

Case Closed? Full Remediation of a 1980's Era Superfund Site

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Background/Objectives. Historical in-ground disposal of mixed solvent waste at an industrial research facility in the Midwest from the 1940s to 1960s was reported to the USEPA in 1981 in accordance with Superfund requirements. Based on subsequent site investigations, the site was added to the Superfund National Priorities List (NPL) in 1984 and a Consent Order establishing groundwater pump and treat as the primary remedy was signed with the state environmental agency the same year. A groundwater pump and treat system began operation in 1985 and was shut down in 2010 when VOC concentrations declined below site-specific remediation levels.

The identification of vapor intrusion risks at nearby residences led to additional site investigation activities in the early 2010s. These investigations led to the identification of an additional TCE source area approximately ½ mile upgradient from the Superfund site with a TCE plume that was impacting the site and areas downgradient. This upgradient source area was identified as a separate clean-up site and added to the state List of Priorities in 2016 and the USEPA Superfund NPL in 2022.

Approach/Activities. We utilized multiple lines of evidence to evaluate remedy completeness at the original 1980's era Superfund site while accounting for impacts associated with the upgradient TCE source area. Because TCE was the primary contaminant in groundwater even in the 1980s, evaluation of remedial progress from 1985 to 2010 focused almost exclusively on changes in dissolved TCE concentrations. However, review of historical groundwater results indicated that TCE concentrations had always been higher in upgradient wells compared to the immediate vicinity of the mixed solvent waste disposal area, suggesting that the upgradient source area was always the primary source of TCE in groundwater near the original Superfund site.

Based on historical records and soil and groundwater test results from the 1980s, we characterized the historical solvent waste as a complex mixture of petroleum and chlorinated solvent waste containing only a small fraction of TCE. Based on this understanding, we reevaluated the performance of the groundwater pump and treat system based on other chlorinated solvents such as 1,1,1-trichloroethane that made up a larger fraction of the original solvent waste. Maximum concentrations of these other chlorinated solvents were consistently less than 5 ug/L by 1991 and generally non-detect by the late 1990s. This evaluation demonstrated that the pump and treat system had fully remediated the mixed solvent waste historically disposed at the site.

Results/Lessons Learned. Based on our evaluation, the site responsible party (RP) submitted a request for site closure to the USEPA and state agency. A third-party review contracted by the USEPA found our evaluation approach to be scientifically valid and concluded that any on-going contribution of TCE from the original Superfund site "*may be negligible compared to the TCE that appears to be entering the site from upgradient sources*". Based on our evaluation and the third-party validation of our analysis, the RP concluded that their response obligations have been completed. Although response actions and groundwater monitoring at the site have ceased, the USEPA and state agency have declined to formally recognize remedy completion or to delist the original Superfund site. Formal designation of the upgradient TCE source area

as a Superfund site in 2022 provides a new opportunity for the regulatory authorities to recognize and celebrate remedy completion at the original 1980's era site.