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GEOLOGY OF THE WEEKS ISLAND SALT DOME WITH A FOCUS ON THE CURRENT 1500 FT. LEVEL OF THE MORTON SALT MINE

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Abstract

The Weeks Island salt dome is mined for rock salt from the Jurassic Louann Salt formation since 1902. Extensive geological work in three salt mines, a brine field operation and the former Strategic Petroleum Reserve (SPR) of the U.S. Department of Energy (DOE) have contributed to the wide knowledge of the salt deposit, highlighting Weeks Island as one of the best studied salt domes of the Gulf Coast.

This study focusses on the geological framework of the current operational level at Weeks Island approximately 1,440 ft. below sea level and mined by Morton Salt. Regular mapping campaigns of the present geological parameters and anomalies reveal strong similarities to overlying levels of a former, now flooded salt mine. This level was studied extensively in the past, indicating the presence of local zones with uncommon geological features like local geogenic brine and gas occurrences, higher concentrations of impurities or hydrocarbon impregnation in the salt (e.g. Kupfer et al., 1998). These so-called anomalous zones, formerly interpreted as shear zones, are now identified as contact zones, caused by a differential salt spine movement in the salt dome (Looff, 2001).

The regular documentation and interpretation of the geological structures underground, as well as the projection of the structural features from other mining levels, supports the current mining activities in terms of mining safety, grade control and the definition of the natural mining boundaries. A prediction and extrapolation of identified geological features and anomalies also supports the planning of future mining levels.

Key words: Salt Geology, Salt Mining, Salt Dome, Anomalous Zone, Gulf Coast, Gulf of Mexico, Louann Salt Formation, Five Islands Salt Domes, Morton Salt

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