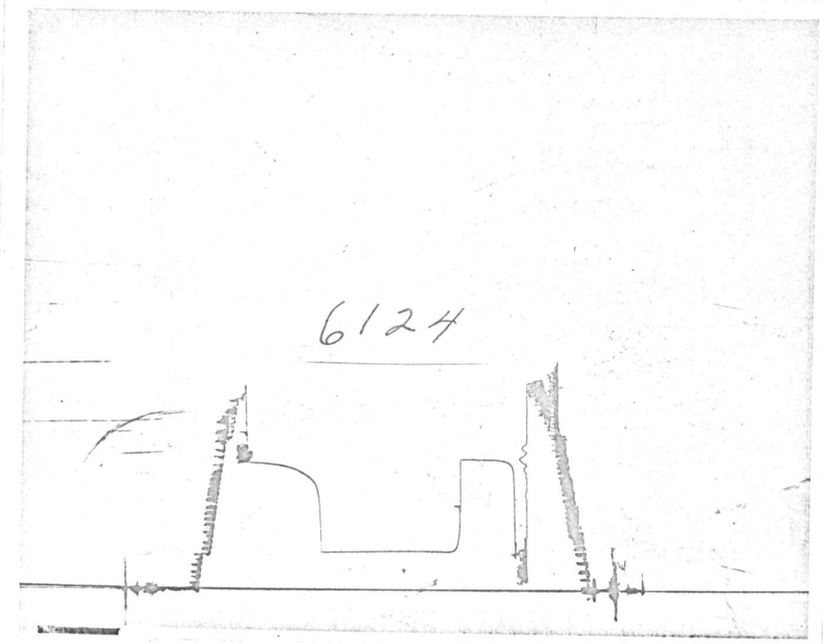
SUN

OIL WELL CEMENTING INC.

Date 12/11/68 **DRILL STEM TEST RECOVERY REPORT** Ticket No. 6124



Company American Drlg. Contractor American Drlg.

Well No. 1 Lease Bartunek County Ellsworth Sec. 4 Twp 14 Rng 10

Test No. 1 Size Hole 7 7/8 Packer Size 6 3/4 Drill Pipe Size 4½ F. H.

Interval Tested From 2100 To 2185 Depth of Well 2185 Size Choke 5/8

Fluid Recovered In _____ Temp. 88 Elev. _____

Initial Hyd. 1216 P.S.I

Final Hyd. _____ P.S.I.

First Initial Flow Pressure 239 P.S.I.

Opened Tool 12:30 ~~AM~~ P.M.

First Final Flow Pressure _____ P.S.I.

First Flow Pres. 10 Min.

Initial Closed-in Pressure 789 P.S.I.

Initial Closed-in Pres. 45 Min.

Second Initial Flow Pressure 239 P.S.I.

Second Flow Pres. 120 Min.

Second Final Flow Pressure _____ P.S.I.

Final Closed-in Pres. 60 Min.

Final Closed-in Pressure 761 P.S.I.

Blow Strong Thru-Out Test

Recovery Gas To Surface In 3 Min. Ga. On Initial Flow 481,000

Ga. On Final Flow 887,000 In 15-30-45-60-75-Min. Ga. 857,000 In 90-120 Min.

240' Gas Cut Mud B. T. U. 662.9

Remarks _____

Approved By Grant Tester Philbern

150

Gas Production

B.T. Gauge Numbers			Ticket Number		6124
Initial Hydrostatic		Pressure 1216	Elevation		ft.
Final Hydrostatic		1216	Production Rate	Intial	481 m cu. ft.
1st Flow Initial	Time — — — —	232		Final	857 m cu. ft.
1st Flow Final	10	232	Hole Size		7 7/8 in.
Initial Closed In Pressure	48	790	Footage Tested		85 ft.
2nd Flow Initial	— — — —	280	Mud Weight		10 lbs. gal.
2nd Flow Final	120	260	Gas Viscosity		.015 cp
Final Closed In Pressure	60	770	Gas Gravity		0.7 —
Extrapolated Static Pressure	Initial	791	Gas Compressibility		0.84 —
	Final	782			548
Slope Psi²/cycle	Initial	11,025			
	Final	36,960			

Remarks: K_1 and b_1 use 8 feet for formation height

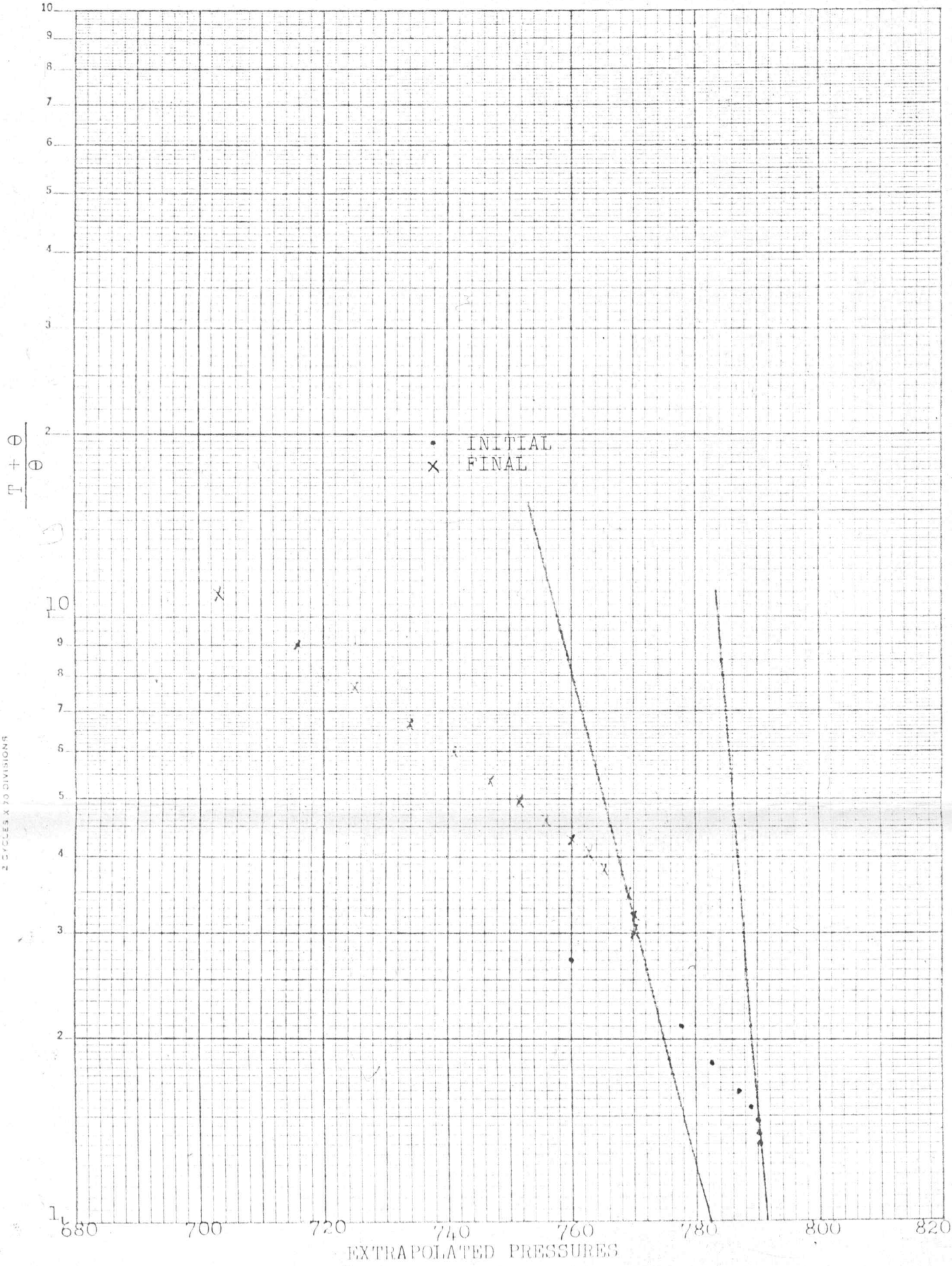
SUMMARY

BT Gauge Number Depth

Product	Equation	Initial	Final	Units
Transmissability	$\frac{Kh}{\mu} = \frac{1637\ Q_g\ ZT}{m}$	32,875	17,472	$\frac{md.\ ft.}{cp}$
Theoretical Flow Capacity	$Kh = \frac{Kh}{\mu}\ \mu$	49.3	26.2	md. ft.
Average Effective Permeability	$K = \frac{Kh}{h}$	0.6	0.3	md.
	$K_1 = \frac{Kh}{h_1}$	6.2	3.3	md.
Indicated Flow Capacity	$(Kh)_a = \frac{3200\ Q_g\ \mu\ ZT\ \mathrm{Log}(0.472\ b/r_w)}{P_R^2 - P_F^2}$	19.7	50.8	md. ft.
Damage Ratio	$DR = \frac{\text{Theo. Flow Cap}}{\text{Indicated Flow Cap}} \quad \frac{Kh}{(Kh)_a}$	2.5	0.5	—
Indicated Flow Rate	$OF_1 = \frac{Q_g}{P_R^2 - P_F^2}$	524	959	MCFD
				MCFD
Theoretical Potential Rate	$OF_3 = OF_1\ DR$ Max.	1,310	959	MCFD
	$OF_4 = OF_2\ DR$ Min.			MCFD
Approx. Radius of Investigation	$b \leq \sqrt{Kt}$ or $\sqrt{Kt_0}$	2	6	ft.
	$b_1 \leq \sqrt{K_1 t}$ or $\sqrt{K_1 t_0}$	8	20	ft.
Potentiometric Surface *	$Pot. = (EI - GD) + (2.319\ Ps)$			ft.

WHELAN PRINTERS

INTERPRETATIONS AND CALCULATIONS


INITIAL
FINAL
Φ / Φ + 1
EXTRAPOLATED PRESSURES
680
700
720
740
760
780
800
820
10
9
8
7
6
5
4
3
2
1
SEMI-LOGARITHMIC 359-61G
KEUFFEL & ESSER CO.
2 CYCLES X 70 DIVISIONS

Form 731 (Rev. 9-61)

CALCULATION SHEET FOR NATURAL GAS ANALYSIS
Constants from NGAA 2145-57, CNGA TS401, ASTM-109
(Corrected to 30 Inches Mercury, 60° F)

Laboratory No._____ Date_____
Sample of_____ Tank No._____
Station Number_____ Source_____
Date Taken_____ Location_____ Date Analyzed_____

Component	Symbol	Mol%	Liq. Content of Component Gal/MCF	Liq. Content x Mol%	Sp. Gr. of Component	Sp. Gr. x Mol%/100	BTU of Component (Dry)	BTU of Component (Sat)	BTU x Mol%/100
Hydrogen	H_2	.01			0.070		330	324	
Helium	He	1.19			0.138				
Oxygen	O_2				1.105				
Carbon Dioxide	CO_2				1.519				
Nitrogen	N_2	36.68			0.967				
Hydrogen Sulfide	H_2S				1.176				
Methane	CH_4	59.37	.16994		0.555		1015	997	
Ethane	C_2H_6	1.83	.25545		1.046		1788	1757	
Propane	C_3H_8	0.55	.28023		1.546		2564	2519	
Isobutane	iC_4H_{10}	0.08	.33759		2.066		3363	3304	
Normal Butane	nC_4H_{10}	0.21	.32585		2.070		3378	3319	
Isopentane	iC_5H_{12}	0.02	.36593		2.491		4012	3942	
Normal Pentane	nC_5H_{12}	0.02	.36223		2.491		4020	3950	
Hexane plus	C_6H_{14}	0.04	.44757		3.238		5192	5100	
Hexane	C_6H_{14}		.41126		2.975		4769	4686	
Heptane	C_7H_{16}		.46141		3.459		5518	5421	
Octane	C_8H_{18}		.51208		3.943		6267	6157	
Totals		100.00%	Calc. Liquids Gal/MCF		Calculated Sp. Gr.		Calc. BTU Dry		661.9

Sat_____

H_2S_____GRS/100 SCF
RSH_____GRS/100 SCF
TS _____GRS/100 SCF

Balance Gravity_____

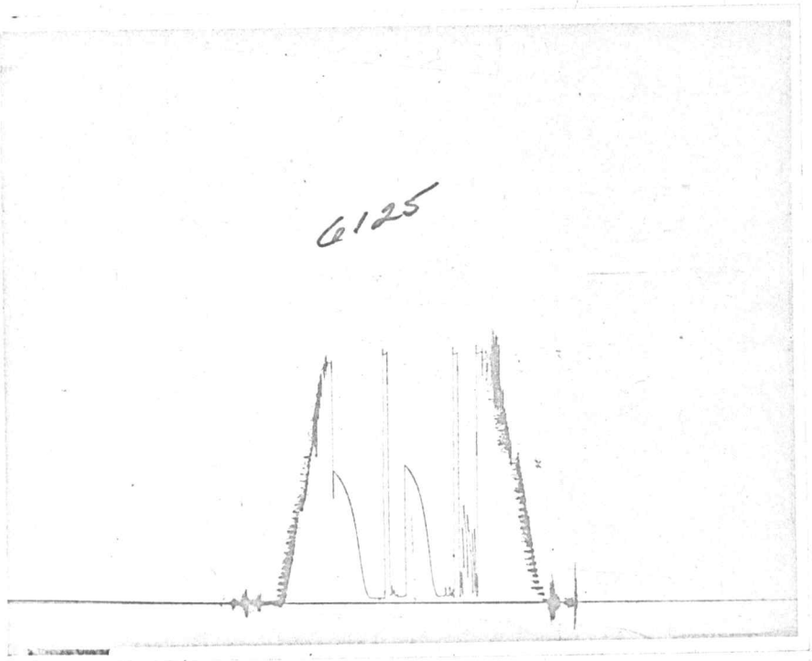
Calorimeter
BTU Dry_____
Sat_____

cc;

Analyst_____

SUN OIL WELL CEMENTING INC.

Date 12/12/68 **DRILL STEM TEST RECOVERY REPORT** Ticket No. 6125



Company American Drlg. Contractor American Drlg.

Well No. 1 Lease Bartunek County Ellsworth Sec. 4 Twp 14 Rng 10

Test No. 2 Size Hole 7 7/8 Packer Size 6 3/4 Drill Pipe Size 4½ F. H.

Interval Tested From 2503 To 2530 Depth of Well 2530 Size Choke 5/8

Fluid Recovered In _____ Temp. _____ Elev. _____

Initial Hyd. 1470 P.S.I

First Initial Flow Pressure 55 P.S.I.

First Final Flow Pressure _____ P.S.I.

Initial Closed-in Pressure 798 P.S.I.

Second Initial Flow Pressure 55 P.S.I.

Second Final Flow Pressure _____ P.S.I.

Final Closed-in Pressure 789 P.S.I.

Final Hyd. _____ P.S.I.

Opened Tool 9:40 ~~AM~~ P.M.

First Flow Pres. 30 Min.

Initial Closed-in Pres. 30 Min.

Second Flow Pres. 30 Min.

Final Closed-in Pres. 30 Min.

Blow Weak 4Min. Flush Tool Weak Surge

Recovery 15' Drlg. Mud

Remarks _____

Approved By Grant Tester Philbern

150

MILLER TESTING COMPANY

Box 547

GREAT BEND, KANSAS

Company AMERICAN EXPLORATION

Lease and Well No. BARTUNEK #1

County ELLSWORTH State KANSAS Date DEC 14, 1968

Formation Test No. 5th Zone Total Depth 2660 Elev.

Interval Tested 1455 To 1485 Anchor Length 30'
BETWEEN PACKERS.

Size Hole 7 7/8 Size Drill Pipe 4 1/2 FH & XH Size Packer 6 3/4

Mud Weight 10.2 Viscosity 46 Water Loss 9.6 c.c. Bottom Hole Temp. 98 °F

Chokes: Top 1/2 Bottom 1/2 Ticket No. 9534

Lease and Well No. BARTUNEK #1 4 14S 10S

Formation Test No.

RECOVERY

WEAK BLOW FOR 40 MINUTES. THEN INTERMITTENT BLOW.

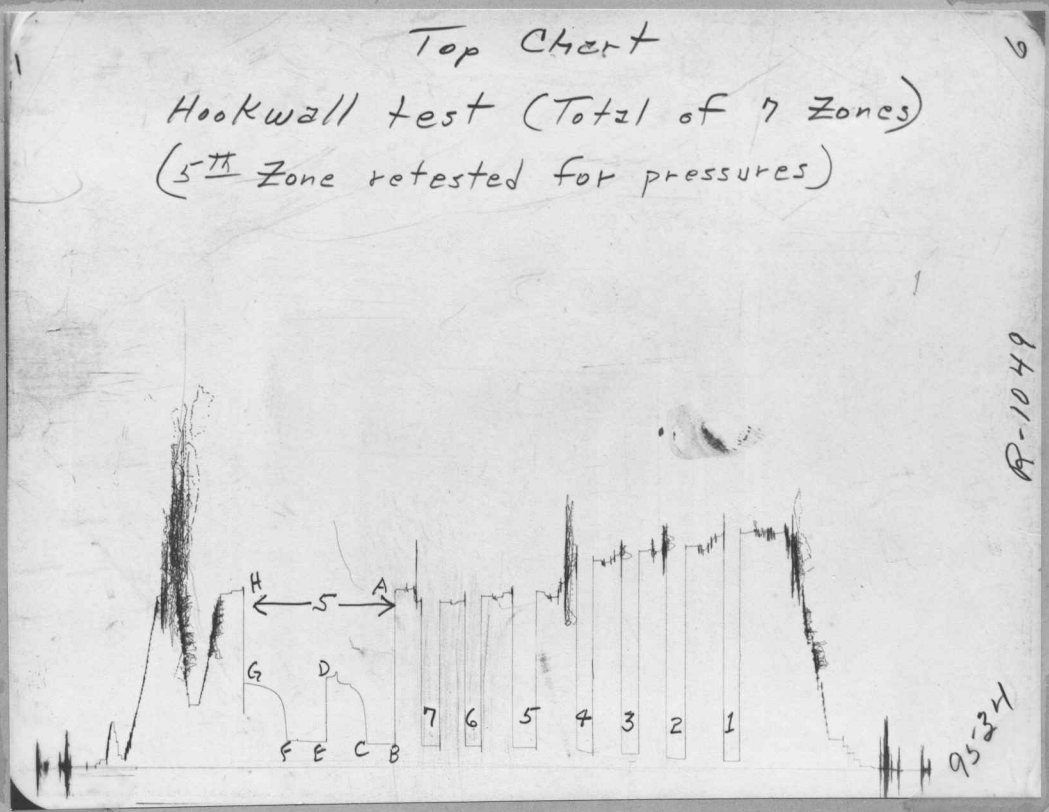
FIRST ZONE :	1927 to 1957.	10 MINUTES.	NO BLOW.
SECOND ZONE :	1823 to 1853.	10 MINUTES.	NO BLOW.
THIRD ZONE :	1779 to 1809.	12 MINUTES.	WEAK BLOW.
FOURTH ZONE :	1681 to 1711.	12 MINUTES.	WEAK BLOW.
FIFTH ZONE :	1455 to 1485.	12 MINUTES.	WEAK BLOW.
SIXTH ZONE :	1382 to 1412.	10 MINUTES.	NO BLOW.
SEVENTH ZONE :	1339 to 1369.	10 MINUTES.	NO BLOW.

180 FEET OF WATERY MUD.

Top Chart

Hookwall test (Total of 7 Zones)

(5th Zone retested for pressures)



5th ZONE:

Tool Open: 1st Flow 2 hr. 20 mins: Shut-in Initial hr. 30 min: 2nd Flow hr. 30 min: Shut-in Final hr. 30 min.

	Field Reading	Corrected Reading
(A) Initial Hydrostatic Pressure	842	842
(B) Initial 1st Flow Pressure	110	110
(C) Final 1st Flow Pressure	110	112
(D) Initial Shut-in Pressure	428	428
(E) Initial 2nd Flow Pressure	128	125
(F) Final 2nd Flow Pressure	128	128
(G) Final Shut-in Pressure	398	403
(H) Final Hydrostatic Pressure	833	836

9534