KEY ENGINEERING GROUP LTD.
735 North Water Street, Suite 510
Milwaukee, Wisconsin 53202
(414) 224-8300
Fax (414) 224-8383

February 10, 2015

Mr. Douglas Cieslak
Hydrogeologist
Remediation & Redevelopment Program
Wisconsin Department of Natural Resources
9531 Rayne Road
Sturtevant, WI 53177

via email: douglas.cieslak@wisconsin.gov

Reference: *Work Plan for Additional Site Investigation*
Superior Health Linens
5005 South Packard Avenue
Cudahy, Wisconsin
BRRTS #02-41-532649
FID #241780880

KEY ENGINEERING GROUP, LTD.
File No. 2403001

Dear Mr. Cieslak:

Key Engineering Group, Ltd. (KEY), on behalf of D&C Partners, LLP, submitted a Request for Technical Assistance to the Wisconsin Department of Natural Resources (WDNR) on November 5, 2014. As the WDNR Project Manager, you met with D'Arcy Gravelle and Michele Norman from KEY and William Nicklas and James Baumgartner from D&C Partners, LLP on December 2, 2014 to discuss the status of the investigation for the site identified above. Following our meeting, you prepared the enclosed letter, dated January 21, 2015, identifying the need for further investigation. In response to your letter, KEY is pleased to submit this "Work Plan for Additional Site Investigation". Your letter provided comments in four general categories, which are each addressed below.

NEED TO DEFINE THE DEGREE AND EXTENT OF CVOC CONTAMINATION

The WDNR is requesting further work to address the vertical and horizontal extent of the chlorinated volatile organic compound (CVOC) contamination that has been identified on the subject site. Refer to the Site Layout figure.

Railroad Right-of-Way (R-O-W)

Sampling has been performed in a narrow area (approximately 22 feet in width) between the building and property line on the west side of the site. CVOC soil concentrations increase as sampling locations become closer to the property line with the Union Pacific Railroad right-of-way. This trend indicates a possible contamination source on the railroad property. KEY plans to obtain access from the railroad to collect samples by requesting an "Environmental Right of Entry". This will require completion and submittal of the following to the Union Pacific's Environmental Management Group: application form, $555 review fee, contact information, work plan, agency directive, map(s), and monitoring well design (if applicable). The railroad requires 60 days to review the application and materials. If the request is approved, KEY will need to obtain Railroad Protective Liability Insurance before the access agreement is executed. This insurance policy is available from Marsh for a minimum fee of $750 for 24 months.

If the railroad approves access onto its property, KEY plans to perform a survey to accurately define the property boundaries of the subject site. This will provide a reference point and allow KEY to accurately identify the sampling locations with respect to the property line. KEY will then collect shallow (< 4 feet below ground surface (bgs)) and deep (> 4 feet bgs) soil samples from the railroad property adjacent to and outward (further west, north and south) from the high CVOC concentrations detected near the subject site's property line. KEY expects to encounter groundwater and will collect groundwater samples from temporary wells. The samples will be sent to a WDNR-certified laboratory and analyzed for CVOCs.

If the railroad denies access onto their property, KEY will request assistance from the WDNR.

Higher CVOC concentrations on the railroad property, compared to samples collected on the subject site, would likely indicate an off-site source that is migrating onto the subject site. Conversely, lower concentrations would likely indicate a source on the subject site.

NEED TO COMPLETE A VAPOR INVESTIGATION

On-Site Vapor Impacts

In October 2013, Sigma detected TCE in one sub-slab sample below the building's foundation. Following the detection of TCE in a sub-slab vapor sample, a vapor mitigation system was installed in the southwest corner of the building in January 2014. KEY confirmed that post-construction testing of the vapor system was not completed to define the radius of influence and demonstrate the system's effectiveness in mitigating areas impacted by CVOC vapors. KEY plans to perform sub-slab pressure testing to confirm that the pressure field extends beneath the foundation area impacted by contaminated vapors. If the vapor system needs modification, KEY will provide a vapor mitigation contractor with the system requirements. KEY will prepare and submit an operation and maintenance (O&M) plan for the operating vapor system following additional sampling and possible system modifications.

KEY proposes to collect indoor air verification samples to confirm that an exposure to contaminant vapors is not occurring. As recommended by the WDNR, verification samples should be collected after the system has been operating, in its original or modified configuration, for a minimum of 3 months. The samples will be sent to a WDNR-certified laboratory and analyzed for CVOCs.

Off-Site Vapor Impacts

The WDNR is requesting an assessment of vapors that may possibly be migrating off-site. Sampling data indicates that CVOC-impacted groundwater is migrating from the southwest to the northeast across the subject site. Below-grade utilities are present in the northeast area of the subject site. Utilities can become preferential migration pathways for sub-surface vapors. KEY proposes to collect soil-gas samples along the utility lines on the subject site to assess the potential for off-site vapor migration.

NEED TO CONDUCT ADDITIONAL GROUNDWATER MONITORING

KEY plans to conduct additional groundwater monitoring to demonstrate a stable or receding plume.

CLOSURE DOCUMENTS

The WDNR is requesting the following with future submittals and closure documents:

Detailed Site Map

The current version of the site map identifies all site features, including subsurface utilities, monitoring wells, and sampling locations. No spills, waste disposal or fill areas, or contaminant sources have been identified on the subject site. Further sampling on the subject site and off-site may identify a source area. KEY plans to modify the map to include BRRTS activities, topography, and historic shipping and receiving areas (ingress/egress), as requested.

Surface Water and Sediment

Surface water is not present on the subject site, therefore no assessment of surface water and sediment was conducted. KEY will identify and explain the absence of an assessment within the closure documents.

Remedial Actions

Following additional work to define the degree and extent of contamination and the identification of on-site and/or off-site source(s), KEY will determine the appropriate response action.

KEY will complete/supervise these proposed activities, complete the appropriate documentation (including abandonment forms and investigative waste disposal paperwork), and report all sampling results to the WDNR and property owners and occupants of the property from which the samples were collected. The results of these additional site investigation activities will be presented in an "Addendum to the Site Investigation" Report, including recommendations for further actions. Sampling results from these proposed activities will be reviewed to determine if additional investigation is necessary.

Please contact me at (414) 224-8300, ext. 25 if you have any questions or comments regarding this proposed work plan.

Sincerely,

KEY ENGINEERING GROUP, LTD.

Michele R. Norman

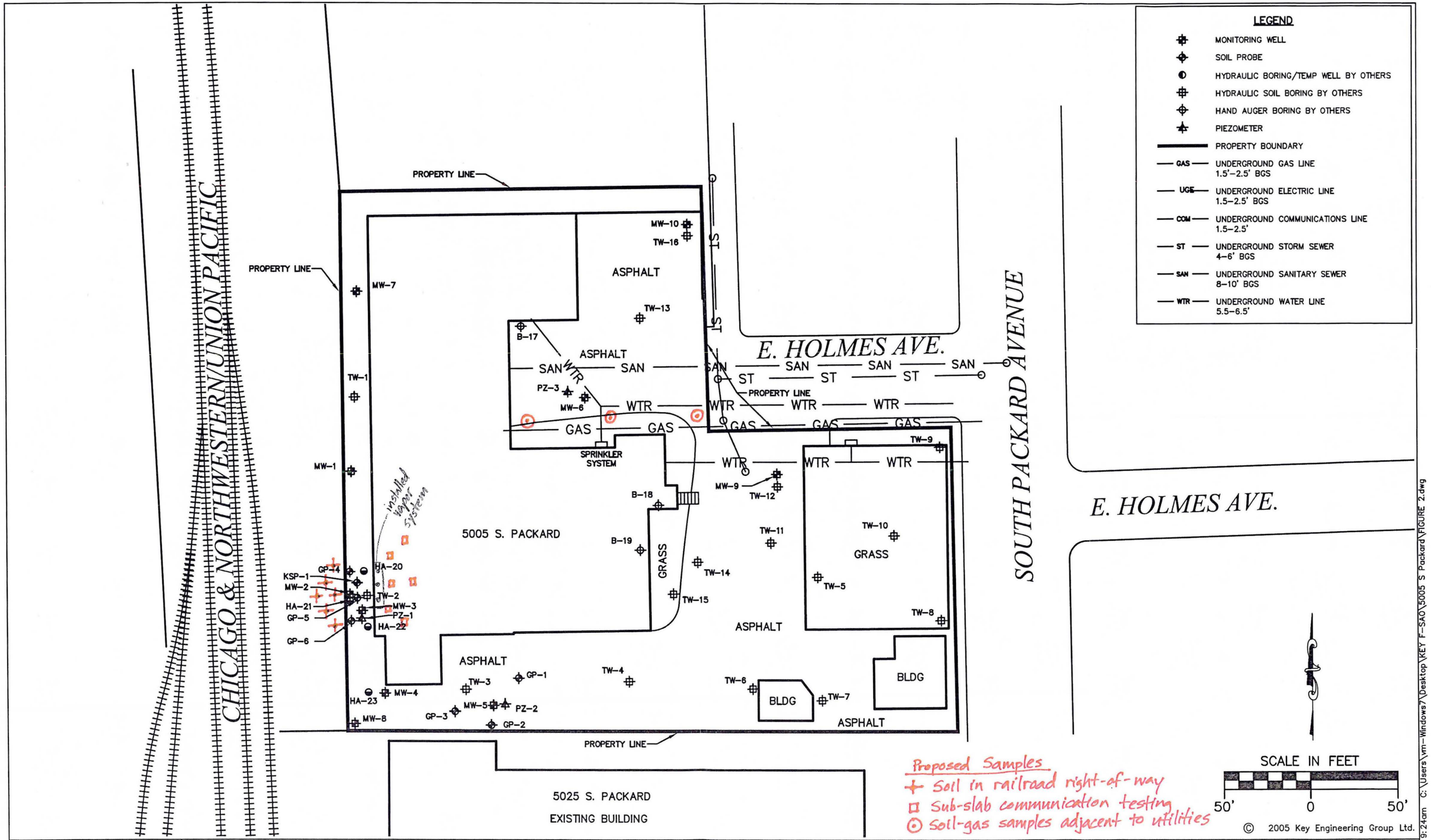
Michele R. Norman
Senior Hydrogeologist

D'Arcy J. Gravelle, CPG, PG
Vice President

cc: James Baumgartner, D&C Partners, LLP (via e-mail: jbaum777@gmail.com)
William Nicklas, D&C Partners, LLP (via e-mail: wjnicklas@gmail.com)

Enclosures:

Figure 1 – Site Layout
DNR letter from Doug Cieslak, re: Technical Assistance Request, dated 1/21/2015



DESIGNED BY DML	DATE 06–23–2014
DRAWN BY SAO	PROJECT 2403001
APPROVED BY KWW	SHEET NO. 1

CADFILE C:\Users\vm-Windows7\Desktop\KEY F-SAO\5005 S Packard\FIGURE 2.dwg
XREF
LMAN

FIGURE 2.1
SITE LAYOUT
5005 SOUTH PACKARD AVENUE
SUPERIOR HEALTH LINENS
CUDAHY, WI

KEY ENGINEERING GROUP LTD.
735 NORTH WATER STREET, SUITE 510
MILWAUKEE, WI 53202
414.224.8300 (tel) - 414.224.8383 (fax)

Aug 29, 2014 - 9:24am C:\Users\vm-Windows7\Desktop\KEY F-SAO\5005 S Packard\FIGURE 2.dwg

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
9531 Rayne Rd
Sturtevant WI 53177

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

January 21, 2015

VIA US MAIL AND EMAIL

William Nicklas
James Baumgartner
D & C Partners, LLP
W223 N7658 Cherry Hill Road
Sussex, WI 53089

Subject: Technical Assistance Superior Linens - BRRT 02-41-532649 - FID 241780880

Dear Sirs,

Thank you for the opportunity to meet with you and your consultant on December 2, 2014 to review your progress on the above named site. During our meeting you identified as your goal as to achieve case closure as soon as possible to finalize your transfer of the property to new operators of the medical linen business. I have reviewed your file and your November 5, 2014 status report and prepared the following comments to assist you in achieving your goal.

Additional site work is necessary in order to meet the requirements for site closure. You need to complete an investigation to determine the degree and extent of chlorinated volatile organic compounds (CVOC) contamination in soil and groundwater and to initiate and complete a vapor intrusion assessment of all occupied dwellings that are potentially impacted by the CVOC contamination.

Need to Define the Degree and Extent of CVOC Contamination
Additional soil and groundwater sampling is needed in order to define the degree and extent of CVOC contamination in soil and groundwater. More should be done to determine the vertical and horizontal extent of CVOC contamination in the source areas you have identified. This work will enable you to make decisions regarding what, if any, remediation is necessary.

Need to Complete a Vapor Investigation
It is my understanding your vapor intrusion mitigation systems are operational for all affected occupied buildings on your site. Please submit as-built documentation that demonstrates the effectiveness of the systems and an operation and maintenance (O&M) plan for your vapor intrusion mitigation systems. Your systems should be inspected in accordance with that O&M plan and the results of that inspection included with the plan. Additional vapor intrusion assessment is needed to determine whether or not vapor intrusion is a completed pathway that represents an off-site exposure risk due to residual contamination. If vapor intrusion is an issue off-site document all source control actions taken.

Need to Conduct Additional Groundwater Monitoring
Additional groundwater monitoring is needed in order to establish compliance with the closure criteria of ch. NR 726. If monitored natural attenuation is to be used as a remedial action, you need to determine the extent of groundwater contamination, monitor for natural attenuation parameters, and determine whether there is a stable or receding plume. I encourage you to use the Department's guidance, *Understanding Chlorinated Hydrocarbon Behavior in Groundwater,* RR-699, found on our website.

Closure Documents
Included with future submittals and your closure documents, please provide the following:

- **Detailed site map** illustrating all the following; polygon of all previous spills and BRRTs activities, all waste disposal sites, fill sites, subsurface facilities and utilities, topography, locations of historic contaminant sources, historic shipping and receiving ingress/egress, and monitoring well and sampling locations.
- **Surface Water and Sediment** Identify whether surface water and/or sediment was assessed and describe the impacts found. If this pathway was not assessed, explain why. Identify any surface water and/or sediment action levels used to assess the impacts for this pathway and how these were derived. Describe where the DNR action levels were reached or exceeded.
- **Remedial Actions** Identify how all exposure pathways were removed and/or adequately addressed by immediate and/or remedial action(s).

Please submit a workplan that addresses items above within 60 days of receipt of this letter, March 25, 2015. Addressing the potential for vapor intrusion exposures should one of your priorities.

It was a pleasure meeting you both and I appreciate your efforts to restore the environment at this site. Please feel free contact me directly at 262-884-2344 if you have any questions regarding this letter especially if you would like advice on your vapor intrusion monitoring and response actions.

Sincerely,

Doug Cieslak
Hydrogeologist
Sturtevant Service Center
Remediation & Redevelopment Program

c: Michele Norman – Key Engineering Group (email)
Darcy Gravelle - Key Engineering Group (email)

Sub-Slab Depressurization System (SSDS) Operations & Maintenance Plan

1. VMS Description, Purpose and Location

Location

Superior Health Linens (SHL), 5005 South Packard Avenue, Cudahy Wisconsin
FID #241780880
BRTTS #02-41-532649

Date of Maintenance Plan

February 1, 2015

System Description

This document is the design and maintenance plan for an active sub-slab depressurization system (SSDS) commonly known as a Vapor Mitigation System (VMS) at the above referenced property in accordance with the requirements of S. NR 724.13 (2) Wisconsin Administrative Code. The SSDS is located in the southwest corner of the plant as shown by the System Location Diagram on page 4. The SSDS is a very simple, yet very effective system for removing harmful vapors from beneath the plant floor and was designed to remove possible vapors from the primary soil contaminants defined below. The system utilizes an industrial fan to create negative sub slab pressure to draw contaminated vapors out and exhaust them to the exterior of the building (see VMS Diagram on page 3).

Primary Soil Contaminants

The primary contaminants in the soil are CVOC's, more specifically, Trichloroethene (TCE) and 1,1,1-Trichloroenthene (TCA). Breakdown products of TCE, cis-1-2 TCE has also been found in several soil samples.

