NOMENCLATURE

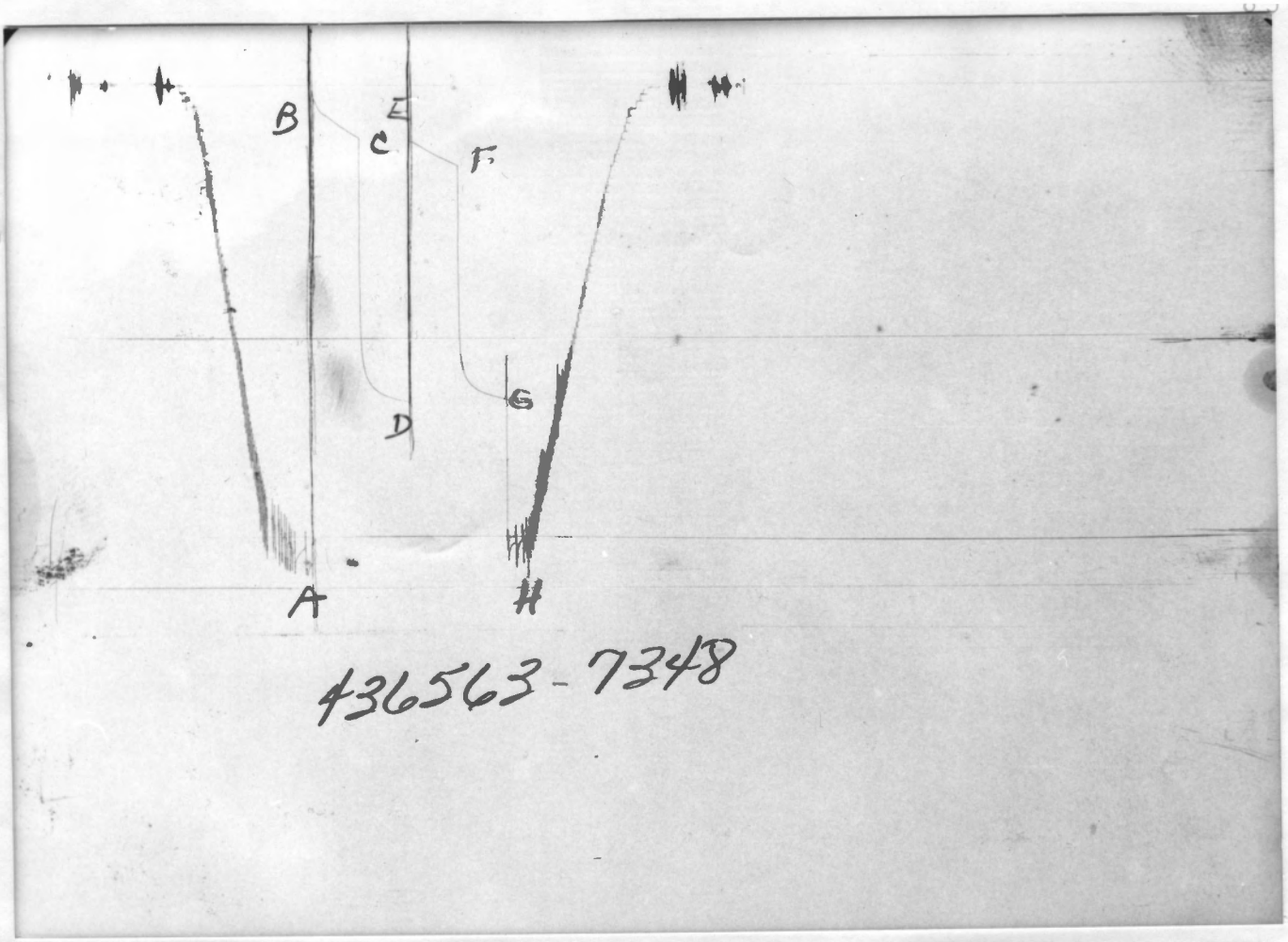
B	=	Formation Volume Factor	(Res Vol/Std Vol)
c_t	=	System Total Compressibility	(Vol/Vol)/psi
DR	=	Damage Ratio	
h	=	Estimated Net Pay Thickness	Ft
k	=	Permeability	md
m	=	(Liquid) Slope Extrapolated Pressure Plot	psi/cycle
		(Gas) Slope Extrapolated m(P) Plot	MM psi^2/cp/cycle
m(P*)	=	Real Gas Potential at P*	MM psi^2/cp
$m(P_f)$	=	Real Gas Potential at P_f	MM psi^2/cp
AOF_1	=	Maximum Indicated Absolute Open Flow at Test Conditions	MCFD
AOF_2	=	Minimum Indicated Absolute Open Flow at Test Conditions	MCFD
P*	=	Extrapolated Static Pressure	Psig
P_f	=	Final Flow Pressure	Psig
Q	=	Liquid Production Rate During Test	BPD
Q_1	=	Theoretical Liquid Production w/Damage Removed	BPD
Q_g	=	Measured Gas Production Rate	MCFD
r_i	=	Approximate Radius of Investigation	Ft
r_w	=	Radius of Well Bore	Ft
S	=	Skin Factor	
t	=	Total Flow Time Previous to Closed-in	Minutes
Δt	=	Closed-in Time at Data Point	Minutes
T	=	Temperature Rankine	°R
ϕ	=	Porosity (fraction)	
μ	=	Viscosity of Gas or Liquid	cp
Log	=	Common Log	

HALLIBURTON
SERVICES

TICKET NO. 43656300
12-SEP-86
PRATT

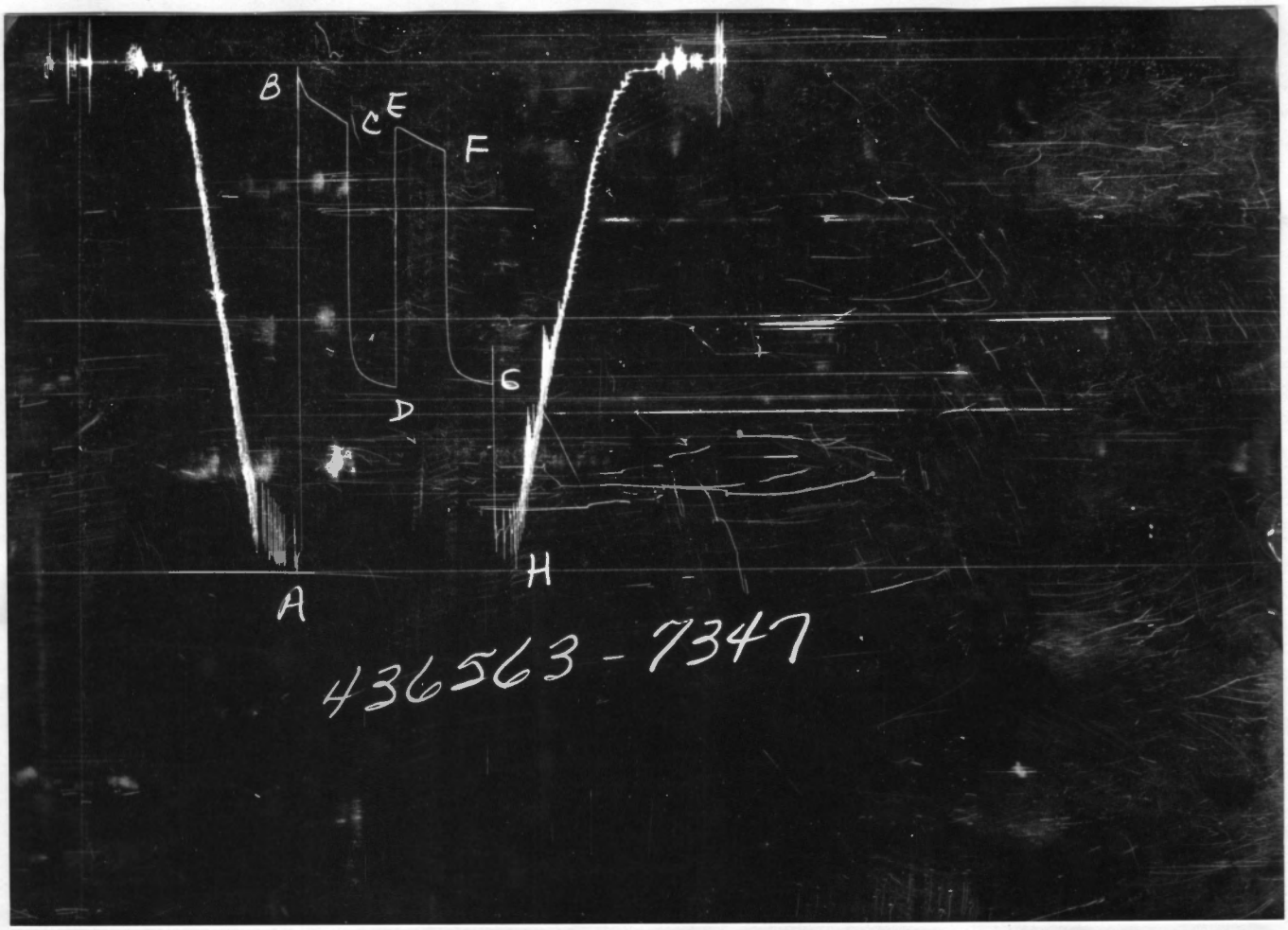
FORMATION TESTING SERVICE REPORT

BLANTON	1	1	3874.0 - 3925.0	MC NEISH OIL OPERATIONS	
LEASE NAME	WELL NO.	TEST NO.	TESTED INTERVAL	LEASE OWNER/COMPANY NAME	
LEGAL LOCATION SEC. - TWP. - RNG.	3-25S-15W	FIELD AREA	COUNTY STAFFORD	STATE KANSAS	IC



GAUGE NO: 7348 DEPTH: 3853.0 BLANKED OFF: NO HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC		1838.0			
B	INITIAL FIRST FLOW		20.1	30.0	30.1	F
C	FINAL FIRST FLOW		207.5			
C	INITIAL FIRST CLOSED-IN		207.5	30.0	29.0	C
D	FINAL FIRST CLOSED-IN		1250.1			
E	INITIAL SECOND FLOW		221.8	30.0	30.9	F
F	FINAL SECOND FLOW		312.4			
F	INITIAL SECOND CLOSED-IN		312.4	30.0	28.6	C
G	FINAL SECOND CLOSED-IN		1239.5			
H	FINAL HYDROSTATIC		1819.9			



GAUGE NO: 7347 DEPTH: 3922.0 BLANKED OFF: YES HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	1863	1856.1			
B	INITIAL FIRST FLOW	39	56.4	30.0	30.1	F
C	FINAL FIRST FLOW	232	236.2			
C	INITIAL FIRST CLOSED-IN	232	236.2	30.0	29.0	C
D	FINAL FIRST CLOSED-IN	1287	1276.2			
E	INITIAL SECOND FLOW	232	255.2	30.0	30.9	F
F	FINAL SECOND FLOW	329	340.4			
F	INITIAL SECOND CLOSED-IN	329	340.4	30.0	28.6	C
G	FINAL SECOND CLOSED-IN	1249	1266.8			
H	FINAL HYDROSTATIC	1863	1840.1			

EQUIPMENT & HOLE DATA

FORMATION TESTED: KANSAS CITY
NET PAY (ft):
GROSS TESTED FOOTAGE: 51.0
ALL DEPTHS MEASURED FROM: KELLY BUSHING
CASING PERFS. (ft):
HOLE OR CASING SIZE (in): 7.875
ELEVATION (ft): 2040.0
TOTAL DEPTH (ft): 3925.0
PACKER DEPTH(S) (ft): 3868, 3874
FINAL SURFACE CHOKE (in):
BOTTOM HOLE CHOKE (in): 0.750
MUD WEIGHT (lb/gal):
MUD VISCOSITY (sec):
ESTIMATED HOLE TEMP. (°F):
ACTUAL HOLE TEMP. (°F): 115 @ 3920.0 ft

TICKET NUMBER: 43656300

DATE: 9-8-86 TEST NO: 1

TYPE DST: OPEN HOLE

HALLIBURTON CAMP: PRATT

TESTER: L. R. PARKER

WITNESS: M. DUBOIS

DRILLING CONTRACTOR: EAGLE DRILLING COMPANY

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY		CHLORIDES
PIT	@	°F	140000 ppm
TOP	@	°F	29000 ppm
MIDDLE	@	°F	36000 ppm
BOTTOM	@	°F	97650 ppm
	@	°F	ppm
	@	°F	ppm

SAMPLER DATA

Psig AT SURFACE:
cu.ft. OF GAS:
cc OF OIL:
cc OF WATER:
cc OF MUD:
TOTAL LIQUID cc:

HYDROCARBON PROPERTIES

OIL GRAVITY (°API): @ °F
GAS/OIL RATIO (cu.ft. per bbl):
GAS GRAVITY:

CUSHION DATA

TYPE	AMOUNT	WEIGHT

RECOVERED:

90 FEET OF MUDDY WATER
540 FEET OF WATER

MEASURED FROM TESTER VALVE

REMARKS:

TYPE & SIZE MEASURING DEVICE: _____ TICKET NO: 43656300

TIME	CHOKE SIZE	SURFACE PRESSURE PSI	GAS RATE MCF	LIQUID RATE BPD	REMARKS
9-7-86					
2235					CALLED OUT
2345					ON LOCATION - RIG CIRCULATING
					AFTER SHORT TRIP
9-8-86					
0045					STARTED OUT OF HOLE
					(TIGHT STANDS 19,20,21 #23
					VERY TIGHT)
0845					PICKED UP TOOL
0910					TOOL IN TABLE
0915					TOOL THROUGH TABLE
1031					ON BOTTOM
1035					OPENED TOOL WITH A VERY WEAK
					BLOW INCREASING TO BOTTOM OF
					BUCKET IN 7 MINUTES - REMAINED
					STRONG FOR REST OF FLOW WITH
					LAZY ROLL OFF BOTTOM OF BUCKET
1105					CLOSED TOOL
1135					OPENED TOOL WITH A VERY WEAK
					BLOW INCREASING TO BOTTOM OF
					BUCKET IN 10 MINUTES - HAD LAZY
					ROLL OFF BOTTOM OF BUCKET FOR
					REST OF FLOW
1205					CLOSED TOOL
1235					OFF BOTTOM
1405					TOOL IN TABLE

TICKET NO: 43656300	GAUGE NO: 7348
CLOCK NO: 26864 HOUR: 12	DEPTH: 3853.0

HALLIBURTON SERVICES

REF		MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t+\Delta t}$	$\log \frac{t+\Delta t}{\Delta t}$
			FIRST FLOW			
B	1	0.0	20.1			
	2	2.0	44.2	24.1		
	3	4.0	73.7	29.5		
	4	6.0	100.1	26.4		
	5	8.0	112.9	12.8		
	6	10.0	122.4	9.5		
	7	12.0	131.0	8.6		
	8	14.0	141.2	10.2		
	9	16.0	151.1	9.9		
	10	18.0	159.7	8.6		
	11	20.0	167.9	8.1		
	12	22.0	176.8	8.9		
	13	24.0	184.6	7.8		
	14	26.0	192.1	7.5		
	15	28.0	199.0	6.8		
C	16	30.1	207.5	8.5		
			FIRST CLOSED-IN			
C	1	0.0	207.5			
	2	1.0	1013.7	806.2	1.0	1.501
	3	2.0	1094.8	887.3	1.9	1.201
	4	3.0	1129.0	921.6	2.8	1.039
	5	4.0	1150.8	943.3	3.5	0.932
	6	5.0	1164.5	957.0	4.3	0.849
	7	6.0	1175.7	968.3	5.0	0.780
	8	7.0	1186.2	978.7	5.7	0.726
	9	8.0	1194.0	986.5	6.3	0.677
	10	9.0	1199.5	992.1	6.9	0.638
	11	10.0	1205.8	998.3	7.5	0.604
	12	12.0	1214.4	1006.9	8.6	0.546
	13	14.0	1221.9	1014.4	9.5	0.499
	14	16.0	1228.3	1020.8	10.4	0.460
	15	18.0	1232.9	1025.5	11.3	0.427
	16	20.0	1237.4	1030.0	12.0	0.399
	17	22.0	1241.2	1033.7	12.7	0.374
	18	24.0	1243.8	1036.3	13.4	0.353
	19	26.0	1246.1	1038.7	13.9	0.334
	20	28.0	1249.0	1041.5	14.5	0.317
D	21	29.0	1250.1	1042.7	14.8	0.309
			SECOND FLOW			
E	1	0.0	221.8			
	2	2.0	221.1	-0.7		
	3	4.0	226.1	5.0		
	4	6.0	233.4	7.3		
	5	8.0	240.1	6.6		
	6	10.0	247.4	7.3		
	7	12.0	254.7	7.3		
			SECOND FLOW - CONTINUED			
	8	14.0	261.4	6.6		
	9	16.0	268.2	6.8		
	10	18.0	274.5	6.2		
	11	20.0	280.2	5.7		
	12	22.0	286.1	5.8		
	13	24.0	292.4	6.3		
	14	26.0	298.4	5.9		
	15	28.0	303.9	5.6		
F	16	30.9	312.4	8.5		
			SECOND CLOSED-IN			
F	1	0.0	312.4			
	2	1.0	1032.0	719.6	1.0	1.776
	3	2.0	1098.2	785.8	1.9	1.497
	4	3.0	1128.9	816.5	2.9	1.327
	5	4.0	1148.0	835.6	3.7	1.211
	6	5.0	1161.4	848.9	4.6	1.121
	7	6.0	1171.3	858.9	5.5	1.048
	8	7.0	1178.7	866.2	6.3	0.989
	9	8.0	1185.5	873.1	7.1	0.935
	10	9.0	1191.0	878.6	7.8	0.892
	11	10.0	1196.8	884.3	8.6	0.852
	12	12.0	1205.1	892.6	10.0	0.785
	13	14.0	1211.7	899.3	11.4	0.729
	14	16.0	1217.3	904.9	12.6	0.683
	15	18.0	1222.3	909.8	13.9	0.641
	16	20.0	1226.6	914.2	15.0	0.608
	17	22.0	1230.9	918.5	16.2	0.577
	18	24.0	1233.2	920.8	17.2	0.550
	19	26.0	1236.5	924.0	18.2	0.524
G	20	28.6	1239.5	927.1	19.5	0.496

REMARKS:

TICKET NO: 43656300	GAUGE NO: 7347
CLOCK NO: 7046 HOUR: 12	DEPTH: 3922.0

HALLIBURTON SERVICES

REF		MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t+\Delta t}$	$\log \frac{t+\Delta t}{\Delta t}$
			FIRST FLOW			
B	1	0.0	56.4			
	2	2.0	80.5	24.2		
	3	4.0	109.5	28.9		
	4	6.0	135.2	25.7		
	5	8.0	145.3	10.1		
	6	10.0	155.3	10.1		
	7	12.0	164.6	9.3		
	8	14.0	174.3	9.7		
	9	16.0	181.9	7.6		
	10	18.0	190.5	8.6		
	11	20.0	198.9	8.3		
	12	22.0	206.2	7.4		
	13	24.0	213.5	7.3		
	14	26.0	221.3	7.8		
	15	28.0	228.6	7.3		
C	16	30.1	236.2	7.6		
			FIRST CLOSED-IN			
C	1	0.0	236.2			
	2	1.0	1075.6	839.4	1.0	1.479
	3	2.0	1130.1	893.9	1.8	1.213
	4	3.0	1162.1	925.9	2.7	1.045
	5	4.0	1180.7	944.6	3.5	0.934
	6	5.0	1195.5	959.3	4.3	0.848
	7	6.0	1206.4	970.2	5.0	0.777
	8	7.0	1215.0	978.8	5.7	0.722
	9	8.0	1222.2	986.0	6.3	0.678
	10	9.0	1228.0	991.8	6.9	0.640
	11	10.0	1233.5	997.3	7.5	0.602
	12	12.0	1242.9	1006.7	8.6	0.545
	13	14.0	1249.7	1013.5	9.6	0.499
	14	16.0	1255.6	1019.4	10.4	0.461
	15	18.0	1260.1	1023.9	11.3	0.427
	16	20.0	1264.3	1028.1	12.0	0.399
	17	22.0	1267.3	1031.1	12.7	0.374
	18	24.0	1270.4	1034.2	13.3	0.353
	19	26.0	1273.1	1036.9	14.0	0.334
	20	28.0	1275.0	1038.8	14.5	0.317
D	21	29.0	1276.2	1040.0	14.8	0.309
			SECOND FLOW			
E	1	0.0	255.2			
	2	2.0	250.1	-5.1		
	3	4.0	253.8	3.7		
	4	6.0	260.8	7.1		
	5	8.0	268.3	7.5		
	6	10.0	275.4	7.1		
	7	12.0	281.3	5.9		

REF		MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t+\Delta t}$	$\log \frac{t+\Delta t}{\Delta t}$
			SECOND FLOW - CONTINUED			
	8	14.0	288.4	7.2		
	9	16.0	295.2	6.8		
	10	18.0	301.9	6.7		
	11	20.0	307.5	5.6		
	12	22.0	313.9	6.4		
	13	24.0	320.2	6.3		
	14	26.0	326.3	6.1		
	15	28.0	332.1	5.8		
F	16	30.9	340.4	8.3		
			SECOND CLOSED-IN			
F	1	0.0	340.4			
	2	1.0	1072.0	731.6	1.0	1.790
	3	2.0	1136.2	795.7	1.9	1.503
	4	3.0	1165.1	824.7	2.8	1.331
	5	4.0	1182.8	842.3	3.7	1.212
	6	5.0	1195.4	855.0	4.6	1.119
	7	6.0	1204.9	864.5	5.5	1.047
	8	7.0	1212.5	872.1	6.3	0.989
	9	8.0	1219.0	878.6	7.0	0.938
	10	9.0	1224.2	883.8	7.8	0.892
	11	10.0	1229.7	889.2	8.6	0.850
	12	12.0	1236.3	895.8	10.0	0.785
	13	14.0	1242.4	902.0	11.4	0.729
	14	16.0	1247.8	907.3	12.7	0.683
	15	18.0	1252.2	911.8	13.9	0.642
	16	20.0	1256.0	915.6	15.0	0.608
	17	22.0	1259.0	918.6	16.1	0.577
	18	24.0	1261.6	921.2	17.2	0.549
	19	26.0	1263.9	923.5	18.2	0.525
G	20	28.6	1266.8	926.3	19.5	0.496

REMARKS:

TICKET NO. 43656300

		O.D.	I.D.	LENGTH	DEPTH
1	DRILL PIPE.....	4.500	3.826	3631.0	
3	DRILL COLLARS.....	6.250	2.250	89.0	
50	IMPACT REVERSING SUB.....	6.000	2.750	1.0	3720.0
3	DRILL COLLARS.....	6.250	2.250	119.0	
5	CROSSOVER.....	6.000	2.250	1.0	
12	DUAL CIP VALVE.....	5.750	0.870	6.0	
60	HYDROSPRING TESTER.....	5.000	0.750	5.0	3851.0
80	AP RUNNING CASE.....	5.000	2.250	4.0	3853.0
15	JAR.....	5.000	1.750	5.0	
16	VR SAFETY JOINT.....	5.000	1.000	3.0	
70	OPEN HOLE PACKER.....	6.750	1.530	6.0	3868.0
70	OPEN HOLE PACKER.....	6.750	1.530	6.0	3874.0
5	CROSSOVER.....	6.000	2.250	1.0	
3	DRILL COLLARS.....	6.250	2.250	31.0	
5	CROSSOVER.....	6.000	2.250	1.0	
5	CROSSOVER.....	6.000	2.250	1.0	
20	FLUSH JOINT ANCHOR.....	5.000	2.370	10.0	
83	HT-500 TEMPERATURE CASE.....	5.000		1.0	3920.0
81	BLANKED-OFF RUNNING CASE.....	5.000		4.0	3922.0
	TOTAL DEPTH				3925.0

EQUIPMENT DATA

TEMPERATURE RECORDER CHART

10° each circle

EQUATIONS FOR DST GAS WELL ANALYSIS

Indicated Flow Capacity	$kh = \frac{.001637\ Q_g\ T}{m}$	md-ft
Average Effective Permeability	$k = \frac{kh}{h}$	md
Skin Factor	$S = 1.151 \left[\frac{m(P^*)-m(P_1)}{m} - LOG \left(\frac{k\ (t/60)}{\phi\ \mu\ c_t r_w^2} \right) + 3.23 \right]$	
Damage Ratio	$DR = \frac{m(P^*) - m(P_1)}{m(P^*) - m(P_1) - 0.87\ mS}$	
Indicated Flow Rate (Maximum)	$AOF_1 = \frac{Q_g\ m(P^*)}{m(P^*) - m(P_1)}$	MCFD
Indicated Flow Rate (Minimum)	$AOF_2 = Q_g \sqrt{\frac{m(P^*)}{m(P^*) - m(P_1)}}$	MCFD
Approx. Radius of Investigation	$r_i = 0.032 \sqrt{\frac{k\ (t/60)}{\phi\ \mu\ c_t}}$	ft