Well Identification:

API#	AREA	BLOCK	OPERATOR	WELL NAME	
55367000060000	ST GEORGE EAST	631	ARCO Alaska Inc.	OCS Y-0511 SEGULA 1	ST00BP00
LATITUDE	**LONGITUDE**	**KB**	**WATER DEPTH**	**GEO DATUM**	**ZONE**
56° 20' 38.7"	-167° 19' 53.3"	85	-390	NAD83	5

Overview

The Segula 1 was spud as an exploratory well on November 7th, 1984 and located in the Bering Sea of the St. George Basin. The operator reported no commercial hydrocarbons were discovered at this location, the well was subsequently side tracked with the Segula 1A wellbore, and both wellbores were plugged and abandoned. The comprehensive analytical data collection program included well logging and rotary sidewall coring provided by Schlumberger, whole coring, and drill cutting samples collected by EXLOG. Collected samples were analyzed by Core Laboratories, AGAT Consultants, and MicroPaleo Consultants for lithology, fluid saturation, pore volume, and hydrocarbon source generation.

Geologic Intervals used for Analysis:

Interval	Top	Source
Pleistocene	1800	Palynology Report
Pliocene	2600	Palynology Report
Late Miocene	4010	Palynology Report
Miocene	6800	Palynology Report
Oligocene	7900	Palynology Report
Eocene	9600	Palynology Report
Jurassic	10130	Palynology Report

Logging Runs and Parameters:

LOGGED	TOP	BASE	TEMP	BITSIZE	MWIN	RM	WIRELINE RUNS												
INTERVAL	ft	ft	degF	in	ppg	ohmm	RUN#	GR	DLL	DIL	NUC	SON	VSP	DIP	MICRO	SGR	SP	TEMP	RFT
1	1471	5000	110	12.25	9.2	0.323	1	X	X						X		X		
							2				X					X			
							3	X				X							
							4	X				X							
							5							X				X	
							6												
2	5000	10754	208	12.25	9.7	2.85	1	X		X					X		X		
	5000	10512					2	X			X								
							3						X						
							4					X							
							5							X					
	10100	10812					6	X			X								
							7												

Cored Intervals and Sample Analysis:

TOP	BASE	WHOLE CORE			TOP	BASE	PSWC		
ft	ft	REC ft	ROUTINE	SCAL	ft	ft	#REC	ROUTINE	SCAL
7867	7895	30	16	13	1800	5000	79	23	6
8868	8893	25	4	3	5000	10710	209	56	31

Log Discussion:

The Segula 1 well was drilled and logged with sea water-based drilling fluid containing Barite weighting material to 5000 feet measured depth. Subsequent borehole sections were drilled with generic #6 water-based drilling fluid also weighted with 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.

Significant 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. Subsequently, run 6 of logging interval 2 had the bow spring removed from the density tools to log past a washed-out shoulder bed, those reading are completely unreliable. Repair of the density log utilized a Gardner et al. (1974) sonic to density transform.

Observations Logged Interval 1

Observed some high caliper readings, however most of the logged interval showed the borehole was in decent condition and required little editing using the Gardner[1] density transform. Core Porosity measurements from the lab are very high with some results above the upper limit of perfectly sorted spherical grains, Graton and Fraser[2]. Sonic log travel-time was observed faster than the mud slowness arrival for seawater-based drilling fluid at 189 us/ft from Carmichael[3]. Sonic log data was compared to the Faust[4] 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.

Observations Logged Interval 2

Observed excessive caliper readings and large chartbook corrections were applied over large sections of the logged interval. Much of the Bulk Density measurement was reconstructed using the Gardner[1] density transform.

