

WELL DATA

OPERATOR: Cardinal Petroleum Company

WELL NAME: No. 4X Funk

LOCATION: NW SW SE (990' FSL & 330' FWL of SE 1/4) of Section 21
T2N, R36W, Morgan County, Colorado

FIELD: Bonar Field

STATUS: "D" Sand Producer

ELEVATION: 4664' Ground (Powers)
4671' Kelly Bushing
(All depths used in report are from Kelly Bushing)

CONTRACTOR: Stuarco Drilling Company, Rig No. 7

SPUD DATE: May 20, 1967

CASING: Set 4 joints of 8 5/8" surface casing at 140' KB, cemented
to surface with 95 sacks.
Set 185 joints of 4 1/2" production casing at 5968' with
200 sacks.

TOTAL DEPTH: 5970' Driller
3965' Lane Wells

Note: A correlation of the core with the log shows the actual
TD to be 5968'.

LOGS RUN: Lane Wells IES Log 140' to 5965'
Lane Wells Minilog 5800' to 5964'

CORES: Core No. 1 5915' to 5941' ("D" Sand)
(Corrected to Lane Wells measurements)
Cut 26' - Recovered 25'

DRILL STEM TESTS: No drill stem tests were run.

END PAGE
AVAILABLE

II

WELL HISTORY

- 5/20/67** Moved in and spudded. Drilled 12 1/4" hole to 150'. Deviation is 1/4° at 150'. Ran 4 joints of 8 5/8" surface casing to 140' KB, cemented to surface with 95 sacks. Plug down at 2:30 P.M.
- 5/21/67** Drilled 7 7/8" hole to 3500' with water. Pulled Bit No. 1 at 3070'. The deviation is 1/2° at 800', 3/4° at 1560', 1 1/2° at 2000', 1/2° at 2785' and 3/4° at 3070'. Added 250 lbs. Oilfoc.
- 5/22/67** Drilled 7 7/8" hole to 5060'. Pulled Bit No. 2 at 4212'. The deviation is 1 3/4° at 3900', 2 1/4° at 4212', 1 3/4° at 4582' and 1° at 4896'. Mudded up with 3 ex. gel, 200 lbs. caustic, 300 lbs. quebracho, 200 lbs. soda ash, 50 lbs. Oilfoc and 20 gals. DD. Mud weight is 9.3 lbs. and funnel viscosity is 42.
- 5/23/67** Drilled 7 7/8" hole to 5750'. Pulled Bit No. 3 at 5284' and Bit No. 4 at 5706'. The deviation is 1/2° at 5284' and 1° at 5701' (corrected). The strapped drill pipe is 5701' and the board is 5706'. Correction is made. Added 89 ex. gel, 75 lbs. caustic, 150 lbs. quebracho and 75 lbs. soda ash. Mud weight is 9.2, funnel viscosity is 56, water loss is 5.2 and PH is 9.5. Geologist arrives at well.
- 5/24/67** Drilled 7 7/8" hole to 5917' (5915' Lane Wells). Pulled Bit No. 5 at 5917'. Added 18 ex. gel, 50 lbs. caustic, 100 lbs. quebracho and 50 lbs. soda ash. Mud weight is 9.9, funnel viscosity is 87, water loss is 5.0 and PH is 9.5. Cored 7 27/32" hole from 5915' to 5941' (Lane Wells). Cored 26' and recovered 25'. See Part III for details.
- 5/25/67** Drilled 7 5/8" hole to TD of 5970'. Added 25 lbs. caustic, 50 lbs. quebracho and 25 lbs. soda ash. Mud weight is 9.9 and funnel viscosity is 75. Circulated 1 1/2 hours for samples at TD. Ran Lane Wells IES and Minilog. Geologist left well. Ran 185 joints of 4 1/2" production casing, cemented with 200 sacks. Plug down at 9:30 P.M. Rig released at 10:00 P.M.

III

LITHOLOGY

Note: Corrected to Lane Wells measurements.

5900-5915 Shale, dark gray.

"D" Sand

Core No. 1 5915' - 5941' Cut 26' - Recovered 25'

Coring time in minutes per foot:

5915-16 - 27	5924-25 - 29	5933-34 - 25
5916-17 - 31	5925-26 - 44	5934-35 - 15
5917-18 - 25	5926-27 - 19	5935-36 - 17
5918-19 - 25	5927-28 - 25	5936-37 - 26
5919-20 - 26	5928-29 - 11	5937-38 - 30
5920-21 - 25	5929-30 - 17	5938-39 - 29
5921-22 - 13	5930-31 - 12	5939-40 - 45
5922-23 - 22	5931-32 - 21	5940-41 - 40
5923-24 - 21	5932-33 - 21	

