

Well Identification:

API#	AREA	BLOCK	OPERATOR	WELL NAME	
55201000090000	Beaufort Sea		BPX OPERATING COMPANY	OCS Y-1650 LIBERTY #1 ST00BP00	
LATITUDE	LONGITUDE	KB	WATER DEPTH	GEO DATUM	ZONE
70° 16' 44.2"	-147° 29' 57.9"	44	-21	NAD83	6

Overview

The Liberty 1 was spud as an exploratory well on February 8th, 1997 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 and drill cutting samples collected by Sperry Sun.

Geologic Intervals used for Analysis:

Age/Period	Stratigraphy	Top	Source	Comments
Tertiary	SAGAVANIRKTOK FM	40		
	GH_Srfc_Top_Interval	1000		
	IBPF_Srfc_Bot	1717		
	GH_Srfc_Bot_Interval	3000		
	MIKKELSEN TONGUE OF CANNING	4950		
	STAINES TONGUE OF SAGAVANIRKTOK	7887		
Cretaceous	CANNING FM	9860		
Devonian	BASEMENT	14750		

Logging Runs and Parameters:

LOGGED	TOP	BASE	TEMP	BITSIZE	MWIN	RM	LOGGING RUNS												
INTERVAL	ft	ft	degF	in	ppg	ohmm	RUN#	GR	DLL	DIL	NUC	SON	VSP	DIP	MICRO	SGR	SP	TEMP	RFT
1	44	5008	40	13.5	9.3	2.17	1	X		X									
2	5008	10870	212	9.875	10.5	0.071	1	X		X	X	X			X		X	X	
3	13804	14804	204	6.75	9.8	0.419	1	X		X	X	X			X		X	X	

Cored Intervals and Sample Analysis:

No Core Data

Log Discussion:

The Liberty 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.

Report Date:

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

Observed some significant caliper readings where density log was affected, occasional coal seams, the logged interval showed the bulk density required editing using the Gardner¹ density transform. Sonic log data was compared to the Faust⁴ 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

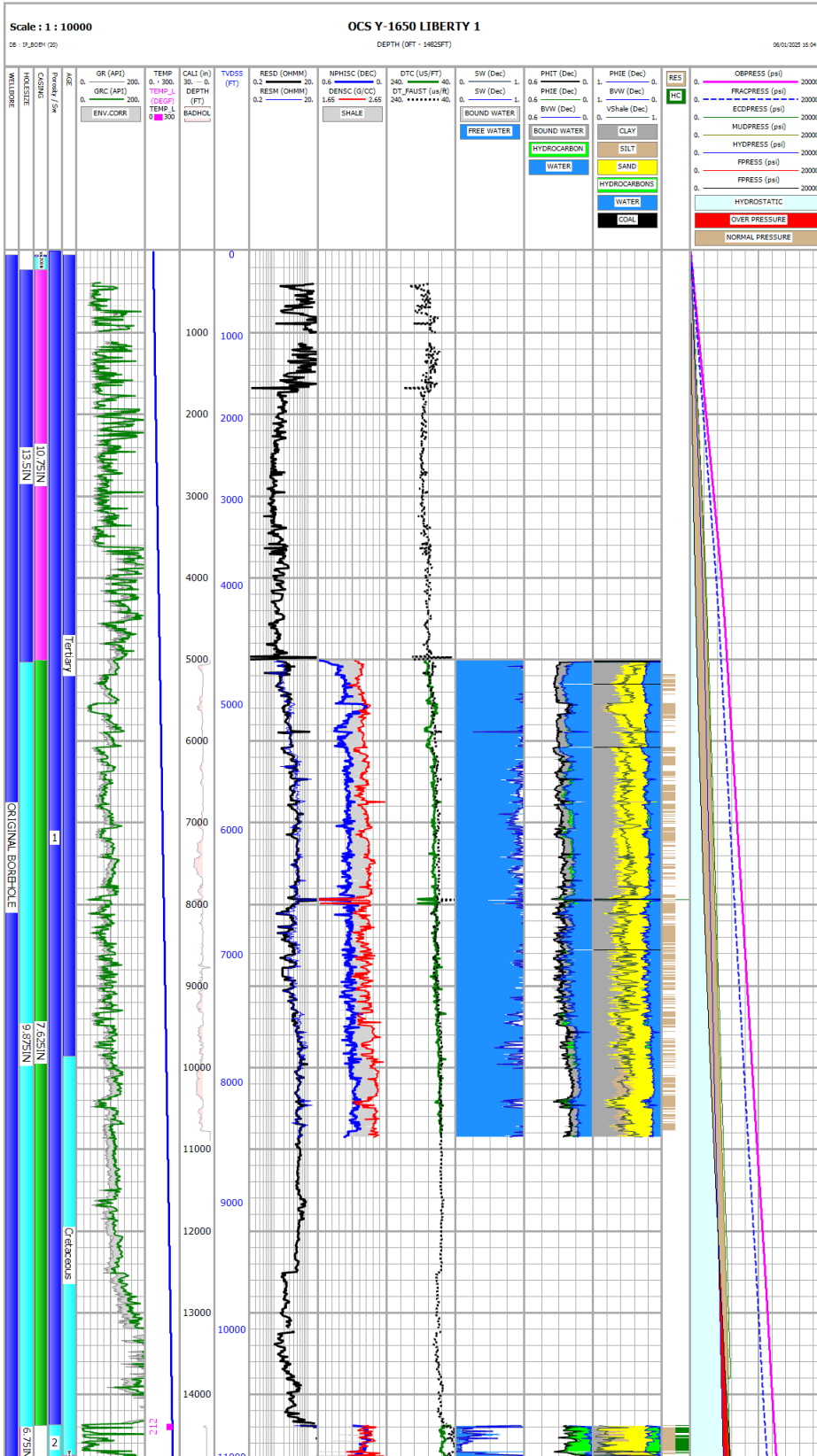
1. Gardner et al., 1974, Formation velocity and density—the diagnostic basics for stratigraphic traps Geophysics, 39 (6) (1974), pp. 770-780
2. Graton, L. C., and H. J. Fraser, 1935, Systematic packing of spheres with particular reference to porosity and permeability: Journal of Geology, v. 43, p. 785–909, 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	Av Phi	Av Sw	Av Vcl	Phi*H	PhiSo*H
1	ORIGINAL BPREHOLE	44	14825	14781	306	0.021	0.192	0.145	0.151	58.89	50.37

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).

Summary Plot:



Report Date: