

TRILOBITE TESTING, L.L.C.

P.O. Box 362 • Hays, Kansas 67601

Drill-Stem Test Data

Well Name BOALDIN #1-21 Test No. 1 Date 5/19/93
Company ENSIGN OPERATING CO Zone KEYS
Address 621 17TH ST #1800 DENVER CO 80293 Elevation 3675
O. Rep./Geo. JOHN PRUITT Cont. G&J DRLG #3 Est. Ft. of Pay 25
Location: Sec. 21 Twp. 35S Rge. 43W Co. MORTON State KS

Interval Tested <u>4580-4605</u>	Drill Pipe Size <u>4.5" XH</u>
Anchor Length <u>25</u>	Wt. Pipe I.D. - 2.7 Ft. Run <u> </u>
Top Packer Depth <u>4575</u>	Drill Collar - 2.25 Ft. Run <u>537</u>
Bottom Packer Depth <u>4580</u>	Mud Wt. <u>9.0</u> lb/Gal.
Total Depth <u>4729</u>	Viscosity <u>50</u> Filtrate <u>10</u>

Well Open @ 5:40 PM Initial Blow STRONG BLOW - BOTTOM OF BUCKET IN 30 SECONDS
GAS TO SURFACE IN 3 MINUTES - GAUGED @ 30.8 MCF/DAY
Final Blow FAIR BLOW - BOTTOM OF BUCKET IN 2 MINUTES
GAUGED @ 8.95 MCF/DAY

Recovery - Total Feet 1363 Flush Tool? NO

EC. <u>1363</u>	Feet of <u>GASSY SALT WATER</u>
EC. <u> </u>	Feet of <u> </u>
EC. <u> </u>	Feet of <u> </u>
EC. <u> </u>	Feet of <u> </u>
EC. <u> </u>	Feet of <u> </u>

HT 119 °F Gravity °API @ °F Corrected Gravity °API
W 0.211 @ 74 °F Chlorides 31000 ppm Recovery Chlorides 1000 ppm System

1) Initial Hydrostatic Mud 2216.9 PSI AK1 Recorder No. 13277 Range 4125

2) First Initial Flow Pressure 35.6 PSI @ (depth) 4584 w / Clock No. 19960

3) First Final Flow Pressure 85.3 PSI AK1 Recorder No. 5495 Range 4200

4) Initial Shut-in Pressure 693.7 PSI @ (depth) 4597 w / Clock No. 26199

5) Second Initial Flow Pressure 441.5 PSI AK1 Recorder No. 11038 Range 5025

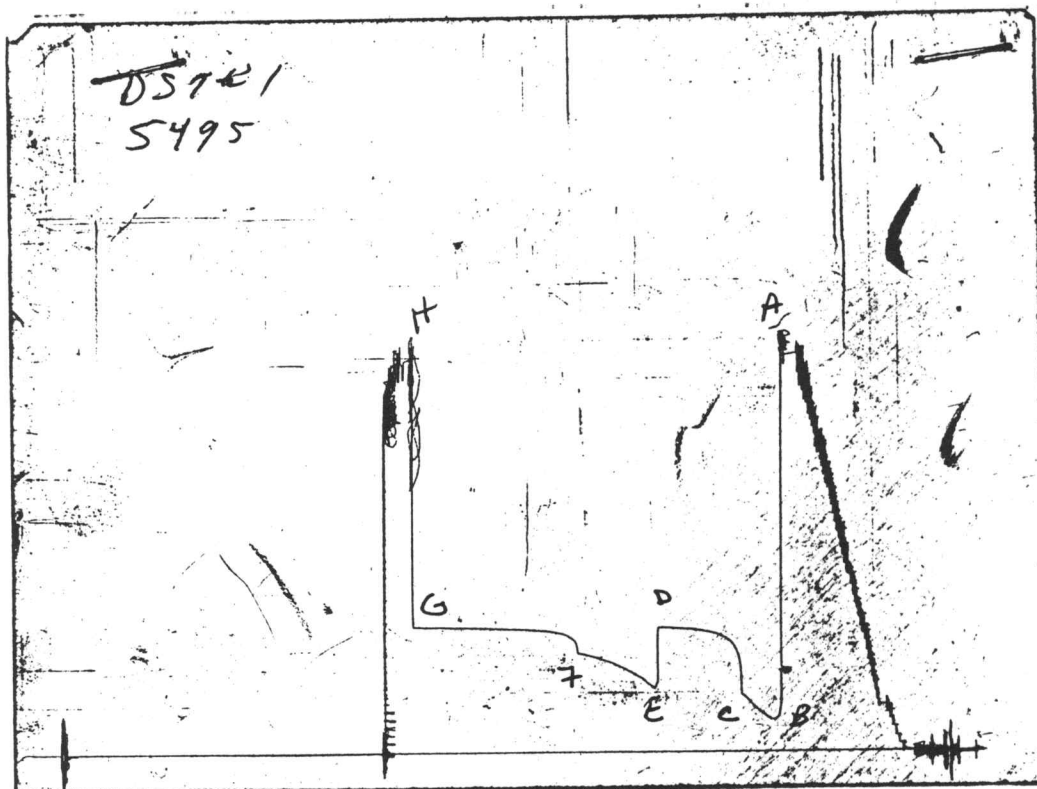
6) Second Final Flow Pressure 547.1 PSI @ (depth) 4726 w / Clock No. 3942

7) Final Shut-in Pressure 699.8 PSI Initial Opening 30 Final Flow 60

8) Final Hydrostatic Mud 2203.4 PSI Initial Shut-in 60 Final Shut-in 120

Our Representative TOM HORACEK

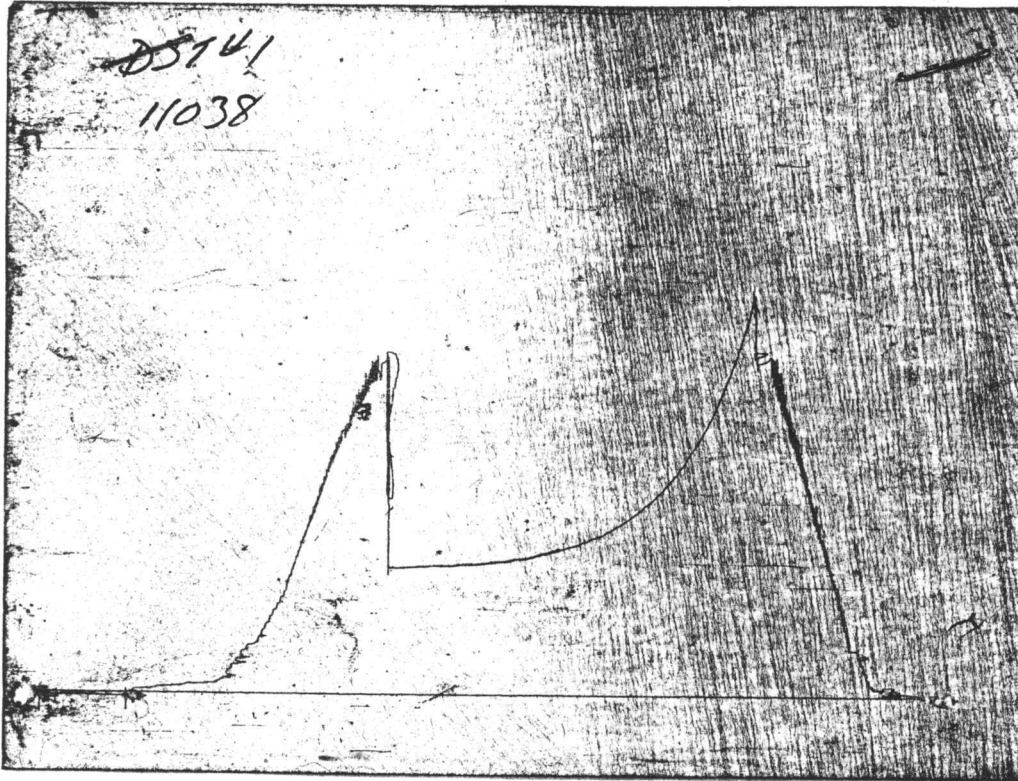
CHART PAGE



This is an actual photograph of recorder chart

	FIELD READING	OFFICE READING
(A) INITIAL HYDROSTATIC MUD	2204	2216.9
(B) FIRST INITIAL FLOW PRESSURE	237	35.6
(C) FIRST FINAL FLOW PRESSURE	291	85.3
(D) INITIAL CLOSED-IN PRESSURE	701	693.7
(E) SECOND INITIAL FLOW PRESSURE	442	441.5
(F) SECOND FINAL FLOW PRESSURE	548	547.1
(G) FINAL CLOSED-IN PRESSURE	712	699.8
(H) FINAL HYDROSTATIC MUD	2184	2203.4

CHART PAGE



This is an actual photograph of recorder chart

FIELD
READING

OFFICE
READING

- (A) INITIAL HYDROSTATIC MUD
- (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

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

ENSIGN OPERATING CO

BOALDIN #1-21

DST 1

21 35S 43W

MORTON

KS

ELEVATION:	3675 KB	EST. PAY:	25 FT.
DATUM:	-910	ZONE TESTED:	KEYS
TEST INTERVAL:	4580-4605	TIME INTERVALS:	30-60-60-120
RECORDER DEPTH:	4584	VISCOSITY:	0.01401 CP
BOTTOM HOLE TEMP:	119	HOLE SIZE:	7.875 IN
COMPRESSIBILITY:	0.9973	GAS GRAVITY:	0.7132

TEMPERATURE RANKINE:	579.00	&
TRANSMISSIBILITY:	389.48	Kh/%
THEORITICAL FLOW CAPICITY:	5.46	Kh
AVERAGE EFFECTIVE PERMEABILITY:	0.22	K(md.)
RADIUS OF INVESTIGATION:	4.43	FT.
DAMAGE RATIO:	2.66	
ABSOLUTE OPEN FLOW(MAX)	21.57	MCFD
ABSOLUTE OPEN FLOW(MIN)	13.90	MCFD
THEORITICAL OPEN FLOW(MAX)	57.34	MCFD
THEORITICAL OPEN FLOW(MIN)	36.93	MCFD
POTENTIOMETRIC SURFACE	0.00	(FT.)

INITIAL SHUT-IN VALUES:	
SLOPE	476465.43
THEORETICAL STATIC PRESSURE	693

FINAL SHUT-IN VALUES:	
SLOPE	21721.70
THEORETICAL STATIC PRESSURE	715

DRAWDOWN FACTOR:	-3.22 (%)
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INITIAL FLOW

RECORDER #13277

DST # 1

TIME(MIN)	PRESSURE	<>PRESSURE
3	35.6	35.6
6	35.6	0.0
9	36.7	1.1
12	36.7	0.0
15	36.7	0.0
18	38.8	2.1
21	43.2	4.4
24	47.5	4.3
27	56.1	8.6
30	69.1	13.0
33	85.3	16.2

FINAL FLOW

RECORDER .#13277

DST # 1

TIME(MIN)	PRESSURE	<> PRESSURE
15	441.5	441.5
30	442.6	1.1
45	443.6	1.0
60	443.6	0.0
75	443.6	0.0
90	445.8	2.2
21	452.1	6.3
24	461.7	9.6
27	472.3	10.6
30	478.6	6.3
33	486.1	7.5
36	492.4	6.3
39	497.7	5.3
42	504.1	6.4
45	512.5	8.4
48	521.1	8.6
51	527.3	6.2
54	529.4	2.1
57	535.7	6.3
60	544.1	8.4
63	547.1	3.0

