

Overview

- Case Study of Real-Time tools to Assess Potential VI Pathway
- Taking Control of the VI Pathway
 - Spatial, temporal and other uncertainties
 - Innovative methods to assess indoor air
 - Managing risk & liability

Salem Vapor Trials

Deacons lose another heartbreaker / B1

WINSTON-SALEM JOURNAL

SUNDAY

Jan. 25, 2015 52.00 www.journalnow.com

They've shot every Super Bowl; see their iconic images / Inside

When is the best time to buy TVs, toys and other items? / A

INSIDE

COURTAINS WORTH \$235



A trailer behind Lawrence Middle School sits on top of contaminated groundwater in the location where the new school is proposed to be built.

Toxic legacy

Schools sit atop contaminated earth

Questions about health risks, testing rise concerns

BY BERTRAND M. GUTIERREZ and ARIAN HERRON

Winston-Salem Journal

As students walk up to Hanes and Lawrence middle schools in northern Winston-Salem, a local buzzing rumor follows them to the front door of the building. It's the sound of a very strong pump, that of a decontamination project initiated by a manufacturer across the street to clean up a large plume of toxic groundwater.

It's a sound that is not new to the area. For years, it has been a constant reminder of the toxic legacy that has plagued the area since the 1960s. The sound is a pump that is used to clean up a large plume of toxic groundwater that has contaminated the area since the 1960s.



Kaba Ilico, a locking-product manufacturer, sits across the street from Lawrence Middle School. The trailer on the right houses a pumping system for treating contaminated groundwater.

Chemicals in groundwater

The state safety standard in groundwater for PCBs, a chemical found in many products, is 0.01 parts per billion (ppb). The state safety standard in groundwater for PCBs is 0.01 ppb. The state safety standard in groundwater for PCBs is 0.01 ppb. The state safety standard in groundwater for PCBs is 0.01 ppb.



City Council

Dispute over minutes keeps public in the dark

Is nervousness about liability in Smith's conviction keeping information secret?

BY MICHAEL HEWLETT

Winston-Salem Journal

More than three years ago, some members of the Winston-Salem City Council who supported in favor of the city's support of the federal appeal suddenly changed their minds after two closed-door meetings. The public, however, was not invited to attend the meetings. And the public was not told that the city's support of the federal appeal was being reconsidered.



Photo of a person.

Sources: ASU to name new AD today / B1

WINSTON-SALEM JOURNAL

FRIDAY

February 27, 2015 75 cents www.journalnow.com

Area couple turn barn and silo into a cozy guest cottage with a view / C

BB&T faces federal probe over FHA loans / A9

Bodies of man, dog found after Lewisville fire



Jackie Hildner's body was found in his home Thursday morning.

LEWISVILLE — Authorities are investigating the death of a man whose body was discovered Thursday morning in his home on Hildner Road after a house fire.

The body of Jackie Galtner Hildner, 44, was found inside the house after a fire was reported at 10:11 a.m., according to the Forsyth County Sheriff's Office.



Map showing the location of the fire.

Piling on

Schools will remain empty



Snow-covered branches frame the historic buildings at Bethesda.

Forsyth gets 5 inches of wet snow, some power outages

BY WESLEY YOUNG

Winston-Salem Journal

About 5 inches of wet snow fell on Forsyth County during an overnight storm that began in the early morning hours. The snow was wet and sticky, and it was accompanied by strong winds. The snow was wet and sticky, and it was accompanied by strong winds.



A blanket of snow covers the area around downtown Winston-Salem, including the Forsyth County Courthouse.

Tattoo Joe still has get-up, just needs way to go

The photographer, though, is a professional. He has a camera and a tripod. He has a camera and a tripod. He has a camera and a tripod. He has a camera and a tripod.

Joe is a professional photographer. He has a camera and a tripod. He has a camera and a tripod. He has a camera and a tripod. He has a camera and a tripod.



Photo of a person.

Local News: A. Winston-Salem, B. Greensboro, C. Durham, D. Raleigh, E. Charlotte, F. Asheville, G. Spartanburg, H. Greenville, I. Columbia, J. Florence, K. Myrtle Beach, L. Charleston, M. Savannah, N. Jacksonville, O. Orlando, P. Tampa, Q. St. Petersburg, R. Clearwater, S. Fort Myers, T. Naples, U. Fort Lauderdale, V. Miami, W. Fort Myers, X. Naples, Y. Fort Lauderdale, Z. Miami.

the X

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Local News: A. Winston-Salem, B. Greensboro, C. Durham, D. Raleigh, E. Charlotte, F. Asheville, G. Spartanburg, H. Greenville, I. Columbia, J. Florence, K. Myrtle Beach, L. Charleston, M. Savannah, N. Jacksonville, O. Orlando, P. Tampa, Q. St. Petersburg, R. Clearwater, S. Fort Myers, T. Naples, U. Fort Lauderdale, V. Miami, W. Fort Myers, X. Naples, Y. Fort Lauderdale, Z. Miami.

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Partly sunny page 25, Low 18. More: A9.

Different Trial Tactics: DQO Process

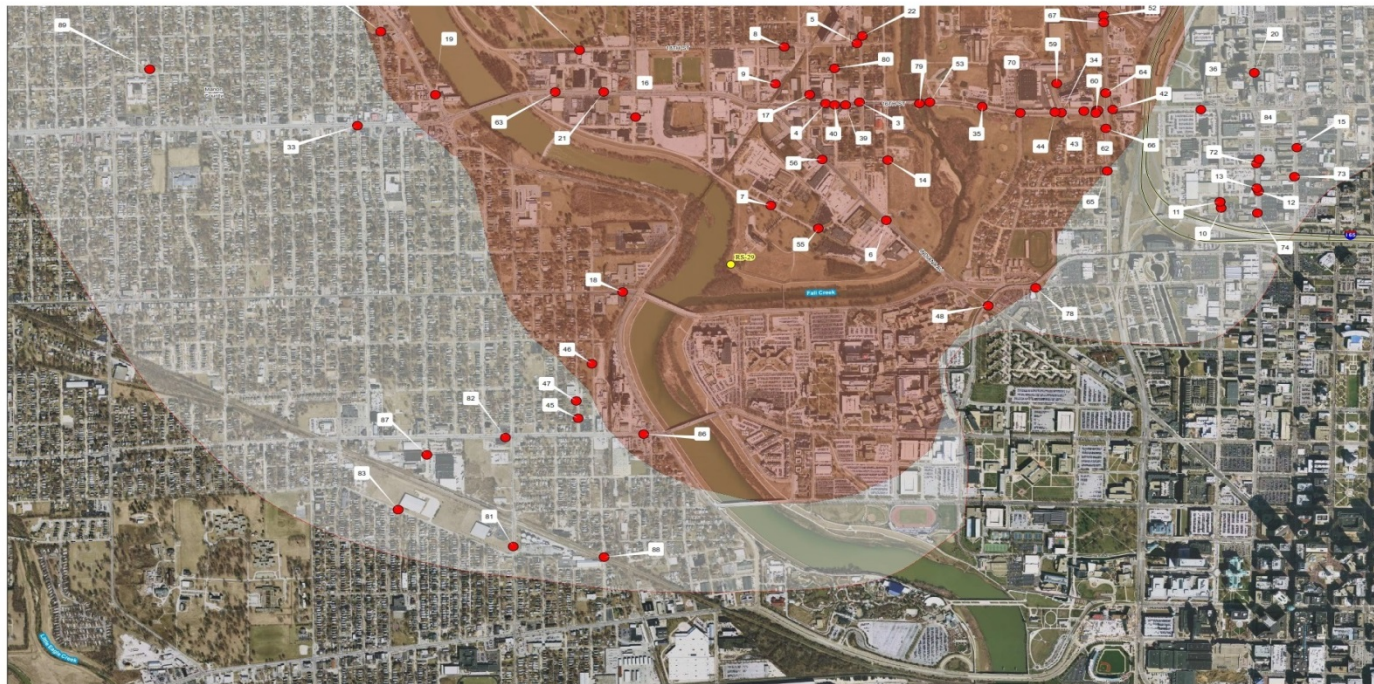
- Seven Steps in the DQO Process:
 - State the Problem
 - Identify the Decision
 - Identify the Inputs to the Decision
 - Define the Boundaries of the Study
 - Develop a Decision Rule
 - Specify Tolerable Limits on Decision Errors
 - Optimize the Design for Obtaining Data

Step 1 – The Problem

- Due Diligence Trigger (VI) (12/2014)
- Regional / localized groundwater levels exceed VI GW screening level (SL) for PCE
- Facility & School overlies groundwater with PCE levels > VI GW SL
- Is there unacceptable risk in indoor air to the students, faculty, staff?

Regional GW

Potential Contamination Sources
Within the 5 Year Time of Travel Wellhead Protection Area
Riverside Groundwater Contamination



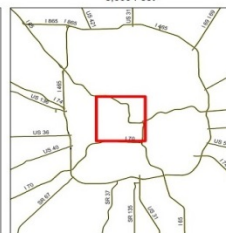
This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

Mapped By:
Shane Moore, Office of Land Quality
Date: 10/01/2013

Sources:
Non Orthophotography
Data - Obtained from the State of Indiana Geographical Information Office Library
Potential GW Contamination Sources provided by OLQ Geology Section
Orthophotography - Obtained from Indiana Map Framework Data (www.indianamap.org)
Map Projection: UTM Zone 16 N **Map Datum:** NAD83



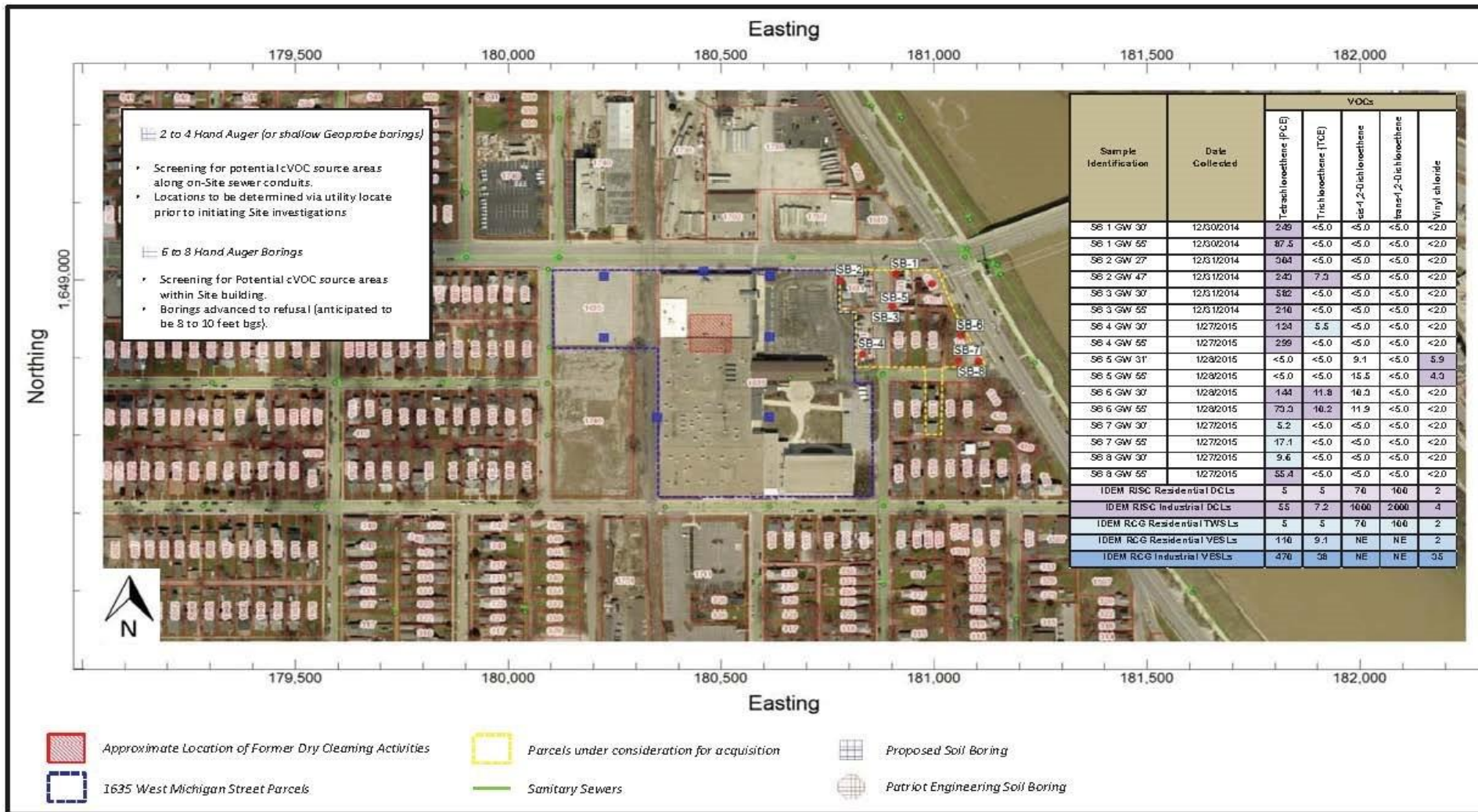
0 275 550 1,100 Meters
0 900 1,800 3,600 Feet



- Potential GW Contamination Sources
- PWS Well RS 29
- Wellhead 5 Year Delineation
- Wellhead 1 Year Delineation

Potential sources label number refers to:
Table 1: Riverside Potential Sources

Site & Adjacent Properties



Step 2 – Identify Decision

- The data will be used to support recommendations to, and final decisions by, Execute Mgmt Team & School Board
 - Limiting Occupancy
 - PEM /ASD
 - HVAC Adjustments
 - Sealing of cracks, etc.

Step 3 – Identify Inputs

- Indoor air sampling within representative areas of facility as threshold test (TO-15)
- Indoor air and sub-slab measured with GC using an ultra-sensitive electron capture detector and a PID (mod TO-14)
- Confirmatory indoor air samples (5 minute grab and 24-hr TO-15)

Step 4 – The Boundary

- Limited to on-Site, multi-use Building
 - Two parcels; 7.2 acres
 - 170,400 ft²
 - HQs, High School (9 – 12); adult learning center with day care
- Building zones (9) and sophisticated HVAC system with ability to control fresh-air makeup

Site Map



Step 5

- Decision Rule:
 - Residential indoor air level of 42 ug/
m³
 - Risk Communication protocols
 - How to communicate risks, results
and potential health effects
established
 - Regulatory input

Step 6 – Confidence with Data

- Lowest standard concentration was reporting limit for each compound; 2.3 ug/m³ for TCE and 3.5 ug/m³ for PCE
- 10% duplicate samples for mobile lab
- Continuing calibrations within 30%
- Final QA – 24 hr sampling, EPA TO-15 (24 hr), individually-certified Summas

Step 7 – TRIAD Approach

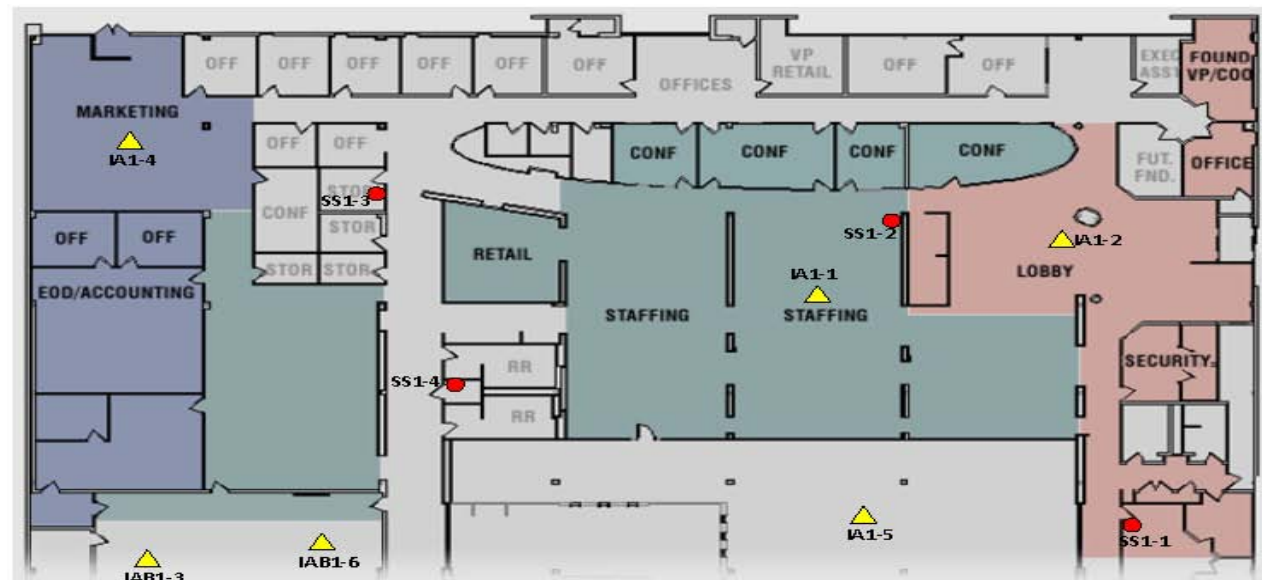
- March 28 – eleven TO-15 samples
- April 20 – eight TO-15 samples
- April 25-26 – 70 indoor air; 30 sub-slab
- Five Areas identified: 1, 2, 3, 8, & Excel
 - HVAC Adjustments (4/28 – 6/13)
 - Fresh air damper adjustments (100% – 25%)
 - June 13 Final QA Samples

Area 1 – Corporate Staff

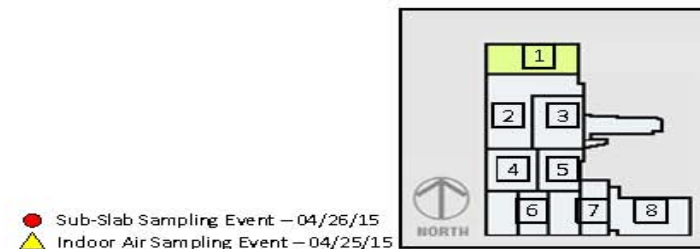
Area 1 – IA/SS Sampling Locations/Results: Investigation

Sample ID	PCE (ug/m3)
IA1-1	42
IA1-1 DUP	45
IA1-2	44
IAB1-3	59
IA1-4	61
IA1-5	59
IAB1-6	60

Sample ID	PCE (ug/m3)
SS1-1	70,000
SS1-2	150,000
SS1-3	14,000
SS1-4	2,200



Notes: IAB 1-3 / IAB 1-6 were collected in the basement. All samples were collected with the HVAC system fresh air damper set to approximately 15% open.

