International Business Machines Corporation
2455 South Road
Poughkeepsie, NY, 12601

March 14, 2024

Jessica LaClair
New York State Department of Environmental Conservation
Division of Environmental Remediation, Remedial Bureau D
625 Broadway, 12th Floor
Albany, New York 12233-7013

Re: Vapor Intrusion Engineering Controls 2023 Annual Report
IBM Poughkeepsie Facility, Poughkeepsie, New York
NYSDEC Site No. 314001
EPA ID NYD080480734

Dear Ms. LaClair:

The enclosed document presents a summary of the monitoring conducted in 2023 in accordance with IBM's Performance Monitoring Plan (PMP) for Vapor Intrusion Engineering Controls at the IBM Poughkeepsie facility.

If you wish to further discuss this document or have questions, please contact Mr. Steve Brannen of IBM at (914) 474-3125.

Sincerely,
International Business Machines Corporation

Nicolette Visalli

Nicolette Visalli
US Manager, Environmental, Chemical & Safety Services
Global Real Estate

Enclosure: Vapor Intrusion Engineering Controls 2023 Annual Report

cc: J. Kenney, NYSDOH
B. Ashby, IBM

SANBORN HEAD

Vapor Intrusion Engineering Controls
2023 Annual Report

IBM POUGHKEEPSIE FACILITY

Poughkeepsie, New York

Poughkeepsie, New York

Prepared for IBM Corporation

File No. 4238.02

March 2024

SANBORN HEAD

NYS Professional Engineer Certification
Vapor Intrusion Engineering Controls - 2023 Annual Report
IBM Poughkeepsie Facility
NYSDEC Site No. 314001

I, David Shea, certify that I am currently a NYS registered professional engineer and that the vapor intrusion engineering controls employed at this site are protective of public health and the environment, based on the data and information provided to me and my inquiry of those persons responsible for operating the engineering controls and gathering the data and information.

Date: March 14, 2024

Name: David Shea

NYS P.E. License No. 70026

TABLE OF CONTENTS

1.0 INTRODUCTION

This report summarizes the results of monitoring conducted in 2023 for the soil vapor intrusion (VI) engineering controls (ECs) established in accordance with IBM's Performance Monitoring Plan for Vapor Intrusion Engineering Controls (PMP)[1] for certain buildings at the IBM Poughkeepsie Facility (the site). The PMP was approved by the New York State Department of Environmental Conservation (NYSDEC) and Department of Health (NYSDOH) (collectively the Departments) in a letter to IBM dated October 12, 2022.

The site is located at 2455 South Road, Poughkeepsie, New York. A Site Location Plan is provided as Figure 1, and a map of the site buildings subject to the PMP is provided as Figure 2. The work described herein was conducted on behalf of IBM by Sanborn, Head Engineering, P.C. in accordance with the PMP. The services conducted, and this report, are subject to the standard limitations for this type of work, as described in Appendix A.

1.1 Report Organization

This report is organized into four sections as described below:

Section 1.0 presents a general introduction, including the background and purpose of the report.

Section 2.0 summarizes the status of building use and occupancy in 2023.

Section 3.0 provides a summary of the VI EC operations in 2023.

Section 4.0 is the closing, which indicates IBM has met its obligations under the PMP to document conditions consistent with those under which appropriate indoor air quality (IAQ) has been previously demonstrated.

1.2 Background and Purpose

Indoor air and VI assessments were completed in accordance with IBM's October 23, 2012 Resource Conservation and Recovery Act (RCRA) Facility Investigation Work Plan (RFI Work Plan)[2] for volatile organic compound (VOC) source assessment, which was approved by the Departments in an August 12, 2013 letter to IBM. The purpose of the assessments was to evaluate the potential presence of certain VOCs in indoor air related to potential VI from subsurface VOC sources beneath certain occupied buildings on the site. The results and findings for the completed RFI work are found in a series of reports submitted to the Departments.

As part of the RFI, indoor air sampling was conducted in 8 buildings. Among those 8 buildings, IBM implemented reasonable and practical measures to reduce VOC concentrations in 6 buildings (B001, B002, B003, B004, B008, and B012) as reviewed and approved by the Departments. The remaining 2 of 8 buildings subject to indoor air sampling (B077 and B416) did

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1 Sanborn, Head Engineering, PC, *Performance Monitoring Plan for Vapor Intrusion Engineering Controls, IBM Poughkeepsie Facility, Poughkeepsie, NY,* November 2021 (includes Amendment #1).

2 *RFI Work Plan, VOC Source Assessment, IBM Poughkeepsie Facility*, Sanborn Head Engineering P.C. and IBM Corporation, October 2012.

not require any measures based on the indoor air VOC sampling results. Nonetheless, these two buildings were included in the PMP for periodic checks for changes to building conditions and status of heating, ventilating, and air conditioning (HVAC) operations under the presumption that existing HVAC operations may be acting as VI ECs.[3]

Thirty-two site buildings were not subject to indoor air sampling under the RFI because they are either located outside the area of known presence of VOCs in soil vapor or groundwater (21 buildings), within the footprint of VOC presence in soil vapor or groundwater but unoccupied (7 buildings), or may be subject to occupational VOC presence in indoor air due to the presence of groundwater remediation systems or treatment residuals handling (4 buildings). The 11 buildings that were unoccupied or that may be subject to occupational VOC presence are included in the PMP for periodic checks for changes to building infrastructure, use, and occupancy. One of the previously vacant buildings, B414, was partially re-occupied in 2023 as further described herein. A summary of each of the 19 buildings subject to the PMP and the implemented VI ECs, if any, is provided in Table 1.

The VI ECs rely upon both active and passive components. Active VI ECs comprise active mechanical measures to maintain appropriate indoor air quality, and include subslab depressurization (SSD) systems, trench and manhole vapor extraction systems (VES), and HVAC systems. Passive ECs do not employ mechanical systems; examples include sealing of utility penetrations and floor covers.

Annual checks were conducted at the site by IBM in 2023 in accordance with the VI EC long-term monitoring plan included in the PMP and presented in Appendix B.

The purpose of this report is to summarize the status of building use/occupancy and the consistency of VI EC operations in the buildings that were the subject of the PMP for the calendar year 2023.

2.0 STATUS OF BUILDING USE AND OCCUPANCY

The status of building use and occupancy in 2023 was reviewed by IBM. As further described herein, a small portion of the previously vacant B414 became occupied after undergoing pre-occupancy indoor air sampling. No other significant occupancy and use changes were observed in other buildings during the 2023 PMP checks or noted by IBM. A summary of occupancy and use changes that were noted in 2023 based on PMP checks and information provided by IBM is presented in Table 2.

2.1 B414

B414 is a single-story office building of approximately 85,000 square feet that was previously unoccupied. In 2023, IBM completed renovations to re-occupy a small portion of the building for use as a computer lab area, as shown in Figure 3. The remaining areas of the building may be renovated and occupied in future stages. In accordance with the PMP and the Department-

[3] B077 does not have an active HVAC system and is only periodically occupied.

approved work plan, pre-occupancy indoor air sampling was conducted in the new computer lab area on May 4, 2023 with the HVAC system running at the intended occupied operational settings.

The May 4, 2023 IAQ results were reported to the Departments in a May 16, 2023 letter report, which included a request for approval for occupancy. The Departments provided their approval in an October 6, 2023 letter to IBM, and the B414 computer lab area became occupied. Due to this change in occupancy, B414 is shown as a Category 4 building on Figure 2 (acceptable IAQ under normal HVAC operations). For convenience, the laboratory analytical results for the May 2023 IAQ sampling event are presented in Table 3, and the trichloroethene (TCE) results are shown on Figure 3.

