HSA ENGINEERS & SCIENTISTS

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HSA Develops New Method for Assessing Volatile Organic Compounds in Soil

Why a New Method?

The most popular method for assessing volatile organic compounds in soil is discrete sampling. Although easy to perform and conceptualize, the method has several limitations. Discrete sampling consists of going out to a site, taking gram-sized samples from the areas expected to be contaminated. The problem is that, unless the release was fairly continuous, the chance of collecting representative samples is very small. For example, if 10 5-gram samples are collected in a 100-by-100-foot area (10 feet deep), the percentage of the soil sampled is 0.000001%. HSA's experience is that major sources of contamination are regularly missed at solvent-impacted sites. By leaving source material in place, remediation to standards becomes difficult and costly, with "rebound" being blamed for remedial failures. After studying discrete sampling, HSA found that a better method was needed that sampled larger areas rapidly. Modified Active Gas Sampling (MAGS) does just that.

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What is it?

Modified Active Gas Sampling (MAGS) is an assessment tool, invented by HSA, which is effective at rapidly detecting unsaturated soil source areas impacted by volatile organic compounds. Although most effective in sandy and silty soils, MAGS has been used successfully in clay. Rather than sampling tiny areas of soil in a statistically insignificant fashion, a method was created that measured volatile concentrations in the large volumes of soil vapor rather than the soil. Traditional active gas sampling uses low flow rates to measure local soil vapor concentrations, but suffers from many of the same statistical significance issues as discrete soil sampling. By testing soil vapor, HSA is able to cover a 20-foot radius in sandy soils in a single point rather than a gram-sized sample. By sequentially testing MAGS points, you can then zero in on exactly where the contamination is located. Although there is a loss of resolution as compared to traditional soil sampling techniques, the entire assessment area can be tested and the resolution of testing is on the order of the resolution needed for a remedial action. That is, you do not need to know to the inch where the contamination is, you need to locate the contamination well enough to conduct further assessment or implement soil vapor extraction (SVE).

One of the additional benefits to using MAGS is that it allows you to gather design information while you are performing your assessment. For SVE, you can obtain radius of influence, flow versus pressure, and emissions data, all during assessment.

Who is using it?

HSA is not the only one using this new method. MAGS has gained so much popularity that the State of Florida has adopted it. HSA is using it at a number of sites that were showing signs of rebound after initial attempts at remediation. The rebound was commonly the result of multiple (relatively small) release areas that had not been previously discovered. Currently, we have over 10 No Further Action letters for solvent-impacted sites, some having contained DNAPL. Currently MAGS is incorporated into assessment at all but the most straightforward sites.

How do I learn more about it?

A Modified Active Gas Sampling Manual was created for the FDEP. This manual explains the MAGS theory, data collection and interpretation, limitations, and general cautions. If you would like a copy of this manual, please contact Richard Lewis at the address listed in the "Contact Us" section of this newsletter.