dock area. During the Remedial Investigation (RI), PCE was detected at a maximum concentration of 1,100 micrograms per kilogram (mg/kg) and TCE was detected at a maximum concentration of 30 mg/kg.

SVE Pilot Test

The objective of the pilot test was to gain information sufficient to specify the full scale treatment system elements. The pilot test provided site-specific data that assisted in determining the ROI, well placement and system design.

The SVE Pilot Test Report prepared by Envirotrac Engineering PE PC of Yaphank, NY is included in Attachment 1.

The results of the pilot test indicated a full-scale SVE system "can serve as an effective means of remediation for the remaining area of contamination." The pilot test indicated that an effective

ROI of 15 feet would be attainable with a minimum vacuum of ten inches of water column (in-wc) at 55 cubic feet per minute (cfm).

SVE Design

The system will consist of three existing SVE cluster wells located within the impacted soil interval of eight to 16 feet below grade (ft-bg). The wells are screened from eight to 13 ft-bg and 13 to 16 ft-bg, above the groundwater interface of approximately 19 ft-bg in the source area. The SVE wells are constructed of 10-slot, two-inch diameter PVE. Seven vacuum monitoring points (VMPs) are installed. The SVE wells and VMPs are shown on Figure 1. The treatment area and ROI are shown on Figure 2.

The wells will be connected via two-inch diameter sub-grade PVC piping and above-grade galvanized steel piping to a three-inch diameter galvanized manifold header with ball valves to balance the vacuum and flow between the extraction points. The manifolded flow will go through two 55-gallon vapor phase carbon absorbers connected in series on the first floor and then a moisture separator, an air filter and a ten-horsepower regenerative blower on the roof. The piping will be galvanized in the building and PVC on the roof. The exhaust will be above the roof of the existing building. The system layout is shown on Figures 3 and 4.

The location of the manifold and drums will be on the first floor and the blower and controls will be on the roof in an enclosure, as shown on Figure 6. The final location on the roof was based on a structural analysis included in Attachment 2.

Treatment Zone

The treatment zone based on the Remedial Investigation (RI) findings is approximately 425 square feet, as shown on Figure 1. The actual area to be treated will be approximately 1,600 square feet, as also shown on Figure 1. The treatment interval will be approximately eight to 16 ft-bg. The well construction and treatment depth are shown on Figure 5.

SVE System Components

The SVE system includes a 10 hp regenerative blower (FPZ model SCL K09-MS-10-3). The blower will include a dual connection inline filter (Ametek-Rottron model 515254 or similar) to prevent abrasion of the vanes during operation. The specification sheets for the blower are included in Attachment 3. The SVE system will operate at approximately 55 cfm and 10 in-wc (to account for system losses).

The effluent from the blower will be treated through two vapor phase granular activated charcoal (GAC) units in series before discharging to the atmosphere. Each carbon vessel contains 170-175 pounds of virgin vapor phase carbon (TIGG Corporation, Econosorb-V or similar). The drums will be connected in series and include a sampling port located between the two units.

Treated effluent will be discharged through a two-inch diameter PVC pipe which will extend approximately two feet above the enclosure and at least ten feet from any air intake.

System Start-up

Following installation of the SVE system, the following actions will be completed during system start-up:

- check all exposed/visible piping for evidence of damage, cracks or leaks;
- turn system on and off to ensure the controls are functioning properly;
- record the vacuum reading at blower;
- record vacuum readings at the VMPs; and,
- collect photoionization detector (PID) readings before, between and after the carbon vessels.

The system testing described above will be conducted whenever the SVE system is restarted including after any significant changes are made to the system.

A visual inspection of the complete system will be conducted during each monitoring event. SVE system components to be monitored include, but are not limited to, the following:

- vacuum blower;
- observable system piping;
- vacuum gauges at blower;
- control switches; and
- PID readings before, between and after the carbon vessels.

The SVE system components are not adjustable and the regenerative blower shall not be serviced or repaired at the Site. The manifold contains ball valves that can be adjusted to balance the flow in the subsurface.

Remedial Performance Monitoring

Vapor samples will be collected on a quarterly basis to evaluate the performance of the system during the first six months of operation. PID readings and vapor samples will be collected from the system influent (before the carbon canisters), between the carbon canisters and from the system effluent (after the carbon canisters). Air samples will be submitted to a NYSDOH ELAP-certified laboratory for analysis of VOCs by USEPA Method TO-15.

Initial vapor concentrations will be high as accumulated vapors are removed with accelerated carbon depletion rates. Carbon usage will diminish over the first month as the accumulated vapors are removed soils. Carbon drums will be set up in series and PID readings and vapor samples collected between the drums will be utilized to determine when breakthrough occurs at the first drum. When this occurs, the drum will be changed out and shipped back to the supplier for regeneration. If nuisance odors are observed from the discharge at any time, operation of the system will be temporarily halted until the situation is remedied by changing out the carbon or through other necessary repairs / actions (loose valve / fitting, broken pipe, etc.).

Reporting

Laboratory reports will include ASP Category B data deliverables for use in the preparation of data usability summary reports (DUSRs). All results will be provided in accordance with the NYSDEC Environmental Information Management System (EIMS) electronic data deliverable (EDD) format.

A letter report will be prepared after each quarterly air sampling event and will include, at a minimum:

- date of event;
- personnel conducting sampling;
- description of the activities performed;
- description of samples collected;
- copies of all field forms;
- sampling results in comparison to appropriate standards/criteria;
- a figure illustrating the sample type and sampling locations;
- copies of all laboratory data deliverables;
- any observations, conclusions, or recommendations; and
- a determination as to whether conditions have changed since the last reporting event.

All performance monitoring and/or final post-remedial sampling analysis will be included in the Final Engineering Report (FER) and, if necessary, in post-Certificate of Completion (COC) Period Review Reports (PRRs).

Conclusions

SVE is a viable alternative for remediation of cVOCs in soil. The SVE system will treat contaminated soil present above the groundwater interface. The pilot test demonstrated that an effective ROI of 15 feet can be achieved. The selected SVE components will be installed and operated to treat the cVOCs in soil.

Please contact us if you require any additional information.

Sincerely,
Tenen Environmental, LLC



Matthew Carroll, P.E.
Principal / Environmental Engineer

Figure 1: SVE System Layout

Figure 2: SVE System Radius of Influence

Figure 3: SVE System Layout – First Floor

Figure 4: SVE System Layout – Roof

Figure 5: SVE System Well Design

Figure 6: SVE System Schematic

Table 1: SVE System Installation Schedule

Attachment 1: SVE Pilot Test Report

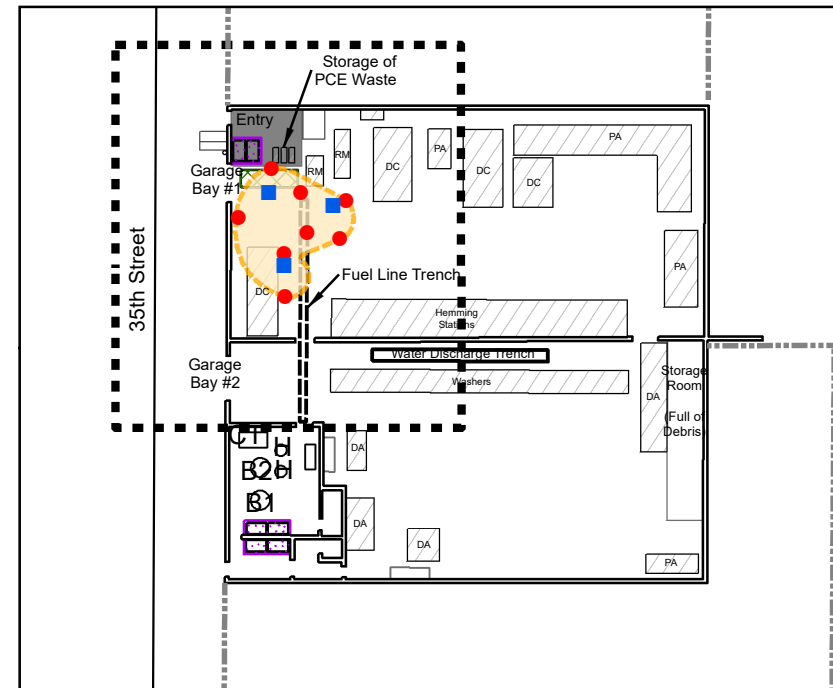
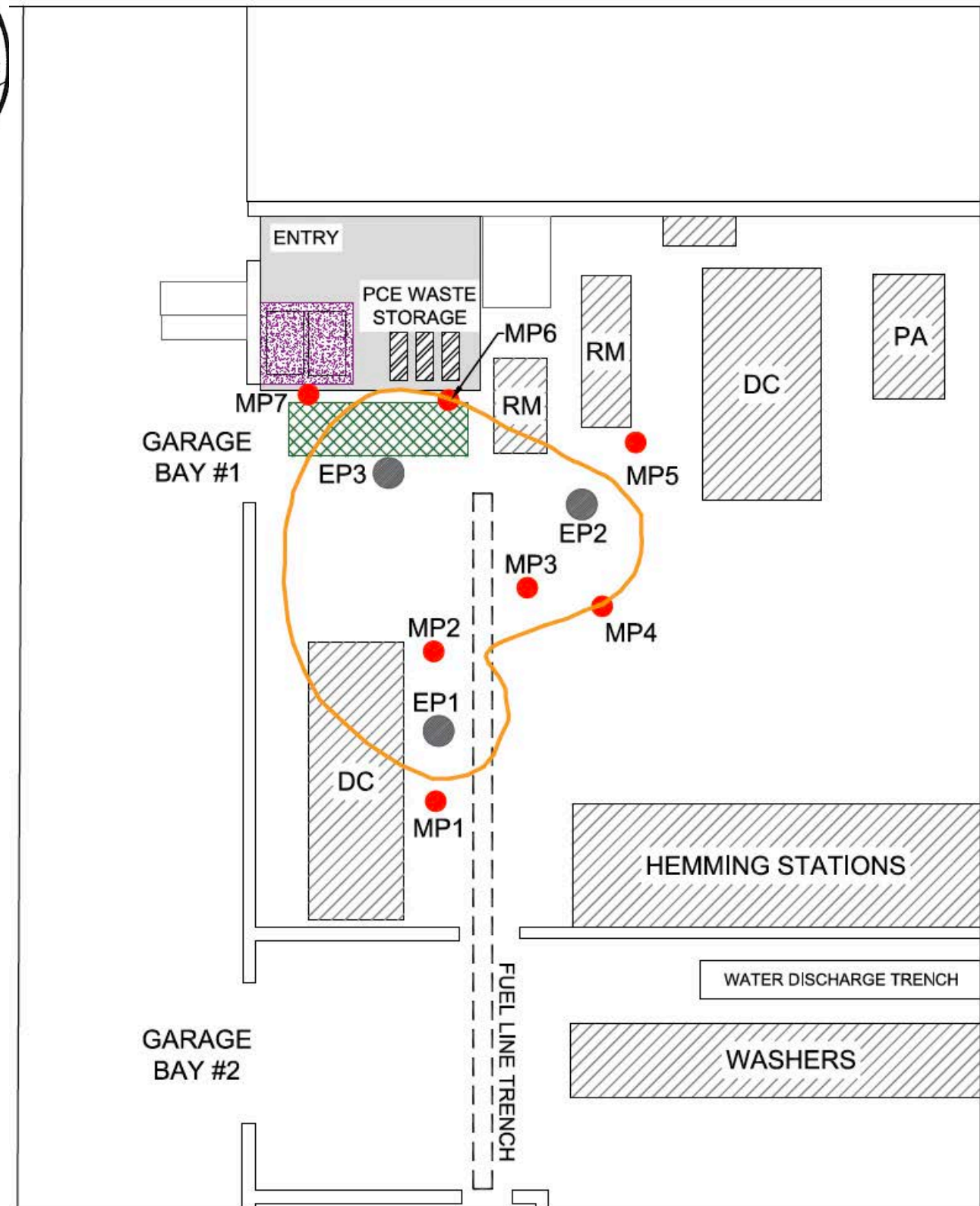
Attachment 2: Structural Analysis

Attachment 3: SVE Blower

Figures



35TH STREET



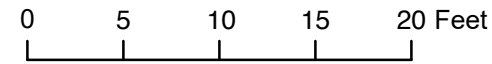
Inset Map

Legend

- Coupled Soil Vapor Extraction Wells (deep and shallow)
- Soil Vapor Extraction Monitoring Points
- PCE Treatment Area
- Concrete Block Enclosed 275-Gallon Fuel Oil ASTs
- Inaccessible
- Partial Cellar
- Abandoned 1,500 Gallon UST
- DC Dry Cleaning Machine
- PA Pressing Area
- DA Dryer Area
- RM PCE Recycling
- (B) Boiler
- (H) Hot Water Heater
- [CT] Condensate Tank

Notes:

1. Placement and size of equipment is approximate.
2. Dashed line indicates inferred contour
3. Shallow SVE Wells are screened 8-13 feet below grade.
4. Deep SVE Wells are screened 13-18 feet below grade.
5. Treatment area consists of soil with PCE concentrations in excess of Protection of Groundwater Soil Cleanup Objectives.



Source: TENEN ENVIRONMENTAL, RAWP, FIGURE 11

SVE Design Document
Teitelbaum Dry Cleaning, Inc.
35-45 35th Street
Astoria, New York

TENEN ENVIRONMENTAL

Tenen Environmental, LLC
 121 West 27th Street
 Suite 702
 New York, NY 10001
 O: (646) 606-2332
 F: (646) 606-2379

Drawn By	LM
Checked By	AC
Date	March 2025
Scale	As Noted

Soil Vapor Extraction (SVE) System Layout

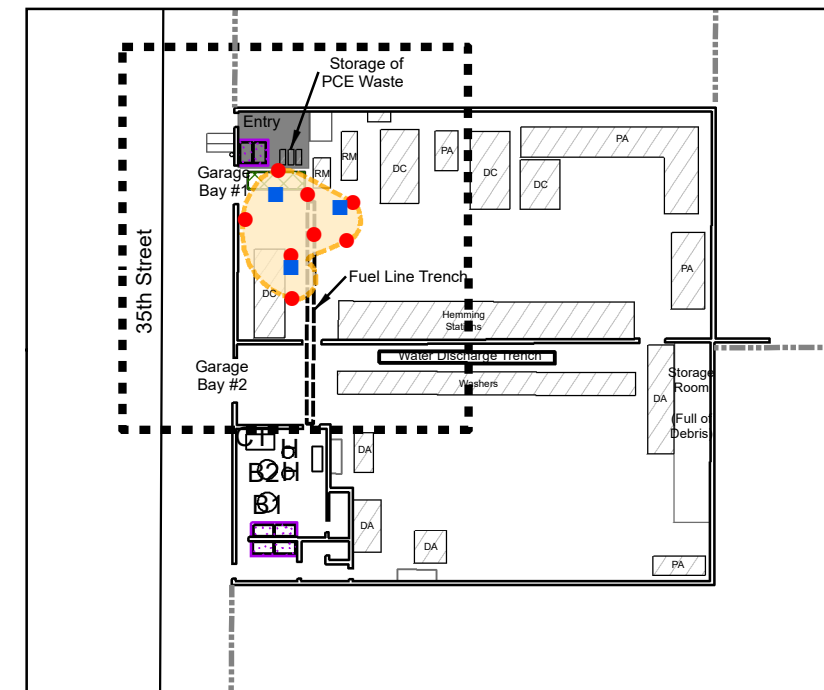
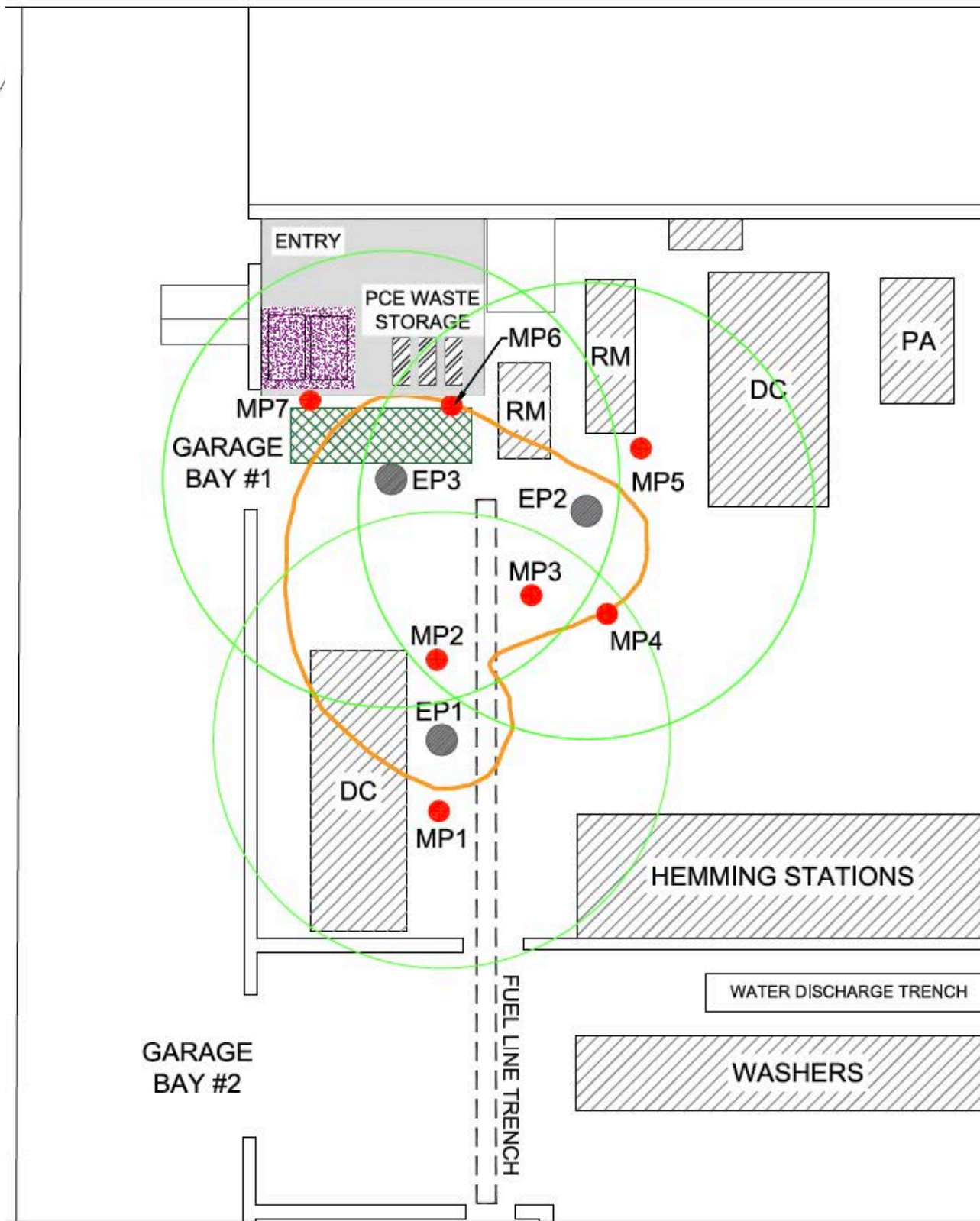
Figure 1

Drawing Title

Drawing No



35TH STREET



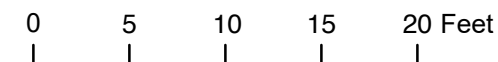
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TENEN ENVIRONMENTAL, RAWP, FIGURE 11

SVE Design Document
Teitelbaum Dry Cleaning, Inc.
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Soil Vapor Extraction (SVE)
System Radius of Influence

Drawing Title

Figure 2

Drawing No



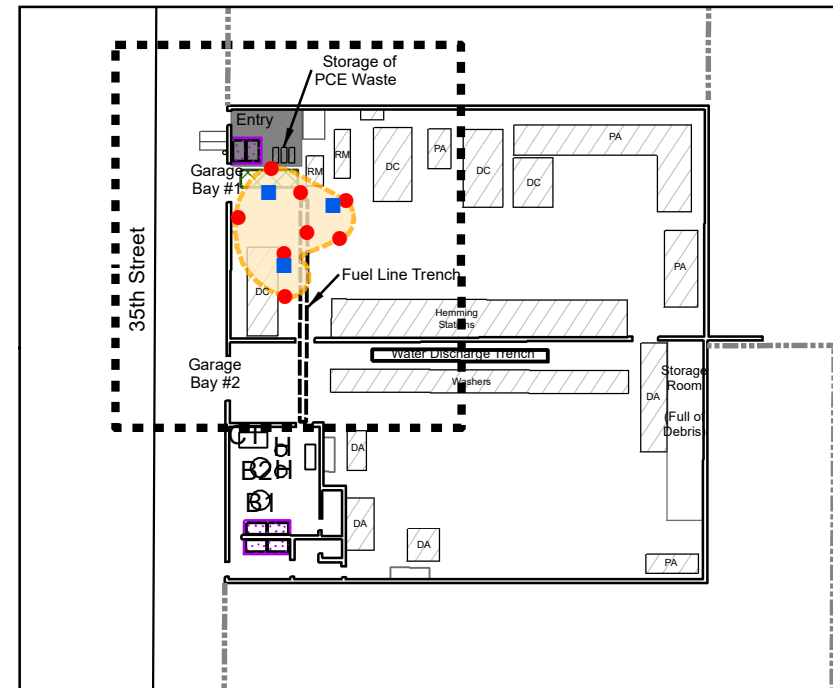
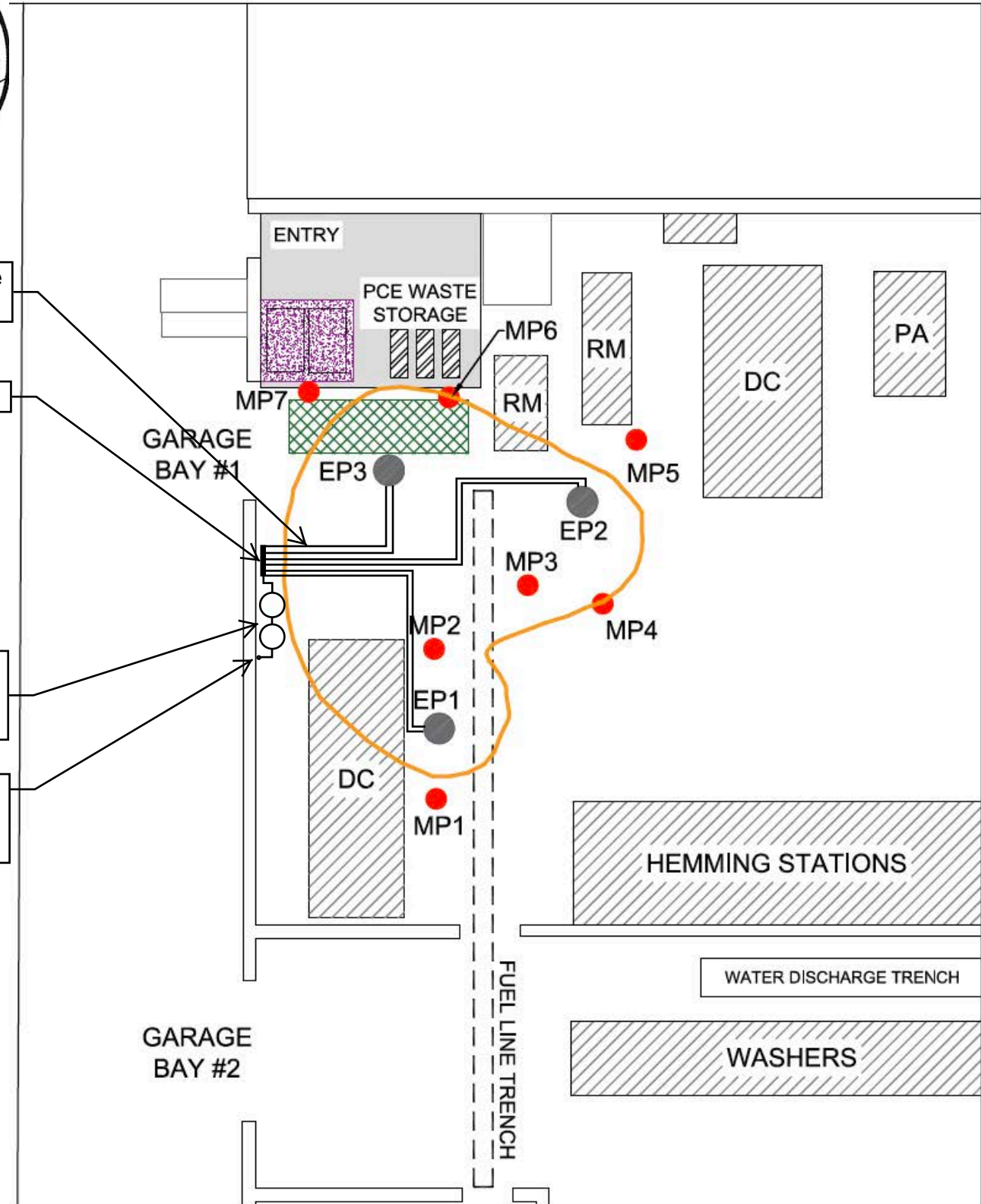
Two inch subgrade PVC piping

Manifold

Two 55-gallon carbon treatment drums

Three inch galvanized riser to roof

35TH STREET



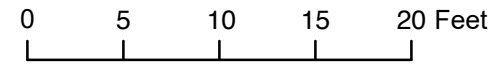
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Source: TENEN ENVIRONMENTAL, RAWP, FIGURE 11

SVE Design Document
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Astoria, New York

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Date	March 2025
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Soil Vapor Extraction (SVE)
System Layout - First Floor

Figure 3

Drawing Title

Drawing No



Site

SVE Design Document
Teitelbaum Dry Cleaning, Inc.
35-45 35th Street
Astoria, New York



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Drawn By LM

Checked By MC

Date March 2025

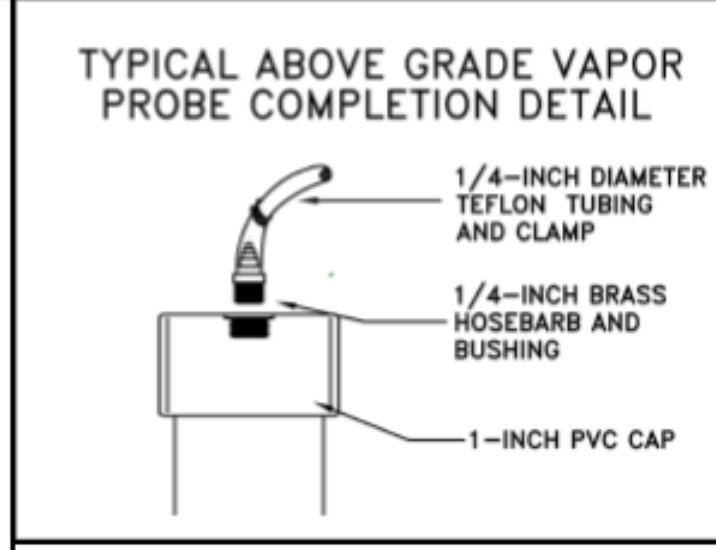
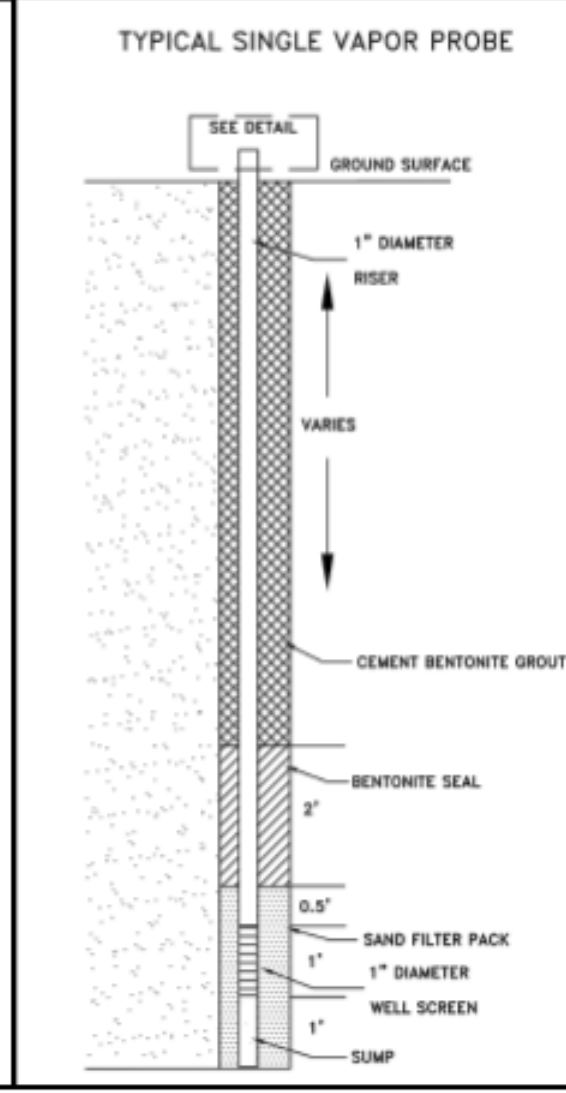
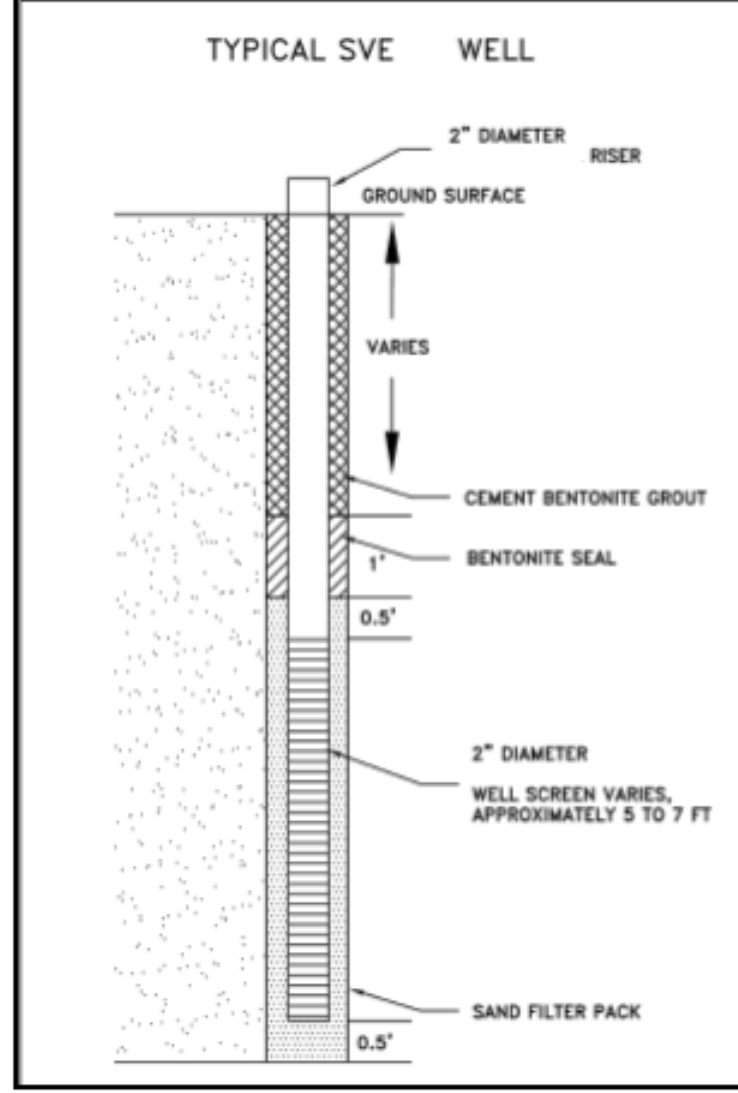
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Soil Vapor Extraction
(SVE) System Layout - Roof

Drawing Title

Figure 4

Drawing No



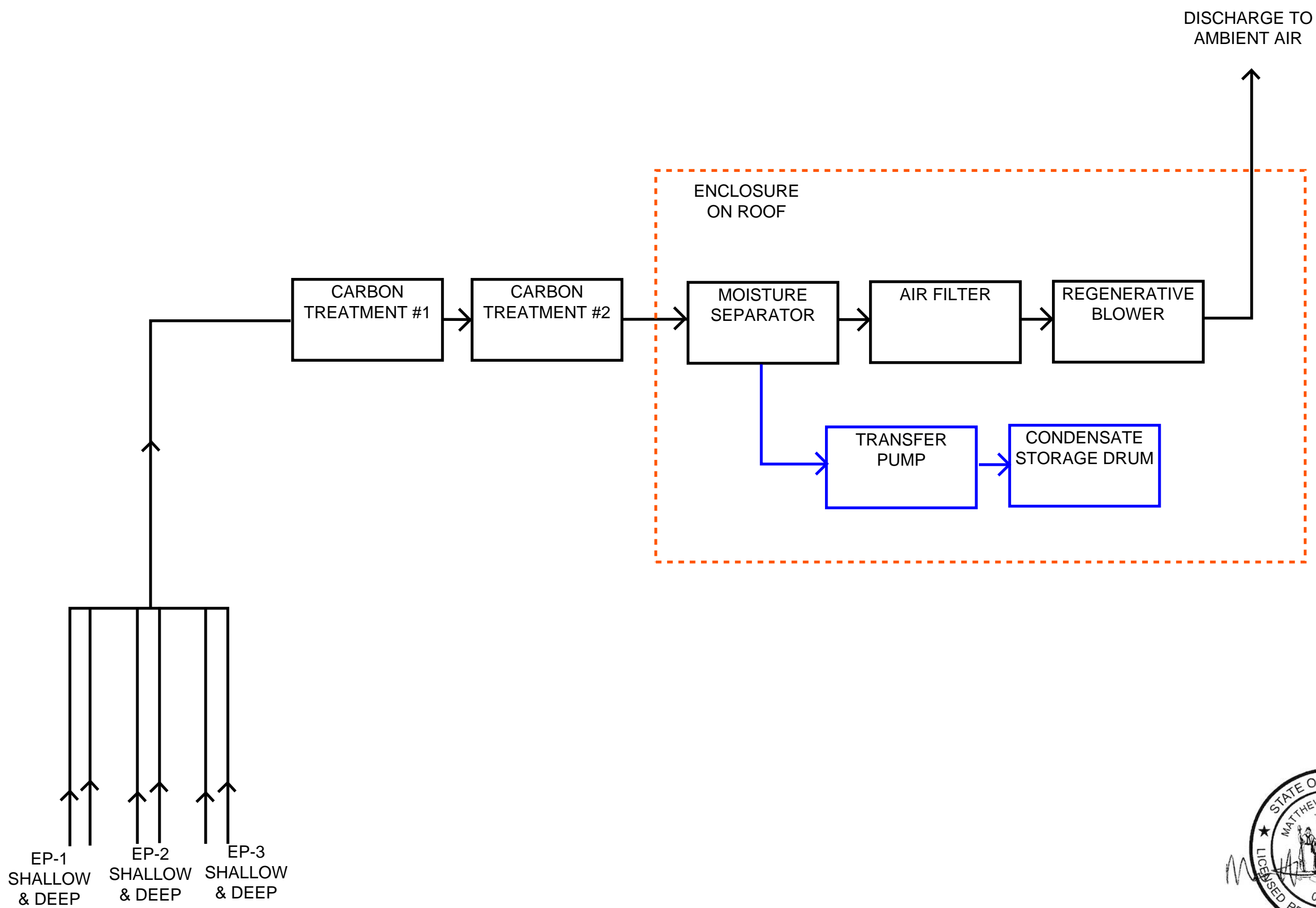
Drawing Title
Soil Vapor Extraction (SVE) System Well Design

Drawing No
Figure 5

Drawn By **LM**
 Checked By **MC**
 Date **March 2025**
 Scale **As Noted**

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Site
SVE Design Document
Teitelbaum Dry Cleaning, Inc.
35-45 35th Street
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Drawn By	LM
Checked By	MC
Date	March 2025
Scale	N.T.S.

Drawing Title
Soil Vapor Extraction (SVE) System Schematic

Drawing No
Figure 6

Table

Table 1. SVE System Installation Schedule
 Teitelbaum Dry Cleaners, Inc.
 35-45 35th Street - Queens, NY
 BCP Site No. C241149

Task Number	Task	Estimated Task Duration (Business Days)	Total Duration (Business Days)
1	SVE System Design Document Approval	0	0
2	7-day notice to NYSDEC and Site Operator for start of SVE System Design Document Implementation	5	5
3	Trench Excavation and Sub-Slab Piping Installation	10	10
4	Order and Delivery of Equipment	20	25*
5	System Integration	15	40
6	System Testing	2	42
7	System Breakdown and Packing, Shipment and Delivery to Site	3	45
8	Above-Ground System Installation	10	55
9	SVE System Start-Up	1	56
10	First Quarterly Vapor Sample Collection (to occur at least one month following SVE System Start-Up)	30	86
11	Second Quarterly Vapor Sample Collection (to occur approximately three months following first sampling event)	90	176

Notes:

* = Task 4 will be conducted concurrently with Tasks 2 and 3.

Tasks 2 and 4 to be started immediately upon approval of the Design Document by NYSDEC, expected in late March.

Task 3 to begin following the 7-day notice to NYSDEC (Task 2); expected to begin in early to mid-April and end in late April or early May.

Delivery of equipment (Task 4) expected by late April to early May. Tasks 5, 6, and 7 expected to be completed in early to mid-May.

Tasks 8 and 9 expected to begin in mid-May and end in late May or early June.

Task 10 expected to take place in late June or early July.

Task 11 expected to take place in late September or early October.

Attachment 1: SVE Pilot Test Report



Soil Vapor Extraction (SVE) Pilot Test Report

Site:

BCP Site No. C241149
Teitelbaum Dry Cleaning, Inc.
35-45 35th Street
Astoria, New York

Prepared for:

Tenen Environmental
121 West 27th Street, Suite 702
New York, New York 10001

Prepared by:

EnviroTrac Engineering PE PC
5 Old Dock Road
Yaphank, NY 11980

Rev. July 2024

Soil Vapor Extraction (SVE) Pilot Test Report

35-45 35th Street, Brooklyn, New York.

PURPOSE

This report is intended to summarize the results of the SVE pilot study that was conducted by Tenen Environmental. The purpose of the test was to determine the feasibility of implementing a full scale SVE system as a viable means of remediating the remaining areas of contamination. The results of this study were used to determine the required operating parameters and layout for the final remediation system.

PILOT TEST SPECIFICATIONS

1. Soil Vapor Extraction Equipment

- Extraction Blower – Ametek Rotron Inc. Model #DR505AW58M, Regenerative Vacuum Blower (2-HP, 115/230V, 1 Phase).
 - Max Flow: 150 SCFM
 - Max Vac: 70 "H₂O

2. Test Wells

Three (3) soil vapor extraction cluster wells (EP1, EP2 and EP3) were tested. Each cluster well consists of a shallow well screened from 8-13' below grade and a deep well screened from 13-18' below grade. To monitor the subsurface vacuum response, several vacuum monitoring points were installed extending radially outward from the test points. The locations of each test extraction well and monitoring point can be seen in **Figure 1**.

SVE TESTING METHODOLOGY

Each extraction well was tested at varying operational conditions. During each test, the vacuum blower was configured to operate at two different steps of increasing flow and vacuum. During each step, parameters to estimate the applied vacuum and applied induced flow as well as the subsurface vacuum responses were recorded. Due to the limits of the monitoring instruments used the applied vacuum and extraction flow rate readings were estimated based on the blower performance curve and the performance of the other test wells. For remedial design purposes the applied vacuum and extraction flow rate for each step were entered as the following:

EP-1S and EP-3D

- Step 1 – 50 "H₂O Wellhead Vacuum, 20 cfm Extraction Flow Rate.
- Step 2 – 70 "H₂O Wellhead Vacuum, 40 cfm Extraction Flow Rate.

EP-2S, 3S, and 2D

- Step 1 – 25 "H₂O Wellhead Vacuum, 60 cfm Extraction Flow Rate.
- Step 2 – 50 "H₂O Wellhead Vacuum, 100 cfm Extraction Flow Rate.

During each step vacuum influence was recorded from all monitoring points utilizing a handheld digital manometer. Well EP-1D did not induce any vacuum response most likely due to a clogged screen zone and was not used in the system design.

PILOT TESTING RESULTS

The field data collected during the SVE pilot test is included as an attachment to this report. For each step #1 the air stream was diluted with 50% fresh air and for each step 2 the full air stream of the blower was extracted from the test well. During each step vacuum influence was measured at the observation points. A copy of the pilot test data analysis, along with the associated data plots, are also included as attachments to this report.

To determine the performance requirements at the proposed SVE extraction wells, the pilot test data was used to generate a semi-logarithmic plot of the sub-slab vacuum response vs. the distance from the extraction well. From this plot the effective Radius of Influence (ROI) of each pilot test step is determined by finding the radial distance where the vacuum response equals 0.10" H₂O vacuum response.

In order to have vacuum influence coverage over the complete area of concern conservative ROIs of 15 to 25 ft were chosen for the extraction wells. To produce the desired ROIs the following minimum performance criteria are required:

- EP-1S wellhead vacuum of 73 "H₂O, extraction flow rate of 43 cfm.
- EP-1D wellhead vacuum of 73 "H₂O, extraction flow rate of 43 cfm (assumes well screen can be cleared)
- EP-2S wellhead vacuum of 14 "H₂O, extraction flow rate of 34 cfm.
- EP-2D wellhead vacuum of 25 "H₂O, extraction flow rate of 22 cfm.
- EP-3S wellhead vacuum of 13 "H₂O, extraction flow rate of 33 cfm.
- EP-3D wellhead vacuum of 48 "H₂O, extraction flow rate of 18 cfm.

CONCLUSIONS

Based on the results tabulated, the pilot testing performed demonstrates that a full-scale SVE system can serve as an effective means of remediation for the remaining area of contamination. If a target ROI of 15 feet is selected for each proposed extraction point, it was determined that a minimum vacuum of 10 "H₂O and average extraction air flow rate of 55 CFM would need to be applied at each point. **Figure 2** shows the proposed radius of influence coverage.

Recommended Design Parameters (Total System Performance, 6 Wells):

- | | |
|-------------------------------------|---|
| • Target Radius of Influence (ROI): | 15 feet (per well) |
| • Fan Vacuum: | 100 "H ₂ O (inc. SF for system losses) |
| • Fan Total Flow Rate: | 200 CFM |
| • Proposed Extraction Blower: | Atlantic Blower Model #AB-800 |

SVE SYSTEM SPECIFICATIONS

To provide adequate coverage of the remaining area of contamination it is proposed to install a full-scale remediation system consisting of the three (3) 2-inch diameter SVE cluster wells used during the pilot test. Each well will be piped to a common manifold using 2-inch diameter SCH 40 PVC pipe below grade and 2" galvanized steel pipe above grade. The manifold header shall be constructed of 3-inch diameter SCH 40 galvanized steel pipe. Each leg of the manifold shall contain a butterfly valve, vacuum gauge, and air flow meter. The common header pipe shall be piped to the system equipment enclosure that will house the moisture separator, air filter, extraction blower, carbon vessels, transfer pump, and condensate storage drum. The effluent pipe shall exhaust to the atmosphere at a location that is at least 2-feet above the roofline and 10-ft from any opening to the building occupied spaces. **Figures 3** shows the proposed layout for the system piping and equipment enclosure. **Figure 4** is the system process flow diagram. A specification sheet for the proposed extraction blower is attached.

A formal Remedial Design (RD) Report will be provided to the Department in August 2024. The system will be installed before October 1, 2024. As will be further detailed in the RD Report, start-up and quarterly sampling and reporting will be completed.

FIGURES

- Figure 1: Soil Vapor Extraction Pilot Test Layout
- Figure 2: Proposed SVE Radius of Influence Map
- Figure 3: Proposed SVE System Layout with Foundation Plan
- Figure 4: SVE System Process Flow Diagram

ATTACHMENTS

1. SVE Pilot Test Data
2. SVE Pilot Test Data Analysis
3. Proposed SVE Blower Specification Sheet
4. Well Logs

FIGURES






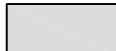

NOTES:

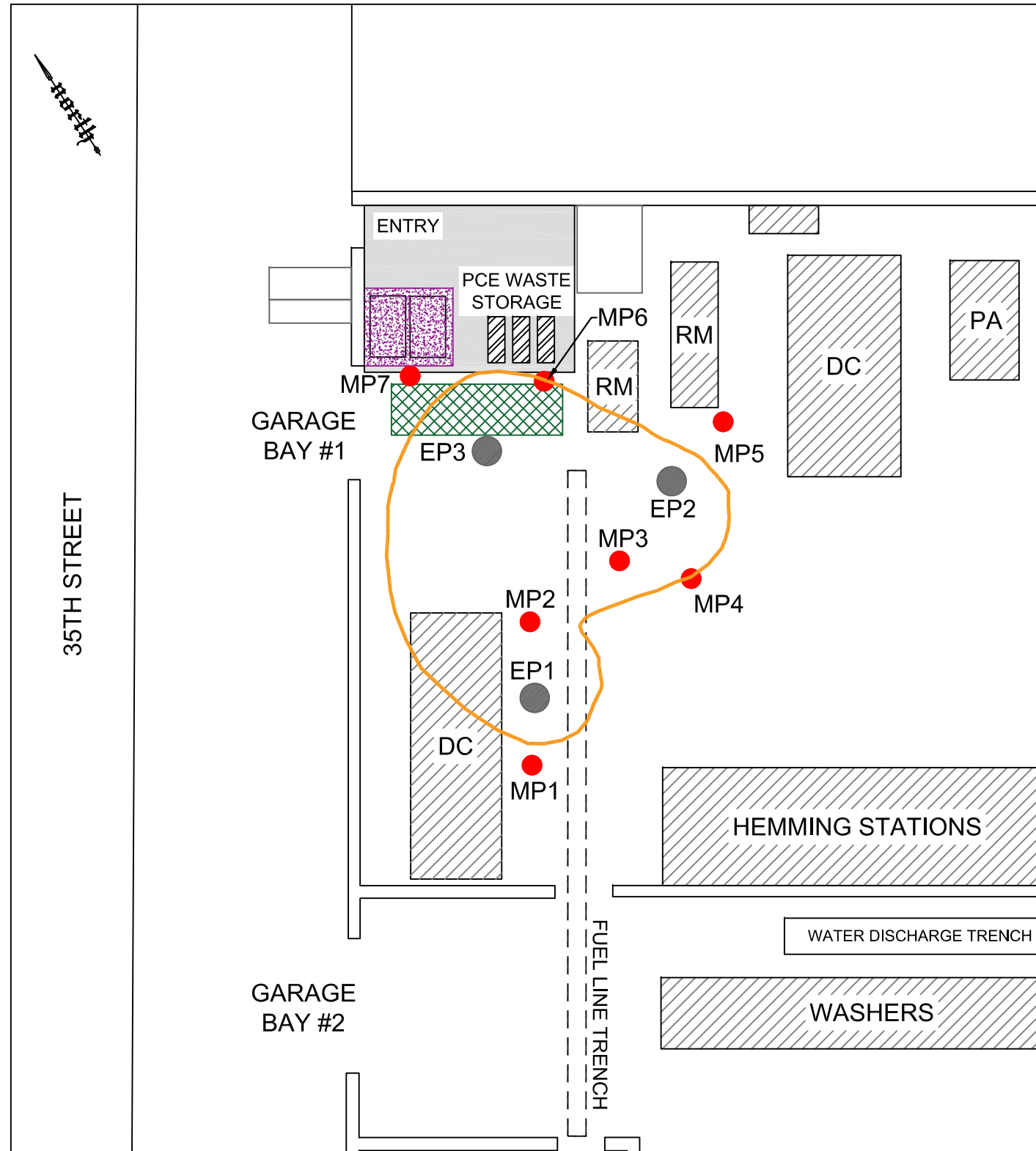
1. PLACEMENT AND SIZE OF EQUIPMENT IS APPROXIMATE.
2. DASHED LINE INDICATES INFERRED CONTOUR.
3. SHALLOW SVE WELLS ARE SCREENED 8-13 FEET BELOW GRADE.
4. DEEP SVE WELLS ARE SCREENED 13-16 FEET BELOW GRADE.
5. TREATMENT AREA CONSISTS OF SOILS WITH PCE CONCENTRATIONS IN EXCESS OF PROTECTION OF GROUNDWATER SOIL CLEANUP OBJECTIVES.

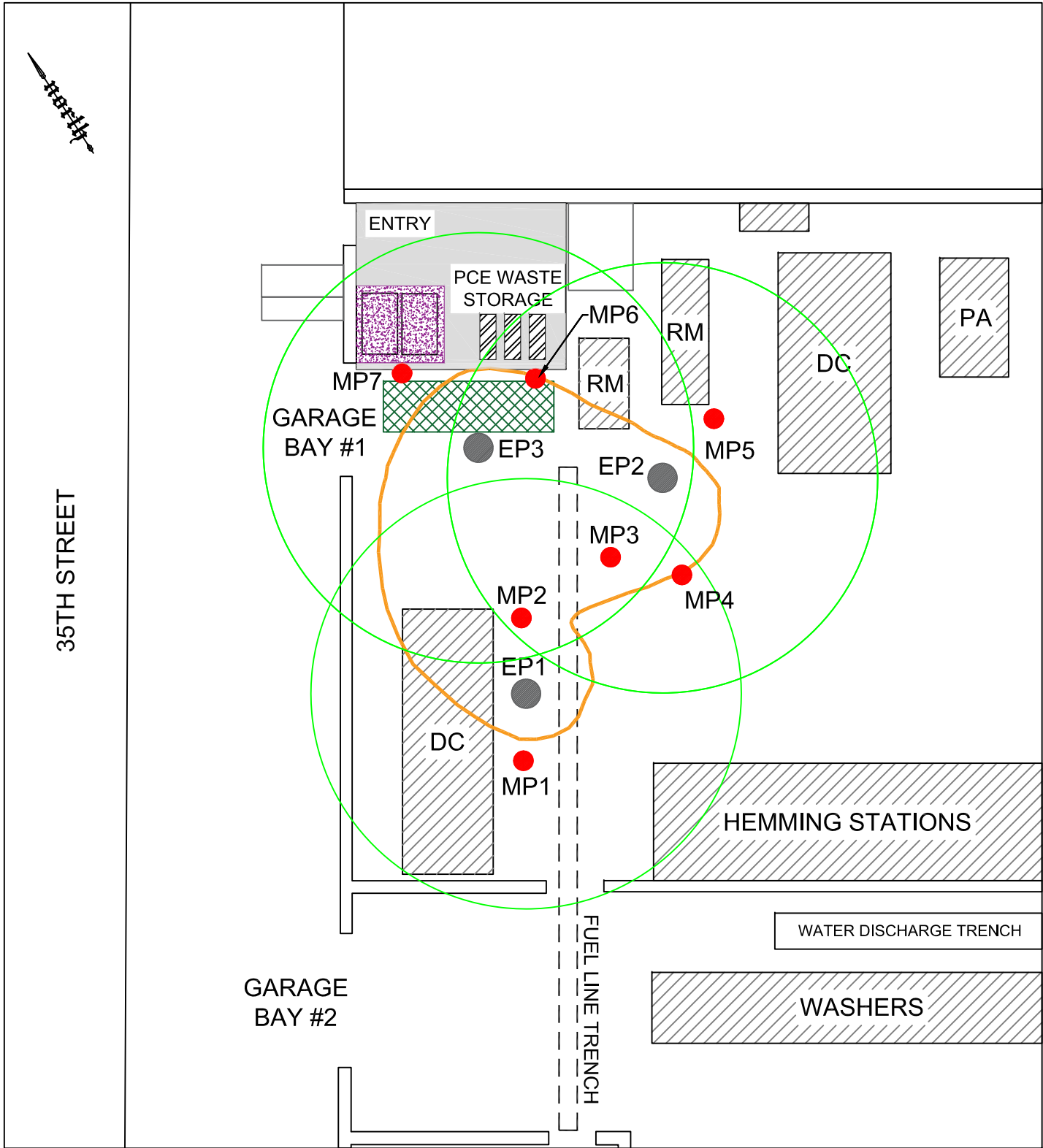
SOURCE:

TENEN ENVIRONMENTAL, 35-45 35TH STREET RAWP FIGURE 11.

LEGEND:

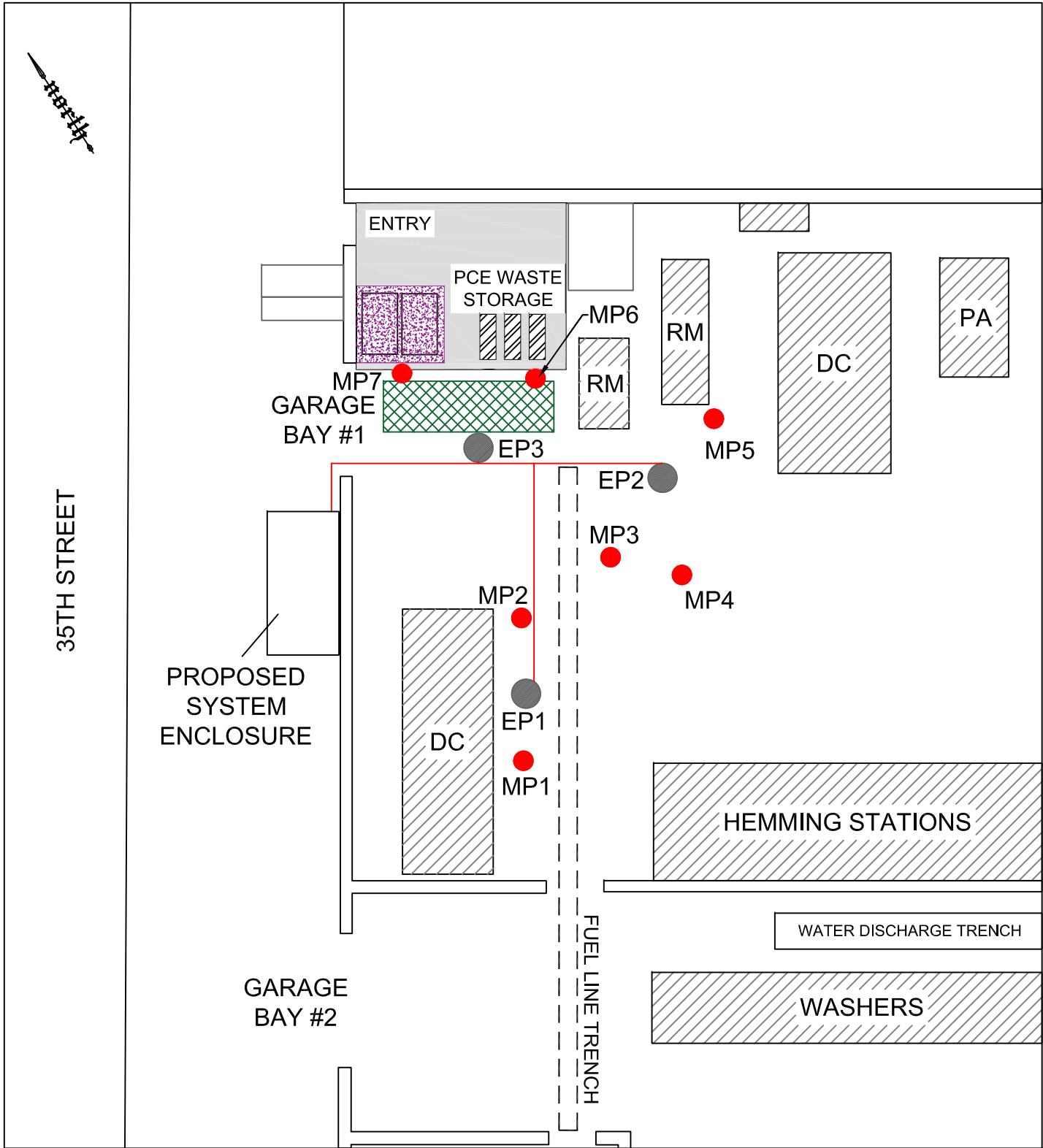
-  SVE TEST EXTRACTION CLUSTER WELL
-  SVE TEST MONITORING POINT
-  PCE TREATMENT AREA
-  CONCRETE ENCLOSED 275-GAL FUEL OIL ASTS
-  INACCESSIBLE
-  PARTIAL BASEMENT
-  ABANDONED 1,500-GAL USTS
- DC DRY CLEANING MACHINE
- PA PRESSING AREA
- DA DRYING AREA
- RM PCE RECYCLING












LEGEND:

- SVE EXTRACTION CLUSTER WELL
- PROPOSED SVE RADIUS OF INFLUENCE = 15 FT
- SVE TEST MONITORING POINT
- ▭ PCE TREATMENT AREA
- ▨ CONCRETE ENCLOSED 275-GAL FUEL OIL ASTS
- ▨ INACCESSIBLE
- ▨ PARTIAL BASEMENT
- ▨ ABANDONED 1,500-GAL USTS
- DC DRY CLEANING MACHINE
- PA PRESSING AREA
- DA DRYING AREA
- RM PCE RECYCLING



LEGEND:

-  SVE EXTRACTION CLUSTER WELL
-  SVE TEST MONITORING POINT
-  SUBSURFACE SYSTEM PIPING
-  CONCRETE ENCLOSED 275-GAL FUEL OIL ASTS
-  INACCESSIBLE
-  PARTIAL BASEMENT
-  ABANDONED 1,500-GAL USTS
- DC** DRY CLEANING MACHINE
- PA** PRESSING AREA
- DA** DRYING AREA
- RM** PCE RECYCLING



5 OLD DOCK ROAD, YAPHANK, NEW YORK 11980
 PHONE: (631)924-3001 FAX: (631)924-5001



REVISION DATE: 7/21/2023

REVISED BY: JW

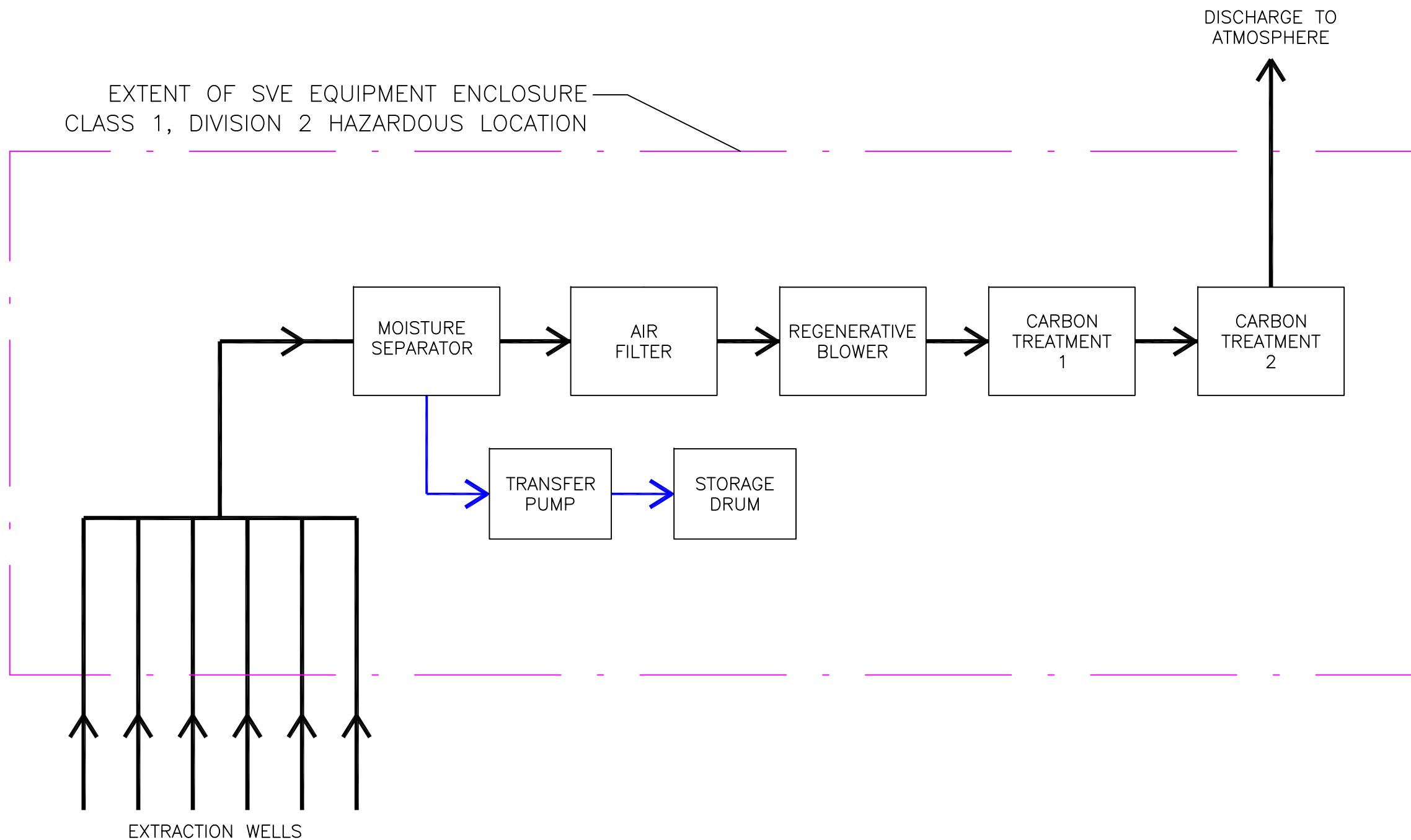
TEITELBAUM DRY CLEANING, INC.
 35-45 35TH STREET
 ASTORIA, NEW YORK

PROPOSED SVE SYSTEM LAYOUT

FIGURE #

3

EXTENT OF SVE EQUIPMENT ENCLOSURE
CLASS 1, DIVISION 2 HAZARDOUS LOCATION



LEGEND:

- AIR FLOW DIRECTION
- CONDENSATE WATER FLOW DIRECTION



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REVISION DATE: 7/21/2023

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TEITELBAUM DRY CLEANING, INC.
35-45 35TH STREET
ASTORIA, NEW YORK

SVE SYSTEM PROCESS FLOW DIAGRAM

FIGURE #

4

ATTACHMENTS

Estimated Vacuum and Flow				
EP1 Shallow		50" H2O Vacuum	70" H2O Vacuum	
Monitoring Point	Distance	20 CFM Flow Rate	40 CFM Flow Rate	
MP1	5.39	0.009	0.084	
MP2	4.94	0.036	0.222	
MP3	11.36	0.027	0.184	
MP4	13.76	0.011	0.061	
MP5	24.12	0	0.005	

EP3 Deep
No induced vacuum. Check screen.

Estimated Vacuum and Flow				
EP2 Shallow		25" H2O Vacuum	50" H2O Vacuum	
Monitoring Point	Distance	60 CFM Flow Rate	100 CFM Flow Rate	
MP1	22.41	0.063	0.21	
MP2	14.41	0.248	0.676	
MP3	6.92	0.321	0.904	
MP4	7	0.75	2.084	
MP5	6.59	0.491	1.487	
MP6	11.45	0.037	0.231	
MP7	20.19	0.024	0.097	

Estimated Vacuum and Flow				
EP2 Deep		25" H2O Vacuum	50" H2O Vacuum	
Monitoring Point	Distance	60 CFM Flow Rate	100 CFM Flow Rate	
MP1	22.41	0.276	0.699	
MP2	14.41	0.295	0.785	
MP3	6.92	0.744	1.444	
MP4	7	1.096	2.334	
MP5	6.59	1.496	3.074	
MP6	11.45	0.821	1.74	
MP7	20.19	0.044	0.161	

Estimated Vacuum and Flow				
EP3 Shallow		25" H2O Vacuum	50" H2O Vacuum	
Monitoring Point	Distance	60 CFM Flow Rate	100 CFM Flow Rate	
MP1	23.16	0.082	0.38	
MP2	13.38	0.15	0.491	
MP3	13.25	0.209	0.608	
MP4	18.01	0.217	0.589	
MP5	18.32	0.413	1.113	
MP6	6.38	0.563	1.509	
MP7	7.12	0.335	1.191	

Estimated Vacuum and Flow				
EP3 Deep		50" H2O Vacuum	70" H2O Vacuum	
Monitoring Point	Distance	20 CFM Flow Rate	40 CFM Flow Rate	
MP1	23.16	0.808	1.9	
MP2	13.38	0.197	0.442	
MP3	13.25	0.295	0.47	
MP4	18.01	0.215	0.392	
MP5	18.32	0.25	0.513	
MP6	6.38	0.327	0.509	
MP7	7.12	0.084	1.62	

Summary of Soil Vapor Extraction Pilot Test Data
35-45 35th Street
Astoria, New York

Performed By: Tenen Environmental
Extraction Well: EP-1S
Wellhead Vacuum ("H2O): 25 to 50
Vapor Discharge Flow (scfm): 60 to 100

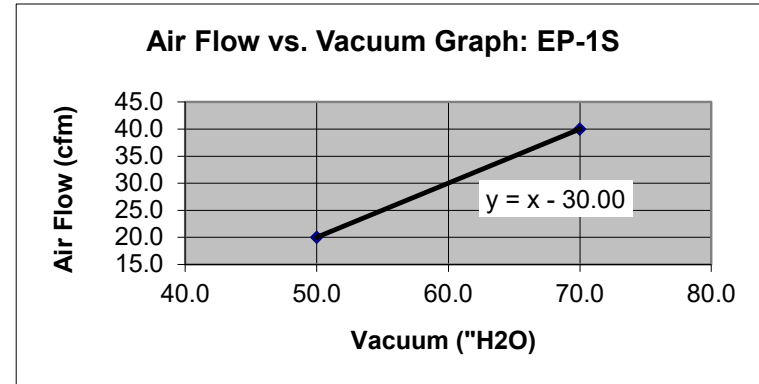
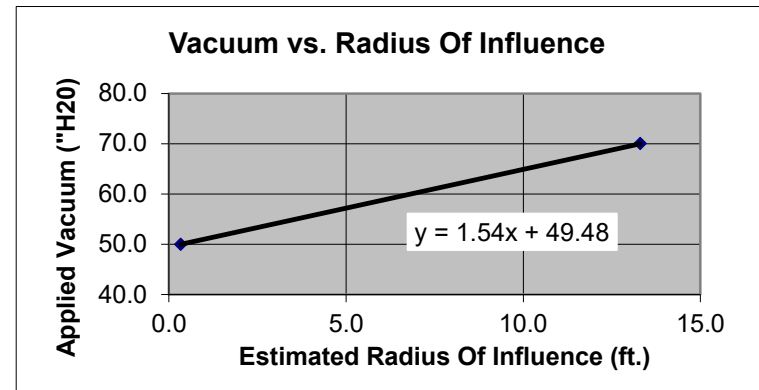
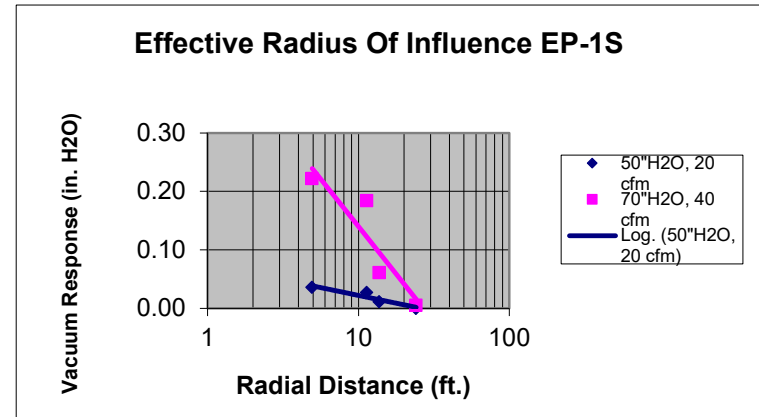
SVE Design Data

Radial Distance (ft.)	Vacuum Response 1 50" H2O Applied Vacuum, 20 scfm ("H2O)	Vacuum Response 2 70" H2O Applied Vacuum, 40 scfm ("H2O)
4.94	0.036	0.222
11.36	0.027	0.184
13.76	0.011	0.061
24.12	0.000	0.005

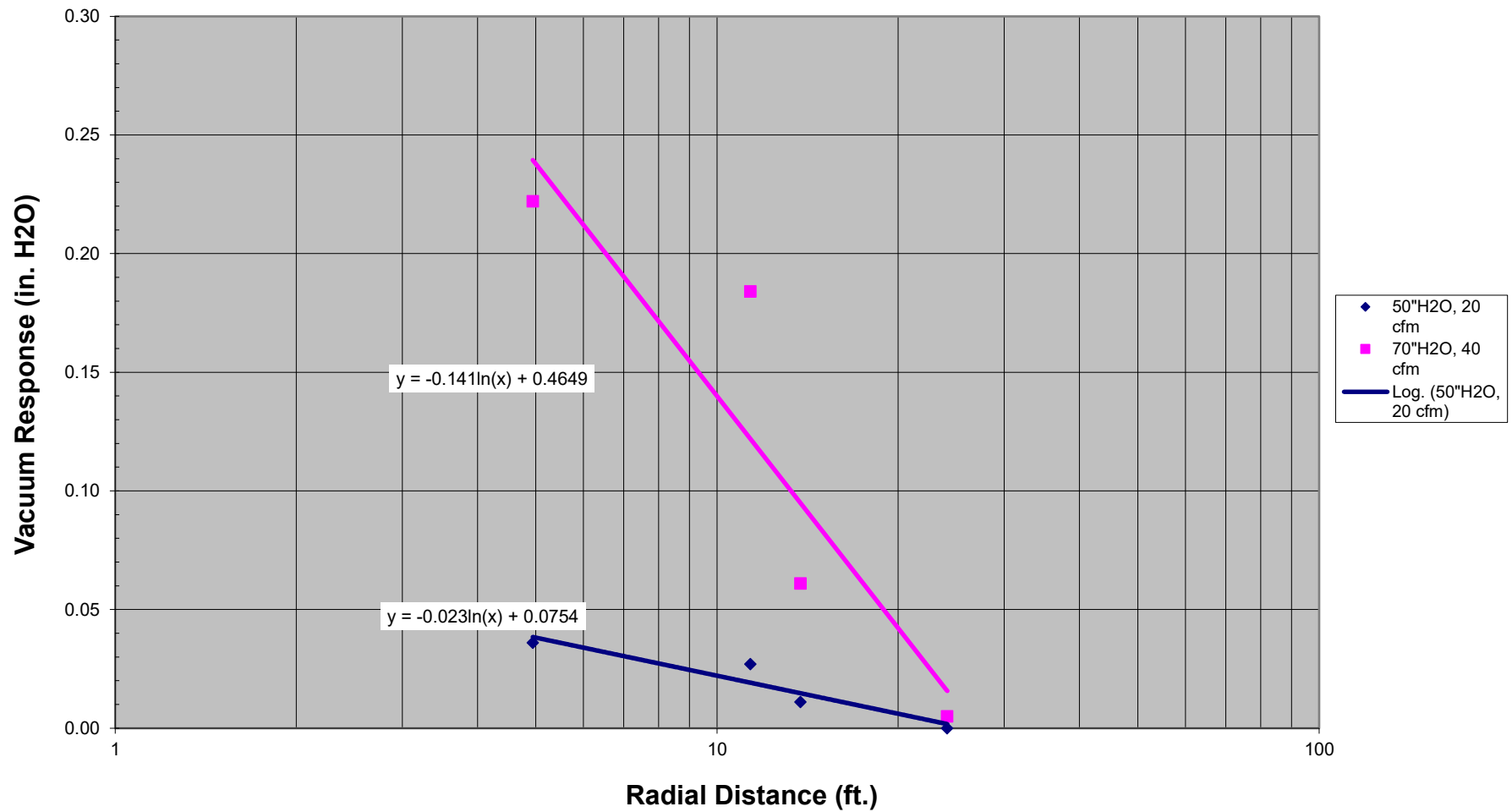
Est. ROI (ft.)	Vacuum ("H2O)	Flow (scfm)
0.34	50.0	20.0
13.3	70.0	40.0

Desired Radius of Influence = 15 ft
 @ ROI = 15 ft, Applied Vacuum = 73"H2O
 @ 73"H2O Vacuum, Flow Rate = 43 cfm

Note: For SVE ROI is the radial distance where the vacuum response equals 0.10" H2O.



Effective Radius Of Influence EP-1S



Summary of Soil Vapor Extraction Pilot Test Data
35-45 35th Street
Astoria, New York

Performed By: Tenen Environmental
Extraction Well: EP-2S
Wellhead Vacuum ("H2O): 25 to 50
Vapor Discharge Flow (scfm): 60 to 100

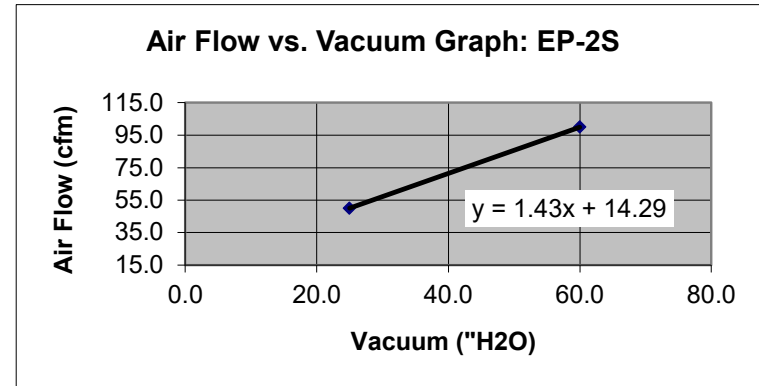
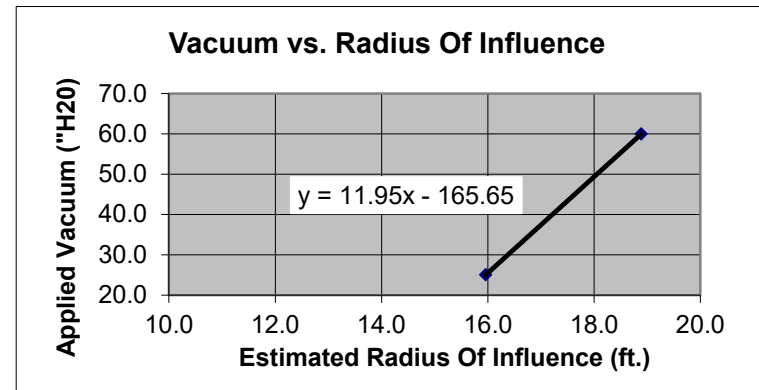
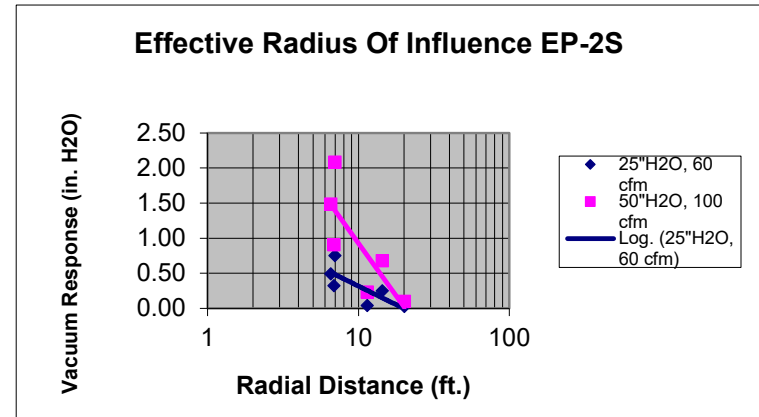
SVE Design Data

Radial Distance (ft.)	Vacuum Response 1 25" H2O Applied Vacuum, 60 scfm ("H2O)	Vacuum Response 2 50" H2O Applied Vacuum, 100 scfm ("H2O)
6.59	0.491	1.487
6.92	0.321	0.904
7.00	0.750	2.084
11.45	0.037	0.231
14.41	0.248	0.676
20.19	0.024	0.097

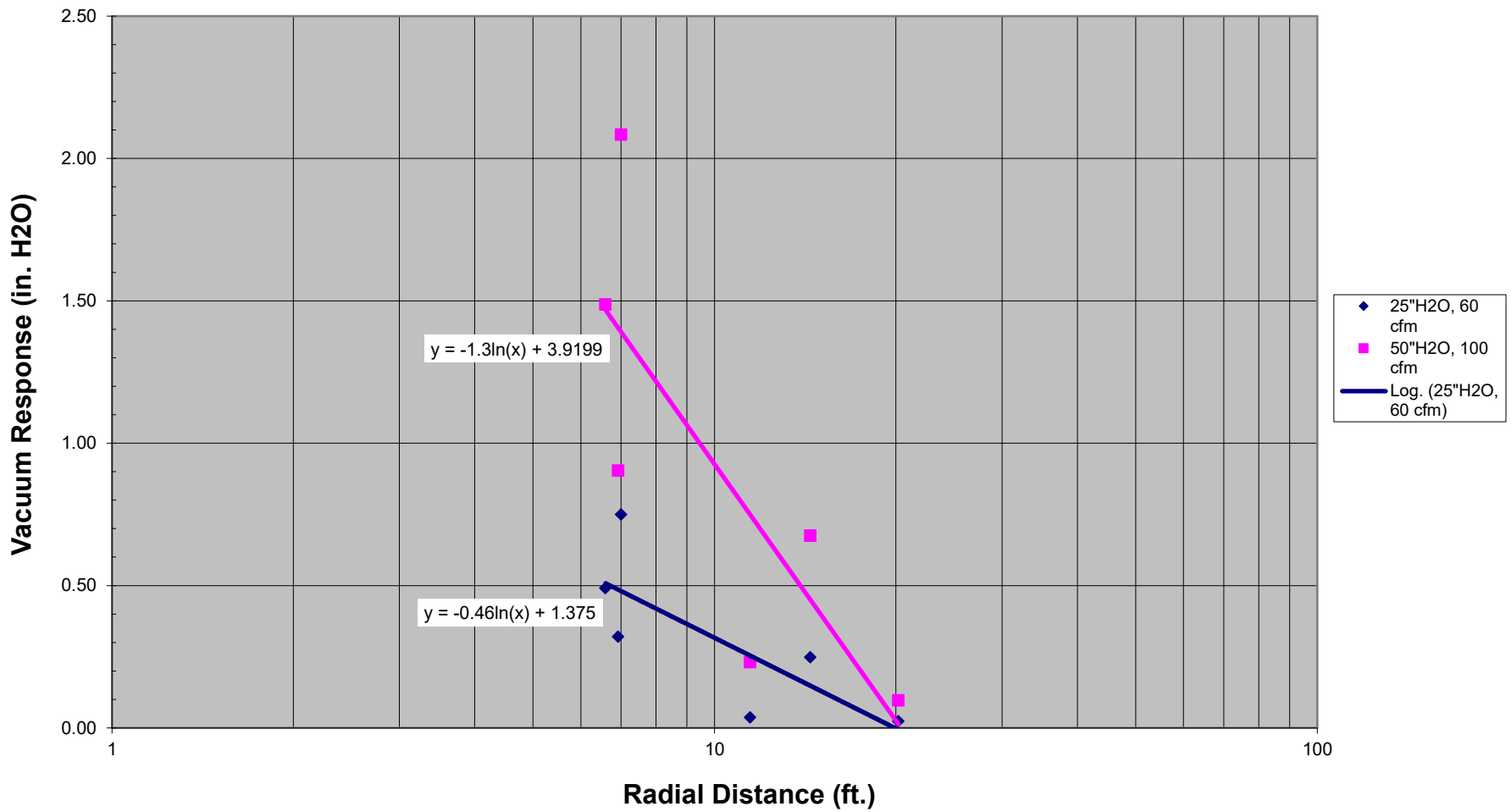
Est. ROI (ft.)	Vacuum ("H2O)	Flow (scfm)
16.0	25.0	50.0
18.9	60.0	100.0

Desired Radius of Influence = 15 ft
 @ ROI = 15 ft, Applied Vacuum = 13.6"H2O
 @ 13.6"H2O Vacuum, Flow Rate = 33.7 cfm

Note: For SVE ROI is the radial distance where the vacuum response equals 0.10" H2O.