3.0 STATUS OF VI ENGINEERING CONTROLS

The VI ECs at the site include the following:

- B003 – SSD system for the full building footprint and two vapor extraction systems (VES) for perimeter utility floor trenches and certain interior stormwater manholes.
- B001, B004 – Partial building footprint SSD system and HVAC ECs for the remaining portion of the building footprints.
- B001, B002, B004, B008, B012 – HVAC ECs for either the full or partial building footprint.
- B414 and B416 – Changes to HVAC operations were not needed for VI control; however, it is presumed that the HVAC systems may be acting as ECs and need to remain operating in occupied areas.
- B001, B002, B003, B004, B012 – Passive ECs – Sealing of preferential VI pathways and closed perimeter hallway doorways (B012 only).

VI EC performance monitoring was conducted in 2023 in accordance with the PMP and included HVAC system operational checks, passive EC checks, and monitoring of SSD/VES operational and vacuum conditions.

The PMP documents the HVAC settings that reflect conditions that have been shown effective for VI ECs as determined by previous acceptable indoor air quality sampling results. In addition, the PMP calls for SSD system and passive EC checks. In accordance with the PMP, if differences are noted during checks, further assessment or actions may be appropriate.

A summary of the 2023 VI EC operational checks is provided in Table 2 and described in the following sections.

3.1 B001

An SSD system began operating beneath the northern, mostly occupied area of B001 on November 18, 2014. The southern portion of B001 is a storage/warehousing area that is not routinely occupied. An HVAC system in the warehouse area is activated by a motion sensor when the area is accessed. In addition, sealed preferential pathways serve as ECs within the building.

Indoor air sampling conducted in December 2014 after SSD system start-up indicated acceptable indoor air quality in the building, including in the warehouse area to the south of the SSD system influence, as documented in a report submitted to the Departments.[4]

Based on the November 2023 system operations checks and cross-slab differential pressure (DP) measurements, the SSD system is operating in accordance with its design objectives. The November 2023 cross-slab DP readings, the approximate extent of subslab depressurization, and the induced vacuum at each of the operating extraction ports are shown on Figure 4.[5] The area of subslab vacuum influence and induced vacuum at the extraction ports were found to be consistent with conditions observed in 2014 as documented in the B001 SSD system O&M Manual[6] included in the PMP (see Appendix C for the figure from the O&M Manual showing SSD operating conditions), with the following exceptions:

- The localized change in DP initially observed during the December 2022 PMP checks was still present at SSV2023 in the center of the print room, where the DP was measured as +0.015. This location is in the center of an open area surrounded by ports where DPs were measured as being negative and under the influence of SSD. Therefore, indoor air quality is unlikely to be affected by this change isolated to one port.

- A localized change was observed at monitoring port SSV2013 in the warehouse area of the building, where the DP was measured at 0.000 inches of water column (in. WC) as compared to -0.006 in December 2014, shifting it outside the influence of the SSD system. This slight shift in DP can be attributable to normal variability that is not considered significant given that the warehouse is not routinely occupied and given that the HVAC system is activated by a motion sensor when occupied.

During the PMP checks, the HVAC unit that serves the warehouse, and the motion sensor that activates it, were found to be operating properly.

The passive ECs in B001 were found to be in satisfactory condition.

3.2 B003

VI ECs implemented in B003 include an SSD system beneath the building footprint and two vapor extraction systems to collect vapor from the perimeter floor trenches and certain interior stormwater manholes. The three systems began operation on October 2, 2013. In addition, sealed preferential pathways serve as ECs within the building.

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4 Sanborn, Head Engineering, PC, *Performance Monitoring and Confirmatory Sampling Results, Building 001 Vapor Extraction System, IBM Poughkeepsie Facility, Poughkeepsie, NY,* January 2015

5 Note that the subslab vapor monitoring ports that were found to be outside the influence of the SSD system established during system start-up (i.e., the grayed-back ports on Figure 4) are not monitored as part of the PMP with the assumption that these ports remain outside the area of influence. This applies to the figures for B003 and B004 as well.

6 Sanborn, Head Engineering, PC, *Operations and Maintenance Manual, B001 Subslab Vapor Extraction and Treatment System, Building 001 - IBM Poughkeepsie Facility, Poughkeepsie, NY,* March 2015.

Indoor air sampling conducted in November 2013 after SSD system start-up indicated acceptable indoor air quality, as documented in a report submitted to the Departments.[7]

The November 2023 cross-slab differential pressure readings for the B003 SSD system, the approximate extent of subslab depressurization, and induced vacuum at each of the operating extraction ports are shown on Figure 5. The area of subslab vacuum influence and induced vacuum at the extraction ports were found to be consistent with those observed in December 2014 as documented in the SSD system O&M Manual[8] (see Appendix C for the figure from the O&M Manual showing SSD operating conditions), with the following exceptions: Localized changes were observed at monitoring ports SSV1026, SSV1067, SSV1072 in the southern portion of the building, where the DPs were measured at 0.210, 0.000, and 0.017 in. WC as compared to -0.024, -0.005, and -0.009 in. WC, respectively, in December 2014. These locations are generally surrounded by ports where DPs were measured as being negative and under the influence of SSD. Therefore, indoor air quality is unlikely to be affected by these relatively isolated changes to DP.

The November 2023 differential pressure measurements and induced vacuums at the trench and manhole extraction ports associated with the VESs are shown on Figure 6 and are consistent with the 2014 measurements (see Appendix C for the figure from the O&M Manual showing operating conditions).

The passive ECs in B003 were found to be in satisfactory condition.

3.3 B004

An SSD system is operating beneath the loading dock in the western area of B004 as shown on Figure 7. The SSD system consists of one extraction port that was connected to the B003 SSD system and began operation on February 17, 2015. In addition, HVAC systems serve as ECs in areas outside the area of influence of the SSD system, and sealed preferential pathways serve as ECs within the building.

Indoor air sampling conducted in February 2015 after SSD system start-up indicated acceptable indoor air quality, as documented in a report submitted to the Departments.[9]

Based on the November 2023 system operational checks and the cross-slab differential pressure measurements, the SSD system is operating in accordance with its design objectives. The November 2023 cross-slab differential pressure readings within B004, the approximate extent of subslab depressurization, and induced vacuum at the extraction port are shown on Figure 7 and were found to be consistent with conditions observed in 2015, as documented in

[7] Sanborn, Head Engineering, PC, *Performance Monitoring and Confirmatory Sampling Results, Building 003 Vapor Extraction System, IBM Poughkeepsie Facility, Poughkeepsie, NY,* February 2014.

[8] Sanborn, Head Engineering, PC, *Operations and Maintenance Manual, B003/B004 Subslab Vapor Extraction and Treatment System, Buildings 003 and 004 - IBM Poughkeepsie Facility, Poughkeepsie, NY,* April 2015.

[9] Sanborn, Head Engineering, PC, *Performance Monitoring and Confirmatory Sampling Results, Building 004 Vapor Extraction System, IBM Poughkeepsie Facility, Poughkeepsie, NY,* March 2015.

the April 2015 B003/B004 SSD system O&M Manual (see Appendix C for the figure from the O&M Manual showing SSD operating conditions).

There were no changes to the HVAC operational settings observed during the PMP checks.

The passive ECs in B004 were found to be in satisfactory condition.

3.4 B416

B416 is a Category 4 building; therefore, changes are allowed to the HVAC operational settings as long as the units remain operating in occupied areas. Operational adjustments were made in 2021 to four of the five HVAC units in B416 and included increasing the schedules to 24/7 operation (previously operated during normal working hours). These changes remained consistent during the December 2022 and the November 2023 PMP checks. No additional action is needed given that the units are continuing to run while the areas are occupied.

3.5 B002, B008, and B012

There were no changes to the HVAC operational settings observed during the PMP checks in B002, B008, and B012. In addition, the passive sealants were found to be in satisfactory condition in B002 (none are present in B008 and B012).

4.0 CLOSING

The findings of routine checks of building use and occupancy, and the results of performance monitoring of the VI ECs conducted in 2023 in accordance with the PMP, indicate conditions consistent with those under which appropriate IAQ has been previously documented.

Based on the results of subslab vacuum monitoring and routine system operations monitoring, the SSD systems in B001, B003, and B004, and the vapor extraction systems for the trenches and manholes in B003, are meeting their design objectives.

In 2024, IBM intends to continue checks of building use and occupancy and the operation of the VI ECs in accordance with the PMP. If any significant changes are observed, IBM will consult with the Departments and evaluate whether additional indoor air sampling is appropriate.

Tables

Table 1
Building Conditions and VI Engineering Controls
2023 VI EC Annual Report
IBM Poughkeepsie Facility
Poughkeepsie, NY

Building ID	Description of Current Use	# Floors	SSD/VES Engineering Controls	Summary of HVAC Adjustments for VI Engineering Controls	Preferential Pathways Sealed
001	Warehouse, vacant space, printing, storage, offices	1	Partial Building SSD	None	X
002	Light machining, offices, storage, vacant space	3	None	Operational adjustments to AHUs serving Level 1 to provide full-time operation, resulting in an increase in overall OA exchange.	X
003	Storage, offices, vacant space, DI water, laboratory	3	Full Building SSD VES for perimeter trenches and manholes	None	X
004	Loading dock, mail room, storage	3	Partial Building SSD	Operational adjustments to AHUs serving Level 1 to provide full-time operation, resulting in an increase in overall OA exchange.	X
008	Data center and offices	3	None	Increased the volume of OA makeup to the first floor, and made adjustments to the operational schedules.	
012	First floor vacant. Data center and offices on second and third floors.	3	None	Increased the volume of OA makeup to the first floor.	
020	Central utility plant (steam and chilled water); connected to Building 030	2	None	None	
026	Boiler room	1	None	None	
028	Solvent dispensing and hazardous material handling/storage (virgin and waste chemicals)	1	None	None	
030	Groundwater treatment; ; connected to Building 020	1	None	None	
033	Warehouse	1	None	None	
075	Storage/vacant	1	None	None	
077	Storage and recycling	1	None	None	
098	Vacant	1	None	None	
414	Renovated portion of building used for computer lab	1	None	None	
415	Vacant	1	None	None	
416	Offices, cafeteria, kitchen	1	None	None	
450	Industrial wastewater treatment plant	3	None	None	
454	Vacant	1	None	None	

Notes
1. Abbreviations:
OA = Outside Air
AHU = Air Handling Unit
HVAC = Heating, Ventilation, and Air Conditioning Unit
SSD = Subslab Depressurization System
SVE = Soil Vapor Extraction
VES = Vapor Extraction System
VI = Vapor Intrusion

Table 2
Summary of 2023 PMP Monitoring
2023 VI EC Annual Report
IBM Poughkeepsie Facility
Poughkeepsie, NY

Building ID	Occupancy and Use Changes?	If yes, describe	HVAC Operational Settings Different than PMP?	If yes, describe	Passive Sealant Repairs Needed?	If yes, describe	SSD Systems Operating in Accordance with Design Objectives?	If no, describe
001	N		N		N		Y	
002	N		N		N		NA	
003	N		NA		N		Y	
004	N		N		N		Y	
008	N		N		NA		NA	
012	N		N		NA		NA	
020	N		NA		NA		NA	
026	N		NA		NA		NA	
028	N		NA		NA		NA	
030	N		NA		NA		NA	
033	N		NA		NA		NA	
075	N		NA		NA		NA	
077	N		NA		NA		NA	
098	N		NA		NA		NA	
414	Y	Renovated computer lab now occupied	NA		NA		NA	
415	N		NA		NA		NA	
416	N		Y	Adjusted AC-1, AC-2, AC-3, AC-4 operating schedules to 24/7 (previously on during working hours). No action needed.	NA		NA	
450	N		NA		NA		NA	
454	N		NA		NA		NA	

Notes
1. Refer to the VI EC Annual Report text for additional information on the occupancy/use and VI EC changes noted above.
2. Abbreviations:
NA = Not Applicable
SSD = Subslab Depressurization System
HVAC = Heating, Ventilation, and Air Conditioning
PMP = Performance Monitoring Plan

Table 3
Summary of Analytical Results
Building 414
IBM Poughkeepsie Facility
Poughkeepsie, NY

Analyte	Sample Location	AA414-01			IA414-03			IA414-03			IA414-03			IA414-04			IA414-04			IA414-04			IA414-04			IA414-08			IA414-08			IA414-10			Field Blank		
	Sample Name	AA414-01			IA414-03			FD-01			IA414-03			IA414-04			IA414-04			FD-01			IA414-08			IA414-08			IA414-10			FB-01		
	Collection Date	5/4/2023			12/7/2022			12/7/2022			5/4/2023			12/7/2022			5/4/2023			5/4/2023			12/7/2022			5/4/2023			5/4/2023			5/4/2023		
	Units	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias
Chloroethane	µg/m^3	0.26	U		0.264	U		0.264	U		0.26	U		0.264	U		0.26	U		0.26	U		0.264	U		0.26	U		0.26	U		0.26	U	
Dichloroethane (1,1-)	µg/m^3	0.081	U		0.081	U		0.081	U		0.081	U		0.081	U		0.081	U		0.081	U		0.081	U		0.081	U		0.081	U		0.081	U	
Dichloroethene (1,1-)	µg/m^3	0.079	U		0.079	U		0.079	U		0.079	U		0.079	U		0.079	U		0.079	U		0.079	U		0.079	U		0.079	U		0.079	U	
Dichloroethene (cis-1,2-)	µg/m^3	0.079	U		0.19			0.15			0.079	U		0.16			0.079	U		0.079	U		0.17			0.079	U		0.079	U		0.079	U	
Dichloroethene (trans-1,2-)	µg/m^3	0.079	U		0.079	U		0.079	U		0.079	U		0.079	U		0.079	U		0.079	U		0.079	U		0.079	U		0.079	U		0.079	U	
Tetrachloroethene (PCE)	µg/m^3	0.14	U		0.27			0.26			0.14	U		0.30			0.14	U		0.14	U		0.24			0.14	U		0.14	U		0.14	U	
Trichloroethene (TCE)	µg/m^3	0.11	U		1.6			1.6			0.11	U		1.5			0.11	U		0.11	U		2.8			0.11	U		0.11	U		0.11	U	
Vinyl chloride	µg/m^3	0.051	U		0.051	U		0.051	U		0.051	U		0.051	U		0.051	U		0.051	U		0.051	U		0.051	U		0.051	U		0.051	U	

Notes:

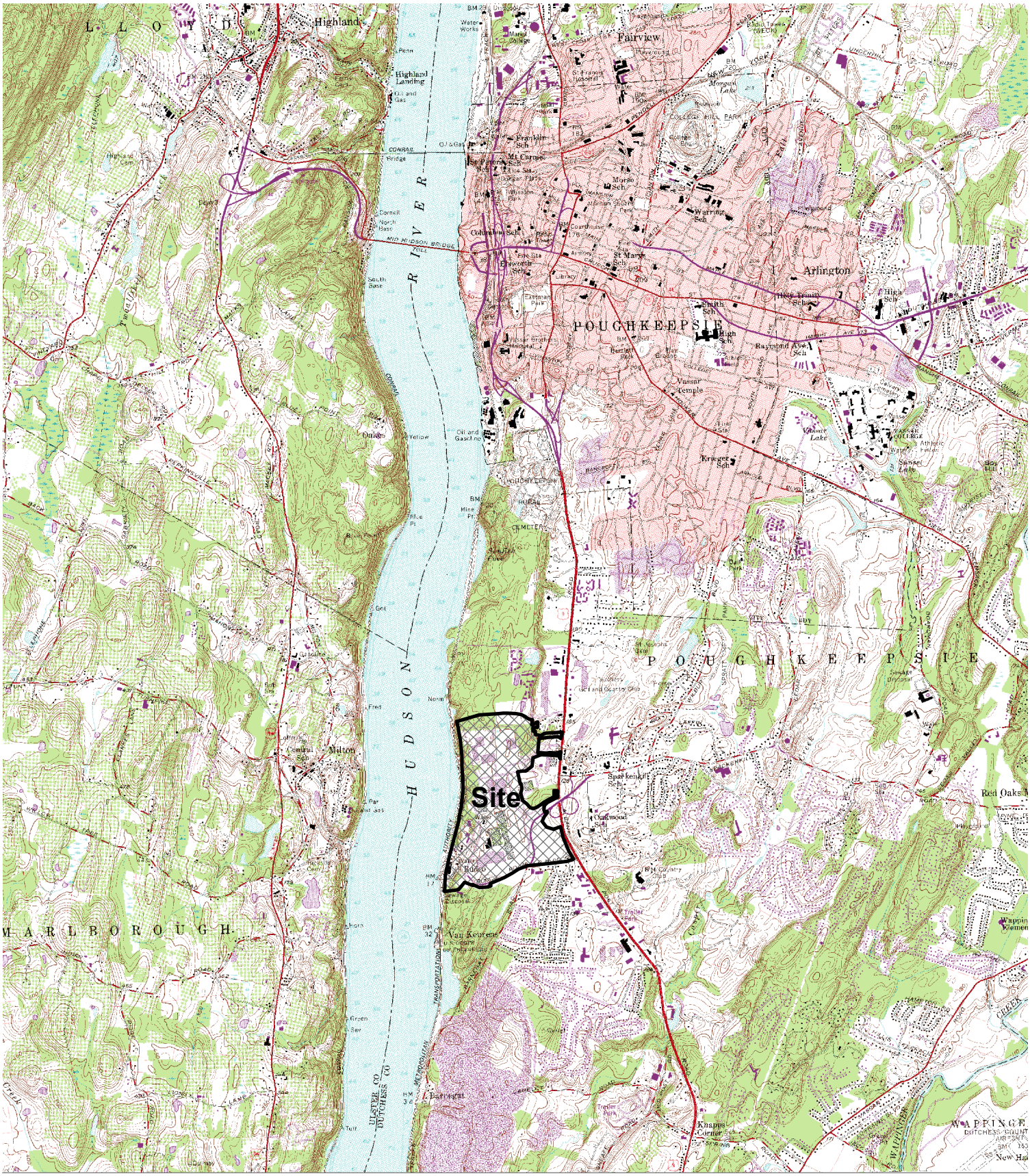
1. Samples from December 2022 were collected by Sanborn, Head Engineering P.C. on behalf of IBM Corporation on the dates indicated over an approximately 12-hour sampling interval using 2.7-liter, stainless steel, pre-evacuated SUMMA® canisters. The samples were analyzed by Alpha Analytical, Inc. (Alpha) of Mansfield, Massachusetts for the project-specific list of volatile organic compounds (VOCs) by United States Protection Agency (USEPA) Method TO-15 in selective ion monitoring (SIM) mode. Samples from May 2023 were collected by Sanborn, Head Engineering P.C. on behalf of IBM Corporation on the dates indicated over an approximately 8-hour sampling interval using 6-liter, stainless steel, pre-evacuated SUMMA® canisters. The samples were analyzed Alpha for the project-specific list of VOCs by TO-15 SIM.

2. The "AA" designation indicates that the sample consists of ambient air collected from outside the building. "Field Blank" represents a field blank sample, where laboratory-supplied nitrogen was transferred from one SUMMA® canister into another.

3. Results are displayed with two significant figures.

4. Data usability summary report (DUSRs) were performed on the data by Environmental Standards Inc. (ES). All results were considered acceptable, with the understanding of the potential uncertainty (bias) in the qualified results. In some cases, ES assigned the following qualifiers and biases to the data. Refer to the DUSR report for further details.
"U" indicates the analyte was not detected above the associated reporting limit.
"UR" indicates the analyte was reported as not detected, but the determination that the analyte was not present in the sample is unreliable due to serious analytical deficiencies. The presence or absence of the analyte cannot be verified.

Figures



N
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Note
Base map taken from 15 minute USGS Quadrangle Map: Poughkeepsie, N.Y., dated 1957 (Photorevised 1982)

Drawn By: E. Wright
Designed By: C. Kilbourne
Reviewed By: D. Shea
Project No: 4238.02
Date: March 2024

2,000' 0 4,000' Feet

SANBORN HEAD

SANBORN, HEAD ENGINEERING, P.C.

Figure 1

Site Location Plan

2023 Vapor Intrusion Engineering Controls Annual Report

IBM Poughkeepsie Facility
Poughkeepsie, New York

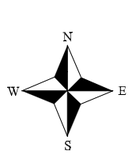

Figure 2

Building Status

2023 Vapor Intrusion Engineering Controls Annual Report

IBM Poughkeepsie Facility
Poughkeepsie, New York

Drawn By: E. Wright
Designed By: C. Kilborne
Reviewed By: D. Shea
Project No: 4238.02
Date: March 2024

Figure Narrative

This figure shows the buildings at the IBM Poughkeepsie facility that are subject to the Performance Monitoring Plan for Vapor Intrusion Engineering Controls.

Notes

1. Base plan was prepared using AutoCAD files provided by Grubb & Ellis Management Services, Inc. (GEMS) in December 2009.

Legend

001 Indicates building number

Category 1 - Subslab depressurization (SSD) or subslab soil vapor extraction (SVE) system for full building footprint

Category 2 - SSD system for partial building footprint

Category 3 - HVAC as Engineering Control

Category 4 - No changes to HVAC were needed for VI mitigation purposes

Building is not routinely occupied

Possible occupational VOC presence

175' 87.5' 0 175' 350' Feet

SANBORN HEAD

SANBORN, HEAD ENGINEERING, P.C.

File:P:\4200s\4238.00\Graphics Files\CAD\POK 2023 Annual Rpt\POK_BldStatus.dwg Plot Date: 2-20-24

Figure 3

Summary of Indoor Air Sampling Results - Trichloroethene

2023 Vapor Intrusion Engineering Controls Annual Report

IBM Poughkeepsie Facility
Poughkeepsie, New York

Drawn By: E. Wright
Designed By: C. Kilbourne
Reviewed By: D. Shea
Project No: 4238.02
Date: March 2024

Figure Narrative

This figure shows the trichloroethene (TCE) results for indoor air samples collected on May 4, 2023. The samples were collected as 8-hour time weighted average samples using 6-L SUMMA canisters. Results are shown in micrograms per cubic meter (µg/m^3).

