TRILOBITE TESTING COMPANY

P.O. Box 362 • Hays, Kansas 67601

Drill-Stem Test Data

Well Name KELLER #1 Test No. 4 Date 9/13/91

Company N-B COMPANY INC Zone Tested MARMATON

Address P.O. BOX 506 RUSSELL KANSAS 67665 Elevation 2955 KB

Co. Rep./Geo. MIKE DAVIGNON Cont. EMPHASIS #7 Est. Ft. of Pay 4

Location: Sec. 19 Twp. 11S Rge. 31W Co. GOVE State KS

Interval Tested 4264-4343 Drill Pipe Size 4.5 XH

Anchor Length 79 Wt. Pipe I.D. - 2.7 Ft. Run

Top Packer Depth 4259 Drill Collar — 2.25 Ft. Run

Bottom Packer Depth 4264

Total Depth 4343

Mud Wt. 9.2 lb / gal. Viscosity 45 Filtrate 10.4

Tool Open @ 4:12 PM Initial Blow STRONG BLOW-OFF BOTTOM OF BUCKET IN 6 MIN-BLED THROUGH 2"/ISI:WEAK SURFACE BLOW-STEADY THROUGHOUT

Final Blow STRONG BLOW-OFF BOTTOM OF BUCKET IN 5 MIN-BLED THROUGH 2"/FSI:WEAK BLOW BUILT TO 3" IN 30 MIN

Recovery — Total Feet 270 Flush Tool? NO

Rec. 1500 Feet of GAS IN PIPE

Rec. Feet of

Rec. 90 Feet of CLEAN GASSY OIL-10%GAS/90%OIL

Rec. 180 Feet of MUDDY OIL-10%GAS/80%OIL/10%MUD

Rec. Feet of

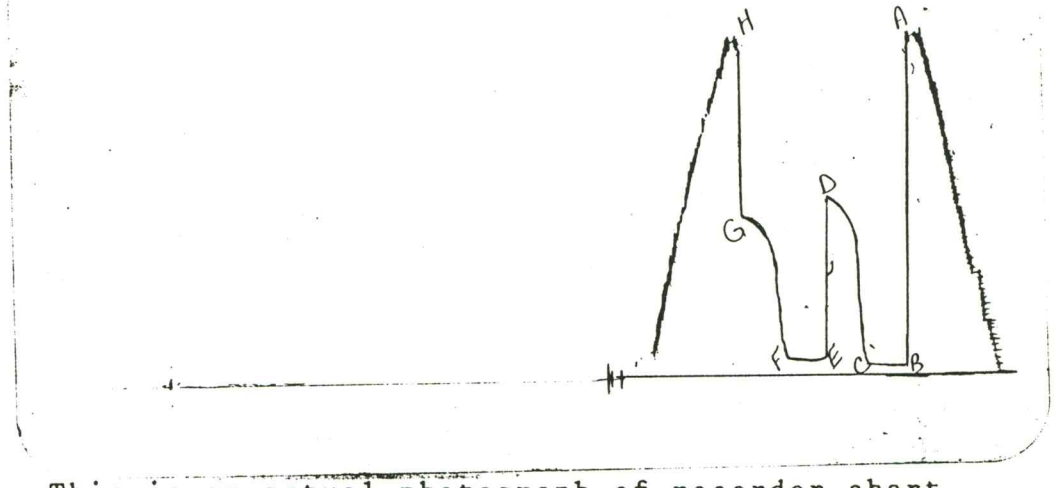
BHT 121 °F Gravity 40 °API @ 78 °F Corrected Gravity 39 °API

RW @ °F Chlorides ppm Recovery Chlorides 4000 ppm System

(A) Initial Hydrostatic Mud	2168 PSI	Ak1 Recorder No.	13308	Range	4700
(B) First Initial Flow Pressure	73.6 PSI	@ (depth)	4268	w/Clock No.	27573
(C) First Final Flow Pressure	122.2 PSI	AK1 Recorder No.	2023	Range	4000
(D) Initial Shut-in Pressure	1148.9 PSI	@ (depth	4340	w/Clock No.	8376
(E) Second Initial Flow Pressure	137.1 PSI	AK1 Recorder No.		Range	
(F) Second Final Flow Pressure	173.2 PSI	@ (depth)		w/Clock No.	
(G) Final Shut-in Pressure	1034.7 PSI	Initial Opening	30	Final Flow	30
(H) Final Hydrostatic Mud	2133.7 PSI	Initial Shut-in	30	Final Shut-in	30

Our Representativve LEWAYNE TRESNER TOTAL PRICE $ 550

DST #4
13308



This is an actual photograph of recorder chart

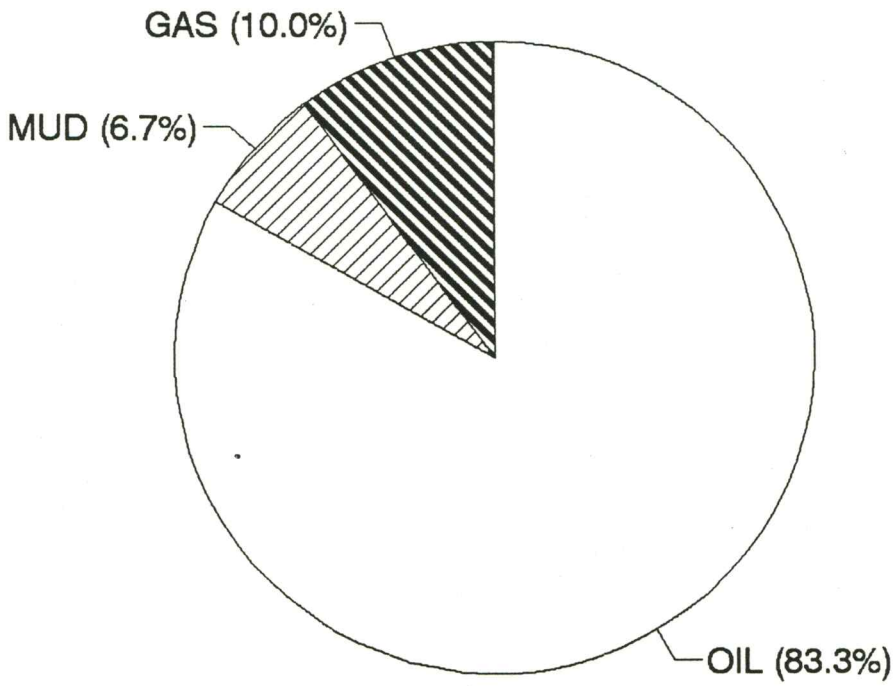
POINT	PRESSURE	
	FIELD READING	OFFICE READING
(A) INITIAL HYDROSTATIC MUD	2129	2168
(B) FIRST INITIAL FLOW PRESSURE	66	73.6
(C) FIRST FINAL FLOW PRESSURE	109	122.2
(D) INITIAL CLOSED-IN PRESSURE	1147	1148.9
(E) SECOND INITIAL FLOW PRESSURE	120	137.1
(F) SECOND FINAL FLOW PRESSURE	152	173.2
(G) FINAL CLOSED-IN PRESSURE	1051	1034.7
(H) FINAL HYDROSTATIC MUD	2190	2133.7

CALCULATED RECOVERY ANALYSIS DRILL PIPE

DST # 4 TICKET # 3871

SAMPLE #	TOTAL FEET	%	GAS FEET	%	OIL FEET	%	WATER FEET	%	MUD FEET
1	90	10	9	90	81	0	0	0	0
2	180	10	18	80	144	0	0	10	18
3			0		0		0		0
4			0		0		0		0
5			0		0		0		0
TOTAL	270	10	27	83.3333	225	0	0	6.66667	18

			HRS OPEN	BBL/DAY
BBL OIL=	3.1995	*	1	76.788
BBL WATER	0	*		0
BBL MUD=	0.25596			
BBL GAS	0.38394			



'COMPUTER EVALUATION BY TRILOBITE TESTING
N-B COMPANY
REPORT FOR DST#4 FOR THE KELLER #1
19-11S-31W GOVE KANSAS

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TEST PARAMETERS

ELEVATION:	2955 KB	EST. PAY:	4 FT
DATUM:	-1386	ZONE TESTED:	MARMATON
TEST INTERVAL:	4264-4343		
		TIME INTERVALS:	30-30-30-30
RECORDER DEPTH:	4340	VISCOSITY:	4.960126 CP
BOTTOM HOLE TEMP:	121	HOLE SIZE:	7.875 IN

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CALCULATIONS

CUBIC FEET OF GAS IN PIPE: 119.7591

TOTAL FEET OF RECOVERY: 270
BARRELS IN DRILL PIPE: 3.8394
GAS OIL RATIO: 31.19213 CU.FT./BBL
BUBBLE POINT PRESSURE: ; 1.169847
TOTAL BARRELS OF RECOVERY: 3.8394
UNCORR. INIT. PROD.: 92.1456 BBL/DAY
API GRAVITY: 39
FLUID GRADIENT: .359
CORRECTED PIPE FILLUP: 482.4513
CORR. BARRELS OF RECOVERY: 6.859728 BBL
INITIAL PRODUCTION CORRECTED TO FINAL FLOW PRESSURE: 164.6335 BBL/DAY
INITIAL PRODUCTION CORRECTED TO PSEUDO STEADY FLOW STATE
81.94095

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INITIAL SLOPE 689.03 PSI/CYCLE
INITIAL P* 1342 PSI

FINAL SLOPE 615.26 PSI/CYCLE
FINAL P* 1312 PSI

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TRANSMISSIBILITY	43.50909 (MD.-FT./CP.)
PERMEABILITY	53.95264 (MD.)
INDICATED FLOW CAPACITY	215.8106 (MD.FT)
PRODUCTIVITY INDEX	4.916527E-02 (BARRELS/DAY/PSI)
DAMAGE RATIO	.3387193
RADIUS OF INVESTIGATION	56.89603 (FT.)
POTENTIOMETRIC SURFACE	1657.528 (FT.)
DRAWDOWN FACTOR	2.235472 (%)

INITIAL FLOW

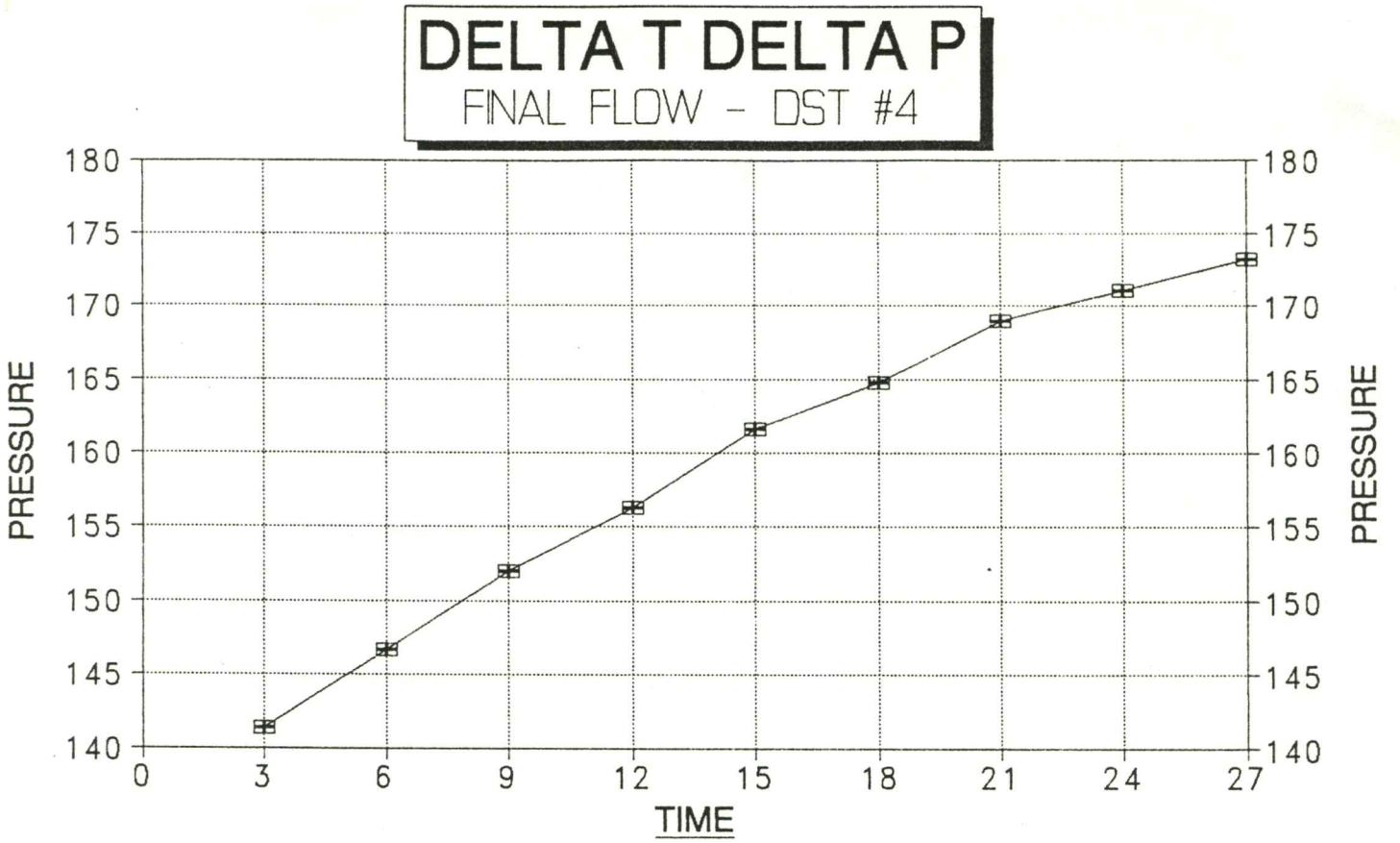
RECORDER # 2023
DST #4

DT(MIN)	PRESSURE	<> PRESSURE
0	73.6	73.6
3	80.1	6.5
6	86.6	6.5
9	93.1	6.5
12	96.3	3.200005
15	100.6	4.299996
18	102.8	2.200005
21	108.2	5.399994
24	111.4	3.200005
27	116.8	5.400002
30	122.2	5.399994

FINAL FLOW

RECORDER # 2023
DST #4

DT(MIN)	PRESSURE	<> PRESSURE
0	137.1	137.1
3	141.4	4.299988
6	146.7	5.300003
9	152	5.300003
12	156.3	4.300003
15	161.6	5.300003
18	164.8	3.199997
21	169	4.199997
24	171.1	2.100006
27	173.2	2.099991



INITIAL PRODUCTION CORRECTED TO PSEUDO STEADY FLOW STATE 81.94095 BBL/DAY

KELLER #1
INITIAL

DST #4
SHUTIN
30 INITIAL FLOW TIME

Slope -689.03 psi/cycle
P * 1,342 psi

	TIME(MIN)	Pws (psi)	Horn T	Log Horn T	<> PRESSURE
	3	136.1	11	1.041	136.1
	6	280.6	6	0.778	144.5
	9	669.1	4	0.637	388.5
	12	906.4	4	0.544	237.3
	15	980.7	3	0.477	74.3
	18	1028.9	3	0.426	48.2
	21	1062.7	2	0.385	33.8
	24	1093.6	2	0.352	30.9
X	27	1118.8	2	0.325	25.2
	30	1135.3	2	0.301	16.5
X	33	1148.9	2	0.281	13.6

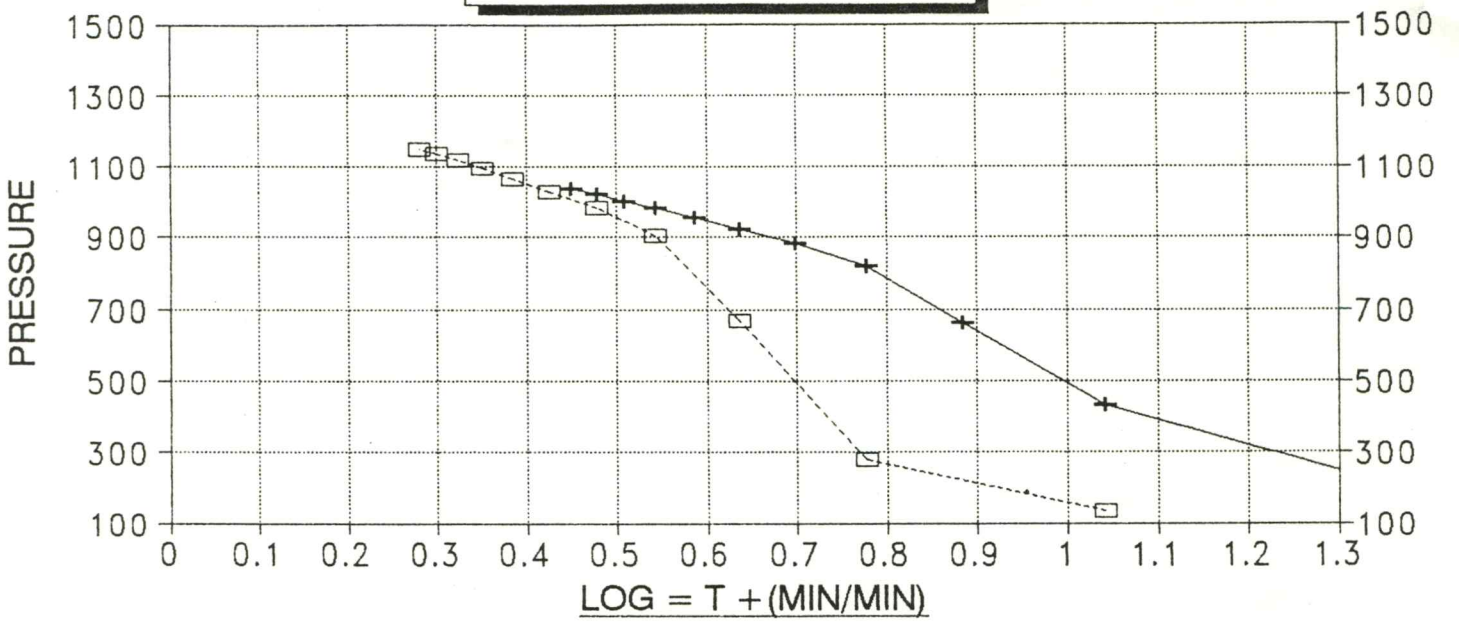
KELLER #1
FINAL

DST #4
SHUTIN
60 TOTAL FLOW TIME

Slope -615.26 psi/cycle
P * 1,312 psi

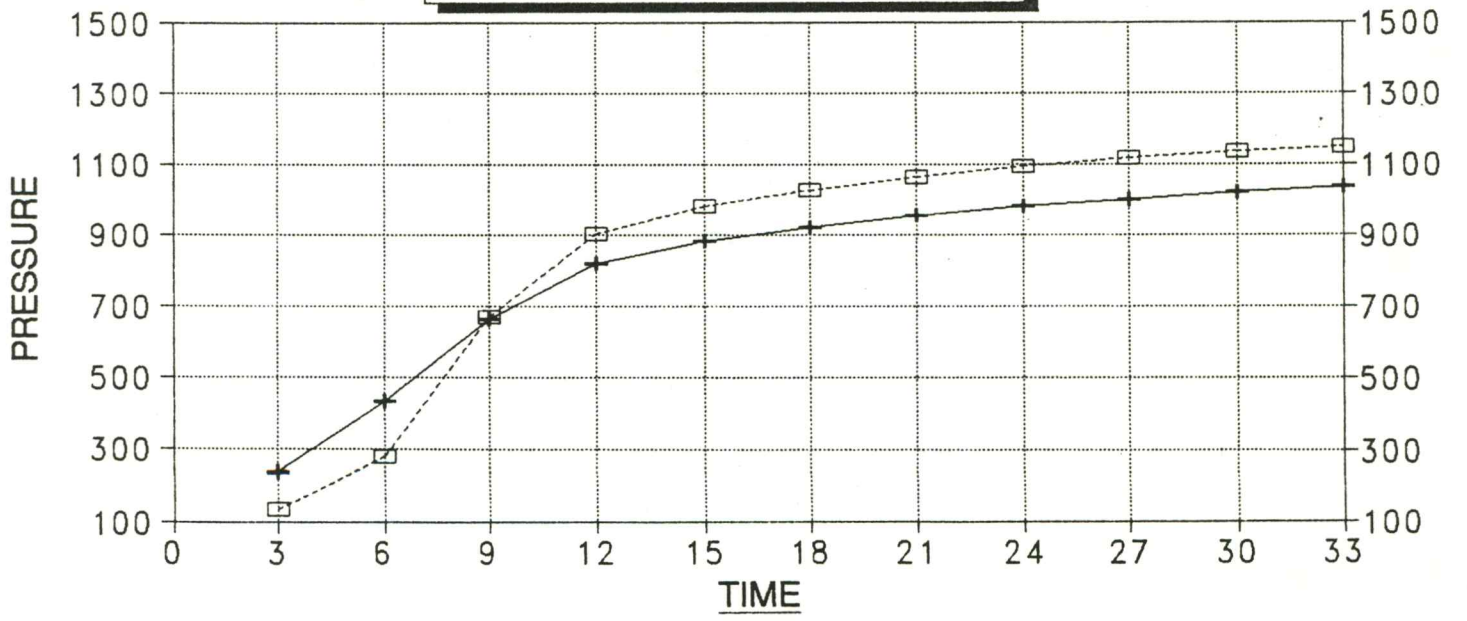
	TIME(MIN)	Pws (psi)	Horn T	Log Horn T	<> PRESSURE
	3	240.3	21	1.322	240.3
	6	434.4	11	1.041	194.1
	9	663.3	8	0.885	228.9
	12	818.8	6	0.778	155.5
X	15	881.5	5	0.699	62.7
	18	923.8	4	0.637	42.3
	21	954.7	4	0.586	30.9
	24	981.7	4	0.544	27.0
	27	999.9	3	0.508	18.2
	30	1020.2	3	0.477	20.3
X	33	1034.7	3	0.450	14.5

HORNER PLOT
KELLER #1-DST #4



INITIAL — FINAL

DELTA T DELTA P
KELLER #1-DST #4



INITIAL — FINAL

TRILOBITE TESTING COMPANY

P.O. Box 362 • Hays, Kansas 67601

Drill-Stem Test Data

Well Name KELLER #1 Test No. 8 Date 9/16/91
Company N-B COMPANY INC Zone Tested MARMATON
Address P.O. BOX 506 RUSSELL KANSAS 67665 Elevation 2955 KB
Co. Rep./Geo. MIKE DAVIGNON Cont. EMPHASIS #7 Est. Ft. of Pay 4
Location: Sec. 19 Twp. 11S Rge. 31W Co. GOVE State KS

Interval Tested 4269-4312 Drill Pipe Size 4.5 XH
Anchor Length 43 Wt. Pipe I.D. - 2.7 Ft. Run
Top Packer Depth 4269-4264 Drill Collar — 2.25 Ft. Run
Bottom Packer Depth 4315
Total Depth 4610

Mud Wt. 9.0 lb / gal. Viscosity 50 Filtrate 8.4

Tool Open @ 4:25pm Initial Blow STRONG BLOW OFF BOTTOM OF BUCKET IN 7 MINUTES
ISI: BLED THROUGH 2: NO BLOW BACK ON SHUTIN
Final Blow STRONG BLOW OFF BOTTOM OF BUCKET IN 11 MINUTES
FSI: BLED THROUGH 2" WEAK SURFACE BLOW DIED OUT IN 71 MINUTES

Recovery — Total Feet 660 Flush Tool? NO

Rec. 65 Feet of GAS IN PIPE

Rec. 660 Feet of OIL CUT MUD 30%GAS/20%OIL/50%MUD

Rec. Feet of

Rec. Feet of

Rec. Feet of

BHT 124 °F Gravity °API @ °F Corrected Gravity 39 °API

RW @ °F Chlorides ppm Recovery Chlorides 3800 ppm System

(A) Initial Hydrostatic Mud 2215.6 PSI AK1 Recorder No. 13308 Range 4700

(B) First Initial Flow Pressure 68.1 PSI @ (depth) 4273 w/Clock No. 27573

(C) First Final Flow Pressure 139 PSI AK1 Recorder No. 2023 Range 4000

(D) Initial Shut-In Pressure 1124.6 PSI @ (depth 4290 w/Clock No. 8376

(E) Second Initial Flow Pressure 177.4 PSI AK1 Recorder No. 10248 Range 4400

(F) Second Final Flow Pressure 289.6 PSI @ (depth) 4607 w/Clock No. 25810

(G) Final Shut-In Pressure 1023.7 PSI Initial Opening 30 Final Flow 60

(H) Final Hydrostatic Mud 2151.7 PSI Initial Shut-In 60 Final Shut-In 120

Our Representative LEWAYNE TRESNER TOTAL PRICE $ 950

BITF TESTING INS

13908
DST #8

This is an actual photograph of recorder chart

POINT	PRESSURE	
	FIELD READING	OFFICE READING
(A) INITIAL HYDROSTATIC MUD	2220	2215.6
(B) FIRST INITIAL FLOW PRESSURE	66	68.1
(C) FIRST FINAL FLOW PRESSURE	173	139
(D) INITIAL CLOSED-IN PRESSURE	1167	1124.6
(E) SECOND INITIAL FLOW PRESSURE	204	177.4
(F) SECOND FINAL FLOW PRESSURE	357	289.6
(G) FINAL CLOSED-IN PRESSURE	1070	1023.7
(H) FINAL HYDROSTATIC MUD	2159	2151.7

COMPUTER EVALUATION BY TRILOBITE TESTING
N-B COMPANY
REPORT FOR DST#8 FOR THE KELLER #1
19 11S 31W GOVE KS

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TEST PARAMETERS

ELEVATION:	2955 KB	EST. PAY:	4 FT
DATUM:	-1319	ZONE TESTED:	MARMATON
TEST INTERVAL:	4269-4312		
		TIME INTERVALS:	30-60-60-120
RECORDER DEPTH:	4273	VISCOSITY:	6.818207 CP
BOTTOM HOLE TEMP:	124	HOLE SIZE:	7.875 IN

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CALCULATIONS

CUBIC FEET OF GAS IN PIPE: 5.18956

TOTAL FEET OF RECOVERY: 660
BARRELS IN DRILL PIPE: 9.385201
GAS OIL RATIO: .5529514 CU.FT./BBL
BUBBLE POINT PRESSURE: ; 4.580964E-02
TOTAL BARRELS OF RECOVERY: 9.385201
UNCORR. INIT. PROD.: 150.1632 BBL/DAY
API GRAVITY: 39
FLUID GRADIENT: .359
CORRECTED PIPE FILLUP: 806.6853
CORR. BARRELS OF RECOVERY: 11.46985 BBL
INITIAL PRODUCTION CORRECTED TO FINAL FLOW PRESSURE: 183.5176 BBL/DAY
INITIAL PRODUCTION CORRECTED TO PSEUDO STEADY FLOW STATE
134.9616

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INITIAL SLOPE 405.23 PSI/CYCLE
INITIAL P* 1196 PSI

FINAL SLOPE 320.9 PSI/CYCLE
FINAL P* 1102 PSI

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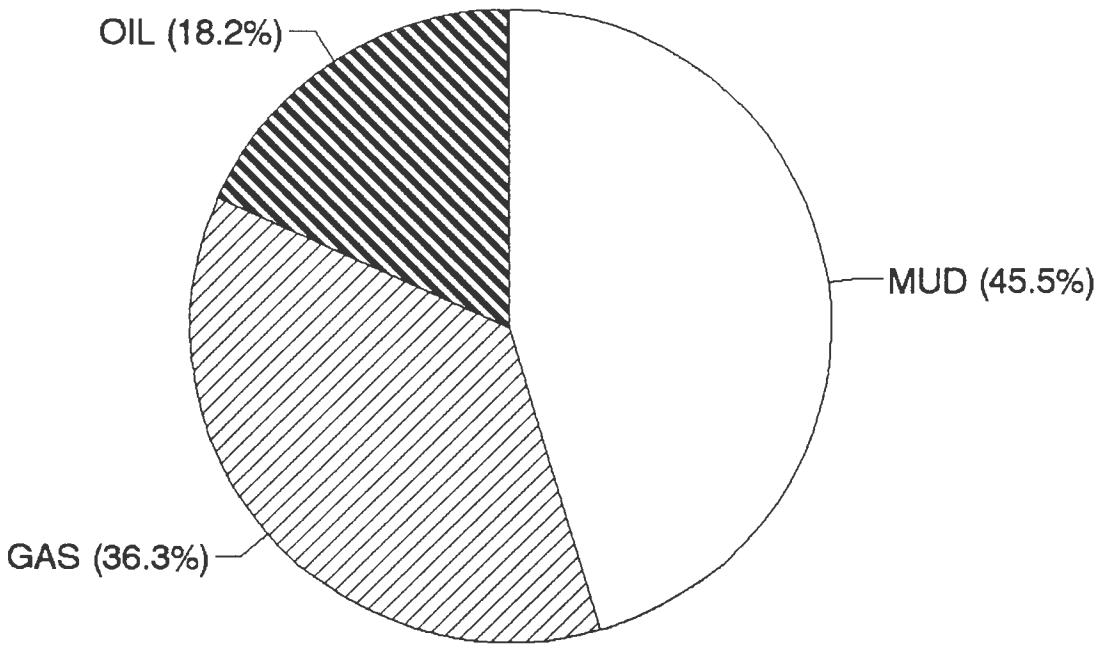
TRANSMISSIBILITY	92.98836 (MD.-FT./CP.)
PERMEABILITY	158.5035 (MD.)
INDICATED FLOW CAPACITY	634.014 (MD.FT)
PRODUCTIVITY INDEX	.1050769 (BARRELS/DAY/PSI)
DAMAGE RATIO	.4632883
RADIUS OF INVESTIGATION	119.4375 (FT.)
POTENTIOMETRIC SURFACE	1237.538 (FT.)
DRAWDOWN FACTOR	7.859535 (%)

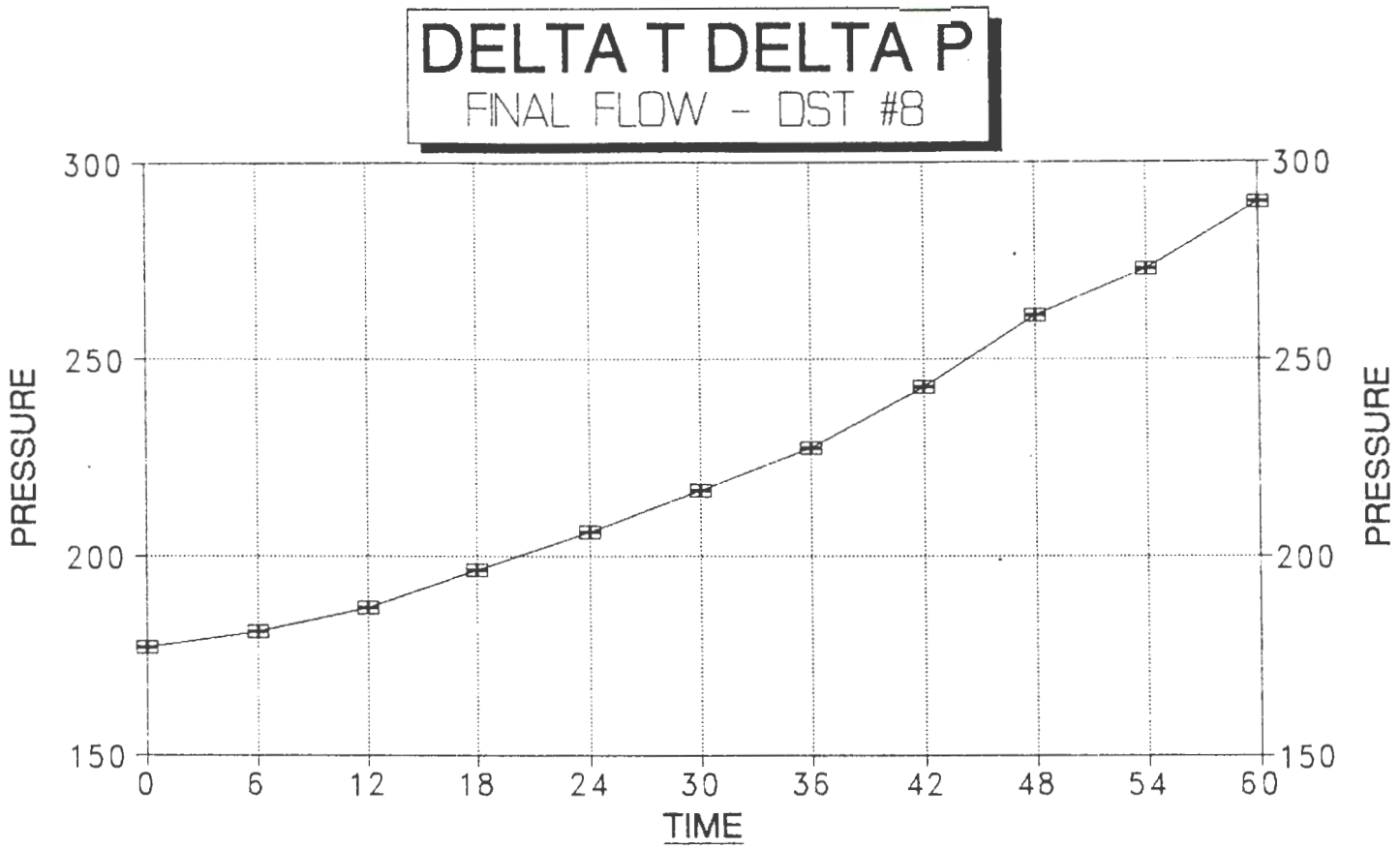
CALCULATED RECOVERY ANALYSIS DRILL PIPE

DST # 8 TICKET # 3875

SAMPLE #	TOTAL FEET	%	GAS FEET	%	OIL FEET	%	WATER FEET	%	MUD FEET
1	65	100	65		0		0		0
2	660	30	198	20	132		0	50	330
3			0		0		0		0
4			0		0		0		0
5			0		0		0		0
TOTAL	725	36.3	263	18.2069	132	0	0	45.5172	330

			HRS OPEN	BBL/DAY
BBL OIL=	1.87704	*	1.5	30.0326
BBL WATER	0	*		0
BBL MUD=	4.6926			
BBL GAS	3.73986			





INITIAL PRODUCTION CORRECTED TO PSEUDO STEADY FLOW STATE 134.9616 BBL/DAY

KELLER #1 DST #8
INITIAL SHUTIN

30 INITIAL FLOW TIME

Slope -405.23 psi/cycle
P * 1,196 psi

	TIME(MIN)	Pws (psi)	Horn T	Log Horn T	<> PRESSURE
	6	1009.6	6	0.778	1009.6
	12	1046.1	4	0.544	36.5
	18	1064.7	3	0.426	18.6
	24	1072.9	2	0.352	8.2
	30	1087.1	2	0.301	14.2
	36	1094.1	2	0.263	7.0
X	42	1101.1	2	0.234	7.0
	48	1112.8	2	0.211	11.7
	54	1119.9	2	0.192	7.1
X	60	1124.6	2	0.176	4.7

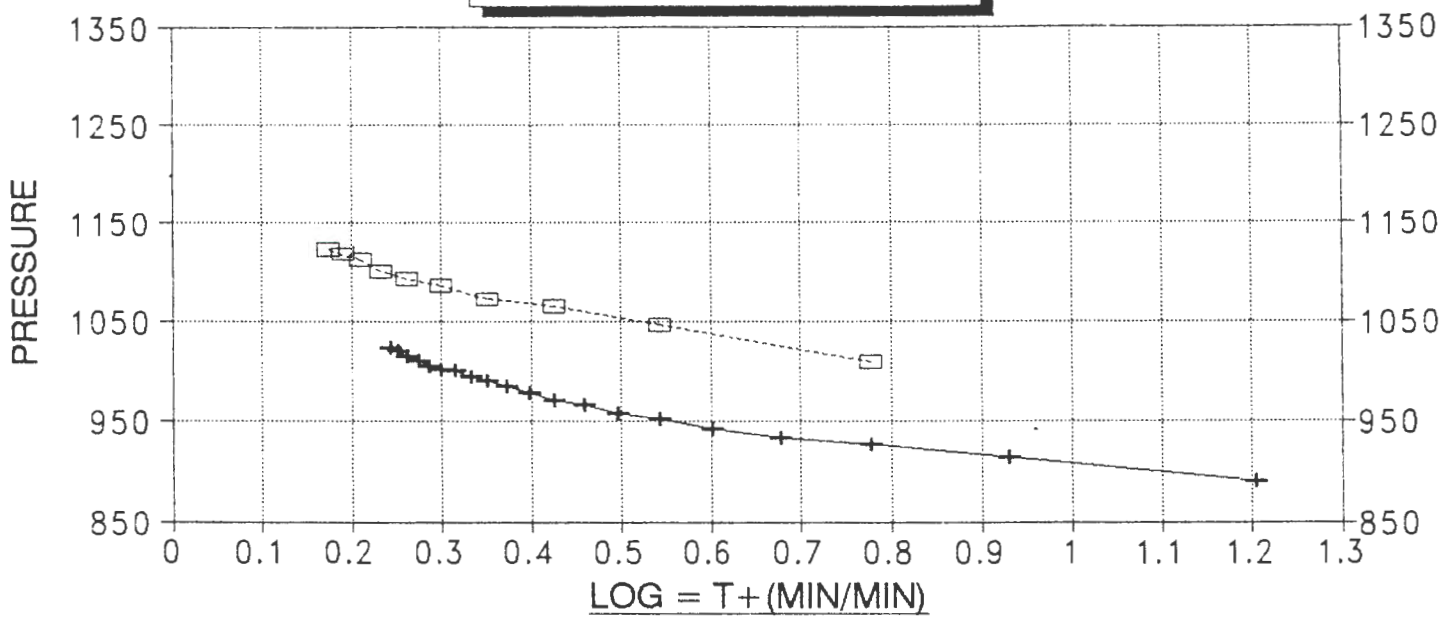
KELLER #1 DST #8
FINAL SHUTIN

90 TOTAL FLOW TIME

Slope -320.90 psi/cycle
P * 1,102 psi

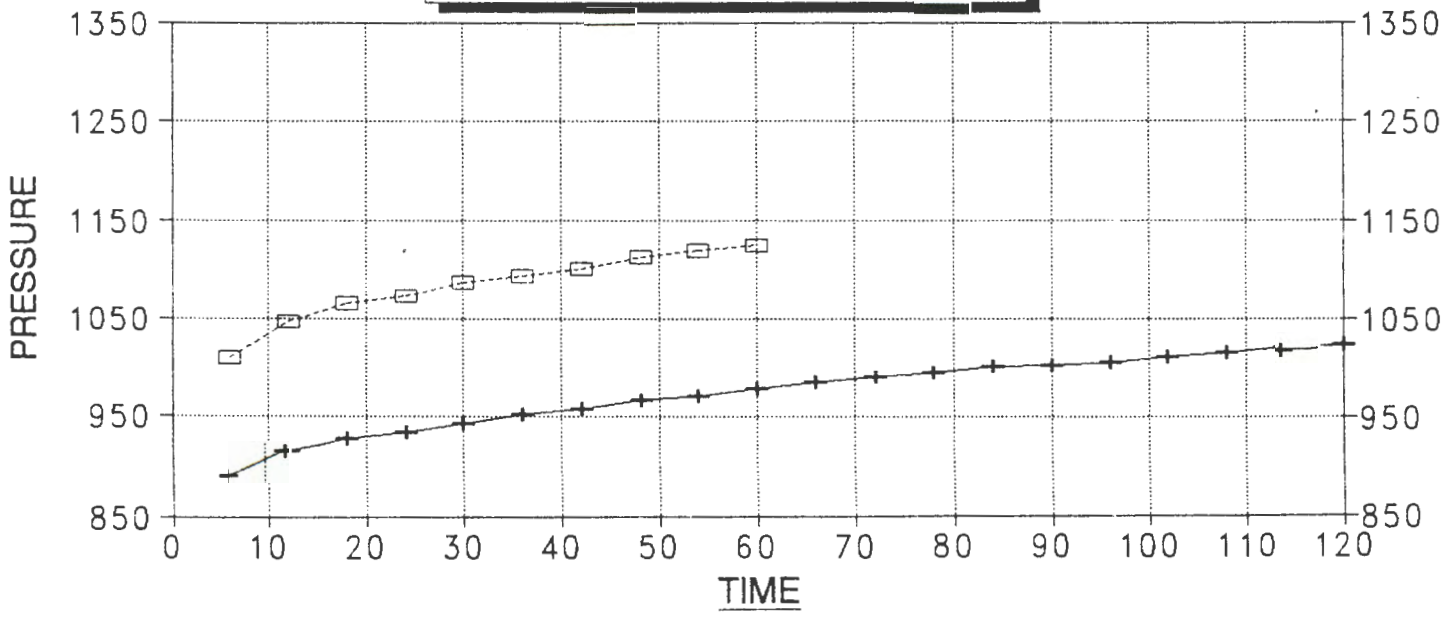
	TIME(MIN)	Pws (psi)	Horn T	Log Horn T	<> PRESSURE
	6	890.1	16	1.204	890.1
	12	914.7	9	0.929	24.6
	18	927.6	6	0.778	12.9
	24	934.6	5	0.677	7.0
	30	941.6	4	0.602	7.0
	36	952.1	4	0.544	10.5
	42	958.1	3	0.497	6.0
	48	966.2	3	0.459	8.1
	54	970.9	3	0.426	4.7
	60	978.1	3	0.398	7.2
	66	985.1	2	0.374	7.0
	72	989.7	2	0.352	4.6
	78	994.4	2	0.333	4.7
X	84	1000.2	2	0.316	5.8
	90	1002.6	2	0.301	2.4
	96	1006.1	2	0.287	3.5
	102	1010.8	2	0.275	4.7
	108	1015.5	2	0.263	4.7
	114	1020.2	2	0.253	4.7
X	120	1023.7	2	0.243	3.5

HORNER PLOT
KELLER #1 DST #8



INITIAL — FINAL

DELTA T DELTA P
KELLER #1 DST #8



INITIAL — FINAL

INITIAL FLOW

RECORDER # 13308
DST #8

DT(MIN)	PRESSURE	<> PRESSURE
0	68.1	68.1
3	70.5	2.400002
6	73	2.5
9	77.8	4.800003
12	82.6	4.799996
15	94.7	12.1
18	111.5	16.8
21	121.5	10
24	131.8	10.3
27	139	7.199997

FINAL FLOW

RECORDER # 13308
DST #8

DT(MIN)	PRESSURE	<> PRESSURE
0	177.4	177.4
6	181.1	3.700012
12	187.1	6
18	196.6	9.5
24	206.1	9.5
30	216.9	10.79999
36	227.6	10.70001
42	243.1	15.5
48	261.1	18
54	272.9	11.79999
60	289.6	16.70001