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## **HOLISTIC UNDERSTANDING OF THE BIG HILL SALT DOME GEOLOGIC PROCESSES IN RELATION TO IMPACTS ON CAVERN WELL INTEGRITY**

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### **Abstract**

The Big Hill salt dome, located in southeast Texas, is one of four sites operated by the U.S. Strategic Petroleum Reserve (SPR). A collection of reports has been produced since the 1980's presenting various geologic characterization studies of the dome. Currently, 9 of the 28 Big Hill SPR cavern wells are experiencing deformation at the salt-caprock interface severe enough to require remediation in order to prevent fluid loss. A holistic understanding of the Big Hill dome geologic processes can be attained through the compilation of past and current work. This knowledge will allow for a better understanding of what process(es) may ultimately be affecting well integrity, which is vital to maintaining site drawdown readiness for emergency disruptions in national oil supply.

This paper reviews, at a high level, all the known geologic pieces of the Big Hill system in an attempt to provide a complete and informed geologic picture and ultimately demonstrate how geology is the driving force behind well failure. Presented, in relation to the Big Hill caverns, is the dome salt and caprock geology, known shear zones, faults, and the latest subsidence trends and possible causes/contributors.

**Key words:** Geology, Strategic Petroleum Reserve, Subsidence, Well Casing

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