Detailed Indoor Air Characterization and Interior Source Identification by Portable GC/MS

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Traditional sampling of indoor air with off-site analysis typically involves the collection of one to three indoor air samples, sometimes in conjunction with one or more sub-slab samples. Although the distribution of VOCs within and below a building may be suggestive of the source, the results obtained from traditional indoor air sampling and analysis methods are rarely definitive. The time and expense associated with off-site analysis of indoor air samples limits the ability to definitively identify the source of VOCs detected in indoor air samples.

A portable gas chromatograph/mass spectrometer (GC/MS) has been used to conduct detailed indoor air characterizations for the assessment of potential vapor intrusion and for the identification of interior sources. The key advantage of using on-site analysis is that the analytical results can be used to guide the collection of additional samples. This real-time feedback allows the investigator to focus additional sampling on the specific portion of the building that exhibits the highest VOC concentration. Within a few rounds of sampling and analysis, the investigator can often identify a specific indoor source or vapor intrusion entry pathway. The ability to identify a specific interior source minimizes the frustration of affected residents and prevents unnecessary mitigation. On the other hand, if specific routes of vapor intrusion are identified, mitigation measures can be evaluated and implemented to prevent future vapor intrusion.

Techniques for conducting detailed indoor air characterization will be illustrated with results from several case studies.