Letter Health Consultation

Evaluation of Exposures Related to Soil Vapor Intrusion
Mitigation Verification — December 2009

SOUTHSIDE HIGH SCHOOL
ELMIRA, CHEMUNG COUNTY, NEW YORK

EPA FACILITY ID: NYD987025921

Prepared by
State of New York Department of Health

MARCH 4, 2010

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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LETTER HEALTH CONSULTATION

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State of New York
Department of Health
Under a cooperative agreement with the
Agency for Toxic Substances and Disease Registry

STATE OF NEW YORK
INTERDEPARTMENTAL MEMORANDUM

DATE: March 3, 2010

TO: Mr. Carl Thurnau, Facilities Planning Coordinator
New York State Education Department

FROM: Ms. Krista M. Anders, Public Health Specialist *Krista M. Anders*
New York State Department of Health

RE: NYSDOH's Assessment of Air Results
Southside High School, Elmira, Chemung County, New York

Between January 28 and February 9, 2010, the New York State Department of Health's (NYS DOH's) Bureau of Environmental Exposure Investigation received a validated air data package from the Elmira City School District's consultant, Sterling Environmental Engineering, P.C. (Sterling), for the above-referenced property. The air samples were collected in December of 2009 to verify that mitigation actions currently being implemented at the school are continuing to be effective. These actions are intended to ensure that contaminants beneath the school are not being drawn into the building and affecting the indoor air quality. The NYS DOH, under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), has completed our evaluation of the data in the context of prior air sampling completed at the school. The NYS DOH and ATSDR's goal is to make sure the New York State Education Department (NYS ED) has the information the NYS ED, Elmira City School District and Southside High School community need to understand the health effects associated with the chemicals found in the indoor air of the high school and what additional actions, if any, we recommend to reduce human exposures. The following is a summary of our assessment.

BACKGROUND

Sterling collected the samples in accordance with the Elmira City School District's indoor air quality action plan, which the district developed in response to the NYS DOH's and ATSDR's recommendations presented in the *Health Consultation for Southside High School* (ATSDR 2003). In 1995, fuel oil contamination was discovered in nearby Miller Pond, which is east of Southside High School. Environmental investigations completed by the New York State Department of Environmental Conservation (NYS DEC) found that the petroleum contamination extends from beneath the school, at an approximate depth of 15 feet below ground, toward Miller Pond. During their investigations, the NYS DEC also discovered the presence of numerous contaminants, including chlorinated solvents, associated with prior industrial activities. As discussed in the health consultation, the NYS DEC and NYS DOH completed several indoor air investigations at the school in 1997 and 2000 to evaluate whether the subsurface environmental contaminants were affecting the indoor air quality due to soil vapor intrusion.

These previous air investigations identified several compounds in the indoor air at concentrations slightly higher than typical background—most likely due to indoor sources or activities, or due to their presence in the outdoor air that enters the school building. As discussed in the health consultation, their presence was not unusual and exposure at the reported levels was not expected to be a health concern. Relatively elevated concentrations of Freons and chlorinated solvents were found in the air beneath the building's slab (referred to as the sub-slab air). However, sampling demonstrated that human exposure to the contaminants was being minimized due to the operation of the building's heating, ventilating, and air-conditioning system. The system is operated in a manner intended to

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minimize the potential for contaminants that are present beneath the building from being drawn into the building and affecting the indoor air quality (i.e., it is operated in a positive pressure mode).

The results of the NYS DEC and NYS DOH's sampling events in 1997 and 2000 did not show an indoor air contamination problem at the school. Overall, the results of Sterling's air sampling this past December are consistent with these previous findings.

STERLING's DECEMBER 2009 AIR SAMPLING

On December 17 and 18, 2009, Sterling collected 24 air samples at the school: 8 indoor air, 14 sub-slab air, and 2 outdoor air (duplicates from the same location). Samples were collected over a 24-hour time period. During this time period, the building's heating, ventilating, and air-conditioning system was operating in a positive pressure mode during times of occupancy (approximately 10 hours). Centek Laboratories, LLC, analyzed the air samples for a range of volatile organic compounds by using US EPA Method TO-15. The sampling locations, methods and analytical procedures are comparable to those implemented by the agencies during previous sampling events. Additional details regarding this sampling event can be found in the Elmira City School District's Indoor Air Quality Action Plan, which is included in the Environmental Management Plan for the school (Sterling 2009).

The results for all of the air samples are given in Tables 1 (indoor air), 2 (sub-slab air) and 3 (outdoor air). The sample locations and results for volatile organic compounds specifically identified in our exposure assessment are provided in Figure 1.

NYS DOH's EXPOSURE ASSESSMENT

Indoor Air

- As expected, volatile organic compounds were found in the air samples collected from inside the school. Based on a review of studies conducted to evaluate background levels of volatile chemicals in indoor air, most of the compounds present in the indoor air of the school are at concentrations consistent with levels usually found in the indoor air of buildings not affected by environmental contamination and do not represent a concern.
- Several compounds were detected at levels above those commonly found in indoor air (Table 4), but below applicable public health comparison values (Table 5):

  (a) <u>Freon-12 and Freon-113, throughout the school</u>: These compounds are typically used as refrigerants and as cleaning solvents. Their presence may be related to their use at the school, their presence in the outdoor air that enters the school, or due to soil vapor intrusion.

  (b) <u>Chloroform, in the gym and the pool filter room</u>: This compound is a known chlorination by-product and may be related to the swimming pool.

  (c) <u>1,1-Dichloroethene, throughout the school</u>: This compound is most likely associated with its presence in the outdoor air that enters the school.

  (d) <u>Trichloroethene, in Room-127</u>: The concentration detected (2.4 micrograms per cubic meter) was higher than typical background levels, but lower than the NYS DOH's guideline of 5 micrograms per cubic meter. Its presence may be due to soil vapor intrusion.

  Overall, health effects from exposure to these compounds at the concentrations detected are unlikely (i.e., the health risks are minimal).

Sub-slab Air

- Similar to previous sampling events, chlorinated solvents and Freons were found at relatively elevated levels in the air beneath the school. In particular, elevated concentrations of one or more compounds were found beneath a portion of the gym, the pool filter room, and Room-127. No one is coming into direct contact with this air.

Outdoor Air

- Based on a review of studies conducted to evaluate background levels of volatile chemicals in outdoor air, the concentrations of most of the volatile organic compounds detected in the outdoor air sample are consistent with typical outdoor air background levels and do not represent a concern. Two compounds, 1,1-dichloroethene and Freon-12, were present at levels above those commonly found in outdoor air (Table 6), but below applicable public health comparison values (Table 5). Health effects from exposure to the concentrations detected are unlikely (i.e., the health risks are minimal).

NYS DOH's CONCLUSIONS AND RECOMMENDATIONS

Overall, the NYS DOH and ATSDR conclude that breathing volatile organic compounds at the levels found in the indoor air at the Southside High is not expected to harm people's health. Consistent with previous investigations, the recent indoor air testing results do not show a problem with chemical contamination in the school's air. However, given the concentrations of Freons and chlorinated solvents found beneath the building, we recommend that

- the school's heating, ventilating and air-conditioning system continue to be operated in a manner to prevent sub-slab air from being drawn into the building (particularly at times when the school is occupied);
- routine monitoring (e.g., of the pressure differentials between the sub-slab and building interior) be continued to verify that this mitigation measure continues to be effective;
- additional sampling be completed to evaluate the indoor air quality and the pressure differentials between the inside and outside of the building in the area of Room-127. The samples should be collected during periods when the school's heating, ventilating and air-conditioning system is operating in a positive pressure mode to obtain a more representative sample of the exposure scenario; and
- if necessary, adjustments be made to the school's heating, ventilating and air-conditioning system in the area of Room-127 to reduce the concentration of trichloroethene in the indoor air to within background ranges.

We also recommend that reasonable and practical actions be taken to reduce exposures to those compounds that are present in the indoor air at levels above background and are used or stored within the building.

We understand that the district is planning to do some work on the floor and/or concrete slab in the gym before the next school year begins. Given the levels of volatile organic compounds found beneath the slab, they may want to consider installing a sub-slab depressurization system in this portion of the building. If the building's slab is to be breached during these activities, then we recommend that an indoor air-monitoring program be implemented to address the potential for exposure to volatile organic compounds and, if possible, that the intrusive activities be completed when the building is unoccupied.

CONTACT INFORMATION

If you have any questions regarding this assessment or the recommendations contained herein, please feel free to contact me at 518-402-7860 or as follows:

via email: BEEI@health.state.ny.us [RE: Southside High School Air Results]

via mail: Krista M. Anders, Ph.D.
Public Health Specialist
Bureau of Environmental Exposure Investigation
New York State Department of Health
547 River Street, Troy, NY 12180

ADDITIONAL INFORMATION

- For information on what we mean when using the term "exposure," please see the NYS DOH's fact sheet titled *What is Exposure?* (enclosed). This fact sheet is also available on the NYS DOH's website at http://www.nyhealth.gov/environmental/about/exposure.htm.

