A.1 Technology Name

Beacon Sampler (Thermal Desorbed)

A.1.1 Source

Bhate Environmental Associates, Inc., Beacon Environmental Services, Inc., *Soil Gas Sampling Report November 2020 Cost Proposal #18, Former Mountain Brook Cleaners, Birmingham, Jefferson County, AL*

A.1.2 Summary

Media:	Soil gas
Study Type:	Subsurface Investigation (Delineation)
Technology:	Accumulation
Peer Reviewed:	No
Publication Date:	January 22, 2021

A.1.3 Site Description

- The Site, which is a commercial property located in Birmingham, Alabama, was formerly occupied by a dry-cleaning facility and is currently an attorney's office. A chlorinated solvent-impacted groundwater plume emanates from the Site, which is associated with the use of tetrachloroethene (PCE) as part of the historical dry-cleaning operations. Sensitive receptors are located both on- and off-Site.

  The depths to groundwater and bedrock in the vicinity of the site are approximately 6 to 12 and 30 to 40 feet below ground surface (bgs), respectively. The site lies within the Birmingham Valley physiographic district, on the south flank of Red Mountain. The site is underlain by the Mississippian-age Pride Mountain Formation, which consists of 120 to 420 feet of dark gray fissile clay shale, locally occurring thin beds of sandstone, and an approximately 8-foot basal bed of oolitic limestone. The Pride Mountain Formation is underlain by the Tuscumbia Limestone, that consists of thick-bedded medium dark to medium gray crystalline oolitic limestone with minor amounts of chert. The Tuscumbia Limestone is approximately 110 feet thick in the vicinity of the site and likely contains secondary openings that allow for the movement of groundwater.

- Contaminants of concern (COCs) include tetrachloroethene (PCE), trichloroethene (TCE), and cis-1,2 – dichloroethane (cid-1,2-DCE).
- COCs are evaluated at the Site by an annual groundwater monitoring event that includes the sampling of 18 on-Site monitoring wells.
- Beacon's passive soil gas samplers. Samples were analyzed by a laboratory using USEPA Test Method TO-17.

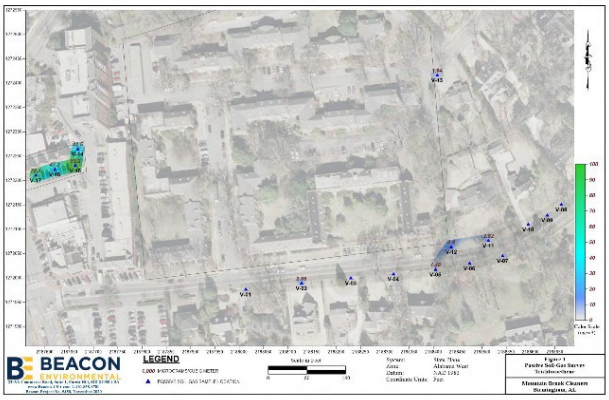
A.1.4 Remedial Phase Site investigations, conducted between 2000 and 2019, identified impacts of COCs in soil and groundwater. A 2015 Risk Assessment Evaluation (RAE) suggested that soil gas and/or indoor air may also be impacted by COCs. As of 2020, due to a lack of access to downgradient

properties, the lateral extent of the groundwater plume remained not fully delineated. In 2019, the property owner's environmental consultant reviewed the historical groundwater data and determined that the plume was not naturally attenuated at a rate sufficient for case closure. The environmental consultant proposed that a soil gas survey be conducted to evaluate the potential for indoor vapor intrusion to on-Site commercial and off-Site residential receptors using Beacon Environmental's passive soil gas sampling technology. The soil gas survey was completed between October and November 2020. A total of 17 passive soil gas samplers were installed near the former dry cleaner and along a downgradient road. Note that one sample was deployed at a an upgradient location, northeast of the source area.

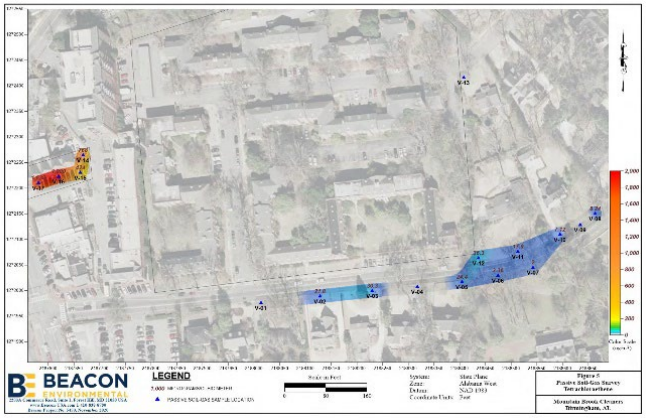
A.1.5 Outcome

After being allowed to passively collect soil gas for 14 days, the samplers were retrieved and submitted for laboratory analysis of VOCs. As shown in the figures below, passive soil gas sampling was able to clearly identify the on-Site source area, as well as impacts of COCs downgradient. Based on the sampling results, the environmental consultant concluded that there was a potential risk of vapor intrusion for both the Site and downgradient properties. The conclusions of this investigation were later used to support further corrective action measures and mitigation at the source area.

TCE



PCE



A.1.6 References

BEA. 2021. Soil Gas Sampling Report November 2020 Cost Proposal #18, Former Mountain Brook Cleaners, Birmingham, AL, January 2021

BEA. 2015. Alabama Risk Based Corrective Action Report, Former Mountain Brook Cleaners, Birmingham, AL, October 2015

BEA. 2023. Alabama Risk Based Corrective Action Report, Former Mountain Brook Cleaners, Birmingham, AL, July 2023