References

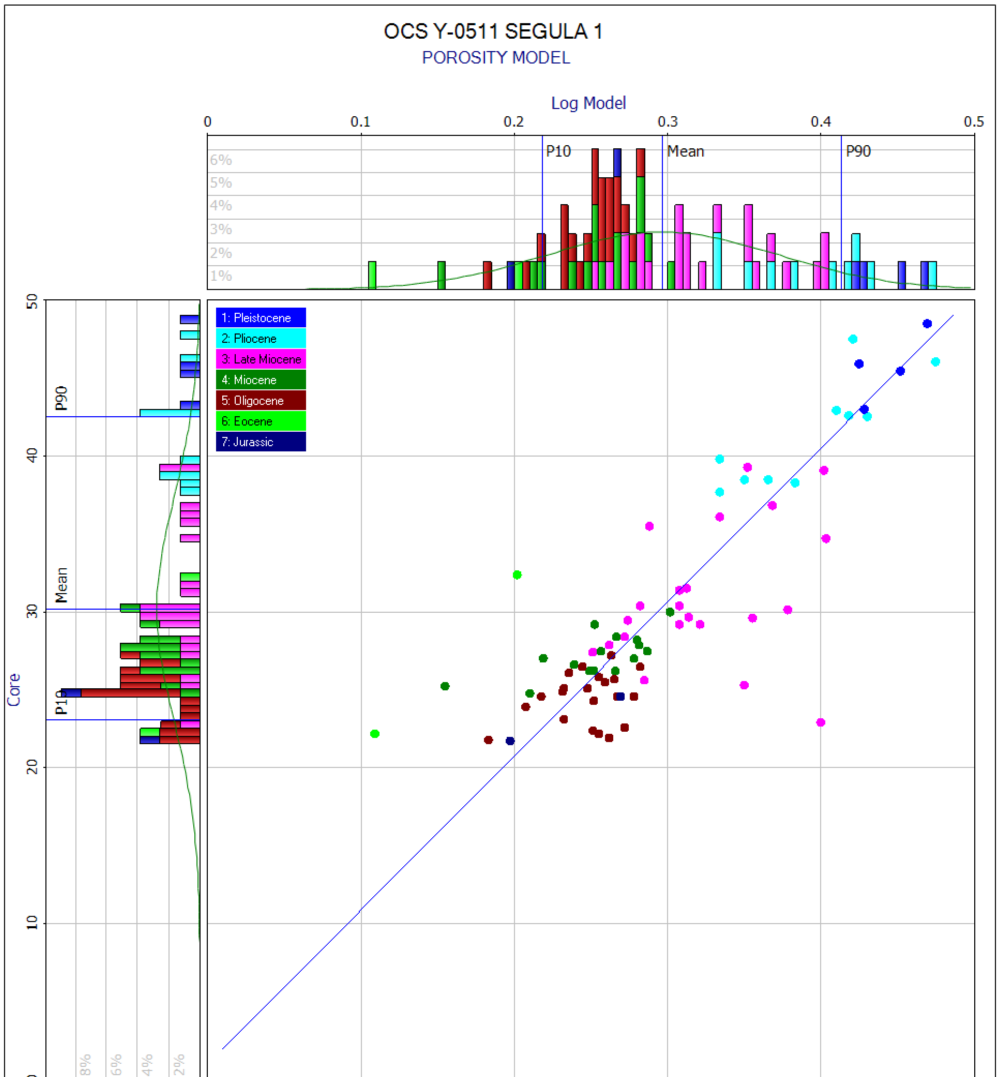
1. Gardner et al., 1974, Formation velocity and density—the diagnostic basics for stratigraphic traps Geophysics, 39 (6) (1974), pp. 770-780
2. Graton, L. C., and H. J. Fraser, 1935, Systematic packing of spheres with particular reference to porosity and permeability: Journal of Geology, v. 43, p. 785–909, 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	390	10774	10384	6182.5	0.595	0.334	0.973	0.322	2062.39	54.73

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:



77 points plotted out of 18121 (1 outliers, 18043 nulls)

REGRESSION PARAMETERS

Date : 10/04/2024 20:01:29

Well	X Curve	Y Curve	Top	Bottom
OCS Y-0511 SEGULA 1	Msol:PhiT	RSWC:CPHI	1800	2600
OCS Y-0511 SEGULA 1	Msol:PhiT	RSWC:CPHI	2600	4010
OCS Y-0511 SEGULA 1	Msol:PhiT	RSWC:CPHI	4010	6800
OCS Y-0511 SEGULA 1	Msol:PhiT	RSWC:CPHI	6800	7900
OCS Y-0511 SEGULA 1	Msol:PhiT	RSWC:CPHI	7900	9600
OCS Y-0511 SEGULA 1	Msol:PhiT	RSWC:CPHI	9600	10130
OCS Y-0511 SEGULA 1	Msol:PhiT	RSWC:CPHI	10130	10860

Statistics of data points used by regressions applied to all points:

Number of data points	78	
Standard Deviation	Msol:PhiT = 0.07576	RSWC:CPHI = 7.47720
Mean	Msol:PhiT = 0.29833	RSWC:CPHI = 30.46667
Maximum	Msol:PhiT = 0.47420	RSWC:CPHI = 51.50000
Minimum	Msol:PhiT = 0.10876	RSWC:CPHI = 21.70000

RMA linear regression
RSWC:CPHI = 1.02198676 + 98.6978633 * Msol:PhiT
Msol:PhiT = -0.0103546999 + 0.0101319316 * RSWC:CPHI
R2 = 0.680839

Created in IP 2023

Summary Plot: