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NUMBER 1713

PEL 5 AND PEL 6, PATCHAWARRA CENTRAL BLOCK

COOPER BASIN

FLY LAKE 1

TEST REPORTS

Submitted by

Delhi Australian Petroleum Ltd, CSIRO and Santos Ltd
1993

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SCANNED

MINES AND ENERGY
SOUTH AUSTRALIA

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ENVELOPE 1713

TENEMENT: PEL 5 and PEL 6, Patchawarra Central Block; Cooper Basin

TENEMENT HOLDER: Delhi International Oil Corp. (operator), Santos Ltd, Bridge Oil NL, Vamgas NL, Reef Oil NL and Basin Oil NL

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FLUID SAMPLER 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.	
Recovery Mud Filtrate	____ @ ____ °F.	____ ppm
Mud Pit Sample	____ @ ____ °F.	
Mud Pit Sample Filtrate	____ @ ____ °F.	____ ppm
Mud Weight	9.7 vis 38 cp	

Date 9-23-71 Ticket Number 1658
Kind of Job OPEN HOLE Halliburton District BRISBANE
Tester MR. JONES Witness MR. COVEY
Drilling Contractor O.D. AND E. BC S

EQUIPMENT & HOLE DATA

Formation Tested Gidgealpa
Elevation 96.3' Ft.
Net Productive Interval 8411' - 8490' Ft.
All Depths Measured From Kelly Bushing
Total Depth 8490' Ft.
Main Hole/Casing Size 8½"
Drill Collar Length 668.50' I.D. 2.40"
Drill Pipe Length 7794' I.D. 3.826"
Packer Depth(s) 8408' Ft.
Depth Tester Valve 8391' Ft.

Cushion TYPE AMOUNT Ft. Depth Back Pres. Valve
Surface Choke ½" = 3/8" Bottom Choke 3/4"

Recovered 1380 Feet of Muddy water and mud on top of tool was gas cut
Recovered Feet of
Recovered Feet of CHARTS INDICATE PARTIAL PLUGGING OF ANCHOR PERFORATIONS
Recovered Feet of DURING FIRST AND SECOND FLOW PERIODS.
Recovered Feet of UNABLE TO SCRIBE 5000# LINE.

Meas. From Tester Valve

Remarks Tool opened for a 17 minute first flow with a very weak blow, died after 5 minutes. Closed tool for 30 minute first closed in pressure. Reopened tool for 60 minute second flow. Blow started at 12:28, increased to fair blow at 12:39 when tool was closed for a 59 minute second closed in pressure.

TEMPERATURE	Gauge No. 2040		Gauge No. 2039		Gauge No.		TIME	
	Depth: 8396 Ft.		Depth: 8481' Ft.		Depth: Ft.			
	12 Hour Clock		24 Hour Clock		Hour Clock		Tool Opened	A.M. 10:53 P.M.
Est. °F.	Blanked Off No		Blanked Off Yes		Blanked Off			
Actual 230 °F.	Pressures		Pressures		Pressures		Tool Closed	A.M. 1:39 P.M.
	Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic	4105	4150	4164	4178				
First Period Flow Initial	433	233Q	439	331			—	—
First Period Flow Final	853	743	864	816			16	17
First Period Closed in	3276	3316	3311	3340			30	30
Second Period Flow Initial	379	374	439	435			—	—
Second Period Flow Final	501	484	508	510			60	60
Second Period Closed in	3099	3140	3104	3161			60	59
Third Period Flow Initial							—	—
Third Period Flow Final								
Third Period Closed in								
Final Hydrostatic	4105	4137	4150	4162			—	—

Q = Questionable

Legal Location Sec. - Twp. - Rng. ---
Lease Name FLY LAKE
Well No. 1
Test No. 1
Field Area COOPER BASIN
County ---
State SOUTH AUSTRALIA
Tested Interval 8408' - 8490'
Lease Owner/Company Name DELHI INTERNATIONAL OIL CORPORATION

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FORMATION TEST DATA

LITTLE'S 93429 15M 4/69—33, 34-13

9

Casing perfs. _____ Bottom choke 3/4" Surf. temp _____ °F Ticket No. 1658

Gas gravity _____ Oil gravity _____ GOR _____

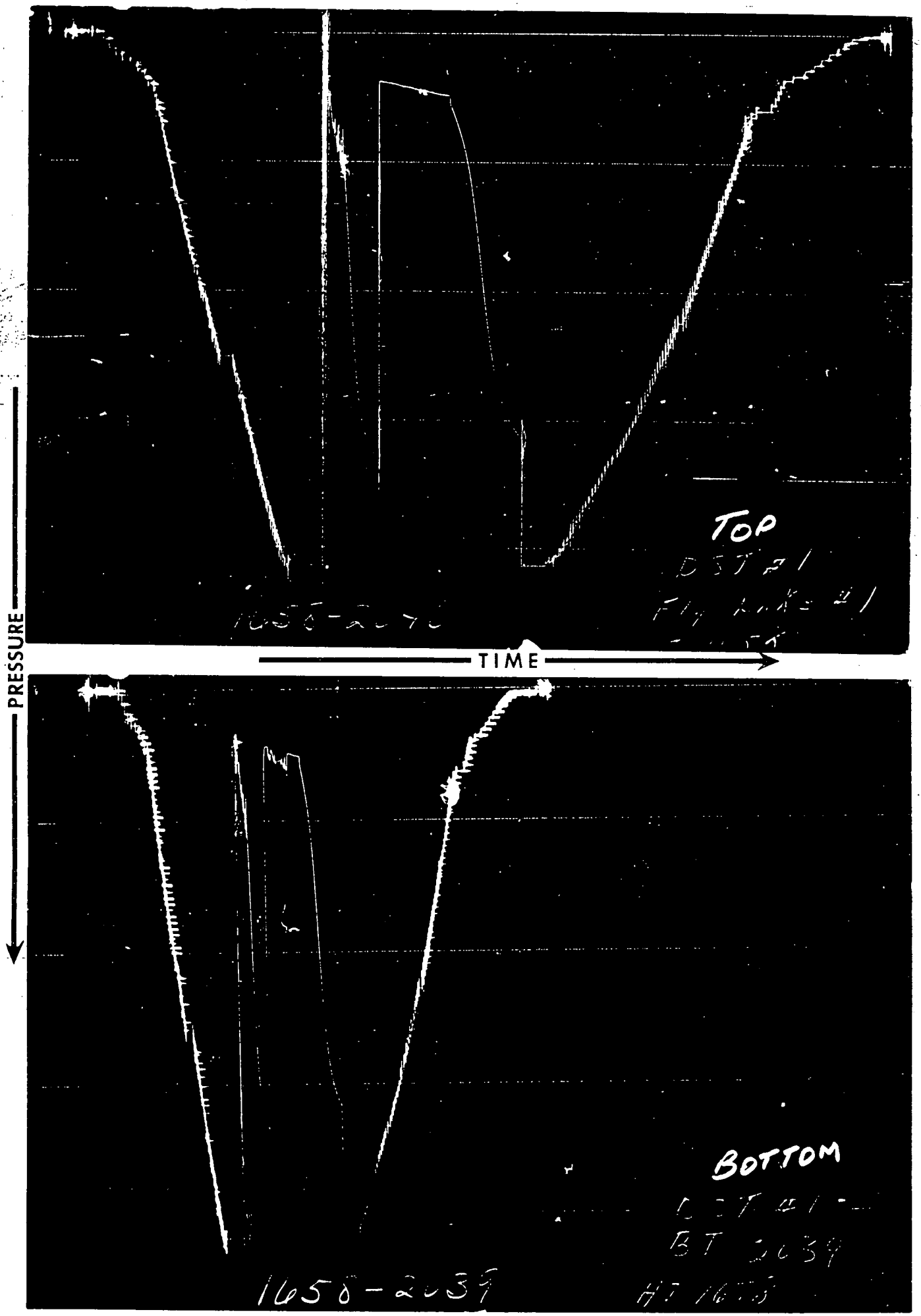
Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F

Date 9-23-71 Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
6:40					Engaged Stylus
6:45					Started in hole
10:53	½"				Tester open
11:09					Closed tool
11:39	3/8"				Opened tool
12:39					Closed tool
1:39					Picked up off bottom
					Jars did not trip
					Pulled loose 10,000# over weight of
					tools

Gauge No. 2040			Depth 8396'			Clock No. 7588			12 hour		Ticket No. 1658		
	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"	$\text{Log}\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\text{Log}\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\text{Log}\frac{t+\theta}{\theta}$	PSIG Temp. Corr.
0	.0000	233Q	.0000		743	.0000	374	.0000		484					
1	.1150	743	.0209		1289	.0675	386	.0423		683					
2			.0418		1874	.1350	407	.0846		749					
3			.0627		2384	.2025	428	.1269		1192					
4			.0836		2746	.2700	449	.1692		1694					
5			.1045		2963	.3375	469	.2115		2206					
6			.1254		3097	.4050	484	.2538		2600					
7			.1463		3178			.2961		2840					
8			.1672		3238			.3384		2984					
9			.1881		3282			.3807		3084					
10			.2090		3316			.4160		3140*					
11															
12															
13															
14															
15															

Gauge No. 2039				Depth 8481'			Clock No. 7498		24 hour					
0	.0000	331	.0000		816	.0000	435	.0000		510					
1	.0570	816	.0100		1379	.2040	510	.0203		721					
2			.0200		1933			.0407		930					
3			.0300		2420			.0610		1262					
4			.0400		2756			.0813		1728					
5			.0500		2997			.1017		2260					
6			.0600		3120			.1220		2650					
7			.0700		3207			.1423		2879					
8			.0800		3266			.1626		3012					
9			.0900		3310			.1830		3106					
10			.1000		3340			.2000		3161*					
11															
12															
13															
14															
15															
Reading Interval					3		10			6					Minutes

REMARKS: *Interval = 5 minutes



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

	O. D.	I. D.	LENGTH	DEPTH
Reversing Sub	5"	2.50"	12"	
Water Cushion Valve				
Drill Pipe	4½"	3.826"	7794'	
Drill Collars	6½"	2.40"	668.50'	
Handling Sub & Choke Assembly	5.87"	2.58"	32"	
Dual CIP Valve	5.03"	.87"	48"	
Dual CIP Sampler				
Hydro-Spring Tester	5"	.75"	60.21"	8391'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.06"	49.63"	8396'
Hydraulic Jar	5"	.87"	39.46"	
VR Safety Joint	5"	1"	33.40"	
Pressure Equalizing Crossover				
Packer Assembly	6.25"	1.75"	72.33"	8408'
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars	6.50"	2.40"	59.75'	
Flush Joint Anchor	5"	2.37"	15'	
Blanked-Off B.T. Running Case	5"	2.44"	48.71"	8481'

000008

FLUID SAMPLER 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.	
Recovery Mud Filtrate	____ @ ____ °F.	____ ppm
Mud Pit Sample	____ @ ____ °F.	
Mud Pit Sample Filtrate	____ @ ____ °F.	____ ppm
Mud Weight	9.9 vis 37 cp	

Date 9-26-71 Ticket Number 1718
Kind of Job OPEN HOLE Halliburton District BRISBANE
Tester MR. BORAIN Witness MR. COVEY
Drilling Contractor O. D. & E. RIG #9 IC S

EQUIPMENT & HOLE DATA

Formation Tested Gidgealpa
Elevation 114' Ft.
Net Productive Interval - Ft.
All Depths Measured From Kelly Bushing
Total Depth 8703' Ft.
Main Hole/Casing Size 8 1/2"
Drill Collar Length 525.03' I.D. 2 13/16"
Drill Pipe Length 7960' I.D. 4.276"
Packer Depth(s) 8507.15' Ft.
Depth Tester Valve 8491.96' Ft.
Cushion TYPE - AMOUNT - Ft. Depth Back Pres. Valve - Surface Choke 1/4" - Bottom Choke 3/8" 3/4"

Recovered 250 Feet of Condensate
Recovered 350 Feet of Gas cut mud
Recovered 100 Feet of Formation water
Recovered Feet of
Recovered Feet of

Meas. From Tester Valve

Remarks Opened tool for 18 minute first flow with a weak blow increasing to very strong in 2 minutes. SEE PRODUCTION TEST DATA SHEET FOR REST OF REMARKS.

TEMPERATURE	Gauge No. 2039	Gauge No. 2040	Gauge No.	TIME
	Depth: 8496.09' Ft.	Depth: 8700' Ft.	Depth: Ft.	
	12 Hour Clock	24 Hour Clock	Hour Clock	Tool Opened A.M. 5:41
Est. °F.	Blanked Off NO	Blanked Off YES	Blanked Off	Tool Closed A.M. 9:02
Actual 236 °F.	Pressures	Pressures	Pressures	

		Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic		4264	4242	4351	4337				
First Period	Flow Initial	1742	1939	1865	1914			____	____
	Flow Final	1522	2499	2559	2549			17	18
	Closed in	3745	3722	3778	3760			31	31
Second Period	Flow Initial	2185	2171	2297	2283			____	____
	Flow Final	3040	3021	3083	3069			60	61
	Closed in	3712	3698	3786	3735			93	91
Third Period	Flow Initial							____	____
	Flow Final								
	Closed in								
Final Hydrostatic		4236	4229	4319	4297			____	____

Legal Location Sec. - Twp. - Rng. ---
Lease Name FLY LAKE
Well No. 1
Test No. 2
Tested Interval 8507.15' - 8703'
Field Area COOPER BASIN
County ---
State SOUTH AUSTRALIA
Owner DELHI INTERNATIONAL OIL CORPORATION
Company SANTOS LTD, VAMGOS NL, BRIDGE OIL N.L.

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FORMATION TEST DATA

LITTLE'S 03429 15M 4/69—33, 34-13

6

Casing perfs. _____ Bottom choke _____ Surf. temp _____ °F Ticket No. 1718

Gas gravity _____ Oil gravity _____ GOR _____

Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
9-26-71 12:36					Engaged stylus on bottom recorder
12:47					Started running in hole
1:26					Engaged stylus on top recorder
5:39					On bottom
5:41	1/4"				Opened tool
5:46	1/4"				Gas to surface
5:58	1/4"	1300			Closed tool
6:29	3/8"				Opened tool
6:30	3/8"	1050			
6:35	3/8"	1275			
6:40	3/8"	1510			
6:50		1700			
6:55		1840			
7:00		1980			
7:05		2000			
7:10		2000			
7:15		1990			
7:20		1990			
7:25		1990			
7:29					Closed tool
9:02					Pulled tool loose

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PRODUCTION TEST DATA

LITTLE'S

Gauge No.	2039	Depth	8496.09'	Clock No.	7588	12 hour	Ticket No.	1718

	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	.000	1939	.000		2499	.000	2171	.000		3021					
1	.0193	1792	.0204		3618	.0675	2559	.0616		3598					
2	.0386	1774	.0408		3657	.1351	2877	.1232		3623					
3	.0579	1895	.0612		3676	.2026	3004	.1848		3639					
4	.0772	2070	.0816		3689	.2702	3040	.2464		3652					
5	.0965	2295	.1020		3697	.3377	3030	.3080		3663					
6	.1160	2499	.1224		3704	.4120	3021**	.3696		3671					
7			.1428		3709			.4312		3679					
8			.1632		3713			.4928		3686					
9			.1836		3718			.5544		3691					
10			.2110		3722*			.6230		3698***					
11															
12															
13															
14															
15															

Gauge No.	2040	Depth	8700'	Clock No.	???	24 hour

0	.000	1914	.000		2549	.000	2283	.000		3069					
1	.010	1982	.010		3658	.0331	2627	.0302		3637					
2	.020	1889	.020		3696	.0662	2926	.0604		3663					
3	.030	1984	.030		3713	.0993	3050	.0906		3679					
4	.040	2145	.040		3726	.1325	3087	.1208		3693					
5	.050	2362	.050		3735	.1656	3079	.1510		3704					
6	.060	2549	.060		3740	.2020	3069**	.1812		3712					
7			.070		3747			.2114		3719					
8			.080		3751			.2416		3726					
9			.090		3754			.2718		3731					
10			.103		3760*			.3050		3735***					
11															
12															
13															
14															
15															
Reading Interval	3		3			10		9							Minutes

REMARKS: *Last interval equal to 4 minutes **Last interval equal to 11 minutes ***Last interval equal to 10 minutes

000010

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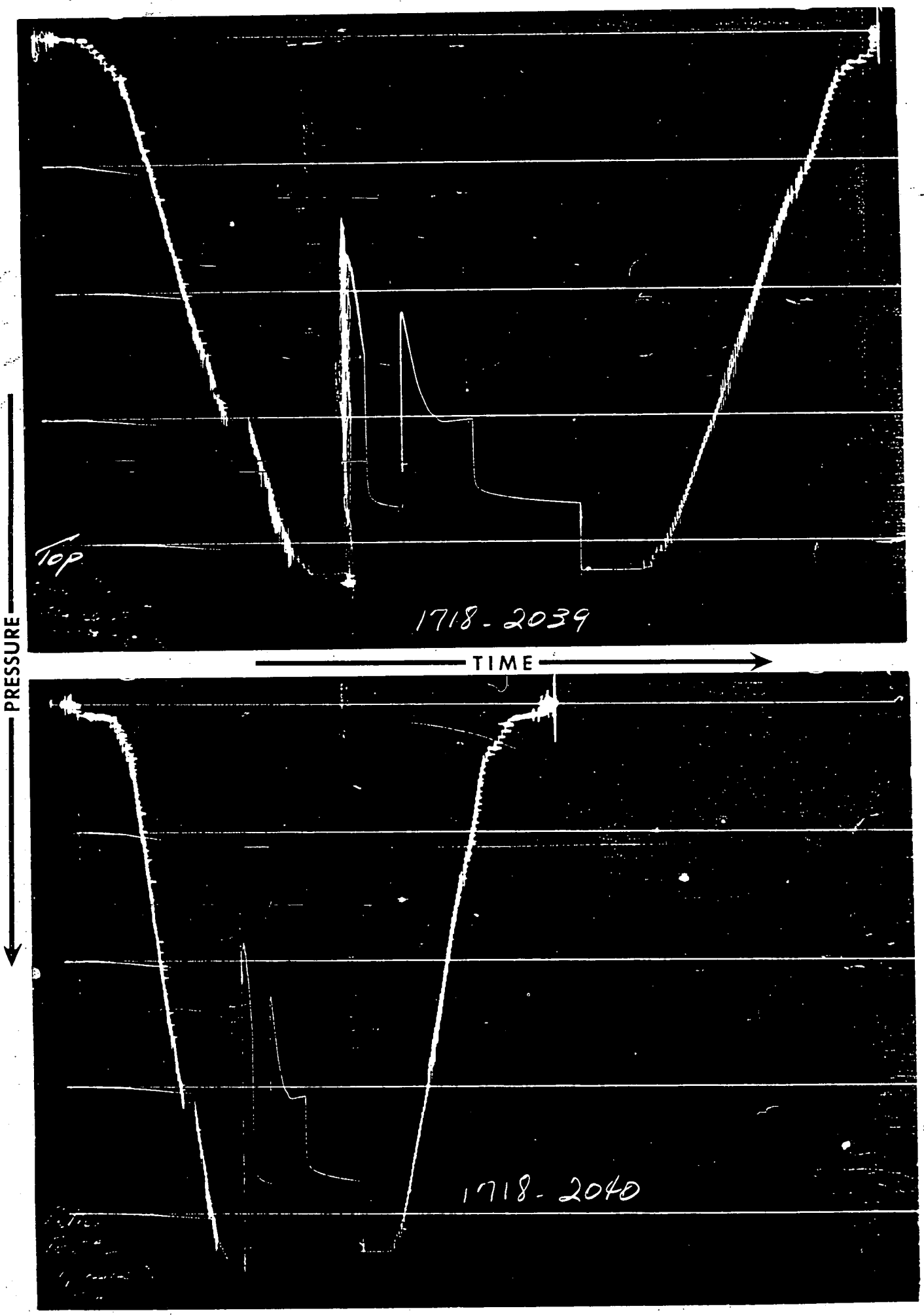
SPECIAL PRESSURE DATA

LITTLE'S



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

	O. D.	I. D.	LENGTH	DEPTH
Reversing Sub				
Water Cushion Valve				
Drill Pipe	5"	4.276"	7960'	
Drill Collars	6 1/4"	2 13/16"	525.03'	
X OVER SUB	5 3/4"	3"	.65'	
Handling Sub & Choke Assembly	5.87"	2.58"	2.65'	
Dual CIP Valve	5"	.87"	3.99'	
Dual CIP Sampler				
Hydro-Spring Tester	5"	3/4"	5.01'	8491.96'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.06"	4.13'	8496.09'
Hydraulic Jar	5"	1"	3.29'	
VR Safety Joint	5"	1"	2.33'	
Pressure Equalizing Crossover				
Packer Assembly				
Distributor				
Packer Assembly	7 3/4"	1.75"	6.29'	8507.15'
Flush Joint Anchor	5"	2.37"	14.00'	
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
	5 15/16"	2"	.64' X OVER SUB	
Drill Collars	6 1/4"	2 13/16"	146.53'	
	5 5/8"	2 5/16"	.75' X OVER SUB	
Flush Joint Anchor	5"	2.37"	29.00'	
Blanked-Off B.T. Running Case	5"	2.44"	4.08'	8700'

000013

FLUID SAMPLER 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.		
Recovery Mud Filtrate	____ @ ____ °F.		____ ppm
Mud Pit Sample	____ @ ____ °F.		
Mud Pit Sample Filtrate	____ @ ____ °F.		____ ppm
Mud Weight	9.7	vis 40	cp

Date	9-28-71
Ticket Number	1719
Kind of Job	OPEN HOLE
Halliburton District	BRISBANE
Tester	B. V. BORAIN
Witness	C. COVEY
Drilling Contractor	OCEAN DRILLING & EXPLORATION RIG 9

EQUIPMENT & HOLE DATA

Formation Tested	Gidealpa
Elevation	114' Ft.
Net Productive Interval	24' Ft.
All Depths Measured From	Kelly bushing
Total Depth	8834' Ft.
Main Hole/Casing Size	8 1/2"
Drill Collar Length	612.80' I.D. 2 13/16"
Drill Pipe Length	8225' I.D. 4.276"
Packer Depth(s)	8749.77' Ft.
Depth Tester Valve	8733.73' Ft.

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

Recovered 100 Feet of condensate
Recovered 250 Feet of muddy water
Recovered _____ Feet of _____
Recovered _____ Feet of _____
Recovered _____ Feet of _____

Meas. From Tester Valve

Remarks SEE PRODUCTION TEST DATA SHEET

TEMPERATURE	Gauge No. 1895	Gauge No. 2188	Gauge No.	TIME
	Depth: 8737.86 Ft.	Depth: 8830 Ft.	Depth: Ft.	
	12 Hour Clock	24 Hour Clock	Hour Clock	Tool Opened A.M. 7:54 P.M.
Est. °F.	Blanked Off no	Blanked Off yes	Blanked Off	Tool Closed A.M. 11:14 P.M.
Actual 236 °F.	Pressures	Pressures	Pressures	

		Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic		4371	4367	4392	4401				
First Period	Flow Initial	1839	1899	2114	2128			———	———
	Flow Final	2521	2534	2666	2691			16	15
	Closed in	3884	3886	3878	3887			30	30
Second Period	Flow Initial	2230	2227	2348	2354			———	———
	Flow Final	3242	3251	3282	3282			60	60
	Closed in	3884	3884	3887	3887			94	95
Third Period	Flow Initial							———	———
	Flow Final								
	Closed in								
Final Hydrostatic		4367	4367	4392	4401			———	———

Legal Location Sec. - Twp. - Rng.

Lease Name: FLY LAKE
Well No.: 1
Test No.: 3
Tested Interval: 8749.77-8834'
Field Area: COOPER BASIN
County:
State: SOUTH AUSTRALIA
Lease Owner/Company Name: DELHI INTERNATIONAL OIL CORPORATION
SANTOS LTD. VAMGAS N.L. BRIDGE OIL N.L.

: IN U.S.A.

FORMATION TEST DATA

LITTLE'S 63429 15M 4/69—39, 34-19

8

Casing perfs. _____ Bottom choke 3/4" Surf. temp 114 °F Ticket No. 1719

Gas gravity _____ Oil gravity _____ GOR _____

Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F

Date 9-28-71 Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
2:48 AM					Engaged stylus on bottom recorder.
3:10 AM					Started running in hole.
3:38 AM					Engaged stylus on top recorder.
7:15 AM					On bottom.
7:54 AM	1/4"				Tool opened.
7:58	1/4"				Gas to the surface.
8:00	1/4"	600			
8:05	1/4"	1100			
8:10	1/4"	1450			Closed tool.
8:40	3/8"	750			Tool opened.
8:45	3/8"	1150			
8:50	3/8"	1450			Mud to surface.
8:55	3/8"	1720			
9:00	3/8"	1900			
9:05	3/8"	2000			
9:10	3/8"	2060			
9:15	3/8"	2100			
9:20	3/8"	2110			
9:25	3/8"	2150			
9:30	3/8"	2120			
9:35	3/8"	2120			
9:40	3/8"	2120			

Gauge No.	1895		Depth	8737.86'		Clock No.	7588		12 hour	Ticket No.	1719			
	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	.000	1899	.000		2534	.000	2227	.000		3251					
1	.0216	1914	.0209		3792	.0675	2618	.0614		3799					
2	.0432	1942	.0418		3827	.1350	3024	.1228		3827					
3	.0648	2122	.0627		3844	.2025	3176	.1842		3842					
4	.0864	2326	.0836		3857	.2700	3233	.2456		3852					
5	.1080	2534	.1045		3865	.3375	3246	.3070		3863					
6			.1254		3872	.4050	3251	.3684		3869					
7			.1463		3876			.4298		3874					
8			.1672		3880			.4912		3876					
9			.1881		3884			.5526		3880					
10			.2090		3886			.6140		3882					
11								.6480	*	3884					
12															
13															
14															
15															

Gauge No.	2188		Depth	8830'		Clock No.	7498		24 hour					
0	.000	2128	.000		2691	.000	2354	.000		3282					
1	.0098	2350Q	.0101		3793	.033	2774	.0298		3800					
2	.0196	2269	.0202		3827	.066	3104	.0596		3829					
3	.0294	2460	.0303		3844	.099	3231	.0894		3844					
4	.0392	2574	.0404		3858	.132	3278	.1192		3853					
5	.0490	2691	.0505		3864	.165	3291	.1490		3862					
6			.0606		3871	.198	3282	.1788		3869					
7			.0707		3876			.2086		3876					
8			.0808		3880			.2384		3880					
9			.0909		3882			.2682		3882					
10			.1010		3887			.2980		3884					
11								.3150*		3887					
12															
13															
14															
15															
Reading Interval	3		3			10		9							Minutes

REMARKS: *Last interval is equal to 5 minutes.

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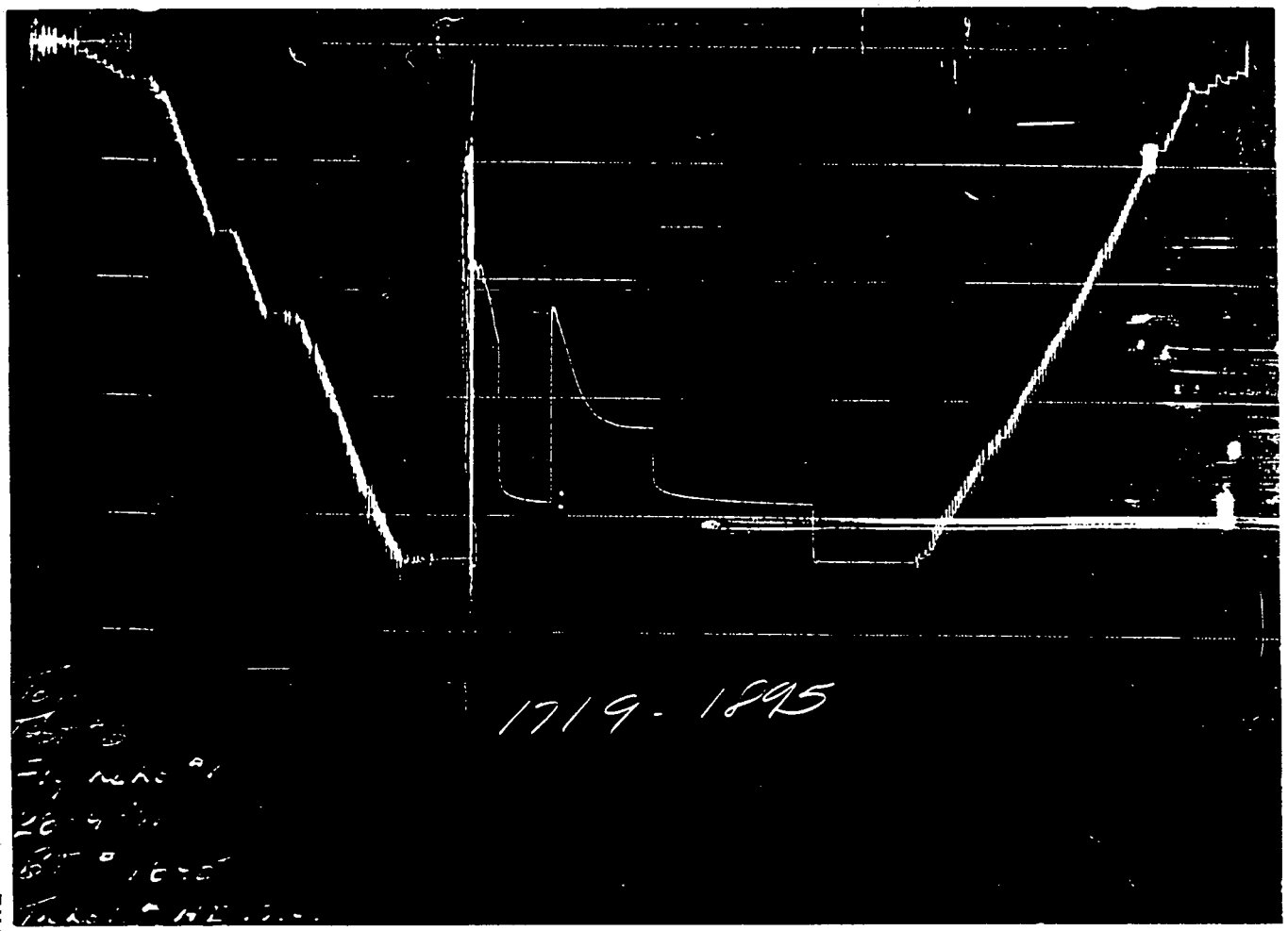
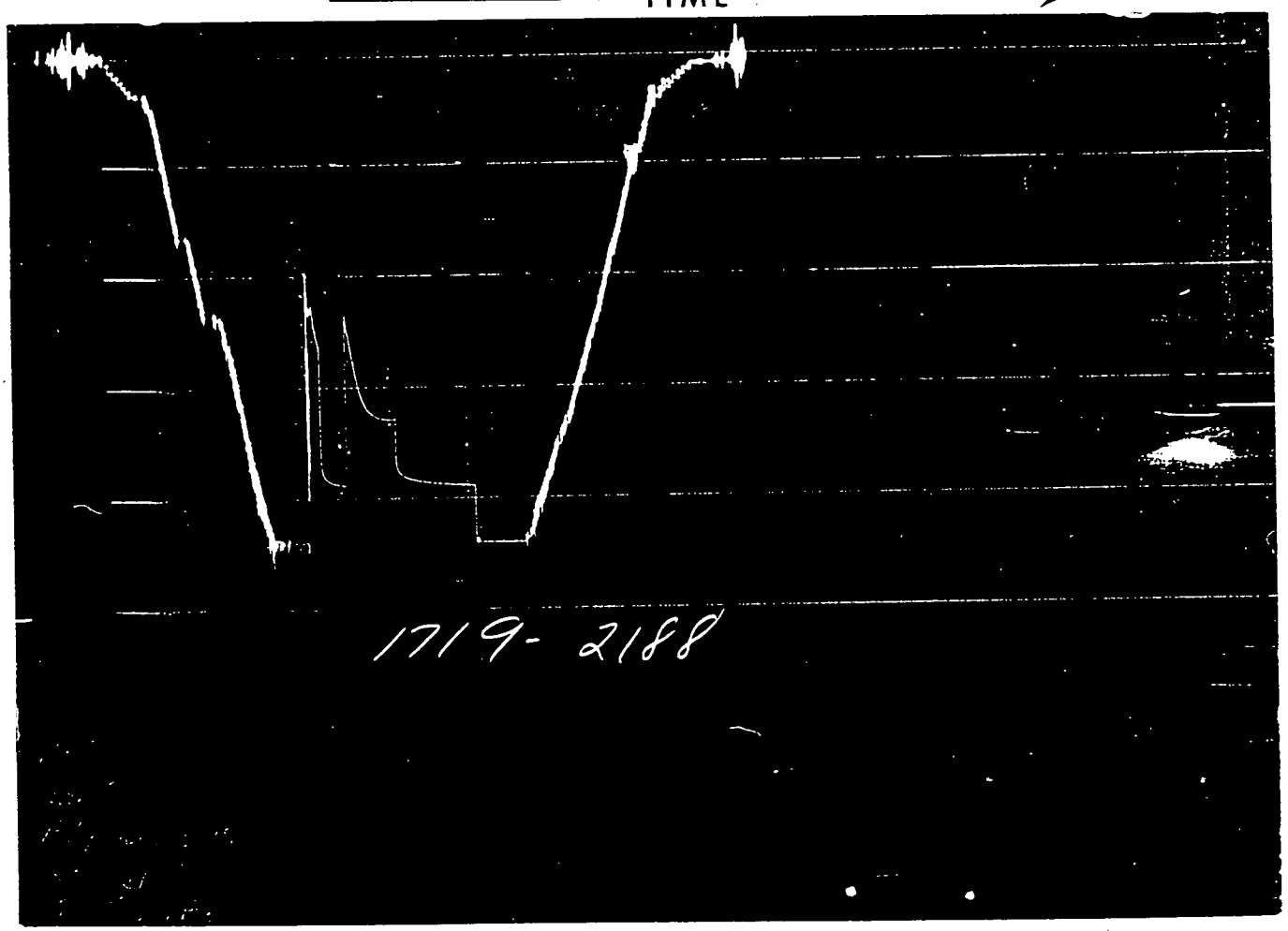
SPECIAL PRESSURE DATA

LITTLE'S



PRESSURE

TIME



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

	O. D.	I. D.	LENGTH	DEPTH
Reversing Sub	6"	3"	1'	
Water Cushion Valve				
Drill Pipe	5"	4.276"	8225'	
Drill Collars	6 1/4"	2 13/16"	612.80'	
S over sub	5 3/4"	3"	.65'	
Handling Sub & Choke Assembly	5.87"	2.58"	2.65'	
Dual CIP Valve	5"	.87"	3.99'	
Dual CIP Sampler				
Hydro-Spring Tester	5"	3/4"	5'	8733.73'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.06"	4.13'	8737.86'
Hydraulic Jar	5"	1"	3.29'	
VR Safety Joint	5"	1"	2.33'	
Pressure Equalizing Crossover				
Packer Assembly	7 3/4"	1.75"	6.29'	8749.77'
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
X over sub	5 5/16"	2"	.64'	
Drill Collars	6 1/4"	2 13/16"	58.76'	
X over sub	5 5/8"	2 5/16"	.75'	
Flush Joint Anchor	5"	2.37"	20'	
Blanked-Off B.T. Running Case	5"	2.44"	4.08'	8830'

000018

FLUID SAMPLER 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.		
Recovery Mud Filtrate	____ @ ____ °F.		____ ppm
Mud Pit Sample	____ @ ____ °F.		
Mud Pit Sample Filtrate	____ @ ____ °F.		____ ppm
Mud Weight	9.6 vis	37 cp	

Date 9-30-71 Ticket Number HI 1720
Kind of Job OPEN HOLE Halliburton District BRISBANE
Tester MR. BORAIN Witness MR. COVEY
Drilling Contractor O.D. & E. RIG 9 DR S

EQUIPMENT & HOLE DATA

Formation Tested Gidgealpa (Middle Member)
Elevation 114' Ft.
Net Productive Interval - Ft.
All Depths Measured From Kelly Bushing
Total Depth 8909' Ft.
Main Hole/Casing Size 8½"
Drill Collar Length 519.43' I.D. 2 13/16"
Drill Pipe Length - I.D. -
Packer Depth(s) 8839.56' Ft.
Depth Tester Valve 8823.52' Ft.

Cushion TYPE AMOUNT Ft. Depth Back Pres. Valve
Surface Choke 1/4-3/8" Bottom Choke 3/4"

Recovered 100 Feet of condensate
Recovered 250 Feet of formation water
Recovered Feet of
Recovered Feet of
Recovered Feet of

Meas. From Tester Valve

Remarks SEE PRODUCTION TEST DATA SHEET

TEMPERATURE	Gauge No. 1895 Depth: 8827.65' Ft.	Gauge No. 2188 Depth: 8905 Ft.	Gauge No. Depth: Ft.	TIME
	12 Hour Clock	24 Hour Clock	Hour Clock	Tool Opened 1:25 P.M.
Est. °F.	Blanked Off No	Blanked Off Yes	Blanked Off	Tool Closed 4:40 P.M.
Actual 246 °F.	Pressures	Pressures	Pressures	

		Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic		4371	4373	4410	4399				
First Period Flow	Initial	1586	1605	1881	1637			____	____
	Final	2212	2215	2388	2379			15	14
Closed in		3871	3869	3873	3864			30	31
Second Period Flow	Initial	1976	1970	2177	2161			____	____
	Final	2066	3075	3136	3122			60	60
Closed in		3854	3854	3851	3844			90	90
Third Period Flow	Initial							____	____
	Final								
Closed in									
Final Hydrostatic		4371	4373	4410	4399			____	____

Legal Location Sec. - Twp. - Rng.
Lease Name FLY LAKE
Well No. 1
Test No. 4
Tested Interval 8839.56'-8909'
Field Area COOPER BASIN
County
State SOUTH AUSTRALIA
DELHI INTERNATIONAL OIL CORPORATION-SANTOS, LTD, VAMGAS PTY. LTD. BRIDGE OIL N.L.

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FORMATION TEST DATA

LITTLE'S 63429 15M 4/69—33, 34-13

Casing perfs._____ Bottom choke_____ Surf. temp_____ °F Ticket No. HI 1720

Gas gravity_____ Oil gravity_____ GOR_____

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

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
8:57					Engaged stylus bottom recorder
9:05					Start in hole
9:35					Engage stylus top recorder
1:25					Opened tool
1:40					Closed tool
2:10					Reopened tool
3:10					Closed tool
4:40					Pulled tool loose

Casing perfs. _____ Bottom choke _____ Surf. temp _____ °F Ticket No. HI 1720

Gas gravity _____ Oil gravity _____ GOR _____

Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
1:30	¼	440			GAs to surface
1:35	¼	900			
1:38	¼				Mud to surface
1:40	¼	1220			
2:10	3/8	630			
2:15	"	1040			
2:20	"	1390			
2:25	"	1610			
2:30	"	1740			
2:35	"	1900			
2:40	"	1950			
2:45	"	1990			
2:50	"	2020			
2:55	"	2050			
3:00	"	2060			
3:05	"	2075			
3:10	"	2080			

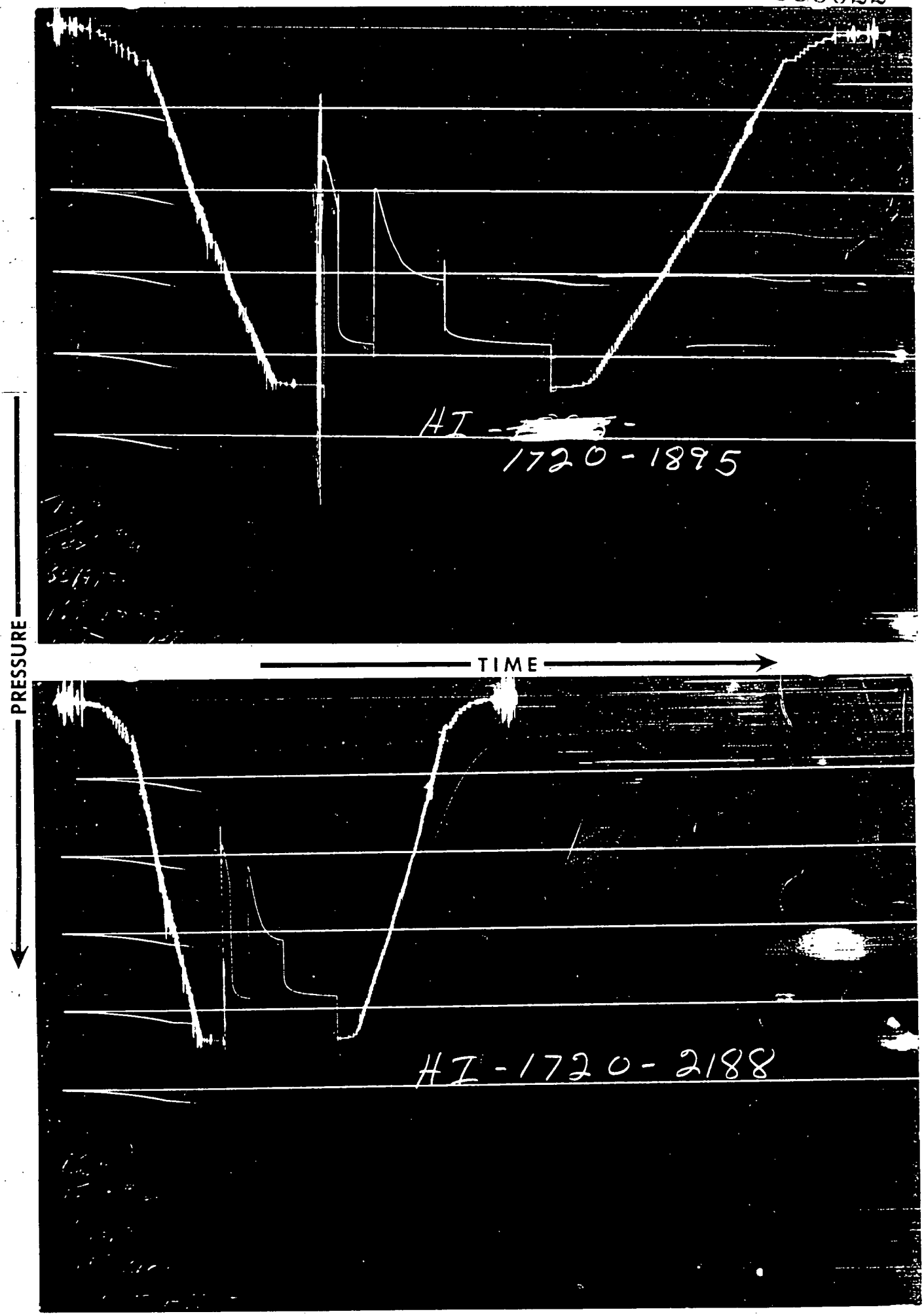
Gauge No. 1895			Depth 8827.65'			Clock No. 7588			12 hour		Ticket No. HI 1720		
	First Flow Period		First Closed In Pressure			Second Flow Period		Second Closed In Pressure			Third Flow Period		Third Closed In Pressure		
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	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	.000	1605	.000		2215	.000	1970	.000		3075					
1	.0146	1592	.0199		3745	.0675	2384	.0620		3756					
2	.0292	1601	.0398		3794	.1350	2742	.1240		3790					
3	.0438	1689	.0597		3816	.2025	2938	.1860		3807					
4	.0584	1818	.0796		3831	.2700	3021	.2480		3820					
5	.0730	1955	.0995		3844	.3375	3058	.3100		3831					
6	.0876	2075	.1194		3850	.4050	3075	.3720		3837					
7	.1020	2215	.1393		3857			.4340		3844					
8			.1592		3861			.4960		3848					
9			.1791		3865			.5580		3852					
10			.2060		3869*			.6200		3854					
11															
12															
13															
14															
15															

Gauge No. 2188			Depth 8905'			Clock No. 7498			24 hour				
0	.000	1637	.000		2379	.000	2161	.000		3122			
1	.0069	1917	.0099		3751	.033	2509	.0301		3751			
2	.0138	1903	.0198		3791	.066	2818	.0602		3784			
3	.0207	1982	.0297		3811	.099	2996	.0903		3800			
4	.0276	2056	.0396		3829	.132	3074	.1204		3813			
5	.0345	2150	.0495		3840	.165	3107	.1505		3822			
6	.0414	2262	.0594		3847	.198	3122	.1806		3827			
7	.0480	2379	.0693		3853			.2197		3836			
8			.0792		3858			.2408		3838			
9			.0891		3862			.2709		3842			
10			.1020		3864*			.3010		3844			
11													
12													
13													
14													
15													

Reading Interval	2	3	10	15	Minutes

REMARKS: * Last interval equal to 4 minutes.

120021



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

	O. D.	I. D.	LENGTH	DEPTH
Reversing Sub	6"	3"	1.00'	
Water Cushion Valve				
Drill Pipe				
Drill Collars	6¼"	2 13/16"	519.43'	
Handling Sub & Choke Assembly	4.87"	2.58"	2.65'	
Dual CIP Valve	5"	.87"	3.99ρ'	
Dual CIP Sampler				
Hydro-Spring Tester	5"	3/4"	5.01'	8823.52'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.06"	4.13'	8827.65'
Hydraulic Jar	5"	1"	3.29'	
VR Safety Joint	5"	1"	2.33'	
Pressure Equalizing Crossover				
Packer Assembly	7 3/4"		6.29'	8839.56'
X over sub	5 5/16"	2"	.64'	
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars	6¼"	2 13/16"	31.97'	
X over sub	5 5/8"	2 5/16"	.75'	
Flush Joint Anchor	5"	2.37"	32.00'	
Blanked-Off B.T. Running Case	5"	2.44"	4.08'	8905'

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.	
Recovery Mud Filtrate	____ @ ____ °F.	____ ppm
Mud Pit Sample	____ @ ____ °F.	
Mud Pit Sample Filtrate	____ @ ____ °F.	____ ppm
Mud Weight	9.6 vis 46 cp	

Date 3-10-71 Ticket Number 024877
Kind of Job OPEN HOLE Halliburton District ADELAIDE
Tester A. DEWER B. PRYOR Witness C. COVEY
Drilling Contractor OCEAN DRILLING & EXPLORATION RIG 9

EQUIPMENT & HOLE DATA

Formation Tested Permiam
Elevation 114' Ft.
Net Productive Interval - Ft.
All Depths Measured From Kelly bushing
Total Depth 9034' Ft.
Main Hole/Casing Size 8 1/2"
Drill Collar Length 697.09' I.D. 2.87"
Drill Pipe Length 8282.82' I.D. 4.276"
Packer Depth(s) 8916.67' Ft.
Depth Tester Valve 8901.92' Ft.

Cushion TYPE AMOUNT Ft. Depth Back Pres. Valve Surface Choke 1/4 & 3/8" Bottom Choke 3/4"

Recovered 6080 Feet of gas cut water
Recovered Feet of
Recovered Feet of
Recovered Feet of
Recovered Feet of

Mea. From Tester Valve

Remarks Tool opened for 14 minute first flow with a weak blow increasing to fair in 5 minutes. Closed tool after 14 minute flow for 31 minute first closed in pressure. Tool reopened for 60 minute second flow. Closed tool for 60 minute second closed in pressure.

CHARTS INDICATE PARTIAL PLUGGING IN ANCHOR PERFORATIONS DURING TEST.

TEMPERATURE	Gauge No. 1895 Depth: 8906 Ft.	Gauge No. 2188 Depth: 9030 Ft.	Gauge No. Depth: Ft.	TIME
	12 Hour Clock	24 Hour Clock	Hour Clock	Tool Opened 6:38 A.M. P.M.
Est. °F.	Blanked Off no	Blanked Off yes	Blanked Off	Tool Closed 9:23 A.M. P.M.
Actual 246 °F.	Pressures	Pressures	Pressures	

		Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic		4422	4434	4490	4475				
First Period	Flow Initial	238	257	729	927			—	—
	Flow Final	491	512	957	998			15	14
	Closed in	3781	3792	3824	3822			30	31
Second Period	Flow Initial	605	635	1250	1595			—	—
	Flow Final	1337	1358	1858	1890			60	60
	Closed in	3760	3784	3802	3809			60	60
Third Period	Flow Initial							—	—
	Flow Final								
	Closed in								
Final Hydrostatic		4401	4424	4468	4421			—	—

Legal Location Sec. - Twp. - Rng.
Lease Name FLY LAKE
Well No. 1
Test No. 5
Tested Interval 8916.67' - 9034'
Field Area COOPER BASIN
County
State SOUTH AUSTRALIA
Lease Owner/Company Name DELHI INTERNATIONAL OIL CORPORATION
SANTOS LIMITED, VANICAS NL

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FORMATION TEST DATA

LITTLE'S

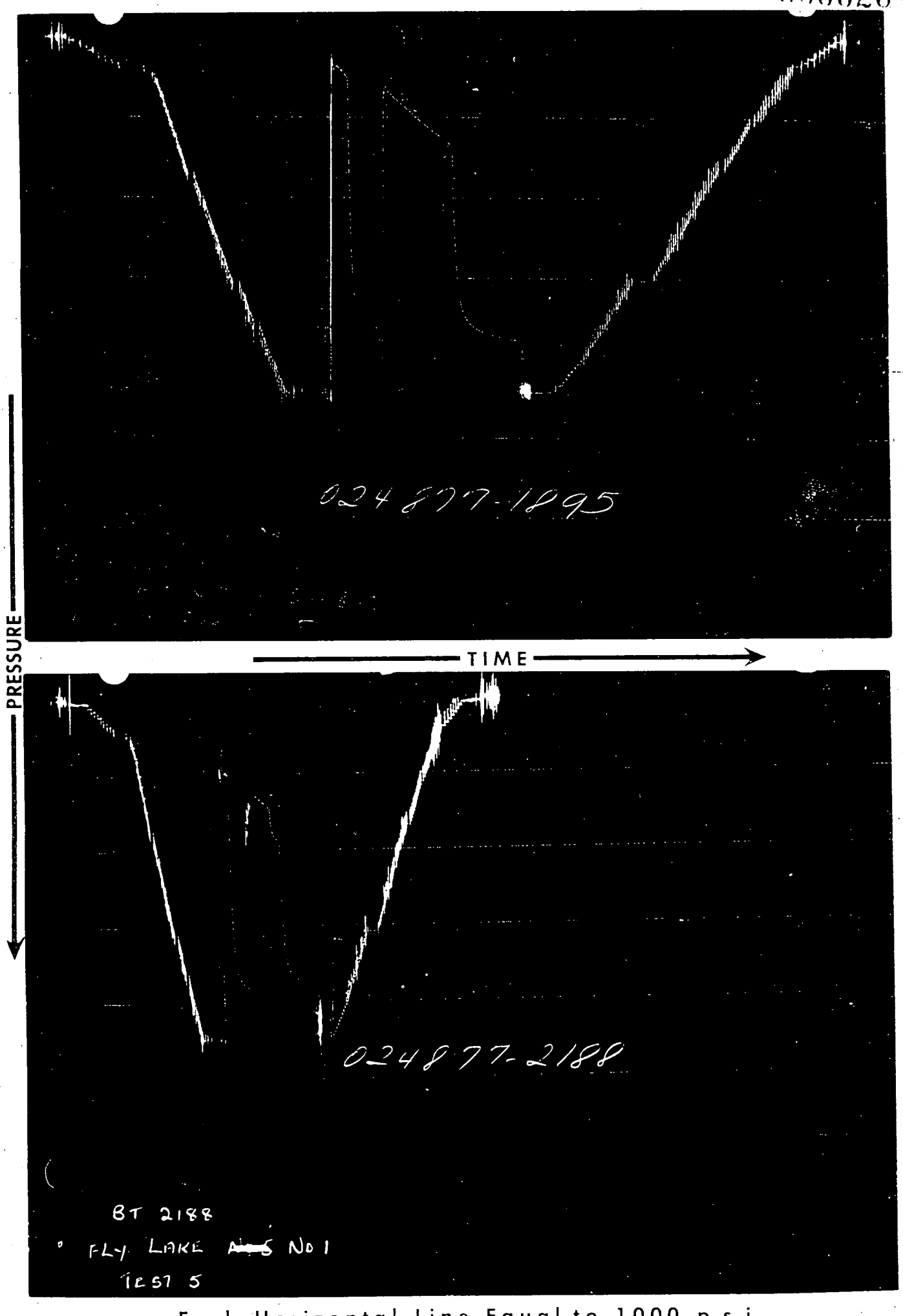
Gauge No.	1895	Depth	8906'	Clock No.	7588	12 hour	Ticket No.	024877

	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	.000	257	.000		512	.000	635	.000		1358					
1	.0134	404	.0201		2609	.0683	762	.0408		3255					
2	.0268	354	.0402		3274	.1366	881	.0816		3520					
3	.0402	376	.0603		3490	.2049	1019	.1224		3608					
4	.0536	404	.0804		3600	.2732	1133	.1632		3660					
5	.0670	445	.1005		3662	.3415	1242	.2040		3692					
6	.0804	473	.1206		3702	.4100	1358	.2448		3719					
7	.0940	512	.1407		3734			.2856		3739					
8			.1608		3758			.3264		3756					
9			.1809		3773			.3672		3771					
10			.2080*		3792			.4080		3784					
11															
12															
13															
14															
15															

Gauge No.	2188	Depth	9030'	Clock No.	7498	24 hour								
0	.000	927	.000		998	.000	1595	.000		1890					
1	.048	998	.0093		3040	.201	1890	.0198		3291					
2			.0186		3407			.0396		3549					
3			.0279		3580			.0594		3638					
4			.0372		3660			.0792		3687					
5			.0465		3707			.0990		3720					
6			.0558		3742			.1188		3744					
7			.0651		3769			.1386		3767					
8			.0744		3791			.1584		3782					
9			.0837		3807			.1782		3798					
10			.0960*		3822			.1980		3809					
11															
12															
13															
14															
15															

Reading Interval	2	3	6	6			Minutes

REMARKS: *Last = 4 minutes.



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

	O. D.	I. D.	LENGTH	DEPTH
Reversing Sub	5.75"	2.78"	1.00'	
Water Cushion Valve				
Drill Pipe	5"	4.276"	8282.82'	
Drill Collars	6.25"	2.87"	88.00'	
X/ over	5.875"	3.00"	.65'	
Handling Sub & Choke Assembly	5.87"		2.65'	
Dual CIP Valve	5.03"	.87"	4'	
Dual CIP Sampler				
Hydro-Spring Tester	5"	.75"	5'	8901.92'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.06"	4.14'	8906.92'
Hydraulic Jar	5"	1.00"	3.26'	
VR Safety Joint	5"	1"	2.35'	
Pressure Equalizing Crossover				
Packer Assembly	7.75"	1.75"	6.25'	8916.67'
Flush joint anchor Distributor	5"	2.37"	10.00'	
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
X over	6.00"	2.125"	.65'	
Drill collar	6.25"	2.25"	88.22'	
Drill Collars X over	6.25"	2.25"	2.50'	
X over	5.75"	2.375"	.65'	
Flush Joint Anchor X over	5.00"	2.37"	5'	
Blanked-Off B.T. Running Case	5.00"	2.44"	4.06'	9030'

000028

FLUID SAMPLER 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.	
Recovery Mud Filtrate	____	@ ____	°F.	____ ppm
Mud Pit Sample	____	@ ____	°F.	
Mud Pit Sample Filtrate	____	@ ____	°F.	____ ppm
Mud Weight	9.7	vis 48		cp

Date 10-5-71 Ticket Number 24878
Kind of Job OPEN HOLE Halliburton District ADELAIDE
Tester MR. PRYOR / MR. DEWAR Witness MR. COVEY
Drilling Contractor O. D. & E. RIG #9 IC

EQUIPMENT & HOLE DATA

Formation Tested Permian
Elevation 114' Ft.
Net Productive Interval - Ft.
All Depths Measured From Kelly Bushing
Total Depth 9266' Ft.
Main Hole/Casing Size 8 1/2"
Drill Collar Length 697.07' I.D. 2.25"
Drill Pipe Length 8499.75' I.D. 4.276"
Packer Depth(s) 9092.42' Ft.
Depth Tester Valve 9071.42' Ft.

Cushion TYPE 1100' WATER AMOUNT Ft. Depth Back Pres. Valve - Surface Choke 1/4" & 3/8" Bottom Choke 3/4"

Recovered 1100 Feet of Water cushion
Recovered Feet of
Recovered Feet of
Recovered Feet of
Recovered Feet of

Meas. From Tester Valve

Remarks Ran tool to bottom. 52' fill on bottom. Tried to work tool through fill and could not. Pulled out of hole.

TEMPERATURE	Gauge No. 1895	Gauge No. 2188	Gauge No.	TIME
	Depth: 9076.42' Ft.	Depth: 9262' Ft.	Depth: Ft.	
	12 Hour Clock	24 Hour Clock	Hour Clock	Tool Opened A.M. P.M.
Est. °F.	Blanked Off NO	Blanked Off YES	Blanked Off	
Actual 246 °F.	Pressures	Pressures	Pressures	Tool Closed A.M. P.M.

		Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic		NO READINGS		NO READINGS				____	____
First Period	Flow Initial	COULD NOT REACH		COULD NOT REACH					
	Flow Final	BOTTOM...52' FILL		BOTTOM...52' FILL					
	Closed in								
Second Period	Flow Initial							____	____
	Flow Final								
	Closed in								
Third Period	Flow Initial							____	____
	Flow Final								
	Closed in								
Final Hydrostatic								____	____

Lease Name: FLY LAKE
Well No.: 1
Test No.: 6
Tested Interval: 9092.42' - 9266'
Company Name: DELHI INTERNATIONAL OIL CORPORATION, SANTOS LIMITED, VAMGAS N.V., Co.
Legal Location Sec. - Twp. - Rng.: ---
Field Area: COOPER BASIN
County: ---
State: SOUTH AUSTRALIA

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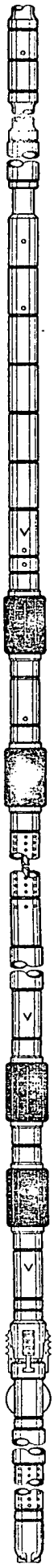
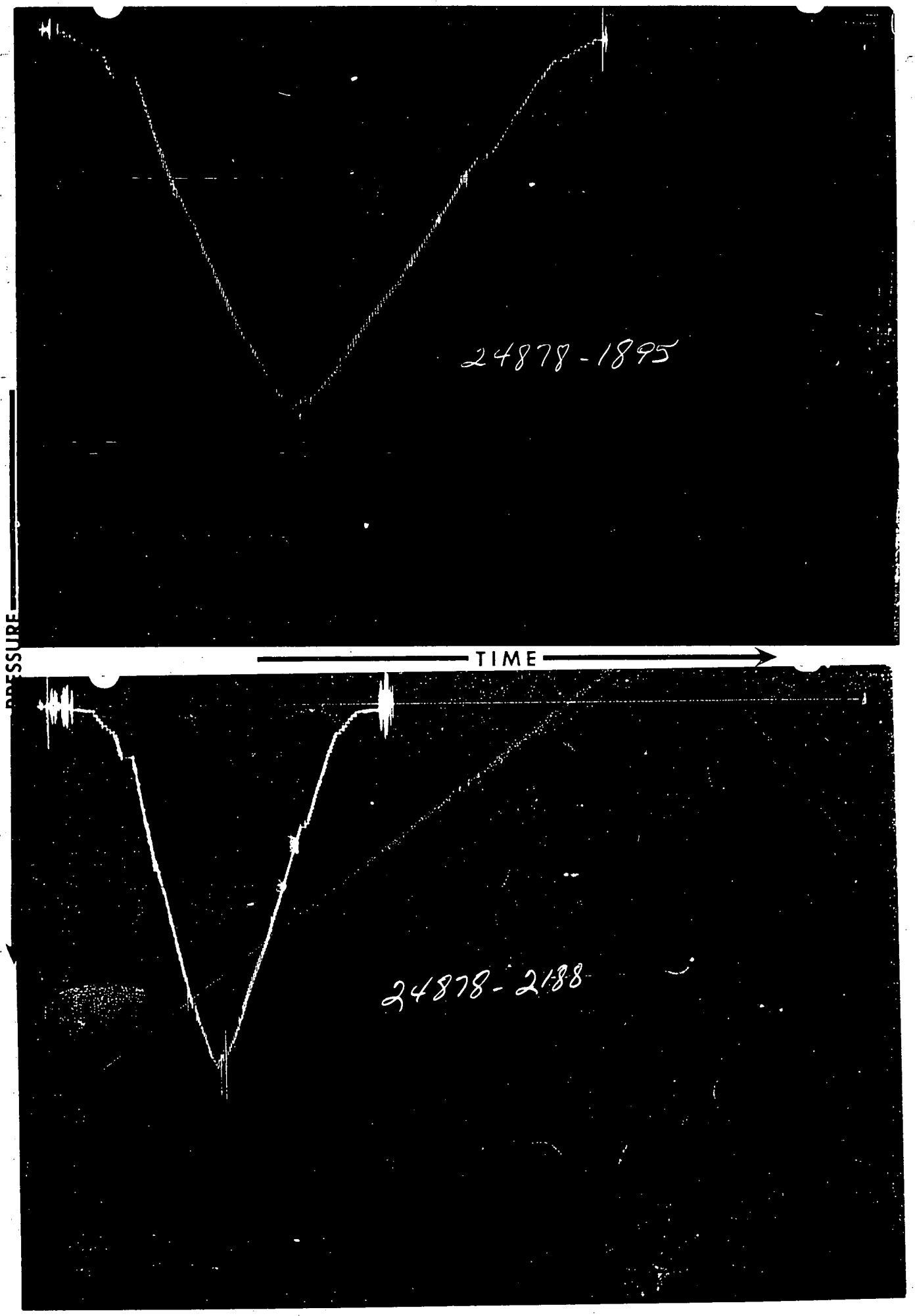
FORMATION TEST DATA

LITTLE'S 83429 15M 4/69—35, 34-13



	O. D.	I. D.	LENGTH	DEPTH
Reversing Sub	5.75"	2.78"	1.00'	
Water Cushion Valve				
Drill Pipe	5"	4.276"	8499.75'	
Drill Collars	6.25"	2.25"	697.07'	
X/O	5.875"	3.00"	.65'	
Handling Sub & Choke Assembly	5.87"		2.65'	
Dual CIP Valve	5.03"	.87"	4.00'	
Dual CIP Sampler				
Hydro-Spring Tester	5.00"	.75"	5.00'	9071.42'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5.00"	3.06"	4.14'	9076.42'
Hydraulic Jar	5.00"	1.00"	3.26'	
VR Safety Joint	5.00"	1.00"	2.35'	
Pressure Equalizing Crossover				
Packer Assembly	7.75"	1.75"	6.25'	9092.42'
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Packer Assembly				
Anchor Pipe Safety Joint				
~~XXXXXXXXXXX~~ FLUSH JOINT ANCHOR	5.00"	2.37"	13'	9098.67'
XO	6.00"	2.125"	.65'	
DRILL COLLAR	6.25"	2.25"	117.47'	
XO	6.25"	2.25"	2.50'	
~~XXXXXXXX~~ XO	5.75"	2.375"	.65'	
Flush Joint Anchor	5.00"	2.37"	29.00'	
Blanked-Off B.T. Running Case	5.00"	2.44"	4.06'	9262'



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

000031

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.	
Recovery Mud Filtrate	____ @ ____ °F.	____ ppm
Mud Pit Sample	____ @ ____ °F.	
Mud Pit Sample Filtrate	____ @ ____ °F.	____ ppm
Mud Weight	10.0 vis 76 cp	

Date 10-6-71 Ticket Number 24879
Kind of Job OPEN HOLE Halliburton District ADELAIDE
Tester MR. PRYOR. MR. DEWAR Witness MR. COVEY
Drilling Contractor O.D. AND E. RIG #9 BC S

EQUIPMENT & HOLE DATA

Formation Tested Permian
Elevation 114' Ft.
Net Productive Interval - Ft.
All Depths Measured From Kelly Bushing
Total Depth 9266' Ft.
Main Hole/Casing Size 8½"
Drill Collar Length 697.07' I.D. 2.25"
Drill Pipe Length 8499.75" I.D. 4.276"
Packer Depth(s) 9092.42' Ft.
Depth Tester Valve 9071.42' Ft.

Cushion TYPE Water AMOUNT 1100' Ft. Depth Back Pres. Valve — Surface Choke ¼" & 3/8" Bottom Choke 3/4"

Recovered 60 Feet of Salty water
Recovered 30 Feet of Condensate (Reversed drill pipe through pump out sub)
Recovered Feet of
Recovered Feet of
Recovered Feet of

Mea. From Tester Valve

Remarks See production test data sheet.

TEMPERATURE	Gauge No. 1895 Depth: 9076.42 Ft.	Gauge No. 2188 Depth: 9262 Ft.	Gauge No. Depth: Ft.	TIME
	12 Hour Clock	24 Hour Clock	Hour Clock	Tool Opened 2:45 P.M.
Est. °F.	Blanked Off No	Blanked Off Yes	Blanked Off	Tool Closed 6:00 P.M.
Actual 246 °F.	Pressures	Pressures	Pressures	

		Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic		4614	4631	4712	4714				
First Period	Flow Initial	2303	2444 Q	2397	2574 Q			—	—
	Flow Final	2582	2601	2643	2682			15	13
	Closed in	3996	3994	4024	4013			30	30
Second Period	Flow Initial	2474	2483	2599	2621			—	—
	Flow Final	3503	3488	3513	3529			60	62
	Closed in	3996	3979	4046	4000			90	90
Third Period	Flow Initial							—	—
	Flow Final								
	Closed in								
Final Hydrostatic		4614	4610	4712	4687			—	—

Q = Questionable

Legal Location Sec. - Twp. - Rng. ---
Lease Name FLY LAKE
Well No. 1
Test No. 7
Tested Interval 9092.42' - 9266'
Field Area COOPER BASIN
County ---
State SOUTH AUSTRALIA
Company Name DELHI INTERNATIONAL OIL CORPORATION
SANTOS LIMITED, VAMGAS N.L.

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FORMATION TEST DATA

LITTLE'S

000032

Casing perfs. _____ Bottom choke 3/4" Surf. temp _____ °F Ticket No. 24879

Gas gravity _____ Oil gravity _____ GOR _____

Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
9:25					Engaged bottom stylus
9:40					Started in hole
10:38					Engaged top stylus
11:00					Started water cushion
2:45 PM					Opened tool
3:00	¼"	950			Closed tool (Gas to surface)
3:30	3/8"				Opened tool
3:35	"	950			
3:40	"	1250			
3:45	"	1500			
3:50	"	1700			
3:55	"	1900			
4:00	"	1950			
4:05	"	2000			
4:10	"	2000			
4:15	"	2000			
4:20	"	2000			
4:25	"	2000			
4:30	"				Closed tool
6:00					Pulled out of hole. Jarred three times.
					Pulled out of hole without further
8:55					incident. Dropped bar and reversed
					condensate.

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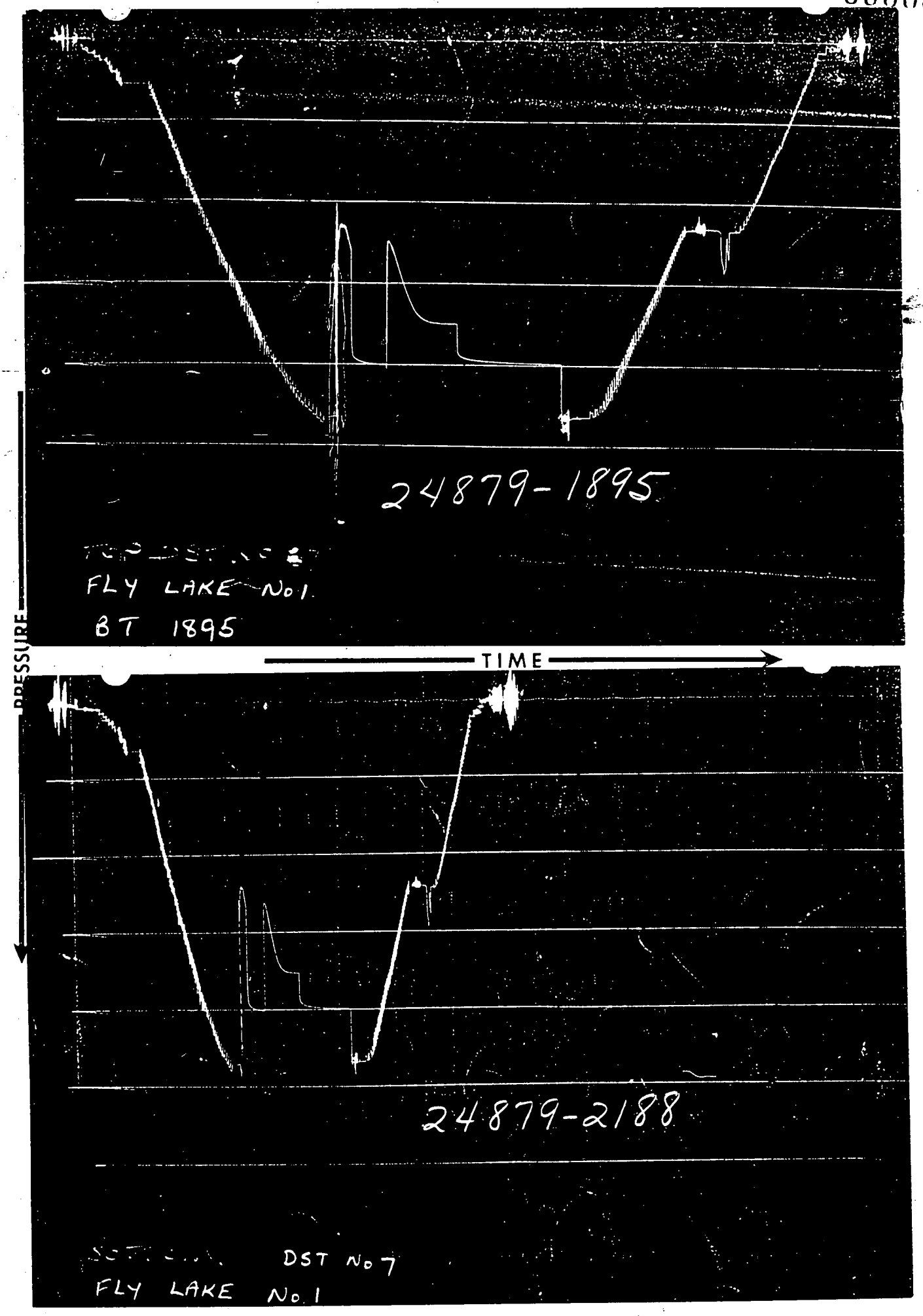
PRODUCTION TEST DATA

LITTLE'S

Gauge No. 1895			Depth 9076.42'			Clock No. 7588			12 hour	Ticket No. 24879				
	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	2444Q	.0000		2601	.0000	2483	.0000		3488					
1	.0132	2457	.0069		3831	.0669	2762	.0068		3852					
2	.0265	2294	.0137		3895	.1339	3180	.0135		3872					
3	.0397	2294	.0206		3912	.2008	3409	.0203		3884					
4	.0529	2318	.0275		3923	.2678	3471	.0270		3893					
5	.0662	2427	.0343		3931	.3347	3486	.0338		3899					
6	.0794	2543	.0412		3940	.4150	3488***	.0405		3906					
7	.0860	2601*	.0481		3946			.0473		3910					
8			.0549		3951			.0540		3916					
9			.0618		3957			.0608		3919					
10			.0687		3959			.0676		3922					
11			.1030		3976			.2027		3953					
12			.1373		3985			.3378		3966					
13			.1717		3989			.4729		3974					
14			.2060		3994			.6080		3979					
15															

Gauge No. 2188					Depth 9262'			Clock No. 7498		24 hour					
0	.0000	2574Q	.0000		2682	.0000	2621	.0000		3529					
1	.0065	2592	.0033		3873	.0326	2841	.0033		3869					
2	.0129	2428	.0067		3916	.0652	3227	.0066		3891					
3	.0194	2424	.0100		3933	.0977	3449	.0099		3904					
4	.0258	2442	.0133		3944	.1303	3509	.0132		3913					
5	.0323	2549	.0167		3953	.1629	3524	.0165		3920					
6	.0388	2657	.0200		3960	.2020	3529***	.0198		3927					
7	.0420	2682*	.0233		3967			.0231		3933					
8			.0267		3973			.0264		3938					
9			.0300		3978			.0297		3940					
10			.0333		3982			.0330		3944					
11			.0500		3998			.0990		3973					
12			.0667		4007			.1650		3987					
13			.0833		4011			.2310		3993					
14			.1000		4013			.2970		4000					
15															
Reading Interval	2			**			10		****						Minutes

REMARKS: Q = Questionable *Interval = 1 minute **First 10 intervals read in one minute intervals, last four intervals equal 5 minutes. ***Interval = 12 minutes ****First 10 intervals read in one minute intervals, last four intervals equal 20 minutes.



