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3636 N. 124th Street
Wauwatosa, WI 53222

Feasibility Study and Design - Vapor Mitigation System
The Community Within the Corridor Development – East Block
Former Wisconsin Industries Pension Plan & Trust
2748 N 32nd Street, Milwaukee, WI 53208
BRRTS # 02-41-263675 FID 24102540010200

Submitted To:
Ms. Jennifer Dorman
Remediation and Redevelopment Program
Wisconsin Department of Natural Resources
2300 North Martin Luther King Drive
Milwaukee, WI, 53212

KSingh | Engineers Scientists Consultants

March 10, 2021

Ms. Jennifer Dorman
Remediation and Redevelopment Program
Wisconsin Department of Natural Resources
2300 North Martin Luther King Drive
Milwaukee, WI, 53212

Project # 40420

Subject: **Feasibility Study and Design – Vapor Mitigation System**
The Community Within the Corridor Development (East Block)
Former Wisconsin Industries Pension Plan & Trust
2748 N 32nd Street, Milwaukee, WI 53208
BRRTS # 02-41-263675 FID 241025400

Dear Ms. Dorman:

On behalf of the Community Within the Corridor Limited Partnership, K. Singh & Associates, Inc. (KSingh) submits this Feasibility Study and Design for a Vapor Mitigation System for the referenced site. This study has been prepared to supplement the Technical Assistance Request / Post-Closure Modification for the referenced facility.

If we can be of further assistance in discussing this report with you, please contact us.

Sincerely,

K. SINGH & ASSOCIATES, INC.

Robert T. Reineke, P.E.
Project Manager

Pratap N. Singh, Ph.D., P.E.
Principal Engineer

cc: Mr. Shane LaFave / Roers Companies
Mr. Que El-Amin / Scott Crawford, Inc.

FEASIBILITY STUDY AND DESIGN – VAPOR MITIGATION SYSTEM

THE COMMUNITY WITHIN THE CORRIDOR DEVELOPMENT (EAST BLOCK)
FORMER WISCONSIN INDUSTRIES PENSION PLAN & TRUST
2748 N 32ND STREET, MILWAUKEE, WI 53208
BRRTS # 02-41-263675 FID 241025400

MARCH 10, 2021

PREPARED BY

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PROJECT #40420

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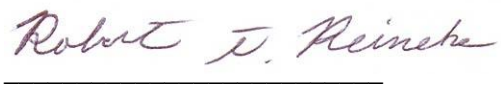
FEASIBILITY STUDY AND DESIGN – VAPOR MITIGATION SYSTEM

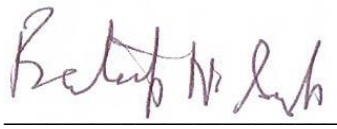
THE COMMUNITY WITHIN THE CORRIDOR DEVELOPMENT
FORMER WISCONSIN INDUSTRIES PENSION PLAN & TRUST
2748 N 32ND STREET, MILWAUKEE, WI 53208
BRRTS # 02-41-263675 FID 241025400

MARCH 10, 2021

I, Robert Reineke, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.



I, Pratap Singh, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.



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EXECUTIVE SUMMARY

The Community Within the Corridor Limited Partnership has purchased the property located at 2748 N 32nd Street and has initiated detailed planning and engineering for a mixed residential, retail, and commercial facility, known as the Community Within the Corridor. The East Block property, located at 2748 N 32nd Street, is 4.16 acres in size. The existing property and building is a former Briggs and Stratton manufacturing facility.

Project Background

The Community Within the Corridor Limited Partnership is proposing to redevelop the property into a mix of affordable housing, commercial spaces, and other amenities. The proposed development includes the following: The Corridor Lofts (64 Units), Creme City Lofts (36 Units) & 30 Square Townhomes (6 Units) and the Briggs Apartment Homes (91 Units) and a Community Service Facility which will include early childhood education, Science, Technology, Engineering, Art & Math after school programming, a health club (Basketball, Volleyball & Futsal, Skatepark), laundromat and a petite grocery store. The property has been rezoned Industrial Mix to facilitate development of the project.

No demolition of existing buildings is planned. The building interiors will be renovated and reconfigured. A ramp will be constructed to utilize the basement as a parking garage. Paved areas will be milled and paved or have pavement removed, be regraded, and then restored with asphalt.

The property was previously investigated and granted Case Closure with continuing obligations as an industrial property under BRRTS # 02-41-263675. KSingh was retained to perform environmental consulting services for the redevelopment of the property. Following a Phase I Environmental Site Assessment, a Phase II Environmental Site Assessment, and Sub-Slab Vapor Sampling Memorandum, a Post-Closure Modification Request was submitted to the WDNR on July 8, 2020. Following submission of the Post-Closure Modification Request, KSingh performed a Sub-Slab Vapor Investigation of the building.

The findings from the sub-slab vapor sampling activities are described as follows:

- Contamination related to chlorinated solvents consisting of TCE, Vinyl Chloride, 1,1,2-Trichloroethane, 1,1-Dichloroethane, 1,4-Dichlorobenzene, and/or Benzyl Chloride exceeds Residential VRSLs and/or Large Industrial / Commercial Building VRSLs below much of the building.
- TCE is the most widespread contaminant of concern under the building and is associated with past industrial uses of the facility.
- Petroleum VRSL exceedances are located in the northeast portion of the building and are associated with the previously closed Leaking Underground Storage Tank case.

Based on the Sub-Slab Vapor Investigation, it was determined by the WDNR that a vapor mitigation system would be required for the facility in addition to the construction and maintenance of engineered barriers.

Pressure Field Extension Test

To design a Sub-Slab Depressurization System for the facility, KSingh installed nine (9) vapor extraction points throughout the facility and then performed Pressure Field Extension testing on seven of the nine points.

Upon completion of PFE testing, negative pressure measurements were tabulated in a semi-log plot to determine the radius of influence observed at each extraction point to -0.004 inH_2O (or 1 Pascal). The calculated radii of influence are as follows:

- VE-3 – 10.44 feet
- VE-4 – 10.36 feet
- VE-5 – 10.75 feet
- VE-6 – 30.93 feet
- VE-7 – 10.29 feet
- VE-8 – 20.16 feet
- VE-9 – 10.71 feet

Based on the PFE data, a vacuum of 44 inches of water is required in order to achieve adequate radius of influence.

Recommended Sub-Slab Depressurization System

The following recommendations are made for the installation of a Sub-Slab Depressurization System.

Based on the estimated radius of influence for 6-inch diameter extraction points under 44 inches of water vacuum for various areas of the buildings, a system was designed for the building. The sub-slab depressurization / soil vapor extraction system will consist of three (3) 6-inch diameter extraction points and four (4) extraction trenches containing 4-inch diameter slotted piping are proposed for the sub-slab depressurization system. Exhaust points will be at least 24 inches above the roof line and 12 feet from any window.

A Radonaway HS5000 fan, or equivalent, is proposed for vapor extraction points. Based on the blower size calculations, the following extraction rates are recommended at 44 inches of water column vacuum.

Storage Area – 35 Standard Cubic Feet Per Minute (SCFM)
Garage Area – 150 SCFM
Gymnasium Area – 85 SCFM
Residential / Commercial Area – 115 SCFM
Total Blower Capacity – 385 SCFM

Startup testing will be required before occupancy of the building. As part of start up testing, exhaust air samples will be collected for permitting purposes.

Following completion of construction of the engineered barriers and commissioning of the vapor mitigation systems, a Remedial Action Documentation Report will be submitted for the project. Maintenance plans for the engineered barriers and vapor mitigation systems will be submitted as part of the Post-Closure Modification Process with the Remedial Action Documentation Report. Regular inspection and maintenance will be part of Continuing Obligations for the engineered barriers and vapor mitigation systems and will continue indefinitely into the foreseeable future.

SECTION I. BACKGROUND INFORMATION

1.1 Introduction

On behalf of the Community Within the Corridor Limited Partnership, K. Singh & Associates, Inc. (KSingh) was retained to update the Post-Closure Modification Request and Remedial Action Plan (RAP) for the property located at 2748 North 32nd Street, City of Milwaukee, Milwaukee County, Wisconsin.

This report describes the plan for the remediation of the environment to comply with state and federal laws to the extent practicable. The preferred remedial action considers the site and contaminant characteristics, surrounding environment, cleanup goals, and costs. The RAP has been developed in accordance with Wisconsin Department of Natural Resources (WDNR) Administrative Code NR 722, Standards for Selecting Remedial Actions.

1.2 Site Description and Location

The Community Within the Corridor Limited Partnership has purchased the property located at 2748 N 32nd Street and has initiated detailed planning and engineering for a mixed residential, retail, and commercial facility, known as the Community Within the Corridor. The East Block property, located at 2748 N 32nd Street, is 4.16 acres in size (1). The existing property and building is a former Briggs and Stratton manufacturing facility. A collection of interconnecting buildings cover the industrial property covering over 300,000 square feet. A topographic map of the project area is depicted as Figure 1. A site layout / aerial of the site is shown on Figure 2.

The subject property is described as:

Address: 2748 N 32nd Street, City of Milwaukee, WI 53208
Location: Southwest ¼ of the Northeast ¼ of Section 13, Township 7 North, Range 22 East
WTM91 Coordinates: X Coordinate: 686613 Y Coordinate: 290511
Latitude: 43.0690139 Longitude: -87.9536164
Parcel Number: 3091206000

The overall topography of the site area slopes to the west and the south towards 32nd Street and West Center Street. Elevation at the project site ranges between 686 and 673 feet mean seal level (MSL). Surface water collects in storm sewers on and surrounding the site and also infiltrates the grassy areas in the eastern and southern portions of the site. Groundwater flows to the southeast based on groundwater monitoring data collected during the site investigation.

1.3 Proposed Project Plans

The Community Within the Corridor Limited Partnership is proposing to redevelop the property into a mix of affordable housing, commercial spaces, and other amenities. The proposed development includes the following: The Corridor Lofts (64 Units), Creme City Lofts (36 Units) & 30 Square Townhomes (6 Units) and the Briggs Apartment Homes (91 Units) and a Community Service Facility which will include early childhood education, Science, Technology, Engineering, Art & Math after school programming, a health club (Basketball, Volleyball & Futsal, Skatepark), laundromat and a petite grocery store. The property has been rezoned Industrial Mix to facilitate development of the project.

No demolition of existing buildings is planned. The building interiors will be renovated and reconfigured. A ramp will be constructed to utilize the basement as a parking garage. Paved areas will be milled and paved or have pavement removed, be regraded, and then restored with asphalt.

Properties to the west at 3212 W Center Street, 2727 N 32nd Street, and 2758 N 33rd Street will also be part of the development, identified as the West Block, but do not require a Post-Closure Modification.

1.4 Property Owner and Responsible Party Information

Property contact information and the requester of the Post Closure Modification is as follows:

Roers Companies
Attn: Mr. Shane LaFave
110 Cheshire Lane, Suite 120
Minnetonka, MN 55305
Office: (763) 285-8795
Cell Phone: (763) 300-1861
shane@roerscompanies.com

1.5 Consultant Information

The project manager for the site investigation is:

Mr. Robert Reineke, P.E.
K. Singh & Associates, Inc.
3636 North 124th Street, Wauwatosa, WI 53222
(262) 821-1171 ext. 111
rreineke@ksinghengineering.com

1.6 Regulatory Status of Site

The Site is regulated under the NR 700 Wisconsin Administrative Code (WAC) for the investigation and remediation of environmental contamination. The WDNR was notified of a release on the property on January 11, 2002 on behalf of the Wisconsin Industries Pension Plan and Trust. Soil, groundwater, and indoor air were investigated before Case Closure was granted (2). According to the WDNR's August 26, 2018 Final Case Closure letter, several continuing obligations were noted for the site.

As part of the sale of the property and to comply with Continuing Obligations for the redevelopment of the property, several additional environmental investigations have been conducted. A Phase I Environmental Site Assessment (ESA) was prepared for the development on March 10, 2020 (3). Recognized Environmental Conditions (REC) were noted based on past industrial uses of the properties and surrounding properties.

A Post Closure Modification Request was submitted to WDNR on July 8, 2020 for development of the site into a mixed use residential / commercial property. The Post Closure Modification Request is currently in the review process with the WDNR.

1.7 Geologic and Hydrogeologic Characteristics

Geologic and hydrogeologic characteristics of the site were identified in KSingh's Phase II Environmental Site Assessment dated May 24, 2020 (4).

The subject site geology outside the building generally consists of:

- 4 feet of fill material;
- 2 to 6 feet of brown clay with some gravel and some sand at 10 feet below ground surface;
- 7 to 11 feet of gray silty clay with some gravel and little sand at 21 feet below ground surface;
- 2 feet of silty sand at 23 below ground surface;
- 4 feet of gray silty clay with gravel and cobbles at 27 feet below ground surface; and
- 2 feet of weathered dolomite at 32 feet below ground surface.

Groundwater flow at the subject property is to the south / southeast.

1.8 Summary of Nature and Extent of Vapor Contamination

Based on the Phase I ESA, a Phase II ESA investigation was performed in April 2020 consisting of 12 soil borings with four temporary wells.

In June 2020, an investigation was performed to analyze the sub-slab depressurization system (SSDS) and the present of contaminants in sub-slab vapors and indoor air. Two sub-slab vapor pins were installed for the purpose of collecting sub-slab vapor samples. Following indoor air and sub-slab vapor sampling, a series of test points were installed to determine the radius of influence of the existing SSDS.

The investigation found that indoor air complied with Vapor Action Levels for residential properties in the vicinity of the active SSDS. In addition, the west area, which is proposed to be developed into an underground parking garage, had sub-slab vapors which complied with all Vapor Risk Screening Levels (VRSLs) for residential properties. The east area, which is proposed to be developed into storage, had sub-slab vapor concentrations for 1,1-Dichloroethane, 1,2,4-Trimethylbenzene, and Trichloroethene (TCE) exceeding residential VRSLs (5).

Based on the findings of the sub-slab vapor investigation, a Post Closure Modification request was prepared (6). The Post Closure Modification request recommended repairs to the east area SSDS so that it could be maintained in operation. In addition, it was recommended to be submitted for the west area to be converted to utilize the air exchange system of the parking garage as a modified continuing obligation.

The WNDR requested a full vapor investigation of the facility during a conference call with CWC and KSingh on October 26, 2020. KSingh submitted a Site Investigation Work Plan on November 3, 2020, consisting of 51 sub-slab vapor (SSV) probes, and approved by the WDNR on December 2, 2020. KSingh had questions to the approval which were addressed by the WDNR with the following comments on December 11, 2020:

- Proposed SSV probes SS-4, SS-19, SS-25, and SS-37 may be moved closer to the nearest elevator pits.
- An assessment shall be conducted to determine whether utilities are acting as preferential mitigation pathways at the site. Locations of utilities in relation to known areas of contamination should be considered when conducting this assessment. The utility assessment may need to identify the need

for additional sampling locations. A figure indicating locations of all underground utilities should be provided with the investigation report.

- Passive air sampling in each of the site's four elevator pits is recommended to be performed. Passive air sampling may be performed after the results of the SSV sampling is known.
- It is understood construction activities within the building may facilitate abandonment of any SSV probe locations after installation. The WDNR recommends a minimum of one additional round of sampling after reconstruction is completed, any HVAC systems are installed and operating, and the building is under standard operating conditions. Less obtrusive vapor probe locations will be considered prior to additional sampling.

The results of Sub-Slab Vapor Sampling were submitted to the WDNR in a report dated January 8, 2021 (7). The following conclusions were arrived at following the sub-slab vapor investigation.

- Chlorinated solvents, Cyclohexane, Hexane, and petroleum constituents were detected under the existing building at concentrations exceeding Residential Vapor Risk Screening Levels (VRSLs) and/or Large Commercial / Industrial Building VRSLs.
- Contamination related to chlorinated solvents consisting of TCE, Vinyl Chloride, 1,1,2-Trichloroethane, 1,1-Dichloroethane, 1,4-Dichlorobenzene, and/or Benzyl Chloride exceeds Residential VRSLs in vapor points SS-1, SS-2, SS-3, SS-5, SS-6, SS-7, SS-10, SS-14, SS-18, SS-20, SS-23, SS-25, SS-26, SS-27, SS-28, SS-33, SS-34, SS-35, SS-36, SS-37, SS-38, SS-39, SS-42, SS-43, SS-45, SS-49, and SS-51.
- Contamination related to chlorinated solvents consisting of TCE, 1,1-Dichloroethane, and/or Benzyl Chloride exceeds Large Industrial / Commercial Building VRSLs in vapor points SS-2, SS-5, SS-18, SS-20, SS-25, SS-26, SS-27, SS-35, SS-36, and SS-41.
- Contamination related to Cyclohexane and/or Hexane was detected exceeding Residential VRSLs in vapor points SS-2, SS-5, SS-18, SS-39, and SS-41 and Large Industrial / Commercial Building VRSLs in vapor points SS-5 and SS-39.
- TCE is the most widespread contaminant of concern under the building and is associated with past industrial uses of the facility.
- Petroleum related contaminants consisting of Benzene, Ethylbenzene, Toluene, 1,2,4-Trimethylbenzene, 1,2,5-Trimethylbenzene, and/or Xylenes were detected exceeding Residential VRSLs in vapor points SS-2, SS-3, SS-5, SS-39, SS-41, and SS-43.
- Petroleum related contaminants consisting of Benzene, 1,2,4-Trimethylbenzene, and/or m&p-Xylenes were detected exceeding Large Industrial / Commercial Building VRSLs in vapor points SS-2, SS-5, and/or SS-39.
- Petroleum VRSL exceedances are located in the northeast portion of the building and are associated with the previously closed Leaking Underground Storage Tank case.
- There is no pattern suggesting that existing underground utilities are acting as preferential migratory pathways.
- Petroleum sub-slab vapors are associated with the existing LUST release.
- Other sub-slab vapor concentrations are associated with the history of industrial operations at the facility.

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Results of the SSV sampling are summarized in Table 1. SSV test results are shown on Figure 2. Vapor isoconcentration plumes for Residential and Large Commercial / Industrial Building VRSL exceedances of TCE, the main contaminant of concern, are shown on Figure 3.

SECTION II. PRESSURE FIELD EXTENSION TESTING AND PRELIMINARY DESIGN

2.1 Installation of Pressure Field Extension Extraction Points

A Pressure Field Extension Testing and Sub-Slab Depressurization System Feasibility Study Work Plan was prepared by KSingh and submitted to the WDNR on February 1, 2021. The work plan proposed installation of nine (9) pressure field extension extraction points throughout the facility.

Eight (8) pressure field extension extraction points, VE-1, VE-3, VE-4, VE-5, VE-6, VE-7, VE-8, and VE-9, were installed from February 16 to 18, 2021 using a three-inch diameter core drill. The locations of the extraction points are shown on Figure 4. Vapor extraction point VE-2 was established in a saw cut portion of the basement slab. The concrete slab thickness varied between 4 and 8.5 inches throughout the property.

Approximately three to five gallons of soil were removed from beneath the slab from vapor extraction points VE-4 to VE-9. One gallon of soil was removed from beneath the slab from vapor extraction point VE-3. No soils were removed from VE-1 and VE-2 as pressure field extension tests were not performed at those points.

No granular base course was observed underlying the concrete slab throughout the building. Extraction points VE-1 to VE-5 and VE-7 consist of clay directly below the concrete slab. Extraction point VE-6 consists of clay comingled with cobbles and gravel beneath the concrete slab. Extraction point VE-8 consists of clay with some concrete debris and charred wooden debris encountered directly beneath the concrete slab. Extraction point VE-9 consists of clayey sand directly beneath the concrete slab. Frozen soil conditions were observed at extraction point VE-3 and VE-8 on February 24, 2021.

2.2 Performance of Pressure Field Extension Test

KSingh conducted pressure field extension (PFE) testing at multiple extraction points on February 18 to 19, 2021. PFE was performed by connecting 3-inch schedule-40 PVC piping to each extraction point. The extraction point was then sealed with plumbers' putty to prevent pressure loss. Negative pressure points and flow points were installed in the piping. Locations where flow would be recorded were a minimum of 6 duct-diameters away from any bends or turns in the piping configuration to limit turbulent flow. A GP 501c series fan was connected to the 3-inch pipe. The fan's exhaust comprised of flex ducting which was ran to the nearest exit point of the facility to exhaust air outside the workspace. Any SSV probes within the vicinity would be utilized to collect negative pressure measurements during the testing. Additional points were also temporarily installed in 3/8-inch holes in increments of every five to ten feet from the extraction location to prevent data gaps, as practical. Once all negative pressure points were configured and/or installed, power was supplied to the fan and field measurements were recorded every ten minutes until a minimum of 45 minutes or when measurements or until measurements stabilized.

Locations VE-3 to VE-9 were tested. Extraction points VE-1 and VE-2 were ultimately not tested due to frozen ground conditions observed in the vicinity and past observances of high water columns in this section of the property.

A dual differential input digital manometer (TPI 621) with a 0.001 inches of water column (inH_2O) resolution was used to measure differential pressure in the subsurface. A thermo-anemometer (Dwyer 471B-1) capable of measuring an air velocity up to 6000 feet-per-minute (FPM) was used to measure flow velocity and temperature.

Photographs documenting the PFE testing are included in Appendix A. Data from the PFE testing is summarized in Appendix B. Vacuum contours of the tests are shown on Figure 5.

2.3 Pressure Field Extension Test Analysis

Upon completion of PFE testing, negative pressure measurements were tabulated in a semi-log plot to determine the radius of influence observed at each extraction point to -0.004 inH_2O (or 1 Pascal). Calculations and analysis of the PFE test are included in Appendix C. The calculated radii of influence are as follows:

- VE-3 – 10.44 feet
- VE-4 – 10.36 feet
- VE-5 – 10.75 feet
- VE-6 – 30.93 feet
- VE-7 – 10.29 feet
- VE-8 – 20.16 feet
- VE-9 – 10.71 feet

The typical CRM and static pressure recommended for the fan model chosen for the PFE testing (GP 501c) when using 3-inch diameter pipe is 3.8 inH_2O at 4 to 27 CFM. The actual static pressures observed during the PFE testing exceeded 3.8 inH_2O by 106 to 119 percent. The actual CFM readings observed during the PFE testing ranged from 10.3 to 37.9 CFM, somewhat greater than the recommended operating specifications. The increased static pressures and minor radii of influence observed during field testing support a hypothesis that the low permeable nature of surficial soils directly beneath the sub-slab are not favorable to sub-slab depressurization under the facility's current condition.

Another variable to consider from is temperature of the vapors extracted during PFE testing. Initial temperatures of extracted vapors during testing ranged from 25 to 45 degrees Fahrenheit. Frost was also observed within the surficial soils directly beneath the slab at extraction points VE-3 and VE-8, which may have intensified the degree of low permeability encountered.

Recommendations to mitigating low permeable soils include increasing vacuum and increasing the number of extraction points or utilizing vapor extraction trenches. Simply increasing vacuum to the system does not necessarily correlate with an increase to the radius of influence.

2.4 Selection of Piping and Fans for Sub-Slab Depressurization System

Based on the findings of the PFE test, piping friction losses will need to be minimized for optimal functioning of the system given the low permeable soils underlying the basement slab. KSingh is proposing a minimum 4-inch diameter pipe for the extraction points and extraction trenches, but preferably a 6-inch diameter pipe for optimal performance.

To achieve a minimum radius of influence of at least 20 feet from extraction points, 44 inches of vacuum must be maintained as shown in Appendix B. To maintain that vacuum, a Radonaway HS5000 fan, or equivalent, is proposed for vapor extraction points.

Given the large areas of influence, it is impractical to install individual extraction points in many areas of the building. Therefore, vapor extraction trenches are proposed for the storage area, garage area, gymnasium area, and residential / commercial area of the building. For each area, the vadose zone is estimated to be four feet below the slab. The air vapor porosity of each area is estimated to be 0.3. The U.S. Army Corp of Engineers recommends 5,000 pore volume exchanges for soil vapor extraction, although a highly volatile compound such as TCE may require fewer (8). To achieve sub-slab depressurization as well as to remediate soils in approximately four years, four pore volume exchanges per day, one every 360 minutes, is proposed for the system. Based on those assumptions, the required size of blowers were calculated in Table 2.

Based on the blower size calculations, the following extraction rates are recommended at 44 inches of water column vacuum.

Storage Area – 35 Standard Cubic Feet Per Minute (SCFM)
Garage Area – 150 SCFM
Gymnasium Area – 85 SCFM
Residential / Commercial Area – 115 SCFM
Total Blower Capacity – 385 SCFM

2.5 Proposed Extraction Points and Trenches for Sub-Slab Depressurization System

Based on the estimated radius of influence for 6-inch diameter extraction points under 44 inches of water vacuum for various areas of the buildings, a system was designed for the building. The sub-slab depressurization / soil vapor extraction system will consist of three (3) 6-inch diameter extraction points and four (4) extraction trenches containing 4-inch diameter slotted piping are proposed for the sub-slab depressurization system. The locations of extraction points, extraction trenches, and their associated radius of influence in relations to VRSL exceedances are shown on Figure 6. The extraction trenches, extraction points, related piping and details of the proposed system are shown on Figures 7 and 8. Exhaust points shall be vented at least 24 inches above the roof line and 12 feet from any window.

Due to the low permeability of surficial soils directly beneath the sub-slab of the facility, suction pits will be excavated to a minimum depth and width of 18-inches to ensure adequate vacuum at each extraction point. Excavated surficial soils will be removed from the facility and containerized for future disposal at a landfill. Each suction pit will be backfilled with 3/8-inch washed pea gravel to the bottom of the slab elevation. A 6-inch schedule-40 PVC pipe will be set within the approximate top 4-inches in each pit and extended up through the sub-slab.

The vertical extraction points may require trenching and installation of piping laterals from the extraction pits to the nearest column to construct the vertical extraction risers adjacent to columns or walls for minimal interference with future floor plans. Proposed vertical extraction pits are generally located approximately 5 to 10 feet away from columns and walls, rather than placing pits immediately adjacent to columns/footers, for optimal spacing to maximize the radius of vacuum influence for each pit. Placing the extraction pits immediately adjacent to columns/footings would require additional extraction points to achieve vacuum coverage across the slabs, and thereby increase the number and/or sizes of blowers/fans required.

Since trenching and installation of sub-slab piping is necessary, the proposed vertical extraction pits may be saw-cut 18 inches square and excavated by hand or using a mini-backhoe to 16-inch depth rather than installation using a concrete coring rig. A 6-inch diameter schedule 40 PVC lateral will be installed from top of pit to nearest column location. The PVC pipe will be stubbed up to 2 ft. above top of slab elevation and capped pending riser construction by the designated contractor. Trenches for horizontal collection will be sawcut with the horizontal collection pipe, 4-inch diameter Slotted SDR 26 Pipe, placed and surrounded by granular fill. 10-mil poly will be installed above the pea gravel pit or trenches prior to concrete placement. Concrete will be poured down to top of footing elevation along the piping trench, encasing the galvanized steel pipe lateral to maintain the integrity of the slab. The extraction pipes will be sealed at top of floor slab using Sikaflex 1A construction sealant, or equivalent. After the stub up is constructed, the connections to rooftop fans/blowers and exhaust will be constructed.

In addition, the underground garage will have an active fan system operating to vent automobile exhaust. The fan system will provide added protection in the garage area.

Following construction of the vapor mitigation systems, commissioning will be performed in accordance with WDNR Publication RR-800 (9). Three rounds of commissioning measurements are proposed to document that the system is functioning properly. Each round of commissioning of the sub-slab depressurization system will include pressure field extension measurements using a micromanometer, vacuum measurements on each extraction point system, and visual inspection of the facility and equipment for cracks and equipment defects. Modifications to the systems will be performed, as necessary, based on the results of the commissioning process. The results of commissioning and a maintenance plan will be submitted to WDNR in a Remedial Action Documentation report at the conclusion of the commissioning process. Regular inspection and maintenance of the system will be part of Continuing Obligations for the sub-slab vapor mitigation system.

SECTION III. CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

The Community Within the Corridor Limited Partnership has purchased the property located at 2748 N 32nd Street and has initiated detailed planning and engineering for a mixed residential, retail, and commercial facility, known as the Community Within the Corridor. The East Block property, located at 2748 N 32nd Street, is 4.16 acres in size. The existing property and building is a former Briggs and Stratton manufacturing facility.

The Community Within the Corridor Limited Partnership is proposing to redevelop the property into a mix of affordable housing, commercial spaces, and other amenities. The proposed development includes the following: The Corridor Lofts (64 Units), Creme City Lofts (36 Units) & 30 Square Townhomes (6 Units) and the Briggs Apartment Homes (91 Units) and a Community Service Facility which will include early childhood education, Science, Technology, Engineering, Art & Math after school programming, a health club (Basketball, Volleyball & Futsal, Skatepark), laundromat and a petite grocery store. The property has been rezoned Industrial Mix to facilitate development of the project.

No demolition of existing buildings is planned. The building interiors will be renovated and reconfigured. A ramp will be constructed to utilize the basement as a parking garage. Paved areas will be milled and paved or have pavement removed, be regraded, and then restored with asphalt.

The property was previously investigated and granted Case Closure with continuing obligations as an industrial property under BRRTS # 02-41-263675. KSingh was retained to perform environmental consulting services for the redevelopment of the property. Following a Phase I Environmental Site Assessment, a Phase II Environmental Site Assessment, and Sub-Slab Vapor Sampling, a Post-Closure Modification Request was submitted to the WDNR on July 8, 2020. Following submission of the Post-Closure Modification Request, KSingh performed a Sub-Slab Vapor Investigation of the building.

The findings from the Sub-Slab Vapor sampling activities are described as follows:

- Contamination related to chlorinated solvents consisting of TCE, Vinyl Chloride, 1,1,2-Trichloroethane, 1,1-Dichloroethane, 1,4-Dichlorobenzene, and/or Benzyl Chloride exceeds Residential VRSLs and/or Large Industrial / Commercial Building VRSLs below much of the building.
- TCE is the most widespread contaminant of concern under the building and is associated with past industrial uses of the facility.
- Petroleum VRSL exceedances are located in the northeast portion of the building and are associated with the previously closed Leaking Underground Storage Tank case.

Based on the Sub-Slab Vapor Investigation, it was determined that a vapor mitigation system would be required for the facility. To design a Sub-Slab Depressurization System for the facility, KSingh installed nine (9) vapor extraction points throughout the facility and then performed Pressure Field Extension testing on seven of the nine points.

Upon completion of PFE testing, negative pressure measurements were tabulated in a semi-log plot to determine the radius of influence observed at each extraction point to -0.004 inH_2O (or 1 Pascal). The calculated radii of influence are as follows:

- VE-3 – 10.44 feet
- VE-4 – 10.36 feet
- VE-5 – 10.75 feet
- VE-6 – 30.93 feet
- VE-7 – 10.29 feet
- VE-8 – 20.16 feet
- VE-9 – 10.71 feet

Based on the PFE data, a vacuum of 44 inches of water is required in order to achieve adequate radius of influence.

3.2 Recommendations

The following recommendations are made for the installation of a Sub-Slab Depressurization System.

Based on the estimated radius of influence for 6-inch diameter extraction points under 44 inches of water vacuum for various areas of the buildings, a system was designed for the building. The sub-slab depressurization / soil vapor extraction system will consist of three (3) 6-inch diameter extraction points and four (4) extraction trenches containing 4-inch diameter slotted piping are proposed for the sub-slab depressurization system. Exhaust points will be at least 24 inches above the roof line and 12 feet from any window.

A Radonaway HS5000 fan, or equivalent, is proposed for vapor extraction points. Based on the blower size calculations, the following extraction rates are recommended at 44 inches of water column vacuum.

Blower requirements at 44 inches of water vacuum has been calculated as follows:

Storage Area – 35 Standard Cubic Feet Per Minute (SCFM)
Garage Area – 150 SCFM
Gymnasium Area – 85 SCFM
Residential / Commercial Area – 115 SCFM
Total Blower Capacity – 385 SCFM

Startup testing will be required before occupancy of the building. As part of start up testing, exhaust air samples will be collected for permitting purposes.

Following completion of construction of the engineered barriers and commissioning of the vapor mitigation systems, a Remedial Action Documentation Report will be submitted for the project. Maintenance plans for the engineered barriers and vapor mitigation systems will be submitted as part of the Post-Closure Modification Process with the Remedial Action Documentation Report. Regular inspection and maintenance will be part of Continuing Obligations for the engineered barriers and vapor mitigation systems and will continue indefinitely into the foreseeable future.

3.3 Limitations of Data

The pressure field extension testing and preliminary design of a sub-slab depressurization system was based on conditions known to exist prior to and encountered during field exploration. The radius of influence for the final system is estimated and will have to be verified during commissioning.

This report has been prepared exclusively for Roers Companies and it may not be altered or changed in any manner without expressed written consent of K. Singh & Associates, Inc.

The sub-slab depressurization system will require continuing inspections and maintenance to function properly. Regular sealing of cracks will allow the system to achieve required zones of influence. Repair of roofs, roof drains, floor drains, and storm drains will prevent water from entering the subslab pore space. Repair of and operation of sumps and drain tiles will be necessary to minimize water interfering with the soil vapor extraction system and successful completion of remediation.

SECTION IV. REFERENCES

1. Milwaukee County Land Information Office. http://county.milwaukee.gov/mclio/applications/interactivemapping.html

2. Wisconsin Department of Natural Resources Bureau of Remediation and Redevelopment Tracking System. http://dnr.wi.gov/topic/Brownfields/botw.html

3. Phase I Environmental Site Assessment, Community Within the Corridor, 2748 N 32nd Street, Milwaukee, Wisconsin prepared by K. Singh & Associates, Inc. dated March 10, 2020.

4. Phase II Environmental Site Assessment, Community Within the Corridor, 2748 N 32nd Street, Milwaukee, Wisconsin prepared by K. Singh & Associates, Inc. dated May 24, 2020.

5. Indoor Air and Sub-Slab Vapor Sampling, Community Within the Corridor, 2748 N 32nd Street, Milwaukee, Wisconsin prepared by K. Singh & Associates, Inc. dated July 7, 2020.

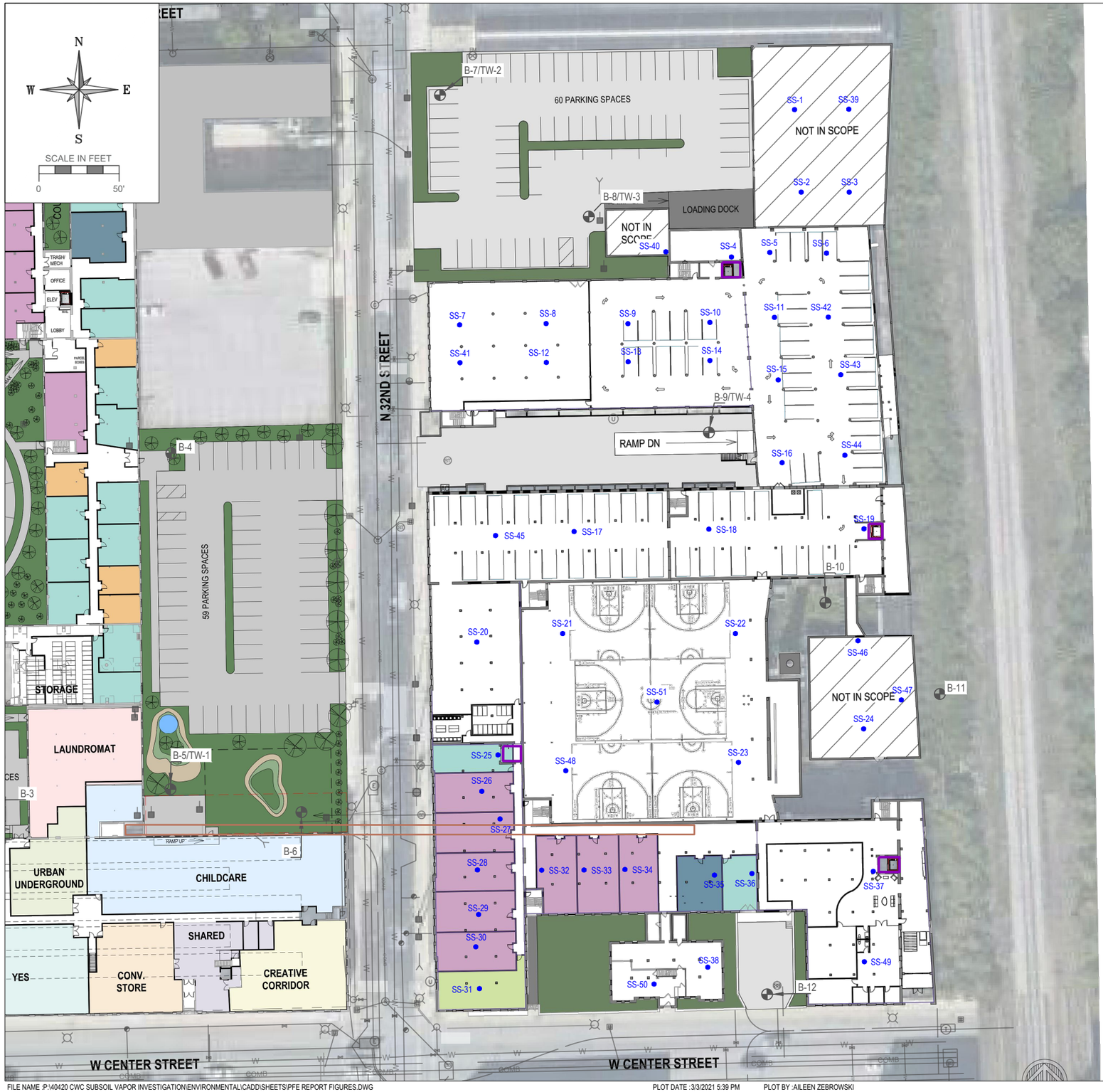
6. Request for Post Closure Modification, The Community Within the Corridor Development, 2748 N 32nd Street, Milwaukee, Wisconsin prepared by K. Singh & Associates, Inc. dated July 8, 2020.

7. Additional Sub-Slab Vapor Sampling Investigation for Post Closure Modification, Community Within the Corridor Development, 2748 N 32nd Street, Milwaukee, Wisconsin prepared by K. Singh & Associates, Inc. dated January 8, 2021.

8. Soil Vapor Extraction and Bioventing Engineering Manual, EM 1110-1-4001, prepared by the United States Army Corps of Engineers, dated June 3, 2002.

