TRILOBITE TESTING, L.L.C.

P.O. Box 362 • Hays, Kansas 67601

Drill-Stem Test Data

Well Name GRASS #5 Test No. 1 Date 12/9/92

Company NATIONAL OIL COMPANY Zone CHEROKEE

Address P.O. BOX 399 GARDEN CITY KS 67846 Elevation 2303

Co. Rep./Geo. SCOTT CORSAIR Cont. EMPHASIS RIG #5 Est. Ft. of Pay

Location: Sec. 11 Twp. 21S Rge. 25W Co. HODGEMAN State KS

Interval Tested 4355-4407 Drill Pipe Size 4.5" XH

Anchor Length 52 Wt. Pipe I.D. - 2.7 Ft. Run 620

Top Packer Depth 4350 Drill Collar — 2.25 Ft. Run

Bottom Packer Depth 4355 Mud Wt. 8.9 lb/Gal.

Total Depth 4407 Viscosity 44 Filtrate 9

Tool Open @ 8:20 PM Initial Blow WEAK-DIED IN 19 MINUTES

Final Blow WEAK -FLUSHED TOOL - NO HELP

Recovery - Total Feet 5 Flush Tool? YES

Rec. 5 Feet of DRILLING MUD

Rec. Feet of

Rec. Feet of

Rec. Feet of

Rec. Feet of

BHT 113 °F Gravity °API @ °F Corrected Gravity °API

RW @ °F Chlorides ppm Recovery Chlorides ppm System

(A) Initial Hydrostatic Mud 2222.6 PSI AK1 Recorder No. 13754 Range 4000

(B) First Initial Flow Pressure 46.2 PSI @ (depth) 4359 w / Clock No. 25828

(C) First Final Flow Pressure 46.2 PSI AK1 Recorder No. 7437 Range 4200

(D) Initial Shut-in Pressure 215.8 PSI @ (depth) 4403 w / Clock No. 8376

(E) Second Initial Flow Pressure 46.2 PSI AK1 Recorder No. Range

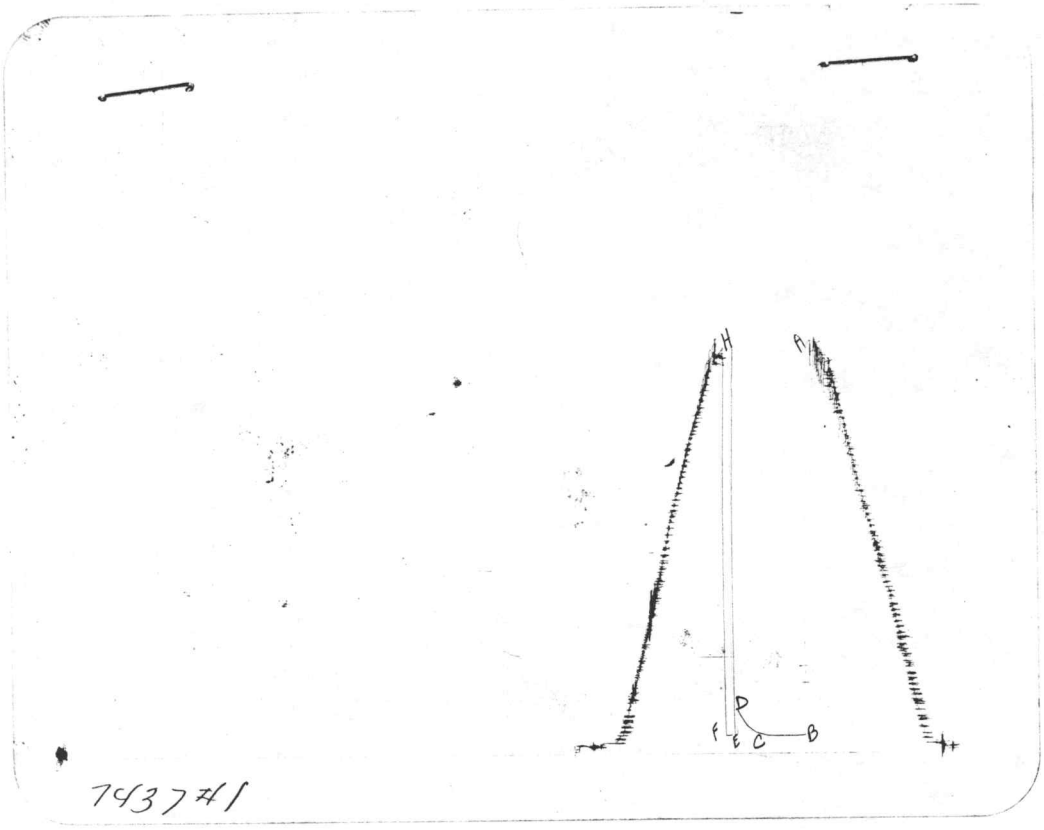
(F) Second Final Flow Pressure 46.2 PSI @ (depth) w / Clock No.

(G) Final Shut-in Pressure PSI Initial Opening 20 Final Flow 10

(H) Final Hydrostatic Mud 2190.6 PSI Initial Shut-in 30 Final Shut-in 0

Our Representative DAN BANGLE

CHART PAGE



This is an actual photograph of recorder chart

	FIELD READING	OFFICE READING
(A) INITIAL HYDROSTATIC MUD	2218	2222.6
(B) FIRST INITIAL FLOW PRESSURE	39	46.2
(C) FIRST FINAL FLOW PRESSURE	39	46.2
(D) INITIAL CLOSED-IN PRESSURE	206	215.8
(E) SECOND INITIAL FLOW PRESSURE	39	46.2
(F) SECOND FINAL FLOW PRESSURE	39	46.2
(G) FINAL CLOSED-IN PRESSURE	0	
(H) FINAL HYDROSTATIC MUD	2188	2190.6

TRILOBITE TESTING, L.L.C.

P.O. Box 362 • Hays, Kansas 67601

Drill-Stem Test Data

Well Name GRASS #5 Test No. 2 Date 12/10/92

Company NATIONAL OIL COMPANY Zone MISS

Address P.O. BOX 399 GARDEN CITY KS 67846 Elevation 2303

Co. Rep./Geo. SCOTT CORSAIR Cont. EMPHASIS RIG #5 Est. Ft. of Pay 6

Location: Sec. 11 Twp. 21S Rge. 25W Co. HODGEMAN State KS

Interval Tested 4413-4422 Drill Pipe Size 4.5" XH

Anchor Length 9 Wt. Pipe I.D. - 2.7 Ft. Run 620

Top Packer Depth 4408 Drill Collar – 2.25 Ft. Run

Bottom Packer Depth 4413 Mud Wt. 9 lb/Gal.

Total Depth 4422 Viscosity 45 Filtrate 8

Tool Open @ 7:42 AM Initial Blow WEAK - BUILDING TO 6.5"

Final Blow WEAK - BUILDING TO 2"

Recovery - Total Feet 248 Flush Tool? NO

Rec. 186 Feet of GAS IN PIPE

Rec. 124 Feet of CLEAN GASSY OIL

Rec. 62 Feet of MUD CUT GASSY OIL-10%GAS/70%OIL/20%MUD

Rec. 62 Feet of SLTLY OIL CUT GSY WTR-15%GAS/5%OIL/80%WTR

Rec. Feet of

BHT 120 °F Gravity °API @ °F Corrected Gravity 39 °API

RW 0.2 @ 70 °F Chlorides 36000 ppm Recovery Chlorides ppm System

(A) Initial Hydrostatic Mud 2290.6 PSI AK1 Recorder No. 13754 Range 4000

(B) First Initial Flow Pressure 19.6 PSI @ (depth) 4414 w / Clock No. 17639

(C) First Final Flow Pressure 46.2 PSI AK1 Recorder No. 7437 Range 4200

(D) Initial Shut-in Pressure 425.1 PSI @ (depth) 4418 w / Clock No. 25828

(E) Second Initial Flow Pressure 60.0 PSI AK1 Recorder No. Range

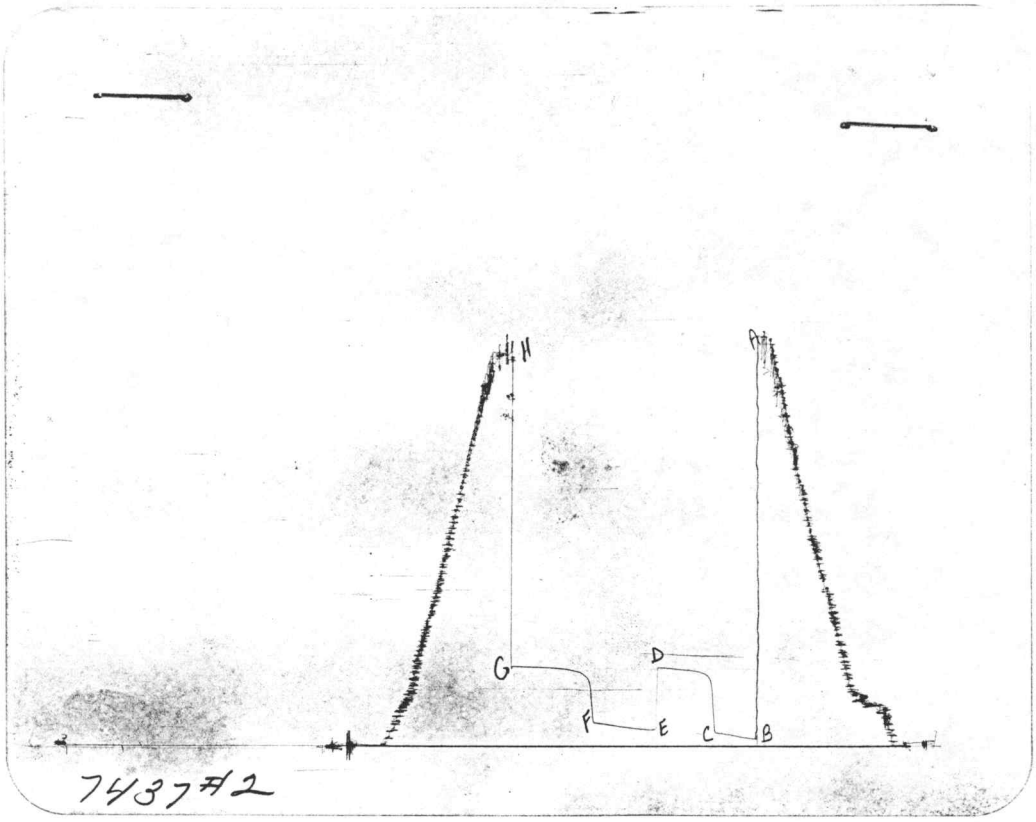
(F) Second Final Flow Pressure 92.5 PSI @ (depth) w / Clock No.

(G) Final Shut-in Pressure 427.1 PSI Initial Opening 30 Final Flow 45

(H) Final Hydrostatic Mud 2260.9 PSI Initial Shut-in 45 Final Shut-in 60

Our Representative DAN BANGLE

CHART PAGE



This is an actual photograph of recorder chart

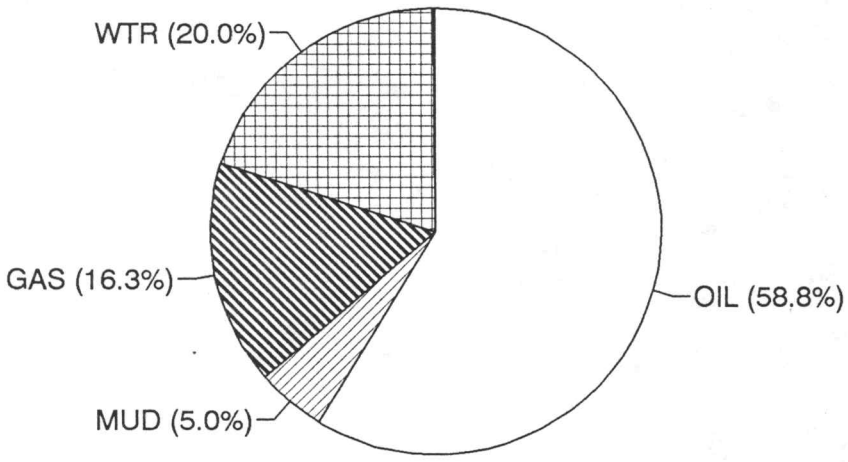
	FIELD READING	OFFICE READING
(A) INITIAL HYDROSTATIC MUD	2279	2290.6
(B) FIRST INITIAL FLOW PRESSURE	39	19.6
(C) FIRST FINAL FLOW PRESSURE	68	46.2
(D) INITIAL CLOSED-IN PRESSURE	442	425.1
(E) SECOND INITIAL FLOW PRESSURE	78	60
(F) SECOND FINAL FLOW PRESSURE	108	92.5
(G) FINAL CLOSED-IN PRESSURE	442	427.1
(H) FINAL HYDROSTATIC MUD	2248	2260.9

CALCULATED RECOVERY ANALYSIS WEIGHT PIPE

DST # 2 TICKET # 5572

SAMPLE	TOTAL		GAS		OIL		WATER		MUD
#	FEET	%	FEET	%	FEET	%	FEET	%	FEET
1	124	20	24.8	80	99.2	0	0	0	0
2	62	10	6.2	70	43.4	0	0	20	12.4
3	62	15	9.3	5	3.1	80	49.6	0	0
4			0		0		0		0
5			0		0		0		0
TOTAL	248	16.25	40.3	58.75	145.7	20	49.6	5	12.4

			HRS OPEN	BBL/DAY
BBL OIL=	1.0199	*	1.25	19.58208
BBL WATER=	0.3472	*		6.66624
BBL MUD=	0.0868			
BBL GAS=	0.2821			



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

NATIONAL OIL COMPANY GRASS #5 DST 2

11 21S 25W HODGEMAN KS

ELEVATION:	2303	KB	EST. PAY	6	FT
DATUM:	-2112		ZONE TESTED:	MISS	
TEST INTERVAL:	4413-4422		TIME INTERVALS:	30-45-45-60	
RECORDER DEPTH:	4414		VISCOSITY:	3.850	CP
BOTTOM HOLE TEMP:	120		HOLE SIZE:	7.875	IN

CUBIC FEET OF GAS IN PIPE:	7.26			
TOTAL FEET OF RECOVERY:	248.00	CORRECTED PIPE FILLUP:	257.660	
TOTAL BARRELS OF RECOVERY:	1.74	CORR. BARRELS OF RECOVERY:	1.799	BBL
BARRELS IN DRILL PIPE:	0.00	API GRAVITY:	39	
BARRELS IN WEIGHT PIPE:	1.74	FLUID GRADIENT:	0.359	
BARRELS IN DRILL COLLARS:	0.00			
GAS OIL RATIO:	4.1808	CU.FT/BBL		
BUBBLE POINT PRESSURE:	36.916			
UNCORRECTED INITIAL PRODUCTION:			33.33	BBL
INITIAL PRODUCTION CORRECTED TO FINAL FLOW PRESSURE:			34.54	BBL/DAY
INITIAL PRODUCTION CORRECTED TO PSEUDO STEADY FLOW STATE:			19.655	

