

TRILOBITE TESTING, L.L.C.

P.O. Box 362 • Hays, Kansas 67601

Drill-Stem Test Data

Well Name LADENBURGER #1 Test No. 1 Date 4/24/94
Company PRODUCTION DRILLING, INC. Zone LKC-"B-C"
Address P.O. BOX 680 HAYS KS 67601-0680 Elevation 2976
Co. Rep./Geo. JOHN FARMER IV Cont. MURFIN DRLG RIG #3 Est. Ft. of Pay _____
Location: Sec. 7 Twp. 13S Rge. 33W Co. LOGAN State KS

Interval Tested	<u>3915-3971</u>	Drill Pipe Size	<u>4.5 XH</u>
Anchor Length	<u>56</u>	Wt. Pipe I.D. - 2.7 Ft. Run	<u>32</u>
Top Packer Depth	<u>3910</u>	Drill Collar - 2.25 Ft. Run	<u>471</u>
Bottom Packer Depth	<u>3915</u>	Mud Wt.	<u>9</u> lb/Gal.
Total Depth	<u>3971</u>	Viscosity	<u>50</u>
		Filtrate	<u>9.6</u>

Tool Open @ 4:20 AM Initial Blow WEAK-BUILDING TO BOTTOM OF BUCKET IN 32 MINUTES

Final Blow WEAK - BUILDING TO 6"

Recovery - Total Feet 670 Flush Tool? NO

Rec. 670 Feet of MUDDY WATER- 70% WTR/ 30% MUD
Rec. _____ Feet of _____
Rec. _____ Feet of _____
Rec. _____ Feet of _____
Rec. _____ Feet of _____

BHT 112 °F Gravity _____ °API @ _____ °F Corrected Gravity _____ °API
RW 0.13 @ 72.6 °F Chlorides 60000 ppm Recovery Chlorides 3500 ppm System

(A) Initial Hydrostatic Mud 1865.9 PSI AK1 Recorder No. 13754 Range 4000

(B) First Initial Flow Pressure 41.3 PSI @ (depth) 3919 w / Clock No. 27501

(C) First Final Flow Pressure 209.6 PSI AK1 Recorder No. 7437 Range 4200

(D) Initial Shut-in Pressure 1230.9 PSI @ (depth) 3967 w / Clock No. 27567

(E) Second Initial Flow Pressure 231.3 PSI AK1 Recorder No. _____ Range _____

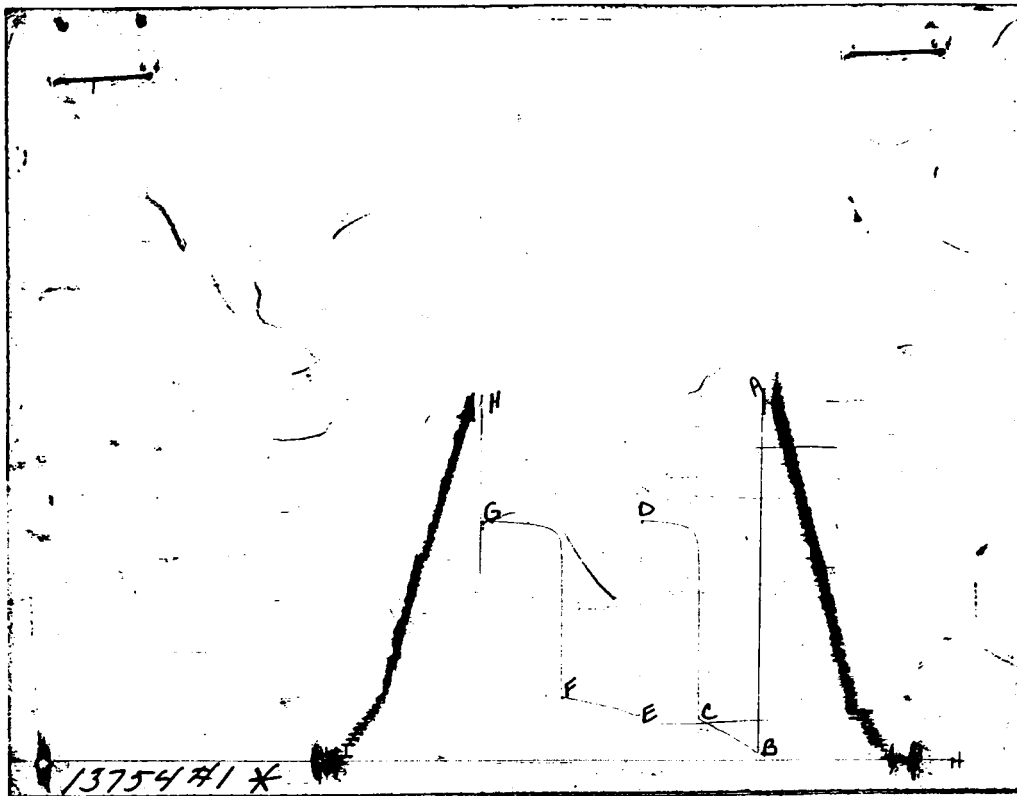
(F) Second Final Flow Pressure 322.8 PSI @ (depth) _____ w / Clock No. _____

(G) Final Shut-in Pressure 1228.9 PSI Initial Opening 45 Final Flow 60

(H) Final Hydrostatic Mud 1815.9 PSI Initial Shut-in 45 Final Shut-in 60

Our Representative DAN BANGLE

CHART PAGE



This is an actual photograph of recorder chart #13754

	FIELD READING	OFFICE READING
(A) INITIAL HYDROSTATIC MUD	1936	1865.9
(B) FIRST INITIAL FLOW PRESSURE	49	41.3
(C) FIRST FINAL FLOW PRESSURE	226	209.6
(D) INITIAL CLOSED-IN PRESSURE	1226	1230.9
(E) SECOND INITIAL FLOW PRESSURE	236	231.3
(F) SECOND FINAL FLOW PRESSURE	324	322.8
(G) FINAL CLOSED-IN PRESSURE	1216	1228.9
(H) FINAL HYDROSTATIC MUD	1886	1815.9

TRILOBITE TESTING, L.L.C.

P.O. Box 362 • Hays, Kansas 67601

Drill-Stem Test Data

Well Name LADENBURGER #1 Test No. 2 Date 4/26/94
Company PRODUCTION DRILLING, INC. Zone JOHNSON
Address P.O. BOX 680 HAYS KS 67601-0680 Elevation 2976
Co. Rep./Geo. JOHN FARMER IV Cont. MURFIN DRLG RIG #3 Est. Ft. of Pay _____
Location: Sec. 7 Twp. 13S Rge. 33W Co. LOGAN State KS

Interval Tested	<u>4445-4490</u>	Drill Pipe Size	<u>4.5 XH</u>
Anchor Length	<u>45</u>	Wt. Pipe I.D. - 2.7 Ft. Run	<u>32</u>
Top Packer Depth	<u>4440</u>	Drill Collar - 2.25 Ft. Run	<u>471</u>
Bottom Packer Depth	<u>4445</u>	Mud Wt.	<u>9.3</u> lb/Gal.
Total Depth	<u>4490</u>	Viscosity	<u>47</u>
		Filtrate	<u>9.2</u>

Tool Open @ Initial Blow HIT BRIDGE AT 1876' - SET ALL THE WEIGHT ON
THE TOOL - WOULD NOT GO

Final Blow _____

Recovery - Total Feet _____ Flush Tool? NO

Rec. _____ Feet of _____
Rec. _____ Feet of _____
Rec. _____ Feet of _____
Rec. _____ Feet of _____
Rec. _____ Feet of _____

BHT 86 °F Gravity _____ °API @ _____ °F Corrected Gravity _____ °API
RW _____ @ _____ °F Chlorides _____ ppm Recovery Chlorides 4000 ppm System

(A) Initial Hydrostatic Mud 1086.2 PSI AK1 Recorder No. 13754 Range 4000

(B) First Initial Flow Pressure _____ PSI @ (depth) 4449 w / Clock No. 27501

(C) First Final Flow Pressure _____ PSI AK1 Recorder No. 7437 Range 4200

(D) Initial Shut-in Pressure _____ PSI @ (depth) 4486 w / Clock No. 27567

(E) Second Initial Flow Pressure _____ PSI AK1 Recorder No. _____ Range _____

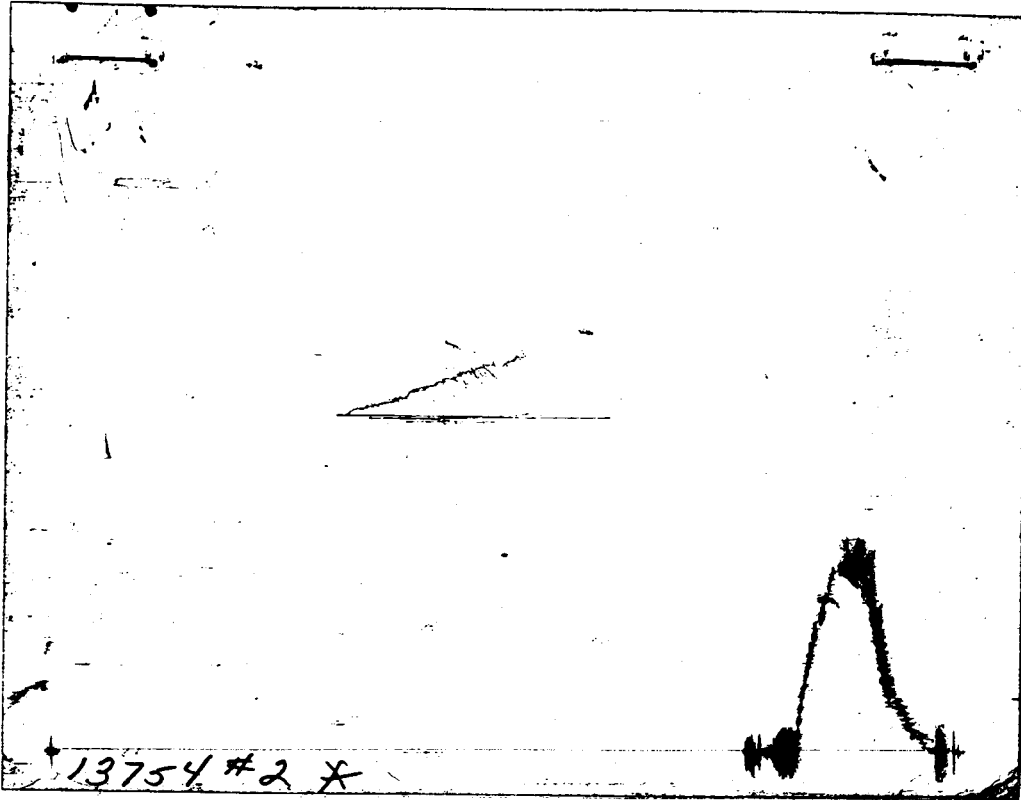
(F) Second Final Flow Pressure _____ PSI @ (depth) _____ w / Clock No. _____

