Sub-Slab Depressurization System Design Report

136 Fuller Road Site
Brownfield Cleanup Program
NYSDEC Site No. C401055

City of Albany and Town of Guilderland
Albany County, New York

February 2011

Chazen Project No. 90618.00

THE Chazen COMPANIES

Engineers
Environmental Professionals
Land Surveyors
Landscape Architects
Planners

Prepared for:

Fuller Partners, LLC
PO Box 370
133 Route 395
East Chatham, NY 12060

New York State Department of Environmental Conservation – Region 4
1130 N. Westcott Road
Schenectady, New York

Prepared by:

Capital District Office:
The Chazen Companies
547 River Street
Troy, New York 12180

I certify that I am currently a NYS registered professional engineer and that this Remedial Design was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER10) and that all activities were performed in full accordance with the DER-approved work plan.

NYSPE: Mr. Dan Stone, PE

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1.0 INTRODUCTION

1.1 Introduction

A sub-slab depressurization system (SSDS) has been required by the New York State Departments of Environmental Conservation (NYSDEC) and Health (NYSDOH) to mitigate the potential for vapor intrusion at the former Fuller Brush facility located at 136 Fuller Road in the City of Albany (Figure 1). This site is currently part of the State's Brownfield Cleanup Program (BCP Site No. C401055). The SSDS is an approved Interim Remedial Measure (IRM) presented in the June 2010 Remedial Investigation Work Plan and approved by NYSDEC on June 18, 2010. An area of impacted soil and groundwater is documented on this site and extends beneath part of the main site building (Figure 2). The contaminants of concern at the site primarily consist of volatile organic compounds (VOCs). The system is being installed to be consistent with the NYSDOH 2006 Soil Vapor Intrusion Guidance Document to monitor and mitigate vapors at the site.

The Department-approved IRM Work Plan included installation of eight vapor extraction wells (VEWs) for pilot testing. Corporate Environmental Advisors (CEA) installed the VEWs between June 28 and 30, 2010. The Chazen Companies (Chazen) performed pilot testing on the VEWs to gather data for the system design. This report outlines the pilot test methods, results, analysis, and concludes in a recommended SSDS design. Once approved by the Department, the SSDS will be installed and a Construction Completion Report will be prepared after the system start-up occurs

1.2 Existing Site Use

The site is a 15.72-acre property located at 136 Fuller Road in the City of Albany and Town of Guilderland, Albany County, New York. The site is currently developed with a 266,000-square foot commercial/industrial, single-story building which is predominately occupied by UltrePet LLC, recyclers of polyethylene (PET) plastic bottles and manufacturer of PET plastic resins. Equal Vision Records, a T-shirt silk screening printer is a tenant occupying space in the eastern end of the building. The remaining portion of the site building is vacant warehouse space. Crown Castle International currently leases a 0.06-acre portion of the northeastern site area for the location and operation of cellular telecommunications tower, antenna and associated equipment (Crown Castle Site # 806676). However, Crown Castle is not a tenant of the building where the impacted area has been identified.

1.3 Past Site Investigations and Regulatory Involvement

A 2007 initial remedial investigation was conducted before the site was accepted into the NYSDEC's Brownfield Cleanup Program (BCP) in April 2009. The 2007 draft remedial investigation report concluded that VOCs, primarily the chlorinated solvent tetrachloroethylene

(PCE) and associated degradation products, are present in site soil, groundwater and sub-slab vapors at concentrations greater than the regulatory cleanup standards. The source area was identified as the former tank farm and the footprint of impacted groundwater was identified beneath a section of the building. Additional remedial investigation sampling performed in 2010 after the site was formally within the BCP, confirmed the 2007 investigation findings and added significant resolution regarding the distribution of VOC impacts beneath the site.

2.0 INTRODUCTION

The work described herein conforms to generally accepted pilot test and construction protocols published within NYSDOH's Soil Vapor Intrusion (SVI) guidance policy.

2.1 Test Well Construction

Between June 28 and 30, 2010, the project team installed eight VEWs at Department-approved locations in the building for SSDS pilot testing. The VEW locations are depicted in Figure 2. Figure 3 depicts a typical SSDS VEW construction detail. Each VEW was constructed using an approximately 12-inch long, 20 slot (0.02 inch), 4–inch diameter, Schedule 40, PVC pipe.

To install each VEW screen, the concrete slab was cut and removed using a combination of common hand tools, a diamond grinder, and percussion jack-hammer. Once the concrete was removed, an excavation approximately 24 inches deep by 18 inches wide was advanced by hand. The 12-inch long and 4-inch diameter screen was installed vertically, and reduced to two-inch diameter PVC piping below grade. The VEW pipe was extended vertically alongside the nearest roof support column and temporarily terminated and capped at about six feet above the floor grade until pilot testing was complete.

Soils beneath the slab at all eight locations consisted of native brown silt and silty sand. No sub-slab gravel base was identified. The remaining excavation around each VEW was backfilled with coarse gravel and the six-inch thick concrete floor was replaced using high strength concrete. This work occurred approximately one month prior to the pilot testing.

2.2 Pilot Test

The goal of the pilot testing program was to determine the radius of influence (ROI) of each VEW under specific vacuum and air-flow regimes. This ROI testing became the basis for extrapolating the final number of VEWs necessary to cover the footprint of impacted groundwater. The pilot test results were used to select appropriately-sized manifolded blower units for the SSDS.

On July 27 and 28, 2010, each VEW was tested for approximately one hour. The project team performed each VEW test individually by using a combination air-compressor and Vaccon Air-flow ST Series silencer to apply a vacuum on each VEW. Air flows generated during testing were directed to exterior discharge locations since permanent discharge lines would not be installed until after the design is approved by NYSDEC and NYSDOH.

A network of 33 temporary sub-slab monitoring points (MPs) was installed during the two-day pilot test in locations shown on Figure 2. The MPs along with the VEWs were used to record sub-slab pressure responses during the pilot tests. MPs were installed according to guidelines

recommended in the Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH, October, 2006) and referenced appendices, including Radon Mitigation Standards (USEPA 402-R-93-078, revised April 1994). The monitoring points were installed through and penetrated sufficiently below the building slab. A hammer drill was used to create a 3/4-inch diameter hole through the existing slab that extended six inches into soil beneath the slab. A section of 3/8-inch diameter polyethylene tubing was installed to within one inch of the bottom of the drilled hole. A temporary clay seal was placed between the tubing and the borehole sidewall to ensure that no air leaks could occur between the building interior and the sub-slab sample port during collection of pressure readings.

Sub-slab materials were examined at each location to identify sub-slab construction and material details. No gravel sub-base was identified, and the building slab appears to have been constructed on top of native fine sandy soil.

Tables 1 through 8 summarize the pilot test data generated for each VEW during the pilot test. Before the start of each VEW test, air pressure measurements were recorded at MPs to confirm that static air pressures beneath the building slab were within normal ranges. The static pressures recorded at individual MPs were typically positive indicating a slightly positive pressure environment exists below the building slab. This may be related to the industrial design of the building and the many large utility doors that are frequently opened/closed as part of ongoing operations.

After pre-test conditions were recorded, the field crew applied a continuous vacuum that consistently generated a vacuum intensity in the range of 35 inches of water column (inWC) resulting in an airflow rate of 10 cubic feet per minute (CFM). Vacuum measurements were recorded at each MP location during this testing phase of the project. Pressure responses in each location were measured using a digital manometer sensitive to 0.001 inWC, and readings were manually recorded on field data sheets. Airflows were measured and recorded using an inline air gauge. Changes in sub-slab pressure that showed a vacuum change greater than 0.004 inWC from the static reading were considered the direct result of the pilot test vacuum source.

The distance between each VEW and associated MPs were recorded to document where vacuum responses in MPs dropped off below the minimum vacuum goal of 0.004 inWC. These data were use to generate maps depicting the approximate capture area of each VEW. The typical ROI for VEWs was found to range between 75 and 135 feet in varying directions; however, VE-7 registered a ROI greater than 200 feet. Figures 4 through 11 show the individual ROIs created during the pilot tests. Figure 2 shows the combined vacuum capture area imposed by the simultaneous operation of VEWs 3, 4, 5, 7 and 8. VEWs 1 and 2 were determined to have ROIs that were overlapping VE-3 and VE-4, and thus were considered redundant and unnecessary as part of the SSDS. VE-6 was also determined to be a redundant extraction point, and is not included in the SSDS design.

Chazen abandoned all MP holes once the pilot testing activities were completed. The tubing was removed, resulting sub-slab voids were backfilled with residual base material, and the concrete slab floor was patched using high strength concrete to emulate pre-test floor slab conditions. All VEWs were capped with vapor tight expanding plugs pending future use in the SSDS.

On the basis of the distribution of sub-slab vacuum responses recorded in MPs installed throughout the building, VEWs responded favorably to a vacuum setting of 35 inWC that resulted in an approximate 10 CFM of airflow.

3.0 DEVELOPMENT OF THE SSDS PROGRAM

The project team designed the SSDS system for the facility based on the results of the pilot testing program.

3.1 Recommended VEW Locations

Locations for the proposed operational VEW network are shown on Figure 2. The results of the pilot tests indicate VEWs 1, 2 and 6 provided redundant and overlapping capture zones and were therefore excluded from the recommended design. The combined vacuum capture region shown in Figure 2 was created by merging ROI results from individual VEW pilot tests. This figure shows that depressurization was achieved under a significant portion of the building and the majority of the area of impacted groundwater.

A sixth system VEW (VE-9) is recommended in the south side of the building to expand the SSDS capture zone to an area not affected during pilot testing.

3.2 Sub-Slab Depressurization System Construction and Startup

Based on the test data and site geometry, it was determined that the system could be logically divided into three SSDS zones. This configuration allows for the use of smaller, lower-cost 1.5-horsepower (HP) regenerative blowers rather than one or two larger blowers. The use of smaller blowers reduces energy consumption, and in the event of blower mechanical defect or failure, the component replacement costs would be less.

- Zone 1 includes VE-3 and VE-5 within the UltrePET occupied area.
- Zone 2 includes VE-4 and VE-9, within the UltrePET occupied area.
- Zone 3 includes VE-7 and VE-8, within the vacant space and Equal Vision tenant spaces.

Each zone will be equipped with an Ametek Rotron 1.5-Horsepower (HP), 460 volt, 3 phase regenerative blower (Model DR454R72M, Part 080480, 60 Hertz) capable of producing approximately 70 CFM airflow at 35 inWC (see Appendix A for blower performance curve on product cut sheet). Each blower provides some limited excess vacuum/airflow extraction capacity for each configured zone to insure each VEW receives the specified 35 IWC/10CFM relationship. Two-inch diameter Schedule 40 PVC piping was installed between each VEW and the corresponding blower unit. An inline sample port will be installed at a working height of approximately five feet above each SSDS well head, allowing for future collection of pressure readings. The piping will extend from each VEW vertically to the ceiling and then follow ceiling framing to the blower. Transfer piping will be clamped to the ceiling framing every 10 feet, at a minimum. Four-inch diameter PVC piping will be used in “manifold” locations where two

individual VEW pipes converge. The four-inch diameter manifold provides a slightly lower pressure zone within the system to equalize airflow distribution amongst both VEWs.

Three extraction pipes (two VEWs per pipe) will exit the building and be connected to their respective blowers that will be mounted on top of an overhang roof (Figures 12 and 13). Two-inch diameter vent piping connected to each blower exhaust will extend to above the main roofline elevation, allowing the sub-slab soil vapors to vent to the atmosphere. A remote blower control panel will be mounted at an accessible height. Each of the three zones will contain a system run light on the remote start/stop control switch. Separate fault lighting for each zone will be illuminated on a full-time basis unless the system becomes inoperable due to equipment malfunctions and/or power outages.

3.3 Sub-Slab Depressurization System Operations and Maintenance

See previous sections for description of SSDS.

Should the building experience power outage, the blower motors will shut down. Once power is restored to the building, the blowers must be manually restarted at the remote control panel. The system should be checked for proper operation whenever there is an indication that electrical service to the blowers is interrupted.

During operation, the SSDS should be inspected on a monthly basis. Each blower should be checked for visual and audible conditions to confirm that it appears to be operating normally. Operating temperatures should be checked at each blower unit. Blowers should be warm to the touch, but not hot, and all blowers should be operating at the same approximate temperature. The piping entering each blower unit should be cool to the touch, and piping leaving the blower should be warm, but not hot.

During inspections, the qualified technician should begin by listening to each blower for strange noises. Under normal operation, the blowers should emit a mild hum. Noises that might indicate mechanical problems include, but are not limited to rattles, squeals, whines and vibrations. The technician should visually inspect all visible and accessible piping runs, noting any separations, kinks, cracks or any other visible damage or evidence of air leaks.

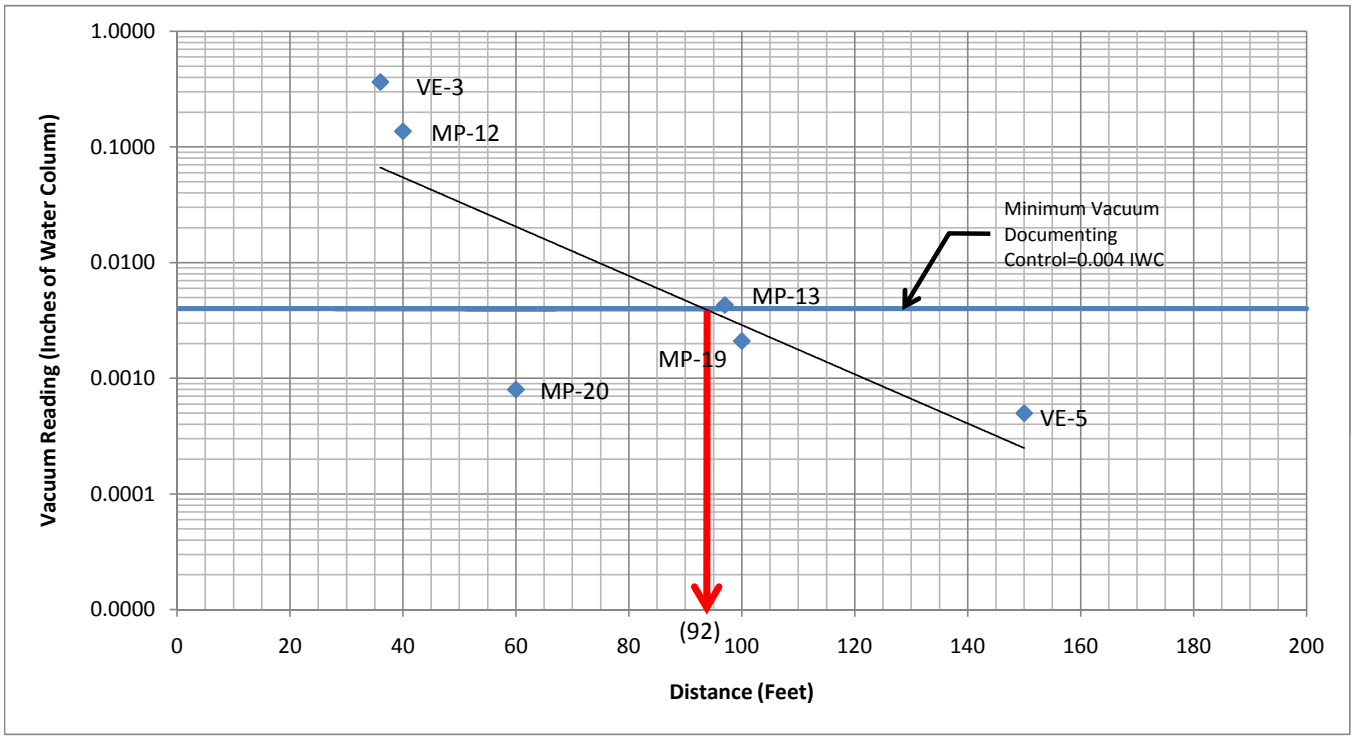
Once the SSDS becomes operational, vacuum readings will be collected from the six VEW sample ports. Vacuum readings will be gauged using a manometer to confirm that 35 inWC is maintained at each VEW. If the vacuum is insufficient at any VEW, Chazen will assess the possible causes (e.g., new or expanding floor cracks, blower performance failures, piping blockages or breaks, etc) and work with the site's management team to promptly correct the pressure deficiency.

Tables

Table 1: VE-1 Radius of Influence Test

Date of Test: 27-Jul-10
Test Well ID: VE-1

Measurement Point	Distance to VEW	Pre-Test Pressure Measurements	Vacuum applied: 35-inches W.C and approx. 10 CFM	Change in Pressure Resulting from Vacuum Pilot Testing
	Feet	Inches W.C.	Inches W.C.	Inches W.C.
VE-2	78	0.0010	0.0045	+
VE-3	36	0.0013	-0.3622	-0.3635
VE-5	150	0.0077	0.0072	-0.0005
MP-12	40	0.0028	-0.1335	-0.1363
MP-13	97	0.0063	0.0020	-0.0043
MP-14	125	0.0090	0.0175	+
MP-18	50	0.0067	0.0075	+
MP-19	100	0.0091	0.0070	-0.0021
MP-20	60	0.0324	0.0316	-0.0008

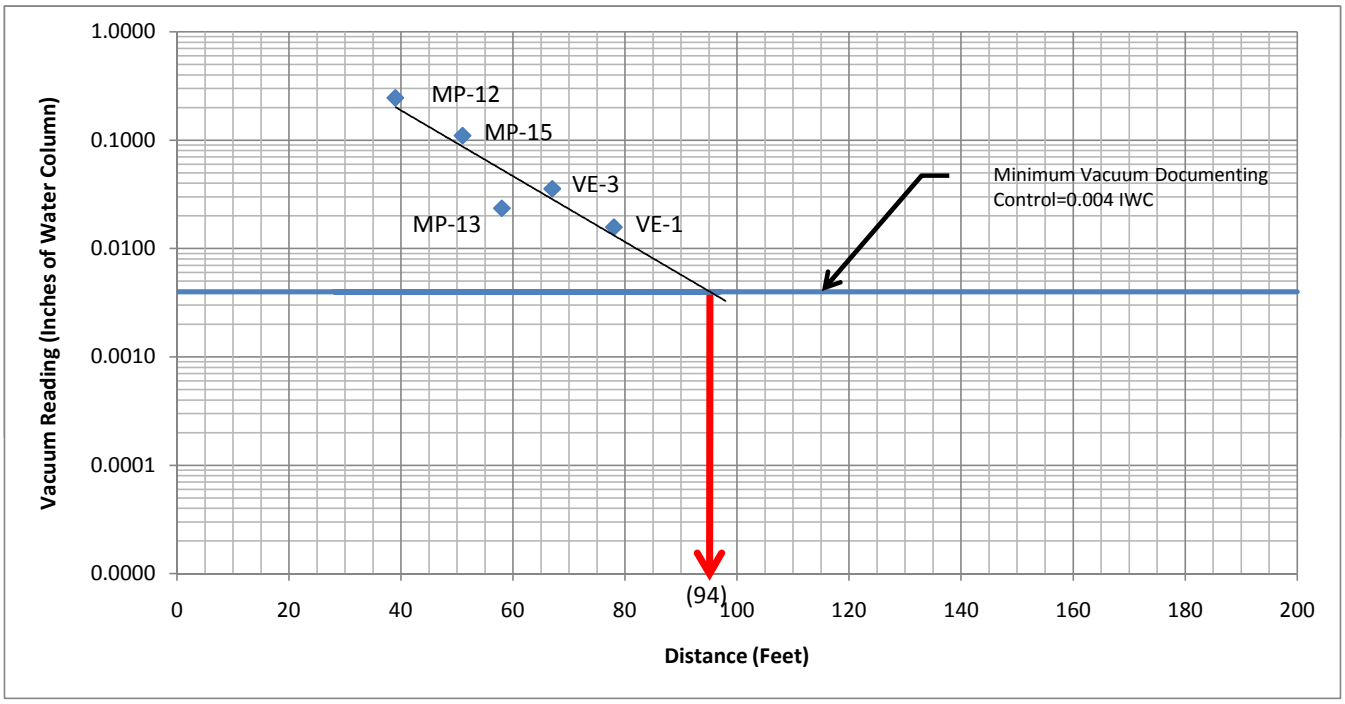


NOTES:
(+) No pressure response or positive pressure response recorded beneath slab during testing.
(-) Negative net pressure response recorded as a result of vacuum testing.

Table 2: VE-2 Radius of Influence Test

Date of Test: 27-Jul-10
Test Well ID: VE-2

Measurement Point	Distance to VEW	Pre-Test Pressure Measurements	Vacuum applied: 35-inches W.C and approx. 10 CFM	Change in Pressure
	Feet	Inches W.C.	Inches W.C.	Inches W.C.
VE-1	78	0.0057	-0.0100	-0.0157
VE-3	67	0.0096	-0.0260	-0.0356
MP-11	28	0.0009	0.0010	+
MP-12	39	0.0064	-0.2400	-0.2464
MP-13	58	0.0050	-0.0185	-0.0235
MP-14	97	0.0200	0.0268	+
MP-15	51	0.0050	-0.1050	-0.1100
MP-16	99	0.0070	0.0120	+

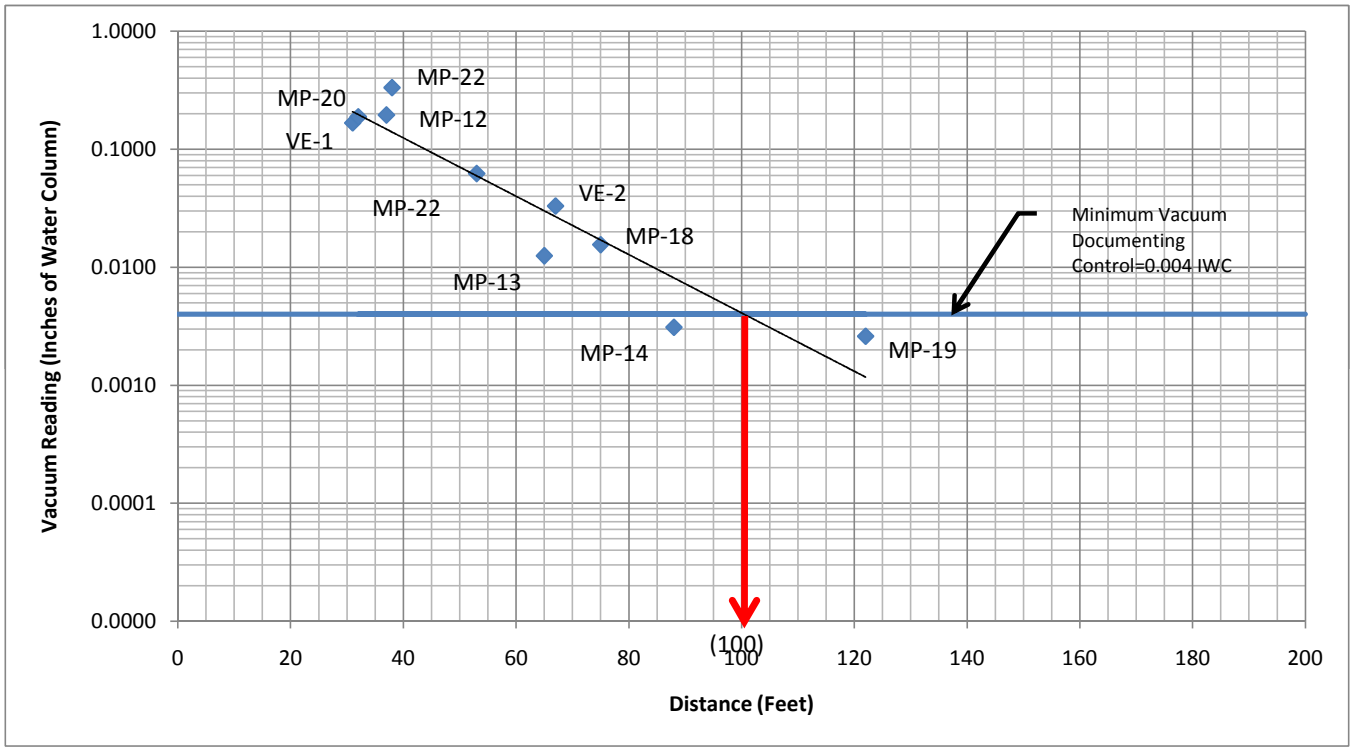


NOTES:
(+) No pressure response or positive pressure response recorded beneath slab during testing.
(-) Negative net pressure response recorded as a result of vacuum testing.

Table 3: VE-3 Radius of Influence Test

Date of Test: 28-Jul-10
Test Well ID: VE-3

Measurement Point	Distance to VEW	Pre-Test Pressure Measurements	Vacuum applied: 35-inches W.C and approx. 10 CFM	Change in Pressure
	Feet	Inches W.C.	Inches W.C.	Inches W.C.
VE-1	31	0.0009	-0.1660	-0.1669
VE-2	67	0.0010	-0.0320	-0.0330
VE-5	125	0.0063	0.0088	+
MP-12	37	0.0008	-0.1940	-0.1948
MP-13	65	0.0070	-0.0055	-0.0125
MP-14	88	0.0280	0.0249	-0.0031
MP-18	75	0.0110	-0.0045	-0.0155
MP-19	122	0.0080	0.0054	-0.0026
MP-20	32	0.0081	-0.1801	-0.1882
MP-21	53	0.0149	-0.0473	-0.0622
MP-22	38	0.0230	-0.3096	-0.3326

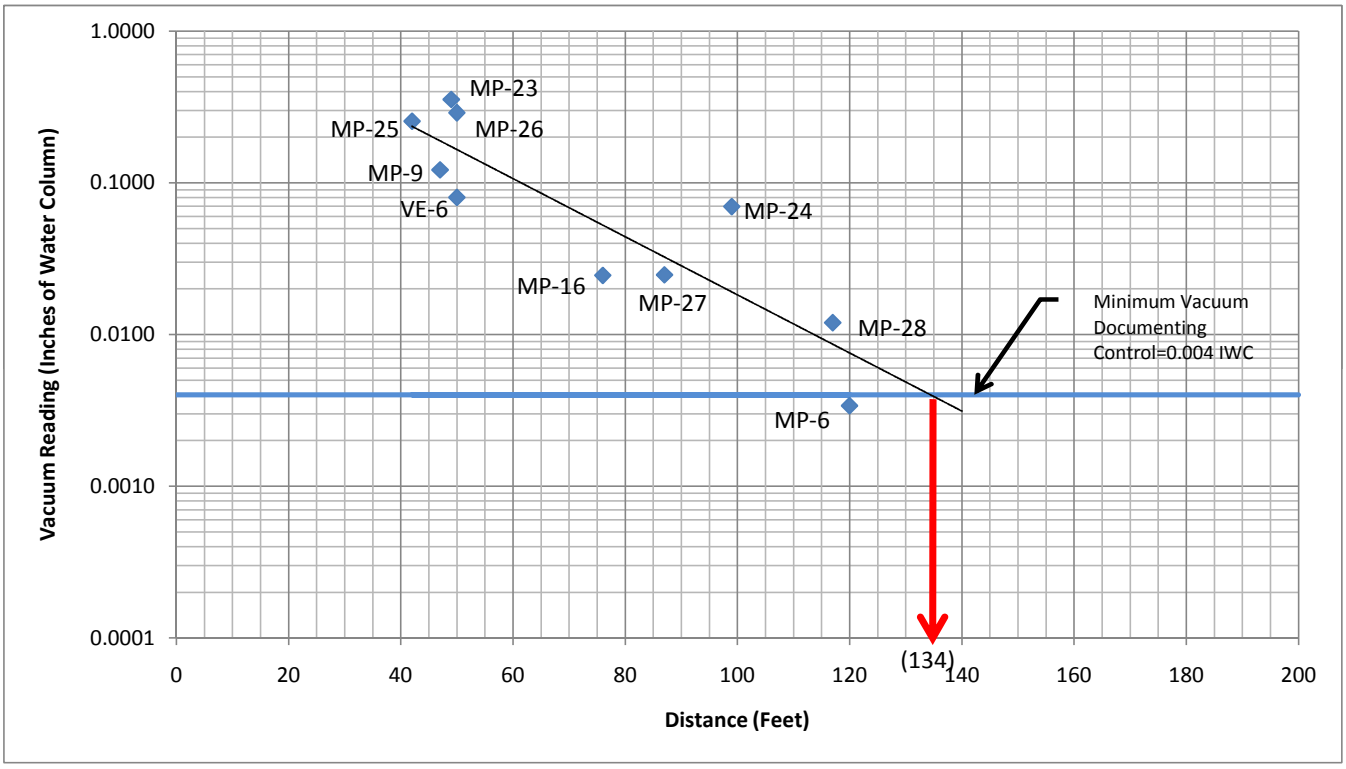


NOTES:
(+) No pressure response or positive pressure response recorded beneath slab during testing.
(-) Negative net pressure response recorded as a result of vacuum testing.