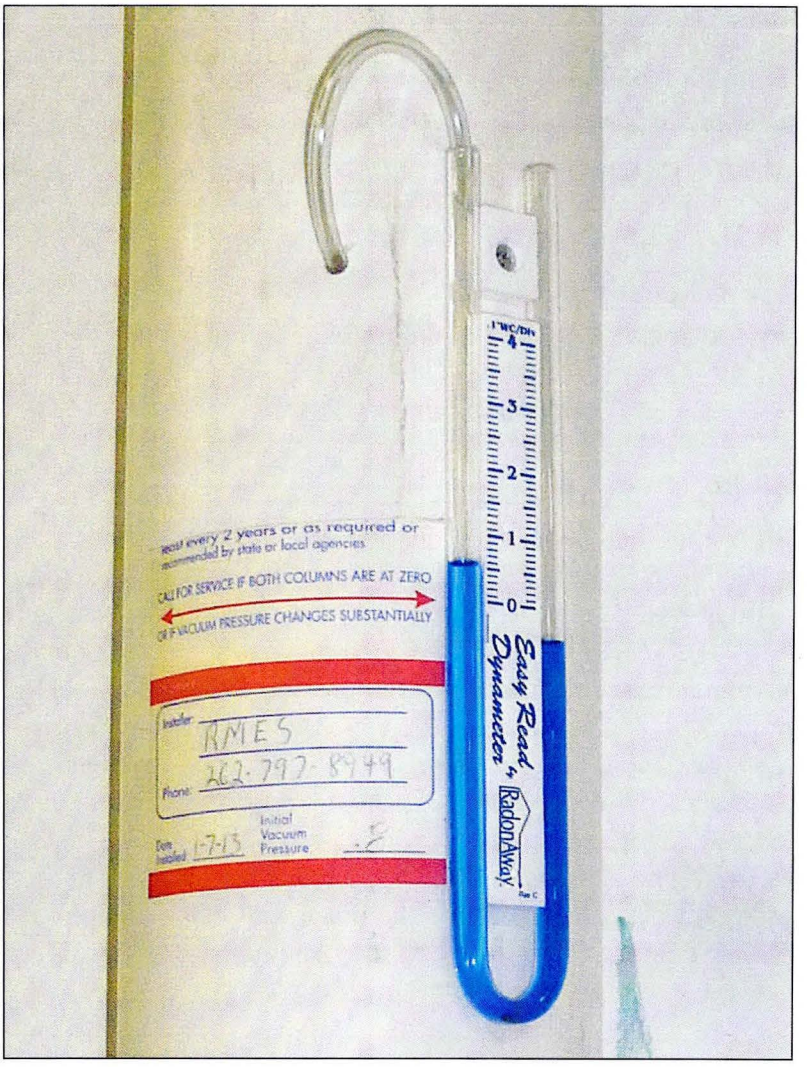
2. VMS Design

Construction Specifications

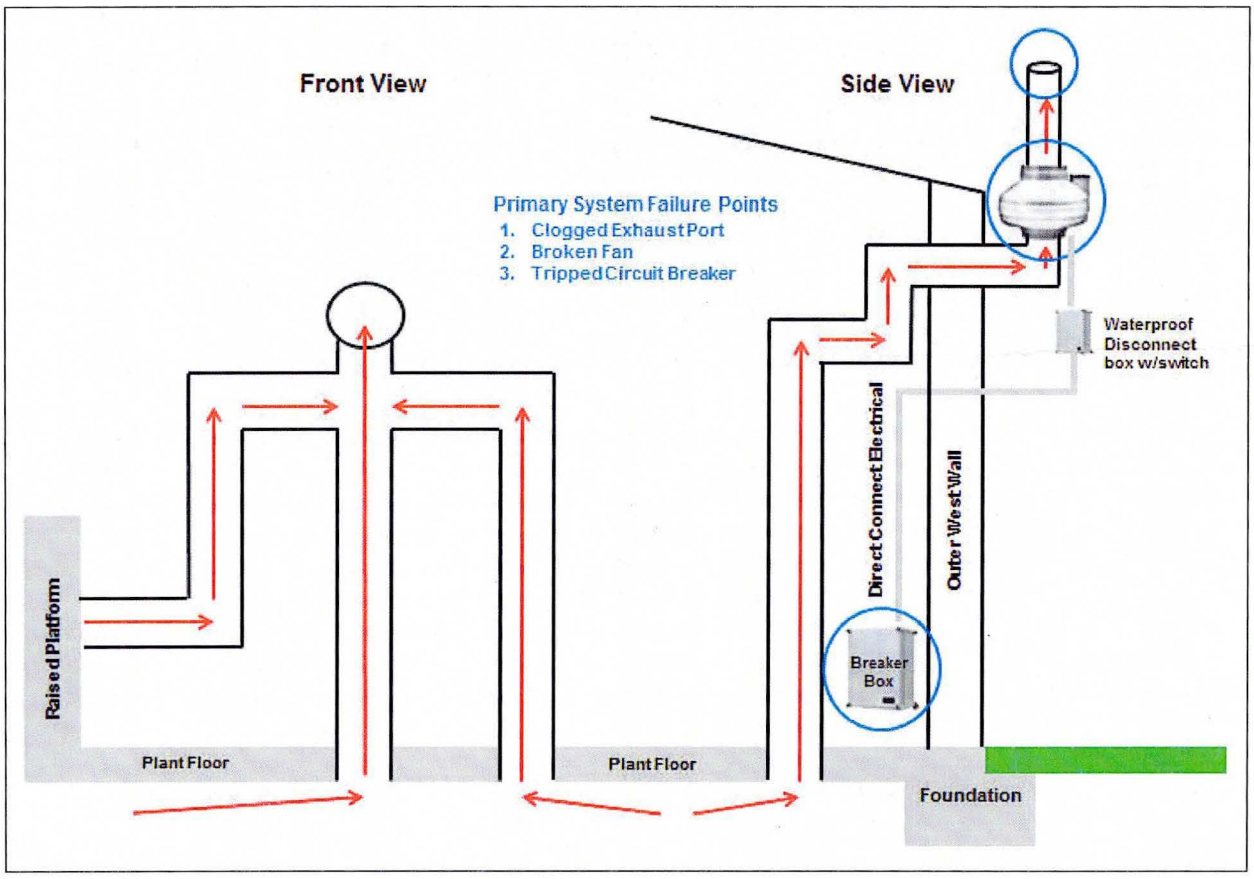
The Vapor Mitigation System is located in the southwest corner of the building (see VMS Location Diagram on page 4). Three 5" sub slab draw-points were bored through the interior cement floor of the building to expose sub-soil materials. These draw-points are placed as follows - one through the wall of the raised platform area, and two through the floor adjacent to the west factory wall, approximately 12" – 15" from the wall/foundation. The entire system is constructed of 4" Schedule 40 PVC material. The draw-points are connected by 4" risers that run vertical to a 4" manifold located on top of a ledge aproximately 7' off the floor. Another vertical riser runs from a central point in the manifold up approximately 3 feet and out through the sheet metal west wall to the exterior of the building. On the exterior of the building the vertical riser continues to a height of approximately 17'. The Vapor Mitigation

System is powered by a UL listed RadonAway RP265 fan (see Specification Sheet on page 9). A 45 degree 6" PVC angle is attached to the top of the fan to point the exhaust up and away from the building (see photos 1 – 6 on pages 5 - 9). **Note – the louvers to the left of the of the vertical exhaust riser shown on photo 5, page 9 are exhaust louvers/fans.** Power to the fan is supplied by a separate 20 amp circuit that is hard-wired to a weatherproof disconnect box/switch. An Easy Read Dynameter Manometer is installed on one of the draw point risers to measure sub-slab vacuum pressure (see below). The VMS is currently at .6WC on 4" pipe, which equate to about 290cfm. The concrete floor is in good sound condition. All cracks or gaps in the concrete floor that may affect the efficiency of the system or cause back drafting were filled.

Post VMS testing completed by Key Engineering and RMES shows excellent sub-slab communication. The "area of influence" of the system is approximately +3,500 sq. ft. or 35' to 40' from each draw point (see attached APPENDIX A).