- Please see the NYS DOH's fact sheet titled *Soil Vapor Intrusion: Frequently Asked Questions* (enclosed) for additional information on the process referred to as "soil vapor intrusion." This fact sheet is also available on the NYS DOH's website at http://www.nyhealth.gov/environmental/indoors/vapor_intrusion/fact_sheets/.

- Please see the NYS DOH's fact sheet titled *Trichloroethene (TCE) in Indoor and Outdoor Air* (enclosed) for additional information on trichloroethene and the NYS DOH's guideline of 5 micrograms per cubic meter for trichloroethene in air. This fact sheet is also available on the NYS DOH's website at http://www.nyhealth.gov/environmental/investigations/soil_gas/svi_guidance/fs_tce.htm.

REFERENCES

- ATSDR (Agency for Toxic Substance and Disease Registry). 2003. Health Consultation for Southside High School, Elmira, Chemung County, New York. U.S. September 30, 2003. Prepared by the New York State Department of Health under a cooperative agreement with the Agency for Toxic Substance and Disease Registry.

- Sterling Environmental Engineering, P.C. 2009. Elmira City School District, Southside High School, Elmira, New York: Environmental Management Plan. June 19, 2009. Prepared for the Elmira City School District.

Enclosures

ec: A. Salame-Alfie / G. Litwin / D. Miles / G. Laccetti / FILE
D. Luttinger / T. Johnson
B. Putzig / T. Schneider — NYSDEC, Region 8
L. Graziano — ATSDR, NY
G. Ulirsch — ATSDR, GA
T. Kump — Chemung County Health Department

Table 1. Indoor Air Results (micrograms per cubic meter, mcg/m^3)

Southside High School, Elmira, NY — December 16-17, 2009

Volatile Organic Compound	IA-GYM	IA-PF	IA-DUP [5]	IA-151A	IA-127	IA-138	IA-CAF	IA-LIB
	Gymnasium	Pool Filter Room	Duplicate of Pool Filter Room	Room 151A	Room 127	Room 138	Cafeteria	Library
Chloroform	28	55	65	1.8	0.94	4.2	0.69 J	0.94
Freon 12 (Dichlorodifluoromethane)	4.2	27 JDV	3.3 JDV	25	12	6.0 J	25	9.6
Freon 113 (Trichlorotrifluoroethane)	16	97 JDV	66 JDV	9.0	4.8	6.6	7.2	7.3
1,1-Dichloroethene	< 0.60	1.1	< 0.60	1.0	0.69	0.60	0.97	1.0
1,1,1-Trichloroethane	2.4	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83
Trichloroethene	0.22	1.4 JDV	1.0 JDV	0.44	2.4	0.27	0.33	0.49
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83
1,1-Dichloroethane	< 0.62	0.49 J	< 0.62	0.49 J	< 0.62	< 0.62	0.49 J	0.41 J
1,2,4-Trichlorobenzene	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
1,2,4-Trimethylbenzene	< 0.75	1.8 JDV	1.1 JDV	< 0.75	< 0.75	1.0	0.55 J	< 0.75
1,2-Dibromoethane	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
1,2-Dichlorobenzene	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92
1,2-Dichloroethane	< 0.62	< 0.62	< 0.62	< 0.62	< 0.62	< 0.62	< 0.62	< 0.62
1,2-Dichloropropane	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70
1,3,5-Trimethylbenzene	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
1,3-Butadiene	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34
1,3-Dichlorobenzene	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92
1,4-Dichlorobenzene	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92
1,4-Dioxane	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
2,2,4-Trimethylpentane	< 0.71	< 0.71	< 0.71	< 0.71	< 0.71	< 0.71	< 0.71	< 0.71
4-Ethyltoluene	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Acetone	17	37	37	18	14	23	17	16
Allyl Chloride	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48
Benzene	0.42 J	0.58	0.45 J	0.52	0.42 J	0.65	0.49	0.42 J
Benzyl Chloride	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88
Bromodichloromethane	< 1.0	1.0	0.9 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Bromomethane	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Carbon Disulfide	< 0.47	0.32 J	< 0.47	< 0.47	< 0.47	0.95	< 0.47	< 0.47
Carbon Tetrachloride	0.32	0.45	0.38	0.38	0.32	0.38	0.38	0.38
Chlorobenzene	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70
Chloroethane	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40
Chloromethane	0.63	0.61	0.69	0.61	0.55	0.5	0.8	0.67
cis-1,2-Dichloroethene	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60
cis-1,3-Dichloropropene	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69
Cyclohexane	< 0.52	< 0.52	< 0.52	< 0.52	< 0.52	1.5	< 0.52	< 0.52
Dibromochloromethane	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3
Ethanol	3.5 JN	3.7 JN	3.2 JN	7.1 JN	7.9 JN	12 JN	6.5 JN	13 JN
Ethyl Acetate	< 0.92	< 0.92	0.77 J	< 0.92	2.1	< 0.92	3.0	< 0.92
Ethylbenzene	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66
Freon 11 (Trichlorofluoromethane)	0.80 J	1.4	1.1	2.5	0.91	2.0	2.5	1.0
Freon 114 (1,2-Dichlorotetrafluoroethane)	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
Heptane	< 0.62	< 0.62	< 0.62	0.67	6.4	0.79	< 0.62	0.87
Hexachloro-1,3-Butadiene	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Hexane	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	0.79	< 0.54	0.97
Isopropyl Alcohol	3.6	5.0	5.2	10	11	< 0.37	4.3	24
m&p-Xylene	< 1.3	0.88 J	0.66 J,JDV	0.79 J	< 1.3	1.0 J	< 1.3	< 1.3
Methyl Butyl Ketone	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Methyl Ethyl Ketone	1.0	1.4	1.4	0.57 J	0.51 J	0.84 J	0.36 J	0.78 J
Methyl Isobutyl Ketone	1.0 J	< 1.2	< 1.2	< 1.2	< 1.2	1.3	< 1.2	1.1 J
Methyl tert-Butyl Ether	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55
Methylene Chloride	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53
o-Xylene	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66
Propylene	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26
Styrene	< 0.65	< 0.65	< 0.65	< 0.65	< 0.65	< 0.65	< 0.65	< 0.65
tert-Butyl Alcohol	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene	< 1.0	0.69 J	< 1.0	0.76 J	< 1.0	< 1.0	< 1.0	< 1.0
Tetrahydrofuran	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45
Toluene	2.3	9.2 J	8.8	2.1	6.6	4.6	1.0	1.3
trans-1,2-Dichloroethene	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60
trans-1,3-Dichloropropene	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69
Vinyl Acetate	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54
Vinyl Bromide	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67
Vinyl Chloride	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

NOTES:

Indoor air sample locations are illustrated in Figure 1.

< The parameter is not detected at the laboratory detection limit shown.

ND Not detected in tentatively identified compounds.

LABORATORY/DATA VALIDATION QUALIFIERS:

J Analyte detected at or below quantitation limits.

JN Non-routine analyte. Quantitation estimated.

JDV Value is estimated as a result of Data Validation.

Table 2. Sub-slab Vapor Results (micrograms per cubic meter, mcg/m^3)

Southside High School, Elmira, NY — December 16-17, 2009

Volatile Organic Compound	SV-WM	SV-GYM EAST	SV-GYM WEST	SV-GS	SV-PF	SV-WS	SV-DUP [5]	SV-GL	SV-NR	SV-151A	SV-127	SV-HALL 113	SV-LIB	SV-BR
	Room 159	East Side of Gymnasium	West Side of Gymnasium	Gymnasium Storage Room	Pool Filter Room	Room 139C	Duplicate of Room 139C	Hallway Outside of Gymnasium	Room 146	Room 151A	Room 127	Hallway Behind Room 113B	Library	Boiler Room
Chloroform	18	79	32	27	1,100	4	4.1	5.3	4.7	5	7.9	4.8	15	1.9
Freon 12 (Dichlorodifluoromethane)	65	3,600	4.7	4.5	110	420	460	48	270	360	1,800	87	980	33
Freon 113 (Trichlorotrifluoroethane)	4.8	1,100	39	36	660	3.5 JDV	6.2 JDV	6.6	17	33	< 1.2	3	1.6	3.1
1,1-Dichloroethene	< 0.6	240	< 0.6	< 0.6	1.2	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
1,1,1-Trichloroethane	0.83 JDV	23,000	1.7	1.2	16	< 0.83	< 0.83	< 0.83	5.7 JDV	1.7	1.6 JDV	3.4 JDV	1.7 JDV	5
Trichloroethene	3.1 JDV	28	0.6 J	< 0.82	460	< 0.82	< 0.82	0.71 J	1.2 JDV	4.2	2,100	< 0.82	< 0.82	97
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83
1,1-Dichloroethane	3.9	85	< 0.62	< 0.62	1.7	0.62	0.70	< 0.62	1.1	1.7	1.3	2.1	< 0.62	< 0.62
1,2,4-Trichlorobenzene	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
1,2,4-Trimethylbenzene	1.6 JDV	2.4 JDV	1.2	0.60 J	4.1 JDV	2.2 JDV	2.3 JDV	0.75	5.3 JDV	4.5 JDV	4.2 JDV	4.6 JDV	2.5 JDV	3.7 JDV
1,2-Dibromoethane	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
1,2-Dichlorobenzene	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92
1,2-Dichloroethane	0.53 J	< 0.62	< 0.62	< 0.62	0.62	< 0.62	< 0.62	< 0.62	< 0.62	0.62	0.45 J	0.95	< 0.62	< 0.62
1,2-Dichloropropane	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70
1,3,5-Trimethylbenzene	< 0.75	0.65 J,JDV	< 0.75	< 0.75	1.4 JDV	0.65 J,JDV	0.65 J,JDV	< 0.75	1.2 JDV	1.1 JDV	0.85 JDV	1.1 JDV	< 0.75	0.85 JDV
1,3-Butadiene	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34
1,3-Dichlorobenzene	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92
1,4-Dichlorobenzene	< 0.92	1.2	< 0.92	< 0.92	0.67 J,JDV	< 0.92	< 0.92	< 0.92	1.1 JDV	< 0.92	< 0.92	< 0.92	< 0.92	0.67 J,JDV
1,4-Dioxane	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
2,2,4-Trimethylpentane	0.66 J,JDV	0.95 JDV	< 0.71	< 0.71	< 0.71	< 0.71	< 0.71	< 0.71	< 0.71	1.0 JDV	0.57 J,JDV	1.6 JDV	0.90 JDV	< 0.71
4-Ethyltoluene	< 0.75	0.60 J,JDV	< 0.75	< 0.75	1.4 JDV	0.70 J,JDV	0.80	< 0.75	1.3 JDV	1.2 JDV	1.0 JDV	0.95 JDV	< 0.75	0.95 JDV
Acetone	77	190	11	22	51	190	190	25	47	49	130	110	120	27
Allyl Chloride	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48
Benzene	1.9 JDV	17	0.36 J	0.42 J	1.4	0.58 JDV	0.75	1.8	1.2 JDV	1.7	1.4 JDV	30	1.8 JDV	0.81
Benzyl Chloride	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88
Bromodichloromethane	2.7 JDV	11	< 1.0	< 1.0	12	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Bromomethane	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Carbon Disulfide	13	15	0.76	< 0.47	3.5	2.7	2.3	1.2	3.6	3.4	1.2	2.3	3.9	0.92
Carbon Tetrachloride	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96
Chlorobenzene	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70
Chloroethane	9.7	3.0	< 0.40	< 0.40	2.2	0.86	0.91	< 0.40	2.1	2.5	2.4	2.8	< 0.40	< 0.40
Chloromethane	0.27 J	< 0.31	0.69	1.0	< 0.31	< 0.31	< 0.31	0.69	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31
cis-1,2-Dichloroethene	< 0.60	< 0.60	< 0.60	< 0.60	3.2	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	300	< 0.60	< 0.60	< 0.60
cis-1,3-Dichloropropene	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69
Cyclohexane	< 0.52	< 0.52	< 0.52	< 0.52	2.6	< 0.52	< 0.52	< 0.52	< 0.52	2.9	< 0.52	< 0.52	< 0.52	< 0.52
Dibromochloromethane	< 1.3	2.0	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3
Ethanol	ND	ND	ND	3 JN	ND	8.3 JN	7.2 JN	2.7 JN	ND	ND	ND	ND	8.8 JN	ND
Ethyl Acetate	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	1.7	< 0.92	< 0.92	< 0.92	11	< 0.92	< 0.92
Ethylbenzene	1.5 JDV	3.4 JDV	< 0.66	0.53 J	0.97 JDV	1.6 JDV	1.9 JDV	1.7	2.8 JDV	2.9 JDV	2.6 JDV	3.3 JDV	1.3 JDV	2.0 JDV
Freon 11 (Trichlorofluoromethane)	0.69 J	21	0.86	1.5	3.8	1.3	1.3	0.86	34	1.9	0.86	1.3	1.0	4.2
Freon 114 (1,2-Dichlorotetrafluoroethane)	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
Heptane	25	50	< 0.62	< 0.62	5.3	2.9	3.2	0.67	9.3	6.3	3.9	6.6	7.1	4.0
Hexachloro-1,3-Butadiene	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Hexane	54	65	< 0.54	< 0.54	6.8	< 0.54	< 0.54	< 0.54	8.1	7.1	< 0.54	< 0.54	22	< 0.54
Isopropyl Alcohol	< 0.37	< 0.37	2.8	2.2	3.2	< 0.37	9.5	3.1	< 0.37	< 0.37	< 0.37	< 0.37	< 0.37	2.9
m&p-Xylene	4.1 JDV	6.8 JDV	0.88 J	1.7	2.1 JDV	4 JDV	4.9 JDV	0.62 J	9.5 JDV	9.2 JDV	7.6 JDV	9.9 JDV	3.7 JDV	6.6 JDV
Methyl Butyl Ketone	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	3.0 JDV	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Methyl Ethyl Ketone	19	< 0.90	0.84 J	0.90	3.2	3.2	3.5	13	9.0	6.6 J	5.5	210	6.4	3.1
Methyl Isobutyl Ketone	7.2 JDV	7.0 JDV	0.92 J	2.2	< 1.2	0.54 J,JDV	0.58 J,JDV	< 1.2	< 1.2	1.3 JDV	1.8 JDV	1.4 JDV	2.0 JDV	0.71 J,JDV
Methyl tert-Butyl Ether	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55
Methylene Chloride	0.88	< 0.53	< 0.53	< 0.53	3.4	< 0.53	< 0.53	1.5	< 0.53	0.42 J	0.46 J	1.9	0.42 J	< 0.53
o-Xylene	1.1 JDV	2.0 JDV	0.49 J	0.62 J	0.88 JDV	1.5 JDV	1.8 JDV	0.66	2.6 JDV	2.8 JDV	2.5 JDV	2.7 JDV	1.0 JDV	2.2 JDV
Propylene	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26
Styrene	< 0.65	2.3 JDV	< 0.65	< 0.65	1.0 JDV	< 0.65	< 0.65	16	1.9 JDV	1.2 JDV	1.3 JDV	0.87 JDV	0.43 J,JDV	1.1 JDV
tert-Butyl Alcohol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene	< 1.0	54 JDV	< 1.0	< 1.0	7.4 JDV	< 1.0	< 1.0	< 1.0	1.2 JDV	1.1 JDV	2.6 JDV	< 1.0	3.1 JDV	1.9 JDV
Tetrahydrofuran	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45
Toluene	16	39 JDV	1.7	5.8	7.1 JDV	37	31	2.9	21	31	29	45	14	19
trans-1,2-Dichloroethene	< 0.60	< 0.60	< 0.60	< 0.60	0.52 J	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	21 J	< 0.60	< 0.60	< 0.60
trans-1,3-Dichloropropene	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69
Vinyl Acetate	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54
Vinyl Bromide	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67
Vinyl Chloride	2.1	0.78	< 0.39	< 0.39	0.44	< 0.39	< 0.39	< 0.39	0.52	0.39	0.55	0.42	< 0.39	< 0.39

NOTES:

Indoor air sample locations are illustrated in Figure 1.

< The parameter is not detected at the laboratory detection limit shown.

ND Not detected in tentatively identified compounds.

LABORATORY/DATA VALIDATION QUALIFIERS:

J Analyte detected at or below quantitation limits.

JN Non-routine analyte. Quantitation estimated.

JDV Value is estimated as a result of Data Validation.

Table 3. Outoor Air Results (micrograms per cubic meter, mcg/m^3)

Southside High School, Elmira, NY — December 16-17, 2009

Volatile Organic Compound	OA-UR Roof, Upwind	OA-DUP [5] Duplicate of Roof, Upwind
Chloroform	0.60 J	< 0.74
Freon 12 (Dichlorodifluoromethane)	5.5 J	9.0
Freon 113 (Trichlorotrifluoroethane)	6.3	5.5
1,1-Dichloroethene	0.81	0.73
1,1,1-Trichloroethane	< 0.83	< 0.83
Trichloroethene	< 0.22	< 0.22
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0
1,1,2-Trichloroethane	< 0.83	< 0.83
1,1-Dichloroethane	< 0.62	< 0.62
1,2,4-Trichlorobenzene	< 1.1	< 1.1
1,2,4-Trimethylbenzene	< 0.75	< 0.75
1,2-Dibromoethane	< 1.2	< 1.2
1,2-Dichlorobenzene	< 0.92	< 0.92
1,2-Dichloroethane	< 0.62	< 0.62
1,2-Dichloropropane	< 0.70	< 0.70
1,3,5-Trimethylbenzene	< 0.75	< 0.75
1,3-Butadiene	< 0.34	< 0.34
1,3-Dichlorobenzene	< 0.92	< 0.92
1,4-Dichlorobenzene	< 0.92	< 0.92
1,4-Dioxane	< 1.1	< 1.1
2,2,4-Trimethylpentane	< 0.71	< 0.71
4-Ethyltoluene	< 0.75	< 0.75
Acetone	9.9	9.9
Allyl Chloride	< 0.48	< 0.48
Benzene	0.39 J	0.36 J
Benzyl Chloride	< 0.88	< 0.88
Bromodichloromethane	< 1.0	< 1.0
Bromoform	< 1.6	< 1.6
Bromomethane	< 0.59	< 0.59
Carbon Disulfide	< 0.47	< 0.47
Carbon Tetrachloride	< 0.26	< 0.26
Chlorobenzene	< 0.70	< 0.70
Chloroethane	< 0.40	< 0.40
Chloromethane	0.57	0.55
cis-1,2-Dichloroethene	< 0.60	< 0.60
cis-1,3-Dichloropropene	< 0.69	< 0.69
Cyclohexane	< 0.52	< 0.52
Dibromochloromethane	< 1.3	< 1.3
Ethanol	ND	ND
Ethyl Acetate	< 0.92	< 0.92
Ethylbenzene	< 0.66	< 0.66
Freon 11 (Trichlorofluoromethane)	1.7 JDV	0.91 JDV
Freon 114 (1,2-Dichlorotetrafluoroethane)	< 1.1	< 1.1
Heptane	< 0.62	< 0.62
Hexachloro-1,3-Butadiene	< 1.6	< 1.6
Hexane	< 0.54	< 0.54
Isopropyl Alcohol	< 0.37	< 0.37
m&p-Xylene	< 1.3	< 1.3
Methyl Butyl Ketone	< 1.2	< 1.2
Methyl Ethyl Ketone	< 0.90	< 0.90
Methyl Isobutyl Ketone	< 1.2	< 1.2
Methyl tert-Butyl Ether	< 0.55	< 0.55
Methylene Chloride	< 0.53	< 0.53
o-Xylene	< 0.66	< 0.66
Propylene	< 0.26	< 0.26
Styrene	< 0.65	< 0.65
tert-Butyl Alcohol	ND	ND
Tetrachloroethylene	< 1.0	< 1.0
Tetrahydrofuran	< 0.45	< 0.45
Toluene	0.50 J	< 0.57
trans-1,2-Dichloroethene	< 0.60	< 0.60
trans-1,3-Dichloropropene	< 0.69	< 0.69
Vinyl Acetate	< 0.54	< 0.54
Vinyl Bromide	< 0.67	< 0.67
Vinyl Chloride	< 0.10	< 0.10

NOTES:

Indoor air sample locations are illustrated in Figure 1.

< The parameter is not detected at the laboratory detection limit shown.

ND Not detected in tentatively identified compounds.

LABORATORY/DATA VALIDATION QUALIFIERS:

J Analyte detected at or below quantitation limits.

JN Non-routine analyte. Quantitation estimated.

JDV Value is estimated as a result of Data Validation.

Table 4. Summary of Indoor Air Results for Volatile Organic Compounds Found at Concentrations Above Typical Indoor Air Levels at the Southside High School

[All concentrations are reported in units of micrograms per cubic meter, mcg/m^3]

	LOCATION	Chloroform	Freon 12 (Dichlorodifluoromethane)	Freon 113 (Trichlorotrifluoroethane)	1,1-Dichloroethene	Trichloroethene
Southside High School	Gymnasium	28	4.2	16	< 0.60	0.2
	Pool Filter Room	55	27 JDV	97 JDV	1.1	1.4 JDV
	Duplicate of Pool Filter Room	65	3.3 JDV	66 JDV	< 0.60	1.0 JDV
	Room 151A	1.8	25	9.0	1.0	0.4
	Room 127	0.9	12	4.8	0.7	2.4
	Room 138	4.2	6.0 J	6.6	0.60	0.3
	Cafeteria	0.7 J	25	7.2	1.0	0.3
	Library	0.9	9.6	7.3	1.0	0.5
Typical Indoor Air Levels	NYS DOH Fuel Oil Study Database*					
	25th – 75th percentile	< 0.25 – 0.5	< 0.25 – 4.1	< 0.25 – 1.1	< 0.25 – < 0.25	< 0.25 - < 0.25
	95th percentile	4.6	26	3.4	0.7	0.8
	US EPA BASE Database**					
	25th – 75th percentile	< 0.4 - < 1.2	4.8 – 10.5	< 1.7 - < 3.0	< 0.9 - < 1.2	< 1.2 – 1.2
	95th percentile	1.4	32.9	9.4	< 1.4	6.5

*The New York State Department of Health (NYS DOH) database is a summary of indoor and outdoor air results from samples collected from control homes in New York State that heat with fuel oil. The NYS DOH conducted this study between 1997 and 2003.

**The United State Environmental Protection Agency (US EPA) database is a summary of indoor and outdoor air results from samples collected from 100 randomly selected public and commercial office buildings across the United States. The US EPA conducted this study from 1994 through 1996.

<u>NOTES</u>:

< = The parameter is not detected at the laboratory detection limit shown.

J = Analyte detected at or below quantitation limits.

JDV = Value is estimated as a result of Data Validation.

Additional information about the levels of volatile organic compounds that are often found in residential and non-residential buildings is available on the NYS DOH's website at http://www.nyhealth.gov/environmental/investigations/soil_gas/svi_guidance/ — in Section 3.2.4 of the first bulleted item titled "Guidance for Evaluating Soil Vapor Intrusion in New York State", as well as in the fourth bulleted item titled "Appendix C – Background VOCs."

Table 5. Public Health Comparison Values for Volatile Organic Compounds Found at Concentrations Above Typical Indoor and/or Outdoor Air Levels at the Southside High School

[All concentrations are reported in units of micrograms per cubic meter, mcg/m^3]

Volatile Organic Compound	NYS Air Guideline	Public Health Comparison Values*			
		Cancer	Basis**	Noncancer	Basis**
Chloroform	--	167	Health Canada UR	240	US EPA Region 3 RfC
Freon 12 (Dichlorodifluoromethane)	--	--	--	3400	US EPA IRIS RfD
Freon 113 (Trichlorotrifluoroethane)	--	--	--	146,000	US EPA HEAST RfC
1,1-Dichloroethene	--	--	--	970	US EPA IRIS RfC
Trichloroethene	5[a]	3.4	NYS DOH UR[a]	49	NYS DOH CV[a]

* Noncancer and cancer comparison values assume a person inhales about 8 cubic meters of air per day, 180 days per year. The cancer comparison value is the air concentration that corresponds to an increased lifetime cancer risk of one-in-one million and is based on an exposure duration of 30 years of a 70 year lifetime.

** Health Canada UR: Health Canada Unit Risk

US EPA Region 3 RfC: United States Environmental Protection Agency Region 3 Reference Concentration

US EPA IRIS RfD: United States Environmental Protection Agency Integrated Risk Information System Reference Dose. The reference dose was converted to an air concentration assuming a 70 kg person inhales 20 cubic meters of air per day.

US EPA HEAST RfC: United States Environmental Protection Agency Health Effect Assessment Summary Tables Reference Concentration.

US EPA IRIS RfC: United States Environmental Protection Agency Integrated Risk Information System Reference Concentration.

NYS DOH UR: New York State Unit Risk. The cancer comparison value for TCE is based on the highest of several estimates of cancer potency derived by the New York State Department of Health.

NYS DOH CV: New York State Department of Health Criteria Value for non-cancer endpoints.

[a]NYSDOH. 2006. *Final Report: Trichloroethene (TCE) Air Criteria Document*. Center for Environmental Health, Bureau of Toxic Substance Assessment. Troy, NY.

Table 6. Summary of Outdoor Air Results for Volatile Organic Compounds Found at Concentrations Above Typical Outdoor Air Levels at the Southside High School

[All concentrations are reported in units of micrograms per cubic meter, mcg/m^3]

	LOCATION	Freon 113 (Trichlorotrifluoroethane)	1,1-Dichloroethene
	Outdoor Air	6.3	0.81
	Duplicate Outdoor Air	5.5	0.73
Typical Outdoor Air Levels	NYS DOH Fuel Oil Study Database*		
	25th – 75th percentile	< 0.25 – 1.1	< 0.25 – < 0.25
	95th percentile	3.6	< 0.25
	US EPA BASE Database**		
	25th – 75th percentile	< 1.6 - < 2.0	< 1.0 - < 1.2
	95th percentile	1.8	< 1.4

*The New York State Department of Health (NYS DOH) database is a summary of indoor and outdoor air results from samples collected from control homes that heat with fuel oil. The NYS DOH conducted this study between 1997 and 2003.

**The United State Environmental Protection Agency (US EPA) database is a summary of indoor and outdoor air results from samples collected from 100 randomly selected public and commercial office buildings across the United States. The US EPA conducted this study from 1994 through 1996.

NOTES:

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Additional information about the levels of volatile organic compounds that are often found in residential and non-residential buildings is available on the NYS DOH's website at http://www.nyhealth.gov/environmental/investigations/soil_gas/svi_guidance/ — in Section 3.2.4 of the first bulleted item titled "Guidance for Evaluating Soil Vapor Intrusion in New York State", as well as in the fourth bulleted item titled "Appendix C – Background VOCs."

