



## Core Analysis: Reducing Uncertainty

### Aims

Core analysis provides the only direct and quantitative measurement of the intact reservoir properties and should provide the foundation for formation evaluation. Too frequently core analysis planning and programme design are done poorly and the results are often confusing or contradictory. It is conservatively estimated that 50% of special core analysis (SCAL) data are unfit for purpose due to poor data quality or programme design.

This industry-leading, fully independent training course will provide participants with a solid grounding in the acquisition, evaluation and implementation of routine (RCA) and SCAL data. On completion, the participants will be able to design core analysis programmes, recognise and correct questionable data, and will be better placed to appreciate the importance of quality core analysis in integrated studies. The knowledge gained is reinforced by practical sessions and reference to real core analysis reports.

### Benefits

You will learn:

- 🕒 the principal routine and special core analysis methods
- 🕒 about data uncertainties and sensitivities
- 🕒 how to interpret RCA and SCAL reports – both old and new
- 🕒 how to design core test programmes
- 🕒 how to quality control and evaluate RCA and SCAL tests
- 🕒 how to make better use of core analysis data in reservoir models

**“Most relevant and directly applicable course attended to date... and is a must for all petrophysicists and engineers.”**  
**Petrophysicist, Woodside.**



### Who should attend?

Reservoir engineers, geoscientists and petrophysicists who wish to find out more about the principles and practices of core analysis data interpretation, and better appreciate their application in reservoir modelling.

Attendees should be familiar with basic petrophysics and/or reservoir engineering principles, perhaps having used core data.

### Duration

- 🕒 3 days

### Course Instructor

Colin McPhee has almost 30 years' experience in the interpretation of core analysis data for over 50 fields worldwide and has reviewed and quality controlled over 20,000 SCAL measurements.

Colin has worked closely with geoscientists, petrophysicists and reservoir engineers in ensuring that core data used in integrated studies are reliable, robust and representative. He has also been involved in several equity redeterminations which have involved detailed reviews of core data and innovative solutions in SCAL data interpretation.

## Course Description

Modules include:

### Introduction to core analysis

- what we use the data for
- coring and core types
- conventional and unconventional coring methods

### Core damage and its impact

- wettability alteration
- clay damage
- unconsolidated core

### Porosity evaluation

- total and effective porosity from logs and core
- why different core porosity methods give different results and which one to use
- porosity compaction at stress
- pore volume compressibility

### Permeability

- air and Klinkenberg permeability
- measurement methods
- understanding porosity-permeability relationships
- permeability at stress
- absolute-effective permeability conversion
- reconciling core permeabilities with welltests
- permeability averaging and pseudo-PLTs

### Water saturation

- formation factor and cementation exponent,  $m$
- resistivity index and saturation exponent,  $n$
- Waxman-Smits parameters:  $B$ ,  $Q_v$ ,  $m^*$  and  $n^*$
- impact of data uncertainties and sensitivities
- recognising and correcting poor data
- Dean-Stark water saturation measurements and applications

### Capillary pressure and saturation-height modelling

- capillary pressure tests methods – what to expect
- why  $P_c$  data differ
- quality control and when to eliminate data
- integrating and scaling  $P_c$  data
- pitfalls in lab to reservoir-condition  $P_c$  corrections
- saturation-height models from core  $P_c$ : the fundamentals
- how to ensure saturation-height models work

### Relative permeability

- relative permeability theory and interpretation
- endpoints and curves explained!
- when to use Corey exponents and why
- laboratory measurement methods: water-oil, gas-oil, gas-water
- steady-state versus unsteady-state
- reservoir condition experiments
- the importance of wettability
- key steps in improved test design

### Getting better value from core analysis

- SCAL programme design
- lab supervision and management
- “real time” quality control
- lab reporting requirements

To book this course, please contact **Sarah McPhee** - Training Co-ordinator

**Email: [training@senergyworld.com](mailto:training@senergyworld.com)**

Senergy Training Centre 40 Princes Street Edinburgh EH2 2BY United Kingdom

Telephone: +44 131 523 1000 Fax: +44 1224 213453

**[www.senergyworld.com/training](http://www.senergyworld.com/training)**