BOALDIN #1-21
INITIAL

DST #1
SHUTIN

30 TOTAL FLOW TIME

Slope 476465.43 psi/cycle
P * 693 psi

TIME(MIN)	Pws (psi)	Log Horn T	<> PRESSURE	Horn T
3	437.3	1.041	437.3	11
6	557.4	0.778	120.1	6
9	591.3	0.637	33.9	4
12	609.7	0.544	18.4	4
15	624.1	0.477	14.4	3
18	635.2	0.426	11.1	3
21	645.4	0.385	10.2	2
24	652.6	0.352	7.2	2
27	659.8	0.325	7.2	2
30	667.1	0.301	7.3	2
33	670.1	0.281	3.0	2
36	674.2	0.263	4.1	2
39	677.3	0.248	3.1	2
42	681.4	0.234	4.1	2
45	684.5	0.222	3.1	2
48	688.6	0.211	4.1	2
51	689.6	0.201	1.0	2
54	691.7	0.192	2.1	2
X 57	692.7	0.184	1.0	2
X 60	693.7	0.176	1.0	2

BOALDIN #1-21
FINAL

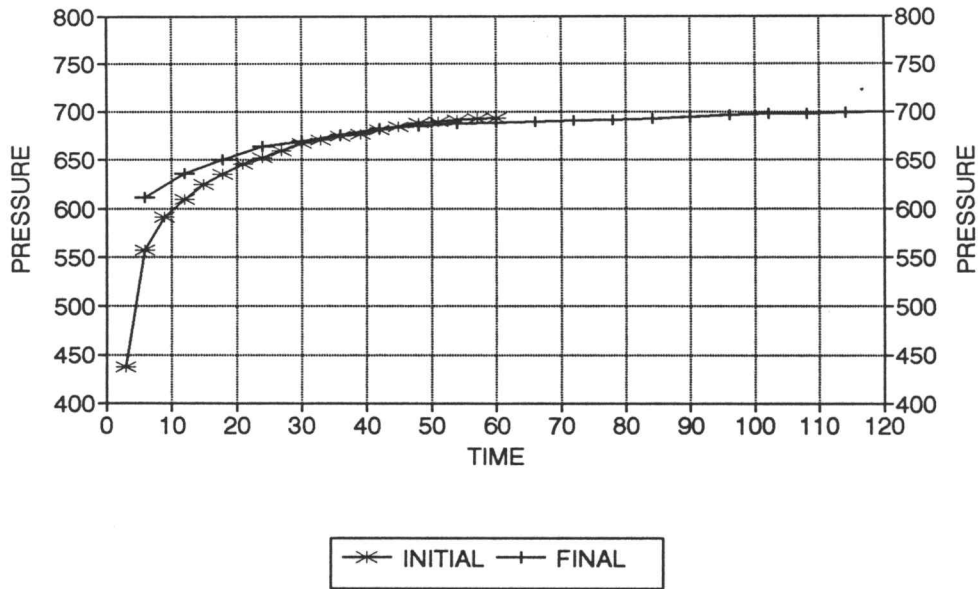
DST #1
SHUTIN

90 TOTAL FLOW TIME

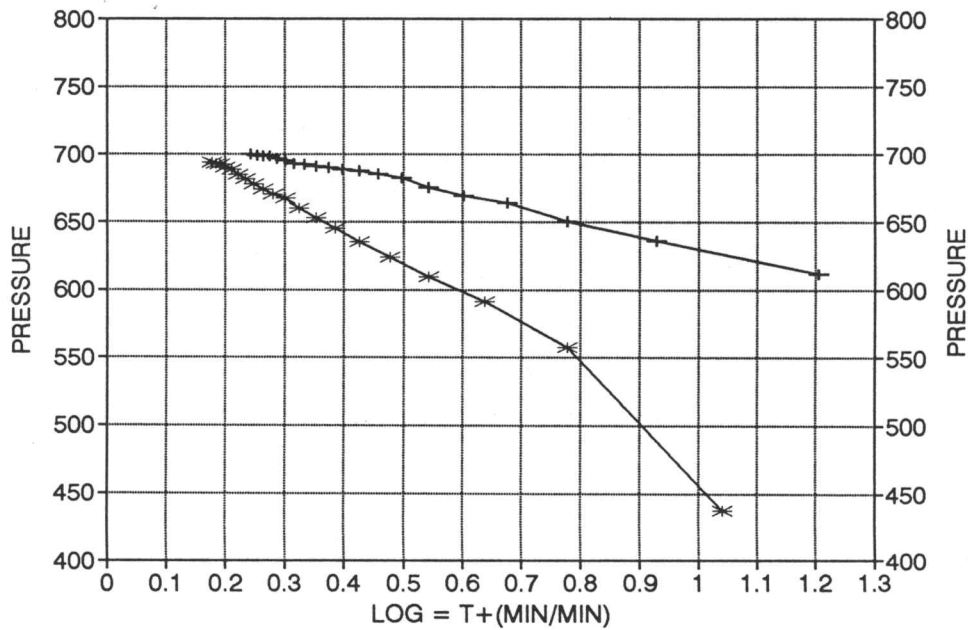
SLOPE 21721.7 PSI/CYCLE
P* 715.2 PSI

	Pws (psi)	Log Horn T	<> PRESSURE	Horn T
6	611.8	1.204	611.8	16
12	636.2	0.929	24.4	9
18	650.6	0.778	14.4	6
24	663.9	0.677	13.3	5
30	669.1	0.602	5.2	4
36	675.2	0.544	6.1	4
42	682.4	0.497	7.2	3
48	685.5	0.459	3.1	3
54	687.5	0.426	2.0	3
60	688.6	0.398	1.1	3
66	689.6	0.374	1.0	2
72	690.6	0.352	1.0	2
78	691.7	0.333	1.1	2
84	692.7	0.316	1.0	2
90	694.7	0.301	2.0	2