VMS Design Diagram



Failure/Monitoring Points

There are three primary potential areas where system failure can occur noted by the blue circles in the above VMS Design Diagram. 1) The external exhaust port could become clogged by debris; 2) The system fan could fail; 3) The circuit breaker could be tripped for some reason.

VMS Location Diagram

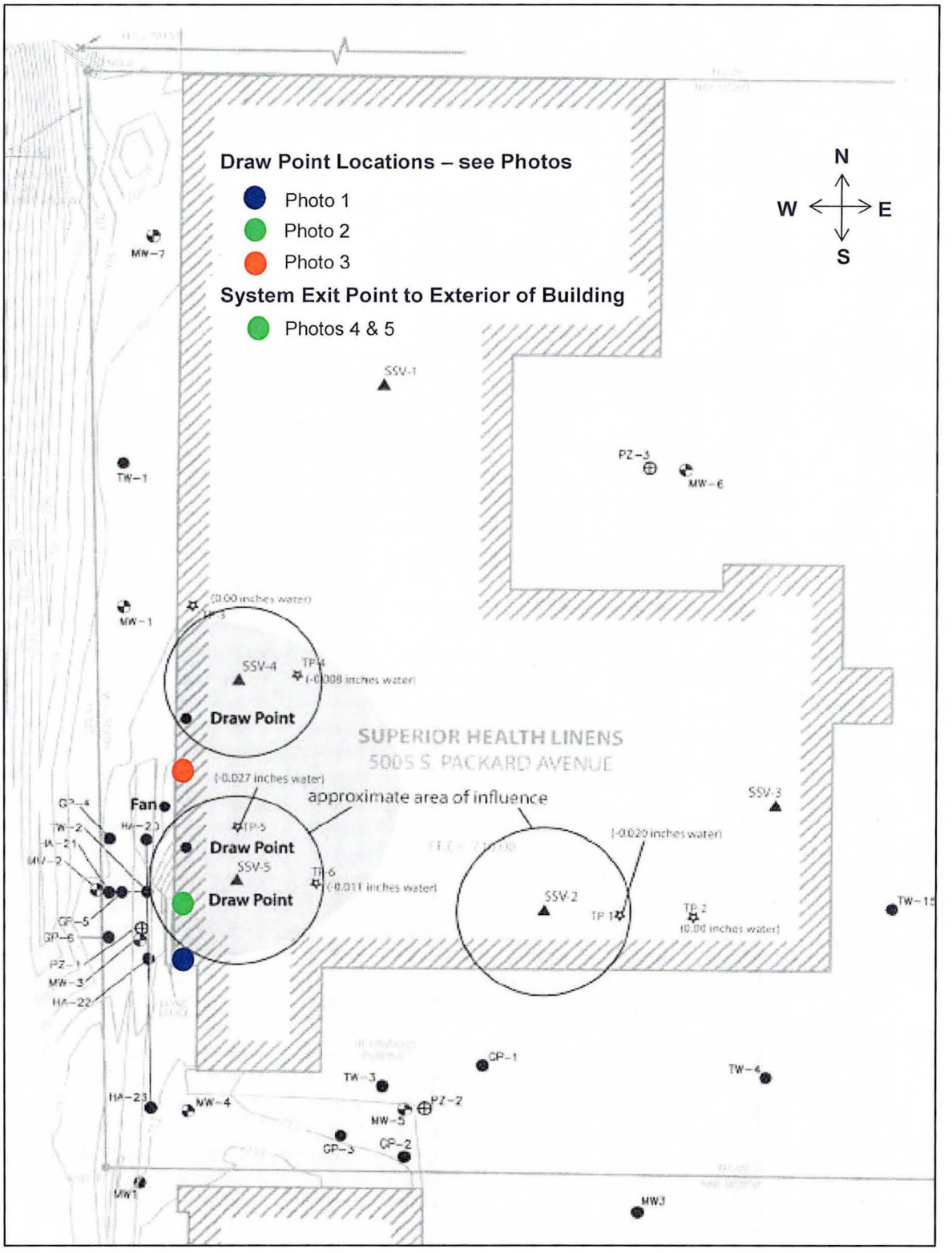


Photo 1

Photo 2

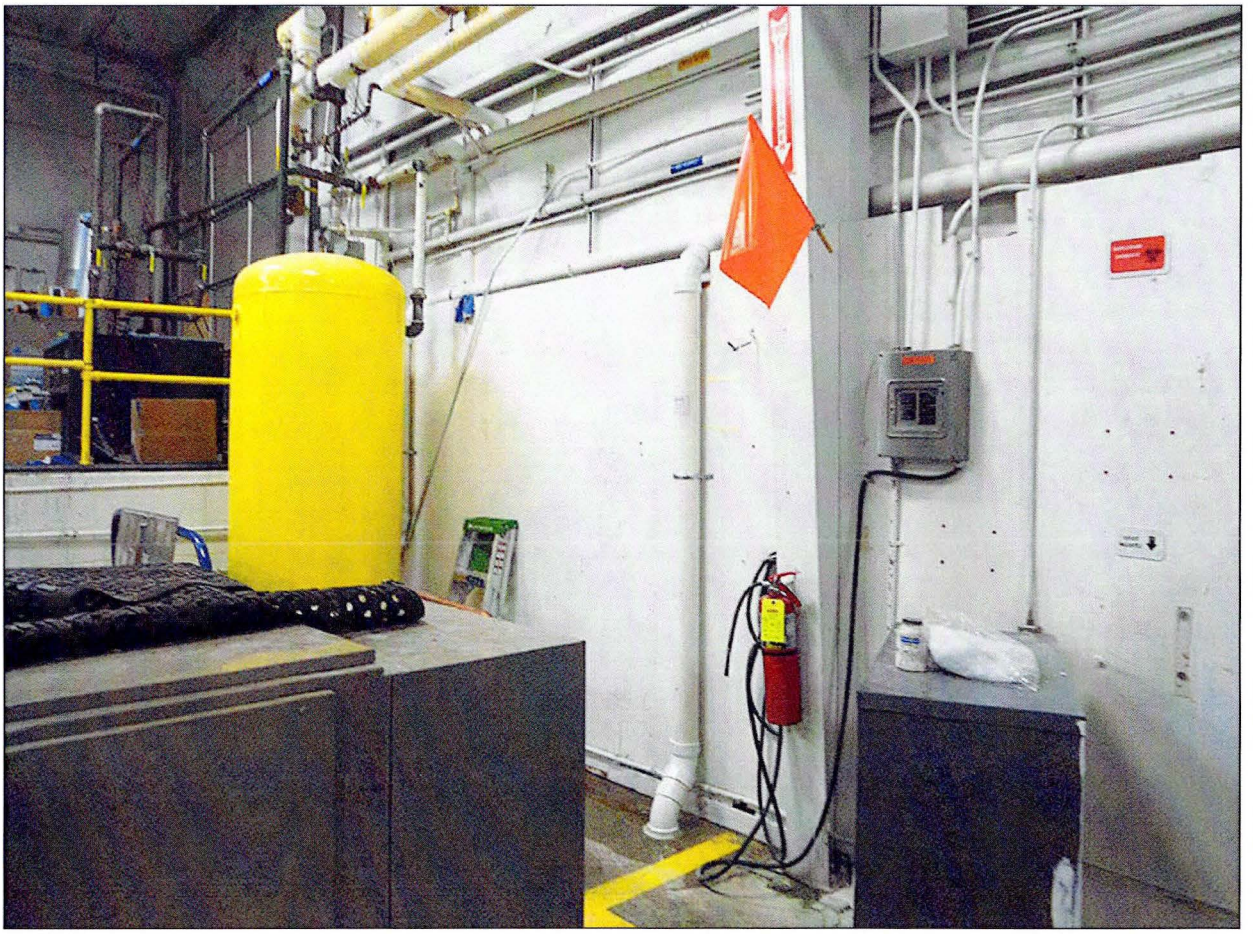


Photo 3

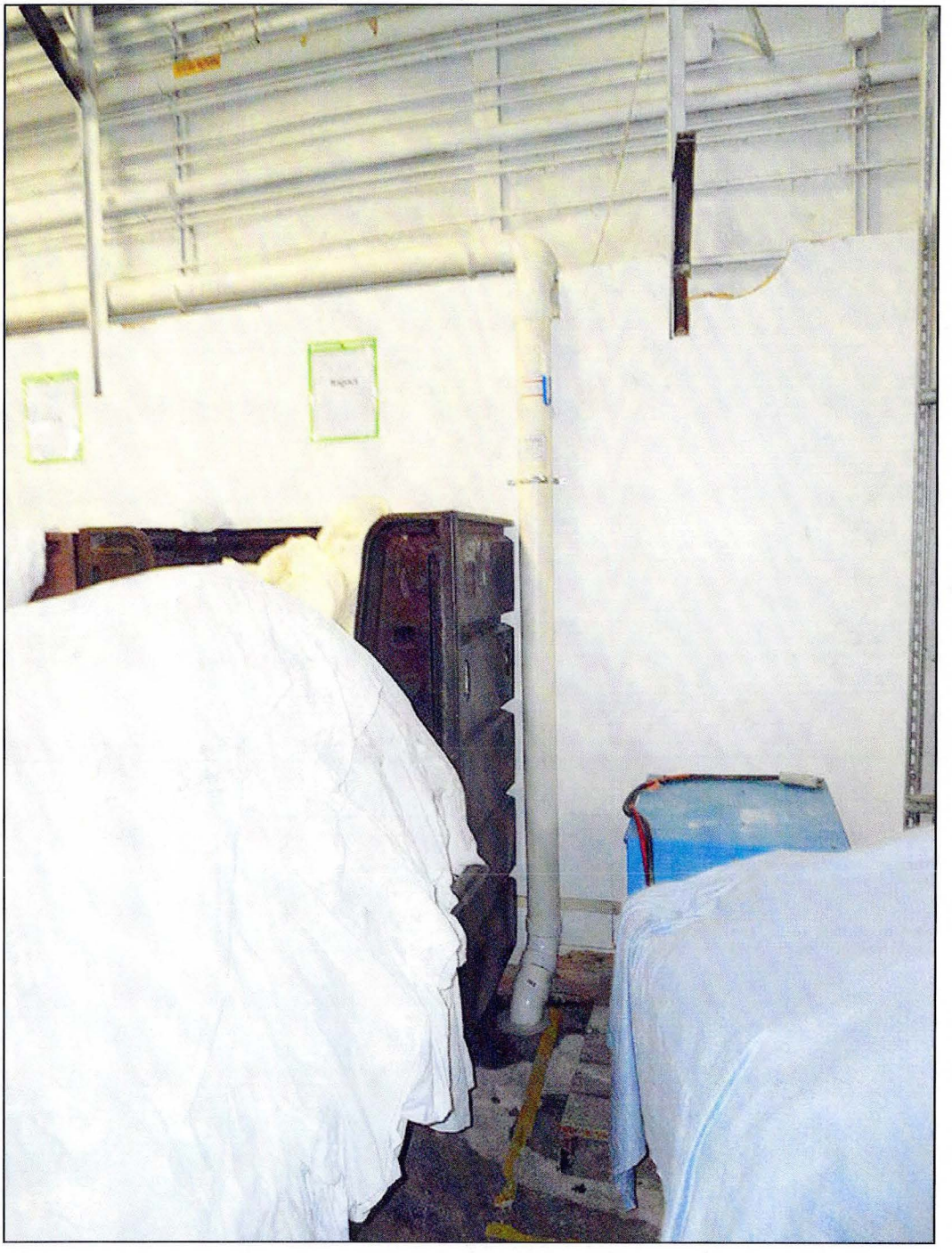


Photo 4

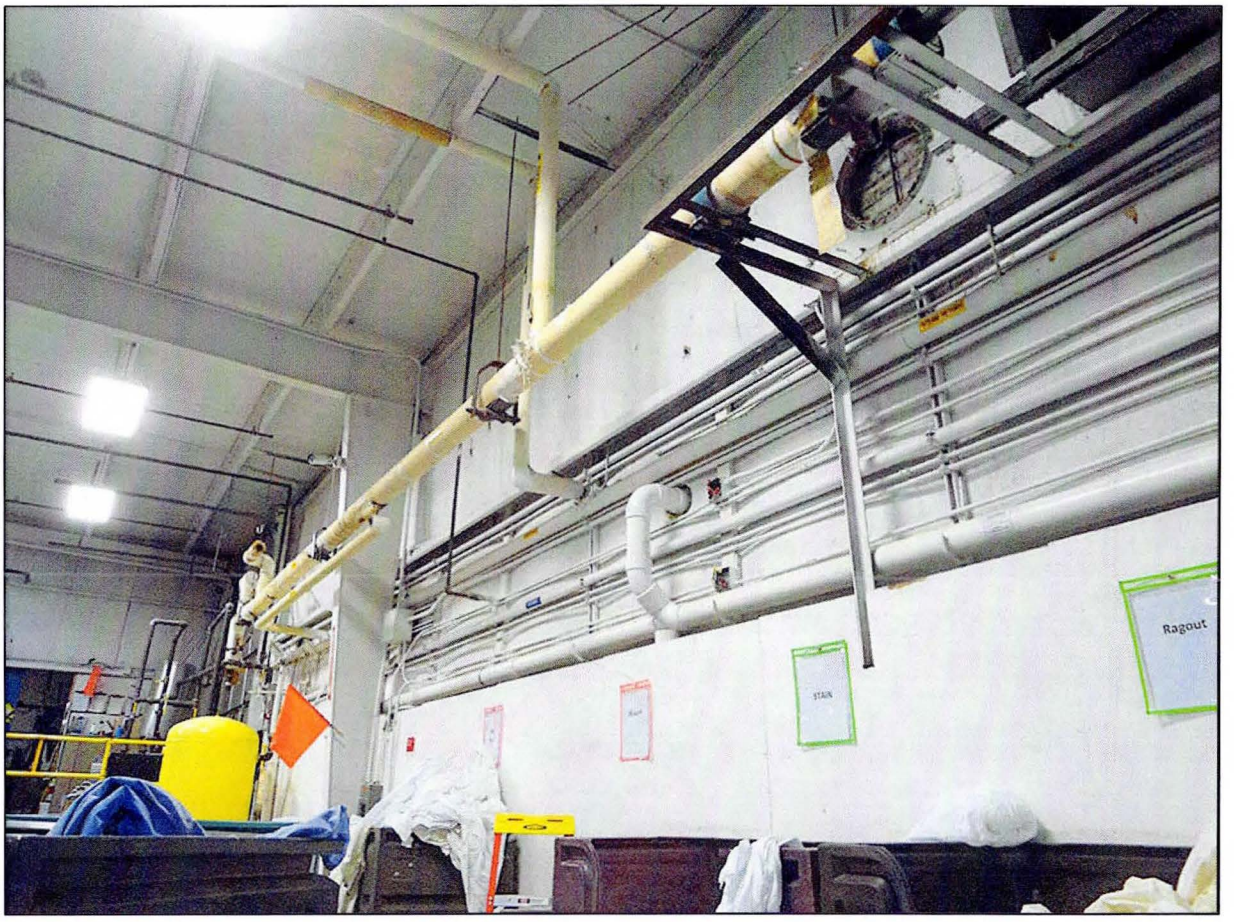


Photo 5

Note: louvers shown to the left of the vertical riser are exhaust louvers/fans

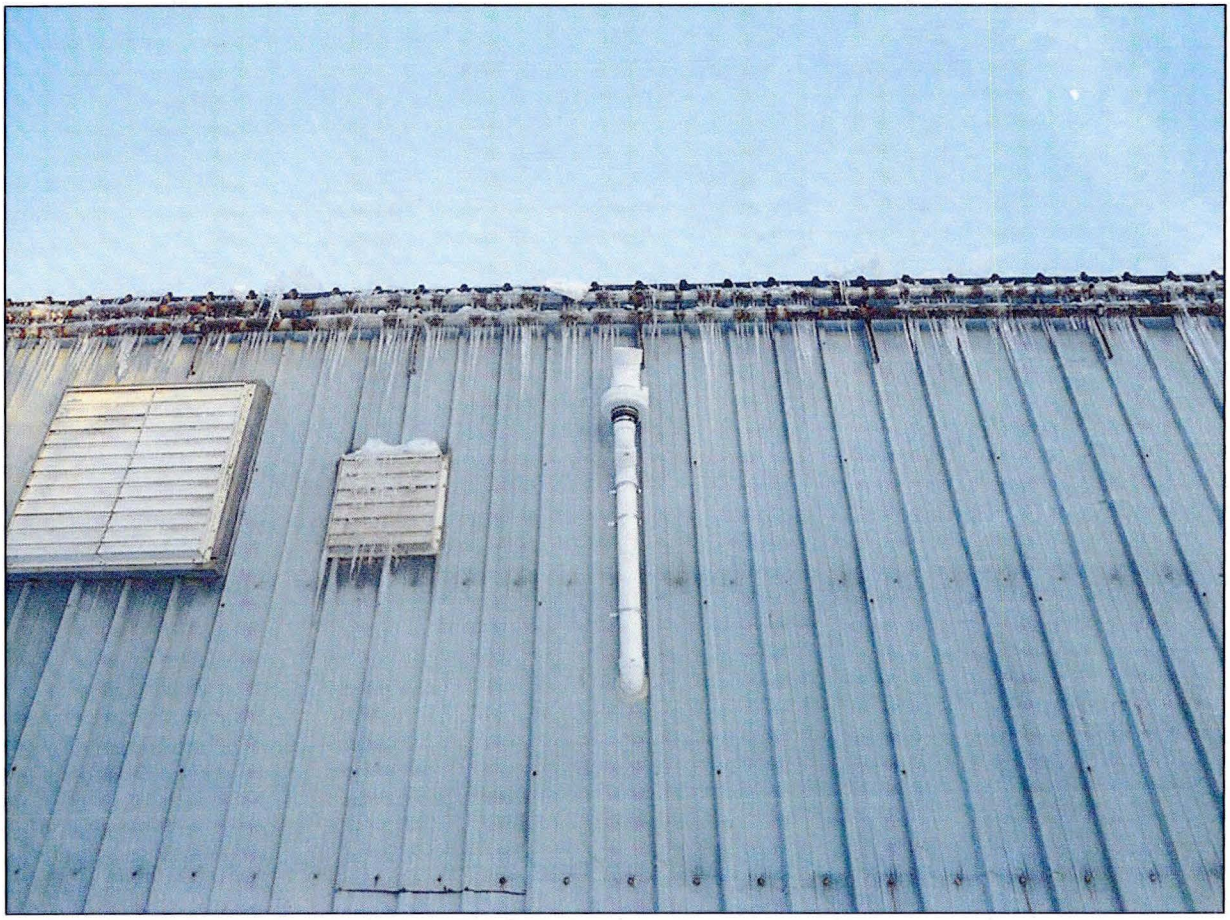
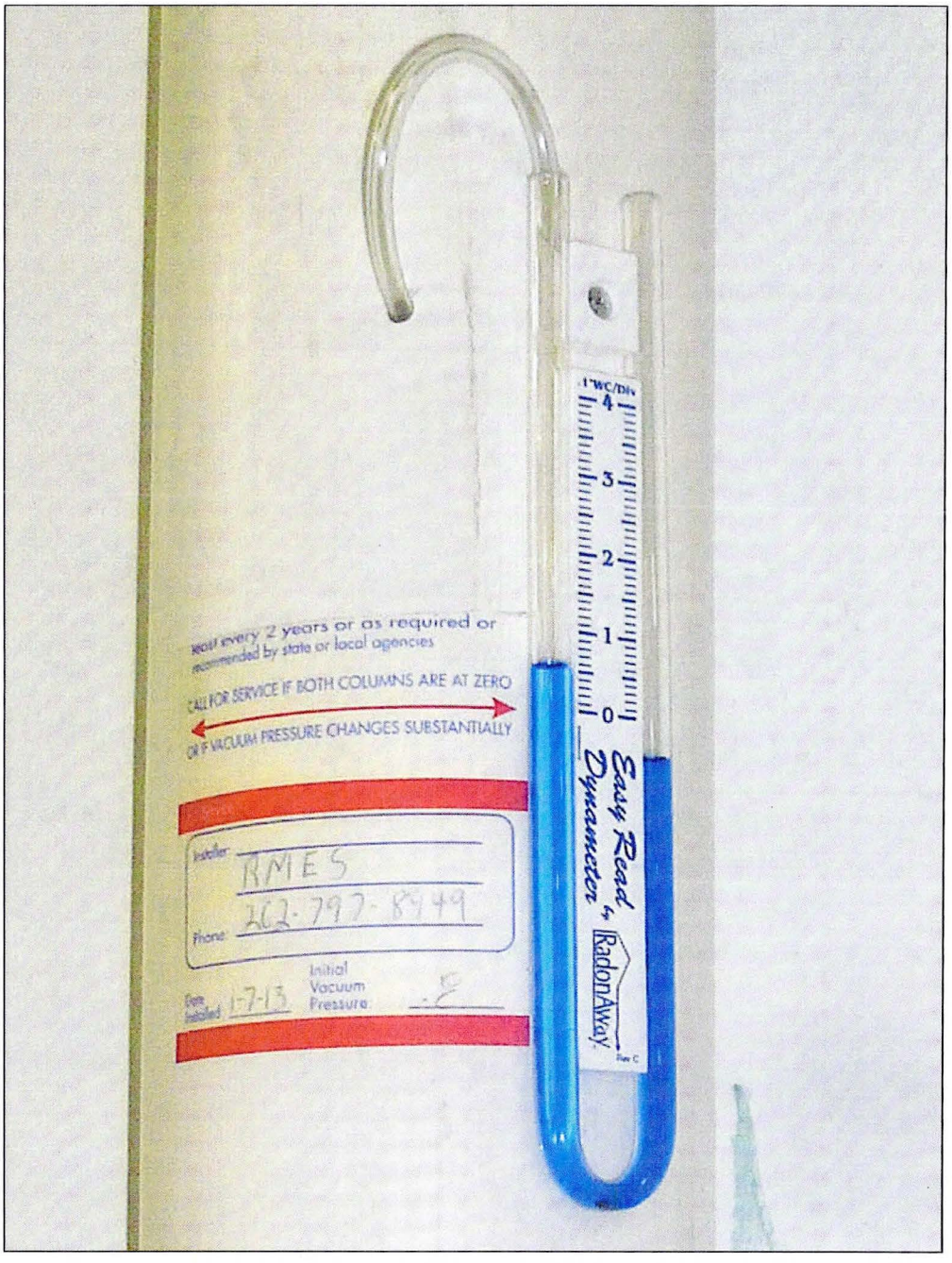


Photo 6

Manometer Installed on draw tube 3 as shown in Photo 3



3. VMS Maintenance

Required Maintenance of the VMS Fan/Blower

According to the manufacturer of the fan, there is no periodic maintenance required. The fan is an industrial model designed for exterior use. The motor is thermally protected. The fan body seams are sealed to inhibit vapor leaks and water intrusion, and the fan utilizes a water-hardened motorized impeller (see Fan Specification Sheet on page 12). The remaining elements of the system (PVC piping & electrical system) also do not require periodic maintenance.

Required Floor Maintenance

During the quarterly inspection of the system, the plant floor in the "area of influence", defined as 35' to 40' from the draw points, must also be inspected to make sure old and new cracks are sealed. Maintenance of the cracks will be logged on the SHL VMS Inspection Log Sheet shown below.

Reassess the VMS System Due to Changes in the Use of the Space

Vapor intrusion tests of the facility were done using both high and low volume testing methods throughout the plant. These tests were performed during February, the coldest month of the year in Wisconsin when the plant was completely closed up and the HVAC systems were operating (plant overhead door are open during the spring, summer and fall). In the high volume test, negligible CVOC were detected at each of the test points. In the low volume test, one of the test points in the southwest corner of the plant registered CVOC slightly higher than WDNR guidelines which is what precipitated installing a VMS. Based on these facts, we feel strongly that changes in use of the facility space would not require a reassessment of vapor intrusion or the Vapor Mitigation System.

System Changes/Removal

In case of the need for system removal or replacement, a written request to and a formal written approval document from the WDNR would be required prior to system removal. If removal or replacement is approved the sub-slab vapor will need to be reassessed and sub-slab vapor testing will be required.

Note: All maintenance and changes to the SHL Vapor Mitigation System will be logged in the Inspection and Maintenance Log, WDNR Form 4400-305

Fan Specification Sheet

RadonAway™
The world's leading radon fan manufacturer

RP Series

Radon Mitigation Fan

All RadonAway™ fans are specifically designed for radon mitigation. RP Series Fans provide superb performance, run ultra-quiet and are attractive. They are ideal for most sub-slab radon mitigation systems.

Features

- Energy efficient
- Ultra-quiet operation
- Meets all electrical code requirements
- Water-hardened motorized impeller
- Seams sealed to inhibit radon leakage (RP140 & RP145 double snap sealed)
- RP140 and RP260 Energy Star® Rated
- ETL Listed - for indoor or outdoor use
- Thermally protected motor
- Rated for commercial and residential use

MODEL	P/N	FAN DUCT DIAMETER	WATTS	MAX. PRESSURE"WC	TYPICAL CFM vs. STATIC PRESSURE WC				
					0"	.5"	1.0"	1.5"	2.0"
RP140*	23029-1	4"	15-21	0.8	135	70	-	-	-
RP145	23030-1	4"	41-72	2.1	166	126	82	41	3
RP260*	23032-1	6"	50-75	1.6	272	176	89	13	-
RP265	23033-1	6"	91-129	2.3	334	247	176	116	52
RP380*	28208	8"	95-152	2.3	497	353	220	130	38

*Energy Star® Rated

Made in USA with US and imported parts

ETL Listed

All RadonAway inline radon fans are covered by our 5-year, hassle-free warranty

Model	A	B	C
RP140	4.5"	9.7"	8.5"
RP145	4.5"	9.7"	8.5"
RP260	6"	11.75"	8.6"
RP265	6"	11.75"	8.6"
RP380	8"	13.41"	10.53"

For Further Information Contact

9/12
P/N 02008

4. System & Plant Floor Inspection

The Vapor Mitigation System installed at 5005 South Packard Avenue is a very simple system. The only mechanical part of the system is the fan that draws air from the sub slab entry points shown in the VMS Design Diagram (page 3), System Location Diagram (page 4) and Photos 1, 2, & 3 (pages 5 – 7). Verification of an active and working system is also very easy and straightforward. In addition to making sure the VMS is operating properly, the plant floor will also be inspected to make sure that existing cracks and any new cracks are sealed properly. Cracks in the floor could reduce the effectiveness of the VMS.

System Operation Verification

Step 1 – Inspect the plant floor in the "area of influence" (35' to 40' from each of the draw points for unsealed cracks. If cracks are found, seal them with a high grade silicon sealer.

Step 2 - Inspect the Manometer to verify the system is maintaining negative sub slab pressure to .6 WC as shown on page 2. **If negative pressure is maintained, the system is operating properly.**

Step 3 (if required) - If the Manometer does not show negative sub slab pressure of 0.6 WC check to make sure there is power to the fan by checking the circuit breaker. The fan is hard-wired directly to the fan and an on its own circuit. If the breaker is tripped, reset the breaker and make sure the system is operating properly by checking the Manometer for negative sub slab pressure. If the breaker immediately trips again, check the electrical circuit for a faulty breaker or possible short in the system. Once the electrical problem has been isolated and repaired, check the operation of the system by checking the Manometer for negative sub slab pressure.

Step 4 (if required) - If the breaker is not tripped check the operation of the fan located on the exterior of the building (see photo 5 on page 9). If the fan is not operating properly check to make sure the cutoff switch on the waterproof box is in the on position. If there is power to the fan then the issue is with the fan. Replace the fan with one of similar specification shown on page 12.

Step 5 (if required) - If the fan is operating properly then inspect the vent stack to make sure nothing has blocked or prevented the sub slab air from being evacuated.

Inspection Frequency

The operation of the Vapor Mitigation System will be checked quarterly at the beginning of the month (March 1st, June 1st, September 1st, and December 1st) by the maintenance staff employed by Superior Health Linens (SHL).

An annual visual inspection of the system will also be performed. All areas of the system including the concrete floor, sub-slab entry points, riser pipe joints and piping will be inspected for cracking, defect or general deterioration.

Should any obvious damage to the system be observed during inspection and/or if the system is no longer functioning, repair of the damaged components must be completed immediately.

An inspection log listing key inspection items such as inspector, date, items inspected, state of the system, parts replaced, repairs needed and when follow up was completed must be filled out during each inspection and maintained on-site and available for viewing by all interested parties. If any problem(s) with the system is identified in 2 or more successive inspections SHL maintenance personnel will notify the current owners of the property (William Nicklas & James Baumgartner) at that time. The owners will in turn notify the Remediation & Redevelopment Program Case Manager at the Wisconsin Department of Natural Resources (WDNR). The form used will be the WDNR Inspection and Maintenance Log – Form 4400-305.

5. Notifications

Where changes in land or property use or system changes are required to be reported, include contact names, phone numbers and email addresses for the DNR/agency with administrative authority

Doug Cieslak & Michele Norman
Remediation & Redevelopment Program Case Manager
Wisconsin Department of Natural Resources
2300 N. Drive Martin Luther King Drive
Milwaukee, WI 53212-3128

6. Contacts

Site Owner:	D & C Partners, LLP William J. Nicklas & James S. Baumgartner Partners W223 N7858 Cherry Hill Road Sussex, WI 53089
Building Lessee:	Superior Health Linens, Inc. Greg Schermerhorn Chief Operating Officer 5005 South Packard Ave. Cudahy, WI 53110
Consultant:	Key Engineering Group D'Arcy J. Gravelle, CPG, P.G. Vice President Environmental Division 735 North Water Street, Suite 510 Milwaukee, WI 53202
Regulatory Authority:	Remediation& Redevelopment Program Case Manager Wisconsin Department of Natural Resources 2300 N. Drive Martin Luther King Drive Milwaukee, WI 53212-3128

APPENDIX A

POST VMS INSTALLATION TESTING

On Sunday, May 17 2015 RMES, certified specialists in vapor elimination services in conjunction with Key Engineering Group conducted sub-slab vacuum pressure tests to determine the effectiveness of the VMS installed at 5005 South Packard Ave, Cudahy Wisconsin, and to establish the "area of influence" of the system.

Summary

As noted in the Operations & Maintenance document, the system uses 3 sub-slab draw points that are connected to a manifold that exhausts to the west exterior of the building. The exhaust fan is generating 0.6WC on 4" pipe which equates to about 290cfm and provides a negative vacuum pressure "area of influence" of +3,500 sq. ft. The tests were conducted using an Alnor[tm] Micromanometer that measures down to 0.001 WC. **All of the vacuum pressure tests register negative sub-slab pressure – no positive pressure was recorded.**

The first series of tests were done at approximately 35' to 40' away from each of the draw points to establish the maximum range of effectiveness of the system. Subsequent tests were done at various locations closer to each of the draw points.

The following diagram shows the location of each of the sub-slab vacuum tests along with the corresponding pressure reading. A photo of the pressure reading for each test location is also included.

RMES

Radon Measurement &
Elimination Services

Saving Lives One Family At A Time

Bill Nicklas and Jim Baumgartner May 19, 2015
Superior Health Linens
5005 S. Packard Avenue
Cudahy, WI 53110

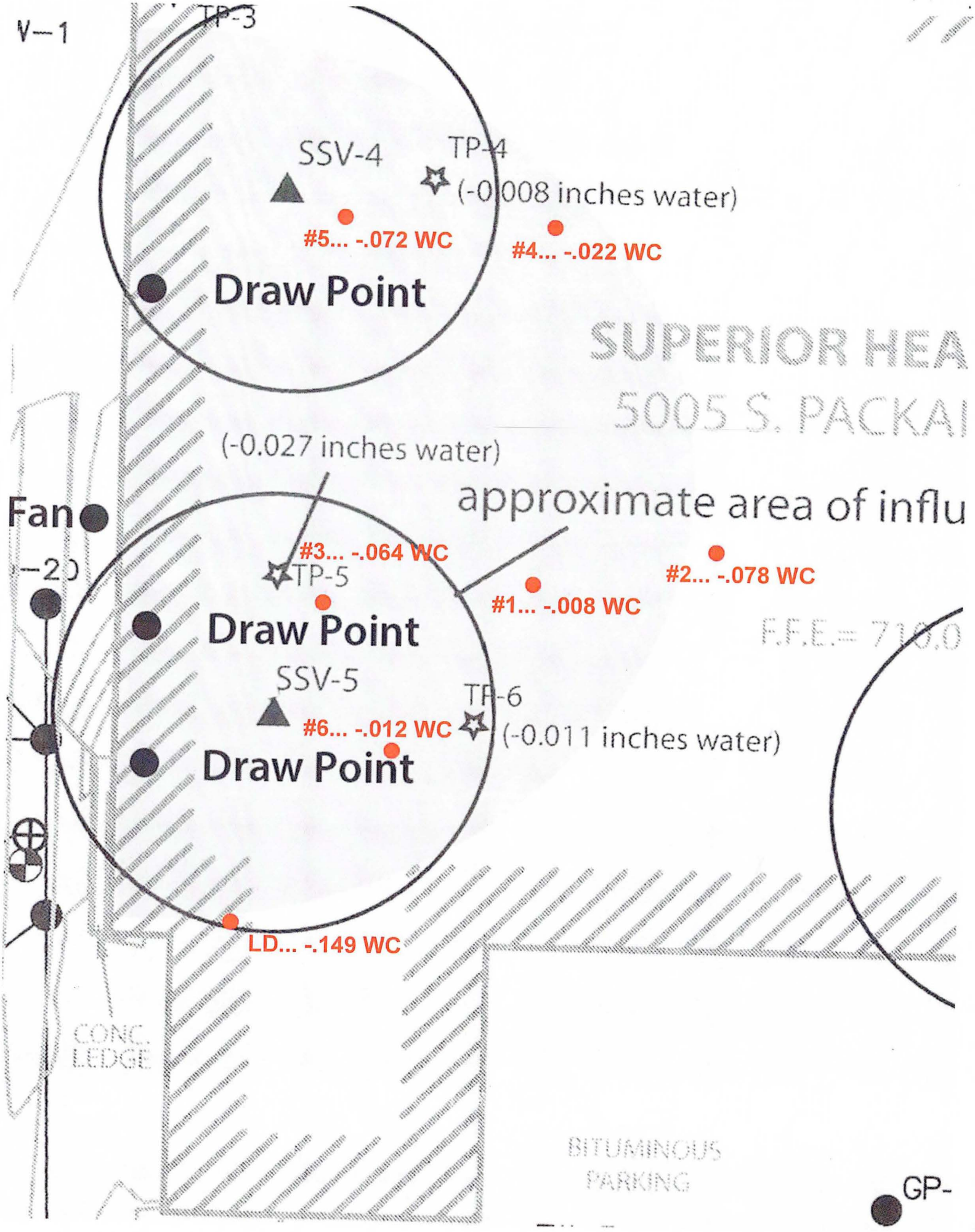
Gentlemen,
I've attached our site map of Superior Health Linens which illustrates a number of test points at your facility, demonstrating the effects of the vapor intrusion system we installed for you January 2014. Additionally, I've attached photos of our micro-manometer used, taken at each test location for back-up.

If you should have any questions about our testing methodology, or anything regarding the project in general, please let me know.

Sincerely,

Paul A. Nicholson
Cert.: 102417RT; 102418RMT

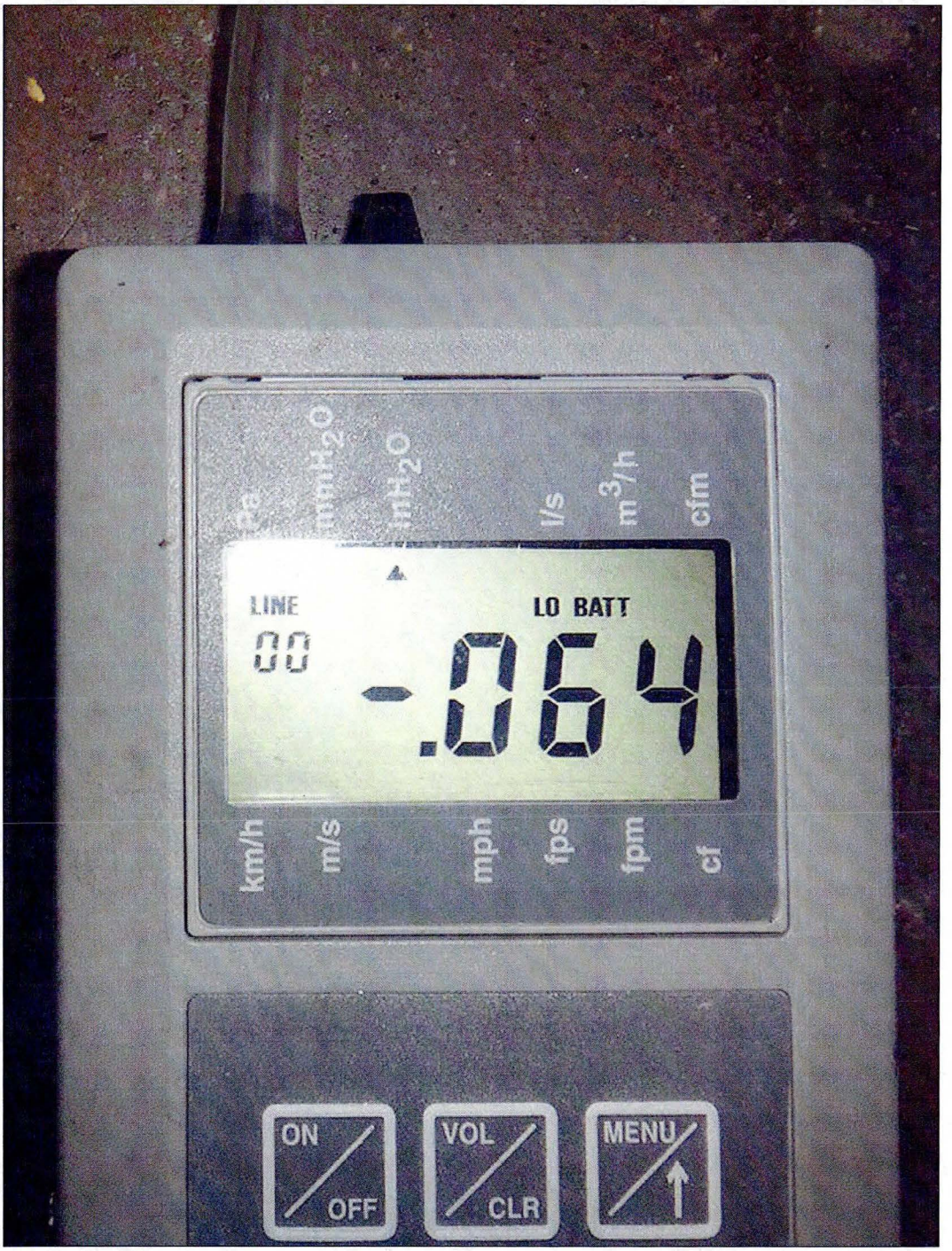
P.O. BOX 655 • ELM GROVE, WISCONSIN 53122-0655 • (262) 797-8949 • e-mail: rmes@wi.rr.com • www.rmeswi.com


V–1
TP-3
SSV-4
TP-4
(-0.008 inches water)
#5... -.072 WC
#4... -.022 WC
Draw Point
SUPERIOR HEA
5005 S. PACKAI
(-0.027 inches water)
approximate area of influ
Fan
–20
#3... -.064 WC
TP-5
#2... -.078 WC
#1... -.008 WC
Draw Point
F.F.E.= 710.0
SSV-5
TP-6
#6... -.012 WC
(-0.011 inches water)
Draw Point
LD... -.149 WC
CONC.
LEDGE
BITUMINOUS
PARKING
GP-

Test Point Photo #1

Test Point Photo #2

Test Point Photo #3



Test Point Photo #4

Test Point Photo #5

Test Point Photo #6

Test Point Photo #7