Effects on Groundwater of an Ash-Disposal Operation at an East Texas Lignite Mine

Keith A. Wheeler,[1] Scott Mills,[2] and J. V. Rouse[3]
[1]Groundwater Technology, Inc., 505 E. Huntland Dr., Austin, TX 78752
[2]Texas Utilities Services Inc., 400 N. Olive St., Dallas, TX 75201
[3]Geochem, Inc., 12265 W. Bayaud Ave., Lakewood, CO 80228

A study was undertaken to evaluate the effects on groundwater of a proposed in-pit ash disposal operation at an East Texas lignite mine. An estimated 8 million tons of fly ash was to be deposited in a mined-out part of an active lignite mine during a 5-year period. A constructed bottom liner was not planned for the operation because of the low permeability of spoil materials in which the fly ash would be encapsulated and the abundance of low-permeability native sediments surrounding the mined-out area. The disposal site, according to state regulations, would be classified as a class II nonhazardous landfill.

An intensive investigation was initiated to characterize the geologic, geotechnical, hydrogeologic, and geochemical features within and surrounding the identified disposal area. The data were used in a three-dimensional numerical flow and transport computer model (SWIFT) to simulate the movement of fly-ash leachate from the landfill. The computer simulations indicate that the plume of leachate will travel 200 to less than 500 ft from the perimeter of the disposal area in 100 yr. Movement will not begin until after resaturation of the spoil materials, which will likely take several decades to occur. A buffer zone of mine spoils without ash will surround the disposal area. The study was reviewed by technical staffs at state agencies, and regulatory approval for the proposed landfill operations was obtained. Fly ash is currently being disposed of at the permitted class II nonhazardous landfill.

Subsalt Risk Reduction Using Seismic Sequence Stratigraphic Analysis

Walter W. Wornardt, Jr.
Micro-Strat Inc., 5755 Bonhomme, Houston, TX 77036

Several recent projects involving detailed seismic sequence stratigraphic analysis of existing wells near subsalt prospects in the south additions of the offshore Louisiana area in the Gulf of Mexico have demonstrated the utility of using seismic sequence stratigraphic analysis to reduce risk when drilling subsalt plays. First, the thick section of sedimentary rocks that was thought to be above and below the salt was penetrated in the area away from the salt. These sedimentary rocks were accurately dated using maximum flooding surface first occurrence downhole of important bioevent, condensed sections, abundance and diversity histograms, and high-resolution biostratigraphy while the wells were being drilled. Potential reservoir sandstones within specific Vail sequences in these wells were projected using seismic data up to the subsalt and non-subsalt sediment interface. The systems tract above and below the maximum flooding surface and the type of reservoir sandstones that were to be encountered were predictable based on the paleobathymetry, increase and decrease of fauna and flora, recognition of the bottom-set turbidite, slope fan and basin floor fan condensed sections, and superpositional relationship of the Vail sequences and systems tracts to provide a detailed sequence stratigraphic analysis of the well. Subsequently, wells drilled through the salt could be accurately correlated with Vail sequences and systems tracts in wells that were previously correlated away from the salt layer with seismic reflection profiles.