96	696.8	0.287	2.1	2
X 102	697.8	0.275	1.0	2
108	697.8	0.263	0.0	2
114	698.8	0.253	1.0	2
X 120	699.8	0.243	1.0	2

BOALDIN #1-21 / DST #1 DELTA T DELTA P



HORNER PLOT



GAS VOLUME REPORT

ENSIGN OPERATING CO

BOALDIN #1-21

DST # 1

MIN	PSIG	ORIFICE	MCF/D	MIN	PSIG	ORIFICE	MCF/D
10	4	0.75	156	10	3	0.25	17.1
20	1	0.75	76	20	5	0.25	20.7
30	10	0.25	30.8	30	2	0.25	12.7
				40	2	0.25	12.7
				50	1.5	0.25	11.02
				60	1	0.25	8.95

Remarks: GAS TO SURFACE IN 3 MINUTES/GAS WILL BURN

FLUID SAMPLER DATA

Ticket No.: 5507 Date: 5/19/93
Company: ENSIGN OPERATING CO
Lease: BOALDIN #1-21 Test No.: 1
County: MORTON Sec.: 21 Twp.: 35S Rng.: 43W

SAMPLER RECOVERY

Gas 100
Oil
Mud
Water 3900
Other 2.5 CUBIC FT
Pressure 425
TOTAL 4000

SAMPLER ANALYSIS

Resistivity 0.211 ohms@ 74 F
Chlorides 31000 ppm.
Gravity corrected @60F

PIT MUD ANALYSIS

Chlorides
Resistivity ohms@ F
Viscosity 50
Mud Wt. 9.0
Filtrate 10
Other

PIPE RECOVERY

TOP

Resistivity 0.241 ohms@ 74 F
Chlorides 28000 ppm

MIDDLE

Resistivity 0.241 ohms@ 74 F
Chlorides 28000 ppm

BOTTOM

Resistivity 0.211 ohms@ 74 F
Chlorides 31000 ppm