MEMORANDUM

TO: Tenant(s) of 333 Strawberry Field Road

FROM: Becky Raymond; Lacy Reyna; Jacob Butterworth (SAGE Environmental, Inc.)

CC: Don Wignall, Jr.; Jeff Laramee; Don Wignall, Sr. (Lares Group II); Rachel Simpson (Rhode Island Department of Environmental Management)

DATE: June 13, 2025

RE: ***On-Going Assessment Activities – Tenant Notification***
Strawberry Field Estates (SFE)
333 Strawberry Field Road
Warwick, Rhode Island
SAGE Project No. L5247140 (formerly R041C)
RIDEM Site Number: SR-35-0733

SAGE Environmental, Inc. (SAGE) has prepared this notice on behalf of Lares Group II to provide the results of recent indoor air assessments and corresponding corrective actions at the property (hereinafter referred to as the “Site”).

As required by the Rhode Island Department of Environmental Management (RIDEM), sub-slab soil gas and indoor air sampling occurred in May 2024 and February 2025, respectively. In summary, the indoor air assessment identified a number of chlorinated volatile organic compounds (CVOCs) above the Massachusetts Department of Environmental Protection (MassDEP) Commercial/Industrial Threshold Values (C/I-TVs). Most notably, one CVOC, trichloroethylene (TCE), was detected above the MassDEP Imminent Hazard (IH) threshold. Upon identification, mitigation efforts to lower concentrations and investigations to identify the source have been ongoing. During these efforts, SAGE has provided RIDEM weekly progress reports, and this notice serves as a summary of work conducted to date.

Since February 2025, work at the Site has included routine indoor air sampling, walkthroughs of tenant spaces, identification of potential confounding sources, and collaboration with tenants to phase out and replace select products. During these assessments, consumer products containing TCE were identified within the building. Following the discontinued use of the TCE-containing products, SAGE conducted additional rounds of indoor air screening at select locations in May 2025. The results indicated a substantial reduction in indoor air TCE concentrations - by one to two orders of magnitude - falling below the MassDEP IH threshold. These findings suggest that prior elevated results may have been influenced by indoor product use, and not necessarily attributable to vapor intrusion. Nonetheless, the potential for vapor intrusion from sub-slab soil gas remains under evaluation and will be mitigated as necessary in accordance with RIDEM requirements.

The following sections provide further details regarding the investigation and associated corrective actions.

Timeline of Events

In 2024, RIDEM requested that a vapor intrusion assessment be performed to evaluate whether CVOCs previously detected in soil and groundwater at the Site may be migrating into the indoor air. Based on historical soil and groundwater data, the primary vapor intrusion contaminants of concern (COCs) include tetrachloroethene (PCE), TCE, cis-1,2-dichloroethene (cis-1,2-DCE), and vinyl chloride (VC). Additional information regarding vapor intrusion is included in **Attachment 1**.

In April 2024, prior to initiating air sampling, SAGE conducted a reconnaissance of the Site building and tenant spaces. The purpose of this inspection was to perform a chemical inventory and identify potential confounding source of indoor air contamination. At that time, SAGE documented several CVOC-containing products utilized by multiple tenants.

The initial assessment conducted in May 2024 included the collection and analysis of sub-slab soil gas samples using a field gas chromatograph/mass spectrometer (GC/MS) instrument, specifically a HAPSite. The objective of this sampling was to determine the concentrations of TCE, PCE, and cis 1-2 DCE in the soil gas. The results confirmed the potential for CVOC migration from sub-slab soil gas into indoor air. This conclusion was based on measured concentrations of target CVOCs in the sub-slab soil gas samples exceeding the MassDEP Sub-Slab Soil Gas Screening Values (SSSGSVs). It should be noted that RIDEM has not issued its own vapor intrusion guidance document or screening values. Therefore, MassDEP's vapor intrusion guidance and screening values were adopted for this assessment.

In February 2025, twelve (12) indoor air samples were collected from select locations throughout the building and analyzed for VOCs. On February 27, 2025, SAGE submitted an email notification of the indoor air results to RIDEM, followed by a formal report on March 25, 2025. The indoor air evaluation identified concentrations of acetone, bromodichloromethane, naphthalene, PCE, TCE, and VC in at least one (1) of the twelve (12) samples in excess of the C/I-TVs. Although acetone, bromodichloromethane, and naphthalene exceeded their respective MassDEP C/I-TVs in some samples, these compounds are not considered to be associated with vapor intrusion, but rather product use within the building. This determination is based on lack of historical evidence linking these compounds to known releases, as well as their absence in historical soil, groundwater, and sub-slab soil gas results. Accordingly, these compounds have been excluded from further evaluation.

A Site plan illustrating indoor air results for detected COCs (i.e., PCE, TCE, VC) compared to the MassDEP C/I-TVs is provided as **Attachment 2**. In addition, a summary table of the February 2025 indoor air data is included as **Attachment 3**.

The analytical results for the COCs were also compared to MassDEP established IH thresholds. MassDEP defines an Imminent Hazard as "*a hazard which would pose a significant risk of harm to health, safety, public welfare, or the environment if it were present for even a short period of time (five years or less).*"

TCE was detected in ten (10) of the twelve (12) indoor air samples at concentrations exceeding the MassDEP IH threshold for a commercial/industrial use, with women of child-bearing age (24 ug/m^3). Additional information regarding TCE in indoor air is provided in **Attachment 4**. Upon identification of the IH condition, RIDEM was notified and corrective actions began immediately, including:

- Modifying the existing soil vapor extraction (SVE) system to enhance performance;
- Sealing cracks in the basement and building slab to eliminate potential preferential pathways for vapor intrusion;
- Placing air purifying units in areas with the highest concentrations of CVOCs;
- Adjusting the building's ventilation systems to increase the rate of fresh air exchange;
- Conducting routine indoor air sampling to monitor progress;
- Isolating industrial tenant spaces to prevent cross contamination; and,
- Coordinating with tenants to determine whether potentially confounding sources (i.e., products containing the COCs) were being used within their operations.

