

DETECTING SVOCs AND PAHs

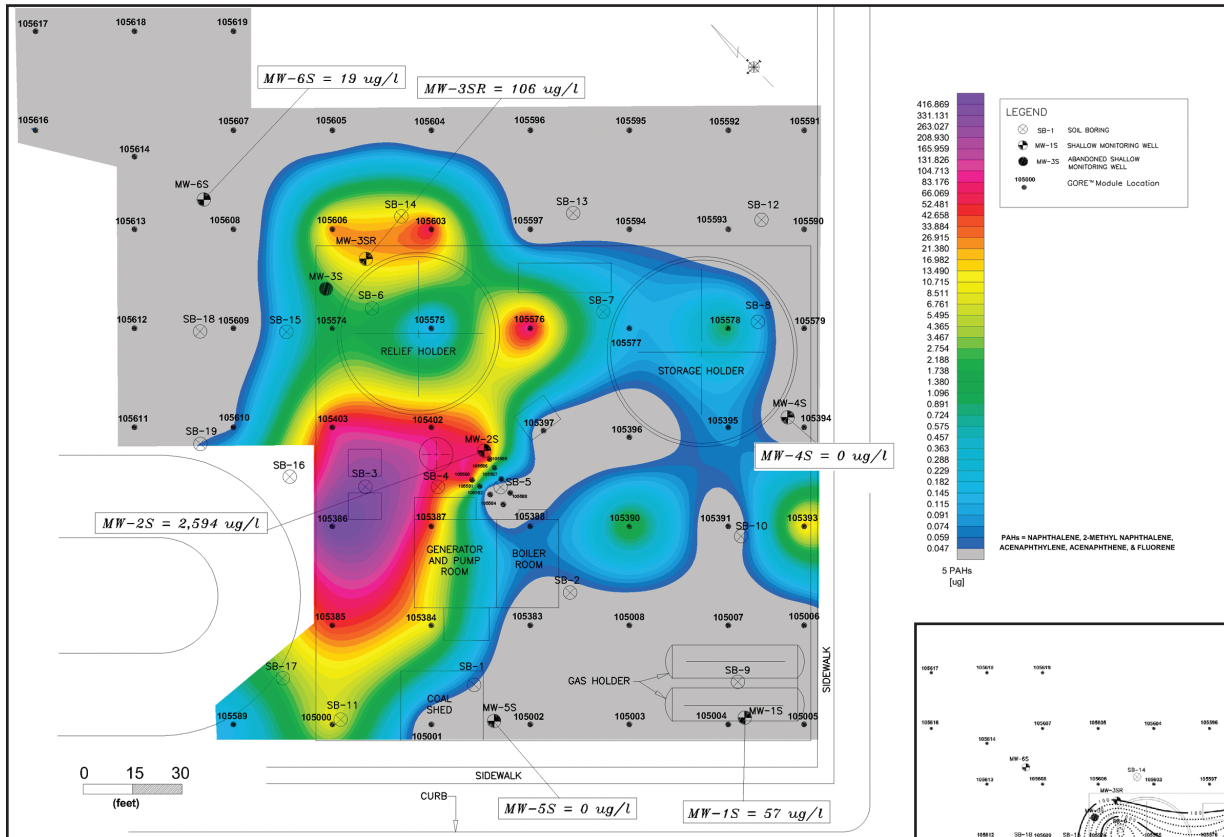


Figure 2. AGI Survey results along with water quality data for five target PAHs.

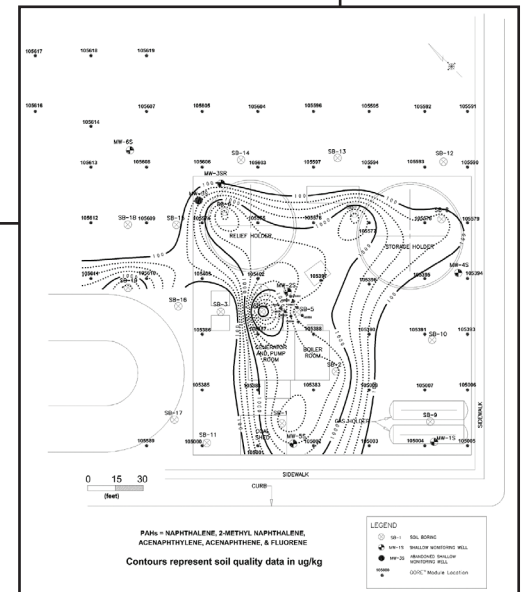


Figure 1. AGI Survey soil gas sampling locations along with soil quality data for five target PAHs.

Survey Summary

Location: Eastern US

Property: Former manufactured gas plant (MGP)

Objective: Delineate nature and extent of SVOCs and PAHs

Survey Objective

This survey was conducted to demonstrate the applicability of a AGI Survey in delineating the subsurface distribution of low volatility, high molecular weight organic compounds. The study area was selected because of the availability of soil and groundwater data showing the nature and extent of subsurface impact by PAHs and SVOCs related to historical MGP operations.

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Site Background & Geology

- Former manufactured gas plant, Eastern US
- Buildings removed; adjacent to city park
- Permeable mixed soils, 2 – 4 ft. fill over silty sands, clay sands/sandy clays, silts and sand
- Known lateral and vertical variability in soil quality
- Groundwater depth: 3 – 5 ft., seasonal fluctuations

AGI Survey

- 66 AGI passive samplers over 0.9 acres
- Regular grid, 60 ft. spacing, 3 ft. deep
- Modules also placed directly into 3 monitoring wells
- 21-day exposure
- Modified EPA method 8260/8270 GC/MS analysis at AGI labs

Survey Results

The soil quality data for five PAH compounds (Fig. 1), collected between two and five foot depths during an earlier investigation phase, suggest primary subsurface impact in the area north and east of the Generator Room with lower levels near the Coal Shed and Relief and Storage Holders. (Fig. 1 also illustrates the location of the AGI passive samplers.) AGI Survey data for the same five PAHs (Fig. 2) correlates well with the soil quality data.

Although the number of shallow monitoring wells was limited, there was good agreement between the results of the AGI Survey and available water quality data (Fig. 2). The monitoring well data also indicated the area of greatest impact to groundwater was to the northeast of the Generator Room.

Finally, results obtained from AGI passive samplers that were placed directly in groundwater at wells MW-2S, MW-2I and MW-2D (a clustered well set), when compared to actual water quality data, showed excellent correlation (Table 1).

Survey Conclusions

The AGI Survey was clearly able to detect and delineate semi-volatile compounds, including PAHs, in the vapor state. Low volatility PAHs, dissolved in groundwater, can also be detected successfully and in proportion to actual groundwater concentrations using AGI passive samplers, when deployed directly in the saturated zone.

These data provide compelling evidence that the AGI Survey can be applied effectively in site assessment programs where the compounds of concern are found in the PAH range of semi-volatile organic compounds.

Comparison of Water Quality Data and AGI Survey Data for Monitoring Well Cluster #2

WELL ID	WATER QUALITY FIVE PAHs (µg/l)	AGI Survey FIVE PAHs (µg)
MW-2S	2,594	180
MW-2I	8,229	561
MW-2D	nd	<0.01

Table 1. Comparison of water quality data and AGI Survey data for monitoring well cluster #2.

Note: All groundwater data represents the most recent data for each well. Water quality data and AGI Survey data are not from concurrent sampling events. Five PAHs are naphthalene, 2-methyl naphthalene, acenaphthylene, acenaphthene and fluorene.