9. WDNR Publication RR-800 “Addressing Vapor Intrusion at Remediation & Redevelopment Sites in Wisconsin”, January 2018.

FIGURES



LEGEND

- Sub-Slab Sampling Locations (51)
- Previous Boring and Temporary Well Locations
- Known Elevator Shaft
- 1 - Bedroom Apartment
- 2 - Bedroom Apartment
- 3 - Bedroom Apartment
- 4 - Bedroom Apartment
- Studio Apartment

NOTES:
1. SAMPLING LOCATIONS ARE APPROXIMATE

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MILWAUKEE, WI
PROJECT NUMBER: 40420

CLIENT: COMMUNITY WITHIN THE CORRIDOR LIMITED PARTNERSHIP

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SHEET TITLE
SITE LAYOUT AND SUBSLAB VAPOR SAMPLING LOCATIONS

FIGURE 1

FILE NAME :P:\40420 CWC SUBSOIL VAPOR INVESTIGATION\ENVIRONMENTAL\CADD\SHEETS\PFE REPORT FIGURES.DWG
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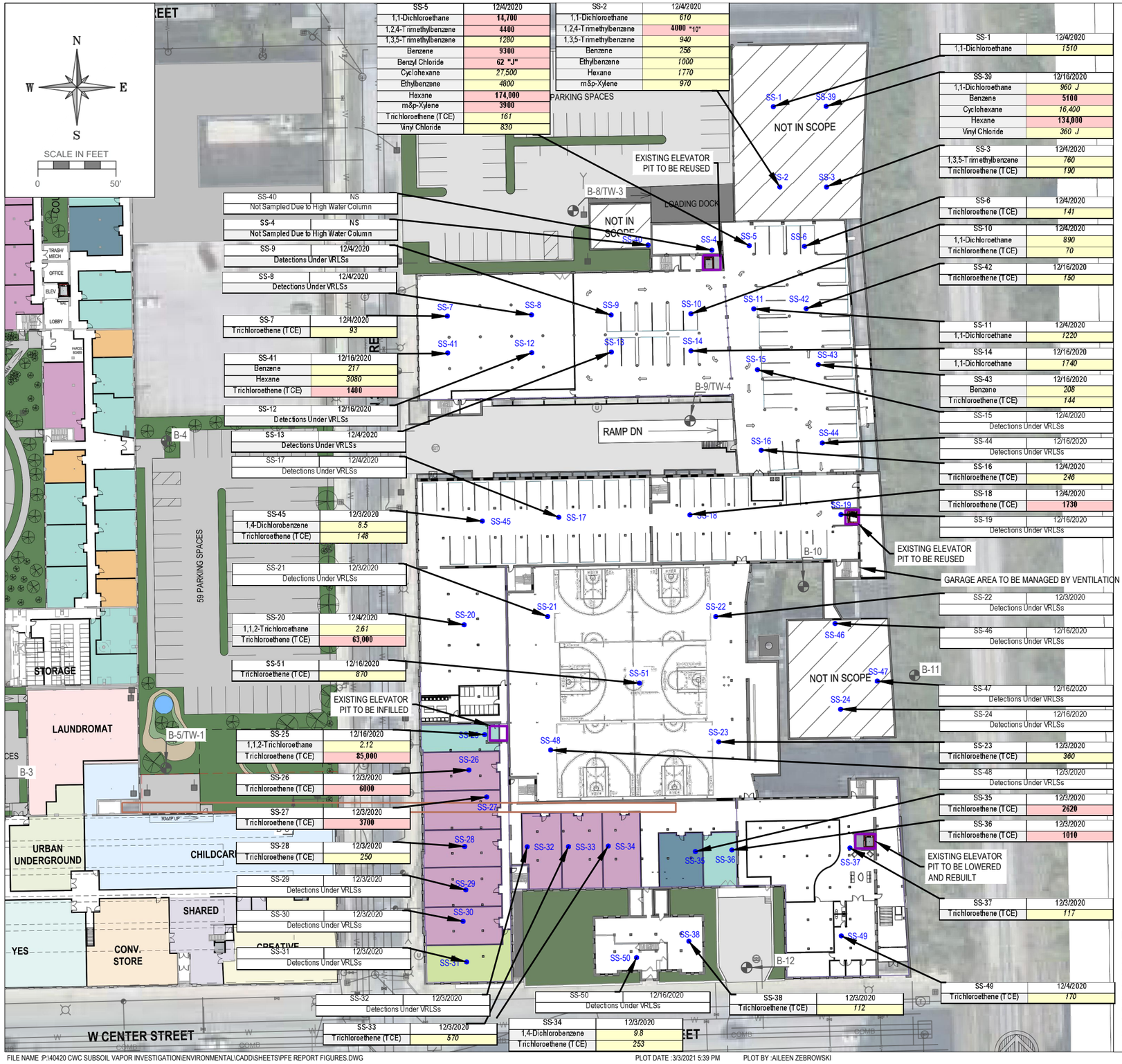

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- Studio Apartment

Sub-Slab Vapor		
Attenuation Factor	**0.03**	**0.01**
Analyte	*Residential Vapor Risk Screening Level (VRSL)*	**Large Commercial / Industrial VRSL**
1,1,2-Trichloroethane	*0.7*	**8.8**
1,1-Dichloroethane	*600*	**7700**
1,2,4-Trimethylbenzene	*210*	**2600**
1,3,5-Trimethylbenzene	*210*	**2600**
1,4-Dichlorobenzene	*8*	**110**
Benzene	*120*	**1600**
Benzyl Chloride	*1.9*	**25**
Cyclohexane	*3333*	**44000**
Ethylbenzene	*370*	**4900**
Hexane	*1400*	**18000**
m&p-Xylene	*333*	**4400**
Methyl tert-butyl ether (MTBE	*3700*	**47000**
Naphthalene	*28*	**360**
o-Xylene	*3300*	**44000**
Tetrachloroethene	*1400*	**18000**
trans-1,2-Dichloroethene	---	---
Trichloroethene (TCE)	*70*	**880**
Vinyl Chloride	*57*	**2800**

NOTES:
1. REPORTED UNITS IN ug/m^3
2. BASED ON WI VAPOR QUICK LOOKUP - TABLE VAPOR RISK SCREENING LEVELS
3. NS = NOT SAMPLED
4. SAMPLING LOCATIONS ARE APPROXIMATE
5. "J" = ANALYTE DETECTED BETWEEN 'LIMIT OF DETECTION' AND 'LIMIT OF QUANTITATION'
6. "10" = LINEAR RANGE OF CALIBRATION CURVE EXCEEDED DURING ANALYSIS
7. BOLD INDICATES DETECTION IS ABOVE LARGE COMMERCIAL / INDUSTRIAL VRSLS
8. ITALICS INDICATES DETECTION IS ABOVE RESIDENTIAL VRSLS

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SHEET TITLE
SUB-SLAB VAPOR SAMPLING RESULTS

FIGURE 2

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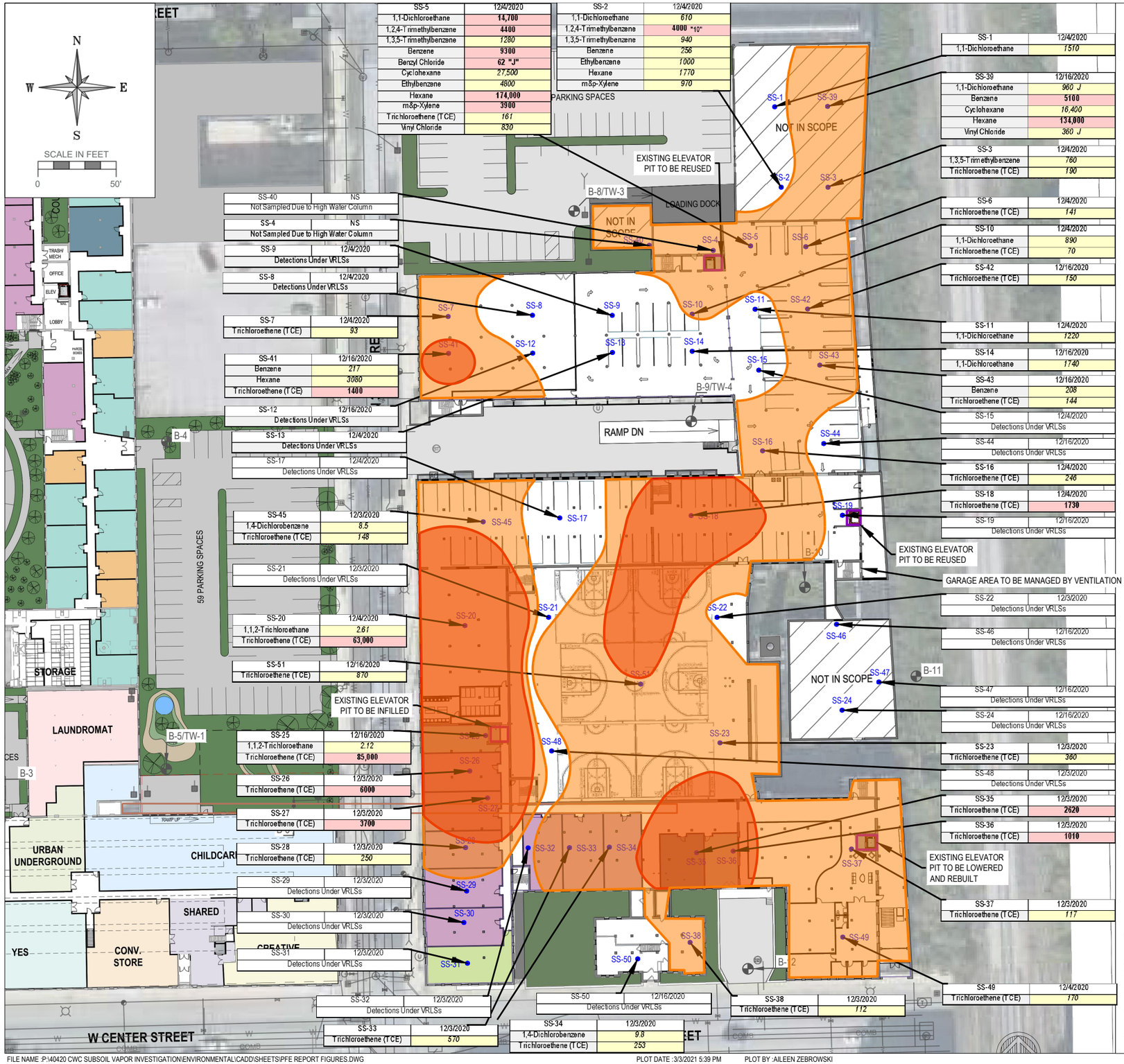

LEGEND

- Sub-Slab Sampling Locations (51)
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- WI Residential VRSL Exceedance Extents
- WI Large Commercial / Industrial VRSL Exceedance Extents

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1,3,5-Trimethylbenzene	*210*	**2600**
1,4-Dichlorobenzene	*8*	**110**
Benzene	*120*	**1600**
Benzyl Chloride	*1.9*	**25**
Cyclohexane	*3333*	**44000**
Ethylbenzene	*370*	**4900**
Hexane	*1400*	**18000**
m&p-Xylene	*333*	**4400**
Methyl tert-butyl ether (MTBE	*3700*	**47000**
Naphthalene	*28*	**360**
o-Xylene	*3300*	**44000**
Tetrachloroethene	*1400*	**18000**
trans-1,2-Dichloroethene	---	---
Trichloroethene (TCE)	*70*	**880**
Vinyl Chloride	*57*	**2800**

NOTES:
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2. BASED ON WI VAPOR QUICK LOOKUP - TABLE VAPOR RISK SCREENING LEVELS
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4. SAMPLING LOCATIONS ARE APPROXIMATE
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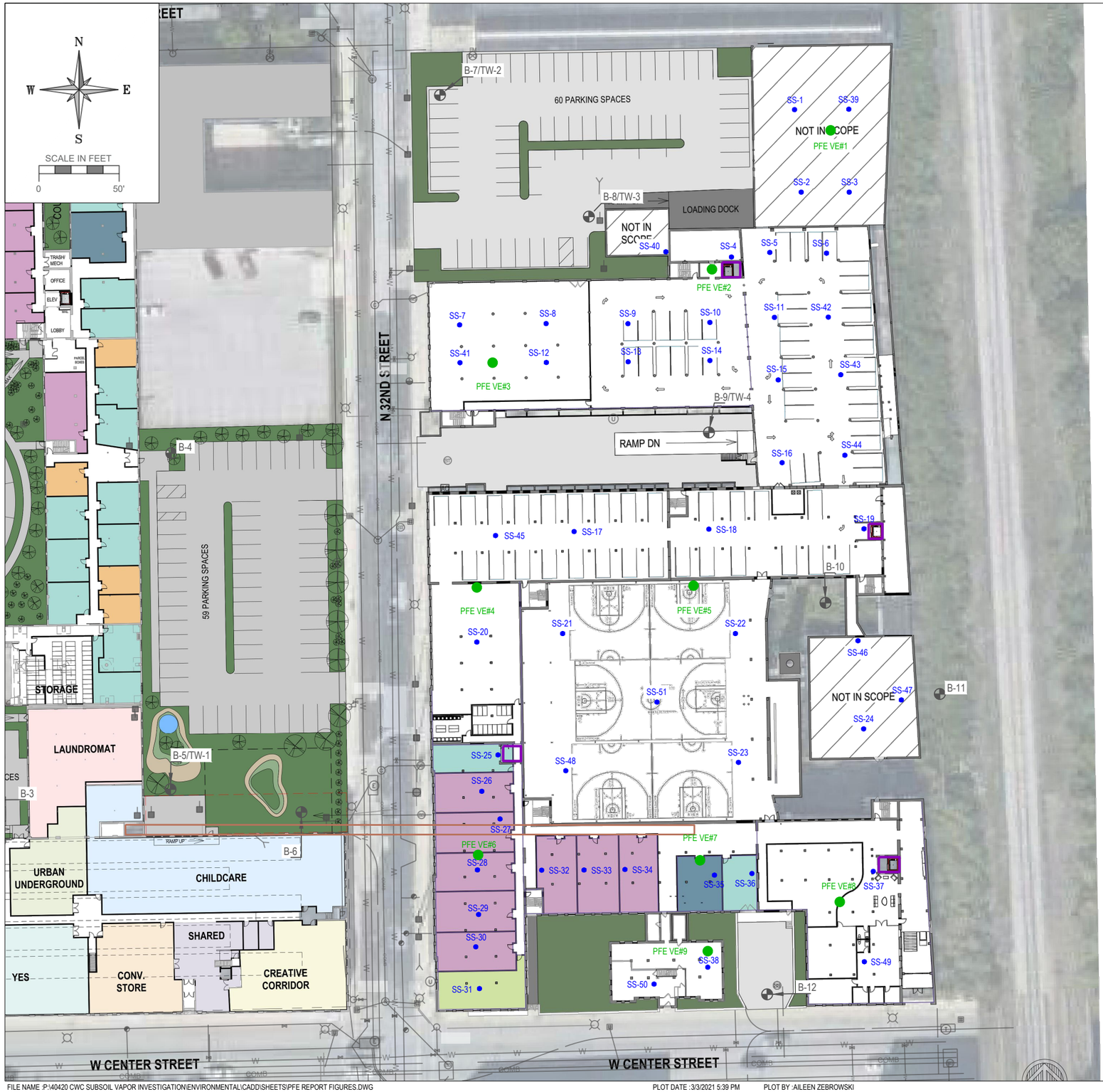
SHEET TITLE
VRSL EXCEEDANCE PLUMES FOR TCE

FIGURE 3

SHEET 3 of SHEET 8

FILE NAME :P:\40420 CWC SUBSOIL VAPOR INVESTIGATION\ENVIRONMENTAL\CADD\SHEETS\PFE REPORT FIGURES.DWG PLOT DATE :3/3/2021 5:39 PM PLOT BY :AILEEN ZEBROWSKI



LEGEND

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- 2 - Bedroom Apartment
- 3 - Bedroom Apartment
- 4 - Bedroom Apartment
- Studio Apartment
- PFE Vapor Extraction Points

NOTES:

1. SAMPLING LOCATIONS AND VAPOR EXTRACTION POINTS ARE APPROXIMATE
2. PFE VE#1 AND PFE VE#2 HAVE NOT HAD PRESSURE FIELD EXTENSION TESTS PERFORMED AS OF MARCH 3, 2021

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SHEET TITLE

PRESSURE FIELD EXTENSION TEST EXTRACTION POINTS

FIGURE 4

SHEET 4 of SHEET 8

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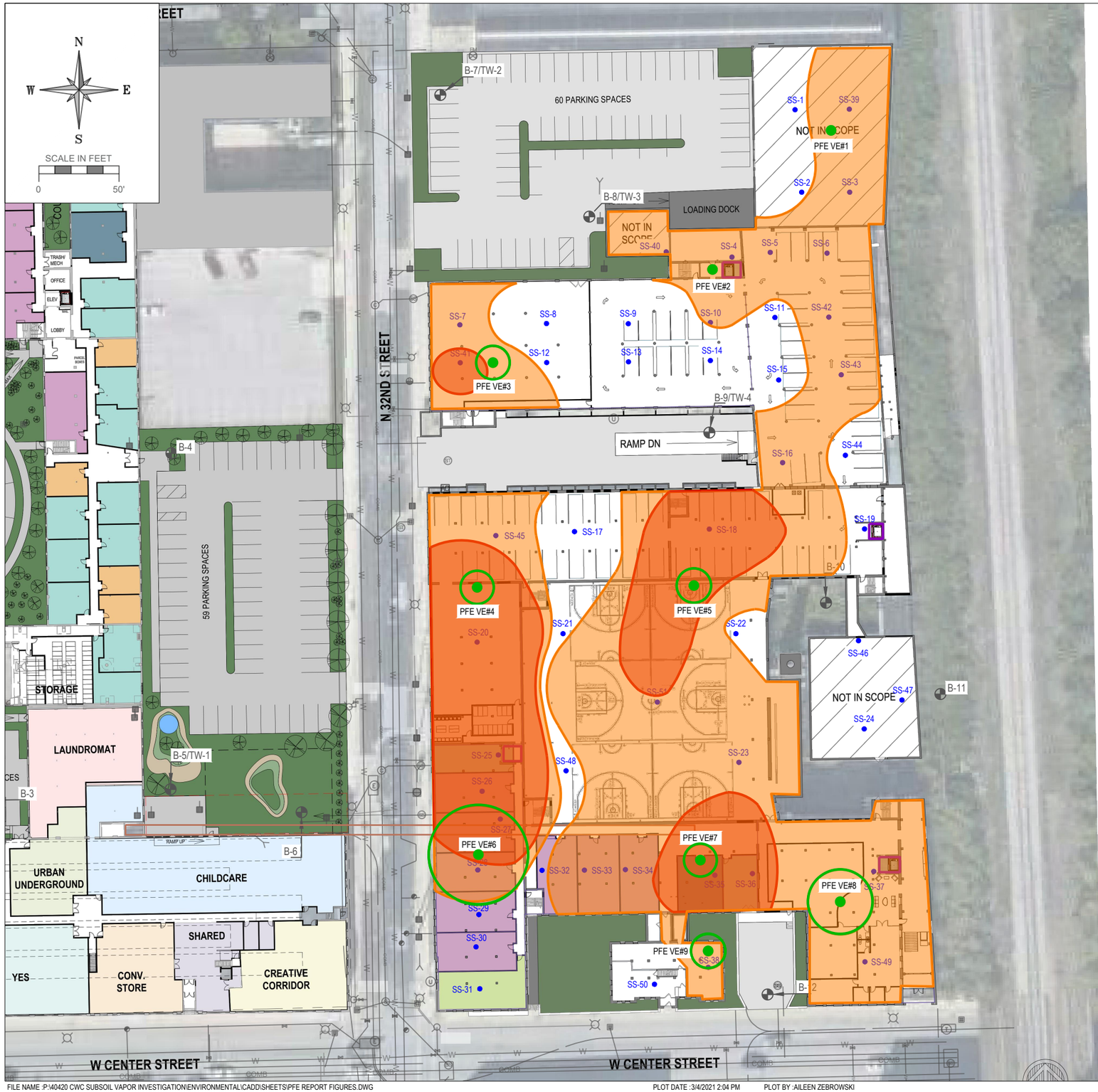

LEGEND

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- Previous Boring and Temporary Well Locations
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- 2 - Bedroom Apartment
- 3 - Bedroom Apartment
- 4 - Bedroom Apartment
- Studio Apartment
- WI Residential VRSL Exceedance Extents
- WI Large Commercial / Industrial VRSL Exceedance Extents
- PFE Vapor Extraction Points and Radius of Influence

NOTES:

1. SAMPLING LOCATIONS AND VAPOR EXTRACTION POINTS ARE APPROXIMATE
2. PFE VE#1 AND PFE VE#2 HAVE NOT HAD PRESSURE FIELD EXTENSION TESTS PERFORMED AS OF MARCH 3, 2021

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SHEET TITLE

PFE TEST RESULTS TO -0.004 INCHES OF WATER

FIGURE 5

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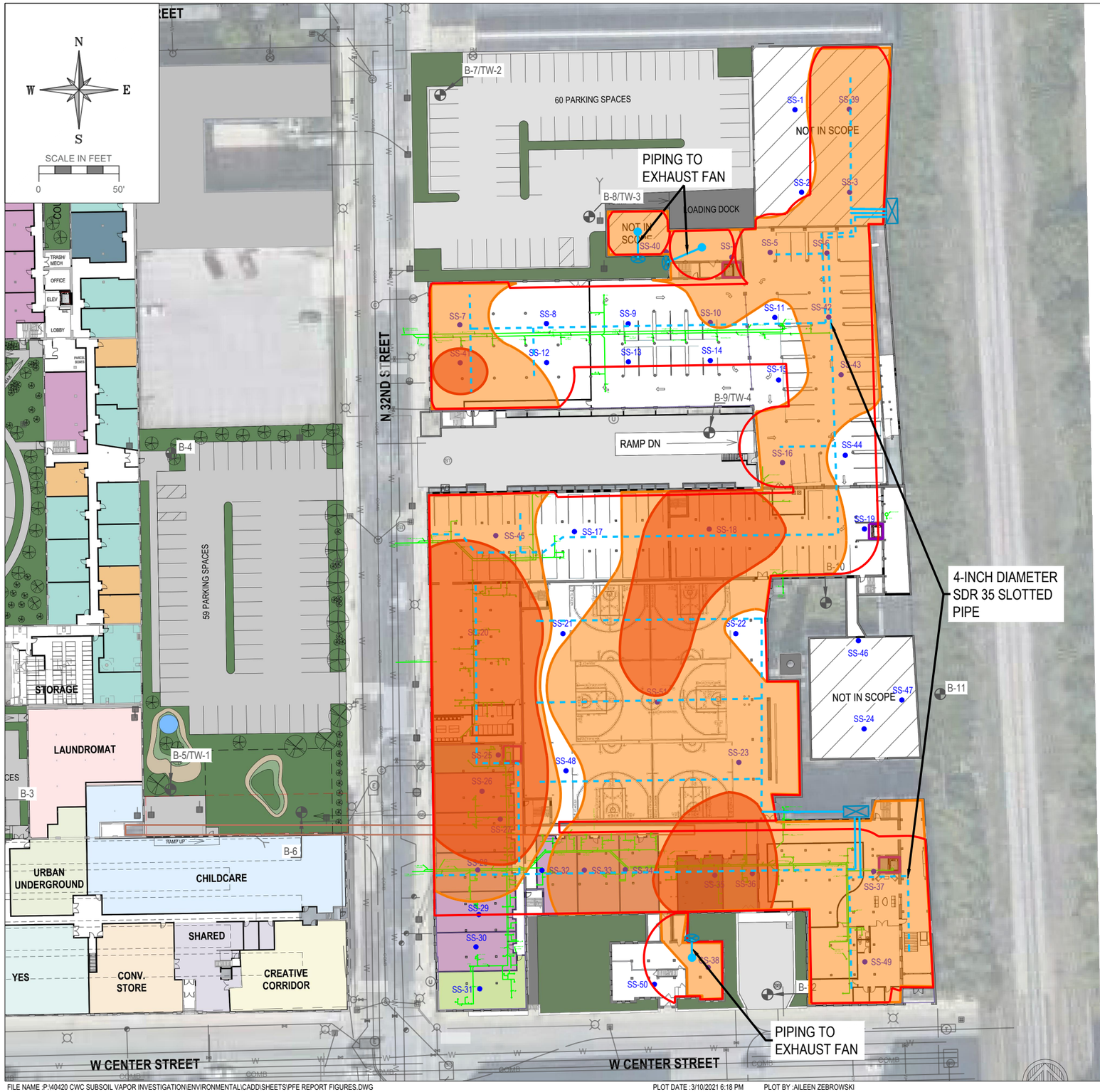

LEGEND

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- Studio Apartment
- WI Residential VRSL Exceedance Extents
- WI Large Commercial / Industrial VRSL Exceedance Extents
- Slotted Horizontal Extraction Piping
- Solid Horizontal Extraction Piping
- Extraction Points
- Potential Blower Locations
- Vapor Mitigation Fan (RadonAway HS5000 or Equivalent)
- Underground Plumbing
- Zone of Influence

NOTES:
1. SAMPLING LOCATIONS AND VAPOR EXTRACTION POINTS ARE APPROXIMATE

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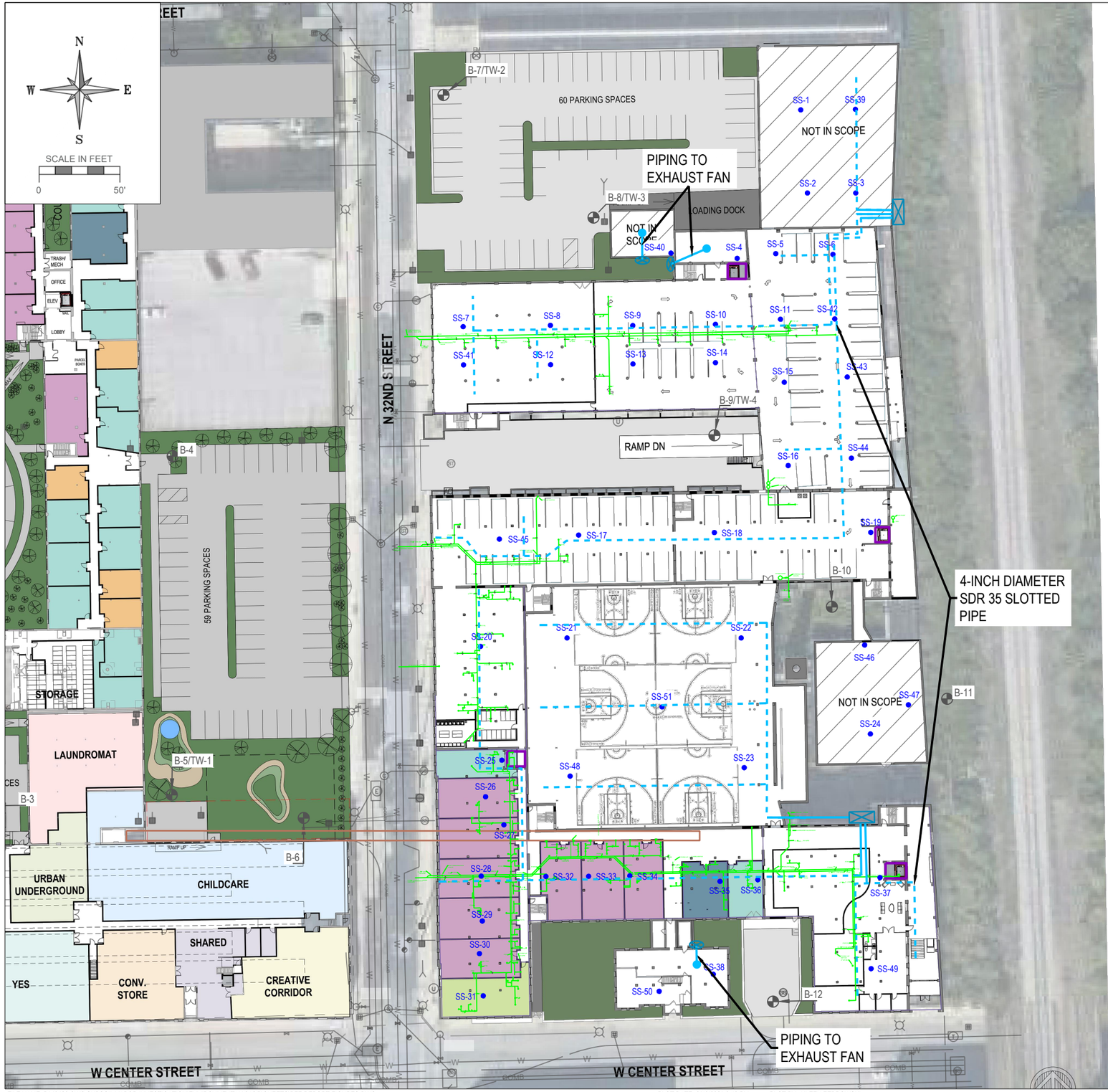
SHEET TITLE

PROPOSED VAPOR MITIGATION SYSTEM IN RELATION TO VRSL EXCEEDANCES

FIGURE 6

SHEET 6 of SHEET 8

FILE NAME :P:\40420 CWC SUBSOIL VAPOR INVESTIGATION\ENVIRONMENTAL\CADD\SHEETS\PFE REPORT FIGURES.DWG PLOT DATE :3/10/2021 6:18 PM PLOT BY :AILEEN ZEBROWSKI



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VAPOR MITIGATION SYSTEM COMPONENTS

- Slotted Horizontal Extraction Piping
- Solid Horizontal Extraction Piping
- Extraction Points
- Potential Blower Locations
- Vapor Mitigation Fan (RadonAway HS5000 or Equivalent)
- Underground Plumbing

NOTES:
1. SAMPLING LOCATIONS AND VAPOR EXTRACTION POINTS ARE APPROXIMATE

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SHEET TITLE
LAYOUT OF THE PROPOSED VAPOR MITIGATION SYSTEM

FIGURE 7

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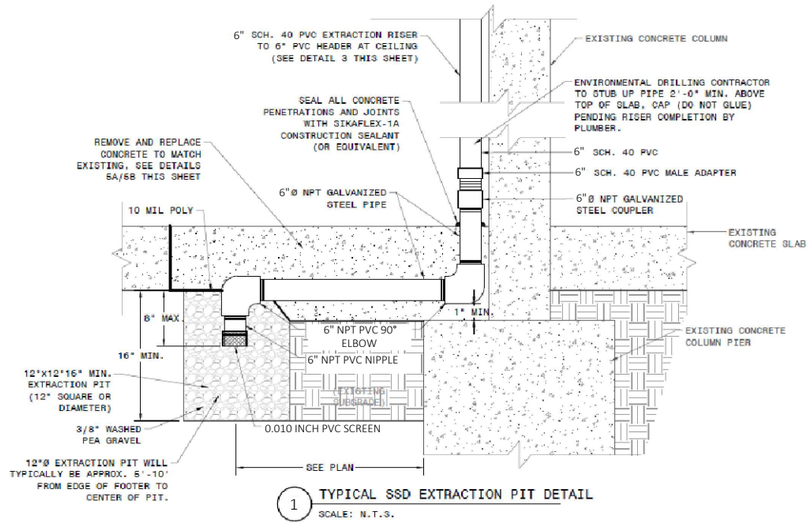
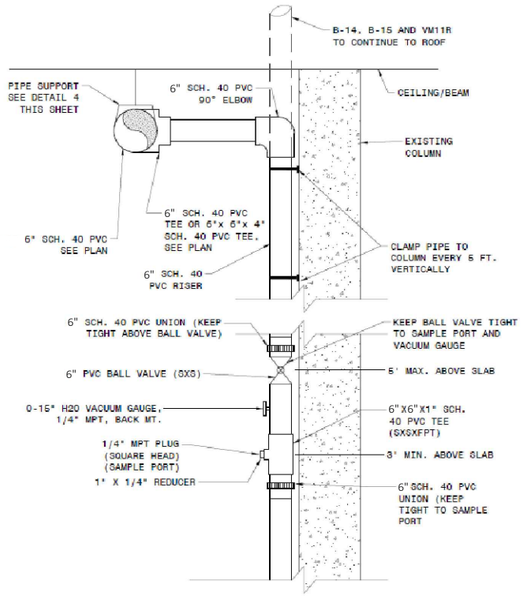


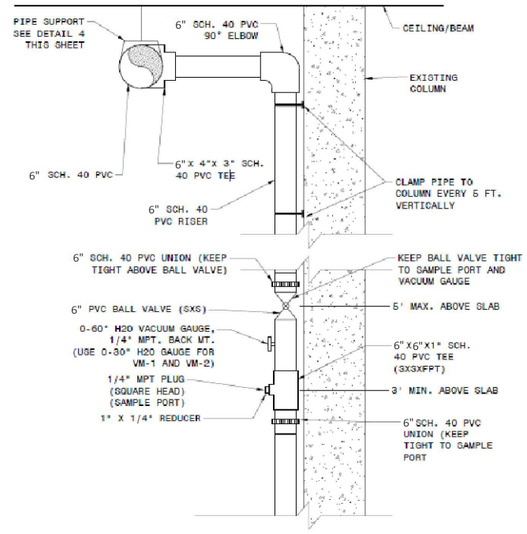
1 TYPICAL SSD EXTRACTION PIT DETAIL
SCALE: N.T.S.

NOTES:
1. SAW-CUT AND EXCAVATE 12"X12"X16" OR CORE 12" DIAMETER HOLE THROUGH EXISTING CONCRETE USING DIAMOND CORE RIG.
2. ANCHOR CORE RIG TO CONCRETE IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
3. ALL EXCAVATED SUB-SLAB MATERIALS TO BE DRUMMED OR CONTAINERIZED.
4. REINFORCING STEEL NOT SHOWN.
5. ENVIRONMENTAL DRILLING CONTRACTOR TO COMPLETE ALL SUBSURFACE WORK WITH PIPING STUBBED UP 2 FT. ABOVE SLAB PENDING RISER COMPLETION BY PLUMBING CONTRACTOR. IN ACCORDANCE WITH DETAIL 3.
6. CONTRACTOR IS TO PREP AND COMPACT EXISTING SUBGRADE PRIOR TO PLACEMENT OF PEA GRAVEL AND CONCRETE. SUBGRADE SHALL BE COMPACTED TO 100% STANDARD PROCTOR.



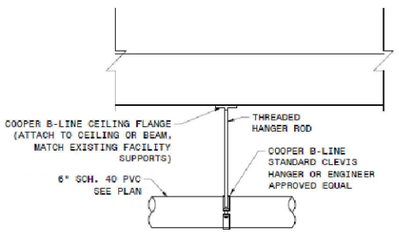
2 TYPICAL VM-# EXTRACTION RISER
SCALE: N.T.S.

NOTE:
1. PLUMBING CONTRACTOR TO COMPLETE RISER CONSTRUCTION AND ALL PIPING FROM STUB-UP 2 FT ABOVE FLOOR SLAB TO SSDS EQUIPMENT AT 1 FOOT ABOVE ROOF.



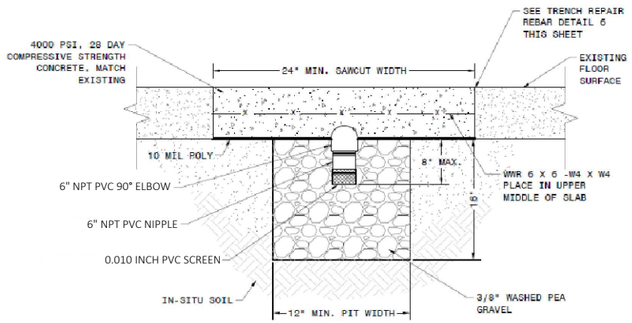
3 TYPICAL VE-# EXTRACTION RISER
SCALE: N.T.S.

NOTE:
1. PLUMBING CONTRACTOR TO COMPLETE RISER CONSTRUCTION AND ALL PIPING FROM STUB-UP 2 FT ABOVE FLOOR SLAB TO SSDS EQUIPMENT AT ROOF.
2. EXTRACTION RISERS VM-1 AND VM-2 TO BE REDUCED FROM 6" SCH 40 PVC AT RISER STUB-UP AND CONSTRUCTED IN ACCORDANCE WITH THIS DETAIL INSTEAD OF THE VM-# RIGER DETAIL 2 ON THIS SHEET.

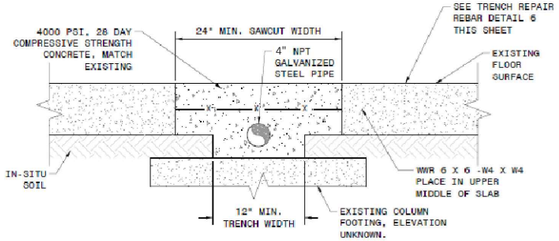


NOTES:
1. HORIZONTAL PIPING SHALL BE SUPPORTED A MINIMUM OF EVERY 7.5 FEET.
2. SEE SLOPE REQUIREMENT BELOW FOR SPECIFICATIONS REGARDING DRAINAGE. SEE PLAN FOR SLOPE DIRECTION.

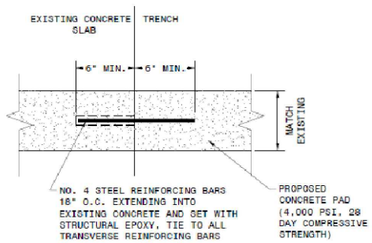
4 HANGING PIPE SUPPORT (TYP.)
SCALE: N.T.S.



5A EXTRACTION PIT CONCRETE SLAB REPAIR DETAILS
SCALE: N.T.S.



5B PIPING TRENCH TO COLUMN CONCRETE SLAB REPAIR DETAILS
SCALE: N.T.S.

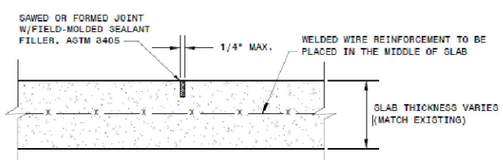


6 TYPICAL TRENCH REPAIR REBAR DETAIL
SCALE: N.T.S.

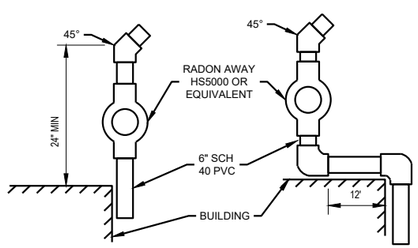
NOTE:
1. WHERE TRENCH LENGTHS EXCEEDS 10 FT. TRANSVERSE CONTROL JOINTS TO BE PLACED ON 10 FT. SPACING. SEE DETAIL 7 THIS SHEET.
2. 10 MIL POLY TO BE PLACED OVER TRENCH OR EXTRACTION PIT PRIOR TO CONCRETE POUR.

SLOPE REQUIREMENT:

ABOVE-GROUND DUCT PIPING SHALL HAVE A CONTINUOUS DOWNWARD SLOPE TOWARDS THE SUCTION POINT(S) OF NOT LESS THAN $\frac{1}{4}$ INCH PER FOOT TO ALLOW RAINWATER OR CONDENSATION WITHIN THE PIPES TO DRAIN DOWNWARD INTO THE GROUND BENEATH THE SLAB OR SOIL-GAS RETARDER MEMBRANE. CONFIGURATIONS THAT RESULT IN OBSTRUCTED AIRFLOW BY ALLOWING WATER TO COLLECT WITHIN DUCT PIPING ARE PROHIBITED. WHEN THE REQUIRED SLOPE OR DRAINAGE CANNOT BE ACHIEVED, OTHER METHODS FOR DRAINING COLLECTED WATER SHALL BE PROVIDED.

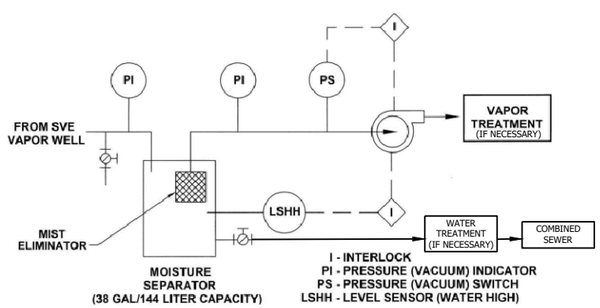


7 CONTROL JOINT DETAIL
SCALE: N.T.S.

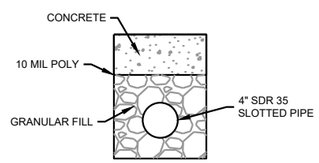


8A VAPOR EXTRACTION POINT EXHAUST DETAILS
SCALE: N.T.S.

8B VAPOR EXTRACTION POINT EXHAUST DETAILS
SCALE: N.T.S.



9 SSDS / SVE BLOWER SCHEMATIC
SCALE: N.T.S.



10 EXTRACTION TRENCH DETAIL
SCALE: N.T.S.

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CONSULTANT

CONSULTANT

CONSULTANT

PROJECT TITLE: COMMUNITY WITHIN THE CORRIDOR
MILWAUKEE, WI
PROJECT NUMBER: 40420

CLIENT: COMMUNITY WITHIN THE CORRIDOR LIMITED PARTNERSHIP

REVISIONS	DATE	DESCRIPTION

DRAWN BY	DATE
AMZ	03/10/2021
CHECKED BY	DATE
RTR	03/10/2021

SHEET TITLE
DETAILS OF SUB-SLAB DEPRESSURIZATION SYSTEM

FIGURE 8

SHEET 8 of SHEET 8

TABLES

TABLE 1
DECEMBER 2020 SUB-SLAB VAPOR ANALYTICAL RESULTS
EASTERN COMPLEXES
COMMUNITY WITHIN THE CORRIDOR LIMITED PARTNERSHIP - MILWAUKEE, WI

