Cased-Hole RMT-3D™ Mineralogy and KUTh Spectral Gamma Ray

MORE INSIGHT INTO YOUR FORMATION

OVERVIEW

The Halliburton Reservoir Monitor Tool 3-Detector™ (RMT-3D™) tool achieves enhanced formation evaluation, through passive and active modes, to provide elemental mineralogy and shale typing information for better characterization of your reservoir. The data is useful in finding pay or determining where to stimulate. The RMT-3D tool measures critical components that help define the reservoir through capture and inelastic elemental yields, as well as passive spectral gamma ray information.

ELEMENTAL YIELDS AND MINERALOGY

The RMT-3D tool generates high-energy neutrons that interact with both the matrix and fluids. Neutrons, going through a series of collisions, go from high to low energy before they're finally captured. These interactions produce gamma rays of specific energies, based on the atomic element.

Inelastic and capture elemental yields include: carbon, oxygen, silicon, calcium, magnesium, hydrogen, iron, chlorine, sulfur, potassium, and other elemental yields that are important to understanding the formation.

SPECTRAL GAMMA RAY

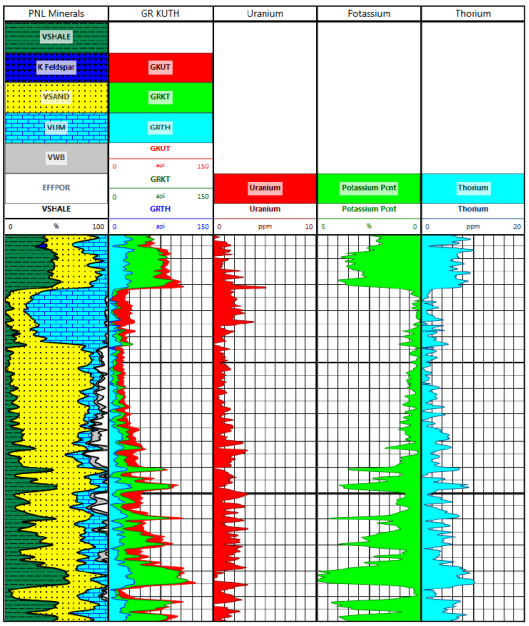
With the neutron generator off, the RMT-3D tool can passively listen to naturally occurring radioactive elements such as potassium, uranium, and thorium. KUTh analysis is used for advanced shale and clay typing through the use of crossplotting both potassium and thorium. These measurements can also be used as a shale indicator where normal total gamma ray tools are ineffective due to uranium-rich formations.

CONVENTIONAL TO UNCONVENTIONAL SOLUTIONS

In conventional and unconventional reservoirs, the RMT-3D tool provides detailed knowledge about porosity, volumes, mineralogy, lithology, and the water, oil, and gas saturations. This data is analyzed to create advanced solutions to produce the information you need to make informed decisions on your wells.

MINERALOGY AND KUTH ADVANCED SOLUTIONS AND PRODUCTS

- Cased-Hole ShaleXpert™ and FracInsight® services–Reservoir characterization that aids in stimulation design for optimizing results in unconventional new wells
- Cased-Hole TightGasXpert™ service–Gas saturation, porosity, lithology, and brittleness in tight rock
- Cased-Hole FracCombo service–Pulsed neutron in combination with slim sonic
- Sigma-derived saturations–Traditional oil or gas saturation in high formation water salinity



Track 1 – Mineralogy: shale, sandstone, and limestone
Track 2 – Gamma ray values for: KUTh, KTh, and Th
Track 3 – Uranium (ppm)
Track 4 – Potassium (%)
Track 5 – Thorium (ppm)

- Carbon-Oxygen derived saturations–Oil saturation for fresh, mixed, or unknown formation water salinity
- SATG saturation–Gas saturation in fresh, mixed, or unknown formation water salinity
- KUTh spectral gamma ray–Potassium, uranium, and thorium natural gamma ray analysis for describing shale and clay properties

COMBINABILITY

The RMT-3D™ tool is designed with a focus on combinability to save time and cost by gathering all data requirements in a single trip in the hole.

Combinability includes, but is not limited to:

- Production logging–Standard and array production logging tool suites for water, oil, and gas entry and flow
- CBL–Casing-to-cement and cement-to-formation bond log
- RCBL–Radial casing-to-cement and cement-to-formation bond log
- CAST-M™ tool–High-resolution radial casing-to-cement bond log and casing integrity
- Multifinger caliper tool–High-resolution radial casing integrity and evaluation

Reservoir Monitor Tool 3-Detector Dimensions and Ratings

Maximum Temperature Flasked	325°F (163°C) / 400°F (204°C)
Maximum Pressure Flasked	15,000 psi (103 400 Kpa) 18,000 psi (124 105 Kpa)*
Maximum Outside Diameter Maximum Hole	2.125 in. (5.398 cm) / 2.48 in. (6.30 cm)
Minimum Hole Inside Diameter Maximum Hole	2.375 in. (6.033 cm) / 16.0 in. (40.6 cm)
Tool Length with Telemetry	15.30 ft (4.66 m) / 24.70 ft (7.53 m)
Tool Weight with Telemetry	86 lb (39 kg) / 146 lb (66 kg)

*High-pressure equipment also available

Borehole Conditions

Borehole Type	Open ■ Cased ■
Borehole Fluids	Salt ■ Fresh ■ Oil ■ Air ■
Tool Length	15.3 ft (4.66 m)
Recommended Max Logging Speed (C/O)	3 ft/min (1.0 m/min)
Recommended Max Logging Speed (Sigma)	15 ft/min (4.75 m/min)
Recommended Max Logging Speed (KUTh Far + Long)	30 ft/min (9.14 m/min)
Tool Positioning	Centralized □ Eccentralized ■

For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com

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