FLUID SAMPLE DATA

Sampler Pressure _____ P.S.I.G. at Surface
Recovery: Cu. Ft. Gas _____
cc. Oil _____
cc. Water _____
cc. Mud _____
Tot. Liquid cc. _____
Gravity _____ ° API @ _____ °F.
Gas/Oil Ratio _____ cu. ft./bbl.

		RESISTIVITY		CHLORIDE CONTENT
Recovery Water	@	°F.		ppm
Recovery Mud	@	°F.		ppm
Recovery Mud Filtrate	@	°F.		ppm
Mud Pit Sample	@	°F.		ppm
Mud Pit Sample Filtrate	@	°F.		ppm

Mud Weight 9.6 vis 42 sec

Date 7-16-77 Ticket Number 182878
Kind of Job OPEN HOLE Halliburton District HAYS
Tester MR. WEATHERBEE Witness MR. HAMMOND
Drilling Contractor RED TIGER DRILLING COMPANY #5 BC S

EQUIPMENT & HOLE DATA

Formation Tested Lower Kansas City
Elevation 1943' KB Ft.
Net Productive Interval 8' Net Ft.
All Depths Measured From Kelly Bushing
Total Depth 3298' Ft.
Main Hole/Casing Size 7 7/8"
Drill Collar Length 780' WP I.D. 2.764"
Drill Pipe Length 2421' I.D. 3.826"
Packer Depth(s) 3220' - 3224' Ft.
Depth Tester Valve 3214' Ft.

Cushion TYPE _____ AMOUNT _____ Ft. Depth Back Pres. Valve _____ Surface Choke 1/4" Bottom Choke 3/4"

Recovered 190 Feet of Gas in pipe
Recovered 280 Feet of Gassy mud with a trace of oil throughout
Recovered 90 Feet of Oily gassy salt water
Recovered _____ Feet of
Recovered _____ Feet of

Remarks SEE PRODUCTION TEST DATA SHEET.

TEMPERATURE	Gauge No. 684 Depth: 3226' Ft.	Gauge No. 528 Depth: 3294' Ft.	Gauge No. Depth: Ft.	TIME
	12 Hour Clock	12 Hour Clock	Hour Clock	Tool Opened 2125 A.M. P.M.
Est. °F.	Blanked Off No	Blanked Off Yes	Blanked Off	Opened A.M.
3293 Actual 80 °F.	Pressures	Pressures	Pressures	Bypass 0111 P.M.

	Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic		1705	1759	1748				
First Period Flow Initial		25	69	72			———	———
First Period Flow Final		77	107	116			30	30
First Period Closed in		501	534	540			45	46
Second Period Flow Initial		83	120	127			———	———
Second Period Flow Final		142	181	182			61	62
Second Period Closed in		506	543	546			92	90
Third Period Flow Initial							———	———
Third Period Flow Final								
Third Period Closed in								
Final Hydrostatic		1701	1750	1739			———	———

Legal Location Sec. - Twp. - Rng. SE SW SE 2 - 16 - 17
Lease Name SULUMUN ESTATE
Well No. 1-2
Test No. 1
Tested Interval 3224' - 3298'
Field Area
County RUSH
State KANSAS
Lease Owner/Company Name GRAHAM MICHAELIS
Meo. From Tester Valve

FORM 181-R2—PRINTED IN U.S.A.

FORMATION TEST DATA

LITTLE'S 102548 5M 9/76

5

Casing perfs._____ Bottom choke_____ Surf. temp 99 °F Ticket No. 182878

Gas gravity_____ Oil gravity_____ GOR_____

Spec. gravity_____ Chlorides_____ ppm Res._____ @_____ °F

INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED_____

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
1530					Truck called out
1800					Truck on location
1930					Picked up tool
2000					Tool in table
2122					Tool on bottom
2125					Tool opened with a weak to strong blow
					in 5 minutes
2155					Closed tool
2240					Opened tool with a strong blow throughout
2341					Closed tool
0111					Off bottom

FORM 182-R1—PRINTED IN U.S.A.

PRODUCTION TEST DATA

LITTLE'S 96672 5M 8/74

5

Gauge No.	684	Depth	3226'	Clock No.	13855	12 hour	Ticket No.	182878

	First Flow Period		First Closed In Pressure			Second Flow Period		Second Closed In Pressure			Third Flow Period		Third Closed In Pressure		
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.
0	.0000	25	.0000		77	.0000	83	.0000		142					
1	.0337	41	.0400		219*	.0795	97**	.0400		264					
2	.0673	50	.0667		299	.1458	106	.0800		346					
3	.1010	58	.0934		352	.2121	117	.1200		405					
4	.1347	65	.1201		399	.2784	125	.1600		443					
5	.1683	71	.1468		432	.3447	134	.2000		465					
6	.2020	77	.1735		458	.4110	142	.2400		477					
7			.2002		474			.2800		485					
8			.2269		485			.3200		489					
9			.2536		492			.3600		494					
10			.2803		496			.4000		497					
11			.3070		501			.4400		499					
12								.4800		502					
13								.5200		504					
14								.5600		505					
15								.6000		506					

Gauge No.		528	Depth	3294'	Clock No.	4773	12 hour

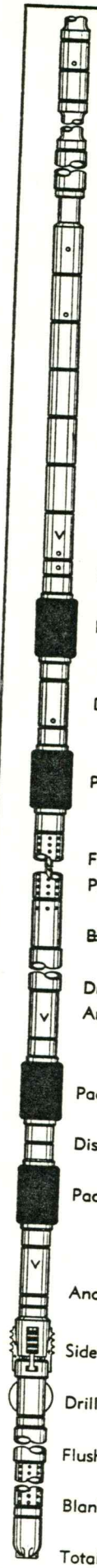
0	.0000	72	.0000		116	.0000	127	.0000		182					
1	.0332	82	.0397		250*	.0786	136**	.0395		297					
2	.0663	90	.0661		334	.1441	147	.0791		378					
3	.0995	97	.0925		386	.2095	155	.1186		438					
4	.1327	103	.1190		431	.2750	164	.1581		477					
5	.1658	110	.1454		468	.3405	172	.1977		500					
6	.1990	116	.1718		495	.4060	182	.2372		514					
7			.1983		513			.2767		522					
8			.2247		524			.3163		528					
9			.2511		532			.3558		533					
10			.2776		537			.3953		536					
11			.3040		540			.4349		538					
12								.4744		540					
13								.5139		543					
14								.5535		545					
15								.5930		546					
Reading Interval		5		4			10		6						Minutes