Notes

1. Base plan was prepared using AutoCAD files provided by Grubb & Ellis Management Services, Inc. (GEMS) in December 2009.

2. Building 414 interior base plan provided electronically by IBM in October 2022.

Legend

- Proposed computer lab space to be renovated
- AHU-1 — Air Handling Unit ID and approx. area served
- IA414-01 — Indoor air sampling location
- AA414-01 — Outdoor air sample at intake of AHU-2 located on roof
- <0.11 — TCE Concentration in µg/m^3
- ( ) — Indicates duplicate result

AHU	5/4/2023
1	On
2	On
3	On
4	Off

20' 10' 0 20' 40' Feet

SANBORN HEAD

SANBORN, HEAD ENGINEERING, P.C.

File:P:\4200s\4238.00\Graphics Files\CAD\POK 2023 Annual Rpt\POK_Bld414_IA_Results.dwg Plot Date: 3-8-24

Figure 4

Building 001 Subslab Pressure Response to Vapor Extraction

2023 Vapor Intrusion Engineering Controls Annual Report

IBM Poughkeepsie Facility

Poughkeepsie, New York

Drawn By:	E. Wright
Designed By:	C. Kilbourne
Reviewed By:	D. Shea
Project No:	4238.02
Date:	March 2024

Figure Narrative

This figure shows subslab vapor extraction system operation data and observed subslab pressure response. Subslab pressure was monitored using a digital manometer referenced to the indoor pressure. Negative values indicate subslab pressure less than indoor air pressure. A differential pressure of less than -0.004 in. wc typically indicates that the vapor extraction system is intercepting vapor. Subslab monitoring ports outside the area of influence established at startup in 2014 are not monitored under the VI EC PMP.

Legend

- SSV2037 — Subslab vapor monitoring port
- SSV2001 — Subslab vapor monitoring port not monitored
- EP2008 — Vapor extraction port connected to system
- EP2011 — Vapor extraction port not connected to system
- EP2003 in. wc — Extraction Port Vacuum (extraction port)
- -0.24 — Subslab air pressure (in. wc) relative to room air pressure
- Area where differential pressure measurements less than -0.004 in. wc were recorded on November 15, 2023

20 10 0 20 40 Feet

SANBORN HEAD

SANBORN, HEAD ENGINEERING, P.C.

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Last Edited By: ewright

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Figure 5

Building 003 Subslab Pressure Response to Vapor Extraction

2023 Vapor Intrusion Engineering Controls Annual Report

IBM Poughkeepsie Facility

Poughkeepsie, New York

Drawn By:	E. Wright
Designed By:	C. Kilbourne
Reviewed By:	D. Shea
Project No:	4238.02
Date:	March 2024

Figure Narrative

This figure shows subslab vapor extraction system operation data and observed subslab pressure response. Subslab pressure was monitored using a digital manometer referenced to the indoor pressure. Negative values indicate subslab pressure less than indoor air pressure. A differential pressure of less than -0.004 in. wc typically indicates that the vapor extraction system is intercepting vapor. Subslab monitoring ports outside the area of influence established at startup in 2013 are not monitored under the VI EC PMP.

Legend

- SSV1005 — Subslab vapor monitoring port
- SSV1023 — Subslab vapor monitoring port not monitored
- EP1015 — Vapor extraction port connected to system
- EP1003 — Vapor extraction port not connected to system
- EP1015 in. wc — Extraction Port Vacuum (extraction port)
- -0.25 — Subslab air pressure (in. wc) relative to room air pressure
- Area where differential pressure measurements less than -0.004 in. wc recorded on November 15, 2023

20 10 0 20 40 Feet

SANBORN HEAD

SANBORN, HEAD ENGINEERING, P.C.

Figure 6

Building 003 Measured Trench and Manhole Vapor Extraction Parameters

2023 Vapor Intrusion Engineering Controls Annual Report

IBM Poughkeepsie Facility
Poughkeepsie, New York

Drawn By:	E. Wright
Designed By:	C. Killbourne
Reviewed By:	D. Shea
Project No:	4238.02
Date:	March 2024

Figure Narrative

This figure shows the operation data and observed pressure response to trench and manhole vapor extraction. Trench air pressure was monitored using a digital manometer referenced to the indoor air pressure. Negative values indicate trench pressure less than indoor air pressure.

Legend

- TEP1002 — Trench extraction port (West Trench extraction system)
- MHEP30 — Manhole extraction port (West Trench extraction system)
- TEP1010 — Trench extraction port (East Trench extraction system)
- MHEP29 — Manhole extraction port (East Trench extraction system)
- TEP1009 — Vapor extraction port not connected to the system
- TEP1001 — Unconnected trench extraction port not monitored
- M — Manhole
- Covered Utility Floor Trench

Data collected on November 15, 2023

TEP1002 in. wc — Trench Extraction Port Vacuum (extraction port)

-0.009 — Trench air pressure (in. wc) relative to room air pressure

Feet
20 10 0 20 40

SANBORN HEAD

SANBORN, HEAD ENGINEERING, P.C.

Open (Uncovered) Trench

TEP1006 11 in. wc
TEP1016 11 in. wc
MHEP-Center 2.5 in. wc
MHEP30 3.5 in. wc
MHEP31 0.5 in. wc
TEP1002 10 in. wc