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

24879

	O. D.	I. D.	LENGTH	DEPTH
Reversing Sub	5.75"	2.78"	1'	
Water Cushion Valve				
Drill Pipe	5"	4.276"	8499.75'	
Drill Collars	6.25"	2.25"	697.07'	
X/O	5.875"	3"	.65'	
Handling Sub & Choke Assembly	5.87"	-	2.65'	
Dual CIP Valve	5.03"	.87"	4'	
Dual CIP Sampler				
Hydro-Spring Tester	5"	.75"	5'	9071.42'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.06"	4.14'	9076.42'
Hydraulic Jar	5"	1"	3.26'	
VR Safety Joint	5"	1"	2.35'	
Pressure Equalizing Crossover				
Packer Assembly	7.75"	1.75"	6.25'	9092.42'
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Packer Assembly				
Anchor Pipe Safety Joint				
Flush Joint Anchor	5"	2.37"	13'	
~~Side Wall Anchor~~ X/O	6"	2.125"	.65'	
Drill Collars	6.25"	2.25"	117.47'	
~~Drill Collars~~ X/O	6.25"	2.25"	2.50'	
X/O	5.75"	2.375"	.65'	
Flush Joint Anchor	5"	2.37"	29'	
Blanked-Off B.T. Running Case	5"	2.44"	4.06'	9262'

000036

FLUID SAMPLER 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	.34 @ 74 °F.		_____ ppm
Recovery Mud	_____ @ _____ °F.		
Recovery Mud Filtrate	_____ @ _____ °F.		_____ ppm
Mud Pit Sample	_____ @ _____ °F.		
Mud Pit Sample Filtrate	_____ @ _____ °F.		_____ ppm
Mud Weight	9.9 vis		57 cp

Date 10-8-71 Ticket Number 24881
Kind of Job OPEN HOLE Halliburton District ADELAIDE
Tester MR. PRYOR / MR. DEWAR Witness MR. COVEY
Drilling Contractor O.D.E. RIG 9 DR S

EQUIPMENT & HOLE DATA

Formation Tested Permium
Elevation 114' Ft.
Net Productive Interval ? Ft.
All Depths Measured From Kelly Bushing
Total Depth 9333' Ft.
Main Hole/Casing Size 8½"
Drill Collar Length 697.09' I.D. 2.87"
Drill Pipe Length 8555.12' I.D. 4.276"
Packer Depth(s) 9278.69'-9284.94' Ft.
Depth Tester Valve 9263.94' Ft.

Cushion TYPE Water AMOUNT 1350' Ft. Depth Back Pres. Valve _____ Surface Choke 1/2" Bottom Choke 3/4"

Recovered 90 Feet of water below pump out sub after reversing.
Recovered _____ Feet of _____
Recovered _____ Feet of _____
Recovered _____ Feet of _____
Recovered _____ Feet of _____

Meas. From Tester Valve

Remarks SEE PRODUCTION TEST DATA SHEET

TEMPERATURE	Gauge No. 1895		Gauge No. 2188		Gauge No.		TIME	
	Depth: 9268.94' Ft.		Depth: 9329 Ft.		Depth: Ft.			
	12 Hour Clock		24 Hour Clock		Hour Clock		Tool Opened	A.M. 1:55 P.M.
Est. °F.	Blanked Off No		Blanked Off Yes		Blanked Off			
Actual 156 °F.	Pressures		Pressures		Pressures		Tool Closed	A.M. 5:01 P.M.
	Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic	4827.1	4657	4866.7	4683				
First Period Flow Initial	734.3	454	728.9	729			—	—
First Period Flow Final	777.5	892	911.2	934			17	16
First Period Closed in	4095.5	4036	4024.2	4044			34	32
Second Period Flow Initial	803.9	862	911.2	902			—	—
Second Period Flow Final	1572.9	1564	1587.8	1588			60	63
Second Period Closed in	3974.1	3974	3957.6	3982			75	75
Third Period Flow Initial							—	—
Third Period Flow Final								
Third Period Closed in								
Final Hydrostatic	4613.9	4574	4600.7	4596			—	—

Legal Location Sec. - Twp. - Rng.
Lease Name FLY LAKE
Well No. 1
Test No. 8
Tested Interval 9285'-9333'
Field Area COOPER BASIN
County
State SOUTH AUSTRALIA
Lease Owner/Company Name DELHI SANTOS VAMGAS N.L.

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FORMATION TEST DATA

LITTLE'S 83429 15M 4/69—33-34-13

8

000037

Casing perfs. _____ Bottom choke 3/4" Surf. temp. _____ °F Ticket No. 24881

Gas gravity _____ Oil gravity _____ GOR _____

Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
8:00					Engage bottom stylus
8:40					Engage top stylus
10:25					Start water cushion
1:55 PM	1/2"	0			Opened tool
2:12	"	350			Closed tool
2:46					Opened tool
2:50	"	150			
2:55	"	200			
3:00	"	250			
3:05	"	350			
3:10	"	400			
3:15	"	500			
3:20	"	500			
3:25	"	500			
3:30	"	510			
3:35	"	540			
3:40	"	550			
3:45	"	550			
3:46	"				Closed tool
5:01					Pull tool loose
7:45					Reversed condensate

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PRODUCTION TEST DATA

LITTLE'S

8

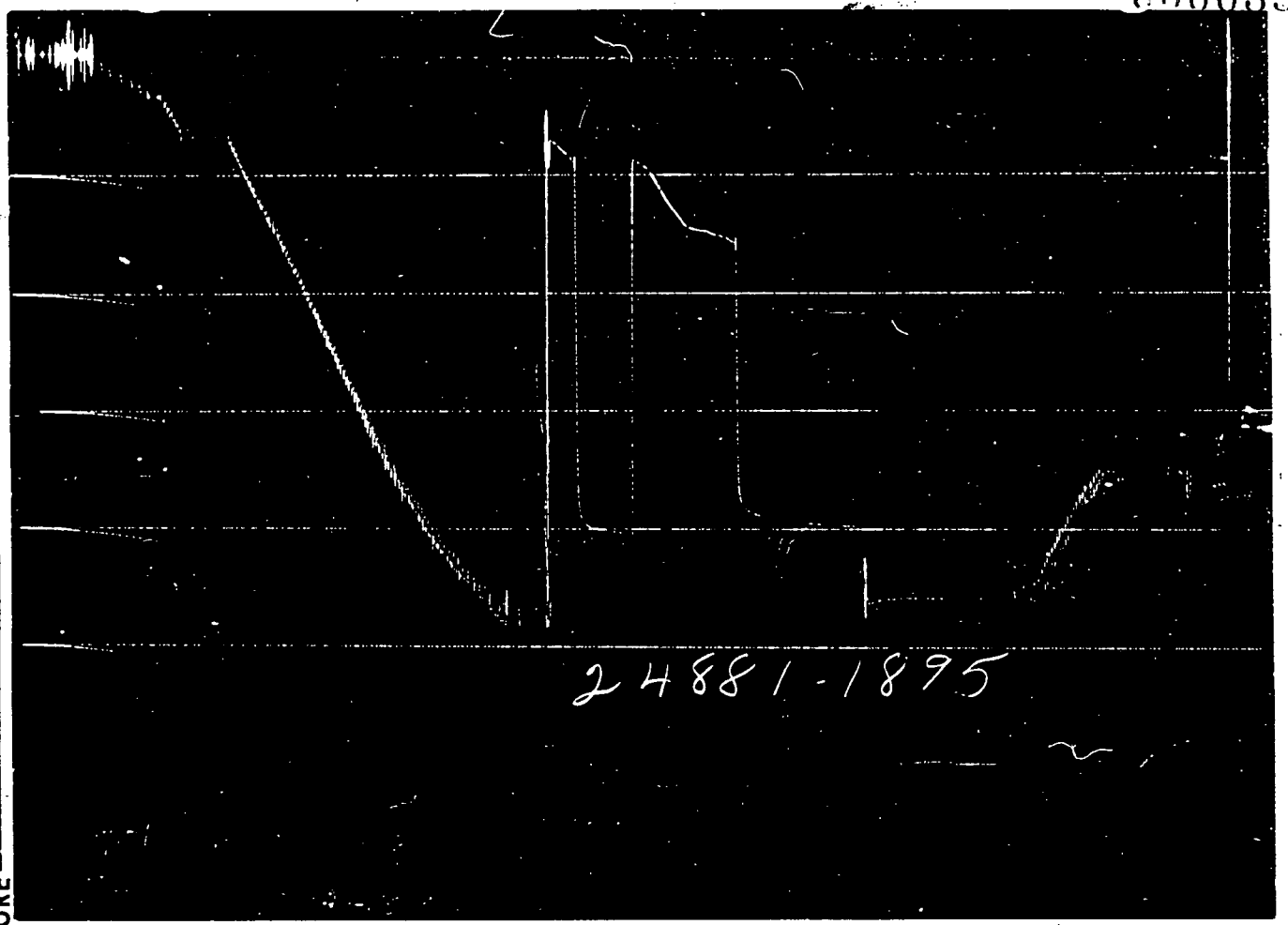
Gauge No. 1895			Depth 9268.94'			Clock No. 7588			12 hour		Ticket No. 24881		
	First Flow Period		First Closed In Pressure			Second Flow Period		Second Closed In Pressure			Third Flow Period		Third Closed In Pressure		
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\text{Log}\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\text{Log}\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\text{Log}\frac{t+\theta}{\theta}$	PSIG Temp. Corr.
0	.000	454	.000		892	.000	862	.000		1496					
1	.028	719	.0213		3886	.0668	944	.0479		3842					
2	.056	773	.0426		3964	.1336	1180	.0958		3884					
3	.084	827	.0639		3989	.2004	1376	.1437		3910					
4	.112	892	.0852		4004	.2672	1455	.1916		3923					
5			.1062		4013	.3340	1496	.2395		3936					
6			.1278		4019	.4210	1564**	.2874		3946					
7			.1491		4026			.3353		3955					
8			.1704		4030			.3832		3961					
9			.1917		4034			.4311		3966					
10			.2270		4036*			.5140		3974***					
11															
12															
13															
14															
15															

Gauge No. 2188					Depth 9329'			Clock No. 7498			24 hour				
0	.000	729	.000		934	.000	902	.000		1588					
1	.0133	761	.0099		3933	.0329	965	.0230		3858					
2	.0266	813	.0198		3984	.0658	1189	.0460		3898					
3	.0399	859	.0297		4002	.0987	1392	.0690		3918					
4	.0530	934	.0396		4013	.1316	1480	.0920		3933					
5			.0495		4022	.1645	1518	.1150		3944					
6			.0594		4027	.2070	1588**	.1380		3953					
7			.0693		4031			.1610		3962					
8			.0792		4035			.1840		3969					
9			.0891		4040			.2070		3973					
10			.1060		4044*			.2460		3982***					
11															
12															
13															
14															
15															
Reading Interval	4		3			10		7							Minutes

REMARKS: * Last interval equal to 5 minutes ** 13 minutes ***-10 minutes.

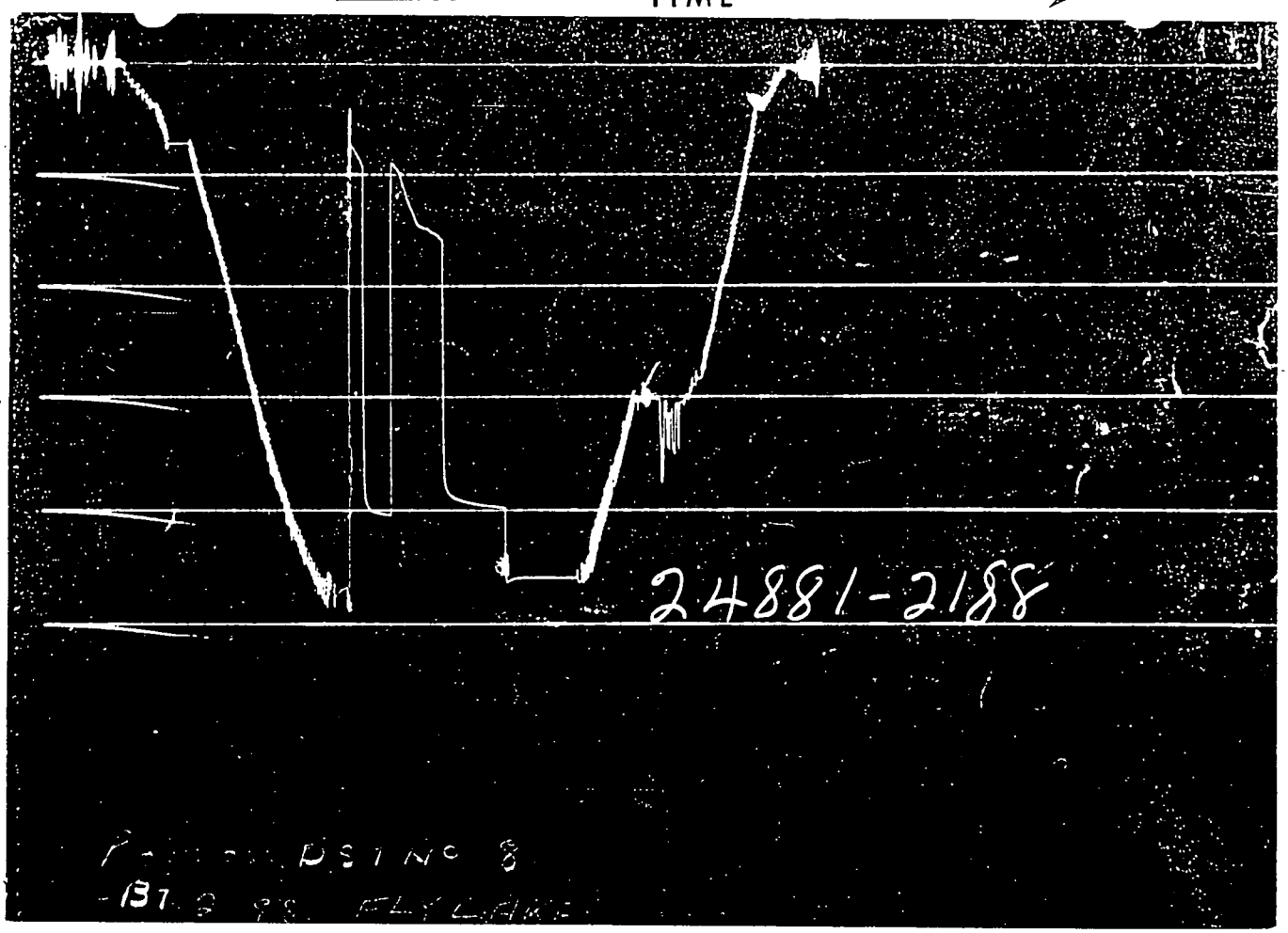
SPECIAL PRESSURE DATA

0000038



PRESSURE

TIME



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

	O. D.	I. D.	LENGTH	DEPTH
Reversing Sub	5.75"	2.78"	1.00'	
Water Cushion Valve				
Drill Pipe	5"	4.276"	8555.12'	
Drill Collars	6.25"	2.87"	697.09'	
X over	5.875"	3.00"	.65' XO	
Handling Sub & Choke Assembly	5.87"		2.65'	
Dual CIP Valve	5.03"	.87"	4.00'	
Dual CIP Sampler				
Hydro-Spring Tester	5.00"	.75"	5.00'	9263.94'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5.00"	3.06"	4.14'	9268.94'
Hydraulic Jar	5.00"	1.00"	3.26'	
VR Safety Joint	5.00"	1.00"	2.35'	
Pressure Equalizing Crossover				
Packer Assembly	7.75"	1.75"	6.25'	9278.69'
Bottom of packer			1.00'	9284.94'
~~Distributor~~ - Flush joint anchor	5.00"	2.37"	43.00'	
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor				
Blanked-Off B.T. Running Case	5.00"	2.44"	4.06'	9329'

000041

FLUID SAMPLER 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	.22 @ 82 °F.		
Recovery Mud Filtrate	____ @ ____ °F.		____ ppm
Mud Pit Sample	____ @ ____ °F.		
Mud Pit Sample Filtrate	____ @ ____ °F.		____ ppm
Mud Weight	9.9 vis	55 cp	

Date 10-10-71 Ticket Number 24883
Kind of Job OPEN HOLE Halliburton District ADELAIDE
Tester MR. PRYOR / MR. DEWAR Witness MR. COVEY
Drilling Contractor O.D.E. RIG 9 DR S

EQUIPMENT & HOLE DATA

Formation Tested Permium
Elevation 114' Ft.
Net Productive Interval - Ft.
All Depths Measured From Kelly Bushing
Total Depth 9393' Ft.
Main Hole/Casing Size 8½"
Drill Collar Length 697.09' I.D. 2.25"
Drill Pipe Length 8632' I.D. 4.276"
Packer Depth(s) 9327.14'-9333.39' Ft.
Depth Tester Valve 9312.39' Ft.

Cushion TYPE 1350' Water AMOUNT Ft. Depth Back Pres. Valve — Surface Choke 1/2" Bottom Choke 3/4"

Recovered 90 Feet of mud (reversed oil and gas cut water cushion)
Recovered Feet of
Recovered Feet of
Recovered Feet of
Recovered Feet of

Mea. From Tester Valve

Remarks Opened tool for 14 minute e first flow with a weak blow. Closed tool for 29 minute first closed in pressure. Gas to surface. Reopened tool for 95 minute second flow. Closed tool for 87 minute final closed in pressure.

TEMPERATURE	Gauge No. 1895 Depth: 9317.39' Ft.	Gauge No. 2188 Depth: 9389 Ft.	Gauge No. Depth: Ft.	TIME
	12 Hour Clock	24 Hour Clock	Hour Clock	Tool Opened 5:57 A.M.
Est. °F.	Blanked Off No	Blanked Off Yes	Blanked Off	Tool Closed 9:42 A.M.
Actual 258 °F.	Pressures	Pressures	Pressures	

		Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic		4699.2	4699	4711.5	4736				
First Period	Flow Initial	475.2	549	523.9	597			—	—
	Flow Final	496.8	499	546.7	540			15	14
	Closed in	4038.2	4045	4024.2	4067			30	29
Second Period	Flow Initial	475.2	499	501.1	506			—	—
	Flow Final	777.5	790	797.3	820			90	95
	Closed in	3952.7	3974	3957.6	3989			90	87
Third Period	Flow Initial							—	—
	Flow Final								
	Closed in								
Final Hydrostatic		4677.8	4676	4667.2	4701			—	—

Legal Location Sec. - Twp. - Rng.
Lease Name: FLY LAKE
Well No.: 1
Test No.: 9
Tested Interval: 9333'-9393'
Field Area: COOPER BASIN
County
State: SOUTH AUSTRALIA
Lease Owner/Company Name: DELHI SANTOS VAMGAS N.L.

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FORMATION TEST DATA

LITTLE'S 83429 15M 4/69—33, 34-13

Casing perfs. _____ Bottom choke 3/4" Surf. temp _____ °F Ticket No. 24883

Gas gravity _____ Oil gravity _____ GOR _____

Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
11:40 PM					Engaged bottom stylus
12:15 AM					Engaged top stylus
12:50					Water cushion
5:57	1/2"				Open tool
6:12					Closed tool
6:42					Opened tool
8:12	1/2"	40			Closed tool
9:42					Pull tool loose
11:15					Reversed oil and gas cut water cushion

Gauge No.	1895	Depth	9317.39'	Clock No.	7588	12 hour	Ticket No.	24883

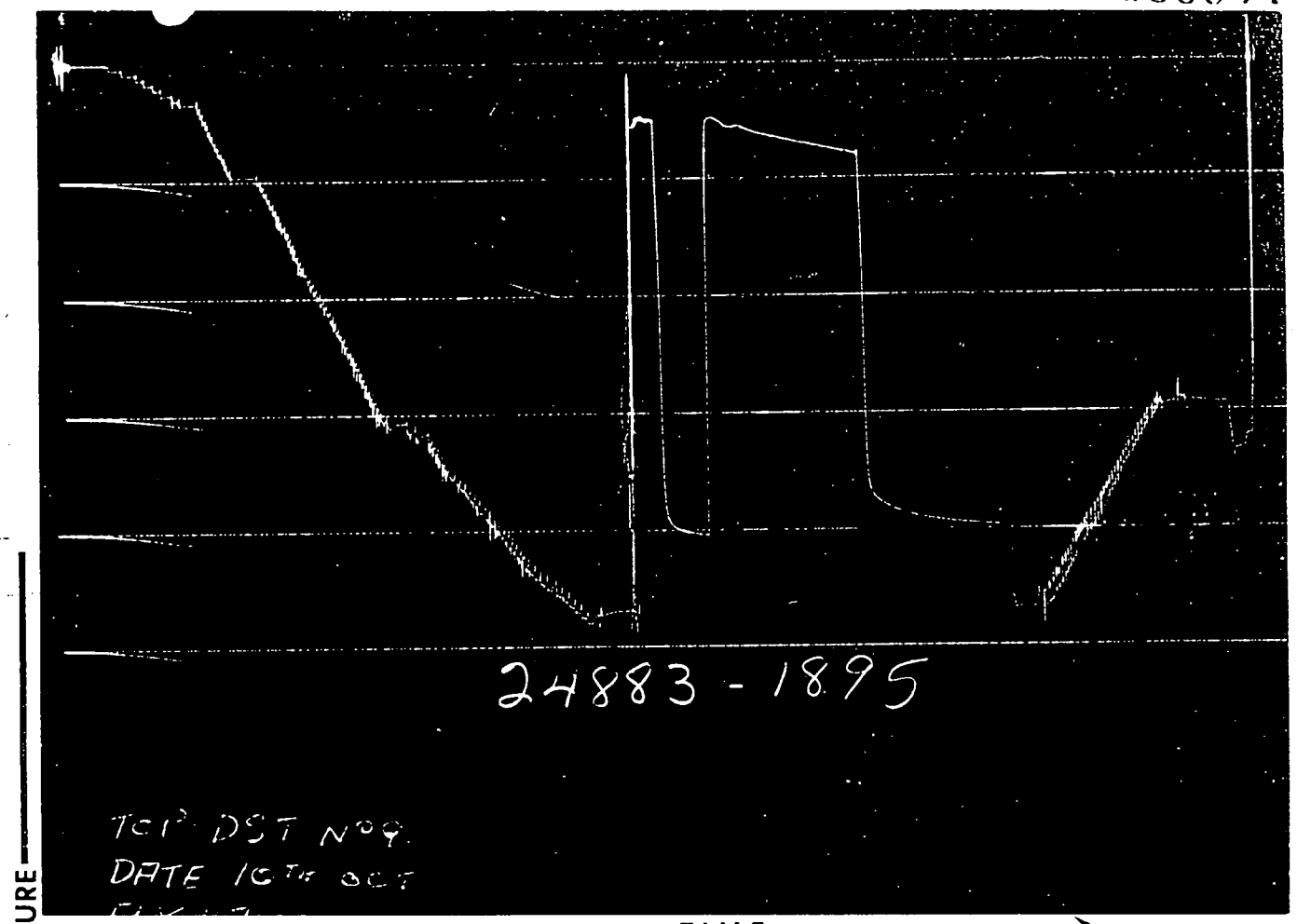
	First Flow Period		First Closed In Pressure			Second Flow Period		Second Closed In Pressure			Third Flow Period		Third Closed In Pressure		
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.
0	.000	549	.000		499	.000	499	.000		790					
1	.099	499	.0210		3443	.1256	551	.0631		3738					
2			.0420		3891	.2512	622	.1262		3820					
3			.0630		3968	.3768	687	.1893		3867					
4			.0840		3996	.5024	739	.2524		3901					
5			.1050		4013	.6280	790	.3155		3921					
6			.1260		4021			.3786		3936					
7			.1470		4030			.4417		3949					
8			.1680		4038			.5048		3961					
9			.1890		4043			.5679		3970					
10			.2030		4045*			.6100		3974**					
11															
12															
13															
14															
15															

Gauge No.	2188	Depth	9389'	Clock No.	7498	24 hour

0	.000	597	.000		540	.000	506	.000		820					
1	.047	540	.0100		3496	.0636	583	.0303		3771					
2			.0200		3960	.1272	654	.0606		3853					
3			.0300		3998	.1908	720	.0909		3900					
4			.0400		4020	.2544	770	.1212		3920					
5			.0500		4035	.3180	820	.1515		3942					
6			.0600		4047			.1818		3956					
7			.0700		4053			.2121		3971					
8			.0800		4058			.2424		3978					
9			.0900		4062			.2828		3989					
10			.0970		4067*			.2930		3989**					
11															
12															
13															
14															
15															

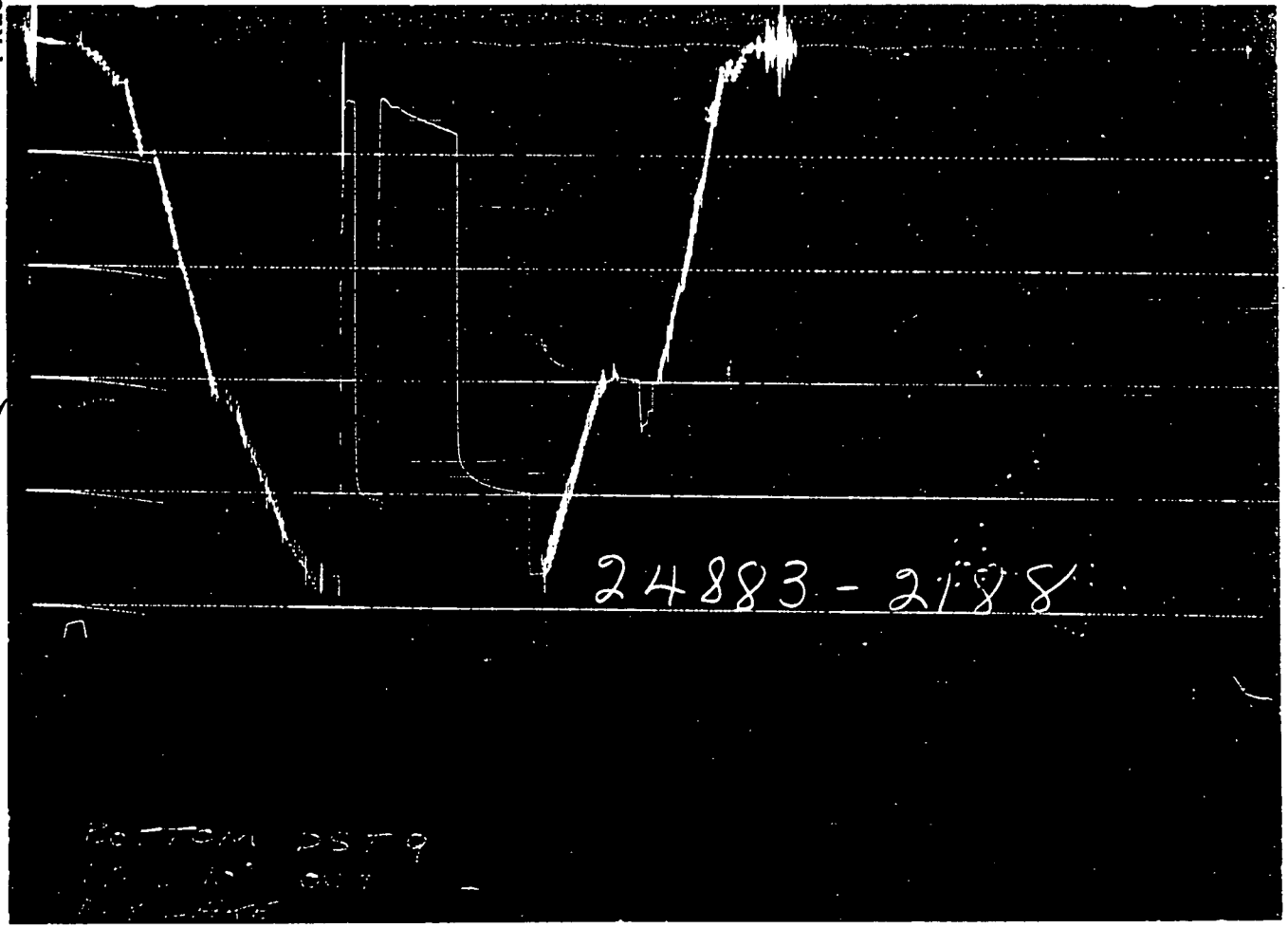
Reading Interval	3	19	9	Minutes

REMARKS: * Last interval equal to 2 minutes **-6 minutes.



PRESSURE

TIME



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

24883

	O. D.	I. D.	LENGTH	DEPTH
Reversing Sub	5.75"	2.78"	1.00'	
Water Cushion Valve				
Drill Pipe	5"	4.276"	8632'	
Drill Collars	6.25"	2.25"	697.09'	
XO	5.875"	2.87"	.65'	
Handling Sub & Choke Assembly	5.87"	2.58"	2.65'	
Dual CIP Valve	5.03"	.87"	4.00'	
Dual CIP Sampler				
Hydro-Spring Tester	5.00"	.75"	5.00'	9312.39'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5.00"	3.06"	4.14'	9317.39'
Hydraulic Jar	5.00"	1.00"	3.26'	
VR Safety Joint	5.00"	1.00"	2.35'	
Pressure Equalizing Crossover				
Packer Assembly	7.75"	1.75"	6.25'	9327.14'
Bottom of packer				9333.39'
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Packer Assembly				
Anchor Pipe Safety Joint				
~~Side Wall Anchor~~ Flush joint anchor	5.00"	2.37"	10.00'	9334.39'
X)	6.00"	2.125"	.65'	
Drill Collars	6.25"	2.25"	29.25'	
XO	5.75"	2.375"	.65'	
Flush Joint Anchor	5.00"	2.37"	14.00'	
Blanked-Off B.T. Running Case	5.00"	2.44"	4.06'	9389'

000046

FLUID SAMPLER 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.	
Recovery Mud Filtrate	____ @ ____ °F.	____ ppm
Mud Pit Sample	____ @ ____ °F.	
Mud Pit Sample Filtrate	____ @ ____ °F.	____ ppm
Mud Weight	9.9 vis 61 cp	

Date 10-12-71 Ticket Number 24884
Kind of Job OPEN HOLE Halliburton District ADELAIDE
Tester ADEWAR - PRYOR Witness COVEY
Drilling Contractor ODE RIG # 9 NM

EQUIPMENT & HOLE DATA

Formation Tested Permian
Elevation 114' Ft.
Net Productive Interval - Ft.
All Depths Measured From Rotary Table
Total Depth 9470' Ft.
Main Hole/Casing Size 8½"
Drill Collar Length 697.09' I.D. 2.87"
Drill Pipe Length 8714.64' I.D. 4.276"
Packer Depth(s) 9392.89' Ft.
Depth Tester Valve 9372.89' Ft.

Cushion TYPE WATER AMOUNT 1400' Ft. Depth Back Pres. Valve NONE Surface Choke ½" Bottom Choke 3/4"

Recovered 2000' Feet of muddy water cushion
Recovered Feet of
Recovered Feet of
Recovered Feet of
Recovered Feet of

Mea. From Tester Valve

Remarks Packer failure...

TEMPERATURE	Gauge No. 1895 Depth: 9377.89' Ft.	Gauge No. 2188 Depth: 9466' Ft.	Gauge No. Depth: Ft.	TIME
	12 Hour Clock	24 Hour Clock	Hour Clock	Tool Opened A.M. P.M.
Est. °F.	Blanked Off NO	Blanked Off YES	Blanked Off	
Actual 260°F.	Pressures	Pressures	Pressures	Tool Closed A.M. P.M.

	Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic	4683.7	4806	4738.9	4840				
First Period Flow Initial							____	____
First Period Flow Final								
First Period Closed in								
Second Period Flow Initial							____	____
Second Period Flow Final								
Second Period Closed in								
Third Period Flow Initial							____	____
Third Period Flow Final								
Third Period Closed in								
Final Hydrostatic		4806		4840			____	____

Legal Location Sec. - Twp. - Rng. -
Lease Name FLY LAKE
Well No. 1
Test No. 10
Field Area COOPER BASIN
Tested Interval 9392.89' - 9470'
County -
State SOUTH AUSTRALIA
Lease Owner/Company Name DELHI - SANTOS VAM GAS N L

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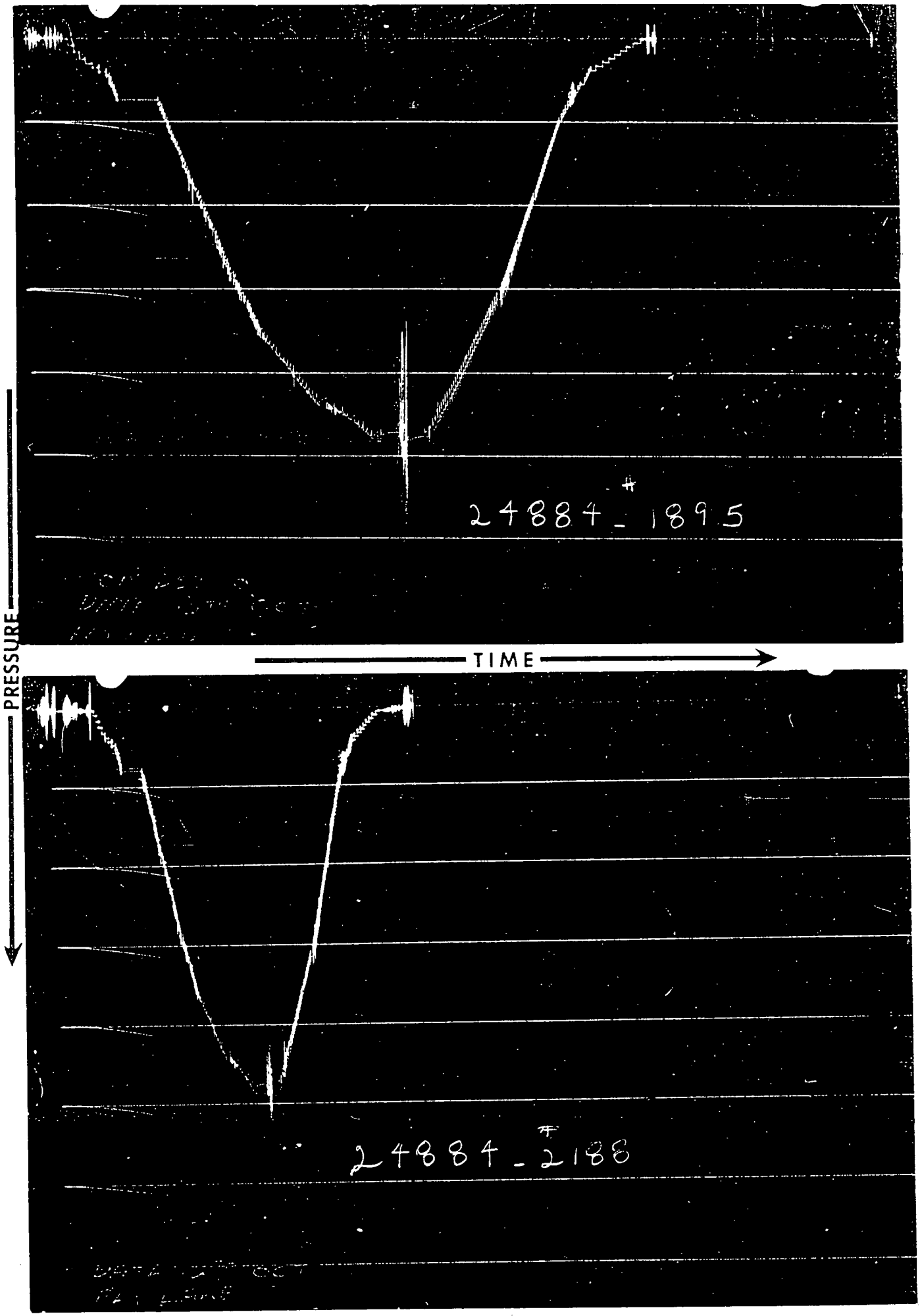
FORMATION TEST DATA

LITTLE'S 83429 15M 4/69—33, 34-13



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

	O. D.	I. D.	LENGTH	DEPTH
Reversing Sub	5.75"	2.78"	1.00'	
Water Cushion Valve				
Drill Pipe				
Drill Collars	6.25"	2.87"	88.00'	
CROSS OVER	5.875"	3.00"	.65'	
Handling Sub & Choke Assembly	5.87"	2.58"	2.65'	
Dual CIP Valve	5.03"	.87"	4.00'	
Dual CIP Sampler				
Hydro-Spring Tester	5.00"	.75"	5.00'	9372.89'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5.00"	3.06"	4.14'	9377.89'
Hydraulic Jar	5.00"	1.00"	3.26'	
VR Safety Joint	5.00"	1.00"	2.35'	
Pressure Equalizing Crossover				
Packer Assembly	7.75"	1.75"	5.25'	9387.64'
BOTTOM OF PACKER			1.00'	9392.89'
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Packer Assembly				
Anchor Pipe Safety Joint				
~~Sidewall Anchor~~ ANCHOR	5.00"	2.37"	13.00'	
CROSS OVER	6.00"	2.125"	.65'	
DRILL COLLARS	6.25"	2.25"	29.25'	
~~Drill Collars~~ CROSS OVER	6.25"	2.25"	2.50'	
CROSS OVER	5.75"	2.375"	.65'	
Flush Joint Anchor	5.00"	2.37"	26.00'	
Blanked-Off B.T. Running Case	5.00"	2.44"	4.06'	9466.00'

000049

FLUID SAMPLER 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.	
Recovery Mud Filtrate	____ @ ____ °F.	____ ppm
Mud Pit Sample	____ @ ____ °F.	
Mud Pit Sample Filtrate	____ @ ____ °F.	____ ppm
Mud Weight	9.8 vis	57 cp

Date 10-13-71 Ticket Number 24885
Kind of Job OPEN HOLE Halliburton District ADELAIDE
Tester DEWAR & PRYOR Witness COVEY
Drilling Contractor ODE RIG # 9 NM S

EQUIPMENT & HOLE DATA

Formation Tested Permian
Elevation 114' Ft.
Net Productive Interval - Ft.
All Depths Measured From Kelly Bushing
Total Depth 9493' Ft.
Main Hole/Casing Size 8½"
Drill Collar Length 697.09' I.D. 2.87"
Drill Pipe Length 8373' I.D. 4.276"
Packer Depth(s) 9375.82'-9384.07' Ft.
Depth Tester Valve 9360' Ft.

Cushion TYPE WATER AMOUNT 1400' Ft. Depth Back Pres. Valve NONE Surface Choke ½" Bottom Choke 3/4"

Recovered 1400' Feet of gas and slightly oil cut water cushion
Recovered Feet of
Recovered Feet of
Recovered Feet of
Recovered Feet of

Meas. From Tester Valve

Remarks Tool opened with a very weak blow for a 17 minute first flow. Rotated tool for a 29 minute first closed in pressure. Tool reopened for a 92 minute second flow. Took a 87 minute second closed in pressure.

TEMPERATURE	Gauge No. 1895 Depth: 9365' Ft.	Gauge No. 2188 Depth: 9489' Ft.	Gauge No. Depth: Ft.	TIME
	12 Hour Clock	24 Hour Clock	Hour Clock	Tool Opened 6:05 A.M.
Est. °F.	Blanked Off NO	Blanked Off YES	Blanked Off	Tool Closed 10:40 A.M.
Actual 262 °F.	Pressures	Pressures	Pressures	

		Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic		4705.1	4710	4805.4	4772				
First Period	Flow Initial	564.5	594	640.0	665			—	—
	Flow Final	607.6	609	653.7	674			15	17
	Closed in	3786	3839	3917.5	3896			30	29
Second Period	Flow Initial	607.6	620	685.6	692			—	—
	Flow Final	650.8	659	731.1	727			90	92
	Closed in	3786.4	3809	3895.3	3864			90	87
Third Period	Flow Initial							—	—
	Flow Final								
	Closed in								
Final Hydrostatic		4683.7	4680	4761.1	4738			—	—

Legal Location Sec. - Twp. - Rng. -
Lease Name FLY LAKE
Well No. 1
Test No. 11
Field Area COOPER BASIN
County -
State SOUTH AUSTRALIA
Tested Interval 9389' - 9493'
Lease Owner/Company Name DELHI SANTOS VAMGAS NL

PRINTED IN U.S.A.

FORMATION TEST DATA

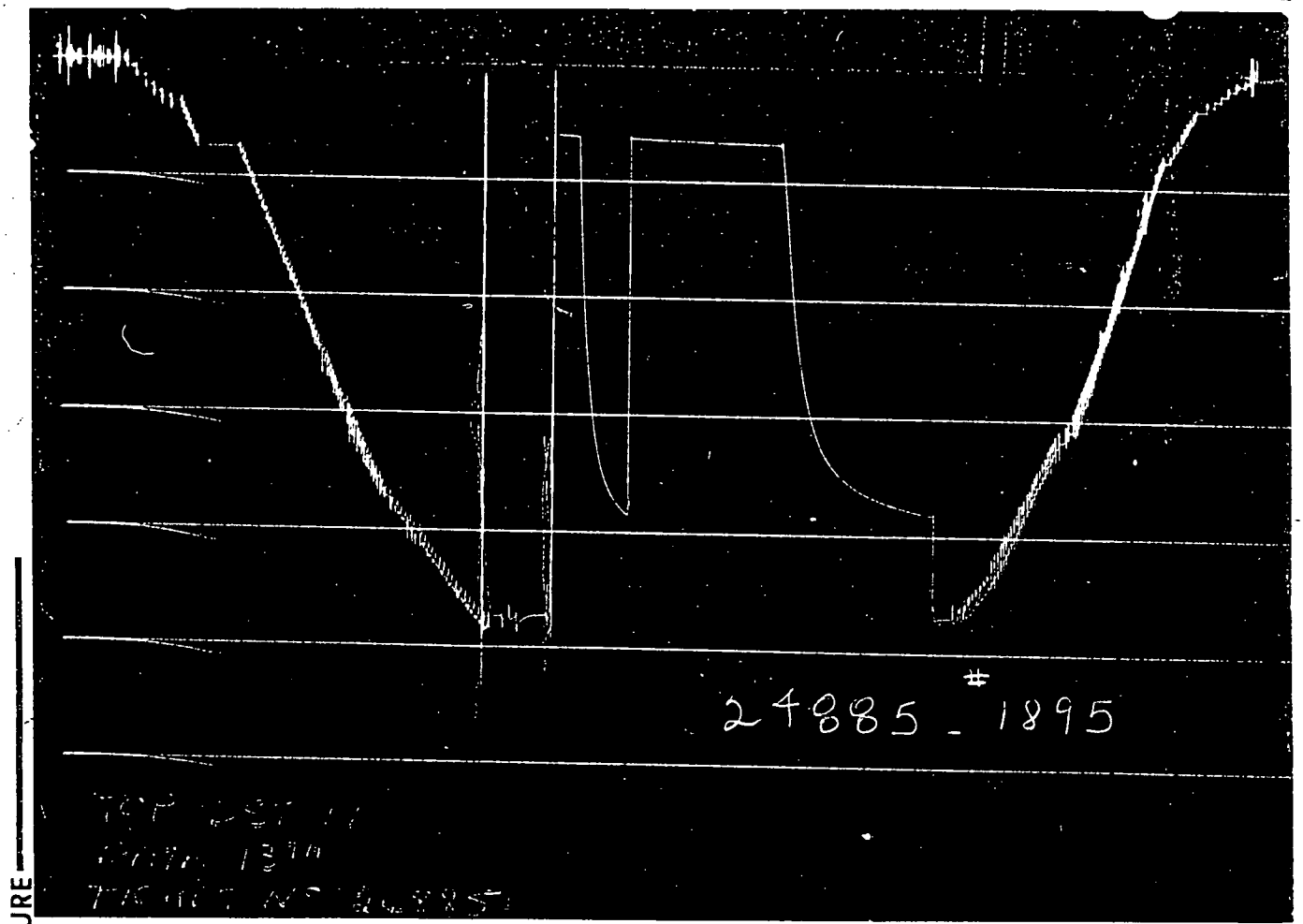
LITTLE'S 03429 15M 4/69—33, 34-12

Gauge No.	1895		Depth	9365'		Clock No.	7588		12 hour		Ticket No.	24885				
	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	.000	594	.000		609	.000	620		.000		659						
1	.018	598	.0212		1929	.1346	633		.0639		2313						
2	.036	600	.0424		2629	.2692	641		.1278		3043						
3	.054	603	.0636		3081	.4038	650		.1917		3355						
4	.072	605	.0848		3345	.5384	654		.2556		3510						
5	.102	609*	.1060		3522	.619	659***		.3195		3606						
6			.1272		3634				.3834		3672						
7			.1484		3711				.4473		3722						
8			.1696		3769				.5112		3762						
9			.1908		3814				.5751		3794						
10			.205		3839**				.618		3809****						
11																	
12																	
13																	
14																	
15																	

Gauge No.	2188		Depth	9489'		Clock No.	7495		hour	24						
0	.000	665	.000		674	.000	692		.000		727					
1	.0099	665	.0098		2605	.0667	702		.0298		2471					
2	.0198	665	.0196		3307	.1334	708		.0596		3264					
3	.0297	670	.0294		3309	.2001	718		.0894		3427					
4	.0396	672	.0392		3620	.2668	724		.1192		3596					
5	.056	674*	.0490		3622	.307	727***		.1490		3693					
6			.0588		3776				.1788		3733					
7			.0686		3789				.2086		3787					
8			.0784		3840				.2384		3827					
9			.0882		3878				.2682		3851					
10			.095		3896**				.288		3864****					
11																
12																
13																
14																
15																
Reading Interval	3		3			20			9						Minutes	

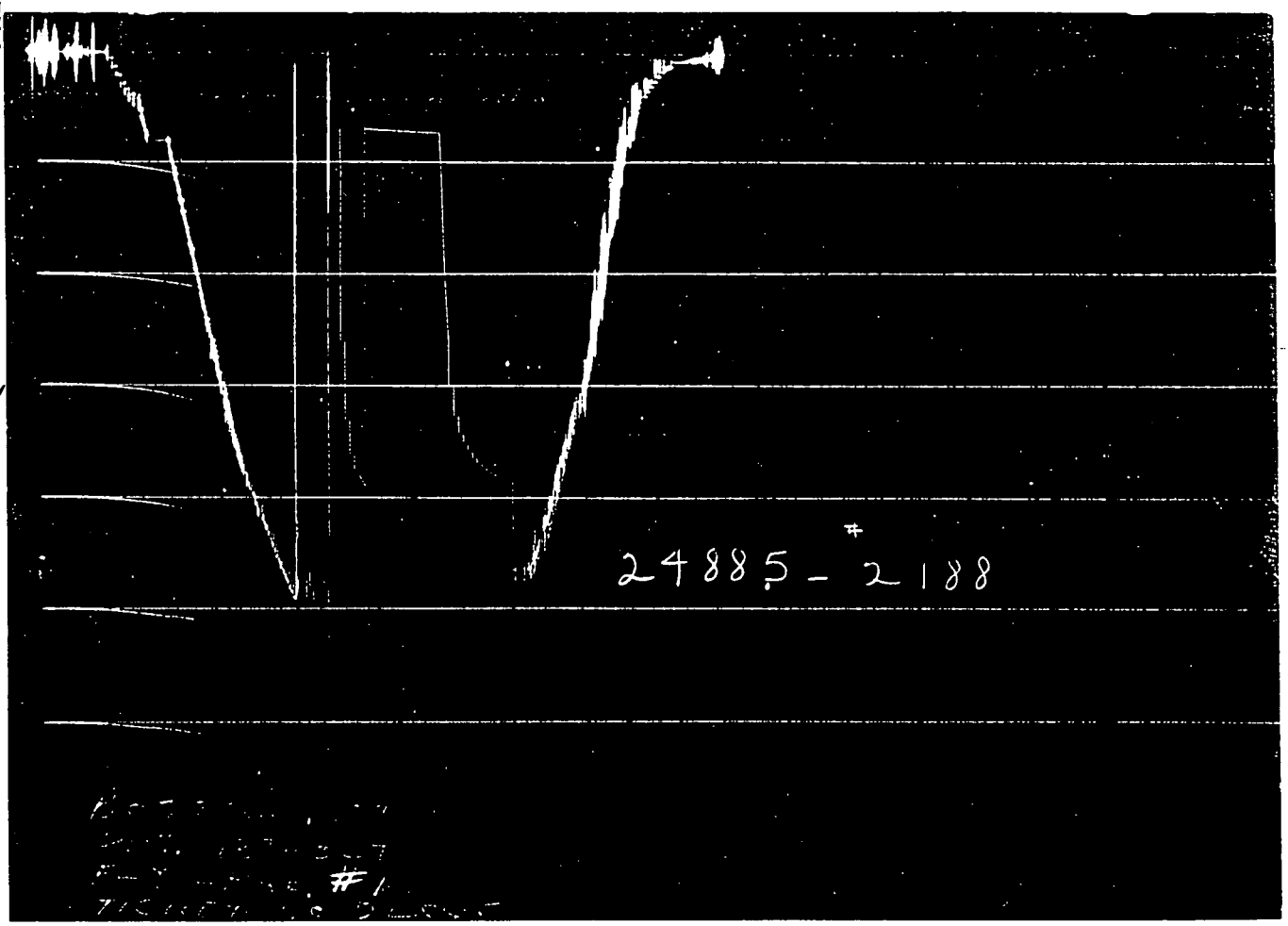
REMARKS: * INTERVAL = 5 MINUTES. ** INTERVAL = 2 MINUTES. *** INTERVAL = 12 MINUTES. **** INTERVAL = 6 MINUTES.

000050



PRESSURE

TIME



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

000052

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.	
Recovery Mud Filtrate	____ @ ____ °F.	____ ppm
Mud Pit Sample	____ @ ____ °F.	
Mud Pit Sample Filtrate	____ @ ____ °F.	____ ppm
Mud Weight	9.6 vis	BRINE cp

Date 2-23-72 Ticket Number 001675
Kind of Job HOOK WALL Halliburton District MOOMBA
Tester MR. DEWAR Witness MR. MC KINNEY
Drilling Contractor O.D.E RIG #8 BC S

EQUIPMENT & HOLE DATA

Formation Tested Lower Gidgealpa
Elevation 96' GL 114' KB Ft.
Net Productive Interval 9297-9311 * 9335'-9385' Ft.
All Depths Measured From Kelly Bushing
Total Depth 9482' Ft.
Main Hole/Casing Size 7"
Drill Collar Length _____ I.D. _____
Drill Pipe Length Tubing 9242' I.D. 2.441"
Packer Depth(s) 9259' Ft.
Depth Tester Valve 9251' Ft.

Cushion TYPE AMOUNT _____ Ft. Depth Back Pres. Valve _____ Surface Choke 7/16" Bottom Choke .62"

Recovered 60 Feet of Salt water
Recovered _____ Feet of _____
Recovered _____ Feet of _____
Recovered _____ Feet of _____
Recovered _____ Feet of _____

Meas. From Tester Valve

Remarks Tool opened for a 795 minute flow. Flow put through separator at various times for testing. Tool closed. Impact reversing sub opened and pulled out of hole.

TEMPERATURE	Gauge No. 2171 Depth: 9256' Ft.	Gauge No. 2170 Depth: 9274' Ft.	Gauge No. Depth: Ft.	TIME
	72 Hour Clock	72 Hour Clock	Hour Clock	Tool Opened 2-22-72 A.M. 11:08 P.M.
Est. 250 °F.	Blanked Off No	Blanked Off Yes	Blanked Off	Tool Closed 2-23-72 A.M. 12:45 P.M.
Actual °F.	Pressures	Pressures	Pressures	

		Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic		4456	4397	4465	4476				
First Period	Flow Initial	199	214	223	242			____	____
	Flow Final	712	718	750	584			SEE PRODUCTION	
	Closed in			CLOCK STOPPED DURING				TEST DATA SHEET	
Second Period	Flow Initial			FIRST FLOW PERIOD.				____	____
	Flow Final								
	Closed in								
Third Period	Flow Initial							____	____
	Flow Final								
	Closed in								
Final Hydrostatic		4456	4397	4465	4476			____	____

Legal Location Sec. - Twp. - Rng.
Lease Name FLY LAKE
Well No. 1
Test No. 12
Field Area COOPER BASIN
County
State SOUTH AUSTRALIA
Owner DELHI INTERNATIONAL OIL CORPORATION
Company BRIDGE OIL COMPANY, N.L.
(PERFORATIONS - Tested 9297-9311=9335-9385) SANTOS, LIMITED, Agency N.L.
9259' - 9482'

PRINTED IN U.S.A.

FORMATION TEST DATA

LITTLE'S

8-C

Casing perfs. _____ Bottom choke _____ Surf. temp _____ °F Ticket No. 001675

Gas gravity _____ Oil gravity _____ GOR _____

Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F

Date 2-22-72 Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
6:30 PM					Engaged B.T. #2170
6:35					Engaged B.T. #2171
11:05					Set Packer
11:08					Tool opened with a weak blow
11:30	7/16"				Slight gas flow to surface.
2-23-72 3:00 AM	"	150			Pressure gauge Nil reading
3:15	"	100			
3:30	"	180			
3:45	"	180			
4:00	"	200			
4:15	"	200			
4:30	"	150			
4:35					Shut in at surface to engage separator
4:45	"	210			Flowed through separator tool. Opened at surface
4:50					Shut in at surface to repair separator line leaks.
4:56					Surface Valve reopened Flowed through separator
5:00	"	210			
5:15	"	210			
5:30	"	210			
5:45	"	220			
6:00	"	200			
6:15	"	200		No Water 183 Oil	
6:30	"	200			
6:45	"	200			
7:00	"	200			
7:03					Shut in at surface to remove surface Choke from tube.
7:10					Surface valve opened.

Casing perfs. _____ Bottom choke _____ Surf. temp _____ °F Ticket No. 001675

Gas gravity _____ Oil gravity _____ GOR _____

Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
2-23-72 7:15 AM		100			
7:45		100			
8:00					Surface pressure gauge not registering
9:25					Shut in to engage separator
9:30					Opened through separator
11:00		200		22.5 Water 195 Oil	
12:30 PM		200		No water 240 Oil	
12:45					Tool closed
1:10					Impact reversing sub opened

COMPANY NAME: DELHI INTERNATIONAL OIL CORPORATION
SANTOS, LIMITED
VAMGAS, N.L.
BRIDGE OIL COMPANY, N.L.

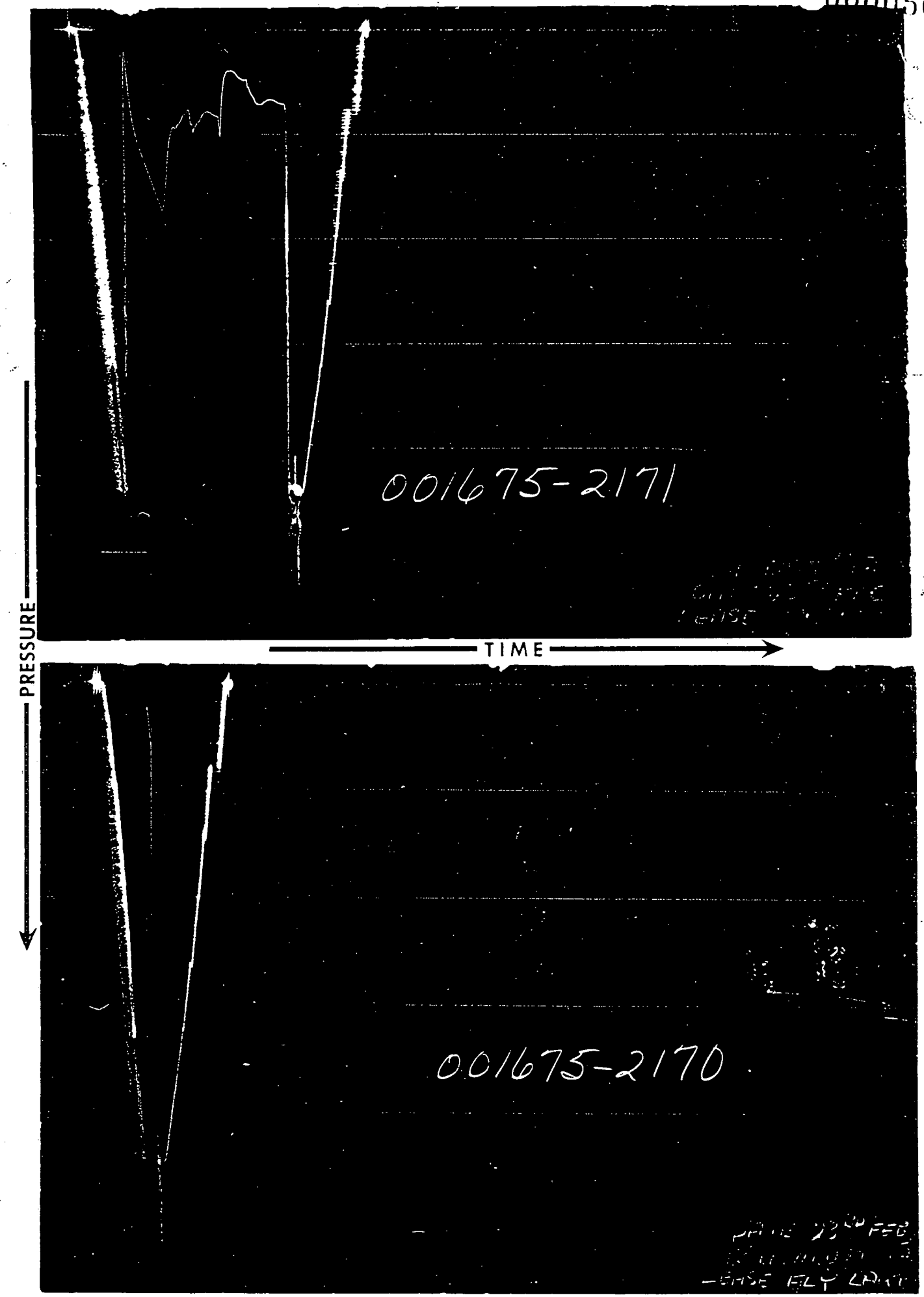
TICKET NUMBER : 001675

B.T. #2171

B.T. #2170
CLOCK STOPPED ....

TIME DEFL.	PSI	TIME
.0000	214	0
.0265	577	22
.2525	1313	210
.2706	1041	225
.2886	939	240
.3066	944	255
.3247	903	270
.3427	859	285
.3608	811	300
.3668	798	305
.3788	770	315
.3848	770	320
.3920	861	326
.3968	907	330
.4149	964	345
.4329	903	360
.4509	874	375
.4690	816	390
.4870	790	405
.5051	793	420
.5231	810	435
.5411	826	450
.5447	828	453
.5532	833	460
.5592	836	465
.5952	460	495
.6133	404	510
.7155	488	595
.7215	487	600
.8297	705	690
.9380	713	780
.9560	718	795

This test read at points reported on production test data sheet.



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

	O. D.	I. D.	LENGTH	DEPTH
Reversing Sub	4.12"	2.12"	2'	
~~Water Cushion Valve~~ Cross Over	3.44"	2"	.83'	
Drill Pipe Tubing	3.875"	2.441"	9242'	
Drill Collars				
Handling Sub & Choke Assembly				
Dual CIP Valve				
~~Dual CIP Sampler~~ Cross Over	3.69"	2"	.83'	
Hydro-Spring Tester	3.90"	.62"	5.09'	9251'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	3.75"	2.50"	4.58'	9256'
Hydraulic Jar				
VR Safety Joint				
Pressure Equalizing Crossover				
Packer Assembly				
Distributor				
Packer Assembly 7" RTTS	5.75"	2.55"	3.18'	9259'
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Cross Over	3.5"	1.75"	.58'	
Flush Joint Anchor	3.75"	1.75"	10'	
Blanked-Off B.T. Running Case	3.75"	2.50"	4.20'	9274'

R13 HSH

1972 APR 21 AM 9:52 000058

amdel
The Australian Mineral Development Laboratories
Flemington Street, Frewville, South Australia 5063
Phone 79 1662, telex AA82520

Please address all correspondence to the Director
In reply quote: AN3/51/0 - 4364/72

REPORT COMPLETE

20 April 1972.

Mr H.J. Hannah
Production Manager
Delhi International Oil Corporation
Box 1837P GPO
ADELAIDE SA 5001

REPORT AN4364/72

YOUR REFERENCE:	Purchase Order A16368
MATERIAL:	Condensate
IDENTIFICATION:	As listed
DATE RECEIVED:	17/3/72

Enquiries quoting AN4364/72 to Officer in Charge please.

Analysis by: H.W.J. Sears and G.R. Holden

Officer in Charge, Analytical Section: A.B. Timms

a. B. Timms
for F.R. Hartley
Director

jw

SCANNED

Well tested:	Fly Lake 1, PD-60
Date tested:	29/2/72, 1200 hrs
Type of test:	-
Type of sample:	Condensate
Field sampling conditions:	Pressure 75 psi, Temp. 87°F
Reference:	Purchase Order A 16368
Source of sample:	Separator

Sample collected by displacement of Magnesium Sulphate Solution. The sample received was flashed to obtain 4.4 litres of gas and 200 mls oil at approximately 760 mm pressure and 20°C.

The flashed gas obtained from the condensate was analysed as follows:

Oxygen plus argon	<0.02 % mol vol
Nitrogen	0.25
Carbon dioxide	11.64
Methane	12.3
Ethane	16.1
Propane	28.0
i Butane	6.27
n Butane	11.68
i Pentane	3.75
n Pentane	4.70
Hexanes	3.15
Heptanes	1.50
Octanes and higher hydrocarbons	0.66
Calculated gas density (relative air = 1)	1.603

The separated liquid phase was submitted to A.S.T.M. distillation with the following results:

Initial Boiling Point	31°C
10% Recovery	71
20	90
30	110
40	122
50	144
60	179
70	225
80	278
84	300

Weight distillate	62.3 gms
Weight residue	11.3 gms
Loss	3.2 gms
Recovery	96.2 %
Kinematic Viscosity	0.986 Centistokes/sec at 100°F
Pour Point	<-5°C
Flash Point	<0°C
Aniline Point	58°C
Olefines and Aromatics	25 %
Sulphur	0.025 %
Specific gravity at 60°F	0.766
A.P.I. gravity at 60°F	53.3

The condensate was analysed by gas chromatography and the results obtained were combined with those of the flash gas to give the following calculated composition by weight of the sample as submitted.

Nitrogen	0.008 % by weight
Carbon dioxide	0.39
Methane	0.41
Ethane	0.54
Propane	1.75
Butanes	6.26
Pentanes	7.60
Hexanes	7.93
Benzene	1.16
Heptanes	9.95
Toluene	2.00
Octanes	12.60
Xylene plus Ethybenzene	2.00
Nonanes	7.20
Decanes + C_9 Aromatic Compounds	8.75
Undecanes	5.00
Dodecanes	3.63
Tridecanes	2.63
Tetradecanes	2.20
Pentadecanes	1.96
Hexadecanes	1.73
Higher hydrocarbons	14.30

The hydrocarbon group from decane onwards all include higher aromatic compounds which elute with the paraffinic compounds.

Well tested:	Fly Lake 1, PD-62
Date tested:	29/2/72, 1200 hrs
Type of test:	-
Type of sample:	Condensate
Field sampling conditions:	Pressure 75 psi, Temp. 87°F
Reference:	Purchase Order A 16368
Source of sample:	Separator

Sample collected by displacement of Magnesium Sulphate Solution. The sample received was flashed to obtain 4.6 litres of gas and 205 mls oil at approximately 760 mm pressure and 20°C.

The flashed gas obtained from the condensate was analysed as follows:

Oxygen plus argon	<0.02 % mol vol
Nitrogen	0.51
Carbon dioxide	12.72
Methane	12.64
Ethane	16.35
Propane	29.2
i Butane	6.10
n Butane	12.45
i Pentane	3.67
n Pentane	3.87
Hexanes	1.71
Heptanes	0.56
Octanes and higher hydrocarbons	0.22
Calculated gas density (relative air = 1)	1.532

The separated liquid phase was submitted to A.S.T.M. distillation with the following results:

Initial Boiling Point	32°C
10% Recovery	72
20	93
30	110
40	125
50	145
60	176
70	222
80	277
84	300
Weight distillate	62.4 gms
Weight residue	11.2 gms
Loss	3.2 gms
Recovery	96.2 %
Kinematic Viscosity	0.986 Centistokes/sec at 100°F
Pour Point	<-5°C
Flash Point	<0°C
Aniline Point	58°C
Olefines and Aromatics	25 %
Sulphur	0.025 %
Specific gravity at 60°F	0.766
A.P.I. gravity at 60°F	53.3

The condensate was analysed by gas chromatography and the results obtained were combined with those of the flash gas to give the following calculated composition by weight of the sample as submitted.

Nitrogen	0.017 % by weight
Carbon dioxide	0.43
Methane	0.43
Ethane	0.55
Propane	1.80
Butanes	4.52
Pentanes	7.18
Hexanes	7.60
Benzene	1.07
Heptanes	10.1
Toluene	2.17
Octanes	13.6
Xylene plus Ethylbenzene	3.40
Nonanes	8.24
Decanes + C_9 Aromatic Compounds	7.73
Undecanes	5.58
Dodecanes	3.04
Tridecanes	2.76
Tetradecanes	2.62
Pentadecanes	1.82
Hexadecanes	1.24
Higher hydrocarbons	14.10

The hydrocarbon group from Decane onwards all include higher aromatic compounds which elute with the paraffinic compounds.

000065

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.	
Recovery Mud Filtrate	____ @ ____ °F.	____ ppm
Mud Pit Sample	____ @ ____ °F.	
Mud Pit Sample Filtrate	____ @ ____ °F.	____ ppm
Mud Weight	9.2 vis 26 cp	

Date 5-16-72 Ticket Number 100755
Kind of Job HOOK WALL Halliburton District MOOMBA
Tester MR. HARRIS Witness MR. MC KINNEY / MR. GAYLE
Drilling Contractor O.D. AND E. DRILLING COMPANY #8 BC

EQUIPMENT & HOLE DATA

Formation Tested Gidgealpa
Elevation 114' KB Ft.
Net Productive Interval 88' Ft.
All Depths Measured From Kelly Bushing
Total Depth 9482' Ft.
Main Hole/Casing Size 7"
Drill Collar Length - I.D. _____
Drill Pipe Length Tubing 9218' I.D. 2.441"
Packer Depth(s) 9231' Ft.
Depth Tester Valve 9226' Ft.

Cushion TYPE AMOUNT Ft. Depth Back Pres. Valve — Surface Choke 7/16" — Bottom Choke .625"

Recovered Feet of Reversed tubing -- not measured
Recovered Feet of
Recovered Feet of
Recovered Feet of
Recovered Feet of

Mea. From Tester Valve

Remarks See production test data sheet.

TEMPERATURE	Gauge No. 4341 Depth: 9228' Ft.	Gauge No. 4340 Depth: 9245' Ft.	Gauge No. Depth: Ft.	TIME
Calc.	48 Hour Clock	72 Hour Clock	Hour Clock	Tool 5-16-72 A.M.
Est. 200 °F.	Blanked Off No	Blanked Off Yes	Blanked Off	Opened 0445 P.M.
Actual °F.	Pressures	Pressures	Pressures	Tool 5-17-72 A.M. Closed 1430 P.M.

		Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic		4251	4246	4300	4264				
First Period	Flow Initial	712	878	723	1465			—	—
	Flow Final	696	3965	712	3975				
	Closed in	-	-	-	-				
Second Period	Flow Initial	1342	3973	1364	3983			—	—
	Flow Final	1408	679C-1416	1431	689C-1426				
	Closed in								
Third Period	Flow Initial							—	—
	Flow Final								
	Closed in								
Final Hydrostatic		4246	4227	4284	4250			—	—

C = Choke change

Legal Location Sec. - Twp. - Rng.
Lease Name: FLY LAKE
Well No.: 1
Test No.: 1 (Cased Hole)
Tested Interval: 9231' - 9482'
Field Area: FLY LAKE
County
State: SOUTH AUSTRALIA
Lease Owner/Company Name: DELHI INTERNATIONAL OIL CORPORATION
SANTOS LIMITED-VAMGAS N.L.-BRIDGE OIL N.L.

PRINTED IN U.S.A. LITTLE'S

FORMATION TEST DATA

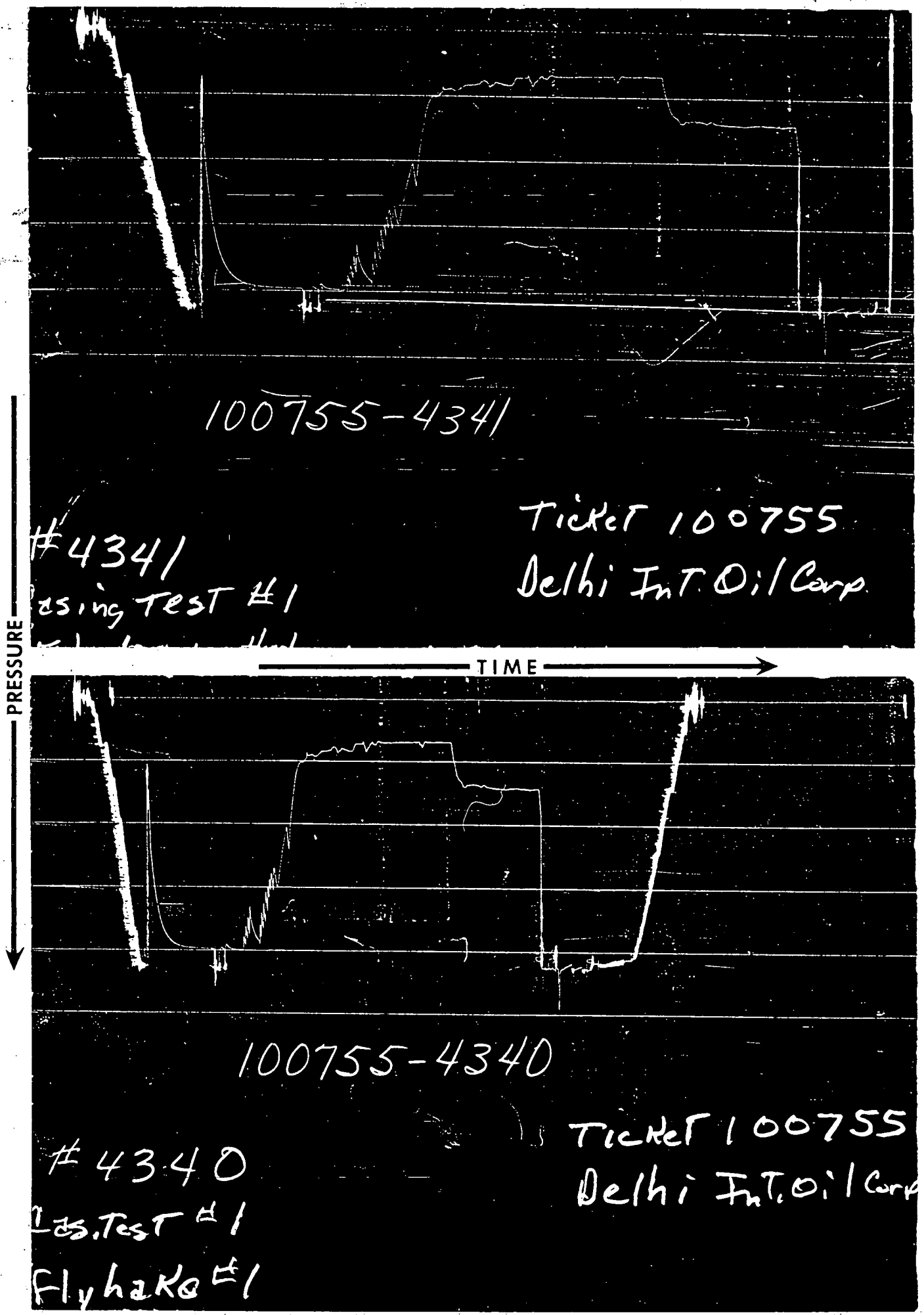
10

Casing perfs. 9297'-9385' Bottom choke .62" Surf. temp. °F Ticket No. 100755

Gas gravity Oil gravity GOR

Spec. gravity Chlorides ppm Res. @ °F

Date Time 5-15-72 a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
2155					Started B.T. #4341
2201					Started B.T. #4340
5-16-72 0445					Hydrospring opened with a weak blow,
					steady.
1030					Flushed tool
1125					Flushed tool
					Swabbed tubing down 2800'
1630					Kicked off
					Flowed to pit overnight-no choke
5-17-72 0630	7/16"				Installed choke
0700	"	350			Gas, oil and water
0800	"	425			Gas, oil and water. Water decreasing
0900	"	450			
0930	"	460			
1000	"	455			
1030	"	475			
1100	"	460			
1130	"	425			
1200	"	480			
1230	"	475			
1300	"	505			
1330	"	480			
1400	"	500			
1430					Closed hydrospring, bled off PSI
1500					Dropped bar on reversing sub
					Cleaned up hole, pulled tool



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

000068

100755

	O. D.	I. D.	LENGTH	DEPTH
Reversing Sub	3.875"	1.75"	2.60'	
Water Cushion Valve				
Drill Pipe Tubing	2.875"	2.441"	9218'	
Drill Collars				
Handling Sub & Choke Assembly				
Dual CIP Valve				
Dual CIP Sampler				
Hydro-Spring Tester	3.875"	.62"	5.80'	9226'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	3.875"	2.50"	4.60'	9228'
Hydraulic Jar				
VR Safety Joint				
Pressure Equalizing Crossover				
Packer Assembly 7" RTTS	5.12"	2.355"	3.45'	9231'
~~Distributor~~ Cross Over	3.875"	2.50"	.50'	
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor	3.875"	1.75"	10'	
Blanked-Off B.T. Running Case	3.875"	2.50"	4'	9245'

000069

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.	
Recovery Mud Filtrate	____	@ ____	°F.	____ ppm
Mud Pit Sample	____	@ ____	°F.	
Mud Pit Sample Filtrate	____	@ ____	°F.	____ ppm
Mud Weight	9.2	vis 26		cp

Date 5-18-72 Ticket Number 100781
Kind of Job HOOK WALL Halliburton District MOOMBA
Tester MR. HARRIS Witness MR. MC KINNEY
Drilling Contractor O. D. AND E. DRILLING COMPANY #8 BC

EQUIPMENT & HOLE DATA

Formation Tested Gidgealpa
Elevation 114' KB Ft.
Net Productive Interval 10' Ft.
All Depths Measured From Kelly Bushing
Total Depth 9250' Ft.
Main Hole/Casing Size 7"
Drill Collar Length - I.D. _____
Drill Pipe Length Tubing 8810' I.D. 2.441"
Packer Depth(s) 8825' Ft.
Depth Tester Valve 8820' Ft.

Cushion TYPE AMOUNT Ft. Depth Back Pres. Valve
Surface Choke 7/16" Bottom Choke .62"

Recovered Feet of REVERSED TUBING --NOT MEASURED
Recovered Feet of
Recovered Feet of
Recovered Feet of
Recovered Feet of

Mea. From Tester Valve

Remarks RAN RTTS HOOKWALL PACKER AND HYDROSPRING TOOL FOR PURPOSE OF FLOW PRESSURES ONLY. SEE PRODUCTION TEST DATA SHEET.

TEMPERATURE	Gauge No. 4341 Depth: 8822' Ft.	Gauge No. 4340 Depth: 8839' Ft.	Gauge No. Depth: Ft.	TIME
Calc.	48 Hour Clock	72 Hour Clock	Hour Clock	Tool 5-18-72 A.M.
Est. 200 °F.	Blanked Off No	Blanked Off Yes	Blanked Off	Opened 1717 P.M.
Actual °F.	Pressures	Pressures	Pressures	Tool 5-19-72 A.M. Closed 0805 P.M.

		Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic		4027	4003	3285	NO READINGS				
First Period	Flow Initial	2555	1728	1745	AVAILABLE..			—	—
	Flow Final	2555	2575	1745					
	Closed in				GAUGE				
Second Period	Flow Initial				MALFUNCTION...			—	—
	Flow Final								
	Closed in								
Third Period	Flow Initial							—	—
	Flow Final								
	Closed in								
Final Hydrostatic		3972	3973		3201			—	—

Lease Name: FLY LAKE
Well No.: 1
Test No.: 2 (Second Test)
Tested Interval: 8825' - 9250'
Field Area: FLY LAKE
County: SANTOS LIMITED-VAMGAS, N.L.
State: SOUTH AUSTRALIA
Lease Owner/Company Name: DELHI INTERNATIONAL OIL CORPORATION - BRIDGE OIL N.L.
Legal Location Sec. - Twp. - Rng.

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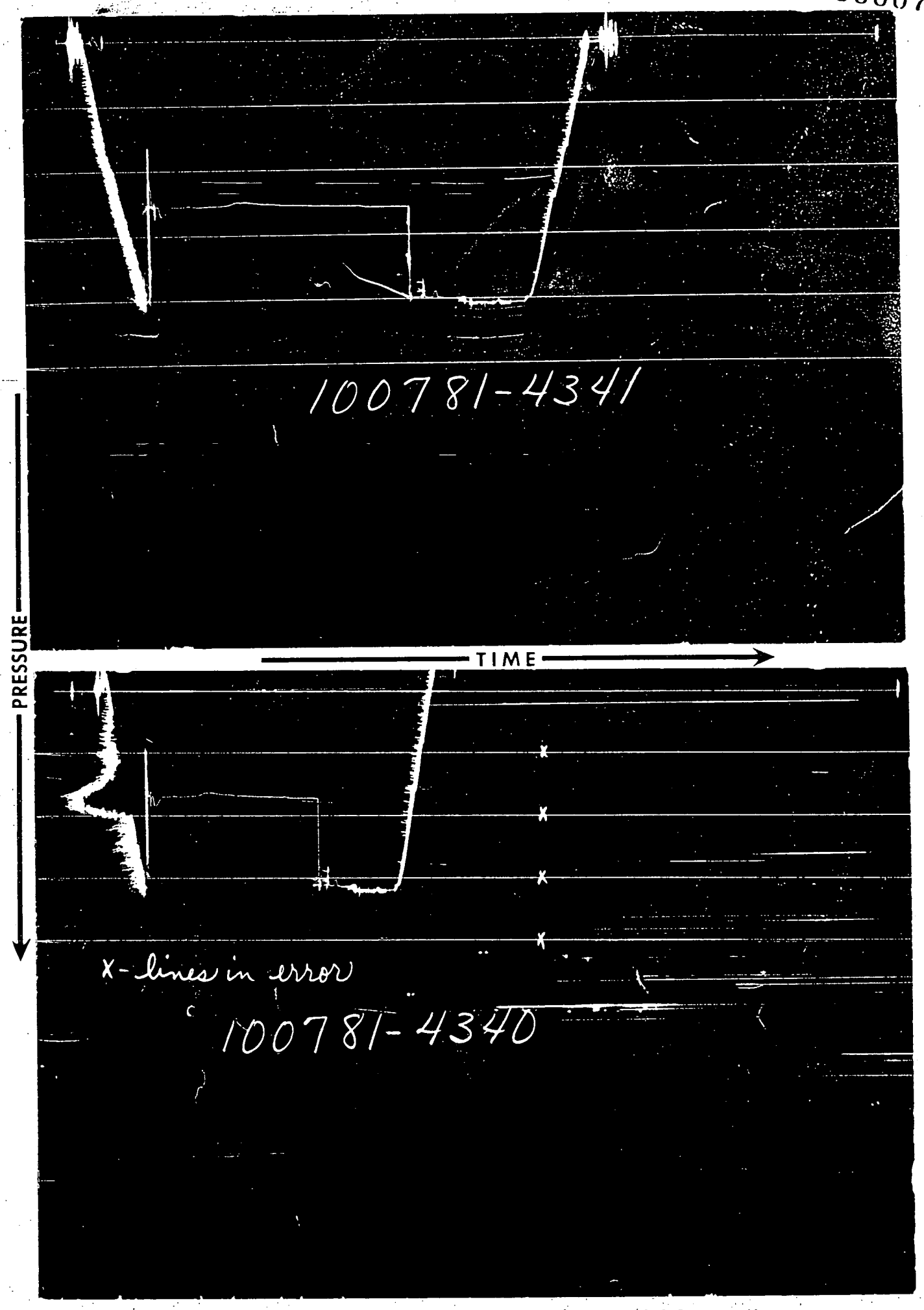
FORMATION TEST DATA

LITTLE'S

10-D

Casing perfs. 8872' - 8882' Bottom choke .62" Surf. temp ____ °F Ticket No. 100781
Gas gravity ____ Oil gravity ____ GOR ____
Spec. gravity ____ Chlorides ____ ppm Res. ____ @ ____ °F

Date 5-18-72 Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
1316					Started B.T. #4340
1318					Started B.T. #4341
1717					Hydrospring opened
1727	7/16"				Water to surface
1730	"	1250			Gas and water
1800	"	1450			Watery gas
1900	"	1575			"
2000	"	1550			"
2100	"	1575			
2200	"	1625			
2300	"	1625			
2400	"	1625			
0100	"	1625			
0200	"	1625			
0300	"	1625			
0400	"	1640			
0500	"	1650			
0600	"	1650			
0700	"	1650			
0800	"	1650			
0805					Closed hydrospring, unseated packer
0850					Dropped reversing sub bar
					Circulated hole clean
					Came out of hole



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

	O. D.	I. D.	LENGTH	DEPTH
Reversing Sub	3.875"	1.75"	2.60'	'
Water Cushion Valve				
Drill Pipe — Tubing	2.875"	2.441"	8810'	
Drill Collars				
Handling Sub & Choke Assembly				
Dual CIP Valve				
Dual CIP Sampler				
Hydro-Spring Tester	3.875"	.62"	5.80'	8820'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	3.875"	2.50"	4.60'	8822'
Hydraulic Jar				
VR Safety Joint				
Pressure Equalizing Crossover				
Packer Assembly — 7" RTTS	5.12"	2.355"	3.45'	8825'
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor	3.875"	1.75"	10'	
Blanked-Off B.T. Running Case	3.875"	2.50"	4'	8839'

R 16 Mines

000073

FLY LAKE No 1

PRODUCTIVITY TEST & PRESSURE SURVEY

Location: Lat. 27° 38' 13" S
Long. 139° 56' 48" E

Pool Gidgealpa Lower Member

PERFORATED INTERVAL 9297' - 9385'

DATUM (MID-POINT OF PERFS) 9341'

MIN. TUBING SIZE 1.995" I.D.

LENGTH OF FLOW STRING 9259'

27/2/72 0930 - 1115 Ran Initial Static Pressure Gradient Survey

Amerada Element # 16311-N. Range 0-5000 psi

Lubricator D/W Pressure = 1767.65 psia

DEPTH (FEET)	PRESSURE PSIA	GRADIENT PSIA/FT
0	1764.61	-
1000	1947.78	.1832
2000	2226.98	.2792
3000	2492.51	.2655
4000	2740.80	.2483
5000	2981.49	.2407
6000	3212.55	.2311
7000	3436.78	.2242
8000	3650.87	.2141
9000	3870.78	.2199
9250	3930.32	.2382
9300	3945.28	.2992
9350	3958.96	.2736
9400	3981.00	.4408

CALCULATED DATUM PRESSURE = 3956.50 psia

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PRODUCTIVITY TEST

Date	Time	Pressure PSIA Wellhead	Pressure PSIA Datum	Wellhead Temp. °F	HP Separator Data PF PSIA	HP Separator Data HW (ins)	HP Separator Data Temp °F	Gas Flow Rate MCFD	Oil Flow Rate Bbls/D	Water Flow Rate Bbls/D	G.O.R. CF/ Bbl.
27/2	1615	-	3959.03	Started flow through 1.50" orifice 28/64" choke							
	2115	-	909.34	Started flow through test separator							
	2215	315	934.67	88	70	63	64	756	306	Nil	2471
	2315	315	917.70	89	75	67	65				
28/2	0315	315	937.21	90	75	67	66	816	301	7.5	2711
	0415	315	936.19	90	75	67	66				
	0515	315	936.19	90	75	67	66				
	0815	315	937.21	94	80	69	72	864	329	3.5	2626
	0915	315	943.04	98	80	69	74				
	1115	315	943.54	98	85	70	81	888	320	3.5	2775
	1215	315	912.38	97	85	72	80				
		Choke adjusted to 29/64"				Weighted Averages		816	310.5	3.7	2627
	1415	315	911.11	99	85	73	84	900	320	3.5	2812
	1515	315	912.63	98	90	73	79				
	1715	315	915.67	97	90	73	77	900	320	3.5	2812
	1815	320	915.67	97	85	72	76				
	2015	325	917.45	97	85	71	77	888	329	3.5	2699
	2115	325	922.01	97	80	71	76				
	2315	325	921.25	97	80	72	76	869	329	3.5	2641
29/2	0015	325	922.01	96	80	72	75				
	0215	327	927.07	97	80	72	75	888	333	3.5	2667
	0315	327	932.14	97	85	72	75				
	0515	327	927.07	97	80	73	74	888	333	3.5	2667
	0615	327	929.61	97	85	72	75				
	0815	335	934.17	101	90	75	80	919	333	3.5	2760
	0915	335	933.41	103	90	75	84				
	1115	335	937.71	103	90	75	86	919	329	3.5	2793
	1215	335	937.71	103	90	75	87				
	1415	335	-	104	90	75	84	919	333	3.5	2760
	1515	345	-	105	90	75	84				
	1532	Well shut in.		End of Test.		Weighted Averages		900	328.8	3.5	2735

PRESSURE BUILD-UP TEST

Prior to shutting-in well for Build-up, the following stops were made to obtain a flowing pressure gradient.

Depth	Pressure PSIA	Gradient PSIA/ft
0	330.90	-
3000	514.31	.0611
6000	709.65	.0651
9000	926.58	.0723
(Datum) 9341	976.11	.1452

Date	Time	Pressure PSIA Wellhead	Pressure PSIA Datum	Wellhead Temp. °F.
29/2	1532	Well shut-in		
	1602	784	2081.61	102
	1632	1157	2774.07	102
	1732	1504	3219.37	102
	1832	1606	3658.31	99
	1932	1637	3702.26	93
	2032	1652	3725.88	90
	2132		3743.66	
	2232	1687	3756.36	84
	2332		3766.52	
1/3	0032	1695	3784.31	82
	0132		3793.45	
	0232	1702	3803.36	80
	0332		3811.23	
	0432	1709	3819.87	77
	0532		3827.49	
	0632	1719	3835.62	74
	0732		3841.21	
	0832	1727	3846.79	94
	0932		3853.15	
	1032	1735	3857.21	105
	1132		3862.54	
	1232	1741	3866.10	105
	1332		3871.43	
	1432	1746	3877.28	107
	1532		3880.83	
	1632	1751	3885.15	107
	BOMBS WITHDRAWN & RE-RUN (CHART CHANGE)			
	1832	1736	3890.99	
	1932		3890.99	
	2032	1756	3895.31	87
	2132		3899.12	
	2232		3902.93	
	2332		3904.20	
2/3	0032		3907.51	
	0132		3910.55	
	0232		3912.08	
	0332		3913.86	
	0432	1769	3916.90	72
	0532		3918.94	
	0632	1773	3922.49	79
	0732		3924.52	
	0832	1777	3925.79	101
	0932		3926.56	
	1032		3928.34	
	1132		3928.84	
	1232		3930.11	

PRESSURE BUILD-UP TEST

Date	Time	Pressure PSIA Wellhead	Datum	Wellhead Temp. °F
2/3	1332		3931.64	
	1432		3933.16	
	1532		3934.94	
	1632		3937.23	
	1732	1783	3937.23	106
	1832		3937.48	
	1932	1783	3939.26	97
	2032		3939.77	
	2132	1784	3941.80	87
	2232	1784	3942.56	85
	2332		3944.34	
3/3	0032		3945.86	
	0432		3946.37	
	0532	1788	3947.89	79
	0632	1788	3949.42	82
	(0700)		3951.20	BOMBS WITHDRAWN

END OF TEST

3/3 0822 - 1010 Ran Final Static Pressure Gradient Survey

Amerada Element #16311-N Range 0-5000psi

Lubricator D/W Pressure = 1766.65 psia

DEPTH FEET	PRESSURE PSIA	GRADIENT PSIA/FT
0	1764.10	-
1000	1958.68	.1945
2000	2231.04	.2723
3000	2494.54	.2635
4000	2745.87	.2513
5000	2980.48	.2346
6000	3208.25	.2277
7000	3426.65	.2184
8000	3645.30	.2186
9000	3875.86	.2305
9250	3935.65	.2391
9300	3948.65	.2600
9350	3968.84	.4038
9400	3993.67	.4966

CALCULATED DATUM PRESSURE = 3965.21 psia

END OF ALL TESTS

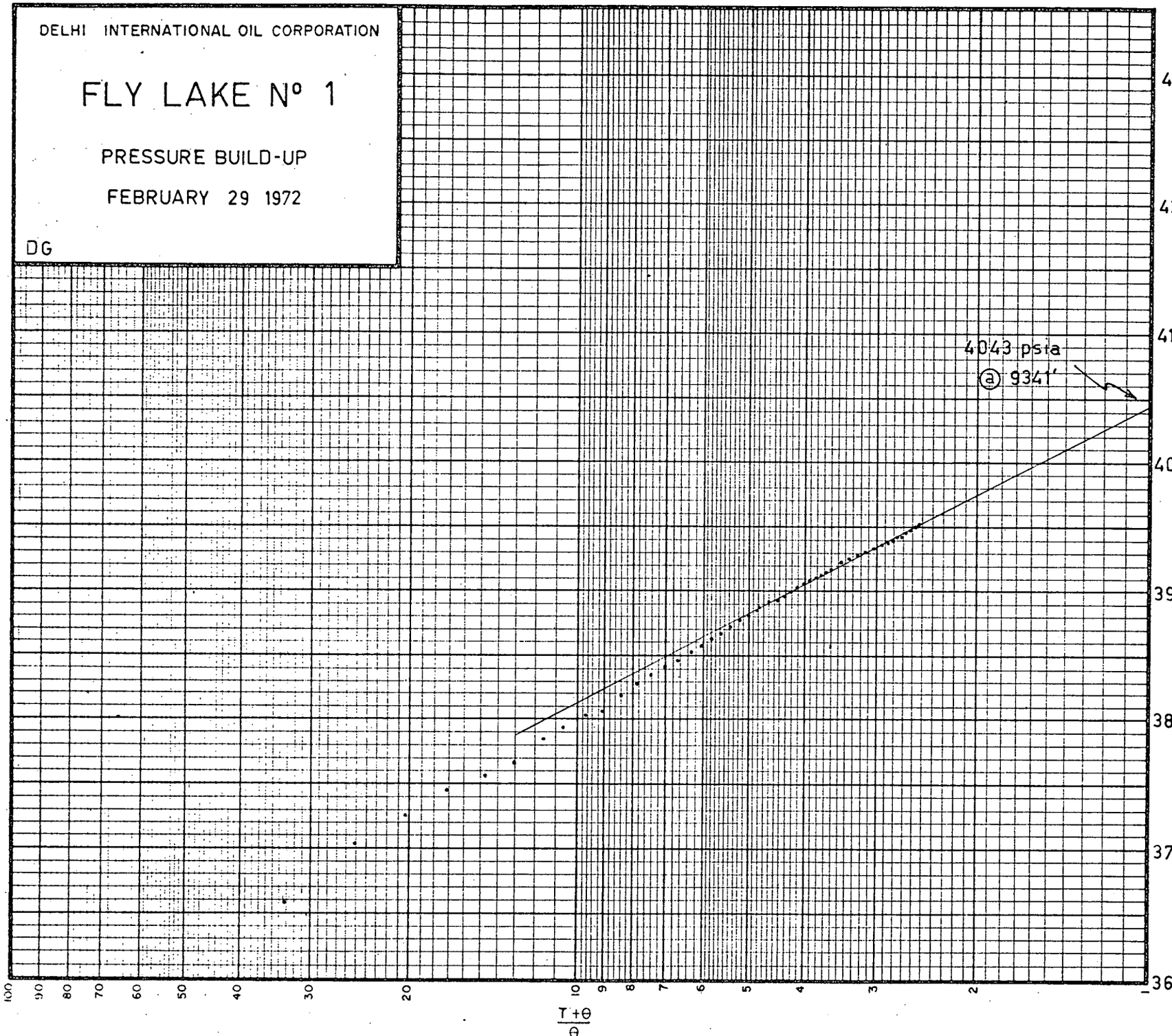
DELHI INTERNATIONAL OIL CORPORATION

FLY LAKE Nº 1

PRESSURE BUILD-UP

FEBRUARY 29 1972

DG



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Well tested:	Fly Lake No.1, PD-58
Date tested:	29/2/72, 1200 hrs.
Type of test:	-
Type of sample:	Dry Gas
Source of sample:	Separator
Field sampling conditions:	Pressure 75 psi, Temp. 87°
Reference:	Purchase Order A16368

RESULTS OF ANALYSIS

Oxygen plus argon	<0.02 % mol vol
Nitrogen	2.00
Hydrogen	Trace
Helium	0.025
Carbon dioxide	23.7
Methane	49.5
Ethane	11.2
Propane	9.77
i Butane	0.87
n Butane	1.45
i Pentane	0.45
n Pentane	0.41
Hexanes	0.285
Heptanes	0.165
Octanes and higher hydrocarbons	0.175
Calculated Gas Density (relative air = 1)	1.010

R17

000080

FLY LAKE 1 UPPER

PRODUCTION TEST AND PRESSURE SURVEYS

Location:	Longitude 139° 56' 48" E Latitude 27° 38' 13" S
Elevation:	Ground 96.3' K.B. 114'
Length of Flow String:	8519'
Tubing Size:	2-7/8" O.D. to 8460' then 2-3/8" O.D. to 8519'
Perforations:	8591 - 8606' 8632 - 8635' 8678 - 8694' 8770 - 8791' 8820 - 8827' 8838 - 8845' 8872 - 8882' 9138 - 9160' 9163 - 9165' 9168 - 9170'

JUNE 1972

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FLY LAKE 1 UPPER PRODUCTION TEST SUMMARY

Date	Time	Wellhead Press. (psig)	Wellhead Temp. (°F)	B.H. Press. @ 8500'	H.P. Separator Press. (psig)	H.P. Separator Hw (ins)	H.P. Separator Temp. (°F)	H.P. Separator Orifice Size	L.P. Separator Press. (psig)	L.P. Separator Hw (ins)	L.P. Separator Temp. (°F)	L.P. Separator Orifice Size	Gas Production (MMCFD) H.P.	Gas Production (MMCFD) L.P.	Gas Production (MMCFD) Total	Oil Prod. Bbls/D	Water Prod. Bbls/D	G.O.R. CF/Bbl
May 29	1100	Commenced clean up flow																
31	1615	Well shut in																
June 12	0730	2587	64	N/A														
	0750	Flowed well through 18/64" choke. Hydrates formed in separator. Dissolved by methanol.																
	1000	Choke adjusted to 26/64". Hydrates continued to form.																
	1150	Choke adjusted to 28/64".																
	1500	2079	123	N/A	300	160	56	2.0"	92	50	46	1.5"	5.184	0.780	5.964	(Gross 846)		N/A
June 13	0800	2159	126	N/A	390	164	47	2.0	62	40	44	1.5	5.736	0.590	6.326	(Gross 674)		N/A
	?	Well shut in																
June 14	0850	Flowed well through 28/64" choke. Hydrates again effecting separator. Methanol applied. Orifice sizes increased.																
	1000	Well shut in																
	1145	Flowed well through 30/64" choke.																
	1600	2029	130	3245	500	84	65	2.25	44	3	52	1.75	6.384	0.194	6.578	467	57	14086
	2200	2044	139	3239	500	82	55	2.25	36	3	44	1.75	6.360	0.182	6.542	320	29	20444
June 15	1300	2060	150	3237	500	88	77	2.25	34	2	64	1.75	6.480	0.143	6.623	304	31	21786
	1320	Choke adjusted to 32/64".																
	1500	1994	150	3190	650	77	85	2.25	40	3	72	1.75	6.840	0.185	7.025	391	64	17967
	1600	Choke adjusted to 34/64".																
	2000	1912	152	3143	650	91	75	2.25	44	3	68	1.75	7.488	0.192	7.680	371	59	20701
June 16	0300	1915	148	3140	660	88	65	2.25	40	3	62	1.75	7.440	0.186	7.626	379	22	20121
	1000	1924	151	3143	650	93	84	2.25	39	3	72	1.75	7.536	0.182	7.718	N/A	N/A	N/A
	1430	1927	154	N/A	650	92	87	2.25	36	3	78	1.75	7.512	0.176	7.688	N/A	N/A	N/A
	1435	Well shut in. End of production test.																

000081

BOTTOM HOLE PRESSURE DRAWDOWN

DEPTH TESTED: 8500'

Lubricator	2607.93	(D/W pressure = 2610 psig)
@ 3000'	3052.73	
@ 6000'	3457.33	(Shut in)
@ 8500'	3793.39	

Date	Time	Pressure (psig)	
14/6/72	0850	3793.39	Commenced flow through 28/64" choke
	0950	3373.42	
	1000	3368.44	Shut in due to hydrates at separator
	1100	3768.53	
	1145	3774.74	Resumed flow through 30/64" choke
	1245	3280.77	
	1345	3260.83	
	1445	3250.87	
	1545	3245.89	
	1645	3243.64	
	1745	3242.89	
	1845	3242.64	
	1945	3240.90	
	2045	3238.41	
	2145	3239.65	
	2245	3238.41	
	2345	3237.16	
15/6/72	0045	3237.16	
	0145	3237.16	
	0245	3238.16	
	0345	3233.93	
	0445	3238.41	
	0545	3238.41	
	0645	3237.16	
	0745	3237.16	
	0845	3235.92	
	0945	3235.92	
	1045	3235.92	
	1145	3237.16	
	1245	3237.16	
	1320	3237.16	Increased choke to 32/64"
	1345	3196.05	
	1445	3189.82	
	1545	3189.82	
	1630	3190.32	Increased choke to 34/64"
15/6/72	1645	3150.44	
	1745	3141.72	
	1845	3143.22	
	1945	3143.22	
	2045	3143.22	
	2145	3141.22	
	2245	3139.97	
	2345	3142.47	
16/6/72	0045	3142.47	
	0145	3139.97	
	0245	3139.97	
	0345	3141.22	
	0445	3140.37	
	0545	3140.37	
	0645	3140.37	
	0745	3142.47	
	0845	3142.47	
	0945	3142.47	
	1045	3142.47	
	1145	3143.22	
	1245	3143.22	
	1300	3143.22	Bombs removed

BOTTOM HOLE PRESSURE BUILD-UP

Depth Tested: 8520'

Date	Time	Pressure (psig)	
@ 0' (Lub.)		1941.77	(D/w pressure 1935 psi)
16/6/72	1435	Well shut-in (Note:	Well shut in while bombs were at 8484' then lowered to 8520')
	1535	3687.35	
	1635	2709.29	
	1735	3723.17	
	1835	3730.72	
	1935	3738.79	
	2035	3743.33	
	2135	3746.55	
	2235	3750.37	
	2335	3753.41	
17/6/72	0035	3755.93	
	0135	3757.18	
	0235	3759.70	
	0335	3760.97	
	0435	3763.49	
	0535	3764.74	
	0635	3766.01	
	0735	3768.01	
	0835	3769.78	
	0935	3771.55	
	1035	3772.30	
	1135	3773.05	
	1235	3773.57	
	1335	3774.82	
	1435	3775.57	
	1535	3777.34	
	1635	3777.34	
	1735	3778.61	
	1835	3779.86	
	1935	3780.11	
	2035	3781.13	
	2135	3781.88	
	2235	3782.38	
	2335	3783.13	
18/6/72	0035	3784.14	
	0135	3784.89	
	0235	3784.89	
	0335	3785.64	
	0435	3785.64	
	0535	3786.91	
	0635	3788.69	
	0735	3788.69	
	0835	3789.94	
	0935	3789.94	
	1035	3790.69	
	1135	3790.69	
	1235	3790.69	
	1335	3791.95	
	1435	3792.7	

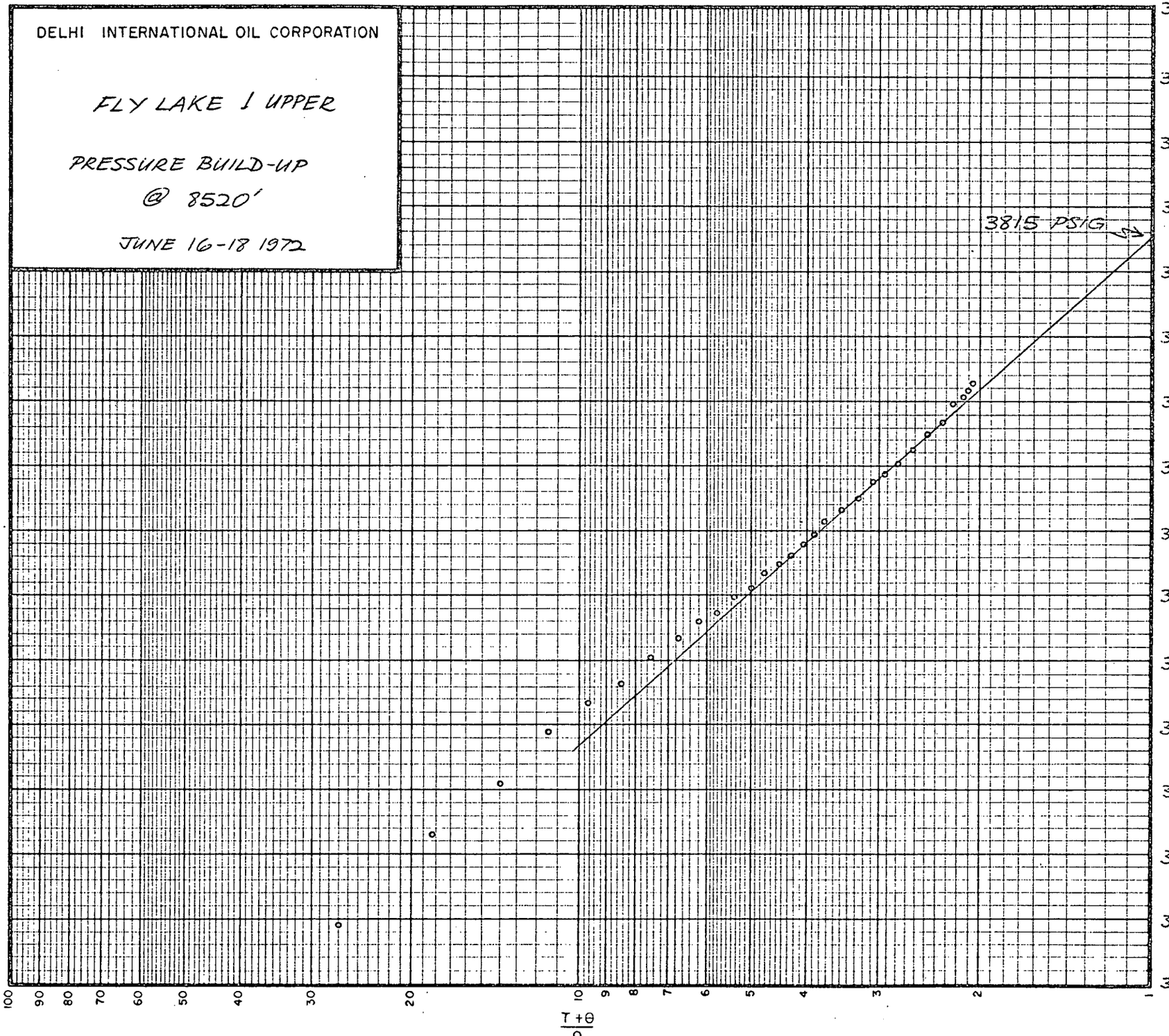
DELHI INTERNATIONAL OIL CORPORATION

FLY LAKE 1 UPPER

PRESSURE BUILD-UP

@ 8520'

JUNE 16-18 1972



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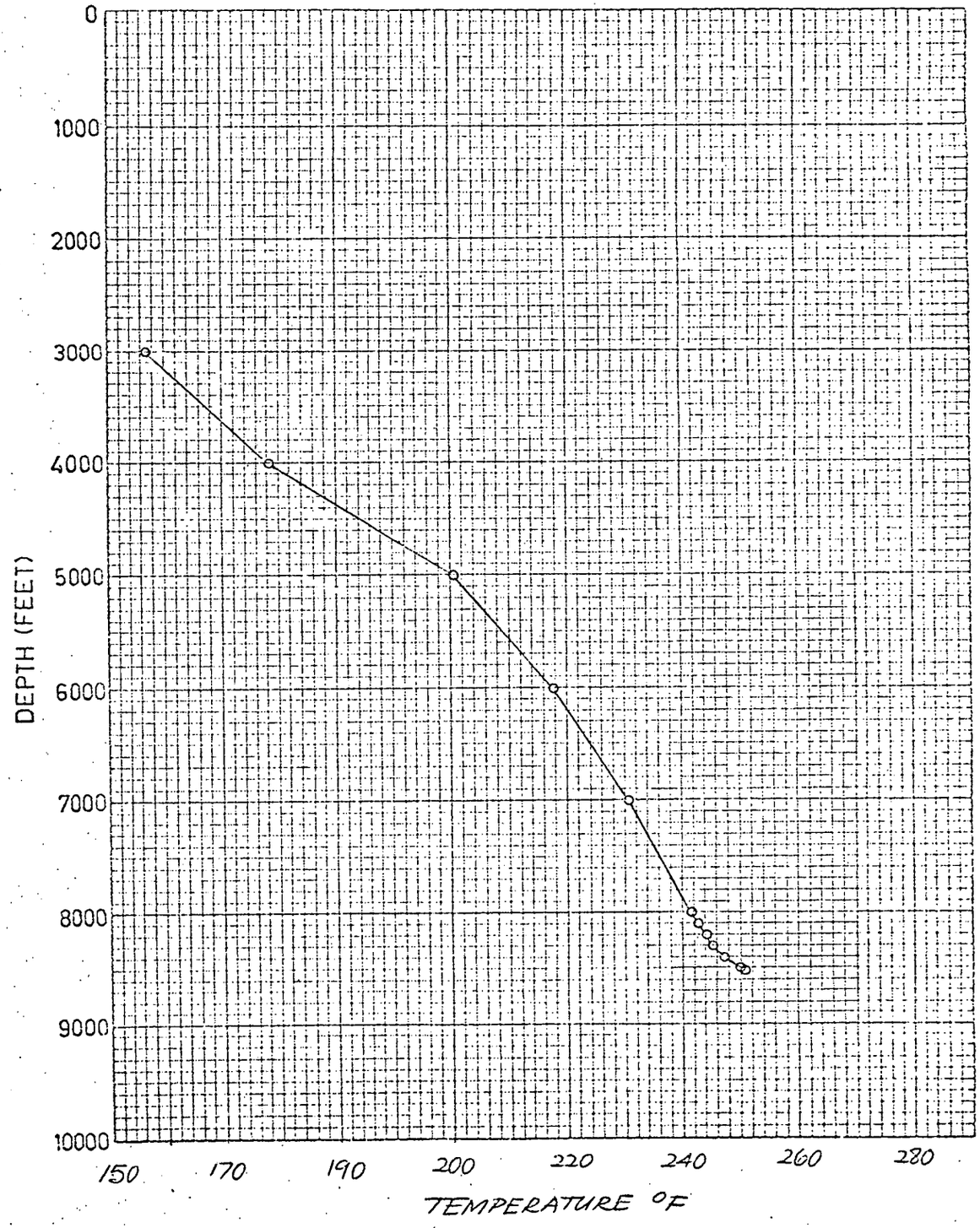
STATIC TEMPERATURE GRADIENT

WELL FLY LAKE 1 UPPER

DATE JUNE 18 1972

GAUGE N° 28115 RANGE 150°-350°

DEPTH	TEMP °F
0	BELOW MINIMUM RANGE OF RECORDER
1000	
2000	
3000	156·8
4000	178·4
5000	200·5
6000	217·8
7000	230·4
8000	241·8
8100	242·9
8200	244·3
8300	245·5
8400	247·4
8500	250·3
8519	250·8



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STATIC PRESSURE GRADIENT

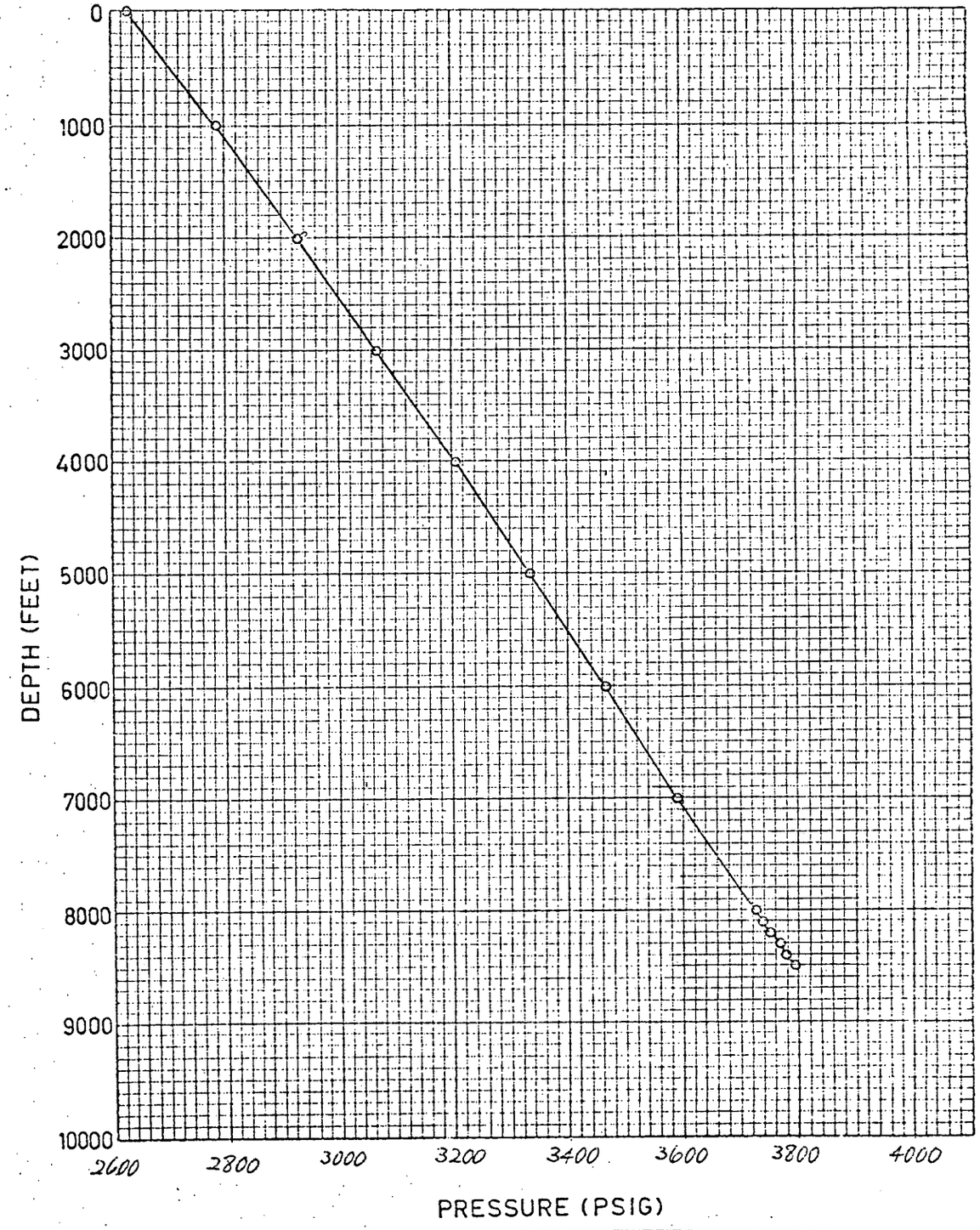
WELL FLY LAKE 1 UPPER

DATE JUNE 18 1972

GAUGE N° 21702 RANGE 0-5000psi

* DEAD WEIGHT PRESS. 2635psi

DEPTH	PRESSURE PSIG	GRADIENT PSI/FT
0 (LUB)	*2631.99	-
1000	2783.72	.1517
2000	2927.83	.1441
3000	3068.11	.1403
4000	3204.56	.1365
5000	33 4.63	.1301
6000	3464.64	.1300
7000	3590.79	.1261
8000	3724.43	.1336
8100	3737.03	.1260
8200	3750.89	.1386
8300	3764.75	.1386
8400	3778.61	.1386
8500	3796.24	.1763
8519	3798.06	.0958



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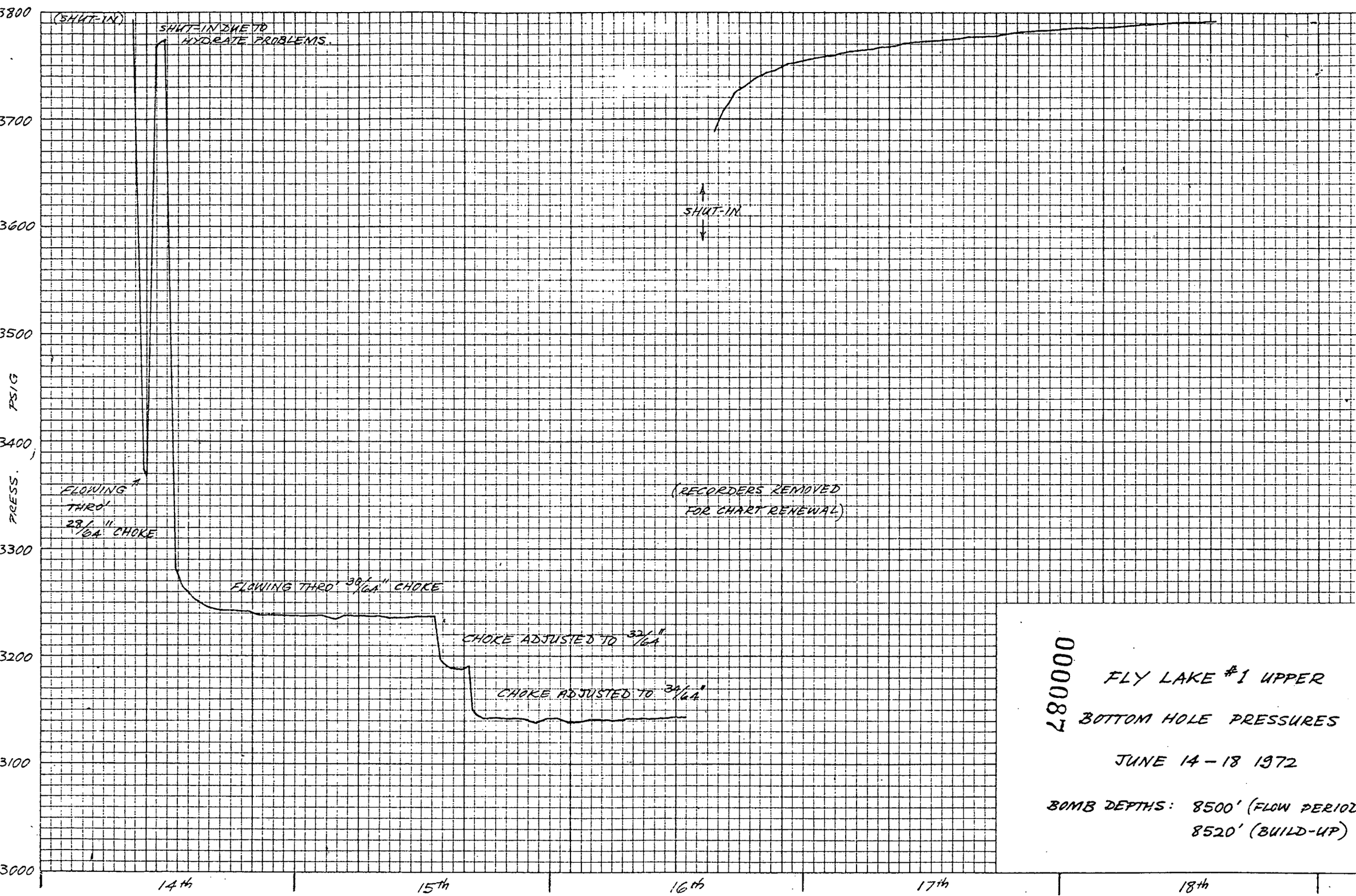

(SHUT-IN)
SHUT-IN DUE TO HYDRATE PROBLEMS.
SHUT-IN
FLOWING THRO' 28/64" CHOKE
(RECORDERS REMOVED FOR CHART RENEWAL)
FLOWING THRO' 30/64" CHOKE
CHOKE ADJUSTED TO 32/64"
CHOKE ADJUSTED TO 34/64"
3800
3700
3600
3500
3400
3300
3200
3100
3000
PSIG
PRESS.
14th
15th
16th
17th
18th
FLY LAKE #1 UPPER
BOTTOM HOLE PRESSURES
JUNE 14 – 18 1972
BOMB DEPTHS: 8500' (FLOW PERIOD
8520' (BUILD-UP)

1972 JUL 20 AM 9:40

HJH

000088

amdel
The Australian Mineral Development Laboratories

Flemington Street, Frewville, South Australia 5063
Phone 79 1662, telex AA82520

Please address all correspondence to the Director
In reply quote: AN3/51/0 - 36/73

18 July 1972

Mr H.J. Hannah
The Production Manager
Delhi International Oil Corporation
Box 1837P GPO
ADELAIDE SA 5001

REPORT AN36/73

YOUR REFERENCE:	Purchase Order A18046
IDENTIFICATION:	As listed
DATE RECEIVED:	4/7/72

Enquiries quoting AN36/73 to Officer in Charge please.

Analysis by: H.W.J. Sears, A.H. Jorgensen and G.R. Holden

Officer in Charge, Analytical Section: A.B. Timms

for F.R. Hartley
Director

jw

ITEM 1 (a)

Well tested:	Fly Lake 1, Upper Zone PD 18
Date tested:	June 16, 1972; 1010 hrs
Type of test:	-
Type of sample:	H.P. Gas
Source of sample:	Separator
Field sampling conditions:	Press. 650 psi; Temp. 72°F.
Reference:	Purchase Order A18046

RESULTS OF ANALYSIS

Oxygen plus argon	<0.02 % mol vol
Nitrogen	1.26
Hydrogen	<0.01
Helium	0.030
Carbon dioxide	27.6
Methane	54.5
Ethane	10.2
Propane	4.19
i Butane	0.620
n Butane	0.880
i Pentane	0.230
n Pentane	0.230
Hexanes	0.150
Heptanes	0.075
Octanes and higher hydrocarbons	0.035
Calculated Gas Density (relative air = 1)	0.953

ITEM 1 (b)

Well tested:	Fly Lake 1, Upper Zone PD 69
Date tested:	June 16, 1972; 0930 hrs.
Type of test:	-
Type of sample:	H.P. Gas
Source of sample:	Separator
Field sampling conditions:	Press. 650 psi; Temp. 72°F.
Reference:	Purchase Order A18046

RESULTS OF ANALYSIS

Oxygen plus argon	<0.020 % mol vol
Nitrogen	1.25
Hydrogen	<0.010
Helium	0.030
Carbon dioxide	27.6
Methane	54.2
Ethane	10.2
Propane	4.19
i Butane	0.640
n Butane	0.870
i Pentane	0.285
n Pentane	0.305
Hexanes	0.230
Heptanes	0.135
Octanes and higher hydrocarbons	0.065
Calculated Gas Density (relative air = 1)	0.961

ITEM 2 (a)

Well tested:	Fly Lake 1, Upper Zone PD 54
Date tested:	June 16, 1972; 1343 hrs
Type of test:	-
Type of sample:	H.P. Fluid
Source of sample:	Separator
Field sampling conditions:	Press. 650 psi; Temp. 85°F.
Reference:	Purchase Order A18046

RESULTS OF ANALYSIS

The sample was released to air pressure and temperature by displacement with saturated brine solution to yield gas and liquid. The relative volume of each was measured, both fractions were then analysed chromatographically and the results combined mathematically to give an analysis of the sample as submitted.

The sample yielded oil and gas in the ratio of 92 ml oil and 12.9 litres of gas at 17°C and 762 mm pressure.

Flash Gas Analysis

Nitrogen	0.44 % mol vol
Carbon dioxide	22.3
Methane	34.9
Ethane	15.1
Propane	12.9
i Butane	2.83
n Butane	4.85
i Pentane	1.50
n Pentane	1.84
Hexanes	1.73
Heptanes	0.91
Octanes and higher hydrocarbons	0.70

Calculated Composition of Sample as Received

Nitrogen	0.070 % by weight
Carbon dioxide	5.98
Methane	3.42
Ethane	2.77
Propane	4.01
Butanes	5.10
Pentanes	5.60
Hexanes	6.70
Benzene	0.600
Heptanes	9.25
Toluene	2.12
Octanes	12.90
Xylenes plus ethyl benzene	2.96
Nonanes	6.66
C_9 aromatics	1.61
Decanes plus C_{10} aromatics	6.32
Undecanes plus aromatics	4.05
Dodecanes plus aromatics	3.26
Tridecanes plus aromatics	2.46
Tetradecanes plus aromatics	1.89
Pentadecanes plus aromatics	1.49
Hexadecanes plus aromatics	1.02
Heptadecanes and higher hydrocarbons	9.36

Specific Gravity of C_{17} + from A.S.T.M. Distillation
= 0.84 (17°C)

ITEM 2 (b)

Well tested:	Fly Lake 1, Upper Zone PD 73
Date tested:	June 16, 1972; 1400 hrs.
Type of test:	-
Type of sample:	H.P. Fluid
Source of sample:	Separator
Field sampling conditions:	Press. 650 psi; Temp. 89°F.
Reference:	Purchase Order A18046

RESULTS OF ANALYSIS

The sample was released to air pressure and temperature by displacement with saturated brine solution to yield gas and liquid. The relative volume of each was measured, both fractions were then analysed chromatographically and the results combined mathematically to give an analysis of the sample as submitted.

The sample yielded oil and gas in the ratio of 98 mls oil and 13.4 litres of gas at 17°C and 762 mm pressure.

Flash Gas Analysis

Nitrogen	0.42 % mol vol
Carbon dioxide	22.3
Methane	33.9
Ethane	15.4
Propane	13.6
i Butane	3.01
n Butane	5.20
i Pentane	1.47
n Pentane	1.63
Hexanes	1.63
Heptanes	0.91
Octanes and higher hydrocarbons	0.53

Calculated Composition of Sample as Received

Nitrogen	0.070 % by weight
Carbon dioxide	5.87
Methane	3.26
Ethane	2.77
Propane	4.19
Butanes	5.34
Pentanes	5.68
Hexanes	6.64
Benzene	0.200
Heptanes	9.33
Toluene	1.94
Octanes	12.96
Xylenes plus ethyl benzene	3.07
Nonanes	6.76
C_9 aromatics	1.60
Decanes plus C_{10} aromatics	6.05
Undecanes plus aromatics	4.15
Dodecanes plus aromatics	3.28
Tridecanes plus aromatics	2.67
Tetradecanes plus aromatics	1.79
Pentadecanes plus aromatics	1.37
Hexadecanes plus aromatics	1.19
Heptadecanes and higher hydrocarbons	9.76

Specific Gravity of C_{17} + from A.S.T.M. Distillation = 0.84

($17^{\circ}C$)

carnadel

AN36/73

ITEM 3 (a)

Well tested:	Fly Lake 1, Upper Zone PD 3
Date tested:	June 16, 1972; 1400 hrs.
Type of test:	-
Type of sample:	L.P. Gas
Source of sample:	Separator
Field sampling conditions:	Press. 37 psi; Temp. 76°F
Reference:	Purchase Order A18046

RESULTS OF ANALYSIS

Oxygen plus argon	<0.020 % mol vol
Nitrogen	0.260
Hydrogen	-
Helium	-
Carbon dioxide	27.3
Methane	27.4
Ethane	18.9
Propane	15.2
i Butane	2.82
n Butane	4.50
i Pentane	1.28
n Pentane	1.21
Hexanes	0.68
Heptanes	0.28
Octanes and higher hydrocarbons	0.17
Calculated Gas Density (relative air = 1)	1.243

ITEM 3 (b)

Well tested:	Fly Lake 1, Upper Zone PD 4
Date tested:	June 16, 1972; 1430 hrs
Type of test:	-
Type of sample:	L.P. Gas
Source of sample:	Separator
Field sampling conditions:	Press. 36 psi; Temp. 78°F.
Reference:	Purchase Order A18046

RESULTS OF ANALYSIS

Oxygen plus argon	<0.020 % mol vol
Nitrogen	0.220
Hydrogen	-
Helium	-
Carbon dioxide	26.3
Methane	28.7
Ethane	18.3
Propane	14.6
i Butane	2.65
n Butane	4.05
i Pentane	1.42
n Pentane	1.55
Hexanes	1.17
Heptanes	0.60
Octanes and higher hydrocarbons	0.44
Calculated Gas Density (relative air = 1)	1.255

ITEM 4

Well tested:	Fly Lake 1, Upper Zone
Date tested:	June 16, 1972; 1000 hrs.
Type of test:	-
Type of sample:	Condensate
Source of sample:	Stock tank
Field sampling conditions:	-
Reference:	Purchase Order A18046

RESULTS OF ANALYSIS

Kinematic Viscosity	1.011 centistokes/sec. at 100°F.
Specific Gravity at 15.6°C (60°F)	0.749
A.P.I. Gravity at 15.6°C (60°F)	57.4

A.S.T.M. Distillation

Initial Boiling Point	27 °C
10 % recovery	70
20	89
30	105
40	118
50	132
60	159
70	196
80	254
87	300

Weight distillate	65.5 grams	Weight residue	7.3 grams
Loss	2.1 grams	Recovery	97.3 %

Residue after distillation
Specific Gravity at 15.6°C (60°F) 0.84

Pour Point	<-2°C	Flash Point	<0°C
Aniline Point	59.5°C	Sulphur (X.R.F.)	0.031 % by weight

000098

D. G.

amdel
The Australian Mineral Development Laboratories

Flemington Street, Frewville, South Australia 5063
Phone 79 1662, telex AA82520

Please address all correspondence to the Director
In reply quote: AN3/51/0 - 36/73

PART REPORT 1

10 July 1972

Mr H.J. Hannah
Production Manager
Delhi International Oil Corporation
GPO Box 1837P
ADELAIDE SA 5001

REPORT AN36/73

YOUR REFERENCE:	Purchase Order A18046
MATERIAL:	Water
IDENTIFICATION:	Fly Lake I - ex stock tank (UPPER ZONE)
DATE RECEIVED:	4/7/72

Enquiries quoting AN36/73 to Officer in Charge please.

Analysis by: C.R. Trigg

Officer in Charge, Analytical Section: A.B. Timms

for F.R. Hartley
Director

pkm

000099

amdel

WATER ANALYSIS REPORT

SAMPLE NO. Fly Lake 1 - ex Stock Tank JOB NO. 36/73

CHEMICAL COMPOSITION

		Milligrams per litre mg/l	Milliequivalents per litre me/l
Cations			
Calcium	(Ca)	96	4.8
Magnesium	(Mg)	11	0.9
Sodium	(Na)	2100	91.3
Potassium	(K)	48	1.2
Iron	(Fe)	67	2.4
Anions			
Carbonate	(CO_3)		
Bicarbonate	(HCO_3)	420	6.9
Sulphate	(SO_4)	560	11.7
Chloride	(Cl)	2850	80.4
Fluoride	(F)		
Nitrate	(NO_3)	Nil	Nil
Phosphate	(PO_4)		

TOTALS and BALANCE

Cations me/l	Anion me/l
100.6	99.0

diff Δ 1.6 sum Σ 199.6 % $(\frac{\Delta \times 100}{\Sigma})$ 0.80

DERIVED AND OTHER DATA

Conductivity (E.C.) μS/cm at 25°C 10250

	Milligrams per litre mg/l
Total Dissolved Solids:	
a. Based on E.C.	
b. Calculated (HCO_3=CO_3)	5937
c. Residue on evaporation at 180°C	
Total Hardness as $CaCO_3$	405
Carbonate Hardness as $CaCO_3$	345
Non-carbonate Hardness as $CaCO_3$	60
Total Alkalinity as $CaCO_3$	345
Free Carbon Dioxide (CO_2)	
Suspended Solids	
Silica (SiO_2)	
Boron (B)	
	Units
Reaction—pH	5.7
Turbidity (Jackson)	
Colour (Hazen)	
Sodium Absorption Ratio	90.8

Name ..... Hundred ..... Supply .....

..... Section ..... Depth Hole .....

Address ..... Hole No. ..... Date Collected .....

..... Water Cut ..... Sample Collected by .....

..... Water Level ..... Date Received .....

REMARKS:

Resistivity 97.5 ohms/cm/cm^2

for Director

R 18

000100

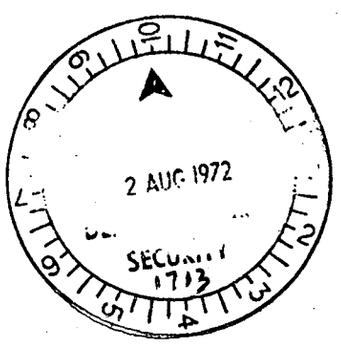
FLY LAKE 1 LOWER

PRODUCTION TEST AND PRESSURE SURVEYS

(AFTER FRAC)

Location:	Longitude	139° 56' 48" E
	Latitude	27° 38' 13" S
Elevation:	Ground	96.3'
	K.B.	114'
Length of Flow String:		9247'
Tubing Size:	0 - 8519'	2-3/8" OD
	8519 - 9238'	2-7/8" OD
	9238 - 9247'	2-3/8" OD
Perforations:	9297 - 9311' }	Mid point 9341'
	9335 - 9385' }	

JUNE 1972



PRODUCTION TEST SUMMARY

1972 Date	Time	Wellhead Press. psig	Wellhead Temp. °F	B.H. Press. @ 9235'	H.P. Separator Press. psig	H.P. Separator Hw Ins.	H.P. Separator Temp. °F	H.P. Separator Orifice Size "	L.P. Separator Press. psig	L.P. Separator Hw Ins.	L.P. Separator Temp. °F	L.P. Separator Orifice Size "	Gas Production MMCFD H.P. Sep.	Gas Production MMCFD L.P. Sep.	Gas Production MMCFD Total	Oil Prod. Bbls/D	Water Prod. Bbls/D	G.O.R. CF/Bbl
May 26	2115	Commenced clean up flow																
May 29	0900	Shut in																
June 1	1650	Resumed flow through 10/64" choke																
	0315	1222	96	*	135	53	40	1.000	34	10	48	0.375	0.456	0.014	0.470	168	23	2798
June 2	0800	1220	96	*	140	48	44	1.000	38	10	52	0.375	0.437	0.015	0.452	180	15	2511
	1130	1212	97	*	140	52	64	1.000	38	12	64	0.375	0.440	0.015	0.455	180	18	2528
	1430	1205	98	*	140	52	67	1.000	38	13	78	0.375	0.444	0.016	0.400	174	19	2644
	1630	1200	97	*	140	50	57	1.000	38	11	72	0.375	0.439	0.015	0.454	173	18	2624
	2205	1205	95	*	140	48	45	1.000	36	10	56	0.375	0.436	0.014	0.450	176	16	2557
June 3	0900	1197	94	*	138	51	50	1.000	34	11	62	0.375	0.444	0.014	0.458	180	14	2544
	1430	1202	97	*	140	50	68	1.000	36	14	76	0.375	0.432	0.016	0.448	174	18	2575
	1830	1199	94	*	138	46	46	1.000	34	13	63	0.375	0.422	0.015	0.437	179	16	2441
June 4	1200	1196	97	*	140	46	56	1.000	35	13	72	0.375	0.425	0.015	0.440	180	20	2444
	1500	Shut in for build up																
June 8	1830	1786	Commenced flow through 18/64" choke															
	2130	489	Increased choke to 26/64"					1.250				0.375						
	2230	455	Increased choke to 28/64"					1.250				0.375						
	2330	460	Increased choke to 30/64"					1.250				0.375						
	2340	-	Changed orifice sizes					1.500				0.500						
June 9	0105	380	87	1145	130	62	49	1.500	24	11	45	0.500	1.116	0.024	1.140	377	37	3024
	0200	380	Increased choke to 31/64"															
	0600	369	94	1103	130	56	48	1.500	28	16	50	0.500	1.061	0.029	1.090	363	51	3003
	1100	369	102	1080	150	48	73	1.500	34	7	72	0.500	1.056	0.020	1.076	354	29	3040
	1300	365	104	1076	150	60	80	1.500	38	8	78	0.500	1.152	0.023	1.175	384	29	3060
	1500	350	105	1090	150	64	78	1.500	36	8	79	0.500	1.181	0.022	1.203	369	29	3260
	1700	365	103	1083	150	64	70	1.500	36	8	74	0.500	1.188	0.022	1.210	369	29	3279
	1830	356	-	1081	Shut in for build up													

* No record due to clock failures

H_2S = 31 ppm

000101

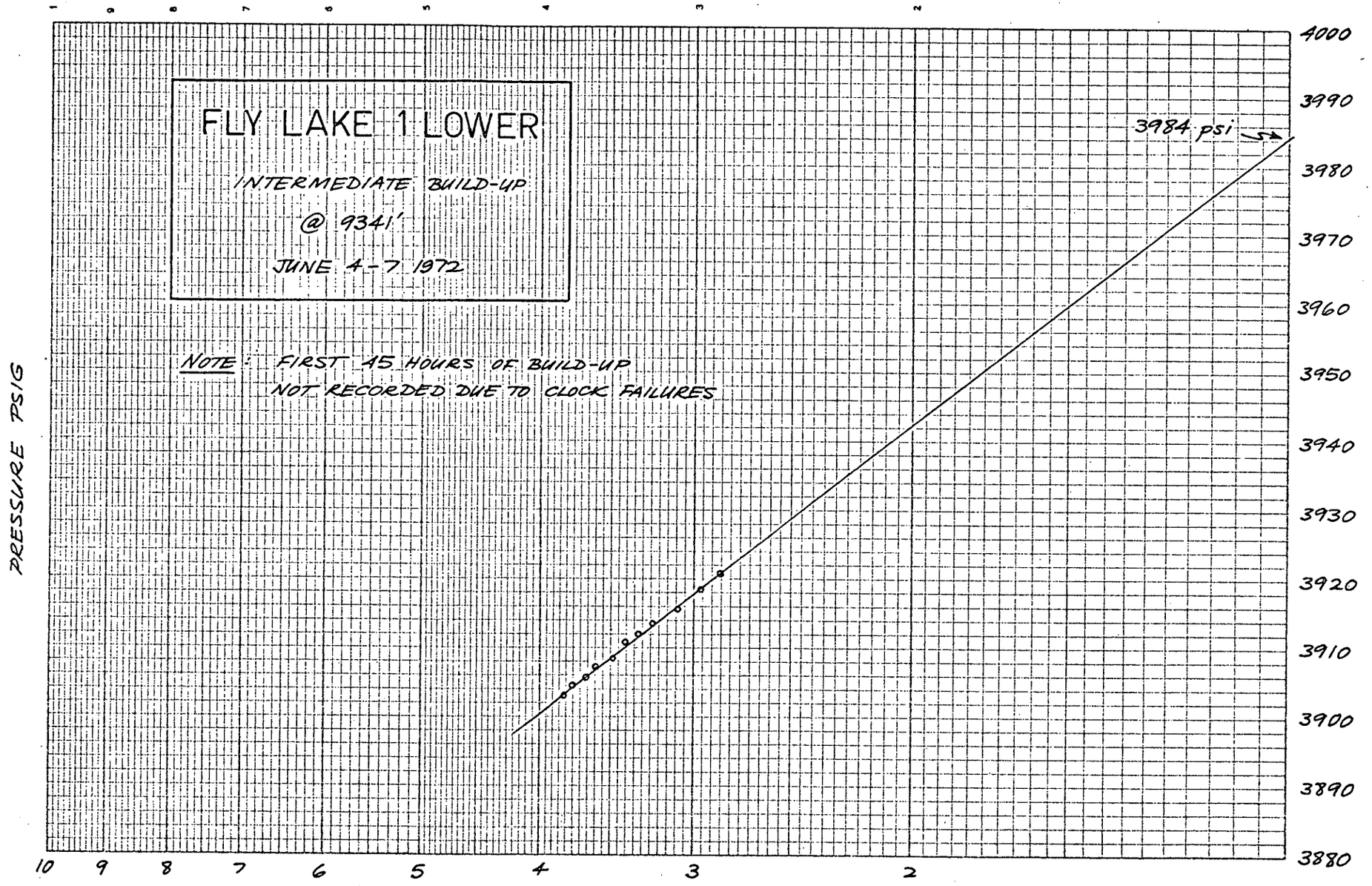
INTERMEDIATE PRESSURE BUILD UP

Recorder Depth: 9341'

LUBRICATOR PRESSURE 1816 psig (D/Wt. 1815 psig)

Date	Time	Pressure (psig)	Surface Pressure (psig)
4.6.72	1500	Well shut in.	
*			
6.6.72	1300	3903.1	
	1400	3904.3	
	1500	3904.3	1830
	1600	3905.6	
	1700	3906.9	
	1800	3907.4	
	1900	3908.2	1829
	2000	3908.9	
	2100	3910.7	
	2200	3910.7	
	2300	3912.5	1829
7.6.72	2400	3912.5	
	0100	3913.3	
	0200	3913.3	
	0300	3914.0	1827
	0400	3915.8	
	0500	3915.8	
	0600	3915.8	
	0700	3917.1	1827
	0800	3917.6	
	0900	3918.4	
	1000	3918.4	
	1100	3919.1	1827
	1200	3919.1	
	1300	3920.9	
	1400	3920.9	
	1500	3920.9	

* FIRST 46 HOURS OF BUILD-UP NOT AVAILABLE DUE TO CLOCK FAILURES.


FLY LAKE 1 LOWER
INTERMEDIATE BUILD-UP
@ 9341'
JUNE 4-7 1972
NOTE: FIRST 45 HOURS OF BUILD-UP NOT RECORDED DUE TO CLOCK FAILURES
3984 psi
PRESSURE PSIG
4000
3990
3980
3970
3960
3950
3940
3930
3920
3910
3900
3890
3880
10 9 8 7 6 5 4 3 2

STATIC PRESSURE GRADIENT

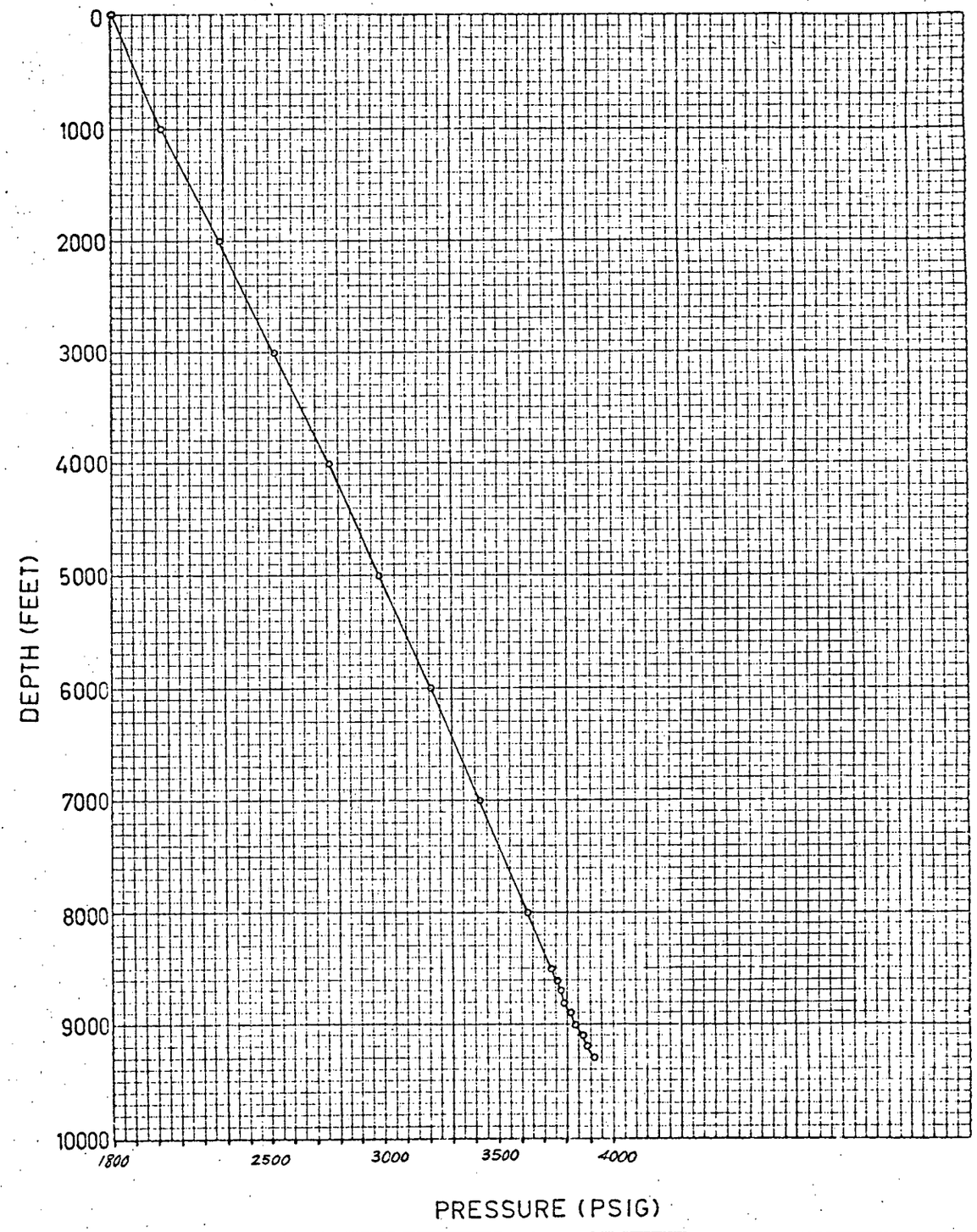
WELL FLY LAKE NO. 1 LOWER

DATE JUNE 7, 1972

GAUGE N° 31825 RANGE 0-5000 psi

* Dead weight pressure 1794 psi

DEPTH	PRESSURE PSIG	GRADIENT PSI/FT
0	*1800.7	-
1000	2024.1	.2234
2000	2279.2	.2551
3000	2525.4	.2462
4000	2761.4	.2360
5000	2986.0	.2246
6000	3205.3	.2193
7000	3420.9	.2156
8000	3632.7	.2118
8500	3735.9	.2064
8600	3755.1	.1920
8700	3773.0	.1790
8800	3794.6	.2160
8900	3816.3	.2170
9000	3839.3	.2300
9100	3864.8	.2550
9200	3887.8	.2300
9300	3915.8	.2800



PRESSURE DRAWDOWN

SECOND FLOW PERIOD

Recorder Depth 9235'

LUBRICATOR PRESSURE 1787 psig (D/Wt. 1782 psig)

Date	Time	Pressure (psig)	Surface Pressure (psig)	
8.6.72	1736	3913.4		
	1830	3916.0	1786	Began flow 18/64" choke
	1930	2082.3		
	2030	1795.9		
	2130	1330.7	489	Reset choke to 26/64"
	2230	1288.1	455	Reset choke to 28/64"
	2330	1151.2	460	Reset choke to 30/64"
9.6.72	0030	1134.4	370	
	0130	1140.8		
	0200	1120.2		Reset choke to 31/64"
	0230	1105.9	370	
	0330	1098.2		
	0430	1105.9		
	0530	1100.8	364	
	0630	1098.2		
	0730	1096.9		
	0830	1085.3		
	0930	1087.9	358	
	1030	1105.9	364	
	1130	1085.3	364	
	1230	1073.7	362	
	1330	1087.9	362	
	1430	1078.8	355	
	1530	1085.3	352	
	1630	1077.5	359	
	1730	1081.4	360	
	1830	1081.4	356	Shut in

Note: No bottom hole pressure record of first flow period due to recorder clock failure.

FINAL PRESSURE BUILD UP

Recorder Depth 9235'

Date	Time	Pressure (psig)	Surface Pressure (psig)	
9.6.72	1830	1081.4	356	Well shut in
	1930	2944.7	1330	
	2030	3444.4	1549	
	2130	3569	1617	
	2230	3616.3	1646	
	2330	3643.4	1663	
10.6.72	0030	3662.8		
	0130	3682.2		
	0230	3697.7	1694	
	0330	3709.3		
	0430	3720.9		
	0530	3731.3		
	0630	3740.3	1718	
	0730	3750.7		
	0830	3758.4	1731	
	0930	3764.9		
	1030	3772.6		
	1130	3777.8		
	1230	3784.2	1751	
	1330	3789.4		
	1430	3793.3		
	1530	3798.4		
	1630	3801.7	1760	
	1730	3806.2		
	1830	3810.3	1762	
	1930	3814.0		
	2030	3819.1		
	2130	3820.4		
	2230	3824.3		
	2330	3824.3		
11.6.72	0030	3830.7		
	0130	3833.3		
	0230	3837.2		
	0330	3838.5		
	0430	3841.1		
	0530	3842.4		
	0630	3845.0	1782	
	0700	3846.2		

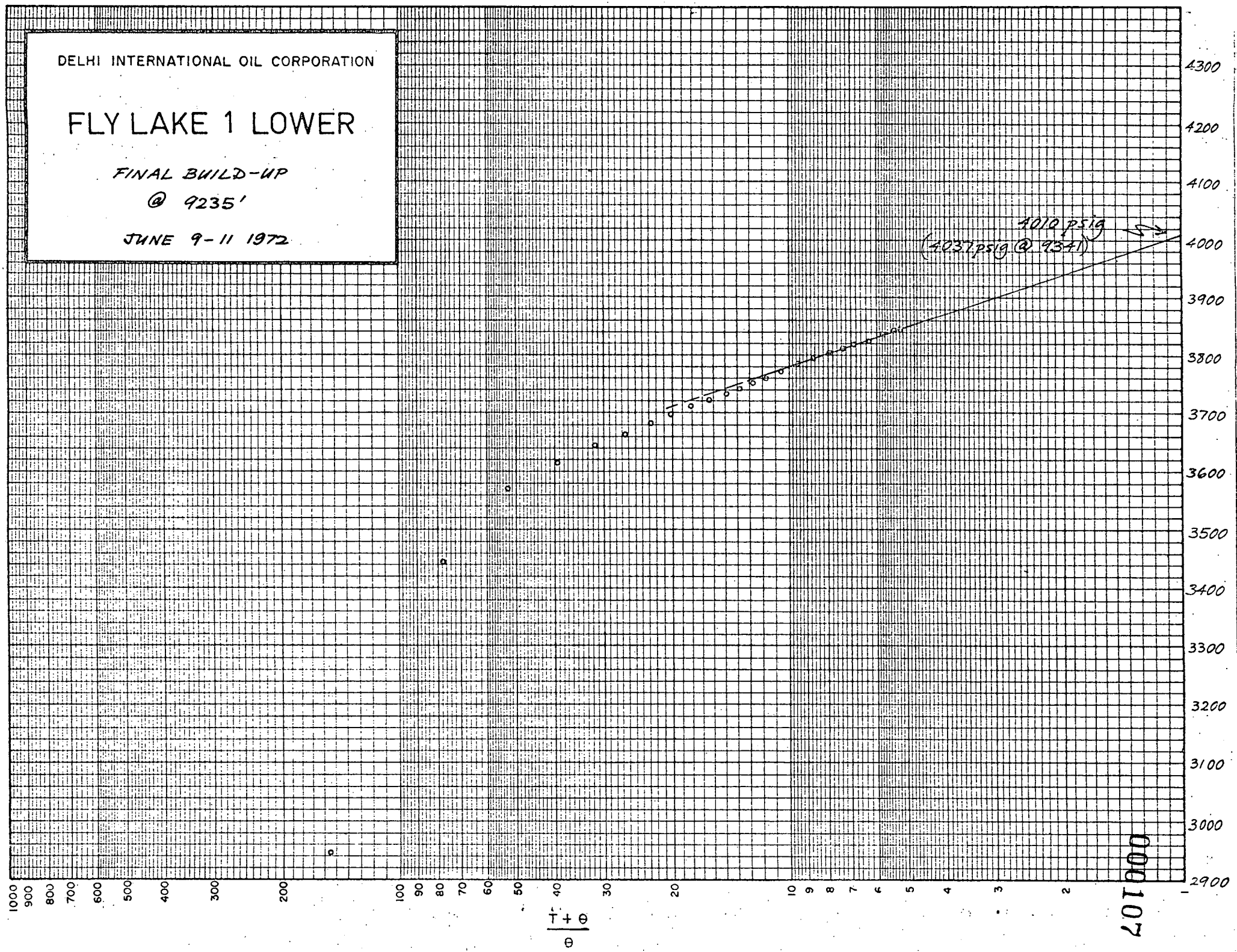
DELHI INTERNATIONAL OIL CORPORATION

FLY LAKE 1 LOWER

FINAL BUILD-UP

@ 9235'

JUNE 9-11 1972



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amdel
The Australian Mineral Development Laboratories

Flemington Street, Frewville, South Australia 5063
Phone 79 1662, telex AA82520

Please address all correspondence to the Director
In reply quote: AN3/51/0 - 5870/72

REPORT - PART 1

27 June 1972

Mr H.J. Hannah
Production Manager
Delhi International Oil Corporation
GPO Box 1387P
ADELAIDE SA 5001

REPORT AN5870/72

YOUR REFERENCE:	Purchase Order A17779
MATERIAL:	Water
IDENTIFICATION:	Fly Lake No. 1 stock tank
DATE RECEIVED:	19/6/72

Enquiries quoting AN5870/72 to Officer in Charge please.