During the initial assessments in 2024, the use of consumer products containing PCE and/or TCE was identified within the Site building that may influence indoor air results. To determine whether the elevated concentrations observed in the February 2025 indoor air sampling were attributable to the use of such products, Lares Group II worked with the tenants to discontinue the use of such products in their operation(s), followed by additional indoor sampling.

May 2025 Indoor Air Sampling

Following the implementation of corrective actions and the removal of most COC-containing products, follow-up indoor air screening conducted in May 2025 identified a reduction in COC concentrations (by one to two orders of magnitude) and in the case of TCE, bringing levels below the IH threshold. These results suggest the primary source of previous COC detections in indoor air was likely attributed by the use of products. A Site plan depicting the May 2025 indoor air screening results is included in **Attachment 5**.

Upcoming Efforts

Corrective actions continue and upcoming efforts include expanding the current SVE system, and confirmatory indoor air sampling will be conducted upon system construction completion. Communications with RIDEM remain ongoing.

Rhode Islanders are encouraged to call the RIDOH General Health Information Line at **401-222-5960** with any health-related questions. With any further questions, please feel free to contact the below:

Rachel Simpson
Environmental Scientist III
Office of Land Revitalization & Sustainable Materials Management
Site Remediation & Targeted Brownfield Assessment Program
Rachel.simpson@dem.ri.gov
401-537-4362

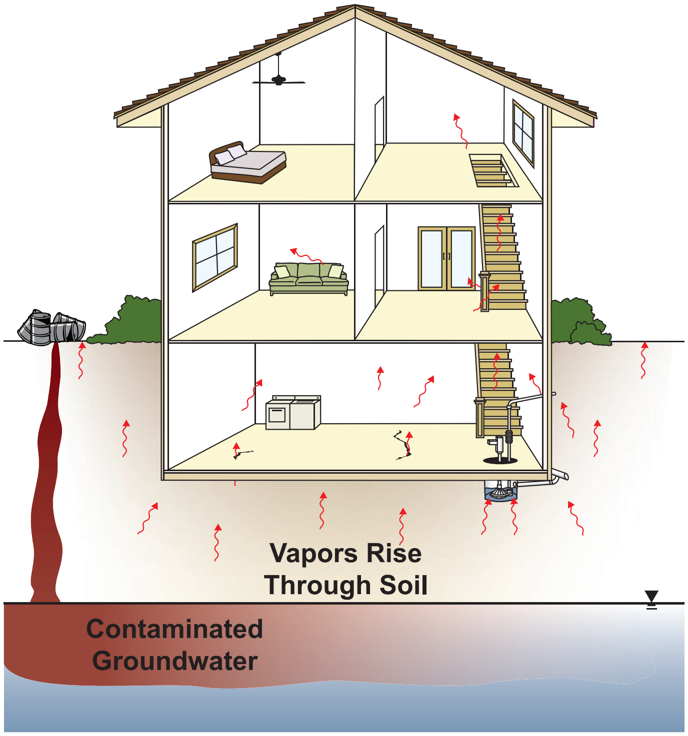
Community Guide to Vapor Intrusion Mitigation

What Is Vapor Intrusion and Why Is It a Concern?

Vapor intrusion is the movement of chemical vapors from contaminated soil, groundwater or sewer lines into nearby buildings. Vapors enter buildings primarily through openings, such as cracks and seams in the foundation or basement walls, gaps around utility lines, and sump pits. They can also enter homes from sewer lines due to chemicals disposed of in drains. Once inside the home or workplace, inhaled chemical vapors may pose health risks for occupants. In some cases, buildup of vapors, such as those from methane or gasoline, may cause explosive conditions.

What Is Vapor Intrusion Mitigation?

Vapor intrusion mitigation removes or decreases the amount of vapor that enters a home. The long-term response to vapor intrusion into buildings is to remove or reduce the underground contamination that is the source of vapors – usually contaminated groundwater, subsurface soil or sewer lines.



Vapors from contaminated groundwater enter a home.

However, if contamination cannot be cleaned up right away, building-specific vapor intrusion mitigation can reduce risks to building occupants faster.

How Does It Work?

Vapor intrusion mitigation methods are available for both existing buildings and those planned for construction near the contaminated area. Chemical vapor entry into buildings can be mitigated by:

- **Sealing openings:** Filling cracks in the floor slab and gaps around pipes and utility lines in basement walls or pouring concrete over unfinished dirt floors.
- **Installing vapor barriers:** Placing sheets of "geomembrane" or strong plastic beneath a building to prevent vapor entry. Vapor barriers are best installed during building construction but can be installed in existing buildings that have crawl spaces.
- **Passive venting:** Installing a venting layer beneath a building, usually with a vapor barrier. Wind or the buildup of vapors moves the vapors through the venting layer toward the sides of the building where they vent to outside air. A venting layer can be installed before building construction or underneath existing buildings.
- **Sub-slab depressurization:** Connecting a blower (an electric fan) to a suction pit underneath the building foundation, which vents vapors from below the foundation to outside air.
- **Building over-pressurization:** Adjusting the building's heating, ventilation, and air-conditioning (HVAC) system to make the pressure indoors greater than the sub-foundation pressure.

Vapor intrusion mitigation also can be accomplished by using air treatment units that remove vapors from indoor air. Units can be portable, wall-mounted or ceiling-mounted or can be installed in HVAC ducts. Air treatment units typically contain a sorbent material, such as carbon (see [Community Guide to Granular](#)

Activated Treatment.) to which vapors "sorb" (stick). Air treatment units can remove chemical vapors from soil, groundwater or sewer lines.

How Long Will It Take?

Vapor intrusion mitigation usually will be needed to prevent vapor intrusion into buildings as long as a significant source of vapors remains in the ground beneath or near the building. It may require several years, or even decades, to complete cleanup of underground vapor sources.

Is Vapor Intrusion Mitigation Safe?

Vapor intrusion mitigation systems are safe to use and will improve the quality of the indoor air by reducing indoor levels of chemical vapors from vapor intrusion. They can also reduce indoor levels of radon gas and soil moisture. Mitigation systems have been installed and operated at hundreds of homes near Superfund sites and at homes near many other types of sites across the country.

How Might It Affect Me?

Installation of vapor intrusion mitigation systems in existing homes typically takes one or two days. Installers may need to access crawl spaces or indoor living areas and may need to pull back carpet or move your furniture to find and seal cracks. They also may need to drill holes in the foundation for sub-foundation pipes. These pipes can often be located near the basement walls, in closets or in low-traffic areas for convenience. The vent pipes and fan may be visible on the outside of the house. However, in some cases, the pipes may be run through a closet to the attic and vented through the roof.

During operation, you might not even notice a mitigation system, although you may hear the hum of the electric fans. These fans typically use less electricity than an LED television, but you might notice a small increase in electric bills.

You will be asked to grant access for indoor air monitoring to verify that the mitigation systems are working properly. Until the threat of vapor intrusion is gone, mitigation systems should be inspected regularly to ensure proper function. For example, floors and walls should be checked to see that no new cracks have developed, a geomembrane in a crawl space checked for rips and holes, and electric fans checked to ensure they are working correctly. You should not turn off the electric fans until EPA or the state agency notifies you that it is appropriate to do so. You will need to report broken fans and vent pipes to the agency point of contact provided.

Typical fan and vent pipe.

NOTE: This fact sheet is intended solely as general information to the public. It is not intended, nor can it be relied upon, to create any rights enforceable by any party in litigation with the United States, or to endorse the use of products or services provided by specific vendors.