(G) Final Shut-in Pressure _____ PSI Initial Opening _____ Final Flow _____

(H) Final Hydrostatic Mud 1086.2 PSI Initial Shut-in _____ Final Shut-in _____

Our Representative DAN BANGLE

CHART PAGE



This is an actual photograph of recorder chart # 13754

MISRUN

	FIELD READING	OFFICE READING
(A) INITIAL HYDROSTATIC MUD	1086	1086.2
(B) FIRST INITIAL FLOW PRESSURE		
(C) FIRST FINAL FLOW PRESSURE		
(D) INITIAL CLOSED-IN PRESSURE		
(E) SECOND INITIAL FLOW PRESSURE		
(F) SECOND FINAL FLOW PRESSURE		
(G) FINAL CLOSED-IN PRESSURE		
(H) FINAL HYDROSTATIC MUD	1086	1086.2

TRILOBITE TESTING, L.L.C.

P.O. Box 362 • Hays, Kansas 67601

Drill-Stem Test Data

Well Name LADENBURGER #1 Test No. 3 Date 4/26/94
Company PRODUCTION DRILLING, INC. Zone JOHNSON
Address P.O. BOX 680 HAYS KS 67601-0680 Elevation 2976
Co. Rep./Geo. JOHN FARMER IV Cont. MURFIN DRLG RIG #3 Est. Ft. of Pay 10
Location: Sec. 7 Twp. 13S Rge. 33W Co. LOGAN State KS

Interval Tested <u>4445-4490</u>	Drill Pipe Size <u>4.5 XH</u>
Anchor Length <u>45</u>	Wt. Pipe I.D. - 2.7 Ft. Run <u>32</u>
Top Packer Depth <u>4440</u>	Drill Collar - 2.25 Ft. Run <u>471</u>
Bottom Packer Depth <u>4445</u>	Mud Wt. <u>9.4</u> lb/Gal.
Total Depth <u>4490</u>	Viscosity <u>60</u> Filtrate <u>9.2</u>

Tool Open @ 11:40 PM Initial Blow STRONG-BOTTOM OF BUCKET IN 8 MINUTES

Final Blow STRONG - BOTTOM OF BUCKET IN 17 MINUTES

Recovery - Total Feet 530 Flush Tool? NO

Rec. <u>990</u>	Feet of <u>GAS IN PIPE</u>
Rec. <u>300</u>	Feet of <u>CLEAN GASSY OIL- 30% GAS / 70% OIL</u>
Rec. <u>170</u>	Feet of <u>MUD CUT GSY OIL- 10% GAS/ 60% OIL/ 30%MUD</u>
Rec. <u>60</u>	Feet of <u>OIL CUT GSY MUD- 10% GAS/ 30%OIL/ 60%MUD</u>
Rec. _____	Feet of _____

BHT 118 °F Gravity _____ °API @ _____ °F Corrected Gravity 39 °API
RW _____ @ _____ °F Chlorides _____ ppm Recovery Chlorides 4000 ppm System