Analysis by: C.R. Trigg

Officer in Charge, Analytical Section: A.B. Timms

for F.R. Hartley
Director

pkm

000109

WATER ANALYSIS REPORT

SAMPLE NO. Stock Tank Fly Lake 1 JOB NO. AN5870/72

CHEMICAL COMPOSITION

		Milligrams per litre mg/l	Milliequivalents per litre me/l
Cations			
Calcium	(Ca)	291	14.5
Magnesium	(Mg)	97	8.0
Sodium	(Na)	18840	819.5
Potassium	(K)	865	22.1
Iron	(Fe)	6	0.2
Anions			
Carbonate	(CO_3)	-	-
Bicarbonate	(HCO_3)	895	14.7
Sulphate	(SO_4)	825	17.2
Chloride	(Cl)	29400	829.0
Fluoride	(F)	-	-
Nitrate	(NO_3)	Nil	Nil
Phosphate	(PO_4)	-	-

TOTALS and BALANCE

Cations me/l	Anion me/l
864.3	860.9

diff Δ 3.4 sum Σ 1725.2 % $\left(\frac{\Delta \times 100}{\Sigma}\right)$ 0.20

DERIVED AND OTHER DATA

Conductivity (E.C.) μS/cm at 25°C 56900

	Milligrams per litre mg/l
Total Dissolved Solids:	
a. Based on E.C.	
b. Calculated (HCO_3=CO_3)	50670
c. Residue on evaporation at 180°C	
Total Hardness as $CaCO_3$	1135
Carbonate Hardness as $CaCO_3$	735
Non-carbonate Hardness as $CaCO_3$	400
Total Alkalinity as $CaCO_3$	735
Free Carbon Dioxide (CO_2)	-
Suspended Solids	
Silica (SiO_2)	
Boron (B)	

	Units
Reaction–pH	6.6
Turbidity (Jackson)	
Colour (Hazen)	
Sodium Absorption Ratio	94.8

Name ..... Hundred ..... Supply .....

..... Section ..... Depth Hole .....

Address ..... Hole No. ..... Date Collected .....

..... Water Cut ..... Sample Collected by .....

..... Water Level ..... Date Received .....

REMARKS: Resistivity 17.5 ohms/cm/cm^2

for Director

HJH

000110

ammdel
The Australian Mineral Development Laboratories 14 AM 9:39
Flemington Street, Frewville, South Australia 5063
Phone 79 1662, telex AA82520

Please address all correspondence to the Director
In reply quote: AN3/51/0 - 5870/72

REPORT - PART 2

13 July 1972

Mr H.J. Hannah
Production Manager
Delhi International Oil Corporation
GPO Box 1837P
ADELAIDE SA 5001

REPORT AN5870/72

YOUR REFERENCE:	Purchase Order A17779
MATERIAL:	Gas, Fluid and Oil
LOCATION:	Fly Lake No. 1
IDENTIFICATION:	As listed
DATE RECEIVED:	19/6/72

Enquiries quoting AN5870/72 to Officer in Charge please.

Analysis by: H.W.J. Sears and A.H. Jorgensen

Officer in Charge, Analytical Section: A.B. Timms

for F.R. Hartley
Director

pkm

ITEM 1 (a)

Well tested:	Fly Lake 1 Lower PD 59
Date tested:	June 4, 1972; 1430 hours
Type of test:	
Type of sample:	H.P. Gas
Source of sample:	Separator
Field sampling conditions:	Press. 140 psi and Temp. 65°F
Reference:	Purchase Order A17779

RESULTS OF ANALYSIS

Oxygen plus argon	<0.02	% mol vol
Nitrogen	1.85	
Hydrogen	<0.01	
Helium	0.030	
Carbon dioxide	25.1	
Methane	47.9	
Ethane	13.1	
Propane	8.4	
i Butane	1.02	
n Butane	1.74	
i Pentane	0.28	
n Pentane	0.32	
Hexanes	0.15	
Heptanes	0.08	
Octanes and higher hydrocarbons	0.03	
Calculated Gas Density (relative air = 1)	1.008	

REMARKS:

ITEM 1 (b)

Well tested:	Fly Lake (Lower) PD 16
Date tested:	June 4 1972; 1455 hours
Type of test:	
Type of sample:	H.P. Gas
Source of sample:	Separator
Field sampling conditions:	Press. 140 psi; Temp 65°F
Reference:	Purchase Order A 17779

RESULTS OF ANALYSIS

Oxygen plus argon	<0.02	% mol vol
Nitrogen	1.75	
Hydrogen	<0.01	
Helium	0.030	
Carbon dioxide	25.3	
Methane	47.7	
Ethane	13.2	
Propane	8.30	
i Butane	1.02	
n Butane	1.72	
i Pentane	0.32	
n Pentane	0.34	
Hexanes	0.16	
Heptanes	0.11	
Octanes and higher hydrocarbons	0.05	
Calculated Gas Density (relative air = 1)	1.012	

REMARKS:

Well tested:	Fly Lake 1 (Lower) PD 61
Date tested:	June 4 1972; 1430 hours
Type of test:	
Type of sample:	L.P. Gas
Source of sample:	Separator
Field sampling conditions:	Press. 36 psi; Temp 74°F
Reference:	Purchase Order A 17779

RESULTS OF ANALYSIS

Oxygen plus argon	<0.02	% mol vol
Nitrogen	0.24	
Hydrogen		
Helium		
Carbon dioxide	25.7	
Methane	22.9	
Ethane	21.6	
Propane	19.5	
i Butane	2.71	
n Butane	4.55	
i Pentane	0.95	
n Pentane	1.00	
Hexanes	0.47	
Heptanes	0.26	
Octanes and higher hydrocarbons	0.12	
Calculated Gas Density (relative air = 1)	1.263	

REMARKS:

Well tested:	Fly Lake L (Lower) PD 67
Date tested:	Juen 4 1972; 1459 hours
Type of test:	
Type of sample:	L.P. Gas
Source of sample:	Separator
Field sampling conditions:	Press. 36 psi; Temp 74°F
Reference:	Purchase Order A17779

RESULTS OF ANALYSIS

Oxygen plus argon	<0.02	% mol vol
Nitrogen	0.22	
Hydrogen		
Helium		
Carbon dioxide	26.0	
Methane	23.1	
Ethane	22.0	
Propane	19.7	
i Butane	2.65	
n Butane	4.10	
i Pentane	0.74	
n Pentane	0.77	
Hexanes	0.40	
Heptanes	0.19	
Octanes and higher hydrocarbons	0.13	
Calculated Gas Density (relative air = 1)	1.252	

REMARKS:

Well tested:	Fly Lake 1 (Lower) PD 9
Date tested:	June 4 1972
Type of test:	
Type of sample:	H.P. Fluid
Source of sample:	Separator
Field sampling conditions:	Press. 140 psi; Temp 65°F
Reference:	Purchase Order A17779

RESULTS OF ANALYSIS

The sample was released to air pressure and temperature by displacement with saturated brine solution to yield gas and liquid. The relative volume of each was measured, both fractions were then analysed chromatographically and the results combined mathematically to give an analysis of the sample as submitted.

The sample yielded oil and gas in the ratio of 160 mls oil and 7.8 litres of gas at 17.0 °C and 762 mm pressure.

Flash Gas Analysis

Nitrogen	0.10	% mol vol
Carbon dioxide	14.0	
Methane	12.5	
Ethane	17.6	
Propane	30.2	
i Butane	6.40	
n Butane	11.7	
i Pentane	2.90	
n Pentane	2.85	
Hexanes	1.18	
Heptanes	0.365	
Octanes and higher hydrocarbons	0.205	

Calculated Composition of Sample as Received

Nitrogen	0.005	% by weight
Carbon dioxide	1.50	
Methane	0.490	
Ethane	1.29	
Propane	3.91	
Butanes	5.77	
Pentanes	6.70	
Hexanes	6.68	
Benzene	0.375	
Heptanes	3.77	
Toluene	1.88	
Octanes	12.10	
Xylenes plus ethyl benzene	3.16	
Nonanes	6.50	
C_9 aromatics	1.88	
Decanes plus C_{10} aromatics	6.32	
Undecanes plus aromatics	4.20	
Dodecanes plus aromatics	3.40	
Tridecanes plus aromatics	2.90	
Tetradecanes plus aromatics	2.39	
Pentadecanes plus aromatics	2.05	
Hexadecanes plus aromatics	0.970	
Heptadecanes plus aromatics		
Octadecanes and higher hydrocarbons	16.76	

Specific Gravity of C_{17}^{+} from A.S.T.M. Distillation = 0.83 ($17^{o}C$)

Well tested:	Fly Lake 1 (Lower) PD 68
Date tested:	June 4 1972
Type of test:	
Type of sample:	H.P. Fluid
Source of sample:	Separator
Field sampling conditions:	Press. 140 psi; Temp. 65°F
Reference:	Purchase Order A17779

RESULTS OF ANALYSIS

The sample was released to air pressure and temperature by displacement with saturated brine solution to yield gas and liquid. The relative volume of each was measured, both fractions were then analysed chromatographically and the results combined mathematically to give an analysis of the sample as submitted.

The sample yielded oil and gas in the ratio of 104 mls oil and 6.3 litres of gas at 17.0 °C and 762 mm pressure.

Flash Gas Analysis

Nitrogen	0.080	% mol vol
Carbon dioxide	14.1	
Methane	12.1	
Ethane	17.3	
Propane	30.2	
i Butane	6.50	
n Butane	12.0	
i Pentane	2.97	
n Pentane	3.02	
Hexanes	1.18	
Heptanes	0.39	
Octanes and higher hydrocarbons	0.16	

Calculated Composition of Sample as Received

Nitrogen	0.005	% by weight
Carbon dioxide	1.83	
Methane	0.575	
Ethane	1.53	
Propane	4.50	
Butanes	6.23	
Pentanes	6.83	
Hexanes	6.78	
Benzene	0.30	
Heptanes	8.62	
Toluene	1.62	
Octanes	11.76	
Xylenes plus ethyl benzene	2.77	
Nonanes	6.43	
C_9 aromatics	1.67	
Decanes plus C_{10} aromatics	6.37	
Undecanes plus aromatics	4.23	
Dodecanes plus aromatics	3.22	
Tridecanes plus aromatics	2.68	
Tetradecanes plus aromatics	2.26	
Pentadecanes plus aromatics	1.85	
Hexadecanes plus aromatics	0.93	
Heptadecanes plus aromatics		
Octadecanes and higher hydrocarbons	16.91	

Specific Gravity of C_{17}^{+} fraction from A.S.T.M. Distillation = 0.83 ($17^{o}C$)

Well tested:	Fly Lake 1 (Lower 1)
Date tested:	June 4 1972; 1505 hours
Type of test:	
Type of sample:	Condensate
Source of sample:	Stock tank
Field sampling conditions:	
Reference:	Purchase Order A17779

RESULTS OF ANALYSIS

Kinematic Viscosity	1.130	centistokes/second at 100°F
Specific Gravity at 15.6°C (60°F)	0.751	
A.P.I. Gravity at 15.6°C (60°F)	56.9	

A.S.T.M. Distillation

Initial Boiling Point	27	°C
10% recovery	66	
20	88	
30	104	
40	123	
50	142	
60	173	
70	223	
80	287	
XX 83	300	

Weight distillate	62.2	grams
Weight residue	11.9	grams
Loss	1.0	grams
Recovery	98.7	%

Residue after distillation
Specific Gravity at 15.6°C (60°F) 0.83

Pour Point	<-5	°C
Flash Point	< 0	°C
Aniline Point	59	°C
Sulphur (X.R.F.)	to follow	% by weight

1972 JUL 21 AM 9:40

H-SH

000120

amdel
The Australian Mineral Development Laboratories
Flemington Street, Frewville, South Australia 5063
Phone 79 1662, telex AA82520

Please address all correspondence to the Director
In reply quote: AN3/51/0 - 5870/72

REPORT COMPLETE

20 July 1972

Mr H.J. Hannah
Production Manager
Delhi International Oil Corporation
GPO Box 1837P
ADELAIDE SA 5001

REPORT AN5870/72

YOUR REFERENCE:	Purchase Order A17779
LOCATION:	Fly Lake 1
IDENTIFICATION:	Condensate - ex stock tank
DATE RECEIVED:	19/6/72

XRF
ANALYSIS
% by weight

Sulphur	S	0.057

Enquiries quoting AN5870/72 to Officer in Charge please.

Analysis by: G.R. Holden

Officer in Charge, Analytical Section: A.B. Timms

for F.R. Hartley
Director

pkm

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000121
RECEIVED
13 MAR 1973
DEPT. OF MINES
SECURITY
1713

DELHI INTERNATIONAL OIL CORPORATION

WELL TEST SUMMARY PAGE 1

Well: Fly Lake 1 Upper Location: Lat 28° 08' 45" S Long 141° 09' 24" E Test Date: Jan 18-21, 1973.

Field: Fly Lake Pool: Patchawarra Tested By: Agnew

Casing Size: 7" Weight: 29#/ft Grade: N-80 Producing Interval: 8591-9170

Tubing Size: 2-7/8" OD Weight: 6.5#/ft Grade: J55 Producing Through: Tubing

Well Blown 48 hours Description of Blow: None

Gas Gravity: 0.964 Source: Calc. Mean Annual Surface Temp _____ °F

Liquid Gravity: 0.671 Source: Calc. B.H. Temp: 258 °F Source: Max. Thermom.

INITIAL SHUT-IN PERIOD Date Shut-In: Jan 16 Time: 1200 Tot. Shut-In 48.0 hrs.

Time of Observation			Observed Pressures				Wellhead Temp.-°F	Remarks
Date	Time	Shut-In Time Hrs.	Tubing psig	Tubing psia	Casing psig	Casing psia		
Jan 18	1200	48.0	2594	2609	NOT AVAILABLE			

FLOW PERIODS Approximate Duration of Flow Periods 2 hours

Run No. 1 Duration of Run 2 hrs. Orifice Size 1.75 Meter Run 3.068

High Pressure Separator - Operating Pressure _____ psig Temp. _____ °F

Low Pressure Separator - Operating Pressure _____ psig Temp. _____ °F

Flowed well on 16/64" choke

Date	Time	Flow Time Hours	Wellhead Readings Tubing psig	Wellhead Readings Casing psig	Wellhead Readings Temp. °F	Meter or Prover Data Pf psia	Meter or Prover Data Hw Ins	Meter or Prover Data Temp. °F	Condensate Prod.-Bbls	Water Prod-Bbls
Jan 18	1230	0.5	2385	N/A	99	490	64	70		
	1300	1.0	2423	"	102	490	70	73		
	1330	1.5	2453	"	104	490	75	73		
	1400	2.0	2463	"	107	490	76	77	26.33	.04

INTERMEDIATE SHUT-IN PERIOD (For use with Isochronal Type Tests)

Date	Time	Shut-In Time Hrs.	Tubing Pressure psig	Tubing Pressure psia	Casing Pressure psig	Casing Pressure psia	Wellhead Temp. °F
Jan 18	1430	0.5	2588	2603	89	104	108
	1500	1.0	2590	2605	89	104	108
	1530	1.5	2590	2605	89	104	108
	1600	2.0	2589	2604	89	104	108

Run No. 2 Duration of Run 2 Hrs. Orifice Size 1.75" Meter Run or Prover Size 3.068"

High Pressure Separator - Operating Pressure _____ psig Temp. _____ °F

Low Pressure Separator - Operating Pressure _____ psig Temp. _____ °F

Flowed well on 20/64" choke

Date	Time	Flow Time Hours	Wellhead Readings Tubing psig	Wellhead Readings Casing psig	Wellhead Readings Temp. °F	Meter or Prover Date Pf psia	Meter or Prover Date Hw Ins	Meter or Prover Date Temp. °F	Condensate Prod.-Bbls	Water Prod-Bbls
Jan 18	1630	0.5	2414	90	105	505	127	60		
	1700	1.0	2406	100	107	500	120	58		
	1730	1.5	2415	120	108	495	120	55		
	1800	2.0	2415	130	108	495	128	55	26.71	.38

WELL TEST SUMMARY PAGE 2

For Use with Isochronal Tests

Date	Time	Shut-In Time Hrs.	Tubing Pressure		Casing Pressure		Wellhead Temp. °F
			psig	psia	psig	psia	
Jan 18	1830	0.5	2607	2622	NOT AVAILABLE		103
	1900	1.0	2608	2623	"	"	99
	1930	1.5	2606	2621	"	"	97
	2000	2.0	2605	2620	"	"	97

Run No. 3 Duration of Run 2 hrs. Orifice Size 2.00" Meter Run: 3.068"
High Pressure Separator - Operating Pressure _____ psig Temp. _____ °F
Low Pressure Separator - Operating Pressure _____ psig Temp. _____ °F
Flowed Well on 24/64" choke

Date	Time	Flow Time Hours	Wellhead Readings			Meter or Prover Data			Condensate Prod-Bbls	Water Prod-Bbls
			Tubing psig	Casing psig	Temp. °F	Pf psia	Hw Ins	Temp. °F		
Jan 18	2030	0.5	2268	110	104	495	112	60		
	2100	1.0	2282	130	110	505	110	60		
	2130	1.5	2294	140	112	495	113	57		
	2200	2.0	2299	140	116	485	117	55	35.76	2.86

For Use with Isochronal Type Tests

Date	Time	Shut-In Time Hrs.	Tubing Pressure		Casing Pressure		Wellhead Temp. °F
			psig	psia	psig	psia	
Jan 18	2230	0.5	2614	2629	125	140	109
	2300	1.0	2615	2630	105	120	99
	2330	1.5	2614	2629	100	115	94
	2400	2.0	2613	2628	90	105	92

Run No. 4 Duration of Run 2 hrs. Orifice Size 2.25 Meter Run or Prover Size: 3.068"
High Pressure Separator - Operating Pressure _____ psig Temp. _____ °F
Low Pressure Separator - Operating Pressure _____ psig Temp. _____ °F
Flowed well on 28/64" choke setting

Date	Time	Flow Time Hours	Wellhead Readings			Meter or Prover Data			Condensate Prod-Bbls	Water Prod-Bbls
			Tubing psig	Casing psig	Temp. °F	Pf psia	Hw Ins	Temp. °F		
Jan 19	0030	0.5	2034	110	110	500	104	60		
	0100	1.0	2028	125	116	495	105	60		
	0130	1.5	2036	135	120	495	107	61		
	0200	2.0	2040	145	124	495	108	63	44.28	2.33

For Use with Isochronal Type Tests

Date	Time	Shut-In Time Hrs.	Tubing Pressure		Casing Pressure		Wellhead Temp. °F
			psig	psia	psig	psia	
Jan 19	0230	0.5	2623	2638	115	130	110
	0300	1.0	2625	2640	105	120	106
	0330	1.5	2625	2640	100	115	100
	0400	2.0	2625	2640	90	105	96

Remarks : TWO STAGE SEPARATION UTILIZED - STATED METER DATA IS FOR HIGH PRESSURE SEPARATOR ONLY.

DELHI INTERNATIONAL OIL CORPORATION

000123

WELL TEST SUMMARY PAGE 3

FINAL STABILIZATION FLOW PERIOD

Run No. 5 Duration of Run 24 Hrs. Orifice Size 2.25 Meter Run 3.068" I.D.
Flowed well on 24/64" choke

Date	Time	Flow Time Hours	Wellhead Readings			Meter or Prover Data			Condensate Prod-Bbls/D	Water Prod - Bbls/D
			Tubing psig	Casing psig	Temp. °F	Pf psia	Hw Ins	Temp. °F		
Jan 19	0430	0.5	2316	90	112	500	54	56		
	0500	1.0	2313	100	116	495	54	60		
	0530	1.5	2314	105	119	500	54	60		
	0600	2.0	2317	110	122	495	55	60		
	0700	3.0	2320	115	124	495	55	65		
	0800	4.0	2321	130	126	500	56	70	381.4	7.2
	0900	5.0	2324	130	124	500	56	73		
	1000	6.0	2324	135	128	500	56	80		
	1100	7.0	2326	140	132	500	57	80		
	1200	8.0	2337	140	133	500	57	83	337.7	9.5
	1300	9.0	2337	140	135	500	57	85		
	1400	10.0	2333	140	133	500	57	81		
	1500	11.0	2331	140	134	500	56	82		
	1600	12.0	2331	140	137	505	56	82		
	1700	13.0	2331	140	136	501	56	81		
	1800	14.0	2331	140	136	495	58	81		
	1900	15.0	2331	130	137	495	58	80		
	2000	16.0	2331	130	126	495	58	80	337.7	10.3
	2100	17.0	2331	130	130	485	59	75		
	2200	18.0	2331	120	140	480	60	75		
	2300	19.0	2331	115	141	475	60	74		
	2400	20.0	2331	110	139	490	58	74	328.5	12.0
Jan 20	0100	21.0	2331	100	138	490	58	72		
	0200	22.0	2331	100	130	490	58	72		
	0300	23.0	2331	90	130	490	58	70		
	0400	(24.0	2331	90	132	490	58	70	329.1	10.9
		(WELL SHUT-IN FOR PRESSURE BUILD-UP OBSERVATIONS.)								

DELHI INTERNATIONAL OIL CORPORATION

000124

WELL TEST SUMMARY PAGE 4

FINAL BUILD-UP PERIOD

For use with Isochronal Type Tests

Date	Time	Shut-In Time Hrs.	Tubing Pressure		Casing Pressure		Wellhead Temp. oF
			psig	psia	psig	psia	
Jan 20	0430	0.5	2646	2661	60	75	125
	0500	1.0	2651	2666	50	65	114
	0530	1.5	2652	2667	45	60	108
	0600	2.0	2653	2668	45	60	100
	0700	3.0	2651	2666	40	55	90
	0800	4.0	2650	2665	40	55	89
	0900	5.0	2650	2665	NOT AVAILABLE		91
	1000	6.0	2644	2659	"	"	96
	1200	8.0	2641	2656	"	"	101
	1400	10.0	2637	2652	"	"	102
	1600	12.0	2631	2646	"	"	102
	2000	16.0	2626	2641	"	"	96
	2400	20.0	2620	2635	"	"	89
Jan 21	0400	24.0	2616	2631	"	"	80
	0800	28.0	2613	2628	"	"	83
	1200	32.0	2612	2627	"	"	NOT AVAILABLE
	1600	36.0	2609	2624	"	"	" "

DELHI INTERNATIONAL OIL CORPORATION

000125

WELL TEST SUMMARY PAGE 5

CALCULATION SHEET

CASE 1: FLOW THROUGH METER RUN

Run No.	HW(in wtr)	P_f (psia)	Size Orifice Plate (inches)	F_t °F	b	$\frac{Hw}{P_f}$
1	76"	490	1.750	77	.0524	.155
2	128"	495	1.750	55	.0524	.259
3	117"	485	2.000	55	.0624	.241
4	108"	495	2.250	63	.0706	.218
5	58"	490	2.250	70	.0706	.118

HIGH PRESSURE SEPARATOR

CASE 2: FLOW THROUGH METER RUN 3.068" I.D.

Run No.	F_b	F_g	F_{tf}	F_{pv}	F_{pb}	F_{tb}
1	663.42	1.0185	.9840	1.0347	1.0068	1.0000
2	663.42	"	1.0048	1.0415	"	"
3	906.01	"	1.0048	1.0403	"	"
4	1223.2	"	.9971	1.0388	"	"
5	1223.2	"	.9905	1.0376	"	"

FLOW THROUGH METER RUN (Continued)

Run No.	F_r	Y	C'	$\sqrt{H_w P_f}$	Q MCF/Hour	Q MCFD
1	1.0003	.9981	691.284	192.977	133.402	3201.6
2	1.0002	.9968	709.594	251.714	178.615	4286.8
3	1.0003	.9969	968.162	238.212	230.628	5535.1
4	1.0003	.9969	1295.124	231.214	299.450	7186.8
5	1.0004	.9983	1286.929	168.582	216.953	5206.9

DELHI INTERNATIONAL OIL CORPORATION

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WELL TEST SUMMARY PAGE 5

CALCULATION SHEET

CASE 1: FLOW THROUGH METER RUN

Run No.	HW(in wtr)	Pf (psia)	Size Orifice Plate (inches)	F_t °F	b	$\frac{Hw}{Pf}$
1	32	65	0.750	102	.0498	.492
2	37	83	0.750	86	.0498	.446
3	41	89	0.750	63	.0498	.461
4	47	101	0.750	66	.0498	.465
5	14	92	0.750	74	.0498	.152

LOW PRESSURE SEPARATOR

CASE 2: FLOW THROUGH METER RUN 3.068" I.D.

Run No.	F_b	F_g	F_{tf}	F_{pv}	F_{pb}	F_{tb}
1	113.56	.9214	.9619	1.0031	1.0068	1.0000
2	113.56	"	.9759	1.0046	"	"
3	113.56	"	.9971	1.0030	"	"
4	113.56	"	.9943	1.0046	"	"
5	113.56	"	.9868	1.0048	"	"

FLOW THROUGH METER RUN (Continued)

Run No.	F_r	Y	C'	$\sqrt{H_w P_f}$	Q MCF/Hour	Q MCFD
1	1.0011	.9944	101.188	45.607	4.615	110.8
2	1.0009	.9949	102.817	55.417	5.698	136.7
3	1.0008	.9947	104.880	60.407	6.335	152.0
4	1.0007	.9947	105.664	68.898	7.280	174.7
5	1.0014	.9983	104.422	35.889	3.748	89.9

BACK PRESSURE TEST - SUMMARY SHEET

000127

Long 141° 09' 24" E

Well: Fly Lake 1 Upper Location: Lat 28° 08' 45" S Field: Fly Lake

Pool: Patchawarra Tested by: Agnew Calculated by: DG

Casing Size: 6.184" I.D. Tubing Size: 2.441" I.D. Produced Through: Tubing

Perforations: 8591-9170 Length of Flow String: 8519'

Properties of Well Effluent. Spec. Gravity _____ Pc _____ Tc _____

H_2S N/A p.p.m.

A. FLOW TEST DATA

Run No.	Tubing psia	Casing psia	Calculated Sandface Press. psia	Gas Flow Rate MMCFD	Condensate Prod- Bbl/d	Total Flow Rate MMCFD	Water Prod. Bbl/d
1	2478	N/A	Measured	3.312	316.0	3.601	0.5
2	2430	145	"	4.423	320.5	4.717	4.6
3	2314	155	"	5.687	429.1	6.080	34.3
4	2055	160	"	7.361	531.4	7.848	28.0
5	2346	105	"	5.927	329.1	6.228	10.9

B. BOMB MEASURED PRESSURES Datum from KB 8500'

Flow Rate No.	Date	Time	Depth	Corr. Press. @ Run Depth - psia	Corr. Press. @ Datum - psia	Remarks
1	Jan 18	1400	8500	3660.7	3660.7	
2	"	1800	8500	3589.4	3589.4	
3	"	2200	8500	3495.6	3495.6	
4	Jan 19	0200	8500	3318.3	3318.3	
5	Jan 20	0400	8500	3454.6	3454.6	

C. SHUT-IN DATA

Shut-In No.	Pressure - psia		Shut-In Time-Hrs.	Shut-In No.	Pressure - psia		Shut-In Time-hrs
	Wellhead	Sandface			Wellhead	Sandface	
Initial	2609	3803.7	48.0				
1	2604	3795.7	2.0				
2	2620	3789.6	2.0				
3	2628	3783.2	2.0				
4	2640	3774.3	2.0				

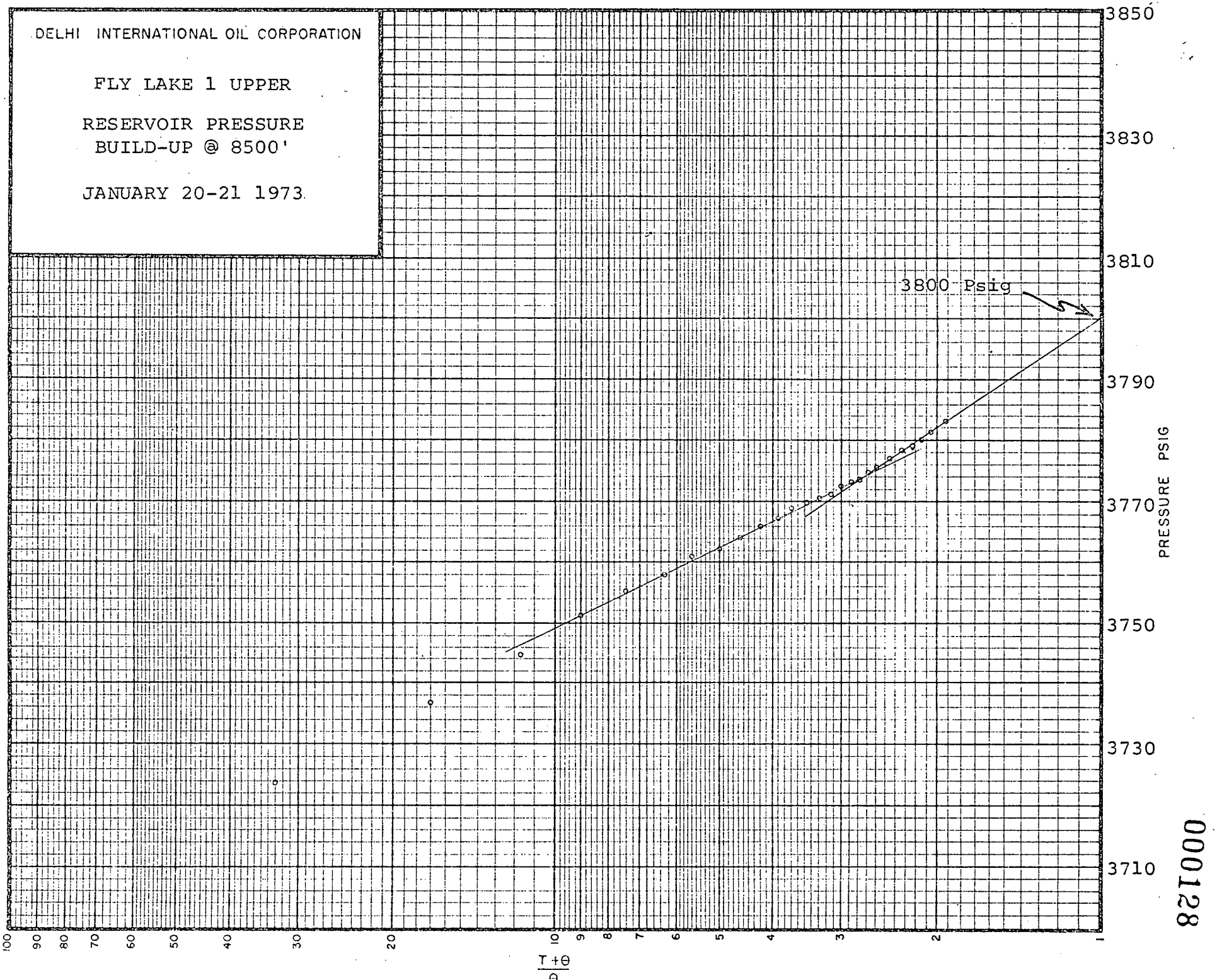
D. PLOTTING DATA

P_f	$P_f^2 \times 10^3$	P_s	$P_s^2 \times 10^3$	$P_f^2 - P_s^2 \times 10^3$	Q Total-MMCFD
3803.7	14468	3660.7	13401	1067	3.601
3795.7	14407	3589.4	12884	1523	4.717
3789.6	14361	3495.6	12219	2142	6.080
3783.2	14313	3318.3	11011	3302	7.848
3774.3	14245	3454.6	11934	2311	6.228

A.O.F. 21.0 MMCFD, n 0.66188

Total Volume of Gas Produced During Test 8.08 MMCF/CONDENSATE 462 Bbls.

Remarks: _____


DELHI INTERNATIONAL OIL CORPORATION
FLY LAKE 1 UPPER
RESERVOIR PRESSURE
BUILD-UP @ 8500'
JANUARY 20-21 1973
3800 Psig
3850
3830
3810
3790
3770
3750
3730
3710
PRESSURE PSIG
100
90
80
70
60
50
40
30
20
10
9
8
7
6
5
4
3
2
1
$\frac{T+\theta}{\theta}$

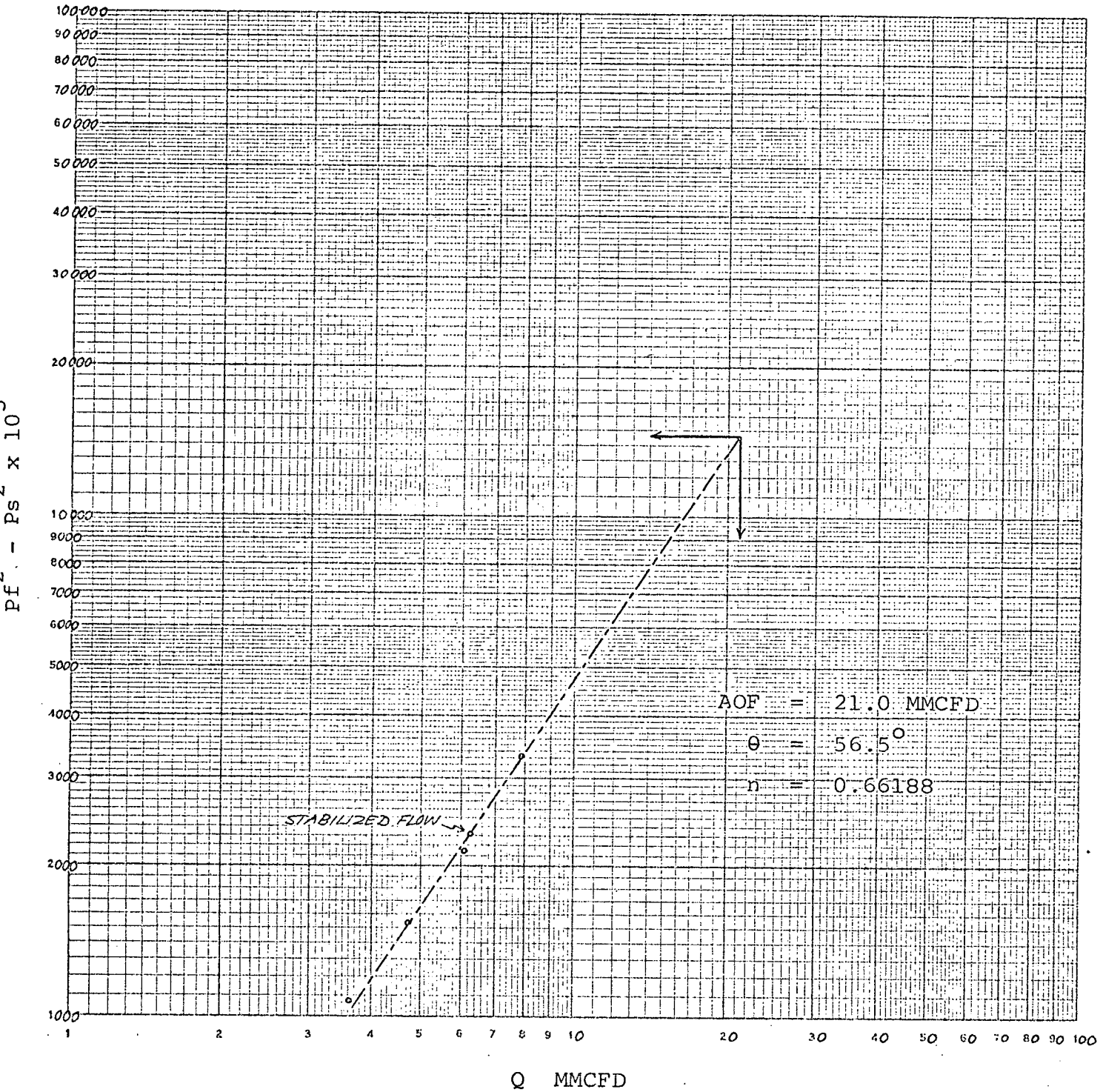
000128

000129

FLY LAKE #1 UPPER

OPEN FLOW POTENTIAL TEST

JANUARY 18-21 1973



1973 MAR 2 AM 9:04

45H

D.G.

000130

amdel
The Australian Mineral Development Laboratories
Flemington Street, Frewville, South Australia 5063
Phone 79 1662, telex AA82520

Please address all correspondence to the Director
In reply quote: AN3/51/0 - 3302/73

PART REPORT 1

NATA CERTIFICATE

28 February 1973

Mr H.J. Hannah
Production Manager
Delhi International Oil Corporation
GPO Box 2364
ADELAIDE SA 5001

REPORT AN 3302/73

YOUR REFERENCE:	Purchase Order A 19333
LOCATION:	Fly Lake 1 Upper
IDENTIFICATION:	As listed
DATE RECEIVED:	31/1/73

Enquiries quoting AN 3302/73 to Officer in Charge please

Officer in Charge, Analytical Section: A.B. Timms

for F.R. Hartley
Director

pkm

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Canadel

AN 3302/73

Well tested:	Fly Lake1 Upper PD 54
Date tested:	20/1/73 0030 hrs
Type of test:	-
Type of sample:	Gas
Source of sample:	HP separator
Field sampling conditions:	Press 475 psi Temp 72°F
Reference:	Purchase Order A19333

RESULTS OF ANALYSIS

Oxygen plus argon	<0.02 % mol vol
Nitrogen	1.33
Hydrogen	not detected
Helium	0.020
Carbon dioxide	28.0
Methane	53.7
Ethane	10.3
Propane	4.30
i Butane	0.62
n Butane	0.96
i Pentane	0.237
n Pentane	0.235
Hexanes	0.135
Heptanes	0.100
Octanes and higher hydrocarbons	0.063
Calculated Gas Density (relative air = 1)	0.964

REMARKS:

Well tested:	Fly Lake 1 Upper PD 70
Date tested:	20/1/73 0150 hrs
Type of test:	-
Type of sample:	Gas
Source of sample:	HP separator
Field sampling conditions:	Press 475 psi Temp 73°F
Reference:	Purchase Order A19333

RESULTS OF ANALYSIS

Oxygen plus argon	<0.02% mol vol
Nitrogen	1.29
Hydrogen	not detected
Helium	0.02
Carbon dioxide	28.1
Methane	53.4
Ethane	10.4
Propane	4.32
i Butane	0.600
n Butane	0.940
i Pentane	0.265
n Pentane	0.276
Hexanes	0.150
Heptanes	0.169
Octanes and higher hydrocarbons	0.070
Calculated Gas Density (relative air = 1)	0.970

REMARKS:

Well tested:	Fly Lake 1 Upper PD 75
Date tested:	20/1/73 0300 hrs
Type of test:	-
Type of sample:	Gas
Source of sample:	LP Separator
Field sampling conditions:	Press 78 psi Temp 74°F
Reference:	Purchase Order A19333

RESULTS OF ANALYSIS

Oxygen plus argon	<0.02 % mol vol
Nitrogen	0.29
Hydrogen	-
Helium	-
Carbon dioxide	32.1
Methane	30.8
Ethane	19.1
Propane	11.4
i Butane	1.69
n Butane	2.65
i Pentane	0.670
n Pentane	0.640
Hexanes	0.345
Heptanes	0.165
Octanes and higher hydrocarbons	0.150
Calculated Gas Density (relative air = 1)	1.178

REMARKS:

Well tested:	Fly Lake 1 Upper PD 81
Date tested:	20/1/73 0130 hrs
Type of test:	-
Type of sample:	Gas
Source of sample:	LP Separator
Field sampling conditions:	Press 76 psi Temp 76°F
Reference:	Purchase Order A19333

RESULTS OF ANALYSIS

Oxygen plus argon	<0.02% mol vol
Nitrogen	0.22
Hydrogen	-
Helium	-
Carbon dioxide	31.9
Methane	30.2
Ethane	18.4
Propane	11.6
i Butane	1.93
n Butane	2.94
i Pentane	0.96
n Pentane	1.00
Hexanes	0.54
Heptanes	0.180
Octanes and higher hydrocarbons	0.130
Calculated Gas Density (relative air = 1)	1.198

REMARKS:

Well tested:	Fly Lake 1 Upper PD 60
Date tested:	20/1/73 0115 hrs
Type of test:	-
Type of sample:	LP Condensate
Source of sample:	LP Separator
Field sampling conditions:	Press 76 psi Temp 75°F
Reference:	Purchase Order A19333

RESULTS OF ANALYSIS

The sample was released to air pressure and temperature by displacement with saturated brine solution to yield gas and liquid. The relative volume of each was measured, both fractions were then analysed chromatographically and the results combined mathematically to give an analysis of the sample as submitted.

The sample yielded oil and gas in the ratio of 185 millilitres oil and 7.4 litres of gas at 27.0 °C and 763 mm pressure.

Flash Gas Analysis

Nitrogen	0.02	% mol vol
Carbon dioxide	12.9	
Methane	5.20	
Ethane	19.6	
Propane	31.2	
i Butane	7.70	
n Butane	12.6	
i Pentane	3.75	
n Pentane	3.65	
Hexanes	2.16	
Heptanes	0.89	
Octanes and higher hydrocarbons	0.33	

Calculated Composition of Sample as Received

Nitrogen	<0.001	% by Weight
Carbon dioxide	1.14	
Methane	0.17	
Ethane	1.18	
Propane	3.95	
Butanes	5.61	
Pentanes	6.00	
Hexanes	6.70	
Benzene	0.28	
Heptanes	9.35	
Toluene	2.52	
Octanes	13.80	
Xylenes plus ethyl benzene	3.20	
Nonanes	8.20	
C_9 aromatics	2.01	
Decanes plus C_{10} aromatics	6.90	
Undecanes plus aromatics	5.28	
Dodecanes plus aromatics	4.19	
Tridecanes plus aromatics	3.44	
Tetradecanes plus aromatics	2.76	
Pentadecanes plus aromatics	2.14	
Hexadecanes plus aromatics	1.52	
Heptadecanes and higher hydrocarbons	9.66	

Specific Gravity of C_{17} + (from A.S.T.M. Distillation)

= 0.84

REMARKS:

Well tested:	Fly Lake 1 Upeer PD 79
Date tested:	20/1/73 0100 hrs
Type of test:	-
Type of sample:	LP Condensate
Source of sample:	LP Separator
Field sampling conditions:	Press 78 psi Temp 74°F
Reference:	Purchase Order A19333

RESULTS OF ANALYSIS

The sample was released to air pressure and temperature by displacement with saturated brine solution to yield gas and liquid. The relative volume of each was measured, both fractions were then analysed chromatographically and the results combined mathematically to give an analysis of the sample as submitted.

The sample yielded oil and gas in the ratio of 202 millilitres oil and 7.6 litres of gas at 27.0 °C and 763 mm pressure.

Flash Gas Analysis

Nitrogen	0.02	% mol vol
Carbon dioxide	12.9	
Methane	6.0	
Ethane	18.9	
Propane	31.0	
i Butane	7.70	
n Butane	12.0	
i Pentane	4.00	
n Pentane	3.95	
Hexanes	2.16	
Heptanes	0.92	
Octanes and higher hydrocarbons	0.45	

Calculated Composition of Sample as Received

Nitrogen	<0.001	% by Weight
Carbon dioxide	1.07	
Methane	0.18	
Ethane	1.07	
Propane	3.82	
Butanes	5.50	
Pentanes	5.90	
Hexanes	6.66	
Benzene	0.26	
Heptanes	9.30	
Toluene	2.50	
Octanes	13.80	
Xylenes plus ethyl benzene	3.16	
Nonanes	8.20	
C_9 aromatics	2.24	
Decanes plus C_{10} aromatics	7.23	
Undecanes plus aromatics	5.32	
Dodecanes plus aromatics	4.10	
Tridecanes plus aromatics	3.41	
Tetradecanes plus aromatics	2.77	
Pentadecanes plus aromatics	2.16	
Hexadecanes plus aromatics	1.57	
Heptadecanes and higher hydrocarbons	9.78	

Specific Gravity of C_{17} + (from A.S.T.M. Distillation)

= 0.84

REMARKS:

Well tested:	Fly Lake 1 Upper
Date tested:	
Type of test:	
Type of sample:	Condensate
Source of sample:	Stock tank
Field sampling conditions	-
Reference:	Purchase Order A19333

RESULTS OF ANALYSIS

Kinematic Viscosity	0.900	centistokes/second at 37.8°C (100°F)
Specific Gravity at 15.6°C (60°F)	0.750	
A.P.I. Gravity at 15.6°C (60°F)	57.1	

A.S.T.M. Distillation

Initial Boiling Point	36	°C
10% recovery	70	
20	92	
30	106	
40	118	
50	136	
60	152	
70	199	
80	256	
~~90~~ 85.4	300	

Weight distillate	64.5	grams
Weight residue	6.90	grams
Loss	2.65	grams
Recovery	96.3	%
Residue after distillation Specific Gravity at 15.6°C (60°F)	0.84	
Pour Point	<-5	°C
Flash Point	<0	°C
Aniline Point	59	°C
Sulphur (X.R.F.)	to follow	% by weight

1973 FEB 19 AM 10:15

A.J.H.
D.G.
000140

amdel
The Australian Mineral Development Laboratories
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Phone 79 1662, telex AA82520

Please address all correspondence to the Director
In reply quote: AN3/51/0 - 3302/73

PART REPORT 1

NATA CERTIFICATE

16 February 1973

Mr H.J. Hannah
Production Manager
Delhi International Oil Corporation
GPO Box 2364
ADELAIDE SA 5001

REPORT AN 3302/73

YOUR REFERENCE:	Purchase Order A19333
LOCATION:	Fly Lake 1 Upper
MATERIAL:	Water ex stock tank
IDENTIFICATION:	As listed
DATE RECEIVED:	31/1/73

Enquiries quoting AN 3302/73 to Officer in Charge please

Officer in Charge, Analytical Section: A.B. Timms

for F.R. Hartley
Director

pkm

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000141

WATER ANALYSIS REPORT

SAMPLE NO. Fly Lake #1 JOB NO. 3302/73

CHEMICAL COMPOSITION

		Milligrams per litre mg/l	Milliequivalents per litre me/l
Cations			
Calcium	(Ca)	34	1.7
Magnesium	(Mg)	5	0.4
Sodium	(Na)	560	24.5
Potassium	(K)	23	0.6
Iron	(Fe)		
Anions			
Carbonate	(CO_3)		
Bicarbonate	(HCO_3)	120	2.0
Sulphate	(SO_4)	130	2.8
Chloride	(Cl)	765	21.5
Fluoride	(F)		
Nitrate	(NO_3)	< 5	< 0.1
Phosphate	(PO_4)		

TOTALS and BALANCE

Cations me/l	Anion me/l
27.2	26.3

diff Δ 0.9 sum Σ 53.5 % $(\frac{\Delta \times 100}{\Sigma})$ 1.68

DERIVED AND OTHER DATA

Conductivity (E.C.) μS/cm at 25°C 3175

	Milligrams per litre mg/l
Total Dissolved Solids:	
a. Based on E.C.	
b. Calculated (HCO_3=CO_3)	1,577
c. Residue on evaporation at 180°C	
Total Hardness as $CaCO_3$	105
Carbonate Hardness as $CaCO_3$	100
Non-carbonate Hardness as $CaCO_3$	5
Total Alkalinity as $CaCO_3$	100
Free Carbon Dioxide (CO_2)	
Suspended Solids	
Silica (SiO_2)	
Boron (B)	
	Units
Reaction—pH	4.8
Turbidity (Jackson)	
Colour (Hazen)	
Sodium Absorption Ratio	90.1

Name Delhi Hundred Supply

Section Depth Hole

Address Hole No. Upper Stock tank Date Collected

Water Cut Sample Collected by

Water Level Date Received

REMARKS:

for Director

1973 APR 30 AM 10:25

R20

000142

amdel
The Australian Mineral Development Laboratories

Flemington Street, Frewville, South Australia 5063
Phone 79 1662, telex AA82520

Please address all correspondence to the Director
In reply quote: AN3/51/0 - 3302/73

REPORT COMPLETE

NATA CERTIFICATE

27 April 1973

The Production Manager
Delhi International Oil Corporation
GPO Box 2364
ADELAIDE SA 5001

REPORT AN 3302/73

YOUR REFERENCE:	Purchase Order A19333
LOCATION:	Fly Lake 1 Upper
IDENTIFICATION:	Condensate ex Stock Tank
DATE RECEIVED:	31/1/73

ANALYSIS

% by weight

Sulphur	S	0.11

Enquiries quoting AN 3302/73 to Officer in Charge please

Officer in Charge, Analytical Section: A.B. Timms

for F.R. Hartley
Director

RECEIVED
4 MAY 1973
SECURITY
1713

pkm

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RESTRICTED
CIRCULATION

RESTRICTED INVESTIGATION REPORT 870R

000143

CSIRO

MINERALS RESEARCH LABORATORIES
DIVISION OF MINERALOGY

THE PETROGRAPHY OF SOME COAL SEAMS FROM FLY LAKE NO 1 WELL, COOPER BASIN

MICHELLE SMYTH

P.O. Box 136
NORTH RYDE, N.S.W.
AUSTRALIA 2113

JUNE 1977

000144

Introduction

Many samples of coal, usually at one foot intervals, from a number of seams in the Fly Lake No 1 well of the Cooper Basin have been supplied to CSIRO by Delhi Oil Company. These samples were requested by CSIRO, together with interseam sediments, as part of a study of the relationship between coals, dispersed organic matter and hydrocarbons.

Because there are so many samples for analysis, complete results will not be available for some time yet. This is thus a progress report.

Analysis

Petrographic analyses, both macerals and microlithotypes, have been carried out on the coal samples of five seams from the Permian Gidgealpa Group.

Seams Nos 1 and 2 are from the Toolachee Formation at depths of 8446 ft to 8456 ft 11 ins [2574.3 m to 2577.7 m] and 8471.5 ft to 8480 ft [2582.1 m to 2584.7 m] respectively. Seams Nos 3, 4 and 5 are in the Patchawarra Formation at depths of 8800 ft 2 ins to 8808 ft 7 ins [2682.3 m to 2684.9 m], 8828 ft to 8833 ft [2690.8 m to 2692.3 m] and 8849 ft to 8864 ft 2 ins [2697.2 m to 2701.8 m] respectively. Seam No 4 is very dirty and does not appear on large scale logs as a coal seam.

Results

Results of maceral analyses are given in Tables 1 to 5, and of microlithotype analyses in Tables 6 to 10. The average compositions of each seam, on a mineral-matter-free basis, are shown in Fig. 1 for macerals and Fig. 2 for microlithotypes.

Petrographic profiles of each seam, giving the variations in the coal microlithotypes, are in Figs 3 to 7.

000145

Discussion

The seams have vitrinite contents ranging from low to moderate, that of seam No 4 being the highest. A higher vitrinite content is often associated with seams which have a high mineral matter content. (Shibaoka and Smyth, 1975). All the seams have low vitrite plus clarite contents.

Seam No 1 (Fig. 3) exhibits two distinct cycles in its vitrite plus clarite content. (Because a coal seam is usually analysed on samples representing a continuous column of coal, the present results based on lump samples may be misleading. However, assuming these samples have been taken without bias at regular intervals the petrographic profiles should be meaningful.)

Seam No 2 (Fig. 4) does not show such distinct cycles, but there is a tendency for the inertinite rich microlithotypes to be less at the base and top of the seam than in the middle.

In seam No 3 (Fig. 5) the vitrite plus clarite has three cycles; in the No 4 seam (Fig. 6) there is probably only one cycle present.

Seam No 5 (Fig. 7) is quite thick, with three distinct cycles and the beginning of a fourth.

In Restricted Investigation Report 652R, comparison was made between the coals from the Gidgealpa Group in Fly Lake No 1 well and coals from the Illawarra Coal Measures of the Sydney Basin. The two groups are quite similar in petrographic composition and in the Bulli and Tongarra seams of the Illawarra Coal Measures, such distinct cycles of vitrinite-rich to vitrinite-poor coal occurs.

These petrographic profiles have been used in other coal basins for correlating seams, and may prove useful in the Cooper Basin. Tentative correlation of the seams from the Fly Lake Nos 1, 2 and 3 and Brolga No 1 wells using a rectangular plot was given in Restricted Investigation Report 797R. Some refinements to and support of the correlations are proposed using the petrographic profiles.

000146

Coal microlithotypes are an expression of the ways in which the macerals are related. In my view the relationships of the macerals are more useful indicators of depositional environments than the macerals on their own. For this reason petrographic profiles of the microlithotypes have been used for proposed seam correlations.

Previously the seam at 9016 ft (2748.1 m) in Fly Lake No 2 was correlated in the plot with the seam at 8850 ft (2697.5 m) in Fly Lake No 1. The petrographic profile of the former seam is shown on Fig. 6, and it is not at all similar to the latter (Fig. 7). However, this seam, No 5, of Fly Lake No 2, is very similar in profile to seam No 4 at 8828 ft (2690.8 m) of Fly Lake No 1 (Fig. 6), and perhaps this would be a more refined correlation.

The seam at 9256 ft (2821.2 m) in Fly Lake No 2 has been correlated by plot with the seam at 9274 ft (2826.7 m) in Brolga No 1 (R.I. 797R). Comparison of the profiles of these two seams (Fig. 8) shows that the Fly Lake No 2 seam is very similar to the top part of the Brolga No 1 seam. Perhaps the seam has thinned, but more probably samples of the top part in Fly Lake No 2 well only have been sent for analysis.

Conclusions

As found previously for Fly Lake No 1 well seams, the coal has low to moderate vitrinite and low vitrite plus clarite contents. However sampling of the coal at regular intervals has permitted the construction of petrographic profiles of the seams, which may prove useful for seam correlation in the Fly Lake - Brolga area.

Note

As work continues on these seams it would be vastly more convenient if some of them were defined and named. Unless this is being done, if Delhi Oil has no objections, I would like to propose names for the seams, designated in this report, Nos 1, 2, 3 and 5. Proposed names would be selected from such aboriginal

000147

words as - Bandup, Bunora, Capemount, Daymar, Dulgum, Gabyon, Galong, Gilba, Holpin, Kimba, should they be considered suitable by the Stratigraphic Nomenclature Committee.

References

Shibaoka, M. and Smyth, Michelle; 1975: Coal petrology and the formation of coal seams in some Australian sedimentary basins, Econ. Geol. 70, pp 1463-1473.

TABLE 1

000148

MACERAL COMPOSITION OF COALS FROM FLY LAKE NO 1 WELL, COOPER BASIN

SEAM NO 1

(Results are given as percentages by volume unless otherwise stated)

Lab. No.	Depth Feet	Depth (m)	Vitrinite	Exinite	Micrinite	Semifusinite	Fusinite	Mineral Matter					Reflectance %
								Cy.	Cb.	Py.	Q.	Oth.	
43280	8446.5	2574.5	9	5	42	32	1	11	-	tr	tr	-	*
47209			9	5	39	32	2	12	-	-	1	-	
47210	8447.5	2574.8	19	4	29	42	1	5	-	tr	tr	-	
47211	8448.5	2575.1	34	3	15	37	5	6	tr	-	tr	-	
47212	8449.5	2575.4	36	6	7	28	2	19	-	tr	2	-	
47213	8450.5	2575.7	55	2	8	24	4	7	-	-	tr	-	
47214	8451.5	2576.0	56	1	15	21	2	4	-	-	1	-	
47215	8452.5	2576.3	11	1	35	39	3	10	-	-	1	-	
47216	8453.5	2576.6	17	4	26	44	3	6	-	-	-	-	
47217	8454.5	2576.9	41	1	18	31	2	7	-	tr	-	tr	
47218	8455.5	2577.2	49	3	16	25	1	6	-	tr	tr	-	0.89
47219	8456.5	2577.5	14	4	41	33	3	4	-	-	1	-	
1.	Seam average		29	3	24	32	3	8	tr	tr	1	tr	

Cy. - Clay.
Cb. - Carbonate.
Py. - Pyrite.
Q. - Quartz.
Oth. - Other minerals.

* Reported in IR 652R

TABLE 2

000149

MACERAL COMPOSITION OF COALS FROM FLY LAKE NO 1 WELL,

COOPER BASIN

SEAM NO 2

(Results are given as percentages by volume unless otherwise stated)

Lab. No.	Depth Feet	Depth (m)	Vitrinite	Exinite	Micrinite	Semifusinite	Fusinite	Mineral Matter					Reflectance %	
								Cy.	Cb.	Py.	Q.	Oth.		
47220	8471.5	2582.1	35	8	23	30	3	1	tr	tr	-	-		
47221	8472.5	2582.4	8	4	41	39	3	5	-	-	tr	-		
47222	8473.5	2582.7	5	5	60	21	2	7	-	-	tr	-		
47223	8474.5	2583.0	13	2	40	39	2	4	-	tr	tr	-		
47224	8475.5	2583.3	7	4	45	34	4	5	tr	-	1	-		
43283	8476	2583.5	13	4	34	43	1	5	-	-	tr	-	*	
47225	8476.5	2583.6	15	4	41	31	4	4	-	-	1	-		
47226	8477.5	2583.9	20	4	34	35	3	3	-	-	1	-		
47227	8478.5	2584.2	50	3	14	25	5	2	-	-	1	-		
					DIRT BAND									
47228	8479.5	2584.6	31	1	5	12	1	41	-	-	9	-		
2.	Seam Average	excluding dirt band	19	4	37	33	3	4	tr	tr	tr	-		

Cy. - Clay.

Cb. - Carbonate.

Py. - Pyrite.

Q. - Quartz.

Oth. - Other minerals.

* Reported in IR 652R

TABLE 3

000150

MACERAL COMPOSITION OF COALS FROM FLY LAKE NO 1 WELL,

COOPER BASIN

SEAM NO 3

(Results are given as percentages by volume unless otherwise stated)

Lab. No.	Depth Feet	Depth (m)	Vitrinite	Exinite	Micrinite	Semifusinite	Fusinite	Mineral Matter					Reflectance %
								Cy.	Cb.	Py.	Q.	Oth.	
47229	8801.5	2682.7	47	5	18	26	3	1	-	-	-	-	
47230	8802	2682.8	62	3	2	3	tr	30	-	tr	-	-	
47231	8804	2683.5	21	5	26	40	4	4	-	-	tr	-	
43286	8805	2683.8	45	4	12	34	1	4	-	tr	tr	-	*
47232	8805.5	2683.9	22	4	38	31	1	3	-	-	1	-	
47233	8806.5	2684.2	8	4	59	24	2	2	-	-	1	-	
47234	8807.5	2684.5	28	4	41	23	1	2	-	-	1	-	
47235	8808.5	2684.8	72	7	3	6	4	8	-	-	tr	-	
3. Seam average			38	5	25	23	2	7	-	tr	tr	-	

Cy. - Clay.
Cb. - Carbonate.
Py. - Pyrite.
Q. - Quartz.
Oth. - Other minerals

* Reported in IR 652R

TABLE 4

000151

MACERAL COMPOSITION OF COALS FROM FLY LAKE NO 1 WELL,

COOPER BASIN

SEAM NO 4

(Results are given as percentages by volume unless otherwise stated)

Lab. No.	Depth Feet	Depth (m)	Vitrinite	Exinite	Micrinite	Semifusinite	Fusinite	Mineral Matter					Reflectance %
								Cy.	Cb.	Py.	Q.	Oth.	
47236	8828	2690.8	40	2	21	31	4	2	-	-	-	-	
47237	8829	2691.1	60	6	2	3	2	26	-	tr	1	-	
						DIRT BAND							
47238	8830	2691.4	45	2	1	1	tr	50	-	-	1	-	
47239	8831	2691.7	58	2	7	28	4	1	-	tr	-	-	
47240	8833	2692.3	43	2	15	34	3	3	-	-	tr	-	
4. Seam Average		excluding dirt band	50	3	12	24	3	8	-	tr	tr	-	

Cy. - Clay.
Cb. - Carbonate.
Py. - Pyrite.
Q. - Quartz.
Oth. - Other minerals.

TABLE 5

MACERAL COMPOSITION OF COALS FROM FLY LAKE NO 1 WELL,

COOPER BASIN

000152

SEAM NO 5

(Results are given as percentages by volume unless otherwise stated)

Lab. No.	Depth Feet	Depth (m)	Vitrinite	Exinite	Micrinite	Semifusinite	Fusinite	Mineral Matter					Reflectance %
								Cy.	Cb.	Py.	Q.	Oth.	
47241	8850	2697.5	47	3	12	31	5	2	-	-	tr	-	
47242	8851	2697.8	7	4	63	15	2	8	-	-	1	-	
47243	8852	2698.1	6	3	57	20	2	10	tr	-	2	-	
43291	8853	2698.4	8	5	59	14	2	8	2	tr	2	tr	*
47244	8853		4	7	56	27	1	3	-	-	2	-	
47245	8854	2698.7	20	5	33	33	6	3	-	-	tr	-	
47246	8855	2699.0	15	2	28	45	4	5	tr	-	1	-	
47247	8856	2699.3	83	10	2	3	1	1	-	-	-	-	
47248	8857	2699.6	62	1	5	26	3	3	-	tr	-	-	
47249	8858	2699.9	56	5	13	22	2	2	-	-	tr	-	
47250	8859	2700.2	4	3	70	13	1	6	tr	-	3	-	
47251	8860	2700.5	2	6	80	6	2	3	tr	tr	1	-	
47252	8861	2700.8	9	3	51	30	2	4	-	-	1	-	
47253	8862	2701.1	39	1	14	34	9	3	-	-	-	-	
47254	8863	2701.4	4	2	59	21	1	12	-	-	1	-	
47255	8864	2701.7	3	6	82	7	1	1	-	-	-	-	
47256	8865	2702.1	35	2	18	38	5	2	-	-	-	-	
5.	Seam Average		24	4	41	23	3	4	tr	tr	1	tr	

Cy. - Clay.
Cb. - Carbonate.
Py. - Pyrite.
Q. - Quartz.
Oth. - Other minerals.

* Reported in IR 652R

MICROLITHOTYPE COMPOSITION OF COALS FROM FLY LAKE NO 1 WELL, COOPER BASIN

SEAM NO 1

(Results are given as percentages by volume unless otherwise stated)

Lab. No.	Depth Feet	Depth (m)	Vitrite	Clarite	Intermediates	Durite	Fusite	Shaly Coal	Mineral Matter					
									Cy.	Cb.	Py.	Q.	Oth.	
43280	8446.5	2574.5	1	-	15	59	24	1	tr	-	-	tr	-	*
47209			tr	-	25	44	26	4	1	-	-	-	-	
47210	8447.5	2574.8	6	-	28	27	37	2	tr	-	-	-	-	
47211	8448.5	2575.1	11	-	49	3	36	1	tr	tr	-	-	-	
47212	8449.5	2575.4	19	2	32	2	22	10	13	-	tr	tr	-	
47213	8450.5	2575.7	33	1	44	-	19	2	1	-	-	-	-	
47214	8451.5	2576.0	41	tr	42	1	14	1	1	-	-	-	-	
47215	8452.5	2576.3	1	-	22	36	38	2	1	-	-	tr	-	
47216	8453.5	2576.6	4	-	46	17	32	1	tr	-	-	-	-	
47217	8454.5	2576.9	15	-	55	4	23	2	1	-	-	tr	-	
47218	8455.5	2577.2	38	-	20	20	19	3	tr	tr	-	-	-	
47219	8456.5	2577.5	7	-	18	49	25	1	tr	-	-	tr	-	
1. Seam average			15	tr	33	22	26	3	1	tr	tr	tr	-	

Cy. - Clay.
Cb. - Carbonate.
Py. - Pyrite.
Q. - Quartz.
Oth. - Other minerals.

* Reported in IR 652R

MICROLITHOTYPE COMPOSITION OF COALS FROM ELY LAKE NO 1 WELL,

COOPER BASIN

000154

SEAM NO 2

(Results are given as percentages by volume unless otherwise stated)

Lab. No.	Depth Feet	Depth (m)	Vitrite	Clarite	Intermediates	Durite	Fusite	Shaly Coal	Mineral Matter					
									Cy.	Cb.	Py.	Q.	Oth.	
47220	8471.5	2582.1	13	-	45	15	26	1	tr	-	-	tr	-	
47221	8472.5	2582.4	2	-	18	51	28	1	tr	-	-	tr	-	
47222	8473.5	2582.7	2	-	16	65	15	2	tr	-	-	tr	-	
47223	8474.5	2588.0	6	-	15	45	32	1	tr	-	-	1	-	
47224	8475.5	2583.3	2	-	11	61	23	2	tr	-	-	1	-	
43283	8476	2583.5	3	-	20	36	38	1	1	-	-	1	-	*
47225	8476.5	2583.6	4	-	19	44	29	3	1	-	-	tr	-	
47226	8477.5	2583.9	7	tr	40	23	28	1	1	-	-	-	-	
47227	8478.5	2584.2	24	1	49	2	22	1	1	-	-	tr	-	
					DIRT BAND									
47228	8479.5	2584.6	18	-	8	-	7	29	36	-	-	1	-	
2. Seam Average		excluding dirt band	7	tr	26	38	27	1	1	-	-	tr		

Cy. - Clay.

Cb. - Carbonate.

Py. - Pyrite.

Q. - Quartz.

Oth. - Other minerals.

* Reported in IR 652R

MICROLITHOTYPE COMPOSITION OF COALS FROM FLY LAKE NO 1 WELL,

COOPER BASIN

000155

SEAM NO 3

(Results are given as percentages by volume unless otherwise stated)

Lab. No.	Depth Feet	Depth (m)	Vitrite	Clarite	Intermediates	Durite	Fusite	Shaly Coal	Mineral Matter					
									Cy.	Cb.	Py.	Q.	Oth.	
47229	8801.5	2682.7	11	1	67	1	19	-	tr	-	-	1	-	
47230	8802	2682.8	57	6	2	1	4	9	21	-	-	-	-	
47231	8804	2683.5	2	-	46	18	32	1	1	-	-	-	-	
43286	8805	2683.8	22	5	46	2	24	tr	1	-	tr	tr	-	*
47232	8805.5	2683.9	2	-	51	23	22	1	1	-	-	-	-	
47233	8806.5	2684.2	tr	-	26	56	16	1	1	-	-	tr	-	
47234	8807.5	2684.5	5	tr	57	15	21	1	1	-	-	tr	-	
47235	8808.5	2684.8	46	21	16	-	6	3	8	-	-	-	-	
3. Seam average			18	4	39	15	18	2	4	-	tr	tr	-	

Cy. - Clay.
Cb. - Carbonate.
Py. - Pyrite.
Q. - Quartz.
Oth. - Other minerals.

* Reported in IR 652R

TABLE 9

MICROLITHOTYPE COMPOSITION OF COALS FROM FLY LAKE NO 1 WELL,

COOPER BASIN

000156

SEAM NO 4

(Results are given as percentages by volume unless otherwise stated)

Lab. No.	Depth Feet	Depth (m)	Vitrite	Clarite	Intermediates	Durite	Fusite	Shaly Coal	Mineral Matter				
									Cy.	Cb.	Py.	Q.	Oth.
47236	8828	2690.8	9	-	61	5	24	1	tr	-	-	-	-
47237	8829	2691.1	48	13	1	-	3	16	18	-	-	1	-
					DIRT BAND								
47238	8830	2691.4	38	4	-	-	-	12	45	-	-	1	-
47239	8831	2691.7	42	tr	31	1	26	tr	tr	-	-	-	-
47240	8833	2692.3	26	1	37	1	35	tr	tr	-	-	-	-
4. Seam average		excluding dirt band	31	4	32	2	22	4	5	-	-	tr	-

Cy. - Clay.

Cb. - Carbonate.

Py. - Pyrite.

Q. - Quartz.

Oth. - Other minerals.

MICROLITHOTYPE COMPOSITION OF COALS FROM FLY LAKE NO 1 WELL,

COOPER BASIN

000157

SEAM NO 5

(Results are given as percentages by volume unless otherwise stated)

Lab. No.	Depth Feet	Depth (m)	Vitr-ite	Clar-ite	Inter-med-iates	Dur-ite	Fus-ite	Shaly Coal	Mineral Matter					
									Cy.	Cb.	Py.	Q.	Oth.	
47241	8850	2697.5	28	3	31	5	32	1	tr	-	-	-	-	
47242	8851	2697.8	-	-	8	90	tr	2	tr	-	-	-	-	
47243	8852	2698.1	1	-	8	77	7	4	1	2	-	tr	-	
43291	8853	2698.4	tr	-	23	69	3	2	tr	2	tr	1	-	*
47244			tr	-	9	68	18	4	1	tr	-	tr	-	
47245	8854	2698.7	2	tr	44	14	36	4	tr	-	-	tr	-	
47246	8855	2699.0	5	-	29	25	39	1	tr	1	tr	tr	-	
47247	8856	2699.3	41	45	10	-	3	1	tr	-	-	-	-	
47248	8857	2699.6	48	1	22	tr	25	4	tr	-	-	-	-	
47249	8858	2699.9	27	3	46	3	20	1	tr	-	-	-	-	
47250	8859	2700.2	-	-	4	89	2	3	2	tr	-	tr	-	
47251	8860	2700.5	-	-	3	95	-	1	1	tr	-	tr	-	
47252	8861	2700.8	1	-	14	58	26	1	tr	-	-	tr	-	
47253	8862	2701.1	25	tr	44	1	29	tr	1	-	-	tr	-	
47254	8863	2701.4	1	-	5	73	7	10	4	-	-	tr	-	
47255	8864	2701.7	-	-	4	95	tr	1	tr	-	-	tr	-	
47256	8865	2702.1	24	tr	39	1	34	tr	2	-	-	tr	-	
5.	Seam average		12	3	20	45	17	2	1	tr	tr	tr	-	

Cy. - Clay.

Cb. - Carbonate.

Py. - Pyrite.

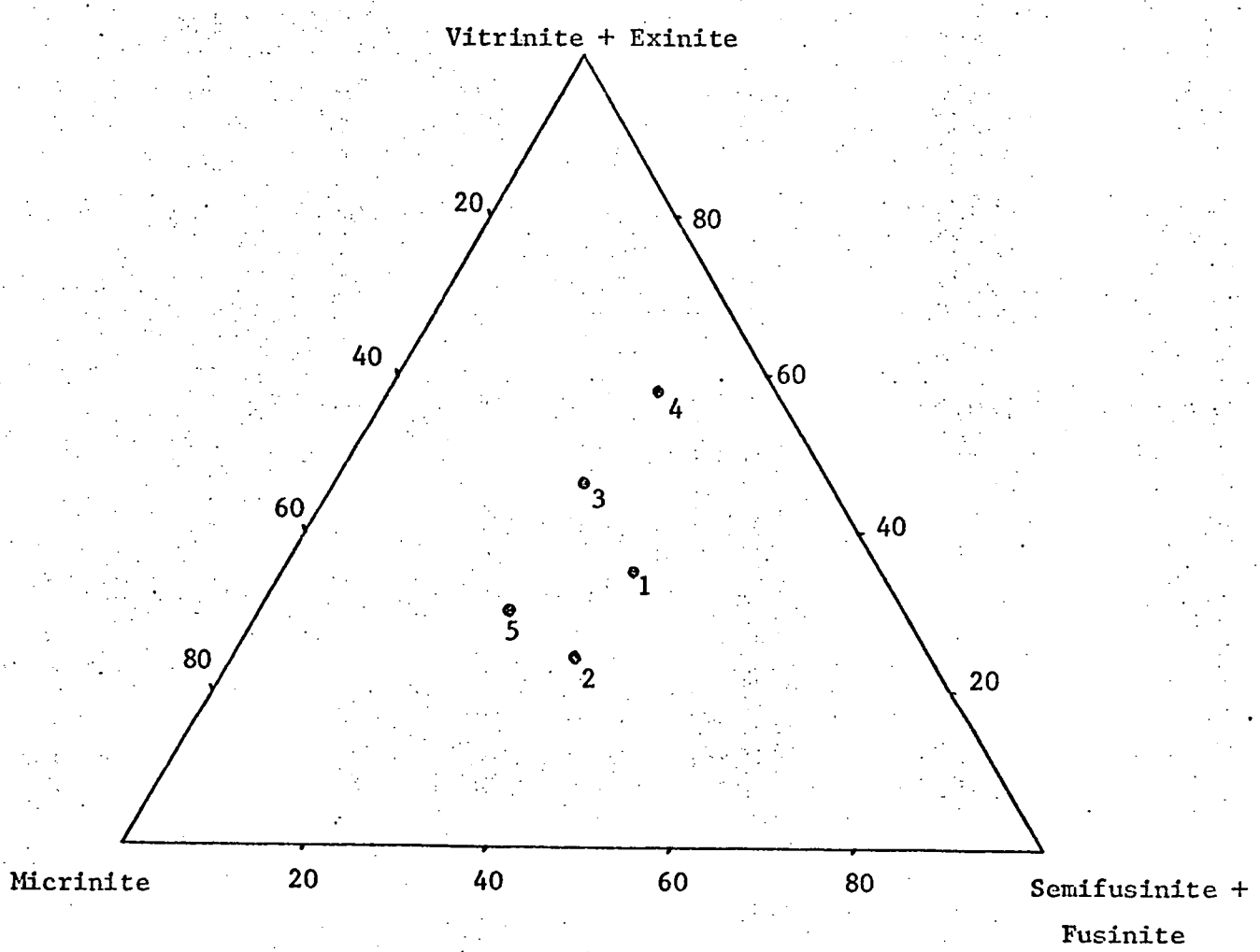
Q. - Quartz.