CHEMICAL (ug/m^3)	SUB-SLAB VAPOR VRSL AF = 0.03 RESIDENTIAL	SUB-SLAB VAPOR VRSL AF = 0.01 LARGE COMMERCIAL / INDUSTRIAL	SSV-1 PRE-DEVELOPMENT 6/12/2020 ug/m^3	SSV-2 PRE-DEVELOPMENT 6/12/2020 ug/m^3	SS-1 PRE-DEVELOPMENT 12/4/2020 ug/m^3	SS-2 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-3 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-4 PRE-DEVELOPMENT NS ug/m3	SS-5 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-6 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-7 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-8 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-9 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-10 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-11 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-12 PRE-DEVELOPMENT 12/16/2020 ug/m3	SS-13 PRE-DEVELOPMENT 12/4/2020 ug/m3
1,1,1-Trichloroethane	*170,000*	2,200,000	< 2.7	88	< 4.98	35	63	NS	< 49.8	225	7.1 J	11.6	0.6 J	157	< 2.49	22.3	< 0.249
1,1,2,2-Tetrachloroethane	*1.6*	21	< 2.5	< 16	< 6.5	< 3.25	< 3.25	NS	< 65	< 3.25	< 3.25	< 0.325	< 0.325	< 3.25	< 3.25	< 0.325	< 0.325
1,1,2-Trichloroethane	*0.7*	8.8	< 0.98	< 6.3	< 5.16	< 2.58	< 2.58	NS	< 51.6	< 2.58	< 2.58	< 0.258	< 0.258	< 2.58	< 2.58	< 0.258	< 0.258
1,1-Dichloroethane	*600*	7,700	7.1 J	*5500*	*1510*	*610*	480	NS	14700	222	< 1.87	0.84	2.48	*890*	*1220*	0.68	0.88
1,1-Dichloroethene	*7,000*	88,000	< 0.79	8.7 J	< 4.2	< 2.1	< 2.1	NS	< 42	< 2.1	< 2.1	< 0.21	< 0.21	4.8 J	< 2.1	< 0.21	< 0.21
1,2,4-Trichlorobenzene	*700*	8,800	< 12	< 76	< 13.14	< 6.57	< 6.57	NS	< 131.4	< 6.57	< 6.57	< 0.657	< 0.657	< 6.57	< 6.57	< 0.657	< 0.657
1,2,4-Trimethylbenzene	*210*	2,600	< 2.5	*290*	< 5.66	4000 10	17.2	NS	4400	7.8 J	3.4 J	0.93	1.52	30.9	2.94 J	0.74 J	2.4
1,2-Dichlorobenzene	*700*	8,800	< 4.6	< 29	< 4.7	< 2.35	< 2.35	NS	< 47	< 2.35	< 2.35	< 0.235	< 0.235	< 2.35	< 2.35	< 0.235	< 0.235
1,2-Dichloroethane	*36*	470	< 1	< 6.5	< 4.8	< 2.4	< 2.4	NS	< 48	< 2.4	< 2.4	< 0.24	< 0.24	< 2.4	< 2.4	< 0.24	< 0.24
1,2-Dichloropropane	*14*	180	< 1.2	< 7.4	< 5.6	< 2.8	< 2.8	NS	< 56	< 2.8	< 2.8	< 0.28	< 0.28	< 2.8	< 2.8	< 0.28	< 0.28
1,2-Dichlorotetrafluoroethane	---	---	< 2.2	< 14 *	< 8.92	< 4.46	< 4.46	NS	< 89.2	< 4.46	< 4.46	< 0.446	< 0.446	< 4.46	< 4.46	< 0.446	< 0.446
1,3,5-Trimethylbenzene	*210*	2,600	< 2.7	190	< 4.64	*940*	*760*	NS	*1280*	< 2.32	< 2.32	0.294 J	0.39 J	203	< 2.32	< 0.232	0.69 J
1,3-Butadiene	---	---	NA	NA	< 2.86	< 1.43	< 1.43	NS	< 28.6	< 1.43	< 1.43	< 0.143	< 0.143	< 1.43	< 1.43	< 0.143	< 0.143
1,3-Dichlorobenzene	---	---	< 2.4	17 J	< 6.04	< 3.02	< 3.02	NS	< 60.4	< 3.02	< 3.02	< 0.302	< 0.302	< 3.02	< 3.02	< 0.302	< 0.302
1,4-Dichlorobenzene	*8*	110	2.8 J	< 15	< 6.04	< 3.02	6 J	NS	< 60.4	7.2 J	7.2 J	< 0.302	3.4	< 3.02	7.2 J	1.02	2.88
1,4-Dioxane	*18*	250	< 2.7	< 17	< 3.14	< 1.57	< 1.57	NS	< 31.4	< 1.57	< 1.57	< 0.157	< 0.157	< 1.57	< 1.57	< 0.157	< 0.157
2-Hexanone	---	---	NA	NA	< 4.44	< 2.22	< 2.22	NS	< 44.4	< 2.22	< 2.22	< 0.222	0.246 J	< 2.22	< 2.22	< 0.222	0.74
4-Ethyltoluene		---	NA	NA	< 4.28	2050	< 2.14	NS	2890	< 2.14	< 2.14	0.49 J	0.294 J	37	< 2.14	< 0.214	0.49 J
Acetone	*106,667*	1,400,000	160	350 J	28.5	< 2.99	43	NS	1970	8.6 J	23.8	69	27	45	5.9 J	NA	57
Acrolein		---	NA	NA	< 1.88	< 0.94	< 0.94	NS	< 18.8	< 0.94	< 0.94	< 0.094	< 0.094	< 0.94	< 0.94	< 0.094	< 0.094
Benzene	*120*	1,600	5 J	42	19.2	*256*	< 1.36	NS	9300	< 1.36	< 1.36	1.72	0.192 J	5.7	< 1.36	< 0.136	1.56
Benzyl Chloride	*1.9*	25	< 4.9	< 31	< 4.18	< 2.09	< 2.09	NS	62 J	< 2.09	< 2.09	< 0.209	< 0.209	< 2.09	< 2.09	< 0.209	< 0.209
Bromodichloromethane	*2.53*	33	< 2.9	< 19	< 7.48	< 3.74	< 3.74	NS	< 74.8	< 3.74	< 3.74	< 0.374	< 0.374	< 3.74	< 3.74	< 0.374	< 0.374
Bromoform	*86.6*	1,100	< 2.3	< 15	< 8.28	< 4.14	< 4.14	NS	< 82.8	< 4.14	< 4.14	< 0.414	< 0.414	< 4.14	< 4.14	< 0.414	< 0.414
Bromomethane	*17.3*	220	< 2.2	< 14	< 4	< 2	< 2	NS	< 40	< 2	< 2	< 0.2	< 0.2	< 2	< 2	< 0.2	< 0.2
Carbon Disulfide	*2,433*	31,000	5.4 J	< 5.6	< 2.76	< 1.38	< 1.38	NS	2360	< 1.38	< 1.38	9.9	2.58	6.8	< 1.38	0.84	114
Carbon Tetrachloride	*156*	2,000	< 1.1	< 7.2	< 6.14	< 3.07	< 3.07	NS	< 61.4	< 3.07	< 3.07	< 0.307	< 0.307	< 3.07	< 3.07	< 0.307	< 0.307
Chlorobenzene	*173*	2,200	< 0.74	< 4.7	< 5.02	< 2.51	< 2.51	NS	< 50.2	< 2.51	< 2.51	< 0.251	< 0.251	< 2.51	< 2.51	< 0.251	< 0.251
Chloroethane	*33,333*	440,000	< 1.9	< 12	125	8.2	< 1.59	NS	1180	< 1.59	< 1.59	< 0.159	< 0.159	< 1.59	< 1.59	< 0.159	< 0.159
Chloroform	*3,100*	39,000	< 0.78	25 J	< 6	< 3	< 3	NS	< 60	< 3	< 3	0.49 J	< 0.3	< 3	< 3	0.68 J	< 0.3
Chloromethane	*3,100*	39,000	< 3.4	< 22	< 16.62	< 8.31	< 8.31	NS	< 166.2	< 8.31	< 8.31	< 0.831	< 0.831	< 8.31	< 8.31	< 0.831	< 0.831
cis-1,2-Dichloroethene	---	---	< 0.99	710	< 3.94	65	36	NS	198	33	< 1.97	0.36 J	0.238 J	34	< 1.97	< 0.197	< 0.197
cis-1,3-Dichloropropene	---	---	< 1.8	< 11	< 4.68	< 2.34	< 2.34	NS	< 46.8	< 2.34	< 2.34	< 0.234	< 0.234	< 2.34	< 2.34	< 0.234	< 0.234
Cyclohexane	*3,333*	44,000	5.1 J	61 J	185	330	< 2.12	NS	*27500*	< 2.12	< 2.12	0.45 J	< 0.212	4.8 J	< 2.12	< 0.212	< 0.212
Dibromochloromethane	---	---	< 1.4	< 9.3	< 7.52	< 3.76	< 3.76	NS	< 75.2	< 3.76	< 3.76	< 0.376	< 0.376	< 3.76	< 3.76	< 0.376	< 0.376
Dichlorodifluoromethane	*3,300*	44,000	4.4 J	< 11	< 5.26	2.97 J	4.9 J	NS	168	< 2.63	< 2.63	2.27	2.57	< 2.63	< 2.63	2.37	2.42
EDB (1,2-Dibromoethane)	*0.157*	2	< 1.3	< 8.4	< 6.84	< 3.42	< 3.42	NS	< 68.4	< 3.42	< 3.42	< 0.342	< 0.342	< 3.42	< 3.42	< 0.342	< 0.342
Ethanol	---	---	NA	NA	54	35	77	NS	1180	13.8	470	1.62	16.8	< 1.52	< 1.52	NA	108 10
Ethyl Acetate	---	---	NA	NA	< 3.52	< 1.76	< 1.76	NS	< 35.2	< 1.76	< 1.76	< 0.176	1.12	< 1.76	< 1.76	< 0.176	< 0.176
Ethylbenzene	*370*	4,900	2.1 J	46 J	< 4.06	*1000*	< 2.03	NS	*4800*	< 2.03	< 2.03	1.82	0.43 J	13	< 2.03	0.217 J	1.3
Heptane	---	---	NA	NA	8.2 J	500	< 2.65	NS	22700	< 2.65	< 2.65	26.1	1.02	8.6	< 2.65	0.74 J	1.43
Hexachlorobutadiene	*4.3*	56	< 8.5	< 55	< 9.78	< 4.89	< 4.89	NS	< 97.8	< 4.89	< 4.89	< 0.489	< 0.489	< 4.89	< 4.89	< 0.489	< 0.489
Hexane	*1,400*	18,000	11 J	660	350	*1770*	< 2.35	NS	174000	< 2.35	< 2.35	11.1	< 0.235	21.5	< 2.35	1.2	7.9
Isopropyl Alcohol	---	---	< 6.9	< 44	9.3	5.2	9.1	NS	128	2.46 J	12.3	0.91	1.89	2.95 J	2.46 J	0.61	3.4
m&p-Xylene	*333*	4,400	< 3.2	47 J	< 7.54	*970*	< 3.77	NS	3900	< 3.77	< 3.77	3.3	1.26	18.2	< 3.77	0.65 J	2.43
Methyl ethyl ketone (MEK)	*17,333*	220,000	22 J	< 35	< 3.56	< 1.78	< 1.78	NS	320	< 1.78	6.8	11.8	3.7 J	14.4	< 1.78	< 0.178	7.7
Methyl isobutyl ketone (MIBK)	*10,333*	130,000	< 5.5	< 35	< 3.36	< 1.68	< 1.68	NS	< 33.6	< 1.68	< 1.68	8.3	0.41	6.1	< 1.68	< 0.168	0.49 J
Methyl Methacrylate	---	---	NA	NA	< 4.34	< 2.17	< 2.17	NS	< 43.4	< 2.17	< 2.17	< 0.217	< 0.217	< 2.17	< 2.17	< 0.217	< 0.217
Methyl tert-butyl ether (MTBE)	*3,700*	47,000	< 4.7	< 30	< 3.2	< 1.6	< 1.6	NS	< 32	< 1.6	< 1.6	< 0.16	< 0.16	< 1.6	< 1.6	< 0.16	< 0.16
Methylene chloride	*21,000*	260,000	< 13	< 81	< 3.18	< 1.59	< 1.59	NS	< 31.8	< 1.59	< 1.59	15.1	< 0.159	< 1.59	< 1.59	< 0.159	48
Naphthalene	*28*	360	< 10	< 64	< 13.5	< 6.75	< 6.75	NS	< 135	< 6.75	< 6.75	5.4	< 0.675	< 6.75	< 6.75	< 0.675	< 0.675
o-Xylene	*3,300*	44,000	1.7 J	38 J	< 4.36	71	< 2.18	NS	530	< 2.18	< 2.18	1.78	0.61 J	71	< 2.18	0.303 J	1.21
Propene	---	---	NA	NA	27.5	25	< 0.79	NS	1590	< 0.79	< 0.79	8.5	1.39	17.9	< 0.79	< 0.079	5.6
Styrene	*3,333*	44,000	< 2.6	< 16	< 3.62	< 1.81	< 1.81	NS	< 36.2	< 1.81	< 1.81	0.38 J	0.72	< 1.81	< 1.81	< 0.181	1.23

TABLE 1
DECEMBER 2020 SUB-SLAB VAPOR ANALYTICAL RESULTS
EASTERN COMPLEXES
COMMUNITY WITHIN THE CORRIDOR LIMITED PARTNERSHIP - MILWAUKEE, WI

CHEMICAL (ug/m^3)	SUB-SLAB VAPOR VRSL AF = 0.03 *RESIDENTIAL*	SUB-SLAB VAPOR VRSL AF = 0.01 LARGE COMMERCIAL / INDUSTRIAL	SSV-1 PRE-DEVELOPMENT 6/12/2020 ug/m^3	SSV-2 PRE-DEVELOPMENT 6/12/2020 ug/m^3	SS-1 PRE-DEVELOPMENT 12/4/2020 ug/m^3	SS-2 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-3 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-4 PRE-DEVELOPMENT NS ug/m3	SS-5 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-6 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-7 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-8 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-9 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-10 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-11 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-12 PRE-DEVELOPMENT 12/16/2020 ug/m3	SS-13 PRE-DEVELOPMENT 12/4/2020 ug/m3
Tetrachloroethene	*1,400*	18,000	< 1.2	100	< 5.56	14.3	15.6	NS	1340	4.1 J	8.1 J	13.4	3.4	14.9	< 2.78	8.8	0.95
Tetrahydrofuran	*7,000*	88,000	< 4.3	< 27	< 2.62	< 1.31	< 1.31	NS	< 26.2	< 1.31	< 1.31	1.36	< 0.131	< 1.31	< 1.31	< 0.131	0.85
Toluene	*170,000*	2,200,000	9	76	< 3.68	22.6	4.9 J	NS	530	4.5 J	3.8 J	3.2	4.3	9	4.5 J	6	9.3
trans-1,2-Dichloroethene	---	---	< 0.63	< 4.1	19.8	31.3	9.1	NS	1870	41	< 2.31	< 0.231	0.32	< 2.31	< 2.31	< 0.231	< 0.231
trans-1,3-Dichloropropene	---	---	< 0.95	< 6.1	< 3.96	< 1.98	< 1.98	NS	< 39.6	< 1.98	< 1.98	< 0.198	< 0.198	< 1.98	< 1.98	< 0.198	< 0.198
Trichloroethene (TCE)	*70*	880	15	310	< 4.74	61	*190*	NS	*161*	*141*	*93*	8	1.66	*70*	17.1	15.6	5.9
Trichlorofluoromethane	---	---	2.2 J	< 6.5	< 6.74	< 3.37	< 3.37	NS	< 67.4	< 3.37	< 3.37	1.24	1.4	< 3.37	< 3.37	1.18	1.35
Trichlorotrifluoroethane	---	---	NA	NA	208	380	330	NS	380	44	< 4.02	3.6	0.54	340	10 J	0.84 J	0.54 J
Vinyl acetate	*700*	8,800	< 2.5	< 16	< 4.06	< 2.03	< 2.03	NS	< 40.6	< 2.03	< 2.03	< 0.203	< 0.203	< 2.03	< 2.03	< 0.203	< 0.203
Vinyl Chloride	*57*	2,800	< 1.7	16 J	< 2.96	5.1	< 1.48	NS	*830*	< 1.48	< 1.48	< 0.148	< 0.148	< 1.48	< 1.48	< 0.148	< 0.148

Comments

All results in micrograms per cubic meter (ug/m^3)

"J" Flag = Analyte detected between Limit of Detection and Limit of Quantitation

"10" Code = Linear Range of Calibration Curve Exceeded

" * " Flag = Laboratory Control Sample or Sample Duplcicates Outside Acceptable Limits

VRSL = Vapor Risk Screening Levels

NA = Not Analyzed

NS = Not Sampled

BOLD indicates detection is above Large Commercial / Industrial VRSLs

Italics indicates detection is above Residential VRSLs

TABLE 1
DECEMBER 2020 SUB-SLAB VAPOR ANALYTICAL RESULTS
EASTERN COMPLEXES
COMMUNITY WITHIN THE CORRIDOR LIMITED PARTNERSHIP - MILWAUKEE, WI

CHEMICAL (ug/m^3)	SUB-SLAB VAPOR VRSL		SS-14	SS-15	SS-16	SS-17	SS-18	SS-19	SS-20	SS-21	SS-22	SS-23	SS-24	SS-25	SS-26	SS-27	SS-28
	AF = 0.03	AF = 0.01	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT
	RESIDENTIAL	LARGE COMMERCIAL / INDUSTRIAL	12/16/2020	12/4/2020	12/4/2020	12/4/2020	12/4/2020	12/16/2020	12/4/2020	12/3/2020	12/3/2020	12/3/2020	12/16/2020	12/16/2020	12/3/2020	12/3/2020	12/3/2020
			ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
1,1,1-Trichloroethane	*170,000*	2,200,000	20.9	25	34	360	150	57	210	20.9	9.7	17.7	1.2	31.3	59	26.7	7.7
1,1,2,2-Tetrachloroethane	*1.6*	21	< 0.325	< 3.25	< 3.25	< 0.325	< 0.325	< 0.325	< 0.325	< 0.325	< 0.325	< 0.325	< 0.325	< 0.325	< 0.325	< 0.325	< 0.325
1,1,2-Trichloroethane	*0.7*	8.8	< 0.258	< 2.58	< 2.58	< 0.258	< 0.258	< 0.258	*2.61*	< 0.258	< 0.258	< 0.258	< 0.258	*2.12*	< 0.258	< 0.258	< 0.258
1,1-Dichloroethane	*600*	7,700	*1740*	400	3.2 J	0.76	2.28	1.76	50	< 0.187	< 0.187	< 0.187	0.96	2.72	< 0.187	0.2 J	< 0.187
1,1-Dichloroethene	*7,000*	88,000	28.6	< 2.1	< 2.1	< 0.21	< 0.21	< 0.21	0.67	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
1,2,4-Trichlorobenzene	*700*	8,800	< 0.657	< 6.57	< 6.57	< 0.657	< 0.657	< 0.657	< 0.657	< 0.657	< 0.657	< 0.657	< 0.657	< 0.657	< 0.657	< 0.657	< 0.657
1,2,4-Trimethylbenzene	*210*	2,600	0.49 J	< 2.83	< 2.83	0.98	0.98	2.7	0.83 J	2.01	0.93	2.26	1.37	0.64 J	1.52	8	1.62
1,2-Dichlorobenzene	*700*	8,800	< 0.235	< 2.35	< 2.35	< 0.235	< 0.235	< 0.235	< 0.235	< 0.235	< 0.235	< 0.235	< 0.235	< 0.235	< 0.235	< 0.235	< 0.235
1,2-Dichloroethane	*36*	470	< 0.24	< 2.4	< 2.4	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24
1,2-Dichloropropane	*14*	180	< 0.28	< 2.8	< 2.8	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28
1,2-Dichlorotetrafluoroethane	---	---	< 0.446	< 4.46	< 4.46	< 0.446	< 0.446	< 0.446	< 0.446	< 0.446	< 0.446	< 0.446	< 0.446	< 0.446	< 0.446	< 0.446	< 0.446
1,3,5-Trimethylbenzene	*210*	2,600	< 0.232	< 2.32	< 2.32	0.245 J	0.245 J	0.44 J	< 0.232	0.49 J	< 0.232	0.54 J	0.34 J	< 0.232	0.44 J	1.77	0.49 J
1,3-Butadiene	---	---	< 0.143	< 1.43	< 1.43	< 0.143	< 0.143	< 0.143	< 0.143	< 0.143	< 0.143	< 0.143	< 0.143	< 0.143	< 0.143	< 0.143	< 0.143
1,3-Dichlorobenzene	---	---	< 0.302	< 3.02	< 3.02	< 0.302	< 0.302	< 0.302	< 0.302	< 0.302	< 0.302	< 0.302	< 0.302	< 0.302	< 0.302	< 0.302	< 0.302
1,4-Dichlorobenzene	*8*	110	0.84 J	7.8 J	7.8 J	2.34	2.4	1.26	2.64	4.6	4.2	5.1	1.92	1.2	6.9	7.2	5
1,4-Dioxane	*18*	250	< 0.157	< 1.57	< 1.57	< 0.157	< 0.157	1.19	< 0.157	< 0.157	< 0.157	< 0.157	< 0.157	< 0.157	< 0.157	< 0.157	< 0.157
2-Hexanone	---	---	< 0.222	< 2.22	< 2.22	0.37 J	0.286 J	< 0.222	< 0.222	0.49 J	0.45 J	0.61 J	< 0.222	< 0.222	0.65 J	0.49 J	1.06
4-Ethyltoluene		---	< 0.214	< 2.14	< 2.14	< 0.214	< 0.214	0.98	< 0.214	0.294 J	< 0.214	0.34 J	0.44 J	0.245 J	0.294 J	1.28	< 0.214
Acetone	*106,667*	1,400,000	NA	11.2	4.8 J	36	15.4	NA	11	39	15	20.4	NA	NA	17.9	22	143
Acrolein		---	< 0.094	< 0.94	< 0.94	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094
Benzene	*120*	1,600	0.16 J	< 1.36	< 1.36	0.64	0.54	0.42 J	5.1	0.54	0.64	0.38 J	0.73	1.95	1.28	0.57	0.61
Benzyl Chloride	*1.9*	25	< 0.209	< 2.09	< 2.09	< 0.209	< 0.209	< 0.209	< 0.209	< 0.209	< 0.209	< 0.209	< 0.209	< 0.209	< 0.209	< 0.209	< 0.209
Bromodichloromethane	*2.53*	33	< 0.374	< 3.74	< 3.74	< 0.374	< 0.374	< 0.374	< 0.374	< 0.374	< 0.374	< 0.374	< 0.374	< 0.374	< 0.374	< 0.374	< 0.374
Bromoform	*86.6*	1,100	< 0.414	< 4.14	< 4.14	< 0.414	< 0.414	< 0.414	< 0.414	< 0.414	< 0.414	< 0.414	< 0.414	< 0.414	< 0.414	< 0.414	< 0.414
Bromomethane	*17.3*	220	< 0.2	< 2	< 2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Carbon Disulfide	*2,433*	31,000	1.03	5	< 1.38	5.3	0.96	< 0.138	1	1.06	1.56	0.81	0.187 J	0.218 J	0.96	0.68	13.8
Carbon Tetrachloride	*156*	2,000	< 0.307	< 3.07	< 3.07	0.44 J	1.32	< 0.307	0.5 J	0.38 J	< 0.307	0.38 J	0.5 J	0.57 J	0.5 J	0.44 J	< 0.307
Chlorobenzene	*173*	2,200	< 0.251	< 2.51	< 2.51	< 0.251	< 0.251	< 0.251	< 0.251	< 0.251	< 0.251	< 0.251	< 0.251	< 0.251	< 0.251	< 0.251	< 0.251
Chloroethane	*33,333*	440,000	< 0.159	< 1.59	< 1.59	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	0.66
Chloroform	*3,100*	39,000	1.12	< 3	< 3	< 0.3	5.9	< 0.3	78	0.34 J	< 0.3	< 0.3	< 0.3	33	10.8	4.2	0.78 J
Chloromethane	*3,100*	39,000	< 0.831	< 8.31	< 8.31	< 0.831	< 0.831	< 0.831	< 0.831	< 0.831	< 0.831	< 0.831	< 0.831	< 0.831	< 0.831	< 0.831	2.39 J
cis-1,2-Dichloroethene	---	---	135	38	< 1.97	< 0.197	11.8	< 0.197	39	< 0.197	< 0.197	< 0.197	< 0.197	25.2	< 0.197	< 0.197	< 0.197
cis-1,3-Dichloropropene	---	---	< 0.234	< 2.34	< 2.34	< 0.234	< 0.234	< 0.234	< 0.234	< 0.234	< 0.234	< 0.234	< 0.234	< 0.234	< 0.234	< 0.234	< 0.234
Cyclohexane	*3,333*	44,000	< 0.212	< 2.12	< 2.12	< 0.212	< 0.212	< 0.212	0.48 J	< 0.212	< 0.212	< 0.212	1.14	< 0.212	< 0.212	< 0.212	< 0.212
Dibromochloromethane	---	---	< 0.376	< 3.76	< 3.76	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376
Dichlorodifluoromethane	*3,300*	44,000	2.62	< 2.63	< 2.63	2.47	2.42	2.67	2.13	2.03	1.98	2.42	3.4	2.87	3.2	2.67	2.32
EDB (1,2-Dibromoethane)	*0.157*	2	< 0.342	< 3.42	< 3.42	< 0.342	< 0.342	< 0.342	< 0.342	< 0.342	< 0.342	< 0.342	< 0.342	< 0.342	< 0.342	< 0.342	< 0.342
Ethanol	---	---	NA	22.2	10.7	54	29.3	NA	21.3	67	69	122	NA	NA	56	138	102
Ethyl Acetate	---	---	< 0.176	< 1.76	< 1.76	< 0.176	< 0.176	< 0.176	< 0.176	< 0.176	< 0.176	< 0.176	< 0.176	< 0.176	< 0.176	< 0.176	< 0.176
Ethylbenzene	*370*	4,900	< 0.203	< 2.03	< 2.03	0.78	0.56 J	0.52 J	0.48 J	0.61 J	0.74	0.87	0.61 J	0.43 J	0.65	2.08	0.56 J
Heptane	---	---	0.98	< 2.65	< 2.65	2.53	2.04	0.98	0.94	1.02	1.14	0.78 J	0.94	0.78 J	1.55	0.94	2
Hexachlorobutadiene	*4.3*	56	< 0.489	< 4.89	< 4.89	< 0.489	< 0.489	< 0.489	< 0.489	< 0.489	< 0.489	< 0.489	< 0.489	< 0.489	< 0.489	< 0.489	< 0.489
Hexane	*1,400*	18,000	0.85	< 2.35	< 2.35	1.27	1.27	0.63 J	< 0.235	0.88	0.85	0.74 J	9.3	0.95	1.83	1.06	1.27
Isopropyl Alcohol	---	---	2.38	4.2	2.7 J	2.73	1.57	4.1	1.06	4.1	2.73	4.1	0.74	1.08	2.78	2.09	7.2
m&p-Xylene	*333*	4,400	0.69 J	< 3.77	< 3.77	1.95	1.56	1.04 J	1.26	1.78	1.56	2.04	0.91 J	0.87 J	1.6	5.9	1.56
Methyl ethyl ketone (MEK)	*17,333*	220,000	1.24	< 1.78	< 1.78	4	1.5	1.33	0.94	4.3	1.95	3.6	< 0.178	2.27	2.27	5.2	18.6
Methyl isobutyl ketone (MIBK)	*10,333*	130,000	0.94	< 1.68	< 1.68	0.37 J	0.286 J	< 0.168	< 0.168	0.86	0.41 J	0.65	< 0.168	0.205 J	0.82	0.74	1.1
Methyl Methacrylate	---	---	< 0.217	< 2.17	< 2.17	< 0.217	< 0.217	< 0.217	< 0.217	< 0.217	< 0.217	< 0.217	< 0.217	< 0.217	< 0.217	< 0.217	< 0.217
Methyl tert-butyl ether (MTBE)	*3,700*	47,000	< 0.16	< 1.6	< 1.6	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
Methylene chloride	*21,000*	260,000	25.4	< 1.59	< 1.59	< 0.159	< 0.159	19.1	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159
Naphthalene	*28*	360	< 0.675	< 6.75	< 6.75	< 0.675	< 0.675	< 0.675	< 0.675	0.84 J	< 0.675	0.94 J	< 0.675	< 0.675	< 0.675	0.89 J	< 0.675
o-Xylene	*3,300*	44,000	0.26 J	< 2.18	< 2.18	0.78	0.61 J	0.39 J	0.52 J	0.82	0.69 J	0.95	0.39 J	0.39 J	0.74	2.34	0.78
Propene	---	---	< 0.079	< 0.79	< 0.79	7.4	0.57	< 0.079	1.17	0.5	6.8	0.38	< 0.079	< 0.079	1.07	0.52	6
Styrene	*3,333*	44,000	< 0.181	< 1.81	< 1.81	1.19	1.11	0.34 J	1.11	0.89	0.64	1.66	0.34 J	0.255 J	1.06	3.4	0.77

TABLE 1
DECEMBER 2020 SUB-SLAB VAPOR ANALYTICAL RESULTS
EASTERN COMPLEXES
COMMUNITY WITHIN THE CORRIDOR LIMITED PARTNERSHIP - MILWAUKEE, WI

CHEMICAL (ug/m^3)	SUB-SLAB VAPOR VRSL AF = 0.03 *RESIDENTIAL*	SUB-SLAB VAPOR VRSL AF = 0.01 LARGE COMMERCIAL / INDUSTRIAL	SS-14 PRE-DEVELOPMENT 12/16/2020 ug/m3	SS-15 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-16 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-17 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-18 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-19 PRE-DEVELOPMENT 12/16/2020 ug/m3	SS-20 PRE-DEVELOPMENT 12/4/2020 ug/m3	SS-21 PRE-DEVELOPMENT 12/3/2020 ug/m3	SS-22 PRE-DEVELOPMENT 12/3/2020 ug/m3	SS-23 PRE-DEVELOPMENT 12/3/2020 ug/m3	SS-24 PRE-DEVELOPMENT 12/16/2020 ug/m3	SS-25 PRE-DEVELOPMENT 12/16/2020 ug/m3	SS-26 PRE-DEVELOPMENT 12/3/2020 ug/m3	SS-27 PRE-DEVELOPMENT 12/3/2020 ug/m3	SS-28 PRE-DEVELOPMENT 12/3/2020 ug/m3
Tetrachloroethene	*1,400*	18,000	4.3	3.4 J	< 2.78	1.56	3.3	1.49	10.5	1.09	0.48 J	7.4	< 0.278	51	23.4	23.8	4.1
Tetrahydrofuran	*7,000*	88,000	< 0.131	< 1.31	< 1.31	0.56	< 0.131	< 0.131	< 0.131	0.59	< 0.131	< 0.131	< 0.131	< 0.131	< 0.131	< 0.131	< 0.131
Toluene	*170,000*	2,200,000	6.9	4.1 J	4.5 J	9.1	7.4	12	5.4	2.37	2.41	2.67	7.3	6.4	5.3	4.5	5.3
trans-1,2-Dichloroethene	---	---	258	15.1	< 2.31	< 0.231	5.5	< 0.231	9.8	< 0.231	< 0.231	< 0.231	< 0.231	7.3	0.238 J	< 0.231	< 0.231
trans-1,3-Dichloropropene	---	---	< 0.198	< 1.98	< 1.98	< 0.198	< 0.198	< 0.198	< 0.198	< 0.198	< 0.198	< 0.198	< 0.198	< 0.198	< 0.198	< 0.198	< 0.198
Trichloroethene (TCE)	*70*	880	15.1	6.4 J	*246*	16.8	1730	25.3	63000	31.4	51	*360*	1.07	85000	6000	3700	*250*
Trichlorofluoromethane	---	---	1.4	< 3.37	< 3.37	1.74	2.53	3.5	1.4	1.35	1.69	1.52	1.69	1.69	1.35	1.46	1.74
Trichlorotrifluoroethane	---	---	35	4.6 J	< 4.02	0.61 J	0.54 J	0.61 J	0.46 J	0.54 J	0.54 J	0.61 J	0.77 J	0.77 J	0.54 J	0.61 J	0.54 J
Vinyl acetate	*700*	8,800	< 0.203	< 2.03	< 2.03	< 0.203	< 0.203	< 0.203	< 0.203	< 0.203	< 0.203	< 0.203	< 0.203	< 0.203	< 0.203	< 0.203	< 0.203
Vinyl Chloride	*57*	2,800	2.66	< 1.48	< 1.48	< 0.148	< 0.148	< 0.148	< 0.148	< 0.148	< 0.148	< 0.148	< 0.148	< 0.148	< 0.148	< 0.148	< 0.148

Comments

All results in micrograms per cubic meter (ug/m^3)
"J" Flag = Analyte detected between Limit of Detection and Limit of Quantitation
"10" Code = Linear Range of Calibration Curve Exceeded
" * " Flag = Laboratory Control Sample or Sample Duplcicates Outside Acceptable I
VRSL = Vapor Risk Screening Levels
NA = Not Analyzed
NS = Not Sampled
BOLD indicates detection is above Large Commercial / Industrial VRSLs
Italics indicates detection is above Residential VRSLs

TABLE 1
DECEMBER 2020 SUB-SLAB VAPOR ANALYTICAL RESULTS
EASTERN COMPLEXES
COMMUNITY WITHIN THE CORRIDOR LIMITED PARTNERSHIP - MILWAUKEE, WI

CHEMICAL (ug/m^3)	SUB-SLAB VAPOR VRSL		SS-29	SS-30	SS-31	SS-32	SS-33	SS-34	SS-35	SS-36	SS-37	SS-38	SS-39	SS-40	SS-41	SS-42	SS-43
	AF = 0.03	AF = 0.01	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT
	RESIDENTIAL	LARGE COMMERCIAL / INDUSTRIAL	12/3/2020	12/3/2020	12/3/2020	12/3/2020	12/3/2020	12/3/2020	12/3/2020	12/3/2020	12/16/2020	12/3/2020	12/16/2020	NS	12/16/2020	12/16/2020	12/16/2020
			ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
1,1,1-Trichloroethane	*170,000*	2,200,000	6.6	2.61	1.09	29	8.2	9.6	2.83	4.3	3.3	7.9	< 498	NS	234	62	32
1,1,2,2-Tetrachloroethane	*1.6*	21	< 0.325	< 0.325	< 0.325	< 0.325	< 0.325	< 0.325	< 0.325	< 0.325	< 0.325	< 0.325	< 650	NS	< 32.5	< 0.325	< 0.325
1,1,2-Trichloroethane	*0.7*	8.8	< 0.258	< 0.258	< 0.258	< 0.258	< 0.258	< 0.258	< 0.258	< 0.258	< 0.258	< 0.258	< 516	NS	< 25.8	< 0.258	< 0.258
1,1-Dichloroethane	*600*	7,700	< 0.187	< 0.187	< 0.187	< 0.187	< 0.187	< 0.187	< 0.187	< 0.187	< 0.187	< 0.187	*960 J*	NS	540	28.5	390
1,1-Dichloroethene	*7,000*	88,000	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 420	NS	< 21	< 0.21	< 0.21
1,2,4-Trichlorobenzene	*700*	8,800	< 0.657	< 0.657	< 0.657	< 0.657	< 0.657	< 0.657	< 0.657	< 0.657	< 0.657	< 0.657	< 1314	NS	< 65.7	< 0.657	< 0.657
1,2,4-Trimethylbenzene	*210*	2,600	1.13	1.18	0.54 J	1.18	1.62	1.62	3.5	1.08	0.64 J	0.88 J	< 566	NS	74 J	1.13	< 0.283
1,2-Dichlorobenzene	*700*	8,800	< 0.235	< 0.235	< 0.235	< 0.235	< 0.235	< 0.235	< 0.235	< 0.235	< 0.235	< 0.235	< 470	NS	< 23.5	< 0.235	< 0.235
1,2-Dichloroethane	*36*	470	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 480	NS	< 24	< 0.24	< 0.24
1,2-Dichloropropane	*14*	180	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 560	NS	< 28	< 0.28	< 0.28
1,2-Dichlorotetrafluoroethane	---	---	< 0.446	< 0.446	< 0.446	< 0.446	< 0.446	< 0.446	< 0.446	< 0.446	< 0.446	< 0.446	< 892	NS	< 44.6	< 0.446	< 0.446
1,3,5-Trimethylbenzene	*210*	2,600	0.294 J	0.34 J	< 0.232	0.294 J	0.44 J	0.39 J	1.18	0.294 J	< 0.232	< 0.232	< 464	NS	44 J	0.245 J	< 0.232
1,3-Butadiene	---	---	< 0.143	< 0.143	< 0.143	< 0.143	< 0.143	< 0.143	< 0.143	< 0.143	< 0.143	< 0.143	< 286	NS	< 14.3	< 0.143	< 0.143
1,3-Dichlorobenzene	---	---	< 0.302	< 0.302	< 0.302	< 0.302	< 0.302	< 0.302	< 0.302	< 0.302	< 0.302	< 0.302	< 604	NS	< 30.2	< 0.302	< 0.302
1,4-Dichlorobenzene	*8*	110	6.3	3.8	2.4	6.7	6.6	*9.8*	4.4	5	1.08	3.2	< 604	NS	< 30.2	1.2	< 0.302
1,4-Dioxane	*18*	250	< 0.157	< 0.157	< 0.157	< 0.157	< 0.157	< 0.157	< 0.157	< 0.157	< 0.157	< 0.157	< 314	NS	< 15.7	< 0.157	< 0.157
2-Hexanone	---	---	1.84	< 0.222	0.49 J	0.41 J	< 0.222 J	0.45 J	0.86	0.37 J	0.65 J	0.37 J	< 444	NS	< 22.2	< 0.222	39
4-Ethyltoluene		---	< 0.214	0.245 J	< 0.214	< 0.214	< 0.214	< 0.214	0.78	< 0.214	0.245 J	< 0.214	< 428	NS	29.4 J	0.39 J	< 0.214
Acetone	*106,667*	1,400,000	18.6	18.9	63	9.6	12.1	15.6	45	21.4	NA	17.4	NA	NS	NA	NA	NA
Acrolein		---	< 0.094	< 0.094	< 0.094	< 0.094	0.275	< 0.094	2.7	0.138 J	< 0.094	0.64	< 188	NS	229	< 0.094	< 0.094
Benzene	*120*	1,600	0.77	2.27	0.57	0.45	0.35 J	0.35 J	0.83	0.57	0.35 J	0.32 J	5100	NS	*217*	0.224 J	*208*
Benzyl Chloride	*1.9*	25	< 0.209	< 0.209	< 0.209	< 0.209	< 0.209	< 0.209	< 0.209	< 0.209	< 0.209	< 0.209	< 418	NS	< 20.9	< 0.209	< 0.209
Bromodichloromethane	*2.53*	33	< 0.374	< 0.374	< 0.374	< 0.374	< 0.374	< 0.374	< 0.374	< 0.374	< 0.374	< 0.374	< 748	NS	< 37.4	< 0.374	< 0.374
Bromoform	*86.6*	1,100	< 0.414	< 0.414	< 0.414	< 0.414	< 0.414	< 0.414	< 0.414	< 0.414	< 0.414	< 0.414	< 828	NS	< 41.4	< 0.414	< 0.414
Bromomethane	*17.3*	220	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 400	NS	< 20	< 0.2	< 0.2
Carbon Disulfide	*2,433*	31,000	0.87	60	3.08	0.4 J	3.14	1.21	1.37	0.34 J	0.68	0.4 J	< 276	NS	1180	1.28	1.03
Carbon Tetrachloride	*156*	2,000	< 0.307	< 0.307	< 0.307	< 0.307	< 0.307	0.38 J	0.44 J	0.5 J	< 0.307	0.5 J	< 614	NS	< 30.7	< 0.307	< 0.307
Chlorobenzene	*173*	2,200	< 0.251	0.277 J	< 0.251	< 0.251	< 0.251	< 0.251	< 0.251	< 0.251	< 0.251	< 0.251	< 502	NS	< 25.1	< 0.251	< 0.251
Chloroethane	*33,333*	440,000	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	1790	NS	69	< 0.159	9.9
Chloroform	*3,100*	39,000	< 0.3	0.49 J	< 0.3	< 0.3	1.56	< 0.3	2.77	0.83 J	0.63 J	< 0.3	< 600	NS	< 30	0.92 J	1.51
Chloromethane	*3,100*	39,000	< 0.831	< 0.831	< 0.831	< 0.831	< 0.831	< 0.831	< 0.831	< 0.831	< 0.831	< 0.831	< 1662	NS	< 83.1	< 0.831	< 0.831
cis-1,2-Dichloroethene	---	---	< 0.197	< 0.197	< 0.197	< 0.197	< 0.197	< 0.197	< 0.197	< 0.197	< 0.197	< 0.197	< 394	NS	1860	21.5	9.4
cis-1,3-Dichloropropene	---	---	< 0.234	< 0.234	< 0.234	< 0.234	< 0.234	< 0.234	< 0.234	< 0.234	< 0.234	< 0.234	< 468	NS	< 23.4	< 0.234	< 0.234
Cyclohexane	*3,333*	44,000	< 0.212	< 0.212	< 0.212	< 0.212	< 0.212	< 0.212	0.31 J	< 0.212	< 0.212	< 0.212	*16400*	NS	460	< 0.212	320
Dibromochloromethane	---	---	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 752	NS	< 37.6	< 0.376	< 0.376
Dichlorodifluoromethane	*3,300*	44,000	2.37	2.67	1.19	2.18	2.27	2.22	2.42	2.52	2.92	2.57	< 526	NS	< 26.3	2.67	3.02
EDB (1,2-Dibromoethane)	*0.157*	2	< 0.342	< 0.342	< 0.342	< 0.342	< 0.342	< 0.342	< 0.342	< 0.342	< 0.342	< 0.342	< 684	NS	< 34.2	< 0.342	< 0.342
Ethanol	---	---	42	0.9	1.11	37	34	19.7	41	56	NA	18.4	NA	NS	NA	NA	NA
Ethyl Acetate	---	---	< 0.176	< 0.176	< 0.176	< 0.176	< 0.176	< 0.176	< 0.176	< 0.176	< 0.176	< 0.176	< 352	NS	< 17.6	< 0.176	< 0.176
Ethylbenzene	*370*	4,900	0.48 J	1.13	0.35 J	0.43 J	0.61 J	0.303 J	2.34	0.43 J	0.303 J	1	< 406	NS	48 J	0.52 J	15
Heptane	---	---	1.84	3.03	1.06	1.06	1.23	< 0.265	9.2	1.23	1.06	1.64	1230 J	NS	57 J	1.02	31.2
Hexachlorobutadiene	*4.3*	56	< 0.489	< 0.489	< 0.489	< 0.489	< 0.489	< 0.489	< 0.489	< 0.489	< 0.489	< 0.489	< 978	NS	< 48.9	< 0.489	< 0.489
Hexane	*1,400*	18,000	0.53 J	1.59	< 0.235	< 0.235	0.46 J	0.46 J	1.94	0.85	0.63 J	0.247 J	134000	NS	*3080*	0.7 J	2380
Isopropyl Alcohol	---	---	2.43	0.66	0.39	1.35	1.47	1.15	1.45	2.87	1.45	1.08	4100	NS	61	1.5	1.3
m&p-Xylene	*333*	4,400	1.21	2.34	1.17 J	1.13 J	1.47	0.87 J	6.9	1.13 J	0.78 J	1.78	< 754	NS	56 J	1.13 J	0.65 J
Methyl ethyl ketone (MEK)	*17,333*	220,000	3.6	1.89	11.2	1.71	1.71	2.51	4.5	2.15	1.47	2.15	< 356	NS	289	< 0.178	< 0.178
Methyl isobutyl ketone (MIBK)	*10,333*	130,000	1.15	0.33 J	1.47	0.41 J	< 0.168	0.45 J	0.57	0.53 J	0.33 J	0.41 J	< 336	NS	< 16.8	< 0.168	< 0.168
Methyl Methacrylate	---	---	< 0.217	< 0.217	< 0.217	< 0.217	< 0.217	< 0.217	< 0.217	< 0.217	< 0.217	< 0.217	< 434	NS	< 21.7	< 0.217	< 0.217
Methyl tert-butyl ether (MTBE)	*3,700*	47,000	< 0.16	0.18 J	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 320	NS	< 16	< 0.16	< 0.16
Methylene chloride	*21,000*	260,000	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 318	NS	< 15.9	< 0.159	< 0.159
Naphthalene	*28*	360	< 0.675	< 0.675	< 0.675	< 0.675	< 0.675	0.94 J	1.15 J	< 0.675	< 0.675	< 0.675	< 1350	NS	< 67.5	< 0.675	< 0.675
o-Xylene	*3,300*	44,000	0.56 J	1.04	0.39 J	0.52 J	0.74	0.48 J	2.86	0.48 J	0.303 J	0.78	< 436	NS	52 J	0.52 J	0.91
Propene	---	---	0.43	6.1	3.8	2.67	2.53	3.6	3.2	3.8	< 0.079	3.3	< 158	NS	< 7.9	< 0.079	< 0.079
Styrene	*3,333*	44,000	0.77	0.98	0.47 J	0.68	1.11	0.68	0.68	0.55 J	0.255 J	1.23	< 362	NS	< 18.1	0.298 J	< 0.181

