

Detection and Evaluation of Pore Pressure, Fracture Pressures Gradients and Well Bore Stability Analysis by Creating Mechanical Earth Model of Kanawara Prospect, South Cambay Basin, India.

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Pore and fracture pressure detection is essential for safe and cost-effective drilling of wells. Accurate values of formation pressures are used to design safe mud weights to overcome the formation fracturing and avoid the well kicks. The processes of designing and selection of casing weights/grades is predominately dependent on the utilization of accurate values of formation pressure. Cementing design, kick control, selection of well head and x-mass trees and even rig rating are dependent on the formation pressures encountered in the well.

Pore and fracture pressures gradients of Kanawara prospect is evaluated using a combination of Petrophysical, Seismic and Geological technologies including controlled-source well log data, vertical seismic profiling (VSP) and drilling data. The integration of these data sets produced consistent results for the prospect that reduced the uncertainty of the interpretation. Combining the analyses increased confidence in the interpretation.

In my Study Pore and Fracture pressure prediction analysis of Kanawara prospect was carried out by studying the elastic deformation properties such as Young's modulus, Shear modulus, Poisson's ratio, rock strength data such as unconfined compressive strength (UCS) and friction angle. Mechanical Earth Model (MEM) of Kanawara prospect was generated by utilizing Dipole sonic (DSI) and correlation with seismic attributes. The propagated MEM to the prospective locations was used for wellbore stability analysis. A MEM is a numerical representation of the state of in-situ stresses and pore pressure and rock mechanical properties for a specific Stratigraphy section in a field or basin. (Plumb et al., 2000).