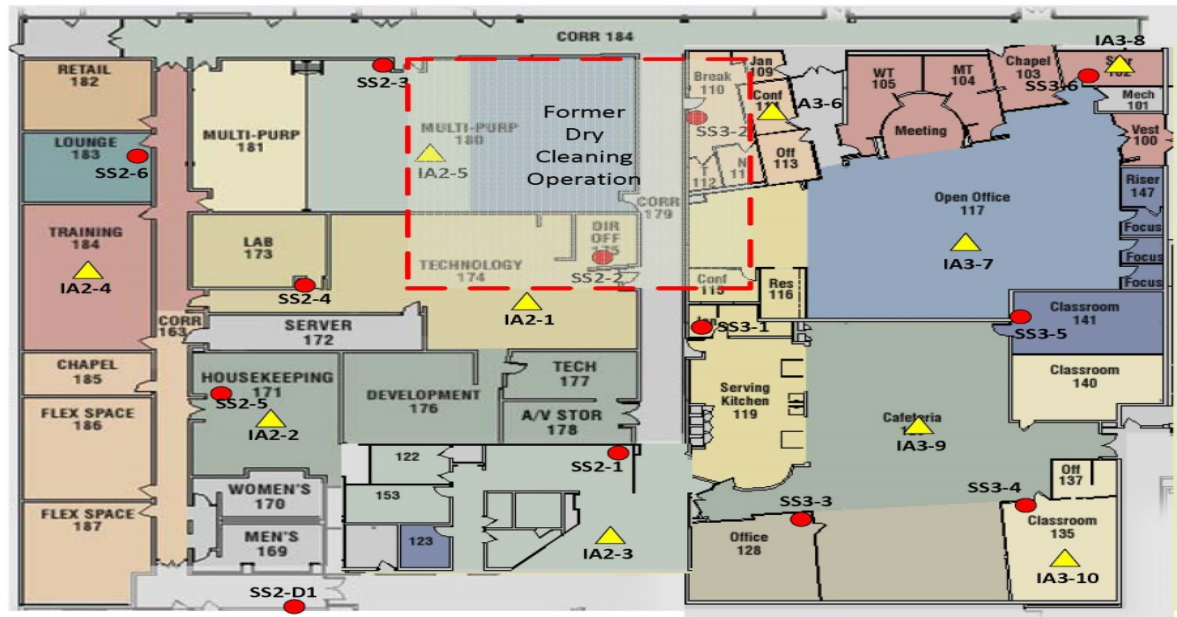


Areas 2 / 3 – Staff & Classroom

Area 2/3 – IA/SS Sampling Locations/Results: Investigation

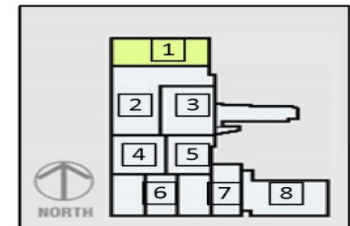
Sample ID	PCE (ug/m3)
IA2-1	23
IA2-1 A	22
IA2-2	19
IA2-2 A	23
IA2-3	12
IA2-3 A	10
IA2-4	24
IA2-4 A	16
IA2-5	20
IA2-5 A	17.5
IA3-6	42
IA3-7	34
IA3-8	38
IA3-10	24

Sample ID	PCE (ug/m3)
SS2-1	193
SS2-1 A	177
SS2-2	160,000
SS2-3	30,000
SS2-3 A	30,000
SS2-4	4,250
SS2-5	275
SS2-5 A	206
SS2-6	3,000
SS3-1	40,000
SS3-2	160,000
SS3-3	2,200
SS3-4	2,100
SS3-5	5,800
SS3-6	32,000
SS2-D1	29



Notes: All samples were collected with the HVAC system fresh air damper set to approximately 15% open. SS2-D1 was taken from the sewer line cleanout. A value was not reported for IA3-9.