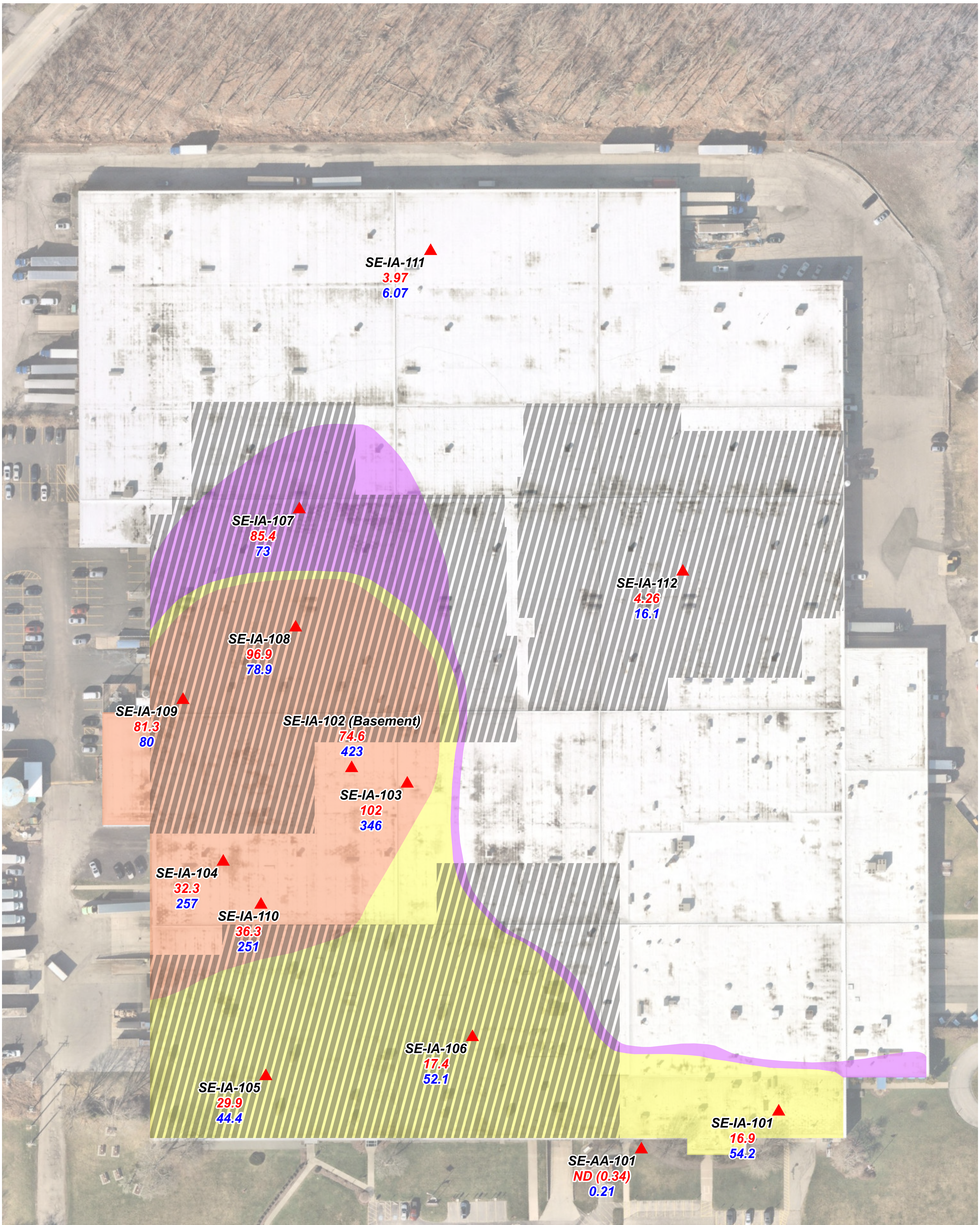
Example

Mitigation is reducing possible risks from vapor intrusion at 43 homes near the Nyanza Superfund site in Massachusetts. Dye manufacturing from the 1910s to 1978 contaminated groundwater with trichloroethene (TCE) and other chemicals. By the 1980s, a plume of groundwater contamination was found to extend beneath a nearby neighborhood. Sampling of indoor air, sub-slab air and groundwater showed that vapor intrusion was occurring, and TCE concentrations posed a risk to occupants of some homes.

As a result, in 2007 EPA began installing depressurization systems in homes located above the most contaminated groundwater where vapor intrusion was most likely to pose health threats. EPA first sealed cracks in basement walls and floors and covered sump pits. In homes with dirt basements, the Agency poured a concrete floor or installed a geomembrane as a vapor barrier. The systems are inspected annually and maintained to ensure that they continue to work.

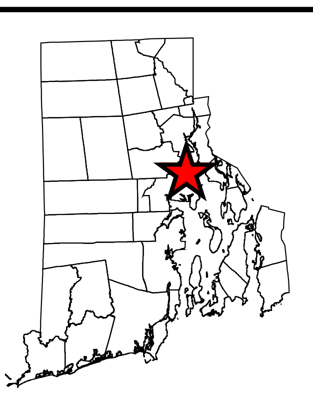
For More Information

- About this and other technologies in the Community Guide Series, visit: https://clu-in.org/cguides or https://www.epa.gov/vaporintrusion
- About use of cleanup technologies at a Superfund site in your community, contact the site's community involvement coordinator or remedial project manager. Select the site name from the list or map at http://www.epa.gov/superfund/sites to view their contact information.



MassDEP Commercial/Industrial Threshold Values	
Tetrachloroethene (PCE)	4.1
Trichloroethene (TCE)	1.8

IMPORTANT DISCLOSURE: This plan is for illustrative purposes only. It may not be relied upon for any purpose. Neither SAGE Environmental, Inc. nor its agents or representatives makes any representations or warranties as to the accuracy, suitability or completeness of the information on the plan or whether the plan complies with any laws. This plan does not address specific site conditions. It has not been reviewed or approved by, without limitation, any engineering, legal or building or zoning officials. SAGE Environmental, Inc. disclaims any and all liability with respect to this plan and the contents thereof.



Indoor Air Sample Location Plan (February 17, 2025)

333 Strawberry Field Road
Warwick, Rhode Island

Figure

Date: 03/04/2025

Job #: R041C

Created By: ALM

Legend

- Approximate Extent of CIS-1,2 in Soil Gas Identified Above MassDEP C/I-SSGSV of 370 ug/m3
- Approximate Extent of PCE in Soil Gas Identified Above MassDEP C/I-SSGSV of 290 ug/m3
- Approximate Extent of TCE in Soil Gas Identified Above MassDEP C/I-SSGSV of 120 ug/m3
- Approximate Indoor Air Sample Location PCE Concentration (ug/m3) TCE Concentration (ug/m3)
- Tenant Spaces Where SAGE Observed Aerosol Products Containing PCE/TCE

C/I-SSGSVs = Commercial/Industrial Sub-Slab Soil Gas Screening Values
ND = Not Detected

