

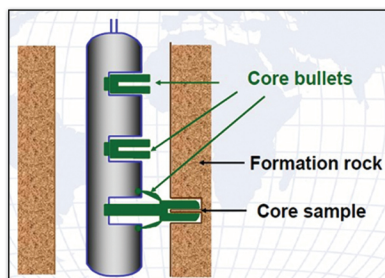
THE MOST COST-EFFECTIVE AND USEFUL TOOL IN YOUR EVALUATION ARSENAL

With over 200 years of combined experience, Weatherford Laboratories' sidewall core analysis team offers an inexpensive and rapid method to determine porosity, permeability, and oil / water saturations. Our experts can explain questionable log responses and also discern pay from non-pay, regardless of mud type. Sidewall cores allow for precise depth control to investigate the petrographic and petrophysical details of your reservoir, ultimately giving you the confidence to make the most informed completion decisions.



BENEFITS OF PERCUSSION CORE SAMPLES

- Residual saturations can be useful in water-based mud systems
- Sample volumes are typically suitable for petrology and geochemistry
- Aid in completion strategies, and evaluate anomalous log response
- Very quick turnaround time

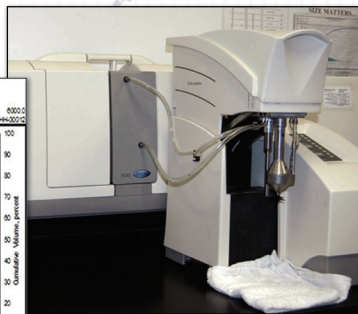
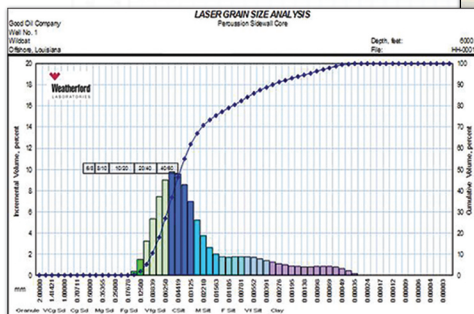


PERCUSSION SIDEWALL CORE ANALYSIS

Sample Depth Feet	Permeability mD	Porosity %	Pore Volume		Prob Prod	Bulk Volume		Comb. Gas	Crit. Water %	QA Factor	Core Lithology
			Saturation			Saturation					
			Oil %	Water %		Oil %	Gas %				
4294.0	2.5	17.7	0.0	78.9	(6)	0.0	3.7	0	70	1	Sd vfg-silt sshy-shy lams vcalc no flu
4296.0	7.1	18.6	0.0	72.0	(6)	0.0	5.2	0	67	1	Sd vfg vsilty sshy lams vcalc no flu
4303.0	525.0	26.8	0.0	65.1	Gas	0.0	9.4	0	38	1s	Sd f-vfg ssilty sshy vcalc no flu
4307.0	130.0	25.9	0.0	61.2	Gas	0.0	10.0	0	50	1s	Sd f-vfg slty shy lams vcalc no flu
4438.0	0.1	15.0	0.0	80.4	(6)	0.0	2.9	0	73	2sf	Sd vfg-silt vshy vcalc no flu
4440.0	105.0	27.7	0.0	69.7	Gas	0.0	8.4	0	54	1s	Sd f-vfg slty shy vcalc no flu
4441.0	125.0	29.9	0.0	68.4	Gas	0.0	9.4	0	53	2s	Sd vfg slty sshy-shy vcalc no flu

GRAIN SIZE ANALYSIS

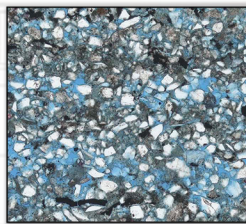
LPSA, GRAVEL PACK DETERMINATION



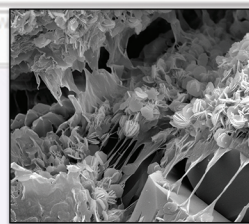
PETROGRAPHIC ANALYSIS

XRD, TS, SEM

- Low Resistivity
- Reservoir Quality
- Fines Migration
- Formation Damage



Thin Section (TS)



Scanning Electron Microscopy (SEM)

Sample Number	Sample Depth (ft)	CLAYS				CARBONATES				OTHER MINERALS								TOTALS	
		Chlorite	Kaolinite	Illite/Mica	Mix I/S*	Calcite	Dolomite	Dolomite/(Fe/Ca)*	Siderite	Quartz	K-spar	Plag.	Pyrite	Apatite	Bartite**	Clays	Carb.	Other	
1	2947.0	2	12	2	3	Tr	1	1	9	49	14	5	2	0	0	19	12	69	
2	3091.0	2	21	2	1	Tr	1	1	13	37	15	3	4	0	0	26	16	58	
3	3135.0	Tr	1	Tr	1	Tr	1	Tr	Tr	86	8	2	Tr	0	Tr	2	2	96	
4	3152.0	Tr	2	Tr	1	Tr	1	Tr	0	84	9	2	1	0	Tr	3	1	96	
5	3164.0	3	1	4	Tr	1	Tr	1	1	78	8	2	1	0	0	9	3	88	
6	3168.0	1	9	2	3	Tr	Tr	1	3	65	11	3	2	0	0	15	5	80	
7	3172.0	2	9	2	4	1	Tr	1	3	59	12	5	2	0	0	17	6	77	
8	3176.0	4	24	2	25	Tr	Tr	Tr	2	21	8	4	10	0	0	55	3	42	
9	3202.0	4	22	5	42	Tr	Tr	Tr	2	11	7	4	3	0	0	73	2	25	
10	3204.0	8	Tr	12	9	8	Tr	Tr	Tr	37	8	3	3	0	0	33	17	60	
11	3208.0	Tr	2	1	Tr	1	0	1	0	78	12	5	Tr	0	Tr	4	2	94	
12	3210.0	Tr	3	Tr	2	Tr	1	1	34	46	10	2	1	0	0	6	36	58	
AVERAGE		2	9	3	8	1	1	1	6	53	10	3	2	0	0	22	9	69	

X-Ray Diffraction (XRD)

SCAL / FORMATION DAMAGE

CAPILLARY SUCTION TIME

- Measures Rock / Fluid Interaction
- Determines Most Compatible Fluid

ACID SOLUBILITY

- Determines Rock Solubility
- Effectiveness of Acid

