

## Mapping of the 2929 Sand and the F1, F2 and F3 Fault Planes

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The 2929 Sand is a Miocene aged sand formation identified on the western side of the Sulphur Mines salt dome at a depth of approximately 2900'. It was mapped on the western side of the Sulphur Mines dome to help understand the overall structural configuration of the stratigraphic formations near the dome in that area. The 2929 Sand was mapped because it is a fairly thick sand and is at the same approximate true vertical depth as the bottom section of Cavern 7.

Wire line well logs and reprocessed 3D seismic data were utilized to interpret and map the 2929 Sand. Wire line well logs were not available for all wells on the western side of Sulphur Mines dome. Of the approximately 40 wells in the area evaluated on the western side of Sulphur Mines dome, 19 did not have well logs. Of the wells without wireline logs, most were drilled in the 1920's and 1930's. The remaining wells with useable wire line logs were utilized in the interpretation of the 2929 Sand and associated faults. The 2023 reprocessed Reverse Time Migrated (RTM) 3D seismic data was also utilized to map the 2929 Sand. However, because of the numerous and closely spaced wellbores compared to the relatively coarse bin size of the seismic data (110'), the seismic data primarily contributed dip information and an indication of formation interval thinning.

The geology of the Miocene formations near the Sulphur Mines dome is extremely complex. This appears to be caused by both stratigraphic complexities between the individual sands and shales and structural complexities related to what appear to be numerous faults near the edge of the dome as well as the movement of the salt itself as the dome developed. The 3D seismic data indicates a zone extending from the edge of the salt outwards approximately 1000' that is interpreted to be highly faulted. Formations also appear to steepen and thin as they approach the dome. It is possible that some sands pinch out up dip before reaching the salt. As a result of this complexity in the Miocene section on the western edge of the Sulphur Mines dome it can be difficult to correlate sands, even between wells that are close to each other.


Three faults, F1, F2 and F3, were mapped on the western side of the Sulphur Mines salt dome. These three faults extend from a depth of approximately 1500' to just over 4000'. Faults F1 and F2 are down-to-the-south faults and F3 is down-to-the-north. The throw for the three faults is approximately 100' near the dome and the faults extend westward from the salt dome approximately 500' before dying out.

The same wire line well logs and reprocessed 3D seismic data used to map the 2929 Sand were utilized to interpret and map faults F1, F2, and F3. Because of the relatively small throw of the faults compared with the vertical resolution of the 3D seismic data the well logs were the primary data set used.

Based on well-to-seismic ties and on published reports from analogous salt domes, we estimate the vertical accuracy of the seismic data to be on the order of  $\pm 50$  feet and the horizontal resolution to be on the order of  $\pm 100$  feet.

Professional Geoscientist Signature Box

Teresa H. Rougon  
January 12, 2024



*Teresa H. Rougon, P.G.*

The image shows a professional signature box for Teresa H. Rougon. It contains the text "Professional Geoscientist Signature Box" at the top. Below this, the name "Teresa H. Rougon" is printed and underlined, followed by the date "January 12, 2024". To the right of the text is a circular seal for the Louisiana Board of Professional Geoscientists. The seal features a map of Louisiana with a hammer and pickaxe, and the text "LOUISIANA BOARD OF PROFESSIONAL GEOSCIENTISTS", "TERESA H. ROUGON", "LICENSE NUMBER 330", and "Est. 2011". Below the seal, the name "Teresa H. Rougon, P.G." is written in a blue cursive signature.