0 30 60 120 180 240 Feet

Data Provided by RIGIS
Orthoimagery provided by nearmap

SAGE ENVIRONMENTAL
A Terracon Company

Sample ID/Date	SE-IA-101	SE-IA-102	SE-IA-103	SE-IA-104	SE-IA-105	SE-IA-106	SE-IA-107	SE-IA-108	SE-IA-109	SE-IA-110	SE-IA-111	SE-IA-112	MassDEP	SE-AA-101
	02/17/2025	02/17/2025	02/17/2025	02/17/2025	02/17/2025	02/17/2025	02/17/2025	02/17/2025	02/17/2025	02/17/2025	02/17/2025	02/17/2025	Commercial/Industrial	02/17/2025
Analyte	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Threshold Values	Result
Volatile Organic Compounds (VOCs) (ug/m3)														**Threshold Values Not Applicable**
1,1,1-Trichloroethane	< 1.36	< 1.36	< 1.36	< 1.36	1.54	< 1.36	< 1.36	< 1.36	< 1.36	< 1.36	< 1.36	< 1.36	4400	< 1.36
1,1-Dichloroethane	< 0.30	0.55	0.34	0.76	0.85	< 0.30	< 0.30	< 0.30	< 0.30	0.53	< 0.30	< 0.30	710	< 0.30
1,1-Dichloroethene	0.57	4.64	2.36	7.21	2.85	0.74	0.7	0.74	0.67	4.36	< 0.40	< 0.40	180	< 0.40
1,2,4-Trimethylbenzene	2.02	4.26	4.04	4.76	< 1.23	1.32	1.5	1.65	1.44	3.49	< 1.23	1.8	NE	< 1.23
1,2-Dibromoethane(EDB)	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	0.038	< 0.04
1,2-Dichloroethane	< 0.04	< 0.04	< 0.04	0.3	< 0.04	0.29	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	0.44	< 0.04
1,2-dichloropropane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	< 0.05	< 0.05	0.6	< 0.05
1,3,5-Trimethylbenzene	< 1.23	1.38	1.29	1.81	< 1.23	< 1.23	< 1.23	< 1.23	< 1.23	1.36	< 1.23	< 1.23	NE	< 1.23
1,3-Butadiene	< 0.55	1.06	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	NE	< 0.55
4-Ethyltoluene	1.32	3.27	2.87	4.26	< 1.23	< 1.23	< 1.23	< 1.23	< 1.23	2.44	< 1.23	< 1.23	NE	< 1.23
4-Isopropyltoluene	< 1.37	< 1.37	1.6	< 1.37	< 1.37	< 1.37	1.74	1.95	1.77	< 1.37	< 1.37	< 1.37	NE	< 1.37
4-Methyl-2-pentanone(MIBK)	< 1.02	3.56	2.69	3.48	32.6	1.54	1.22	1.03	1.04	5.32	< 1.02	< 1.02	2700	< 1.02
Acetone	189	760	532	1170	7860	707	76.2	74.8	74.5	1800	29.7	77.9	710	8.59
Benzene	1.64	4.73	3.8	7.22	1.02	1.57	1.12	1.06	1.09	3.45	0.73	1.53	11	0.53
Bromodichloromethane	0.69	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	0.65	< 0.07
Carbon Disulfide	4.45	5.17	7.97	5.13	1.12	5.91	7.72	7.84	6.38	9.46	13.2	6.97	NE	< 0.78
Carbon Tetrachloride	0.58	0.75	0.74	0.65	0.58	0.56	0.54	0.53	0.55	0.58	0.5	< 0.27	1.9	0.53
Chloroform	< 0.49	0.65	0.69	0.9	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	0.63	0.56	< 0.49	3	< 0.49
Chloromethane	1.45	1.3	1.56	1.35	1.77	1.31	1.18	1.43	1.34	1.39	1.17	0.98	NE	1.39
Cis-1,2-Dichloroethene	< 0.40	4.36	0.48	0.47	1.36	< 0.40	< 0.40	0.46	< 0.40	0.47	< 0.40	< 0.40	5.3	< 0.40
Cyclohexane	3.54	17.4	12.9	19.7	116	8.22	2.24	2.04	2.22	23.7	1.35	< 0.86	NE	< 0.86
Dichlorodifluoromethane	3.21	3.62	4.53	3.57	4	2.96	4.79	4.31	4.42	4.07	5.78	4.16	NE	2.35
Ethanol	116	113	139	140	126	68.4	170	184	145	105	422	71.2	NE	5.1
Ethyl acetate	1.07	1.06	1.01	1.29	9.8	1.72	1.5	1.31	1.19	2.06	< 0.90	< 0.90	NE	< 0.90
Ethylbenzene	2.42	9.11	6.9	10.6	10.5	4.99	1.43	1.39	1.33	9.8	< 1.08	1.23	880	< 1.08
Heptane	3.06	13.6	13.4	8.64	2.94	2.94	2.54	2.45	2.32	6.51	< 1.02	2.09	NE	< 1.02
Hexane	2.15	8.88	6.94	13.8	2.51	1.93	1.91	1.75	1.75	5.6	< 0.79	2.02	NE	< 0.79
Isopropylalcohol	148	235	145	107	265	151	62.4	61.9	52.1	160	134	66.3	NE	< 0.92
m,p-Xylene	7.98	26.4	20.1	30.2	52.9	21.8	4.21	4.25	3.97	34.5	< 2.17	3.86	NE	< 2.17
Methyl Ethyl Ketone	25.9	72.5	61.6	154	1410	111	10.3	9.5	9.34	287	5.6	8.67	4400	1.13
Methylene Chloride	< 5.21	< 5.21	< 5.21	< 5.21	< 5.21	< 5.21	< 5.21	< 5.21	< 5.21	< 5.21	< 5.21	7.01	530	< 5.21
Naphthalene	3.11	0.47	< 0.26	0.56	< 0.26	< 0.26	< 0.26	< 0.26	0.41	< 0.26	< 0.26	< 0.26	2.7	< 0.26
o-Xylene	2.59	8.33	6.73	9.5	18.1	7.42	1.45	1.47	1.39	11.2	< 1.08	1.32	NE	< 1.08
Styrene	1.61	5.58	4.47	7.54	0.95	1.73	0.9	0.91	0.97	14.3	0.52	0.67	20	< 0.43
Tetrachloroethene	16.9	74.6	102	32.3	29.9	17.4	85.4	96.9	81.3	36.3	3.97	4.26	4.1	< 0.34
Tetrahydrofuran	8.31	6.63	4.51	5.84	1.14	2.67	1.16	1.11	1.29	4.8	< 0.74	1.15	NE	< 0.74
Toluene	12.1	22.4	18.2	37	9.6	10.7	4.75	4.56	4.71	32.4	2.35	6.63	4400	< 0.94
Trans-1,2-Dichloroethene	< 0.40	0.52	< 0.40	< 0.40	0.42	0.55	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	53	< 0.40
Trichloroethene	54.2	423	346	257	44.4	52.1	73	78.9	80	251	6.07	16.1	1.8	0.21
Trichlorofluoromethane	< 1.40	< 1.40	< 1.40	< 1.40	< 1.40	< 1.40	< 1.40	< 1.40	< 1.40	< 1.40	< 1.40	< 1.40	NE	1.41
Vinyl Chloride	< 0.13	1.63	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	1.3	< 0.13

Result Detected (blue)

RL Exceeds Criteria (yellow)

Result Exceeds Criteria (red)

<x: Indicates analyte concentration not detected at or above specified laboratory reporting limit (x)

NE: Standard not established for this substance

Trichloroethylene (TCE) In Indoor Air

What is trichloroethylene or TCE?

