

**THREE DIMENSIONAL VISUALIZATION AND ANALYSIS OF GEOLOGICAL,
GEOCHEMICAL, AND GEOPHYSICAL DATA AT THE OSAGE SKIATOOK PETROLEUM
ENVIRONMENTAL RESEARCH "A" SITE, OKLAHOMA**

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Integrated studies of the Osage Skiatook Petroleum Environmental Research (OSPER) "A" site have utilized geological, geochemical, and geophysical methods to characterize subsurface plumes of saline produced waters. Geological studies have concentrated on surface mapping of the stratigraphy, petrophysical and petrologic analysis of drill core, and analysis of surface sediments. Geochemical studies have included the analysis of local uncontaminated and contaminated ground water, analysis of aqueous extracts from drill core and sediment samples, analysis of rock-water interactions, and monitoring of waters both from run-off and drill holes. Geophysical studies include dc resistivity sounding, electromagnetic induction measurements of electrical conductivity in boreholes, land surface, and on Lake Skiatook. Borehole logging also included natural gamma measurements. These studies have demonstrated the saline water plumes have moved in the subsurface beyond pits and other points where they originated. The subsurface extent is larger and geometrically more complex than the surface salt scars associated with the plumes. Though the dispersal of saline produced waters has been documented in other areas, the OSPER study is the first to bring together a comprehensive set of data that can be used in three-dimensional mapping and characterization. Visualization methods are used to enhance the presentation of this data set in three dimensions. These images help to understand the complex subsurface distribution of the signatures of the saline waters.