RM 151A	
SV-151A	
$CHCl_3$	5
FR-12	360
FR-113	33
DCE	<0.6
TCA	1.7
TCE	4.2

ROOM 146	
SV-NR	
$CHCl_3$	4.7
FR-12	270
FR-113	17
DCE	<0.6
TCA	5.7 JDV
TCE	1.2 JDV

HALLWAY OUTSIDE GYM	
SV-GL	
$CHCl_3$	5.3
FR-12	48
FR-113	6.6
DCE	<0.6
TCA	<0.83
TCE	0.71 J

GYM	
SV-GYM WEST	
$CHCl_3$	32
FR-12	4.7
FR-113	39
DCE	<0.6
TCA	1.7
TCE	0.6 J

RM 159	
SV-WM	
$CHCl_3$	18
FR-12	65
FR-113	4.8
DCE	<0.6
TCA	0.83 JDV
TCE	3.1 JDV

GYM	
IA-GYM	
$CHCl_3$	28
FR-12	4.2
FR-113	16
DCE	<0.6
TCA	2.4
TCE	0.22

RM 151A	
IA-151A	
$CHCl_3$	1.8
FR-12	25
FR-113	9
DCE	1
TCA	<0.83
TCE	0.44

GYM-EAST	
SV-GYM EAST	
$CHCl_3$	79
FR-12	3,600
FR-113	1,100
DCE	240
TCA	23,000
TCE	28

RM 127	
IA-127	
$CHCl_3$	0.94
FR-12	12
FR-113	4.8
DCE	0.69
TCA	<0.83
TCE	2.4

GYM STORAGE	
SV-GS	
$CHCl_3$	27
FR-12	4.5
FR-113	36
DCE	<0.6
TCA	1.2
TCE	<0.82

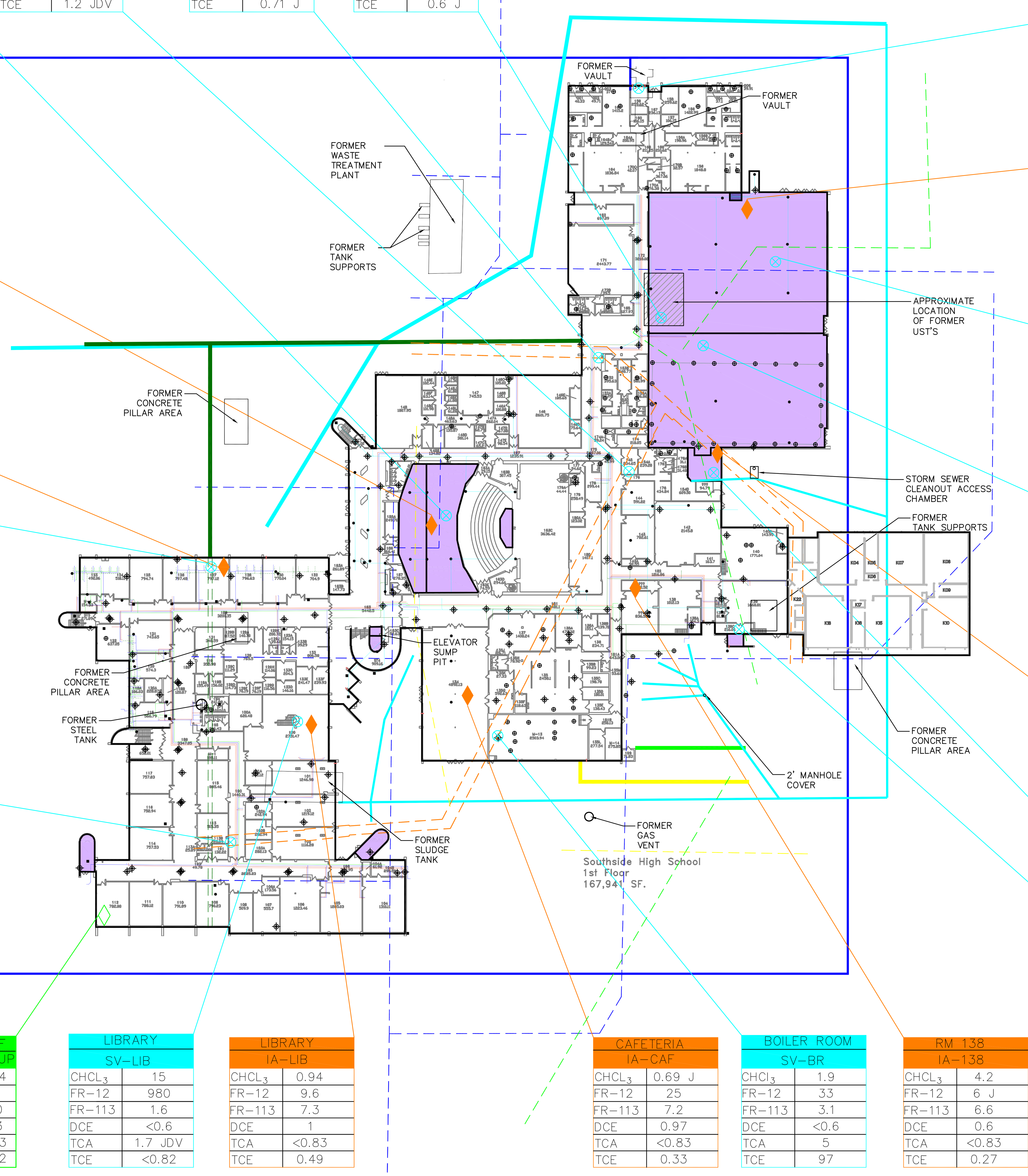
RM 127	
SV-127	
$CHCl_3$	7.9
FR-12	1,800
FR-113	<1.2
DCE	<0.6
TCA	1.6 JDV
TCE	2,100

POOL FILTER ROOM		
	IA-PF	IA-DUP
$CHCl_3$	55	65
FR-12	27 JDV	3.3 JDV
FR-113	97 JDV	66 JDV
DCE	1.1	<0.6
TCA	<0.83	<0.83
TCE	1.40 JDV	1.0 JDV

POOL FILTER ROOM	
SV-PF	
$CHCl_3$	1,100
FR-12	110
FR-113	660
DCE	1.2
TCA	16
TCE	460

HALLWAY BEHIND ROOM 113B	
SV-HALL 113	
$CHCl_3$	4.8
FR-12	87
FR-113	3
DCE	<0.6
TCA	3.4 JDV
TCE	<0.82

RM 139C		
	SV-WS	SV-DUP
$CHCl_3$	4	4.1
FR-12	420	460
FR-113	3.5 JDV	6.2 JDV
DCE	<0.6	<0.6
TCA	<0.83	<0.83
TCE	<0.82	<0.82



UPWIND, ROOF		
	OA-UR	OA-DUP
$CHCl_3$	0.60 J	<0.74
FR-12	5.50 J	9
FR-113	6.30	5.50
DCE	0.81	0.73
TCA	<0.83	<0.83
TCE	<0.22	<0.22

LIBRARY	
SV-LIB	
$CHCl_3$	15
FR-12	980
FR-113	1.6
DCE	<0.6
TCA	1.7 JDV
TCE	<0.82

LIBRARY	
IA-LIB	
$CHCl_3$	0.94
FR-12	9.6
FR-113	7.3
DCE	1
TCA	<0.83
TCE	0.49

CAFETERIA	
IA-CAF	
$CHCl_3$	0.69 J
FR-12	25
FR-113	7.2
DCE	0.97
TCA	<0.83
TCE	0.33

BOILER ROOM	
SV-BR	
$CHCl_3$	1.9
FR-12	33
FR-113	3.1
DCE	<0.6
TCA	5
TCE	97

RM 138	
IA-138	
$CHCl_3$	4.2
FR-12	6 J
FR-113	6.6
DCE	0.6
TCA	<0.83
TCE	0.27

KEY:

	LOCATION
PARAMETERS	SAMPLE ID/RESULTS IN ug/M^3
$CHCl_3$	CHLOROFORM
FR-12	FREON 12 (DICHLORODIFLUOROMETHANE)
FR-113	FREON 113 (TRICHLOROTRIFLUOROETRAFLUOROETHANE)
DCE	1,1 DICHLOROETHENE
TCA	1,1,1 TRICHLOROETHANE
TCE	TRICHLOROETHENE

LEGEND:

SV	SOIL VAPOR SAMPLE
IA	INDOOR AIR SAMPLE
OA	OUTDOOR AIR SAMPLE
	SOIL VAPOR SAMPLE LOCATION
	INDOOR AIR SAMPLE LOCATION
	OUTDOOR AIR SAMPLE LOCATION
J	ANALYTE DETECTED AT OR BELOW QUANTITATION LIMITS
JDV	ESTIMATED AS A RESULT OF DATA VALIDATION
DUP	DUPLICATE SAMPLE AT ASSOCIATED LOCATION
	APPROXIMATE FORMER STEAM LINE LOCATION
	APPROXIMATE GAS LINE LOCATION
	APPROXIMATE ELECTRIC LINE LOCATION
	APPROXIMATE WATER LINE LOCATION
	APPROXIMATE SANITARY SEWER LINE LOCATION
	APPROXIMATE STORMWATER LINE LOCATION
	APPROXIMATE FLOOR DRAIN LOCATION
	APPROXIMATE DECK PLATE CLEANOUT LOCATION
	APPROXIMATE WALL PLATE CLEANOUT LOCATION
	APPROXIMATE CLEANOUT LOCATION
	APPROXIMATE HISTORICAL GAS LINE LOCATION
	APPROXIMATE HISTORICAL UNDERGROUND ELECTRIC LINES
	APPROXIMATE HISTORICAL WATER LINE LOCATION
	APPROXIMATE TILE SANITARY SEWER LINE LOCATION
	APPROXIMATE SLEEVE LOCATION THROUGH FOOTER WALL
	AREAS WITHIN THE PERIMETER FOOTER WALL WITH ENCIRCLING FOOTER WALLS

PLATE 1

MAP REFERENCE:

BASE MAP PROVIDED BY QUE CENTER, ENTITLED SOUTHSIDE HIGH SCHOOL 1ST FLOOR DATED 1/06

UTILITY LINES BASED ON MAPS PROVIDED BY FAMMING-HOWEY ASSOCIATES, INC. ENTITLED:
FLOOR PLAN UNIT "A"PLUMBING, DATED 10-7-77, LAST REVISED 4-12-78.
FLOOR PLAN UNIT "B"PLUMBING, DATED 10-7-77.
FLOOR PLAN UNIT "C"PLUMBING, DATED 10-7-77, LAST REVISED 4-12-78.
FLOOR PLAN UNIT "D"PLUMBING, DATED 10-7-77, LAST REVISED 4-12-78.
FLOOR PLAN UNIT "E"PLUMBING, DATED 10-7-77, LAST REVISED 4-12-78.
FLOOR PLAN UNIT "F"PLUMBING, DATED 10-7-77, LAST REVISED 4-12-78.
FLOOR PLAN UNIT "G"PLUMBING, DATED 10-7-77, LAST REVISED 4-12-78.

NO.	DATE	RECORD OF WORK	DRN	CKD	APPR

PROJECT
PROJ. ENGR.: R.L. Aldrich, P.E.
PROJ. NO.: 28014
PREPARED BY: R.L. Aldrich, P.E.
DRAFTED BY: J.D. Croote
CHECKED BY: P.J. Kellerher, P.E.
APPROVED BY:
DATUM:

0 25 50 100
1" = 50'

SUB-SLAB VAPOR, INDOOR AND OUTDOOR AIR
SELECT SAMPLE RESULTS – DECEMBER 2009

ELMIRA CITY SCHOOL DISTRICT

SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN STREET
CITY OF ELMIRA CHEMUNG CO., N.Y.

STERLING
Sterling Environmental Engineering, P.C.
24 Wade Road • Latham, New York 12110

DATE: 2/04/10 SCALE: 1" = 50' DWG. NO. 28014062 SHEET 1 OF 1

New York State Department of Health

What is Exposure?

Exposure is contact. No matter how dangerous a substance or activity, without exposure, it cannot harm you.

Amount of exposure:

Over 400 years ago, a scientist said "...nothing [is] without poisonous qualities. It is only the dose that makes a thing poison." The **dose** is the amount of a substance that enters or contacts a person. An important factor to consider in evaluating a dose is body weight. If a child is exposed to the same amount of chemical as an adult, the child (who weighs less) can be affected more than the adult. For example, children are given smaller amounts of aspirin than adults because an adult dose is too large for a child's body weight.

The greater the amount of a substance a person is exposed to, the more likely that health effects will occur. Large amounts of a relatively harmless substance can be toxic. For example, two aspirin tablets can help to relieve a headache, but taking an entire bottle of aspirin can cause stomach pain, nausea, vomiting, headache, convulsions or death.

Routes of exposure:

There are three major means by which a toxic substance can come into contact with or enter the body. These are called routes of exposure.

Inhalation (breathing) of gases, vapors, dusts or mists is a common route of exposure. Chemicals can enter and irritate the nose, air passages and lungs. They can become deposited in the airways or be absorbed through the lungs into the bloodstream. The blood can then carry these substances to the rest of the body.

Direct contact (touching) with the skin or eyes is also a route of exposure. Some substances are absorbed through the skin and enter the bloodstream. Broken, cut or cracked skin will allow substances to enter the body more easily.

Ingestion (swallowing) of food, drink, or other substances is another route of exposure. Chemicals that get in or on food, cigarettes, utensils or hands can be swallowed. Children are at greater risk of ingesting substances found in dust or soil because they often put their fingers or other objects in their mouths. Lead in paint chips is a good example. Substances can be absorbed into the blood and then transported to the rest of the body.
The route of exposure can determine whether or not the toxic substance has an effect. For example, breathing or swallowing lead can result in health effects, but touching lead is not usually harmful because lead is not absorbed particularly well through the skin.

Information Sheet

Length of exposure:

Short-term exposure is called **acute exposure**. Long-term exposure is called **chronic exposure**. Either may cause health effects that are immediate or health effects that occur days or years later.

Acute exposure is a short contact with a chemical. It may last a few seconds or a few hours. For example, it might take a few minutes to clean windows with ammonia, use nail polish remover or spray a can of paint. The fumes someone might inhale during these activities are examples of acute exposures.

Chronic exposure is continuous or repeated contact with a toxic substance over a long period of time (months or years). If a chemical is used every day on the job, the exposure would be chronic. Over time, some chemicals, such as PCBs and lead, can build up in the body and cause long-term health effects.

Chronic exposures can also occur at home. Some chemicals in household furniture, carpeting or cleaners can be sources of chronic exposure.

Sensitivity:

All people are not equally **sensitive** to chemicals, and are not affected by them in the same way. There are many reasons for this.

- People's bodies vary in their ability to absorb and break down or eliminate certain chemicals due to **genetic differences.**

- People may become **allergic** to a chemical after being exposed. Then they may react to very low levels of the chemical and have different or more serious health effects than nonallergic people exposed to the same amount. People who are allergic to bee venom, for example, have a more serious reaction to a bee sting than people who are not.

- Factors such as **age, illness, diet, alcohol use, pregnancy and medical or nonmedical drug use** can also affect a person's sensitivity to a chemical. Young children are often more sensitive to chemicals for a number of reasons. Their bodies are still developing and they cannot get rid of some chemicals as well as adults. Also, children absorb greater amounts of some chemicals (such as lead) into their blood than adults.

For more information:

New York State Department of Health
Center for Environmental Health
Flanigan Square
547 River Street, Room 316
Troy, NY 12180-2218
1-800-458-1158 (ext. 2-7530)

March 2001

NEW YORK STATE
DEPARTMENT OF HEALTH

SOIL VAPOR INTRUSION

Frequently Asked Questions

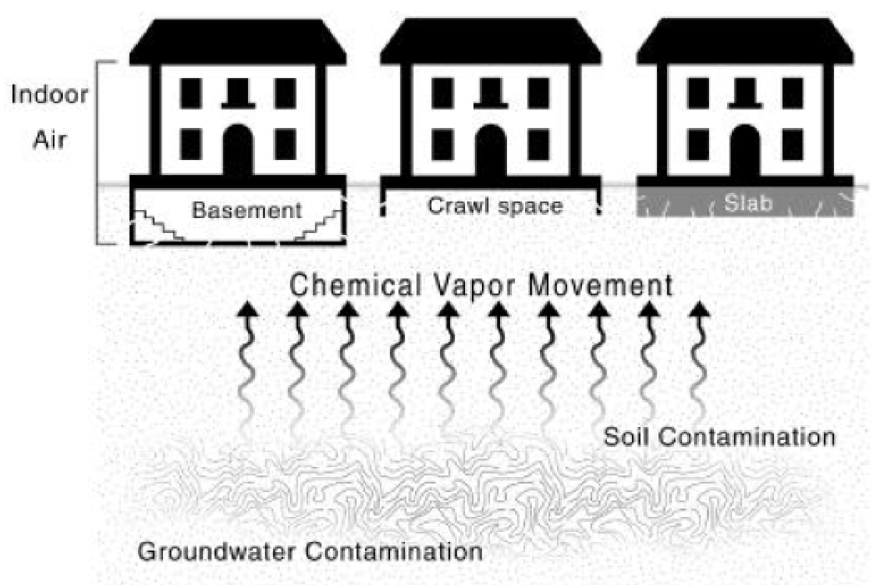
What is soil vapor intrusion?

The phrase "soil vapor intrusion" refers to the process by which volatile chemicals move from a subsurface source into the indoor air of overlying buildings.

Soil vapor, or soil gas, is the air found in the pore spaces between soil particles. Because of a difference in pressure, soil vapor enters buildings through cracks in slabs or basement floors and walls, and through openings around sump pumps or where pipes and electrical wires go through the foundation. Heating, ventilation or air-conditioning systems may create a negative pressure that can draw soil vapor into the building. This intrusion is similar to how radon gas seeps into buildings.

