

# RMT-3D™ Reservoir Monitor Tool for Oil, Water, and Gas Saturations

**MONITOR RESERVOIRS TO INCREASE PRODUCTION, IMPROVE RECOVERY, AND FIND BYPASSED PAY**

The Halliburton Reservoir Monitor Tool 3-Detector™ (RMT-3D™) pulsed-neutron tool solves for water, oil, and gas saturations within reservoirs using three independent measurements (Sigma, CO, and SATG). This provides the ability to uniquely solve simple or complex saturation profiles in reservoirs, while eliminating phase-saturation interdependency. This information can be used to monitor reservoirs, increase production, improve recovery, and find bypassed pay in some of the most difficult situations.

## Cased-Hole Formation Evaluation

The RMT-3D tool provides the following information:

- Water, oil, and gas saturation evaluation
- Flood/EOR monitoring
- Gas phases:
  - Natural gas
  - CO<sub>2</sub>
  - Steam
  - Nitrogen
  - Air
- KUTh spectral gamma ray
- Elemental yields for mineralogy
- Cased-hole porosities
- Gravel pack evaluation
- Water flow velocity and direction

## Flood Monitoring

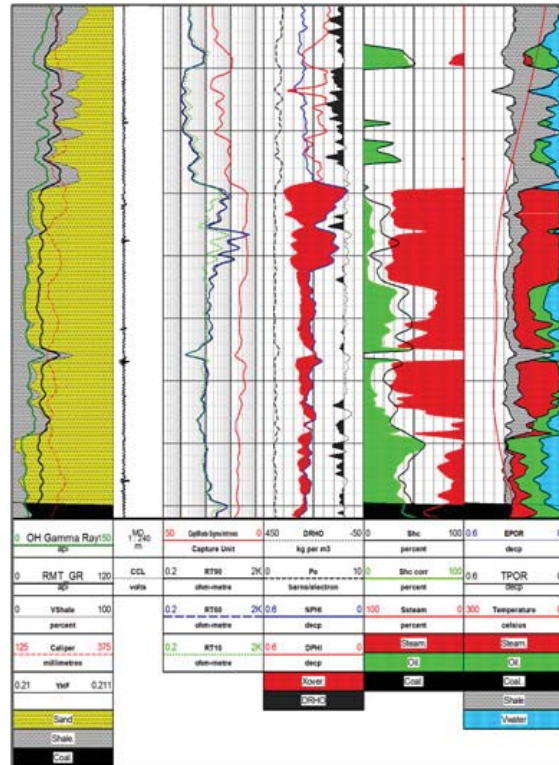
Secondary and enhanced oil recovery projects need to be monitored to maximize production. The RMT-3D tool accurately measures oil, water, and gas saturations in mixed or unknown formation water salinities. With this information, informed decisions can be made to manage the field for greater recovery.

## 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 our customers need to make informed decisions on their wells.

## Advanced Solutions and Products

- Cased-hole ShaleXpert™ and FracInsight™ services—Sweet spot identification and staging in unconventional new wells
- Cased-hole Tight Gas Xpert services—Gas saturation, porosity, lithology, and brittleness in tight rock



Processed pulsed-neutron data in steam flood:

- Track 1—Mineralogy: Volume of shale and sandstone
- Track 2—Openhole resistivity and cased-hole pulsed-neutron sigma
- Track 3—Openhole neutron and density porosity
- Track 4—Steam gas saturation in red, oil saturation in green
- Track 5—Total and effective porosity with water, oil, and steam volumes

- Cased-hole FracCombo services—Pulsed neutron in combination with slim sonic
- Carbon-Oxygen-derived saturations—Oil saturation for fresh, mixed, or unknown formation water salinity
- SATG-derived saturations—Gas saturation in fresh, mixed, or unknown formation water salinity
- Sigma-derived saturations—Traditional oil or gas saturation in high formation water salinity
- KUTh spectral gamma ray—Potassium, uranium, and thorium natural gamma ray
- Water flow—Water flow velocity and direction, inside or outside of casing
- Gravel pack—Gravel pack integrity

### Combinability

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

Dimensions and Ratings			
<b>Maximum Temperature Flashed</b>	325°F (163°C) 400°F (204°C)	<b>Maximum Pressure Flashed</b>	15,000 psi (103 400 Kpa) 18,000 psi (124 105 Kpa)
<b>Maximum OD Flashed</b>	2.125 in. (5.40 cm) 2.48 in. (6.30 cm)	<b>Minimum Hole ID</b>	2.375 in. (6.03 cm)
<b>Tool Length</b>	15.30 ft (4.66 m)	<b>Maximum Hole ID</b>	16.0 in. (40.6 cm)
<b>Tool with Telemetry</b>	24.70 ft (7.53 m)	<b>Tool Weight</b>	86 lb (39 kg)
		<b>Tool Weight with Telemetry</b>	146 lb (66 kg)
Borehole Conditions			
<b>Borehole Type</b>	Open <input checked="" type="checkbox"/> Cased <input checked="" type="checkbox"/>		
<b>Borehole Fluids</b>	Salt <input checked="" type="checkbox"/> Fresh <input checked="" type="checkbox"/> Oil <input checked="" type="checkbox"/> Air <input checked="" type="checkbox"/>		
<b>Recommended Maximum Logging Speed (C/O)</b>	3 ft/min (1.0 m/min)		
<b>Recommended Maximum Logging Speed (Sigma)</b>	15 ft/min (4.75 m/min)		
<b>Tool Positioning</b>	Centralized <input type="checkbox"/> Eccentered <input checked="" type="checkbox"/>		

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