

### Well Identification:

API#	AREA	BLOCK	OPERATOR	WELL NAME	
55201000040100	Beaufort Sea	560	SHELL OIL COMPANY	OCS Y-0197 TERN 3 ST00BP00	
LATITUDE	LONGITUDE	KB	WATER DEPTH	GEO DATUM	ZONE
70° 16' 46.3"	-147° 29' 44.9"	47	-21	NAD83	6

### Overview

The TERN 3 was spud as an exploratory well on February 9<sup>th</sup>, 1987 and located in the Beaufort Sea off the North Slope. The operator reported hydrocarbons discovered at this location, and the well was plugged and abandoned. The analytical data collection program included well logging by Schlumberger, cores, and drill cutting samples collected by Baroid.

### Geologic Intervals used for Analysis:

Age/Period	Stratigraphy	Top	Source	Comments
Miocene	SAGAVANIRKTOK	64		
Oligocene		4929		
Eocene		6902		
Paleocene		7410		
Cretaceous	COLIVILLE	9215		
	SEABEE SHALE	11948		
	PEBBLE CHALE	12569		
	PUT RIVER SILT	12875		
	PUT RIVER CONG	12916		
Mississippian	KEKIKTUK	12963		
	OWC	13152		
	1A_BASE	13323		
Devonian	BASEMENT	14330		

### 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	164	2610	17.5				0												
2	2610	12906	174	12.25	10.8	2.84	1	X		X		X			X		X		
							2	X			X								
							3	X						X		X		X	
3	12906	14650	221	8.5	10.5	2.26	1	X		X		X					X		
							2	X			X				X				
							3	X											X
							4												

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### Cored Intervals and Sample Analysis:

TOP ft	BASE ft	WHOLE CORE ft	ROUTINE	SCAL	TOP ft	BASE ft	SWS CORE #REC	ROUTINE	SCAL
12915	12951	35							
12951	13009	56							
13009	13055	37							
13005	13079	20							
13079	13113	33							
13113	13186	73							
13186	13229	43							
13229	13237	8							
13237	13243	3							
13243	13281	31							
13281	13310	28							
13310	13326	15							
13326	13342	16							
13342	13364	19							

### Log Discussion:

The TERN 3 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.

Some 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

Observed some significant caliper readings where density log was affected, occasional coal seems, the logged interval showed the bulk density 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.

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## 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.

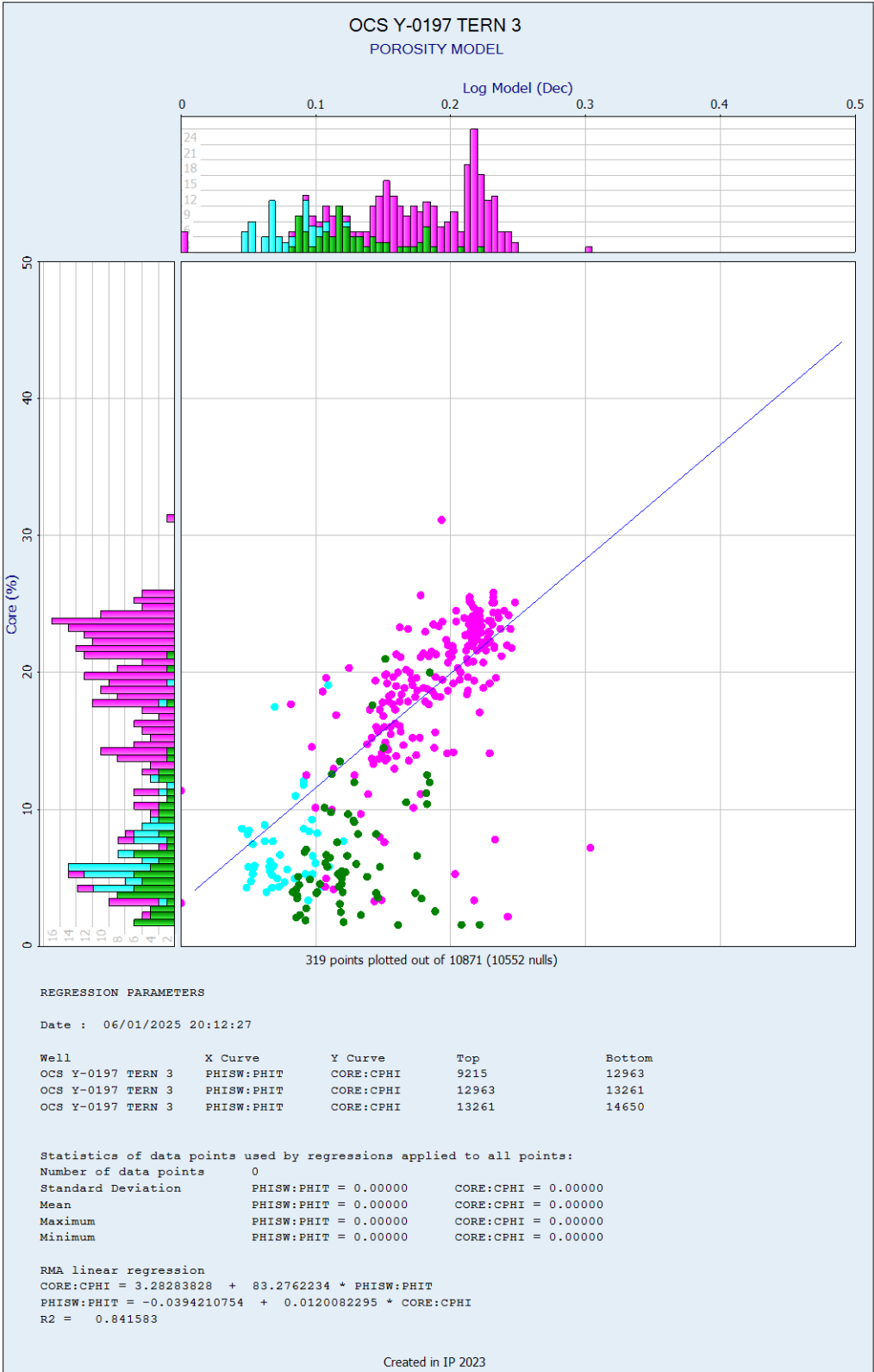
## Summation Report:

RESERVOIR SUMMARY											
Zone	Zone Name	Top	Bottom	Gross	Net	N/G	Av Phi	Av Sw	Av Vcl	Phi*H	PhiSo*H
1	ORIGINAL BOREHOLE	47	14650	14603	303.5	0.021	0.167	0.117	0.14	50.67	44.73

Reservoir summary cut off values used were porosity greater than 10% (PHIE > 0.1), shale volume less than 50% (VSHALE < 0.5), and water saturation less than 50% (SW < 0.5).

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Core versus Log Porosity Crossplot:



Report Date:

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Report Date: