Company Mull Drilling Company — Lease & Well No. Spruill #1

Elevation ----- — Formation Kansas City — Effective Pay ---- Ft. — Ticket No. 7197

Date 11/17/80 — Sec. 32 — Twp. 17S — Range 27W — County Lane — State Kansas

Test Approved by Richard E. Roby — Western Representative Steve Michellich

Formation Test No. 1 — Interval Tested from 4180 ft. to 4210 ft. — Total Depth 4210 ft.

Packer Depth 4180 ft. — Size 6 3/4 in. — Packer Depth – ft. — Size – in.

Packer Depth 4175 ft. — Size 6 3/4 in. — Packer Depth – ft. — Size – in.

Depth of Selective Zone Set –

Top Recorder Depth (Inside) 4203 ft. — Recorder Number 1049 — Cap. 3500

Bottom Recorder Depth (Outside) 4206 ft. — Recorder Number 1134 — Cap. 4500

Below Straddle Recorder Depth – ft. — Recorder Number – — Cap. –

Drilling Contractor Blue Goose Drilling Rig #2 — Drill Collar Length 300 — I. D. 2.25 in.

Mud Type Mon-Pac — Viscosity 50 — Weight Pipe Length – — I. D. – in.

Weight 9.0 — Water Loss 7.2 cc. — Drill Pipe Length 3859 — I. D. 3.8 in.

Chlorides 6,000 P.P.M. — Test Tool Length 21 ft. — Tool Size 5½ in.

Jars: Make None — Serial Number – — Anchor Length 30 ft. — Size 5½ in.

Did Well Flow? No — Reversed Out No — Surface Choke Size 3/4 in. — Bottom Choke Size 3/4 in.

Main Hole Size 7 7/8 in. — Tool Joint Size 4½XH in.

Blow: Initial flow period fair increasing to strong blow.

Recovered 248 ft. of clean oil specific gravity 41

Recovered 155 ft. of oil cut mud 15% oil;85% mud

Recovered 600 ft. of gas in pipe

Recovered 403 ft. of Total Fluid

Recovered ft. of

Remarks:

Time Set Packer(s) 7:45 ~~A.M.~~ ~~P.M.~~ — Time Started Off Bottom 11:00 ~~A.M.~~ ~~P.M.~~ — Maximum Temperature 113°

Initial Hydrostatic Pressure			(A)	2092	P.S.I.	
Initial Flow Period	Minutes 30		(B)	86 P.S.I.	to (C)	130 P.S.I.
Initial Closed In Period	Minutes 48		(D)	932 P.S.I.		
Final Flow Period	Minutes 60		(E)	187 P.S.I.	to (F)	176 P.S.I.
Final Closed In Period	Minutes 63		(G)	872 P.S.I.		
Final Hydrostatic Pressure			(H)	2077 P.S.I.		

WESTERN TESTING CO., INC.
Pressure Data

Date 11/17/80 Test Ticket No. 7197

Recorder No. 1049 Capacity 3500 Location 4203 Ft.

Clock No. -- Elevation ----- Well Temperature 113 °F

Point	Pressure		Time Given	Time Computed
A Initial Hydrostatic Mud	2092 P.S.I.	Open Tool	7:45A M	
B First Initial Flow Pressure	86 P.S.I.	First Flow Pressure	30 Mins.	30 Mins.
C First Final Flow Pressure	130 P.S.I.	Initial Closed-in Pressure	45 Mins.	48 Mins.
D Initial Closed-in Pressure	932 P.S.I.	Second Flow Pressure	60 Mins.	60 Mins.
E Second Initial Flow Pressure	187 P.S.I.	Final Closed-in Pressure	60 Mins.	63 Mins.
F Second Final Flow Pressure	176 P.S.I.			
G Final Closed-in Pressure	872 P.S.I.			
H Final Hydrostatic Mud	2077 P.S.I.			

PRESSURE BREAKDOWN

First Flow Pressure
Breakdown: 6 Inc.
of 5 mins. and a
final inc. of 0 Min.

Point Mins.	Press.
P 1 0	86
P 2 5	88
P 3 10	93
P 4 15	104
P 5 20	114
P 6 25	121
P 7 30	130
P 8	
P 9	
P10	
P11	
P12	
P13	
P14	
P15	
P16	
P17	
P18	
P19	
P20	

Initial Shut-In
Breakdown: 16 Inc.
of 3 mins. and a
final inc. of 0 Min.

Point Minutes	Press.
0	130
3	185
6	315
9	529
12	703
15	775
18	813
21	839
24	857
27	890
30	899
33	908
36	916
39	923
42	929
45	932

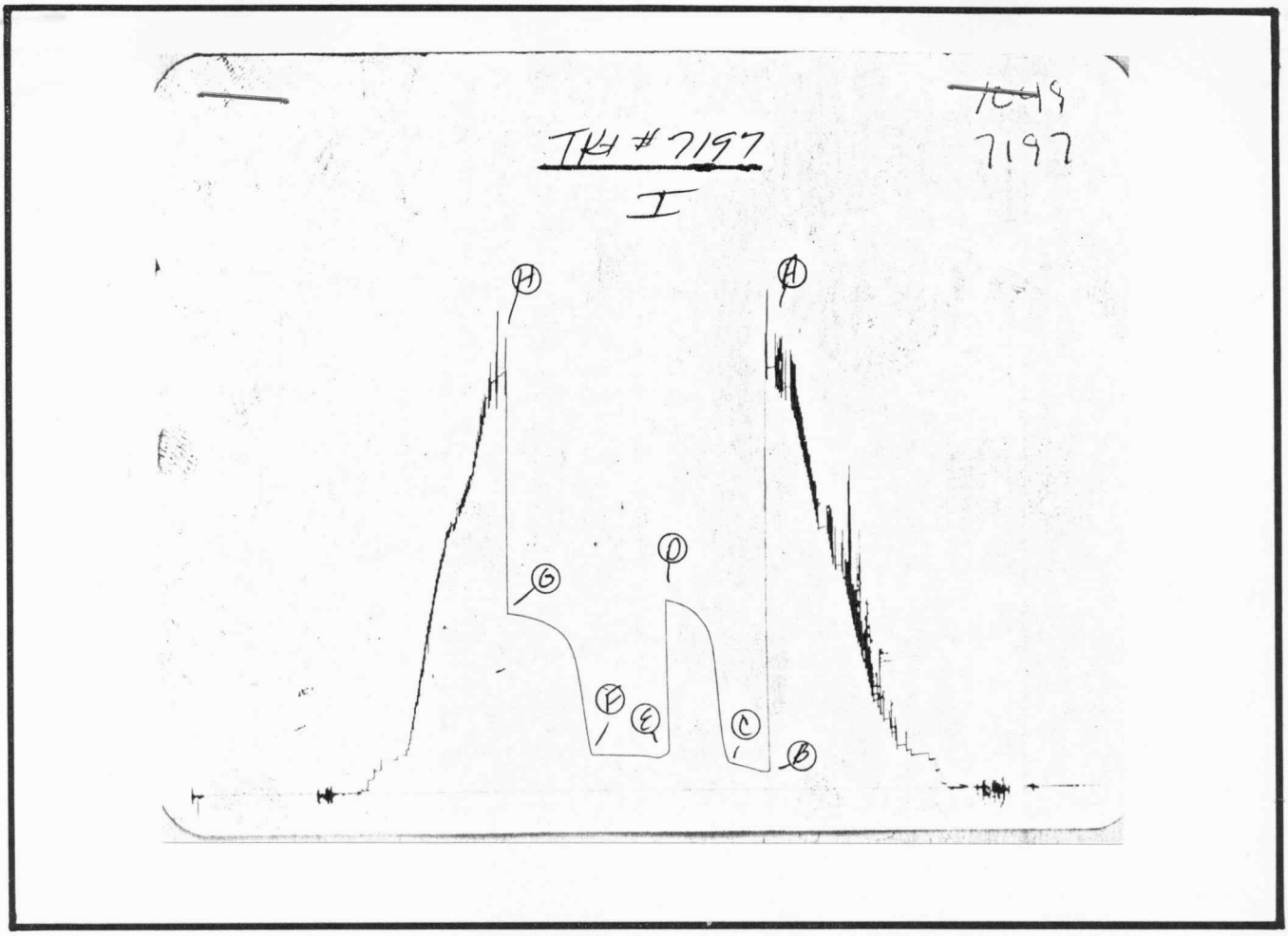
Second Flow Pressure
Breakdown: 12 Inc.
of 5 mins. and a
final inc. of 0 Min.

Point Minutes	Press.
0	187
5	167
10	159
15	165
20	169
25	170
30	172
35	174
40	175
45	176
50	176
55	176
60	176

Final Shut-In
Breakdown: 21 Inc.
of 3 mins. and a
final inc. of 0 Min.

Point Minutes	Press.
0	176
3	264
6	410
9	542
12	637
15	700
18	738
21	766
24	780
27	795
30	810
33	821
36	839
39	837
1 42 3.14	844
45 3	849
2 48 2.87	855
3 51 2.76	859
4 54 2.66	863
5 57 2.57	865
6 60 2.5	868
7 63 2.42	872

WTC - 4



This is an actual photograph of recorder chart.

POINT		PRESSURE Field Reading	Office Reading	
(A)	Initial Hydrostatic Mud	2086	2092	PSI
(B)	First Initial Flow Pressure	82	86	PSI
(C)	First Final Flow Pressure	128	130	PSI
(D)	Initial Closed-in Pressure	934	932	PSI
(E)	Second Initial Flow Pressure	156	187	PSI
(F)	Second Final Flow Pressure	174	176	PSI
(G)	Final Closed-in Pressure	879	872	PSI
(H)	Final Hydrostatic Mud	2077	2077	PSI

Liquid Production

B.T. Gauge Numbers		1049	Ticket Number	7197	
		PRESSURE			
Initial Hydrostatic		2092	Elevation	None	ft.
Final Hydrostatic		2077	Indicated Production — 1st Flow		bbls. day
1st Flow — Initial	Time: — — — —	86	Indicated Production — Total Flow		bbls. day
1st Flow — Final	30	130	Drill Collar Length	300	ft.
Initial Closed In Pressure	48	932	Drill Collar I.D.	2.25	in.
2nd Flow — Initial	— — — —	187	Drill Pipe Factor	.0142	bbls. ft.
2nd Flow — Final	60	176	Hole Size	7.875	in.
Final Closed In Pressure	63	872	Footage Tested	30	ft.
Extrapolated Static Pressure — Initial		1035-549	Mud Weight	9.0	lbs. gal.
Extrapolated Static Pressure — Final		964 - 724	Viscosity, Oil or Water		cp
Slope psi/cycle — Initial		486,102	Oil API Gravity	41°	—
Slope psi/cycle — Final		239,770	Water Specific Gravity		—

Remarks:

SUMMARY

Gauge No. Depth

Product	Equation	INITIAL	FINAL	Units
Production	$Q = \frac{1440\ R}{t}$		46.760	bbls., day.
Transmissability	$\frac{Kh}{\mu} = \frac{162.6\ Q}{m}$		31.680	$\frac{\text{md. ft.}}{\text{cp}}$
Indicated Flow Capacity	$Kh = \frac{Kh}{\mu}\ \mu$		12.672	md. ft.
Average Effective Permeability	$K = \frac{Kh}{h}$		.844	md.
	$K_1 = \frac{Kh}{h_1}$		.844	md.
Damage Ratio	$DR = .183\ \frac{Ps - Pf}{m}$		.600	—
Theoretical Potential w/Damage Removed	$Q_1 = Q\ DR$		28.096	bbls. day
Approx. Radius of Investigation	$b \backsimeq \sqrt{Kt}$ or $\sqrt{Kt_0}$		8.719	ft.
	$b_1 \backsimeq \sqrt{K_1 t}$ or $\sqrt{K_1 t_0}$		8.719	ft.
Potentiometric Surface *	$Pot. = El - GD + 2.319\ Ps$			ft.

NOTICE: These calculations are based upon information furnished by you and taken from Drill Stem Test pressure charts, and are furnished you for your information. In furnishing such calculations and elevations based thereon, Western Testing Co., Inc. is merely expressing its opinion. You agree that Western Testing Co., Inc. makes no warranty express or implied as to the accuracy of such calculations or opinions, and that Western Testing Co., Inc. shall not be liable for any loss or damage, whether due to negligence or otherwise, in connection with such calculations and opinions.

INTERPRETATIONS AND CALCULATIONS

Liquid Production

B.T. Gauge Numbers		1049	Ticket Number	7197	
		PRESSURE			
Initial Hydrostatic		2092	Elevation	None	ft.
Final Hydrostatic		2077	Indicated Production — 1st Flow		bbls. day
	Time		Indicated Production — Total Flow		bbls. day
1st Flow — Initial	————	86			
1st Flow — Final	30	130	Drill Collar Length	300	ft.
Initial Closed In Pressure	48	932	Drill Collar I.D.	2.25	in.
2nd Flow — Initial	————	187	Drill Pipe Factor	.0142	bbls. ft.
2nd Flow — Final	60	196	Hole Size	7.875	in.
Final Closed In Pressure	63	872	Footage Tested	30	ft.
Extrapolated Static Pressure — Initial		1035-549	Mud Weight	9.0	lbs. gal.
Extrapolated Static Pressure — Final		964-724	Viscosity, Oil or Water		cp
Slope psi/cycle — Initial		486,102	Oil API Gravity	41°	—
Slope psi/cycle — Final		239,770	Water Specific Gravity		—

Remarks:

SUMMARY

Gauge No.
Depth

Product	Equation	INITIAL	FINAL	Units
Production	$Q = \frac{1440\ R}{t}$		46.760	bbls., day.
Transmissability	$\frac{Kh}{\mu} = \frac{162.6\ Q}{m}$		31.680	md. ft. / cp .
Indicated Flow Capacity	$Kh = \frac{Kh}{\mu}\ \mu$		12.672	md. ft.
Average Effective Permeability	$K = \frac{Kh}{h}$		.844	md.
	$K_1 = \frac{Kh}{h_1}$		.844	md.
Damage Ratio	$DR = .183\ \frac{Ps - Pf}{m}$		.600	—
Theoretical Potential w/Damage Removed	$Q_1 = Q\ DR$		28.096	bbls. day
Approx. Radius of Investigation	$b \backsimeq \sqrt{Kt}$ or $\sqrt{Kt_0}$		8.719	ft.
	$b_1 \backsimeq \sqrt{K_1 t}$ or $\sqrt{K_1 t_0}$		8.719	ft.
Potentiometric Surface *	$Pot. = El - GD + 2.319\ Ps$			ft.

NOTICE: These calculations are based upon information furnished by you and taken from Drill Stem Test pressure charts, and are furnished you for your information. In furnishing such calculations and elevations based thereon, Western Testing Co., Inc. is merely expressing its opinion. You agree that Western Testing Co., Inc. makes no warranty express or implied as to the accuracy of such calculations or opinions, and that Western Testing Co., Inc. shall not be liable for any loss or damage, whether due to negligence or otherwise, in connection with such calculations and opinions.

INTERPRETATIONS AND CALCULATIONS

Company Mull Drilling Company, Inc. Lease & Well No. Spruill #1

Elevation ----- Formation Kansas City Effective Pay --- Ft. Ticket No. 7198

Date 11/17/80 Sec. 32 Twp. 17S Range 27W County Lane State Kansas

Test Approved by Richard E. Roby Western Representative Steve Michellich

Formation Test No. 2 Interval Tested from 4212 ft. to 4230 ft. Total Depth 4230 ft.

Packer Depth 4212 ft. Size 6 3/4 in. Packer Depth - ft. Size - in.

Packer Depth 4207 ft. Size 6 3/4 in. Packer Depth - ft. Size - in.

Depth of Selective Zone Set -

Top Recorder Depth (Inside) 4223 ft. Recorder Number 1049 Cap. 3500

Bottom Recorder Depth (Outside) 4226 ft. Recorder Number 1134 Cap. 4500

Below Straddle Recorder Depth - ft. Recorder Number - Cap. -

Drilling Contractor Blue Goose Drlg. Rig #1 Drill Collar Length 300 I. D. 2.25 in.

Mud Type mono-pac Viscosity 45 Weight Pipe Length - I. D. - in.

Weight 9.1 Water Loss 5.6 cc. Drill Pipe Length 3891 I. D. 3.8 in.

Chlorides 8,000 P.P.M. Test Tool Length 21 ft. Tool Size 5½ in.

Jars: Make None Serial Number - Anchor Length 18 ft. Size 5½ in.

Did Well Flow? No Reversed Out No Surface Choke Size 3/4 in. Bottom Choke Size 3/4 in.

Main Hole Size 7 7/8 in. Tool Joint Size 4½XH in.

Blow: Strong blow throughout test.