Oth. - Other minerals.

* Reported in IR 652R

000158

Fig. 1 Maceral compositions of coals (mineral-matter-free).



TOOLACHEE FORMATION

SEAM No 1 • 1

8446.5 ft to 8456.5 ft
2574.5 m to 2577.5 m

SEAM No 2 • 2

8471.5 ft to 8478.5 ft
2582.1 m to 2584.2 m

PATCHAWARRA FORMATION

SEAM No 3 • 3

8801.5 ft to 8808.5 ft
2682.7 m to 2684.8 m

SEAM No 4 • 4

8828 ft to 8833 ft
2690.8 m to 2692.3 m

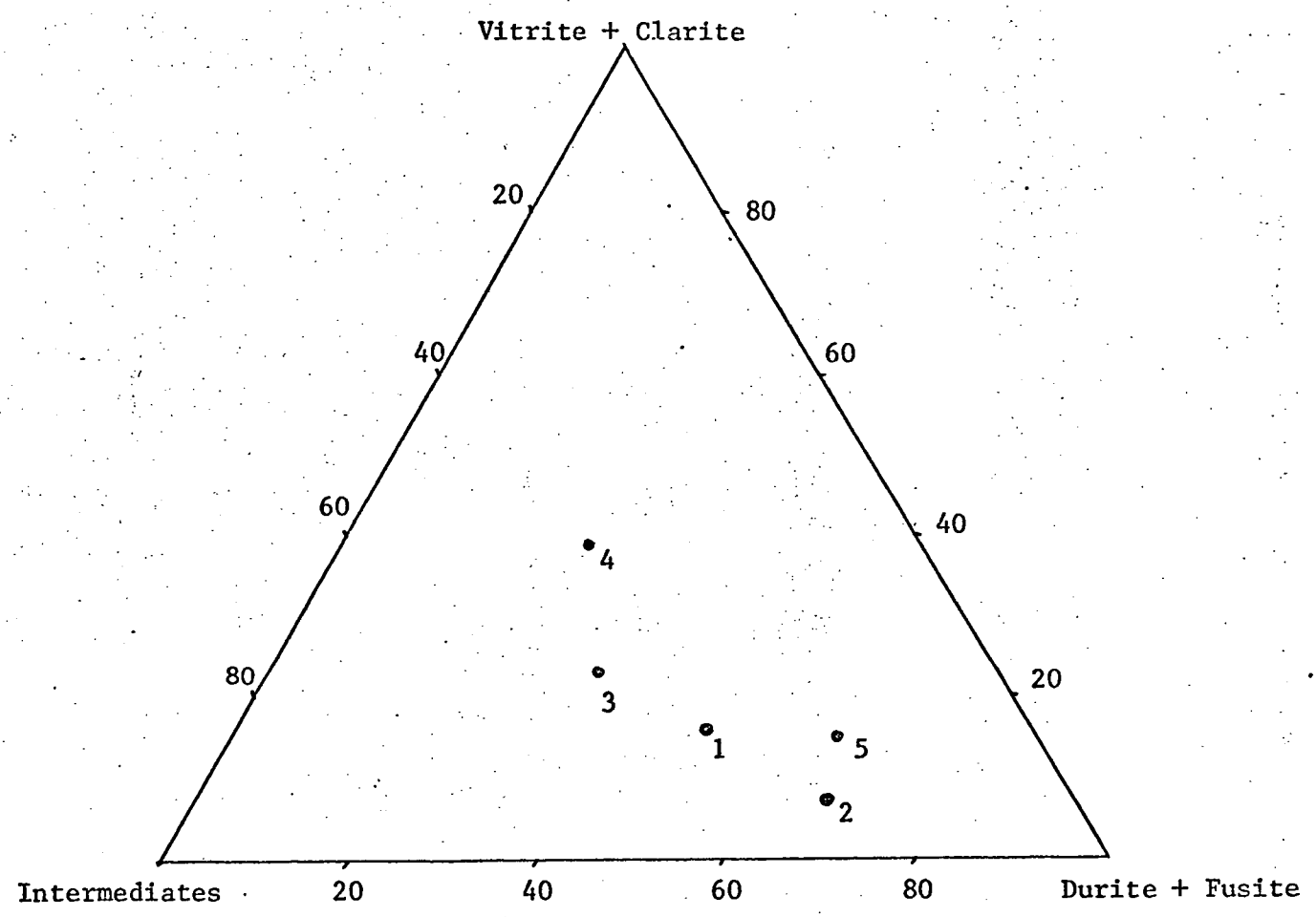
SEAM No 5 • 5

8850 ft to 8865 ft
2697.5 m to 2702.2 m

000159

FIG. 2 MICROLITHOTYPE COMPOSITIONS OF COALS

(mineral-matter-free)



TOOLACHEE FORMATION

SEAM No 1 • 1

8446.5 ft to 8456.5 ft

2574.5 m to 2577.5 m

SEAM No 2 • 2

8471.5 ft to 8478.5 ft

2582.1 m to 2584.2 m

PATCHAWARRA FORMATION

SEAM No 3 • 3

8801.5 ft to 8808.5 ft

2682.7 m to 2684.8 m

SEAM No 4 • 4

8828 ft to 8833 ft

2690.8 m to 2692.3 m

SEAM No 5 • 5

8850 ft to 8865 ft

2697.5 m to 2702.2 m

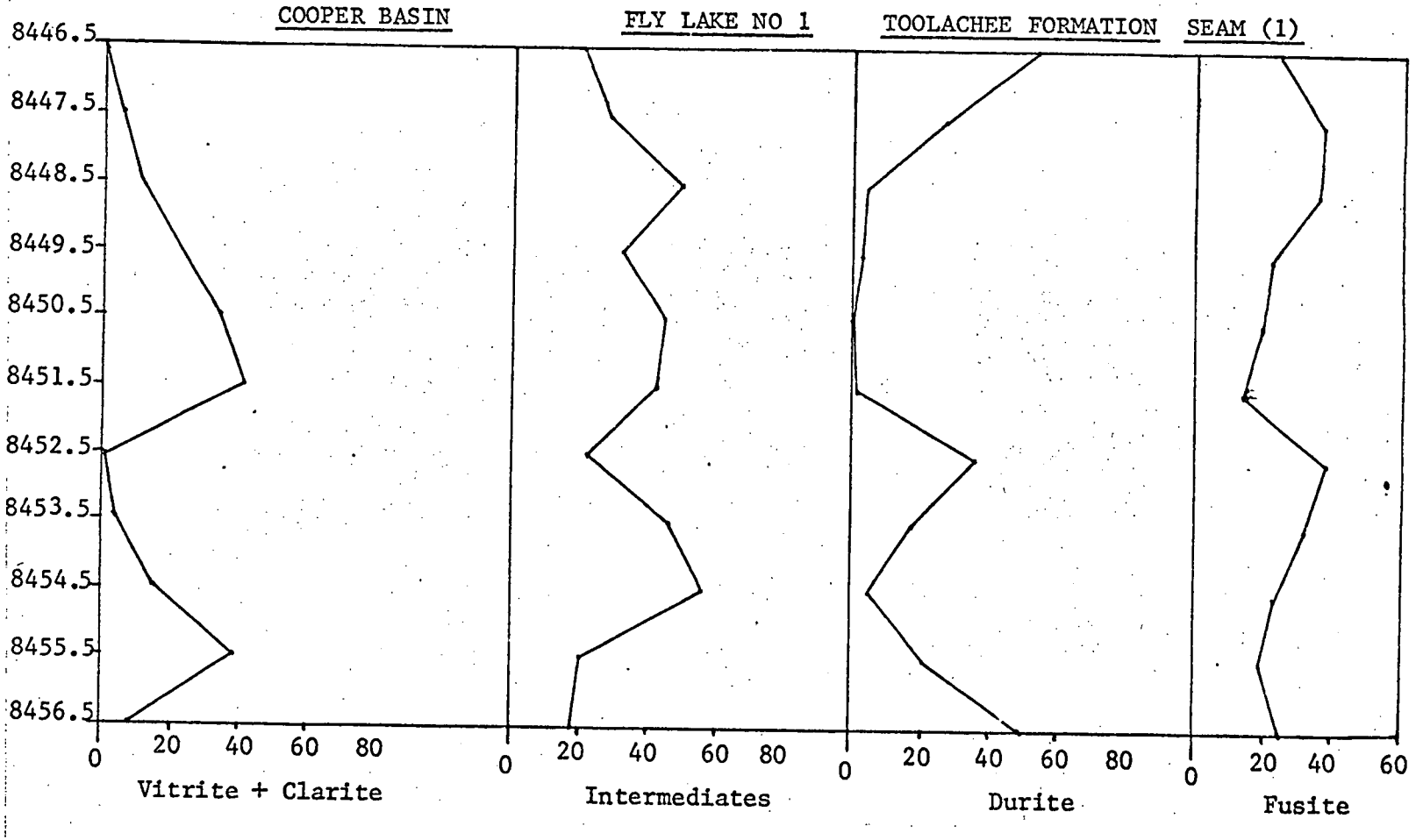


FIG. 3 PETROGRAPHIC PROFILE OF SEAM No 1

000160

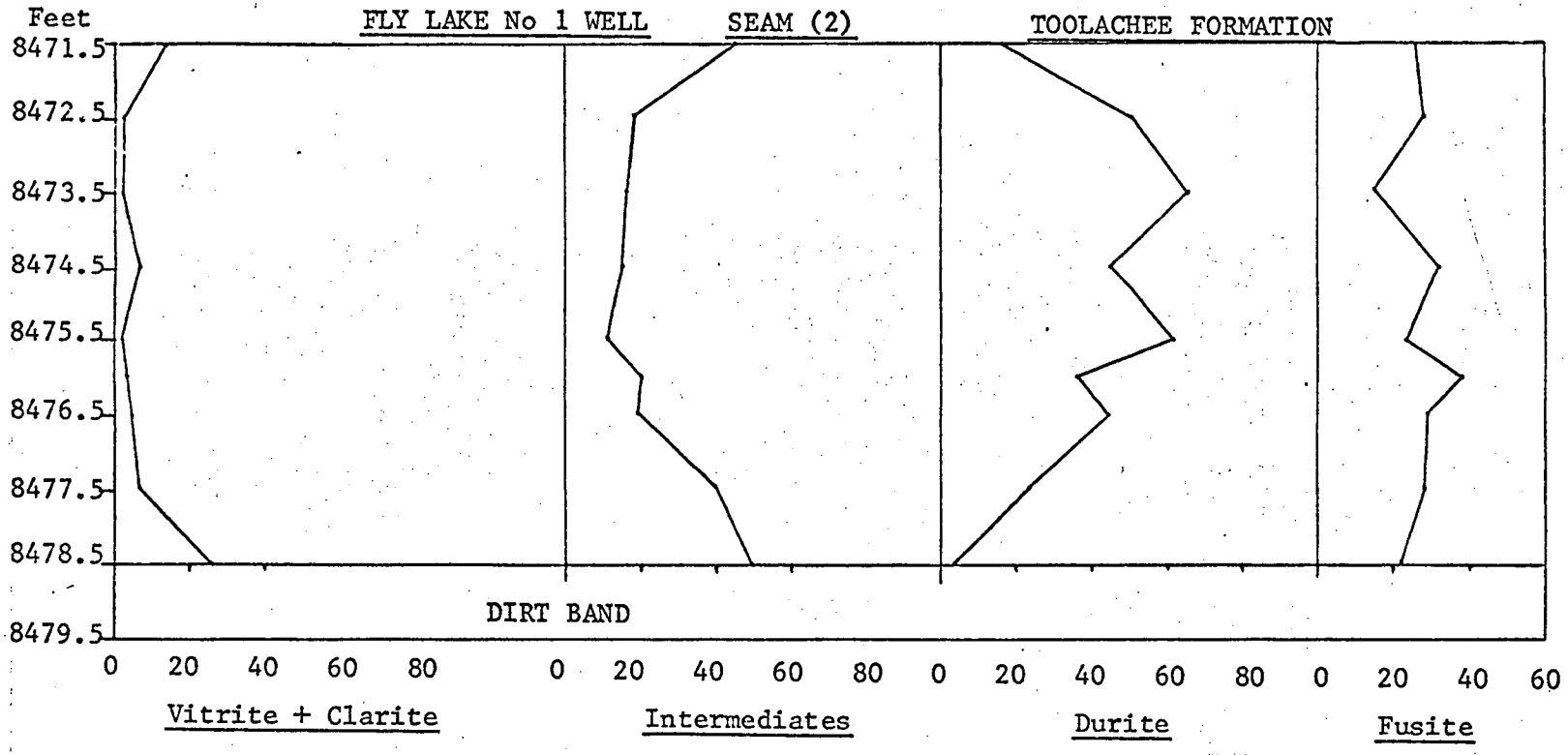


FIG. 4 PETROGRAPHIC PROFILE OF SEAM No 2

000161

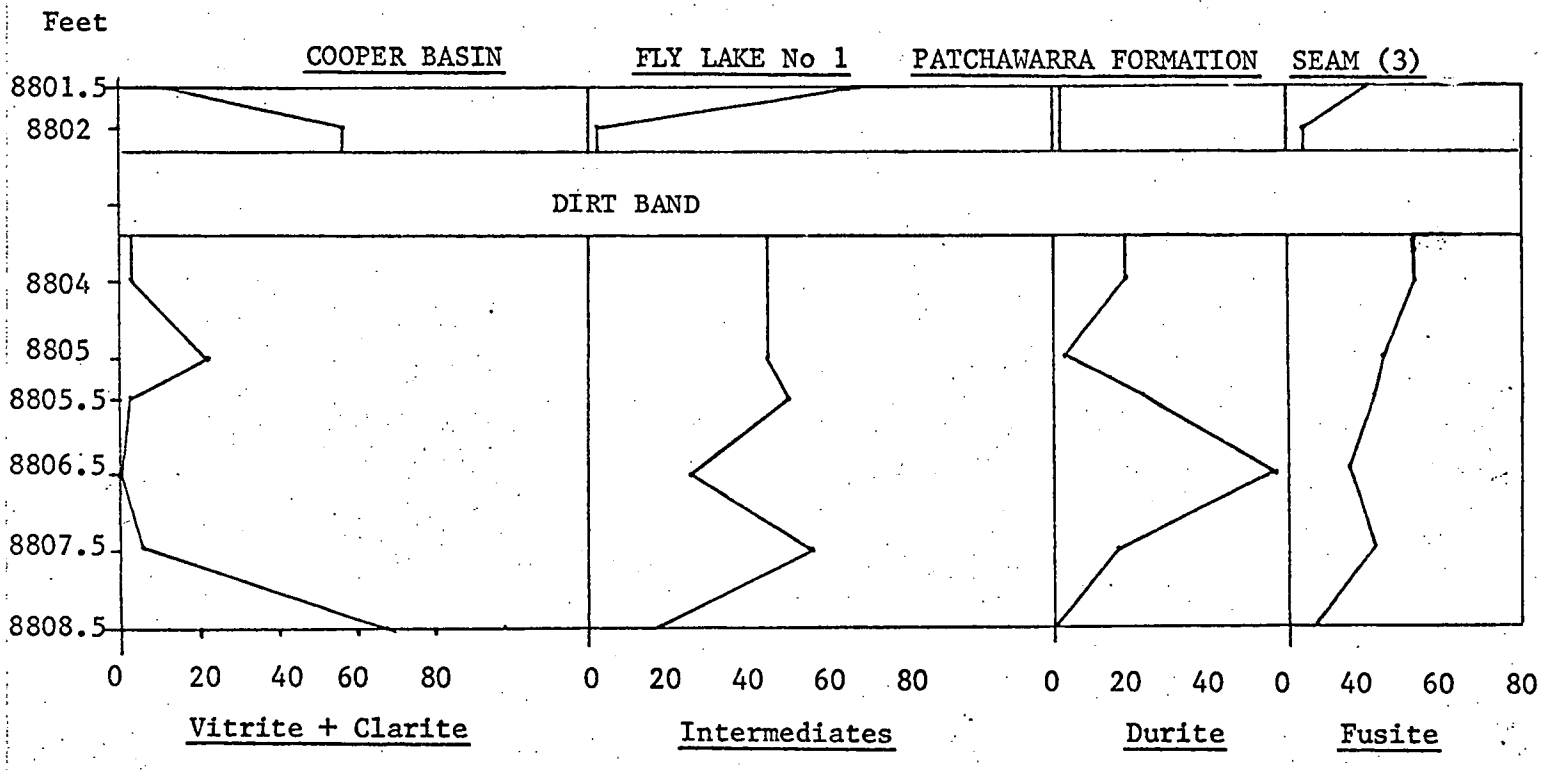


FIG. 5 PETROGRAPHIC PROFILE OF SEAM No 3

000162

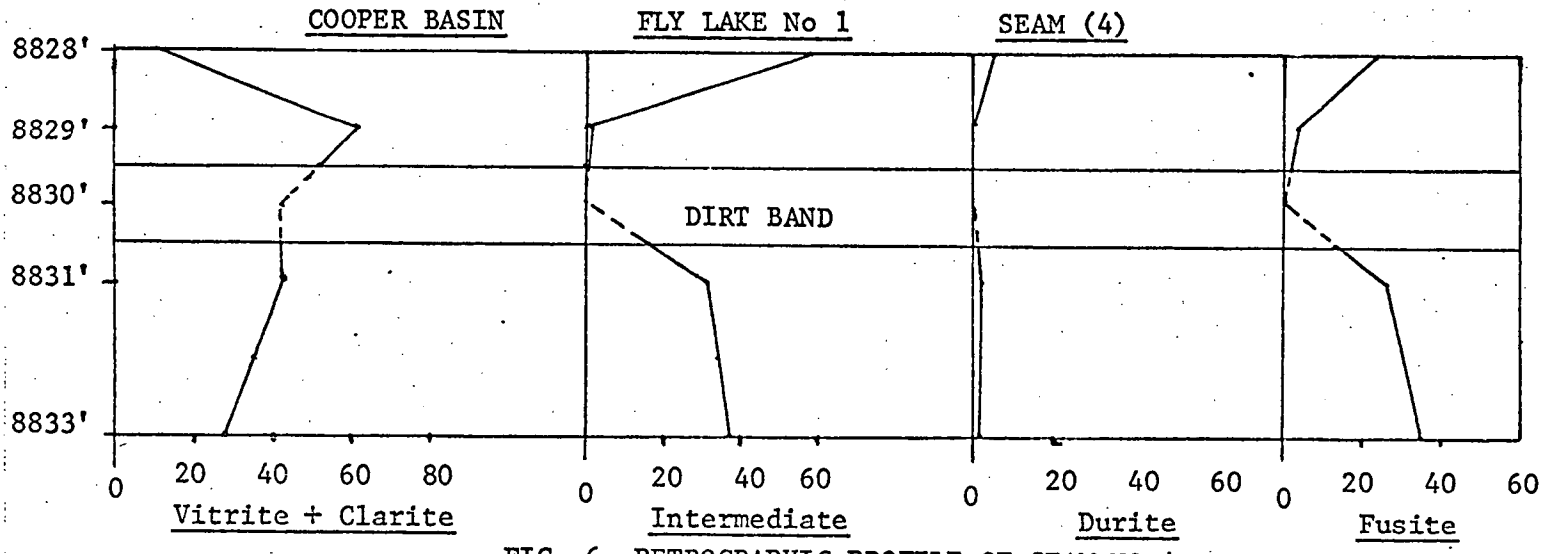


FIG. 6 PETROGRAPHIC PROFILE OF SEAM NO 4

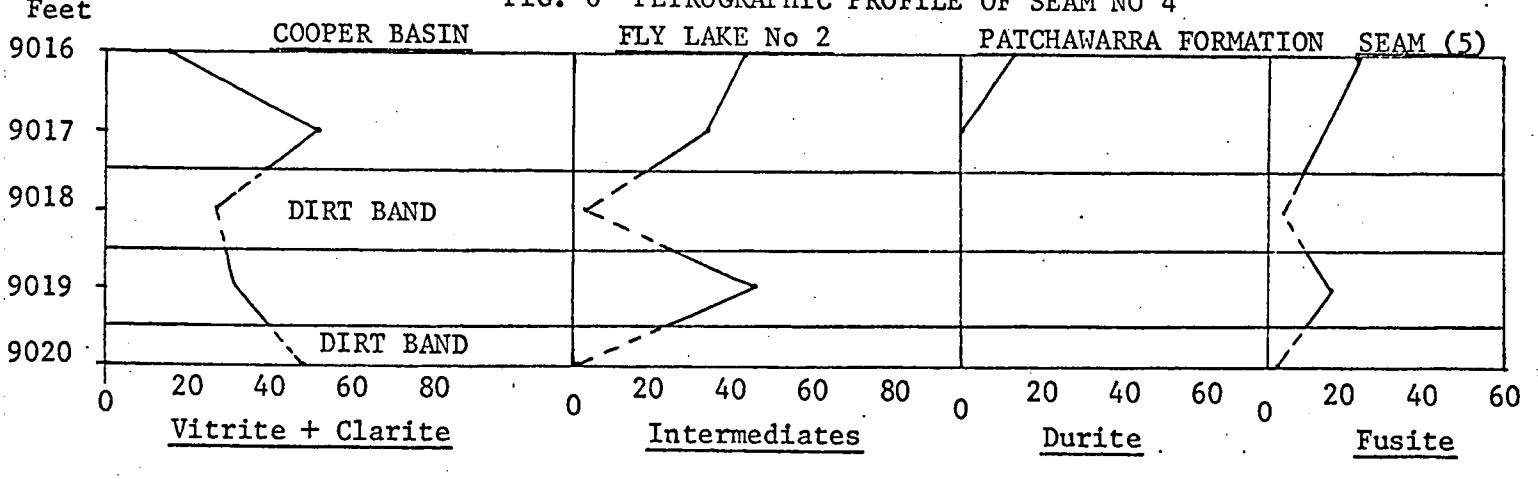


FIG. 6 PETROGRAPHIC PROFILE OF SEAM NO 5

000163

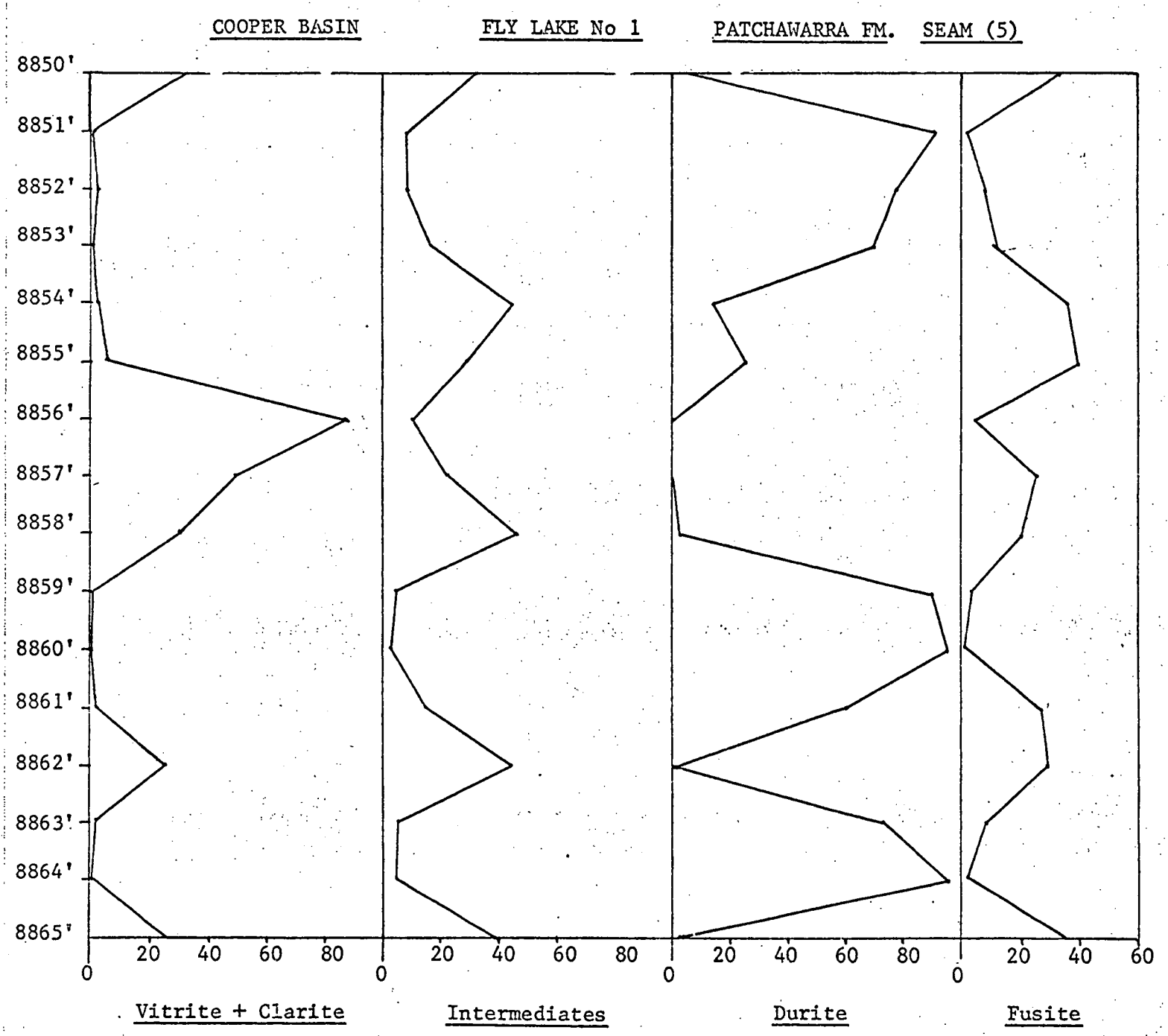


FIG. 7 PETROGRAPHIC PROFILE OF SEAM No 5

000164

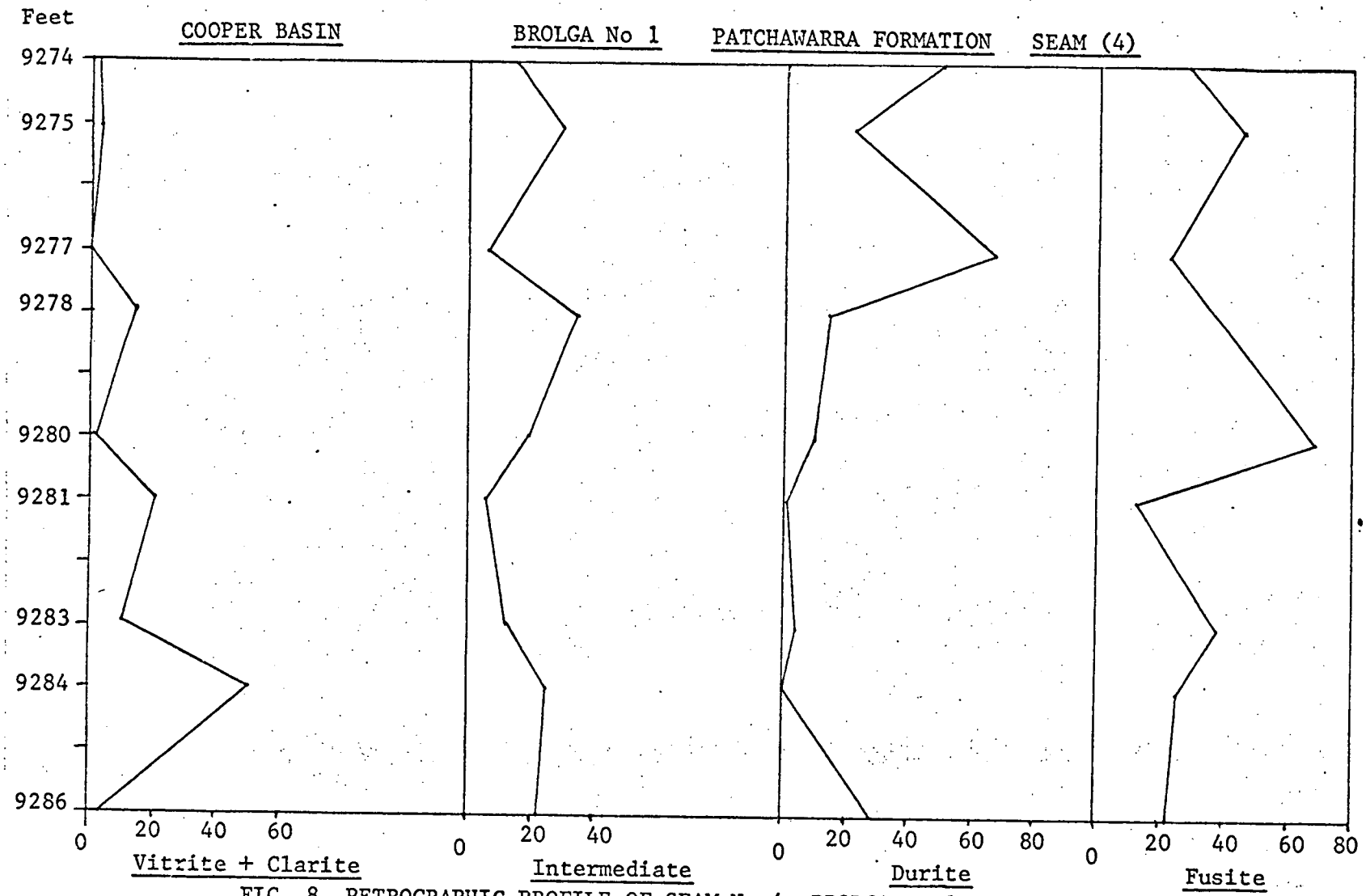


FIG. 8 PETROGRAPHIC PROFILE OF SEAM No 4, BROLGA No 1 WELL

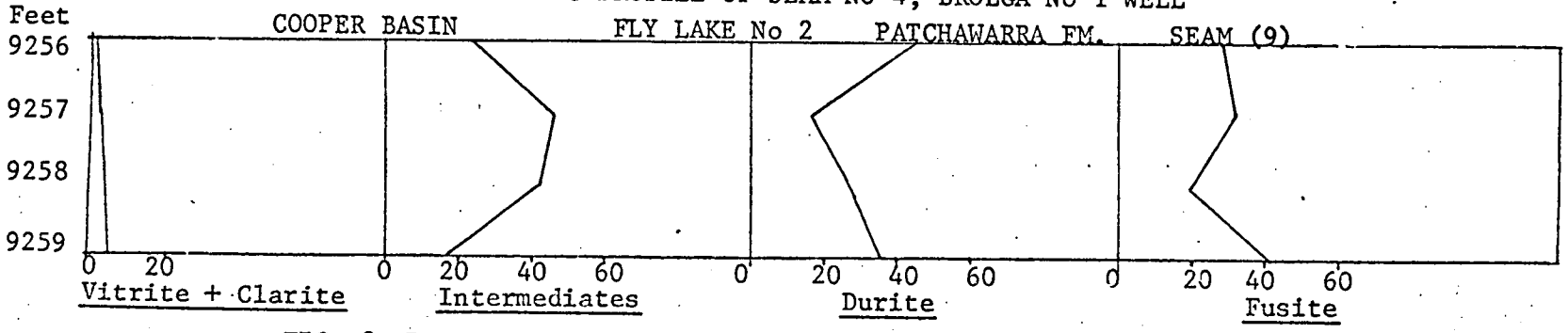
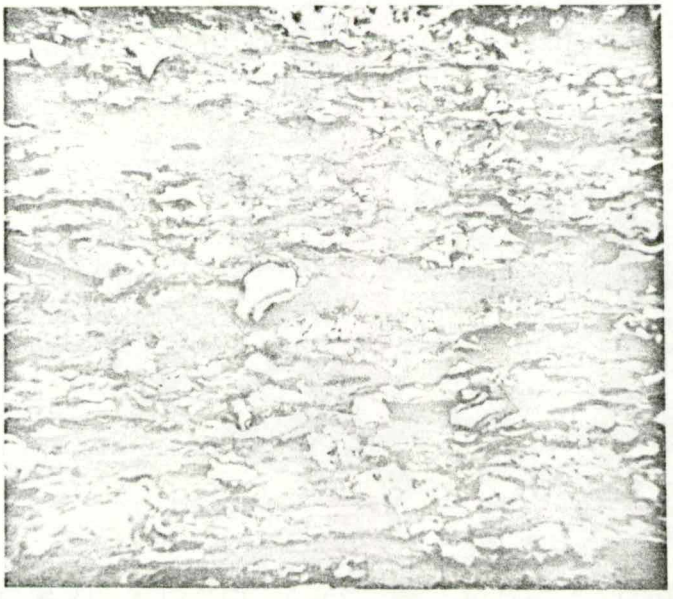


FIG. 8 PETROGRAPHIC PROFILE OF SEAM No 9, FLY LAKE No 2 WELL

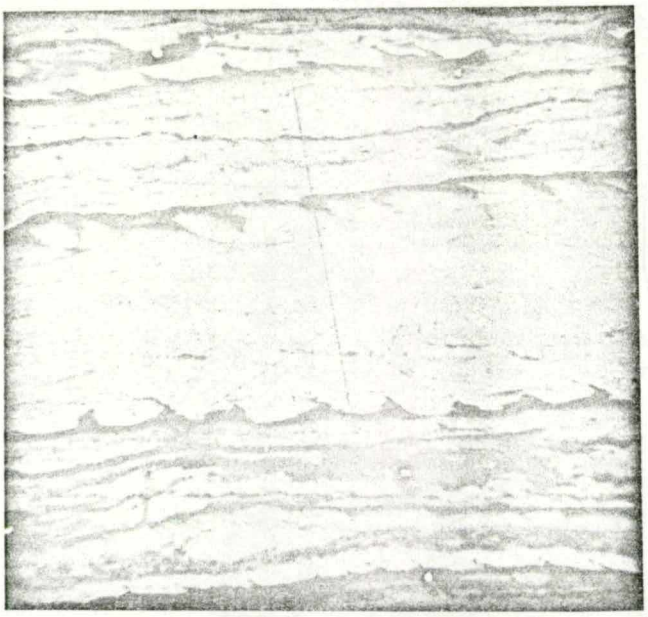
000165

Taken in reflected plane polarised light under oil immersion. Magnification x 140.

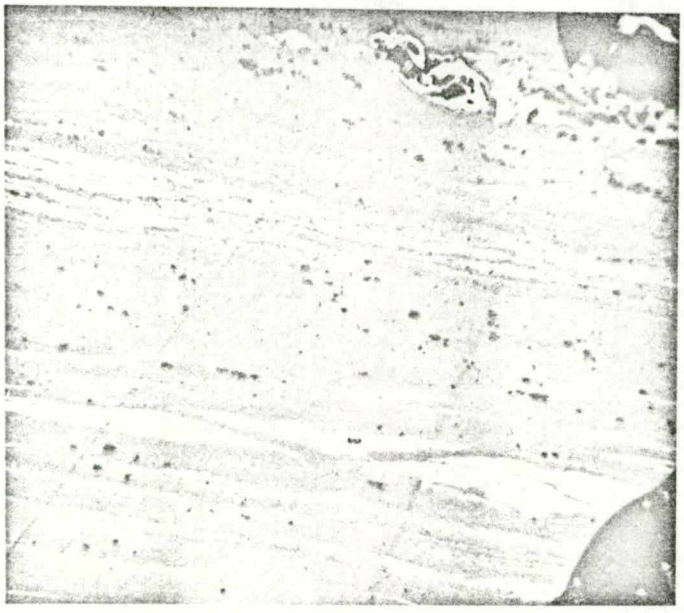
1. Predominantly intertinite fragments and lenses of varying tones of pale grey to white, with darker grey thin bands of vitrinite through them. These macerals make up the microlithotypes durite (including microite) and intermediates. The black bodies are clay, and there are very rare dark grey spores present also. Seam No 1.



2. A groundmass of vitrinite (grey) with fragments of inertinite (pale grey to white) and exinite (dark grey to black) as spores. This is an intermediate microlithotype. Seam No 2.



3. Vitrinite groundmass (grey) with exinite (black) in the form of leaf cuticles. This microlithotype is clarite. Seam No 3.



4. Vitrinite groundmass (grey) with very fine micrinite (white) in bands across it, forming an intermediate microlithotype. Seam No 5.

RESTRICTED
CIRCULATION

000168
RESTRICTED INVESTIGATION
REPORT 652R

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MINERALS RESEARCH LABORATORIES

DIVISION OF MINERALOGY

A PETROGRAPHIC INVESTIGATION OF COALS AND OTHER SEDIMENTS FROM THE GIDGEALPA GROUP, FLY LAKE NO. 1 WELL, COOPER BASIN

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AUGUST 1974

INTRODUCTION

Samples of both coal and interseam sediments of the Gidgealpa Group from Fly Lake No.1 well in the Cooper Basin have been supplied by Delhi Oil Company.

These Permian sediments are believed to be the source rocks of the hydrocarbons found in the area. The coal and other sediments were studied to determine (a) the depositional environment in Permian times; (b) the possible source rocks; and (c) the type of organic material which gave rise to the hydrocarbons.

ANALYSES

Six samples of coal were prepared as grain mounts and thin sections were made of 17 solid cores of sediments. Maceral and microlithotype analyses were carried out on the coals, and the thin sections were examined with particular interest in the amount and type of carbonaceous matter they contain.

The organic matter in the sediments has been described as transparent or opaque. Transparent material is usually exinite-type and/or vitrinite-type if the section is thin enough. Opaque material is inertinite-type and/or vitrinite-type if the section is fairly thick. Also, as diagenesis proceeds vitrinite tends to be more opaque in thin section.

In an attempt to postulate the Permian environment, a Markov Chain analysis has been carried out on the sequence of sediments - shale, siltstone, sandstone and coal - shown in the well log of Fly Lake No.1. It has been assumed that the lithologies recorded in the well log are accurate.

000170

A Markov Chain analysis of a succession of sediments is a statistical attempt to determine whether or not the sediments show a preferred sequence of occurrence. That is, whether there is "memory" in the sedimentary process, so that a particular sequence of rocks occurs more often than would be due to random deposition.

If a particular type of sedimentary sequence occurs, it may be indicative of a particular type of environment. For example, sequences showing fining upwards are cited as forming in fluvial environments, while those showing coarsening upwards may have formed in deltaic environments.

Thornton (1973) has found fining upwards sequences in the Upper Permian Toolachee Formation in the Gidgealpa - Moomba - Big Lake area.

RESULTS

Results of the petrographic analyses are shown in Table 1, and in Figs 1 and 2. The results of thin section examination are summarized in Table 2. The organic carbon content of these samples was also determined chemically on a weight basis (Table 2). As microscopic estimations of carbonaceous content are made on a volume basis, the microscopic results should be about twice those determined by a chemical technique on a weight basis.

The Markov Chain analysis gives a first preference sequence of oscillations between shale and sandstone. Coal, siltstone and sandstone all show a preference to pass upwards into shale. In such instances shale is called an absorbing state. Second preferences give a fining upwards sequence of siltstone and shale between coals.

The results were tested by the Chi Squared method, and it was found that the probability that the sequences are due to chance is less than 1%.

000171

DISCUSSION

Although the cores of coal taken may not represent the whole deposit at each depth, the results obtained are so similar generally, that it may be assumed that coals in the Gidgealpa Group are dull to extremely dull. In Fig 1, maceral compositions are compared with those of coals from Gidgealpa No.3 well (reported previously in IR 620R). The Permian coals from both wells have similar, generally low vitrinite contents, contrasted with those from the Cretaceous which have high vitrinite contents.

In Fig 2 the microlithotype composition of coals from the Gidgealpa Group are compared with those from the Illawarra Coal Measures of the Sydney Basin. The Gidgealpa coals are lower in vitrite plus clarite than the Illawarra coals, but are more similar to these coals than any others from the Sydney or Bowen Basins.

The Illawarra coals are thought to have formed on the marginal shelf areas of the Sydney Basin under conditions of slow, steady and areally uniform subsidence. If vitrinite content of a coal is an indication of depositional environment, the Gidgealpa Group coals must have formed in extremely stable conditions with slow subsidence.

The shale/sandstone oscillations may represent the sediments from a meandering river system. The sand from the main channels was deposited on to clay as the rivers cut into their flood-plains: clay was deposited over the sandy point bar deposits as the rivers curved away from them.

The secondary sedimentation pattern of fining upwards between coal seams probably represents flooding of rivers (silt) on to adjacent peat deposits; immediate compaction of the spongy peat to accommodate a considerable thickness of sediment; waning of inorganic sedimentation (mud) and the gradual re-establishment of vegetation (peat).

The organic matter in the sediments is virtually all opaque,

which may be due to its high degree of diagenesis, or related to the fact that the material of the coals is largely inertinite which is opaque. The reflectance of the vitrinite is 0.88%, so it should be transparent in thin section. The amount is lower in the sandstones and higher in shales and siltstones, as is generally the case. Within the shales, the organic matter content is greatest just below (2692 M) the most vitrinite-rich coal occurrences (2684 m), but is also high near the base of the Gidgealpa Group (2863 m), below vitrinite-poor coal (2842 m).

Inertinite and opaque material are generally considered to be poor sources of hydrocarbons. If this assumption is correct it seems unlikely that either the coals or dispersed organic material can have generated significant amounts of hydrocarbons. However, there are several possibilities that must be considered: (1) opaque material can generate hydrocarbons; (2) the dispersed organic material is opaque because it is the residue of material which has already generated hydrocarbons; (3) very fine transparent organic matter able to generate hydrocarbons is present in the sediments, but has not been observed; (4) these Permian sediments are not the source rocks for the hydrocarbons.

(1) appears to be unlikely because of all the general studies done on this problem. Without detailed geological data it is not possible to consider (4). However the Permian sediments have generally been proposed as possible source rocks.

(2) may be possible, as a similar situation has been found in one area of the North-west Shelf. Opaque organic material found there was considered to be the residue after hydrocarbons had been generated.

(3) is to be investigated.

The agreement between visual and chemical estimation of organic matter content is not always good. Where the greatest discrepancy occurs, at 2692 m and 2701 m, the thin sections have been re-examined and this point is to be checked.

CONCLUSIONS

1. The coals from the Gidgealpa Group all have low to extremely low vitrinite contents.

2. Markov Chain analysis of the sediments shows the primary sedimentation pattern to be one of shale/sandstone oscillations. The secondary pattern is one of siltstone and shale fining upwards between coals.

3. From (1) and (2) a low energy fluvial environment in a stable shelf region of slow, steady and areally uniform subsidence is postulated.

4. Organic matter in the interseam sediments is predominantly opaque. As these Permian sediments are considered to be the source rocks of the hydrocarbons, then either (a) opaque material can generate hydrocarbons; or (b) the material is opaque because it is the residue of material which has already generated hydrocarbons; or (c) very fine transparent organic matter, able to generate hydrocarbons has not been observed; or (d) these particular Permian sediments are not the source rocks for the hydrocarbons.

Reference

Thorton, R.C.N., 1973. Lithofacies Study on the Toolachee Formation, Gidgealpa - Moomba - Big Lake Area, Cooper Basin, South Australia. APEA Journal.

TABLE 1

COOPER BASIN: FLY LAKE NO.1 WELL

GIDGEALPA GROUP

Maceral Analysis of Coals

(ash free)

	DEPTH (m)	VITRINITE	EXINITE	MICRINITE	SEMI-FUSINITE	FUSINITE	CLAY	CARB.	PYRITE	QUARTZ
8445'	2574	9 10	5 6	42	32 84	1	11	-	tr	tr
8474.8	2583	13 14	4 4	34	43 82	1	5	-	-	tr
8806	2684	45 47	4 4	12	34 49	1	4	-	tr	tr
8852	2698	8 9	5 6	59	14 85	2	8	2	tr	2
8999.7	2743	23 24	2 2	26	45 74	1	3	tr	tr	tr
9324.6	2842	11 12	1 1	34	47 97	2	4	-	-	1

Microlithotype Analysis of Coals

DEPTH (m)	VITRITE	CLARITE	INTER-MEDIATE	DURITE	FUSITE	SHALY COAL	CLAY	CARB.	PYRITE	QUARTZ
2574	1	-	15	59	24	1	tr	-	-	tr
2583	3	-	20	36	38	1	1	-	-	1
2684	22	5	46	2	24	tr	1	-	tr	tr
2698	tr	-	23	69	3	2	tr	2	tr	1
2743	2	1	54	5	35	1	2	tr	tr	tr
2842	3	tr	27	27	41	1	1	-	-	tr

TABLE 2

COOPER BASIN: FLY LAKE NO. 1

Amount and type of dispersed organic matter in interseam sediments of the Gidgealpa Group

DEPTH (m)	LITHOLOGY	% ORGANIC MATTER (vol)	% ORGANIC CARBON (wt)	DESCRIPTION OF ORGANIC MATTER	TRANSPARENCY
8498.4 2578	Carbonaceous siltstone	5	2	Fragments up to 200 - 300μ	Opaque: 95% Trans : 5%
8445 2580	Sandstone	<1	1.15	Patches, rims, fragments	Opaque: 0 Trans : 100%
8431 2585	Sandstone	≤1	2.05	Fragments, wrappings (transparent)	Opaque: 95% Trans : 5%
8796 2681	Carbonaceous siltstone	5	0.45	Stringers (opaque) Patches, fragments trans. (<50μ)	Opaque: 95% Trans : 5%
8812.7 2686	Fine sandstone	1	0.90	Fragments → 200μ, mostly ≤50μ	Opaque: 95% Trans : 5%
8822.6 2689	Sandstone	-	0.22	-	-
8829 2691	Carbonaceous shale	25	11.54	Fragments 20 - 30μ stringers → cms	Opaque: 95% Trans : 5%
8832.4 2692	Carbonaceous mudstone	35	3.67	Fragments ≤50μ also cms	Opaque: 100% Trans : 0
8862 2701	Carbonaceous siltstone	25	4.25	Fragments, stringers	Opaque: 95% Trans : 5%
8882' 2707	Sandstone	<<1	0.10	Fragments, staining	Opaque: 0 Trans : 100%
8921 2719	Carbonaceous Siltstone/ sandstone	2	1.68	Fragments, stringers	Opaque: 95% Trans : 5%
9321 2841	Carbonaceous shale	5	1.21	Fragments 20 - 30μ	Opaque: 95% Trans : 5%
9357 2850	Sandstone	<<1	0.23	Fragments	Opaque: 0 Trans : 100%
9392.5 2863	Carbonaceous silty shale	20	6.58	Stringers → mm	Opaque: 95% Trans : 5%
9417.7 2871	Carbonaceous siltstone sandy lenses	2	1.27	Stringers	Opaque: 95% Trans : 5%
9420.4' 2871.2	Sandstone	<<1	0.15	Patches, wisps	Opaque: 0 Trans : 100%
9452.6' 2881	Silty mudstone	<1	0.20	Fragments ≤100μ	Opaque: 95% Trans : 5%

000176

COOPER BASIN: FLY LAKE NO. 1

APPENDIX

2578m Carbonaceous siltstone

Carbonaceous material forms about 5% of the rock, occurring predominantly as fragments, from a few microns, to several hundreds of microns, in size. Approximately 95% of the organic material is opaque: where the fragments are transparent they are generally brown in colour. Very rare, three-dimensional, brown spores are present.

2580m Sandstone

Carbonaceous material is very scarce: there are rare, transparent, brown patches and fragments, less than 50μ in size. The grains are closely compacted, some having a thin film of brown material rimming them.

2585m Sandstone

The grains are tightly compacted with a little clay and micaceous material between some of them. There is very little carbonaceous matter, most of which is opaque. It occurs in the finer-grained minerals between the quartz grains. There are occurrences of brown transparent organic matter squeezed along grain boundaries. Overall the organic matter content is $\leq 1\%$.

2681m Carbonaceous siltstone

The rock contains approximately 5% carbonaceous matter, mostly in the form of opaque stringers. There are very rare, brown, transparent fragments and patches, often circular in outline, generally <50μ in size, which may be resinous spheres.

2686m Fine sandstone

There is quite a high proportion of argillaceous and micaceous

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cementing material between the grains of this sandstone, and carbonaceous matter occurs in this. The organic material is mostly opaque fragments some of them up to 200μ, but mostly ≤50μ. It forms about 1% of the rock and very little of it is transparent.

2689m Sandstone

The quartz grains are closely packed with very little cementing material. There is virtually no carbonaceous matter.

2691m Carbonaceous shale

Masses of fossil leaves are visible. Carbonaceous matter is abundanct, probably about 25% of the rock, mostly in fine fragments of 20-30μ size, but also much larger stringers, centimetres long. Most of the fragments are opaque,and any transparent material is brown.

2692m Carbonaceous mudstone

This rock contains about 35% carbonaceous material, mostly as fine, opaque fragments, ≤50μ. There are also macroscopically visible fragments. Where the section is very thin, transparent material is dark brown.

2701m Carbonaceous siltstone

Carbonaceous matter is about 25% of the rock. It is fairly coarse, fragments and stringers, well aligned with the bedding. The organic matter is predominantly opaque; any transparent material is brown.

2707m Sandstone

Quartz and other detrital grains are tightly packed with very little cementing material. There is virtually no carbonaceous matter, except for a few transparent fragments and some thin yellowish staining around the edges of some grains.

2719m Carbonaceous siltstone/sandstone

There is about 5% carbonaceous material in the silty layers,

000178

none in the sandstone, giving about 2% overall. The layers are a millimetre or so thick. The organic matter occurs in fairly coarse fragments or stringers, mostly opaque. There are more transparent stringers and small circular bodies (<50μ).

2841m Carbonaceous shale

Carbonaceous material is about 5% of the rock. It is fine, the fragments being generally 20-30μ, up to 50μ, and mostly opaque. There are rare, brown transparent fragments.

2850m Sandstone

The quartz grains are tightly packed, with little cementing material. Only a few transparent fragments of organic matter occur.

2863m Carbonaceous silty shale

This contains about 20% carbonaceous material, as opaque stringers from a few microns to millimetres in length. The longer stringers appear to be vitrinite. Some of the finer material is transparent, brown. Quartz grains are generally very angular and elongated.

2871m Carbonaceous siltstone with sandy lens

Carbonaceous material forms 2-10% of the silty lenses; there is very little in the sandy lenses, giving about 2% overall. The organic matter is mostly opaque stringers; a few which are partly transparent are brown.

2871.2m Sandstone

Although in parts the quartz grains are tightly packed, there are areas with micaceous or carbonate cement. Also rock fragments form part of the detrital fragments, which has not been usual in the sandstone above. There is very little organic matter, just a few transparent patches and wisps between grains.

2881m Silty mudstone

There is <1% carbonaceous material, which is generally opaque fragments <100μ in size.

GIDGEALPA NO. 3 (IR 620R)

622 - 631	7	Upper Cretaceous
686 - 695	8	
869 - 878	9	
2054 - 2070	10	M-L Jurassic
2179 - 2195	11	Permian
2234 - 2249	12	
2280 - 2292	13	

FLY LAKE NO. 1

2574 m	1	Permian
2583	2	
2684	3	
2698	4	
2743	5	
2842	6	

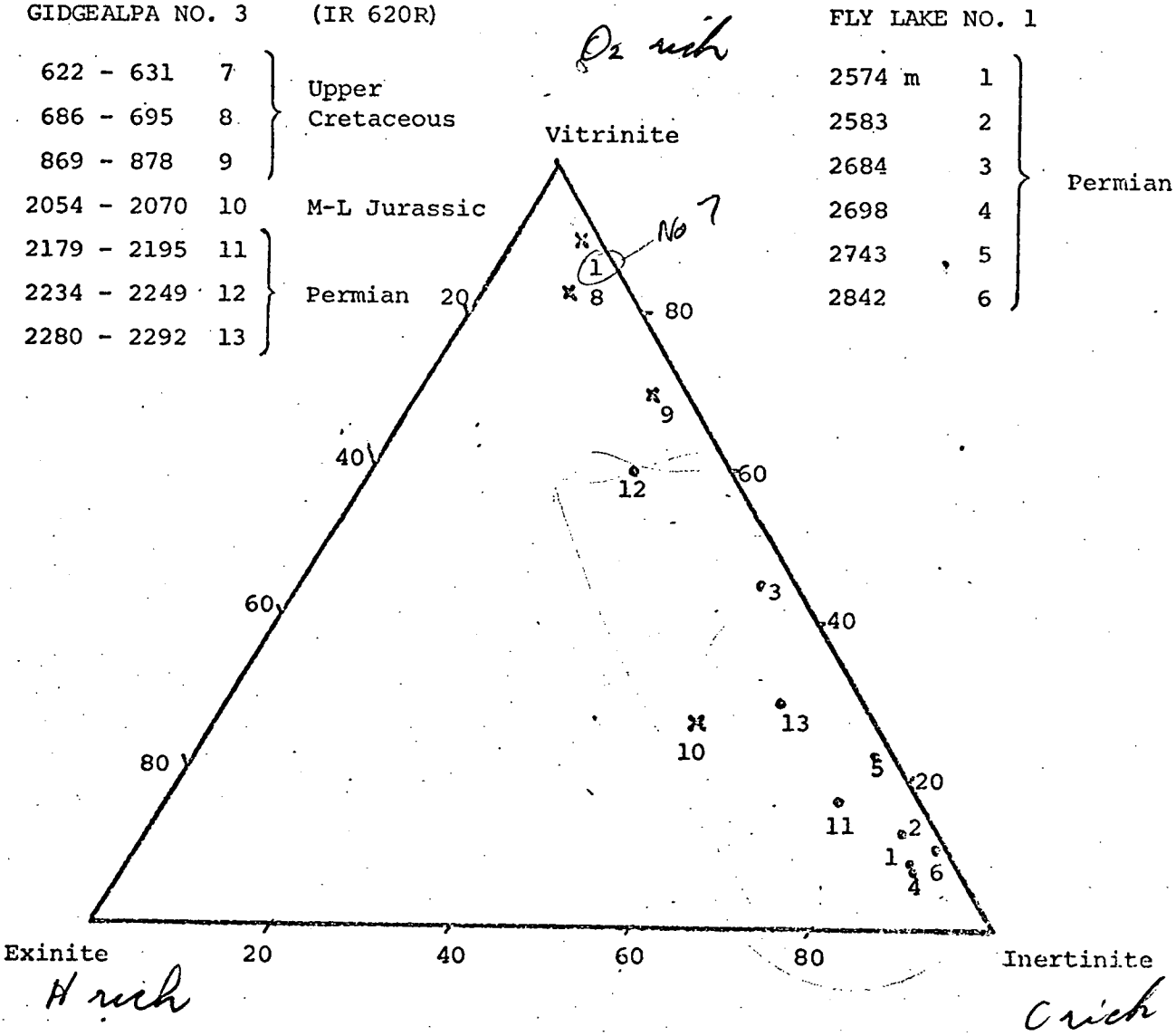
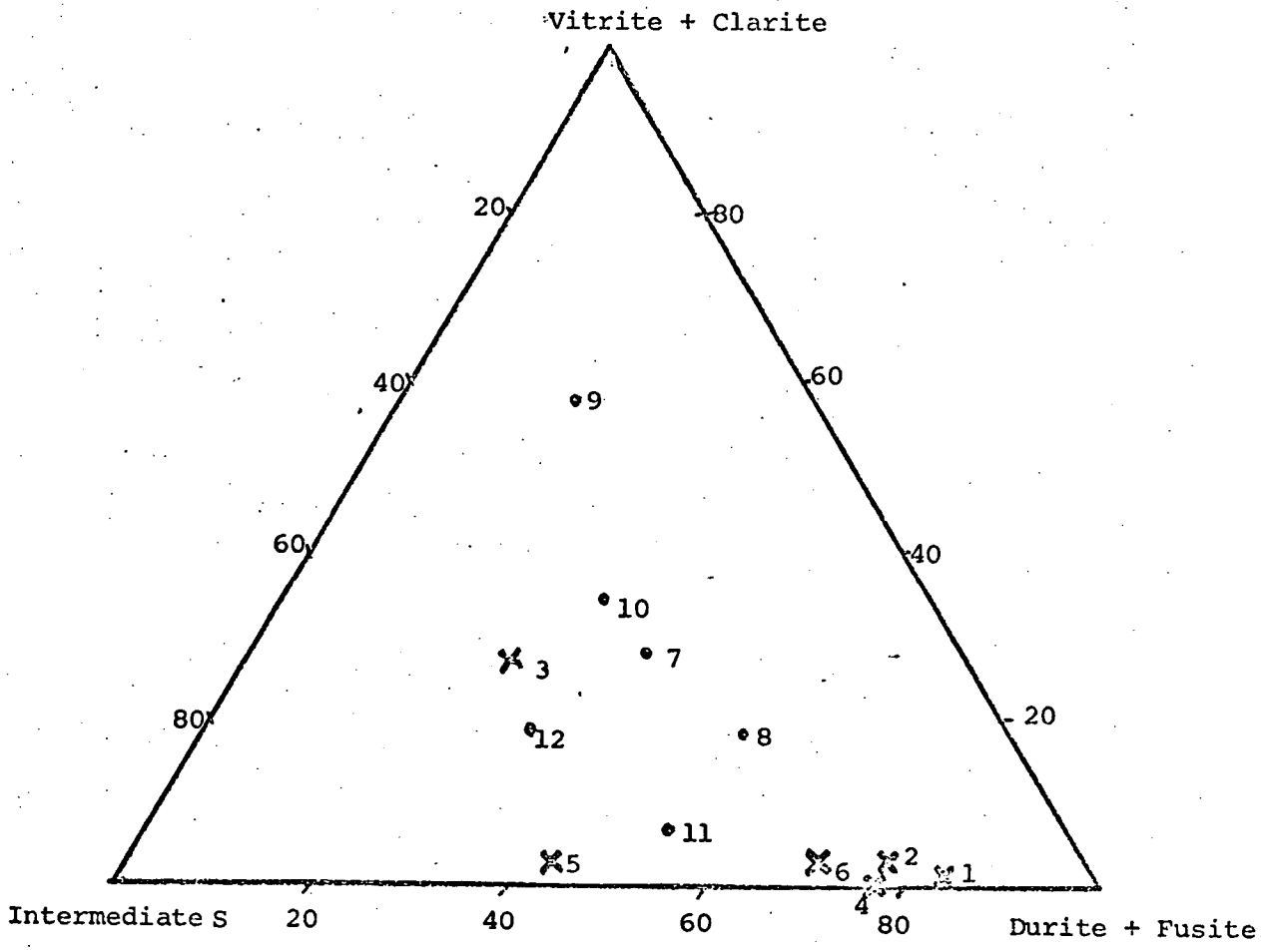


FIG. 1. Maceral Composition of Coals from the Cooper Basin



FLY LAKE NO. 1

2574 m	1
2583	2
2684	3
2698	4
2743	5
2842	6

ILLAWARRA COAL MEASURES

Bulli	7
Balgownie	8
Wongawilli	9
Tongarra	10
Woonona	11
Lithgow	12

FIG 2. Microlithotype Composition of Coals from the Gidgealpa Group, Cooper Basin.

R23 OF / SIRIUME

000181

WP 1405N

FRACTURE STIMULATION REPORT

Date: *2/9/82*

Well No: *Fly Lake #1* Field: *Fly Lake* Formation: *Tirrawarra*

Tubing Size: *2-7/8" N80/L80* Depth (MPP) *9360'*

Perforations: *9335'-9385'*

H.H.P. available on site: *3 - 825 turbine plus 2 - 800 cat fracs = 4075*

H.H.P. used during job: *Max HHP used = 2800*

Acid Spearhead

Type: *15% HCl*

Volume (U.S. Gallons): *3275 (78 bbls)* Rate (BPM): *5* (max)

Wellhead Treating Pressure (psig): *5800 psi* (max) (min)

Effect of Acid on Formation:

Slight reaction noticed immediately. WHTP dropped from 5800 psi during acid phase to 4950 psi at end of acid displacement phase at ± 5 BPM.

Injectivity Test (Maximum rate possible within pressure limitation set)

Fluid Type: *2% KCl*

Gradient (psi/ft): Weight (ppg): *8.4 (approc)*

Volume (USG): *9200* Rate (BPM): *16* W.H.T.P: *7100* (psig)

I.S.I.P (psig): *4300* Annulus Pressure: *2000* (psig)

Fracture Gradient Indication

$$\left(\text{I.S.I.P.}_{4300} + \text{hydrostatic head}_{8.4 \times .052 \times 9360}\right) \div \text{depth (MPP)}_{9360} = 0.89 \text{ psi/ft}$$

Friction Pressures (W.H.T.P. $_{7100}$ - I.S.I.P. $_{4300}$) = *2800* psig

Post Frac Fracture Gradient = psi/ft

RECEIVED
27 OCT 1982
DEPT. OF MINES AND ENERGY SECURITY
1713

10 lb p-gall fluid ≡ .52 psi/ft

1 ppg ≡ .052 psi/ft.

Fracture Treatment Summary.

000182

Well Name FLY LAKE # 1

Chart No.	Time	Stage Volume (bbls)	Cum. Volume (bbls)	Inj. Rate (BPM)	Tubing Pres. (psi)	Casing Pres. (psi)	Remarks
2/9/82	1230						Pressure test annulus line to 3000, annulus to 2000 psi & injection line to 10000psi. Repair line and retest - OK.
	1300						Safety meeting
	1330						Calibrate & prime pumps.
Pre-flush	1408	0	0	4	5500	2000	Start pumping KCl
	1413	21	21	4	5500	2000	Establish feed
Acid	1414	0	21	5	5670	2000	Start pumping acid
	1419	25	46	5	5830	2000	
	1424	57	78	5	5780	2000	Acid at perforations
	1427	78	99	5	5770	2000	End acid & start displacement
Acid Displ.	1430	24	123	5.5	5200	2000	
	1435	55	154	5.5	4900	2000	Shut down & repair leak in treatment line at 1 turbine disch.
Injectivity							Start injectivity, shut down
	1445						due to suction leak on pump unit
	1449						Re-start injectivity
	1453	28	182	9.5	6700	2000	
	1456	60	214	10.5	6950	2000	WHTP too high to bring 1 turbine on line
	1457	70	224	17	7250	2000	Bring turbine on line
	1501	150	332	16.5	7200	2000	
	1507	219	373	16.5	7100	2000	Shut down for ISIP
							ISIP = 4300 psi Frac. press = 2800 psi
Pre-pad	1540	0	373	12	7600	2000	Start prepad & have problem bringing 1 turbine on line against pressure
	1548	96	469	17	6750	2000	Bring turbine on line

Fracture Treatment Summary.

000183

Well Name FLY LAKE # 1

Chart No.	Time	Stage Volume (bbls)	Cum. Volume (bbls)	Inj. Rate (BPM)	Tubing Pres. (psi)	Casing Pres. (psi)	Remarks
Pad	1556	166	539	17	6720	2000	End prepad & start pad adding 5% v/v crude oil (Stratafrac)
	1602	112	641	17	6750	2000	
	1612	272	811	16	6720	2000	
	1622	450	989	16.5	6800	2000	
1 ppg sand 20-40	1632	640	1179	17.5	6620	2000	Stop J84 & end pad Start 1 ppg sand
	1635	60	1239	17.75	6500	2000	1 ppg sand at perforations
	1640	150	1329	17.75	6500	2000	
	1645	245	1424	18	6500	2000	
	1646	260	1444	18	6500	2000	Start easing into 2 ppg sand
2 ppg	1648	298	1482	17.5	6480	2000	2 ppg sand
	1651	60	1542	18.25	6410	2000	2 ppg sand at perforations
	1656	155	1637	18.25	6400	2000	
	1701	245	1727	15.5	6850	2000	Unexplained rise in WHTP (oil slug ?)
	1706	320	1802	16	6490	2000	
	1707	329	1811	14.5	7050	2000	Start to ease into 3 ppg sand
							1st Sand truck empty 44K #
3 ppg	1711	433	1915	14	6950	2000	Sand up to 3 ppg
	1715	60	1975	14	7090	2000	3 ppg sand at perforations
	1720	157	2072	16.5	6980	2000	
4 ppg	1733	410	2320	16.25	6900	2000	Switch to 4 ppg sand
	1735	45	2365	15	7000	2000	
4 ppg 20-40 sint. baux.	1738	110	2430	15.5	6950	2000	Finish 2nd sand truck 124 k pumped switch to 4ppg baux.
	1741	60	2490	16.5	6900	2000	4ppg bauxite at perfs.
displ.	1754	166	2596	16.75	6870	2000	Finish bauxite (24k lbs). blender upset & momentarily loose prime. displace with 15 bbls of uncrosslinked gel & 40 bbls of oil.

Well & Fracture Treatment Summary.

000184

Well Name FLY LAKE # 1 Page No 4 of 6

Chart No.	Time	Stage Volume (bbls)	Cum. Volume (bbls)	Inj. Rate (BPM)	Tubing Pres. (psi)	Casing Pres. (psi)	Remarks
displ.	1757	55	2651	5.13	6000	2000	finish disp & shut down pumps.

SUMMARY OF PUMPING SCHEDULE

NOTE: Volumetric calculations and tank dips prior to or after the job show a descrepency in the ATR reading as follows:-

Gel Fluid:- tank dip 1780 bbls used
Integration of ATR rate measurement 1730 bbls
Digital Counter on ATR 1920 bbls

The above information suggests that the ATR bbl counter was reading high by approximately 10%.

The following table shows ATR volumes and corrected actual volumes and actual sand concentrations.

Stage	Nom Vol usg	ATR Vol usg	Corrected Act Vol usg	Actual Cum Vol usg	From densitometer Concentrations ppg
Preflush		882	794	794	-
15% HCl Acid	3000	3276	2950	3744	-
Acid Displ.	2310	2310	2079	5832	-
Injectivity	-	9200	8280	14100	-
Pre-pad	7000	6970	6270	20370	-
Pad	28000	26880	24190	44560	-
Proppent 1 ppg	12516	12516	11264	55824	1.2
2 ppg	17472	13818	12436	68648	2.14
3 ppg	18186	18186	16367	85015	3.7
4 ppg	9450	4620	4158	89173	4.2
4 ppg	6804	6972	6274	95447	3.9
Flush to MPP	2310	2310	2079	97526	-
	66738				

NOTE: 1) No appreciable volume was allowed for surface lines in the displacement volume calculation. The displacement fluid consisted of 15 bbls of uncrosslinked gel followed by 40 bbls of crude oil.

2) Proppent

20 - 40 ottawa sand (44000 lbs in 1, 2 ppg stages
(80000 lbs in 3, 4 ppg stages
(124000 lbs total.

20 - 40 sintered bauxite 24000 lbs.

GENERAL REMARKS

1. An appreciable acid reaction was noted during the acid displacement stage. Pressure drop was of the order of 900 psi.

2. The digistrip readout in the frac van was funtioning with the only questionable data being the densitometer which seemed to be reading proppent density consistently 50% higher than the actual reading.

3. The underdisplacement problem can be attributed to the following two factors:-

   1) No account for the volume of the surface lines
   2) The Automatic Treatment Recorder (ATR) was reading 10% high for the volume of fluid pumped therefore actual displacement volume approximately 55 - .1 x 55 = 49.5.

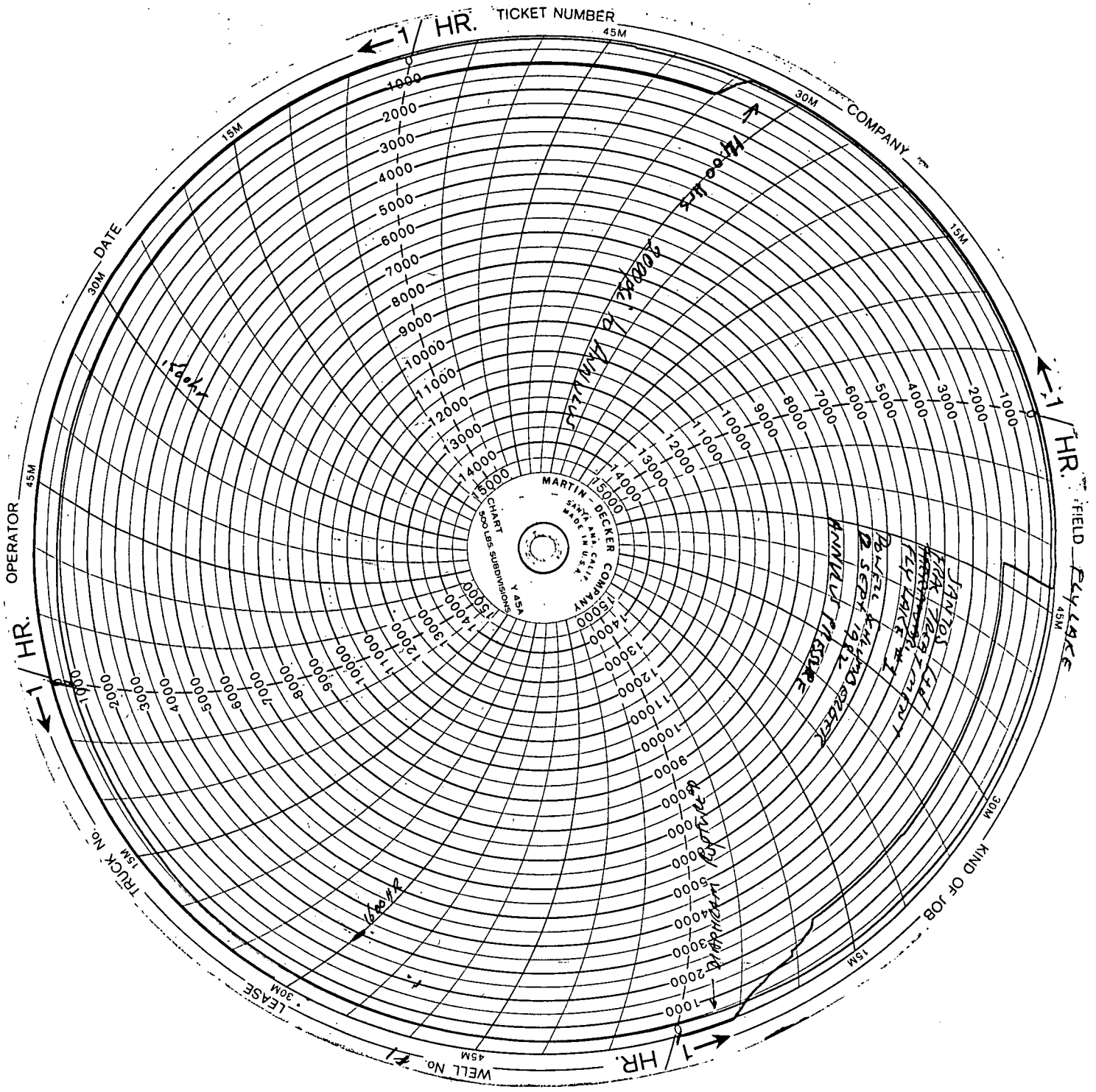
4. A misunderstanding of a command of the Blender resulted in a momentary upset in the prime of the pump units.

5. The turbine pump units have difficulty in coming on line against pressures of the order of 7500 psi or higher due to the size of the fluid ends/power of turbine. This point needs to be taken into account when bringing all units on line.

