

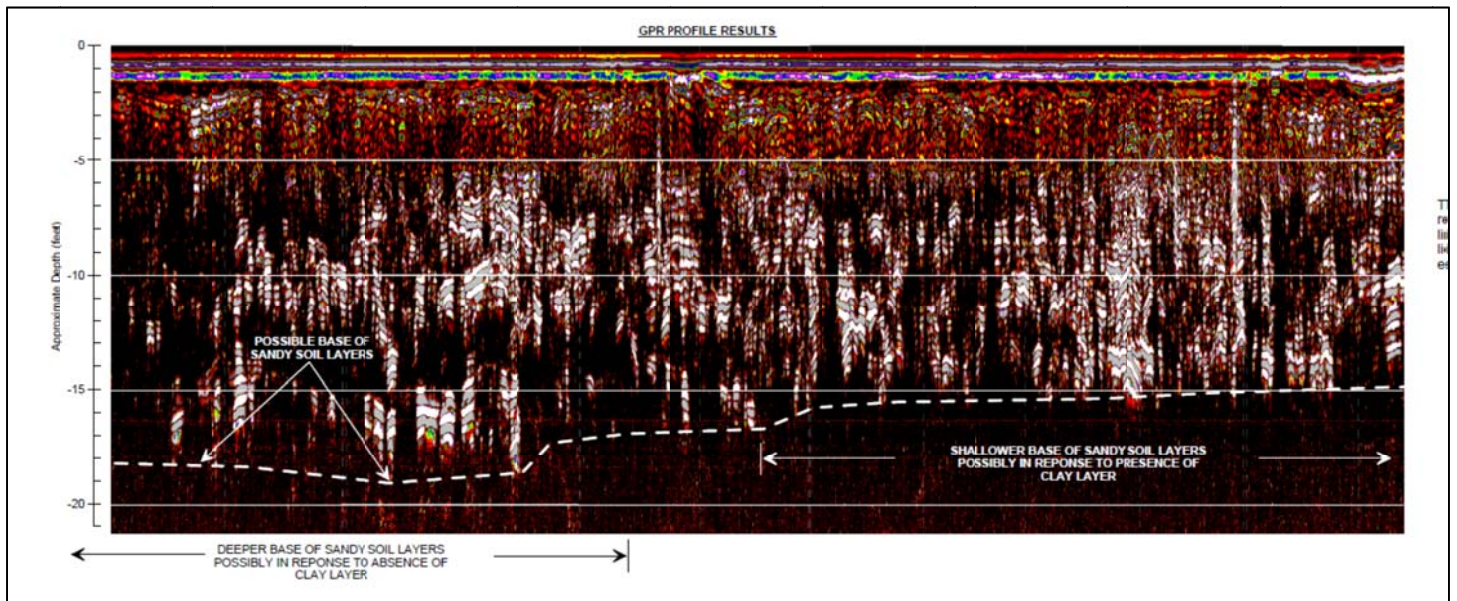


## Geophysical Surveys to Identify Shallow Confining Strata

Pyramid was contracted to conduct a near-surface geophysical investigation in Fayetteville, North Carolina, in an effort to identify the depth and extent of a subsurface clay stratum. The clay unit was of concern to an active chemical plant located at the site.

Due to the potentially thin nature of the clay stratum at depths greater than approximately 10 feet below land surface, Pyramid incorporated three types of geophysical methods to most accurately define the geology across the site. Specifically, we performed an electromagnetic (EM) survey using a Geonics EM34 conductivity meter, a Ground Penetrating Radar (GPR) survey using a GSSI SIR 2000 GPR system with a 200MHz antennae, and an electrical resistivity survey using an AGI Supersting R1 multi-electrode system.

The combination of the fluctuations observed in subsurface conductivity measurements recorded with the EM survey and the variability in depth penetration recorded by the GPR survey allowed Pyramid to generally map the depth and extent of the clay stratum at specific areas across the site. Increases in conductivity at shallower depths were accompanied by decreases in the depth penetration of the radar signal, providing evidence of a shallower clay unit that would typically exhibit higher conductivity levels and would attenuate the GPR signal.



While resistivity is often an excellent method with which to delineate stratigraphic horizons, in this case the nature of the ground surface provided poor conditions for resistivity data collection, making this method ineffective in mapping the clay. However, it was for this reason that Pyramid incorporated multiple geophysical methods. In our experience, whenever possible it is advantageous to have multiple geophysical methods and associated data sets with which to make comparisons and reach more accurate interpretations.