Effective Radius Of Influence EP-2S



Summary of Soil Vapor Extraction Pilot Test Data
35-45 35th Street
Astoria, New York

Performed By: Tenen Environmental
Extraction Well: EP-2D
Wellhead Vacuum ("H2O): 25 to 50
Vapor Discharge Flow (scfm): 60 to 100

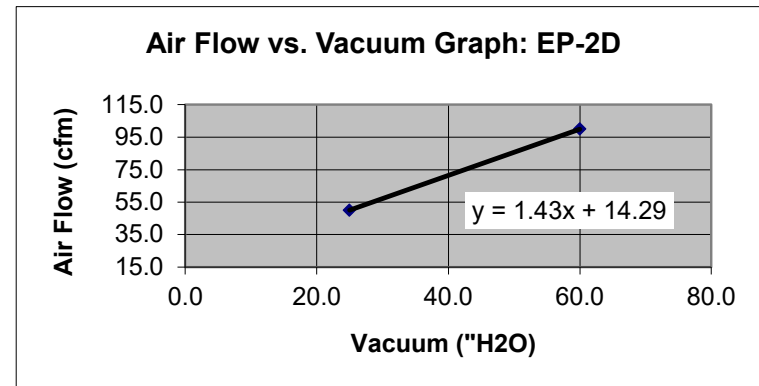
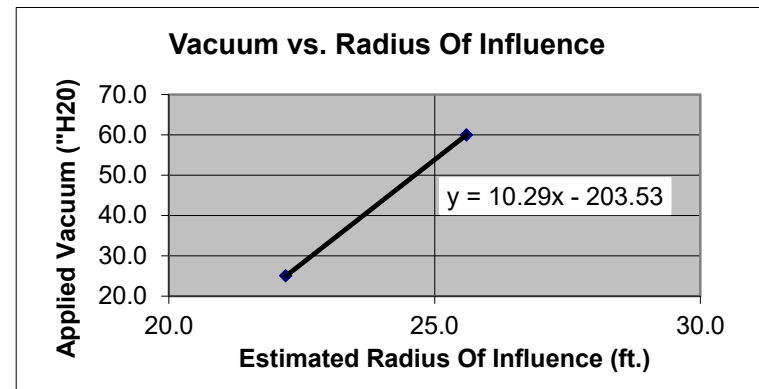
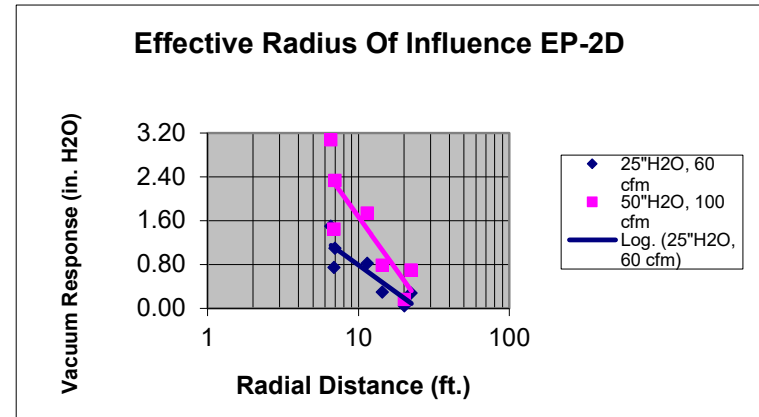
SVE Design Data

Radial Distance (ft.)	Vacuum Response 1 25" H2O Applied Vacuum, 60 scfm ("H2O)	Vacuum Response 2 50" H2O Applied Vacuum, 100 scfm ("H2O)
6.59	1.496	3.074
6.92	0.744	1.444
7.00	1.096	2.334
11.45	0.821	1.74
14.41	0.295	0.785
20.19	0.044	0.161
22.41	0.276	0.699

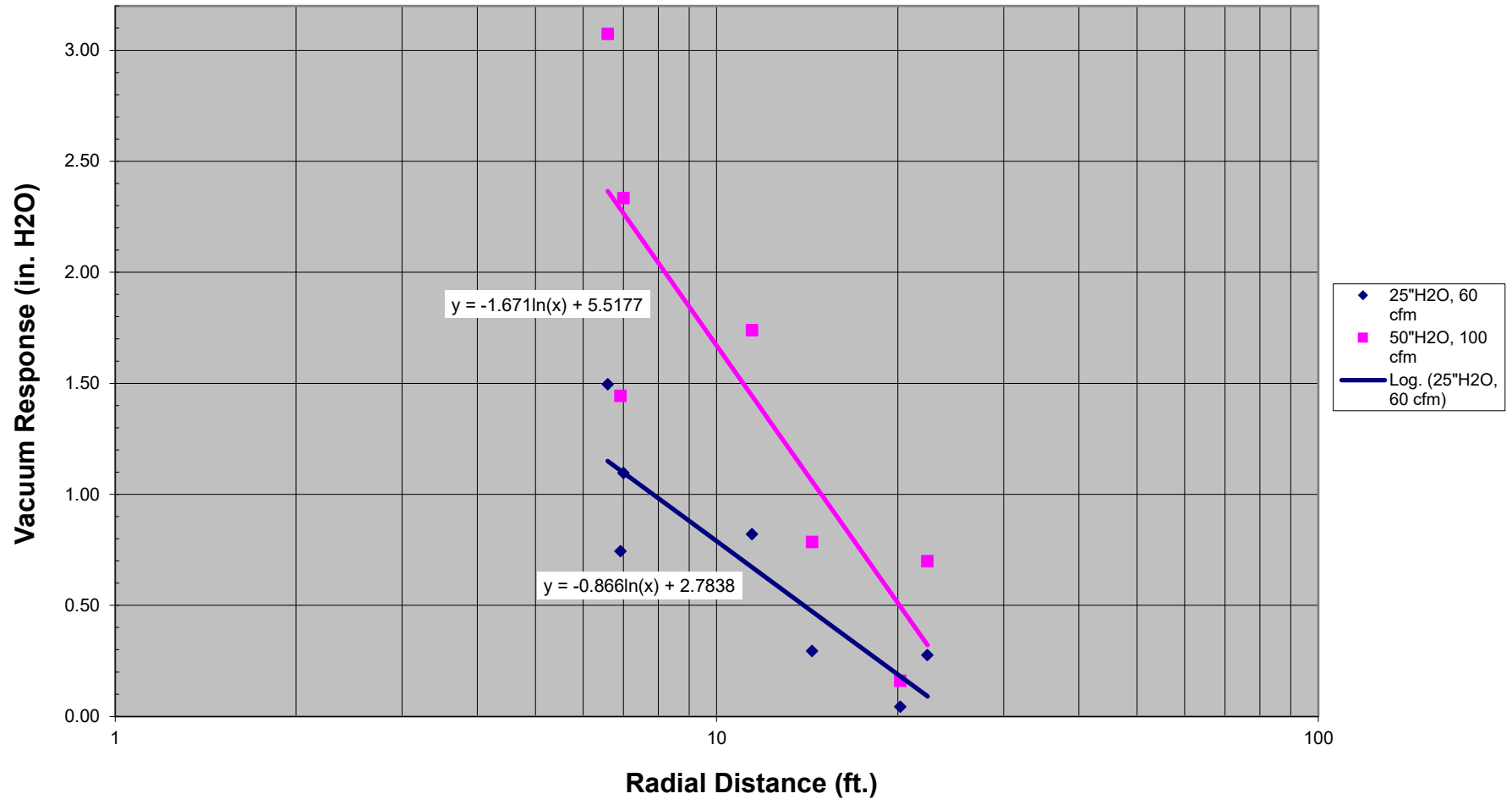
Est. ROI (ft.)	Vacuum ("H2O)	Flow (scfm)
22.2	25.0	50.0
25.6	60.0	100.0

Desired Flow Rate = 50 cfm
 @ 50 cfm, Applied Vacuum = 25"H2O
 @ 25"H2O Vacuum, ROI = 22 ft

Note: For SVE ROI is the radial distance where the vacuum response equals 0.10" H2O.



Effective Radius Of Influence EP-2D



Summary of Soil Vapor Extraction Pilot Test Data
35-45 35th Street
Astoria, New York

Performed By: Tenen Environmental
Extraction Well: EP-3S
Wellhead Vacuum ("H2O): 25 to 50
Vapor Discharge Flow (scfm): 60 to 100

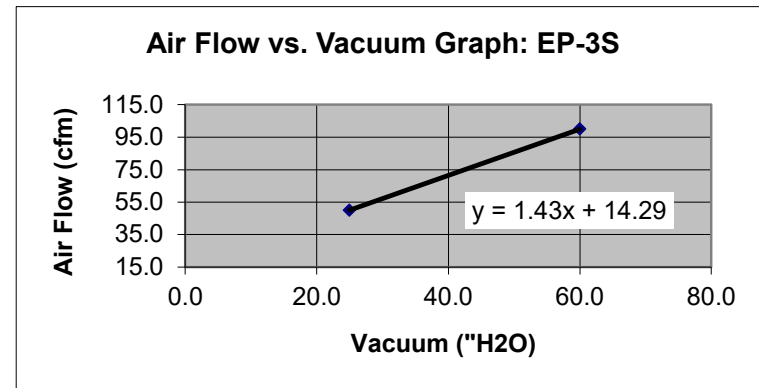
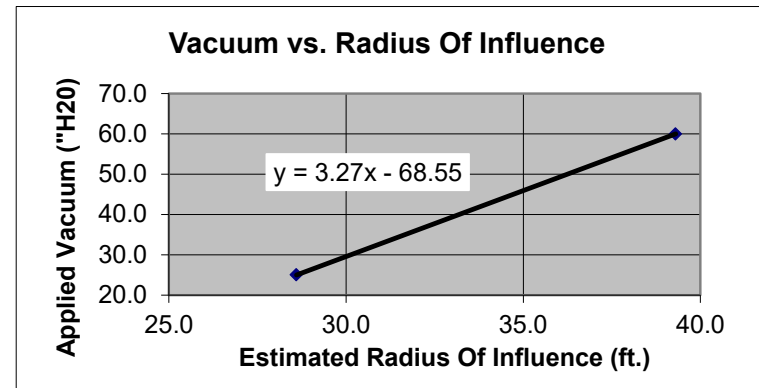
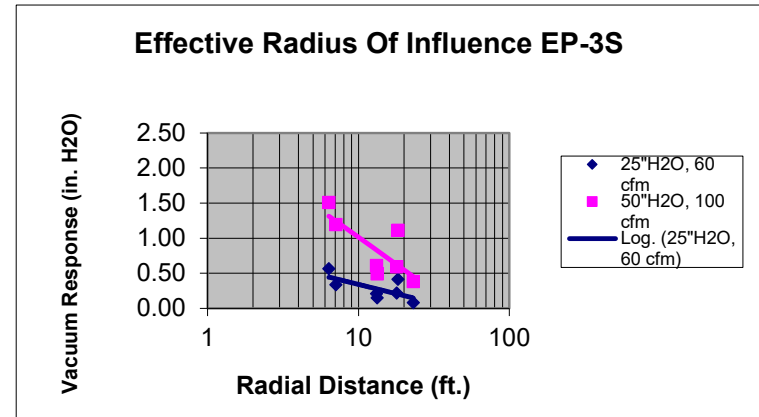
SVE Design Data

Radial Distance (ft.)	Vacuum Response 1 25" H2O Applied Vacuum, 60 scfm ("H2O)	Vacuum Response 2 50" H2O Applied Vacuum, 100 scfm ("H2O)
6.38	0.563	1.509
7.12	0.335	1.191
13.25	0.209	0.608
13.38	0.15	0.491
18.01	0.217	0.589
18.32	0.413	1.113
23.16	0.082	0.380

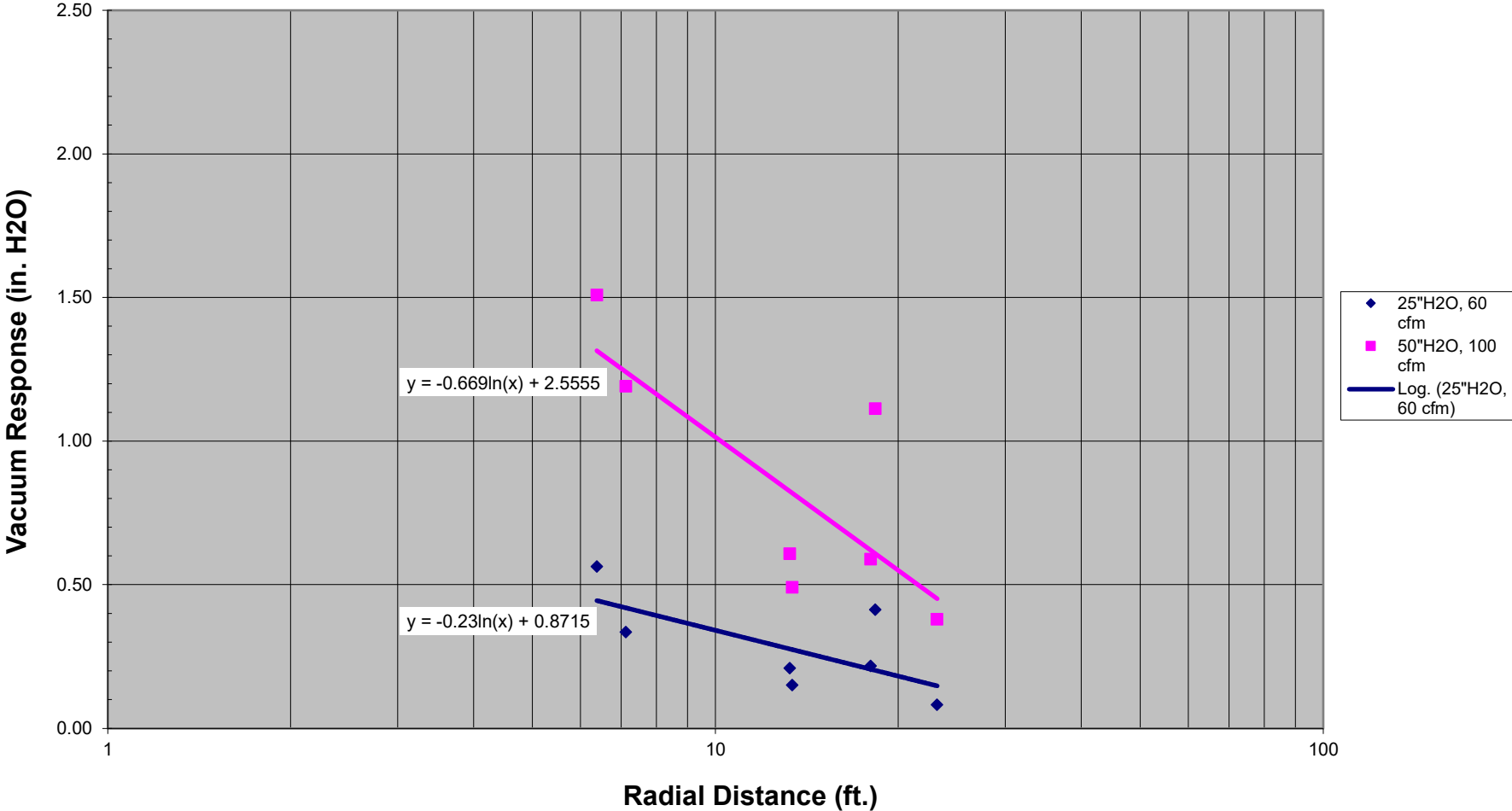
Est. ROI (ft.)	Vacuum ("H2O)	Flow (scfm)
28.6	25.0	50.0
39.3	60.0	100.0

Desired Radius of Influence = 25 ft
 @ ROI = 25 ft, Applied Vacuum = 13.2"H2O
 @ 13.2"H2O Vacuum, Flow Rate = 33 cfm

Note: For SVE ROI is the radial distance where the vacuum response equals 0.10" H2O.



Effective Radius Of Influence EP-3S



Summary of Soil Vapor Extraction Pilot Test Data
35-45 35th Street
Astoria, New York

Performed By: Tenen Environmental
Extraction Well: EP-3D
Wellhead Vacuum ("H2O): 50 to 70
Vapor Discharge Flow (scfm): 20 to 40

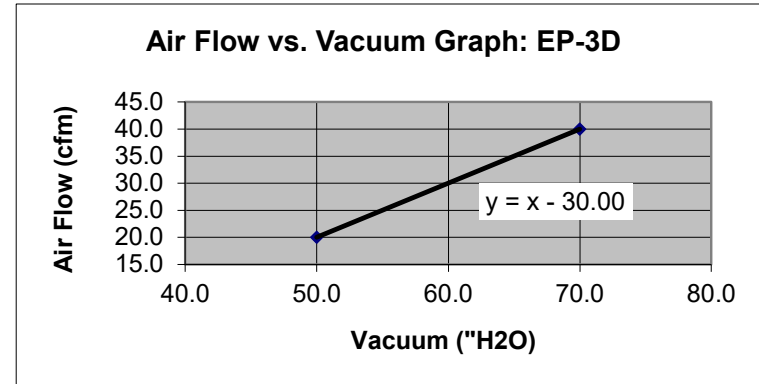
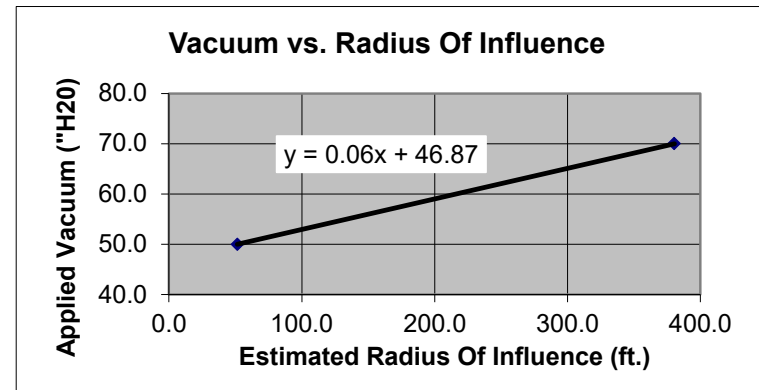
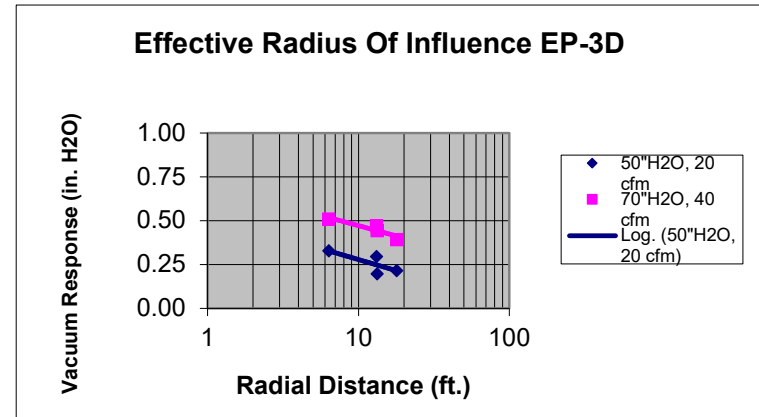
SVE Design Data

Radial Distance (ft.)	Vacuum Response 1 50" H2O Applied Vacuum, 20 scfm ("H2O)	Vacuum Response 2 70" H2O Applied Vacuum, 40 scfm ("H2O)
6.38	0.327	0.509
13.25	0.295	0.47
13.38	0.197	0.442
18.01	0.215	0.392

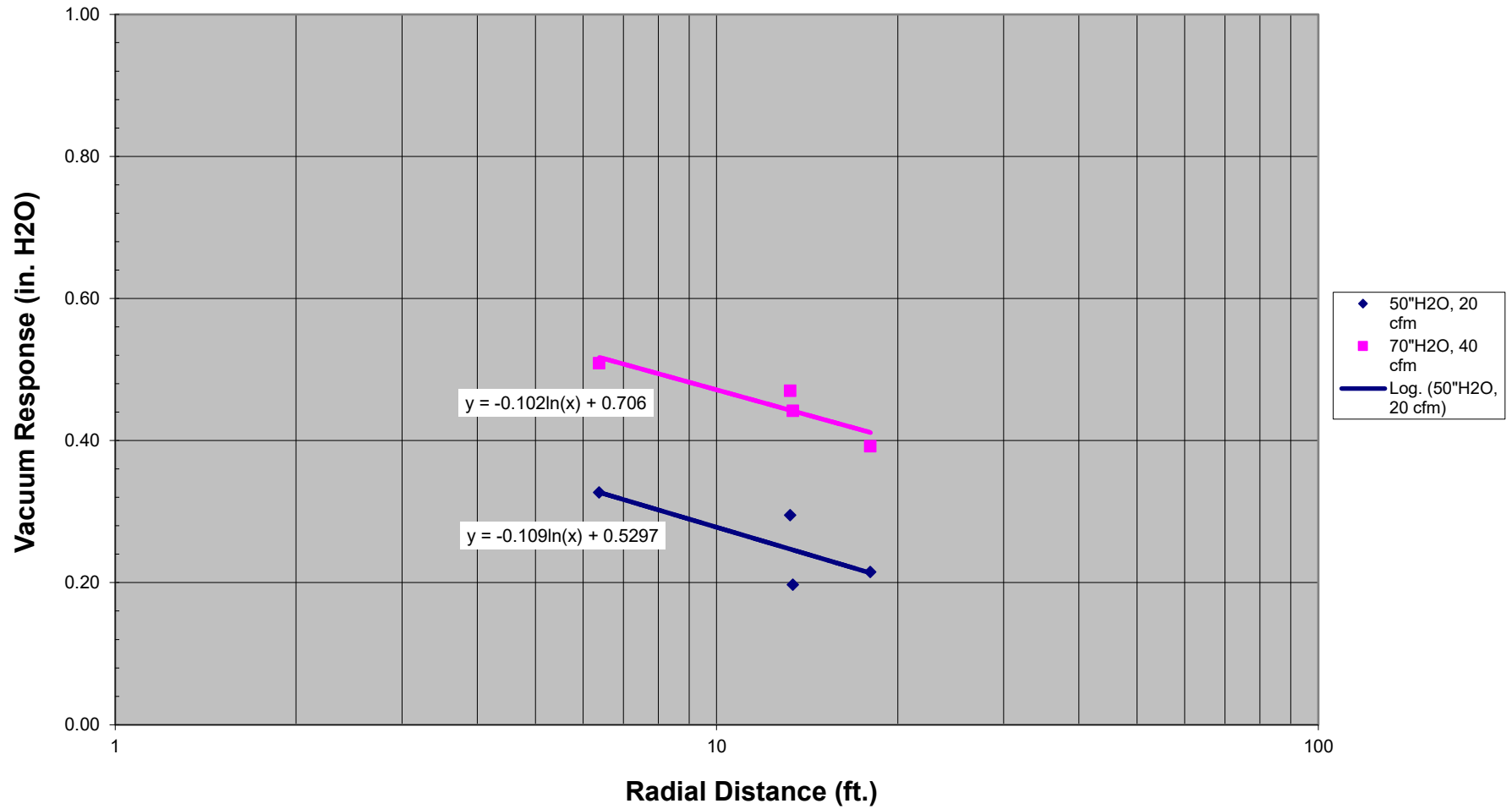
Est. ROI (ft.)	Vacuum ("H2O)	Flow (scfm)
51.5	50.0	20.0
380.4	70.0	40.0

Desired Radius of Influence = 15 ft
 @ ROI = 15 ft, Applied Vacuum = 48"H2O
 @ 48"H2O Vacuum, Flow Rate = 18 cfm

Note: For SVE ROI is the radial distance where the vacuum response equals 0.10" H2O.



Effective Radius Of Influence EP-3D

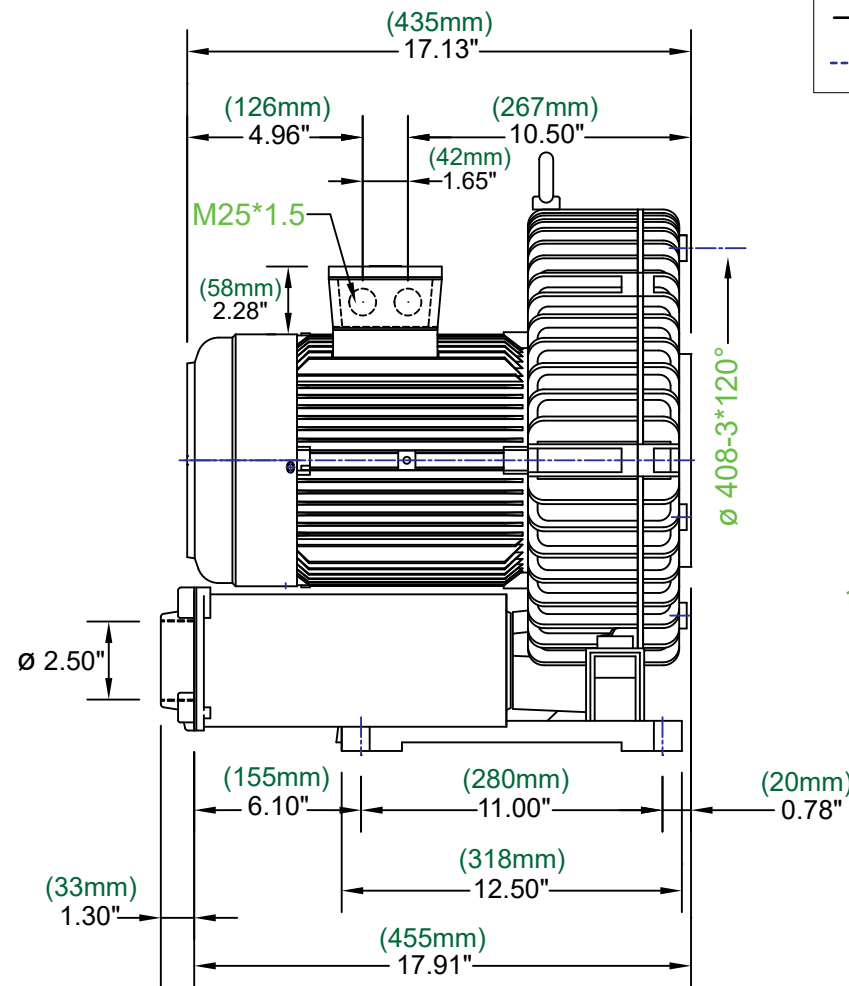
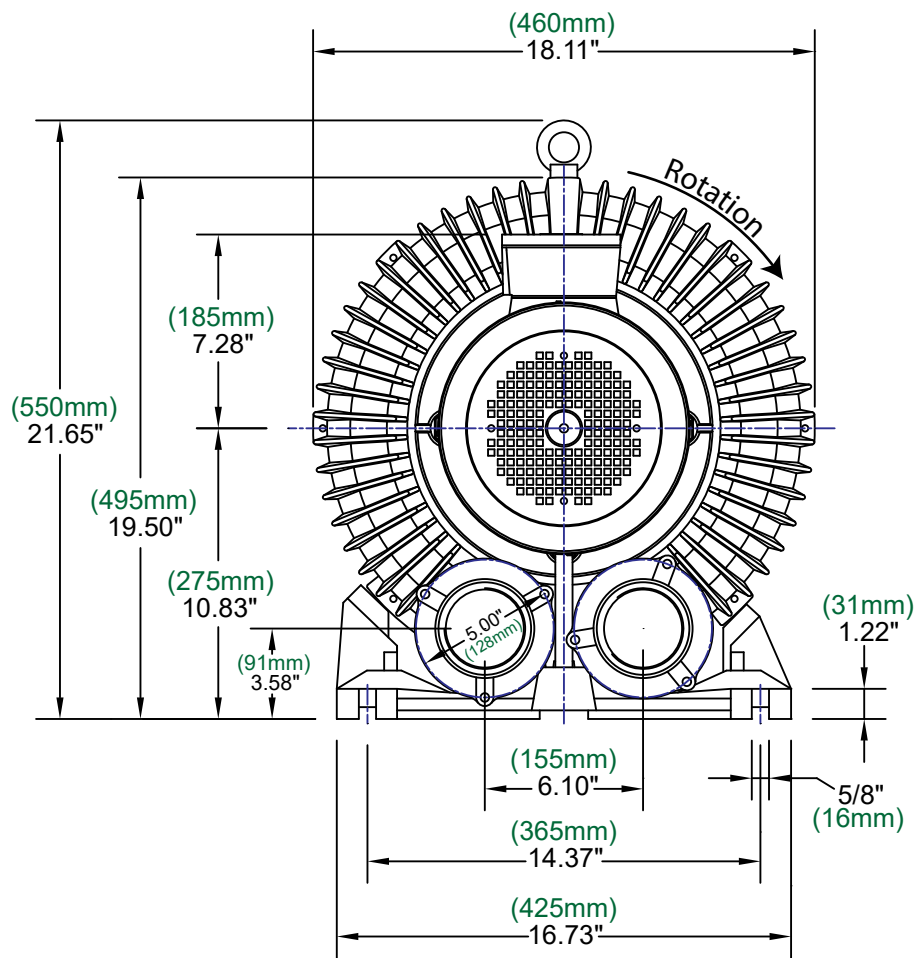




Phase	Model Number	Curve Number	Frequency (Hz)	KW	HP	Max Flow (SCFM)	Max Pressure ("H ₂ O)	Maximum Vacuum	Sound Level (db)	Inlet Diameter	Voltage	Current (A)	Weight (lbs)
3	AB-800	A20	60Hz	6.30	8.50	399	130	125	79	2.50"	220-275/380-480	29.5Δ/17.0Y	170
			50Hz	5.50	7.40	333	90	87	72		200-240/345-415	24.6Δ/14.2Y	

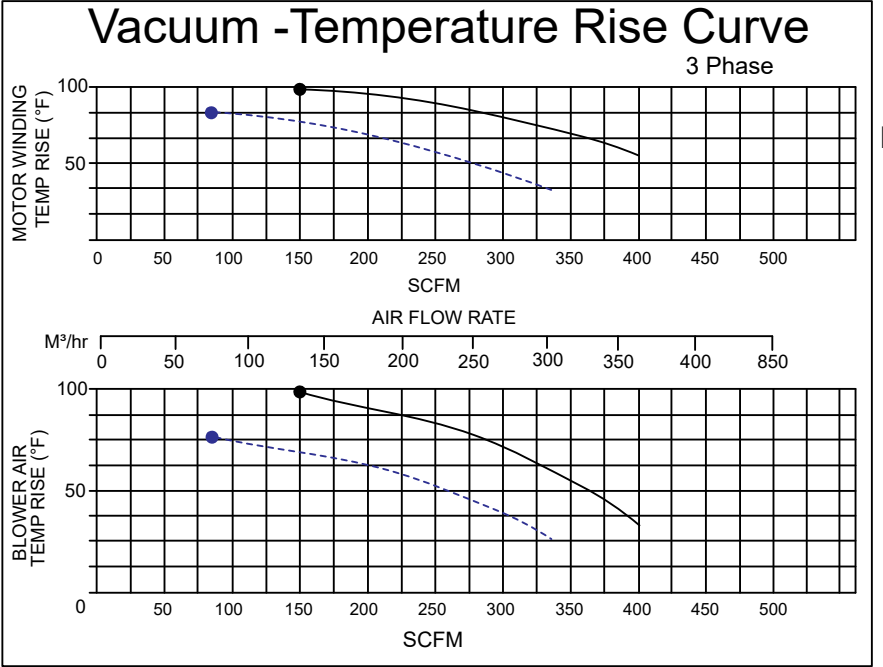
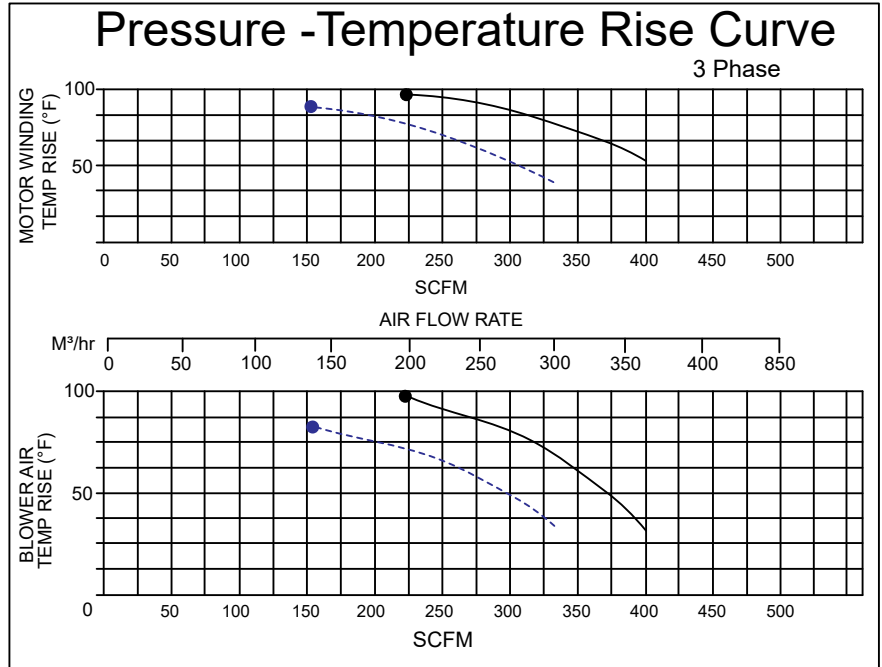
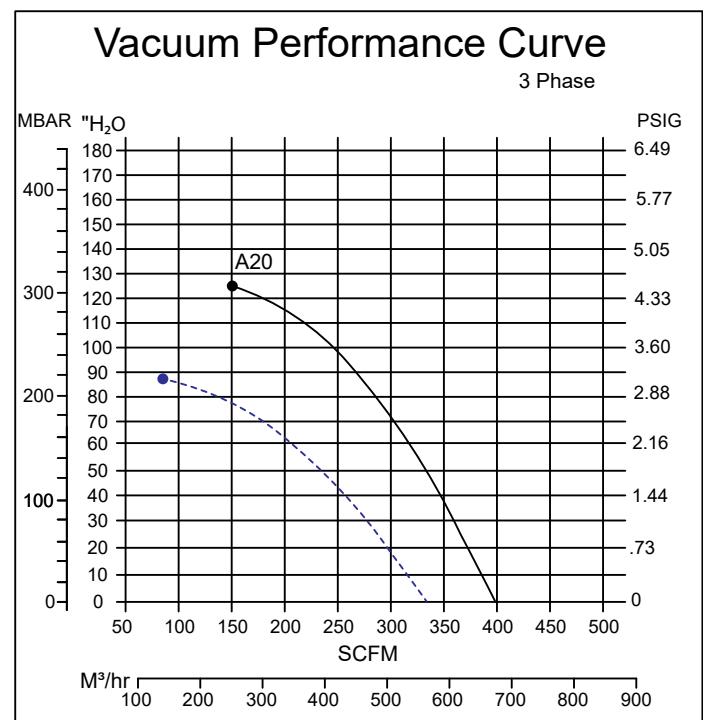
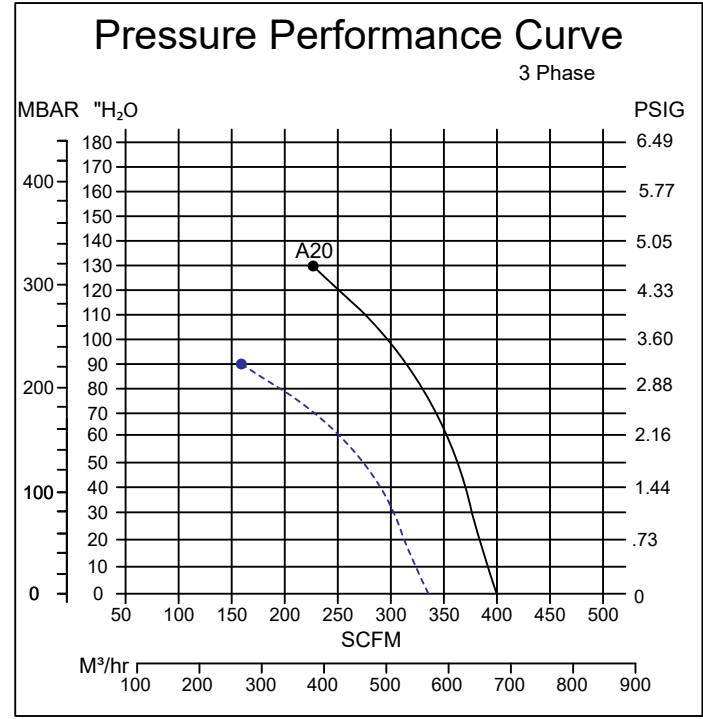
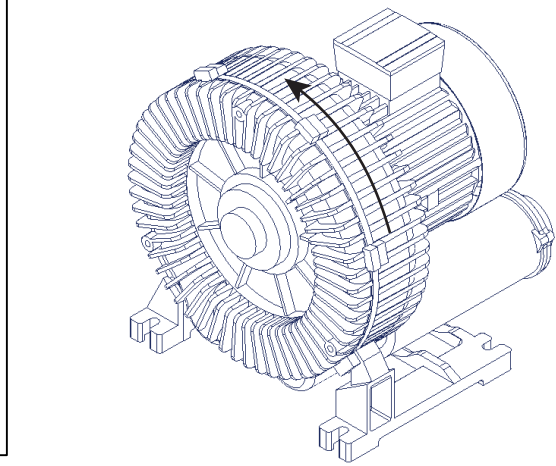
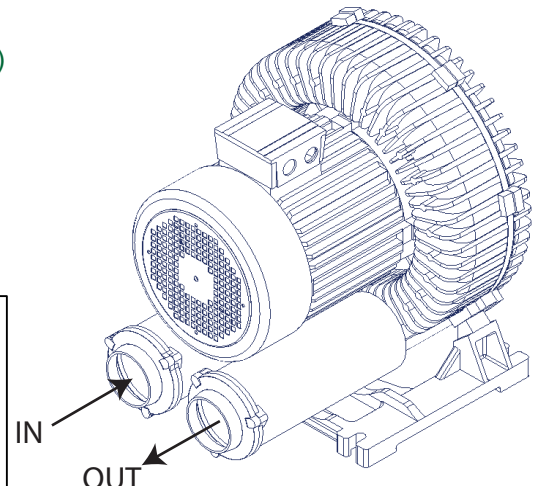
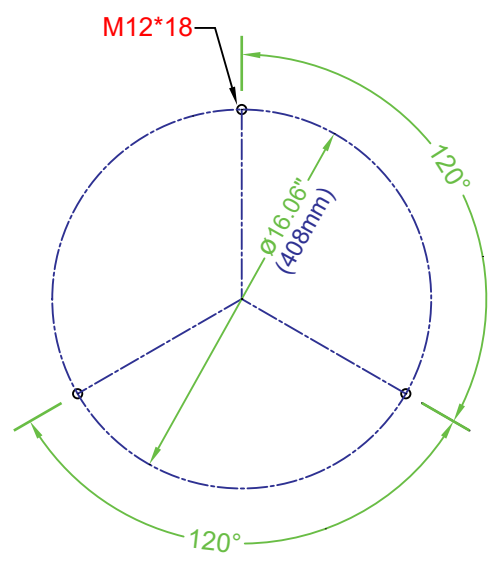
**Sound db measured at 3 ft.