G. GUGLIELMO
Petroleum Engineer

Petroleum Engineer (1)
Well File (1)

WP 1871N


TICKET NUMBER
COMPANY
FIELD
1/HR.
DATE
OPERATOR
TRUCK No.
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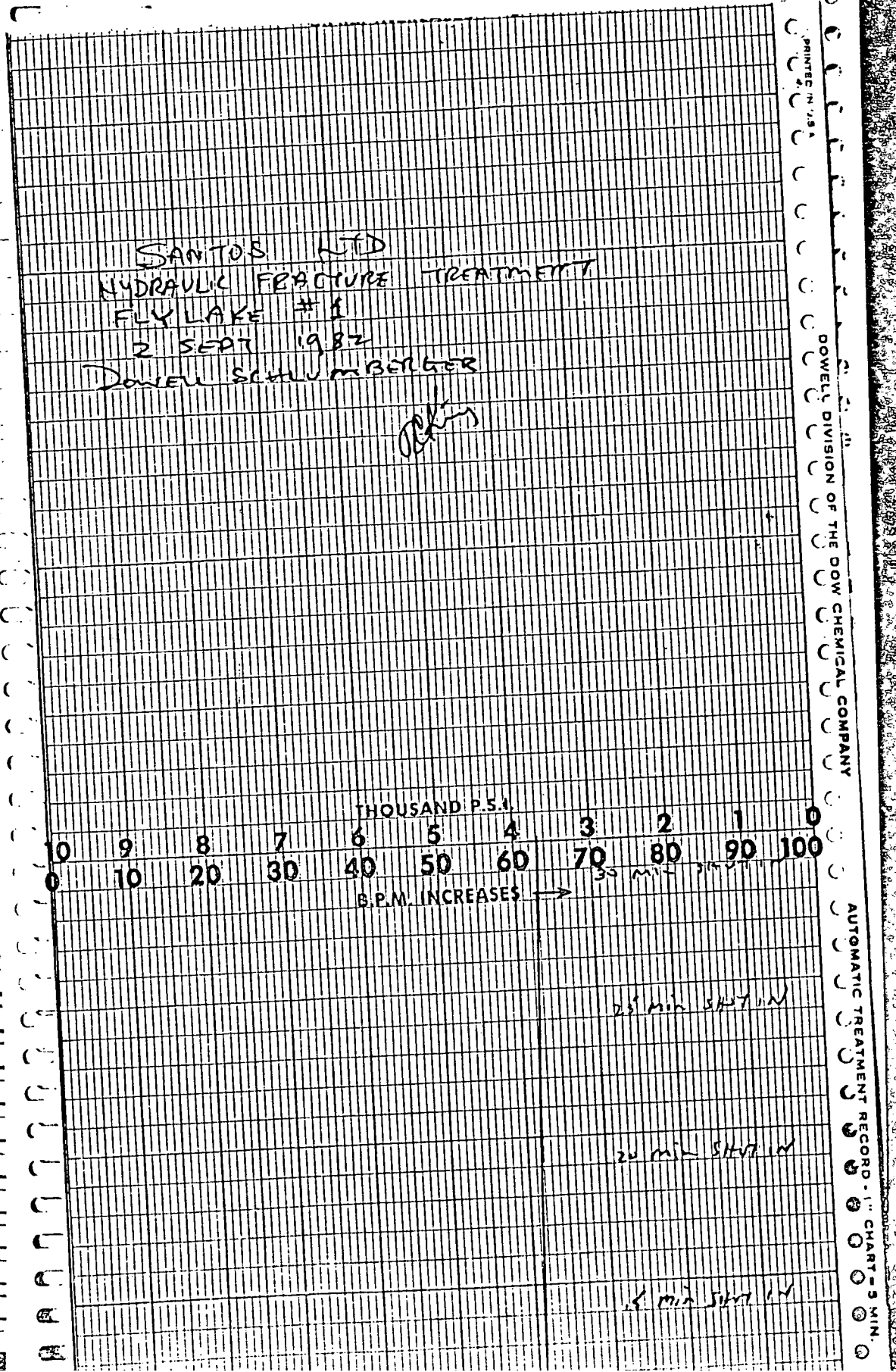
WELL No.
KIND OF JOB
MARTIN-DECKER COMPANY
SANTA ANA, CALIF.
MADE IN U.S.A.
CHART
500 LBS. SUBDIVISIONS
Y 45A

R24

000188


SANTOS LTD
HYDRAULIC FRACTURE TREATMENT
FLY LAKE #1
2 SEPT 1982
DOWELL SCHLUMBERGER
PRINTED IN U.S.A.
DOWELL DIVISION OF THE DOW CHEMICAL COMPANY
AUTOMATIC TREATMENT RECORD - 1" CHART - 5 MIN.
THOUSAND P.S.I.
10 9 8 7 6 5 4 3 2 1 0
0 10 20 30 40 50 60 70 80 90 100
B.P.M. INCREASES →
30 min SHUT IN
25 min SHUT IN
20 min SHUT IN
15 min SHUT IN

000189

THOUSAND P.S.I.

10 9 8 7 6 5 4 3 2 1 0

0 10 20 30 40 50 60 70 80 90 100

B.P.M. INCREASES →

2 PPG SAND AT PERF (1634)

2 PPG SAND (1632)
(298 bbl STAGE)

1 PPG SAND AT PERF (1630)

SAND 1 PPG (667 bbl PAD Pumped)
STOP J84 (1617)
START SAND

159 bbl

THOUSAND P.S.I.

10 9 8 7 6 5 4 3 2 1 0

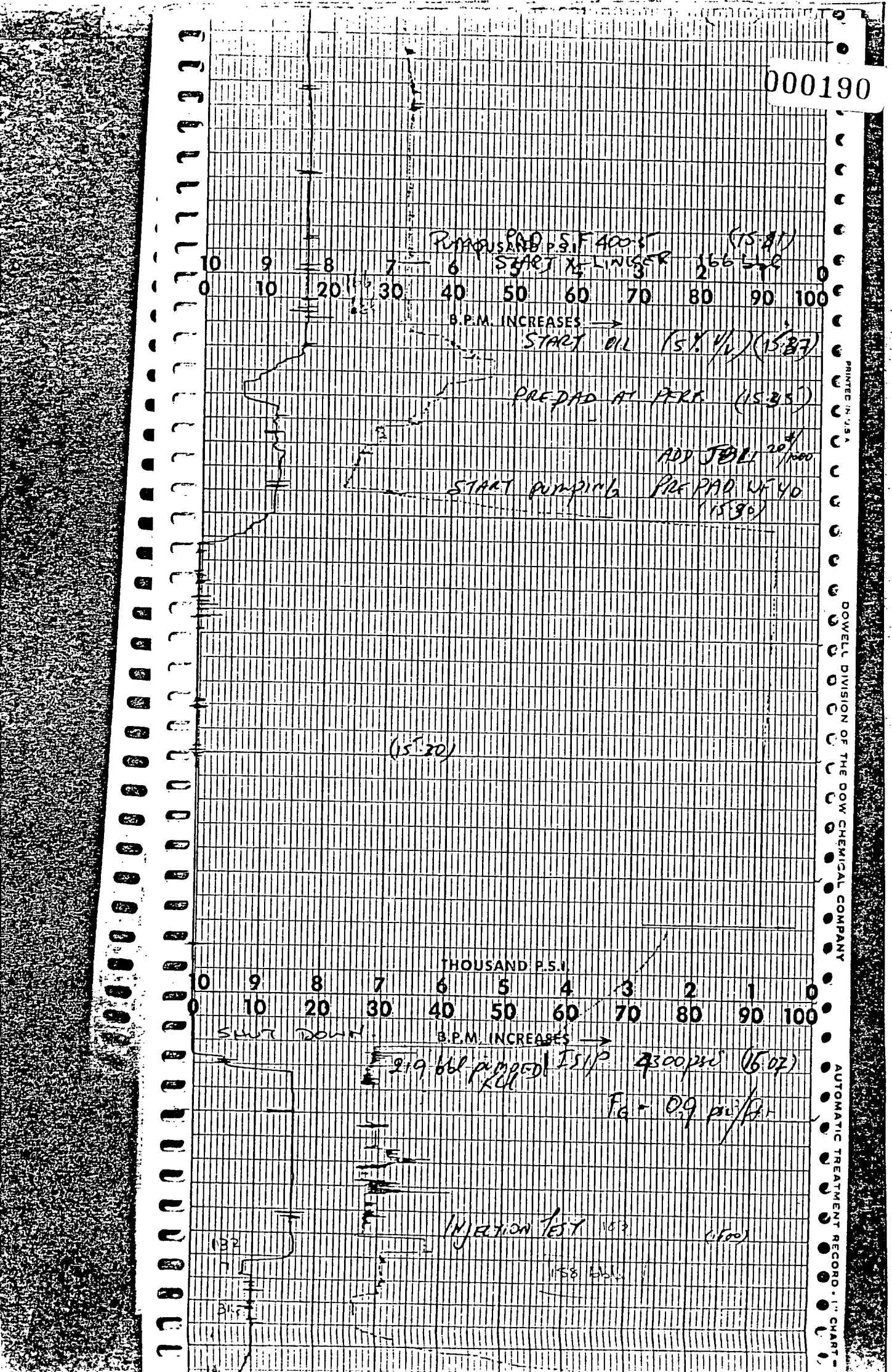
0 10 20 30 40 50 60 70 80 90 100

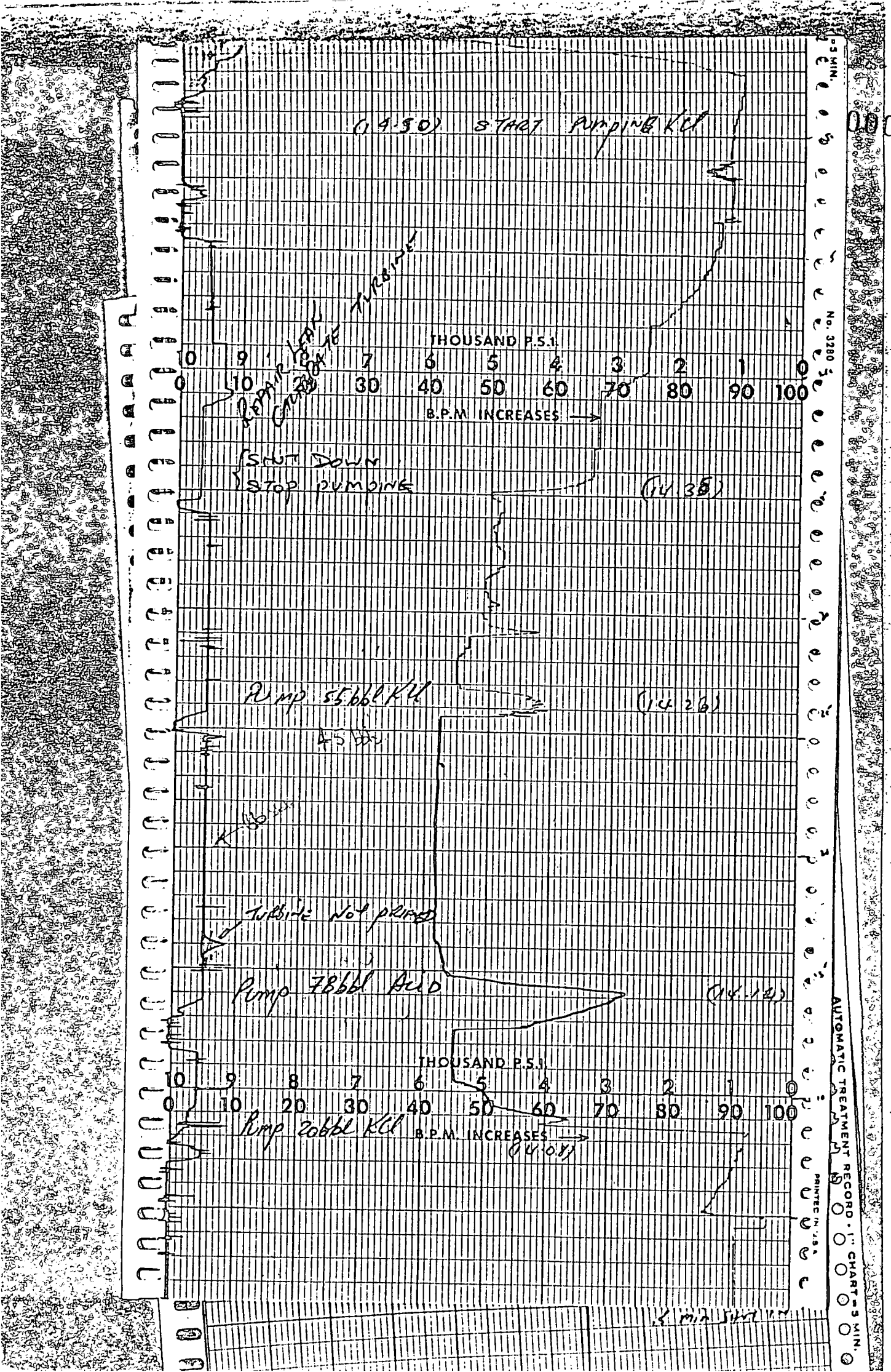
B.P.M. INCREASES →

(1600)

AUTOMATIC TREATMENT RECORD - 1" CHART = 5 MIN.

No. 3280


THOUSAND P.S.I.
10 9 8 7 6 5 4 3 2 1 0
0 10 20 30 40 50 60 70 80 90 100
B.P.M. INCREASES →
PUMP 2000 GAL PAD @ 5 BPM (15:21)
START 1# LINGER (15:26)
START OIL (15:44) (15:47)
PRE PAD AT PERF (15:55)
ADD FDBL 20#/1000
START PUMPING PRE PAD WT 40 (15:59)
(15:30)
SHUT DOWN
2.9 bbl pumped ISIP 4300 psi (16:07)
Fg = .09 psi/ft
INJECTION TEST (16:?) (16:00)
(16:58 ISIP)
DOWELL DIVISION OF THE DOW CHEMICAL COMPANY
AUTOMATIC TREATMENT RECORD
PRINTED IN U.S.A.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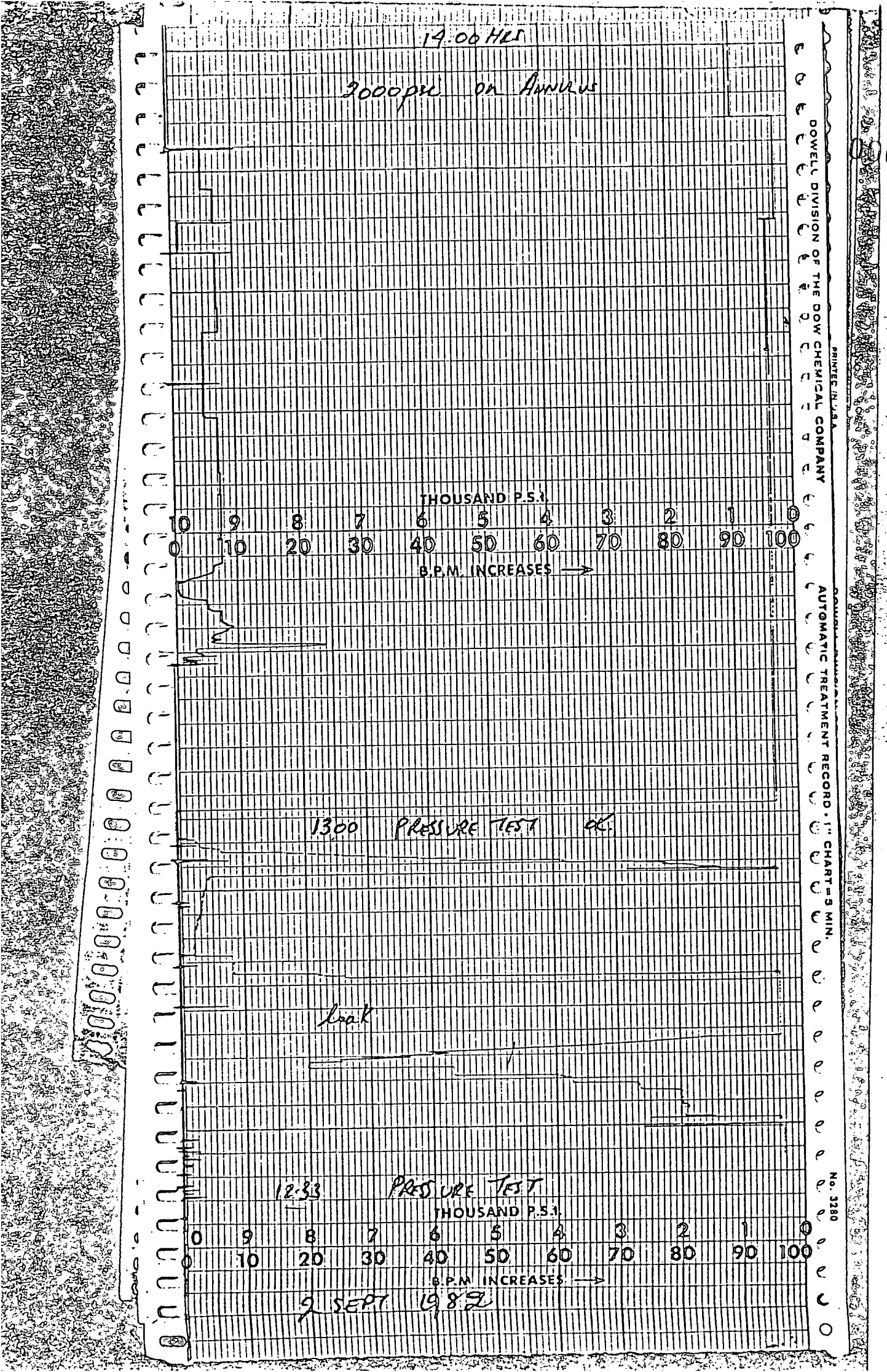
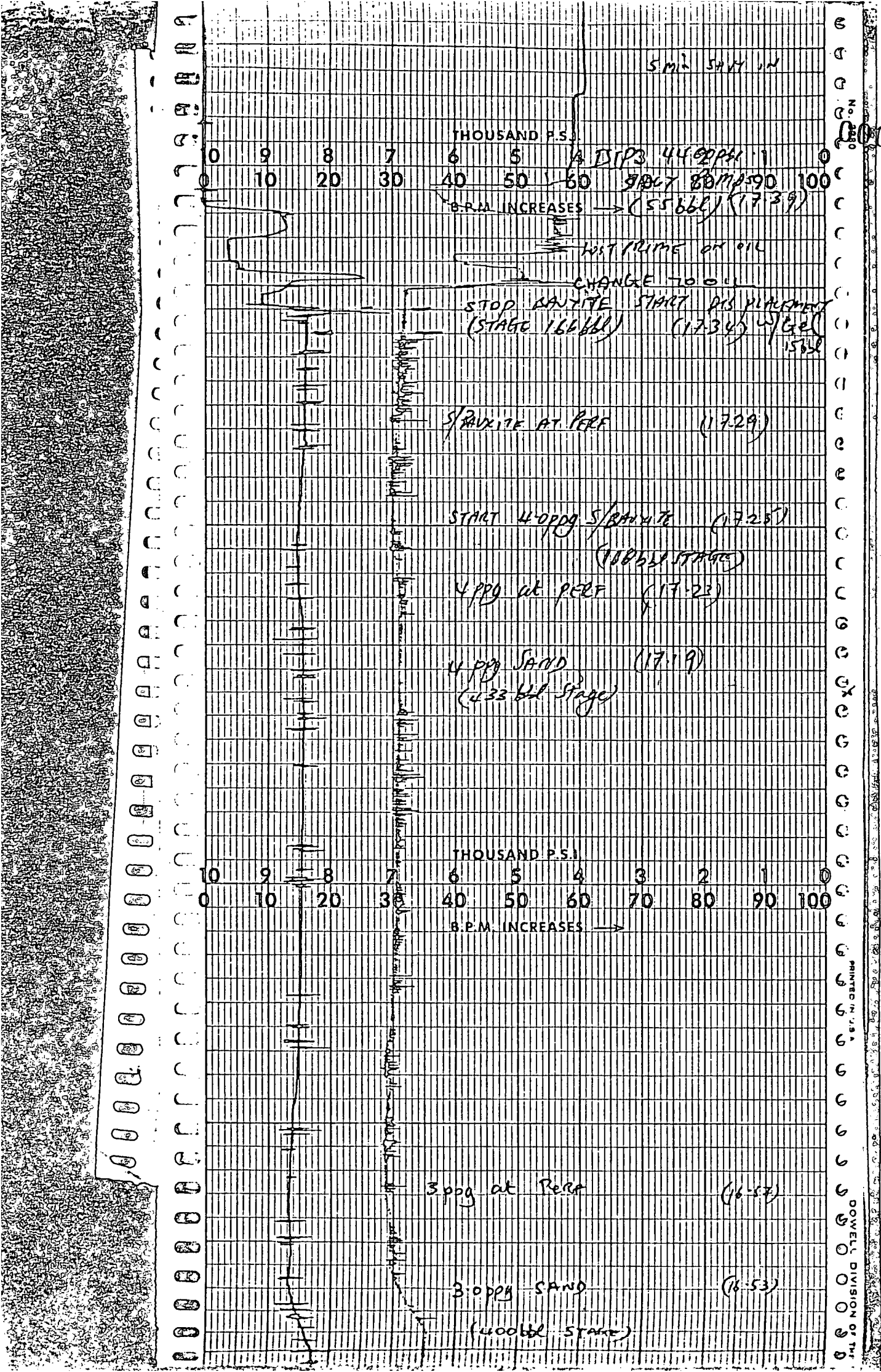
INCREASE
REPAIR LEAK
SHUT DOWN
STOP PUMPING
(1438)
Pump 55bbl KCl
(1426)
Tubing Not Primed
Pump 78bbl Acid
(1414)
Pump 20bbl KCl
(1401)
THOUSAND P.S.I.
B.P.M. INCREASES
No. 3280
AUTOMATIC TREATMENT RECORD
CHART - 3 MIN.


14.00 HRS
3000psi on Annulus
THOUSAND P.S.I.
10 9 8 7 6 5 4 3 2 1 0
0 10 20 30 40 50 60 70 80 90 100
B.P.M. INCREASES →
1300 PRESSURE TEST OK.
leak
12.33 PRESSURE TEST
THOUSAND P.S.I.
0 9 8 7 6 5 4 3 2 1 0
0 10 20 30 40 50 60 70 80 90 100
B.P.M INCREASES →
2 SEPT 1982
DOWELL DIVISION OF THE DOW CHEMICAL COMPANY
AUTOMATIC TREATMENT RECORD - 1" CHART = 5 MIN.
No. 3280

000192


THOUSAND P.S.I.
0 9 8 7 6 5 4 3 2 1 0
0 10 20 30 40 50 60 70 80 90 100
B.P.M. INCREASES →
5 MIN SHUT IN
DISP 44 BBLS
(5566) (1739)
INSTRUME ON OIL
CHANGE TO OIL
STOP BAUXITE (STAGE 166 BBL) START DIS PLACEMENT (1734) W/GEL 158 BBL
S/BAUXITE AT PERF (1729)
START 4-0 PPG S/BAUXITE (1725)
(108 BBL STAGE)
4 PPG at PERF (1723)
4 PPG SAND (1719)
(433 BBL Stage)
3 PPG at PERF (1657)
3-0 PPG SAND (1653)
(400 BBL STAGE)
THOUSAND P.S.I.
10 9 8 7 6 5 4 3 2 1 0
0 10 20 30 40 50 60 70 80 90 100
B.P.M. INCREASES →
No. 200193
PRINTED IN U.S.A.
DOWELL DIVISION OF THE

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Groves, D., 1973. Results of the modified isochronal gas production test and 48 hour reservoir pressure buildup survey of the Upper producing zone conducted over the period 18-21/1/73, including a reservoir engineering estimate of AOF potential, and results of the associated ex separator/stock tank reservoir fluid sample analyses [Amdel Ltd report no. AN 3302/73] (January-February 1973).	**1713 R 19** Pgs 121-141
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	Chapman, T. and Moore, M., 1985. Results of the flowing pressure gradient survey of the Lower producing zone performed on 14/7/85 (Expertest Pty Ltd).	**1713 R 31** Pgs 244-246
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FLY LAKE # 1
PRE AND POST FRACTURE TESTING
INTERPRETATION AND REPORT

Report No: PEO 004/83 WP 2895N
Prepared By: D.A. Thornton
Date: August 1983.

WP 2895N

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INTRODUCTION.

Fly Lake #1 is a dually completed well in the Patchawarra gas Formation and the Tirrawarra Sandstone oil zone.

The Tirrawarra Sandstone was fracture stimulated in May 1972 and subsequently underwent a post frac test to establish the existing well parameters at that time. A second fracture stimulation was carried out on the same sandstone in August 1982 and subsequently underwent a post frac test to establish the current well parameters. The recent fracture treatment was evaluated by comparing the test results from the 1972 and 1982 post frac tests.

This report presents the results and interpretation of the recent testing programme together with the results from the 1972 testing programme.

As the object of this report is to evaluate the 1982 fracture stimulation, and to avoid confusion, the 1972 post frac test will be called the pre frac test, and the 1982 test, the post frac test.

PRE FRAC TEST.

Testing Programme.

Following a clean up flow of six days in which the frac fluid was flowed back to surface until the B.S & W was less than 5%, the well was shut in. After 4 days a static pressure gradient was run, the results of which are appended. The fluid gradient was between 0.18 and 0.28 psi/ft, with the average gradient being 0.23 psi/ft indicating an oil filled wellbore.

The well was subsequently opened on 18/64" choke and flowed for 24 hours at which time it was shut in and the buildup recorded for 36-1/2 hours.

Surface and bottomhole pressure data were recorded throughout the test and are contained in the appendix along with the gas and liquid flow rates.

Type Analysis.

The buildup was analysed, using a Horner Plot (figure 7) only.

The Horner Plot indicated an extrapolated reservoir pressure of 4010 psia. A Kh of 94 md-ft was calculated and no Xe/Xf correction factor was applied.

A skin factor of +7 was calculated from the Horner Plot.

Results.

Table 5 summarises the results of the pre frac test. The results also indicate a D.R. of 1.9 (skin of +7) and a corresponding P.I. of 0.126 BPD/psi. Clearly, the 1972 frac job was not successful in removing damage.

POST FRAC TEST.

Frac Programme.

Fly Lake #1 was fracced for the second time in September 1982. The total volume of treatment fluid pumped was 110,000 USG. Four proppant stages were employed in the treatment, at 1, 2, 3 and 4 ppg 20/40 sand with a final stage of 4 ppg, 20/40 sintered bauxite. Total proppant used was 148,000 lbs. Cumulative pumping time was 192 minutes and the average pump rate was 15 bbl/min. A complete detailed summary of the frac job has been appended.

Testing Programme.

Following the clean up flow of 7 days in which the frac fluid was flowed back to surface until the B.S & W was less than 5%, the well was shut in. After 7 days, a static temperature and pressure survey was run, the results of which are appended. The fluid gradient was between 0.14 and 0.40 psi/ft with the average gradient being 0.234 psi/ft, indicating an oil filled wellbore with the same gradient as that measured in the pre frac test. The temperature survey indicated a maximum B.H.T. of 281^{o}F.

The well was subsequently opened on a 12/64" choke and flowed for 72 hours at which time it was shut in and the buildup recorded for 96 hours.

Surface and bottomhole pressures were recorded throughout the test and are contained in the appendix along with the gas and liquid flow rates.

Buildup Analysis.

The pressure buildup data were analysed using a Horner Plot (figure 1), Delta P vs $t^{1/2}$ Plots (figures 2 & 3), Delta P vs log t Plots (figure 4) and a Gringarten type curve (figures 5 & 6).

Both the Horner Plot and the Gringarten type curve gave compatable results. The flow capacities were within 3.2% of each other. A kh correction factor for the Horner buildup of 0.97, for Xe/Xf less than 20 would have given a perfect match of kh between the two analyses.

The skin calculated from the Horner analysis was -2.9.

The corrected flowtime was 75.5 hours which differs by only 4.6% from the observed flowtime of 72 hours, indicating a stable flow test. The corrected flowtime was calculated by dividing the total cumulative production by the final flow rate.

Figures 2 and 3 are plots of Delta P vs $t^{1/2}$ with figure 3 showing the initial points of figure 2 on an enlarged scale. Formation linear flow (and/or wellbore effects) was detected by a straight line on this graph and was seen to prevail for the first 38 minutes. Figure 4 is a plot of Delta P vs log t and a straight line here indicates the pseudo-radial portion of the buildup. The straight line commenced at approximately 150 minutes thus defining a transition period of 112 minutes. The duration of the formation linear flow is compatable with other wells with similar kh.
NB: As a fracture extending from the wellbore is interconnected to that wellbore by a high permeability passage, then formation linear flow is encompassed within wellbore effects.

The relatively low permeability is reflected in the time to stabilisation which was calculated at approximately 63 days for a drainage radius of 2,000' (based on well spacing). The drainage area observed in this test was 9 acres, corresponding to a drainage radius of 250'.

Figure 5 is a plot of log Delta P versus log t and was matched onto a Gringarten type curve (figure 6). The match suggested that the well was vertically fractured with the ratio of Xe/Xf greater than 20. The kh of 61 md-ft compared favourable with the value of 63 md-ft calculated from the Horner buildup.

RESULTS.

Table 5 summarises the results of the post frac production testing and lists the pre frac test evaluation results for comparison. The pre frac test analysis was derived from data measured during June 1972, using current values of formation and fluid date (table 1).

This permitted a direct comparison to be made between the pre and post frac parameters, allowing the actual change in well characteristics to be evaluated.

The extrapolated pressure from the post frac test was 3990 psia, some 20 psi lower than that observed in 1972. This is undoubtably due to bomb calibration error as the reference depth for the 1972 test was some 119' higher and should have been at a lower pressure than that observed in 1982.

The flow capacity measured in 1982 was 63 md-ft which was approximately 33% less than that observed in the pre frac production test. This is probably a result of too short a buildup time being used in the pre frac test (5.4 hrs) and as a result the wrong Horner slope was used in the calculation of flow capacity. In the post fracture analysis 34' was used for 'h', being the net pay in the Tirrawarra Sandstone as interpreted from logs.

The skin factor changed from approximately +7 (DR = 1.9), indicating a highly damaged well to -2.9 in accordance with a highly stimulated well. The P.I. prior to fracturing was 0.126 BPD/psi with damage, if the damage is removed then the P.I. would have been 0.358 BPD/psi. The productivity after fracturing was 0.430 BPD/psi which indicates a productivity increase of 3.41 fold.

CONCLUSION.

The most significant parameter in the evaluation of a fracture stimulation is the change in P.I. In this case the increase was 3.41 fold indicating a very successful stimulation treatment. However, it should be pointed out that the productivity increase obtained by the frac treatment over an undamaged well was only 1.2 fold.

Considering the productivity index of 0.43 BPD/psi drawdown alone, the maximum possible initial flowrate from this well would be 473 B.P.D. whilst still maintaining the sandface pressure above the bubble point of the reservoir. However, as the stabilised productivity index will probably be less than the above figure, initial production from this well should be limited to something less than 473 B.P.D.

RECOMMENDATION.

Reiterating comments of previous reports of this type, it is suggested that fracture stimulations be seriously considered in fields which either have formation of very low permeability or contain hydrocarbon liquids with a high bubble point, as such treatments can be shown to be economically advantageous. Both of the above factors are evident within the Tirrawarra Formation of the Fly Lake Field, and fracture stilumations have been successfully applied to many oil wells in the Patchawarra Central fields. As a result of these fracture treatments the productivity indices have been increased by an average fold-factor in excess of 4 which will allow these wells to be produced at satisfactory rates without bottomhole pressures falling below the bubble point.

It is recommended that, the practise of running production tests prior to, as well as following the fracture stimulation, in order to be able to completely evaluate the treatment, should be continued.

TABLES

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TABLE 1

FLY LAKE #1

RESERVOIR AND FLUID DATA SUMMARY

ITEM	VALUE	UNIT	SOURCE
Porosity (Ø)	10.9	percent	Geological Data Sheets
Net Pay (h)	34	feet	Geological Data Sheets
Net Sand	54	feet	Interpreted from Logs
Water saturation (Sw)	27.9	percent	Geological Data Sheets
Oil saturation (So)	72.1	percent	Geological Data Sheets
Water Compressibility (Cw)	3×10^{-6}	$(psi)^{-1}$	Correlation Chart (Frick)
Rock Compressibility (Cp)	5×10^{-6}	$(psi)^{-1}$	F/L #1 PVT analysis
Oil Compressibility (Co)	60×10^{-6}	$(psi)^{-1}$	F/L #1 PVT analysis
Total Compressibility (Ct)	49×10^{-6}	$(psi)^{-1}$	Calculated
Oil Viscosity (u)	0.11	cp	Fly Lake #1 PVT analysis
Formation Volume Factor (Bo)	2.55	RB/STB	Fly Lake #1 PVT analysis
Wellbore radius (rw)	0.354	feet	Bit Size

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TABLE 2

FLY LAKE #1

PRE FRACTURE DATA SUMMARY

(June 1972)

ITEM	VALUE	UNIT	SOURCE
Average Flow Rate (q) (18 - 31/64" choke)	369	BPD	Calculated from Data Sheets
Final Flow Rate (qn)	369	BPD	Last Recorded Flow Rate
Final Flowing Pressure (Pwf)	1081	PSIA	Last Recorded FBHP
Flow Time (t)	24	HOURS	Flowtime from Data Sheets
Horner Plot			
Extrapolated Pressure (P*)	4010	PSIA	
Horner Slope (m)	230	PSI/CYCLE	
1 Hour Shutin Pressure (P1hr)	3501	PSIA	
Skin (S)	+ 7	-	
Pressure due to Skin (p skin)	1390	PSI	
Permeability (k)	1.47	md	
Flow Efficiency (Ja/Ji)	0.53	-	
Damage Ratio (D.R.)	1.9	-	
Productivity Index (P.I.)	0.126	BBL/PSI	

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TABLE 3

FLY LAKE #1

POST-FRACTURE DATA SUMMARY

ITEM	VALUE	UNIT	SOURCE
Average Flow Rate (q) (16/64" choke)	263	BPD	Calculated from Data Sheets
Final Flow Rate (qn)	241.0	BPD	Last Recorded Flow Rate
Final Flowing Pressure (Pwf)	-	PSIA	Not Available
Flow time (t)	72	HOURS	Data Sheets
Corrected Flowtime (tc)	75.5	HOURS	Calculated
Horner Plot			
Extrapolated Pressure (p*)	3990	PSIA	
Horner Slope (m)	190	PSI/cycle	
1 Hour Shutin Pressure (Pws1)	3623	PSIA	
Gringarten Type Curve			
$(P_D)m$	1.0		
$(\Delta P)m$	170	PSI	
$(t_{Dxf})m$	100		
$(\Delta t)m$	1.10	HOURS	

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TABLE 4

FLY LAKE #1

EQUATION SUMMARY

Common Equations

$$Ps = \frac{ms}{1.151}$$

$$D.R. = \frac{p^* - pwf}{p^* - pwf - \Delta ps}$$

$$P.I. = \frac{qn}{p^* - pwf}$$

Drawdown

$$kh = \frac{162.6\ q\ \mu\ Bo}{m}$$

$$S = 1.151 \left(\frac{Pi - P1hr}{m} - \log \frac{k}{\emptyset \mu C_t r_w^2} + 3.228 \right)$$

$$\emptyset hA = \frac{0.23395\ q\ Bo}{Ct\ m^*}$$

$$C_A = 5.45 \frac{m}{m^*} \exp \left[\frac{-2.303\ (P1hr - Pint)}{m} \right]$$

TABLE #4 CONTINUED.

Horner Plot

$$kh = \frac{162.6\ q\ \mu\ Bo}{m}$$

$$S = 1.151 \left(\frac{pws1 - pwf}{m} - \log \frac{K}{\phi \mu C_t r w^2} + 3.228 \right)$$

Odeh-Jones Plot

$$kh = \frac{162.6\ qn\ \mu\ Bo}{m}$$

$$S = 1.151 \left(\frac{Pws - pwf}{m} - \log \frac{k}{\phi \mu C_t r w^2} + 3.228 \right)$$

Gringarten et al Type Curve

$$kh = 141.2\ q\ \mu\ Bo \left(\frac{PD}{\Delta P} \right)_m$$

General Equations

$$r_d = 0.029 \sqrt{\frac{kt}{\phi \mu C_t}}$$

$$ts = 1200\ \frac{\phi \mu C_t r_e^2}{k}$$

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TABLE 5

FLY LAKE #1

TEST EVALUATION RESULTS

Quantity	PRE-FRAC	POST-FRAC	
		Horner	Gringarten
Extrapolated Pressure	4010 psi	3990 psi	
Effective Flow Capacity	94 md ft	63 md ft	61 md ft
Permeability	1.47 md	1.86 md	1.80 md
Skin	+7	-2.9	
Pressure Drop due to skin	+1390 psi	-746 psi	
Damage Ratio	1.9	0.45	
Productivity Index	0.126 BPD/psi	0.43 BPD/psi	

FIGURES

Figure 1

FLY LAKE # 1

HORNER PLOT
Post Frac Buildup Test

SEPTEMBER 1982

Element #21380 @ 9354' KB (o)
Element #21820 @ 9360' KB (x)
Flowtime = 72 hours

$P^* = 3990$ psi
$m = 190$ psi/cycle

JMF 16/3/83

000211

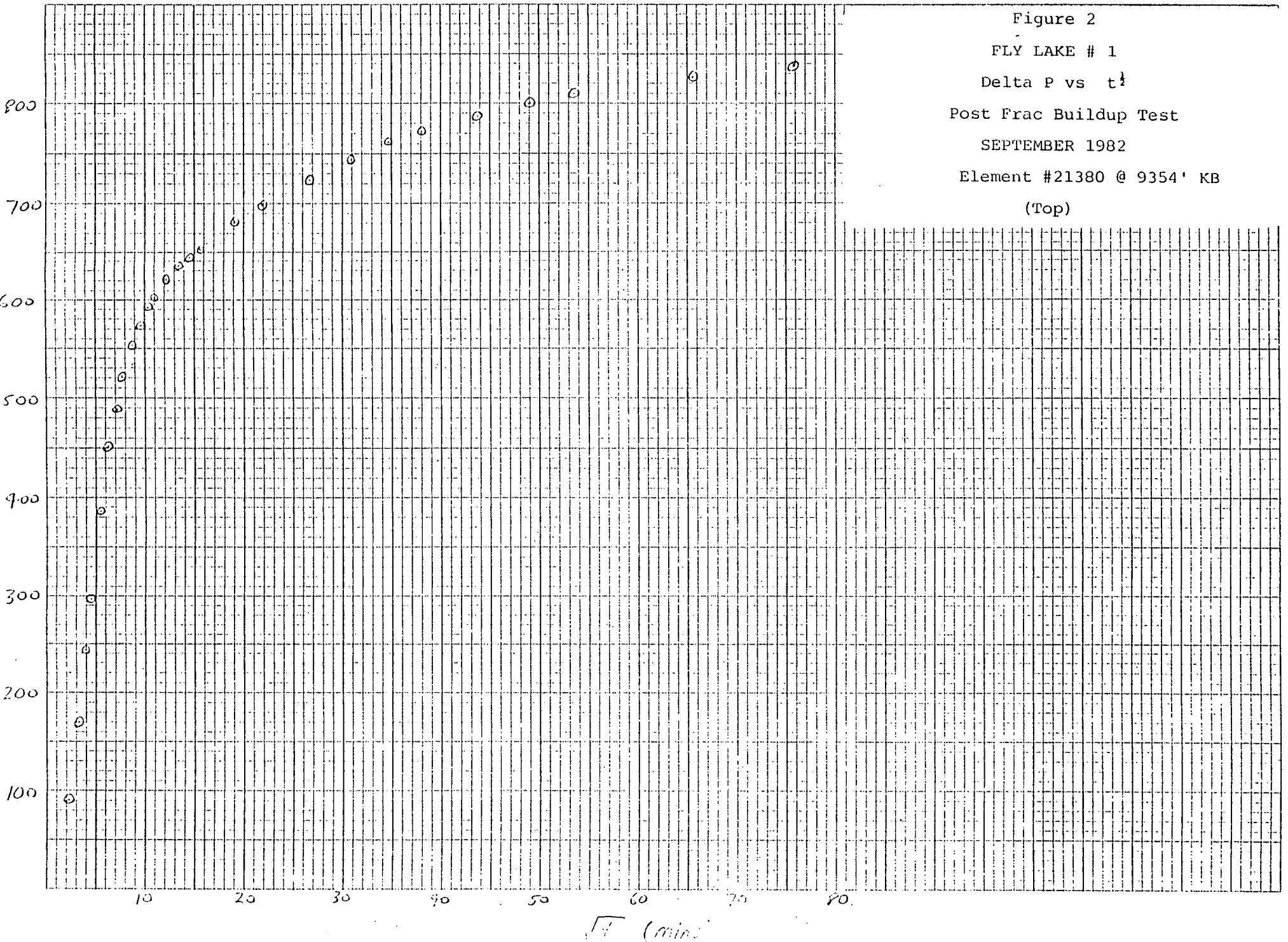


Figure 2

FLY LAKE # 1

Delta P vs $t^{\frac{1}{2}}$

Post Frac Buildup Test

SEPTEMBER 1982

Element #21380 @ 9354' KB

(Top)

GORMACK GRAPH PAPERS : CHRISTCHURCH N.Z. C051Y 18 cm x 25 cm x 2 mm

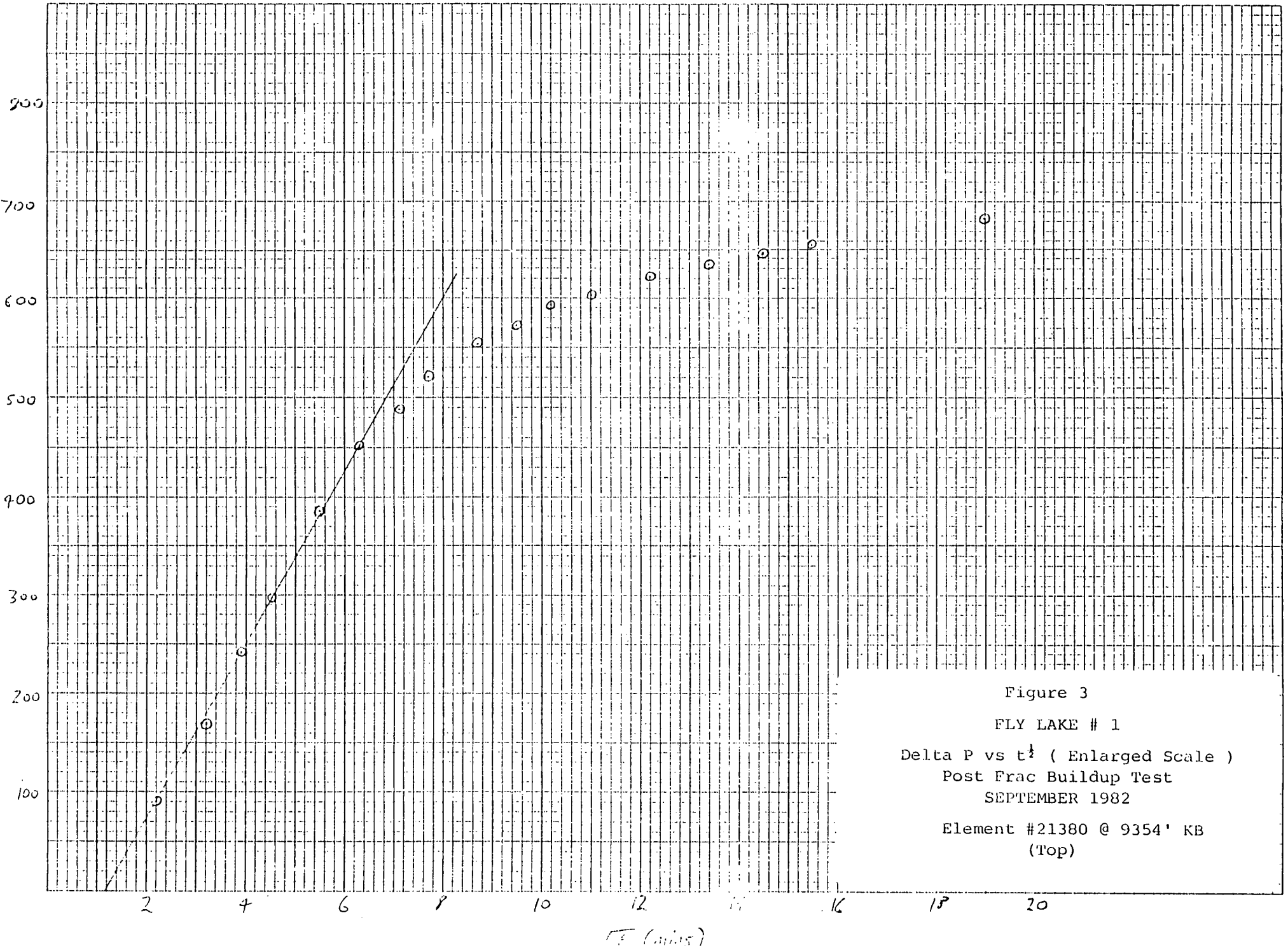


Figure 3

FLY LAKE # 1

Delta P vs $t^{\frac{1}{2}}$ (Enlarged Scale)
Post Frac Buildup Test
SEPTEMBER 1982

Element #21380 @ 9354' KB
(Top)

GORMACK GRAPH PAPERS : CHRISTCHURCH N.Z
C051Y 18 cm x 25 cm x 2 mm

SEMI-LOGARITHMIC 4 CYCLES X 70 DIVISIONS

46 6012

Figure 4
FLY LAKE # 1

Delta P vs Log t
Post Frac Buildup Test
SEPTEMBER 1982

Element #21380 @ 9354' KB
(Top)

000214

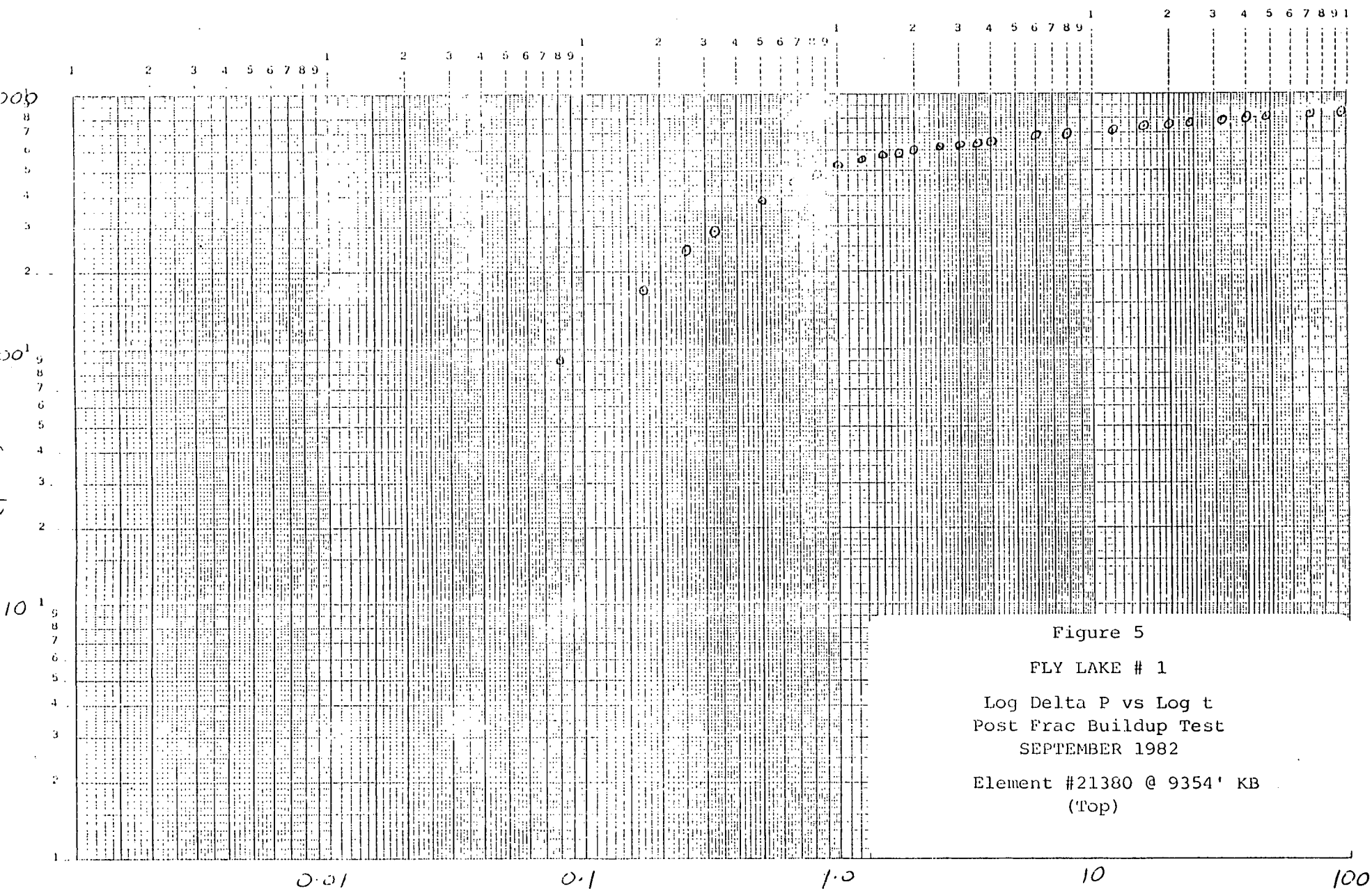


Figure 5

FLY LAKE # 1

Log Delta P vs Log t
Post Frac Buildup Test
SEPTEMBER 1982

Element #21380 @ 9354' KB
(Top)

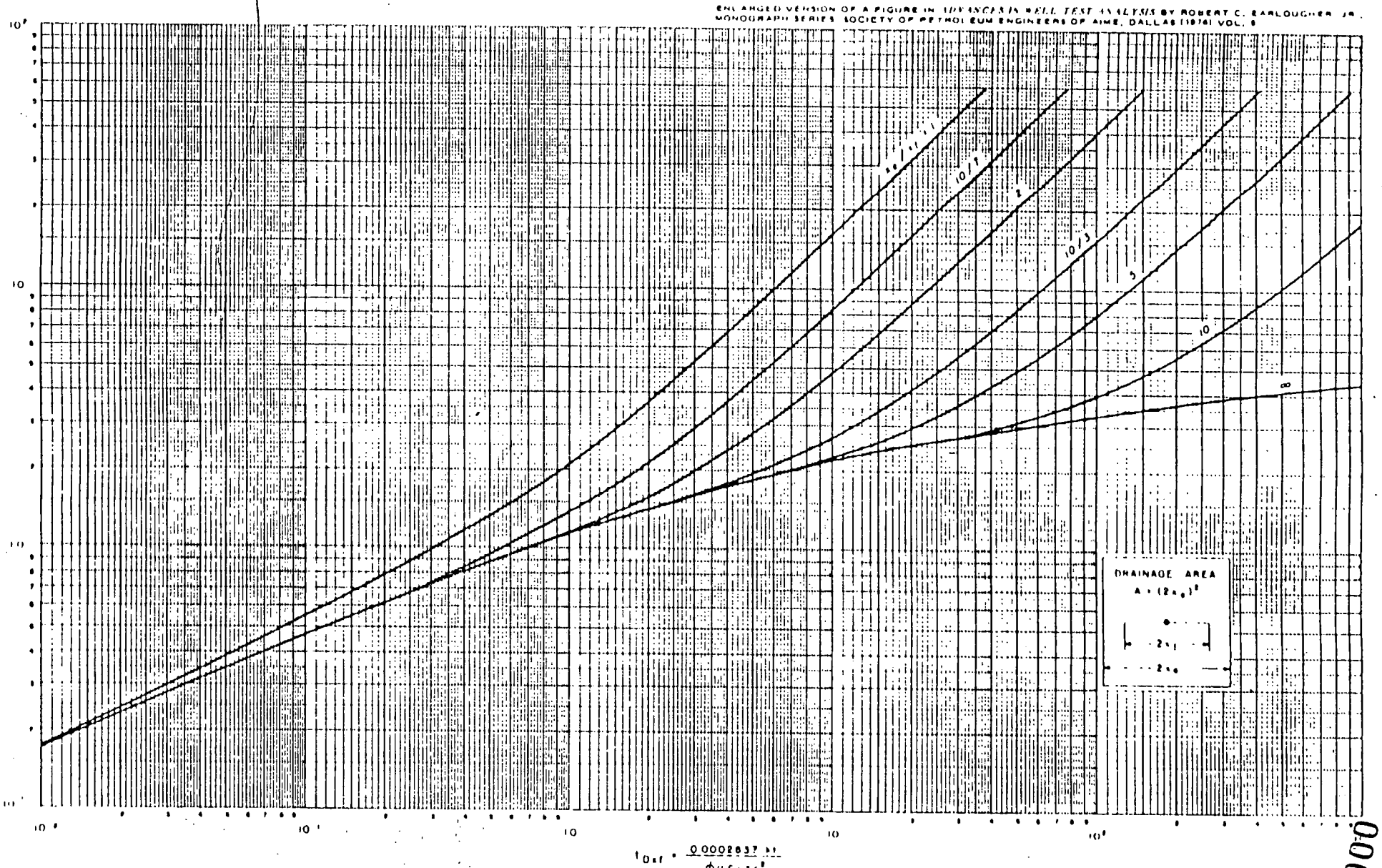


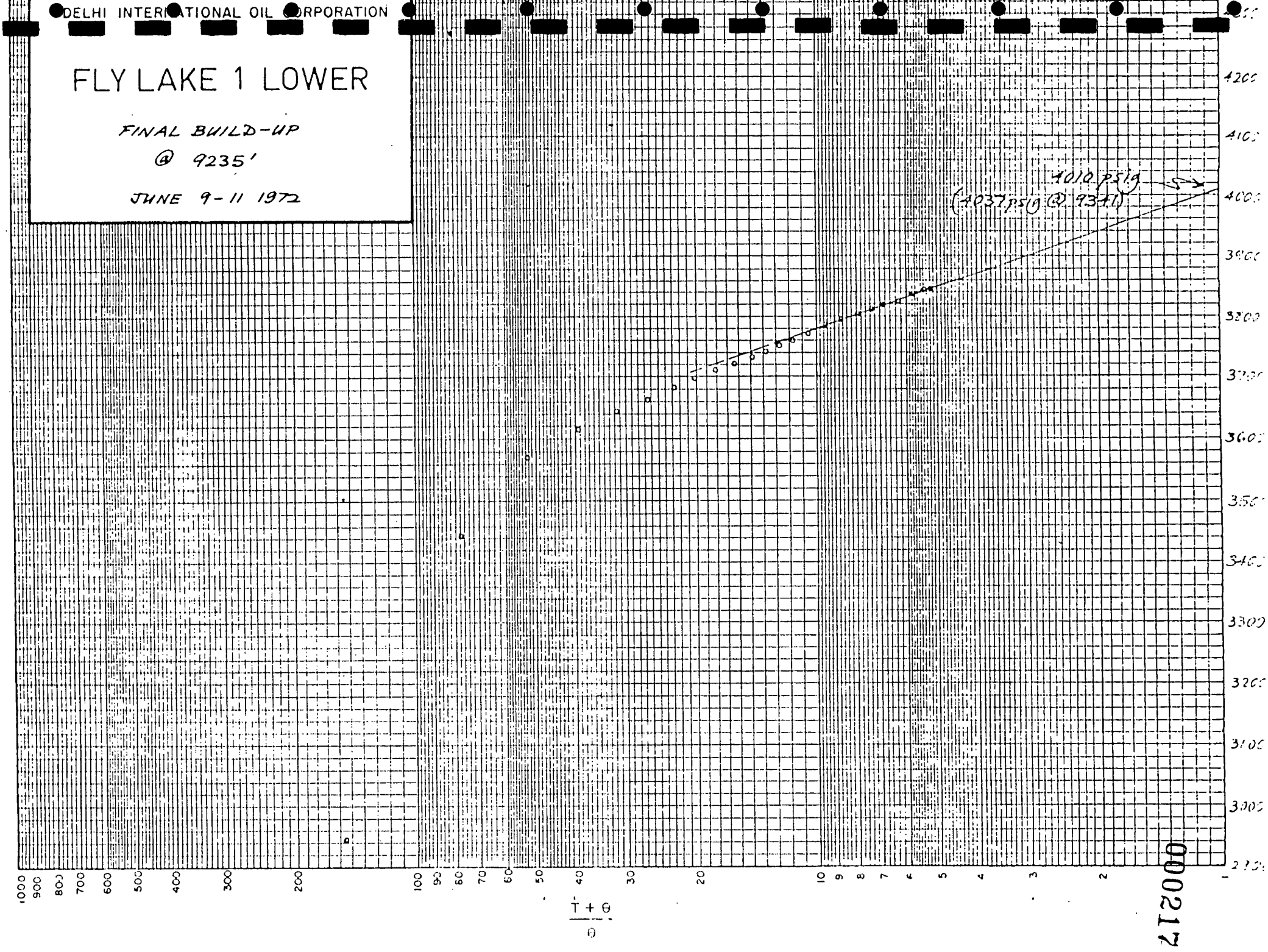
Figure C.18. Dimensionless Pressure for Vertically Fractured Well in the Center of a Closed Square, No Wellbore Storage, Infinite Conductivity Fracture. After Gringarten, Alain C., Ramey, Henry J., Jr., and Raghavan, R.: "Pressure Analysis for Fractured Wells," paper SPE 4051, presented at SPE-AIME 47th Annual Fall Meeting, San Antonio, Oct. 8-11, 1972, and Gringarten, Alain C., Ramey, Henry J., Jr., and Raghavan, R.: "Unsteady-State Pressure Distributions Created by a Well with a Single Infinite-Conductivity Vertical Fracture," Soc. Pet. Eng. J. (Aug., 1974) 347-360.

0021G

DELHI INTERNATIONAL OIL CORPORATION

FLY LAKE 1 LOWER

FINAL BUILD-UP
@ 9235'
JUNE 9-11 1972



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APPENDIX

WP: 2763N

FLY LAKE #1 LOWER
SUMMARY OF POST-FRACTURE PRODUCTION TEST
NOVEMBER 9th - 16th/1982

Static Reservoir Pressure

Static Gradient: 9/11/82 (Mid Point of Perfs. = 9360'KB (Tirrawarra Formation))

Element #21380 @ 9360' KB = 4007 psia) Average Gradient =
Element #21820 @ 9360' KB = 4012 psia) 0.2350 psia/ft.
Maximum Bottom Hole Temperature = 281°F

Extended Flow Test (9 - 12/11/82)

9/11/82: Opened well @ 1645 hrs. on 12/64" choke.
H.P. Separator = 100 psia
Gas Flow Rate = 0.57 MMCF/D
Oil Production = 263 bbls/day
Water Production = 48 bbls/day

12/11/82: Samples taken-: 2 x Stock tank water
2 x H.P. Gas

Build Up Test (12 - 16/11/82) (Shut in time = 96 hrs.)

Element #21380 @ 9354' KB after 96 hrs. = 3941 psia
Element #21820 @ 9360' KB after 96 hrs. = 3959 psia
Maximum Bottom Hole Temperature = 273°F

SANTOS LTD

OIL WELL TEST RESULTS

WELL NAME: FLY LAKE #1 LOWER

TYPE OF TEST: POST-FRAC PRODUCTION TEST

DATE: DECEMBER 9th - 12th/1982

TESTED BY: GMI & A/B. Hwy

SETTER ROD: 4.026"

			WELLHEAD DATA			SUBSURFACE DATA			H.P. SEPARATOR DATA					L.P. SEPARATOR DATA														
DATE	TIME	CHOKE SIZE INS	ANN. PSIA	TBG. PSIA	TEMP °F	EL.#	EL.#	EL.#	P.P. PSIA	H.W. INS H_2O	TEMP °F	ORIF SIZE INS	GAS FLOW RATE MCFD	P.P. PSIA	H.W. INS H_2O	TEMP °F	ORIF SIZE INS	GAS FLOW RATE MCFD	OIL PROD BPD	CUM. OIL BBLS	H_2O PROD BPD	CUM. H_2O BBLS		GOR SCF/BBL	BSSW %	OIL GRAV °API	REMARKS
													MCFD														
9/11	1645																										
	1700	12/64	15	1302	86				93	72	63	1.25	0.65														Open well
	1900	12/64	15	1145	84				86	55	65	1.25	0.54												TRACE		Started test
	2100	12/64	15	1280	82				93	60	61	1.25	0.60						302	25					0		
	2300	12/64	15	1145	82				95	33	55	1.375	0.54						322	52					0		Changed orifice
10/11	0300	12/64	15	1140	82				97	25	52	1.5	0.55						342	80					0		Changed orifice
	0700	12/64	15	1265	84				93	27	59	1.5	0.58						312	111	10	1.677			0		
	1100	12/64	15	1176	97				103	30	76	1.5	0.58						312	142	10	3.354			0		
	1500	12/64	15	1162	100				98	27	77	1.5	0.54						151	165	171	31.4			TRACE		
	1900	12/64	15	1108	93				95	30	71	1.5	0.56						241	207	60	41.4			0.5		
	2300	12/64	15	1105	88				101	28	53	1.5	0.57						251	249	30	46.4			0.5		
11/11	0300	12/64	15	1147	87				97	28	57	1.5	0.55						251	291	50	54.4			0.5		
	0700	12/64	15	1065	87				101	30	55	1.5	0.59						262	357	50	62.4			0.5		
	1100	12/64	15	1168	100				103	30	77	1.5	0.58						251	399	40	69.4			0.5		
	1500	12/64	15	1148	105				105	30	78	1.5	0.59						241	439	50	77.4			1.0		
	1900	12/64	15	1190	87				103	28	73	1.5	0.56						231	477.5	60	87.4			1.0		
	2300	12/64	15	1137	91				107	25	60	1.5	0.55						272	522.7	30	92.4			1.0		
12/11	0300	12/64	15	1137	89				107	25	55	1.5	0.55						252	564.7	40	99.1			1.0		
	0700	12/64	15	1183	93				101	30	53	1.5	0.59						282	611.6	30	104.1			1.0		
	1100	12/64	15	1155	106				106	28	77	1.5	0.57						262	655.6	50	112.1			0.5		
	1500	12/64	15	1165	107				106	27	77	1.5	0.56						241	695.8	50	120.1			2.5		
	1700	12/64	15	1180	104				106	27	78	1.5	0.56						252	737.8	40	126.8			1.0		
																			241	758	40	130.1			1.0		Put well in

000220

NAME: FLY LAKE #1 LOWER TYPE OF TEST: POST-FRAC PRODUCTION TEST DATE: NOVEMBER 12th - 16th/1982

ED BY: GRM & A/N. Bay

E RUN: 4.026"

TIME	SHUT IN TIME (hrs)	WELLHEAD DATA ANN. PSIA	WELLHEAD DATA TBG. PSIA	WELLHEAD DATA TEMP °F	SUBSURFACE DATA PRESSURES (PSIA) EL.# 21380 @ 9354'KB	SUBSURFACE DATA PRESSURES (PSIA) EL.# 21820 @ 9360'KB	SUBSURFACE DATA PRESSURES (PSIA) EL.#	H.P. SEPARATOR DATA P.F. PSIA	H.P. SEPARATOR DATA H.W. INS H_2O	H.P. SEPARATOR DATA TEMP °F	H.P. SEPARATOR DATA ORIF SIZE INS	H.P. SEPARATOR DATA GAS FLOW RATE MCFD	L.P. SEPARATOR DATA P.F. PSIA	L.P. SEPARATOR DATA H.W. INS H_2O	L.P. SEPARATOR DATA TEMP °F	L.P. SEPARATOR DATA ORIF SIZE INS	L.P. SEPARATOR DATA GAS FLOW RATE MCFD	OIL PROD BPD	CUM. OIL BBLS	H_2O PROD BPD	TOTAL LIQ. PROD. BPD	CUM. LIQ. BBLS	GOR SCF/ BBL	BSAW %	OIL GRAV °API	REMARKS
			1187		1159	1181																			
1455					3102	3109																			Hang in lubricator
1700	Ø		1180		3102	3109																			Hang Irmks
1705	0.08				3193	3205																			Shut well in
1710	0.17		1305		3272	3287																			
1715	0.25				3344	3350																			
1720	0.33		1369		3400	3400																			
1730	0.5		1417		3489	3487																			
1740	0.67		1460		3553	3547																			
1750	0.83		1479		3591	3585																			
1800	1		1497		3623	3615																			
1815	1.25		1516		3655	3646																			
1830	1.5		1543		3675	3668																			Maximum Pottom Hole
1845	1.75		1546		3694	3685																			Temperature = 273°F.
1900	2		1560		3704	3699																			
1930	2.5		1577		3724	3719																			
2000	3		1588		3736	3733																			
2030	3.5		1602		3746	3743																			
2100	4		1616		3756	3750																			
2300	6		1638		3783	3779																			
0100	8		1660		3801	3798																			
0500	12		1679		3826	3824																			
0900	16		1695		3846	3844																			
1300	20		1706		3863	3861																			
1700	24		1713		3873	3873																			
0100	32		1720		3890	3893																			
0900	40		1731		3902	3907																			
1700	48		1739		3912	3918																			
0700	72		1747		3930	3943																			

12200

0002221

OIL WELL TEST REPORTS

WELL NAME: FLY TAKE #1 TOWER — TYPE OF TEST PERFORMED: DAC PRODUCTION TEST — DATE: DECEMBER 12th - 16th/1982

TESTED BY: CAM & MN. Hwy

METER RUN: 4.026"

DATE	TIME	SHUT IN TIME (hrs)	WELLHEAD DATA: ANN. PSIA	WELLHEAD DATA: TBG. PSIA	WELLHEAD DATA: TEMP °F	SEPARATOR DATA PRESSURES (PSIA): LL# 21380 @ 9354'KB	SEPARATOR DATA PRESSURES (PSIA): LL# 21820 @ 9360'KB	SEPARATOR DATA PRESSURES (PSIA): LL#	H.P. SEPARATOR DATA: P.F. PSIA	H.P. SEPARATOR DATA: H.W. INS H_2O	H.P. SEPARATOR DATA: TEMP °F	H.P. SEPARATOR DATA: ORIF SIZE INS	H.P. SEPARATOR DATA: GAS FLOW RATE MCFD	L.P. SEPARATOR DATA: P.F. PSIA	L.P. SEPARATOR DATA: H.W. INS H_2O	L.P. SEPARATOR DATA: TEMP °F	L.P. SEPARATOR DATA: ORIF SIZE INS	L.P. SEPARATOR DATA: GAS FLOW RATE MCFD	OIL PROD BPD	CUM. OIL BBLS	H_2O PROD BPD	TOTAL LIQ. PROD. BPD	CUM. LIQ. BBLS	GOR SCF/BBL	H.W. %	OIL GRAV °API	REMARKS
16/1	1700	96		1748		3941	3959																			
				1747		1768	1789																			

WT 04/82

222000

POST - FRAC

STATIC PRESSURE GRADIENT

WELL FLY LAKE # 1 LOWER

TEST DATE 9/11/82 (1310-1525 HRS)

ELEMENT # 21380 (TOP ELEMENT)

DEPTH (FEET)	PRESS. (PSIA)	GRADIENT (PSIA/FT)
LUB.	1790	—
2000	2228	0.2190
4000	2747	0.2595
6000	3227	0.2400
8000	3692	0.2325
9000	3925	0.2330
9200	3984	0.2950
9360	4007	0.1438
LUB.	1807	—

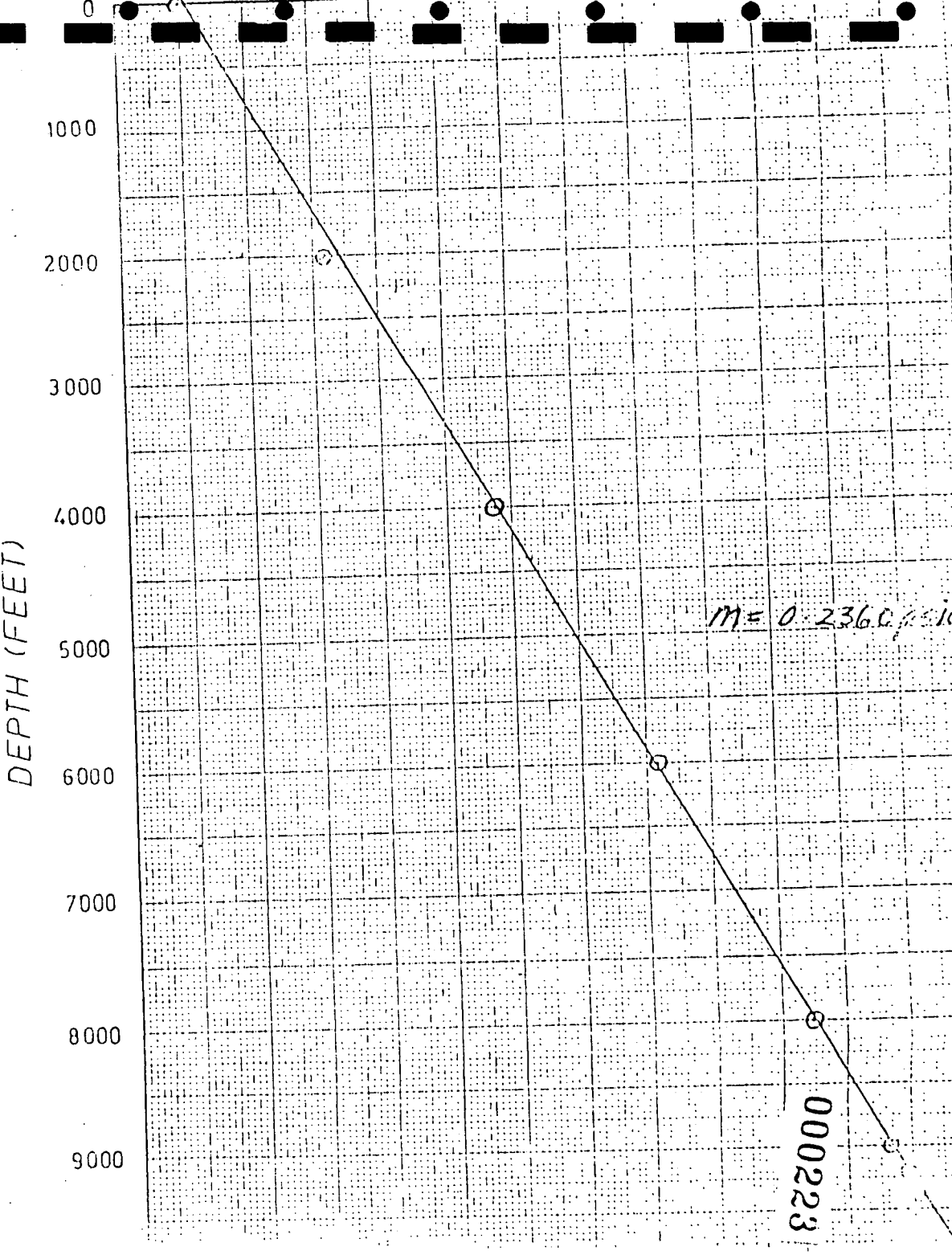
DEPTH (METRES)	PRESS. (KPA ABS)	GRADIENT (KPA ABS/M)
LUB	12345	—
610	15366	4.9540
1219	18945	5.8701
1829	22255	5.4290
2438	25462	5.2594
2743	27069	5.2707
2804	27476	6.6732
2853	27634	3.2529
LUB.	12462	—

LUB. IN DIVT = 1777 psia / OUT = 1780 psia

LUB. IN AMERADA = 1790 psia / OUT = 1807 psia

1 psia/ft = 22.621 kPa ABS/m.

JMF. 16/3/83



POST-FRAC
STATIC PRESSURE
GRADIENT

WELL FLY LAKE #1 LOWER

TEST DATE 9/14/82 (1310-1525 HRS)

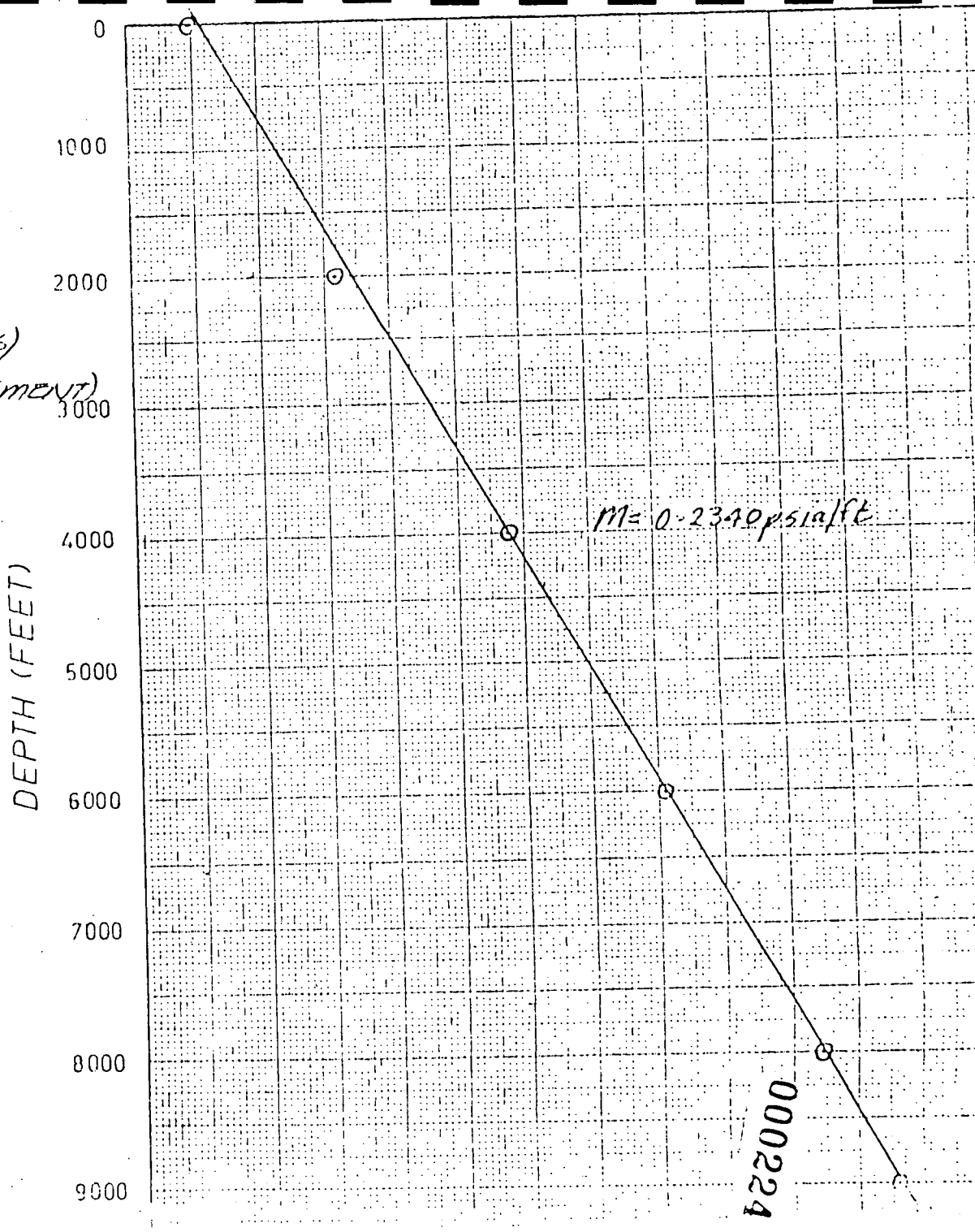
ELEMENT #21820 (MIDDLE ELEMENT)

DEPTH (FEET)	PRESS. (PSIA)	GRADIENT (PSIA/FT)	DEPTH (METRES)	PRESS. (kPa ABS)	GRADIENT (kPa ABS/M)
LUB.	1794	—	LUB.	12372	—
2000	2231	0.2185	610	15386	4.9427
4000	2746	0.2575	1219	18938	5.8249
6000	3222	0.2380	1829	22221	5.3838
8000	3685	0.2315	2438	25414	5.2368
9000	3921	0.2360	2743	27041	5.3386
9200	3986	0.3250	2804	27490	7.3518
9360	4012	0.1625	2853	27669	3.6759
LUB.	1804	—	LUB.	12441	—

LUB. IN DWT. = 1777 psia / OUT = 1780 psia

LUB. IN AMERADA = 1794 psia / OUT = 1804 psia

1 psia/ft = 22.621 kPa ABS/M.



