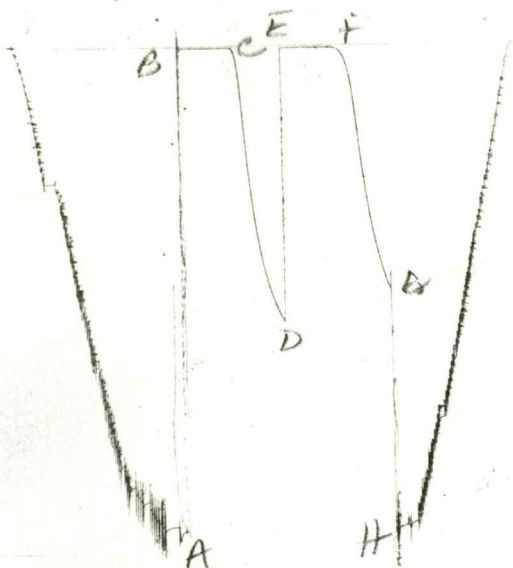




TICKET NO. 60599500
19-JAN-84
NESS CITY

FORMATION TESTING SERVICE REPORT

DEINES "M"	1	1	3967.1 - 4027.1	DONALD C. SLAWSON
LEASE NAME	WELL NO.	TEST NO.	TESTED INTERVAL	LEASE OWNER/COMPANY NAME
LEGAL LOCATION SEC. - TWP. - RNG.	19-15-25	FIELD AREA	WILDCAT	COUNTY
				TREGO
				STATE
				KANSAS
				IC

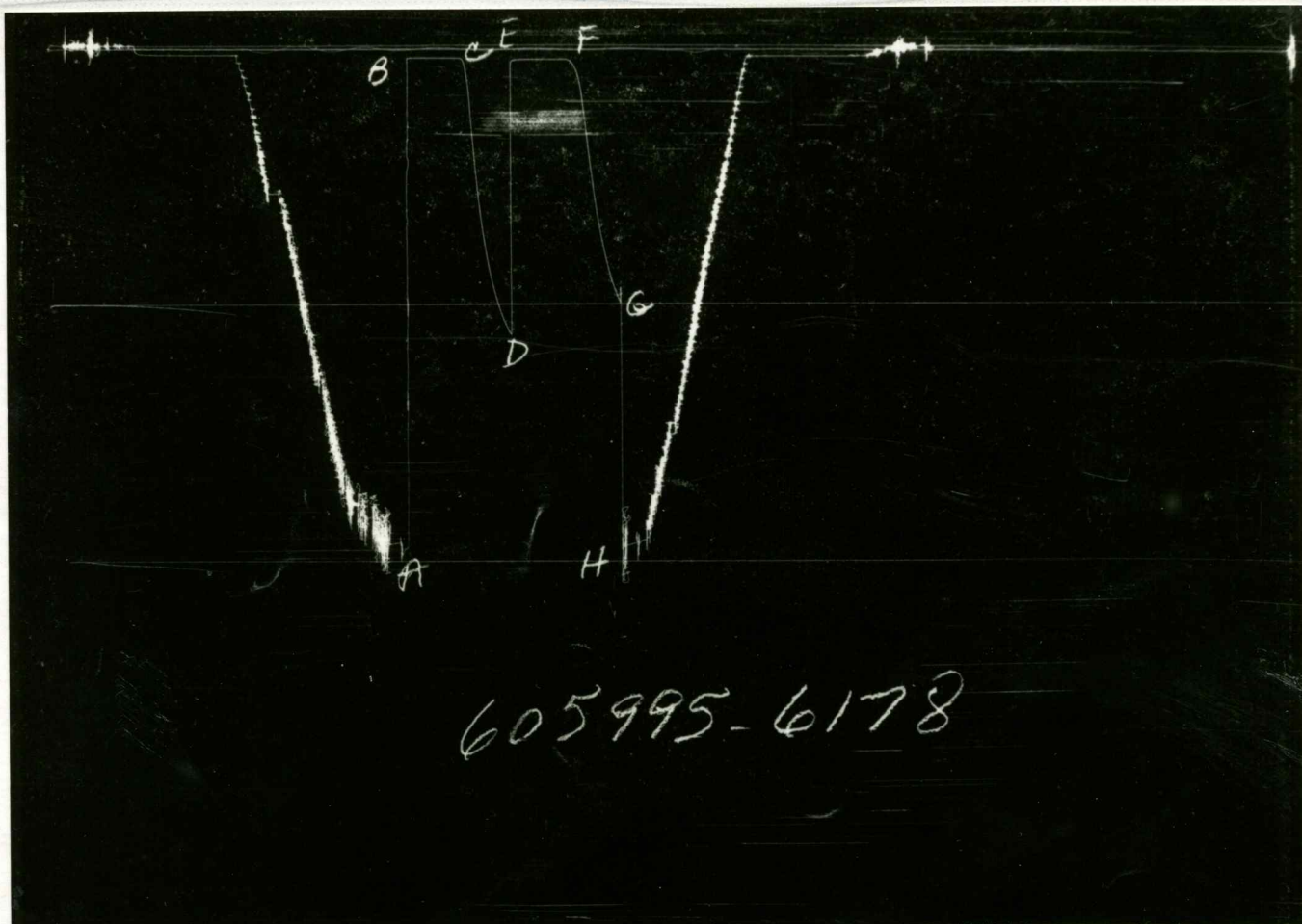


605995-6177

GAUGE NO: 6177 DEPTH: 3952.0 BLANKED OFF: NO HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	1905	1901.1			
B	INITIAL FIRST FLOW	13	9.3	30.0	29.6	F
C	FINAL FIRST FLOW	15	7.8			
C	INITIAL FIRST CLOSED-IN	15	7.8	30.0	29.1	C
D	FINAL FIRST CLOSED-IN	1089	1092.1			
E	INITIAL SECOND FLOW	15	9.1	30.0	31.2	F
F	FINAL SECOND FLOW	15	9.1			
F	INITIAL SECOND CLOSED-IN	15	9.1	30.0	30.2	C
G	FINAL SECOND CLOSED-IN	965	971.9			
H	FINAL HYDROSTATIC	1905	1900.8			

988


GAUGE NO: 6178 DEPTH: 4024.0 BLANKED OFF: YES HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC		1933.4			
B	INITIAL FIRST FLOW		48.1			
C	FINAL FIRST FLOW		46.7	30.0	29.6	F
C	INITIAL FIRST CLOSED-IN		46.7			
D	FINAL FIRST CLOSED-IN		1119.9	30.0	29.1	C
E	INITIAL SECOND FLOW		62.8			
F	FINAL SECOND FLOW		51.7	30.0	31.2	F
F	INITIAL SECOND CLOSED-IN		51.7			
G	FINAL SECOND CLOSED-IN		995.7	30.0	30.2	C
H	FINAL HYDROSTATIC		1933.7			

EQUIPMENT & HOLE DATA

FORMATION TESTED: 160-180 KANSAS CITY
 NET PAY (ft): 8.0
 GROSS TESTED FOOTAGE: 60.0
 ALL DEPTHS MEASURED FROM: KELLY BUSHING
 CASING PERFS. (ft): _____
 HOLE OR CASING SIZE (in): 7.875
 ELEVATION (ft): 2526
 TOTAL DEPTH (ft): 4027.0
 PACKER DEPTH(S) (ft): 3967
 FINAL SURFACE CHOKE (in): _____
 BOTTOM HOLE CHOKE (in): 0.750
 MUD WEIGHT (lb/gal): 9.40
 MUD VISCOSITY (sec): 46
 ESTIMATED HOLE TEMP. (°F): 110
 ACTUAL HOLE TEMP. (°F): 141 @ 4022.0 ft

TICKET NUMBER: 60599500DATE: 1-15-84 TEST NO: 1TYPE DST: OPEN HOLEHALLIBURTON CAMP:
NESS CITYTESTER: J. THOMPSONWITNESS: K. SCHRIENERDRILLING CONTRACTOR:
DONALD C. SLAWSON #4FLUID PROPERTIES FOR
RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
SYSTEMS	<u>0</u> °F	<u>10000</u> ppm
RECOVERY	<u>0</u> °F	<u>10500</u> ppm
	<u>0</u> °F	<u>0</u> ppm
	<u>0</u> °F	<u>0</u> ppm
	<u>0</u> °F	<u>0</u> ppm
	<u>0</u> °F	<u>0</u> ppm

SAMPLER DATA

Pstg 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:

10 FEET OF DRILLING MUD - NO SHOW OF OIL

MEASURED FROM
TESTER VALVE

REMARKS:

TICKET NO: 60599500[illegible]

TICKET NO: 60599500

CLOCK NO: 14248 HOUR: 12


HALLIBURTON
SERVICES

GAUGE NO: 6177

DEPTH: 3952.0

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
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FIRST FLOW

B	1	0.0	9.3		
C	2	29.6	7.8	-1.5	

FIRST CLOSED-IN

C	1	0.0	7.8		
	2	3.0	56.8	48.9	2.7 1.039
	3	6.0	237.7	229.9	5.0 0.774
	4	9.0	483.5	475.7	6.9 0.631
	5	12.0	660.6	652.8	8.5 0.539
	6	15.0	789.1	781.3	9.9 0.473
	7	18.0	889.0	881.2	11.2 0.423
	8	21.0	967.4	959.6	12.3 0.381
	9	24.0	1022.9	1015.1	13.2 0.349
	10	27.0	1071.6	1063.8	14.1 0.321
D	11	29.1	1092.1	1084.3	14.7 0.305

SECOND FLOW

E	1	0.0	9.1		
F	2	31.2	9.1	0.0	

SECOND CLOSED-IN

F	1	0.0	9.1		
	2	3.0	21.1	12.0	2.9 1.325
	3	6.0	53.5	44.4	5.4 1.048
	4	9.0	134.3	125.2	7.9 0.888
	5	12.0	293.0	284.0	10.0 0.783
	6	15.0	474.9	465.8	12.0 0.704
	7	18.0	628.0	618.9	13.9 0.642
	8	21.0	747.7	738.6	15.6 0.590
	9	24.0	839.7	830.6	17.2 0.548
	10	27.0	910.5	901.4	18.7 0.512
G	11	30.2	971.9	962.8	20.2 0.479

REMARKS:

TICKET NO: 60599500

CLOCK NO: 16165 HOUR: 12


HALLIBURTON
SERVICES

GAUGE NO: 6178

DEPTH: 4024.0

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
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FIRST FLOW