REMARKS: *Interval= 6 minutes **Interval = 12 minutes

SPECIAL PRESSURE DATA

LITTLE'S 96673 75C 8/74

TICKET NO. 182878

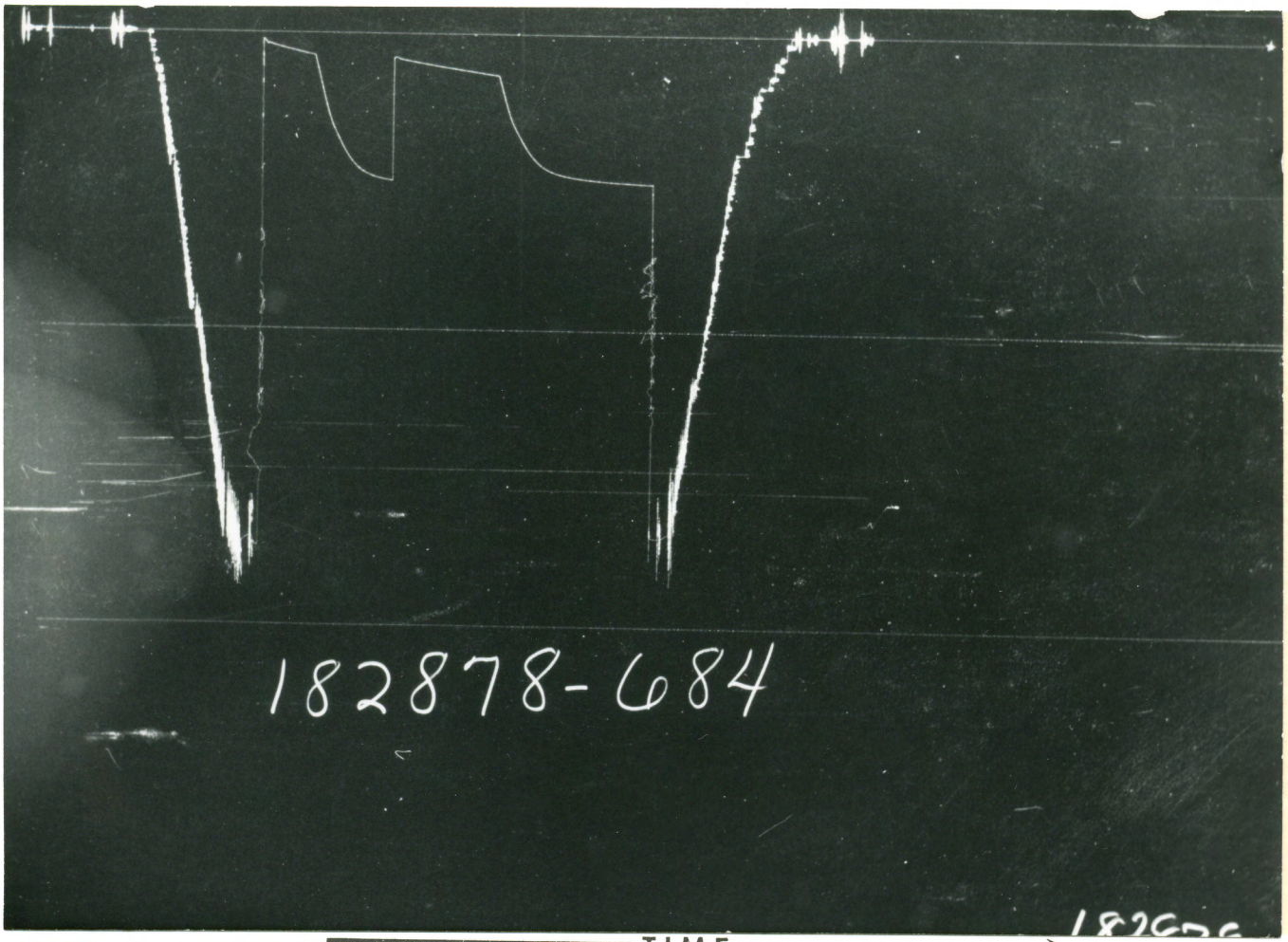


	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing				
Reversing Sub	6"	3"	12"	3076'
Water Cushion Valve	4½" WP	2.764"	780'	
Drill Pipe	4½"	3.826"	2421'	
Drill Collars				
Handling Sub & Choke Assembly				
Dual CIP Valve	5"	.87"	65"	3209'
Dual CIP Sampler				
Hydro-Spring Tester	5"	.75"	60"	3214'
Multiple CIP Sampler				
Extension Joint				
AP Running Case				
Hydraulic Jar				
VR Safety Joint	5"	1"	33"+	
Pressure Equalizing Crossover				
Packer Assembly	6.75"	1.53"	54"	3220'
Distributor				
Packer Assembly	6.75"	1.53"	54"	3224'
Flush Joint Anchor				
Pressure Equalizing Tube				
~~Blanked-Off~~ B.T. Running Case	5"	3.06"	48"+	3226'
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars	4½" WP	2.764"	61.20'	
Flush Joint Anchor	5"	3.84"	4.74'	
Blanked-Off B.T. Running Case	5"	2.44"	48.06"	3294'
Total Depth				3298'

FORM 187-R1—PRINTED IN U.S.A.

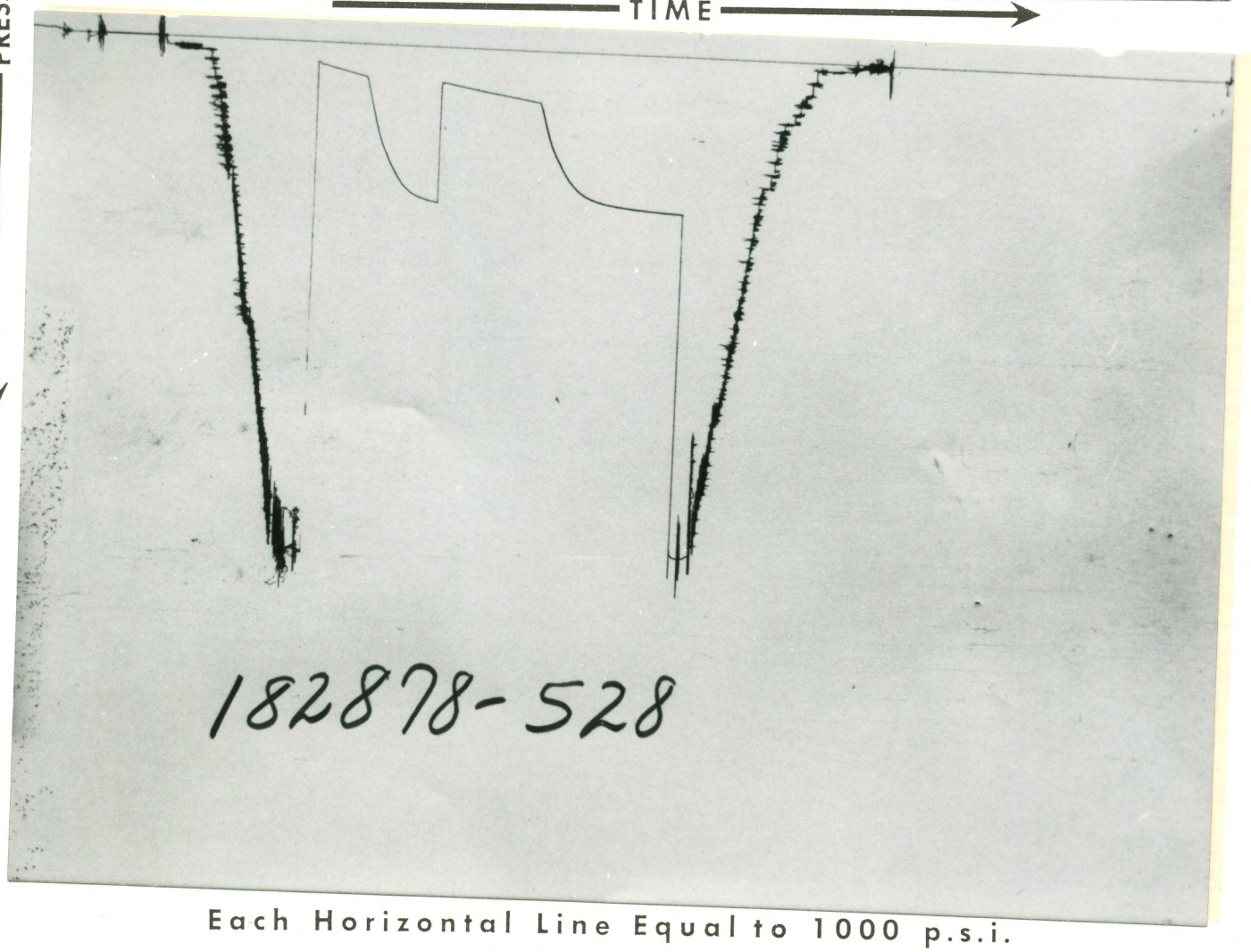
EQUIPMENT DATA

LITTLE'S 96676 75C 8/74

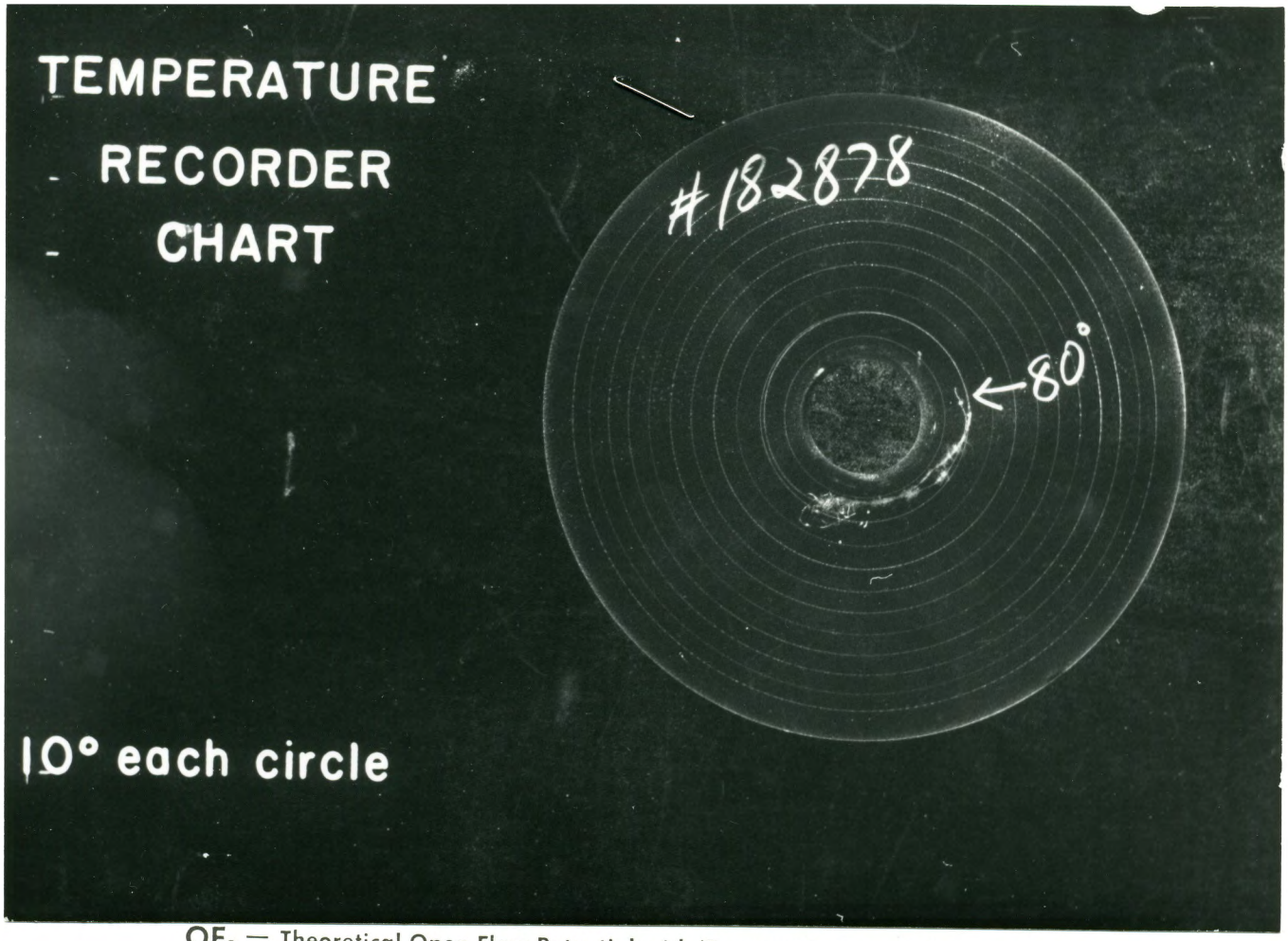


PRESSURE

TIME



Each Horizontal Line Equal to 1000 p.s.i.



OF_3 = Theoretical Open Flow Potential with/Damage Removed Max. . . . . MCF/D

OF_4 = Theoretical Open Flow Potential with/Damage Removed Min. . . . . MCF/D

P_s = Extrapolated Static Pressure . . . . . Psig.

P_F = Final Flow Pressure . . . . . Psig.

P_{ot} = Potentiometric Surface (Fresh Water*) . . . . . Feet

Q = Average Adjusted Production Rate During Test . . . . . bbls/day

Q_1 = Theoretical Production w/Damage Removed . . . . . bbls/day

Q_g = Measured Gas Production Rate . . . . . MCF/D

R = Corrected Recovery . . . . . bbls

r_w = Radius of Well Bore . . . . . Feet

t = Flow Time . . . . . Minutes

t_o = Total Flow Time . . . . . Minutes

T = Temperature Rankine . . . . . °R

Z = Compressibility Factor . . . . . ——

μ = Viscosity Gas or Liquid . . . . . CP

Log = Common Log

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given, Fresh Water Corrected to 100° F.

FLUID SAMPLE DATA

Sampler Pressure _____ P.S.I.G. at Surface
Recovery: Cu. Ft. Gas _____
cc. Oil _____
cc. Water _____
cc. Mud _____
Tot. Liquid cc. _____
Gravity _____ ° API @ _____ °F.
Gas/Oil Ratio _____ cu. ft./bbl.

		RESISTIVITY		CHLORIDE CONTENT
Recovery Water	@	°F.		ppm
Recovery Mud	@	°F.		ppm
Recovery Mud Filtrate	@	°F.		ppm
Mud Pit Sample	@	°F.		ppm
Mud Pit Sample Filtrate	@	°F.		ppm

Mud Weight 9.6 vis 42 sec

Date 7-17-77 Ticket Number 182879
Kind of Job OPEN HOLE Halliburton District HAYS
Tester MR. WEATHERBEE Witness HAMMONS
Drilling Contractor RED TIGER DRILLING COMPANY # 5 bjs

EQUIPMENT & HOLE DATA

Formation Tested Lower Kansas City
Elevation 1943' KB Ft.
Net Productive Interval 6' Net Ft.
All Depths Measured From Kelly Bushing
Total Depth 3348' Ft.
Main Hole/Casing Size 7 7/8"
Drill Collar Length 812' WP I.D. 2.764" WP
Drill Pipe Length 2470' I.D. 3.826"
Packer Depth(s) 3300' 3304' Ft.
Depth Tester Valve 3294' Ft.

Cushion TYPE AMOUNT Ft. Depth Back Pres. Valve Surface Choke 1/4" Bottom Choke 3/4"

Recovered 170' Feet of frothy and heavy oil and gas cut mud.
Recovered Feet of
Recovered Feet of
Recovered Feet of
Recovered Feet of

Remarks SEE PRODUCTION TEST DATA SHEET....

TEMPERATURE	Gauge No. 684	Gauge No. 528	Gauge No.	TIME
	Depth: 3306 Ft.	Depth: 3344 Ft.	Depth: Ft.	
	12 Hour Clock	12 Hour Clock	Hour Clock	Tool Opened 1835 A.M. P.M.
Est. °F.	Blanked Off NO	Blanked Off YES	Blanked Off	
3343' Actual 81 °F.	Pressures	Pressures	Pressures	Opened Bypass 2223 A.M. P.M.

	Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic		1742	1793	1770				
First Period Flow Initial		18	43	47			—	—
First Period Flow Final		38	51	60			30	30
First Period Closed in		762	775	781			45	45
Second Period Flow Initial		52	69	75			—	—
Second Period Flow Final		69	94	92			61	61
Second Period Closed in		1010	1016	1030			92	91
Third Period Flow Initial							—	—
Third Period Flow Final								
Third Period Closed in								
Final Hydrostatic		1728	1785	1750			—	—

Legal Location Sec. - Twp. - Rng. SE SW SE 2 16 17
Lease Name SOLOMON ESTATE
Well No. 1-2
Test No. 2
Tested Interval 3304' to 3348'
Lease Owner/Company Name GRAHAM-MICHAELIS
Field Area
County RUSH
State KANSAS
Meas. From Tester Valve

FORM 181-R2—PRINTED IN U.S.A.

FORMATION TEST DATA

LITTLE'S 102548 5M 9/76

Casing perfs._____ Bottom choke_____ Surf. temp 104 @ 1800 F Ticket No. 182879

Gas gravity_____ Oil gravity_____ GOR_____

Spec. gravity_____ Chlorides_____ ppm Res._____ @ _____ °F

INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED_____

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
1500					Truck called out.
1600					Truck on location.
1645					Picked up tool.
1700					Tool in table.
1832					Tool on bottom.
1835					Opened tool with a weak to a fair blow.
1905					Closed tool.
1950					Reopened tool with a weak blow, to a
					strong blow throughout test.
2051					Closed tool.
2222					Off bottom.

FORM 182-R1—PRINTED IN U.S.A.

PRODUCTION TEST DATA

LITTLE'S 96672 5M 8/74

Gauge No.	684	Depth	3306	Clock No.	13855	12 hour	Ticket No.	182879

	First Flow Period		First Closed In Pressure			Second Flow Period		Second Closed In Pressure			Third Flow Period		Third Closed In Pressure		
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.
0	.0000	18	.0000		38	.0000	52	.0000		69					
1	.0337	28	.0337*		54	.0736**	55	.0466***		98					
2	.0673	33	.0606		73	.1405	58	.0866		128					
3	.1010	33	.0875		95	.2073	61	.1265		169					
4	.1346	34	.1145		124	.2742	64	.1665		221					
5	.1683	36	.1414		158	.3411	67	.2064		293					
6	.2020	38	.1683		207	.4080	69	.2464		391					
7			.1952		277			.2863		519					
8			.2222		371			.3263		654					
9			.2491		496			.3662		768					
10			.2760		639			.4062		851					
11			.3030		762			.4461		905					
12								.4861		943					
13								.5260		970					
14								.5660		992					
15								.6060		1010					

Gauge No.	528		Depth	3344		Clock No.	4773	12 hour						
0	.0000	47	.0000		60	.0000	75	.0000		92					
1	.0333	72	.0332*		72	.0732**	77	.0462***		118					
2	.0666	72	.0598		91	.1398	80	.0859		147					
3	.0999	53	.0864		113	.2063	84	.1255		184					
4	.1332	56	.1129		141	.2729	86	.1651		233					
5	.1665	59	.1395		176	.3394	90	.2047		307					
6	.2000	60	.1661		222	.4060	92	.2443		405					
7			.1926		291			.2840		530					
8			.2192		386			.3236		668					
9			.2458		519			.3632		779					
10			.2724		659			.4028		862					
11			.2990		781			.4424		917					
12								.4821		958					
13								.5217		987					
14								.5613		1012					
15								.6010		1030					
Reading Interval	5		4			10		6							Minutes

REMARKS: * INTERVAL = 5 MINUTES ** INTERVAL = 11 MINUTES *** INTERVAL = 7 MINUTES

5

SPECIAL PRESSURE DATA

LITTLE'S 96673 75C 8/74

TICKET NO. 182879

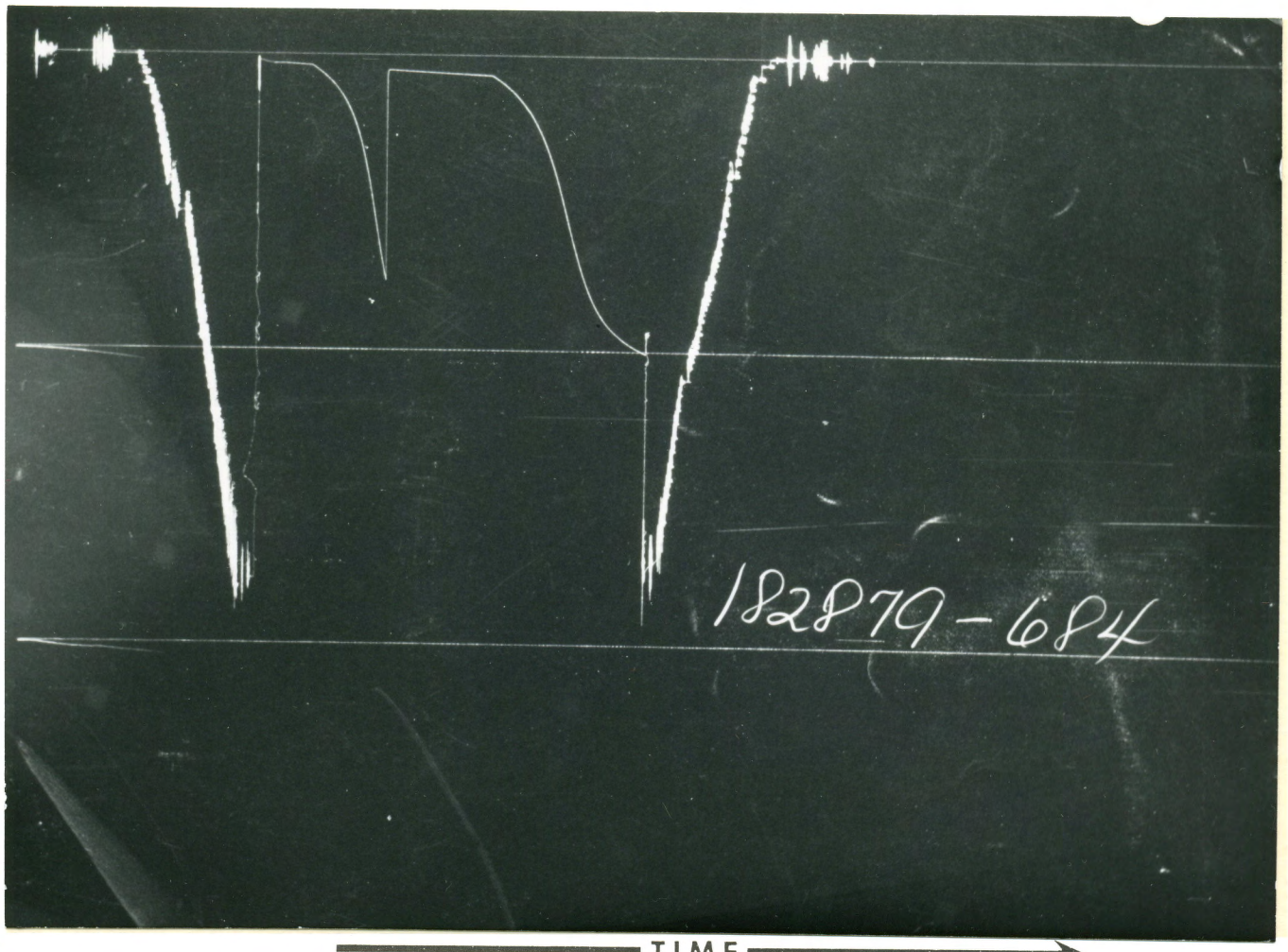
	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing				
Reversing Sub	6"	3"	12"	3157'
Water Cushion Valve	4.50"	2.764"	812'	
Drill Pipe	4.50"	3.826"	2470'	
Drill Collars				
Handling Sub & Choke Assembly				
Dual CIP Valve	5"	.87"	65"	3289'
Dual CIP Sampler				
Hydro-Spring Tester	5"	.75"	60"	3294'
Multiple CIP Sampler				
Extension Joint				
AP Running Case				
Hydraulic Jar				
VR Safety Joint	5"	1"	33"+	
Pressure Equalizing Crossover				
Packer Assembly	6.75"	1.53"	54"	3300'
Distributor				
Packer Assembly	6.75"	1.53"	54"	3304'
Flush Joint Anchor				
Pressure Equalizing Tube				
~~Blanked-Off~~ B.T. Running Case	5"	3.06"	48" +	3306'
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars	4.50"	2.764"	31.10'	
Flush Joint Anchor	5"	3.84"	4.84'	
Blanked-Off B.T. Running Case	5.00"	2.44"	48.06"	3344'
Total Depth				3348'

FORM 187-R1—PRINTED IN U.S.A.

EQUIPMENT DATA

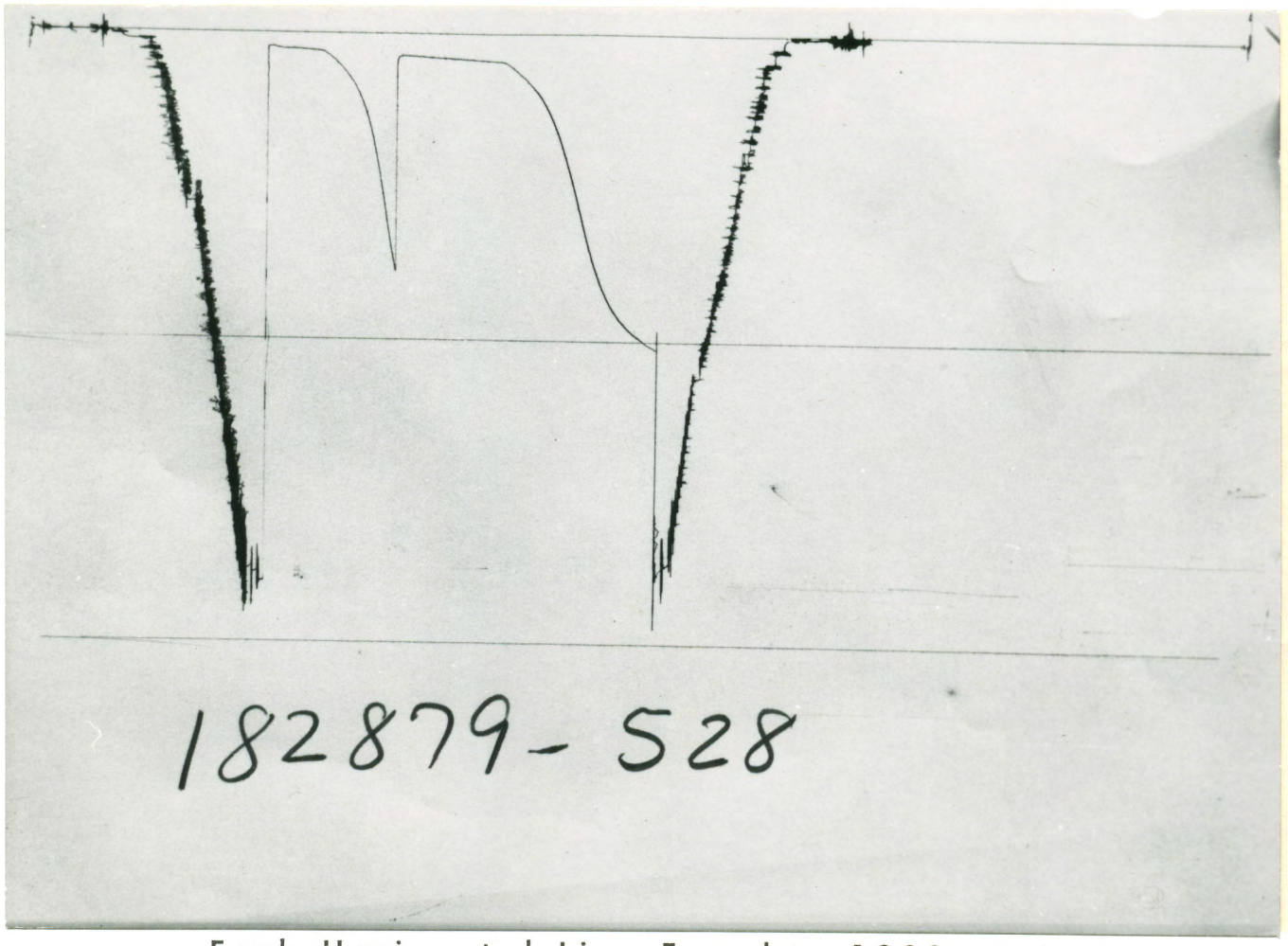
LITTLE'S 96676 75C 9/74

5

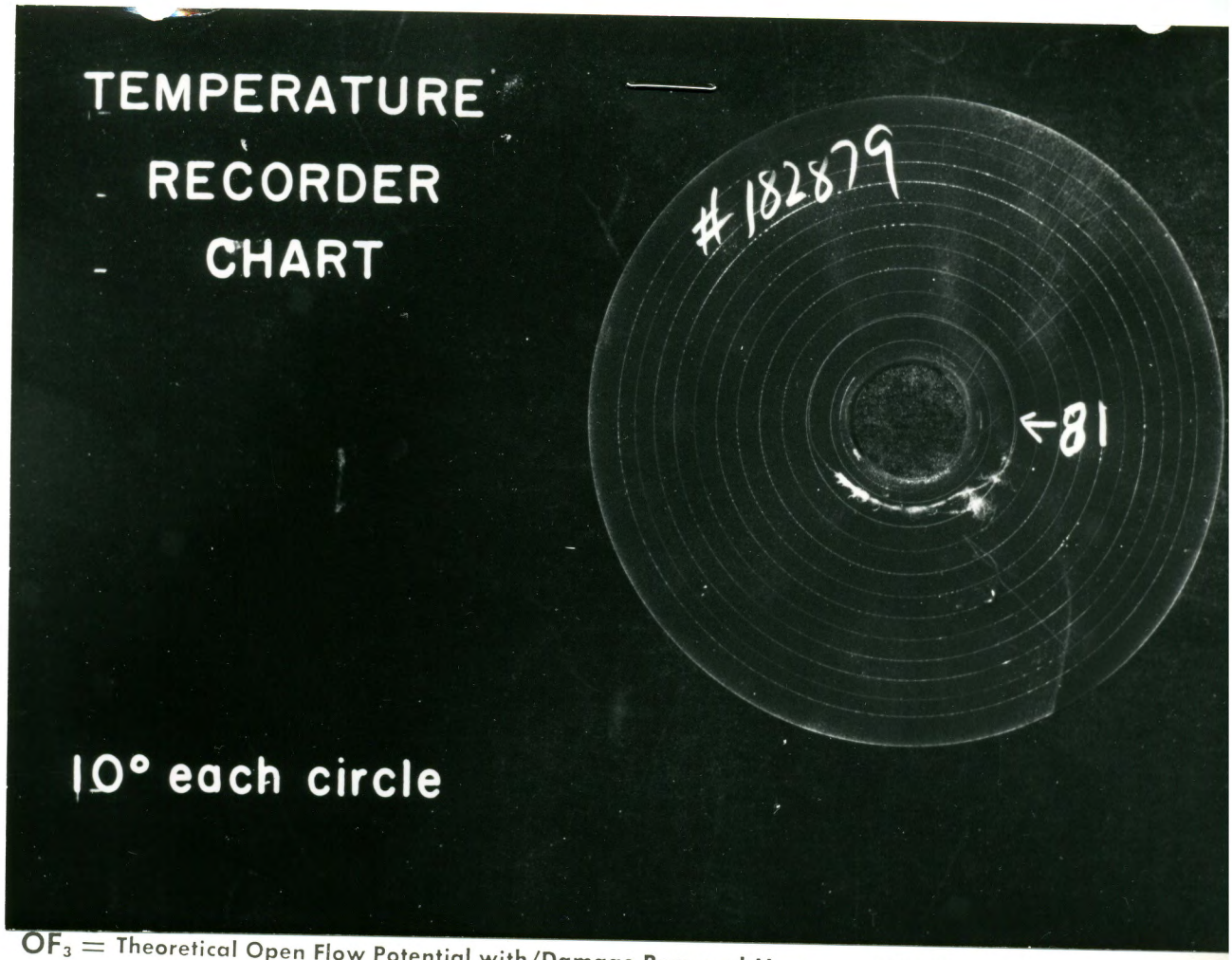


PRESSURE

TIME



Each Horizontal Line Equal to 1000 p.s.i.



OF_3 = Theoretical Open Flow Potential with/Damage Removed Max. . . . . MCF/D

OF_4 = Theoretical Open Flow Potential with/Damage Removed Min. . . . . MCF/D

P_s = Extrapolated Static Pressure . . . . . Psig.

P_F = Final Flow Pressure . . . . . Psig.

P_{ot} = Potentiometric Surface (Fresh Water *) . . . . . Feet

Q = Average Adjusted Production Rate During Test . . . . . bbls/day

Q_1 = Theoretical Production w/Damage Removed . . . . . bbls/day

Q_g = Measured Gas Production Rate . . . . . MCF/D

R = Corrected Recovery . . . . . bbls

r_w = Radius of Well Bore . . . . . Feet

t = Flow Time . . . . . Minutes

t_o = Total Flow Time . . . . . Minutes

T = Temperature Rankine . . . . . °R

Z = Compressibility Factor . . . . . ——

μ = Viscosity Gas or Liquid . . . . . CP

Log = Common Log

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given, Fresh Water Corrected to 100° F.

FLUID SAMPLE DATA

Sampler Pressure _____ P.S.I.G. at Surface
Recovery: Cu. Ft. Gas _____
cc. Oil _____
cc. Water _____
cc. Mud _____
Tot. Liquid cc. _____
Gravity _____ ° API @ _____ °F.
Gas/Oil Ratio _____ cu. ft./bbl.

		RESISTIVITY		CHLORIDE CONTENT
Recovery Water	@	°F.		ppm
Recovery Mud	@	°F.		ppm
Recovery Mud Filtrate	@	°F.		ppm
Mud Pit Sample	@	°F.		ppm
Mud Pit Sample Filtrate	@	°F.		ppm

Mud Weight 9.9 vis 43 sec

Date 7-18-77 Ticket Number 182849
Kind of Job OPEN HOLE Halliburton District HAYS
Tester CARL KENNEDY Witness B. HAMMOND
Drilling Contractor RED TIGER DRILLING COMPANY DR

EQUIPMENT & HOLE DATA

Formation Tested Lower Kansas City
Elevation 1943' kB Ft.
Net Productive Interval - Ft.
All Depths Measured From Kelly Bushing
Total Depth 3394' Ft.
Main Hole/Casing Size 7 7/8 "
Drill Collar Length 843' WP I.D. 2.764"
Drill Pipe Length 2513' I.D. ??
Packer Depth(s) 3372-3376' Ft.
Depth Tester Valve 3366' Ft.

Cushion TYPE AMOUNT Ft. Depth Back Pres. Valve
Surface Choke 1/4" Bottom Choke 3/4"

Recovered 10 Feet of mud with slight trace of oil
Recovered Feet of
Recovered Feet of
Recovered Feet of
Recovered Feet of

Remarks SEE PRODUCTION TEST DATA SHEET

TEMPERATURE	Gauge No. 684	Gauge No. 528	Gauge No.	TIME
	Depth: 3378 Ft.	Depth: 3390 Ft.	Depth: Ft.	
	12 Hour Clock	12 Hour Clock	Hour Clock	Tool Opened 1630 A.M. P.M.
Est. °F.	Blanked Off No	Blanked Off Yes	Blanked Off	
3389' Actual 79 °F.	Pressures	Pressures	Pressures	Opened A.M. Bypass 1830 P.M.

		Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic			1705	1829	1791				
First Period	Flow Initial		14	26	22			———	———
	Flow Final		14	26	22			30	
	Closed in		135	138	140			30	
Second Period	Flow Initial		21	36	34			———	———
	Flow Final		18	36	26			30	
	Closed in		62	69	67			30	
Third Period	Flow Initial							———	———
	Flow Final								
	Closed in								
Final Hydrostatic			1687	1785	1786			———	———

Legal Location Sec. - Twp. - Rng. S-SW-SE-Sec. 2 T-16S-R-17W
Field Area
County RUSH
State KANSAS
Lease Name SULUMAN ESTATE
Well No. 1-2
Test No. 3
Tested Interval 3376-3394'
Lease Owner/Company Name GRAHAM-MICHAELIS
Meas. From Tester Valve

FORM 181-R2—PRINTED IN U.S.A.

FORMATION TEST DATA

LITTLE'S 102548 5M 9/76

Casing perfs._____ Bottom choke_____ Surf. temp_____ °F Ticket No. 182849

Gas gravity_____ Oil gravity_____ GOR_____

Spec. gravity_____ Chlorides_____ ppm Res._____ @_____ °F

INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED_____

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
1345					Called out
1500					On location
1510					Picked up tool
1525					Tool in table
1530					Started tool in hole
1628					Tool on bottom
1630					Opened tool with a weak blow dying in
					10 minutes.
1700					Closed tool
1730					Opened tool with no blow
1800					Closed tool
1830					Started tool off bottom
1945					Tool in table
2015					Laid tool down

FORM 182-R1—PRINTED IN U.S.A.

PRODUCTION TEST DATA

LITTLE'S 96672 5M 8/74

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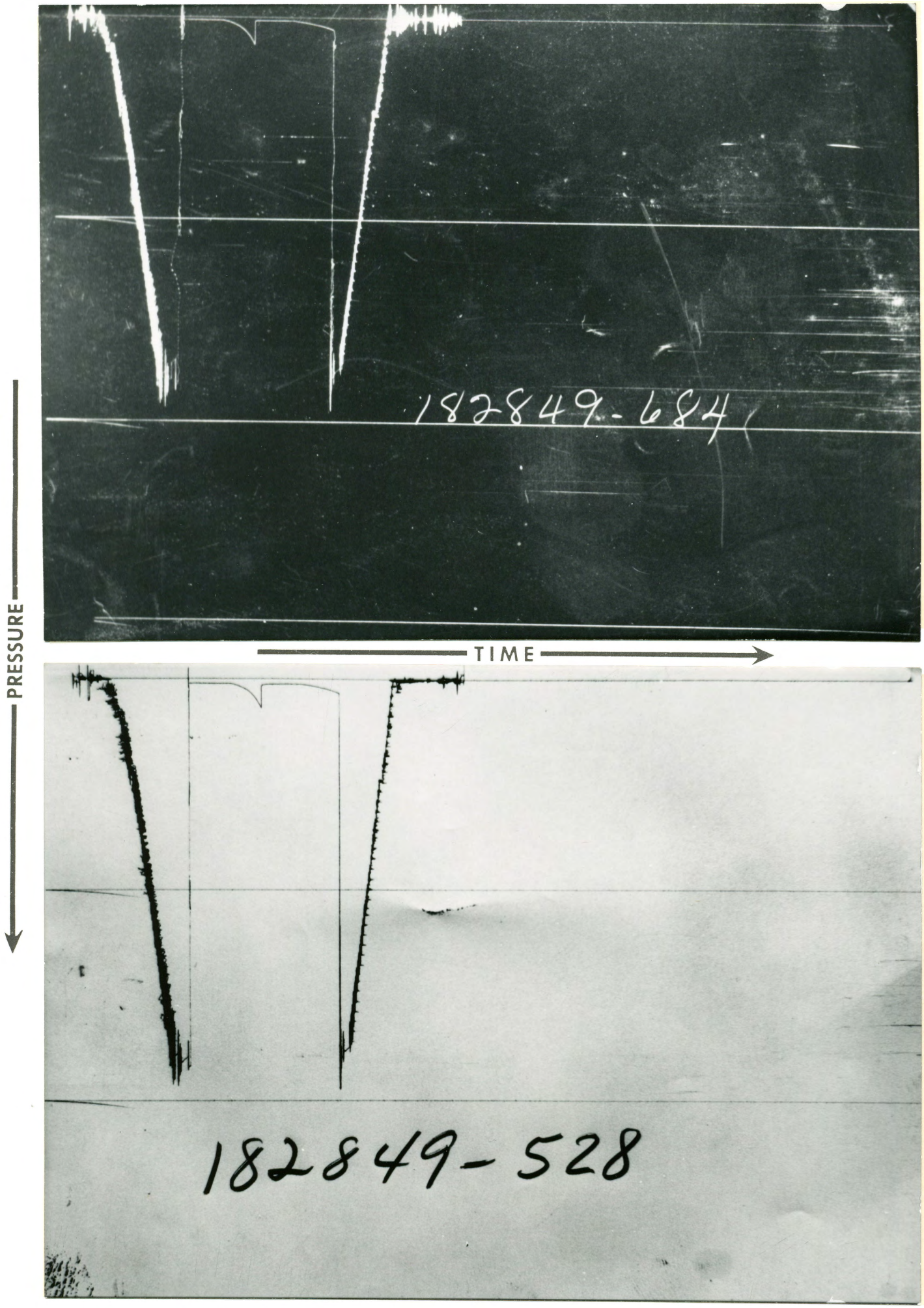
TICKET NO. 182849

	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing				
Reversing Sub	5.75"	1.50"	1'	
Water Cushion Valve	4.50"	2.764"	843' WP	
Drill Pipe	?	?	2513'	
Drill Collars				
Handling Sub & Choke Assembly				
Dual CIP Valve	5.0"	.87"	5'	3361'
Dual CIP Sampler				
Hydro-Spring Tester	5.0"	.75"	5'	3366'
Multiple CIP Sampler				
Extension Joint				
AP Running Case				
Hydraulic Jar				
VR Safety Joint	5.0"	1.00"	3'	
Pressure Equalizing Crossover				
Packer Assembly	6.75"	1.53"	4'	3372 '
Distributor				
Packer Assembly	6.75"	1.53"	4'	3376'
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case	5.0"	3.06"	4'	3378'
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor	5.0"	3.82"	8 1/2'	
Blanked-Off B.T. Running Case	5.0"	2.44"	4'	3390'
Total Depth				3394'

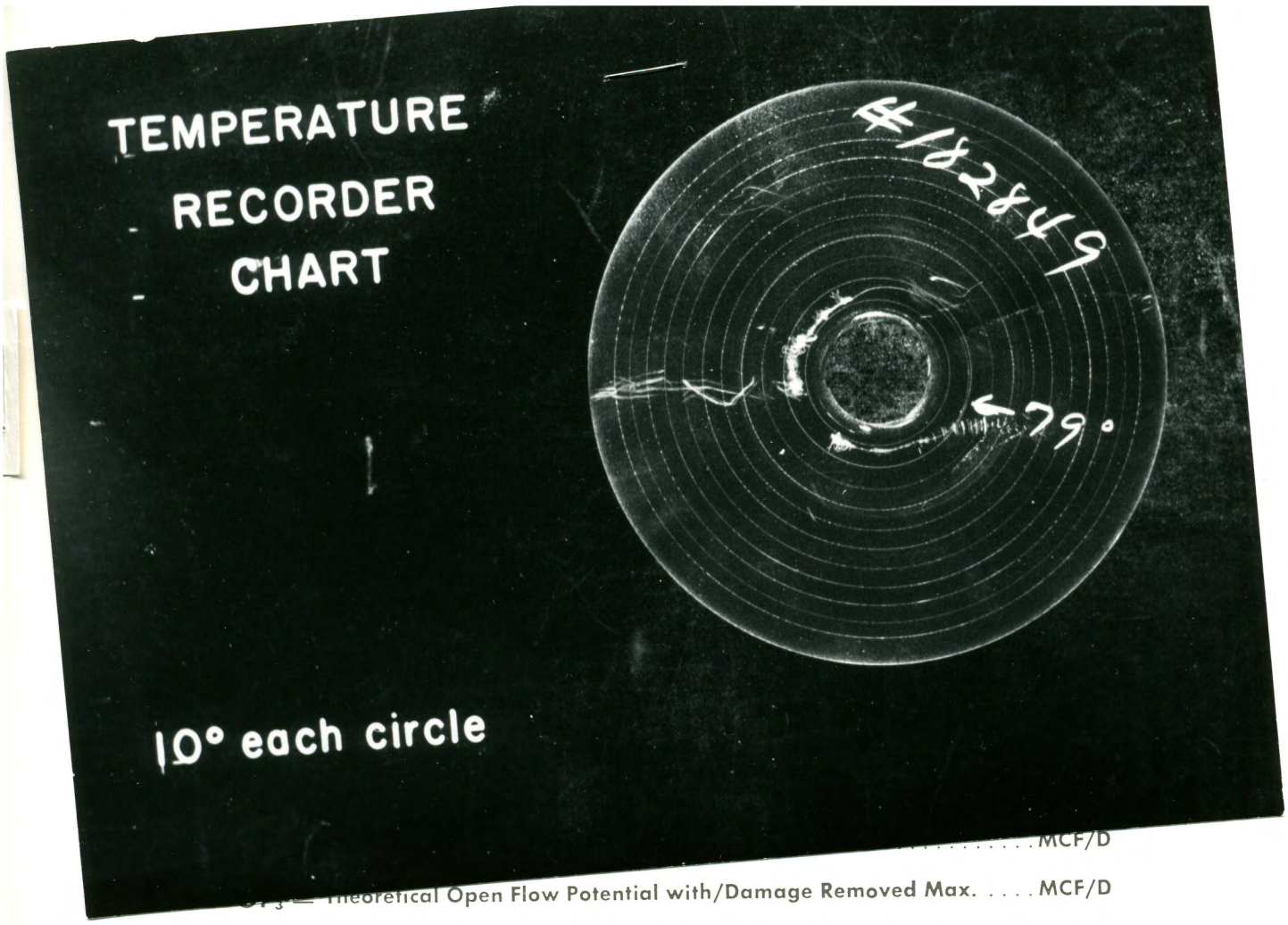
FORM 187-R1—PRINTED IN U.S.A.

EQUIPMENT DATA

LITTLE'S 96676 75C 8/74



Each Horizontal Line Equal to 1000 p.s.i.



MCF/D

OF_3 = Theoretical Open Flow Potential with/Damage Removed Max. ..... MCF/D

OF_4 = Theoretical Open Flow Potential with/Damage Removed Min. ..... MCF/D

P_s = Extrapolated Static Pressure ..... Psig.

P_F = Final Flow Pressure ..... Psig.

P_{ot} = Potentiometric Surface (Fresh Water*) ..... Feet

Q = Average Adjusted Production Rate During Test ..... bbls/day

Q_1 = Theoretical Production w/Damage Removed ..... bbls/day

Q_g = Measured Gas Production Rate ..... MCF/D

R = Corrected Recovery ..... bbls

r_w = Radius of Well Bore ..... Feet

t = Flow Time ..... Minutes

t_o = Total Flow Time ..... Minutes

T = Temperature Rankine ..... °R

Z = Compressibility Factor ..... ——

μ = Viscosity Gas or Liquid ..... CP

Log = Common Log

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given, Fresh Water Corrected to 100° F.

FLUID SAMPLE DATA

Sampler Pressure _____ P.S.I.G. at Surface
Recovery: Cu. Ft. Gas _____
cc. Oil _____
cc. Water _____
cc. Mud _____
Tot. Liquid cc. _____
Gravity 39 ° API @ 60 °F.
Gas/Oil Ratio _____ cu. ft./bbl.

		RESISTIVITY		CHLORIDE CONTENT
Recovery Water	@	°F.		ppm
Recovery Mud	@	°F.		ppm
Recovery Mud Filtrate	@	°F.		ppm
Mud Pit Sample	@	°F.		ppm
Mud Pit Sample Filtrate	@	°F.		ppm

Mud Weight 9.9 vis 47 sec

Date 7-20-77 Ticket Number 182850
Kind of Job OPEN HOLE Halliburton District HAYS
Tester MR. KENNEDY Witness MR. HAMMOND
Drilling Contractor RED TIGER DRILLING COMPANY BC S

EQUIPMENT & HOLE DATA

Formation Tested Arbuckle
Elevation 1943' KB Ft.
Net Productive Interval 7' Ft.
All Depths Measured From Kelly Bushing
Total Depth 3529' Ft.
Main Hole/Casing Size 7 7/8"
Drill Collar Length 843' WP I.D. 2.764"
Drill Pipe Length 2659' I.D. 3.826"
Packer Depth(s) 3518' - 3522' Ft.
Depth Tester Valve 3512' Ft.

Cushion TYPE AMOUNT Ft. Depth Back Pres. Valve Surface Choke 1/4" Bottom Choke 3/4"

Recovered 706 Feet of Gas in pipe
Recovered 1040 Feet of Gassy oil
Recovered 120 Feet of Frothy oil and mud
Recovered Feet of
Recovered Feet of

Remarks SEE PRODUCTION TEST DATA SHEET.