TCE is a nonflammable, colorless liquid used as a solvent to remove grease from metal parts. It is also found in adhesives, paint removers, varnishes, lubricants, and spot removers. It is not unusual for low levels of TCE to be present in indoor air. The Massachusetts Department of Environmental Protection (MassDEP) considers up to 0.4 micrograms per cubic meter ($\mu g/m^3$) of TCE in indoor air to be normal.

How can TCE enter the indoor air of buildings?

TCE can enter the air if you use TCE-containing products indoors. In addition, TCE can enter groundwater (e.g., from a spill) and then travel away from the initial source in the direction that groundwater flows. If the groundwater flows under a building, TCE can enter the indoor air of the building through cracks in the foundation or gaps around utility pipes.

What is the exposure guideline for TCE in indoor air?

The U.S. Environmental Protection Agency (EPA) and MassDEP have a long-term exposure guideline of 2 $\mu g/m^3$ of TCE in indoor air.

If TCE is above the exposure guideline, should I be concerned about immediate health effects?

Effects from exposure to TCE depend on how much you were exposed to, how long the exposure lasted, and how you were exposed. Possible harm from exposure may also depend on personal factors such as age, sex, diet, lifestyle, and current health status. Breathing TCE above the exposure guideline does not mean health effects will occur; however, the risk for health effects increases as the level and length of exposure increases. The EPA/MassDEP exposure guideline of 2 $\mu g/m^3$ is set well below levels expected to result in health effects and is designed to protect the most sensitive individuals. Nonetheless, steps to reduce TCE levels should be taken.

Has MassDEP established any additional guidelines to address potential sources of TCE in indoor air?

Yes. Under Massachusetts hazardous waste site cleanup regulations, short-term exposures (i.e. five years or less) that may pose a health risk are called “Imminent Hazards”. The MassDEP Imminent Hazard value for TCE in residential indoor air is 6 $\mu g/m^3$ for women early in pregnancy and 20 $\mu g/m^3$ for everyone else. For workplace indoor air, the Imminent Hazard values for TCE are 24 $\mu g/m^3$ for women early in pregnancy and 80 $\mu g/m^3$ for everyone else.

What happens when TCE levels in indoor air exceed the MassDEP guidelines?

When levels exceed the MassDEP Imminent Hazard values, certain regulatory actions take place. These include notification to individuals potentially exposed and immediate actions to address the source of the chemical and reduce exposures. Further information about MassDEP regulatory actions and recommendations can be found at https://www.mass.gov/info-details/emerging-contaminants#trichloroethylene-(tce)-

Are there ways to reduce or eliminate TCE in indoor air?

Yes. If TCE is entering buildings from groundwater flowing under the building, steps can be taken to reduce or prevent the TCE from entering the building. Steps may include sealing foundation cracks, changing the direction of air flow, and/or installing a sub-slab depressurization system. A sub-slab depressurization system is like a radon system, a series of pipes under the basement with a fan that vents vapors to the outdoors. Potential sources of TCE in a building (e.g., degreasers) can also be removed.

What happens to TCE in your body?

TCE present in air can enter your body when you breathe. Following exposure, the human body will break down TCE and eliminate it quickly through the breath and urine.

Can exposure to TCE cause cancer?

The U.S. Department of Health and Human Services, US Environmental Protection Agency, and the International Agency for Research on Cancer have all determined that TCE has the potential to cause cancer. The more TCE a person is exposed to and the longer the length of time a person is exposed, the greater the risk of developing cancer. Studies of workers exposed to TCE in the workplace have shown an increased risk of kidney cancer. There is also some limited evidence for increased risks for non-Hodgkin's lymphoma and liver cancer. Short-term (e.g., several months or several years) exposure to low levels poses lower risks than a lifetime of daily exposure.

What are the non-cancer health effects from exposures to TCE?

Some scientific studies suggest that high exposure to TCE during early pregnancy may increase the risk for certain types of heart defects in the developing fetus. Some studies have shown that exposure to TCE over the long term can lead to an increased risk of developing some autoimmune conditions. Exposure to high levels of TCE in the air can cause irritation of the upper respiratory tract, as well as central nervous system effects, including dizziness, headache, confusion, and nausea.

If I am pregnant, who should I talk to?

If you are pregnant and you have questions about TCE and your health, you may contact the Massachusetts Department of Public Health (see contact information below) or your health care provider. As noted previously, the EPA/MassDEP exposure guideline of 2 $\mu g/m^3$ corresponds to a level well below what is known to cause health effects. Levels above exposure guidelines do not mean that health effects will necessarily occur.

Who should I contact if I have more questions about TCE in indoor air and health effects?

If you have health questions about exposure to TCE in indoor air you can contact the Environmental Toxicology Program at the MDPH Bureau of Environmental Health at 617-624-5757.

If you are experiencing any symptoms or have medical care questions, you should consult with your health care provider.

Bureau of Environmental Health
Massachusetts Department of Public Health
250 Washington Street, 7th Floor
Boston, MA 02108
Phone: 617-624-5757 | Fax: 617-624-5183 | TTY: 617-624-5286
www.mass.gov/dph/environmental_health

April 2017

Trichloroethylene - ToxFAQs™

CAS # 79-01-6

This fact sheet answers the most frequently asked health questions (FAQs) about trichloroethylene. For more information, call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Trichloroethylene is used as a solvent for cleaning metal parts. Exposure to very high concentrations of trichloroethylene can cause dizziness headaches, sleepiness, incoordination, confusion, nausea, unconsciousness, and even death. Trichloroethylene has been found in at least 1,051 of the 1,854 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is trichloroethylene?