TEP1006 -0.008 TEP1005 -0.015 TEP1004 -0.006 TEP1003 TEP1002 TEP1001

TEP1014 -0.008 TEP1016

TEP1015 -0.008 MHEP-Center

TEP1013 -0.012 TEP1012 -0.015 TEP1011 TEP1010 TEP1009 -0.014 TEP1008 MHEP29 TEP1007 -0.027

TEP1012 23 in. wc
TEP1010 24 in. wc
TEP1008 23 in. wc
MHEP29 1.5 in. wc

Last Edited By: ewright
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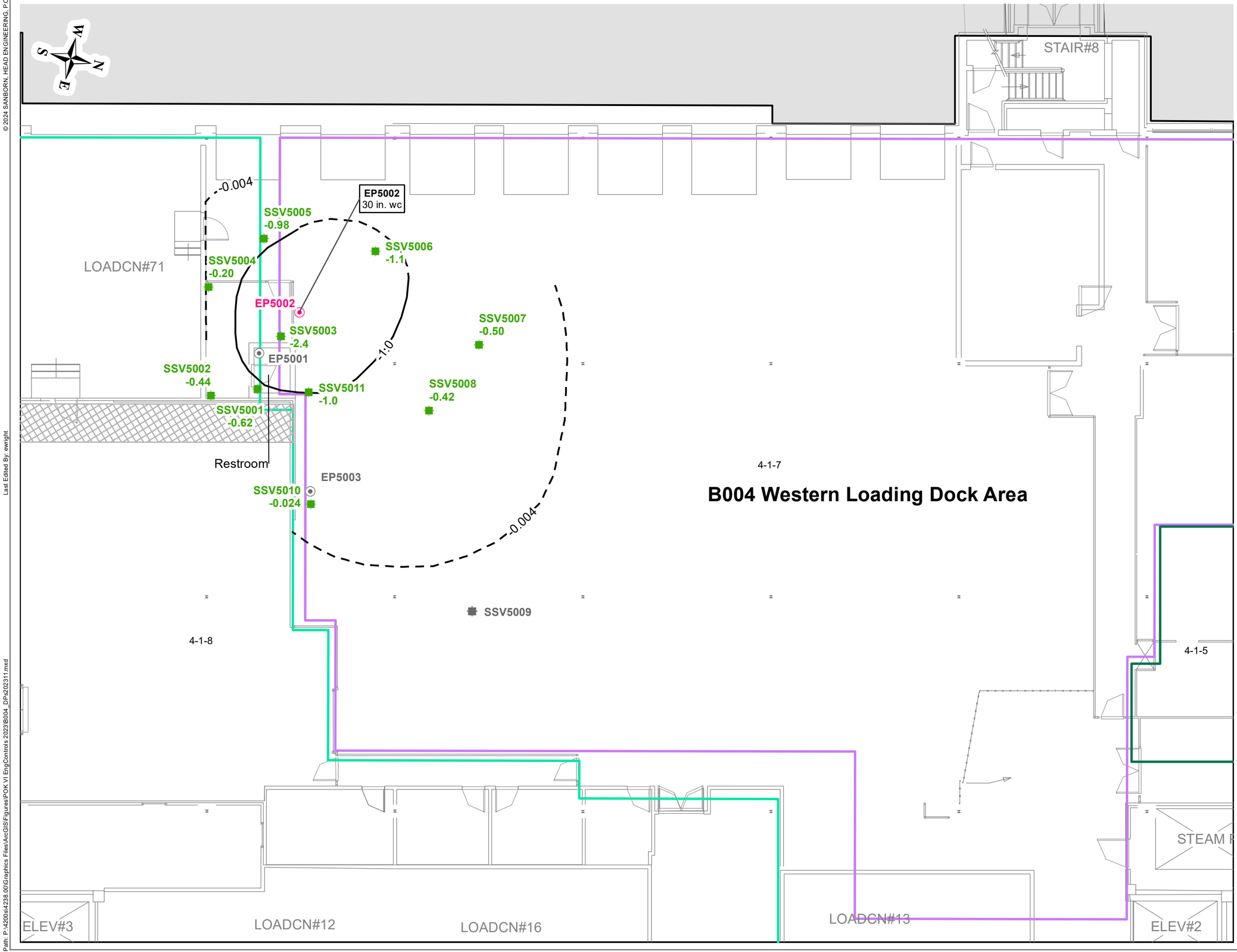

Figure 7

Building 004 Subslab Pressure Response to Vapor Extraction

2023 Vapor Intrusion Engineering Controls Annual Report

IBM Poughkeepsie Facility
Poughkeepsie, New York

Drawn By:	E.Wright
Designed By:	C. Kilbourne
Reviewed By:	D. Shea
Project No:	4238.02
Date:	March 2024

Figure Narrative

This figure shows subslab vapor extraction system operation data and observed subslab pressure response. Subslab pressure was monitored using a digital manometer referenced to the indoor pressure. Negative values indicate subslab pressure less than indoor air pressure. A differential pressure of less than -0.004 in. wc typically indicates that the vapor extraction system is intercepting vapor. Subslab monitoring ports outside of the -0.004 in WC contour established at startup in 2015 are not monitored under the VI EC PMP.

Legend

- SSV5001 — Subslab vapor monitoring port
- SSV5009 — Subslab vapor monitoring port not monitored
- EP5002 — Vapor extraction port connected to system
- EP5001 — Vapor extraction port not connected to system

Data collected on November 15, 2023

- EP5002 / in. wc — Extraction port / Vacuum (extraction port)
- -0.65 — Subslab air pressure (in. wc) relative to room air pressure
- Inferred differential pressure contour (in. wc). Negative values indicate vacuum conditions.
- Differential pressure contour (in. wc). Negative values indicate vacuum conditions.

6 3 0 6 12 Feet

SANBORN HEAD

SANBORN, HEAD ENGINEERING, P.C.

Appendix A

Limitations

APPENDIX A
LIMITATIONS

1. The findings and conclusions described in this report are based in part on the data obtained from a finite number of samples and measurements from widely spaced locations. The figures are intended to depict inferred conditions during a given period of time, consistent with available information. The actual conditions will vary from that shown, both spatially and temporally. Other interpretations are possible. The nature and extent of variations between sampling and monitoring locations may not become evident until further investigation is initiated. If variations or other latent conditions then appear evident, it may be necessary to re-evaluate the conclusions of this report.
2. In preparing this report, Sanborn Head has relied on certain information provided by other parties referenced herein. We did not independently verify the accuracy or completeness of all information reviewed or received in the preparation of this report.
3. Quantitative laboratory testing was performed by others as part of the investigation as noted within the report. Where such analyses have been conducted by an outside laboratory, unless otherwise stated in the report, Sanborn Head has relied upon the data provided, and has not conducted an independent evaluation of the reliability of these data. It must be noted that additional compounds not searched for during the current study may be present in vapor and indoor air at the site. Moreover, it should be noted that variations in the types and concentrations of contaminants and variations in their distribution within the vapor and indoor air may occur due to the passage of time, seasonal water table fluctuations, recharge events, and other factors.
4. This report has been prepared for the exclusive use of the IBM Corporation for specific application to the IBM Poughkeepsie facility in accordance with generally accepted hydrogeologic and engineering practices. No warranty, expressed or implied, is made. The contents of this report should not be relied on by any other party without the express written consent of Sanborn Head.
5. In preparing this report, Sanborn Head has endeavored to conform to generally accepted practices of other consultants undertaking similar studies at the same time and in the same geographical area. Sanborn Head has attempted to observe a degree of care and skill generally exercised by the technical community under similar circumstances and conditions.

Appendix B

Summary of Long-Term VI Management Plan

Table B-1
Summary of Long-Term VI Management Plan by Building
IBM Poughkeepsie Facility
Poughkeepsie, NY

Building Category	Building	Monitoring Type and Frequency (Note 4)															
		Building use, occupancy, and infrastructure		SSD/SVE EPs; TEPs; MHEPs, as applicable (Note 1)		SSD/SVE subslab vacuum field		HVAC system manual checks (Note 2)		VOC entry pathways sealants checks		Interior door closure checks		Indoor air monitoring (Note 3)	
Category 1: SSD and/or SVE for full building footprint	003	√	Annually	√	Monthly	√	Annually		None	√	Annually		Not applicable	√	If SSD system is terminated
Category 2: SSD for partial building footprint	001	√	Annually	√	Monthly	√	Annually	√	Annually	√	Annually		Not applicable	√	If changes found, or SSD system is terminated
	004	√	Annually	√	Monthly	√	Annually	√	Annually	√	Annually		Not applicable	√	If changes found, or SSD system is terminated
Category 3: HVAC EC for full or partial building footprint	002	√	Annually		Not applicable		Not applicable	√	Annually	√	Annually		Not applicable	√	If changes found
	008	√	Annually		Not applicable		Not applicable	√	Annually		Not applicable		Not applicable	√	If changes found
	012	√	Annually		Not applicable		Not applicable	√	Annually		Not applicable	√	Annually	√	If changes found
Category 4: No EC - Alteration of HVAC systems was not necessary for VI mitigation purposes	077	√	Annually		Not applicable		Not applicable		Not applicable		Not applicable		Not applicable	√	If changes found
	416	√	Annually		Not applicable		Not applicable	√	Annually		Not applicable		Not applicable	√	If changes found
	414	√	Annually		Not applicable		Not applicable		Not applicable		Not applicable		Not applicable	√	If changes found
Building Is Not Routinely Occupied	026, 033, 075, 098, 415, 454	√	Annually		Not applicable		Not applicable		None		Not applicable		Not applicable	√	If changes found
Potential Occupational VOC Presence	020, 028, 030, 450	√	Annually		Not applicable		Not applicable		None		Not applicable		Not applicable	√	If changes found

Notes
1. SSD system manual checks will be supplemented by operator readings and continuous, automated monitoring of operations, including alarms that cause system shut down.
2. For category 2 buildings, HVAC system operational checks will only be conducted for the area outside the influence of the SSD system.
3. Indoor air monitoring will only be conducted if changes are identified that could impact indoor air quality and/or occupant exposures (e.g., vacant areas becoming re-occupied, long-term changes to HVAC system operating conditions, SSD termination).
4. Annual checks will be completed in the 4th quarter of the PMP annual reporting period.