POST-FRAC

STATIC TEMPERATURE

GRADIENT

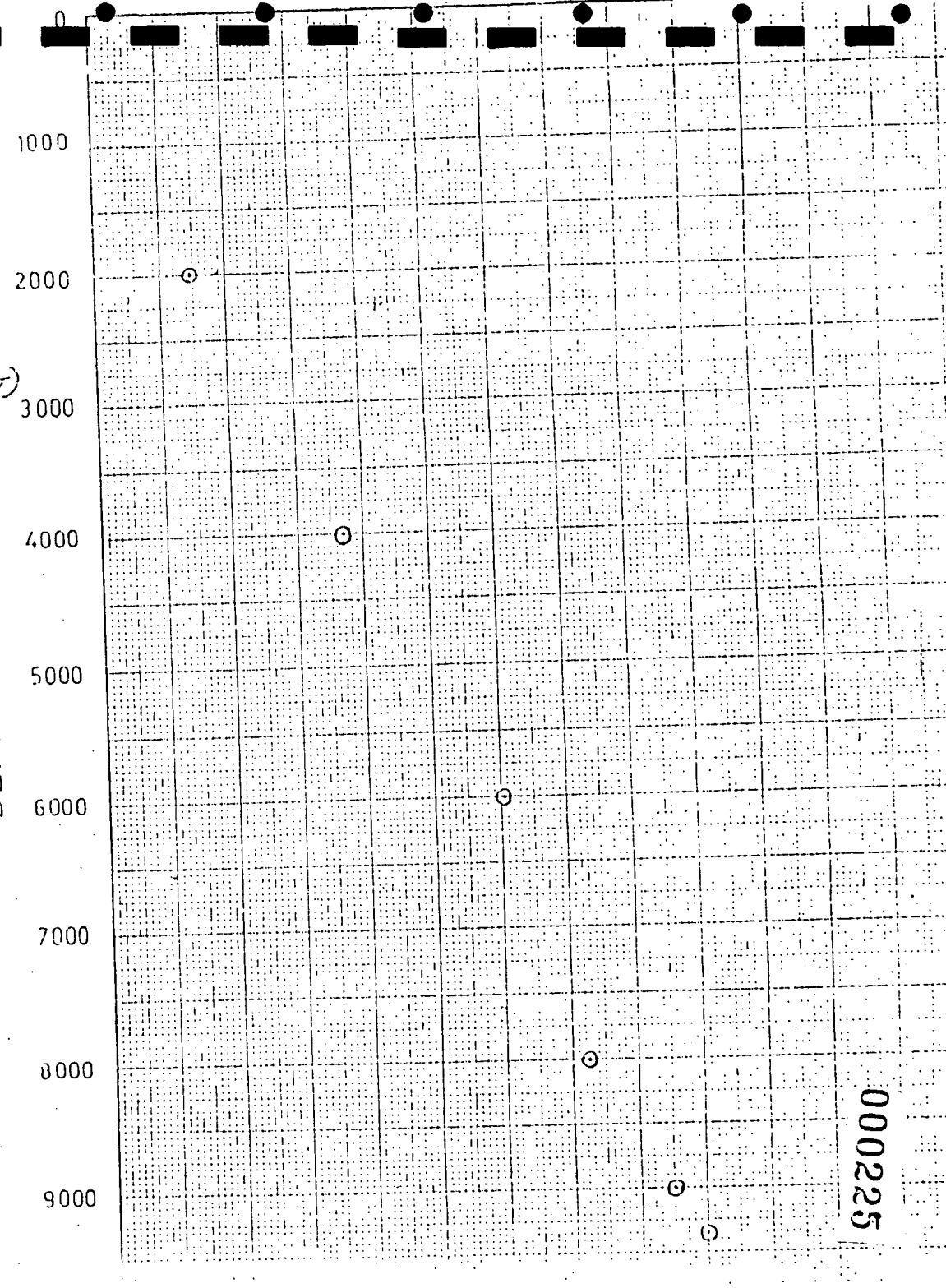
WELL ELY LAKE #1 LOWER

TEST DATE 9/11/83 (1310-1525)IRS)

ELEMENT #16355 (BOTTOM ELEMENT)

DEPTH (FEET)	TEMP (°F)	GRADIENT (°F/FT)
LUB.	—	—
2000	129	—
4000	174	0.0225
6000	221	0.0235
8000	245	0.0120
9000	270	0.0250
9200	N/A.	—
9360	281	—
LUB.	—	—

DEPTH (METRES)	TEMP. (°C)	GRADIENT (°C/M)
LUB.	—	—
610	53.9	—
1219	78.9	0.0411
1829	105.0	0.0428
2438	118.3	0.0218
2743	132.2	0.0456
2804	N/A.	—
2853	138.3	—
LUB.	—	—



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JMF. 16/5/83

PRODUCTION TEST SUMMARY

1972 Date	Time	Wellhead Press. psig	Wellhead Temp. °F	B.H. Press. @ 9235'	H.P. Separator Press. psig	H.P. Separator Hw Ins.	H.P. Separator Temp. °F	H.P. Separator Orifice Size "	L.P. Separator Press. psig	L.P. Separator Hw Ins.	L.P. Separator Temp. °F	L.P. Separator Orifice Size "	Gas Production MMCFD H.P. Sep.	Gas Production MMCFD L.P. Sep.	Gas Production MMCFD Total	Oil Prod. Bbls/D	Water Prod Bbls/
May 26	2115	Commenced clean up flow															
May 29	0900	Shut in															
June 1	1650	Resumed flow through 10/64" choke															
	0315	1222	96	*	135	53	40	1.000	34	10	48	0.375	0.456	0.014	0.470	168	23
June 2	0800	1220	96	*	140	48	44	1.000	38	10	52	0.375	0.437	0.015	0.452	180	15
	1130	1212	97	*	140	52	64	1.000	38	12	64	0.375	0.440	0.015	0.455	180	18
	1430	1205	98	*	140	52	67	1.000	38	13	78	0.375	0.444	0.016	0.400	174	19
	1630	1200	97	*	140	50	57	1.000	38	11	72	0.375	0.439	0.015	0.454	173	18
	2205	1205	95	*	140	48	45	1.000	36	10	56	0.375	0.436	0.014	0.450	176	16
June 3	0900	1197	94	*	138	51	50	1.000	34	11	62	0.375	0.444	0.014	0.458	180	14
	1430	1202	97	*	140	50	68	1.000	36	14	76	0.375	0.432	0.016	0.448	174	18
	1830	1199	94	*	138	46	46	1.000	34	13	63	0.375	0.422	0.015	0.437	179	16
June 4	1200	1196	97	*	140	46	56	1.000	35	13	72	0.375	0.425	0.015	0.440	180	20
	1500	Shut in for build up															
June 8	1830	1786	Commenced flow through 18/64" choke														
	2130	489	Increased choke to 26/64"					1.250				0.375					
	2230	455	Increased choke to 28/64"					1.250				0.375					
	2330	460	Increased choke to 30/64"					1.250				0.375					
	2340	-	Changed orifice sizes					1.500				0.500					
June 9	0105	380	87	1145	130	62	49	1.500	24	11	45	0.500	1.116	0.024	1.140	377	37
	0200	380	Increased choke to 31/64"														
	0600	369	94	1103	130	56	48	1.500	28	16	50	0.500	1.061	0.029	1.090	363	51
	1100	369	102	1080	150	48	73	1.500	34	7	72	0.500	1.056	0.020	1.076	354	29
	1300	365	104	1076	150	60	80	1.500	38	8	78	0.500	1.152	0.023	1.175	384	29
	1500	350	105	1090	150	64	78	1.500	36	8	79	0.500	1.181	0.022	1.203	369	29
	1700	365	103	1083	150	64	70	1.500	36	8	74	0.500	1.188	0.022	1.210	369	29
	1830	356	-	1081	Shut in for build up												

* No record due to clock failures

H_2S = 31 ppm

922000

STATIC PRESSURE GRADIENT

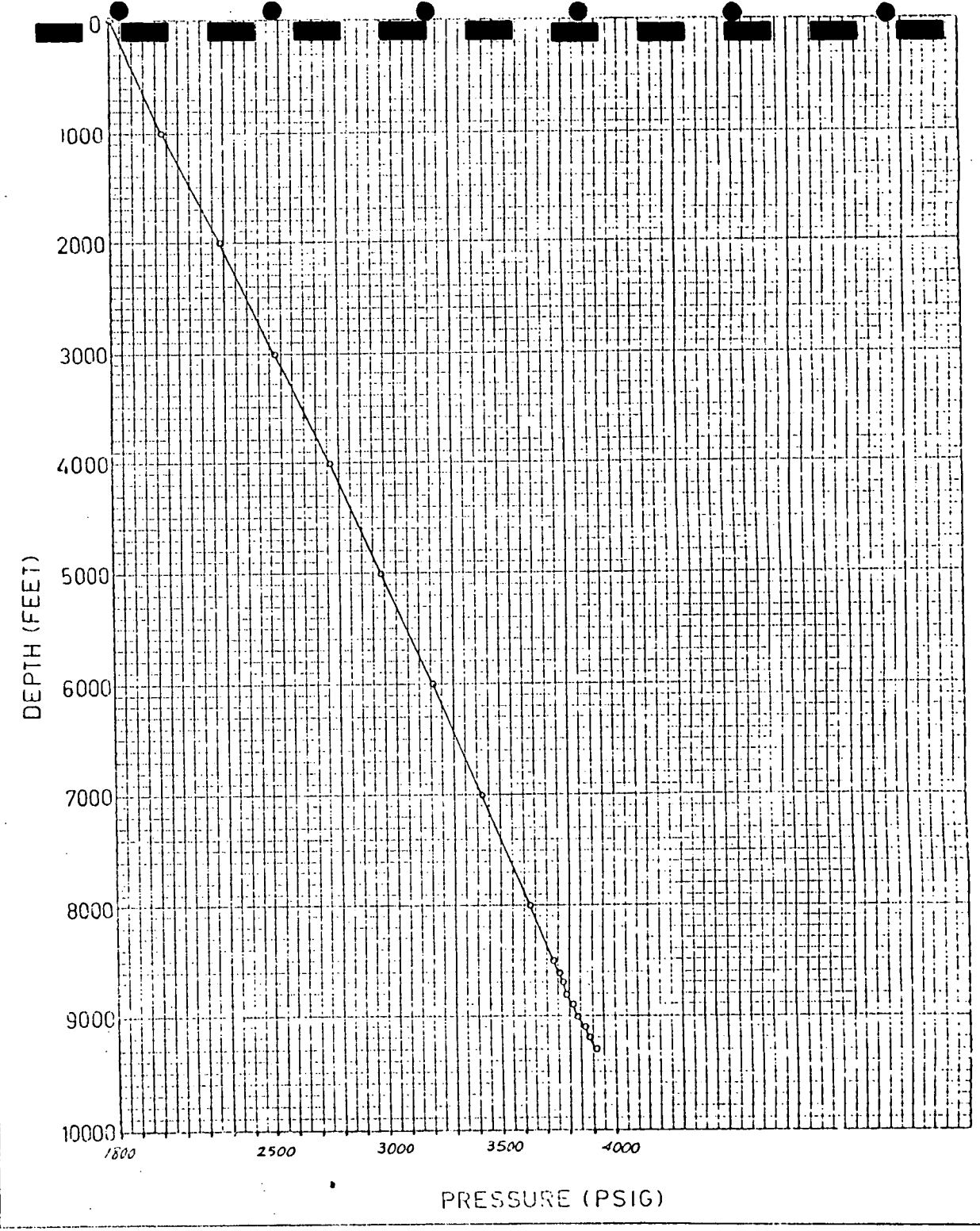
WELL FLY LAKE NO. 1 LOWER

DATE JUNE 7, 1972

GAUGE N° 31825 RANGE 0-5000 psi

* Dead weight pressure 1794 psi

DEPTH	PRESSURE PSIG	GRADIENT PSI/FT
0	*1800.7	-
1000	2024.1	.2234
2000	2279.2	.2551
3000	2525.4	.2462
4000	2761.4	.2360
5000	2986.0	.2246
6000	3205.3	.2193
7000	3420.9	.2156
8000	3632.7	.2118
8500	3735.9	.2064
8600	3755.1	.1920
8700	3773.0	.1790
8800	3794.6	.2160
8900	3816.3	.2170
9000	3839.3	.2300
9100	3864.8	.2550
9200	3887.8	.2300
9300	3915.8	.2800



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SUMMARY OF STAGE VOLUMES

	STAGE ITEMS	MAX RATE	TIME	CUMULATIVE TIME	CORRECTED STAGE VOL.	GEL VOL. REQUIRED	WELLHEAD SAND CONC.	SAND QUANTITY	SLURRY DENSITY	PROPPANT TYPE	MESH SIZE
		B.P.M.	MIN.	MIN.			LB/GAL	LBS			
0	Preflush: pressure test lines	5	5	5					8.43		
1	Formation breakdown with 15% HCl acid	5	15	20	3000				8.96		
2	Displacement of acid into formation	5	15	35	2394				8.43		
3	Injectivity test Pressure limitation is 9000 psig	max	15	50	6000(gal max)				8.45		
4 o	Prepad	15	10	60	7000	7000			8.45		
5	Celled pad	15	44	104	28000	28000			8.34		
6	Proppant gel	15	14	118	10456	10000	1	10000	8.9	sand	20/40
7	Proppant gel	15-18	15	133	10912	10000	2	20000	9.5	sand	20/40
8	Proppant gel	15-18	40	173	25010	22000	3	66000	10.0	sand	20/40
9 *	Proppant gel	15-18	10	183	8800	8000	3	24000	10.3	s/bauxite	20/40
10	Flush to top of perfs. Pressure limitation is 9000 psig	15	4	187	2394	———		———			
	TOTALS				103966	85000		105000			

* Increase sintered bauxite concentration to 3.5 lb/gal at the end of the job.
o Start crude oil after 6500 gals of prepad (5% by volume or approx 3/4 bbl/min).

NOTE: Tirrawarra crude is 54° A.P.I. / 6.37 lb/gal or .33 psi/ft.
Stratafrac fluid is approx 8.34 lb/gal at 5% Tirrawarra crude by volume.
YF400.5 = 8.44 lb/gal.

WP 1606N
GH/skw
31/8/82

000228

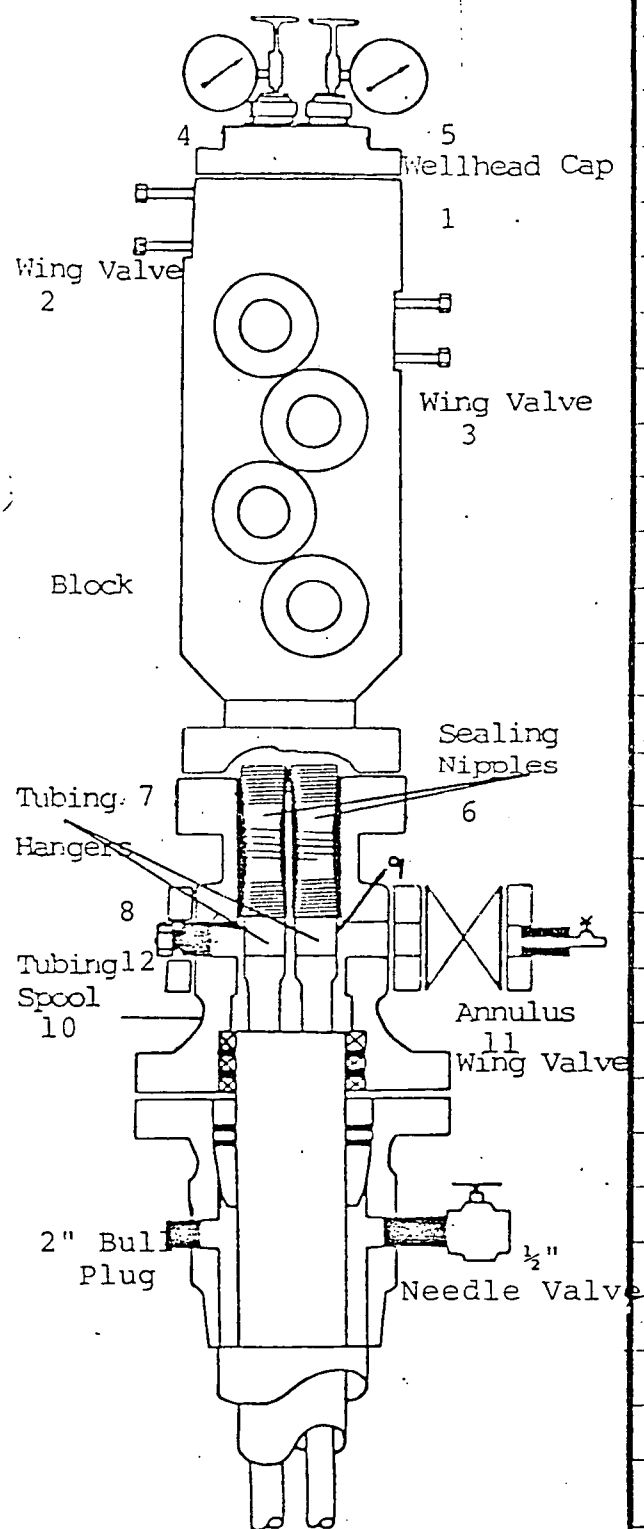
SANTOS LIMITED

000229

PETROLEUM ENGINEERING DEPARTMENT - WORKOVERS

DUAL WELLHEAD AS INSTALLED

WELL: FLY LAKE 1



Item No.	DESCRIPTION
1	CAMERON DUAL WELLHEAD BLOCK 2" x 2½
	3000#.
2	2" 3000# CAMERON WING VALVE. R-24
	C/W 2" COMPANION FLANGE R-24.
3	2" 3000# CAMERON WING VALVE R-24.
4	2" PLUG w/½" NEEDLE VALVE.
5	2½" PLUG W/½" NEEDLE VALVE.
6	2½" SEALING NIPPLE
7	2" SEALING NIPPLE
8	SPLIT CAMERON TUBING HANGER 2 3/8 CS
	HYDRIL BOX UP x 2 3/8" AB BOX DOWN
9	SPLIT CAMERON TUBING HANGER 2 7/8" CS
	HYDRIL BOX UP x 2 7/8" AB BOX DOWN.
10	TUBING SPOOL. CAMERON DCB DUAL 6"
	3000# R45 x 10" 3000" R53.
11	2" CAMERON WING VALVE 3000# R24 C/W
	2" COMPANION FLANGE R24.
12	2" TAPPED BULL PLUG TO ½" + ½"
	NEEDLE VALVE.

REMARKS:

DATE: 07/10/82 DRAWN BY: W. BAER

FLY LAKE #1

DUAL OIL/GAS

000230

1. Cameron split hanger C/W 2-7/8" ABDSS box down and 2-7/8" CS Hydril box up.
2. 2-7/8" ABDSS pin x pin.
3. 1 Jt., 2-7/8" 6.5#/ft. ABDSS J55 tubing.
4. 1 - 2' x 2-7/8" 6.5#/ft. ABDSS Pup.
5. 7 Jts., x 2-7/8" 6.5#/ft. ABDSS J55 tubing.
6. 2-7/8" Otis Flow Nipple 11FN 255.
7. 2-7/8" Otis SSSV Nipple 11X38.
8. 265 Joints 2-7/8" 6.5#/ft. ABDSS J55 tubing.
9. Crossover 2-7/8" ABDSS x 2-3/8" EUE pin.
10. 7" Baker A-5 Dual Packer size 47C2.
11. Crossover 2-3/8" NU box x 2-3/8" EUE pin.
12. 1 - 10' x 2-3/8" 4.7#/ft. EUE J55 Pup.
13. Crossover 2-7/8" EUE x 2-3/8" EUE.
14. 2 Jts., 2-7/8" 6.5#/ft. EUE J55 tubing.
15. 5 - 20' and 2 - 10' 2-7/8" EUE blast joints.
16. 1 Jt., 2-7/8" 6.5#/ft. EUE J55 tubing.
17. 1 - 10' x 2-7/8" 6.5#/ft. EUE J55 Pup.
18. 1 - 8' x 2-7/8" 6.5#/ft. EUE J55 Pup.
19. 1 - 4' x 2-7/8" 6.5#/ft. EUE J55 Pup.
20. 7 - 20' x 2-7/8" EUE blast joints.
21. 3 Jts., 2-7/8" 6.5#/ft. EUE J55 tubing.
22. 1 - 4' 2-7/8" 6.5#/ft. EUE J55 Pup.
23. 2 - 10' 2-7/8" 6.5#/ft. EUE J55 Pups.
24. 1 - 20' and 1 - 10' 2-7/8" EUE blast joints.
25. 2 Jts., 2-7/8" 6.5#/ft. EUE J55 tubing.
26. 2 - 10' 2-7/8" 6.5#/ft. EUE J55 Pups.
27. 2 - 20' and 1 - 10' 2-7/8" EUE blast joints.
28. 1 Jt., 2-7/8" 6.5#/ft.EUE J55 tubing.
29. Crossover 2-3/8" x 2-7/8" EUE.
30. 2-3/8" Otis 121XO1 sliding sleeve.
31. Baker G22 locator seal assembly size 81-32 - 2-3/8" EUE box up.
32. 7" Baker 84DB32 permanent packer C/W 4½" LT & C box down.
33. 4½" LT & C pin x pin millout extension.
34. 4½" LT & C box x 3½" EUE pin crossover.
35. 3½" EUE collar J55.
36. 3½" EUE pin x 2-7/8" EUE pin crossover.
37. 2-7/8" 6.5#/ft. EUE J55 Pup jt.
38. 2-7/8" EUE J55 collar.
39. 2-7/8" EUE pin x 2-3/8" EUE pin crossover.
40. 2-3/8" EUE J55 collar.
41. Otis 11X1 landing nipple (Min. I.D. = 1.875")
42. 2-3/8" 6.5#/ft. EUE J55 Pup jt.
43. 2-3/8" EUE J55 collar.
44. 2-3/8" EUE Pin x 2-7/8" EUE pin crossover.

1A. Cameron split hanger 2-7/8" AB down x 2-3/8" CS Hydril up.
2A. 2-3/8" AB pin x pin.
3A. 1 Jt., 2-3/8" AB 4.7#J55 tubing.
4A. 1 - 6' x 2-3/8" AB 4.7# J55 Pup.
5A. 1 - 4' x 2-3/8" AB 4.7# J55 Pup.
6A. 268 Jts., 2-3/8" AB 4.7# J55 tubing.
7A. Crossover 2-3/8" EUE x 2-3/8" AB.
8A. Baker type S latch snap seal assembly C/W 2-3/8" EUE box up.
9A. 4' x 2-3/8" 4.7# EUE J55 Pup.
10A. 2-3/8" Otis 'N' Nipple 11N12 (No - Go = 1.875")
11A. 2-3/8" Otis catcher sub.
12A. 2-3/8" 4.7# EUE J55 Perforated pup.
13A. 2-3/8" EUE collar blanked off.

8500.41'KB
8509.94'KB
8521.14'KB

PERFORATIONS

Farrawarra: 9335' - 9385' 4 shots/ft.

Patchawarra: 8586' - 8608')
8632' - 8635')
8668' - 8696')
8768' - 8793')
8816' - 8827') 4 shots/ft.
8833' - 8845')
8863' - 8888')
9025' - 9035')
9138' - 9173')

Basal Patchawarra: 9297' - 9311'

DATE DRAWN	21/10/82
DRAWN BY	M. NIESINGH
REVISED	

R26 000231

SANTOS LTD.

ISO-CHRONAL AND BUILD-UP SURVEY

Well: FLY LAISE #1 LOWER Date: 7·1·84

Lubricator Data:

Pressure with D.W.T. IN 1323 OUT 1278

Time Pressured 0950 Time Depressured 10:00

Time Run in Hole 1020 Time off Bottom 08.37

	Bomb No. 1 Data	Bomb No. 2 Data
Element No. and Range	60750 x 5000 PSI	60751 x 5000
Recorder No.	61275 x 15 TLS	61276 x 16 TLS
Clock and Lead Screw Data	C 85-67 x 24 HR	25548 x 24 HR
Engage Stylus	Date: 7·1·84 Time: 0939	Date: 7·1·84 Time: 0939
Disengage	Date: 8·1·84 Time: 1013	Date: 8·1·84 Time: 10·13

Remarks:

Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	Wellhead P.S.I.G.	Casing P.S.I.G.	Wellhead Temp.	Remarks
7·1·84						
	1108					HANG 9360 FT
						MAX BOTTOM HOLE
						TEMP 284°F
		EL# 60750 @ 9354' KB:				
		Wb in = 0·5102" = 1328 psig				
		Hang bomb = 1·2071" = 3136 psig				
		Wb out = 0·5030" = 1305 psig				
		EL# 60751 @ 9360' KB:				
		Wb in = 0·5060" = 1317 psig				
		Hang bomb = 1·2022" = 3138 psig				
		Wb out = 0·4969" = 1294 psig				

Cockington 4204/82

WELL FLYLAKE #1

OPERATOR P. HARLOCK

SANTOS LTD

WELL TEST DATA SHEET

DATE 07/01/84

PAGE No. 1 (ONE)

DATE / TIME	WELLHEAD					H.P. SEPARATOR					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBLS/D	G.O.R. SCF/BBL	REMARKS
						H.P. METER RUN I.D. =					L.P. METER RUN I.D. =								
	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	Pf PSI	HW INS. H_2O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	Pf PSI	HW INS. H_2O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D				
0945						TRIMMED TO SEPERATOR TO OBTAIN LEVELS													
1030	29	1344	113	12/64			START TEST												
1230	25	1343	124	"		900	46	116	.75	.64						.64	258	2869	
1430	25	1320	126	"		900	46	111	.75	.65						.65	240	2895	
1630	25	1318	120	"		900	43	114	.75	.62						.62	263	2744	
1830	25	1318	115	"		905	42	106	.75	.62						.62	259	2804	
2030	25	1317	117	"		905	42	105	.75	.62						.62	251	2893	
2230	25	1315	118	"		905	42	108	.75	.62						.62	259	2797	
08/01/84																			
2430	25	1315	118	"		905	42	107	.75	.62						.62	256	2820	
0230	25	1314	115	"		900	42	104	.75	.62						.62	256	2854	
0430	25	1314	113	"		900	42	106	.75	.62						.62	259	2797	
0630	25	1313	113	"		900	42	104	.75	.62						.62	259	2797	
0830	25	1313	113	"		900	42	105	.75	.62						.62	262	2797	
1030	25	1313	115	"		900	42	106	.75	.62						.62	275	2818	
1035						BYPASS SEPERATOR - E.O.T.													

000232

*0/5574

WELL FLYLAKE #1

TANK:— CAPACITY N/A
SCALE

SANTOS LTD

FLUID PRODUCTION SHEET

DATE 07/01/84
PAGE No. 1 (ONE)
OPERATOR P. HARLOCK.

DATE / TIME	CUM. TIME	OIL/CONDENSATE PRODUCTION					WATER PRODUCTION					REMARKS
		TANK DIP METER	TANK PROD. BBLS	FLOWRATE BBLS/D	CUM. PROD. BBLS	OIL CONDENSATE GRAVITY °API60F°	TANK DIP METER	TANK PROD. BBLS	FLOWRATE BBLS/D	CUM. PROD. BBLS	SALINITY PPM	
1030	0	24036.24	—	—	—	50.4	17494.09	—	—	—	0	API 52.4 @ 76°F
1230	2	24040.82	18.59	223.08	18.59	—"—	17516.63	2.87	34.44	2.87	—"—	
1430	4	24045.43	18.71	224.52	37.30	—"—	17526.49	1.27	15.24	4.14	—"—	
1630	6	24050.07	18.83	225.96	56.13	50.2	17550.31	3.07	36.84	7.21	—"—	API 52.7 @ 69°F
1830	8	24054.61	18.43	221.12	74.56	—"—	17575.08	3.19	38.28	10.40	—"—	
2030	10	24059.01	17.86	214.32	92.42	—"—	17599.06	3.09	37.08	13.49	—"—	
2230	12	24063.56	18.47	221.64	110.89	—"—	17623.38	3.13	37.56	16.62	—"—	
08/01/84												
2430	14	24068.06	18.26	219.12	129.15	—"—	17647.17	3.06	36.72	19.68	—"—	
0230	16	24072.52	18.10	217.22	147.25	50.2	17671.94	3.19	38.28	22.87	—"—	
0430	18	24077.07	18.47	221.64	165.72	—"—	17696.42	3.15	37.80	26.02	—"—	
0630	20	24081.65	18.59	223.08	184.31	—"—	17719.86	3.02	36.24	29.04	—"—	
0830	22	24086.20	18.47	221.64	202.78	—"—	17746.00	3.37	40.44	32.41	—"—	
1030	24	24090.71	18.30	219.66	221.08	—"—	17781.60	4.58	55.00	36.99	—"—	

000233

★0/5576

SANTOS

WELL NAME: FLY LAKE #1 FLOWING ~~STATIC~~ SANTOS LTD GRADIENT SURVEY

DATE: 19-21/5/84

BOMB No. 1 DATA
ELEMENT No. 21372 ELEMENT RANGE 4050
RECORDER No. 59790 CLOCK DATA 25362 X 48HRS
ENGAGE STYLUS 11:25 19/5 DISENGAGE 10:16 21/5/84

BOMB No. 2 DATA
ELEMENT No. 21374 ELEMENT RANGE 4025
RECORDER No. 14023 CLOCK DATA 25551 X 48
ENGAGE STYLUS 11:25 19/5 DISENGAGE 10:16 21/5/84

LUBRICATOR DATE 1305psi
PRESSURE WITH D.W.T. (9.1MPA)
TIME PRESSURED 11:40 19/5
TIME DEPRESSURED 09:59 21/5

DATE	TIME	DEPTH'	DEFLEC-TION	PRESSURE ~~TEMP.~~	GRADIENT psi/ft	DEPTH'	DEFLEC-TION	PRESSURE ~~TEMP.~~	GRADIENT psi/ft	REMARKS
19/5/84	11:40-11:55	LUB	0.6409	1287		LUB	0.6331	1280		Note: Flex ameradas
19-21/5/84	12:32-09:05	9360'	1.4859	3010		9360'	1.4765	3010		before running in hole
21-5-84	0944-0959	LUB	0.6491	1305		LUB	0.6451	1304		

GENERAL REMARKS:

R27

000234

H003

R28

000235

WIRELINE REPORT

WELL: FLY LAKE #1 LOWER

DATE: 16.10.84

PROGRAM: Flowing Gradient

PURPOSE OF WORK: Ensure perfs are clear

REPORT OF WORK PERFORMED: Rig up with Hi-Lab

Run 1.25" blind box to 9396' K.B.

OPERATOR'S SIGNATURE

WORK PERFORMED BY: C. MORRELL OF EXPERTEST

WELL DATA:

Tubing Size: 2 7/8 FWHP: 1200 PSI SIWHP: N/A

Sub Surface S.V./Landing Nipple @ — S.S.D. @: 9210

"X" Nipple @ — "N"/"XN" Nipple @ 9240 other

Min I.D. 1.875 " @ 9240 Packer @ 8500' & 9213

Perforated Interval: 9335' – 9385'

Forward to: Petroleum Engineering — Adelaide
Production Department — Moomba

cm. 1713

G009

000236

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

** FLY LAKE #1 LOWER **

FLOWING PRESSURE GRADIENT

TEST DATE: 18-19/10/84

	TOP PRESSURE ELEMENT 21379/4825			BOTTOM PRESSURE ELEMENT 21821/4750		
DEPTH (FT.)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)
LUB	0.4860	1201.6	----	0.5070	1196.2	----
1000	0.5410	1337.8	0.1361	0.5640	1332.4	0.1362
2000	0.6000	1483.7	0.1459	0.6240	1476.0	0.1435
3000	0.6610	1634.4	0.1507	0.6870	1626.9	0.1509
4000	0.7270	1797.4	0.1630	0.7550	1789.9	0.1631
5000	0.7980	1972.7	0.1753	0.8290	1967.6	0.1777
6000	0.8740	2160.2	0.1875	0.9050	2150.5	0.1828
7000	0.9520	2352.6	0.1924	0.9860	2345.7	0.1952
8000	1.0350	2557.4	0.2048	1.0700	2548.5	0.2029
9000	1.1190	2764.8	0.2073	1.1560	2756.7	0.2081
9360	1.1510	2843.8	0.2195	1.1890	2836.7	0.2222
LUB	0.4930	1219.0	----	0.5110	1205.7	----

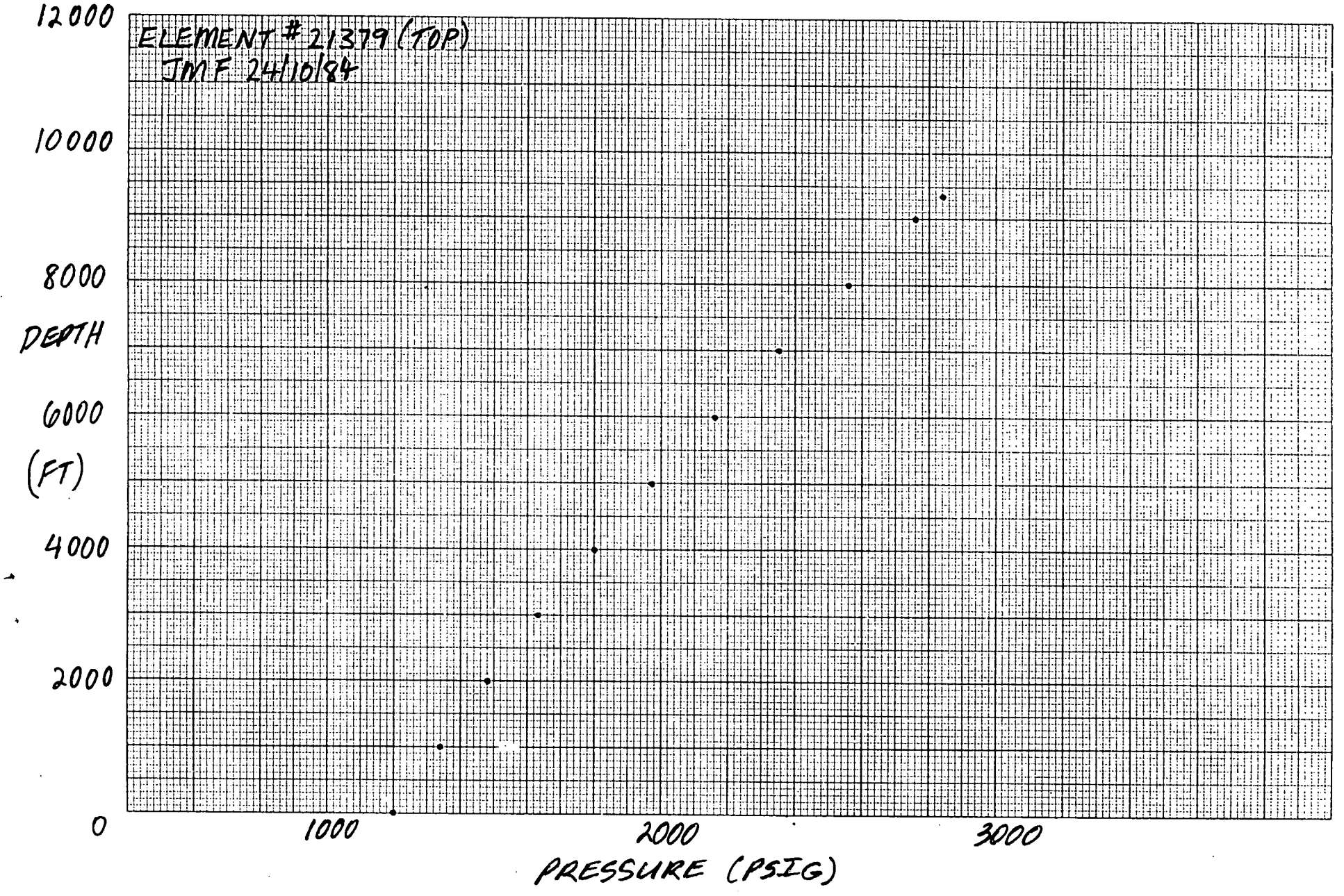
Element 21379/4825 calibrated 8/9/84. Element 21821/4750 calibrated 8/9/84

1.R.TEMP 281 F

LUBRICATOR PRESSURE SUMMARY

TYPE OF MEASUREMENT	ON ENTRY	ON EXIT
Deadweight Tester	1200	1215
Element 21379/4825	1201.6	1219.0
Element 21821/4750	1196.2	1205.7

FLY LAKE # 1 LOWER — FLOWING PRESSURE GRADIENT — 18-19/10/84



000237

Em 5030

R29

WIRELINE REPORT

000238

WELL: FLY LAKE #1 LOWER.

DATE: 17·1·86 + 18·1·86.

PROGRAM:

PURPOSE OF WORK: FLOWING GRADIENT

REPORT OF WORK PERFORMED: RIGGED UP, RAN 1.75 BLIND BOX TO T.D @ 9408', RAN FLOWING GRADIENT SURVEY TO. 9304' BOMBS LEFT ON BOTTOM OVER NIGHT. PRODUCTION SHUT WELL IN @ 07.56 18.1.86. CHARTS O.K. RIGGED DOWN.

OPERATOR'S SIGNATURE

WORK PERFORMED BY: S. MORRELL OF EXPLERTEST.

WELL DATA:

Tubing Size: 2⅞ FWHP: SIWHP:

Sub Surface S.V./Landing Nipple @ S.S.D. @:

"X" Nipple @ "N"/"XN" Nipple @ other

Min I.D. 1.875 " @ Packer @ 9213

Perforated Interval: 9297 – 9311

RECEIVED
11 FEB 1985
DEPT. OF MINES AND ENERGY SECURITY

Forward to: Petroleum Engineering — Adelaide
Production Department — Moomba

4502 - VIII

000239

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

** FLY LAKE 1 LOWER **

FLOWING PRESSURE GRADIENT

TEST DATE: 17-1-85

	TOP PRESSURE ELEMENT 21372/4050			BOTTOM PRESSURE ELEMENT 21374/4075		
DEPTH (FT.)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)
LUB	0.5710	1152.1	----	0.5730	1154.5	----
1000	0.6330	1277.6	0.1255	0.6360	1283.0	0.1285
2000	0.7010	1415.4	0.1378	0.7020	1417.8	0.1348
3000	0.7720	1559.5	0.1440	0.7750	1567.2	0.1493
4000	0.8440	1705.7	0.1462	0.8440	1708.5	0.1414
5000	0.9270	1874.4	0.1687	0.9270	1878.8	0.1703
6000	1.0180	2059.7	0.1852	1.0150	2059.6	0.1808
7000	1.1110	2249.2	0.1896	1.1090	2253.1	0.1935
8000	1.2100	2451.3	0.2021	1.2070	2455.2	0.2021
9000	1.3130	2661.8	0.2105	1.3080	2663.9	0.2087
9304	1.3420	2721.1	0.1952	1.3390	2728.0	0.2109
LUB	0.6620	1336.4	----	0.6550	1321.8	----

Below Bubble Point
RDH

GENERAL REMARKS:
PRODUCTION SHUT IN WELL AT 07.56 HRS

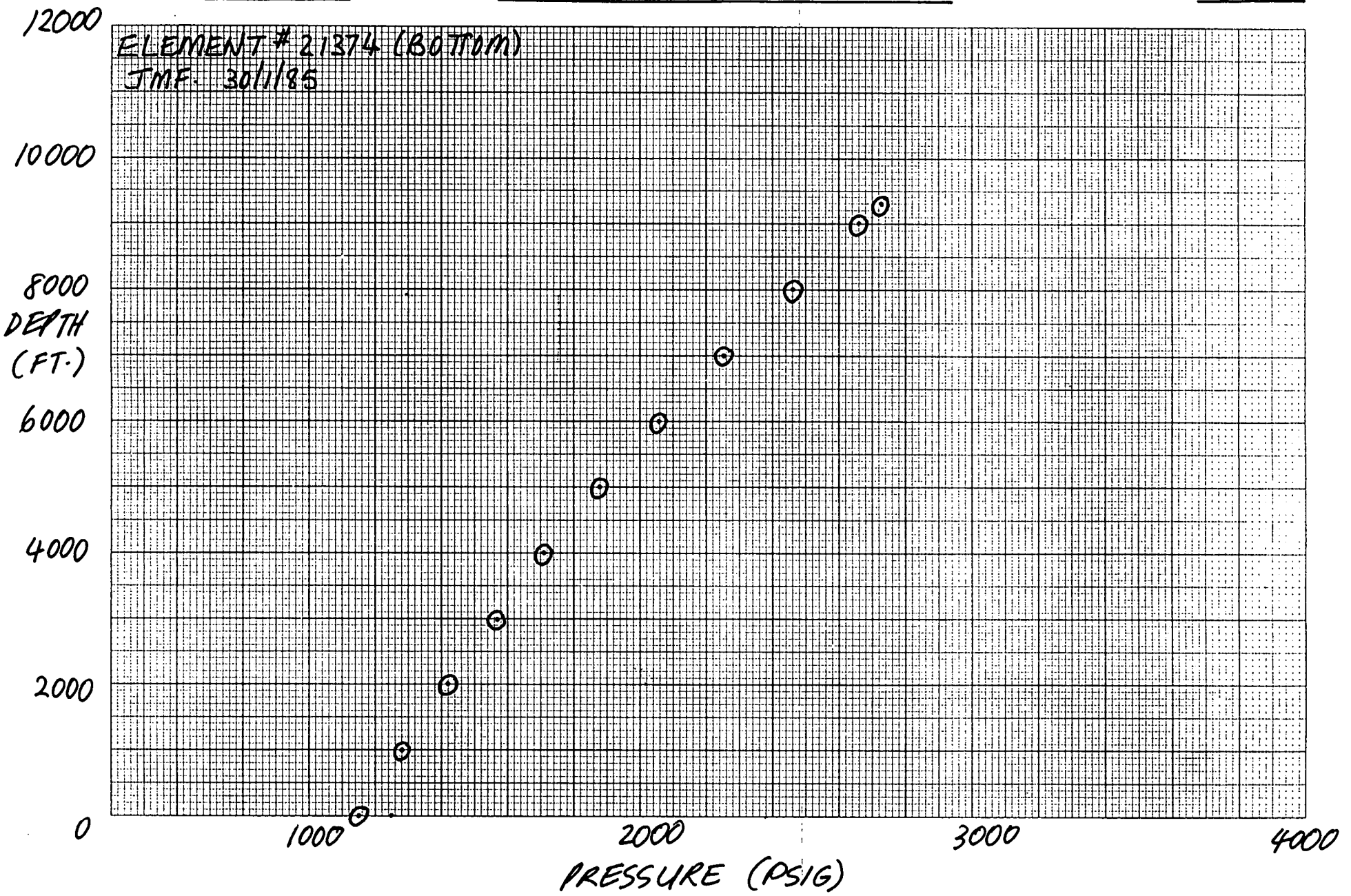
DWT IN: 0
DWT OUT: 0
MAX BHT: 280-F

ELEMENT 21372/4050 CALIBRATED 23/12/84
ELEMENT 21374/4075 CALIBRATED 23/12/84

FLY LAKE #1 LOWER

FLOWING PRESSURE GRADIENT

17/1/85



000240

Fm 5030

R30

TELEPHONE (08) 354 0488 TELEX AA87183

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

138 RICHMOND ROAD MARLESTON SA 5033 POSTAL ADDRESS: PO BOX 354 COWANDILLA 5033

000241

WIRELINE REPORT

CLIENT SANTOS. WELL FLY LAKE #1 LOWER Z

DATE 11-4-85

PROGRAMME FLOWING BOTTOM HOLE PRESSURE SURVEY.

PURPOSE OF WORK TAG PBTD AND RUN GRADIENT.

REPORT OF WORK PERFORMED

OBTAIN WELL FROM PRODUCTION
RIG UP W/L UNIT
R.I.H WITH 1.75" S/BAR TAG PBTD AT 9390' KB P.O.O.H
RIH WITH TANDEM PRESSURE ELEMENTS TO 9341' P.O.O.H
RIG DOWN W/L UNIT
HAND WELL BACK TO PRODUCTION

Operator's Signature

WORKED PERFORMED BY DALE JOHNS OF EXPERTEST

WELL DATA:

Tubing Size 2 7/8" FWHP 813 psi SIWHP

Subsurface S.V./Landing Nipple @ S.S.D. @

'X' Nipple @ 9242' 'N'/'XN' Nipple @ Other @

Min. I.D. 1.875" @ 9242' Packer @ 8500' AND 9218'

Perforated Interval: 9297' TO 9385'

E1

000242

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

** FLY LAKE #1 LOWER **

FLOWING PRESSURE GRADIENT

TEST DATE: 11/4/85

	TOP PRESSURE ELEMENT 59211/5000			BOTTOM PRESSURE ELEMENT 60322/5000		
DEPTH (FT.)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)
LUB	0.3080	795.2	----	0.3150	807.2	----
1000	0.3450	890.9	0.0957	0.3540	906.9	0.0997
2000	0.3880	1002.0	0.1111	0.3970	1016.8	0.1099
3000	0.4310	1112.9	0.1109	0.4400	1126.6	0.1098
4000	0.4760	1228.9	0.1159	0.4870	1246.6	0.1200
5000	0.5250	1355.0	0.1261	0.5310	1359.0	0.1123
6000	0.5770	1488.6	0.1337	0.5900	1509.6	0.1506
7000	0.6330	1632.4	0.1438	0.6460	1652.5	0.1430
8000	0.6920	1783.8	0.1513	0.7060	1805.8	0.1532
9000	0.7780	2004.1	0.2204	0.7910	2023.0	0.2172
LUB	0.3220	831.5	----	0.3350	858.4	----

GENERAL REMARKS:

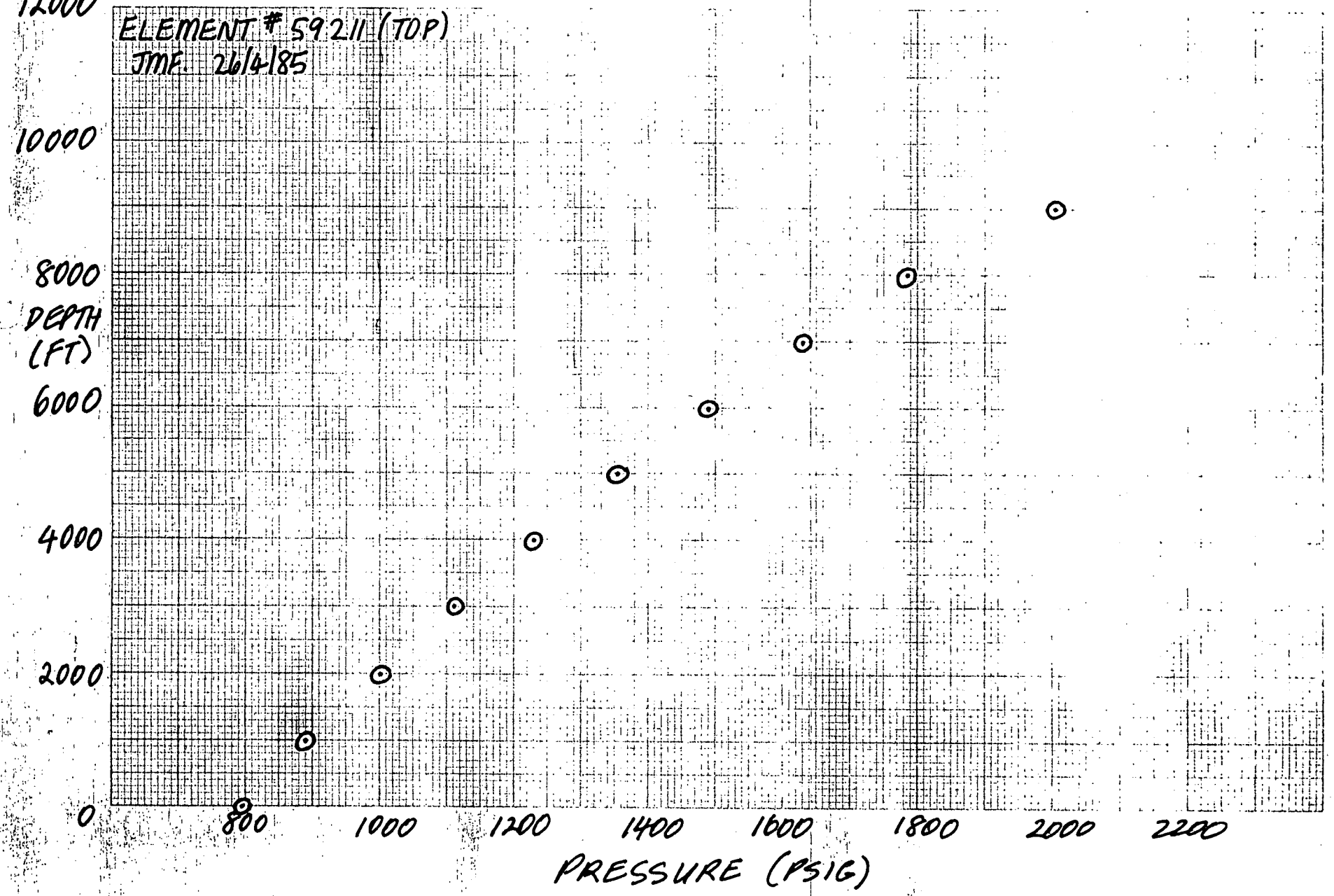
DWT IN: 813
DWT OUT: 810
MAX BHT: 280 F

ELEMENT 59211/5000 CALIBRATED 14/3/85
ELEMENT 60322/5000 CALIBRATED 14/3/85

FLY LAKE #1 LOWER

FLOWING PRESSURE GRADIENT

11/4/85



000243

Fm 5030

R31

WIRELINE REPORT

000244

WELL: FLY LAKE # 1 LOWER

DATE: 14TH JULY 1985

PROGRAM: FLOWING BHP SURVEYS – PATCHAWARRA CENTRAL

PURPOSE OF WORK: TO RECORD WELLS DOWN HOLE CONDITIONS DURING FLOW

REPORT OF WORK PERFORMED:

ARRIVE ON LOCATION
RIG UP 082 WIRE LINE UNIT AND LUBRICATOR
RUN IN HOLE WITH 1.75" BLIND BOX AND TAG BOTTOM @ 9387' K.B.
PULL OUT OF HOLE AND PREPARE TO RUN GRADIENT

RUN IN HOLE WITH TANDUM 5000 PSI PRESSURE ELEMENTS TO
A MAXIMUM DEPTH OF 9304' KB (MPP) AS PER PROGRAM.
PULL OUT OF HOLE TWO GOOD CHARTS
RIG DOWN 082 WIRE LINE UNIT AND LUBRICATOR
MOVE TO NEXT LOCATION

OPERATOR'S SIGNATURE

WORK PERFORMED BY: T. CHAPMAN / M. MOORE OF EXPERTEST

WELL DATA:

Tubing Size: 2 7/8" FWHP: 791 psi SIWHP:

Sub Surface S.S.V./~~Landing Nipple~~ @ DEPTH UNKNOWN S.S.D. @:

"X" Nipple @ 9240' (APROX) "N"/"XN" Nipple @ other 2 7/8 FLOW NIPPLE DEPTH UNKNOWN

Min I.D. 1.875" " @ 9240' (APROX) Packer @ 9213' & 8500'

Perforated Interval: BASAL PATCHAWARRA FORMATION :- 9297' – 9311'

Forward to: **Petroleum Engineering — Adelaide**
Production Department — Moomba

G009

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

** FLY LAKE 1 LOWER **

FLOWING PRESSURE GRADIENT

TEST DATE: 14/7/85

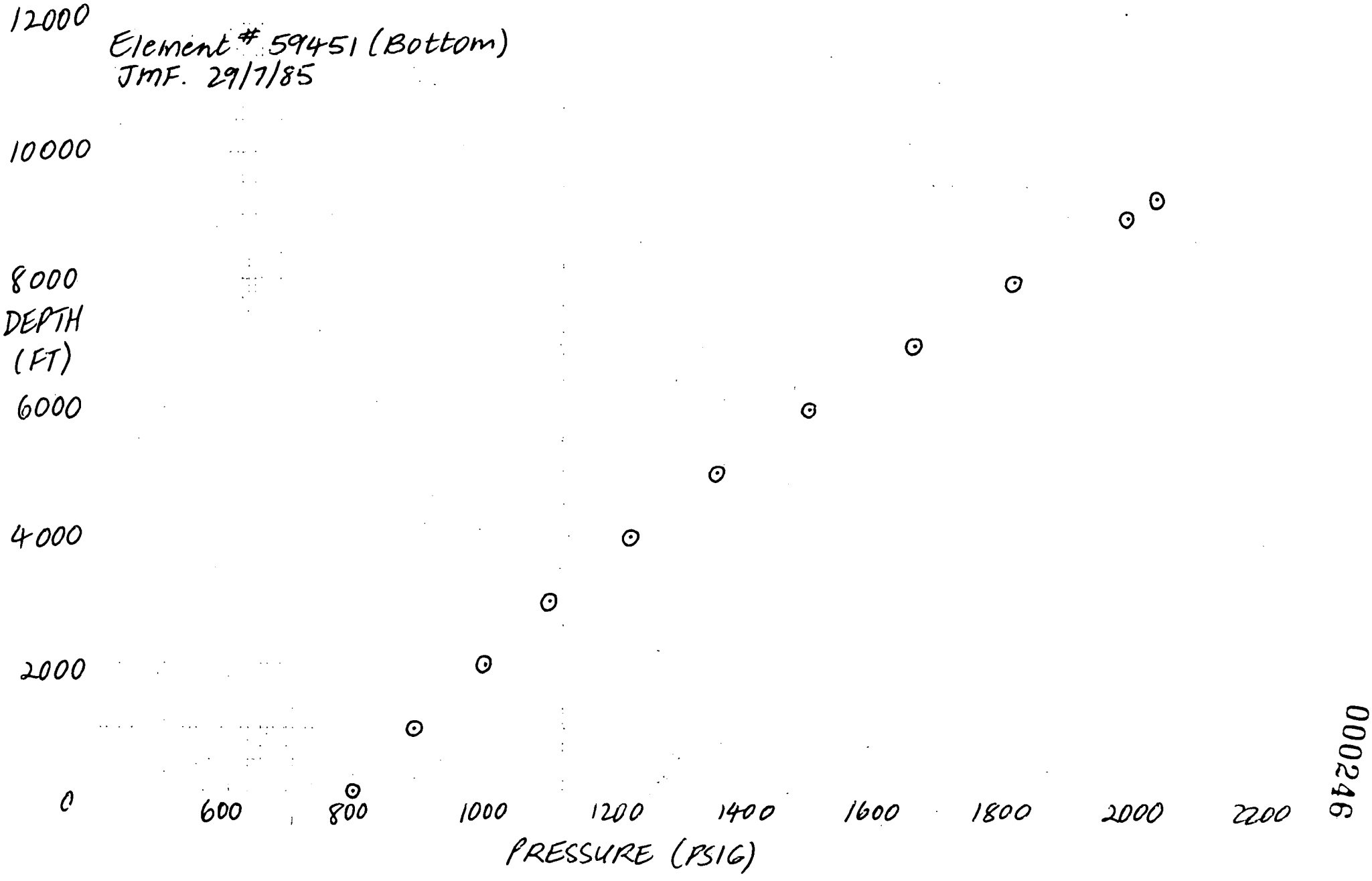
	TOP PRESSURE ELEMENT 60322/5000			BOTTOM PRESSURE ELEMENT 59451/5000		
DEPTH (FT.)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)
LUB	0.3110	794.4	----	0.3040	795.5	----
1000	0.3470	886.7	0.0923	0.3390	886.9	0.0914
2000	0.3910	999.5	0.1128	0.3820	999.2	0.1122
3000	0.4300	1099.5	0.0999	0.4210	1100.9	0.1018
4000	0.4800	1227.6	0.1281	0.4690	1226.1	0.1252
5000	0.5310	1358.2	0.1306	0.5200	1359.1	0.1330
6000	0.5870	1501.6	0.1434	0.5750	1502.5	0.1434
7000	0.6490	1660.3	0.1587	0.6370	1664.1	0.1616
8000	0.7100	1816.5	0.1562	0.6970	1820.5	0.1564
9000	0.7780	1990.7	0.1742	0.7640	1995.1	0.1746
9304	0.7960	2036.8	0.1517	0.7820	2042.0	0.1543
LUB	0.2980	761.0	----	0.2930	766.8	----

GENERAL REMARKS:
O

DWT IN: 791
DWT OUT: 775
MAX BHT: 278

ELEMENT 60322/5000 CALIBRATED 11.6.85
ELEMENT 59451/5000 CALIBRATED 11.6.85

FLY LAKE # 1 LOWER — FLOWING PRESSURE GRADIENT — 14/7/85



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WIRELINE REPORT

WELL: FLY LAKE #1 LOWER.

DATE: 16/1/86

PROGRAM: BHP SURVEY

PURPOSE OF WORK: TO TAG BOTTOM + RUN FLOWING GRADIENT

REPORT OF WORK PERFORMED:

RIG UP WIRELINE UNIT BOPS + SWAB VALVE
PRESS TEST O/K, RUN IN HOLE WITH 1.750 BLIND BOX
AND TAG PBTD AT 9357' KB POOH
0945 RUN IN HOLE WITH PRESSURE ELEMENTS FOR
FLOWING GRADIENT
1245 RIG DOWN UNIT + HAND WELL BACK TO PRODUCTION

OPERATOR'S SIGNATURE

WORK PERFORMED BY: DAVID KAY OF EXPERTEST

WELL DATA:

Tubing Size: 2 7/8 EUE FWHP: 550 SIWHP: N/A

Sub Surface S.V./Landing Nipple @ S.S.D. @: 9209

"X" Nipple @ 9240 "N"/"XN" Nipple @ other

Min I.D. 1.875 " @ 9240 Packer @ 8500 + 9213

Perforated Interval: 9335 TO 9385

Forward to: Petroleum Engineering — Adelaide
Production Department — Moomba

1713

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WIRELINE & WELL TESTING SERVICE

** FLY LAKE 1 LOWER **

FLOWING PRESSURE GRADIENT

TEST DATE: 17/1/86

	TOP PRESSURE ELEMENT 21821/4750			BOTTOM PRESSURE ELEMENT 21379/4825		
DEPTH (FT.)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)
LUB	0.2130	502.2	----	0.2060	510.3	----
1000	0.2420	571.4	0.0692	0.2310	572.0	0.0617
2000	0.2740	647.6	0.0763	0.2630	651.0	0.0790
3000	0.3060	723.9	0.0762	0.2950	730.0	0.0790
4000	0.3420	809.6	0.0857	0.3280	811.5	0.0815
5000	0.3780	895.3	0.0857	0.3640	900.3	0.0888
6000	0.4190	992.8	0.0976	0.4030	996.5	0.0962
7000	0.4640	1100.0	0.1071	0.4460	1102.7	0.1061
8000	0.5110	1211.8	0.1119	0.4920	1216.2	0.1135
9000	0.5440	1290.4	0.0786	0.5320	1314.9	0.0987
9345	0.5730	1359.5	0.2003	0.5480	1354.4	0.1145
LUB	0.2370	559.4	----	0.2240	554.7	----

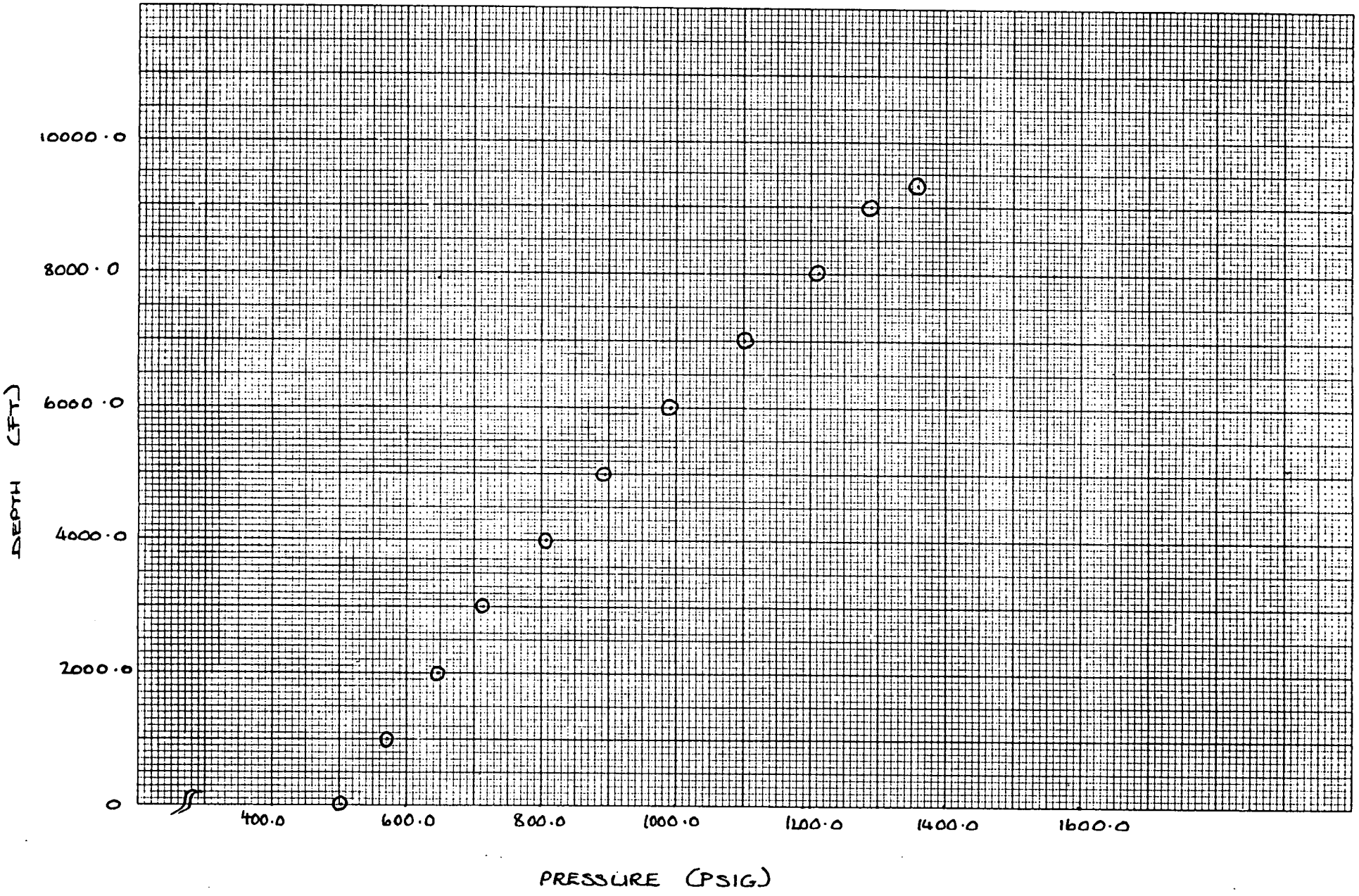
GENERAL REMARKS:
CHOKE SIZE 64/64

DWT IN: 502
DWT OUT: 552
MAX BHT: 274

ELEMENT 21821/4750 CALIBRATED 12.1.86
ELEMENT 21379/4825 CALIBRATED 12.1.86

FLY LAKE # 1L — FLOWING PRESSURE GRADIENT — 17/1/86

ELEMENT # 21821 /4750 (TOP)



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WIRELINE & WELL TESTING SERVICE

** FLY LAKE 1L **

FLOWING PRESSURE GRADIENT

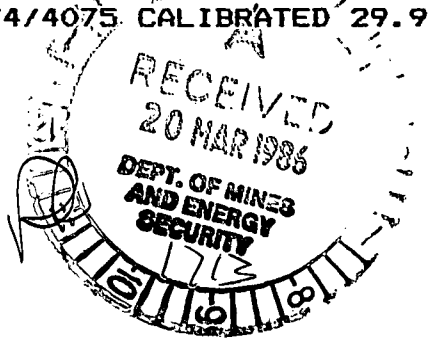
TEST DATE: 2/2/86

	TOP PRESSURE ELEMENT 22410/4100			BOTTOM PRESSURE ELEMENT 21374/4075		
DEPTH (FT.)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)
LUB	0.1280	256.2	----	0.1320	259.6	----
1000	0.1600	321.9	0.0656	0.1660	328.2	0.0685
2000	0.1940	391.6	0.0697	0.1970	390.7	0.0625
3000	0.2120	428.5	0.0369	0.2160	429.0	0.0384
4000	0.2300	465.4	0.0369	0.2360	469.4	0.0404
5000	0.2590	524.9	0.0595	0.2650	528.0	0.0586
6000	0.2930	594.6	0.0697	0.2950	588.7	0.0607
7000	0.3190	648.0	0.0533	0.3260	651.4	0.0627
8000	0.3510	713.6	0.0657	0.3600	720.3	0.0688
9000	0.3860	785.5	0.0718	0.3960	793.2	0.0730
9341	0.4050	824.5	0.1144	0.4130	827.7	0.1011
9385	0.4110	836.8	0.2800	0.4210	843.9	0.3688
LUB	0.1300	260.3	----	0.1340	263.7	----

GENERAL REMARKS:
GAS FLOWRATE .918MMSCF/D OIL FLOWRATE 2718BLS/D H2O FLOWRATE 30BBLS/D
CHOKE SIZE 34/64

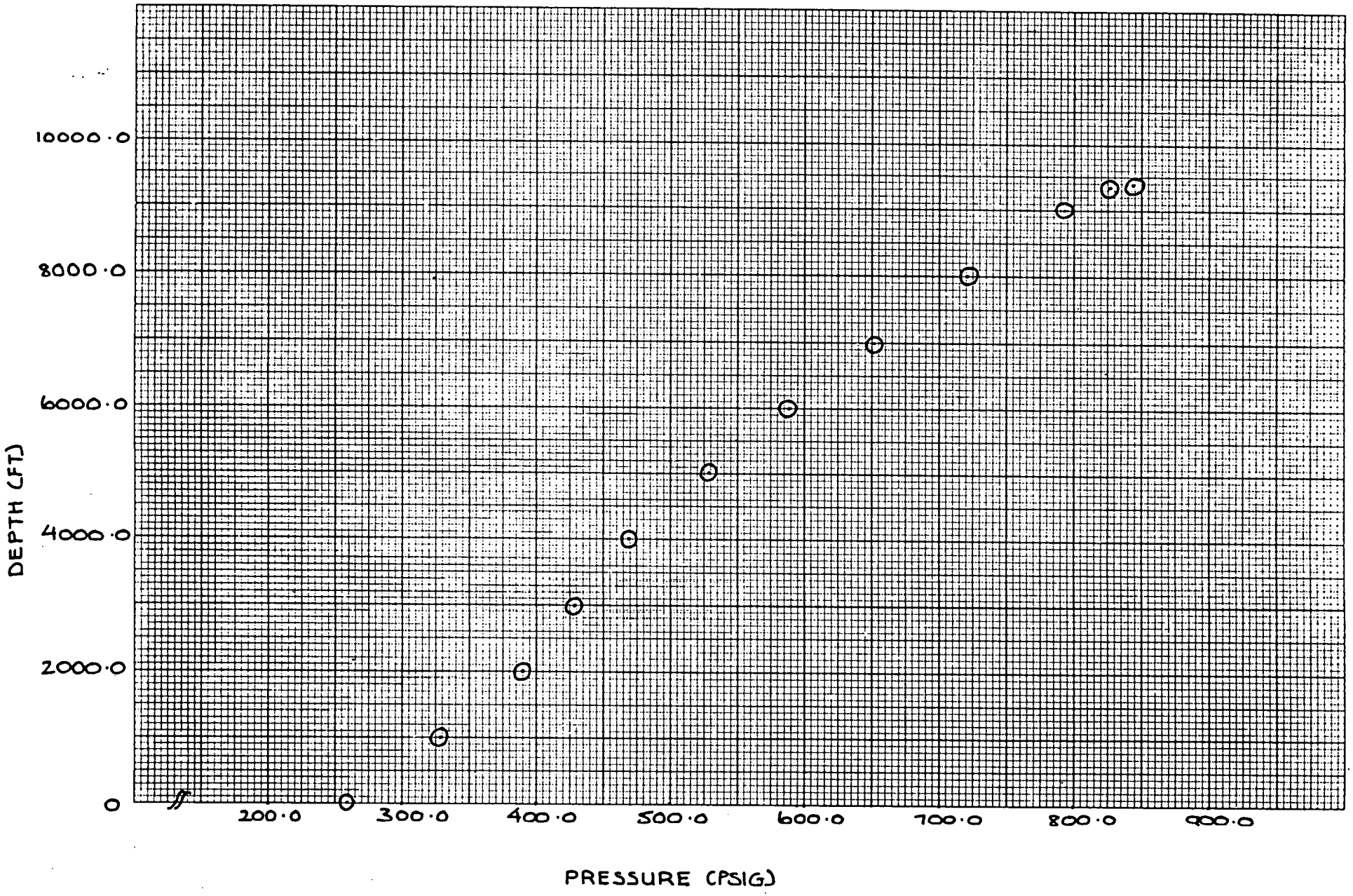
DWT IN: 285 PSI
DWT OUT: 285 PSI
MAX BHT: 0

ELEMENT 22410/4100 CALIBRATED 29.9.85
ELEMENT 21374/4075 CALIBRATED 29.9.85



FLY LAKE # 1L - FLOWING PRESSURE GRADIENT - 2/2/86

ELEMENT # 21374/4075 (BOT)



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FLY LAKE #1L

SUMMARY OF PRODUCTION TEST

1st - 2nd February 1986

FLOW TEST

1st - 2nd February

Opened well on 36/64" choke @ 1400 hours
Cut choke to 34/64" @ 1800 hours
Flowed well on 34/64" choke for 24 hours

F.T.H.P.	=	294 psig	
Separator Pressure	=	78 psig	
Gas Flow Rate	=	0.907 MMSCF/D)	G.O.R. = 2780 SCF/BBL
Oil Production	=	326.296 BPD)	
Water Production	=	43.123 BPD	

FLOWING RESERVOIR PRESSURE

Mid Point of Perforations = 9341'KB

2nd February: Ran flowing pressure gradient

Element # 22410 @ 9341'KB = 824.5 psig
Element # 21374 @ 9341'KB = 827.7 psig

WP0926G(95)

WP 0478N (5)

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OIL WELL TEST RESULTS

WELL NAME: Fly Lake #1L

TYPE OF TEST Production Test

DATE: 1st - 2nd February 1986

TESTED BY: R. Yates

METER RUN: 2.9"

DATE	TIME	WELLHEAD DATA			SUBSURFACE DATA PRESSURES (PSIG)		H.P. SEPARATOR DATA			L P. SEPARATOR DATA			FLUID PRODUCTION			REMARKS
		ANN. PSIG	TBG. PSIG	TEMP °F	EL#	EL#	P.F. PSIG	TEMP °F	GAS FLOW RATE MMSCFD	P.F. PSIG	TEMP °F	GAS FLOW RATE MMSCFD	OIL PROD. BPD	GOR SCF/ BBL	H_2O PROD BPD	
1/2	1400	0	1157				Opened well on 36/64" choke and trimmed Separator									
	1800	0	310	163			72	149	0.972				503.1	1932	70.4	Cut choke to 34/64"
	2200	0	305	149			72	149	0.916				306.9	2985	45.3	
2/2	0200	0	300	158			72	151	0.918				327.0	2807	35.2	
	0600	0	295	156			65	147	0.852				271.7	3136	50.3	
	1000	0	290	156			65	144	0.854				271.7	3143	40.2	
	1400	0	290	158			101	147	0.918				332.0	2765	30.2	
	1447						Engaged Stylus									
	1512						Pressured up Lubricator									
	1522	0	285				R.I.H.									
	1637						On Bottom									
	1640	0	285				P.O.O.H.									
	1710						In Lubricator									
	1720						Depressured Lubricator									
	1730						Disengage Stylus									
	1800	0	285	147			101	147	0.918				271.7	3379	30.2	
	1810															Shut Well In
																End of Test

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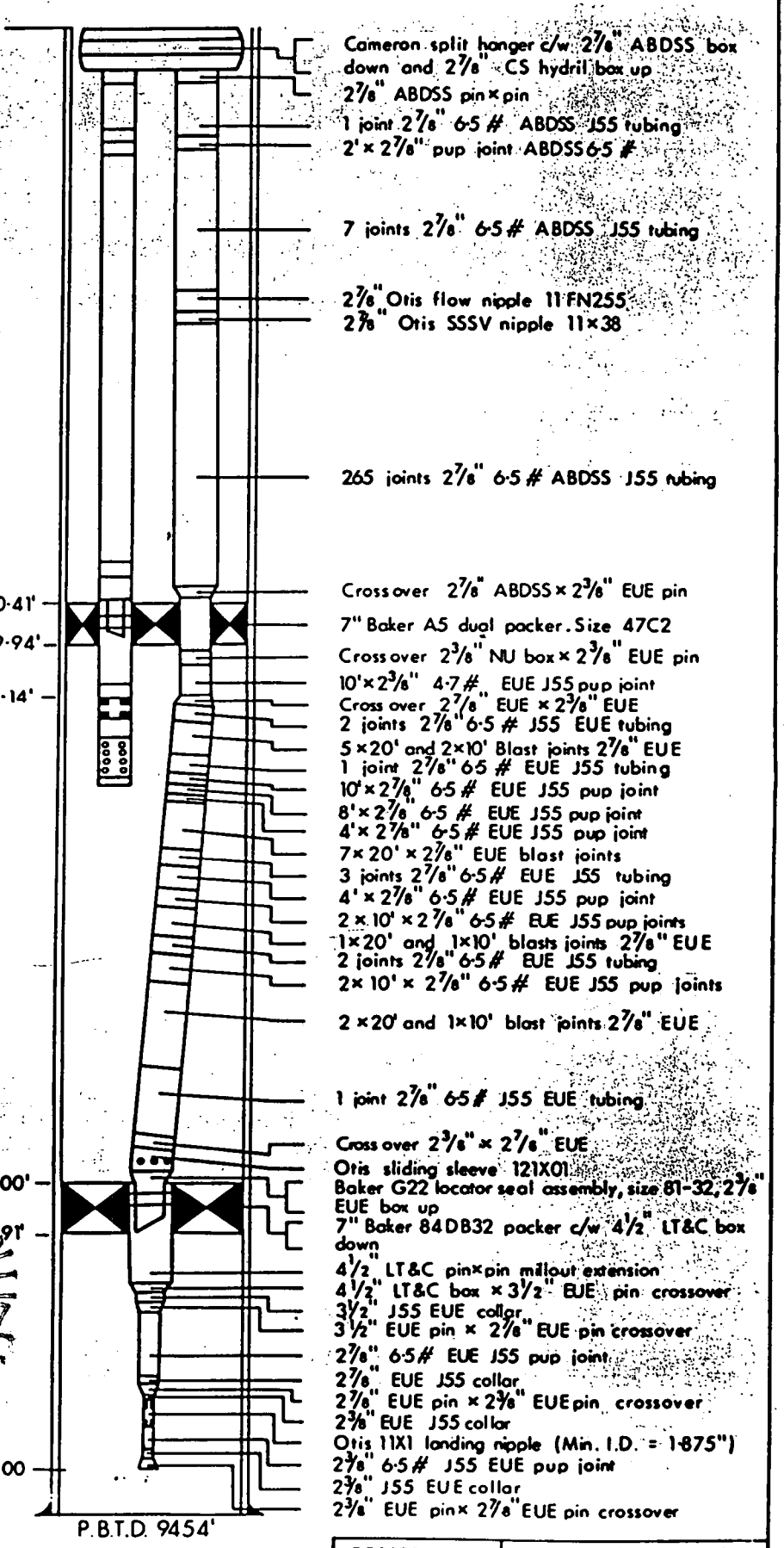
DOWNHOLE INSTALLATION

Well: Fly Lake – 1



PERFORATIONS

Tirrawarra
9335' - 9385' — 4 shots/foot

Basal Patchawarra
9297' - 9311' — 4 shots/foot

Patchawarra
8586' - 8608'
8632' - 8635'
8668' - 8696'
8768' - 8793' — 4 shots/foot
8816' - 8827'
8833' - 8845'
8863' - 8872'
8872' - 8882' — 5 shots/foot
8882' - 8888'
9025' - 9035' — 4 shots/foot
9138' - 9173'

REPERFORATED 30·3·1984

Basal Patchawarra
9297' - 9311' — 1 DP jet/foot

Patchawarra
8591' - 8606'
8632' - 8635'
8675' - 8694'
8770' - 8791' — 2 Hyperjets/foot
8820' - 8827'
8838' - 8845'
8872' - 8882' — 1 Hyperjets/foot
9138' - 9160'
9163' - 9165' — 2 Hyperjets/foot
9168' - 9170'

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PROPOSED RE/COMPLETION	
RE/COMPLETION AS RUN	
NOT TO SCALE	

DESIGNED	M. Niesingh/D.R. Hahn
DRAFTED	D Dean
DATE	4th May 1984

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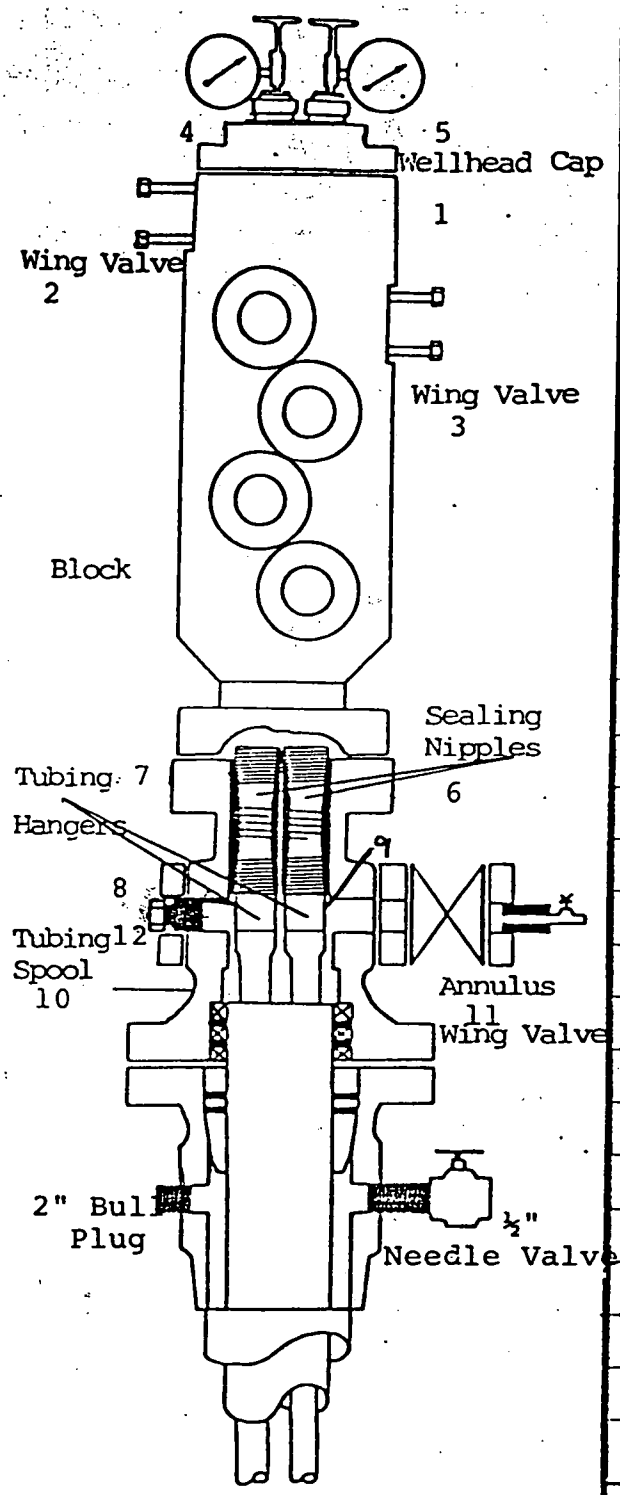
SANTOS LIMITED

PETROLEUM ENGINEERING DEPARTMENT - WORKOVERS

DUAL WELLHEAD AS INSTALLED

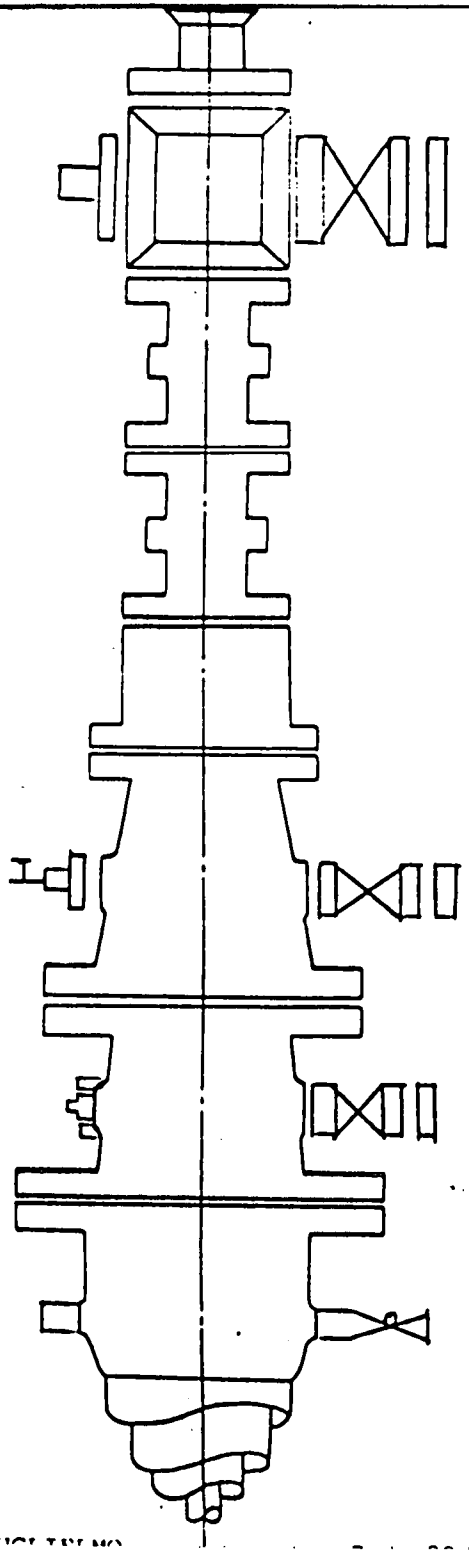
WELL: FLY LAKE 1



Item No.	DESCRIPTION
1	CAMERON DUAL WELLHEAD BLOCK 2" x 2½
	3000#.
2	2" 3000# CAMERON WING VALVE. R-24
	C/W 2" COMPANION FLANGE R-24.
3	2" 3000# CAMERON WING VALVE R-24.
4	2" PLUG w/½" NEEDLE VALVE.
5	2½" PLUG W/½" NEEDLE VALVE.
6	2½" SEALING NIPPLE
7	2" SEALING NIPPLE
8	SPLIT CAMERON TUBING HANGER 2 3/8 CS
	HYDRIL BOX UP x 2 3/8" AB BOX DOWN
9	SPLIT CAMERON TUBING HANGER 2 7/8" CS
	HYDRIL BOX UP x 2 7/8" AB BOX DOWN.
10	TUBING SPOOL. CAMERON DCB DUAL 6"
	3000# R45 x 10" 3000" R53.
11	2" CAMERON WING VALVE 3000# R24 C/W
	2" COMPANION FLANGE R24.
12	2" TAPPED BULL PLUG TO ½" + ½"
	NEEDLE VALVE.