Trichloroethylene is a colorless, volatile liquid. Liquid trichloroethylene evaporates quickly into the air. It is nonflammable and has a sweet odor.

The two major uses of trichloroethylene are as a solvent to remove grease from metal parts and as a chemical that is used to make other chemicals, especially the refrigerant, HFC-134a.

What happens to trichloroethylene when it enters the environment?

- Trichloroethylene can be released to air, water, and soil at places where it is produced or used.
- Trichloroethylene is broken down quickly in air.
- Trichloroethylene breaks down very slowly in soil and water and is removed mostly through evaporation to air.
- It is expected to remain in groundwater for long time since it is not able to evaporate.
- Trichloroethylene does not build up significantly in plants or animals.

How might I be exposed to trichloroethylene?

- Breathing trichloroethylene in contaminated air.
- Drinking contaminated water.
- Workers at facilities using this substance for metal degreasing are exposed to higher levels of trichloroethylene.
- If you live near such a facility or near a hazardous waste site containing trichloroethylene, you may also have higher exposure to this substance.

How can trichloroethylene affect my health?

Trichloroethylene was once used as an anesthetic for surgery. Exposure to moderate amounts of trichloroethylene may cause headaches, dizziness, and sleepiness; large amounts may cause coma and even death. Eating or breathing high levels of trichloroethylene may damage some of the nerves in the face. Exposure to high levels can also result in changes in the rhythm of the heartbeat, liver damage, and evidence of kidney damage. Skin contact with concentrated solutions of trichloroethylene can cause skin rashes. There is some evidence exposure to trichloroethylene in the work place may cause scleroderma (a systemic autoimmune disease) in some people. Some men occupationally-exposed to trichloroethylene and other chemicals showed decreases in sex drive, sperm quality, and reproductive hormone levels.

How likely is trichloroethylene to cause cancer?

There is strong evidence that trichloroethylene can cause kidney cancer in people and some evidence for trichloroethylene-induced liver cancer and malignant lymphoma. Lifetime exposure to trichloroethylene resulted in increased liver cancer in mice and increased kidney cancer and testicular cancer in rats.

The Department of Health and Human Services (DHHS) considers trichloroethylene to be a known human carcinogen. The International Agency for Research on Cancer (IARC) classified trichloroethylene as carcinogenic to humans. The EPA has characterized trichloroethylene as carcinogenic to humans by all routes of exposure.

Trichloroethylene

CAS # 79-01-6

How can trichloroethylene affect children?

It is not known whether children are more susceptible than adults to the effects of trichloroethylene.

Some human studies indicate that trichloroethylene may cause developmental effects such as spontaneous abortion, congenital heart defects, central nervous system defects, and small birth weight. However, these people were exposed to other chemicals as well.

In some animal studies, exposure to trichloroethylene during development caused decreases in body weight, increases in heart defects, changes to the developing nervous system, and effects on the immune system.

How can families reduce the risk of exposure to trichloroethylene?

- Avoid drinking water from sources that are known to be contaminated with trichloroethylene. Use bottled water if you have concerns about the presence of chemicals in your tap water. You may also contact local drinking water authorities and follow their advice.
- Prevent children from playing in dirt or eating dirt if you live near a waste site that has trichloroethylene.
- Trichloroethylene is used in many industrial products. Follow instructions on product labels to minimize exposure to trichloroethylene.

Is there a medical test to determine whether I've been exposed to trichloroethylene?

Trichloroethylene and its breakdown products (metabolites) can be measured in blood and urine. However, the detection of trichloroethylene or its metabolites cannot predict the kind of health effects that might develop from that exposure. Because trichloroethylene and its metabolites leave the body fairly rapidly, the tests need to be conducted within days after exposure.

Has the federal government made recommendations to protect human health?

The EPA set a maximum contaminant goal (MCL) of 0.005 milligrams per liter (mg/L; 5 ppb) as a national primary drinking standard for trichloroethylene.

The Occupational Safety and Health Administration (OSHA) set a permissible exposure limit (PEL) of 100 ppm for trichloroethylene in air averaged over an 8-hour work day, an acceptable ceiling concentration of 200 ppm provided the 8 hour PEL is not exceeded, and an acceptable maximum peak of 300 ppm for a maximum duration of 5 minutes in any 2 hours.

The National Institute for Occupational Safety and Health (NIOSH) considers trichloroethylene to be a potential occupational carcinogen and established a recommended exposure limit (REL) of 2 ppm (as a 60-minute ceiling) during its use as an anesthetic agent and 25 ppm (as a 10-hour TWA) during all other exposures.

Reference

This ToxFAQs™ information is taken from the 2019 Toxicological Profile for Trichloroethylene produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