MODEL NO. : AB-800 SINGLE STAGE



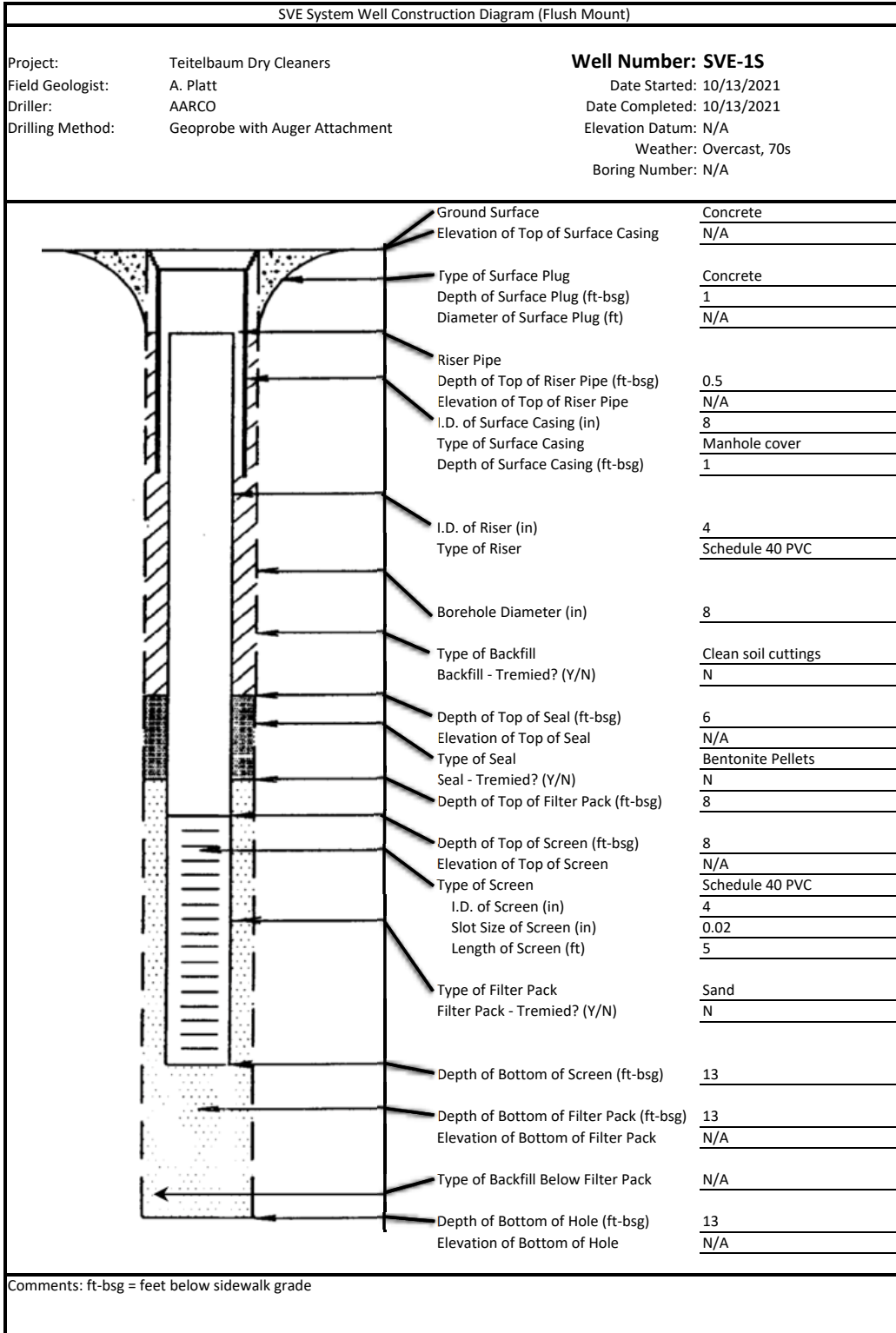
Key
 — 60Hz
 - - - 50Hz

Standard Conditions
 -Sea Level (14.69 PSI)
 -60°F (15°C)
 -0% Relative Humidity

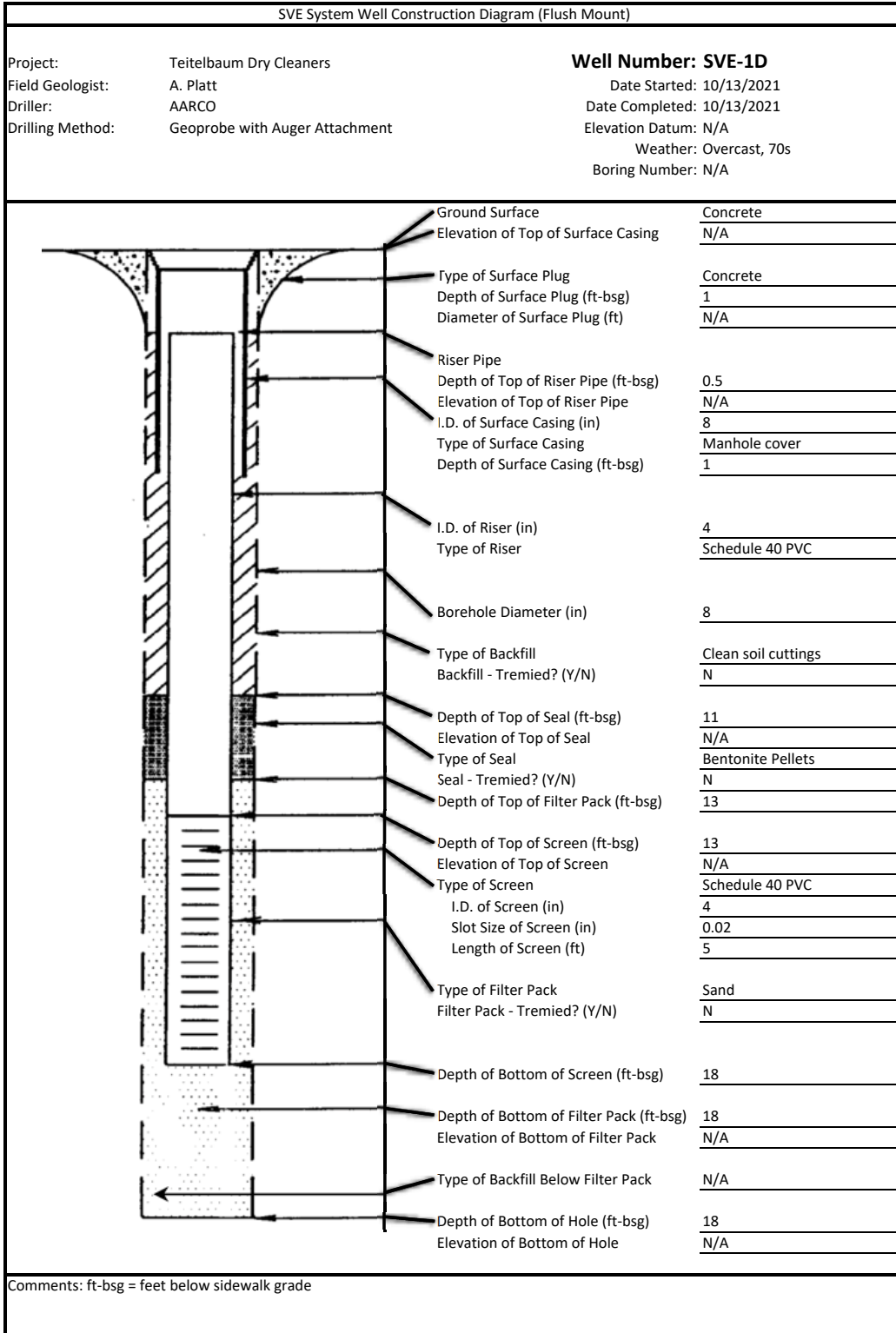


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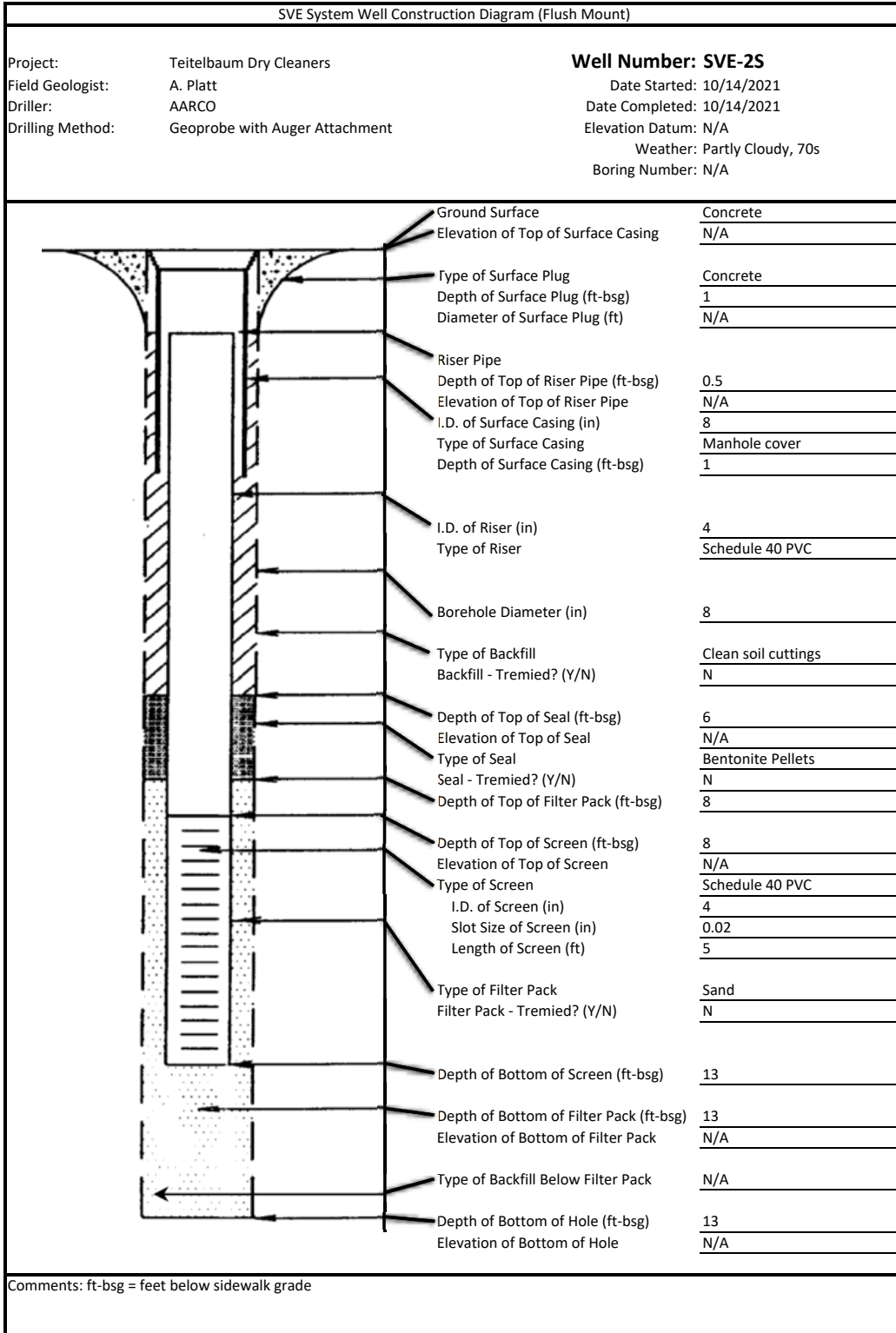
SOIL VAPOR EXTRACTION (SVE) SYSTEM WELL CONSTRUCTION DIAGRAM



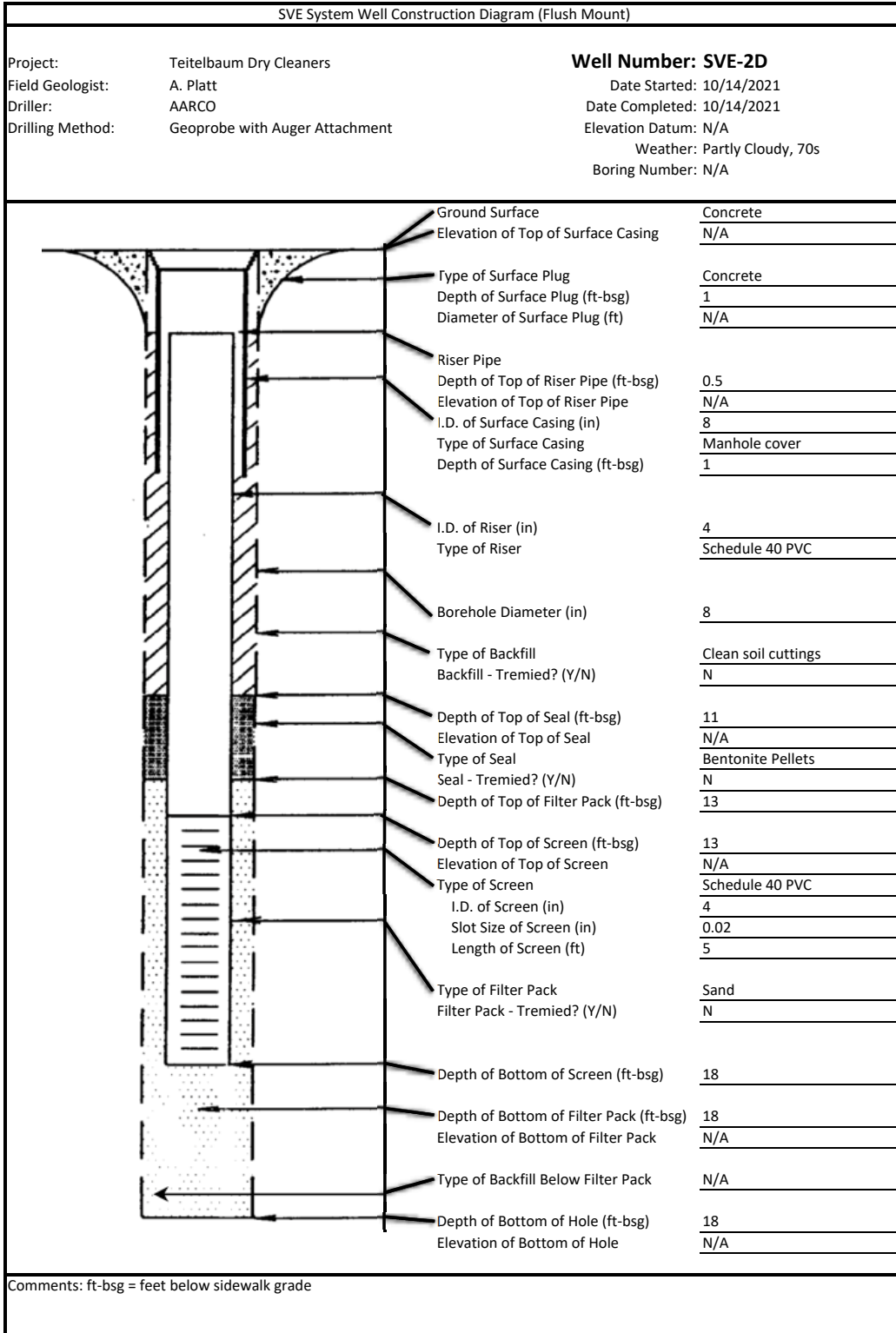
SOIL VAPOR EXTRACTION (SVE) SYSTEM WELL CONSTRUCTION DIAGRAM



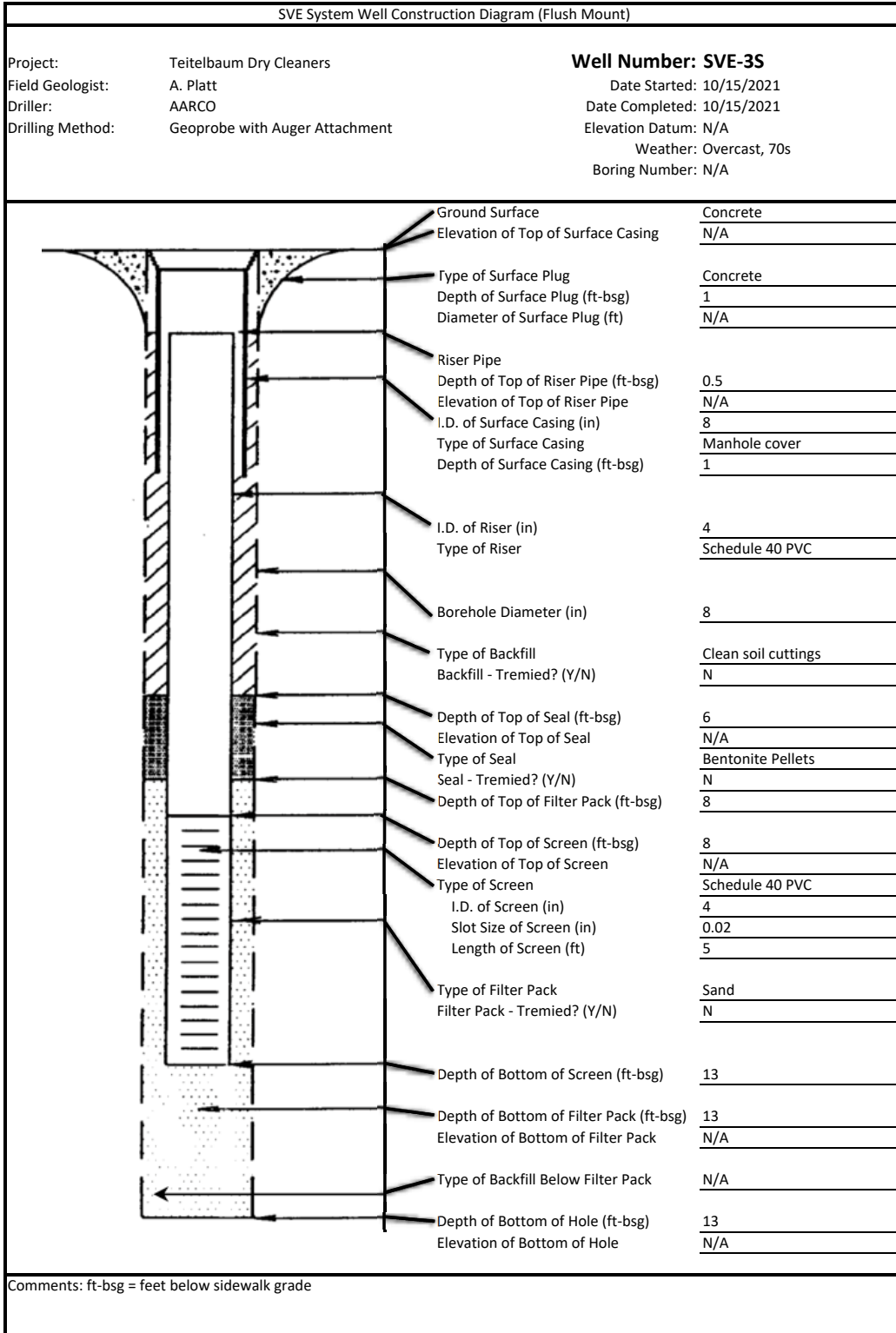
SOIL VAPOR EXTRACTION (SVE) SYSTEM WELL CONSTRUCTION DIAGRAM



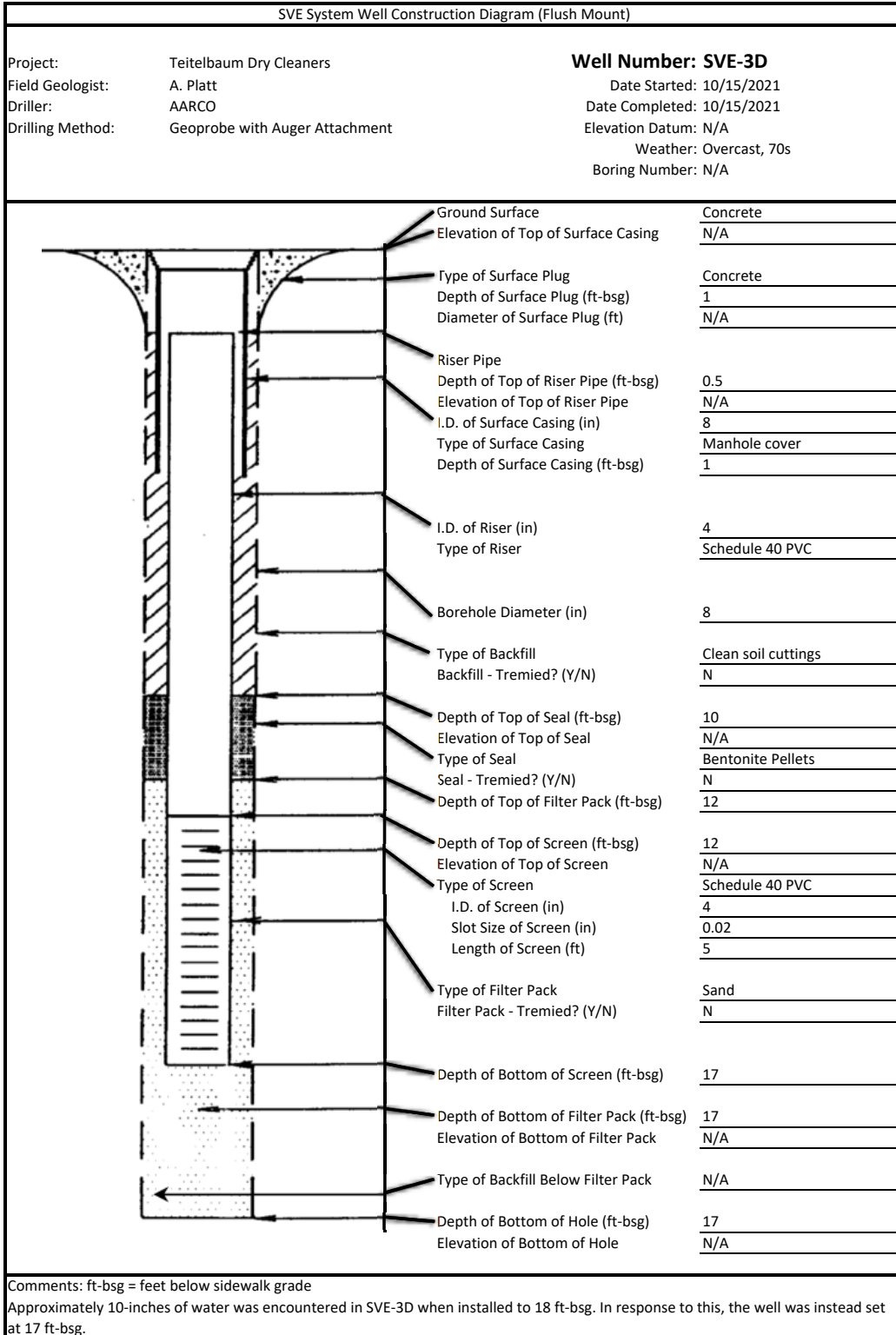
SOIL VAPOR EXTRACTION (SVE) SYSTEM WELL CONSTRUCTION DIAGRAM



SOIL VAPOR EXTRACTION (SVE) SYSTEM WELL CONSTRUCTION DIAGRAM



SOIL VAPOR EXTRACTION (SVE) SYSTEM WELL CONSTRUCTION DIAGRAM



Attachment 2: Structural Analysis



June 21, 2024

S&C Properties, LLC
2 Bay Club Drive, Apartment 10G
Bayside NY 11360
Att: Andrea Pampillonio

