Geoelectrical Imaging of a Hydrocarbon Plume at the Lookout Release Site, St. Helena Parish, Louisiana

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ABSTRACT

The Lookout Release Site in St. Helena Parish, Louisiana is the site of a subsurface hydrocarbon plume created by a gasoline pipeline spill. The Louisiana Department of Environmental Quality (LDEQ) has had regulatory oversight of the project since its discovery in 1997, and the remediation efforts are ongoing. Contaminants, such as BTEX (Benzene, Toluene, Ethyl Benzene, and Xylene) and MTBE (Methyl Tertiary Butyl Ether), have leaked into the subsurface at higher than accepted regulatory standards, affecting the groundwater in the area. The remediation efforts include the development of recovery wells, air sparging systems, and groundwater monitoring wells. Subsurface hydrocarbon plumes can be identified by their abnormally high subsurface resistivity. Working in conjunction with the LDEQ, a survey over the site using the Geometrics OhmMapper, a capacitively coupled resistivity meter, was performed in an effort to obtain electrical images of the shallow subsurface. The data range from 13 ohm-m in the unaffected areas to over 1,700 ohm-m in the hydrocarbon plume and clearly delineate the extend and geometry of the contaminants. This allows for the analysis of the effectiveness of remediation efforts, and the identification of areas where high levels of contaminants still remain.

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