

### Well Identification:

API#	AREA	BLOCK	OPERATOR	WELL NAME	
55141000050000	BEAUFORT SEA	724	AMOCO Production	OCS Y-0917 BELCHER 1 ST00BP00	
LATITUDE	LONGITUDE	KB	WATER DEPTH	GEO DATUM	ZONE
70° 16' 30.5"	-141° 30' 47.5"	66	-169	NAD83	10

### Overview

The Belcher 1 was spud as an exploratory well on October 26<sup>th</sup>, 1988 and located in the Beaufort Sea off the North Slope. The operator reported no commercial hydrocarbons were discovered at this location, and was plugged and abandoned. The comprehensive analytical data collection program included well logging and rotary sidewall coring provided by Schlumberger and drill cutting samples collected by EXLOG. Collected samples were analyzed by Core Laboratories, and MicroPaleo Consultants for lithology, fluid saturation, pore volume, and hydrocarbon source generation.

### Geologic Intervals used for Analysis:

Age/Period	Stratigraphy	Top	Source	Comments
Miocene		238	Geologic Markers	Form MMS-332  TIMS_DOCS_TRIMMED
Oligocene		1720	Geologic Markers	
Eocene		2110	Geologic Markers	
Paleocene		5640		

### Logging Runs and Parameters:

LOGGED INTERVAL	TOP ft	BASE ft	TEMP degF	BITSIZE in	MWIN ppg	RM ohmm	WIRELINE RUNS												
							RUN#	GR	DLL	DIL	NUC	SON	VSP	DIP	MICRO	SGR	SP	TEMP	RFT
1	2010	3977	66	26	12.6	0.155	1	X	X			X			X			X	
							2	X				X						X	
							3	X			X					X		X	
2	3985	8599	163	17.5	12.6	0.134	1	X	X						X			X	
							2	X				X							
3	8552	13157	250	8.5	15.2	0.157	1	X	X						X		X		
							2	X								X			
							3	X					X						
							4												X
							5					X							

LOGGED INTERVAL	TOP ft	BASE ft	TEMP degF	BITSIZE in	MWIN ppg	RM ohmm	LWD RUNS			
							RUN#	GR	RES	NUC
1	3987	7726	126	12.25	12.6	0.17	1	X	X	X
	7726	8601	135	12.25	12.6	0.17	2	X	X	X
2	8554	10938	194	8.5	12.1	0.1	3	X	X	X
	10938	12197	213	8.5	13.7	0.1	4	X	X	X
	12197	13150	225	8.5	14.6	0.1	5	X	X	X

### Cored Intervals and Sample Analysis:

TOP ft	BASE ft	WHOLE CORE ft	TOP ft	BASE ft	SWS CORE #REC
		ROUTINE SCAL			ROUTINE SCAL
			2129	3940	90 3
			4000	8600	63
			8621	13104	122 31

### Log Discussion:

The Belcher 1 well was drilled and logged with water-based drilling fluid containing Barite weighting material to total depth. Subsequent borehole sections were drilled with additional Barite to increase the borehole fluid pressure overbalance. All borehole sections required environmental corrections for hole size, temperature, pressure, and mud weight additives.

### Environmental Corrections:

The Schlumberger 2000 Edition chartbook was used to correct the logs for borehole size, temperature, pressure, and drilling mud additives. The Gamma Ray log was corrected using chart GR-1. Compensated Neutron log was corrected using Por-14c and Por -14d. Dual Laterolog Resistivity logs were corrected using Rcor-2c and invasion corrected using Rint-9b. Dual Induction logs were corrected using Rcor-4a and invasion corrected using Rint-10.

Minor caliper enlargements were observed in various sections of the well, in cases where the borehole caliper readings were above the correction charts, the maximum chart correction was applied, however these corrections under estimate the true formation measurement.

The bulk density measurement was the most environmentally affected log in the dataset, where the density log readings measured drilling fluid when the caliper reading exceed 16 inches. Repair of the density log utilized a Gardner et al. (1974) sonic to density transform.

### Observations Logged Interval 1

Observed some minor caliper readings where density log was affected, however most of the logged interval showed the borehole was in decent condition and required editing using the Gardner<sup>1</sup> density transform. Sonic log data was compared to the Faust<sup>4</sup> velocity transform to correct anomalies in borehole washouts. Logged intervals where the bulk density was not present the delta-t sonic was used as the porosity model input to the final computed results.

### References

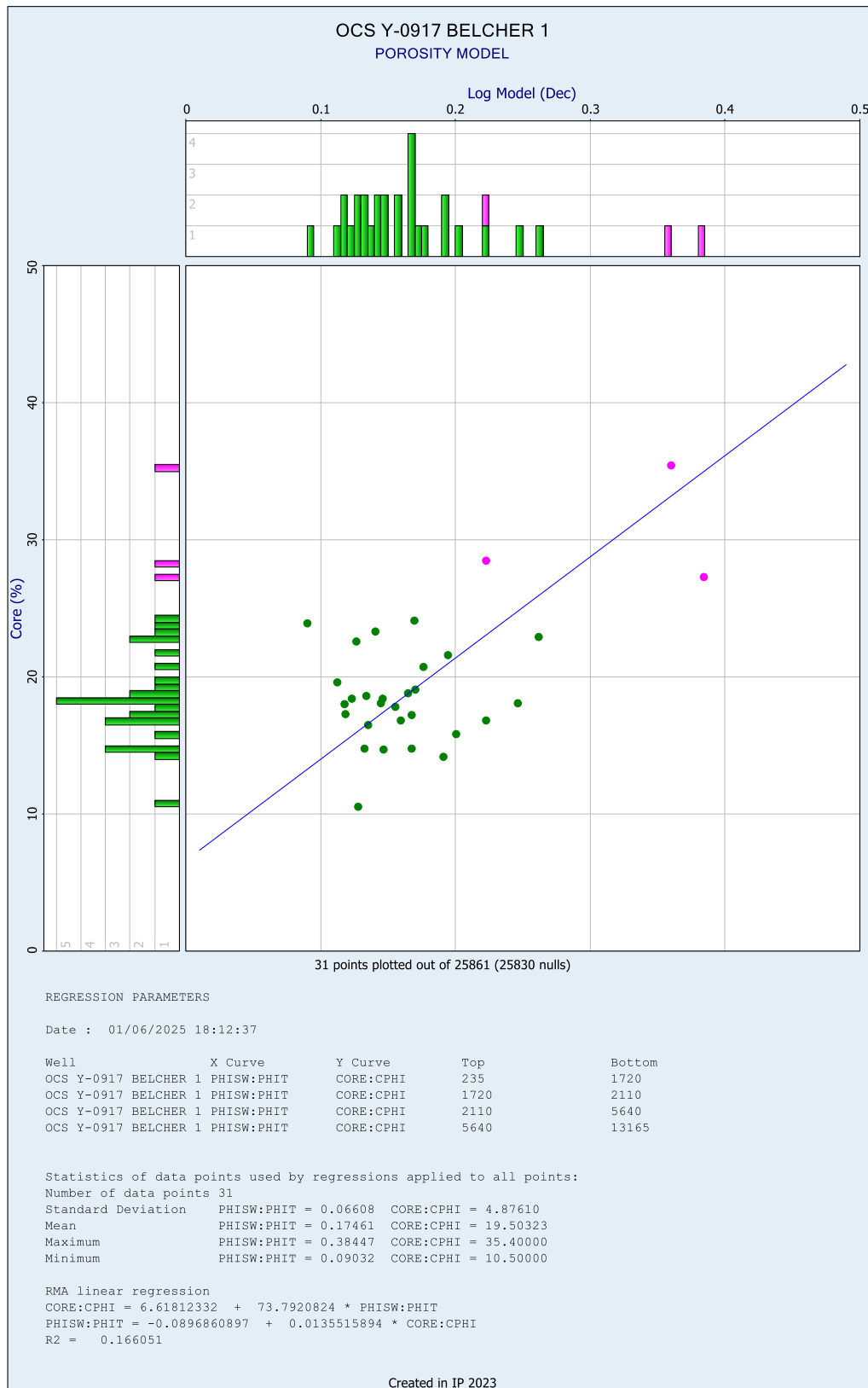
1. Gardner et al., 1974, Formation velocity and density—the diagnostic basics for stratigraphic traps Geophysics, 39 (6) (1974), pp. 770-780
2. Graton, L. C., and H. J. Fraser, 1935, Systematic packing of spheres with particular reference to porosity and permeability: Journal of Geology, v. 43, p. 785–909, DOI: 10.1086/jg.1935.43.issue-8
3. Carmichael, R.S. ed. 1982. Handbook of Physical Properties of Rocks, Vol. 2, 1-228. Boca Raton, Florida: CRC Press Inc.
4. L. Y. Faust, “A Velocity Function Including Lithologic Variation,” Geophysics, Vol. 18, No. 2, 1953, pp. 271-288.

### Summation Report:

RESERVOIR SUMMARY											
Zone	Zone Name	Top	Bottom	Gross	Net	N/G	AvPhi	AvSw	AvVcl	Phi*H	PhiSo*H
1	ORIGINAL BOREHOLE	235	13165	12930	1175	0.091	0.329	0.467	0.36	387	206.47

Reservoir summary cut off values used were porosity greater than 20% (PHIE > 0.2), shale volume less than 40% (VSHALE < 0.4), and water saturation less than 50% (SW < 0.5).

**Core versus Log Porosity Crossplot:**



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