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ENVIRONMENTAL

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USING PASSIVE SOIL-GAS SAMPLING RESULTS AS AN IMPORTANT LINE OF EVIDENCE AT A SUPERFUND SITE

Background/Objectives

Previous state investigations identified the presence of tetrachloroethene (PCE) at concentrations above the EPA MCLs in private wells. When the Site was listed on the NPL, no contaminant source areas had been identified, which necessitated further investigative activities. During the EPA's investigation, five areas of interest (AOIs) were identified that may have contributed to the PCE and trichloroethene (TCE) found in the private wells. Beacon Passive Soil Gas Samplers were collected at each of the five AOIs to characterize the sites for source areas and prioritize them. This case study provides the results from the investigation of AOI 2, which is an active dry cleaner and automotive repair facility. This site overlies karst and limestone hydrogeologic units with clayey soil types.

Approach/Activities

Elevated levels of PCE were detected in a monitoring well in close proximity to AOI 2 and PCE was also recorded in both soil and active soil gas samples without identifying a source area; therefore, a high-resolution passive soil gas (PSG) investigation was conducted to minimize data gaps and pinpoint the location of any source areas. An initial PSG survey included 25 passive soil gas samples that were collected in an approximately 9-meter grid pattern south and east of the active dry cleaner. Based on these results, which had the highest measurement on the western edge of the grid, a second PSG survey was performed to

extend the investigation to the immediate west of the initial grid. Samplers were collected on an approximately 7. 5-meter spacing. The results from the first two surveys confirmed that a source area was present immediately to the southwest of the dry cleaner and a third PSG survey was conducted to define the extent of the source area using eight (8) passive soil gas samplers installed in an approximately 7. 5 meter grid pattern (see **Figure 1**).

Findings

The maximum PCE detections in the PSG survey were located just off of an existing concrete pad that had been used to store 50-gallon drums of PCE, and high levels of PCE, trichloroethene (TCE), and cis-1,2-dichloroethene (1,2-DCE) were identified at PSG location L-12, which is near the location of the former "Luckey" water supply well and behind the active dry cleaner. Active soil-gas samples collected from this area found significant PCE contamination at locations nearest Beacon PSG locations H-11, I-11, J-11, and L-12, with reported measurements ranging from 19,000 ug/m3 to 132,000 ug/m3. Shallow ground water samples were also collected on the property following the PSG surveys at two locations: TB-1 (near the concrete pad used for storing PCE) and TB-2 (near the "Luckey" water supply well). The depths of these borings were approximately 35 feet below ground surface and both were converted into monitoring wells TMW-1 and TWM-2, respectively. The wells were subsequently sampled and found to contain PCE, with highest concentrations reported being 130 ug/l (TMW-1) and 730 ug/l (TMW-2).

Figure 1
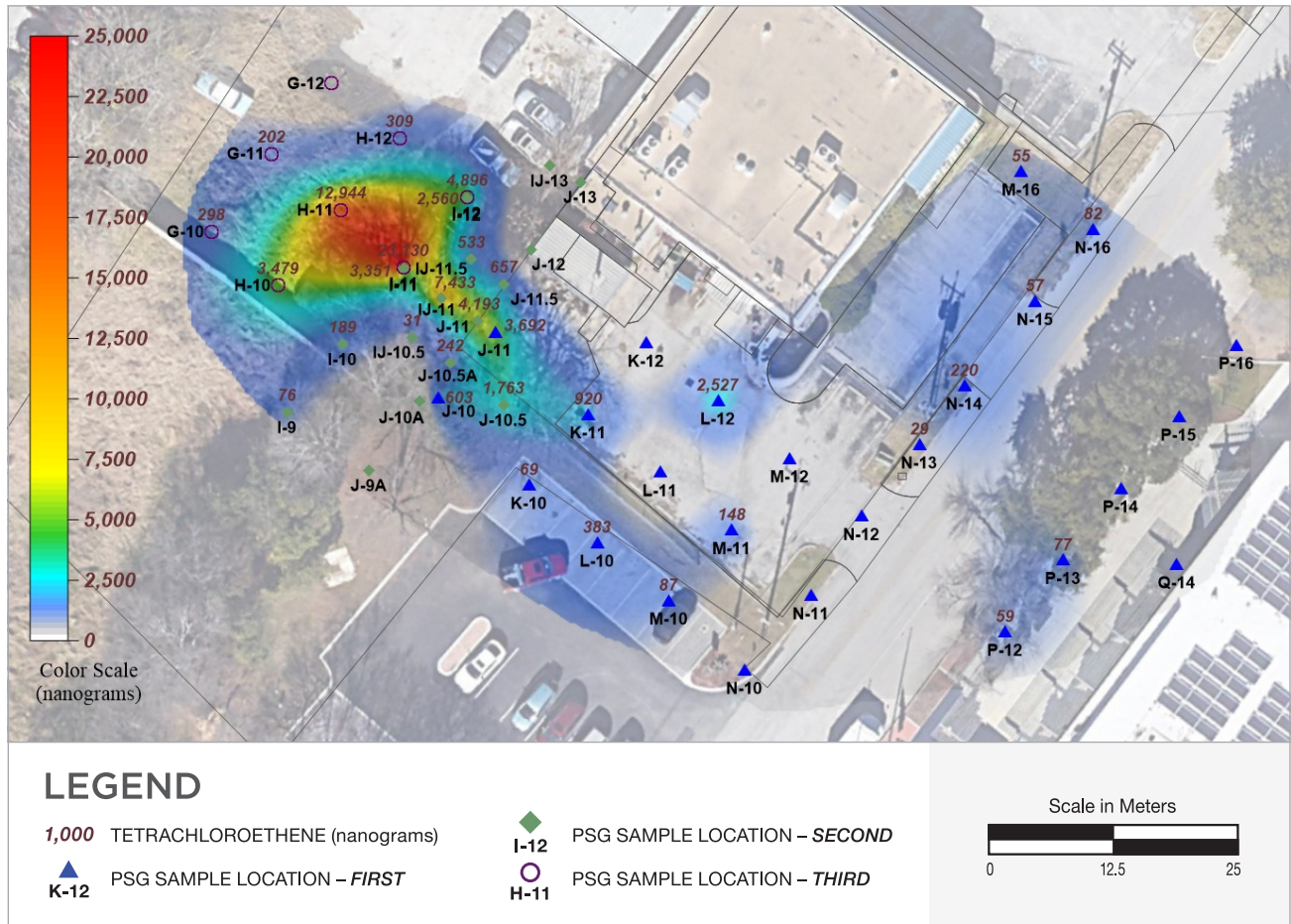
Summary

The PSG investigation clearly identified the locations of PCE releases and accurately guided where soil and groundwater samples should be collected at AOI 2. The PSG survey results had a strong agreement with the soil, groundwater, and active soil-gas samples that were subsequently collected. In addition, the four other AOIs were characterized with high resolution passive soil gas sampling plans, with a total of 134 Beacon PSG samples, to eliminate sites from further investigation and to focus where soil and groundwater samples were required to be collected.

Source: United States Environmental Protection Agency, Record of Decision, Bandera Road Groundwater Superfund Site, TXN000606565, Leon Valley, Bexar County, Texas