



Meadowbrook Avenue Site Trip Report Supplement May 2016

With regards to SERAS Trip report (SERAS-262-DTR-042616), ERT Work Assignment Manager (WAM), Michael Hoppe comments are included below as a supplement.

Overview:

EPA has derived tables for indoor air using Regional Screening Levels (RSLs) for residential air (http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/). The tables include generic screening levels for multiple exposure pathways (including air, drinking water and soil) and for chemicals with both carcinogenic (cancer) and non-carcinogenic (non-cancer) effects. The screening levels listed in the tables correspond to either a 10^{-6} risk level for carcinogens or a Hazard Quotient (HQ) of 1 for non-carcinogens. The generic screening levels are chemical-specific concentrations for individual contaminants that may warrant further investigation or site cleanup. It should be emphasized that these screening levels are not cleanup standards. Potential actions associated with these derived levels could include: continue monitoring (including sampling); adjustments to air handling systems; and installing mitigation systems.

Trichloroethene (TCE) and Tetrachloroethene (PCE) were identified as contaminants of potential concern at the Meadowbrook Avenue Site as TCE and PCE have been identified as contaminants of concern at several EPA remedial sites in the vicinity of the school. Based on the data collected at the school during the February 2016 vapor intrusion investigation, TCE and PCE, were not detected above the RSL in any indoor air samples.

Results:

Four chemicals, discussed below, were detected in indoor air at concentrations above their respective cancer screening levels for residential air.

1,2-Dichloroethane

The cancer screening level or RSL for residential air for 1,2-dichloroethane is $0.11 \mu\text{g}/\text{m}^3$. 1,2-dichloroethane was detected a concentration of $0.203 \mu\text{g}/\text{m}^3$ in the indoor air sample collected from the nurse's office (CBES-IA8), at a concentration of $0.147 \mu\text{g}/\text{m}^3$ in the indoor air sample collected from the principal's office (CBES-IA17), and at a concentration of $0.112 \mu\text{g}/\text{m}^3$ in the indoor air sample in Room 101 (CBES-IA6). Similar to the March 2015 vapor intrusion investigation, sub-slab results for 1,2-dichloroethane show no indication of a potential source below the slab. Other indoor sources should be considered and potentially investigated.

1,2-dichloroethane is used in the production of vinyl chloride which is used to make a variety of plastic and vinyl products including polyvinyl chloride (PVC) pipes, furniture and automobile upholstery, wall coverings, housewares, and automobile parts. It is also used to as a solvent and is added to gasoline to remove lead.

Benzene

Benzene which has a cancer screening level or RSL for residential air of $0.36 \mu\text{g}/\text{m}^3$ was detected in the majority of the indoor and ambient air samples. The maximum indoor air concentration detected was $0.793 \mu\text{g}/\text{m}^3$ (CBES-IA11) and the maximum ambient concentration detected was $0.71 \mu\text{g}/\text{m}^3$ (CBES-AA1). Benzene was detected in one sub-slab at a concentration of $0.38 \mu\text{g}/\text{m}^3$, less than both indoor and ambient levels.

Benzene is a common air pollutant in urban/suburban areas. The school is located in a neighborhood with heavy vehicular traffic and various industrial facilities both of which are potential sources of this chemical.

Some industries use benzene to make other chemicals which are used to make plastics, resins, and nylon and synthetic fibers. Benzene is also used to make some types of rubbers, lubricants, dyes, detergents, drugs, and pesticides. Benzene is also found in crude oil, gasoline, and cigarette smoke.

Carbon Tetrachloride

Carbon tetrachloride which has a cancer screening level or RSL for residential air of $0.47 \mu\text{g}/\text{m}^3$ was detected in the majority of the indoor and ambient air samples. The maximum indoor air concentration detected was $0.665 \mu\text{g}/\text{m}^3$ (CBES-IA2) and the maximum ambient concentration detected was $0.528 \mu\text{g}/\text{m}^3$ (CBES-AA2). Carbon tetrachloride was not detected in sub-slab samples.

Carbon tetrachloride is another common air pollutant in urban/suburban areas. Carbon tetrachloride was used in the production of refrigeration fluid and propellants for aerosol cans, as a pesticide, as a cleaning fluid and degreasing agent, in fire extinguishers, and in spot removers. Because of its harmful effects, these uses are now banned and it is only used in some industrial applications.

Chloroform

Chloroform which has a residential air RSL for cancer of $0.12 \mu\text{g}/\text{m}^3$ was detected at a concentration of $0.28 \mu\text{g}/\text{m}^3$ in the indoor air sample collected from the Mechanical Room (CBES-IA2), at a level of $0.135 \mu\text{g}/\text{m}^3$ in the indoor air sample from the Girls Restroom (CBES-IA5), at a level of $0.131 \mu\text{g}/\text{m}^3$ in the indoor air sample from the Storage Room (CBES-IA11) and at a level of $0.12 \mu\text{g}/\text{m}^3$ in the indoor air sample from Room 101 (CBES-IA6). As a reference, chloroform was detected the ambient air sample, with a maximum concentration of $0.105 \mu\text{g}/\text{m}^3$ (CBES-AA1).

Chloroform can be generated as a by-product when certain chlorine containing cleaning/disinfecting agents, including household bleach, come in contact with naturally occurring water-borne organics. Other common indoor air sources of chloroform include chlorinated water and adhesive remover.

For reference, TCE and PCE were detected in sub-slab samples, however, those results did not directly lead to elevated indoor air concentrations above the RSL. For example:

TCE was detected in several of the sub-slab soil gas samples collected in the building. The maximum concentration of TCE detected was $10.1 \mu\text{g}/\text{m}^3$ in the sub-slab sample

collected in the Room 120 Closet (CBES-SS6). TCE was not detected at the corresponding indoor air sample for this location (CBES-IA14).

PCE was detected in several of the sub-slab soil gas samples collected in the building. The maximum concentration of PCE detected was $106 \mu\text{g}/\text{m}^3$ in the sub-slab sample collected in Room 120 Closet (CBES-SS6). PCE in the corresponding indoor air sample yielded a concentration of $0.29 \mu\text{g}/\text{m}^3$ (CBES-IA14), which is below the RSL of $11 \mu\text{g}/\text{m}^3$.

Additionally, “crawl space” samples (those with CBES-CS location identifiers), were collected in areas with earthen/uncovered ground surfaces. These areas are potentially providing less of a protective barrier than those with a continuous slab, however, there were no results for TCE and PCE above the RSL for the “crawl” space (indoor air) samples.

As part of SERAS Trip Report: SERAS-262-DTR-042616 (submitted under another cover), the complete Analytical Report is presented as Appendix B and RSL exceedances are highlighted in Tables 2-3.

Next Steps:

- EPA OSC and ATSDR toxicologists will continue to review all sampling results, including the results discussed above that exceed the EPA RSLs, and make their recommendations for the Site.
- Based on the results of the initial sampling in March 2015 and follow-up sampling in February 2016, additional sampling is not anticipated.