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USING 3D SEISMIC REFLECTION DATA, VERTICAL SEISMIC PROFILES AND SUB-SURFACE WELL CONTROL TO GET THE REAL PICTURE OF US GULF COAST SALT DOMES

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Abstract

Maps of a number of salt bodies in the US Gulf Coast area of Louisiana and Texas have recently been updated using 3D seismic reflection data, vertical seismic profiles and sub-surface well control. Until recently, maps of the domes were constructed with only well control data, and these were deemed the definitive salt structure of the domes. Recent events around some domes show sub-surface-only structure maps were not reliable. New mapping involves the complete integration of all available data from 3D seismic data sets, vertical seismic profiles and numerous wells drilled in and around the salt domes. This mapping now defines the sediment/salt interface with much higher accuracy than was previously available.

New structure maps, using the fully integrated data, show much different salt bodies than were previously mapped. This is mainly due to 3D seismic data's addition of many new points filling in the gaps between well control.

Many images of complex salt bodies and the associated radial faulting around domes are shown. Current and future mining, storage or maintenance of caverns near dome flanks should now be better managed. This should allow any future mining of the salt to be performed in a safe position away from the salt/sediment interface so that no accidents occur.

This new work over salt domes shows a tremendous increase in reliability of the sediment/salt interface can be achieved with the full integration of all sub-surface data. The author recommends that all salt domes that are or have been mined be re-evaluated using the methods described in this paper.

Key words: 3D, 2d, Seismic, Salt Dome, Mapping, Computer Modeling, Gulf Coast, Sinkhole, Safety, Geophysics