Recovered 372 ft. of gas in pipe

Recovered 62 ft. of oil (slightly muddy)

Recovered 62 ft. of heavy oil cut mud

Recovered 62 ft. of oil and gas cut muddy water

Recovered 1178 ft. of gas cut muddy water

Remarks: 1364 Total Fluid

Time Set Packer(s) 11:25 ~~A.M.~~ P.M. Time Started Off Bottom 2:40 A.M. ~~P.M.~~ Maximum Temperature 104°

Initial Hydrostatic Pressure			(A)	2143	P.S.I.	
Initial Flow Period	Minutes 30	(B)	97	P.S.I. to (C)	352	P.S.I.
Initial Closed In Period	Minutes 48	(D)	1046	P.S.I.		
Final Flow Period	Minutes 60	(E)	401	P.S.I. to (F)	667	P.S.I.
Final Closed In Period	Minutes 63	(G)	1046	P.S.I.		
Final Hydrostatic Pressure		(H)	2082	P.S.I.		

WESTERN TESTING CO., INC.

Pressure Data

Date 11-17-80 Test Ticket No. 7198

Recorder No. 1049 Capacity 3500 Location 4223 Ft.

Clock No. - Elevation - Well Temperature 104 °F

Point	Pressure		Time Given	Time Computed
A Initial Hydrostatic Mud	2143 P.S.I.	Open Tool	11:25P M	
B First Initial Flow Pressure	97 P.S.I.	First Flow Pressure	30 Mins.	30 Mins.
C First Final Flow Pressure	352 P.S.I.	Initial Closed-in Pressure	45 Mins.	48 Mins.
D Initial Closed-in Pressure	1046 P.S.I.	Second Flow Pressure	60 Mins.	60 Mins.
E Second Initial Flow Pressure	401 P.S.I.	Final Closed-in Pressure	60 Mins.	63 Mins.
F Second Final Flow Pressure	667 P.S.I.			
G Final Closed-in Pressure	1046 P.S.I.			
H Final Hydrostatic Mud	2082 P.S.I.			

PRESSURE BREAKDOWN

First Flow Pressure
Breakdown: 6 Inc.
of 5 mins. and a
final inc. of 0 Min.

Point Mins.	Press.
P 1 0	97
P 2 5	163
P 3 10	205
P 4 15	247
P 5 20	288
P 6 25	324
P 7 30	352
P 8	
P 9	
P10	
P11	
P12	
P13	
P14	
P15	
P16	
P17	
P18	
P19	
P20	

Initial Shut-In
Breakdown: 16 Inc.
of 3 mins. and a
final inc. of 0 Min.

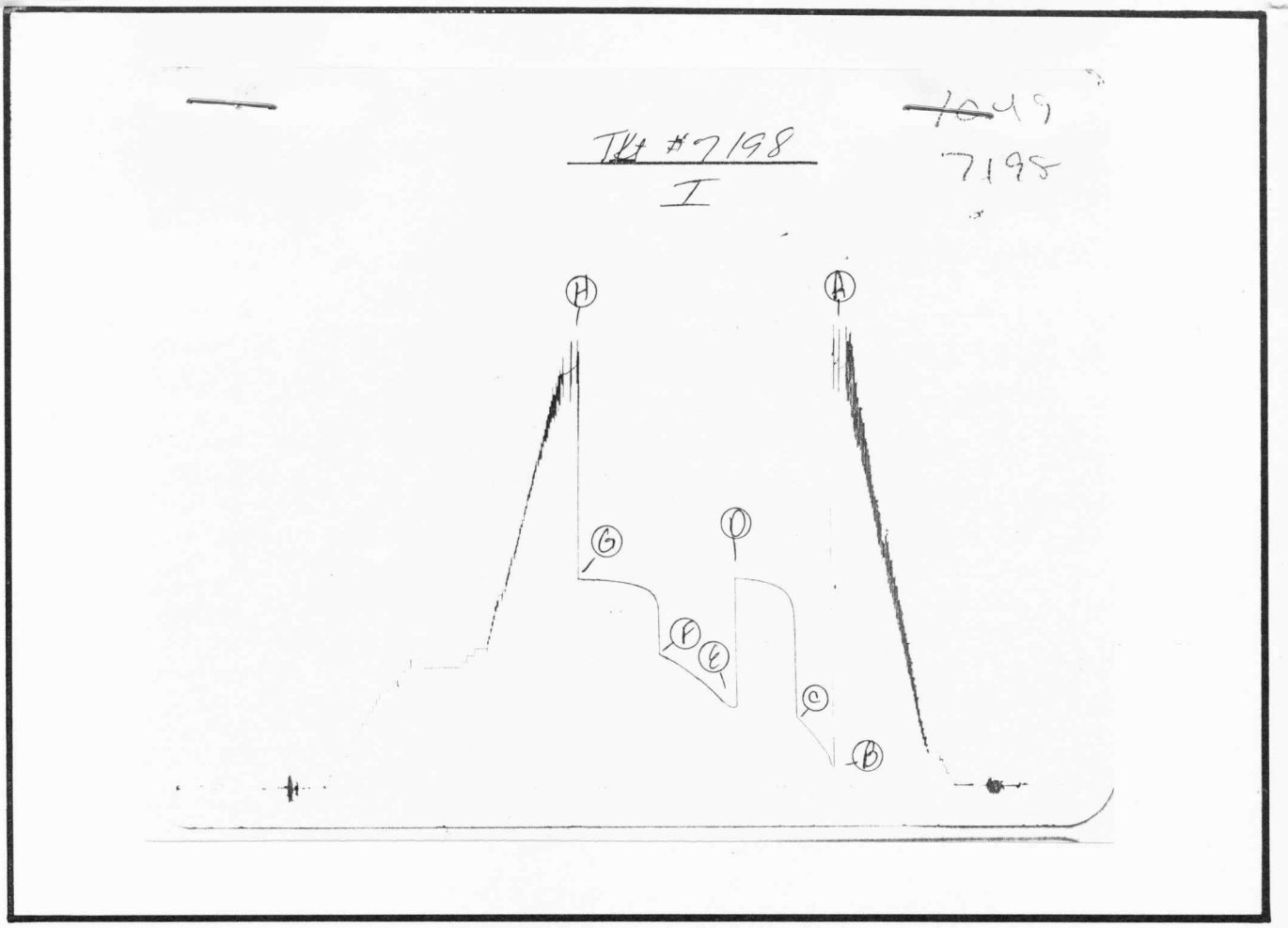
Point Minutes	Press.
0	352
3	910
6	956
9	978
12	993
15	1004
18	1013
21	1018
24	1024
27	1029
30	1032
33	1037
36	1040
39	1041
42	1044
45	1045
48	1046

Second Flow Pressure
Breakdown: 12 Inc.
of 5 mins. and a
final inc. of 0 Min.

Point Minutes	Press.
0	401
5	401
10	425
15	458
20	487
25	516
30	546
35	568
40	592
45	615
50	634
55	650
60	667

Final Shut-In
Breakdown: 21 Inc.
of 3 mins. and a
final inc. of 0 Min.

Point Minutes	Press.
0	667
3	943
6	971
9	987
12	998
15	1007
18	1013
21	1016
24	1022
27	1026
30	1029
33	1031
36	1034
39	1037
42	1038
45	1040
48	1041
51	1042
54	1043
57	1044
60	1044
63	1046



This is an actual photograph of recorder chart.

POINT		PRESSURE Field Reading	Office Reading	
(A)	Initial Hydrostatic Mud	2123	2143	PSI
(B)	First Initial Flow Pressure	92	97	PSI
(C)	First Final Flow Pressure	348	352	PSI
(D)	Initial Closed-in Pressure	1053	1046	PSI
(E)	Second Initial Flow Pressure	394	401	PSI
(F)	Second Final Flow Pressure	669	667	PSI
(G)	Final Closed-in Pressure	1044	1046	PSI
(H)	Final Hydrostatic Mud	2095	2082	PSI

Company Mull Drilling Company, Inc. Lease & Well No. Spruill #1

Elevation ----- Formation Kansas City Effective Pay - Ft. Ticket No. 7199

Date 11/18/80 Sec. 32 Twp. 17S Range 27W County Lane State Kansas

Test Approved by Richard E. Roby Western Representative Steve Michellich

Formation Test No. 3 Interval Tested from 4246 ft. to 4264 ft. Total Depth 4264 ft.

Packer Depth 4246 ft. Size 6 3/4 in. Packer Depth - ft. Size - in.

Packer Depth 4241 ft. Size 6 3/4 in. Packer Depth - ft. Size - in.

Depth of Selective Zone Set -

Top Recorder Depth (Inside) 4257 ft. Recorder Number 1049 Cap. 3500

Bottom Recorder Depth (Outside) 4260 ft. Recorder Number 1134 Cap. 4500

Below Straddle Recorder Depth - ft. Recorder Number - Cap. -

Drilling Contractor Blue Goose Drlg. Rig #1 Drill Collar Length 300 I. D. 2.25 in.

Mud Type Mono-Pac Viscosity 50 Weight Pipe Length = I. D. = in.

Weight 9.0 Water Loss 7.6 cc. Drill Pipe Length 3925 I. D. 3.8 in.

Chlorides 12,000 P.P.M. Test Tool Length 21 ft. Tool Size 5½ in.

Jars: Make None Serial Number - Anchor Length 18 ft. Size 5½ in.

Did Well Flow? No Reversed Out No Surface Choke Size 3/4 in. Bottom Choke Size 3/4 in.

Main Hole Size 7 7/8 in. Tool Joint Size 4½XH in.

Blow: Strong blow throughout test.

Recovered 1140 ft. of gas in pipe

Recovered 120 ft. of heavy oil and gas cut mud

Recovered 300 ft. of clean gassy oil

Recovered 160 ft. of froggy muddy oil

Recovered 345 ft. of muddy water

Remarks: Specific gravity 40

Time Set Packer(s) 7:15 ~~A.M.~~ P.M. Time Started Off Bottom 10:30 ~~A.M.~~ P.M. Maximum Temperature 104°

Initial Hydrostatic Pressure			(A)	2121	P.S.I.	
Initial Flow Period	Minutes 30	(B)	92	P.S.I. to (C)	214	P.S.I.
Initial Closed In Period	Minutes 45	(D)	1127	P.S.I.		
Final Flow Period	Minutes 60	(E)	267	P.S.I. to (F)	383	P.S.I.
Final Closed In Period	Minutes 63	(G)	1153	P.S.I.		
Final Hydrostatic Pressure		(H)	2106	P.S.I.		

WESTERN TESTING CO., INC.
Pressure Data

Date 11-18-80 Test Ticket No. 7199

Recorder No. 1049 Capacity 3500 Location 4257 Ft.

Clock No. - Elevation - Well Temperature 104 °F

Point	Pressure		Time Given	Time Computed
A Initial Hydrostatic Mud	2121 P.S.I.	Open Tool	7:15P M	
B First Initial Flow Pressure	92 P.S.I.	First Flow Pressure	30 Mins.	30 Mins.
C First Final Flow Pressure	214 P.S.I.	Initial Closed-in Pressure	45 Mins.	45 Mins.
D Initial Closed-in Pressure	1127 P.S.I.	Second Flow Pressure	60 Mins.	60 Mins.
E Second Initial Flow Pressure	267 P.S.I.	Final Closed-in Pressure	60 Mins.	63 Mins.
F Second Final Flow Pressure	383 P.S.I.			
G Final Closed-in Pressure	1153 P.S.I.			
H Final Hydrostatic Mud	2106 P.S.I.			

PRESSURE BREAKDOWN

First Flow Pressure
Breakdown: 6 Inc. of 5 mins. and a final inc. of 0 Min.

Point Mins.	Press.
P 1 0	92
P 2 5	128
P 3 10	148
P 4 15	158
P 5 20	178
P 6 25	194
P 7 30	214
P 8	
P 9	
P10	
P11	
P12	
P13	
P14	
P15	
P16	
P17	
P18	
P19	
P20	

Initial Shut-In
Breakdown: 15 Inc. of 3 mins. and a final inc. of 0 Min.

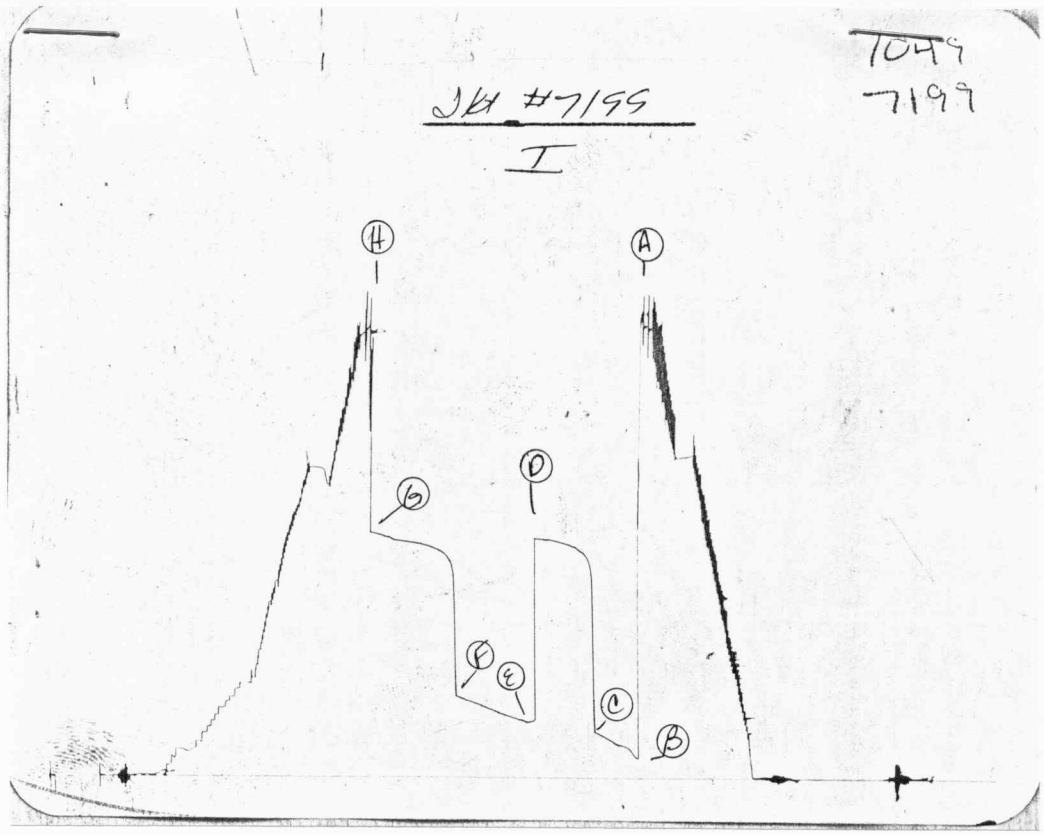
Point Minutes	Press.
0	214
3	905
6	929
9	1051
12	1068
15	1084
18	1091
21	1099
24	1104
27	1109
30	1113
33	1119
36	1122
39	1125
42	1126
45	1127

Second Flow Pressure
Breakdown: 12 Inc. of 5 mins. and a final inc. of 0 Min.

Point Minutes	Press.
0	267
5	264
10	273
15	282
20	291
25	302
30	317
35	330
40	342
45	355
50	363
55	375
60	383

Final Shut-In
Breakdown: 21 Inc. of 3 mins. and a final inc. of 0 Min.

Point Minutes	Press.
0	383
3	938
6	1022
9	1047
12	1064
15	1073
18	1080
21	1089
24	1095
27	1099
30	1102
33	1106
36	1108
39	1111
42	1113
45	1115
48	1120
51	1131
54	1137
57	1141
60	1146
63	1153



This is an actual photograph of recorder chart.

POINT		PRESSURE Field Reading	Office Reading	
(A)	Initial Hydrostatic Mud	2132	2121	PSI
(B)	First Initial Flow Pressure	92	92	PSI
(C)	First Final Flow Pressure	211	214	PSI
(D)	Initial Closed-in Pressure	1126	1127	PSI
(E)	Second Initial Flow Pressure	256	267	PSI
(F)	Second Final Flow Pressure	378	383	PSI
(G)	Final Closed-in Pressure	1153	1153	PSI
(H)	Final Hydrostatic Mud	2095	2106	PSI

Company Mull Drilling Company, Inc. Lease & Well No. Spruill #1

Elevation ---- Formation ---- Effective Pay ---- Ft. Ticket No. 7200

Date 11/19/80 Sec. 32 Twp. 17S Range 27W County Lane State Kansas

Test Approved by Richard E. Roby Western Representative Steve Michellich

Formation Test No. 4 Interval Tested from 4332 ft. to 4388 ft. Total Depth 4388 ft.

Packer Depth 4332 ft. Size 6 3/4 in. Packer Depth - ft. Size - in.

Packer Depth 4327 ft. Size 6 3/4 in. Packer Depth - ft. Size - in.

Depth of Selective Zone Set -

Top Recorder Depth (Inside) 4381 ft. Recorder Number 1049 Cap. 3500

Bottom Recorder Depth (Outside) 4384 ft. Recorder Number 1134 Cap. 4500

Below Straddle Recorder Depth - ft. Recorder Number - Cap. -

Drilling Contractor Blue Goose Drlg. Rig #1 Drill Collar Length 300 I. D. 2.25 in.

Mud Type mono-pac Viscosity 43 Weight Pipe Length - I. D. - in.

Weight 9.0 Water Loss 8.0 cc. Drill Pipe Length 4011 I. D. 3.8 in.

Chlorides 10,000 P.P.M. Test Tool Length 21 ft. Tool Size 5½ in.

Jars: Make None Serial Number - Anchor Length 56 ft. Size 5½ in.

Did Well Flow? No Reversed Out No Surface Choke Size 3/4 in. Bottom Choke Size 3/4 in.

Main Hole Size 7 7/8 in. Tool Joint Size 4½XH in.

Blow: Initial flow period- weak blow throughout. Final flow period weak blow died in twenty minutes; flushed tool, no help.

Recovered 120 ft. of oil cut mud 20% oil

Recovered ft. of

Recovered ft. of

Recovered ft. of

Recovered ft. of

Remarks:

Time Set Packer(s) 8:00 ~~A.M.~~ P.M. Time Started Off Bottom 11:45 ~~A.M.~~ P.M. Maximum Temperature 114°

Initial Hydrostatic Pressure		(A) 2139 P.S.I.		
Initial Flow Period	Minutes 35	(B) 63 P.S.I.	to (C) 67 P.S.I.	
Initial Closed In Period	Minutes 39	(D) 121 P.S.I.		
Final Flow Period	Minutes 90	(E) 79 P.S.I.	to (F) 117 P.S.I.	
Final Closed In Period	Minutes 30	(G) 136 P.S.I.		
Final Hydrostatic Pressure		(H) 2137 P.S.I.		

WESTERN TESTING CO., INC.
Pressure Data

Date 11-19-80 Test Ticket No. 7200

Recorder No. 1049 Capacity 3500 Location 4381 Ft.

Clock No. - Elevation - Well Temperature 114 °F

Point	Pressure		Time Given	Time Computed
A Initial Hydrostatic Mud	2139 P.S.I.	Open Tool	8:00P M	
B First Initial Flow Pressure	63 P.S.I.	First Flow Pressure	30 Mins.	35 Mins.
C First Final Flow Pressure	67 P.S.I.	Initial Closed-in Pressure	45 Mins.	39 Mins.
D Initial Closed-in Pressure	121 P.S.I.	Second Flow Pressure	90 Mins.	90 Mins.
E Second Initial Flow Pressure	79 P.S.I.	Final Closed-in Pressure	60 Mins.	30 Mins.
F Second Final Flow Pressure	117 P.S.I.			
G Final Closed-in Pressure	136 P.S.I.			
H Final Hydrostatic Mud	2137 P.S.I.			

PRESSURE BREAKDOWN

First Flow Pressure
Breakdown: 7 Inc. of 5 mins. and a final inc. of 0 Min.

Point Mins.	Press.
P 1 0	63
P 2 5	63
P 3 10	63
P 4 15	63
P 5 20	63
P 6 25	63
P 7 30	66
P 8 35	67
P 9	
P10	
P11	
P12	
P13	
P14	
P15	
P16	
P17	
P18	
P19	
P20	

Initial Shut-In
Breakdown: 13 Inc. of 3 mins. and a final inc. of 0 Min.

Point Minutes	Press.
0	67
3	75
6	79
9	86
12	93
15	99
18	104
21	108
24	110
27	113
30	115
33	119
36	120
39	121

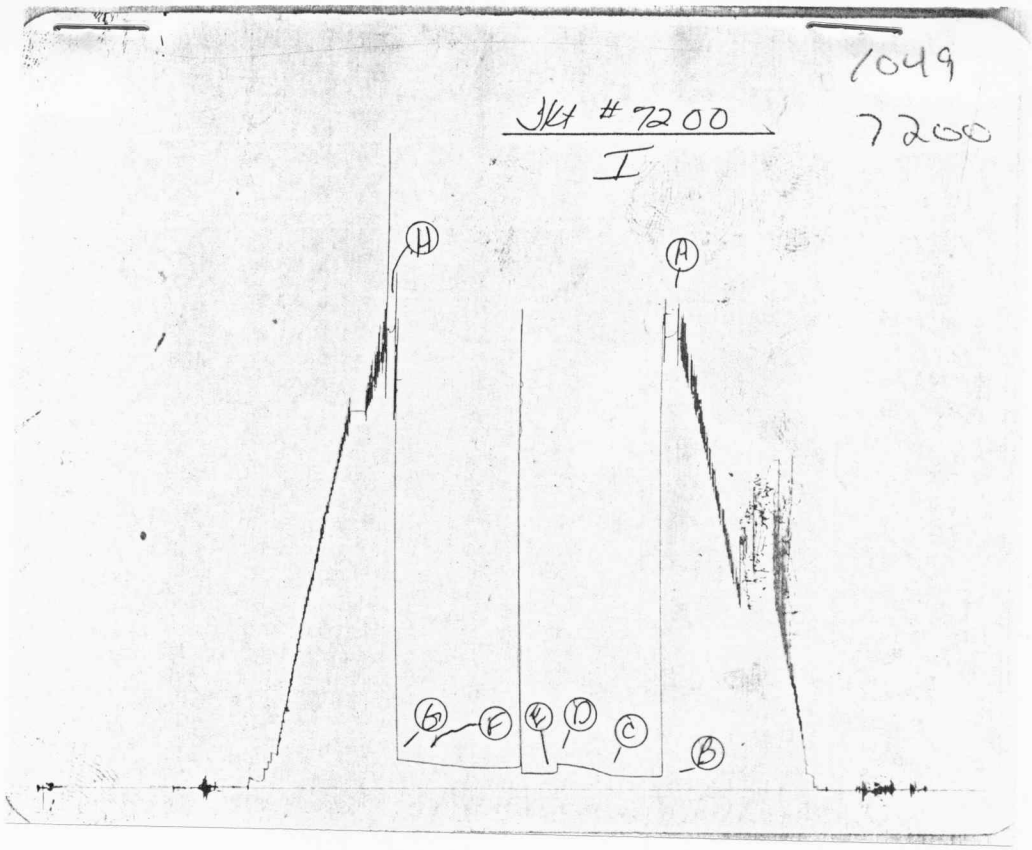
Second Flow Pressure
Breakdown: 18 Inc. of 5 mins. and a final inc. of 0 Min.

Point Minutes	Press.
0	79
5	77
10	77
15	77
20	77
25	77
30	104
35	103
40	102
45	101
50	102
55	102
60	103
65	106
70	108
75	110
80	112
85	114
90	117

Flushed Tool

Final Shut-In
Breakdown: 10 Inc. of 3 mins. and a final inc. of 0 Min.

Point Minutes	Press.
0	117
3	119
6	121
9	123
12	126
15	128
18	131
21	132
24	134
27	135
30	136



This is an actual photograph of recorder chart.

POINT		PRESSURE Field Reading	Office Reading	
(A)	Initial Hydrostatic Mud	2141	2139	PSI
(B)	First Initial Flow Pressure	64	63	PSI
(C)	First Final Flow Pressure	64	67	PSI
(D)	Initial Closed-in Pressure	128	121	PSI
(E)	Second Initial Flow Pressure	73	79	PSI
(F)	Second Final Flow Pressure	92	117	PSI
(G)	Final Closed-in Pressure	137	136	PSI
(H)	Final Hydrostatic Mud	2132	2137	PSI

Company Mull Drilling Company, Inc. Lease & Well No. Spruill #1

Elevation - Formation - Effective Pay - Ft. Ticket No. 8926

Date 11-21-80 Sec. 32 Twp. 17S Range 27W County Lane State Kansas

Test Approved by J. E. Jesperson Western Representative Steve Michellich

Formation Test No. 5 Interval Tested from 4480 ft. to 4542 ft. Total Depth 4542 ft.

Packer Depth 4480 ft. Size 6 3/4 in. Packer Depth - ft. Size - in.

Packer Depth 4475 ft. Size 6 3/4 in. Packer Depth - ft. Size - in.