TABLE 1
DECEMBER 2020 SUB-SLAB VAPOR ANALYTICAL RESULTS
EASTERN COMPLEXES
COMMUNITY WITHIN THE CORRIDOR LIMITED PARTNERSHIP - MILWAUKEE, WI

CHEMICAL (ug/m^3)	SUB-SLAB VAPOR VRSL AF = 0.03 *RESIDENTIAL*	SUB-SLAB VAPOR VRSL AF = 0.01 LARGE COMMERCIAL / INDUSTRIAL	SS-29 PRE-DEVELOPMENT 12/3/2020 ug/m3	SS-30 PRE-DEVELOPMENT 12/3/2020 ug/m3	SS-31 PRE-DEVELOPMENT 12/3/2020 ug/m3	SS-32 PRE-DEVELOPMENT 12/3/2020 ug/m3	SS-33 PRE-DEVELOPMENT 12/3/2020 ug/m3	SS-34 PRE-DEVELOPMENT 12/3/2020 ug/m3	SS-35 PRE-DEVELOPMENT 12/3/2020 ug/m3	SS-36 PRE-DEVELOPMENT 12/3/2020 ug/m3	SS-37 PRE-DEVELOPMENT 12/16/2020 ug/m3	SS-38 PRE-DEVELOPMENT 12/3/2020 ug/m3	SS-39 PRE-DEVELOPMENT 12/16/2020 ug/m3	SS-40 PRE-DEVELOPMENT NS ug/m3	SS-41 PRE-DEVELOPMENT 12/16/2020 ug/m3	SS-42 PRE-DEVELOPMENT 12/16/2020 ug/m3	SS-43 PRE-DEVELOPMENT 12/16/2020 ug/m3
Tetrachloroethene	*1,400*	18,000	< 0.278	9.4	0.88 J	< 0.278	98	640	5.3	9.2	21.2	3.05	< 556	NS	285	1.7	0.48 J
Tetrahydrofuran	*7,000*	88,000	< 0.131	0.59	0.71	< 0.131	0.41 J	< 0.131	0.74	0.68	< 0.131	< 0.131	< 262	NS	< 13.1	< 0.131	< 0.131
Toluene	*170,000*	2,200,000	4.9	7.3	2.86	3.5	4.4	1.2	3.9	3.2	8.2	9.1	830 J	NS	87	9.5	< 0.184
trans-1,2-Dichloroethene	---	---	< 0.231	< 0.231	< 0.231	< 0.231	< 0.231	< 0.231	0.277 J	< 0.231	< 0.231	< 0.231	< 462	NS	< 23.1	3.6	5.9
trans-1,3-Dichloropropene	---	---	< 0.198	< 0.198	< 0.198	< 0.198	< 0.198	< 0.198	< 0.198	< 0.198	< 0.198	< 0.198	< 396	NS	< 19.8	< 0.198	< 0.198
Trichloroethene (TCE)	*70*	880	6.5	6.3	3.6	54	*570*	*253*	2620	1010	*117*	*112*	< 474	NS	1400	*150*	*144*
Trichlorofluoromethane	---	---	1.57	1.63	0.62 J	1.52	1.29	2.02	2.19	1.8	1.57	1.85	< 674	NS	< 33.7	1.18	1.69
Trichlorotrifluoroethane	---	---	0.54 J	0.54 J	< 0.402	0.54 J	0.54 J	0.61 J	0.54 J	0.61 J	0.69 J	0.61 J	< 804	NS	< 40.2	8.4	1.15 J
Vinyl acetate	*700*	8,800	< 0.203	< 0.203	< 0.203	< 0.203	< 0.203	< 0.203	< 0.203	< 0.203	< 0.203	< 0.203	< 406	NS	< 20.3	< 0.203	< 0.203
Vinyl Chloride	*57*	2,800	< 0.148	< 0.148	< 0.148	< 0.148	< 0.148	< 0.148	< 0.148	< 0.148	< 0.148	< 0.148	*360 J*	NS	23 J	< 0.148	1.84

Comments

All results in micrograms per cubic meter (ug/m^3)
"J" Flag = Analyte detected between Limit of Detection and Limit of Quantitation
"10" Code = Linear Range of Calibration Curve Exceeded
" * " Flag = Laboratory Control Sample or Sample Duplcicates Outside Acceptable I
VRSL = Vapor Risk Screening Levels
NA = Not Analyzed
NS = Not Sampled
BOLD indicates detection is above Large Commercial / Industrial VRSLs
Italics indicates detection is above Residential VRSLs

TABLE 1
DECEMBER 2020 SUB-SLAB VAPOR ANALYTICAL RESULTS
EASTERN COMPLEXES
COMMUNITY WITHIN THE CORRIDOR LIMITED PARTNERSHIP - MILWAUKEE, WI

CHEMICAL (ug/m^3)	SUB-SLAB VAPOR VRSL		SS-44	SS-45	SS-46	SS-47	SS-48	SS-49	SS-50	SS-51
	AF = 0.03	AF = 0.01	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT
	RESIDENTIAL	LARGE COMMERCIAL / INDUSTRIAL	12/16/2020	12/3/2020	12/16/2020	12/16/2020	12/3/2020	12/4/2020	12/16/2020	12/16/2020
			ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
1,1,1-Trichloroethane	*170,000*	2,200,000	84	8.4	1.69	0.92	36	6.4	0.76 J	1040
1,1,2,2-Tetrachloroethane	*1.6*	21	< 0.325	< 0.325	< 0.325	< 0.325	< 0.325	< 0.325	< 0.325	< 0.325
1,1,2-Trichloroethane	*0.7*	8.8	< 0.258	< 0.258	< 0.258	< 0.258	< 0.258	< 0.258	< 0.258	< 0.258
1,1-Dichloroethane	*600*	7,700	32	< 0.187	< 0.187	< 0.187	< 0.187	< 0.187	< 0.187	< 0.187
1,1-Dichloroethene	*7,000*	88,000	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
1,2,4-Trichlorobenzene	*700*	8,800	< 0.657	< 0.657	< 0.657	< 0.657	< 0.657	< 0.657	< 0.657	< 0.657
1,2,4-Trimethylbenzene	*210*	2,600	< 0.283	1.08	0.78 J	0.74 J	1.03	0.78	1.03	0.74 J
1,2-Dichlorobenzene	*700*	8,800	< 0.235	< 0.235	< 0.235	< 0.235	< 0.235	< 0.235	< 0.235	< 0.235
1,2-Dichloroethane	*36*	470	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24
1,2-Dichloropropane	*14*	180	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28
1,2-Dichlorotetrafluoroethane	---	---	< 0.446	< 0.446	< 0.446	< 0.446	< 0.446	< 0.446	< 0.446	< 0.446
1,3,5-Trimethylbenzene	*210*	2,600	< 0.232	< 0.232	< 0.232	< 0.232	< 0.232	< 0.232	< 0.232	< 0.232
1,3-Butadiene	---	---	< 0.143	< 0.143	< 0.143	< 0.143	< 0.143	< 0.143	< 0.143	< 0.143
1,3-Dichlorobenzene	---	---	< 0.302	< 0.302	< 0.302	< 0.302	< 0.302	< 0.302	< 0.302	< 0.302
1,4-Dichlorobenzene	*8*	110	1.44	*8.5*	1.14	1.08	7.9	2.22	1.32	1.26
1,4-Dioxane	*18*	250	< 0.157	< 0.157	< 0.157	< 0.157	< 0.157	< 0.157	< 0.157	< 0.157
2-Hexanone	---	---	< 0.222	< 0.222	< 0.222	< 0.222	0.33 J	0.37	< 0.222	< 0.222
4-Ethyltoluene		---	< 0.214	< 0.214	0.294 J	0.34 J	< 0.214	< 0.214	0.39 J	0.294 J
Acetone	*106,667*	1,400,000	NA	29	NA	NA	7.8	16.3	NA	NA
Acrolein		---	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094	< 0.094
Benzene	*120*	1,600	0.192 J	1.18	< 0.136	0.16 J	< 0.136	0.45	0.224 J	0.7
Benzyl Chloride	*1.9*	25	< 0.209	< 0.209	< 0.209	< 0.209	< 0.209	< 0.209	< 0.209	< 0.209
Bromodichloromethane	*2.53*	33	< 0.374	< 0.374	< 0.374	< 0.374	< 0.374	< 0.374	< 0.374	< 0.374
Bromoform	*86.6*	1,100	< 0.414	< 0.414	< 0.414	< 0.414	< 0.414	< 0.414	< 0.414	< 0.414
Bromomethane	*17.3*	220	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Carbon Disulfide	*2,433*	31,000	< 0.138	2.46	0.218 J	0.187 J	0.37 J	0.47	< 0.138	0.56
Carbon Tetrachloride	*156*	2,000	< 0.307	0.38 J	< 0.307	0.315 J	0.315 J	0.38 J	0.38 J	< 0.307
Chlorobenzene	*173*	2,200	< 0.251	< 0.251	< 0.251	< 0.251	< 0.251	< 0.251	< 0.251	< 0.251
Chloroethane	*33,333*	440,000	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159
Chloroform	*3,100*	39,000	0.88 J	< 0.3	< 0.3	< 0.3	0.63 J	< 0.3	< 0.3	3.4
Chloromethane	*3,100*	39,000	< 0.831	0.89 J	< 0.831	< 0.831	< 0.831	< 0.831	< 0.831	< 0.831
cis-1,2-Dichloroethene	---	---	< 0.197	< 0.197	< 0.197	< 0.197	< 0.197	< 0.197	< 0.197	< 0.197
cis-1,3-Dichloropropene	---	---	< 0.234	< 0.234	< 0.234	< 0.234	< 0.234	< 0.234	< 0.234	< 0.234
Cyclohexane	*3,333*	44,000	< 0.212	< 0.212	< 0.212	< 0.212	< 0.212	< 0.212	< 0.212	< 0.212
Dibromochloromethane	---	---	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376
Dichlorodifluoromethane	*3,300*	44,000	2.52	2.42	3.3	3.07	2.42	2.37	3.11	1.88
EDB (1,2-Dibromoethane)	*0.157*	2	< 0.342	< 0.342	< 0.342	< 0.342	< 0.342	< 0.342	< 0.342	< 0.342
Ethanol	---	---	NA	21.7	NA	NA	131 10	27.1	NA	NA
Ethyl Acetate	---	---	< 0.176	< 0.176	< 0.176	< 0.176	< 0.176	< 0.176	< 0.176	< 0.176
Ethylbenzene	*370*	4,900	0.52 J	< 0.203	0.35 J	0.48 J	0.217 J	0.56 J	0.43 J	0.43 J
Heptane	---	---	1.43	< 0.265	0.98	1.02	< 0.265	2.62	1.23	1.43
Hexachlorobutadiene	*4.3*	56	< 0.489	< 0.489	< 0.489	< 0.489	< 0.489	< 0.489	< 0.489	< 0.489
Hexane	*1,400*	18,000	0.81	< 0.235	0.78	0.74 J	0.42 J	0.6 J	0.6 J	1.09
Isopropyl Alcohol	---	---	0.74	1.99	1.11	0.93	5.5	1.38	2.31	2.73
m&p-Xylene	*333*	4,400	1.04 J	0.61 J	0.95 J	1.08 J	0.65 J	1.47	1.26	0.95 J
Methyl ethyl ketone (MEK)	*17,333*	220,000	< 0.178	5.4	< 0.178	< 0.178	1.36	1.59	< 0.178	2.27
Methyl isobutyl ketone (MIBK)	*10,333*	130,000	< 0.168	0.286 J	< 0.168	< 0.168	0.33 J	0.286 J	< 0.168	< 0.168
Methyl Methacrylate	---	---	< 0.217	< 0.217	< 0.217	< 0.217	< 0.217	< 0.217	< 0.217	< 0.217
Methyl tert-butyl ether (MTBE)	*3,700*	47,000	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
Methylene chloride	*21,000*	260,000	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159	< 0.159
Naphthalene	*28*	360	< 0.675	0.78 J	< 0.675	< 0.675	1.05 J	< 0.675	< 0.675	< 0.675
o-Xylene	*3,300*	44,000	0.48 J	0.303 J	0.35 J	0.48 J	0.303 J	0.61 J	0.52 J	0.43 J
Propene	---	---	< 0.079	3.2	< 0.079	< 0.079	2.65	1.7	< 0.079	< 0.079
Styrene	*3,333*	44,000	0.34 J	0.38 J	0.34 J	0.34 J	5	1.15	0.34 J	0.255 J

TABLE 1
DECEMBER 2020 SUB-SLAB VAPOR ANALYTICAL RESULTS
EASTERN COMPLEXES
COMMUNITY WITHIN THE CORRIDOR LIMITED PARTNERSHIP - MILWAUKEE, WI

CHEMICAL (ug/m^3)	SUB-SLAB VAPOR VRSL		SS-44	SS-45	SS-46	SS-47	SS-48	SS-49	SS-50	SS-51
	AF = 0.03	AF = 0.01	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT	PRE-DEVELOPMENT
	RESIDENTIAL	LARGE COMMERCIAL / INDUSTRIAL	12/16/2020	12/3/2020	12/16/2020	12/16/2020	12/3/2020	12/4/2020	12/16/2020	12/16/2020
			ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
Tetrachloroethene	*1,400*	18,000	1.09	3.2	5.9	0.41 J	33	2.1	1.9	6.4
Tetrahydrofuran	*7,000*	88,000	< 0.131	< 0.131	< 0.131	< 0.131	< 0.131	< 0.131	< 0.131	< 0.131
Toluene	*170,000*	2,200,000	10.1	1.43	9.6	10.9	0.83	11.1	13.4	8.2
trans-1,2-Dichloroethene	---	---	< 0.231	< 0.231	< 0.231	< 0.231	< 0.231	< 0.231	< 0.231	< 0.231
trans-1,3-Dichloropropene	---	---	< 0.198	< 0.198	< 0.198	< 0.198	< 0.198	< 0.198	< 0.198	< 0.198
Trichloroethene (TCE)	*70*	880	13.7	*148*	2.04	3.6	52	*170*	1.82	*870*
Trichlorofluoromethane	---	---	1.01 J	1.57	1.46	1.8	1.4	1.46	2.47	1.24
Trichlorotrifluoroethane	---	---	0.54 J	0.61 J	0.54 J	0.77 J	0.54 J	0.61 J	0.77 J	0.69 J
Vinyl acetate	*700*	8,800	< 0.203	< 0.203	< 0.203	< 0.203	< 0.203	< 0.203	< 0.203	< 0.203
Vinyl Chloride	*57*	2,800	< 0.148	< 0.148	< 0.148	< 0.148	< 0.148	< 0.148	< 0.148	< 0.148

Comments

All results in micrograms per cubic meter (ug/m^3)
"J" Flag = Analyte detected between Limit of Detection and Limit of Quantitation
"10" Code = Linear Range of Calibration Curve Exceeded
" * " Flag = Laboratory Control Sample or Sample Duplcicates Outside Acceptable
VRSL = Vapor Risk Screening Levels
NA = Not Analyzed
NS = Not Sampled
BOLD indicates detection is above Large Commercial / Industrial VRSLs
Italics indicates detection is above Residential VRSLs

Table 2

Calculations of Sub-Slab Depressurization Blower Size

Area ID	Size of Area (square feet)	Vadose Zone Depth (feet)	Porosity	Time for 1 Pore Volume Exchange (minutes)	Required Blower Volume Rate (SCFM)*
Storage	9,307	4	0.3	360	31
Garage	44,552	4	0.3	360	149
Gymnasium	24,559	4	0.3	360	82
Residential / Commercial	33,586	4	0.3	360	112

Vacuum is 44 inches of water

*Q = Area * Vadose Depth * Porosity / Pore Exchange Time

APPENDICES

APPENDIX A

Pressure Field Extension Test Photographs

Photograph 1. Installation of PFE VE#5

Photograph 2. Installation of PFE VE#5

APPENDIX B

Pressure Field Extension Test Field Data

Constants: Fan Model: GP501C Inner Pipe Diameter: 3.042" Total pipe run before fan: 74" (includes fitting lengths) Fittings before fan: street 90, 3x3x2 long sweep T, fernco, 3x2 reducer at VE

							Negative Pressure Measurement Points					
	Time	FPM (IN)	Temp (IN)	Negative Pressure (IN)	Temp (OUT)	10'	19' (SS-41)	25'	30'	32' (SS-12)	29.5' (SS-7)
Vapor Extraction Location					*Direction from VE Location*	W	W	W	W	E	NW
VE-3	1525	92	44	-4.457	45	-0.021	0.000	0.000	0.000	0.000	0.000
	1535	119	48	-4.356	48	-0.039	0.000	0.000	0.000	0.000	0.000
	1545	205	49	-4.283	51	-0.044	-0.003	0.000	0.000	0.000	0.000
	1555	228	47	-4.242	49	-0.040	0.000	0.000	0.000	0.000	0.000
	1605	277	48	-4.236	49	-0.037	0.000	0.000	0.000	0.000	0.000

NOTES: Performed PFE on 2/19/2021
Sub-Slab Thickness = 5"
Dominant Sub-Soil Type = Dark Brown Silty CLAY with large gravel
Sub-Soil very frozen; could only remove approx. 1 "gallon" from VE point

						Negative Pressure Measurement Points				
	Time	FPM (IN)	Temp (IN)	Negative Pressure (IN)	Temp (OUT)	10'	20'	30'	34' (SS-20)	40'
Vapor Extraction Location					*Direction from VE Location*	S	S	S	S	S
VE-4	1350	318	32	-4.532	37	-0.037	0.000	0.000	0.000	0.000
	1400	446	38	-4.431	40	-0.038	0.000	0.000	0.000	0.000
	1410	371	51	-4.373	51	-0.032	0.000	0.000	0.000	0.000
	1420	350	38	-4.350	40	-0.036	0.000	0.000	0.000	0.000
	1430	367	38	-4.321	41	-0.028	0.000	0.000	0.000	0.000

NOTES: Performed PFE on 2/19/2021
Sub-Slab Thickness = 5"
Dominant Sub-Soil Type = Light Brown Silty CLAY, some sand, few gravel

							Negative Pressure Measurement Points													
	Time	FPM (IN)	Temp (IN)	Negative Pressure (IN)	FPM (OUT)	Temp (OUT)	10'	20'	30'	40	50'	60'	65' (SS-51)	70'	40' (SS-22)	10'	20'	30'	40'	50'	65' (SS-17)
Vapor Extraction Location					*Direction from VE Location*		SW	SW	SW	SW	SW	SW	SW	SW	SE	NW	NW	NW	NW	NW	NW
VE-5	1115	445	29	-4.525	25	30	-0.074	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	1125	373	28	-4.507	23	31	-0.051	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	1135	261	35	-4.464	24	38	-0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	1145	311	32	-4.450	24	36	-0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NOTES: Performed PFE on 2/18/2021
Sub-Slab Thickness = 8.5"
Dominant Sub-Soil Type = Brown Silty CLAY, few sand & gravel