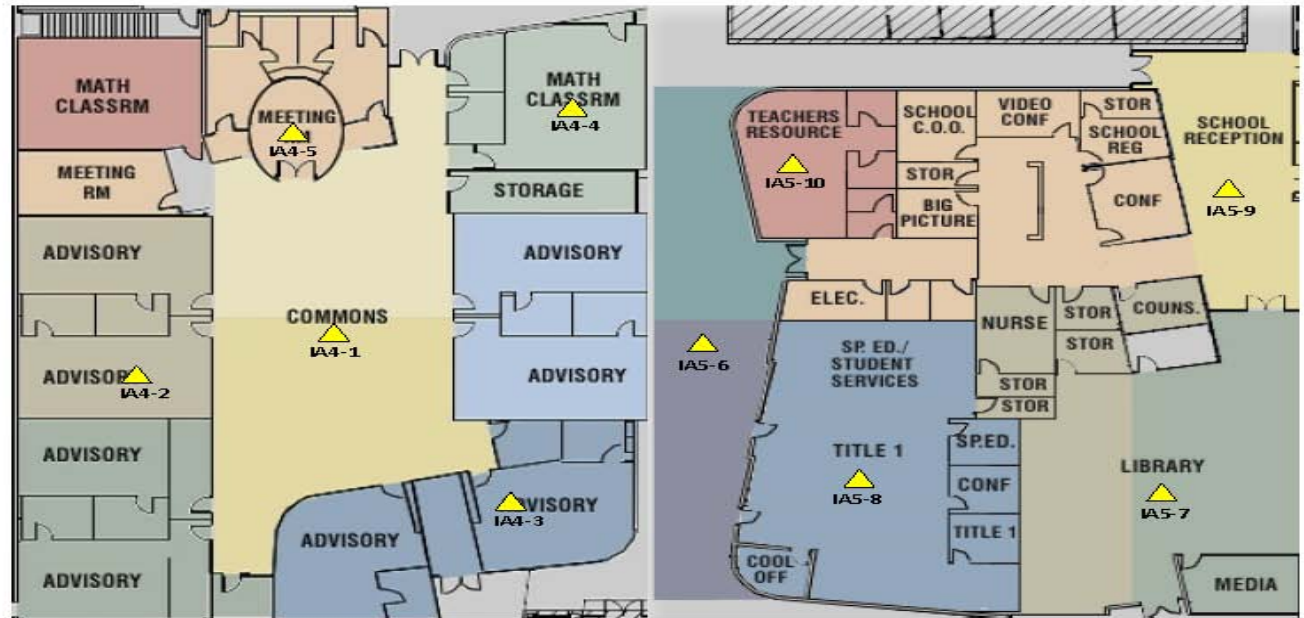
● Sub-Slab Sampling Event – 04/26
 ▲ Indoor Air Sampling Event – 04/25



Areas 4 / 5 - Classroom & Staff

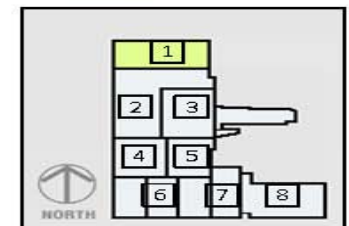
Area 4/5 – IA/SS Sampling Locations/Results: Investigation

Sample ID	PCE (ug/m ³)
IA4-1	9
IA4-2	8
IA4-3	7
IA4-4	10
IA4-5	14
IA4-5 DUP	12
IA5-6	11
IA5-7	9
IA5-8	8
IA5-9	10
IA5-10	10



Notes: All samples were collected with the HVAC system fresh air damper set to approximately 15% open.

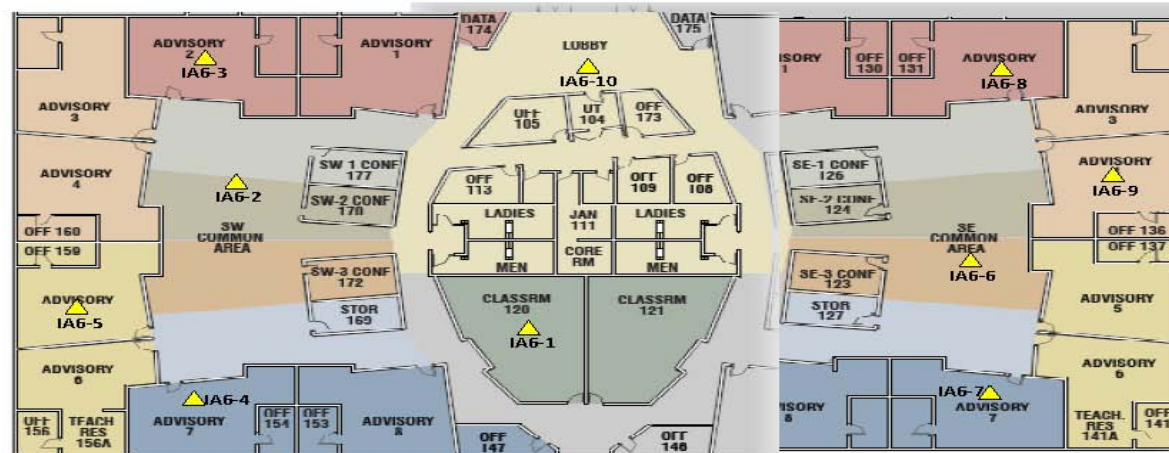
● Sub-Slab Sampling Event – 04/26
 ▲ Indoor Air Sampling Event – 04/25



