MILLER TESTING COMPANY

Box 547

GREAT BEND, KANSAS

Company THUNDERBIRD DRILLING, INC.

Lease and Well No. HARDMAN J-1

County NESS State KANSAS Date MAY 23, 1973

Formation Test No. 1 Total Depth 4160 Elev.

Interval Tested 4033 To 4160 Anchor Length 127'

Size Hole 7 7/8 Size Drill Pipe 4 1/2 F.H. Size Packer 6 3/4

Mud Weight 9.5 Viscosity 43 Water Loss 8.0 c.c. Bottom Hole Temp. 124 °F

Chokes: Top 1/2 Bottom 1/2 Ticket No. 12087

Length of Drill Collar I. D. Length Flexweight 1018 I. D. 2.76

RECOVERY

STRONG BLOW THROUGHOUT TEST.

61 FEET OF GAS CUT AND SLIGHTLY OIL CUT MUD.
60 FEET OF OIL AND GAS CUT MUD.
60 FEET OF HEAVY OIL AND GAS CUT MUD (20-30% OIL)
120 FEET OF HEAVY MUD AND GAS CUT OIL (75-80%)

Lease and Well No. HARDMAN J-1 11-18S-25W NW SW Formation Test No. 1

COMPANY THUNDERBIRD DRILLING, INC. DATE MAY 23, 1973

LEASE HARDMAN WELL NO. J-1 TEST NO. 1 TICKET NO. 12087

	TIME	PSI
INITIAL HYDRO MUD PRESSURE		2198
INITIAL CLOSED IN PRESSURE	45 MINS.	741
INITIAL FLOW	45 MINS.	115 to 203
FINAL FLOW	45 MINS.	219 to 246
FINAL CLOSED IN PRESSURE	45 MINS.	712
FINAL HYDRO MUD PRESSURE		2144

TOTAL DEPTH 4160

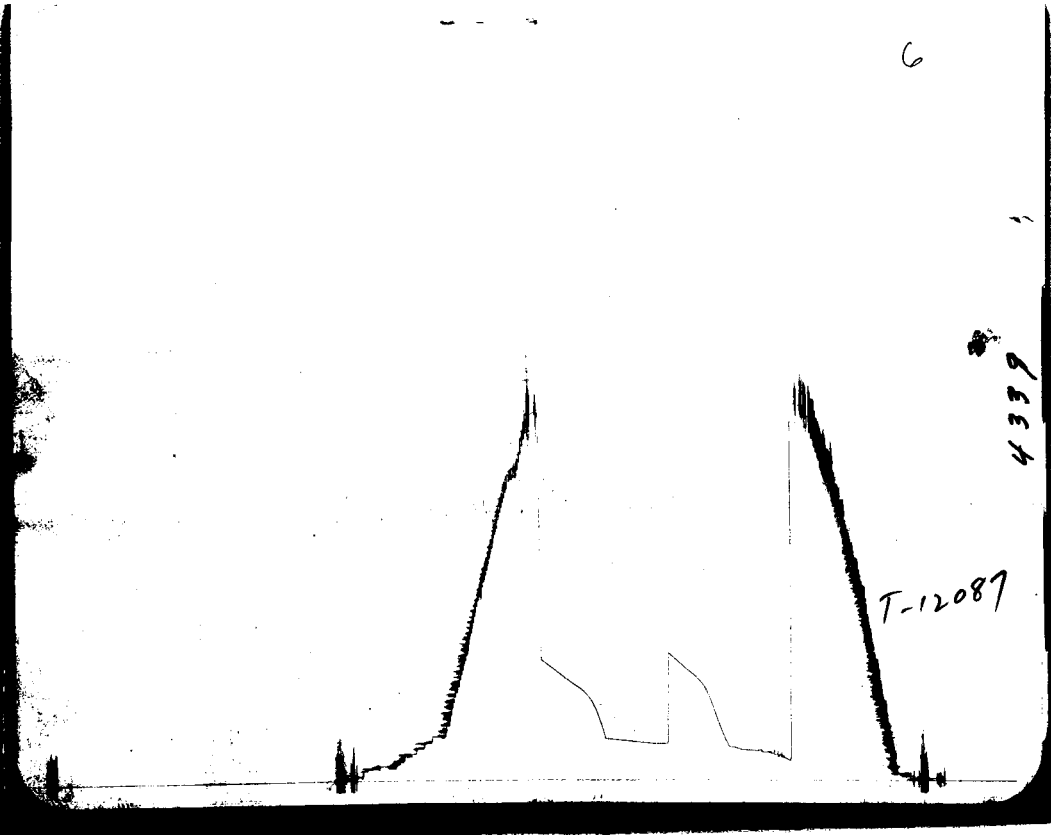
PACKER DEPTH 4033

BT. NO. 4339 DEPTH 4155

	1ST FLOW PRESSURE		INITIAL CIP		2ND FLOW PRESSURE		FINAL CIP	
		115		203		219		246
		161		288		223		357
		184		415		239		438
		203		507		246		488
				573				533
				611				562
				640				584
				685				618
				719				674
				741				712
	15	MINUTE INTERVAL	5	MINUTE INTERVAL	15	MINUTE INTERVAL	5	MINUTE INTERVAL

