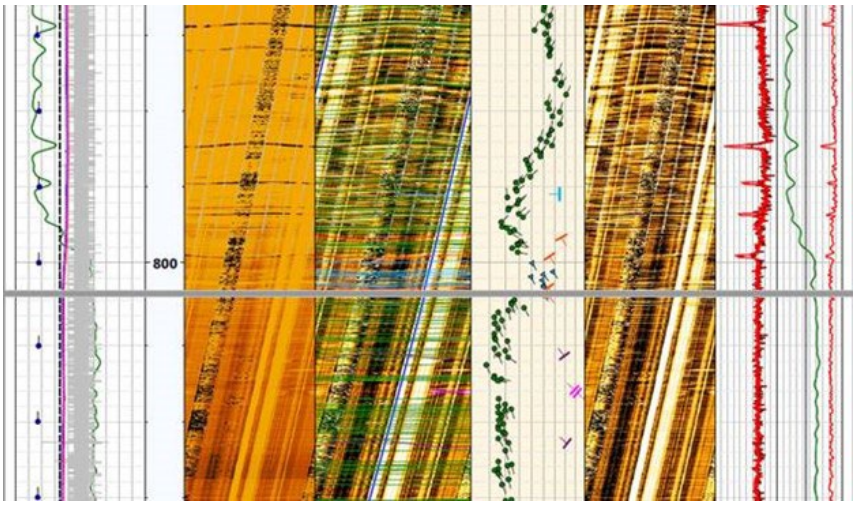
Interpretation and Evaluation Services

Determined Stratigraphic and Structural Features for Development Borehole Drilling Programs



At a depth of 799.6 and 801.64 m, prominent faults are possibly found, striking dominantly from NE to SW. The dip angle changes, becoming steeper and deforming the bedding, a condition that would be a drag on the fold and support the presence of a fault and the abrupt change in bedding orientation (from SE to N) with bedding truncation. This supports the interpretation of the striking fault existing in the NE-SW orientation.

Objectives

- Determine types of stratigraphic and structural features.
- Identify bedding and cross bedding to determine channel flow direction.
- Localize any faults and fractures and determine their general orientation and estimate principal horizontal stress direction.
- Determine natural fracture frequency for the hole stability.

Our Approach

- Weatherford field personnel deployed a Compact™ microimager (CMI) into the wellbore to obtain high-quality raw data.
- After the raw data was processed to generate an image log, the data was handed over to the Weatherford Interpretation and Evaluation Services (IES) team for further analysis and interpretation.
- The raw data consisted of two types: depth and time. The IES team merged both time and depth to generate the image log, including a speed correction based on the inclination range. Speed correction is important to minimize irregular tool movement, cable, and drillpipe stretch.

LOCATION
Australia

WELL TYPE
Exploration

CASING SIZE
7 in.

BIT SIZE AND ANGLE
4.80 in., deviation up to 6°

TEMPERATURE
174.30°F (79.06°C)

DEPTH
5,755.9 to 1,939.3 ft (1,754.6 to 591.1 m)

PRODUCTS/SERVICES
- Wireline services
- Interpretation and Evaluation Services
- Compact microimager

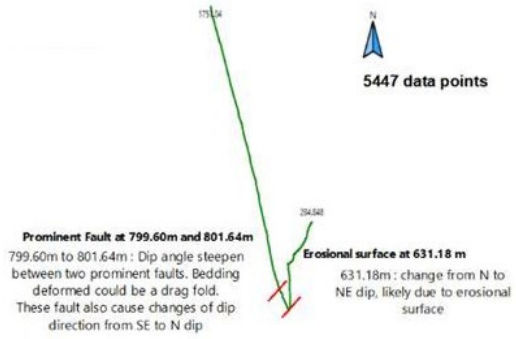
Weatherford®

Interpretation and Evaluation Services

Determined Stratigraphic and Structural Features for Development Borehole Drilling Programs

Our Approach (continued)

- If the image showed acceptable quality, Weatherford experts could convert the DTA into DLIS for the proprietary software. The local IES team started the process to produce a dynamic image for interpretation.
- The Weatherford in-house workflow for interpretation was completed and focused on the following: identifying coal seams, structural analysis, fracture identification, and stress directions.



The dip azimuth vector walkout plots are useful tools in identifying changes in the structural dip direction along the borehole. The plot s also help identify abrupt changes in the structural dip azimuth.

Value to Customer

- The interpretation provided by the local IES team helped the customer to accurately localize any fault and fractures present in the well. This interpretation provided not only the geologic structure, but helped to define the reservoir geometry, characterize traps and seals, and locate wells at strategic sites for optimal orientation.
- The acquisition and analysis of this data provided the customer with the critical information to make decisions faster and more effectively in terms of production, stimulation, modelling, and fracturing. It also helped to better pre-plan the development strategy.
- In addition, the in-situ stress analysis—including compressional or tensile features and orientation of principal stresses—helped the team examine borehole stability as well as create a more detailed model in three dimensions.
- The presence of faults can represent indirect evidence of observation of the well. It helped identify any change in structural dip which represented a few conditions such as differing lithofacies across a discrete fracture, fault drag which involved progressive rotation into a structural boundary, damaged zone, fluid interface (if sealing), and hole damage (commonly known as a washout).