Area 6 – General Student Area

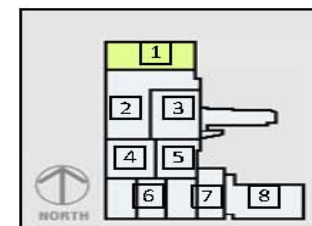
Area 6 – IA/SS Sampling Locations/Results: Investigation

Sample ID	PCE (ug/m3)
IA6-1	6.7
IA6-2	6
IA6-3	7
IA6-4	6.2
IA6-5	5.6
IA6-6	4.8
IA6-7	7.1
IA6-8	6.1
IA6-9	5.7
IA6-10	7.3



Notes: All samples were collected with the HVAC system fresh air damper set to approximately 15% open.

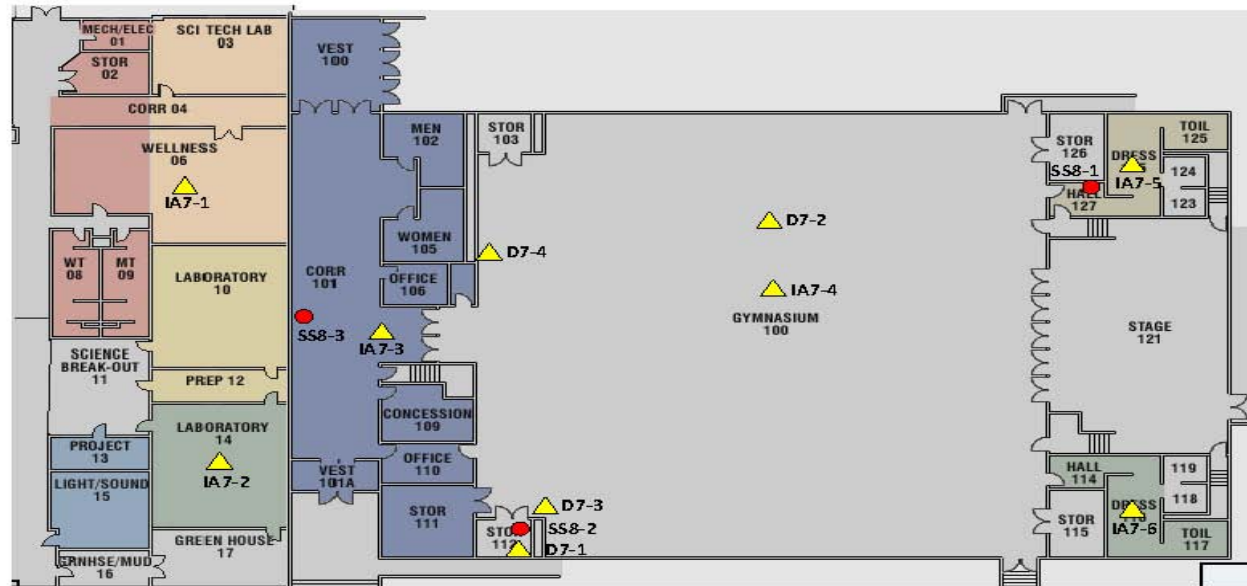
- Sub-Slab Sampling Event – 04/26
- ▲ Indoor Air Sampling Event – 04/25



Areas 7 / 8 – Student & Gym

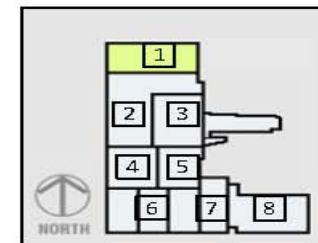
Area 7/8 – IA/SS Sampling Locations/Results: Investigation

Sample ID	PCE (ug/m3)
IA7-1	11
IA7-2	6
IA7-3	57
IA7-3 A	61
IA7-4	94
IA7-4A	95
IA7-5	105
IA7-5 A	108
IA7-6	98
D7-1	91
D7-2	83
D7-3	96
D7-4	91
Sample ID	PCE (ug/m3)
SS8-1	675
SS8-2	140
SS8-3	1700