Abbreviations:
EC = Engineering control
SSD = Subslab depressurization
SVE = Subslab soil vapor extraction
TEPs = Trench extraction ports
MHEPs = Manhole extraction ports

Appendix C

SSD Operations Figures from O&M Manuals

Last Edited By: clavack
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Figure from B001 OM&M Manual, March 2015

Building 008

Mechanical Room

Warehouse Area

Server Room

Print Room

Print Room Storage

Office Area

Alcove

Electrical Room

Loading Dock Area

Linkway to Building 004

T-310C

T-010S

T-032S

T-032SA

T-008SB

T-008S

T-034SA

T-034S

SSV2001	Not monitored	
SSV2002	0.005	
SSV2003	0.008	
SSV2004	0	
SSV2005	Not monitored	
SSV2006	0	
SSV2007	0	
SSV2008	0.011	
SSV2009	0	
SSV2010	-0.56	
SSV2011	0	
SSV2012	0	
SSV2013	-0.006	
SSV2014	0	
SSV2015	Not monitored	
SSV2016	0.004	
SSV2017	-0.077	
SSV2018	-0.069	
SSV2019	-0.073	
SSV2020	0.005	
SSV2021	-0.14	
SSV2022	-0.15	
SSV2023	-0.017	
SSV2024	-0.28	
SSV2025	-0.019	
SSV2026	-0.014	
SSV2027	0.007	
SSV2028	0	
SSV2029	Not monitored	
SSV2030	-0.053	
SSV2031	-0.004	
SSV2032	-0.22	
SSV2033	0.022	
SSV2034	-0.16	
SSV2035	-0.11	
SSV2036	0.017	
SSV2037	-0.52	
SSV2038	-0.19	
SSV2039	-0.019	
SSV2040	-0.051	
SSV2041	-0.058	
SSV2042	-0.30	
SSV2043	-0.049	
SSV2044	-0.024	
SSV2045	-0.032	
SSV2046	-0.39	
SSV2047	-0.023	
SSV2048	-0.012	
SSV2049	-0.004	
EP2001	0.004	
EP2002	-0.004	
EP2003	0.076	
EP2004	0.037	
EP2005	0.012	
EP2006	0.053	
EP2007	0.027	
EP2008	0.079	
EP2009	0.017	
EP2010	0.063	
EP2011	-0.021	
EP2012	-0.093	
EP2013	0.032	
EP2014	-0.046	
EP2015	-0.44	
EP2016	0.032	

EP2004
52 in. wc
37 scfm
70 F
42% RH
81 ppb

EP2003
24 in. wc
76 scfm
70 F
50% RH
120 ppb

EP2013
50 in. wc
32 scfm
71 F
41% RH
830 ppb

EP2010
17 in. wc
63 scfm
69 F
37% RH
320 ppb

EP2016
39 in. wc
32 scfm
62 F
56% RH
670 ppb

EP2005
52 in. wc
12 scfm
69 F
42% RH
700 ppb

EP2006
51 in. wc
5.3 scfm
73 F
39% RH
1,800 ppb

EP2007
50 in. wc
27 scfm
73 F
39% RH
1,800 ppb

EP2009
17 in. wc
60 scfm
62 F
35% RH
2,600 ppb

EP2008
50 in. wc
79 scfm
66 F
35% RH
4,900 ppb

20 10 0 20 40
Feet

Figure 2

Subslab Pressure Response to Vapor Extraction

Building 001 Vapor Extraction System
O&M Manual

IBM Poughkeepsie Facility
Poughkeepsie, New York

Drawn By:	C. LaVack
Designed By:	R. Welch
Reviewed By:	B. Green/D. Shea
Project No:	3463.02
Date:	March 2015

Figure Narrative

This figure shows subslab vapor extraction system operation data and observed subslab pressure response. Subslab pressure was monitored using a digital manometer referenced to the indoor pressure. Negative values indicate subslab pressure less than indoor air pressure. The shaded area indicates the zone where differential pressure measurements were less than -0.004 in. wc as recorded on December 11, 2014 during system startup activities.

Legend

Refer to Figure 4 for additional legend items

- SSV2001 — Subslab vapor monitoring port
- EP2003 — Connected Subslab soil vapor extraction port
- EP2001 — Unconnected Subslab soil vapor extraction port

EP2003
in. wc
scfm
F
% RH
ppbv

Extraction Port
Vacuum (extraction port)
Flow Rate (std. cu. ft. per min.)
Temperature
Relative Humidity
PID Concentration

Footprint of subslab pressure response to vapor extraction (extent of -0.004 in. wc vacuum)

SANBORN HEAD ENGINEERING

Figure from B003/B004 OM&M Manual, April 2015

EP1030
30 in. wc
0.55 scfm
78 F
26% RH
2,600 ppb

EP1004
66 in. wc
1.1 scfm
77 F
30% RH
640 ppb

EP1029
17 in. wc
0.17 scfm
74 F
0.4% RH
1,100 ppb

EP1011
27 in. wc
0.59 scfm
72 F
40% RH
1,400 ppb

EP1023
29 in. wc
14 scfm
69 F
31% RH
1,400 ppb

EP1021
39 in. wc
2.5 scfm
70 F
42% RH
7,100 ppb

EP1010
70 in. wc
1.6 scfm
71 F
35% RH
5,800 ppb

EP1009
68 in. wc
0.77 scfm
73 F
28% RH
3,500 ppb

EP1015
71 in. wc
12 scfm
73 F
38% RH
1,400 ppb

EP1008
69 in. wc
6.4 scfm
72 F
27% RH
1,400 ppb

EP1013
69 in. wc
7.9 scfm
73 F
33% RH
2,400 ppb

EP1012
72 in. wc
7.8 scfm
75 F
35% RH
280 ppb

SSV1018 0.007
SSV1020 0
SSV1070 0.064
SSV1027 -0.005
SSV1029 -0.003
SSV1031 0
SSV1033 -0.023
SSV1061 -0.014
SSV1042 0
SSV1043 0
SSV1066 0
SSV1019 0
SSV1028 -0.013
SSV1032 -0.029
SSV1034 -0.005
SSV1082 -0.004
SSV1035 -0.014
SSV1026 -0.024
SSV1030 -0.096
SSV1001 -0.098
SSV1040 -0.062
SSV1038 -0.078
SSV1081 -0.042
EP1018 -0.037
SSV1004 -0.084
SSV1017R 0
SSV1067 -0.005
SSV1002 -0.032
SSV1039 -0.03
SSV1077 -0.1
SSV1078 -0.072
SSV1037 -0.18
SSV1062 -0.034
SSV1005 -0.24
SSV1003 -0.05
SSV1063 -0.032
SSV1044 -0.18
SSV1041 -0.047
SSV1071 -0.041
SSV1076 -0.13
SSV1036 -0.2
SSV1060 -0.04
SSV1074 -0.011
SSV1052 -0.009
SSV1079 -0.015
SSV1087 -0.092
SSV1069 -0.024
SSV1056 -0.01
SSV1053 Destroyed
SSV1025 -0.051
SSV1046 -0.95
SSV1045 0
SSV1059 -0.022
SSV1055 -0.023
SSV1054 -0.086
SSV1080 -0.055
SSV1049 -0.24
SSV1024 Inaccessible
SSV1015 -0.31
SSV1047 -0.45
SSV1084 -0.5
SSV1016 -0.095
SSV1064 0
SSV1014 -0.009
SSV1072 -0.009
SSV1013 -0.081
SSV1075 -0.03
SSV1086 0
SSV1023 0
SSV1058 -0.056
SSV1068 -0.029
SSV1010 -0.82
SSV1006 -0.35
SSV1048 -0.16
SSV1050 -0.26
SSV1092 -0.24
SSV1012 Inaccessible
SSV1011 -0.64
SSV1051 -1.6
SSV1022 0
SSV1065 0
SSV1057 -0.012
SSV1007 -0.17
SSV1008 0.006
SSV1085 -0.013
SSV1021 Inaccessible
SSV1009 -0.004