Indicates probable fracturing

TEMPERATURE	Gauge No. 528 Depth: 3525' Ft.	Gauge No. Depth: Ft.	Gauge No. Depth: Ft.	TIME
Est. 105 °F.	12 Hour Clock	Hour Clock	Hour Clock	Tool Opened 0215 A.M. P.M.
Actual °F.	Blanked Off Yes	Blanked Off	Blanked Off	Opened Bypass 0600 A.M. P.M.

	Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic	1898	1853						
First Period Flow Initial	121	126					———	———
First Period Flow Final	293	306					30	29
First Period Closed in	896	898					45	46
Second Period Flow Initial	328	336					———	———
Second Period Flow Final	491	494					60	61
Second Period Closed in	965	978					90	89
Third Period Flow Initial							———	———
Third Period Flow Final								
Third Period Closed in								
Final Hydrostatic	1846	1838					———	———

Legal Location Sec. - Twp. - Rng. SE SW SE 2 - 16S - 17W
Field Area
County RUSH
State KANSAS
Lease Name SULUMAN ESTATE
Well No. 1-2
Test No. 4
Tested Interval 3522' - 3529'
Lease Owner/Company Name GRAHAM-MICHAELIS
Meas. From Tester Valve

FORM 181-R2—PRINTED IN U.S.A.

FORMATION TEST DATA

LITTLE'S 102548 5M 9/76

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Casing perfs._____ Bottom choke_____ Surf. temp_____ °F Ticket No. 182850

Gas gravity_____ Oil gravity_____ GOR_____

Spec. gravity_____ Chlorides_____ ppm Res._____ @_____ °F

INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED_____

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
2310					Called out
0010					On location, pulling drill pipe
0100					Picked up tool
0110					Tool in table
0115					Started tool in hole
0213					Tool on bottom
0215					Tool opened with a fair blow, increas-
					ing to a strong blow in 3 minutes
0245					Closed tool
0330					Opened tool with a fair to strong blow
					in 20 minutes
0430					Closed tool
0600					Started tool off bottom
0830					Tool in table
0900					Laid tool down

FORM 182-R1—PRINTED IN U.S.A.

PRODUCTION TEST DATA

LITTLE'S 96672 5M 8/74

Gauge No.	528	Depth	3525'	Clock No.	4773	12 hour	Ticket No.	182850

	First Flow Period		First Closed In Pressure			Second Flow Period		Second Closed In Pressure			Third Flow Period		Third Closed In Pressure		
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.
0	.0000	126	.0000		306	.0000	336	.0000		494					
1	.0265	131*	.0395		576**	.0725	381***	.0598		678****					
2	.0596	182	.0659		634	.1384	410	.1129		743					
3	.0927	225	.0922		685	.2043	435	.1660		793					
4	.1258	259	.1186		726	.2702	458	.2191		833					
5	.1589	285	.1449		758	.3361	476	.2723		866					
6	.1920	306	.1713		790	.4020	494	.3254		892					
7			.1976		816			.3785		915					
8			.2240		839			.4316		935					
9			.2503		862			.4848		952					
10			.2767		880			.5379		966					
11			.3030		898			.5910		978					
12															
13															
14															
15															

Gauge No.		Depth		Clock No.		hour		

0															
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
Reading Interval		5		4			10		8						Minutes

REMARKS: *Interval = 4 minutes **Interval = 6 minutes ***Interval = 11 minutes ****Interval = 9 minutes

5

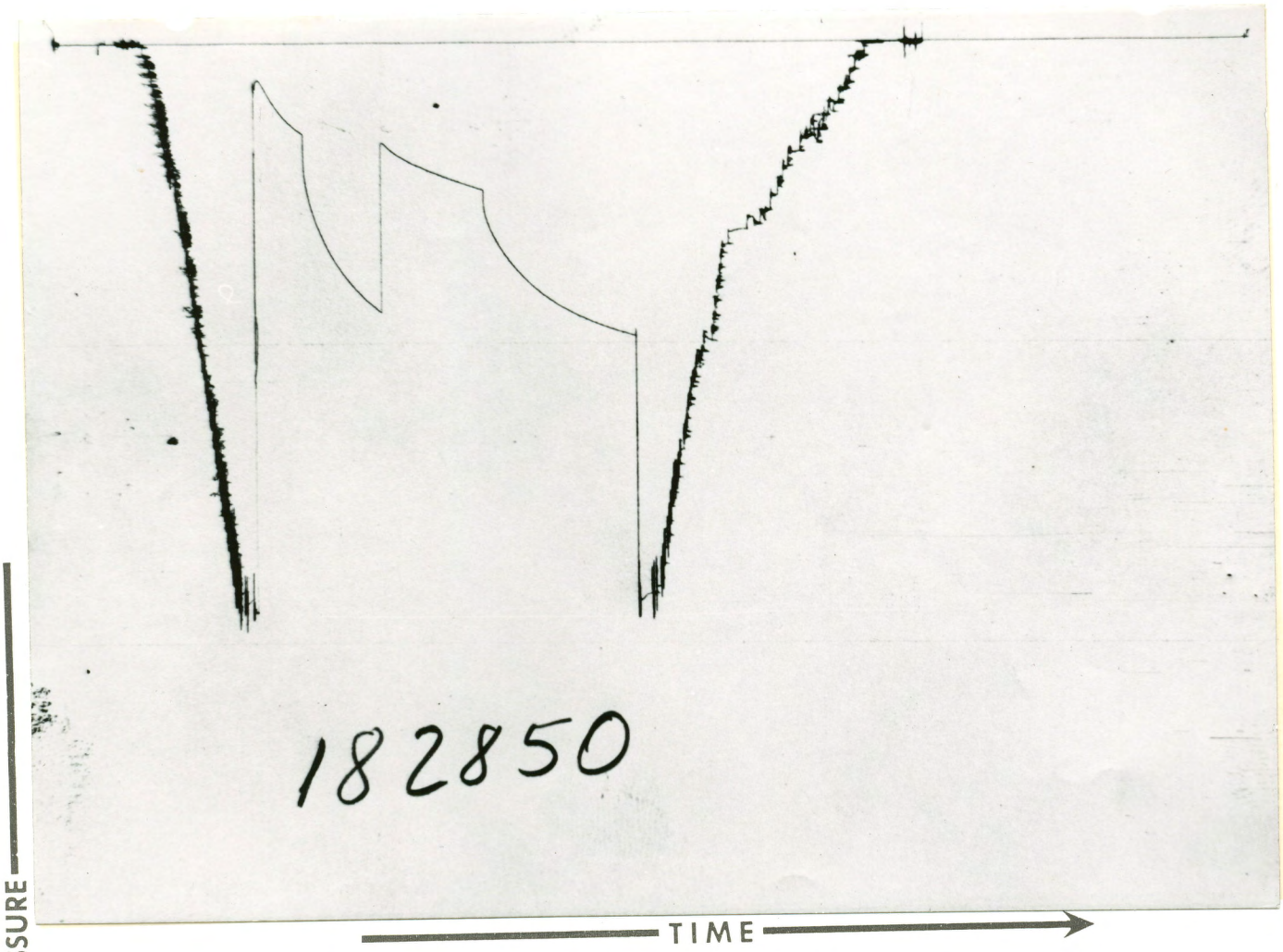
TICKET NO. 182850

	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing				
Reversing Sub	5.75"	1.50"	1'	
Water Cushion Valve	4½" WP	2.764"	843'	
Drill Pipe	4½"	3.826"	2659'	
Drill Collars				
Handling Sub & Choke Assembly				
Dual CIP Valve	5"	.87"	5'	3507'
Dual CIP Sampler				
Hydro-Spring Tester	5"	.75"	5'	3512'
Multiple CIP Sampler				
Extension Joint				
AP Running Case				
Hydraulic Jar				
VR Safety Joint	5"	1"	3'	
Pressure Equalizing Crossover				
Packer Assembly	6.75"	1.53"	4'	3518'
Distributor				
Packer Assembly	6.75"	1.53"	4'	3522'
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor	5"	3.82"	2'	
Blanked-Off B.T. Running Case	5"	2.44"	4'	3525'
Total Depth				3529'

FORM 187-R1—PRINTED IN U.S.A.

EQUIPMENT DATA

LITTLE'S 96676 75C 8/74



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