

HGI is an innovative, solution-oriented geophysical consulting company and service provider to the environmental, engineering, ground water, mining, oil & gas, and natural resource exploration industries. We specialize in the application of 3D geophysical methods for time lapse subsurface characterization and monitoring of fluid flow through geologic materials.

Innovation, quality of work, detailed focus, and flexibility are hallmarks of HGI's service. Our ability to create custom-fit solutions based on individual client needs makes us an industry leader in the field of geophysics and geosciences.

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Brownfield Characterization

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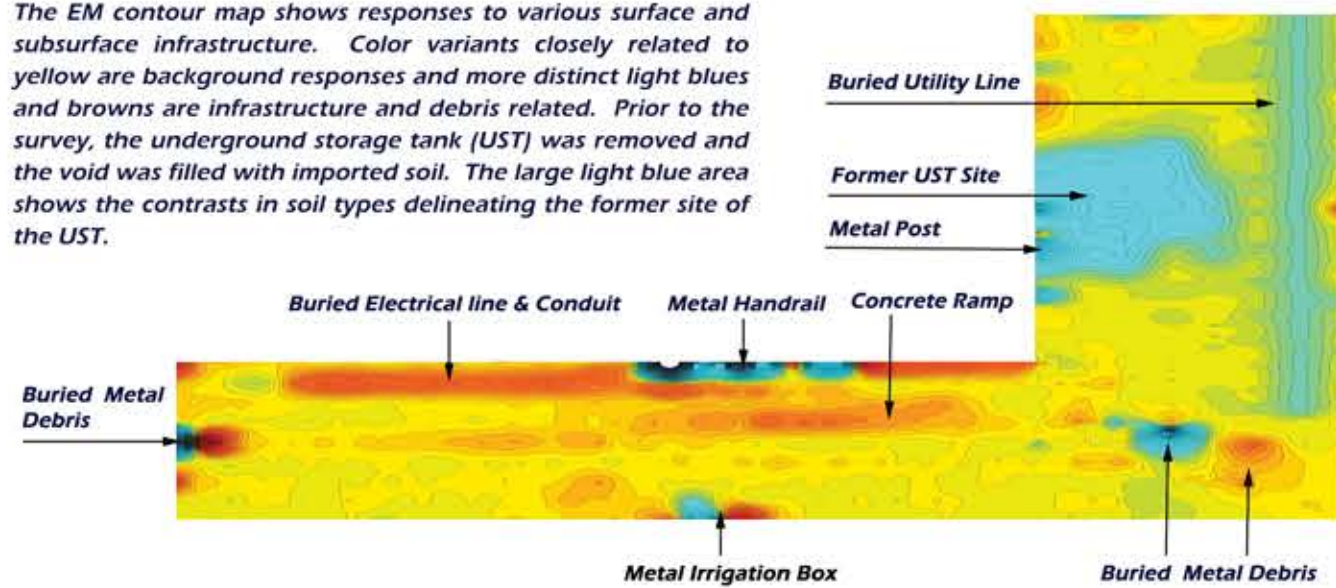
hydroGEOPHYSICS

The Brownfield Challenge

The EPA estimates that there are nearly half a million brownfield sites within the United States located in industrial centers, business districts, and neighborhoods. These properties can contain contamination and hidden subsurface infrastructure from previous commercial or industrial usage.

Brownfield sites carry great uncertainty due to lack of information and documentation on their historical use. This poses challenges for redevelopment, requiring broad site assessment by stakeholders before remedial efforts can proceed. Typically, the greatest unknowns are associated with the subsurface, where contaminants can lurk from historic disposal practices and spills, to unseen dilapidated infrastructure. These unknowns present a great challenge to revitalizing a brownfield site, inhibiting redevelopment potential.

The EM contour map shows responses to various surface and subsurface infrastructure. Color variants closely related to yellow are background responses and more distinct light blues and browns are infrastructure and debris related. Prior to the survey, the underground storage tank (UST) was removed and the void was filled with imported soil. The large light blue area shows the contrasts in soil types delineating the former site of the UST.



Geophysical Groundwork

While geophysics has long been used for subsurface mapping, advancements in data acquisition and analysis techniques have expanded geophysical capabilities to include increasingly complex settings. In the early 2000s, geophysicists and engineers at hydroGEOPHYSICS began developing and applying cutting edge geophysical methods for the characterization of complex industrial environments, including the Hanford, Savannah River, and Los Alamos Department of Energy (DOE) Nuclear Sites. These highly dynamic and hazardous sites required a host of geophysical methods to be layered together to create a holistic understanding of the subsurface infrastructure and contamination zones.

HGI's DOE experience led to the development of a set of cooperative site characterization techniques that provide clarity in the critical steps of assessing and determining reclamation strategies. These complementary geophysical methods offer a uniquely competent set of target recognition tools invaluable to industrial and brownfield site investigations. Our experience has shown that using any single characterization method may not capture the full spectrum of subsurface features defining a brownfield, which can contain a broad range of targets needing to be located. HGI's approach is to complete a site specific survey design that balances geophysical detection and mapping goals with site logistics and project costs in order to maximize results.

Subsurface Imaging

Innovative Solutions

A Complete Picture

HGI's goal is to use our geophysical tools and technologies to optimize site assessment and pinpoint problems prior to intrusive site investigation. We do this by layering geophysical methodologies, which allows us to present and interpret resulting visual data in a way that is meaningful and useful to both geophysicists and non-geophysicists alike. This layered method approach has been successfully used to map soil contaminants and different types and sizes of infrastructure, such as reinforced concrete, underground storage tanks, power lines, vaults, voids, and pipes located on a single site.

Geophysics is a powerful tool that can enhance brownfield cleanup efforts by identifying abandoned infrastructure and possible contamination sources and pathways within the subsurface. Geophysical characterization results contribute to more efficient planning of secondary remedial activities by reducing cost/risk, and improving personnel and environmental safety.

Case Study

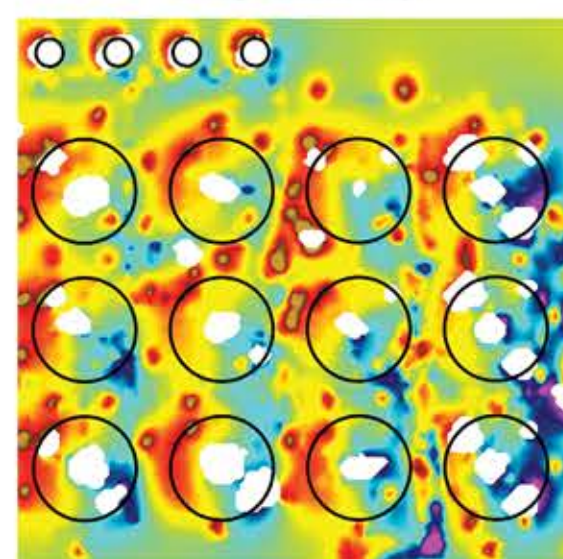
Hanford Tank Farm Subsurface Investigation

These figures demonstrate multiple geophysical methods used to characterize the subsurface infrastructure of a Hanford tank farm site. The image to the right shows magnetic and electro-magnetic data layered together around the outside of the tank farm. Here the combined data delineate and reinforce the locations of subsurface structures. Below is an example of magnetic data inside the tank farm used to locate buried metallic structures around multiple tanks. Below and to the right is a GPR example of linear features (pipes) associated with a single tank at the Hanford site.

Combined Mag & EM



Magnetometry



Ground Penetrating Radar



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