

Analysis of TCE Vapor Distribution in Utility Corridors above a Dissolved Plume and Spatial Correlation with Residential Vapor Intrusion Impacts

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Background/Objectives. Subsurface utilities (i.e., sanitary sewers and land drains) have been shown to be vapor intrusion (VI) sources and pathways at some sites in recent years. The occurrence of volatile organic chemicals (VOCs) in utilities can extend over wider areas than the footprint of the associated dissolved plume, and the connections between them and structures can lead to VI impacts in residences and buildings beyond dissolved plume boundaries. The goal of this study is to measure VOC vapor concentrations in utilities at a large dissolved plume site, and then to determine if that data spatially correlates with known impacts to homes in the vicinity of the dissolved plume. In addition, the temporal variability of the concentrations in the utilities will be studied.

Approach/Activities. This work is being conducted at Hill Air Force Base Operation Unit 8 (OU-8), where groundwater is impacted by dissolved chlorinated solvents and where elevated concentrations of VOCs have been observed in some homes. Vapor samples were collected in sanitary sewers and land drains from up to 270 manholes within OU-8 during each of five synoptic survey events, and VOC concentrations were analyzed.

Results/Lessons Learned. TCE concentrations were both spatially and temporally variable. TCE concentrations were detected in more than 50% of manholes, with concentrations ranging up to 500 ppb_v, and 38% of sampling locations had concentrations that varied over an order of magnitude. Historical VI investigation data from OU-8 was been provided by Hill AFB: The dataset includes historic indoor air and groundwater VOC concentration data within OU-8 area. Spatial occurrence of TCE indoor air detections and concentrations vs TCE distribution in utilities were analyzed, and results will be presented.