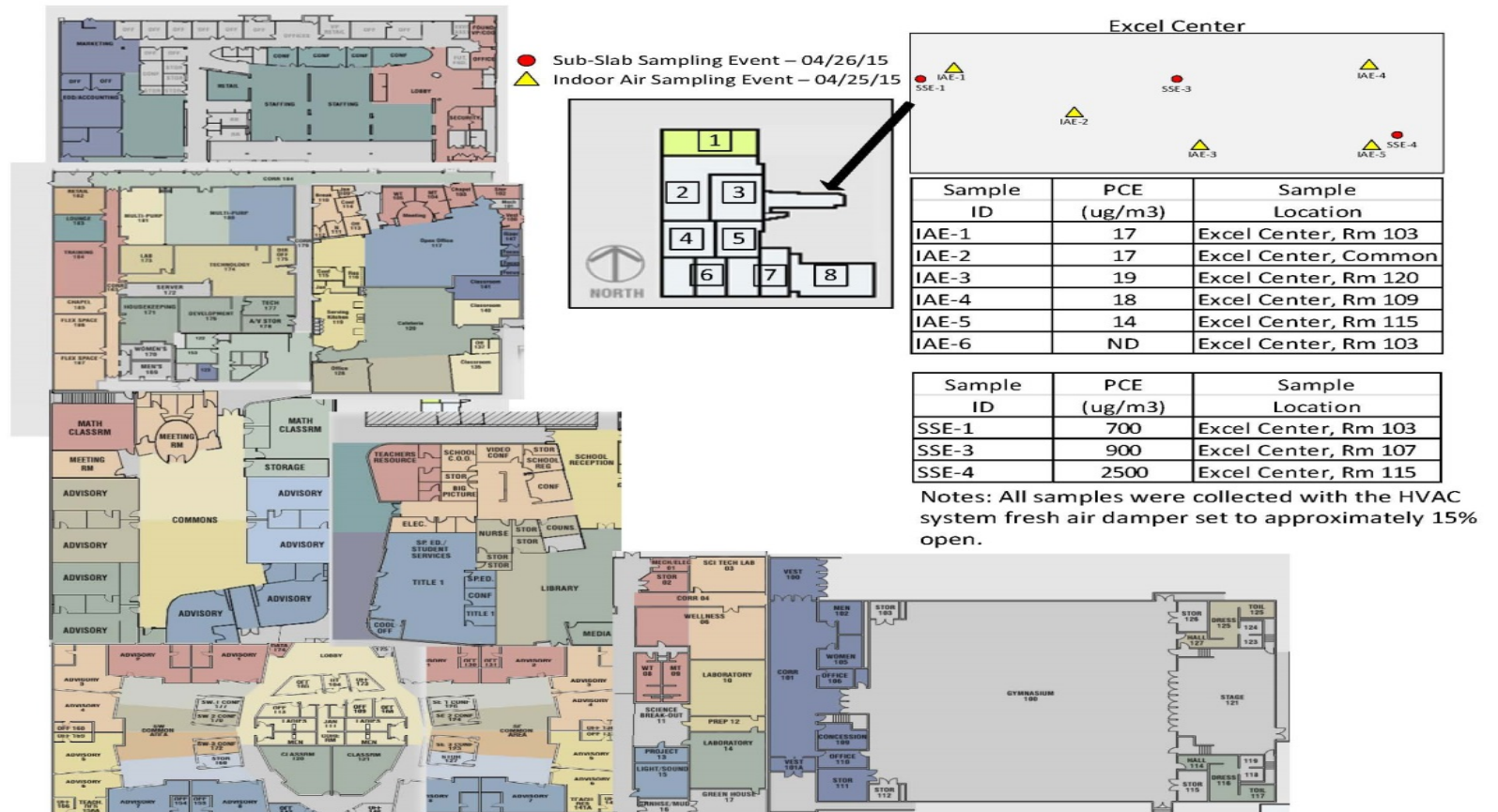


Notes: All samples were collected with the HVAC system fresh air damper set to approximately 15% open. D7-1 through D7-4 were taken from the floor to wall expansion joint at the foundation slab.

● Sub-Slab Sampling Event – 04/26
 ▲ Indoor Air Sampling Event – 04/25



Excel Center – Adult & Daycare



Next Steps

- Cost Benefit Analysis for HVAC adjustments vs ASD
- Impact / Implications with Final US EPA VI Guidance (June 11, 2015)
- Impact / Implications with Proposed ATDSR Tox Profile update for PCE

Next Steps

- Winter Sampling (2015 & beyond)
- O & M & Monitoring
- LTS obligations

Questions or Comments

Please contact:

David R. Gillay, Esq.

Chair, Transactional, Redevelopment & Remediation Practices

(317) 231-7474 or (317) 946-9267

david.gillay@btlaw.com