CORE DESCRIPTION

Core No. 1	5915' to 5941'	Cut 26' - Recovered 25'
5915-5921	(6')	Shale, dark gray to black, silty in part.
5921-5924	(3')	Sandstone, brown, fine grain, poor porosity and permeability, some carbonaceous laminae, <u>good even stain, excellent fluorescence.</u>
5924-5926	(2')	Sandstone, brown, fine grain, poor porosity and permeability, clean, <u>good even stain, excellent fluorescence, bleeding oil from the bottom 6 inches.</u>
5926-5926.50	(.50')	Sandstone, brown, fine grain, low porosity and permeability, numerous carbonaceous laminae, <u>good stain and excellent fluorescence in the sandstone.</u>
5926.50-5930.50	(4')	Sandstone, brown, fine grain, poor porosity and permeability, hard, clean, <u>good even stain, excellent fluorescence.</u>
5930.50-5931	(.50')	Shale, black.
5931-5931.50	(.50')	Sandstone, brown, fine grain, low to poor porosity and permeability, clean, <u>good even stain, excellent fluorescence.</u>

BEST IMAGE
AVAILABLE

5931.50-5931.75	(.25')	Shale, black.
5931.75-5932.50	(.75')	Sandstone, brown, fine grain, poor porosity and permeability, clean, VF, <u>good even stain, excellent fluorescence.</u>
5932.50-5934	(1.50')	Sandstone, brown, fine grain, low porosity and permeability, numerous wavy carbonaceous laminae, <u>good stain and excellent fluorescence in sandstone.</u>
5934-5934.50	(.50')	Sandstone, brown, fine grain, poor porosity and permeability, hard, clean, VF, <u>good stain, excellent fluorescence.</u>
5934.50-5936	(1.50')	Sandstone, brown, fine grain, low porosity and permeability, wavy, carbonaceous laminae, <u>many streaks of good stain and fluorescence,</u> but a few barren streaks.
5936-5940	(4')	Shale, black.

SAMPLES:

5941-5968	Shale, dark gray to black.
5968	<u>Circulated One and One-half Hours</u>
	Shale, dark gray to black.

CORE ANALYSIS

by

Core Lab
Sterling, Colorado

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS		POROSITY PERCENT	RESIDUAL SATURATION	
		Horizontal	Vertical		% oil sat.	% water sat.
1	5921-22	18.0	15.0	15.8	16.4	38.6
2	5922-23	65.0	60.0	16.7	15.0	38.3
3	5923-24	44.0	30.0	16.3	16.5	35.6
4	5924-25	68.0	64.0	16.3	18.4	34.3
5	5925-26	43.0	8.6	18.1	18.2	39.8
6	5926-27	71.0	62.0	17.0	18.2	36.5
7	5927-28	73.0	63.0	17.2	15.7	43.5
8	5928-29	47.0	44.0	17.1	16.9	43.9
9	5929-30	100.0	83.0	19.0	18.4	41.0
10	5930-31	15.0	12.0	13.2	19.7	32.6
11	5931-32	< 0.1	< 0.1	2.5	8.0	44.0
12	5932-33	14.0	12.0	10.6	12.2	33.0
13	5933-34	3.3	0.6	10.9	11.0	44.0
14	5934-35	7.0	5.7	9.4	17.0	26.6
15	5935-36	6.5	4.8	8.0	11.2	25.0


A. L. Bergren, Jr.
BEST IMAGE
AVAILABLE

BIT RECORD:

<u>NO.</u>	<u>SIZE</u>	<u>MAKE</u>	<u>TYPE</u>	<u>JETS</u>	<u>IN</u>	<u>OUT</u>	<u>FOOTAGE</u>	<u>HOURS</u>
A	12 1/4"	Varel	VH3G	11/16"	0	150	150	1 1/4
1	7 7/8"	Varel	V38J	1/2"	150	3070	2920	16 1/2
2	7 7/8"	Varel	V38	11/16"	3070	4212	1142	11
3	7 7/8"	Varel	V38	11/16"	4212	5284	1072	15 1/4
4	7 7/8"	Varel	V38	11/16"	5284	5706	422	11 1/2
5	7 7/8"	Varel	V38	11/16"	5706	5917	211	5 1/4
6	7 27/32"	CDC	Core		5917	5943	26	10 3/4
7	7 5/8"	Varel	V2	11/16"	5943	5970	27	2 3/4

MUD RECORD:

<u>DATE</u>	<u>GEL</u>	<u>CAUSTIC</u>	<u>QUEBRACHO</u>	<u>SODA ASH</u>	<u>OILFOG</u>	<u>DD</u>
5/21/67					250 lbs.	
5/22/67	3 ex.	200 lbs.	300 lbs.	200 lbs.	50 lbs.	20 gals.
5/23/67	89 ex.	75 lbs.	150 lbs.	75 lbs.		
5/24/67	18 ex.	50 lbs.	100 lbs.	50 lbs.		
5/25/67		25 lbs.	50 lbs.	25 lbs.		
<hr/>						
TOTAL	110 ex.	350 lbs.	600 lbs.	350 lbs.	300 lbs.	20 gals.

FORMATION TOPS: (Adjusted to Lane Wells measurements) Elevation: 4664' GR
4671' KB

Niebrara	5132	(- 461)
Ft. Hays	5465	(- 794)
Carlile	5509	(- 838)
Bentonite	5816	(-1145)
"D" Sand	5914	(-1243)
"D" Pay Zone	5921	(-1250)

Total Depth - 5970' Driller 5965' Lane Wells

BEST IMAGE
AVAILABLE