Table 4: Radius of Influence Test

Date of Test: 28-Jul-10
Test Well ID: VE-4

Measurement Point	Distance to VEW	Pre-Test Pressure Measurements	Vacuum applied: 35-inches W.C and approx. 10 CFM	Change in Pressure
	Feet	Inches W.C.	Inches W.C.	Inches W.C.
MP-23	49	0.0155	-0.3400	-0.3555
MP-24	99	0.0078	-0.0621	-0.0699
MP-25	42	0.0305	-0.2250	-0.2555
MP-26	50	0.0336	-0.2570	-0.2906
MP-27	87	0.0068	-0.0180	-0.0248
MP-28	117	0.0018	-0.0102	-0.0120
VE-6	50	0.0064	-0.0740	-0.0804
MP-6	120	0.0025	-0.0009	-0.0034
MP-16	76	-0.0042	-0.0288	-0.0246
MP-9	47	0.0015	-0.1205	-0.1220
MP-13	143	Not Measured	0.0005	+

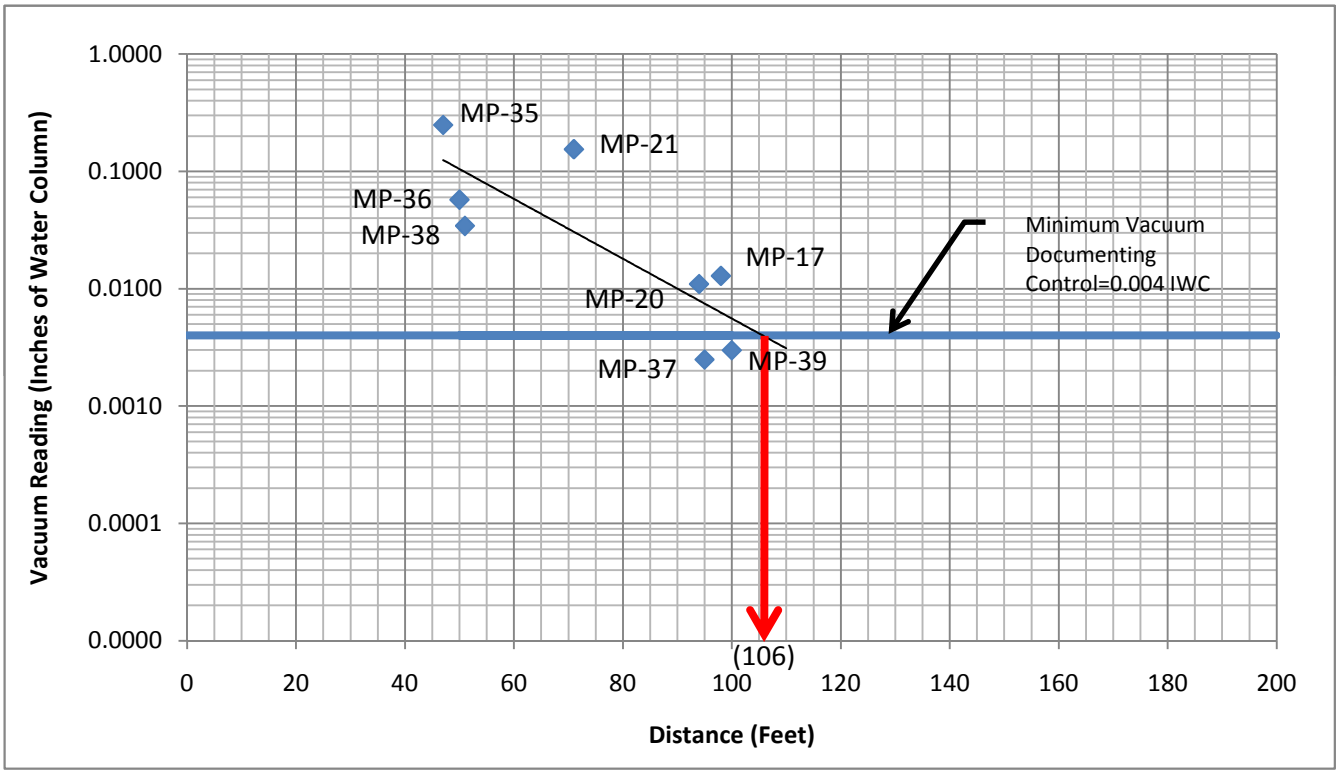


NOTES:
(+) No pressure response or positive pressure response recorded beneath slab during testing.
(-) Negative net pressure response recorded as a result of vacuum testing.

Table 5: VE-5 Radius of Influence Test

Date of Test: 28-Jul-10
Test Well ID: VE-5

Measurement Point	Distance to VEW	Pre-Test Pressure Measurements	Vacuum applied: 35-inches W.C and approx. 10 CFM	Change in Pressure
	Feet	Inches W.C.	Inches W.C.	Inches W.C.
MP-17	98	0.0057	-0.0072	-0.0129
MP-35	47	0.0135	-0.2355	-0.2490
MP-21	71	0.0076	-0.1473	-0.1549
MP-20	94	0.0018	-0.0092	-0.0110
MP-39	100	0.0035	0.0005	-0.0030
MP-38	51	0.0104	-0.0240	-0.0344
MP-36	50	0.0090	-0.0485	-0.0575
MP-37	95	-0.0340	-0.0365	-0.0025

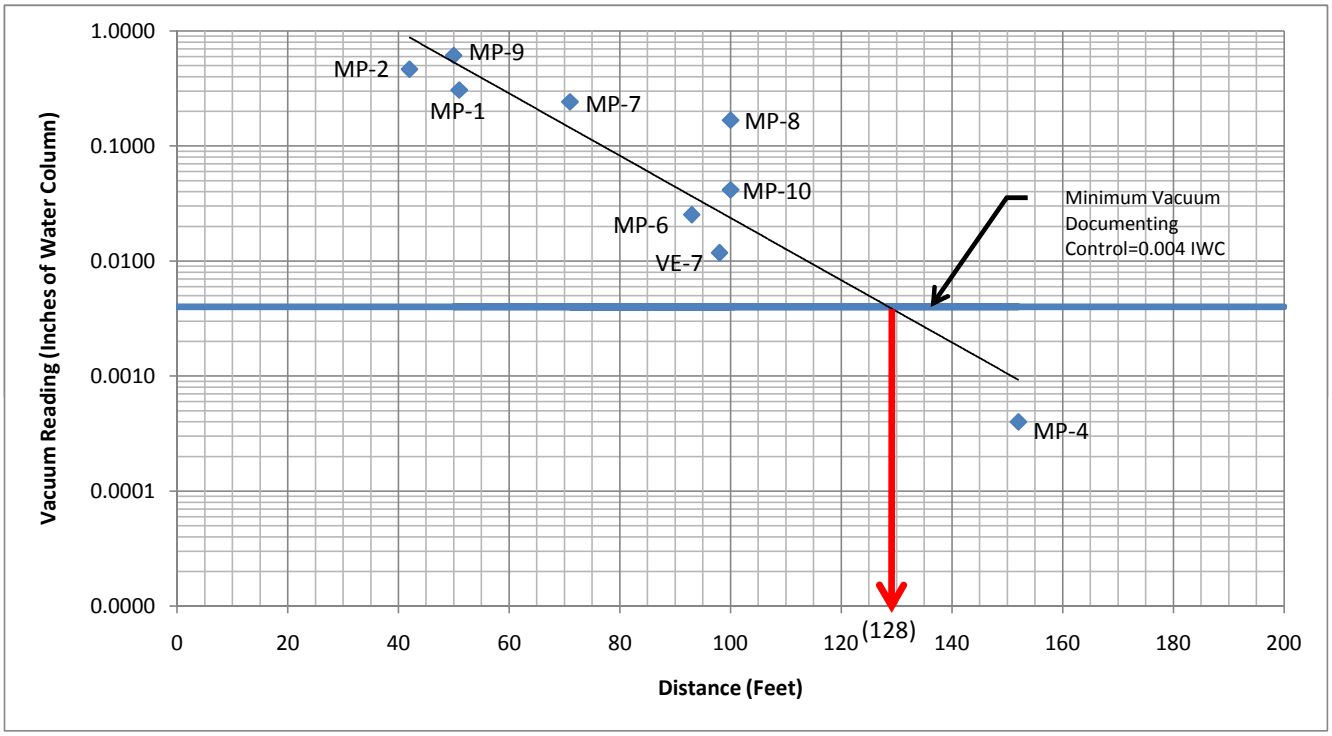


NOTES:
(+) No pressure response or positive pressure response recorded beneath slab during testing.
(-) Negative net pressure response recorded as a result of vacuum testing.

Table 6: VE-6 Radius of Influence Test

Date of Test: 27-Jul-10
Test Well ID: VE-6

Measurement Point	Distance to VEW	Pre-Test Pressure Measurements	Vacuum applied: 35-inches W.C and approx. 10 CFM	Change in Pressure
	Feet	Inches W.C.	Inches W.C.	Inches W.C.
MP-1	51	0.0184	-0.2880	-0.3064
MP-2	42	0.0156	-0.4490	-0.4646
MP-3	162	0.0025	0.0087	+
MP-4	152	0.0007	0.0003	-0.0004
MP-5	127	0.0006	0.0006	+
MP-6	93	0.0095	-0.0158	-0.0253
MP-7	71	0.0137	-0.2278	-0.2415
MP-8	100	0.0060	-0.1616	-0.1676
MP-9	50	0.0290	-0.5837	-0.6127
VE-7	98	0.0000	-0.0118	-0.0118
MP-10	100	0.0124	-0.0291	-0.0415

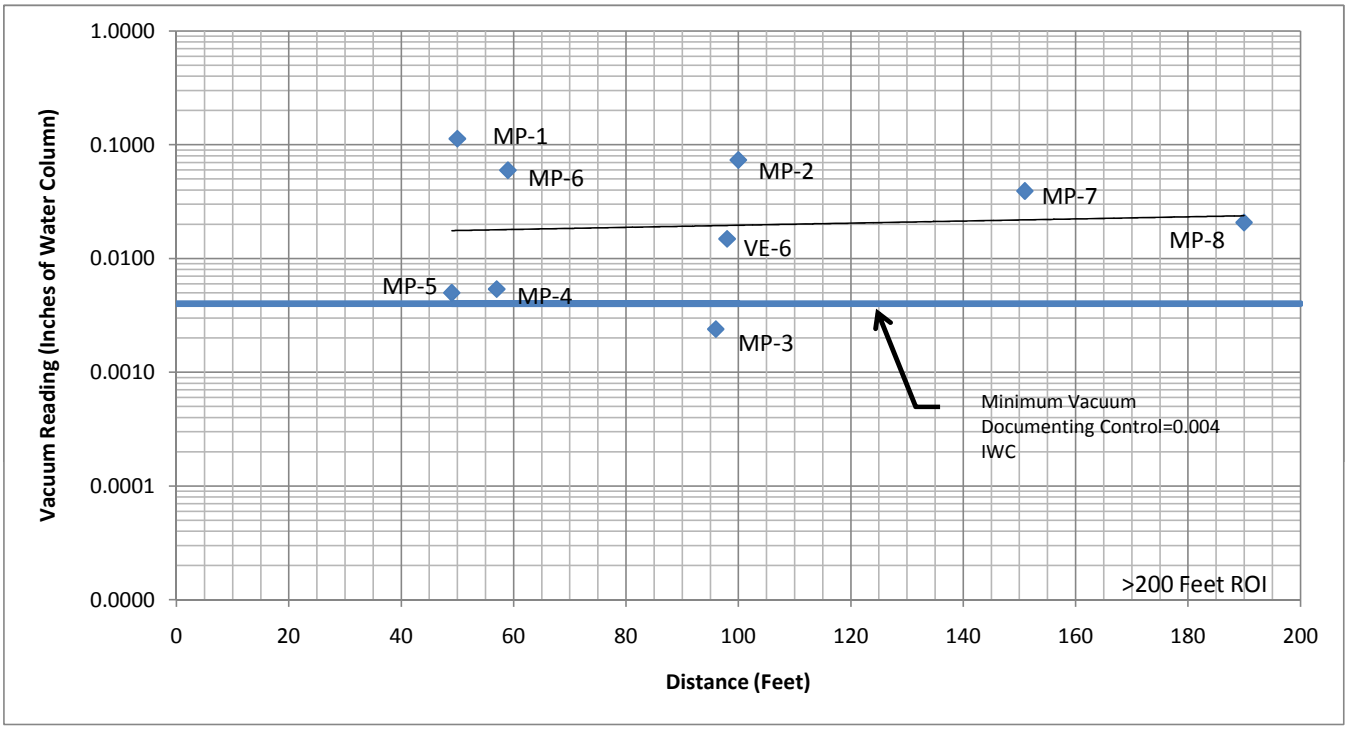


NOTES:
(+) No pressure response or positive pressure response recorded beneath slab during testing.
(-) Negative net pressure response recorded as a result of vacuum testing.

Table 7: VE-7 Radius of Influence Test

Date of Test: 27-Jul-10
Test Well ID: VE-7

Measurement Point	Distance to VEW	Pre-Test Pressure Measurements	Vacuum applied: 35-inches W.C and approx. 10 CFM	Change in Pressure
	Feet	Inches W.C.	Inches W.C.	Inches W.C.
MP-1	50	0.0009	-0.1120	-0.1129
MP-2	100	0.0193	-0.0540	-0.0733
MP-3	96	0.0006	-0.0018	-0.0024
MP-4	57	0.0006	-0.0048	-0.0054
MP-5	49	0.0002	-0.0048	-0.0050
MP-6	59	0.0050	-0.0546	-0.0596
MP-7	151	0.0014	-0.0378	-0.0392
MP-8	190	0.0063	-0.0144	-0.0207
VE-6	98	0.0016	-0.0133	-0.0149

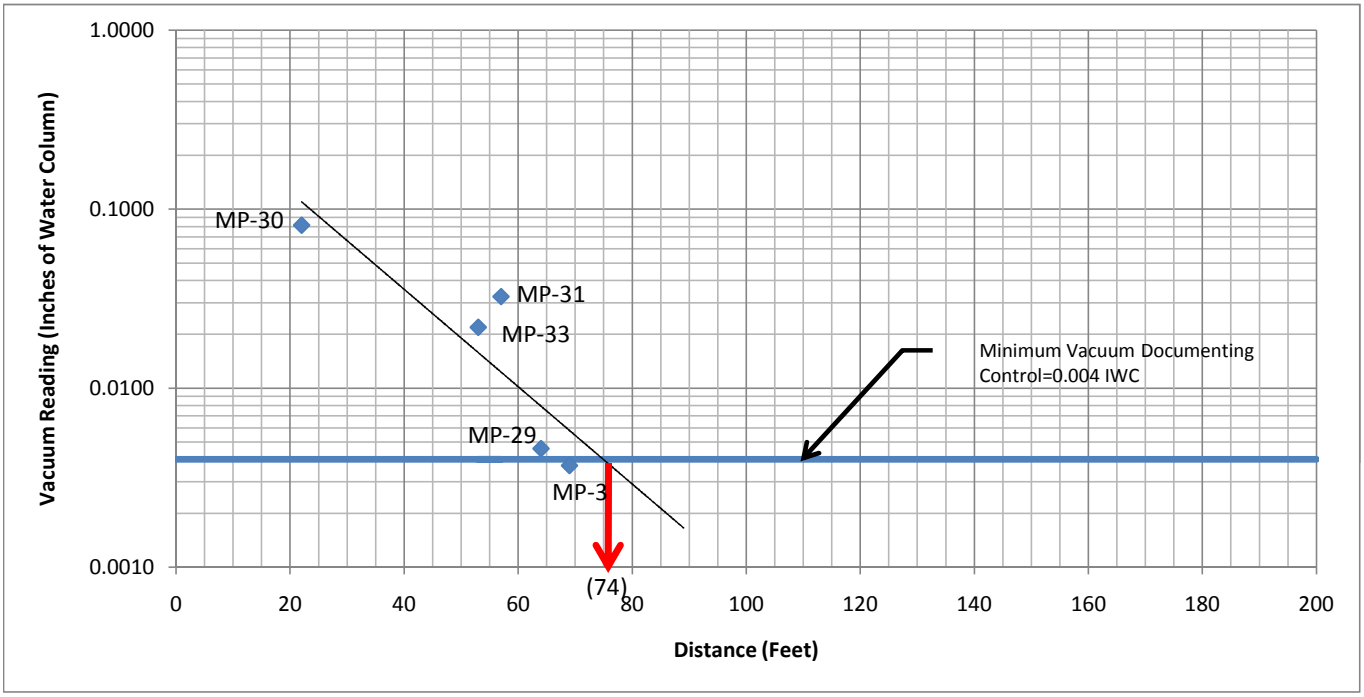


NOTES:
(+) No pressure response or positive pressure response recorded beneath slab during testing.
(-) Negative net pressure response recorded as a result of vacuum testing.

Table 8: VE-8 Radius of Influence Test

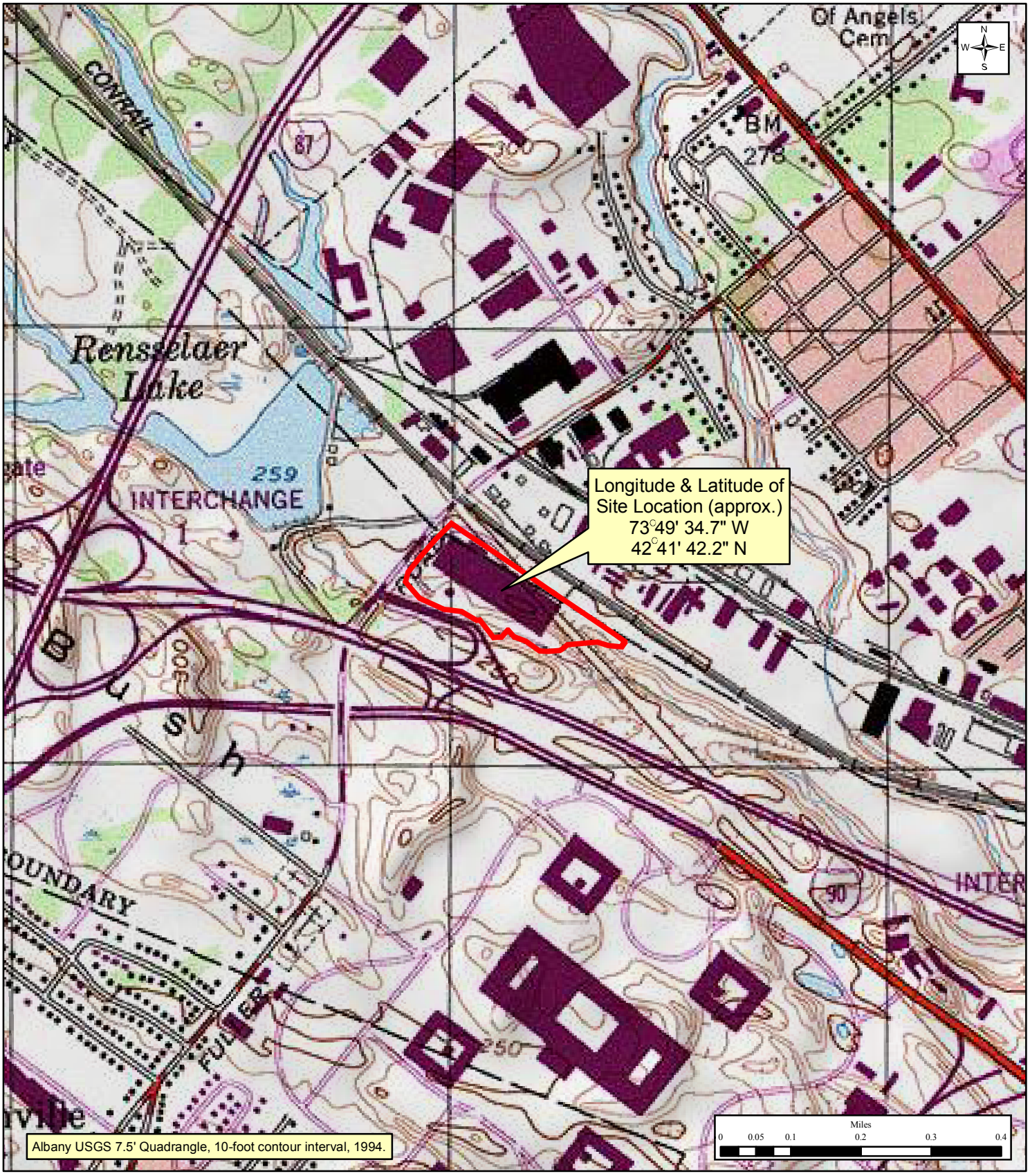
Date of Test: 28-Jul-10
Test Well ID: VE-8

Measurement Point	Distance to VEW	Pre-Test Pressure Measurements	Vacuum applied: 35-inches W.C and approx. 10 CFM	Change in Pressure
	Feet	Inches W.C.	Inches W.C.	Inches W.C.
MP-29	64	0.0007	-0.0039	-0.0046
MP-30	22	0.0006	-0.0809	-0.0815
MP-31	57	0.0098	-0.0227	-0.0325
MP-32	95	0.0016	0.0013	+
MP-33	53	0.0073	-0.0146	-0.0219
MP-34	102	0.0010	0.0004	+
MP-3	69	0.0009	-0.0028	-0.0037



NOTES:
(+) No pressure response or positive pressure response recorded beneath slab during testing.
(-) Negative net pressure response recorded as a result of vacuum testing.

Figures



THE Chazen COMPANIES

ENGINEERS/SURVEYORS
PLANNERS
ENVIRONMENTAL SCIENTISTS
LANDSCAPE ARCHITECTS

Dutchess County Office:
21 Fox Street, Poughkeepsie, NY 12601
Phone: (845) 454-3980

Orange County Office:
356 Meadow Avenue, Newburgh, NY 12550
Phone: (845) 567-1133

Capital District Office:
547 River Street, Troy, NY 12180
Phone: (518) 273-0055

Glens Falls Office:
100 Glen Street, Glens Falls, NY 12801
Phone: (518) 812-0513

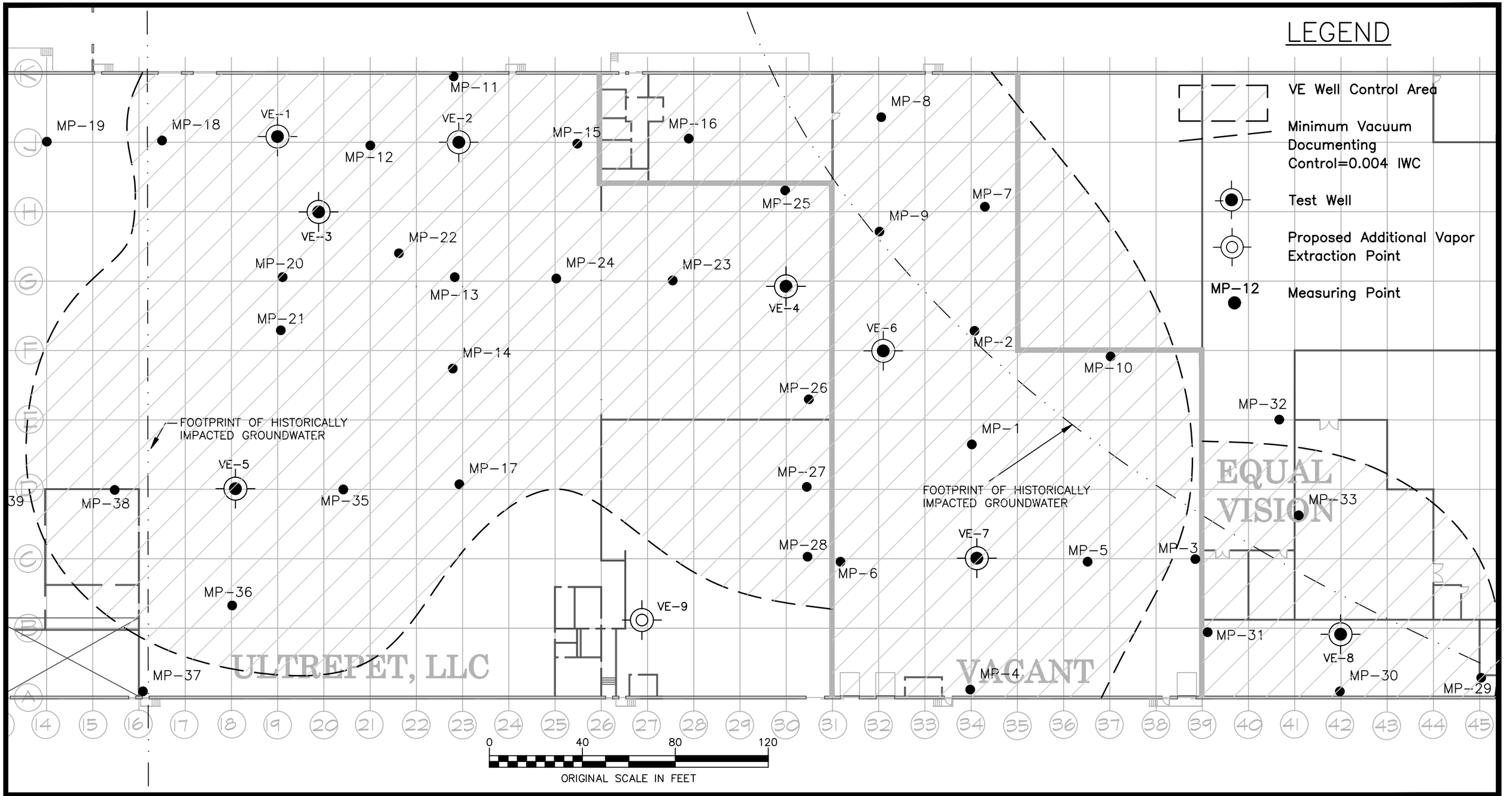
Fuller Partners, LLC

Site Location Map

136 Fuller Road
City of Albany
Albany County, New York

Drawn:	CSD
Date:	1/31/2011
Scale:	As Shown
Project:	90618.00
Figure:	1

Map Document: (R:\9\90601-90699\90618_00\GIS\maps\90618_TopographicMap_8x11.mxd)
1/1/2008 -- 11:52:03 AM



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Glens Falls, New York 12801
Phone: (518) 812-0513

136 FULLER ROAD PROPERTY

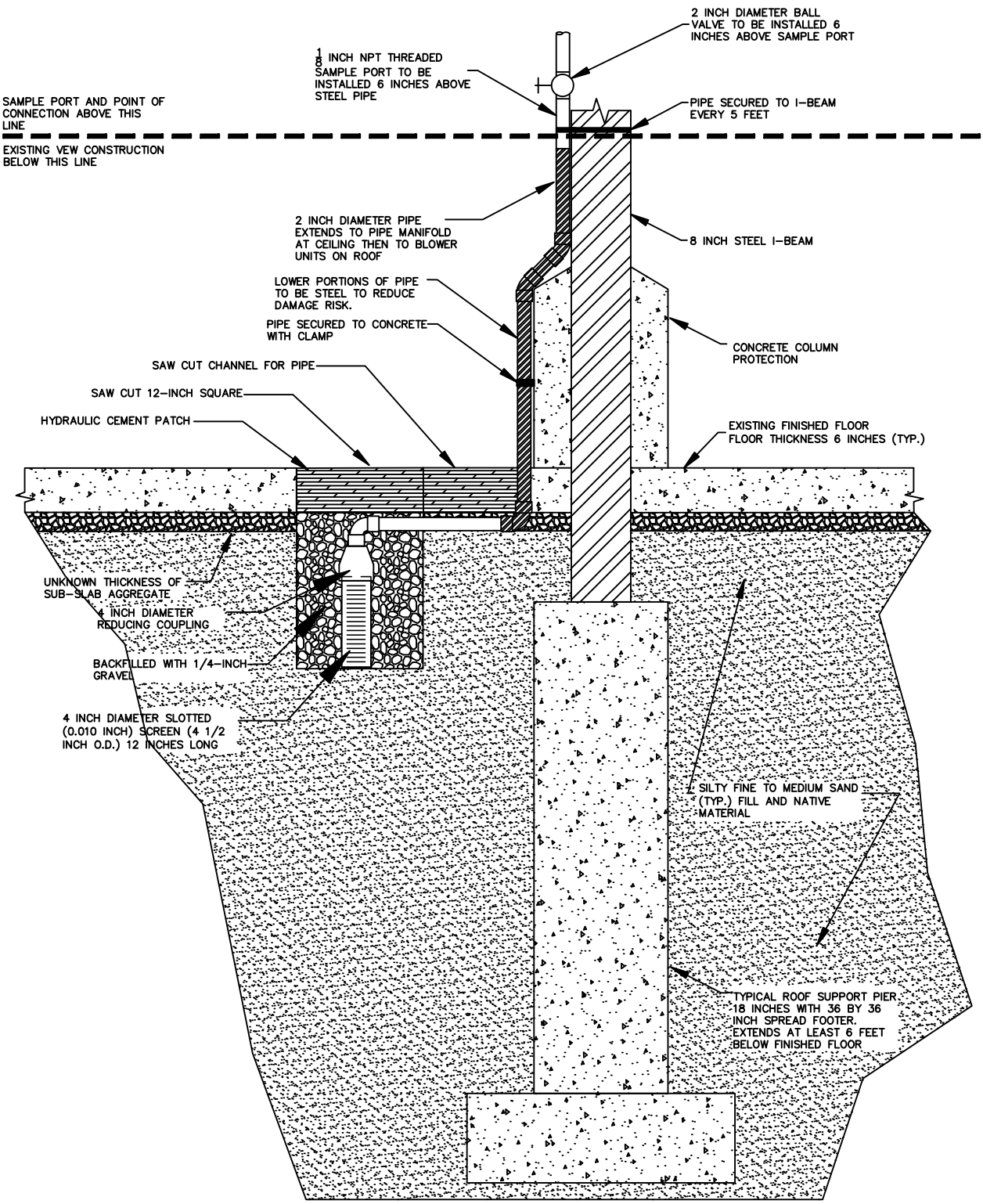
RADIUS OF INFLUENCE

COMBINED INFLUENCE OF VE-3,4,5,7&8
BASED ON ONE HOUR TESTS

CITY OF ALBANY, ALBANY CO. NEW YORK

drawn	checked
CSD	DPM
date	scale
1/31/11	1"=40'
project no.	
90618.00	
sheet no.	
FIGURE 2	

Drawing Name: S:\9\90600-90699\90618_00\ENV\SSDS IRM\Figures\SSDS_FIG1_90618-00.DWG Date Printed: Feb 01, 2011, 1:41pm



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136 FULLER ROAD PROPERTY

TYPICAL VAPOR EXTRACTION POINT CONSTRUCTION DETAIL

CITY OF ALBANY, ALBANY COUNTY, NEW YORK

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date	scale
1/31/11	N.T.S.
project no.	
90618.00	
sheet no.	
FIGURE 3	

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Drawing Name: S:\9\90600-90699\90618_00\ENV\RI Work Plan\Draft RI AAR Work Plan\HASP and IRM Backup files\FIG02-VAPOR WELL DETAIL.dwg Date Printed: Feb 01

LEGEND

VE Well Control Area

Minimum Vacuum Documenting Control=0.004 IWC

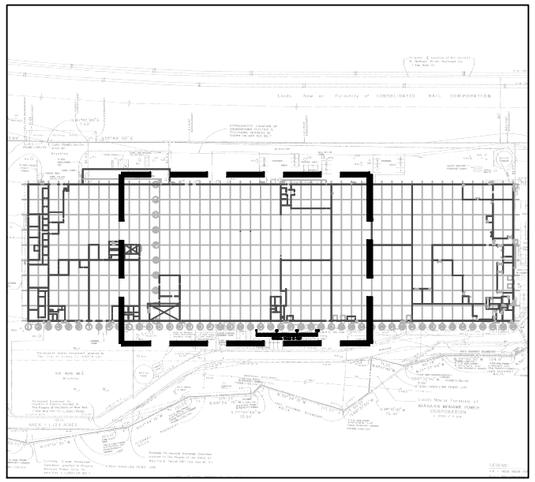
MP–12 — Measuring Point

+ — No control demonstrated during test

–0.6355 — Net change in inches of water column measured during test

Test Well

Proposed Additional Vapor Extraction Point



MP–19 -0.0021
MP–18
VE–1
MP–12 -0.1363
VE–2
MP–11
-0.3635
VE–3
MP–22
MP–20 -0.0008
MP–21
MP–13 -0.0043
MP–14
MP–15
MP–16
MP–8
FOOTPRINT OF HISTORICALLY IMPACTED GROUNDWATER
MP–25
MP–7
MP–9
MP–24
MP–23
VE–4
VE–6
MP–2
MP–26
MP–
FOOTPRINT OF HISTORICALLY IMPACTED GROUNDWATER
VE–5 -0.0005
MP–39
MP–38
MP–35
MP–17
MP–27
MP–28
MP–6
VE–7
MP–36
VE–9
MP–37
MP–
0 40 80 120
ORIGINAL SCALE IN FEET

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FORMER FULLER BRUSH FACILITY

One Hour Radius of Influence
Test of VE–1

136 Fuller Road
City Of Albany, Albany Co. New York

drawn CSD	checked DPM
date 1/31/11	scale 1"=40'
project no. 90618.00	
sheet no. FIGURE 4	

Drawing Name: S:\9\90600-90699\90618_00\ENV\SSDS IRM\Figures\SSDS_FIG1_90618-00.DWG Date Printed: Feb 01, 2011, 3:12pm

LEGEND

VE Well Control Area

Minimum Vacuum Documenting Control=0.004 IWC

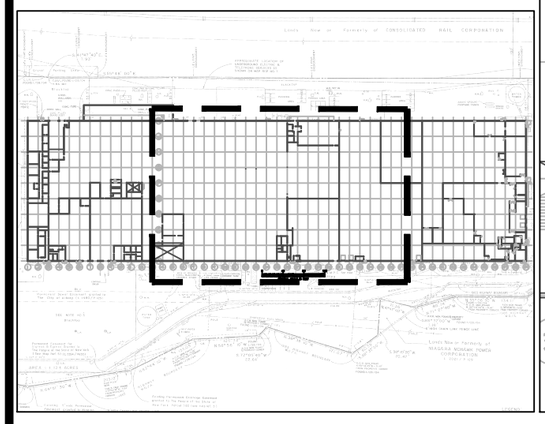
MP–12 — Measuring Point

\+ — No control demonstrated during test

–0.6355 — Net change in inches of water column measured during test

Test Well

Proposed Additional Vapor Extraction Point



0 40 80 120

ORIGINAL SCALE IN FEET

MP–19 MP–18 MP–11 VE–1 VE–2 MP–15 MP–16 MP–8

-0.0157 MP–12 -0.2464 -0.1100

FOOTPRINT OF HISTORICALLY IMPACTED GROUNDWATER

MP–25 MP–7

-0.0356 VE–3 MP–9

MP–22 MP–20 MP–24 MP–23

MP–13 -0.0235 VE–4

MP–21 VE–6 MP–2

MP–14 MP–10

MP–26

FOOTPRINT OF HISTORICALLY IMPACTED GROUNDWATER

MP–1

VE–5 MP–17

MP–39 MP–38 MP–35 MP–27

VE–7

MP–28 MP–5

MP–6

MP–36 VE–9

MP–37 MP–4

3 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38

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Glens Falls, New York 12801
Phone: (518) 812–0513

FORMER FULLER BRUSH FACILITY

One Hour Radius of Influence
Test of VE–2

136 Fuller Road
City Of Albany, Albany Co. New York

drawn	checked
CSD	DPM
date: 1/31/11	scale: 1"=40'
project no.: 90618.00	
sheet no.: FIGURE 5	

Drawing Name: S:\90600-90699\90618_00\ENV\SSDS IRM\Figures\SSDS_FIG1_90618-00.DWG Date Printed: Feb 01, 2011, 3:14pm

LEGEND

VE Well Control Area

Minimum Vacuum Documenting Control=0.004 IWC

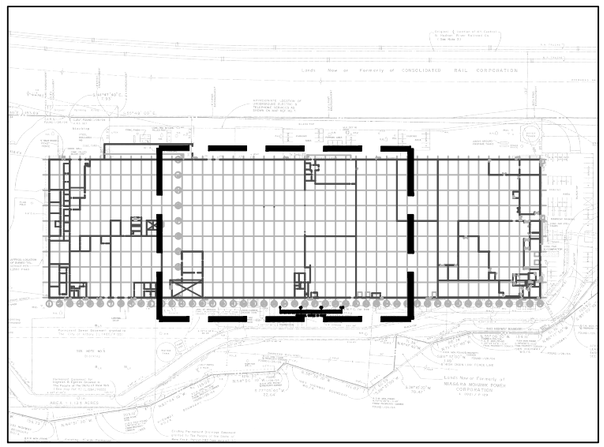
MP–12 — Measuring Point

No control demonstrated during test

–0.6355 — Net change in inches of water column measured during test

Test Well

Proposed Additional Vapor Extraction Point



0 40 80 120

ORIGINAL SCALE IN FEET

MP–19 -0.0026
MP–18 -0.0155
VE–1 -0.1669
MP–12 -0.1948
VE–2 -0.0330
MP–11
MP–15
MP–16
MP–8
FOOTPRINT OF HISTORICALLY IMPACTED GROUNDWATER
MP–25
MP–7
MP–9
VE–3
MP–22 -0.3326
MP–20 -0.1882
MP–21 -0.0622
MP–13 -0.0125
MP–24
MP–23
VE–4
VE–6
MP–2
MP–14 -0.0031
MP–26
FOOTPRINT OF HISTORICALLY IMPACTED GROUNDWATER
MP–1
VE–5
MP–17
MP–27
MP–39
MP–38
MP–35
VE–7
MP–28
MP–6
MP–36
VE–9
MP–37
MP–4

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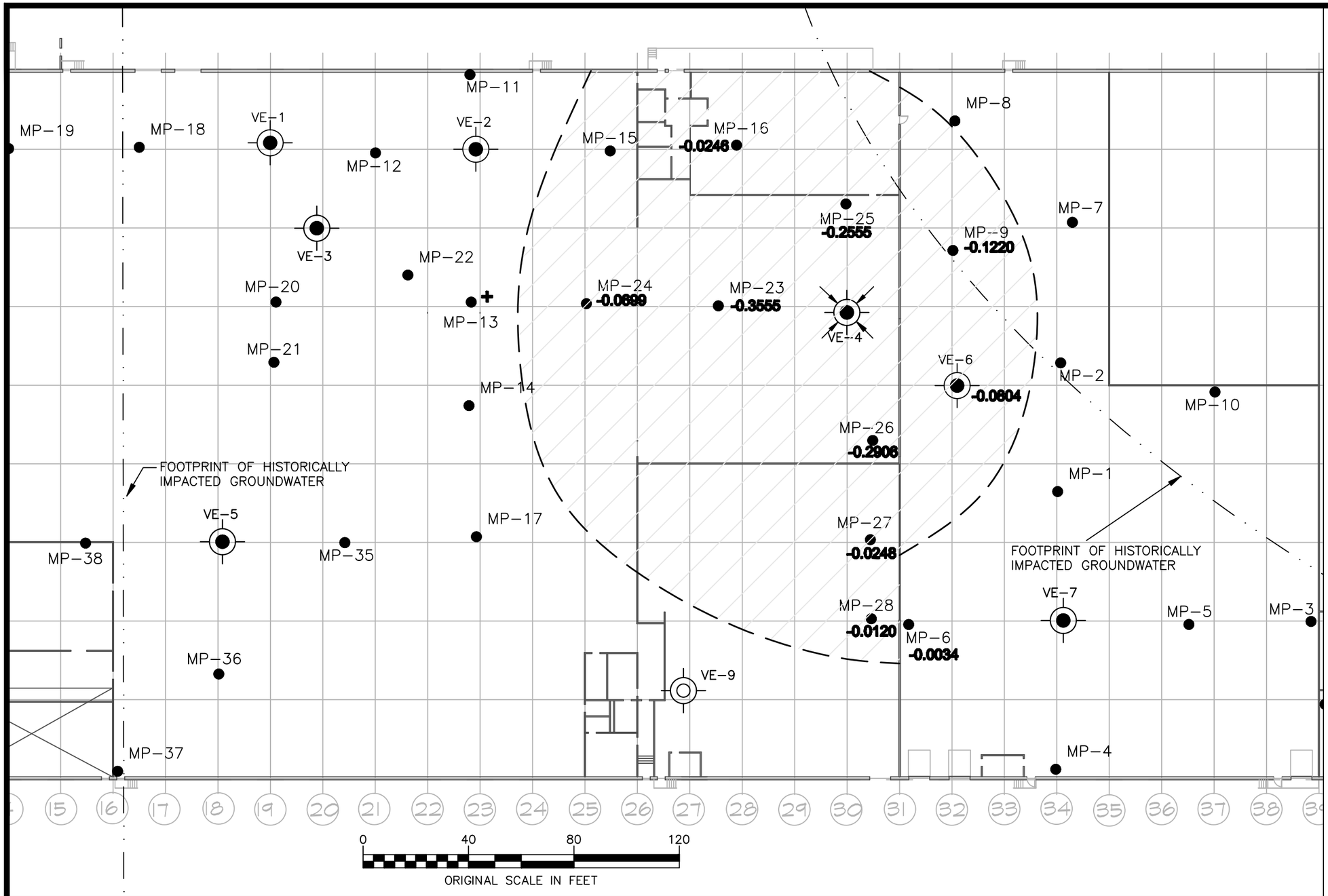
North Country Office:
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Phone: (518) 812–0513

FORMER FULLER BRUSH FACILITY

One Hour Radius of Influence
Test of VE–3
136 Fuller Road
City Of Albany, Albany Co. New York

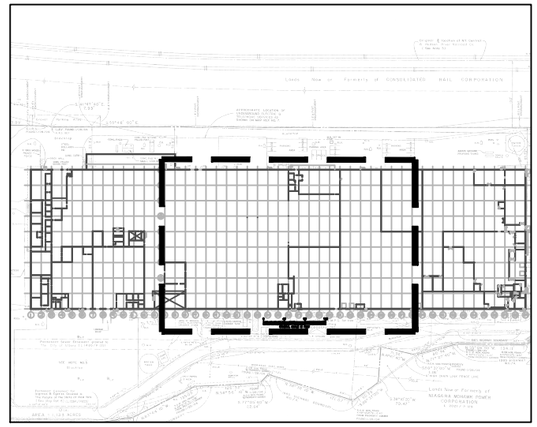
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date	scale
1/31/11	1"=40'
project no.	
90618.00	
sheet no.	
FIGURE 6	

Drawing Name: S:\9\90600-90699\90618_00\ENV\SSDS IRM\Figures\SSDS_FIG1_90618-00.DWG Date Printed: Feb 01, 2011, 3:15pm



LEGEND

- VE Well Control Area
- Minimum Vacuum Documenting Control=0.004 IWC
- MP-12 — Measuring Point
- \+ — No control demonstrated during test
- −0.6355 — Net change in inches of water column measured during test
- Test Well
- Proposed Additional Vapor Extraction Point



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North Country Office:
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Phone: (518) 812-0513

FORMER FULLER BRUSH FACILITY

One Hour Radius of Influence
Test of VE-4
136 Fuller Road
City Of Albany, Albany Co. New York

drawn	checked
CSD	DPM
date: 1/31/11	scale: 1"=40'
project no.: 90618.00	
sheet no.: FIGURE 7	

Drawing Name: S:\9\90600-90699\90618_00\ENV\SSDS IRM\Figures\SSDS_FIG1_90618-00.DWG Date Printed: Feb 01, 2011, 3:26pm

LEGEND

VE Well Control Area

Minimum Vacuum Documenting Control=0.004 IWC

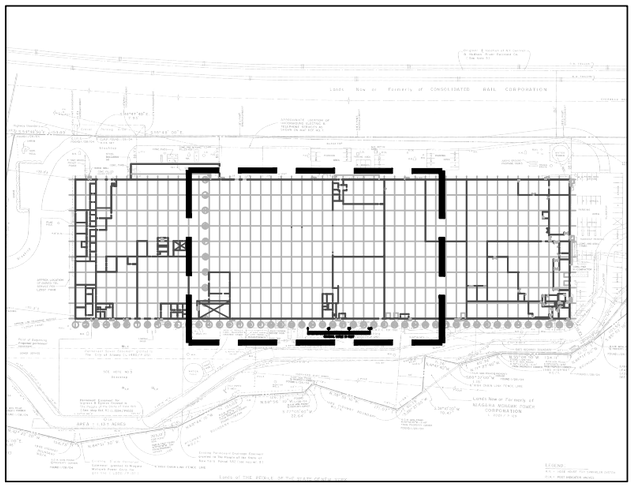
MP–12 — Measuring Point

No control demonstrated during test

–0.6355 — Net change in inches of water column measured during test

Test Well

Proposed Additional Vapor Extraction Point



0 40 80 120
ORIGINAL SCALE IN FEET

MP–11
MP–19
MP–18
VE–1
VE–2
MP–12
MP–15
MP–16
MP–8
MP–25
MP–7
MP–9
VE–3
MP–22
MP–20
-0.0110
MP–24
MP–23
MP–13
VE–4
MP–21
-0.1549
VE–6
MP–2
MP–14
MP–26
FOOTPRINT OF HISTORICALLY IMPACTED GROUNDWATER
MP–1
VE–5
MP–17
MP–27
MP–39
-0.0030
MP–38
-0.0344
MP–35
-0.2490
-0.0129
FOOTPRINT OF HI
IMPACTED GROUN
VE–7
MP–28
MP–6
MP–36
-0.0575
VE–9
MP–37
-0.0025
MP–4

K J H G F E D C B A

12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35

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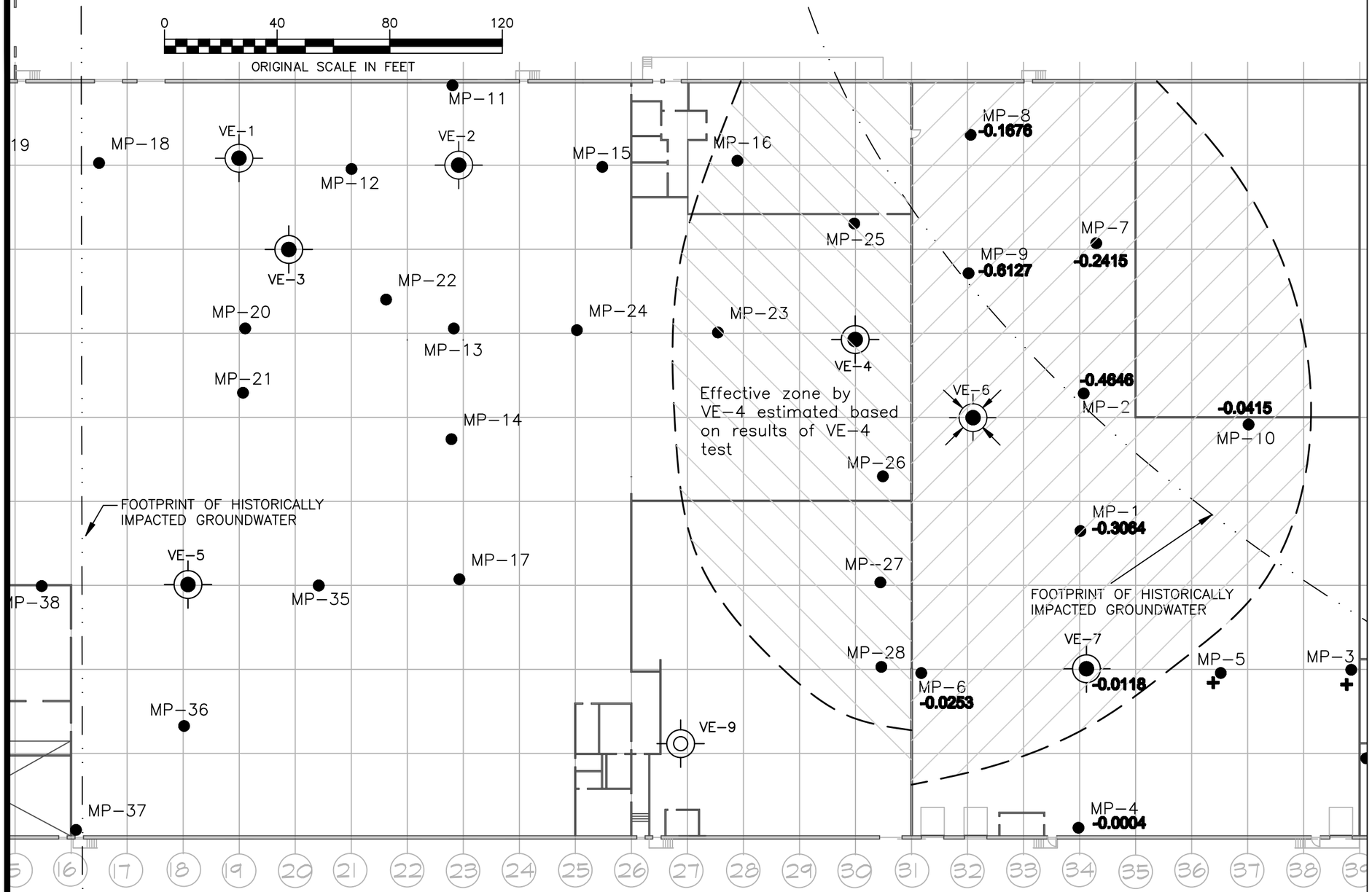
North Country Office:
100 Glen Street
Glens Falls, New York 12801
Phone: (518) 812–0513

FORMER FULLER BRUSH FACILITY

One Hour Radius of Influence
Test of VE–5
136 Fuller Road
City Of Albany, Albany Co. New York

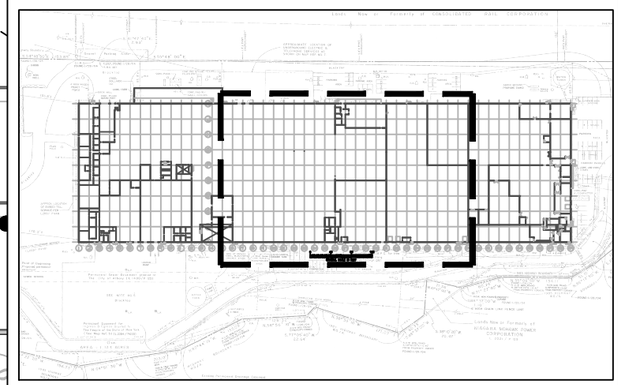
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date	scale
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project no.	
90618.00	
sheet no.	
FIGURE 8	

Drawing Name: S:\9_90600–90699\90618_00\ENV\SSDS IRM\Figures\SSDS_FIG1_90618–00.DWG Date Printed: Feb 01, 2011, 3:27pm



LEGEND

- VE Well Control Area
- Minimum Vacuum Documenting Control=0.004 IWC
- MP-12 — Measuring Point
- \+ — No control demonstrated during test
- −0.6355 — Net change in inches of water column measured during test
- Test Well
- Proposed Additional Vapor Extraction Point



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Troy, New York 12180
Phone: (518) 273-0055

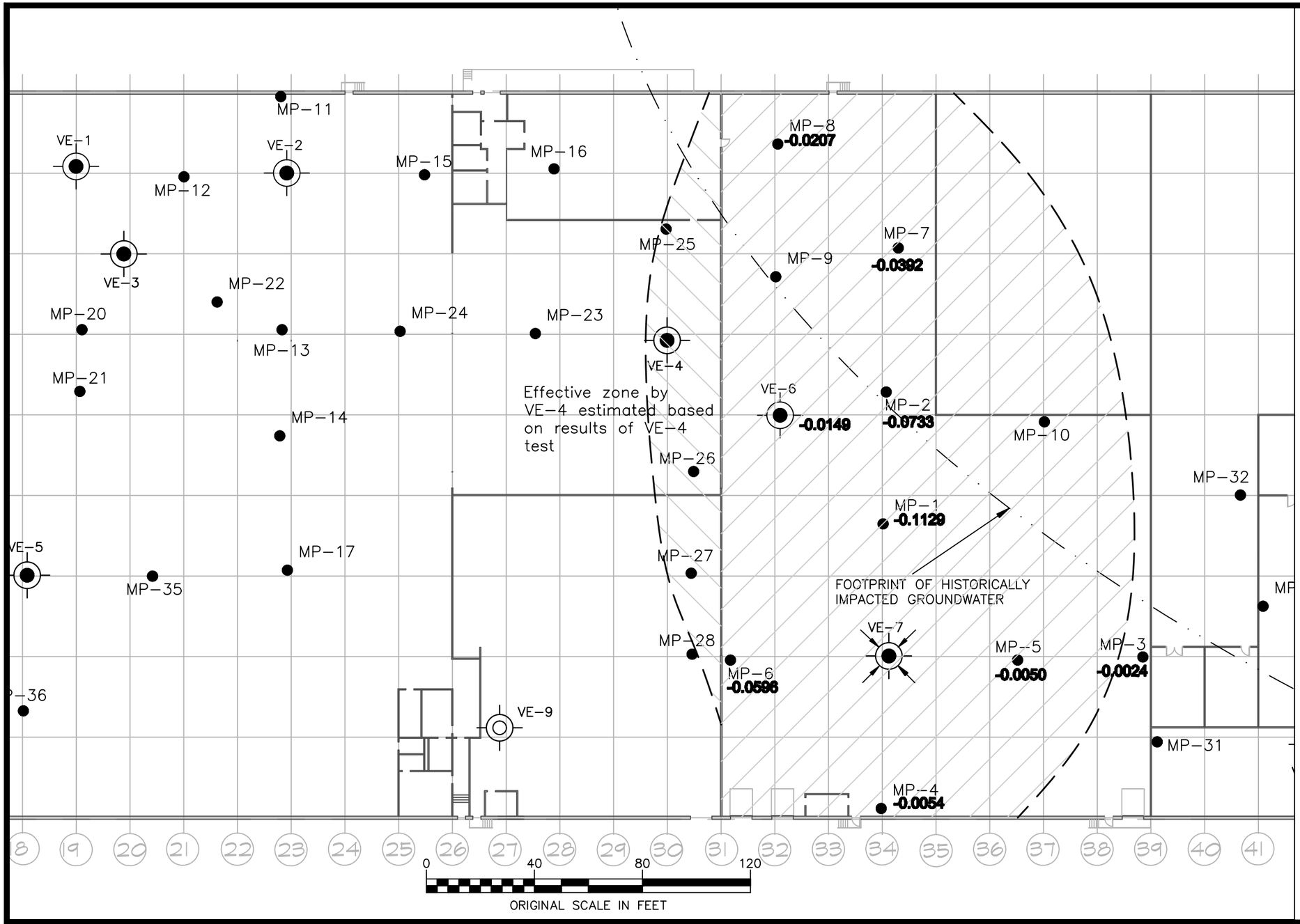
North Country Office:
100 Glen Street
Glens Falls, New York 12801
Phone: (518) 812-0513

FORMER FULLER BRUSH FACILITY

One Hour Radius of Influence
Test of VE-6
136 Fuller Road
City Of Albany, Albany Co. New York

drawn CSD	checked DPM
date 1/31/11	scale 1"=40'
project no. 90618.00	
sheet no. FIGURE 9	

Drawing Name: S:\9\90600-90699\90618_00\ENV\SSDS IRM\Figures\SSDS_FIG1_90618-00.DWG Date Printed: Feb 01, 2011, 3:28pm



LEGEND

VE Well Control Area

Minimum Vacuum Documenting Control=0.004 IWC

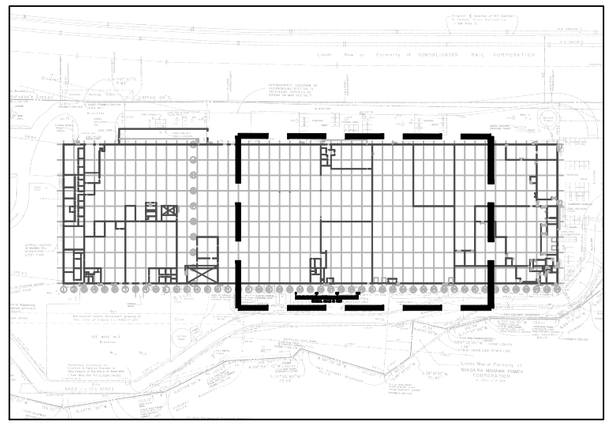
MP-12 — Measuring Point

\+ — No control demonstrated during test

-0.6355 — Net change in inches of water column measured during test

Test Well

Proposed Additional Vapor Extraction Point



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Capital District Office:
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Troy, New York 12180
Phone: (518) 273-0055

North Country Office:
100 Glen Street
Glens Falls, New York 12801
Phone: (518) 812-0513

FORMER FULLER BRUSH FACILITY

One Hour Radius of Influence
Test of VE-7
136 Fuller Road
City Of Albany, Albany Co. New York

drawn	checked
CSD	DPM
date	scale
1/31/11	1"=40'
project no.	
90618.00	
sheet no.	
FIGURE 10	

Drawing Name: S:\9\90600-90699\90618_00\ENV\SSDS IRM\Figures\SSDS_FIG1_90618-00.DWG Date Printed: Feb 01, 2011, 3:31pm

LEGEND

VE Well Control Area

Minimum Vacuum Documenting Control=0.004 IWC

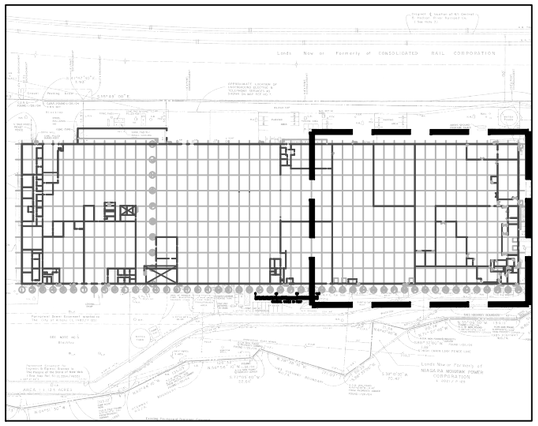
MP–12 — Measuring Point

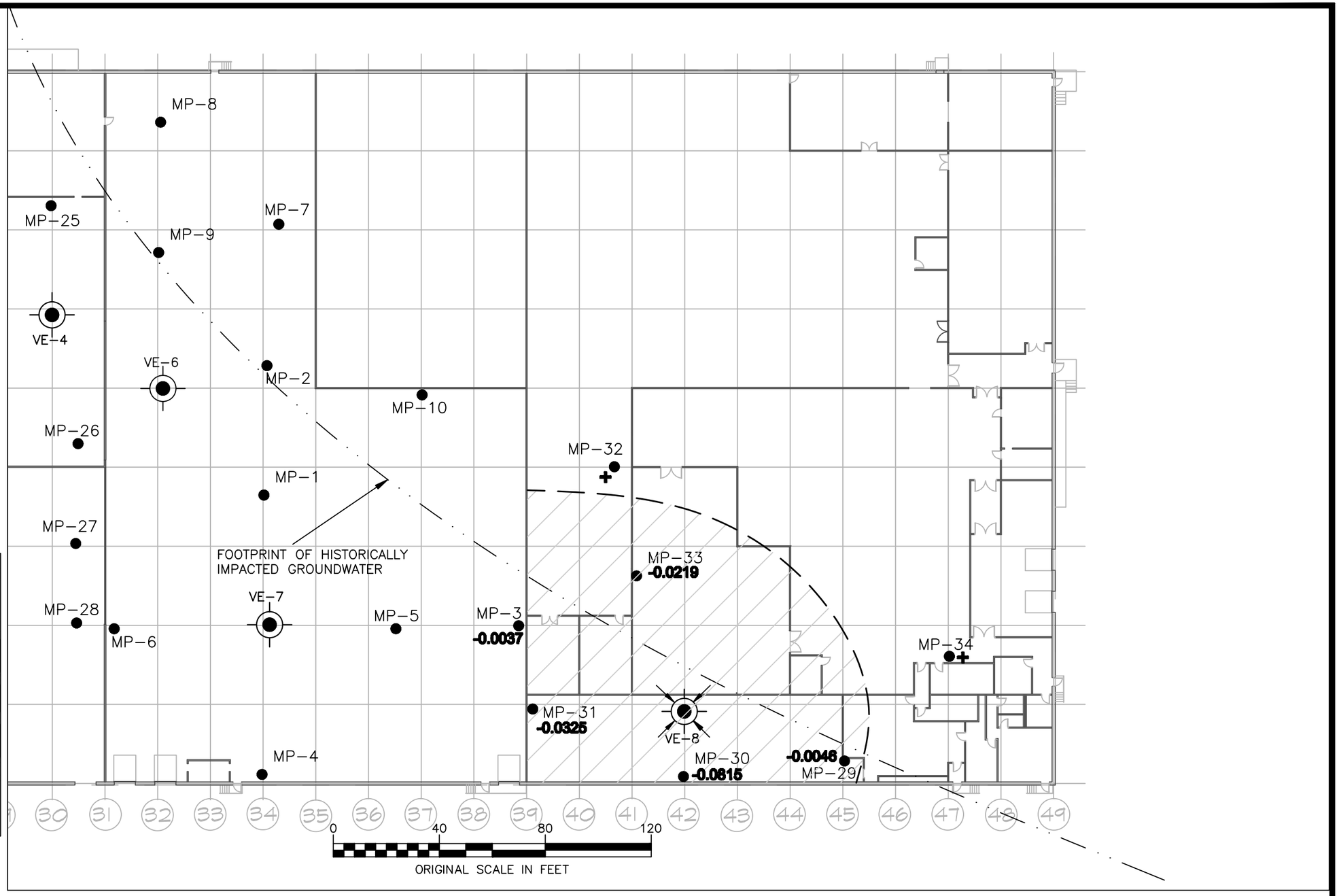
No control demonstrated during test

–0.6355 — Net change in inches of water column measured during test

Test Well

Proposed Additional Vapor Extraction Point





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Phone: (518) 273–0055

North Country Office:
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Glens Falls, New York 12801
Phone: (518) 812–0513

FORMER FULLER BRUSH FACILITY

One Hour Radius of Influence
Test of VE–8
136 Fuller Road
City Of Albany, Albany Co. New York

drawn	checked
CSD	DPM
date	scale
1/31/11	1"=40'

project no. 90618.00

sheet no. FIGURE 11

Drawing Name: S:\9\90600-90699\90618_00\ENV\SSDS IRM\Figures\SSDS_FIG1_90618-00.DWG Date Printed: Feb 01, 2011, 3:33pm

EXISTING ELECTRICAL SUB PANEL

CONTROL PANEL ACCESSIBLE FROM GROUND LEVEL.

BLOWERS B1,B2,B3 ON ROOF.

VE-1

VE-2

VE-3

VE-4

VE-5

VE-6

VE-7

VE-8

VE-9

ULTREPET, LLC

VACANT

EQUAL VISION

LEGEND

Test Well

Proposed Additional Vapor Extraction Point

0 40 80 120

ORIGINAL SCALE IN FEET

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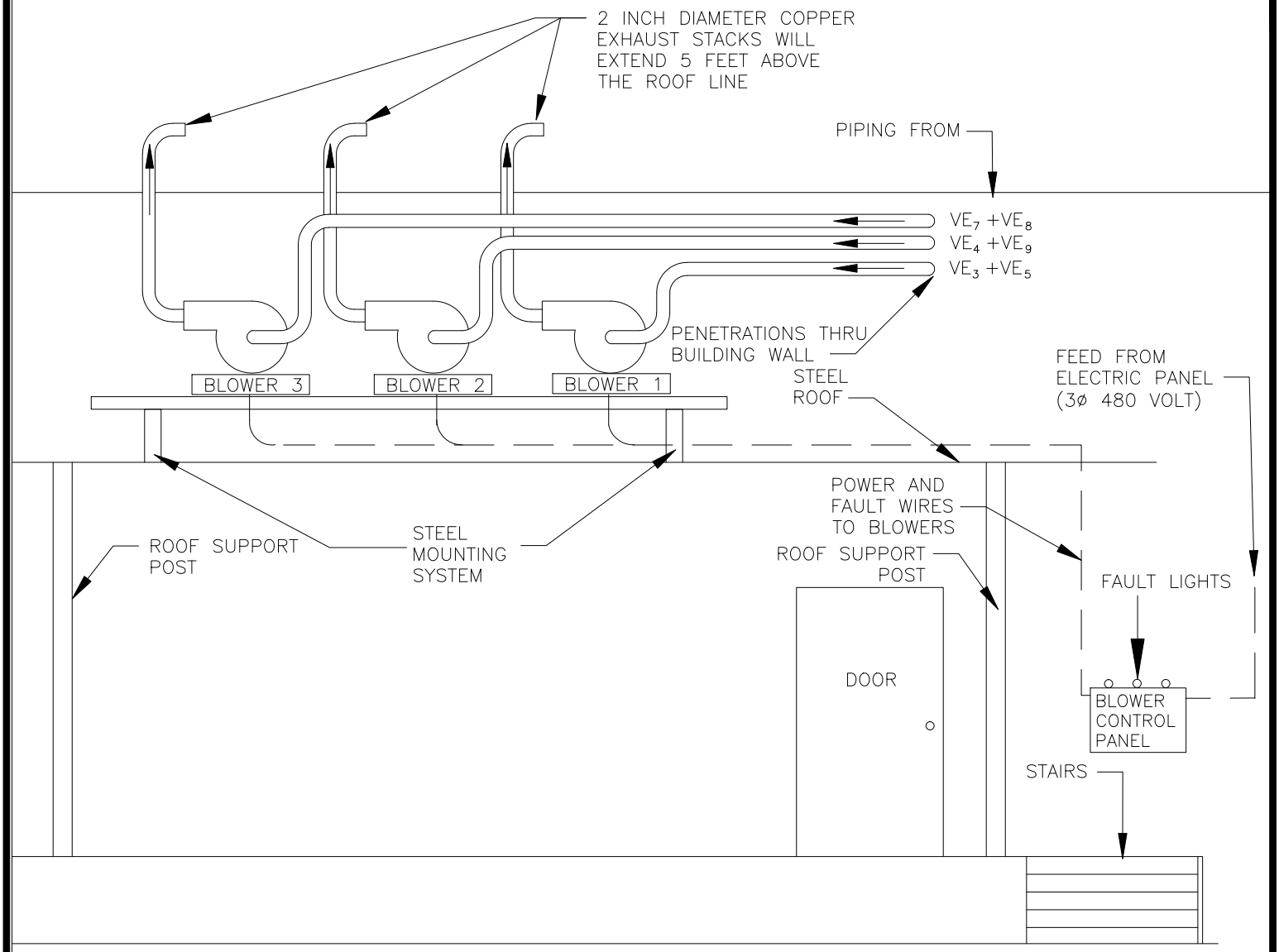
136 FULLER ROAD PROPERTY

PROPOSED SSDS PIPE AND MANIFOLD ROUTING PLAN

CITY OF ALBANY, ALBANY CO. NEW YORK

drawn	checked
CSD	DPM
date	scale
1/31/11	1"=40'
project no.	
90618.00	
sheet no.	
FIGURE 12	

Drawing Name: S:\9\90600-90699\90618_00\ENV\SSDS IRM\Figures\SSDS_FIG1_90618-00.DWG Date Printed: Feb 01, 2011, 12:40pm



NOTES:

- BLOWER CONTROL PANEL INCLUDES "ON" / "OFF" / "AUTO" CONTROLS.
- FAULT LIGHTS LOCATED ON THE BLOWER CONTROL PANEL WILL BE WIRED TO ILLUMINATE IF FAULT OCCURS.
- ← AIRFLOW DIRECTION

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NOTE: FIGURE IS NOT TO SCALE

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North Country Office:
100 Glen Street Glens Falls, NY 12801
Phone: (518) 812-0513

136 FULLER ROAD PROPERTY

BLOWER AND CONTROLS SCHEMATIC

CITY OF ALBANY, ALBANY COUNTY, NEW YORK

drawn	checked
CSD	DPM
date	scale
11/30/10	N.T.S
project no.	
90618.00	
sheet no.	
FIGURE 13	

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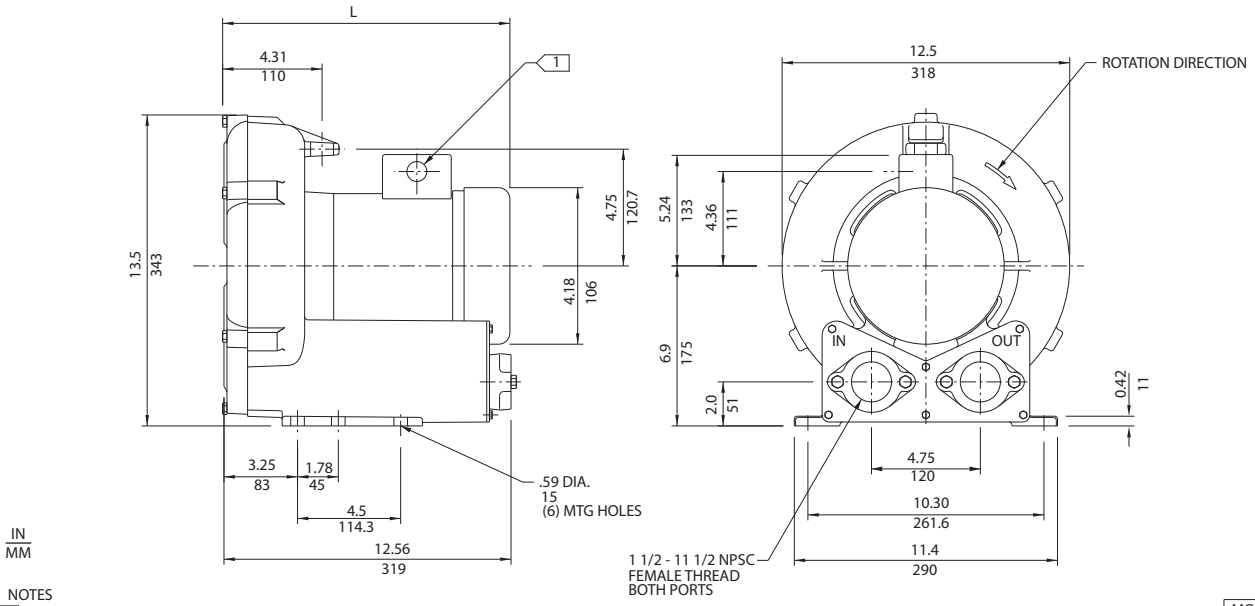
Appendix A:
Ametek Rotron 1.5-HP Blower Cut Sheet

Industrial / Chemical Processing Blowers

ROTRON®

DR 454 & CP 454

1.5 HP Regenerative Blower



NOTES
1. TERMINAL BOX CONNECTOR HOLE .88 (22) DIA.
2. DRAWING NOT TO SCALE, CONTACT FACTORY FOR SCALE CAD DRAWING.
3. CONTACT FACTORY FOR BLOWER MODEL LENGTHS NOT SHOWN.

MODEL	L (IN/MM)
DR454R58M	14.47/367
DR454R72M	13.31/338

		Part/Model Number			
		DR454R58M	DR454R72M	DR454R86M	CP454EZ72MLR
Specification	**Units**	**080481**	**080480**	**080482**	**080491**
Motor Enclosure - Shaft Mtl.	-	TEFC - CS	TEFC - CS	TEFC - CS	Chem TEFC -SS
Horsepower	-	1.5	1.5	1.5	1.5
Voltage	AC	115/230	230/460	575	230/460
Phase - Frequency	-	Single - 50/60 Hz	Three - 50/60 Hz	Three - 50/60 Hz	Three - 50/60 Hz
Insulation Class	-		F		
NEMA Rated Motor Amps	Amps (A)	15.6/7.8	4.6/2.3	1.8	4.6/2.3
Service Factor	-	1.15	1.15	1.15	1.15
Max. Blower Amps	Amps (A)	18/9	5.2/2.6	2.1	5.2/2.6
Locked Rotor Amps	Amps (A)	84/42	32/16	12.8	32/16
NEMA Starter Size	-	1/0	00/00	00	00/00
Shipping Weight	Lbs	73	60	60	60
	Kg	33.1	27.2	27.2	27.2

Voltage - ROTRON motors are designed to handle a broad range of world voltages and power supply variations. Our dual voltage 3 phase motors are factory tested and certified to operate on both: **208-230/415-460 VAC-3 ph-60 Hz** and **190-208/380-415 VAC-3 ph-50 Hz**. Our dual voltage 1 phase motors are factory tested and certified to operate on both: **104-115/208-230 VAC-1 ph-60 Hz** and **100-110/200-220 VAC-1 ph-50 Hz**. All voltages above can handle a ±10% voltage fluctuation. Special wound motors can be ordered for voltages outside our certified range.

Operating Temperatures - Maximum operating temperature: Motor winding temperature (winding rise plus ambient) should not exceed 140°C for Class F rated motors or 120°C for Class B rated motors. Blower outlet air temperature should not exceed 140°C (air temperature rise plus inlet temperature). Performance curve maximum pressure and suction points are based on a 40°C inlet and ambient temperature. Consult factory for inlet or ambient temperatures above 40°C.

Maximum Blower Amps - Corresponds to the performance point at which the motor or blower temperature rise with a 40°C inlet and/or ambient temperature reaches the maximum operating temperature.

This document is for informational purposes only and should not be considered as a binding description of the products or their performance in all applications. The performance data on this page depicts typical performance under controlled laboratory conditions. AMETEK is not responsible for blowers driven beyond factory specified speed, temperature, pressure, flow or without proper alignment. Actual performance will vary depending on the operating environment and application. AMETEK products are not designed for and should not be used in medical life support applications. AMETEK reserves the right to revise its products without notification. The above characteristics represent standard products. For product designed to meet specific applications, contact AMETEK Technical & Industrial Products Sales department.

AMETEK TECHNICAL & INDUSTRIAL PRODUCTS
75 North Street, Saugerties, NY 12477
USA: +1 215-256-6601 - Europe: +44 (0) 845 366 9664 - Asia: +86 21 5763 1258
Customer Service Fax: +1 215.256.1338
www.ametektip.com

AMETEK® TECHNICAL & INDUSTRIAL PRODUCTS

Industrial / Chemical Processing Blowers

DR 454 & CP 454

ROTRON®

1.5 HP Regenerative Blower

FEATURES

- Manufactured in the USA - ISO 9001 and NAFTA compliant
- CE compliant - Declaration of Conformity on file
- Maximum flow: 120 SCFM
- Maximum pressure: 65 IWG
- Maximum vacuum: 60 IWG
- Standard motor: 1.5 HP, TEFC
- Cast aluminum blower housing, impeller & cover; cast iron flanges (threaded)
- UL & CSA approved motor with permanently sealed ball bearings
- Inlet & outlet internal muffling
- Quiet operation within OSHA standards



MOTOR OPTIONS

- International voltage & frequency (Hz)
- Chemical duty, high efficiency, inverter duty or industry-specific designs
- Various horsepowers for application-specific needs

BLOWER OPTIONS

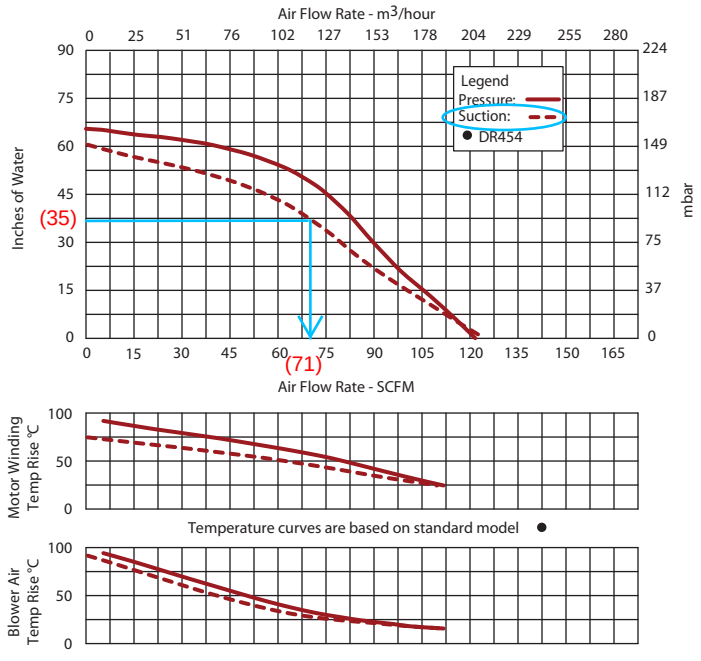
- Corrosion resistant surface treatments & sealing options
- Remote drive (motorless) models
- Slip-on or face flanges for application-specific needs

ACCESSORIES

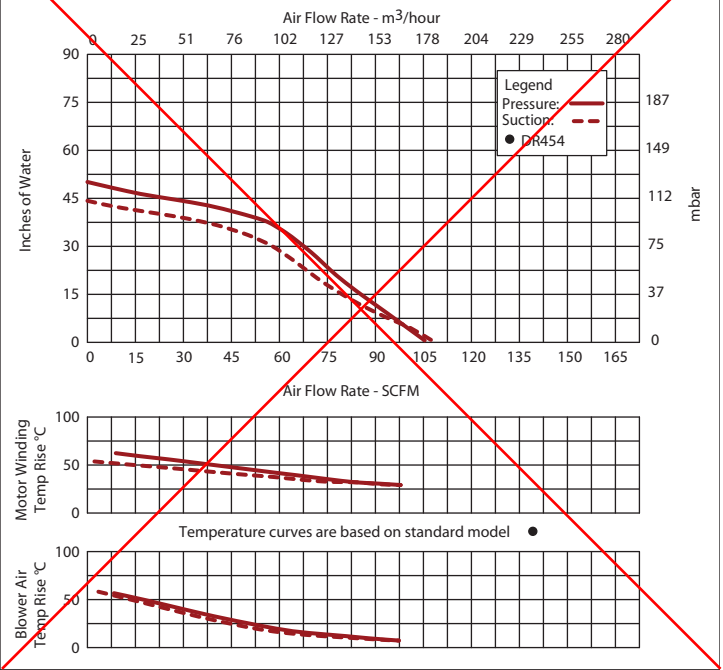
- Flowmeters reading in SCFM
- Filters & moisture separators
- Pressure gauges, vacuum gauges, & relief valves
- Switches - air flow, pressure, vacuum, or temperature
- External mufflers for additional silencing
- Air knives (used on blow-off applications)
- Variable frequency drive package

Blower Performance at Standard Conditions

60 Hz



50 Hz



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