Soil vapor can become contaminated when chemicals evaporate from subsurface sources and enter the soil vapor. Chemicals that readily evaporate are called "volatile chemicals." Volatile chemicals include volatile organic compounds (VOCs). Subsurface sources of volatile chemicals may include contaminated soil and groundwater, or buried wastes. If soil vapor is contaminated, and enters a building as described above, indoor air quality may be affected.

When contaminated vapors are present in the zone directly next to or under the foundation of the building, vapor intrusion is possible. Soil vapor can enter a building whether it is old or new, or whether it has a basement, a crawl space, or is on a slab (as illustrated in the figure).



[Source: United States Environmental Protection Agency, Region 3]

How am I exposed to chemicals through soil vapor intrusion?

Humans can be exposed to soil vapor contaminated with volatile chemicals when vapors from beneath a building are drawn through cracks and openings in the foundation and mix with the indoor air. Inhalation is the route of exposure, or the manner in which the volatile chemicals actually enter the body, once in the indoor air.

Current exposures are when vapor intrusion is documented in an occupied building. *Potential* exposures are when volatile chemicals are present, or are accumulating, in the vapor phase beneath a building, but have not affected indoor air quality. Potential exposures also exist when there is a chance that contaminated soil vapors may move to existing buildings not currently affected or when there is a chance that new buildings can be built over existing subsurface vapor contamination. Both current and potential exposures are considered when evaluating soil vapor intrusion at a site that has documented subsurface sources of volatile chemicals.

In general, exposure to a volatile chemical does not necessarily mean that health effects will occur. Whether or not a person experiences health effects depends on several factors, including inhalation exposure, the length of exposure (short-term or acute versus long-term or chronic), the frequency of exposure, the toxicity of the volatile chemical, and the individual's sensitivity to the chemical.

What types of chemicals associated with environmental contamination may be entering my home via soil vapor intrusion?

Volatile organic compounds, or VOCs, are the most likely group of chemicals found in soil vapor, and which can move through the soil and enter buildings. Solvents used for dry cleaning, degreasing and other industrial purposes (e.g., tetrachloroethene, trichloroethene, 1,1,1-trichloroethane and Freon 113) are examples of VOCs. Examples of petroleum-related VOCs from petroleum spills are benzene, toluene, ethyl benzene, xylenes, styrene, hexane and trimethylbenzenes.

Is contaminated soil vapor the only source of volatile chemicals in my indoor air?

No. Volatile chemicals are also found in many household products. Paints, paint strippers and thinners, mineral spirits, glues, solvents, cigarette smoke, aerosol sprays, mothballs, air fresheners, new carpeting or furniture, hobby supplies, lubricants, stored fuels, refrigerants and recently dry-cleaned clothing all contain VOCs. Household products are often more of a source of VOCs in indoor air in homes than contaminated soil vapor.

Indoor air may also become affected when outdoor air containing volatile chemicals enters your home. Volatile chemicals are present in outdoor air due to their widespread use. Gasoline stations, dry cleaners, and other commercial/industrial facilities are important sources of VOCs to outdoor air.

What should I expect if soil vapor intrusion is a concern near my home?

If you live near a site that has documented soil, groundwater and/or soil vapor contaminated with volatile chemicals, you should expect that the potential for vapor intrusion is being, or has been, investigated. You may be contacted by the site owner or others working on the cleanup with information about the project. Your cooperation and consent would be requested before any testing/sampling would be done on your property. You may ask the person contacting you any questions about the work being done. You can also contact the NYSDOH's project manager for the site at 1-800-458-1158 (extension 2-7850) for additional information.

How is soil vapor intrusion investigated at sites contaminated with volatile chemicals?

The process of investigating soil vapor intrusion typically requires more than one set of samples to determine the extent of vapor contamination. Furthermore, four types of environmental samples are collected: soil vapor samples, sub-slab vapor samples, indoor air samples and outdoor air (sometimes referred to as "ambient air") samples.

Soil vapor samples are collected to characterize the nature and extent of vapor contamination in the soil in a given area. They are often collected before sub-slab vapor and/or indoor air samples to help identify buildings or groups of buildings that need to be sampled. Soil vapor samples are used to determine the *potential* for human exposures. *Soil vapor* samples are not the same as *soil* samples.

Sub-slab vapor samples are collected to characterize the nature and extent of vapor contamination in the soil immediately beneath a building with basement foundations or a slab. Sub-slab vapor results are used to determine the potential for *current* and *future* human exposures. For example, an exposure could occur in the future if cracks develop in the building's foundation or changes in the operation of the building's heating, ventilation or air-conditioning system are made that make the movement of contaminated soil vapor into the building possible.

Indoor air samples are collected to characterize the nature and extent of air contamination within a building. Indoor air sample results help to evaluate whether there are *current* human exposures. They are also compared to sub-slab vapor and outdoor air results to help determine where volatile chemicals may be coming from (indoor sources, outdoor sources, and/or beneath the building).

Outdoor air samples are collected to characterize site-specific background air conditions. Outdoor air results are used to evaluate the extent to which outdoor sources, such as automobiles, lawn mowers, oil storage tanks, gasoline stations, commercial/industrial facilities, and so forth, may be affecting indoor air quality.

What should I expect if indoor air samples are collected in my home?

You should expect the following:

- Indoor air samples are generally collected from the lowest-level space in a building, typically a basement, during the heating season. Indoor air samples may also be collected from the first floor of living space. Indoor air is believed to represent the greatest exposure potential with respect to soil vapor intrusion.
- Sub-slab vapor and outdoor air samples are usually collected at the same time as indoor air samples to help determine where volatile chemicals may be coming from (indoor sources, outdoor sources, and/or beneath the building).
- More limited sampling may be performed outside of the heating season. For example, sub-slab vapor samples without indoor air or outdoor air samples may be collected to identify buildings and areas where comprehensive sampling is needed during the heating season.
- An indoor air quality questionnaire and building inventory will be completed. The questionnaire includes a summary of the building's construction characteristics; the building's heating, ventilation and air-conditioning system operations; and potential indoor and outdoor sources of volatile chemicals. The building inventory describes products present in the building that might contain volatile chemicals. In addition, we take monitoring readings from a real-time organic vapor meter (also known as a photoionization detector or PID). The PID is an instrument that detects many VOCs in the air. When indoor air samples are collected, the PID is used to help determine whether

products containing VOCs might be contributing to levels that are detected in the indoor air.

What happens if soil vapor contamination or soil vapor intrusion is identified during investigation of a site?

Depending on the investigation results, additional sampling, monitoring or mitigation actions may be recommended. Additional sampling may be performed to determine the extent of soil vapor contamination and to verify questionable results. Monitoring (sampling on a recurring basis) is typically conducted if there is a significant potential for vapor intrusion to occur should building conditions change. Mitigation steps are taken to minimize exposures associated with soil vapor intrusion. Mitigation may include sealing cracks in the building's foundation, adjusting the building's heating, ventilation and air-conditioning system to maintain a positive pressure to prevent infiltration of subsurface vapors, or installing a sub-slab depressurization system beneath the building.

What is a sub-slab depressurization system?

A sub-slab depressurization system, much like a radon mitigation system, essentially prevents vapors beneath a slab from entering a building. A low amount of suction is applied below the foundation of the building and the vapors are vented to the outside (see illustration). The system uses minimal electricity and should not noticeably affect heating and cooling efficiency. This mitigation system also essentially prevents radon from entering a building, an added health benefit. The party responsible for cleaning up the source of the soil vapor contamination is usually responsible for paying for the installation of this system. If no responsible party is available, New York State will install the system. Once the contamination is cleaned up, the system should no longer be needed. In areas where radon is a problem, the NYSDOH recommends that these systems remain in place permanently.

What else can I do to improve my indoor air quality?

Household products and other factors, such as mold growth, carbon monoxide, and radon, can degrade the quality of air in your home. Consider the following tips to improve indoor air quality:

- Be aware of household products that contain VOCs. Do not buy more chemicals than you need at a time.
- Store unused chemicals in tightly-sealed containers in a well-ventilated location, preferably away from the living space in your home.
- Keep your home properly ventilated. Keeping it too air-tight may promote build up of chemicals in the air, as well as mold growth due to the build up of moisture.
- Fix all leaks promptly, as well as other moisture problems that encourage mold growth.
- Make sure your heating system, hot water, dryer and fireplaces are properly vented and in good condition. Have your furnace or boiler checked annually by a professional.
- Test your home for radon; take actions to reduce radon levels if needed.
- Install carbon monoxide detectors in your home; take immediate actions to reduce carbon monoxide levels if needed.

Where can I get more information?

For additional information about soil vapor intrusion, contact the NYSDOH's Bureau of Environmental Exposure Investigation at 1-800-458-1158 (extension 2-7850).

NEW YORK STATE
DEPARTMENT OF HEALTH

Trichloroethene (TCE) in Indoor and Outdoor Air

FACT SHEET

February 2005

What is trichloroethene?

