

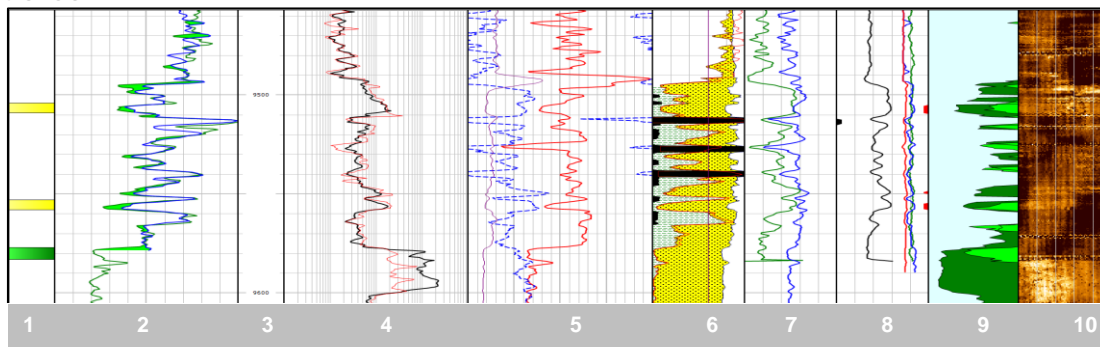
### Reservoir Analysis System – (RAS™)

The RAS™ is a saturation tool that measures the saturation of oil and gas in different clastic deposits behind the casing. The system has three-detector pulsed-neutron logging tools which use sigma and carbon-oxygen techniques to measure reservoir fluid saturation of oil, water and gas.

The ability to accurately monitor reservoir conditions is an ongoing challenge for operators and service companies. This knowledge is critical for maximising the lifecycle of an asset. By using a RAS tool to measure the actual hydrocarbon saturations in the reservoir, allows decisions to be made on whether to convert the well into an injector or whether to perforate new intervals to improve production.

This technology is applied to monitor fluid contacts in the reservoir, diagnose production problems and to locate bypassed pay zones.

Track 1 show perforations, tracks 2, 4 and 5 show Open-Hole logs; track 6 show lithology, volume of clay and total porosity; tracks 7-8 show the logs from RAS tool; Track 9 show saturation OH Vs RAS; Track 10 show the cement in the hole



#### Applications

- Carbon Oxygen (C/O) – saturation monitoring independent of water salinity
- Dual Sigma and C/O
- Oxygen Activation – water flow logging
- Inelastic Gas – advanced gas view

#### Benefits

- Field proven technology
- Full-function pulsed-neutron tool
- Improved reservoir saturation data
- Compact-robust device making it easy for deployment and reduces the potential of failure points
- Versatile and can be configured to suit different conveyancing types and downhole conditions
- Slim-hole tool enabling access through well restrictions

#### Features

- Three detector array that includes time and energy spectra
- High-resolution Lanthanum Chloride detectors
- Shortest reservoir analysis tool string in the industry
- Advanced calibration mechanisms to assure accuracy
- Surface Read-Out (SRO) and memory –operating modes

### System specification

|                      | <b>160°C</b>                   | <b>320°C</b> |
|----------------------|--------------------------------|--------------|
| Temperature rating   | <b>160°C</b>                   | <b>320°C</b> |
| Pressure rating      | 103.4MPa                       | 15,000 psi   |
| Diameter             | 43mm                           | 1 11/16"     |
| Length               | 3573mm                         | 140.7"       |
| Weight               | 20kg                           | 44lb         |
| Measure point - near | 2134mm                         | 84"          |
| Measure point - far  | 2311mm                         | 91"          |
| Measure point - long | 2565mm                         | 101"         |
| Materials            | Corrosion resistant throughout |              |