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Nine Component Three Dimensional “9C-3D” Seismic – Creating a Paradigm Shift in Exploration

Vecta Technology, L.P and its research partner, the UT Bureau of Economic Geology (“BEG”), have made a significant breakthrough in the understanding of shear wave propagation and processing of Nine Component Three Dimensional (“9C 3D”) seismic. The patent pending technology is the final ingredient needed to make 9C 3D commercial and is the result of a four-year joint research and development program.

Because traditional 2D and 3D seismic have been limited in their ability to image stratigraphic traps, these exploration targets have been under explored in the last 70 years due to the risks associated with identification. The United States Geological Survey (USGS), estimates over 50 billion barrels of undiscovered recoverable oil in 200+ stratigraphic plays nation wide.

This paper describes how 9C 3D differs from conventional seismic data in acquisition and processing.

Rock properties and reservoir architecture can now be remotely detected and mapped with 9C 3D data. Practical applications include discriminating sandstone-rich strata from shale-rich strata, identifying dolomitized intervals in carbonate sections, identifying areas of enhanced porosity, monitoring the movement of gas-liquid interfaces, distinguishing hydrocarbon-induced bright spots from lithologically-induced bright spots, and detecting intensity and orientation of fractured strata.

Two case studies it show how conventional and special interpretation techniques are used to determine reservoir parameters such as Poisson’s Ratio and lithology.