B	1	0.0	48.1		
C	2	29.6	46.7	-1.4	

FIRST CLOSED-IN

C	1	0.0	46.7		
	2	3.0	85.4	38.7	2.7 1.033
	3	6.0	259.9	213.2	5.0 0.772
	4	9.0	492.4	445.8	6.9 0.633
	5	12.0	674.6	628.0	8.6 0.539
	6	15.0	809.2	762.5	10.0 0.472
	7	18.0	910.4	863.7	11.2 0.422
	8	21.0	989.9	943.3	12.3 0.381
	9	24.0	1050.5	1003.8	13.2 0.349
	10	27.0	1097.1	1050.4	14.1 0.321
D	11	29.1	1119.9	1073.2	14.7 0.305

SECOND FLOW

E	1	0.0	62.8		
F	2	31.2	51.7	-11.1	

SECOND CLOSED-IN

F	1	0.0	51.7		
	2	3.0	64.4	12.7	2.8 1.333
	3	6.0	105.5	53.8	5.4 1.049
	4	9.0	214.1	162.4	7.8 0.890
	5	12.0	383.7	332.0	10.0 0.784
	6	15.0	546.6	494.9	12.0 0.704
	7	18.0	685.5	633.8	13.9 0.641
	8	21.0	790.4	738.7	15.6 0.590
	9	24.0	876.0	824.2	17.2 0.548
	10	27.0	941.8	890.0	18.7 0.512
G	11	30.2	995.7	944.0	20.2 0.479

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
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REMARKS:

		O.D.	I.D.	LENGTH	DEPTH
1					
	DRILL PIPE.....	4.500	3.826	3815.0	
50					
	IMPACT REVERSING SUB.....	5.000	2.750	1.0	3816.0
1					
	DRILL PIPE.....	4.500	3.826	124.0	
12					
	DUAL CIP VALVE.....	5.000	0.870	6.0	
60					
	HYDROSPRING TESTER.....	5.000	0.750	5.0	3950.0
80					
	AP RUNNING CASE.....	5.000	3.060	4.0	3952.0
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	3967.0
5					
	CROSSOVER.....	5.000	2.750	1.0	
1					
	DRILL PIPE.....	4.500	3.826	31.0	
5					
	CROSSOVER.....	5.000	2.750	1.0	
20					
	FLUSH JOINT ANCHOR.....	5.000	2.370	20.0	
83					
	HT-500 TEMPERATURE CASE.....	5.000		1.0	4022.0
81					
	BLANKED-OFF RUNNING CASE.....	5.000		4.0	4024.0

TOTAL DEPTH

4027.0

EQUIPMENT DATA

TEMPERATURE

RECORDER

CHART



10° each circle

Indicated Flow
Capacity

$$kh = \frac{1637 Q_g T}{m}$$

md-ft

Average Effective
Permeability

$$k = \frac{kh}{h}$$

md

Skin Factor

$$S = 1.151 \left[\frac{m(P^*) - m(P_f)}{m} - \text{LOG} \frac{kt}{\phi \mu c_t r_w^2} + 3.23 \right] \text{ ---}$$

Damage Ratio

$$DR = \frac{m(P^*) - m(P_f)}{m(P^*) - m(P_f) - 0.87 mS} \text{ ---}$$

Indicated Flow
Rate (Maximum)

$$AOF_1 = \frac{Q_g m(P^*)}{m(P^*) - m(P_f)}$$

MCFD

Indicated Flow
Rate (Minimum)

$$AOF_2 = Q_g \sqrt{\frac{m(P^*)}{m(P^*) - m(P_f)}}$$

MCFD

Approx. Radius of
Investigation

$$r_i = 0.032 \sqrt{\frac{kt}{\phi \mu c_t}}$$

ft

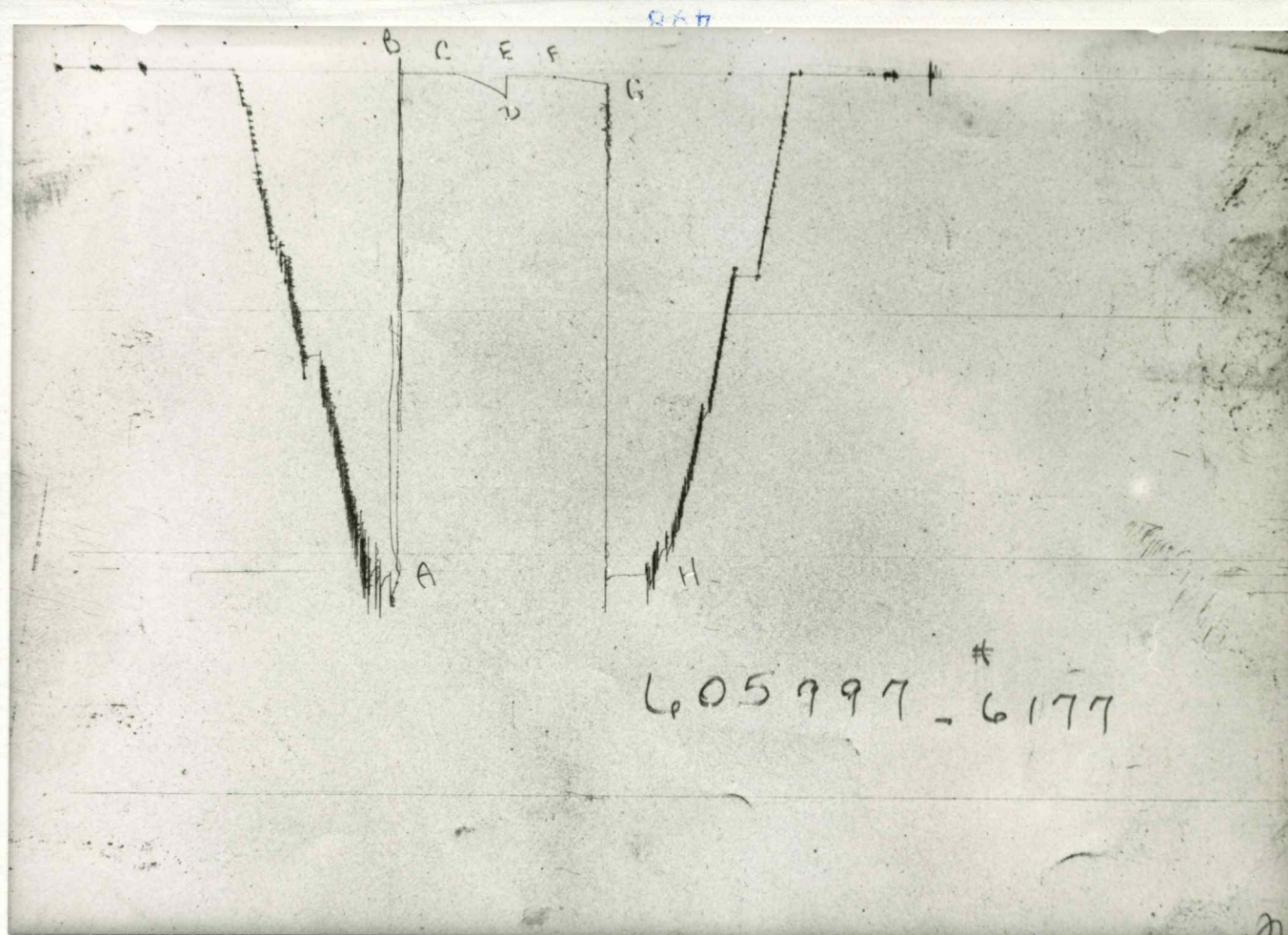
187



TICKET NO. 60599600
24-JAN-84
NESS CITY

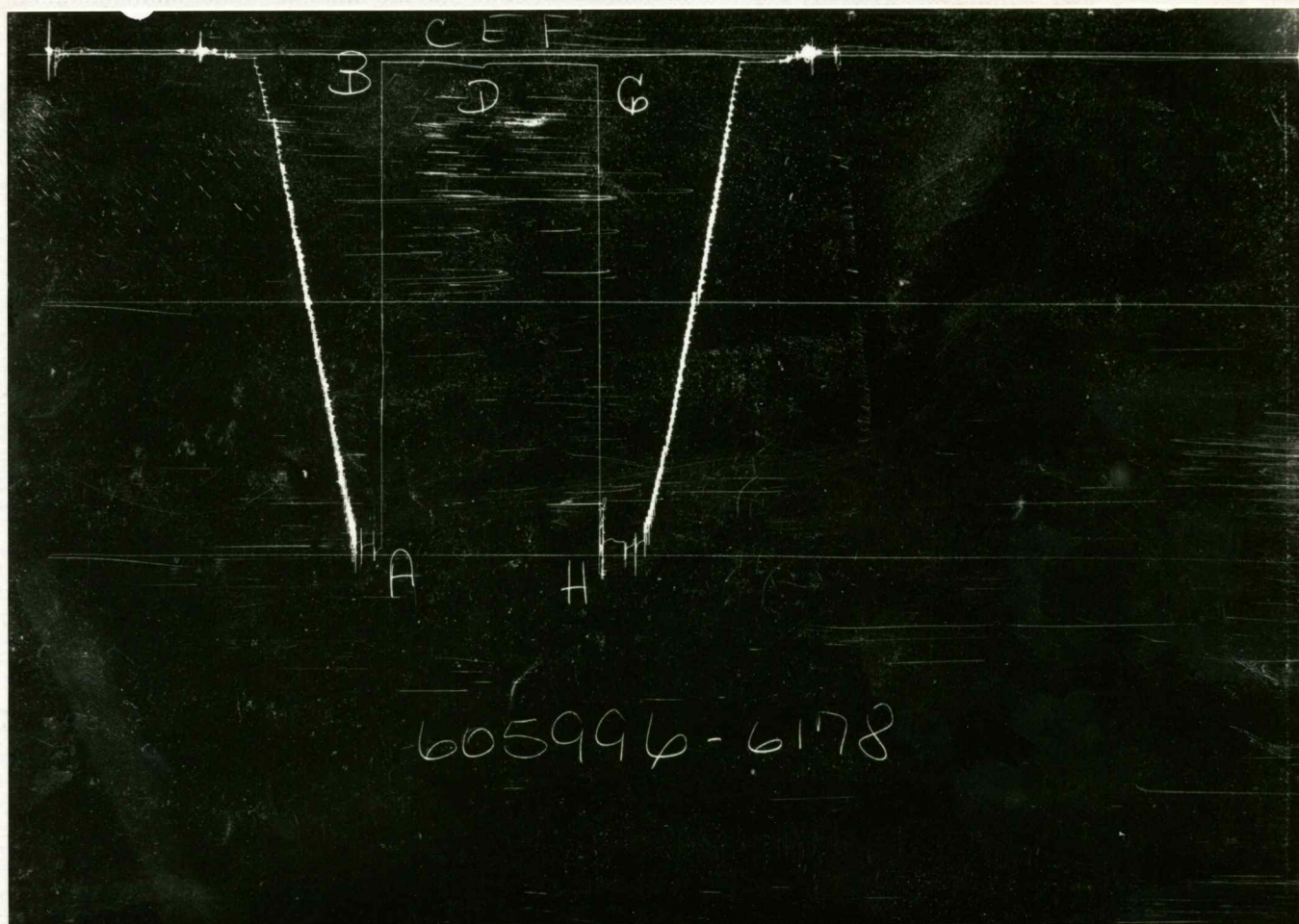
FORMATION TESTING SERVICE REPORT

DEINES M	1	2	4021.' - 4087.'	DONALD C. SLAYSON
LEASE NAME	WELL NO.	TEST NO.	TESTED INTERVAL	LEASE OWNER/COMPANY NAME
LEGAL LOCATION SEC. - TWP. - RNC.	19 - 15 - 25	FIELD AREA	WILDCAT	COUNTY
				TREGO
				STATE KANSAS
				PW



GAUGE NO: 6177 DEPTH: 4006.0 BLANKED OFF: NO HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	1926	1935.3			
B	INITIAL FIRST FLOW	11	7.7			
C	FINAL FIRST FLOW	13	9.6	30.0	30.0	F
C	INITIAL FIRST CLOSED-IN	13	9.6			
D	FINAL FIRST CLOSED-IN	42	32.7	30.0	30.0	C
E	INITIAL SECOND FLOW	13	8.8			
F	FINAL SECOND FLOW	13	8.8	30.0	30.0	F
F	INITIAL SECOND CLOSED-IN	13	8.8			
G	FINAL SECOND CLOSED-IN	21	20.4	30.0	30.0	C
H	FINAL HYDROSTATIC	1909	1914.8			



GAUGE NO: 6178 DEPTH: 4084.0 BLANKED OFF: YES HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC		1969.2			
B	INITIAL FIRST FLOW		45.6			
C	FINAL FIRST FLOW		48.3	30.0	30.0	F
C	INITIAL FIRST CLOSED-IN		48.3			
D	FINAL FIRST CLOSED-IN		70.0	30.0	30.0	C
E	INITIAL SECOND FLOW		62.1			
F	FINAL SECOND FLOW		51.1	30.0	30.0	F
F	INITIAL SECOND CLOSED-IN		51.1			
G	FINAL SECOND CLOSED-IN		59.2	30.0	30.0	C
H	FINAL HYDROSTATIC		1943.8			

EQUIPMENT & HOLE DATA

FORMATION TESTED: KANSAS CITY 200'
 NET PAY (ft): 8.0
 GROSS TESTED FOOTAGE: 66.0
 ALL DEPTHS MEASURED FROM: KELLY BUSHING
 CASING PERFS. (ft): _____
 HOLE OR CASING SIZE (in): 7.875
 ELEVATION (ft): 2526
 TOTAL DEPTH (ft): 4087.0
 PACKER DEPTH(S) (ft): 4021
 FINAL SURFACE CHOKE (in): 0.250
 BOTTOM HOLE CHOKE (in): 0.750
 MUD WEIGHT (lb/gal): 9.30
 MUD VISCOSITY (sec): 44
 ESTIMATED HOLE TEMP. (°F): 120
 ACTUAL HOLE TEMP. (°F): 118 @ 4082.0 ft

TICKET NUMBER: 60599600

DATE: 1-16-84 TEST NO: 2

TYPE DST: OPEN HOLE

HALLIBURTON CAMP:
NESS CITY

TESTER: J. THOMPSON

WITNESS: K. SCRIBNER

DRILLING CONTRACTOR:
COMPANY TOOLS

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
<u>SYSTEMS</u>	<u>0</u> °F	<u>10000</u> ppm
<u>RECOVERY</u>	<u>0</u> °F	<u>10000</u> ppm
_____	<u>0</u> °F	_____ ppm
_____	<u>0</u> °F	_____ ppm
_____	<u>0</u> °F	_____ ppm
_____	<u>0</u> °F	_____ ppm

SAMPLER DATA

Pstg 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:

5 FEET OF DRILLING MUD - NO SHOW OF OIL

MEASURED FROM
TESTER VALVE

REMARKS:

TYPE & SIZE MEASURING DEVICE: _____

TICKET NO: 60599600

[illegible]

		O.D.	I.D.	LENGTH	DEPTH
1					
	DRILL PIPE.....	4.500	3.826	3869.0	
50					
	IMPACT REVERSING SUB.....	5.000	2.750	1.0	3870.0
1					
	DRILL PIPE.....	4.500	3.826	124.0	
12					
	DUAL CIP VALVE.....	5.000	0.870	6.0	
60					
	HYDROSPRING TESTER.....	5.000	0.750	5.0	4004.0
80					
	AP RUNNING CASE.....	5.000	2.250	4.0	4006.0
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	4021.0
5					
	CROSSOVER.....	5.000	2.750	1.0	
1					
	DRILL PIPE.....	4.500	3.826	31.0	
5					
	CROSSOVER.....	5.000	2.750	1.0	
20					
	FLUSH JOINT ANCHOR.....	5.000	2.370	26.0	
83					
	HT-500 TEMPERATURE CASE.....	5.000		1.0	4082.0
81					
	BLANKED-OFF RUNNING CASE.....	5.000		4.0	4084.0

TOTAL DEPTH

4087.0

EQUIPMENT DATA

TEMPERATURE

RECORDER

CHART



10° each circle

Indicated Flow
Capacity

$$kh = \frac{1637 Q_g T}{m}$$

md-ft

Average Effective
Permeability

$$k = \frac{kh}{h}$$

md

Skin Factor

$$S = 1.151 \left[\frac{m(P^*) - m(P_f)}{m} - \text{LOG} \frac{kt}{\phi \mu c_f r_w^2} + 3.23 \right] \text{ ---}$$

Damage Ratio

$$DR = \frac{m(P^*) - m(P_f)}{m(P^*) - m(P_f) - 0.87 mS} \text{ ---}$$

Indicated Flow
Rate (Maximum)

$$AOF_1 = \frac{Q_g m(P^*)}{m(P^*) - m(P_f)}$$

MCFD

Indicated Flow
Rate (Minimum)

$$AOF_2 = Q_g \sqrt{\frac{m(P^*)}{m(P^*) - m(P_f)}}$$

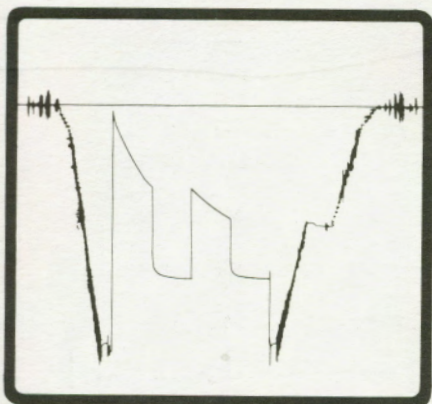
MCFD

Approx. Radius of
Investigation

$$r_i = 0.032 \sqrt{\frac{kt}{\phi \mu c_f}}$$

ft

FORMATION TESTING SERVICE REPORT



Duncan, Oklahoma 73536



A Halliburton Company

DEINES M
LEASE NAME

1
WELL NO.

3
TEST NO.

4291.' - 4347.'
TESTED INTERVAL

DONALD C. SLAYSON
LEASE OWNER/COMPANY NAME



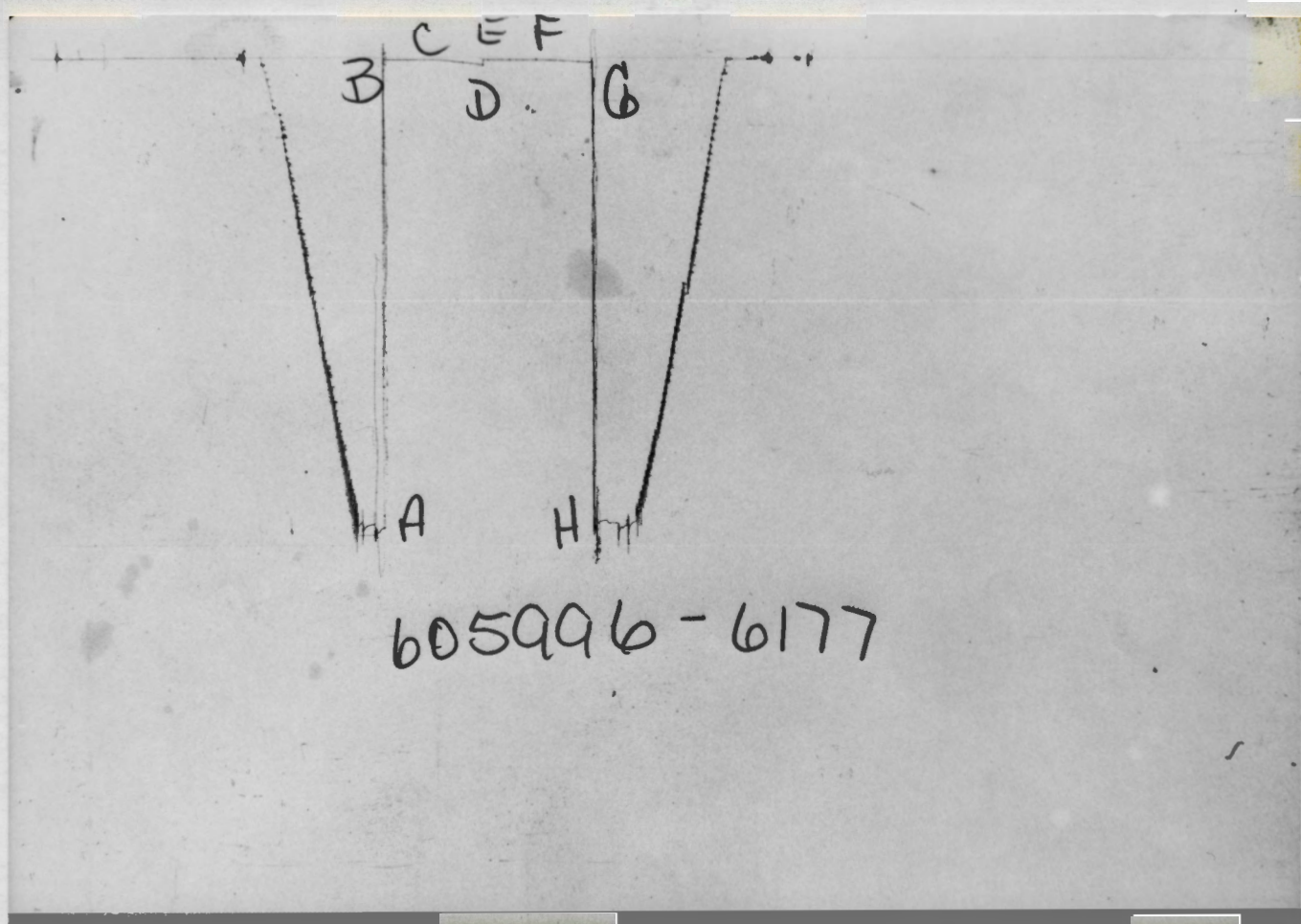
TICKET NO. 60599700

24-JAN-84

NESS CITY

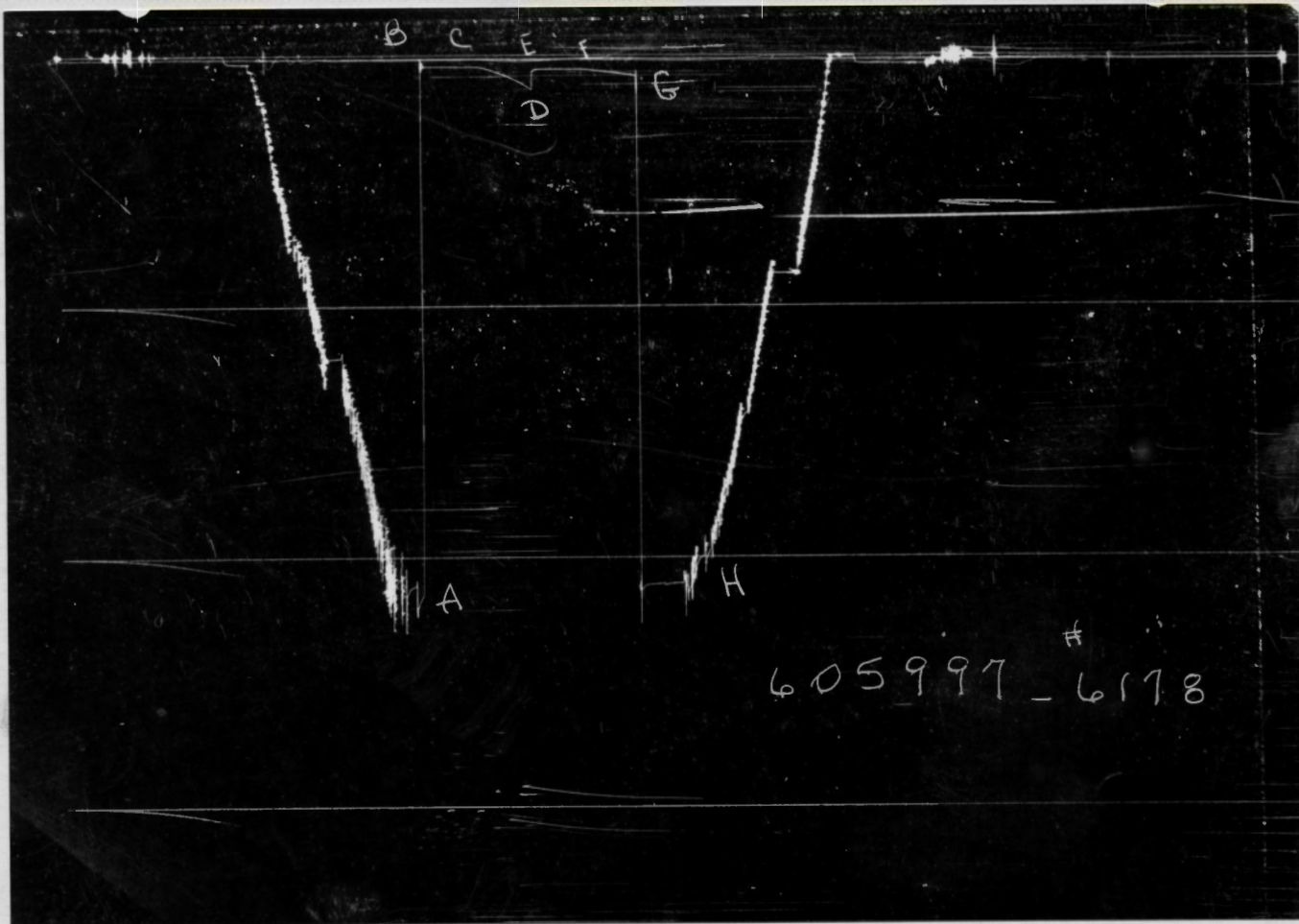
FORMATION TESTING SERVICE REPORT

DEINES, M	1	3	4291.1' - 4347.1'	DONALD C. SLAWSON
LEASE NAME	WELL NO.	TEST NO.	TESTED INTERVAL	LEASE OWNER/COMPANY NAME
LEGAL LOCATION SEC. - TWP. - RNG.	19 - 15 - 25	FIELD AREA	WILDCAT	COUNTY
			TREGO	STATE
				KANSAS
				NM



GAUGE NO: 6177 DEPTH: 4276.0 BLANKED OFF: NO HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	2073	2082.1			
B	INITIAL FIRST FLOW	15	10.5	30.0	30.0	F
C	FINAL FIRST FLOW	17	10.5			
C	INITIAL FIRST CLOSED-IN	17	10.5	30.0	30.0	C
D	FINAL FIRST CLOSED-IN	106	105.5			
E	INITIAL SECOND FLOW	17	15.6	30.0	30.0	F
F	FINAL SECOND FLOW	19	17.4			
F	INITIAL SECOND CLOSED-IN	19	17.4	30.0	30.0	C
G	FINAL SECOND CLOSED-IN	42	46.4			
H	FINAL HYDROSTATIC	2073	2076.2			



GAUGE NO: 6178 DEPTH: 4344.0 BLANKED OFF: YES HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC		2111.3			
B	INITIAL FIRST FLOW		46.0			
C	FINAL FIRST FLOW		47.7	30.0	30.0	F
C	INITIAL FIRST CLOSED-IN		47.7			
D	FINAL FIRST CLOSED-IN		138.8	30.0	30.0	C
E	INITIAL SECOND FLOW		70.9			
F	FINAL SECOND FLOW		56.9	30.0	30.0	F
F	INITIAL SECOND CLOSED-IN		56.9			
G	FINAL SECOND CLOSED-IN		83.4	30.0	30.0	C
H	FINAL HYDROSTATIC		2102.6			

EQUIPMENT & HOLE DATA

FORMATION TESTED: FT. SCOTT
 NET PAY (ft): 5.0
 GROSS TESTED FOOTAGE: 56.0
 ALL DEPTHS MEASURED FROM: KELLY BUSHING
 CASING PERFS. (ft): _____
 HOLE OR CASING SIZE (in): 7.875
 ELEVATION (ft): 2526
 TOTAL DEPTH (ft): 4347.0
 PACKER DEPTH(S) (ft): 4291
 FINAL SURFACE CHOKE (in): 0.250
 BOTTOM HOLE CHOKE (in): 0.750
 MUD WEIGHT (lb/gal): 9.40
 MUD VISCOSITY (sec): 47
 ESTIMATED HOLE TEMP. (°F): 121
 ACTUAL HOLE TEMP. (°F): 144 @ 4342.0 ft

TICKET NUMBER: 60599700DATE: 1-18-84 TEST NO: 3TYPE DST: OPEN HOLEHALLIBURTON CAMP:
NESS CITYTESTER: J. THOMPSONWITNESS: K. SRIBNERDRILLING CONTRACTOR:
COMPANY TOOLSFLUID PROPERTIES FOR
RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
<u>SYSTEMS</u>	<u>@ °F</u>	<u>9000 ppm</u>
_____	<u>@ °F</u>	<u>ppm</u>
_____	<u>@ °F</u>	<u>ppm</u>
_____	<u>@ °F</u>	<u>ppm</u>
_____	<u>@ °F</u>	<u>ppm</u>
_____	<u>@ °F</u>	<u>ppm</u>

SAMPLER DATA

Pstg 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:

25 FEET OF VERY SLIGHTLY OIL CUT MUD -(2% OIL AND
98% MUD)

MEASURED FROM
TESTER VALVE

REMARKS:

TYPE & SIZE MEASURING DEVICE: _____ TICKET NO: 60599700

TICKET NO: 60599700

[illegible]

		O.D.	I.D.	LENGTH	DEPTH	
1		DRILL PIPE.....	4.500	3.826	4139.0	
50		IMPACT REVERSING SUB.....	5.000	2.750	1.0	4140.0
1		DRILL PIPE.....	4.500	3.826	124.0	
12		DUAL CIP VALVE.....	5.000	0.870	6.0	
60		HYDROSPRING TESTER.....	5.000	0.750	5.0	4274.0
80		AP RUNNING CASE.....	5.000	2.250	4.0	4276.0
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	4291.0
5		CROSSOVER.....	5.000	2.750	1.0	
1		DRILL PIPE.....	4.500	3.826	31.0	
5		CROSSOVER.....	5.000	2.750	1.0	
20		FLUSH JOINT ANCHOR.....	5.000	2.370	16.0	
83		HT-500 TEMPERATURE CASE.....	5.000		1.0	4342.0
81		BLANKED-OFF RUNNING CASE.....	5.000		4.0	4344.0
TOTAL DEPTH						4347.0

EQUIPMENT DATA

TEMPERATURE

RECORDER

CHART



10° each circle

EQUATIONS FOR DST GAS WELL ANALYSIS

Indicated Flow
Capacity

$$kh = \frac{1637 Q_g T}{m}$$

md-ft

Average Effective
Permeability

$$k = \frac{kh}{h}$$

md

Skin Factor

$$S = 1.151 \left[\frac{m(P^*) - m(P_f)}{m} - \text{LOG} \frac{kt}{\phi \mu c_l r_w^2} + 3.23 \right] \text{ ---}$$

Damage Ratio

$$DR = \frac{m(P^*) - m(P_f)}{m(P^*) - m(P_f) - 0.87 mS} \text{ ---}$$

Indicated Flow
Rate (Maximum)

$$AOF_1 = \frac{Q_g m(P^*)}{m(P^*) - m(P_f)}$$

MCFD

Indicated Flow
Rate (Minimum)

$$AOF_2 = Q_g \sqrt{\frac{m(P^*)}{m(P^*) - m(P_f)}}$$

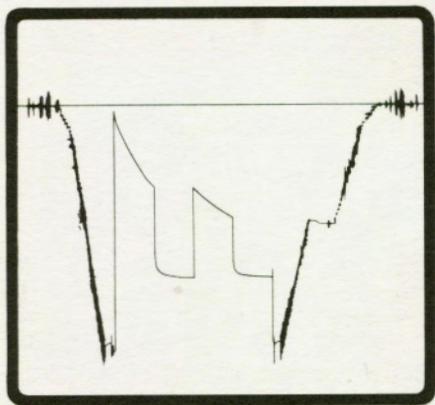
MCFD

Approx. Radius of
Investigation

$$r_i = 0.032 \sqrt{\frac{kt}{\phi \mu c_l}}$$

ft

FORMATION TESTING SERVICE REPORT



Duncan, Oklahoma 73536



A Halliburton Company

DEINES M
LEASE NAME

1
WELL NO.

4
TEST NO.

4413.1 - 4438.1
TESTED INTERVAL

DONALD C. SLAWSON
LEASE OWNER/COMPANY NAME

DEINES M
LEASE NAME

1
WELL NO.

4
TEST NO.

4413.' - 4438.'
TESTED INTERVAL

DONALD C. SLAWSON
LEASE OWNER/COMPANY NAME

LEGAL LOCATION
SEC. - TWP. - RNG.

19 - 15 - 25

FIELD
AREA

WILDCAT

COUNTY

TREGO

STATE

KANSAS NM

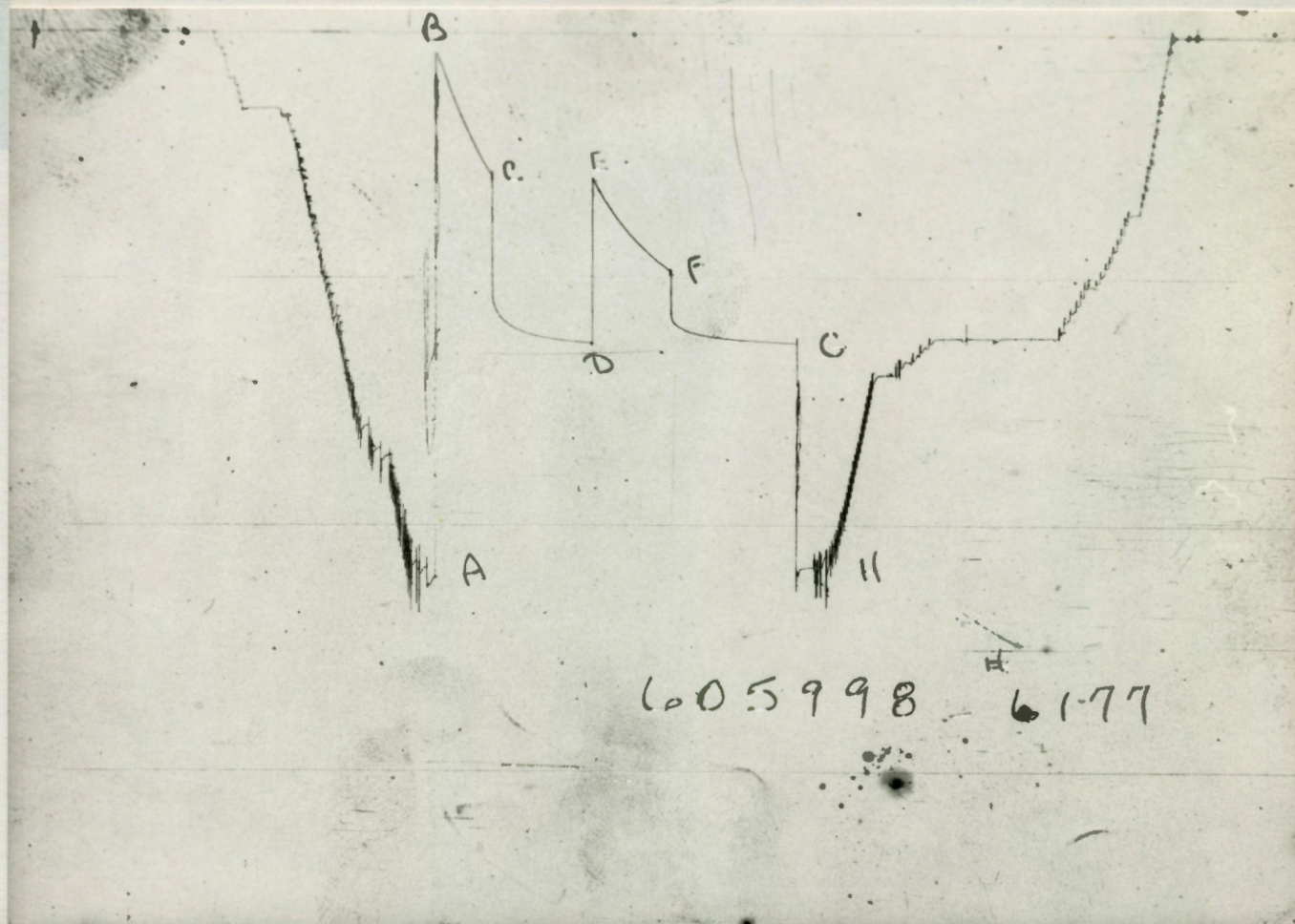


TICKET NO. 60599800

24-JAN-84

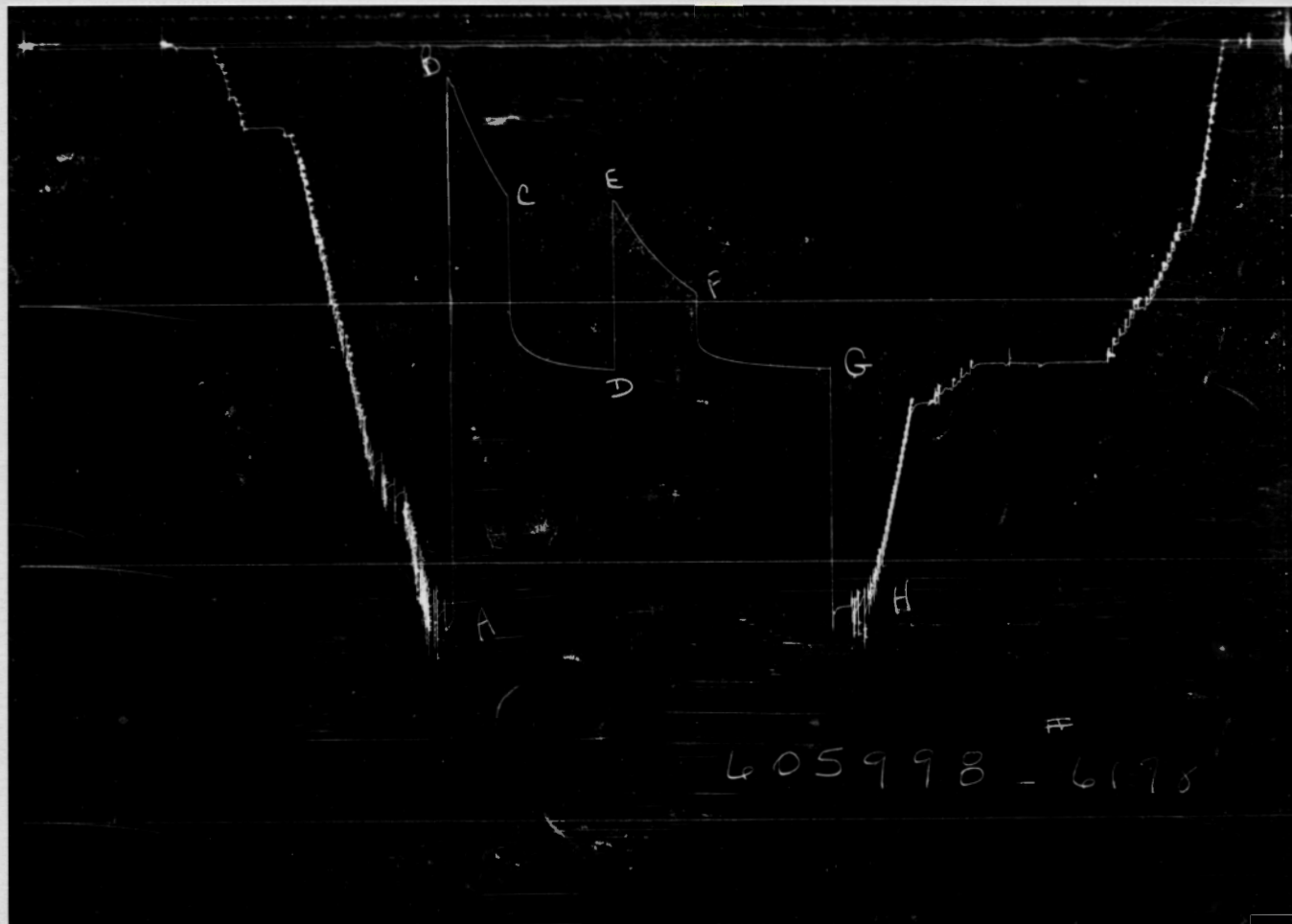
NESS CITY

FORMATION TESTING SERVICE REPORT



GAUGE NO: 6177 DEPTH: 4398.0 BLANKED OFF: NO HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	2157	2198.4			
B	INITIAL FIRST FLOW	84	86.2			
C	FINAL FIRST FLOW	570	576.8	30.0	33.3	F
C	INITIAL FIRST CLOSED-IN	570	576.8			
D	FINAL FIRST CLOSED-IN	1250	1251.8	60.0	59.0	C
E	INITIAL SECOND FLOW	590	592.8			
F	FINAL SECOND FLOW	948	959.9	45.0	46.3	F
F	INITIAL SECOND CLOSED-IN	948	959.9			
G	FINAL SECOND CLOSED-IN	1245	1252.2	75.0	74.7	C
H	FINAL HYDROSTATIC	2157	2161.9			



GAUGE NO: 6178 DEPTH: 4435.0 BLANKED OFF: YES HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC		2213.6			
B	INITIAL FIRST FLOW		135.0			
C	FINAL FIRST FLOW		593.0	30.0	33.3	F
C	INITIAL FIRST CLOSED-IN		593.0			
D	FINAL FIRST CLOSED-IN		1256.1	60.0	59.0	C
E	INITIAL SECOND FLOW		611.8			
F	FINAL SECOND FLOW		963.9	45.0	46.3	F
F	INITIAL SECOND CLOSED-IN		963.9			
G	FINAL SECOND CLOSED-IN		1254.3	75.0	74.7	C
H	FINAL HYDROSTATIC		2168.4			