Re: 35-45 35th Street, Astoria, NY
Feasibility Study,
Soil Vapor Extraction System

Dear Andrea:

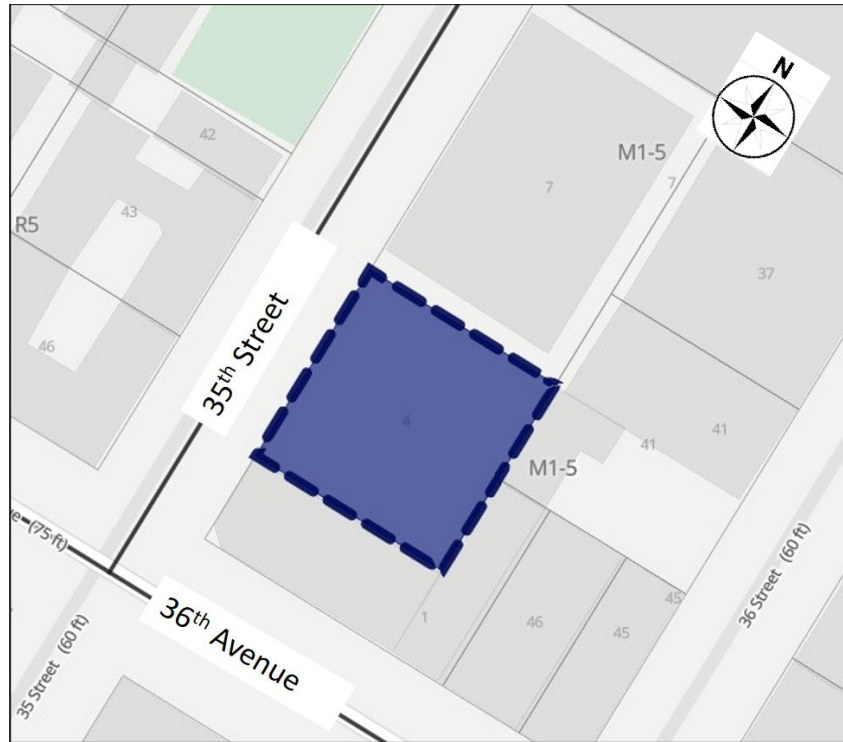
As requested, I visited the above-captioned property on June 4, 2024 where I met with Matthew Carroll from Tenen Environmental. The purpose of the visit was to investigate the feasibility of structural work related to the proposed installation of a soil vapor extraction system on the roof. This Report documents RAND's findings, conclusions and recommendations; a photo supplement is appended.

For the purpose of this Report, the facade of the building along 35th Street shall be referred to as the "west" facade, and other building elements shall be referenced accordingly.

35-45 35th Street is a one-story building with the exception of a 2-story office area forming the south-western portion of the building (photo 1). The building was constructed in 1964 and is being used as a laundry facility. The building is divided into a northern and southern portion each measuring approximately 50 x 100 ft for an overall footprint of 100 x 100 ft.

The roof structure of the northern portion cannot be observed from the interior due to a suspended ceiling. The roof structure of the southern portion (east of the office area) is exposed and consists of precast reinforced concrete planks supported on steel beams. No probes were opened or observed during the preparation of this study.

Observations were made below the roof structure of the southern portion of the building (east of the office area only), and on the roof (photo 2). The roof was accessed via a catwalk and a roof hatch.



Orientation of the building at 35-45 35th Street.

Findings:

- The roof framing geometry of the southern portion of the building is approximately as follows (photos 3 and 4):
 - Main girders in north-south direction; supported on brick walls.
 - Span 50'-0"
 - Spacing 23'-0"
 - Dimensions 30" deep and 10" wide
 - Secondary beams in east-west direction, supported on the main girders.
 - Span 23'-0"
 - Spacing 7'-0"
 - Dimensions 12" deep and 4" wide.
 - Precast concrete planks; supported on the secondary beams.
 - Dimensions 2" thick by 1'-4" wide
- The precast concrete planks appear to be supported on the steel beam simply by bearing without any clamps, anchors or welding. The steel beam-to-girder connections are bolted, unstiffened, seated connections with a seat angle connecting the bottom flange of the beams to the girder webs, and a second angle connecting the beam webs to the girder webs.
- The precast concrete planks appear to be reinforced with smooth 3/16-inch diameter top and bottom wire reinforcement (photo 5).

- The steel beams display deteriorated paint finish and minor surface corrosion throughout. No section loss due to corrosion was observed. No cracks or spalls in the concrete planks were observed.
- The material strengths of steel and concrete are unknown.
- According to information provided by Tenen, the system enclosure plan dimensions will be 52” by 124”, and the total weight of the equipment and enclosure will be approximately 1,000 lbs. Deviations from this information may change the conclusions of this study.
- RAND understands that any piping, ducts, or conduits servicing the system will not penetrate the roof structure, specifically no openings will be broken into the precast concrete planks.

Conclusions:

- Based on the observed existing structure and the preliminary information provided verbally by Tenen Environmental [Tenen], it appears that the placement of the soil vapor extraction system on the roof of the southern portion of the building (east of the office area) is structurally feasible.
- The existing structure including the concrete planks, steel beams, and their connections have sufficient capacity to support the system.

Recommendations:

The following measures are recommended to finalize the structural requirements for the proposed soil vapor extraction (SVE) system installation:

- It is recommended that the SVE system enclosure be placed in a north-south orientation i.e. with the longer side of the unit parallel to 35th Street and parallel to the main girders below.
- The SVE system enclosure should bifurcate the span between two of the secondary beams below to ensure load sharing between the two beams.
- It is recommended that roof protection boards be placed below the system enclosure rails to protect the waterproofing membrane.
- The existing roof structure should not be modified unless reviewed and approved by a licensed structural engineer; including new penetrations of the roof planks.

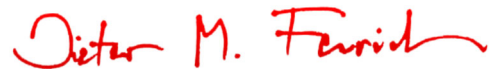
Limitations:

The contents of this Report are correct to the best of our knowledge and belief. This Report and the conclusions stated herein are, however, limited to actual knowledge based upon visual observation of the subject areas of the property, undertaken with due diligence. Physical testing was not within the scope of RAND's investigation.

Please contact us if you have any questions regarding this Report.

Thank you for the opportunity to be of service.

Sincerely,
RAND Engineering & Architecture, DPC



Dieter M. Feurich
Senior Structural Engineer

DF:jv

R240506.cor

**35-45 35th STREET
PHOTOGRAPHIC SUPPLEMENT TO
RAND JUNE 21, 2024 FEASIBILITY STUDY, SOIL VAPOR EXTRACTION SYSTEM**



Photo 1. 35th Street elevation view of 35-45 35th Street.



Photo 2. Roof of the southern portion of 35-45 35th Street; looking west.



Photo 3. View of the underside of the roof structure with main girder, secondary beam, and precast concrete planks.



Photo 4. Detail view of a precast concrete plank (2" thick and 16" wide).



Photo 5. Detail view of exposed wire reinforcement of precast concrete planks.

Attachment 3: SVE Blower



TECHNICAL CHARACTERISTICS

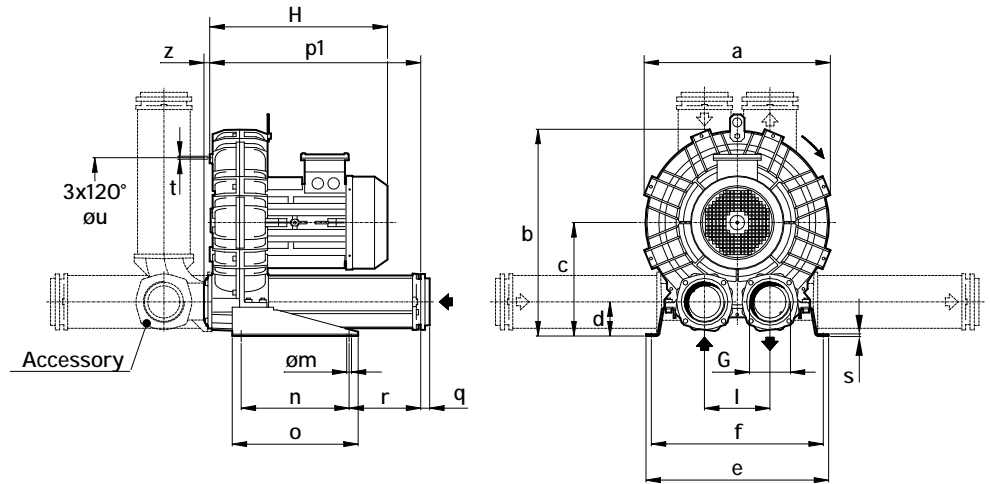
- Aluminium alloy construction
- Smooth operation
- High efficiency impeller
- Maintenance free
- Mountable in any position
- Recognized TEFC - cURus motor

OPTIONS

- Special voltages (IEC 38)
- Surface treatments

ACCESSORIES

- Inlet and/or inline filters
- Additional inlet/outlet silencers
- Safety valves
- Flow converting device
- Optional connectors



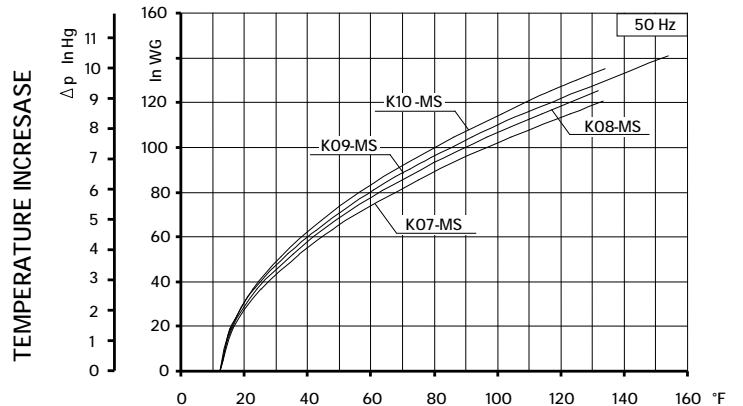
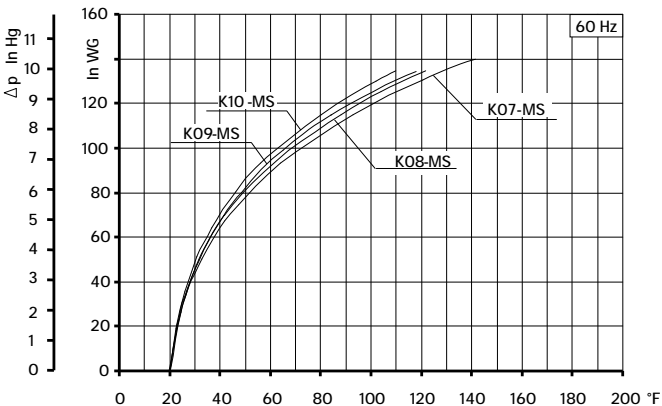
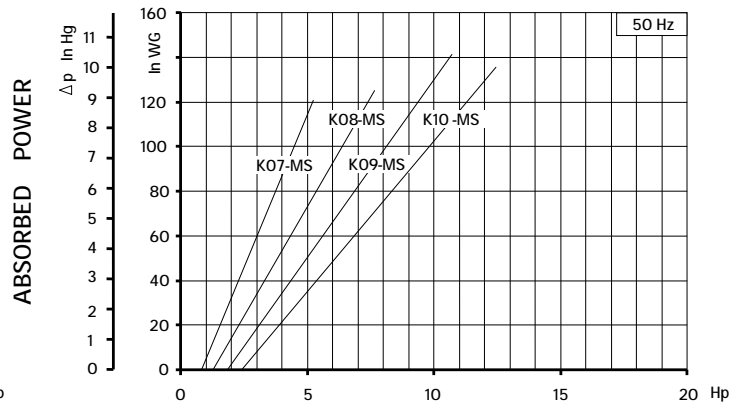
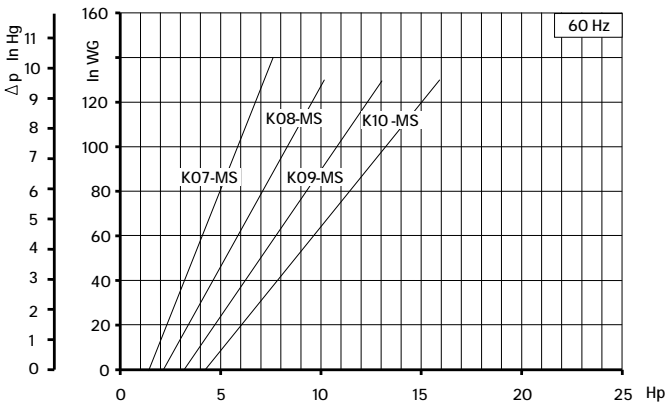
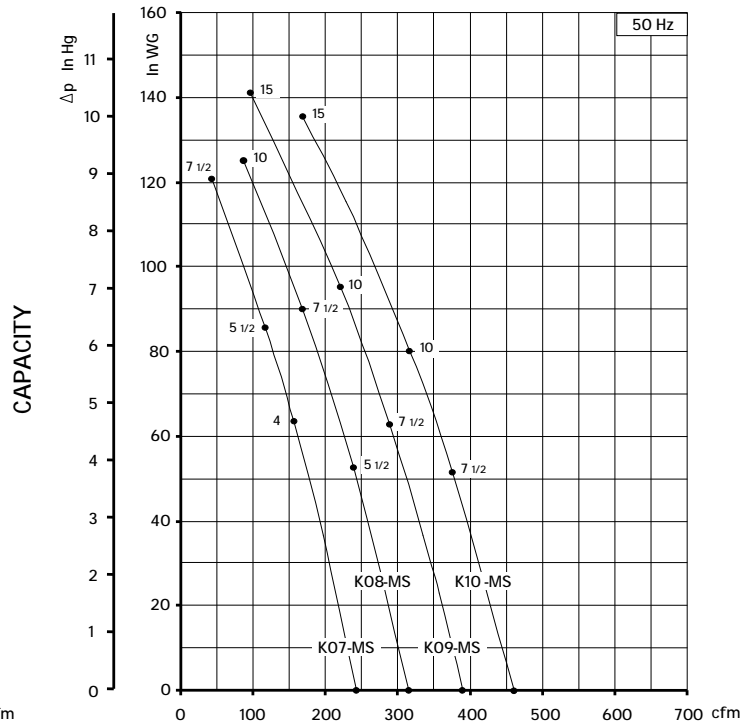
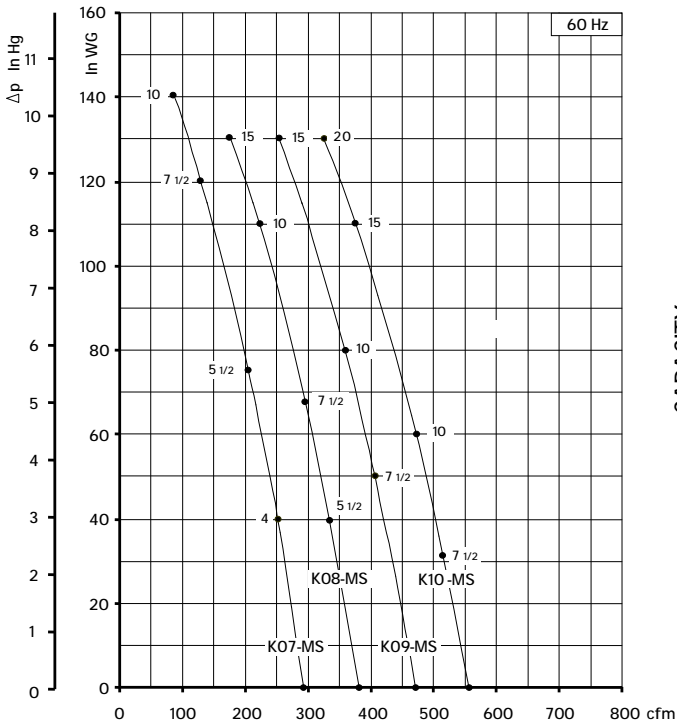
Dimensions in inches.
Dimension for reference only.

Model	a	b	c	d	e	f	G	l	m	n	o	p1	q	r	s	t	u	z
K07-MS	16.69	18.84	10.59	3.23	18.43	17.24	3" NPT	6.10	0.51	11.81	13.78	20.16	0.98	5.39	0.20	M8	11.61	0.63
K08-MS	17.99	19.61	10.59	3.23	18.82	17.64	3" NPT	6.10	0.51	11.81	13.78	20.16	0.98	5.39	0.20	M8	12.2	0.63
K09-MS	19.37	22.09	12.40	3.78	20.00	18.82	4" NPT	7.17	0.51	11.81	13.78	23.07	0.98	7.83	0.20	M8	14.17	0.63
K10-MS	20.31	22.56	12.40	3.78	20.00	18.82	4" NPT	7.17	0.51	11.81	13.78	23.07	0.98	7.83	0.20	M8	14.17	0.63

Model	Maximum flow cfm		Installed power Hp		Maximum differential pressure Δp (In Hg)		Noise level Lp dB (A) ⁽¹⁾		Overall dimensions H Inches	Weight Lbs
	60 Hz 3500 rpm	50 Hz 2900 rpm	60 Hz 3500 rpm	50 Hz 2900 rpm	60 Hz 3500 rpm	50 Hz 2900 rpm	60 Hz 3500 rpm	50 Hz 2900 rpm		
K07-MS	294	243	4	4	3.0	4.6	77.7	75.7	15.6	116.2
			5 ½	5 ½	5.6	6.3	78.0	76.0	16.3	119.0
			7 ½	7 ½	8.9	8.9	78.3	76.3	18.4	160.5
			10	-	10.3	-	78.6	-	19.1	172.6
K08-MS	381	316	5 ½	5 ½	3.0	3.8	78.8	76.8	16.3	124.8
			7 ½	7 ½	5.2	6.6	79.1	77.1	18.4	166.5
			10	10	8.1	9.2	79.4	77.4	19.1	179.0
			15	-	9.6	-	79.7	-	19.1	192.0
K09-MS	471	390	7 ½	7 ½	3.7	4.6	79.3	77.3	18.8	186.3
			10	10	5.9	7.0	79.6	77.6	19.5	245.0
			15	15	9.6	10.4	80.1	78.1	22.0	212.0
K10-MS	556	460	7 ½	7 ½	2.4	3.8	79.4	77.4	18.8	189.6
			10	10	4.4	5.9	79.7	77.7	19.5	202.0
			15	15	8.1	9.9	80.2	78.2	19.6	215.0
			20	-	9.6	-	80.5	-	22.0	248.0

(1) Noise measured at 1 m distance with inlet and outlet ports piped, in accordance to ISO 3744.

- For proper use, the blower should be equipped with inlet filter and safety valve; other accessories available on request.
- Ambient temperature from +5° to +104°F.
- Specifications subject to change without notice.



Curves refer to air at 68° F temperature, measured at inlet port and 29.92 In Hg atmospheric backpressure (abs).
 Values for flow, power consumption and temperature rise: +/-10% tolerance.
 Data subject to change without notice.