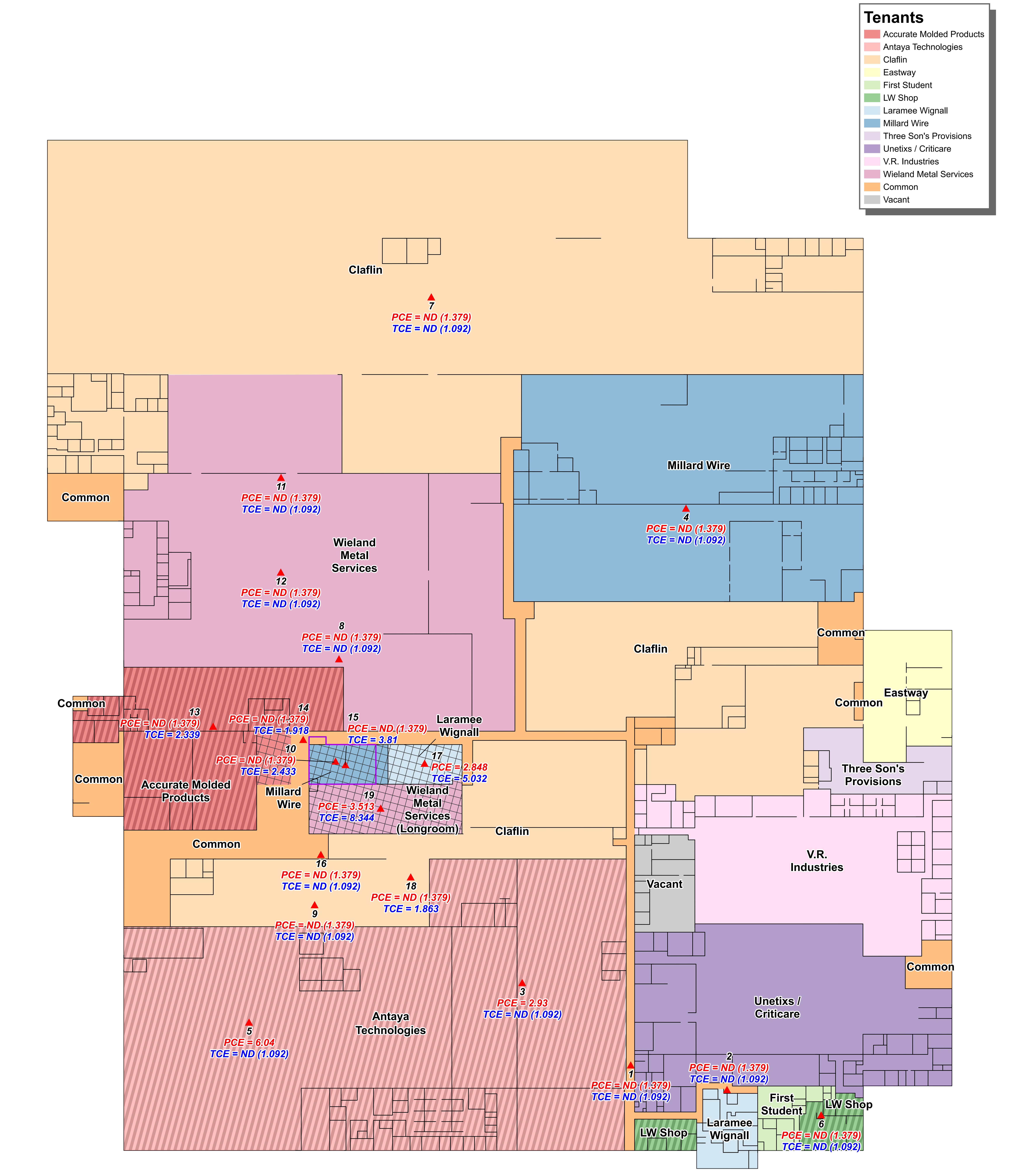
Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636

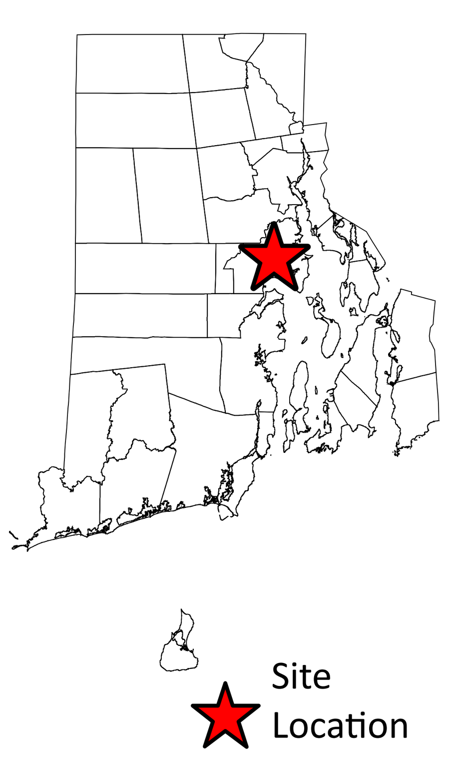
ToxFAQs™ on the web: www.atsdr.cdc.gov/ToxFAQs

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.



IMPORTANT DISCLOSURE: This plan is for illustrative purposes only. It may not be relied upon for any purpose. Neither SAGE Environmental, Inc. nor its agents or representatives makes any representations or warranties as to the accuracy, suitability or completeness of the information on the plan or whether the plan complies with any laws. This plan does not address specific site conditions. It has not been reviewed or approved by, without limitation, any engineering, legal or building or zoning officials. SAGE Environmental, Inc. disclaims any and all liability with respect to this plan and the contents thereof.

MassDEP Commercial/Industrial Threshold Values	
Tetrachloroethene (PCE)	4.1
Trichloroethene (TCE)	1.8



Indoor Air HAPSite Site Plan - May 14, 2025

Strawberry Field Estates
333 Strawberry Field Road
(RIDEM File No. SR-35-0733)
Warwick, Rhode Island

Figure

Date: 5/20/2025

Created By: jplerner

Project No.: R041C

Data Provided by RIGIS

Legend
- Building Basement Area
- Tenant Spaces Confirmed to Currently/Formerly Utilize Aerosol Products Containing TCE
- Storage Area
- Indoor Air HAPSite Sample Location PCE Concentration (ug/m3) TCE Concentration (ug/m3)

Note: Cis-1,2-Dichloroethene results for all sample locations were not identified above the detection limit (4.030 ug/m3), and therefore are not depicted on this plan.

0 30 60 120 180 240 Feet

N

SAGE ENVIRONMENTAL
A Terracon Company