

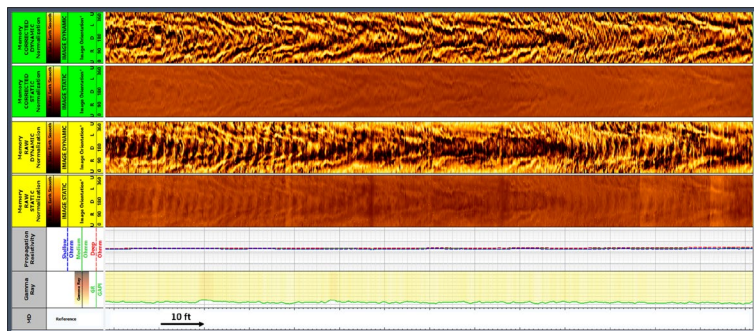
Advanced corrections of LWD high-resolution resistivity images in hostile downhole environments

CHALLENGES

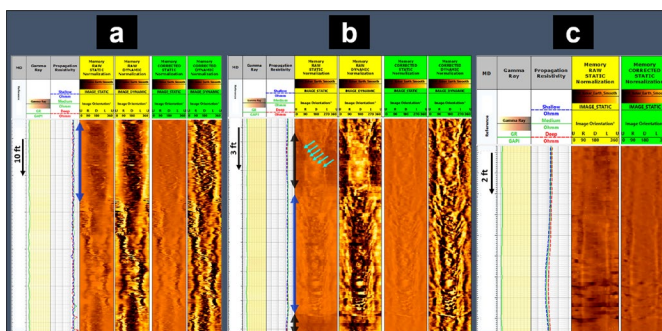
- Multiple intervals within the horizontal section exhibited strong image degradation due to persistent dark band artifacts, obscuring bedding continuity and subtle stratigraphic features
- Coexisting artifacts—including low-side dark bands, saw-tooth patterns, and stick-slip effects—introduced significant noise and distorted the true resistivity response
- Artifact interference led to misrepresentation of geological features, with boundaries appearing blocky and fractures incorrectly interpreted as predominantly conductive

SOLUTION

- 4.75-in. StarTrak™ UHD high-resolution electrical borehole imaging removed dark band artifacts and recover uniform image response
- Integrated filtering eliminated saw-tooth and stick-slip artifacts, improving feature continuity and structural clarity
- Static and dynamic normalization enhanced resistivity contrast and ensured consistency of corrected images along the wellbore
- Reprocessed image datasets at multiple depth intervals to restore bedding geometry and improve visualization of thin layers and fracture characteristics



Static and dynamic normalization, before and after advanced corrections. Removal of entire borehole cyclicality, eccentricity and saw-tooth artifacts.



Three panels illustration. Panel (a) shows the main removal of dark band artifacts. Panel (b) the removal of dark band, occasional saw-tooth, and stick-slip artifacts. Panel (c) is restored boundaries definition and fracture classification after corrections.

RESULTS

- Successfully removed dominant artifacts enabling clear visualization of flat bedding and previously obscured stratigraphic details
- Restored accurate boundary definition, eliminating blocky distortions and enhancing the continuity of geological features
- Improved fracture interpretation, transitioning from artifact-driven conductive responses to more accurate mixed resistive-conductive classifications
- Delivered consistent, high-quality resistivity images across the horizontal interval, supporting confident geological and petrophysical evaluation

Results were published at IPTC conference (IPTC-23991-MS)