



# Advanced Reservoir Evaluation and Monitoring

## Multi-Detector Pulsed-Neutron Logging System

WIRELINE   
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# ***Accurately Identify Smaller Volumes of Hydrocarbon Than Ever Before***

Utilizing Wireline Logging Solutions' multi-detector pulsed-neutron Reservoir Analysis System (RAS), you now have the measurements to accurately identify smaller volumes of formation hydrocarbons than ever before. This will reduce the risk of overlooking potential pay zones and improve your ability to evaluate, monitor and manage reserve production.

Unlike conventional pulsed neutron systems on the market, our RAS uses state-of-the-art detectors that yields high resolution measurements, providing better information for evaluation on reservoir dynamics and changes over time as the wells produce. This increases the certainty in predicting when major changes in production are likely to occur.

More detectors increase the certainty in detecting water movement either inside pipe or in a cement channel. The direction of the flow can be either up or down, and both can be detected in the same trip down hole.

The RAS technology addresses a broad range of applications and delivers valuable information to better optimize perforating and completion programs as well as optimize hydrocarbon recovery in vertical, deviated or horizontal wells.

***Evaluate producing reservoirs  
without removing tubing***

***Evaluate new well hydrocarbon content  
when open-hole logs are constrained***

***Monitor and evaluate well health for  
timely remedial workover decisions***

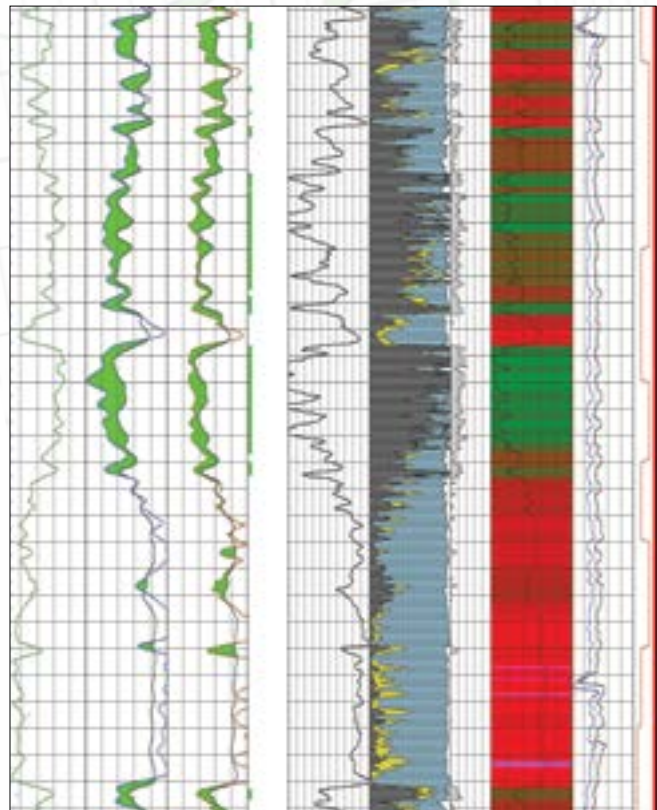
***Analyze cased-hole fluid saturation  
in three-phase reservoirs***

***Locate bypassed hydrocarbons  
with greater confidence***

***Evaluate Shale gas/ oil plays***

***Detect water movement either inside  
pipe or in a cement channel***

***Gain important information to help  
reduce production of unwanted fluids***



*For additional flexibility in reservoir evaluation, Wireline Logging Solutions can combine the Reservoir Analysis Sonde (RAS) with other production logging and evaluation tools. Run with the Spectral Gamma Ray Tool, RAS data improves Clay Volume calculations and correlations with Total Organic Content (TOC), making this tool combination ideal for shale gas plays.*





### **Better resolution leads to more accurate evaluation**

The Reservoir Analysis tool features three gamma detectors for measuring reservoir saturation using Sigma and Carbon-Oxygen (C/O) techniques. Near and far detectors are high-resolution Lanthanum Chloride for Sigma and C/O detection, while the long spacing Sodium Iodide detector incorporates a spacing that is sensitive to gas and porosity.

The combined RAS/SGR log provides all the necessary measurements for computing accurately the volumes of clay, rock porosity and fluid saturations; and obtain a better assessment of reservoir properties which can help optimizing completion programs that reduce CAPEX by eliminating poor frac stages.

### **High-quality log data, and the expertise for advanced interpretation**

Because data is only as good as its interpretation, our experienced Production Petrophysicists, backed by available Reservoir Geoscience support from Hunter Well Science, employ advanced interpretation techniques to map RAS measurements into such properties as hydrocarbon saturation, porosity and rock type, delivering accurate information about reservoir properties.

Specifications		
Temperature rating	320°F	160°C
Pressure rating	15,000 psi	103.4 MPa
Diameter	1 11/16 in.	43 mm
Length	140.7 in.	3573 mm
Weight	44 lb	20 kg
Measure point - Near	84 in.	2134 mm
Measure point - Far	91 in.	2311 mm
Measure point - Long	101 in.	2565 mm
Materials	Corrosion resistant throughout	

Specifications courtesy of Hunter Well Science Limited

### **...when experience matters**

Wireline Logging Solutions is staffed top to bottom by knowledgeable personnel, with deep understanding of this technology and how to get the most value from it. Our focus on service quality ensures rapid turnaround of a quality answer product, so you get the information you need, when you need it.

The background of the entire page is a large, tilted wireline log. It features a grid with several data tracks. A prominent track on the right is filled with a blue and yellow color gradient, showing a complex waveform. Other tracks are visible in shades of green and red. The logo is centered on the page, with the word 'WIRELINE' in black, 'LOGGING' in large green letters, and 'SOLUTIONS' in black. The 'LOGGING' text is partially overlaid by a black bar with a green waveform.

**WIRELINE**  
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*Industry leading service quality combined with  
the best independent reservoir analytics  
to deliver our customers a better solution*

*To learn more or  
to contact your nearest Wireline Logging Solutions'  
representative or visit us online at:*

*[wirelinelogs.com](http://wirelinelogs.com)*