Depth of Selective Zone Set -

Top Recorder Depth (Inside) 4535 ft. Recorder Number 1049 Cap. 3500

Bottom Recorder Depth (Outside) 4538 ft. Recorder Number 1134 Cap. 4500

Below Straddle Recorder Depth - ft. Recorder Number - Cap. -

Drilling Contractor Blue Goose Rig #1 Drill Collar Length 300 I. D. 2.25 in.

Mud Type Mono-pac Viscosity 48 Weight Pipe Length - I. D. - in.

Weight 8.9 Water Loss 8.8 cc. Drill Pipe Length 4159 I. D. 3.8 in.

Chlorides 8,000 P.P.M. Test Tool Length 21 ft. Tool Size 5½ in.

Jars: Make None Serial Number - Anchor Length 62 ft. Size 5½ in.

Did Well Flow? No Reversed Out No Surface Choke Size 3/4 in. Bottom Choke Size 3/4 in.

Main Hole Size 7 7/8 in. Tool Joint Size 4½XH in.

Blow: Strong blow throughout test. Gas to surface 50 minutes final flow period.

Recovered 95 ft. of gassy oil

Recovered 496 ft. of slightly mud cut oil - 90% oil

Recovered 124 ft. of oil cut mud - 45% oil

Recovered 124 ft. of mud cut oil - 70% oil

Recovered 839 ft. of total fluid

Remarks: Specific gravity 41

Time Set Packer(s) 1:45 ~~A.M.~~ P.M. Time Started Off Bottom 5:00 ~~A.M.~~ P.M. Maximum Temperature 106

Initial Hydrostatic Pressure (A) 2310 P.S.I.

Initial Flow Period Minutes 30 (B) 98 P.S.I. to (C) 209 P.S.I.

Initial Closed In Period Minutes 48 (D) 1286 P.S.I.

Final Flow Period Minutes 60 (E) 247 P.S.I. to (F) 333 P.S.I.

Final Closed In Period Minutes 63 (G) 1238 P.S.I.

Final Hydrostatic Pressure (H) 2301 P.S.I.

WESTERN TESTING CO., INC.
Pressure Data

Date 11-21-80 Test Ticket No. 8926

Recorder No. 1049 Capacity 3500 Location 4535 Ft.

Clock No. - Elevation - Well Temperature 106 °F

Point	Pressure		Time Given	Time Computed
A Initial Hydrostatic Mud	2310 P.S.I.	Open Tool	1:45A M	
B First Initial Flow Pressure	98 P.S.I.	First Flow Pressure	30 Mins.	30 Mins.
C First Final Flow Pressure	209 P.S.I.	Initial Closed-in Pressure	45 Mins.	48 Mins.
D Initial Closed-in Pressure	1286 P.S.I.	Second Flow Pressure	60 Mins.	60 Mins.
E Second Initial Flow Pressure	247 P.S.I.	Final Closed-in Pressure	60 Mins.	63 Mins.
F Second Final Flow Pressure	333 P.S.I.			
G Final Closed-in Pressure	1238 P.S.I.			
H Final Hydrostatic Mud	2301 P.S.I.			

PRESSURE BREAKDOWN

First Flow Pressure
Breakdown: 6 Inc.
of 5 mins. and a
final inc. of 0 Min.

Point Mins.	Press.
P 1 0	98
P 2 5	132
P 3 10	169
P 4 15	176
P 5 20	188
P 6 25	200
P 7 30	209
P 8	
P 9	
P10	
P11	
P12	
P13	
P14	
P15	
P16	
P17	
P18	
P19	
P20	

Initial Shut-In
Breakdown: 16 Inc.
of 3 mins. and a
final inc. of 0 Min.

Point Minutes	Press.
0	209
3	789
6	1243
9	1265
12	1271
15	1276
18	1277
21	1278
24	1279
27	1280
30	1281
33	1282
36	1283
39	1284
42	1285
45	1286
48	1286

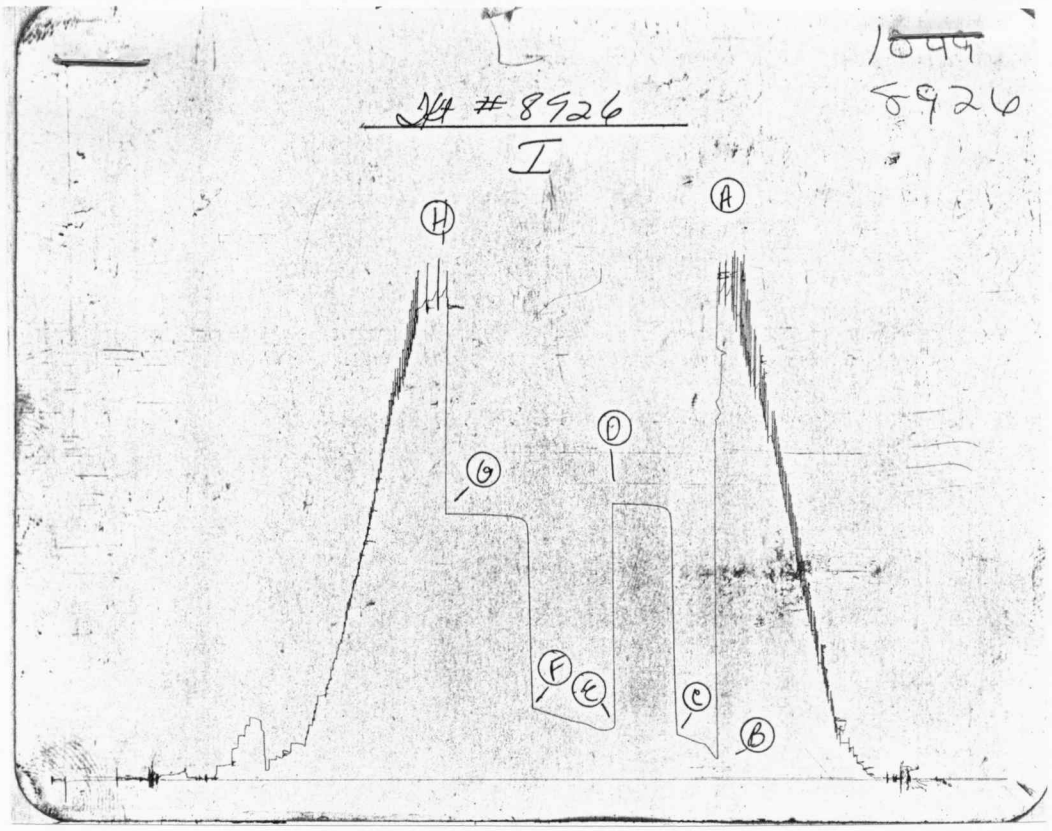
Second Flow Pressure
Breakdown: 12 Inc.
of 5 mins. and a
final inc. of 0 Min.

Point Minutes	Press.
0	247
5	233
10	233
15	244
20	258
25	267
30	275
35	283
40	293
45	305
50	314
55	326
60	333

Final Shut-In
Breakdown: 21 Inc.
of 3 mins. and a
final inc. of 0 Min.

Point Minutes	Press.
0	333
3	949
6	1204
9	1216
12	1223
15	1226
18	1228
21	1230
24	1232
27	1233
30	1234
33	1234
36	1235
39	1236
42	1236
45	1237
48	1237
51	1238
54	1238
57	1238
60	1238
63	

WTC - 4



This is an actual photograph of recorder chart.

POINT		PRESSURE Field Reading	Office Reading	
(A)	Initial Hydrostatic Mud	2315	2310	PSI
(B)	First Initial Flow Pressure	92	98	PSI
(C)	First Final Flow Pressure	211	209	PSI
(D)	Initial Closed-in Pressure	1290	1286	PSI
(E)	Second Initial Flow Pressure	229	247	PSI
(F)	Second Final Flow Pressure	339	333	PSI
(G)	Final Closed-in Pressure	1235	1238	PSI
(H)	Final Hydrostatic Mud	2288	2301	PSI

Company Mull Drilling Company, Inc. Lease & Well No. Spruill #1

Elevation - Formation - Effective Pay - Ft. Ticket No. 8927

Date 11-21-80 Sec. 32 Twp. 17S Range 27W County Lane State Kansas

Test Approved by J. E. Jesperson Western Representative Steve Michellich

Formation Test No. 6 Interval Tested from 4568 ft. to 4582 ft. Total Depth 4582 ft.

Packer Depth 4568 ft. Size 6 3/4 in. Packer Depth - ft. Size - in.

Packer Depth 4563 ft. Size 6 3/4 in. Packer Depth - ft. Size - in.

Depth of Selective Zone Set -

Top Recorder Depth (Inside) 4575 ft. Recorder Number 1049 Cap. 3500

Bottom Recorder Depth (Outside) 4578 ft. Recorder Number 1134 Cap. 4500

Below Straddle Recorder Depth - ft. Recorder Number - Cap. -

Drilling Contractor Blue Goose Rig #1 Drill Collar Length 300 I. D. 2.25 in.

Mud Type Mono-pac Viscosity 51 Weight Pipe Length - I. D. - in.

Weight 9.0 Water Loss 8.8 cc. Drill Pipe Length 4247 I. D. 3.8 in.

Chlorides 8,000 P.P.M. Test Tool Length 21 ft. Tool Size 5½ in.

Jars: Make None Serial Number - Anchor Length 14 ft. Size 5½ in.

Did Well Flow? No Reversed Out No Surface Choke Size 3/4 in. Bottom Choke Size 3/4 in.

Main Hole Size 7 7/8 in. Tool Joint Size 4½XH in.

Blow: Initial flow period weak blow died in twenty nine minutes. Final flow period no blow. Flushed tool - weak blow. Died in three minutes.

Recovered 80 ft. of mud

Recovered ft. of

Recovered ft. of

Recovered ft. of

Recovered ft. of

Remarks:

Time Set Packer(s) 10:25 ~~A.M.~~ P.M. Time Started Off Bottom 12:55 A.M. ~~P.M.~~ Maximum Temperature 116

Initial Hydrostatic Pressure (A) 2315 P.S.I.

Initial Flow Period Minutes 30 (B) 66 P.S.I. to (C) 55 P.S.I.

Initial Closed In Period Minutes 48 (D) 848 P.S.I.

Final Flow Period Minutes 30 (E) 66 P.S.I. to (F) 82 P.S.I.

Final Closed In Period Minutes 45 (G) 833 P.S.I.

Final Hydrostatic Pressure (H) 2311 P.S.I.

WESTERN TESTING CO., INC.

Pressure Data

Date 11-21-80 Test Ticket No. 8927

Recorder No. 1049 Capacity 3500 Location 4575 Ft.

Clock No. - Elevation - Well Temperature 116 °F

Point		Pressure			Time Given		Time Computed	
A	Initial Hydrostatic Mud	2315	P.S.I.	Open Tool	10:25P	M		
B	First Initial Flow Pressure	66	P.S.I.	First Flow Pressure	30	Mins.	30	Mins.
C	First Final Flow Pressure	55	P.S.I.	Initial Closed-in Pressure	45	Mins.	48	Mins.
D	Initial Closed-in Pressure	848	P.S.I.	Second Flow Pressure	30	Mins.	30	Mins.
E	Second Initial Flow Pressure	66	P.S.I.	Final Closed-in Pressure	45	Mins.	45	Mins.
F	Second Final Flow Pressure	82	P.S.I.					
G	Final Closed-in Pressure	833	P.S.I.					
H	Final Hydrostatic Mud	2311	P.S.I.					

PRESSURE BREAKDOWN

First Flow Pressure
Breakdown: 6 Inc.
of 5 mins. and a
final inc. of 0 Min.

Point	Mins.	Press.
P 1	0	66
P 2	5	58
P 3	10	57
P 4	15	56
P 5	20	56
P 6	25	55
P 7	30	55
P 8		
P 9		
P10		
P11		
P12		
P13		
P14		
P15		
P16		
P17		
P18		
P19		
P20		

Initial Shut-In
Breakdown: 16 Inc.
of 3 mins. and a
final inc. of 0 Min.

Point	Minutes	Press.
	0	55
	3	61
	6	73
	9	104
	12	152
	15	203
	18	275
	21	348
	24	421
	27	500
	30	599
	33	643
	36	700
	39	740
	42	774
	45	819
	48	848

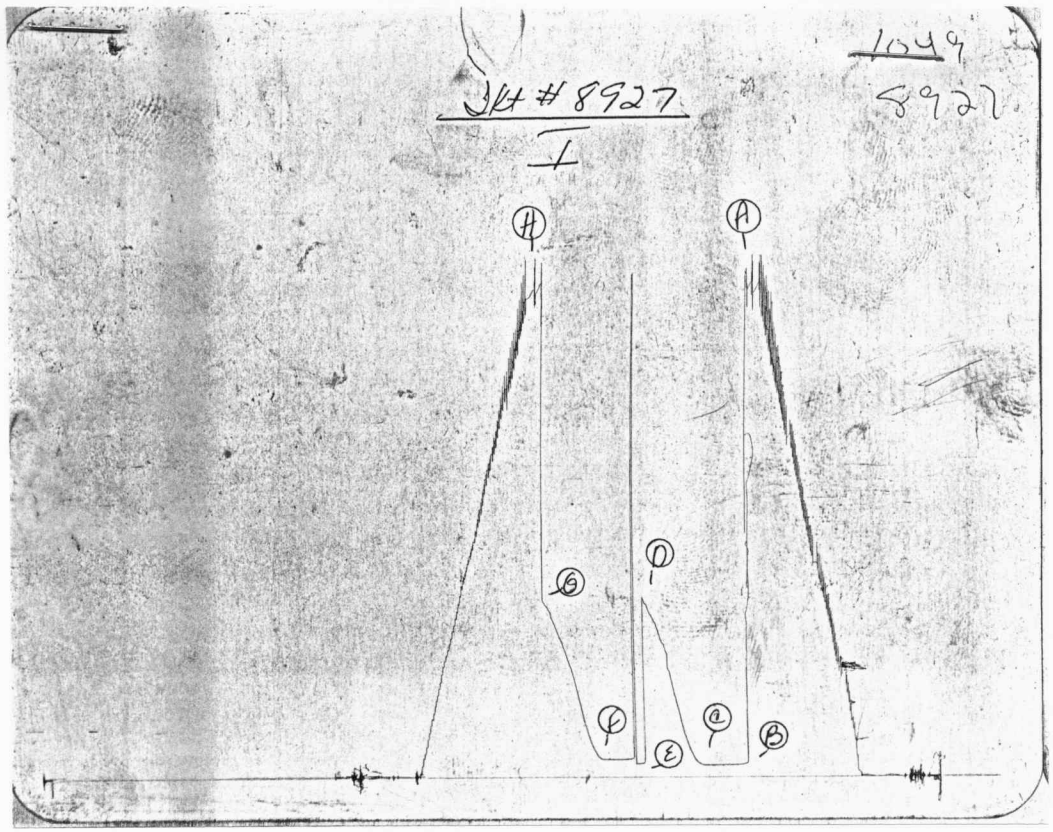
Second Flow Pressure
Breakdown: 6 Inc.
of 5 mins. and a
final inc. of 0 Min.

Point	Minutes	Press.
	0	66
	5	62
	10	85
	15	82
	20	82
	25	82
	30	82

Flushed Tool

Final Shut-In
Breakdown: 15 Inc.
of 3 mins. and a
final inc. of 0 Min.

Point	Minutes	Press.
	0	82
	3	95
	6	126
	9	170
	12	229
	15	297
	18	374
	21	456
	24	518
	27	575
	30	625
	33	667
	36	714
	39	760
	42	804
	45	833



This is an actual photograph of recorder chart.

POINT		PRESSURE Field Reading	Office Reading	
(A)	Initial Hydrostatic Mud	2324	2315	PSI
(B)	First Initial Flow Pressure	55	66	PSI
(C)	First Final Flow Pressure	55	55	PSI
(D)	Initial Closed-in Pressure	852	848	PSI
(E)	Second Initial Flow Pressure	64	66	PSI
(F)	Second Final Flow Pressure	82	82	PSI
(G)	Final Closed-in Pressure	833	833	PSI
(H)	Final Hydrostatic Mud	2315	2311	PSI

Company Mull Drilling Company, Inc. Lease & Well No. Spruill #1

Elevation - Formation - Effective Pay - Ft. Ticket No. 8928

Date 11-22-80 Sec. 37 Twp. 17S Range 27W County Lane State Kansas

Test Approved by J. E. Jesperson Western Representative Steve Michellich

Formation Test No. 7 Interval Tested from 4568 ft. to 4597 ft. Total Depth 4597 ft.

Packer Depth 4568 ft. Size 6 3/4 in. Packer Depth - ft. Size - in.

Packer Depth 4563 ft. Size 6 3/4 in. Packer Depth - ft. Size - in.

