

AN INTEGRATED STUDY TO DETECT HYDROCARBON BY USING 3D SEISMIC REFLECTION AND REMOTE SENSING (THERMAL INFRARED) IN CENTRAL IRAQ

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ABSTRACT

The amalgamation of seismic reflection study with the thermal band in central Iraq within Merjan oil field is located approximately (130 Km) to the southwest Baghdad and south of Razaza. The 3D seismic survey was interpreted and the satellite image is preprocessed and processed to get the thermal anomalies which indicate hydrocarbon presence.

The results showed that the oil was located in Hartha Formation as stratigraphy traps and the absence of any structural traps. Picking of major faults which are trending N-S direction called Altar. There are also minor faults observed using the instantaneous phase. The thermal anomaly shows main faults in the study area which has been confirmed with seismic interpretation. The seismic attributes were studied across 3D seismic volume integration with the thermal map was confirmed. The thermal map shows that the Merjan well area consists stratigraphic trap because of that the distribution anomalies are irregular due to difference facies and irregular fractures.

On the other hand, the well (Wk-1) is the non-oil producer so that the thermal map does not indicate any anomalies, this is supported by the well wildcat, this is may be due to faults near this well, so the thermal anomalies focus on the Merjan well (Me-1) and surrounding, this is shown when intergraded with depth map that observed the absence any structure in the area. The thermal map anomaly shows the evidence of the gas presence in the study area, which has supported with seismic sections and variance attribute. Digital Elevation Model (DEM) integration with depth map shows that the area in the east of the topographical map is rising on the earth's surface but depth maps showing the decreased of ground to the east, because of the fault effect.

Keywords: 3D seismic reflection, fault, thermal anomaly, seismic attribute, instantaneous phase.