EQUIPMENT & HOLE DATA

FORMATION TESTED: MISSISSIPPIAN
NET PAY (ft): 15.0
GROSS TESTED FOOTAGE: 25.0
ALL DEPTHS MEASURED FROM: KELLY BUSHING
CASING PERFS. (ft): _____
HOLE OR CASING SIZE (in): 7.875
ELEVATION (ft): 2526
TOTAL DEPTH (ft): 4438.0
PACKER DEPTH(S) (ft): 4413
FINAL SURFACE CHOKE (in): 0.250
BOTTOM HOLE CHOKE (in): 0.750
MUD WEIGHT (lb/gal): 9.50
MUD VISCOSITY (sec): 45
ESTIMATED HOLE TEMP. (°F): 128
ACTUAL HOLE TEMP. (°F): 132 @ 4433.0 ft

TICKET NUMBER: 60599800

DATE: 1-19-84 TEST NO: 4

TYPE DST: OPEN HOLE

HALLIBURTON CAMP: _____
NESS CITY

TESTER: J. THOMPSON

WITNESS: K. SCRIBNER

DRILLING CONTRACTOR: _____
COMPANY TOOLS

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
SYSTEMS	_____ @ _____ °F	<u>9000</u> ppm
RECOVERY	_____ @ _____ °F	<u>12000</u> ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm

SAMPLER DATA

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

HYDROCARBON PROPERTIES

OIL GRAVITY (°API): 40.6 @ 60°F
GAS/OIL RATIO (cu.ft. per bbl): _____
GAS GRAVITY: _____

CUSHION DATA

TYPE	AMOUNT	WEIGHT
_____	_____	_____
_____	_____	_____

RECOVERED:

2670 FEET TOTAL FLUID CONSISTING OF 2546 FEET CLEAN GASSY OIL, 84 FEET MUD CUT GASSY OIL (40% GAS, 40% OIL, 15% MUD AND 5% WATER), 40 FEET OIL AND GAS CUT WATERY MUD, (10% OIL, 25% GAS, 25% MUD AND 40% WATER 62 FEET OF GAS IN THE PIPE.

MEASURED FROM
TESTER VALVE

REMARKS:

TICKET NO: 60599800[illegible]

TICKET NO: 60599800

CLOCK NO: 14248 HOUR: 12


HALLIBURTON
SERVICES

GAUGE NO: 6177

DEPTH: 4398.0

REF	MINUTES	PRESSURE	AP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B 1	0.0	86.2			
2	5.0	163.4	77.2		
3	10.0	258.0	94.6		
4	15.0	342.8	84.8		
5	20.0	418.5	75.6		
6	25.0	487.9	69.4		
7	30.0	547.6	59.7		
C 8	33.3	576.8	29.2		
FIRST CLOSED-IN					
C 1	0.0	576.8			
2	1.0	1091.9	515.1	1.0	1.543
3	2.0	1113.1	536.3	1.9	1.239
4	3.0	1126.5	549.7	2.8	1.082
5	4.0	1137.9	561.2	3.5	0.972
6	5.0	1147.1	570.3	4.3	0.887
7	6.0	1155.4	578.6	5.1	0.815
8	7.0	1161.6	584.9	5.8	0.759
9	8.0	1168.5	591.7	6.4	0.713
10	9.0	1173.5	596.7	7.1	0.672
11	10.0	1178.5	601.7	7.7	0.636
12	12.0	1187.2	610.4	8.8	0.577
13	14.0	1194.5	617.7	9.8	0.529
14	16.0	1200.7	624.0	10.8	0.489
15	18.0	1206.8	630.0	11.7	0.455
16	20.0	1211.4	634.7	12.5	0.425
17	22.0	1215.5	638.7	13.3	0.400
18	24.0	1219.6	642.9	13.9	0.378
19	26.0	1223.3	646.5	14.6	0.357
20	28.0	1226.2	649.4	15.2	0.340
21	30.0	1228.9	652.1	15.8	0.324
22	35.0	1234.6	657.8	17.1	0.290
23	40.0	1239.5	662.7	18.2	0.263
24	45.0	1243.5	666.7	19.1	0.240
25	50.0	1246.6	669.8	20.0	0.221
26	55.0	1249.1	672.3	20.7	0.205
D 27	59.0	1251.8	675.0	21.3	0.194
SECOND FLOW					
E 1	0.0	592.8			
2	5.0	653.9	61.0		
3	10.0	707.6	53.8		
4	15.0	755.6	48.0		
5	20.0	797.7	42.1		
6	25.0	836.5	38.8		
7	30.0	869.4	32.9		
8	35.0	902.0	32.6		
9	40.0	930.5	28.5		

REF	MINUTES	PRESSURE	AP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND FLOW - CONTINUED					
10	45.0	955.6	25.1		
F 11	46.3	959.9	4.3		
SECOND CLOSED-IN					
F 1	0.0	959.9			
2	1.0	1158.4	198.5	1.0	1.905
3	2.0	1170.2	210.3	1.9	1.616
4	3.0	1176.8	216.9	2.9	1.443
5	4.0	1182.8	223.0	3.8	1.319
6	5.0	1186.7	226.8	4.7	1.227
7	6.0	1190.3	230.4	5.6	1.153
8	7.0	1193.5	233.6	6.5	1.090
9	8.0	1197.7	237.8	7.3	1.039
10	9.0	1201.4	241.5	8.1	0.991
11	10.0	1203.6	243.7	8.9	0.951
12	12.0	1208.0	248.1	10.4	0.883
13	14.0	1211.4	251.5	11.9	0.825
14	16.0	1214.9	255.0	13.3	0.775
15	18.0	1217.7	257.8	14.7	0.733
16	20.0	1220.5	260.6	16.0	0.698
17	22.0	1223.0	263.1	17.2	0.664
18	24.0	1224.7	264.8	18.5	0.634
19	26.0	1227.9	268.0	19.6	0.609
20	28.0	1228.9	269.0	20.7	0.585
21	30.0	1231.0	271.1	21.8	0.563
22	35.0	1234.5	274.6	24.3	0.515
23	40.0	1237.8	277.9	26.6	0.475
24	45.0	1239.8	279.9	28.7	0.442
25	50.0	1242.4	282.5	30.7	0.413
26	55.0	1244.8	284.9	32.5	0.388
27	60.0	1246.3	286.4	34.2	0.367
28	70.0	1249.8	289.9	37.2	0.330
G 29	74.7	1252.2	292.3	38.5	0.315

REMARKS:

TICKET NO: 60599800

CLOCK NO: 16165 HOUR: 12


HALLIBURTON
SERVICES

GAUGE NO: 6178

DEPTH: 4435.0

REF	MINUTES	PRESSURE	AP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B 1	0.0	135.0			
2	5.0	206.9	71.9		
3	10.0	293.9	87.0		
4	15.0	368.6	74.8		
5	20.0	439.7	71.1		
6	25.0	501.3	61.6		
7	30.0	580.0	58.7		
C 8	33.3	593.0	33.0		
FIRST CLOSED-IN					
C 1	0.0	593.0			
2	1.0	1068.7	475.7	1.0	1.517
3	2.0	1101.2	508.3	1.9	1.253
4	3.0	1119.5	526.5	2.8	1.081
5	4.0	1133.2	540.3	3.5	0.972
6	5.0	1143.9	551.0	4.3	0.886
7	6.0	1152.1	559.2	5.1	0.816
8	7.0	1161.3	568.4	5.8	0.758
9	8.0	1167.3	574.3	6.5	0.711
10	9.0	1173.5	580.6	7.1	0.671
11	10.0	1178.2	585.2	7.7	0.636
12	12.0	1188.5	595.5	8.8	0.576
13	14.0	1196.8	603.8	9.9	0.528
14	16.0	1202.9	610.0	10.8	0.489
15	18.0	1209.4	616.4	11.7	0.454
16	20.0	1214.1	621.2	12.5	0.425
17	22.0	1218.9	625.9	13.3	0.399
18	24.0	1223.1	630.2	14.0	0.377
19	26.0	1226.8	633.8	14.6	0.358
20	28.0	1229.8	636.8	15.2	0.340
21	30.0	1232.7	639.8	15.8	0.324
22	35.0	1239.2	646.2	17.1	0.290
23	40.0	1243.8	650.9	18.2	0.263
24	45.0	1247.5	654.5	19.1	0.240
25	50.0	1250.6	657.6	20.0	0.222
26	55.0	1253.4	660.5	20.7	0.205
D 27	59.0	1256.1	663.1	21.3	0.194
SECOND FLOW					
E 1	0.0	611.8			
2	5.0	654.3	42.6		
3	10.0	709.8	55.4		
4	15.0	757.8	48.1		
5	20.0	800.4	42.6		
6	25.0	837.2	36.8		
7	30.0	872.1	34.9		
8	35.0	902.4	30.3		
9	40.0	930.5	28.1		

REF	MINUTES	PRESSURE	AP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND FLOW - CONTINUED					
10	45.0	956.5	26.1		
F 11	46.3	963.9	7.3		
SECOND CLOSED-IN					
F 1	0.0	963.9			
2	1.0	1157.4	193.5	1.0	1.906
3	2.0	1169.0	205.1	1.9	1.610
4	3.0	1176.7	212.8	2.9	1.442
5	4.0	1182.6	218.7	3.8	1.320
6	5.0	1187.5	223.6	4.7	1.231
7	6.0	1191.8	227.9	5.6	1.156
8	7.0	1195.6	231.7	6.4	1.091
9	8.0	1199.1	235.2	7.3	1.038
10	9.0	1201.9	238.0	8.1	0.993
11	10.0	1204.6	240.8	8.9	0.951
12	12.0	1209.3	245.4	10.4	0.883
13	14.0	1213.5	249.7	11.9	0.824
14	16.0	1217.8	253.9	13.3	0.776
15	18.0	1220.7	256.8	14.7	0.734
16	20.0	1223.9	260.1	16.0	0.697
17	22.0	1226.5	262.6	17.2	0.664
18	24.0	1228.5	264.6	18.4	0.635
19	26.0	1231.0	267.1	19.6	0.608
20	28.0	1232.4	268.5	20.7	0.585
21	30.0	1234.3	270.5	21.8	0.562
22	35.0	1237.8	273.9	24.3	0.515
23	40.0	1240.7	276.8	26.6	0.476
24	45.0	1243.7	279.9	28.7	0.442
25	50.0	1246.3	282.4	30.7	0.414
26	55.0	1248.5	284.6	32.5	0.389
27	60.0	1249.9	286.0	34.2	0.366
28	70.0	1253.4	289.6	37.2	0.329
G 29	74.7	1254.3	290.5	38.5	0.315