REMARKS

SPECIAL PRESSURE DATA


T-12087

Tool Open: 1st Flow ___ hr. 45 mins: Shut-in Initial ___ hr. 45 min: 2nd Flow ___ hr. 45 min: Shut-in Final ___ hr. 45 min

	Field Reading	Corrected Reading
(A) Initial Hydrostatic Pressure	2188	2198
(B) Initial 1st Flow Pressure	104	115
(C) Final 1st Flow Pressure	207	203
(D) Initial Shut-in Pressure	730	741
(E) Initial 2nd Flow Pressure	207	219
(F) Final 2nd Flow Pressure	242	246
(G) Final Shut-in Pressure	708	712
(H) Final Hydrostatic Pressure	2144	2144

12087

MILLER TESTING COMPANY

Box 547

GREAT BEND, KANSAS

Company THUNDERBIRD DRILLING, INC.

Lease and Well No. HARDMAN J-1

County NESS State KANSAS Date MAY 24, 1973

Formation Test No. 2 Total Depth 4260 Elev.

Interval Tested 4225 To 4260 Anchor Length 35'

Size Hole 7 7/8 Size Drill Pipe 4 1/2 F.H. Size Packer 6 3/4

Mud Weight 9.6 Viscosity 49 Water Loss 9.2 c.c. Bottom Hole Temp. 116 °F

Chokes: Top 1/2 Bottom 1/2 Ticket No. 12516

Length of Drill Collar I. D. Length Flexweight 960 I. D. 2.76

RECOVERY

WEAK BLOW FOR 5 MINUTES. FLUSHED TOOL IN 15 MINUTES AFTER SECOND OPENING. WEAK BLOW FOR 2 MINUTES.

30 FEET OF MUD.

Lease and Well No. HARDMAN J-1 11-18S-25W NW SW Formation Test No. 2


T-12516
4332

Tool Open: 1st Flow ___ hr. 45 mins: Shut-in Initial ___ hr. 45 min: 2nd Flow ___ hr. 45 min: Shut-in Final ___ hr. 45 min.

	Field Reading	Corrected Reading
(A) Initial Hydrostatic Pressure	2240	2217
(B) Initial 1st Flow Pressure	43	32
(C) Final 1st Flow Pressure	43	43
(D) Initial Shut-in Pressure	1200	1189
(E) Initial 2nd Flow Pressure	80	80
(F) Final 2nd Flow Pressure	80	86
(G) Final Shut-in Pressure	1115	1115
(H) Final Hydrostatic Pressure	2209	2208

12516

MILLER TESTING COMPANY

Box 547

GREAT BEND, KANSAS

Company THUNDERBIRD DRILLING, INC.

Lease and Well No. HARDMAN J-1

County NESS State KANSAS Date MAY 25, 1973

Formation Test No. 3 Total Depth 4345 Elev.

Interval Tested 4303 To 4345 Anchor Length 42'

Size Hole 7 7/8 Size Drill Pipe 4 1/2 F.H. Size Packer 6 3/4

Mud Weight 9.7 Viscosity 52 Water Loss 6.0 c.c. Bottom Hole Temp. 121 °F

Chokes: Top 1/2 Bottom 1/2 Ticket No. 12517

Length of Drill Collar I. D. Length Flexweight 960 I. D. 2.76

RECOVERY

WEAK BLOW, DEAD IN 12 MINUTES.

10 FEET OF MUD. (NO SHOW OF OIL.)

Lease and Well No. HARDMAN J-1 11-18S-25W NW SW

Formation Test No. 3

T-12517

4534

Tool Open: 1st Flow ___ hr. 45 mins: Shut-in Initial ___ hr. 45 min: 2nd Flow ___ hr. 45 min: Shut-in Final ___ hr. 45 min.

	Field Reading	Corrected Reading
(A) Initial Hydrostatic Pressure	2294	2283
(B) Initial 1st Flow Pressure	65	65
(C) Final 1st Flow Pressure	65	65
(D) Initial Shut-in Pressure	65	65
(E) Initial 2nd Flow Pressure	65	65
(F) Final 2nd Flow Pressure	65	65
(G) Final Shut-in Pressure	65	65
(H) Final Hydrostatic Pressure	2272	2251

12517

MILLER TESTING COMPANY

Box 547

GREAT BEND, KANSAS

Company THUNDERBIRD DRILLING, INC.