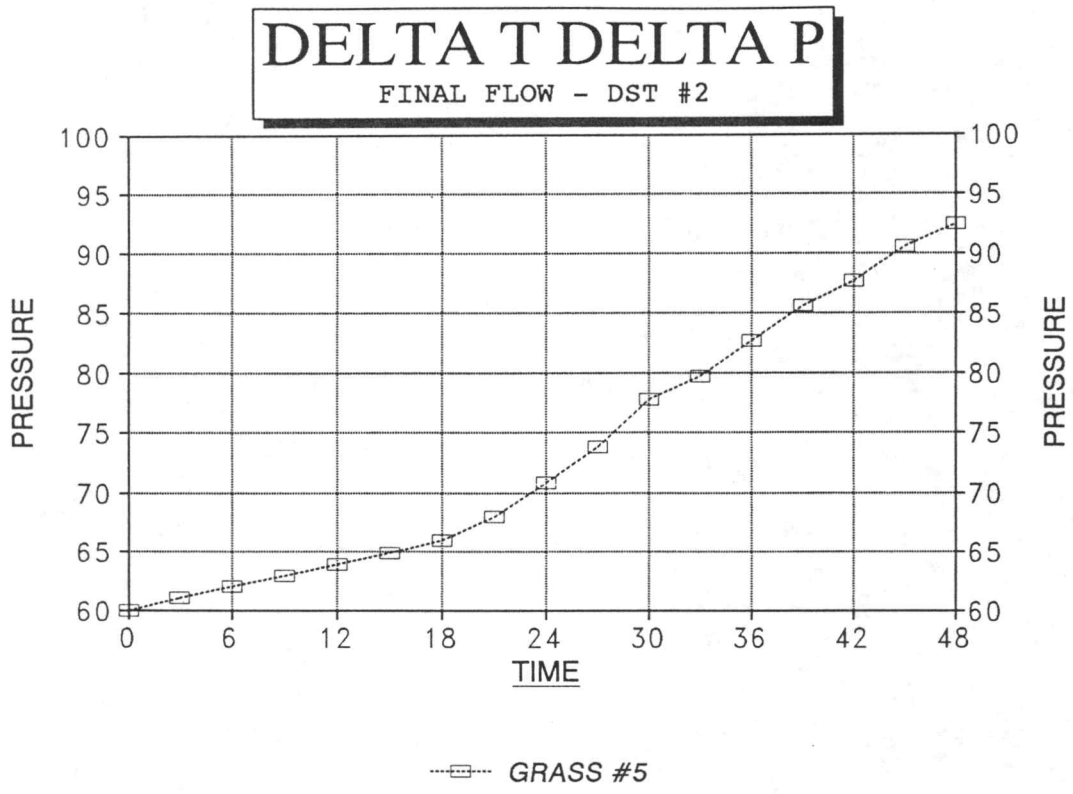
INITIAL SLOPE	78.52	PSI/CYCLE	FINAL SLOPE	8.89	PSI/CYCLE
INITIAL P*	442	PSI	FINAL P*	430	PSI

TRANSMISSIBILITY	631.99	(MD.-FT./CP.)
PERMEABILITY	405.55	(MD.)
INDICATED FLOW CAPACITY	2433.30	)MD.FT)
PRODUCTIVITY INDEX	0.71	(BARRELS/DAY/PSI)
DAMAGE RATIO	6.95	
RADIUS OF INVESTIGATION	174.40	(FT,)
POTENTIOMETRIC SURFACE	-1113.30	(FT.)
DRAWDOWN FACTOR	2.587	(%)
THEORETICAL POTENTIAL FROM FINAL FLOW PRESSURE	240.22	
THEORETICAL POTENTIAL FROM PSEUDO STEADY FLOW STATE	136.69	

FINAL FLOW

RECORDER # 13754 DST # 2

TIME(MIN)	PRESSURE	<> PRESSURE
0	60	60
3	61	1
6	62	1
9	62.9	0.9
12	63.9	1
15	64.9	1
18	65.9	1
21	67.9	2
24	70.8	2.9
27	73.8	3
30	77.7	3.9
33	79.7	2
36	82.6	2.9
39	85.6	3
42	87.6	2
45	90.5	2.9
48	92.5	2



INITIAL PRODUCTION CORRECTED TO PSEUDO STEADY FLOW STATE: 19.655

GRASS #5 DST #2
INITIAL SHUTIN

30 TOTAL FLOW TIME

Slope 78.52 psi/cycle
P * 442 psi

	TIME(MIN)	Pws (psi)	Log Horn T	<> PRESSURE	Horn T
	3	139.7	1.041	139.7	11
	6	351.3	0.778	211.6	6
	9	390.7	0.637	39.4	4
	12	398.6	0.544	7.9	4
	15	406.4	0.477	7.8	3
	18	408.4	0.426	2.0	3
	21	415.3	0.385	6.9	2
	24	416.3	0.352	1.0	2
	27	417.3	0.325	1.0	2
	30	418.3	0.301	1.0	2
	33	420.2	0.281	1.9	2
	36	421.2	0.263	1.0	2
X	39	422.2	0.248	1.0	2
	42	423.2	0.234	1.0	2
	45	424.2	0.222	1.0	2
X	48	425.1	0.211	0.9	2

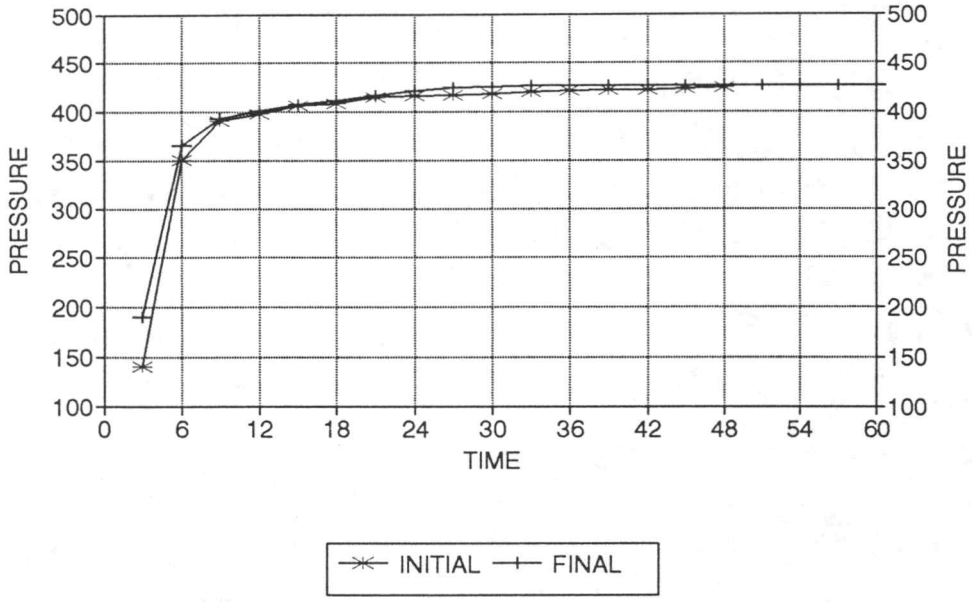
GRASS #5 DST #2
FINAL SHUTIN

75 TOTAL FLOW TIME

Slope 8.89 psi/cycle
P * 430 psi

		Pws (psi)	Log Horn T	<> PRESSURE	Horn T
	3	189.9	1.415	189.9	26
	6	366.1	1.130	176.2	14
	9	393.7	0.970	27.6	9
	12	401.5	0.860	7.8	7
	15	407.4	0.778	5.9	6
	18	412.4	0.713	5.0	5
	21	417.3	0.660	4.9	5
	24	421.2	0.615	3.9	4
X	27	425.1	0.577	3.9	4
	30	426.1	0.544	1.0	4
	33	427.1	0.515	1.0	3
	36	427.1	0.489	0.0	3
	39	427.1	0.466	0.0	3
	42	427.1	0.445	0.0	3
	45	427.1	0.426	0.0	3
	48	427.1	0.409	0.0	3
	51	427.1	0.393	0.0	2
	54	427.1	0.378	0.0	2
	57	427.1	0.365	0.0	2
X	60	427.1	0.352	0.0	2

GRASS #5 / DST #2
DELTA T DELTA P



HORNER PLOT