REMARKS:

		O.D.	I.D.	LENGTH	DEPTH	
1		DRILL PIPE.....	4.500	3.826	4261.0	
50		IMPACT REVERSING SUB.....	5.000	2.750	1.0	4262.0
1		DRILL PIPE.....	4.500	3.826	124.0	
12		DUAL CIP VALVE.....	5.000	0.870	6.0	
60		HYDROSPRING TESTER.....	5.000	0.750	5.0	4395.0
80		AP RUNNING CASE.....	5.000	2.250	4.0	4398.0
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	4413.0
20		FLUSH JOINT ANCHOR.....	5.000	2.370	18.0	
83		HT-500 TEMPERATURE CASE.....	5.000		1.0	4433.0
81		BLANKED-OFF RUNNING CASE.....	5.000		4.0	4435.0
TOTAL DEPTH						4438.0

EQUIPMENT DATA

TEMPERATURE

RECORDER

CHART

TK# 605498

132°

10° each circle

Indicated Flow
Capacity

$$kh = \frac{1637 Q_g T}{m}$$

md-ft

Average Effective
Permeability

$$k = \frac{kh}{h}$$

md

Skin Factor

$$S = 1.151 \left[\frac{m(P^*) - m(P_f)}{m} - \text{LOG} \frac{kt}{\phi \mu c_1 r_w^2} + 3.23 \right] \text{ ---}$$

Damage Ratio

$$DR = \frac{m(P^*) - m(P_f)}{m(P^*) - m(P_f) - 0.87 mS} \text{ ---}$$

Indicated Flow
Rate (Maximum)

$$AOF_1 = \frac{Q_g m(P^*)}{m(P^*) - m(P_f)}$$

MCFD

Indicated Flow
Rate (Minimum)

$$AOF_2 = Q_g \sqrt{\frac{m(P^*)}{m(P^*) - m(P_f)}}$$

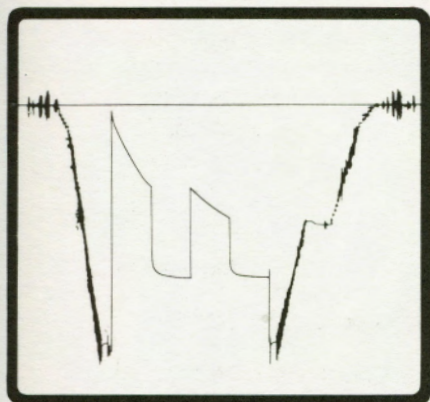
MCFD

Approx. Radius of
Investigation

$$r_i = 0.032 \sqrt{\frac{kt}{\phi \mu c_1}}$$

ft

FORMATION TESTING SERVICE REPORT



Duncan, Oklahoma 73536



A Halliburton Company

DEINES
LEASE NAME

M-1
WELL NO.

5
TEST NO.

4438.1 - 4448.1
TESTED INTERVAL

DONALD C. SLAWSON
LEASE OWNER/COMPANY NAME



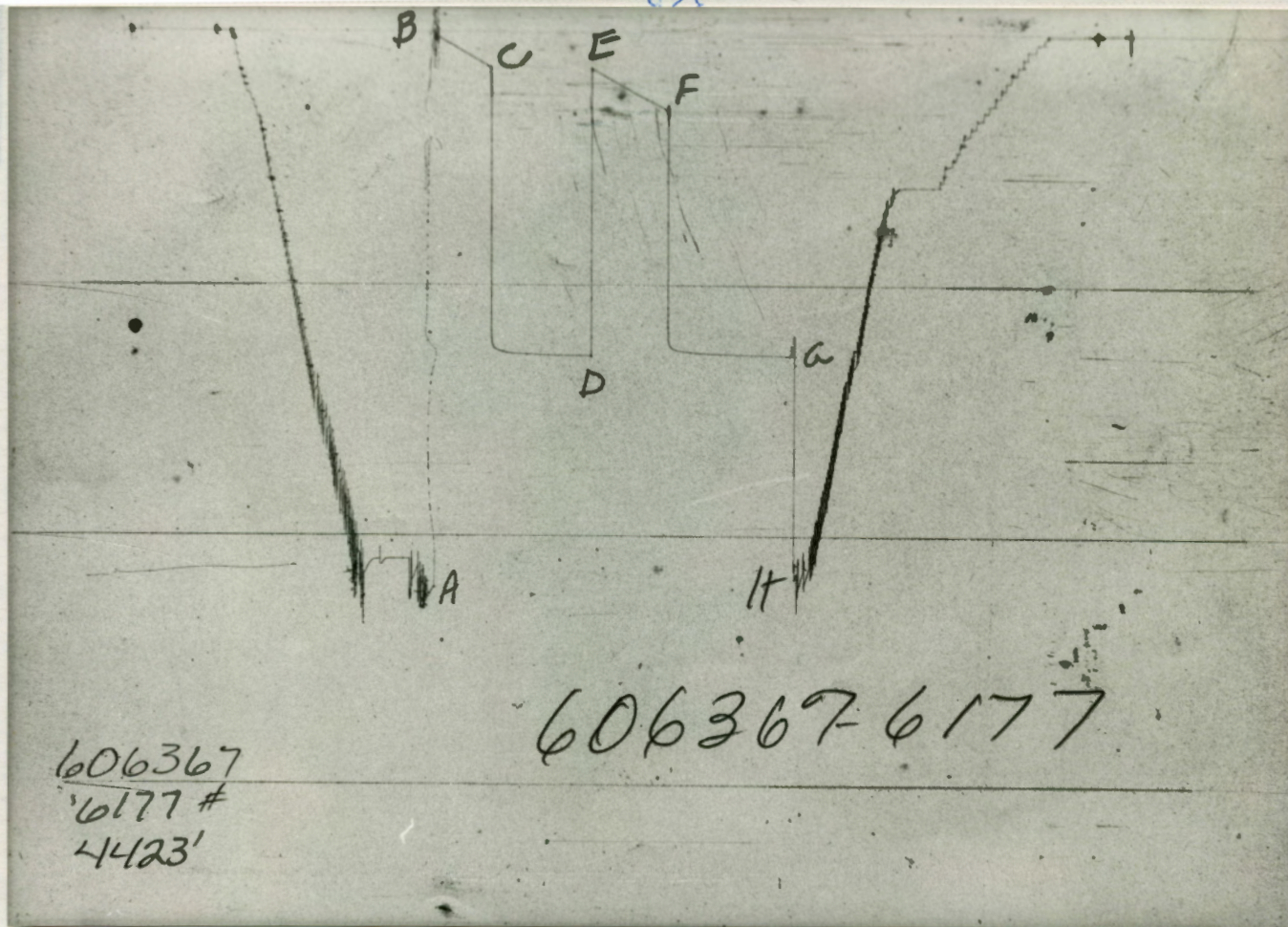
TICKET NO. 60636700

27-JAN-84

HAYS

FORMATION TESTING SERVICE REPORT

DEINES	M-1	5	4438.1' - 4448.1'	DONALD C. SLAWSON
LEASE NAME	WELL NO.	TEST NO.	TESTED INTERVAL	LEASE OWNER/COMPANY NAME
LEGAL LOCATION SEC. - TWP. - RNG.	19-15-25	FIELD AREA	COUNTY	STATE
			TREGO	KANSAS
				SM



GAUGE NO: 6177 DEPTH: 4423.0 BLANKED OFF: NO HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC		2193.8			
B	INITIAL FIRST FLOW		19.5			
C	FINAL FIRST FLOW		142.8	30.0	33.1	F
C	INITIAL FIRST CLOSED-IN		142.8			
D	FINAL FIRST CLOSED-IN		1289.3	60.0	60.3	C
E	INITIAL SECOND FLOW		150.1			
F	FINAL SECOND FLOW		313.3	45.0	45.2	F
F	INITIAL SECOND CLOSED-IN		313.3			
G	FINAL SECOND CLOSED-IN		1287.2	75.0	74.5	C
H	FINAL HYDROSTATIC		2158.6			



GAUGE NO: 6178 DEPTH: 4445.0 BLANKED OFF: YES HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	2283	2195.4			
B	INITIAL FIRST FLOW	21	38.9	30.0	33.1	F
C	FINAL FIRST FLOW	148	154.1			
C	INITIAL FIRST CLOSED-IN	148	154.1	60.0	60.3	C
D	FINAL FIRST CLOSED-IN	1339	1295.4			
E	INITIAL SECOND FLOW	148	175.5	45.0	45.2	F
F	FINAL SECOND FLOW	317	324.1			
F	INITIAL SECOND CLOSED-IN	317	324.1	75.0	74.5	C
G	FINAL SECOND CLOSED-IN	1318	1294.2			
H	FINAL HYDROSTATIC	2241	2168.2			

EQUIPMENT & HOLE DATA

FORMATION TESTED: MISSISSIPPI
NET PAY (ft): 7.0
GROSS TESTED FOOTAGE: 10.0
ALL DEPTHS MEASURED FROM: KELLY BUSHING
CASING PERFS. (ft): _____
HOLE OR CASING SIZE (in): 7.875
ELEVATION (ft): 2526
TOTAL DEPTH (ft): 4448.0
PACKER DEPTH(S) (ft): 4438
FINAL SURFACE CHOKE (in): 0.250
BOTTOM HOLE CHOKE (in): 0.750
MUD WEIGHT (lb/gal): 9.50
MUD VISCOSITY (sec): 45
ESTIMATED HOLE TEMP. (°F): _____
ACTUAL HOLE TEMP. (°F): 160 @ 4443.0 ft

TICKET NUMBER: 60636700

DATE: 1-20-84 TEST NO: 5

TYPE DST: OPEN HOLE

HALLIBURTON CAMP: _____
HAYS _____

TESTER: D. MORGAN

WITNESS: KENT SCRIBNER

DRILLING CONTRACTOR: _____
SLAWSON #4

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
_____	_____ °F	_____ ppm
_____	_____ °F	_____ ppm
_____	_____ °F	_____ ppm
_____	_____ °F	_____ ppm
_____	_____ °F	_____ ppm
_____	_____ °F	_____ ppm

SAMPLER DATA

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

HYDROCARBON PROPERTIES

OIL GRAVITY (°API): 41.0 @ 60°F
GAS/OIL RATIO (cu.ft. per bbl): _____
GAS GRAVITY: _____

CUSHION DATA

TYPE	AMOUNT	WEIGHT
_____	_____	_____
_____	_____	_____

RECOVERED:

217 FEET OF GAS IN PIPE
790 FEET OF SLIGHT GAS CUT OIL (CLEAN)
47 FEET OF SLIGHT OIL CUT WATERY MUD
7% OIL, 88% MUD AND 5% WATER

MEASURED FROM
TESTER VALVE

REMARKS:

TICKET NO: 60636700

[illegible]

TICKET NO: 60636700

CLOCK NO: 14248 HOUR: 12


HALLIBURTON
SERVICES

GAUGE NO: 6177

DEPTH: 4423.0

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	19.5			
2	5.0	33.8	14.2		
3	10.0	52.6	18.9		
4	15.0	71.9	19.3		
5	20.0	90.8	18.9		
6	25.0	111.4	20.6		
7	30.0	131.4	20.0		
C 8	33.1	142.8	11.4		
FIRST CLOSED-IN					
C 1	0.0	142.8			
2	1.0	1235.9	1093.0	1.0	1.524
3	2.0	1254.6	1111.7	1.9	1.252
4	3.0	1261.3	1118.5	2.7	1.086
5	4.0	1265.6	1122.8	3.6	0.965
6	5.0	1268.3	1125.5	4.3	0.882
7	6.0	1270.2	1127.3	5.1	0.812
8	7.0	1272.2	1129.4	5.8	0.758
9	8.0	1274.3	1131.5	6.4	0.711
10	9.0	1276.4	1133.6	7.1	0.669
11	10.0	1277.5	1134.7	7.7	0.635
12	12.0	1279.1	1136.3	8.8	0.575
13	14.0	1280.2	1137.4	9.8	0.527
14	16.0	1281.2	1138.4	10.8	0.486
15	18.0	1282.2	1139.4	11.7	0.453
16	20.0	1283.2	1140.3	12.5	0.424
17	22.0	1283.4	1140.5	13.2	0.398
18	24.0	1283.9	1141.1	13.9	0.376
19	26.0	1284.4	1141.6	14.6	0.356
20	28.0	1285.1	1142.3	15.2	0.338
21	30.0	1285.4	1142.6	15.7	0.323
22	35.0	1286.0	1143.1	17.0	0.289
23	40.0	1287.3	1144.5	18.1	0.262
24	45.0	1287.8	1145.0	19.1	0.239
25	50.0	1288.1	1145.3	19.9	0.220
26	55.0	1288.9	1146.1	20.7	0.204
D 27	60.3	1289.3	1146.5	21.4	0.190
SECOND FLOW					
E 1	0.0	150.1			
2	5.0	165.1	15.0		
3	10.0	184.5	19.4		
4	15.0	204.0	19.5		
5	20.0	223.7	19.7		
6	25.0	243.1	19.4		
7	30.0	260.5	17.4		
8	35.0	277.5	17.0		
9	40.0	294.3	16.8		

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND FLOW - CONTINUED					
F 10	45.2	313.3	19.0		
SECOND CLOSED-IN					
F 1	0.0	313.3			
2	1.0	1240.7	927.5	1.0	1.900
3	2.0	1253.0	939.7	2.0	1.595
4	3.0	1258.3	945.0	2.9	1.432
5	4.0	1261.9	948.6	3.8	1.316
6	5.0	1264.7	951.4	4.7	1.220
7	6.0	1266.1	952.8	5.5	1.150
8	7.0	1267.8	954.5	6.4	1.086
9	8.0	1269.3	956.0	7.3	1.032
10	9.0	1270.3	957.0	8.1	0.986
11	10.0	1271.3	958.0	8.9	0.945
12	12.0	1272.8	959.5	10.4	0.876
13	14.0	1274.0	960.7	11.9	0.818
14	16.0	1275.4	962.1	13.3	0.771
15	18.0	1276.4	963.1	14.6	0.728
16	20.0	1277.5	964.3	15.9	0.691
17	22.0	1278.2	964.9	17.2	0.659
18	24.0	1278.9	965.6	18.4	0.629
19	26.0	1279.1	965.8	19.5	0.603
20	28.0	1280.0	966.8	20.6	0.579
21	30.0	1280.6	967.3	21.7	0.558
22	35.0	1281.2	967.9	24.2	0.510
23	40.0	1282.3	969.0	26.5	0.471
24	45.0	1283.1	969.8	28.6	0.438
25	50.0	1283.8	970.5	30.5	0.409
26	55.0	1284.3	971.0	32.3	0.384
27	60.0	1284.4	971.1	34.0	0.363
28	70.0	1286.1	972.8	37.0	0.326
G 29	74.5	1287.2	973.9	38.2	0.312

REMARKS:

TICKET NO: 60636700

CLOCK NO: 16165 HOUR: 12



GAUGE NO: 6178

DEPTH: 4445.0

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	38.9			
2	5.0	46.4	7.5		
3	10.0	64.8	18.4		
4	15.0	84.7	19.9		
5	20.0	104.8	20.2		
6	25.0	123.6	18.7		
7	30.0	142.1	18.5		
C 8	33.1	154.1	12.0		
FIRST CLOSED-IN					
C 1	0.0	154.1			
2	1.0	1141.0	986.9	1.0	1.516
3	2.0	1248.9	1094.8	1.9	1.237
4	3.0	1261.6	1107.5	2.8	1.079
5	4.0	1267.1	1112.9	3.5	0.970
6	5.0	1271.1	1117.0	4.4	0.878
7	6.0	1273.2	1119.1	5.1	0.813
8	7.0	1276.0	1121.8	5.8	0.755
9	8.0	1277.9	1123.7	6.4	0.711
10	9.0	1279.8	1125.7	7.1	0.671
11	10.0	1281.7	1127.6	7.6	0.636
12	12.0	1283.8	1129.7	8.8	0.574
13	14.0	1285.9	1131.7	9.8	0.526
14	16.0	1286.9	1132.7	10.8	0.487
15	18.0	1288.1	1133.9	11.7	0.453
16	20.0	1288.9	1134.8	12.5	0.423
17	22.0	1289.9	1135.8	13.2	0.398
18	24.0	1290.3	1136.2	13.9	0.376
19	26.0	1291.1	1137.0	14.6	0.356
20	28.0	1291.5	1137.4	15.2	0.339
21	30.0	1291.8	1137.7	15.7	0.322
22	35.0	1292.5	1138.4	17.0	0.289
23	40.0	1293.3	1139.2	18.1	0.262
24	45.0	1294.3	1140.2	19.1	0.239
25	50.0	1294.5	1140.4	19.9	0.221
26	55.0	1295.2	1141.0	20.7	0.205
D 27	60.3	1295.4	1141.2	21.4	0.190
SECOND FLOW					
E 1	0.0	175.5			
2	5.0	176.0	0.5		
3	10.0	195.9	19.9		
4	15.0	214.3	18.4		
5	20.0	232.8	18.4		
6	25.0	251.1	18.3		
7	30.0	268.0	16.9		
8	35.0	286.8	18.7		
9	40.0	304.8	18.0		

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND FLOW - CONTINUED					
F 10	45.2	324.1	19.3		
SECOND CLOSED-IN					
F 1	0.0	324.1			
2	1.0	1199.4	875.3	1.0	1.908
3	2.0	1247.5	923.4	2.0	1.600
4	3.0	1256.6	932.5	2.9	1.431
5	4.0	1261.9	937.8	3.8	1.313
6	5.0	1265.6	941.5	4.7	1.224
7	6.0	1268.2	944.1	5.6	1.146
8	7.0	1270.2	946.1	6.5	1.083
9	8.0	1272.0	947.9	7.3	1.032
10	9.0	1272.7	948.6	8.0	0.989
11	10.0	1274.2	950.1	8.8	0.947
12	12.0	1276.4	952.3	10.4	0.878
13	14.0	1278.7	954.6	11.8	0.820
14	16.0	1280.2	956.1	13.3	0.770
15	18.0	1281.0	956.9	14.6	0.729
16	20.0	1282.1	958.0	16.0	0.691
17	22.0	1282.8	958.7	17.2	0.658
18	24.0	1284.3	960.3	18.4	0.629
19	26.0	1284.4	960.4	19.5	0.603
20	28.0	1285.4	961.3	20.6	0.579
21	30.0	1285.8	961.7	21.7	0.558
22	35.0	1286.8	962.7	24.2	0.510
23	40.0	1288.2	964.1	26.5	0.471
24	45.0	1288.9	964.8	28.6	0.438
25	50.0	1290.1	966.0	30.5	0.409
26	55.0	1290.5	966.4	32.3	0.384
27	60.0	1290.5	966.4	34.0	0.363
28	70.0	1291.9	967.8	37.0	0.326
G 29	74.5	1294.2	970.1	38.2	0.312

REMARKS:

		O.D.	I.D.	LENGTH	DEPTH	
1		DRILL PIPE.....	4.500	3.826	4286.0	
50		IMPACT REVERSING SUB.....	5.750	2.750	1.0	4286.0
1		DRILL PIPE.....	4.500	3.826	124.0	
12		DUAL CIP VALVE.....	5.000	0.870	6.0	
60		HYDROSPRING TESTER.....	5.000	0.750	5.0	4421.0
80		AP RUNNING CASE.....	5.000	3.060	4.0	4423.0
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	4438.0
20		FLUSH JOINT ANCHOR.....	5.000	3.840	3.0	
83		HT-500 TEMPERATURE CASE.....	5.000	3.750	1.5	4443.0
81		BLANKED-OFF RUNNING CASE.....	5.000		4.0	4445.0
TOTAL DEPTH						4448.0

EQUIPMENT DATA

TEMPERATURE RECORDER CHART



10° each circle

Indicated Flow
Capacity

$$kh = \frac{1637 Q_g T}{m}$$

md-ft

Average Effective
Permeability

$$k = \frac{kh}{h}$$

md

Skin Factor

$$S = 1.151 \left[\frac{m(P^*) - m(P_f)}{1\pi} - \text{LOG} \frac{kt}{\phi \mu c_f r_w^2} + 3.23 \right] \text{ ---}$$

Damage Ratio

$$DR = \frac{m(P^*) - m(P_f)}{m(P^*) - m(P_f) - 0.87 mS} \text{ ---}$$

Indicated Flow
Rate (Maximum)

$$AOF_1 = \frac{Q_g m(P^*)}{\pi h (P^*) - \pi h (P_f)}$$

MCFD

Indicated Flow
Rate (Minimum)

$$AOF_2 = Q_g \sqrt{\frac{m(P^*)}{\pi h (P^*) - \pi h (P_f)}}$$

MCFD

Approx. Radius of
Investigation

$$r_i = 0.032 \sqrt{\frac{kt}{\phi \mu c_f}}$$

ft