

Table of Contents

Table of Contents.....	2
1. Introduction	4
2. The Basics.....	5
2.1 The Reservoir	5
2.2 Why Use Log Measurements?.....	6
2.3 What About Core?	6
2.4 Core Calibration – Don’t Do It.....	6
2.5 Objective Setting	7
2.6 Documentation & Audit Trails	9
3.0 Log Measurements	10
3.1 Natural Radiation – Gamma Ray.....	10
3.2 Spontaneous Potential.....	11
3.3 Gamma Scattering – Formation Density	12
3.4 Neutron Scattering – Neutron Log	14
3.5 Sonic Transit Time - Sonic	15
3.6 Formation Resistivity	16
3.7 Nuclear Magnetic Resonance	18
3.8 Formation Pressure	19
3.9 Other Tools	19
3.10 Reliability & Quality control.....	20
4 Core Measurements	21
4.1 What Measurements are Routine?	21
4.2 Grain Density Measurement.....	21
4.3 Porosity & Permeability Measurement.....	21
4.4 Special Core Analyses (SCAL)	22
5. Basic Log Interpretation	23
5.1 Log Preparation	23
5.2 Porosity/Lithology Interpretation	24
5.3 Shale Fraction	28
5.4 Borehole Temperature	28
5.5 Formation Water Resistivity/Salinity	29
5.6 Water/Hydrocarbon Saturation	31
5.7 Net Reservoir Definition	33

6.	Specialised Log Interpretation	36
6.1	Permeability Estimation	36
6.2	NMR Log Integration	42
6.3	Formation Pressure Interpretation	43
6.4	Log Verification Using Core	46
6.5	Determining Likely Mobile Fluid.....	48
6.6	Uncertainty Quantification – Basic Methodology	51
6.7	Probabilistic and Deterministic Petrophysics	55
6.8	Additional Terms	55
	References	63