(A) Initial Hydrostatic Mud 2405.6 PSI AK1 Recorder No. 13754 Range 4000

(B) First Initial Flow Pressure 51.1 PSI @ (depth) 4449 w / Clock No. 27501

(C) First Final Flow Pressure 181.1 PSI AK1 Recorder No. 7437 Range 4200

(D) Initial Shut-in Pressure 1095.9 PSI @ (depth) 4486 w / Clock No. 27567

(E) Second Initial Flow Pressure 187.9 PSI AK1 Recorder No. _____ Range _____

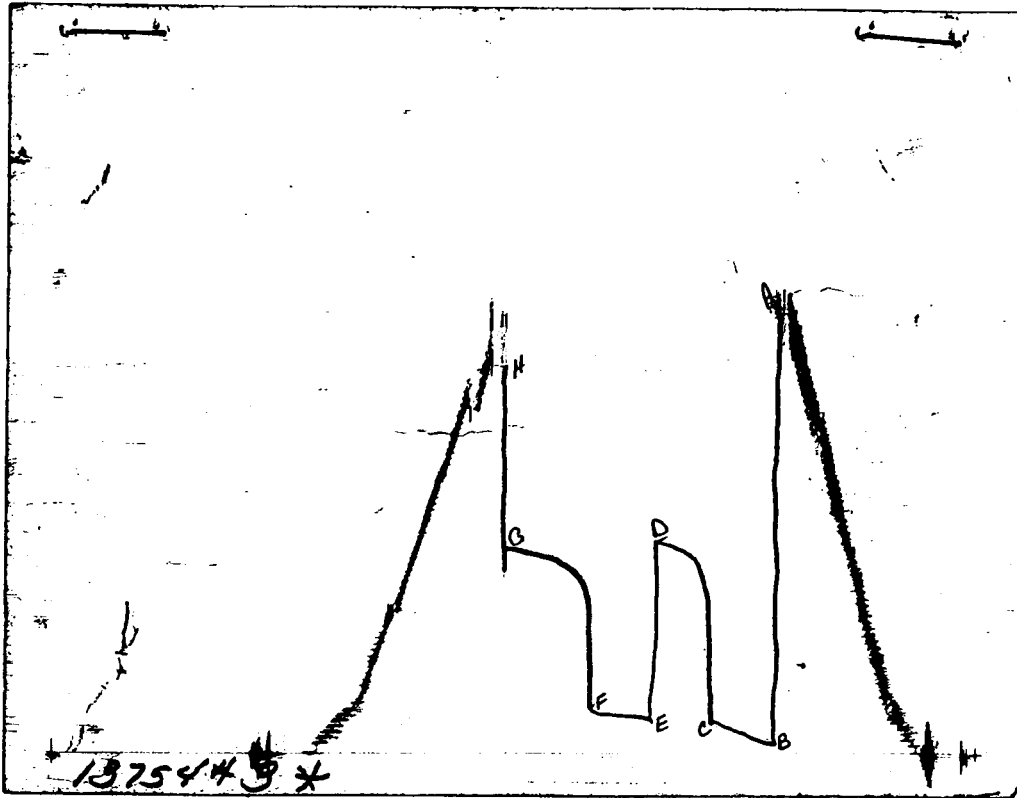
(F) Second Final Flow Pressure 222.4 PSI @ (depth) _____ w / Clock No. _____

(G) Final Shut-in Pressure 1063.0 PSI Initial Opening 45 Final Flow 45

(H) Final Hydrostatic Mud 2276.9 PSI Initial Shut-in 45 Final Shut-in 60

Our Representative DAN BANGLE

CHART PAGE



This is an actual photograph of recorder chart #13754

	FIELD READING	OFFICE READING
(A) INITIAL HYDROSTATIC MUD	2390	2405.6
(B) FIRST INITIAL FLOW PRESSURE	49	51.1
(C) FIRST FINAL FLOW PRESSURE	147	181.1
(D) INITIAL CLOSED-IN PRESSURE	1066	1095.9
(E) SECOND INITIAL FLOW PRESSURE	167	187.9
(F) SECOND FINAL FLOW PRESSURE	216	222.4
(G) FINAL CLOSED-IN PRESSURE	1056	1063
(H) FINAL HYDROSTATIC MUD	2289	2276.9

COMPUTER OIL EVALUATION BY TRILOBITE TESTING, L.L.C.

PRODUCTION DRILLING, INC.

LADENBURGER #1

DST 3

7

13S

33W

LOGAN KS

ELEVATION:	2976 KB	EST. PAY	10 FT
DATUM:	-1474	ZONE TESTED:	JOHNSON
TEST INTERVAL:	4445-4490	TIME INTERVALS:	45-45-45-60
RECORDER DEPTH:	4449	VISCOSITY:	3.82 CP
BOTTOM HOLE TEMP:	118	HOLE SIZE:	7.875 IN

CUBIC FEET OF GAS IN PIPE:	79		
TOTAL FEET OF RECOVERY:	530.00	CORRECTED PIPE FILLUP:	619.499
TOTAL BARRELS OF RECOVERY:	2.91	CORR. BARRELS OF RECOVERY:	4.177 BBL
BARRELS IN DRILL PIPE:	0.38	API GRAVITY:	39
BARRELS IN WEIGHT PIPE:	0.22	FLUID GRADIENT:	0.359
BARRELS IN DRILL COLLARS:	2.30		
GAS OIL RATIO:	27.15	CU.FT/BBL	
BUBBLE POINT PRESSURE:	178		
UNCORRECTED INITIAL PRODUCTION:			46.58 BBL
INITIAL PRODUCTION CORRECTED TO FINAL FLOW PRESSURE:			66.83 BBL/DAY
INITIAL PRODUCTION CORRECTED TO PSEUDO STEADY FLOW STATE:			17.351

INITIAL SLOPE	354.1 PSI/CYCL	FINAL SLOPE	337.5 PSI/CYCLE
INITIAL P*	1207.9 PSI	FINAL P*	1193.1 PSI

TRANSMISSIBILITY	32.20 (MD.-FT./CP.)
PERMEABILITY	12.30 (MD.)
INDICATED FLOW CAPACITY	123.01 (MD.FT)
PRODUCTIVITY INDEX	0.04 (BARREL/DAY/PSI)
DAMAGE RATIO	0.53
RADIUS OF INVESTIGATION	33.27 (FT,)
POTENTIOMETRIC SURFACE	1293.69 (FT.)
DRAWDOWN FACTOR	1.228 (%)
THEORETICAL POTENTIAL FROM FINAL FLOW PRESSURE	0.00
THEORETICAL POTENTIAL FROM PSEUDO STEADY FLOW STATE	0.00