						Negative Pressure Measurement Points				
	Time	FPM (IN)	Temp (IN)	Negative Pressure (IN)	Temp (OUT)	8' (SS-28)	20'	30'	39' (SS-29)	28' (SS-27)
Vapor Extraction Location	*Direction from VE Location*					S	S	S	S	NE
VE-6	1130	328	34	-4.517	38	-0.286	0.000	-0.007	0.000	0.000
	1140	372	43	-4.419	46	-0.191	-0.041	-0.017	0.000	0.000
	1150	290	48	-4.354	46	-0.179	-0.041	-0.023	0.000	0.000
	1200	447	48	-4.321	50	-0.188	-0.050	-0.023	0.000	0.000
	1210	300	41	-4.296	46	-0.193	-0.004	0.000	0.000	0.000

NOTES: Performed PFE on 2/19/2021
Sub-Slab Thickness = 5.35"
Dominant Sub-Soil Type = Dark Brown Silty CLAY with gravel, some sand, some cobbles

							Negative Pressure Measurement Points				
	Time	FPM (IN)	Temp (IN)	Negative Pressure (IN)	FPM (OUT)	Temp (OUT)	10'	20'	30'	40	48' (SS-34)
Vapor Extraction Location					*Direction from VE Location*		W	W	W	W	W
VE-7	1615	382	30	-4.496	34	35	-0.032	-0.003	0.000	0.000	0.000
	1625	235	35	-4.448	24	38	-0.028	0.000	0.000	0.000	0.000
	1635	278	36	-4.377	28	39	-0.035	0.000	0.000	0.000	0.000
	1645	299	39	-4.327	34	46	-0.032	0.000	0.000	0.000	0.000
	1655	297	41	-4.340	30	47	-0.031	0.000	0.000	0.000	0.000

NOTES: Performed PFE on 2/18/2021
Sub-Slab Thickness = 4.5"
Dominant Sub-Soil Type = Dark brown dense Silty CLAY with gravel for the first 2.5", then light brown sandy/gravelly CLAY
Could not collect negative pressure measurements at SS-36; deconstruction debris overlays location

							Negative Pressure Measurement Points							
	Time	FPM (IN)	Temp (IN)	Negative Pressure (IN)	FPM (OUT)	Temp (OUT)	10'	20'	30'	40	50'	60'	28' (SS-37)	40' (SS-49)
Vapor Extraction Location					*Direction from VE Location*		S	S	S	S	S	S	NE	S/SE
VE-8	1355	936	35	-4.091	469	36	-0.183	-0.009	0.000	-0.001	0.000	0.000	-0.017	0.000
	1405	882	34	-4.000	195	38	-0.191	-0.007	0.000	0.000	0.000	0.000	-0.021	0.000
	1415	750	33	-4.064	250	37	-0.191	-0.010	0.000	0.000	0.000	0.000	-0.030	0.000
	1425	783	33	-4.327	202	38	-0.180	-0.011	0.000	0.000	0.000	0.000	-0.026	0.000
	1435	810	31	-4.045	194	35	-0.179	-0.012	0.000	0.000	0.000	0.000	-0.024	0.000
	1445	840	32	-4.068	407	38	-0.185	-0.004	0.000	0.000	0.000	0.000	-0.020	0.000

NOTES: Performed PFE on 2/18/2021
Sub-Slab Thickness = 4"
Dominant Sub-Soil Type = Dark Brown Sandy/Gravelly CLAY, with basaltic concrete, some charred debris

						Negative Pressure Measurement Points					
	Time	FPM (IN)	Temp (IN)	Negative Pressure (IN)	Temp (OUT)	10'	20'	30'	40	10' (SS-38)	unknown (SS-50)
Vapor Extraction Location					*Direction from VE Location*	W	W	W	W	S	SW
VE-9	935	376	35	-4.481	35	-0.014	-0.003	0.000	0.000	-1.033	0.000
	945	266	38	-4.366	43	-0.068	0.000	0.000	0.000	-1.367	0.000
	955	408	40	-4.319	43	-0.015	0.000	0.000	0.000	-1.179	0.000
	1005	347	40	-4.331	45	-0.022	0.000	0.000	0.000	-1.954	0.000
	1015	356	40	-4.296	45	-0.014	0.000	0.000	0.000	0.000	0.000

NOTES: Performed PFE on 2/19/2021
Sub-Slab Thickness = 5"
Dominant Sub-Soil Type = Light brown Clayey SAND with gravel, moist

APPENDIX C

Pressure Field Extension Test Calculations

Location	Date	" WC	FPM	Pipe Diameter (Ft)	Pipe Radius (Ft)	Radius^2	PI	SF	CFM
VP-3	2/19/2021	-4.283	**205**	0.253499899	0.126749949	0.01606555	3.141592654	0.050471413	**10.3**
VP-4	2/19/2021	-4.431	**446**	0.253499899	0.126749949	0.01606555	3.141592654	0.050471413	**22.5**
VP-5	2/18/2021	-4.525	**445**	0.253499899	0.126749949	0.01606555	3.141592654	0.050471413	**22.5**
VP-6	2/19/2021	-4.321	**447**	0.253499899	0.126749949	0.01606555	3.141592654	0.050471413	**22.6**
VP-7	2/18/2021	-4.496	**382**	0.253499899	0.126749949	0.01606555	3.141592654	0.050471413	**19.3**
VP-8	2/18/2021	-4.064	**750**	0.253499899	0.126749949	0.01606555	3.141592654	0.050471413	**37.9**
VP-9	2/19/2021	-4.331	**266**	0.253499899	0.126749949	0.01606555	3.141592654	0.050471413	**13.4**

0.502583 0.251292 0.063148 0.198384

52.15468

Notes: Fan used during PFE study was a GP501c
Recommended max operating pressure is 3.8 ''WC

Typical CFM vs Static Pressure WC when using 3-inch pipe with GP501c

2.0 " WC	*2.5 " WC*	*3.0 " WC*	*3.5 " WC*	*4.0 " WC*
60 CFM	*58 CFM*	*50 CFM*	*27 CFM*	*4 CFM*

Location	" WC	CFM	Sub-Slab Thickness	Dominant Sub-Soil Classification
VP-3	-4.283	**10.3**	5"	Dark Brown Silty CLAY with large gravel
VP-4	-4.431	**22.5**	5"	Light Brown Silty CLAY, some sand, few gravel
VP-5	-4.525	**22.5**	8.5"	Brown Silty CLAY, few sand & gravel
VP-6	-4.321	**22.6**	5.35"	Dark Brown Silty CLAY with gravel, some sand, some cobbles
VP-7	-4.496	**19.3**	4.5"	Dark brown dense Silty CLAY with gravel for the first 2.5", then light brown sandy/gravelly CLAY
VP-8	-4.064	**37.9**	4"	Dark Brown Sandy/Gravelly CLAY, with basaltic concrete, some charred debris
VP-9	-4.331	**17.5**	5"	Light brown Clayey SAND with gravel, moist

Location	CFM	Neg. Pressure Measured at Fan	Greatest-Detected Extent (must exceed 0.004 inches of water column)		Inches of Water Column to Pascals		Estimated ROI (Ft) to Achieve -0.004"WC (or 1 Pascal)
			Negative Pressure	Distance (Ft)	at Fan	at greatest extent	
VE-3	**10.347**	-4.283	-0.044	10'	-1065.78172	-10.94896	**10.44**
VE-4	**22.510**	-4.431	-0.038	10'	-1102.61004	-9.45592	**10.36**
VE-5	**22.460**	-4.525	-0.074	10'	-1126.001	-18.41416	**10.75**
VE-6	**22.561**	-4.321	-0.023	30'	-1075.23764	-5.72332	**30.93**
VE-7	**19.280**	-4.496	-0.032	10'	-1118.78464	-7.96288	**10.29**
VE-8	**37.854**	-4.064	-0.03	28'	-1011.28576	-7.4652	**20.16**
VE-9	**13.425**	-4.366	-0.068	10'	-1086.43544	-16.92112	**10.71**

VP-3		VP-4		VP-5		VP-6		VP-7		VP-8		VP-9	
0.1	1065.78	0.1	1102.61	0.1	1126	0.1	1075.24	0.1	1118.78	0.1	1011.29	0.1	1086.435
1		1		1		1		1		1		1	
2		2		2		2		2		2		2	
3		3		3		3		3		3		3	
4		4		4		4		4		4		4	
5		5		5		5		5		5		5	
6		6		6		6		6		6		6	
7		7		7		7		7		7		7	
8		8		8		8		8		8		8	
9		9		9		9		9		9		9	
10	10.949	10	9.45592	10	18.4142	10		10	7.96288	10		10	16.9211
11		11		11		11		11		11		11	
12		12		12		12		12		12		12	
13		13		13		13		13		13		13	
14		14		14		14		14		14		14	
15		15		15		15		15		15		15	
16		16		16		16		16		16		16	
17		17		17		17		17		17		17	
18		18		18		18		18		18		18	
19		19		19		19		19		19		19	
20		20		20		20		20		20	2.4884	20	
21		21		21		21		21		21		21	
22		22		22		22		22		22		22	
23		23		23		23		23		23		23	
24		24		24		24		24		24		24	
25		25		25		25		25		25		25	
26		26		26		26		26		26		26	
27		27		27		27		27		27		27	
28		28		28		28		28		28		28	
29		29		29		29		29		29		29	
30		30		30		30	5.72332	30		30		30	
31		31		31		31		31		31		31	
32		32		32		32		32		32		32	
33		33		33		33		33		33		33	
34		34		34		34		34		34		34	
35		35		35		35		35		35		35	
36		36		36		36		36		36		36	
37		37		37		37		37		37		37	
38		38		38		38		38		38		38	
39		39		39		39		39		39		39	
40		40		40		40		40		40		40	
41		41		41		41		41		41		41	
42		42		42		42		42		42		42	
43		43		43		43		43		43		43	
44		44		44		44		44		44		44	
45		45		45		45		45		45		45	
46		46		46		46		46		46		46	
47		47		47		47		47		47		47	
48		48		48		48		48		48		48	
49		49		49		49		49		49		49	
50		50		50		50		50		50		50	
51		51		51		51		51		51		51	
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59		59		59		59		59		59		59	
60		60		60		60		60		60		60	
61		61		61		61		61		61		61	
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64		64		64		64		64		64		64	
65		65		65		65		65		65		65	
66		66		66		66		66		66		66	
67		67		67		67		67		67		67	
68		68		68		68		68		68		68	
69		69		69		69		69		69		69	
70		70		70		70		70		70		70	
71		71		71		71		71		71		71	
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73		73		73		73		73		73		73	
74		74		74		74		74		74		74	
75		75		75		75		75		75		75	
76		76		76		76		76		76		76	
77		77		77		77		77		77		77	
78		78		78		78		78		78		78	
79		79		79		79		79		79		79	
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81		81		81		81		81		81		81	
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83		83		83		83		83		83		83	
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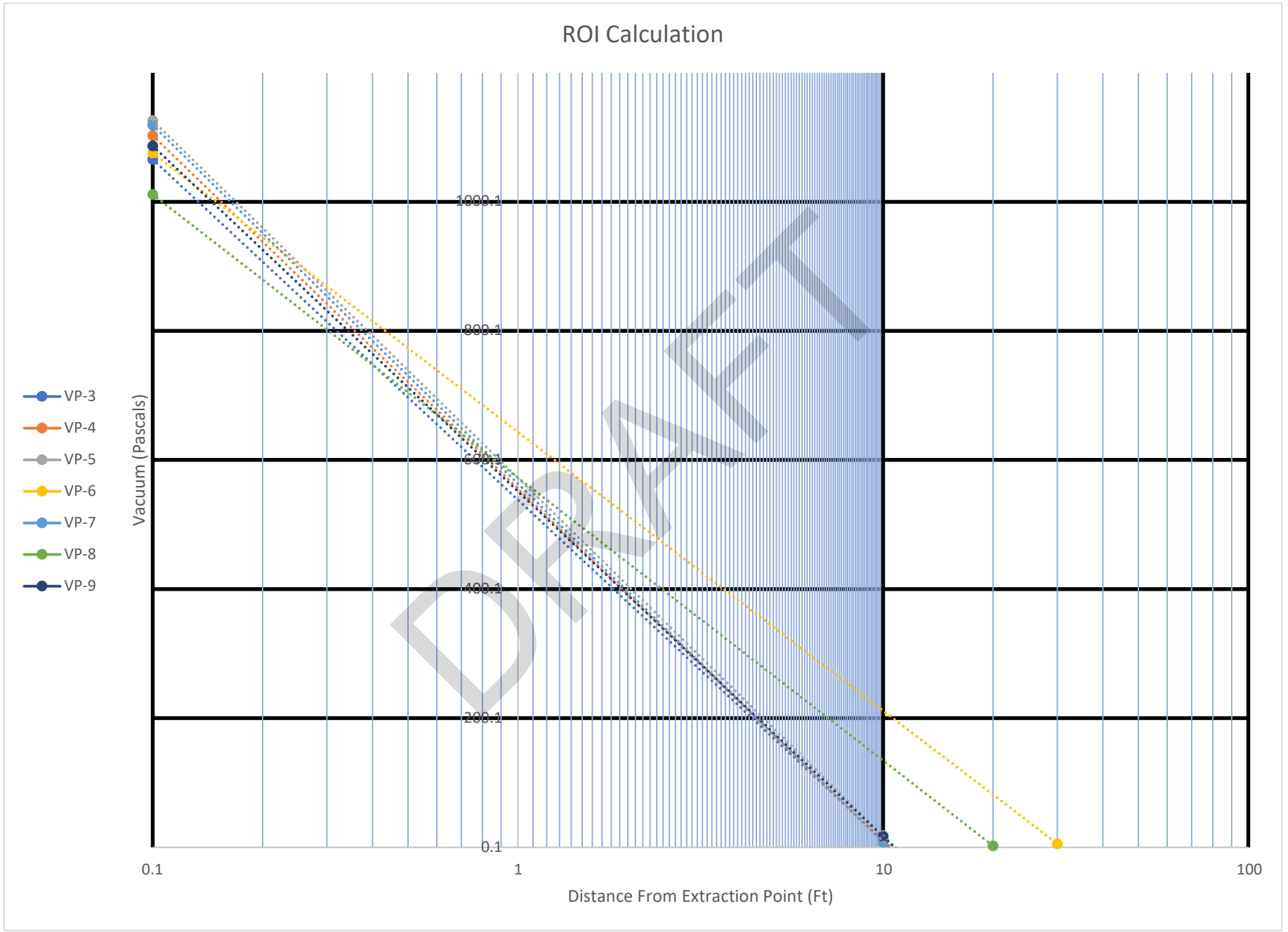
85		85		85		85		85		85		85	
86		86		86		86		86		86		86	
87		87		87		87		87		87		87	
88		88		88		88		88		88		88	
89		89		89		89		89		89		89	
90		90		90		90		90		90		90	
91		91		91		91		91		91		91	
92		92		92		92		92		92		92	
93		93		93		93		93		93		93	
94		94		94		94		94		94		94	
95		95		95		95		95		95		95	
96		96		96		96		96		96		96	

	Trendline Equation	
VP-3	y = -229.1ln(x) + 538.36	10.44
VP-4	y = -237.4ln(x) + 556.03	10.36
VP-5	y = -240.5ln(x) + 572.21	10.75
VP-6	y = -187.5ln(x) + 643.48	30.93
VP-7	y = -241.2ln(x) + 563.37	10.29
VP-8	y = -190.4ln(x) + 572.88	20.16
VP-9	y = -232.2ln(x) + 551.68	10.71

solve for x when y=1..

97	97	97	97	97	97	97
98	98	98	98	98	98	98
99	99	99	99	99	99	99
100	100	100	100	100	100	100


ROI Calculation
VP-3
VP-4
VP-5
VP-6
VP-7
VP-8
VP-9
Vacuum (Pascals)
1000.1
800.1
600.1
400.1
200.1
0.1
0.1
1
10
100
Distance From Extraction Point (Ft)
DRAFT

Diagnostic Test

	VE-3			VE-4			VE-5			VE-6					VE-7				VE-8				VE-9		
Distance (ft)	0.1	10	19	0.1	10	20	0.1	10	20	0.1	8	20	30	40	0.1	10	20	30	0.1	10	20	30	0.1	10	20
"WC	-4.283	-0.044	0	-4.431	-0.038	0	-4.525	-0.074	0	-4.321	-0.188	-0.05	-0.023	0	-4.496	-0.032	-0.003	0	-4.064	-0.191	-0.01	0	-4.366	-0.068	0
Pressure Drop 0-10'	98.97%			99.14%			98.36%			95.65%					99.29%				95.30%				98.44%		
Pressure Drop 10-20'	NA			NA			NA			73.40%					90.63%				94.76%				NA		
Pressure Drop 20-30'	NA			NA			NA			54.00%					NA				NA				NA		
Pressure Drop 30-40'	NA			NA			NA			NA					NA				NA				NA		
CLASS	Poor Aggregate			Poor Aggregate			Poor Aggregate			Poor / Some Aggregate					Poor Aggregate				Poor Aggregate				Poor Aggregate		
Dominant Sub-Soil	Clay w/ gravel			Clay			Clay			Clay w/ gravel, some cobbles					Clay w/ gravel				Clay w/ gravel & sand				Sand & Clay		
Correlation of Actual Fan Operating Pressure vs Recommended	112.71%			116.61%			119.08%			113.71%					118.32%				106.95%				114.89%		

PFE % Drop Calculation

P(x) = p(y)ab
P(x) is pressure at neg. pressure point
p(y) is pressure in PFE test hole
a is fraction of pressure remaining after distance b
b is reference distance (usually 10')

Fan Model Used for Diagnostic Testing: GP 501c
Recommended Max. Operating Pressure: 3.8"WC

RadonAway HS2000 Fan (High Suction and High Flow for Large Areas) - Estimated - Recommended Max. Operating Pressure of 14"WC

	VE-3			VE-4			VE-5			VE-6								VE-7				VE-8				VE-9		
Distance (ft)	0.1	10	19	0.1	10	20	0.1	10	20	0.1	8	20	30	40	50	60	70	0.1	10	20	30	0.1	10	20	30	0.1	10	20
"WC	-15.78	-0.162	-0.002	-16.32	-0.14	-0.001	-16.67	-0.273	-0.004	-15.92	-0.693	-0.184	-0.085	-0.039	-0.018	-0.008	-0.004	-16.56	-0.118	-0.011	-0.001	-14.97	-0.704	-0.037	-0.002	-16.0853	-0.25053	-0.0039
Pressure Drop 0-10'	98.97%			99.14%			98.36%			95.65%								99.29%				95.30%				98.44%		
Pressure Drop 10-20'	98.97%			99.14%			98.36%			73.40%								90.63%				94.76%				98.44%		
Pressure Drop 20-30'	NA			NA			NA			54.00%								90.63%				94.76%				98.44%		
Pressure Drop 30-40'	NA			NA			NA			54.00%								NA				94.76%				NA		
Pressure Drop 40-50'	NA			NA			NA			54.00%								NA				94.76%				NA		
Pressure Drop 50-60'	NA			NA			NA			54.00%								NA				NA				NA		

RadonAway HS25000 Fan (For Very Tight Sub-Slab Materials and Where Number of Holes are Restricted) - Estimated - Recommended Max. Operating Pressure of 44"WC

	VE-3			VE-4			VE-5			VE-6									VE-7				VE-8				VE-9		
Distance (ft)	0.1	10	19	0.1	10	20	0.1	10	20	0.1	8	20	30	40	50	60	70	80	0.1	10	20	30	0.1	10	20	30	0.1	10	20
"WC	-49.59	-0.509	-0.005	-51.31	-0.441	-0.004	-52.39	-0.859	-0.014	-50.03	-2.177	-0.579	-0.266	-0.123	-0.056	-0.026	-0.012	-0.005	-52.06	-0.371	-0.035	-0.003	-47.06	-2.212	-0.116	-0.006	-50.5537	-0.78737	-0.012
Pressure Drop 0-10'	98.97%			99.14%			98.36%			95.65%									99.29%				95.30%				98.44%		
Pressure Drop 10-20'	98.97%			99.14%			98.36%			73.40%									90.63%				94.76%				98.44%		
Pressure Drop 20-30'	NA			NA			NA			54.00%									90.63%				94.76%				98.44%		
Pressure Drop 30-40'	NA			NA			NA			54.00%									NA				94.76%				NA		
Pressure Drop 40-50'	NA			NA			NA			54.00%									NA				94.76%				NA		
Pressure Drop 50-60'	NA			NA			NA			54.00%									NA				NA				NA		
Pressure Drop 60-70'	NA			NA			NA			54.00%									NA				NA						