Lease and Well No. HARDMAN J-1

County NESS State KANSAS Date MAY 26, 1973

Formation Test No. 4 Total Depth 4355 Elev.

Interval Tested 4303 To 4355 Anchor Length 52'

Size Hole 7 7/8 Size Drill Pipe 4 1/2 F.H. Size Packer 6 3/4

Mud Weight 9.6 Viscosity 45 Water Loss 8.6 c.c. Bottom Hole Temp. 124 °F

Chokes: Top 1/2 Bottom 1/2 Ticket No. 12518

Length of Drill Collar I. D. Length Flexweight 960 I. D. 2.76

RECOVERY

GOOD BLOW THROUGHOUT TEST.

330 FEET OF VERY HEAVY OIL CUT MUD- 40% OIL - 60% MUD.
120 FEET OF HEAVY MUD CUT OIL- 70% Oil - 30% MUD.
180 FEET OF MUDDY GASSY OIL.
120 FEET OF HEAVY OIL CUT MUD.

Lease and Well No. HARDMAN J-1 11-18S-25W NW SW Formation Test No. 4

COMPANY THUNDERBIRD DRILLING, INC. DATE MAY 26, 1973

LEASE HARDMAN WELL NO. J-1 TEST NO. 4 TICKET NO. 12518

	TIME	PSI
INITIAL HYDRO MUD PRESSURE		2304
INITIAL CLOSED IN PRESSURE	45 MINS.	1189
INITIAL FLOW	45 MINS.	108 to 249
FINAL FLOW	45 MINS.	296 to 389
FINAL CLOSED IN PRESSURE	45 MINS.	1179
FINAL HYDRO MUD PRESSURE		2262

TOTAL DEPTH 4355

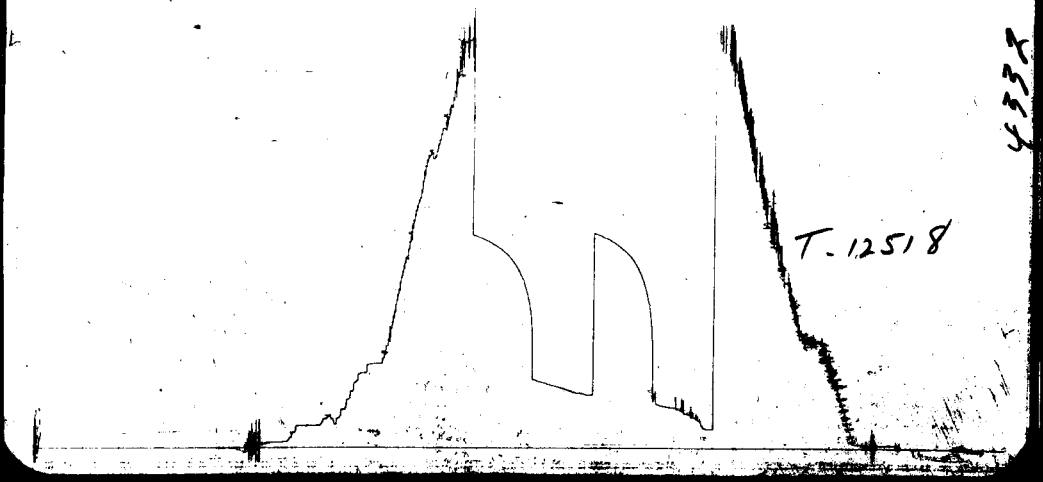
PACKER DEPTH 4303

BT. NO. 4332 DEPTH 4350

	1ST FLOW PRESSURE		INITIAL CIP		2ND FLOW PRESSURE		FINAL CIP	
		108		249		296		389
		173		806		314		870
		227		944		346		966
		249		1030		389		1030
				1072				1062
				1104				1104
				1136				1126
				1157				1147
				1179				1168
				1189				1179
	15	MINUTE INTERVAL	5	MINUTE INTERVAL	15	MINUTE INTERVAL	5.	MINUTE INTERVAL

REMARKS

SPECIAL PRESSURE DATA


T-12518

Tool Open: 1st Flow ___ hr. 45 mins: Shut-in Initial ___ hr. 45 min: 2nd Flow ___ hr. 45 min: Shut-in Final ___ hr. 45 min.

	Field Reading	Corrected Reading
(A) Initial Hydrostatic Pressure	2283	2304
(B) Initial 1st Flow Pressure	97	108
(C) Final 1st Flow Pressure	238	249
(D) Initial Shut-in Pressure	1168	1189
(E) Initial 2nd Flow Pressure	271	296
(F) Final 2nd Flow Pressure	368	389
(G) Final Shut-in Pressure	1168	1179
(H) Final Hydrostatic Pressure	2251	2262

12518