

IHS ENERGY

Pressure Study of the Wilcox and Lower Miocene

This study utilizes the following IHS products

- Gulf of Mexico Formation Pressure Database
- Parametric Temperature Database
- Enerdeq Well Summary Reports
- Biostratigraphy data
- Wireline suite including:
 - Gamma Ray
 - Sonic
 - Resistivity
 - Density

Deepwater Gulf of Mexico

Overview

Although a number of high-profile discoveries have been made to-date (Cascade, St. Malo & Jack), dry holes continue to be drilled and many penetrations continue to encounter highly-pressured formations. This significant new study and the high quality data used in its compilation provide a comprehensive and authoritative picture of formation pressure distribution and its causes within the study area. This information provides a valuable calibration to in-house pressure interpretations thereby reducing exploration and drilling risk.

Dataset

After extensive data-mining for wells available in the study area, 149 wells were selected for inclusion in the study based on pressure data quality and geospatial distribution. A total of 49 wells penetrate the Wilcox reservoir, the remainder encountered Lower Miocene sediments. These sedimentary sequences were mapped above and below salt canopies.

In addition to reinterpreted formation pressures and temperatures, fracture pressures and mud pressures from these wells, additional IHS data resources were used to develop this study; digital LAS data (i.e. Gamma Ray, Sonic, Resistivity and Density), corrected deviation surveys, Enerdeq Well Summary Reports and well header information, correlated biostratigraphical data and a Parametric database, containing log header and BHT information.

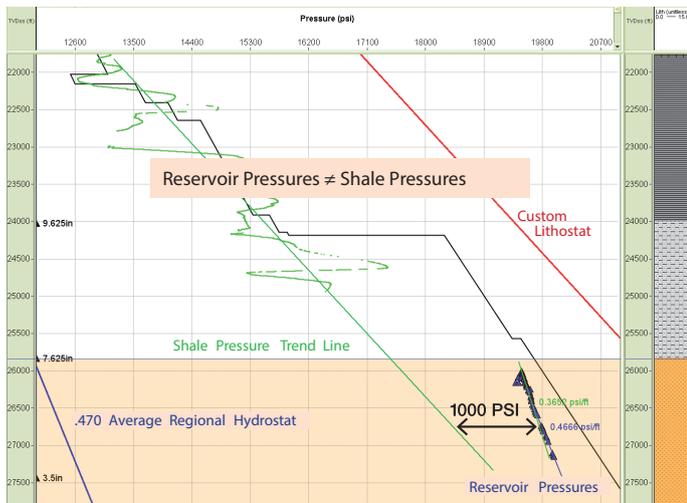


Figure 1

A single-well pressure-depth plot from the IHS Gulf of Mexico Pressure Database displaying direct fluid pressure data within the Wilcox play, mudweights and a shale pressure trend line (green) based on analysis of the interval transit time wireline data. The plot highlights that understanding the overpressure distribution in the Wilcox play is crucial as traditional methods of predicting pressure from thick shale packages may not match the true reservoir pressures.

Methodology

- Re-interpret, standardize and QC formation pressures from the IHS Pressure Database and related data i.e. Biostratigraphy, Wireline Data, Directional Surveys and Temperature (BHT & Wireline derived).
- Analysis of pore fluid and fracture pressure data for all wells utilising creation of Single- and Multi-Well Pressure-Depth plots using Ikon Science's RokDoc= PressureView software.
- Mapping of the distribution of formation overpressures at all main reservoir horizons using ArcView GIS software.
- Determination of fracture and overburden pressures stratigraphically, regionally and in areas both beneath and outside the salt canopy.
- An in depth analysis of trap integrity/seal breaching, hydrodynamic traps, lateral transfer/"centroid" development, pressure regressions, reservoir compartmentalisation and shale pressures, providing a better understanding for the generation of pressure regimes.

Key Deliverables

- A0 Overpressure maps of Miocene and Wilcox formations
- Hard-bound Report in US letter format and CD containing;
 - Overview of Wilcox and Miocene Reservoirs
 - Analysis of Shale Pressures
 - Drilling Implications review
 - Pressure depth plots for key wells within text of study

Benefits

- Improved understanding of the regional pressure regime and its part in controlling aspects of the petroleum system, including trap integrity and regional / field-scale fluid flow, leading to an increased understanding of exploration potential enabling more accurate placement of exploration and appraisal wells.
- Development of a coupled pressure-geological model to aid calibration of velocity-based pressure predictions in un-drilled areas.
- Ability to anticipate abnormally pressured formations allowing safe and effective drilling programs to be developed.

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