Trichloroethene is a manufactured, volatile organic chemical. It has been used as a solvent to remove grease from metal. Trichloroethene has also been used as a paint stripper, adhesive solvent, as an ingredient in paints and varnishes, and in the manufacture of other organic chemicals. Other names for trichloroethene include TCE and trichloroethylene. TCE is a common name for trichloroethene and will be used for the rest of this fact sheet.

TCE is a clear, colorless liquid, and has a somewhat sweet odor. It is non-flammable at room temperature and will evaporate into the air.

How can I be exposed to TCE?

People can be exposed to TCE in air, water and food. Exposure can also occur when TCE, or material containing TCE, gets on the skin.

TCE gets into the air by evaporation when it is used. TCE can also enter air and groundwater if it is improperly disposed or leaks into the ground. People can be exposed to TCE if they drink groundwater contaminated with TCE, and if the TCE evaporates from the contaminated drinking water into indoor air during cooking and washing. They may also be exposed if TCE evaporates from the groundwater, enters soil vapor (air spaces between soil particles), and migrates through building foundations into the building's indoor air. This process is called "soil vapor intrusion."

How can TCE enter and leave my body?

If people breathe air containing TCE, some of the TCE is exhaled unchanged from the lungs and back into the air. Much of the TCE gets taken into the body through the lungs and is passed into the blood, which carries it to other parts of the body. The liver changes most of the TCE taken into the blood into other compounds, called breakdown products, which are excreted in the urine in a day or so. However, some of the TCE and its breakdown products can be stored in the fat or the liver, and it may take a few weeks for them to leave the body after exposure stops.

What kinds of health effects are caused by exposure to TCE in air?

In humans, long term exposure to workplace air containing high levels of TCE (generally greater than about 40,000 micrograms of TCE per cubic meter of air (mcg TCE/m^3)) is linked to effects on the central nervous system (reduced scores on tests evaluating motor coordination, nausea, headaches, dizziness) and irritation of the mucous membranes. Exposure to higher levels (generally greater than 300,000 mcg TCE/m^3) for short periods of time can irritate the eyes and respiratory tract, and can cause effects on the central nervous system, including dizziness, headache, sleepiness, nausea, confusion, blurred vision and fatigue. In laboratory animals, exposure to high levels of TCE has damaged the central nervous system, liver and kidneys, and adversely affected reproduction and development of offspring. Lifetime exposure to high levels of TCE has caused cancer in laboratory animals.

Some studies of people exposed for long periods of time to high levels of TCE in workplace air, or elevated levels of TCE in drinking water, show an association between exposure to TCE and increased risks for certain types of cancer, including cancers of the kidney, liver and esophagus, and non-Hodgkin's lymphoma. One study showed an association between elevated levels of TCE in drinking water and effects on fetal development. Other studies suggest an association between workplace TCE exposure and reproductive effects (alterations in sperm counts) in men. We do not know if the effects observed in these studies are due to TCE or some other possible factor (for example, exposure to other chemicals, smoking, alcohol consumption, socioeconomic status, lifestyle choices). Because all of these studies have limitations, they only suggest, but do not prove, that exposure to TCE can cause cancer in humans and can cause developmental and reproductive effects as well.

What are background levels of TCE for indoor and outdoor air?

The exact meaning of background depends on how a study selected sampling locations and conditions. Generally, sampling locations are selected to be not near known sources of volatile chemicals (for example, a home not near a chemical spill, a hazardous waste site, a dry cleaner, or a factory). In some studies, the criteria for sampling indoor air may require checking containers of volatile chemicals to make sure they are tightly closed or removing those products before samples are taken. The New York State Department of Health (NYSDOH) has used several sources of information on background levels of TCE in indoor and outdoor air. One NYSDOH study of residences heated by fuel oil found that background concentrations of TCE in indoor and outdoor air are less than 1 mcg/m^3 in most cases. In this study, most homes did not have obvious sources of volatile organic compounds (VOCs). In those homes with VOC sources, samples were taken and the data are included in the study.

What are sources of TCE in air in homes?

TCE is found in some household products, such as glues, adhesives, paint removers, spot removers, rug cleaning fluids, paints, metal cleaners and typewriter correction fluid. These and other products could be potential sources for TCE in indoor air.

Another source of TCE in indoor air is contaminated groundwater that is used for household purposes. Common use of water, such as washing dishes or clothing, showering, or bathing, can introduce TCE into indoor air through volatilization from the water.

TCE may also enter homes through vapor intrusion as described on page 1 in the question "How can I be exposed to TCE?".

What is the level of TCE that people can smell in the air?

The reported odor threshold (the air concentration at which a chemical can be smelled) for TCE in air is about 540,000 mcg TCE/m^3. At this level, most people would likely be able to start smelling TCE in air. However, odor thresholds vary from person to person. Some people may be able to detect TCE at levels lower than the reported odor threshold and some people may only detect it at concentrations higher than the reported odor threshold.

If I can't smell TCE in the air, am I being exposed?

Just because you can’t smell TCE doesn’t mean there is no exposure. Sampling and testing is the best way to know if TCE is present.

What is the NYSDOH's guideline for TCE in air?

After a review of the toxicological literature on TCE, the NYSDOH set a guideline of 5 mcg/m^3 for TCE in air. This level is lower than the levels that have caused health effects in animals and humans. In setting this level, the NYSDOH also considered the possibility that certain members of the population (infants, children, the elderly, and those with pre-existing health conditions) may be especially sensitive to the effects of TCE.

The guideline is not a bright line between air levels that cause health effects and those that do not. The purpose of the guideline is to help guide decisions about the nature of the efforts to reduce TCE exposure. Reasonable and practical actions should be taken to reduce TCE exposure when indoor air levels are above background, even when they are below the guideline of 5 mcg/m^3. The urgency to take actions increases as indoor air levels increase, especially when air levels are above the guideline. In all cases, the specific corrective actions to be taken depend on a case-by-case evaluation of the situation. The goal of the recommended actions is to reduce TCE levels in indoor air to as close to background as practical.

Should I be concerned about health effects if I am exposed to air levels slightly above the guideline? Below the guideline?

The possibility of health effects occurring is low even at air levels slightly above the guideline. In addition, the guideline is based on the assumption that people are continuously exposed to TCE in air all day, every day for as long as a lifetime. This is rarely true for most people who are likely to be exposed for only part of the day and part of their lifetime.

How can I limit my exposure to TCE?

TCE can get into indoor air through household sources (for example, commercial products that contain TCE), from contaminated drinking water, or by vapor intrusion. As with any indoor air contaminant, removing household sources of TCE will help reduce indoor air levels of the chemical. Maintaining adequate ventilation will also help reduce the indoor air levels of TCE. If TCE is in the indoor air as a result of vapor intrusion, a sub-slab depressurization system, much like a radon mitigation system, will reduce exposures by minimizing the movement of vapors that are beneath a slab into a building. If TCE is in the water supply of a house, a carbon filter on the water supply to remove the TCE will minimize ingestion and inhalation exposures.

Is there a medical test that can tell me whether I have been exposed to TCE?

TCE can be measured in people’s breath soon after they are exposed. TCE and some of its breakdown products can be measured in the urine and blood. These tests are not routinely available at a doctor’s office. Urine and blood tests can indicate that you may have recently (within the last few days) been exposed to a large amount of the chemical. However, they cannot tell you the source of the exposure. Some of the breakdown products of TCE can also be formed from other chemicals.

When should my children or I see a physician?

If you believe you or your children have symptoms that you think are caused by TCE exposure, you or your children should see a physician. You should tell the physician about the symptoms and about when, how and for how long you think you and/or your children were exposed to TCE.

What is the NYSDOH doing to educate physicians about TCE?

The NYSDOH maintains an Infoline (1-800-458-1158) that physicians or the public can call when they have questions related to various types of chemical exposures. A certified occupational and environmental health nurse is available to triage physicians' questions and to direct their inquiries to the appropriate staff member.

The NYSDOH also works closely with the federal Agency for Toxic Substances and Disease Registry (ATSDR), making their educational materials available to physicians upon request. One of these items is an environmental medicine case study entitled "Trichloroethylene (TCE) Toxicity," which provides the opportunity for physicians to earn continuing medical education credits from the Centers for Disease Control and Prevention. Physicians who would like to complete this training are encouraged to contact the NYSDOH for more information. A printed copy can be mailed to the physician or it can be accessed on-line at the following web site http://www.atsdr.cdc.gov/HEC/CSEM/tce/index.html.

Where can I get more information?

If you have any questions about the information in this fact sheet or would like to know more about TCE, please call the NYSDOH at 1-800-458-1158 or write to the following address:

New York State Department of Health
Bureau of Toxic Substance Assessment
Flanigan Square, 547 River Street
Troy, NY 12180-2216

CERTIFICATION

The letter health consultation for the Southside High School—Evaluation of Exposures Related to Soil Vapor Intrusion Mitigation Verification Sampling — December 2009, was prepared by the New York State Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was initiated. Editorial review was completed by the cooperative agreement partner.

Gregory V. Ulirsch

Technical Project Officer, CAT, CAPEB, DHAC

The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this health consultation, and concurs with its findings.

Alan W. Yarbrough

Team Leader, CAT, CAPEB, DHAC, ATSDR