EP1027 -0.036
EP1006 -0.004
EP1002 -0.008
EP1003 -0.012

EP1032
EP1005
EP1031
EP1001
EP1026
EP1025
EP1024
EP1022
EP1019
EP1020
EP1017
EP1016
EP1007
EP1014

3-1-2 AHU
3-1-3 AHU
3-1-4 AHU
3-1-5 AHU
3-1-6 AHU
3-1-8 AHU

Figure 3

Building 003 Subslab Pressure Response to Vapor Extraction

Vapor Extraction System O&M Manual

IBM Poughkeepsie Facility
Poughkeepsie, New York

Drawn By: C. LaVack
Designed By: R. Welch
Reviewed By: D. Shea
Project No: 3463.01
Date: April 2015

Figure Narrative

This figure shows the operation data and observed pressure response to subslab vapor extraction. Subslab pressure was monitored using a digital manometer referenced to the indoor air pressure. Negative values indicate pressure less than indoor air pressure.

Legend

SSV1001 — Subslab Vapor Monitoring Location

EP1001 — Vapor Extraction Port

EP1001 — Vapor Extraction Port not connected to system

Data collected on December 10 & 11, 2014

EP1002	
in. wc	Vacuum (extraction port)
scfm	Flow Rate
F	Temperature
% RH	Relative Humidity
ppb	PID Concentration

-0.082 — Subslab air pressure (in. wc) relative to room air pressure

Area where differential pressure measurements less than -0.004 in. wc were recorded on December 10 & 11, 2014

3-1-6 AHU — Mechanical room for indicated air handling unit (AHU)

20 10 0 20 40
Feet

SANBORN HEAD ENGINEERING

Figure from B003/B004 OM&M Manual, April 2015

Figure 4

Building 003 Measured Trench and Manhole Vapor Extraction Parameters

Vapor Extraction System O&M Manual

IBM Poughkeepsie Facility
Poughkeepsie, New York

Drawn By:	C. LaVack
Designed By:	R. Welch
Reviewed By:	D. Shea
Project No:	3463.01
Date:	April 2015

Figure Narrative

This figure shows the operation data and observed pressure response to trench and manhole vapor extraction. Trench and manhole air pressure was monitored using a digital manometer referenced to the indoor air pressure. Negative values indicate trench or manhole pressure less than indoor air pressure.

Legend

- TEP1002 — Trench extraction port (West Trench extraction system)
- MHEP30 — Manhole extraction port (West Trench extraction system)
- TEP1010 — Trench extraction port (East Trench extraction system)
- MHEP29 — Manhole extraction port (East Trench extraction system)
- TEP1001 — Vapor extraction port not connected to system
- (M) — Manhole

Data collected on December 10 & 11, 2014

TEP1002	
in. wc	Trench Extraction Port Vacuum (extraction port)
scfm	Flow Rate
F	Temperature
% RH	Relative Humidity
ppb	PID Concentration
µg/m³	TCE Concentration

-0.014 — Trench or Manhole air pressure (in. wc) relative to room air pressure

Covered Utility Floor Trench

3-1-6 AHU — Mechanical room for indicated air handling unit (AHU)

20 10 0 20 40
Feet

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Open (Uncovered) Trench

TEP1006
8.5 in. wc
110 scfm
74 F
29% RH
180 ppb
4.6 µg/m³

TEP1016
8.5 in. wc
86 scfm
71 F
31% RH
110 ppb
4.5 µg/m³

MHEP30
3.5 in. wc
140 scfm
69 F
32% RH
570 ppb
1,500 µg/m³

MHEP31
0.5 in. wc
22 scfm
71 F
31% RH
330 ppb
940 µg/m³

TEP1002
7.0 in. wc
51 scfm
70 F
42% RH
180 ppb
1.9 µg/m³

TEP1005 -0.012
TEP1004 -0.012
TEP1003 -0.009
TEP1001 0
TEP1014 -0.011
MH-Center -0.58
MHEP-Center
MH31 -0.042
MH30 -0.019
TEP1015 -0.011
MHEP29 -0.041
TEP1013 -0.011
TEP1012
TEP1011 -0.015
TEP1010
TEP1009 -0.015
TEP1008
TEP1007 -0.014

TEP1012
19 in. wc
95 scfm
73 F
40% RH
1,000 ppb
170 µg/m³

TEP1010
19 in. wc
83 scfm
71 F
33% RH
200 ppb
1.1 µg/m³

MHEP-Center
3.0 in. wc
100 scfm
71 F
32% RH
3,800 ppb
26,000 µg/m³

TEP1008
19 in. wc
79 scfm
71 F
31% RH
490 ppb
870 µg/m³

MHEP29
1.5 in. wc
21 scfm
69 F
33% RH
260 ppb
13 µg/m³

Figure 6

Building 004 Subslab Pressure Response to Vapor Extraction

Vapor Extraction System O&M Manual

IBM Poughkeepsie Facility
Poughkeepsie, New York

Drawn By:	C. LaVack
Designed By:	J. Sanborn
Reviewed By:	B. Green/D. Shea
Project No:	3463.01
Date:	April 2015

Figure from B003/B004 OM&M Manual, April 2015

Figure Narrative

This figure shows subslab vapor extraction system operation data and observed subslab pressure response. Subslab pressure was monitored using a digital manometer referenced to the indoor pressure. Negative values indicate subslab pressure less than indoor air pressure. A differential pressure of less than -0.004 in. wc typically indicates that the vapor extraction system is intercepting vapor.

EP5002
30 in. wc
49 scfm
70 F
6.2% RH
2.2 ppm

4-1-8 AHU

4-1-7 AHU

Restroom

Steam

SSV5001 -0.57
SSV5002 -0.50
SSV5003 -1.7
SSV5004 -0.084
SSV5005 -1.0
SSV5006 -1.3
SSV5007 -0.60
SSV5008 -0.67
SSV5009 0.043
SSV5010 -0.020
SSV5011 -0.99
EP5001
EP5002 -1.4
EP5003 -0.13

-0.004
-1.0

B004 Western Loading Dock Area

Legend

- SSV5001 — Subslab vapor monitoring location
- EP5002 — Connected Subslab soil vapor extraction port
- EP5001 — Unconnected Subslab soil vapor extraction port

EP5002	
in. wc	Extraction Port Vacuum (extraction port)
scfm	Flow Rate (std. cu. ft. per min.)
F	Temperature
% RH	Relative Humidity
ppm	PID Concentration

-1.0 — Differential Pressure, in wc

Inferred Differential Pressure Contour (in wc). Negative values indicate vacuum conditions

Differential Pressure Contour (in wc). Negative values indicate vacuum conditions

6 3 0 6 12
Feet

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