INITIAL FLOW

RECORDER 13754

DST # 3

TIME(MIN) PRESSURE <> PRESSURE

0	51.1	51.1
3	55.1	4.0
6	63.9	8.8
9	71.8	7.9
12	80.7	8.9
15	94.4	13.7
18	106.3	11.9
21	115.1	8.8
24	125.9	10.8
27	133.8	7.9
30	142.7	8.9
33	152.5	9.8
36	162.4	9.9
39	170.2	7.8
42	176.1	5.9
45	181.1	5.0

FINAL FLOW

RECORDER 13754

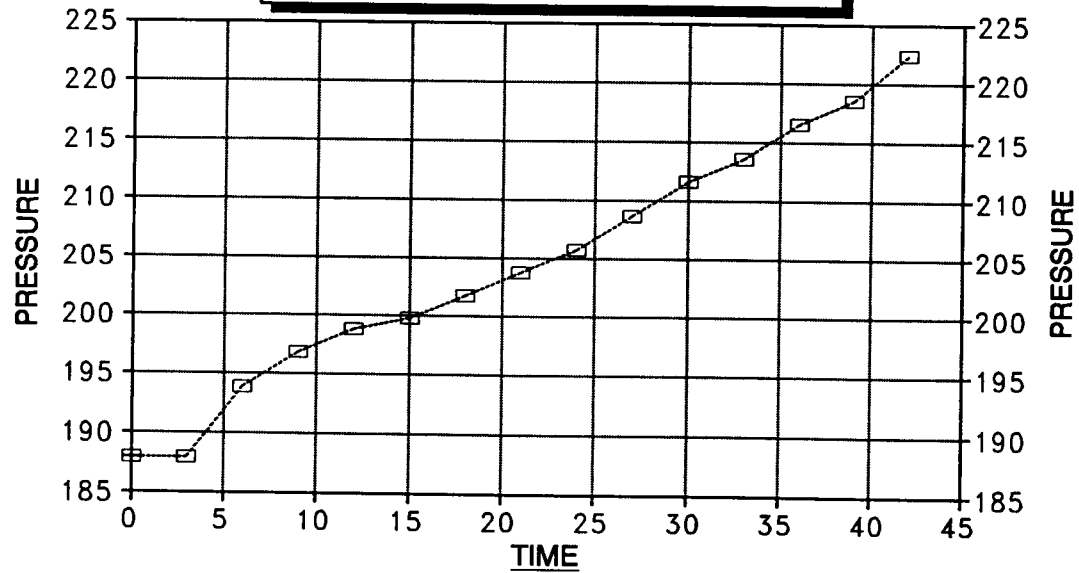
DST # 3

TIME(MIN) PRESSURE <> PRESSURE

0	187.9	187.9
3	187.9	0.0
6	193.8	5.9
9	196.8	3.0
12	198.8	2.0
15	199.8	1.0
18	201.7	1.9
21	203.7	2.0
24	205.7	2.0
27	208.6	2.9
30	211.6	3.0
33	213.5	1.9
36	216.5	3.0
39	218.5	2.0
42	222.4	3.9

DELTA T DELTA P

FINAL FLOW / DST #3



—□— LADENBURGER #1

INITIAL PRODUCTION CORRECTED TO PSEUDO STEADY FLOW STATE:

17.351

LADENBURGER #1 DST #3
INITIAL SHUTIN

45 INITIAL FLOW TIME SLOPE 354.1 PSI/CYCLE
P* 1207.89 PSI

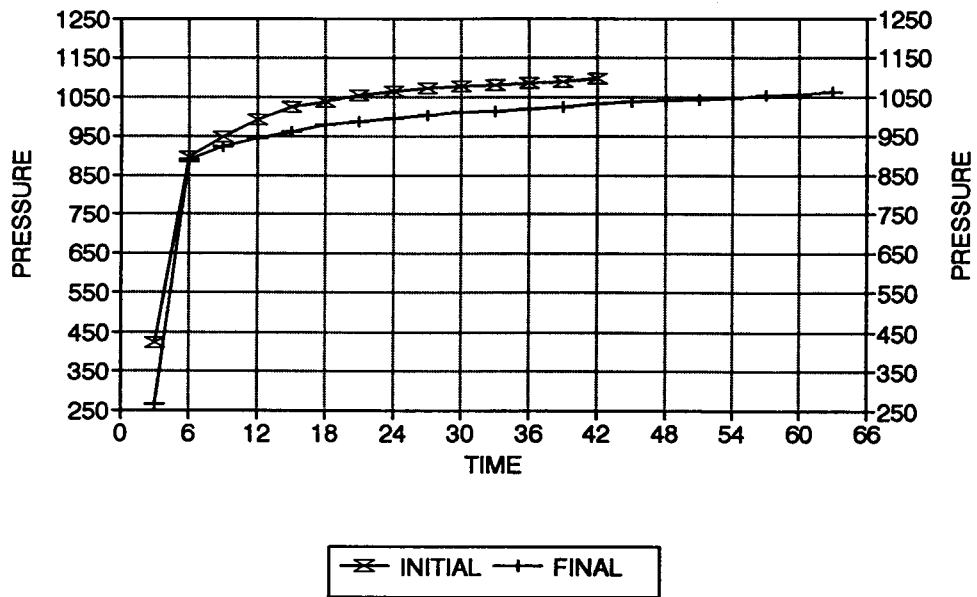
	TIME(MIN)	Pws (psi)	Log Horn T	<> PRESSURE	Horn T
	3	421.2	1.204	421.2	16
	6	897.2	0.929	476.0	9
	9	948.6	0.778	51.4	6
	12	1056.0	0.677	107.4	5
	15	1025.0	0.602	-31.0	4
	18	1039.0	0.544	14.0	4
	21	1053.0	0.497	14.0	3
	24	1065.0	0.459	12.0	3
	27	1074.0	0.426	9.0	3
	30	1079.0	0.398	5.0	3
	33	1082.0	0.374	3.0	2
	36	1085.0	0.352	3.0	2
X	39	1089.9	0.333	4.9	2
X	42	1095.9	0.316	6.0	2

LADENBURGER #1 DST #3
FINAL SHUTIN

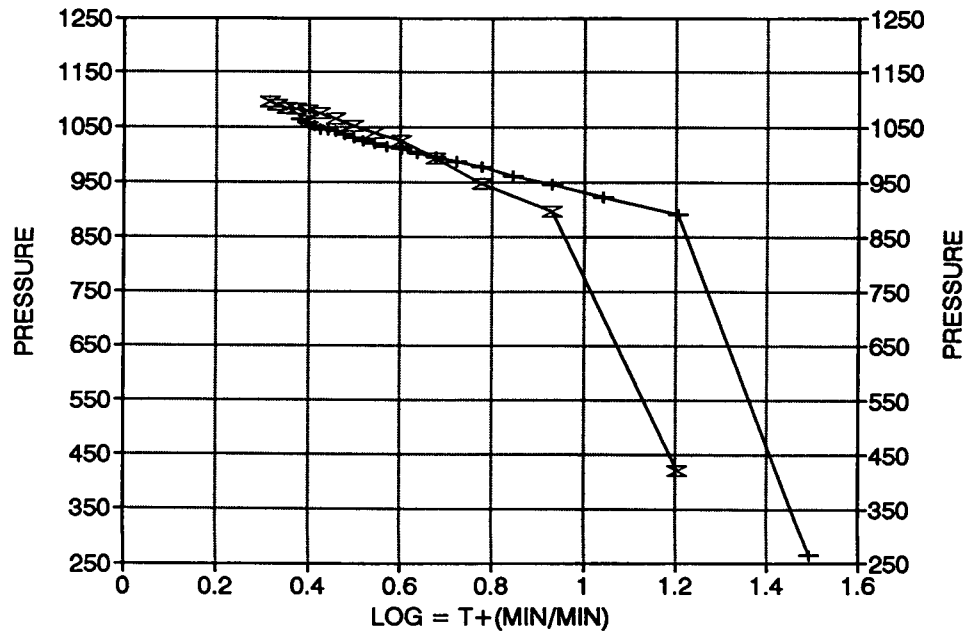
90 TOTAL FLOW TIME SLOPE 337.5 PSI/CYCLE
P* 1193.1 PSI

	TIME(MIN)	Pws (psi)	Log Horn T	<> PRESSURE	Horn T
	3	264.7	1.491	264.7	31
	6	891.3	1.204	626.6	16
	9	922.9	1.041	31.6	11
	12	945.6	0.929	22.7	9
	15	961.4	0.845	15.8	7
	18	978.2	0.778	16.8	6
	21	988.1	0.723	9.9	5
	24	996.1	0.677	8.0	5
	27	1003.1	0.637	7.0	4
	30	1010.1	0.602	7.0	4
	33	1015.0	0.571	4.9	4
	36	1020.0	0.544	5.0	4
	39	1025.0	0.520	5.0	3
	42	1032.0	0.497	7.0	3
	45	1037.0	0.477	5.0	3
	48	1042.0	0.459	5.0	3
X	51	1044.0	0.442	2.0	3
	54	1047.0	0.426	3.0	3
	57	1053.0	0.411	6.0	3
	60	1058.0	0.398	5.0	3
X	63	1063.0	0.385	5.0	2

LADENBURGER #1 / DST #3 DELTA T DELTA P



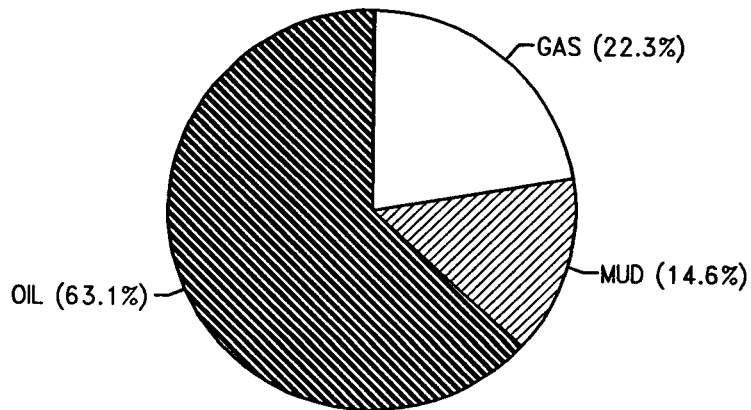
HORNER PLOT



CALCULATED RECOVERY ANALYSIS

DST	3			TICKET #	7107				
SAMPLE #	TOTAL FEET	GAS %	FEET	OIL %	FEET	%	WATER FEET	%	MUD FEET
DRILL 1	27	30	8.1	70	18.9	0	0	0	0
PIPE 2			0		0		0		0
3			0		0		0		0
4			0		0		0		0
5			0		0		0		0
6			0		0		0		0
WEIGHT 1	32	30	9.6	70	22.4	0	0	0	0
PIPE 2			0		0		0		0
3			0		0		0		0
4			0		0		0		0
DRILL 1	241	30	72.3	70	168.7	0	0	0	0
COLLAR 2	170	10	17	60	102	0	0	30	51
3	60	10	6	30	18	0	0	60	36
4			0		0		0		0
5			0		0		0		0
TOTAL	530		113		330		0		87

BBL OIL= 1.837301 * HRS OPEN 1.5 BBL/DAY 29.396816
 BBL WATER= 0 *
 BBL MUD= 0.42543
 BBL GAS = 0.648399



WELL NAME Ladenburger DST # 3 RECORDER # 13754

INIT. HYD. MUD.		FINAL HYD. MUD	
INITIAL FLOW MINUTES	INITIAL SHUTIN MINUTES	FINAL FLOW MINUTES	FINAL SHUTIN MINUTES
<u>45</u>	<u>45</u>	<u>45</u>	<u>60</u>
INTERVAL	INTERVAL	INTERVAL	INTERVAL
.052	51.1	1	.191 187.9
.056	.428	2	.191
.065	.910	3	.197
.073	.962	4	.200
.082	1.007	5	.202
.096	1.039	6	.203
.108	1.053	7	.205
.117	1.067	8	.207
.128	1.079	9	.209
.136	1.088	10	.212
.145	1.093	11	.215
.155	1.0946	12	.217
.165	1.099	13	.220
.173	1.104	14	.222
.179	1.110 1095.9	15	.226 222.4
.184	181.1	16	
		17	
		18	
		19	
		20	
		21	
		22	
		23	
		24	
		25	
		26	
		27	

1	0.052	51.17979
2	0.056	55.11968
3	0.065	63.98031
4	0.073	71.85238
5	0.082	80.70891
6	0.096	94.49184
7	0.108	106.3038
8	0.117	115.1618
9	0.128	125.988
10	0.136	133.8615
11	0.145	142.7192
12	0.155	152.5611
13	0.165	162.4032
14	0.173	170.2768
15	0.179	176.182
16	0.184	181.103

I 7

1	0.191	187.9923
2	0.191	187.9923
3	0.197	193.8974
4	0.2	196.85
5	0.202	198.8186
6	0.203	199.8029
7	0.205	201.7714
8	0.207	203.74
9	0.209	205.7086
10	0.212	208.6614
11	0.215	211.6143
12	0.217	213.5829
13	0.22	216.5357
14	0.222	218.5043
15	0.226	222.4415

77

1	0.428	421.2602
2	0.91	897.23
3	0.962	948.6131
4	1.07	1056.028
5	1.039	1025.077
6	1.053	1039.052
7	1.067	1053.032
8	1.079	1065.017
9	1.088	1074.009
10	1.093	1079.005
11	1.096	1082.003
12	1.099	1085.001
13	1.104	1089.996
14	1.11	1095.99

993.0

ISI

- 1191.8

FSO - 1210.7

C-15

1	0.269	264.7663
2	0.904	891.3019
3	0.936	922.92
4	0.959	945.6483
5	0.975	961.4608
6	0.992	978.2627
7	1.002	988.1644
8	1.01	996.1431
9	1.017	1003.126
10	1.024	1010.109
11	1.029	1015.098
12	1.034	1020.087
13	1.039	1025.077
14	1.046	1032.064
15	1.051	1037.056
16	1.056	1042.048
17	1.058	1044.045
18	1.061	1047.04
19	1.067	1053.032
20	1.072	1058.025
21	1.077	1063.02

A25 - A45

ISI

D1 - D35

TRILOBITE TESTING, L.L.C.

P.O. Box 362 • Hays, Kansas 67601

Drill-Stem Test Data

Well Name LADENBURGER #1 Test No. 4 Date 4/27/94
Company PRODUCTION DRILLING, INC. Zone JOHNSON
Address P.O. BOX 680 HAYS KS 67601-0680 Elevation 2976
Co. Rep./Geo. JOHN FARMER IV Cont. MURFIN DRLG RIG #3 Est. Ft. of Pay _____
Location: Sec. 7 Twp. 13S Rge. 33W Co. LOGAN State KS

Interval Tested 4506-4520 Drill Pipe Size 4.5 XH
Anchor Length 14 Wt. Pipe I.D. - 2.7 Ft. Run 32
Top Packer Depth 4501 Drill Collar - 2.25 Ft. Run 471
Bottom Packer Depth 4506 Mud Wt. 9.3 lb/Gal.
Total Depth 4520 Viscosity 100+ Filtrate 10.4

Tool Open @ 6:15 PM Initial Blow WEAK STEADY SURFACE BLOW

Final Blow NO BLOW

Recovery - Total Feet 5 Flush Tool? NO

Rec. 5 Feet of DRILLING MUD
Rec. _____ Feet of _____
Rec. _____ Feet of _____
Rec. _____ Feet of _____
Rec. _____ Feet of _____

BHT 120 °F Gravity _____ °API @ _____ °F Corrected Gravity _____ °API
RW _____ @ _____ °F Chlorides _____ ppm Recovery Chlorides 5000 ppm System

(A) Initial Hydrostatic Mud 2317.7 PSI AK1 Recorder No. 13754 Range 4000

(B) First Initial Flow Pressure 12.7 PSI @ (depth) 4510 w / Clock No. 27501

(C) First Final Flow Pressure 14.7 PSI AK1 Recorder No. 7437 Range 4200

(D) Initial Shut-in Pressure 953.5 PSI @ (depth) 4516 w / Clock No. 27567

(E) Second Initial Flow Pressure 15.7 PSI AK1 Recorder No. _____ Range _____

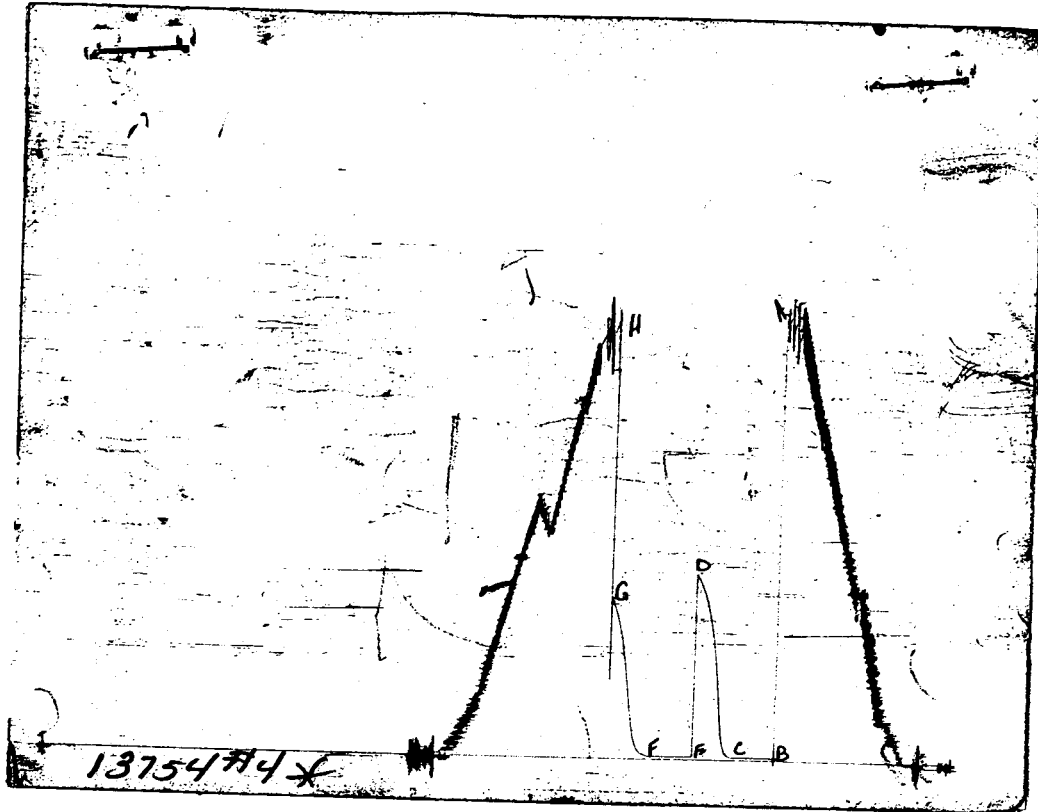
(F) Second Final Flow Pressure 15.7 PSI @ (depth) _____ w / Clock No. _____

(G) Final Shut-in Pressure 818.1 PSI Initial Opening 30 Final Flow 30

(H) Final Hydrostatic Mud 2254.0 PSI Initial Shut-in 30 Final Shut-in 30

Our Representative DAN BANGLE

CHART PAGE



This is an actual photograph of recorder chart #13754

	FIELD READING	OFFICE READING
(A) INITIAL HYDROSTATIC MUD	2390	2317.7
(B) FIRST INITIAL FLOW PRESSURE	19	12.7
(C) FIRST FINAL FLOW PRESSURE	19	14.7
(D) INITIAL CLOSED-IN PRESSURE	966	953.5
(E) SECOND INITIAL FLOW PRESSURE	19	15.7
(F) SECOND FINAL FLOW PRESSURE	19	15.7
(G) FINAL CLOSED-IN PRESSURE	828	818.1
(H) FINAL HYDROSTATIC MUD	2319	2254