Depth of Selective Zone Set -

Top Recorder Depth (Inside) 4590 ft. Recorder Number 1049 Cap. 3500

Bottom Recorder Depth (Outside) 4593 ft. Recorder Number 1134 Cap. 4500

Below Straddle Recorder Depth - ft. Recorder Number - Cap. -

Drilling Contractor Blue Goose Rig #1 Drill Collar Length 300 I. D. 2.25 in.

Mud Type Mono-pac Viscosity 48 Weight Pipe Length - I. D. - in.

Weight 9.0 Water Loss 8.0 cc. Drill Pipe Length 4247 I. D. 3.8 in.

Chlorides 10,000 P.P.M. Test Tool Length 21 ft. Tool Size 5½ in.

Jars: Make None Serial Number - Anchor Length 29 ft. Size 5½ in.

Did Well Flow? No Reversed Out No Surface Choke Size 3/4 in. Bottom Choke Size 3/4 in.

Main Hole Size 7 7/8 in. Tool Joint Size 4½XH in.

Blow: Initial flow period weak blow died in twenty-five minutes.

Final flow period no blow.

Recovered 140 ft. of mud

Recovered ft. of

Recovered ft. of

Recovered ft. of

Recovered ft. of

Remarks:

Time Set Packer(s) 1:20 ~~A.M.~~ P.M. Time Started Off Bottom 3:50 ~~A.M.~~ P.M. Maximum Temperature 118

Initial Hydrostatic Pressure (A) 2324 P.S.I.

Initial Flow Period Minutes 30 (B) 110 P.S.I. to (C) 112 P.S.I.

Initial Closed In Period Minutes 45 (D) 835 P.S.I.

Final Flow Period Minutes 30 (E) 112 P.S.I. to (F) 114 P.S.I.

Final Closed In Period Minutes 48 (G) 705 P.S.I.

Final Hydrostatic Pressure (H) 2292 P.S.I.

WESTERN TESTING CO., INC.

Pressure Data

Date 11-22-80 Test Ticket No. 8928

Recorder No. 1049 Capacity 3500 Location 4590 Ft.

Clock No. - Elevation - Well Temperature 118 °F

Point	Pressure		Time Given	Time Computed
A Initial Hydrostatic Mud	2324 P.S.I.	Open Tool	1:20P M	
B First Initial Flow Pressure	110 P.S.I.	First Flow Pressure	30 Mins.	30 Mins.
C First Final Flow Pressure	112 P.S.I.	Initial Closed-in Pressure	45 Mins.	45 Mins.
D Initial Closed-in Pressure	835 P.S.I.	Second Flow Pressure	30 Mins.	30 Mins.
E Second Initial Flow Pressure	112 P.S.I.	Final Closed-in Pressure	45 Mins.	48 Mins.
F Second Final Flow Pressure	114 P.S.I.			
G Final Closed-in Pressure	705 P.S.I.			
H Final Hydrostatic Mud	2292 P.S.I.			

PRESSURE BREAKDOWN

First Flow Pressure
Breakdown: 6 Inc.
of 5 mins. and a
final inc. of 0 Min.

Point Mins.	Press.
P 1 0	110
P 2 5	110
P 3 10	111
P 4 15	111
P 5 20	112
P 6 25	112
P 7 30	112
P 8	
P 9	
P10	
P11	
P12	
P13	
P14	
P15	
P16	
P17	
P18	
P19	
P20	

Initial Shut-In
Breakdown: 15 Inc.
of 3 mins. and a
final inc. of 0 Min.

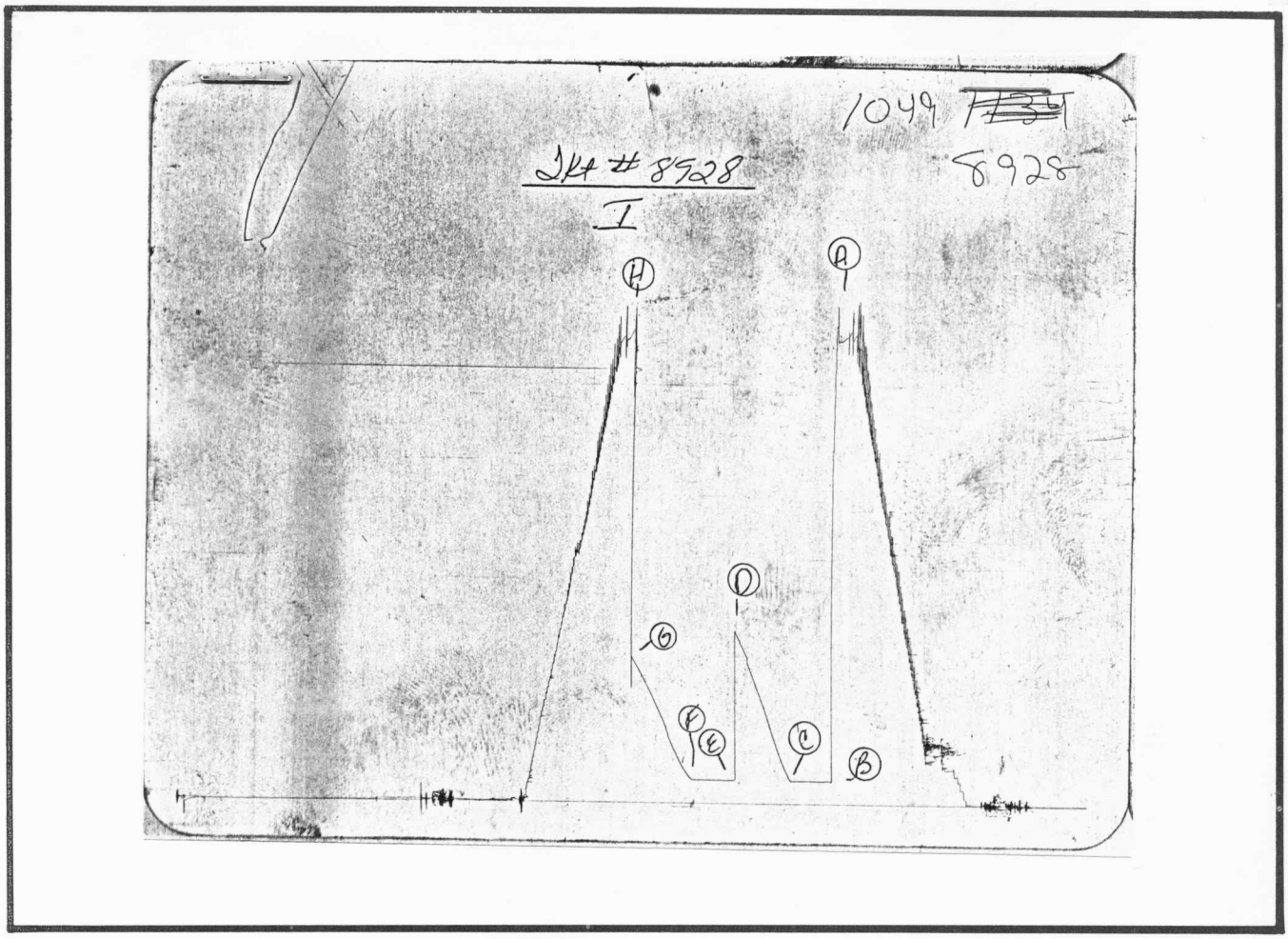
Point Minutes	Press.
0	112
3	138
6	179
9	223
12	273
15	322
18	382
21	438
24	487
27	538
30	586
33	636
36	694
39	747
42	793
45	835

Second Flow Pressure
Breakdown: 6 Inc.
of 5 mins. and a
final inc. of 0 Min.

Point Minutes	Press.
0	112
5	112
10	112
15	113
20	113
25	114
30	114

Final Shut-In
Breakdown: 16 Inc.
of 3 mins. and a
final inc. of 0 Min.

Point Minutes	Press.
0	114
3	124
6	147
9	180
12	214
15	251
18	290
21	346
24	396
27	436
30	477
33	522
36	559
39	595
42	630
45	667
48	705



This is an actual photograph of recorder chart.

POINT		PRESSURE Field Reading	Office Reading	
(A)	Initial Hydrostatic Mud	2297	2324	PSI
(B)	First Initial Flow Pressure	110	110	PSI
(C)	First Final Flow Pressure	110	112	PSI
(D)	Initial Closed-in Pressure	842	835	PSI
(E)	Second Initial Flow Pressure	119	112	PSI
(F)	Second Final Flow Pressure	119	114	PSI
(G)	Final Closed-in Pressure	705	705	PSI
(H)	Final Hydrostatic Mud	2278	2292	PSI