REMARKS:

DATE: 07/10/82 DRAWN BY: W. BAER



TREE CAP etc.	CAMERON 2-9/16" R27 3000# c/w 2-7/8" EUE LIFTING THREADS	
FLOW TEE etc.	CAMERON 2-9/16" x 2-9/16" x 2-9/16" x 2-1/16" 3000# R27 R27 R27 R24	
MASTER VALVE etc.	CAMERON 2-9/16" 3000# R27 TYPE F	
MASTER VALVE etc.	CAMERON 2-9/16" 3000# R27 TYPE F	
SPOOL etc.	2-9/16" R27 x 7-1/16" R45 3000#	HB-A assembly
TUBING HEAD etc.	CAMERON TYPE F TUBING HEAD SPOOL	Tubing hanger FBB 6" - 2-
	7-1/16" R45 x 11" R53 3000#	'X' Bushing
		Bit pilot
	Outlet 2-1/16" R24 COMPANION FLANGE c/w BULL PLUG &	NEEDLE VALVE
	Outlet 2-1/16" R24 3000# CAMERON WING VALVE c/w COMPANION FLANGE 2" NPT	
CASING SPOOL etc.	FMC OCT 11" R53 x 12" R57 3000#	Casing hanger
	Outlet 2-1/16" R24 CAMERON VALVE c/w 2" NPT COMPANION FLANGE	
	Outlet VR PLUG & 2" R24 COMPANION FLANGE	
BRADEN HEAD etc.	13-3/8" x 12" R57 3000# SCREW ON BRADENHEAD	Casing hanger
	Outlet 2" NPT BULL PLUG	
	Outlet 2" NPT NIPPLE c/w BALL VALVE	
CASING Surface	13-3/8" 48# H40 ST&C to 552' KB	
CASING Intermed.	9-5/8" 36# J55 LT&C to 5894'	
CASING Production	7" 23, 26# J55 & N80 to 9943'	
TUBING	2-7/8" [illegible]	

000256

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SANTOS LIMITED
RESERVOIR ENGINEERING DEPARTMENT

FLY LAKE #1 - UPPER - PATCHAWARRA FORMATION MODIFIED ISOCHRONAL TEST, APRIL 1985

Report No. RE:140/85
Date: February 1986
Author: M.R. Fabian

RECEIVED
- 4 JUN 1986
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1. INTRODUCTION

2. RESULTS

3. DISCUSSION

APPENDICES

I INTERPRETATION, BUILD UP PLOTS AND DATA

II STATIC GRADIENT SURVEY

III FLY LAKE #1U, FWS COMPOSITION.

1. INTRODUCTION

Fly Lake #1 was drilled in October 1971 to a total depth of 9522'KB. In February 1972 the Tirrawarra Formation was stimulated with mud acid and then singly completed and commingled with the Basal Patchawarra oil sand. A fracture stimulation was conducted over these intervals increasing the P.I. from 0.110 B/D/psi to 0.126 B/D/psi.

The well was completed as a dual in May 1972 with the Patchawarra being tested at 7.5 MMscf/d with a FWHP of 2100 psig on 7/16" choke. The well was then suspended.

In August 1982 the well was recompleted for fracture stimulation in the Tirrawarra Sandstone and fractured early in September of that year. In October 1982 the well was recompleted as a dual producer from the Patchawarra gas and Tirrawarra/Basal Patchawarra oil sands.

Fly Lake #1 was put on line in October 1983 with the upper zone producing gas at a rate of some 8 MMscf/d at 1400 psi and the lower zone producing oil at a rate of about 200 BOPD.

A Modified Isochronal was conducted on the Patchawarra Formation from 19th to 24th April, 1985. The purpose of this test was to evaluate well deliverability, reservoir parameters and to obtain representative fluid samples.

The Patchawarra sand, pay thicknesses and perforated intervals are as follows:

Sand	Net Pay (feet)	Perforated Interval (feet KB)
85-9	14	8586-8608 & 8632-8635
86-7	12	8668-8696
87-7	21	8768-8793
88-2	7	8816-8827
88-4	9	8833-8845
88-6	35	8863-8888
90-3	8	9025-9035
91-4	21	9138-9173
	127	

All intervals shot at 4 shots per foot with the exception of the interval 8872'-8882'KB which has 5 shots per foot.

2. RESULTS

The following results were obtained using the Horner plot and L.I.T. analysis:-

Flow Capacity	294 md-ft
Permeability	2.31 md
Turbulence Coefficient	0.208 $MMcfd^{-1}$
True Skin	-1.31
Reservoir Pressure	3311 psia @ Datum 9015'KB (8700'SS).
Flow rate (F.W.S. gas)	6.64 MMscf/d @ 1372 psig
Condensate Production	217 BCPD
Water Production	13.3 BWPD
A.O.F.	20 MMscf/d

3. DISCUSSION

Appendix I documents the raw data and interpretation of the Modified Isochronal and build up performed on Fly Lake #1 Upper during April 1985. A static temperature and pressure survey was performed directly before the isochronal and the depth vs temperature and pressure plots are detailed in Appendix II.

A recombination of high pressure gas and liquid samples taken during the flow period was performed, and the full well stream composition is detailed in Appendix III. This composition was used to determine the pseudo-pressures and fluid properties used in the interpretation.

The reservoir pressure, as determined from the extrapolation of the Horner Build-up, is approximately 3296 psia at the mid point of perforations. This indicates that some 560 psi of depletion has taken place from the sands accessed by Fly Lake #1 Upper. At the time of testing, Fly Lake #1 Upper had produced some 3.26 BCF of gas.

APPENDIX I

Interpretation, Build-up Plots and Data.

GAS WELL DELIVERABILITY TEST
RESULTS OF ISOCHRONAL 'LIT' ANALYSIS

WELL NAME: FLY LAKE #1U FORMATION: PATCHAWARRA DATE OF TEST 19-24/4/85

DATUM DEPTH: 9015' KB (8900'SS) DEPTH TESTED: 8484' K.B.

PRESSURE BUILD-UP INFORMATION

EXTRAPOLATED PRESSURE $\overline{P}_R$ = 10582 x 10^3 psia²

= 3253 psia

$\overline{\psi}_R$ = 635 x 10^6 psia²/cp

HORNER BUILD-UP SLOPE m = 548.7 x 10^3 psia²/cycle

m(ψ) = 26.8 x 10^6 psia²/cp/cycle

WELL AND TEST PARAMETERS

Porosity Ø = 12.8 Viscosity μ = 0.025 cp

Compressibility C_t = 0.18 x 10^{-3} well radius r_w = 0.354 ft.

Well drainage r_e = 400 thickness h = 127 ft.

Final flow rate q = 6.64 MMcfd Temperature T = 726 °R

Sandface press. P_{wf} = 2778.6 psia Press 1 hr P_1 = 3159.0 psia

ψ_{wf} = 489.3 x 10^6 psia²/cp ψ_1 = 605.5 x 10^6 psia²/cp

BACK PRESSURE COEFFICIENTS

$$\Delta\psi = a\,q + bq^2$$

a = 17.0998 x 10^6 psia²/cp/MMcfd

b = 0.7294 x 10^6 psia²/cp/MMcfd

FLOW CAPACITY

$$kh = \frac{1.632 \times 10^6}{m} \quad qT = 294 \text{ md-ft}$$

PERMEABILITY

$$k = \frac{kh}{h} = 2.31 \text{ md}$$

APPARENT SKIN

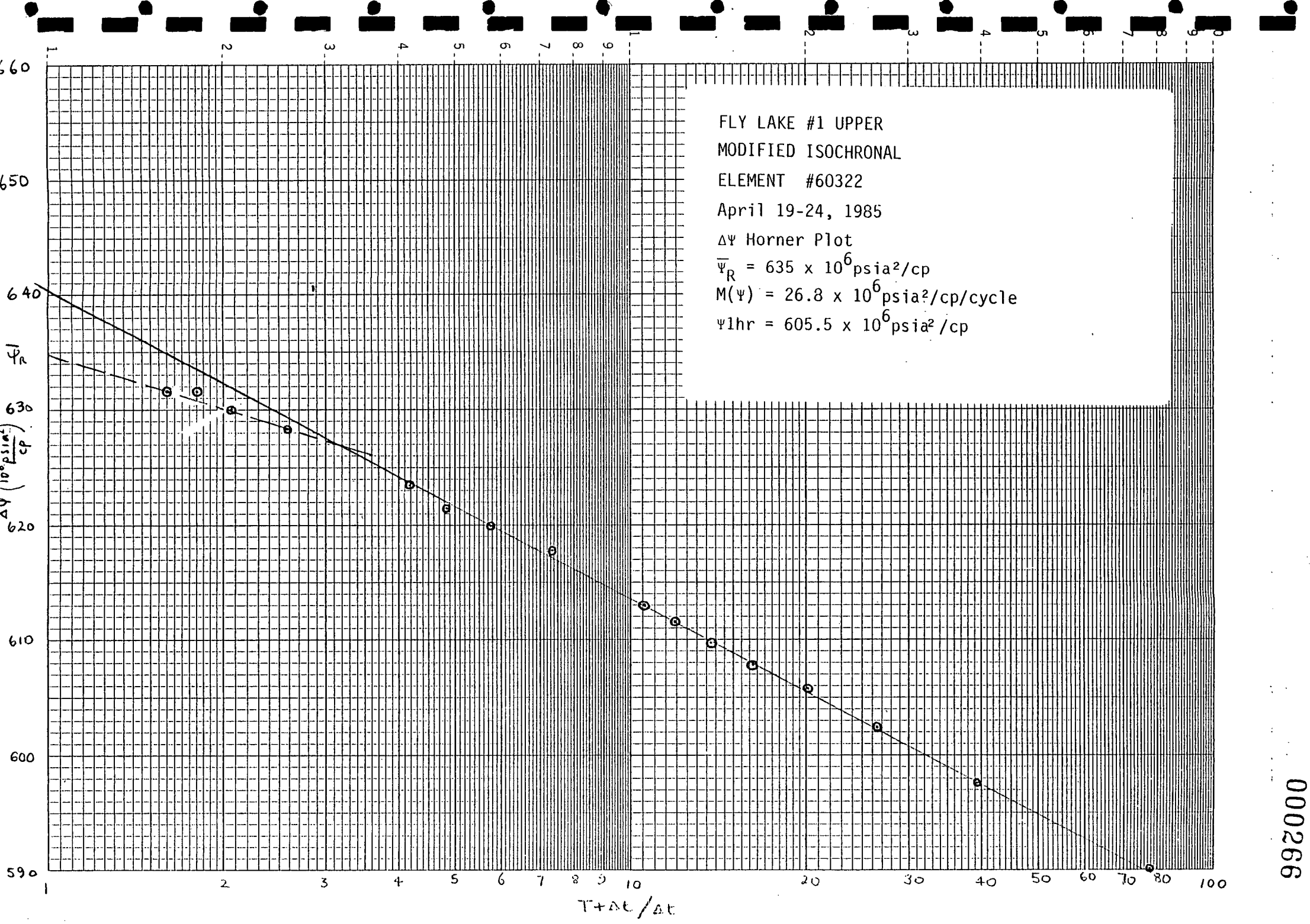
$$S' = 1.151\left[\frac{\psi_1 - \psi_o}{m} - \log\left(\frac{k}{\phi\mu C_t r_w^2}\right) + 3.23\right] = 0.07$$

TURBULENCE COEFFICIENT

$$D = \frac{b\,kh}{1.417 \times 10^6 T} = 0.208 \text{ MMcfd}^{-1}$$

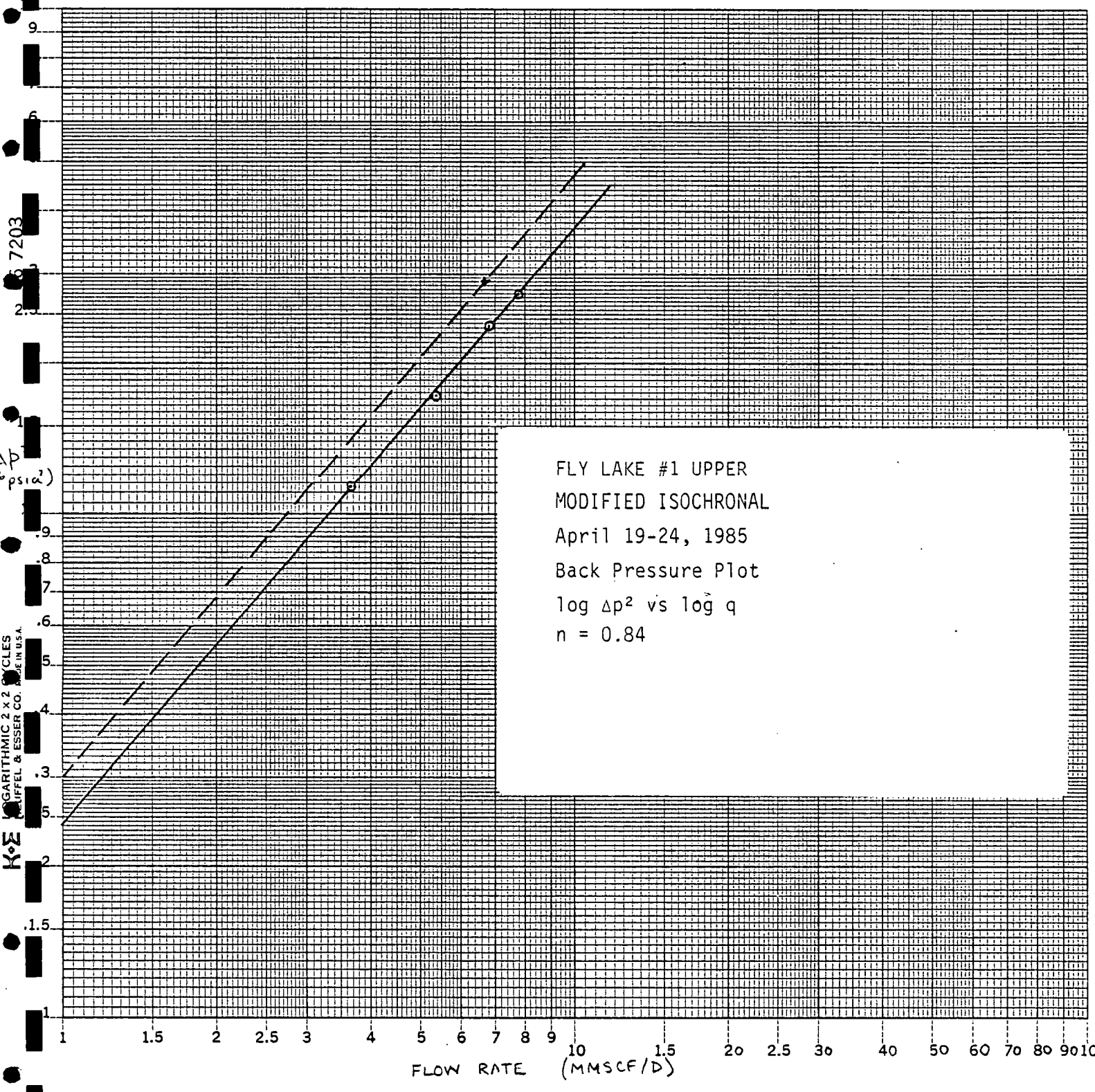
TRUE SKIN

$$S = S' - Dq = -1.31$$


FLY LAKE #1 UPPER
MODIFIED ISOCHRONAL
ELEMENT #60322
April 19-24, 1985
ΔΨ Horner Plot
$\bar{\Psi}_R$ = 635 x 10^6psia²/cp
M(Ψ) = 26.8 x 10^6psia²/cp/cycle
Ψ1hr = 605.5 x 10^6psia²/cp
660
650
640
630
620
610
600
590
Ψ_R
$\Delta\Psi$ ($10^6 \frac{psia^2}{cp}$)
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
100
T+Δt/Δt

000266

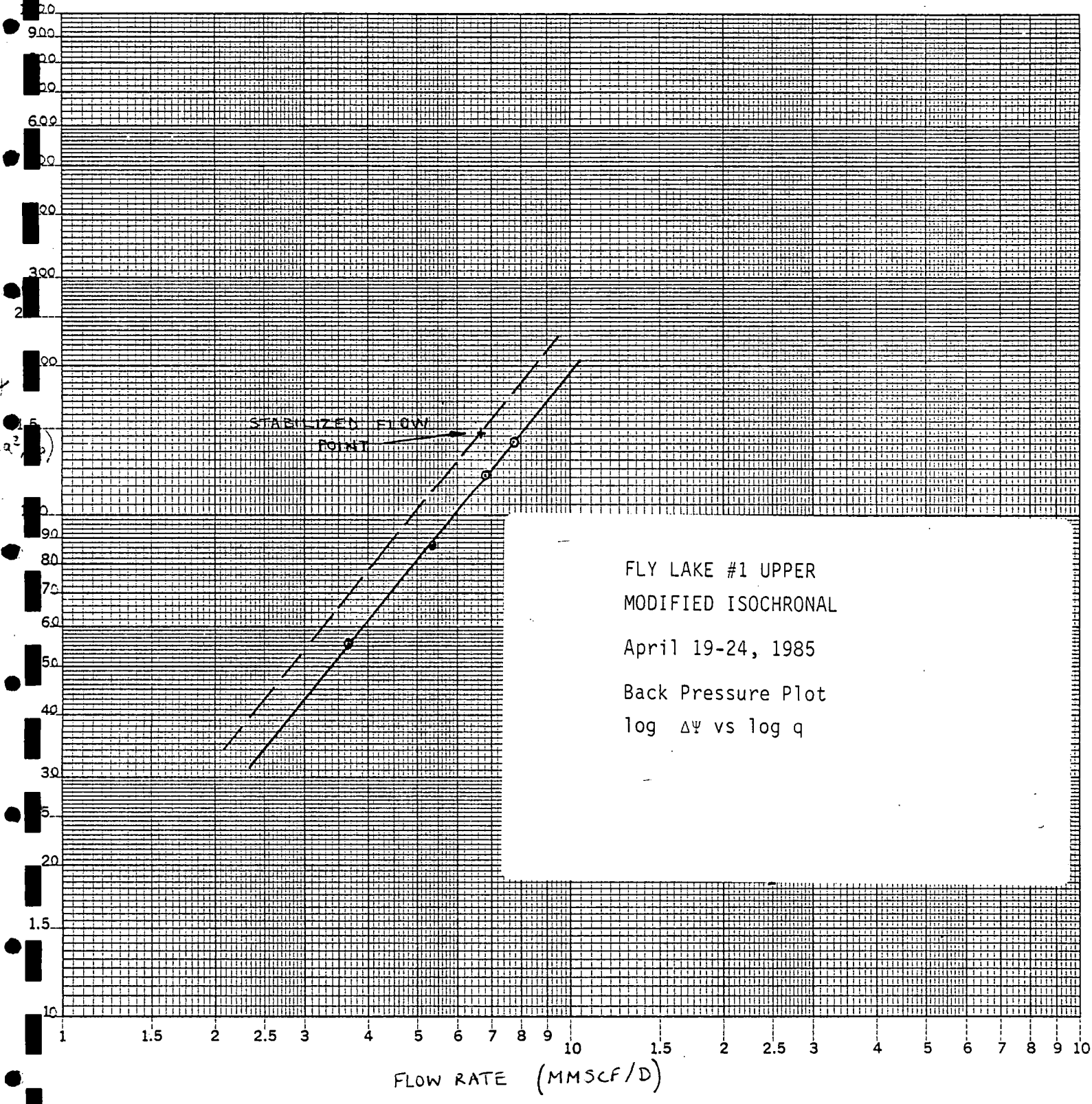
000267



7203

KOGARITHMIC 2 x 2 CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.
K•E

000268


STABILIZED FLOW POINT
FLY LAKE #1 UPPER
MODIFIED ISOCHRONAL
April 19-24, 1985
Back Pressure Plot
log ΔΨ vs log q
1 1.5 2 2.5 3 4 5 6 7 8 9 10 1.5 2 2.5 3 4 5 6 7 8 9 10
FLOW RATE (MMSCF/D)

BUILD UP PRESSURE SURVEY

Well Name: FLY LAKE #1U

Date Tested: 19th - 24th April, 1985

Pressure Element: 60322

Depth Tested: 8484'KB

t = 19.10 hrs

Lubricator Pressure (psia)	In	Out
Amerada	2320	2336
Deadweight	2324	2333

Δt hours	PRESSURE psia	PSEUDO PRESSURE 10^6 psia²/cp	Δ Ψ	$\frac{t+\Delta t}{\Delta t}$
0	2778.6	489.3	0	-
0.25	3109.6	590.1	100.8	77.4
0.50	3133.8	597.7	108.4	39.2
0.75	3148.2	602.2	112.9	26.5
1.00	3160.0	605.8	116.5	20.1
1.25	3166.6	607.9	118.6	16.3
1.50	3172.2	609.6	120.3	13.7
1.75	3178.1	611.5	122.2	11.9
2	3183.1	613.0	123.7	10.6
3	3198.3	617.8	128.5	7.4
4	3205.3	620.0	130.7	5.8
5	3209.9	621.4	132.1	4.8
6	3216.1	623.4	134.1	4.2
12	3231.4	628.2	138.9	2.6
18	3237.1	630.0	140.7	2.1
24	3242.6	631.7	142.4	1.8
32	3242.7	631.7	142.4	1.6

SANTOS LTD.

WELL TEST SUMMARY

WELL: FLYLAKE #1 UPPER EXPERTEST
TESTED BY: S. MAYER (EXPERTEST)
CASING SIZE: 7 ins
TUBING SIZE: 2-3/8 ins

LOCATION: Lat.: 27°38'13"S Long: 139°56'48"E
PERFORATIONS: 8586-9173 ft
WEIGHT: 23 & 26 lb/ft
WEIGHT: 4.7 lb/ft

DATE: APRIL 19TH-24TH/1985
PRODUCING THROUGH: TUBING
GRADE: J55 & N80
GRADE: J55

FIELD PATCHAWARRA FORMATION

DESCRIPTION OF TEST

INITIAL SHUT IN PERIOD

Time of Observations			Observed Pressures			
Date	Time	Shut In Time (Hours)	Tubing psig	Casing psig	Temp. °F	REMARKS
19/4/85	1846	0	1135	44	147	Shut well in
21/4/85	1431	43.75	2309			Ran static gradient survey
						Max. Bottom Hole Temp. = 266°F
21/4/85	2200	51.23	2309	0		Opened well on 1st rate

Flow Period
Run No.: 1 Duration of Run: 2 Hours. Orifice Size: 2.000 ins
Flow Well On: 20/64" Choke. Meter Run: 4.026 ins

Date	Time	Flow Time (Hours)	Wellhead Readings Tubing psig	Casing psig	Temp. °F	Meter or Prover Data Pf psig	Hw inches	Temp. °F	Condensate Production Bbls/d	Water Production Bbls/d
21/4/85	2200	0	2309	0						
	2215	0.25	1990	"	129	515	56	62		
	2230	0.5	2005	"	131	510	48	76		
	2300	1	2017	"	133	520	49	72		
	2330	1.5	"	"	135	530	"	74		
	2400	2	"	"	"	535	"	76	105.0	15.0

000270

2ND SHUT IN PERIOD

Time of Observations			Observed Pressures			
Date	Time	Shut In Time (Hours)	Tubing psig	Casing psig	Temp. °F	REMARKS
21/4/85	2400	0	2017	0	135	Shut well in
22/4/85	0015	0.25	2307	"		
	0030	0.5	2312	"		
	0045	0.75	2315	"		
	0100	1	2316	"		
	0115	1.25	2317	"		
	0130	1.5	2318	"		
	0200	2	2321	"		Opened well on 2nd rate

Run No.: 2 Duration of Run: 2 Hours. Orifice Size: 2.000 ins
Flow Well On: 26/64" Choke. Meter Run: 4.026 ins

Date	Time	Flow Time (Hours)	Wellhead Readings			Meter or Prover Data			Condensate Production	Water Production
			Tubing psig	Casing psig	Temp. °F	Pf psig	Hw inches	Temp. °F	Bbls/d	Bbls/d
22/4/85	0200	0	2321	0						
	0230	0.5	1764	"	133	475	107	76		
	0300	1	1765	"	136	470	127	84		
	0330	1.5	1762	"	140	"	126	87		
	0400	2	1758	"	142	"	"	"	200.0	15.0

0002271

3RD SHUT IN PERIOD

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing psig	Casing psig	Temp. °F	
22/4/85	0400	0	1758	0	142	Shut well in
	0415	0.25	2301	"		
	0430	0.5	2310	"		
	0445	0.75	2312	"		
	0500	1	2314	"		
	0515	1.25	2315	"		
	0530	1.5	2317	"		
	0600	2	2319	"		Opened well on 3rd rate

Run No.: 3 Duration of Run: 2 Hours. Orifice Size: 2.500 ins
Flow Well On: 34/64" Choke. Meter Run: 4.026 ins

Date	Time	Flow Time (Hours)	Wellhead Readings			Meter or Prover Data			Condensate Production	Water Production
			Tubing psig	Casing psig	Temp. °F	Pf psig	Hw inches	Temp. °F	Bbls/d	Bbls/d
22/4/85	0600	0	2319	0						
	0615	0.25	1419	"	136	480	83	89		
	0630	0.5	1401	"	138	450	82	98		
	0700	1	1399	"	142	445	"	101		
	0730	1.5	1385	"	144	450	83	103		
	0800	2	1392	"	"	"	82	105	270.1	10.0

4TH SHUT IN PERIOD

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing psig	Casing psig	Temp. °F	
22/4/85	0800	0	1392	0	144	Shut well in
	0815	0.25	2289	"		
	0830	0.5	2296	"		
	0845	0.75	2301	"		
	0900	1	2306	"		
	0915	1.25	2311	"		
	0930	1.5	2314	"		
	1000	2	2317	"		Opened well on 4th rate

Run No.: 4 Duration of Run: 2 Hours. Orifice Size: 2.500 ins
Flow Well On: 44/64" Choke. Meter Run: 4.026 ins

Date	Time	Flow Time (Hours)	Wellhead Readings			Meter or Prover Data			Condensate Production	Water Production
			Tubing psig	Casing psig	Temp. °F	Pf psig	Hw inches	Temp. °F	Bbls/d	Bbls/d
22/4/85	1000	0	2317	0						
	1015	0.25	1081	"	140	460	113	110		
	1030	0.5	1074	"	144	450	112	116		
	1100	1	1069	"	"	"	"	120		
	1130	1.5	1067	"	"	"	"	122		
	1200	2	1065	"	"	"	"	124	285.1	20.0

SANTOS LTD.
WELL TEST SUMMARY
FINAL STABILIZATION FLOW PERIOD

Run No.: 5 Duration of Run: 12 Hours. Orifice Size: 2.500 ins
Flow Well On: 34/64" Choke. Meter Run: 4.026 ins

Date	Time	Flow Time (Hours)	Wellhead Readings			Meter or Prover Data			Condensate Production	Water Production
			Tubing	Casing	Temp.	Pf	Hw	Temp.		
			psig	psig	°F	psig	inches	°F	Bbls/d	Bbls/d
22/4/85	1200	0	1065	0	144					
	1400	2	1386	"	147	450	86	116	200.0	20.0
	1600	4	1381	"	149	440	"	"	250.1	10.0
	1800	6	1378	"	"	"	84	"	205.0	15.0
	2000	8	1375	"	"	"	"	"	225.0	"
	2200	10	1373	"	147	430	"	115	210.0	10.0
	2400	12	1372	"	145	"	"	"	210.0	"
			Shut well in for final build-up survey							

000274

SANTOS LTD.
WELL TEST SUMMARY
FINAL BUILD-UP PERIOD

Date	Time	Shut in Period (Hours)	Tubing Pressure psig	Casing Pressure psig	Wellhead Temp. °F	REMARKS
22/4/85	2400	0	1372	0	145	Shut well in
23/4/85	0015	0.25	2264	"		
	0030	0.5	2269	"		
	0045	0.75	"	"		
	0100	1	2290	"		
	0115	1.25	"	"		
	0130	1.5	2291	"		
	0145	1.75	2294	"		
	0200	2	2296	"		
	0300	3	2303	"		
	0400	4	2307	"		
	0500	5	2310	"		
	0600	6	2311	"		
	1200	12	2317	"		
	1800	18	2318	"		
	2400	24	"	"		
24/4/85	0800	32	"	"		P.O.H. - End of test

000275

SANTOS LTD.

WELL TEST SUMMARY

FINAL BUILD-UP, SUBSURFACE PRESSURES

ELEMENT NO. 60322 BOMB DEPTH 8484 KB DWT in = 2309 psig/out = 2318 psig
LUB. in = 2305.0 psig/out = 2321.9 psig

Date	Time	Shut In Time (Hours)	PRESSURE psig	PRESSURE $psia^2 \times 10^3$	$\frac{T+\theta}{\theta}$	REMARKS
22/4/85	2400	0	2763.9	7720	-	Shut well in
23/4/85	0015	0.25	3094.9	9669	77.4	
	0030	0.5	3119.1	9820	39.2	
	0045	0.75	3133.5	9911	26.5	
	0100	1	3145.3	9985	20.1	
	0115	1.25	3151.9	10027	16.3	
	0130	1.5	3157.5	10063	13.7	
	0145	1.75	3163.4	10100	11.9	
	0200	2	3168.4	10132	10.6	
	0300	3	3183.6	10229	7.4	
	0400	4	3190.6	10274	5.8	
	0500	5	3195.2	10303	4.8	
	0600	6	3201.4	10343	4.2	
	1200	12	3216.7	10442	2.6	
	1800	18	3222.4	10478	2.1	
	2400	24	3227.9	10514	1.8	
24/4/85	0800	32	3228.0	10515	1.6	P.O.H. - End of test
						T = Cumulative Prod./last Prod. rate before shut in
						= 5.284 -MMSCF/6.64 - MMSCFD
						= 19.10 hours

000276

CASE 1: FLOW THROUGH METER RUN

Run No.	Hw (inches in water)	Pf (psig)	Size Orifice Plate (inches)	Ft (°F)
1	49	535	2.000	76
2	126	470	2.000	87
3	82	450	2.500	105
4	112	450	2.500	124
5	84	430	2.500	115

FLY LAKE #1U
HP Separator-Sample

Specific Gravity = 1.000
TC = 456.9 °R
PC = 772.6 psia
CO2 CONTENT = 27.85 mole %

Meter Run = 4.026 ins

FLOW THROUGH METER RUN (Continued)

Run No.	Q (MMscfd)	Q Total * (MMsf/d)
1	3.520	3.65
2	5.160	5.35
3	6.552	6.80
4	7.483	7.76
5	6.396	6.64

* These rates are divided by 0.964 to take into account shrinkage of FWS gas through the separator

GAS WELL DELIVERABILITY TEST CALCULATIONS
(Base Conditions = 14.65 psia and 60°F)

WELL NAME: FLY LAKE #1 UPPER DATE: April 19th - 24th/1985 ELEMENT NO: 60322 DEPTH TESTED: 8484'KB
DWT IN: 2309 psig OUT: 2318 psig
LUB IN: 2305 psig OUT: 2321.9 psig

SIMPLIFIED ANALYSIS

	Duration (hours)	Sandface Pressure (psia)	Cal.	Meas.	Δp^2 (10^6 psia²)	Flow Rate (Mmscfd)	H/Carbon Prod. (BBLS/D)	Water Prod. (BBLS/D)	REMARKS
Initial Shut In	51.23	3243.0		X	-	-	-	-	$q = C(\bar{p}_R^2 - p_{wf}^2)^n$
Flow 1	2	3063.6		X	1.131	3.65	105.0	15.0	slope n = 0.84
Shut In	2	3236.2		X	-	-	-	-	$\bar{p}_R$ = 3253 psia
Flow 2	2	2955.4		X	1.739	5.35	200.0	15.0	$C = \frac{q}{(\bar{p}_R^2 - p_{wf}^2)^n}$
Shut In	2	3226.7		X	-	-	-	-	
Flow 3	2	2834.5		X	2.377	6.80	270.1	10.0	$= 2.48 \times 10^{-5}$
Shut In	2	3216.3		X	-	-	-	-	AOF (MMscfd)
Flow 4	2	2755.6		X	2.751	7.76	285.1	20.0	= 20
Extended Flow	12	2778.6		X	2.861	6.64	216.7	13.3	
Extrapolated Pressure		3253		X	-	-	-	-	

000278

GAS WELL DELIVERABILITY TEST CALCULATIONS
(Base Conditions = 14.65 psia and 60°F)

LIT (ψ) ANALYSIS

	Duration (hours)	Sandface Pressure (psia)	ψ (10^6 psia²/cp)	$\Delta\psi$ (10^6 psia²/cp)	Flow Rate (q) (MMscfd)	$\Delta\psi/q$	q^2	$\Delta\psi - bq^2$
Initial Shut In	51.23	3243.0	631.8	-	-	-	-	
Flow 1	2	3063.6	575.9	55.9	3.65	15.32	13.32	
Shut In	2	3236.2	629.7	-	-	-	-	
Flow 2	2	2955.4	542.7	87.0	5.35	16.26	28.62	
Shut In	2	3226.7	626.7	-	-	-	-	
Flow 3	2	2834.5	506.0	120.7	6.80	17.75	46.24	
Shut In	2	3216.3	623.4	-	-	-	-	
Flow 4	2	2755.6	482.4	141.0	7.76	18.17	60.22	
Total=	-	-	-	404.6	23.56	67.50	148.40	
Extended Flow	12	2778.6	489.3	145.7	6.64	22.21	44.09	
Extrapolated Pressure		3253	635.0	-	-	-	-	

000279

GAS WELL DELIVERABILITY TEST CALCULATIONS

L.I.T. (Ψ) ANALYSIS

DISCARDED POINT -

N = 4 $\bar{\Psi}_R$ = 635 10^6 psia²/cp

$$a, a_t = \frac{\Sigma\frac{\Delta\Psi}{q}\ \Sigma q^2 - \Sigma q\ \Sigma\Delta\Psi}{N\ \Sigma q^2 - \Sigma q\ \Sigma q} = 12.5790$$

$$b = \frac{N\Sigma\ \Delta\Psi - \Sigma q\ \Sigma\frac{\Delta\Psi}{q}}{N\ \Sigma q^2 - \Sigma q\ \Sigma q} = 0.7294$$

(EXTENDED FLOW)

$\Delta\Psi$ = 145.7 q = 6.64 b = 0.7294

$$a = \frac{\Delta\Psi - bq^2}{q} = 17.0998$$

A.O.F. = 20 MMSCFD n = 0.84

Total Volume of Gas Produced During Test = 5.091 MMSCF (HP separator gas)

Condensate = 180.0 Bbls

Water = 11.6 Bbls

REMARKS

RESULTS

TRANSIENT FLOW: $\bar{\Psi}_R - \Psi_{wf} = a_t q + bq^2$

i.e. 635 $- \Psi_{wf} =$ 12.5790 $q +$ 0.7294 q^2

STABLIZED FLOW: $\bar{\Psi}_R - \Psi_{wf} = aq + bq^2$

i.e. 635 $- \Psi_{wf} =$ 17.0998 $q +$ 0.7294 q^2

DELIVERABILITY:

$$q = \frac{1}{2b}\left[-a + \sqrt{a^2 + 4b\ (\bar{\Psi}_R - \Psi_{wf})}\right]$$

FOR $\Psi_{wf} = 0$, q = AOF = 20 MMscfd

Interpreted by: M.R. Fabian Date: 31/10/85

000280

APPENDIX II

Static Gradient Survey

SANTOS LTD
39 GRENFELL ST
ADELAIDE

SUB-SURFACE PRESSURE SURVEY

CO. SANTOS		RUN 01	FIELD FLY LAKE		WELL 01U
OFF DEPTH		WELL STAT		TOOL HUNG	
CASING 7"	-	CASING PRESS		ON BOTTOM	21/4 1435
LINER	-	TUBING PRESS		OFF BOTTOM	21/4 1610
DATE	850421	ELEMENT RANGE	0 - 5132	ZERO POINT	
ELEVATION		ZONE	PATCHAWARRA	SHUT-IN	
MAX TEMP		PICK-UP		ON-PROD	
PERF	8586'-9173'	CAL SER NO.	59211	MPP	
TUBING 2-3/8"	-				
UNITS	ENGLISH	PURPOSE	STATIC PRESSURE GRADIENT		

SURVEY DATA

CO. SANTOS — RUN 01 FIELD FLY LAKE — WELL 01U

TIME	DEPTH	P/T	GRAD	TIME	DEPTH	P/T	GRAD
14:31	0	2297.7	0.000	15:18	6000	2948.2	.107
14:35	1000	2409.2	.111	15:27	7000	3055.5	.107
14:44	2000	2519.4	.110	15:35	8000	3164.0	.108
14:52	3000	2627.0	.108	15:42	8400	3206.0	.105
15:00	4000	2734.6	.108	15:48	8520	3221.3	.127
15:09	5000	2840.8	.106	0:00	0	0.0	0.000

LUB IN DWT = 2308 PSIG / OUT = 2309 PSIG
LUB IN AMERADA = 2297.7 PSIG / OUT = 2313.1 PSIG

SANTOS LTD
39 GRENFELL ST
ADELAIDE

SUB-SURFACE PRESSURE SURVEY

CO. SANTOS		RUN 02 FIELD FLY LAKE		WELL 01U	
FF DEPTH		WELL STAT		TOOL HUNG	
ASING 7"	-	CASING PRESS		ON BOTTOM	21/4 1435
LINER	-	TUBING PRESS		OFF BOTTOM	21/4 1610
ATE	850421	ELEMENT RANGE	0 - 5136	ZERO POINT	
LEVATION		ZONE	PATCHAWARRA	SHUT-IN	
MAX TEMP		PICK-UP		ON-PROD	
ERF	8586'-9173'	CAL SER NO.	60322	MPP	
UBING 2-3/8"	-				
NITS	ENGLISH	PURPOSE	STATIC PRESSURE GRADIENT		

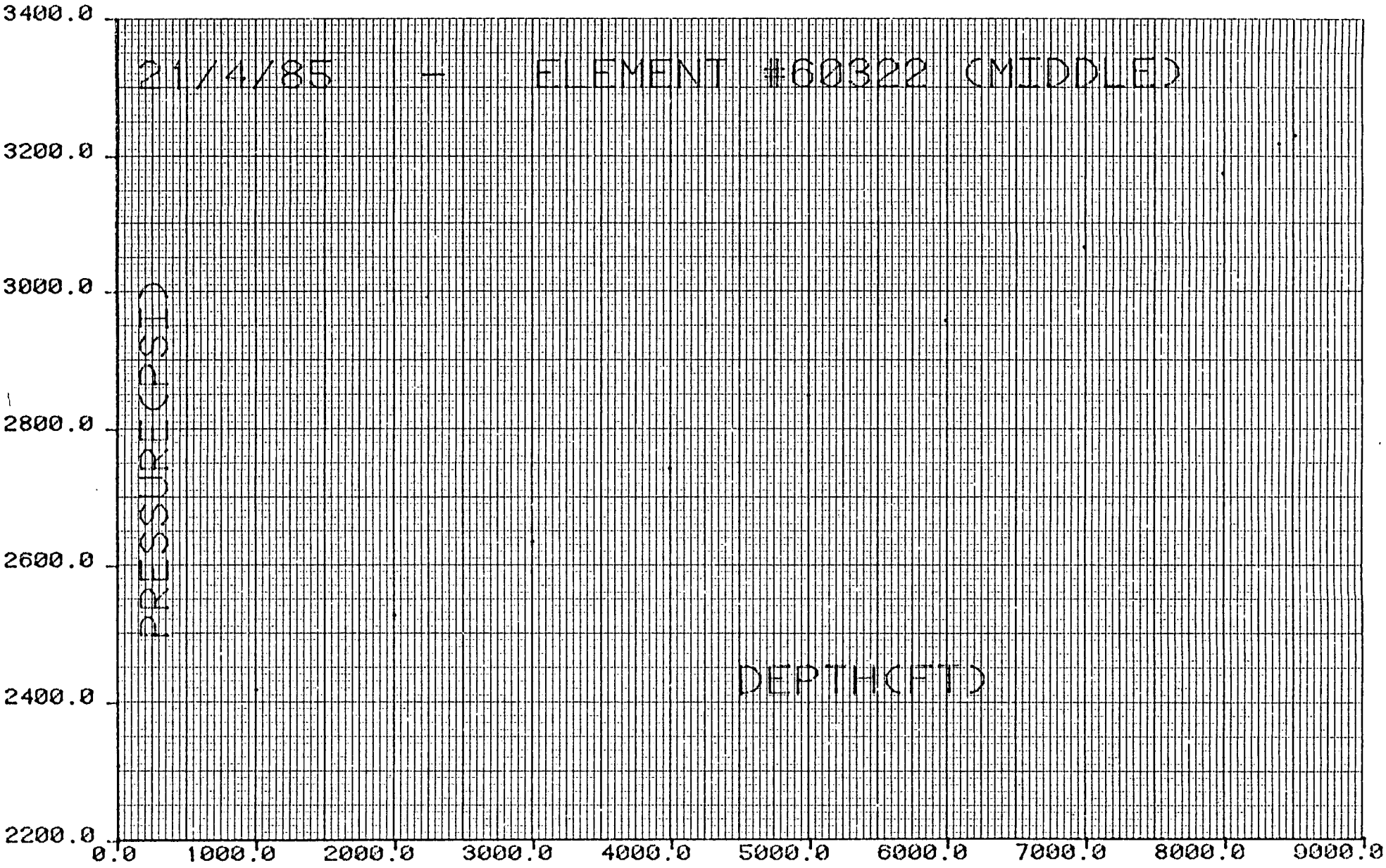
SURVEY DATA

CO. SANTOS — RUN 02 FIELD FLY LAKE — WELL 01U

TIME	DEPTH	P/T	GRAD	TIME	DEPTH	P/T	GRAD
14:31	0	2309.2	0.000	15:18	6000	2955.8	.108
14:35	1000	2419.3	.110	15:27	7000	3062.6	.107
14:44	2000	2527.0	.108	15:35	8000	3171.9	.109
14:52	3000	2634.7	.108	15:42	8400	3215.7	.109
15:00	4000	2742.6	.108	15:48	8520	3227.3	.097
15:09	5000	2847.9	.105	0:00	0	0.0	0.000

LUB IN DWT = 2308 PSIG / OUT = 2309 PSIG
UB IN AMERADA = 2309.2 PSIG / OUT = 2309.2 PSIG

FLY LAKE #1 UPPER - STATIC PRESSURE GRADIENT



000284

SANTOS LTD
39 GRENFELL ST
ADELAIDE

SUB-SURFACE TEMPERATURE SURVEY

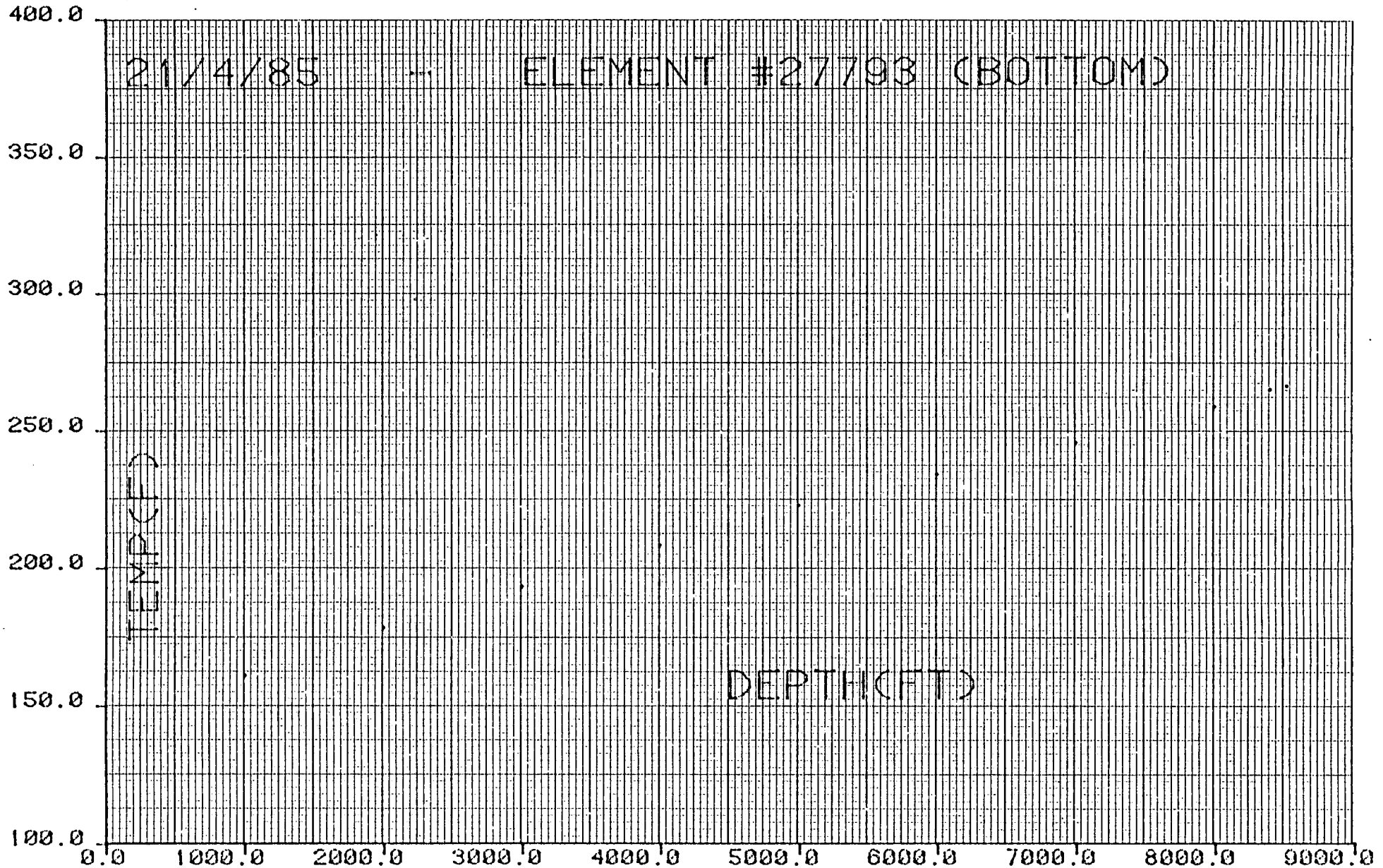
CO. SANTOS		RUN 03	FIELD FLY LAKE		WELL 01U
ELEV DEPTH		WELL STAT		TOOL HUNG	
CASING 7"	-	CASING PRESS		ON BOTTOM	21/4 1435
LINER	-	TUBING PRESS		OFF BOTTOM	21/4 1610
DATE	850421	ELEMENT RANGE	130 - 447	ZERO POINT	
ELEVATION		ZONE	PATCHAWARRA	SHUT-IN	
MAX TEMP		PICK-UP		ON-PROD	
PERF	8586'-9173'	CAL SER NO.	27793	MPP	
TUBING 2-3/8"	-				
UNITS	ENGLISH	PURPOSE	STATIC TEMP.	GRADIENT	

SURVEY DATA

CO. SANTOS RUN 03 FIELD FLY LAKE WELL 01U

TIME	DEPTH	P/T	GRAD	TIME	DEPTH	P/T	GRAD
14:40	1000	161.2	0.000	15:21	6000	234.0	.011
14:48	2000	178.8	.018	15:30	7000	245.8	.012
14:57	3000	193.6	.015	15:38	8000	258.8	.013
15:04	4000	208.7	.015	15:45	8400	265.0	.016
15:13	5000	222.8	.014	15:51	8520	266.3	.011

FLY LAKE #1 UPPER - STATIC TEMPERATURE GRADIENT



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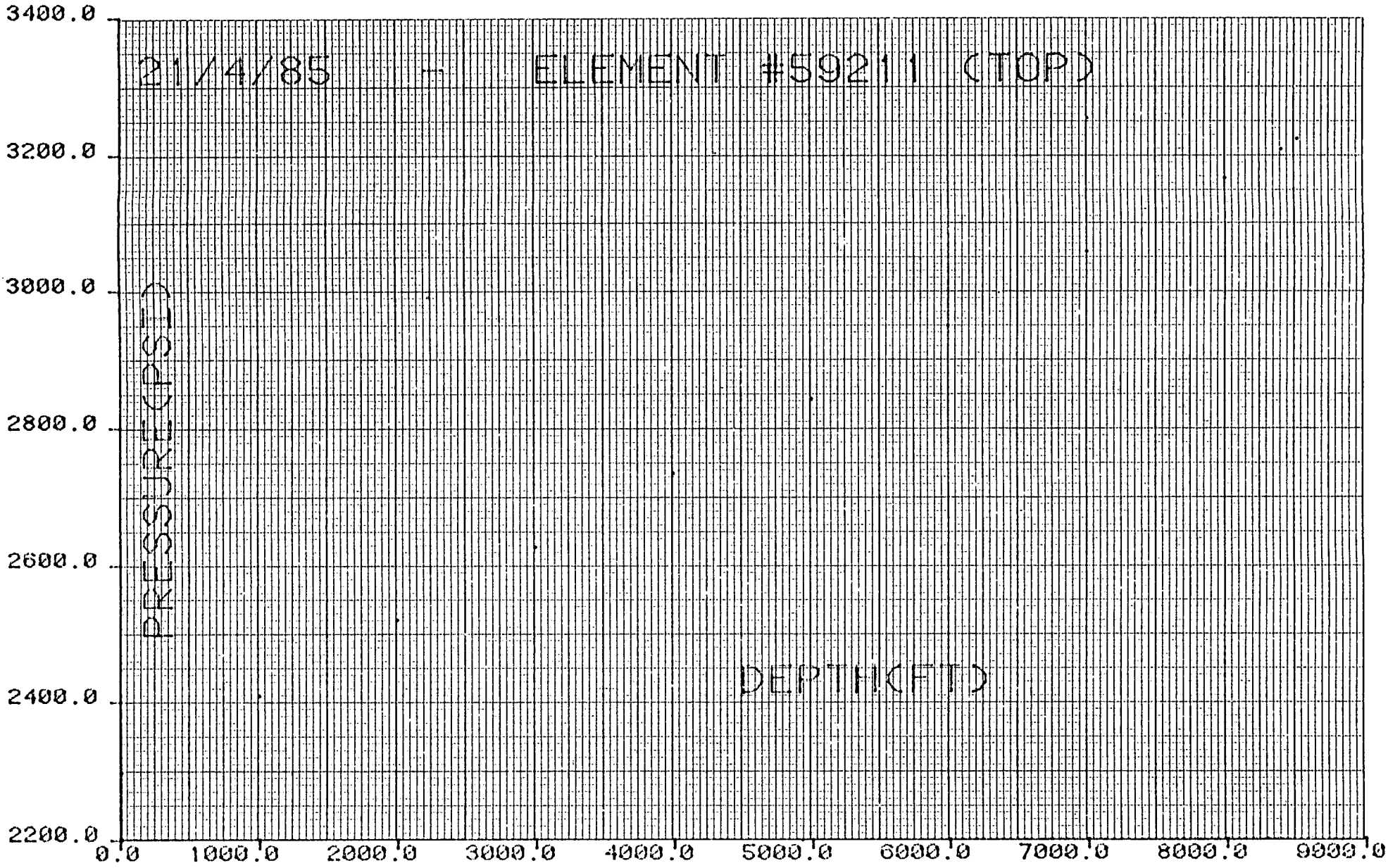
FLY LAKE #1 UPPER - STATIC PRESSURE GRADIENT



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APPENDIX III

Full Well Stream Composition

FLY LAKE #1U

RECOMBINATION

(Sampled 22/4/85)

At the time of sampling, 22/4/85, 2350 hours the well was flowing at the following rates:

Gas Rate = 6.396 MMscf/d
Condensate Rate = 210.0 BBLS/DAY
Water Rate = 10.0 BBLS/DAY

Shrinkage to Stock Tank Conditions

The HP liquid sample was released to atmospheric temperature and pressure yielding 186 millilitres of liquid and 7.2 litres of gas @ 13.6°C.

$$\therefore \text{7.2 litres of gas} = 7.2 \times \frac{35.31 \times 10^{-3}}{380} = 0.6690 \times 10^{-3} \text{ (lb-moles)}$$

$$\text{186 millilitres of liquid} = 186 \times \frac{35.31 \times 10^{-6}}{5.615} = 1.170 \times 10^{-3} \text{ (BBLS)}$$

Molecular weight of flash liquid = 110.65
SG of flash liquid = 0.759 @ 13.6°C

$$\therefore \text{Flash liquid lb-moles} = 186 \times 35.3 \times 10^{-6} \times \frac{0.759 \times 62.43}{110.65}$$

$$= 2.812 \times 10^{-3} \text{ lb moles}$$

$$\therefore \text{Total HP liquid lb-moles} = 0.6690 \times 10^{-3} + 2.812 \times 10^{-3}$$

$$= 3.481 \times 10^{-3} \text{ lb moles}$$

$$\frac{\text{HP lb-moles liquid}}{\text{S.T. BBL}} = \frac{3.481 \times 10^{-3}}{1.170 \times 10^{-3}} = 2.975 \ \frac{\text{lb moles}}{\text{STB}}$$

$\therefore$ Gas Rate $= \frac{6396 \times 10^3}{380} = 16832$ lb moles/day

Liquid Rate = 210.0 x 2.975 = 625 lb moles/day

Therefore total moles produced = 16832 + 625 = 17457 lb moles/day.

Component	Liquid (mole%)	Gas (mole %)	Ki
N_2	0.02	1.20	-
CO_2	4.05	27.85	
C_1	4.00	51.12	12.780
C_2	4.80	10.85	2.260
C_3	6.00	4.75	1.263
IC_4	2.10	0.79	0.376
NC_4	5.00	1.45	0.290
IC_5	3.35	0.45	0.134
NC_5	4.65	0.50	0.108
C_6	8.65	0.47	0.054
C_7	11.89	0.27	0.023
C_8+	45.49	0.30	0.007
	100.00	100.00	

The liquid and gas samples were checked for internal consistency using a log K vs Tc^2 plot (Figure 1) and were found to be valid.

Recombining the liquid and gas samples according to the produced molar ratio gives:-

Component	Liquid (mole%)	Gas (mole %)	FWS (mole %)
N_2	0.02	1.20	1.16
CO_2	4.05	27.85	27.00
C_1	4.00	51.12	49.43
C_2	4.80	10.85	10.63
C_3	6.00	4.75	4.79
IC_4	2.10	0.79	0.84
NC_4	5.00	1.45	1.58
IC_5	3.35	0.45	0.55
NC_5	4.65	0.50	0.65
C_6	8.65	0.47	0.76
C_7	11.89	0.27	0.69
C_8+	45.49	0.30	1.92
			100.00
Multiplication factor	0.03580	0.96420	

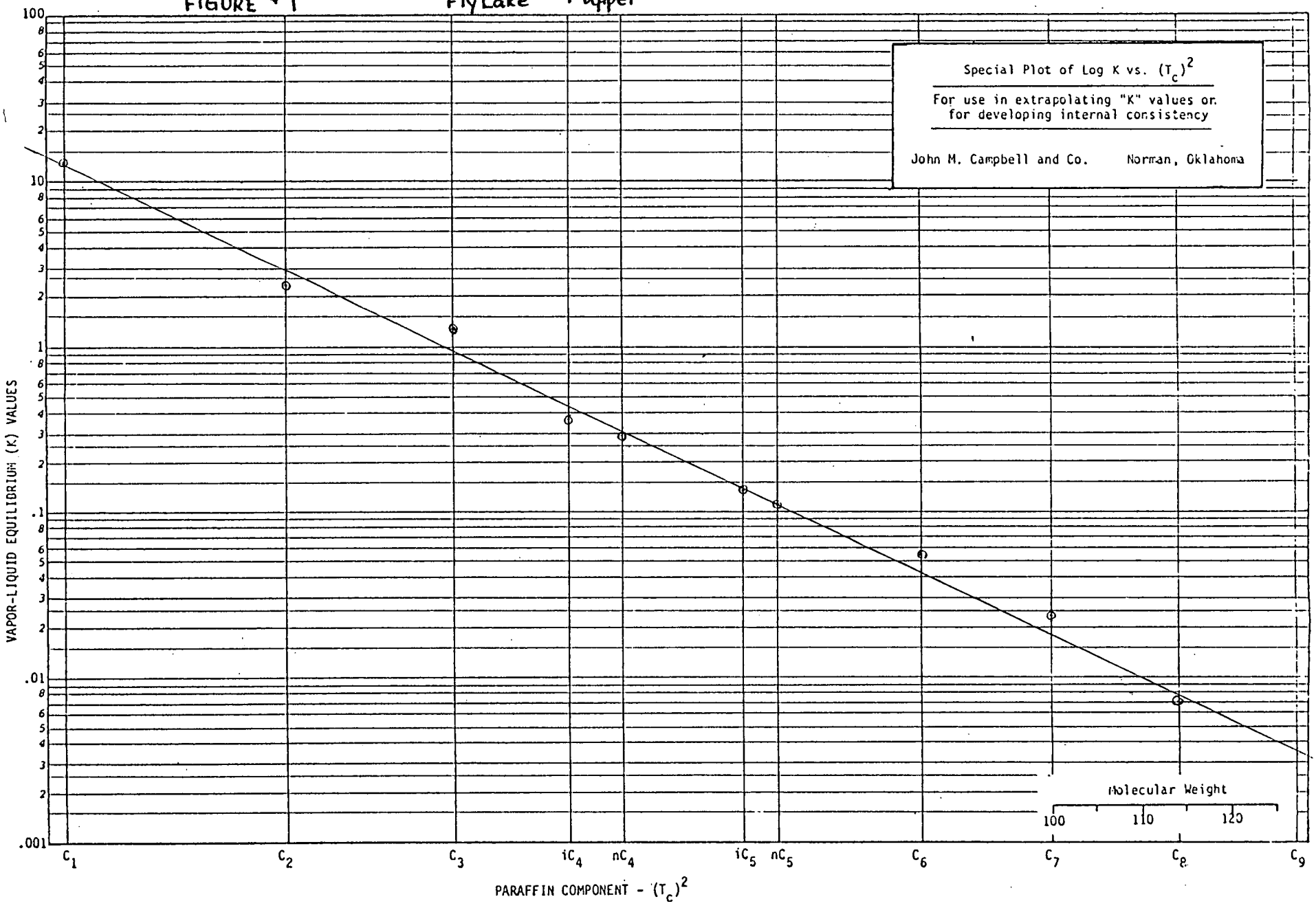

Figure 6.4 Example of Log K vs. T_c^2

000292

The Australian
Mineral Development
Laboratories

Flemington Street, Frewville,
South Australia 5063
Phone Adelaide (08) 79 1662
Telex AA82520

Please address all
correspondence to
P.O. Box 114 Eastwood
SA 5063
In reply quote:

amdel

6 June 1985

PS 3/520/0
PS 4486/85

Santos Limited
PO Box 2319
ADELAIDE SA 5001

Attention: Mr A. Wenk

REPORT P 4486/85

YOUR REFERENCE: 000195

IDENTIFICATION: FLY LAKE NO. 1 UPPER

MATERIAL: Gas condensate, HP condensate

DATE RECEIVED: 3 May 1985

WORK REQUIRED: Codes R1.1, R2.1, R2.2, R2.3, R2.5

Investigation and Report by: Andrew Koutrouzas

Chief - Petroleum Services Section: Dr Brian G. Steveson

Brian G Steveson.

for Dr William G. Spencer
Manager
Mineral and Materials Sciences Division

cc. Copy of F/Sheet to Accounts Payable Section

cap

Head Office:
Flemington Street, Frewville
South Australia 5063
Telephone (08) 79 1662
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Pilot Plant:
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Branch Laboratories:
Melbourne, Vic.
Telephone (03) 645 3093
Perth, W.A.
Telephone (09) 325 7311
Telex: Amdel AA94893
Sydney, N.S.W.
Telephone (02) 439 7735
Telex: Amdel AA20053
Townsville
Queensland 4814

AMDEL GAS ANALYSIS SERVICE

FLY LAKE NO.1 U
PATCHAWARRA FM. 8586-9173 FT.
430 PSI 115 DEG F.
22/4/85

GAS	MOL %
OXYGEN PLUS ARGON	<.01
NITROGEN	1.20
CARBON DIOXIDE	27.85
METHANE	51.05
ETHANE	10.85
PROPANE	4.75
I-BUTANE	0.79
N-BUTANE	1.45
I-PENTANE	0.45
N-PENTANE	0.50
HEXANE	0.47
HEPTANES	0.27
OCTANES AND HIGHER	0.30

(0= LESS THAN 0.01%)

CALCULATED GAS DENSITY
(AIR = 1): 1.00

CALORIFIC VALUE (15.6 DEG C, 760 MM HG):

GROSS: 995 BTU/CU.FT (37.07 MJ/CU.M)
NETT: 905 BTU/CU.FT (33.73 MJ/CU.M)

AVERAGE MOLECULAR WEIGHT = 29.2 G/MOLE

All results calculated on an air and water free basis

000295

AMDEL

LIQUID HYDROCARBON ANALYSIS

FLY LAKE NO.1
PATCHAWARRA FM.
430 PSI 115 DEG F.
22/04/85 2350 HRS.
-

BOILING POINT RANGE (DEG.C)	CARBON NUMBER	% BY WEIGHT	MOL %
-88.6	ETHANE	0.15	0.55
-42.1	PROPANE	1.05	2.65
-11.7	I-BUTANE	0.84	1.60
-0.5	N-BUTANE	2.30	4.40
27.9	I-PENTANE	2.35	3.60
36.1	N-PENTANE	3.35	5.15
36.1-68.9	C-6	8.00	10.30
80.0	BENZENE	0.00	0.00
68.9-98.3	C-7	13.10	14.50
100.9	METHYLCYCLOHEXANE	7.90	8.95
110.6	TOLUENE	2.75	3.30
98.3-125.6	C-8	12.75	12.40
136.1-144.4	ETHYLBENZ.+ XYLENES	3.70	3.85
125.6-150.6	C-9	9.70	8.40
150.6-173.9	C-10	9.25	7.20
173.9-196.1	C-11	5.60	3.95
196.1-215.0	C-12	3.60	2.35
215.0-235.0	C-13	3.10	1.85
235.0-252.2	C-14	2.35	1.30
252.2-270.6	C-15	2.10	1.10
270.6-287.8	C-16	1.40	0.69
287.8-302.8	C-17	0.96	0.44
302.8-317.2	C-18	0.92	0.40
317.2-330.0	C-19	0.63	0.26
330.0-344.4	C-20	0.49	0.19
344.4-357.2	C-21	0.42	0.16
357.2-369.4	C-22	0.36	0.13
369.4-380.0	C-23	0.29	0.10
380.0-391.1	C-24	0.20	0.07
391.1-401.7	C-25	0.16	0.05
401.7-412.2	C-26	0.09	0.03
412.2-422.2	C-27	0.06	0.02
>422.2	C-28 + HIGHER H'CARBONS	0.08	0.02

0 = LESS THAN 0.01%

THE ABOVE BOILING POINT RANGES REFER TO THE NORMAL PARAFFIN HYDROCARBON BOILING IN THAT RANGE.
AROMATICS, BRANCHED HYDROCARBONS, NAPHTHENES AND OLEFINS MAY HAVE HIGHER OR LOWER CARBON NUMBERS BUT ARE GROUPED AND REPORTED ACCORDING TO THEIR BOILING POINTS.

Average molecular weight of C-8 plus fraction (calc)= 133 gm/mol

Specific gravity of C-8 plus fraction (calc)= .829 at 15.6 deg.c)

PHYSICAL PROPERTIES

FLY LAKE NO.1
PATCHAWARRA FM.
430 PSI 115 DEG F.
22/04/85 2350 HRS

Kinematic viscosity = 0.817 centistokes (at 37.8 deg.c)

Pour point = -21 (deg.c)

B.S. & W. = TRACE %

Specific Gravity (15.6 deg.C)= 0.762

API Gravity (15.6 deg.C)= 54.2

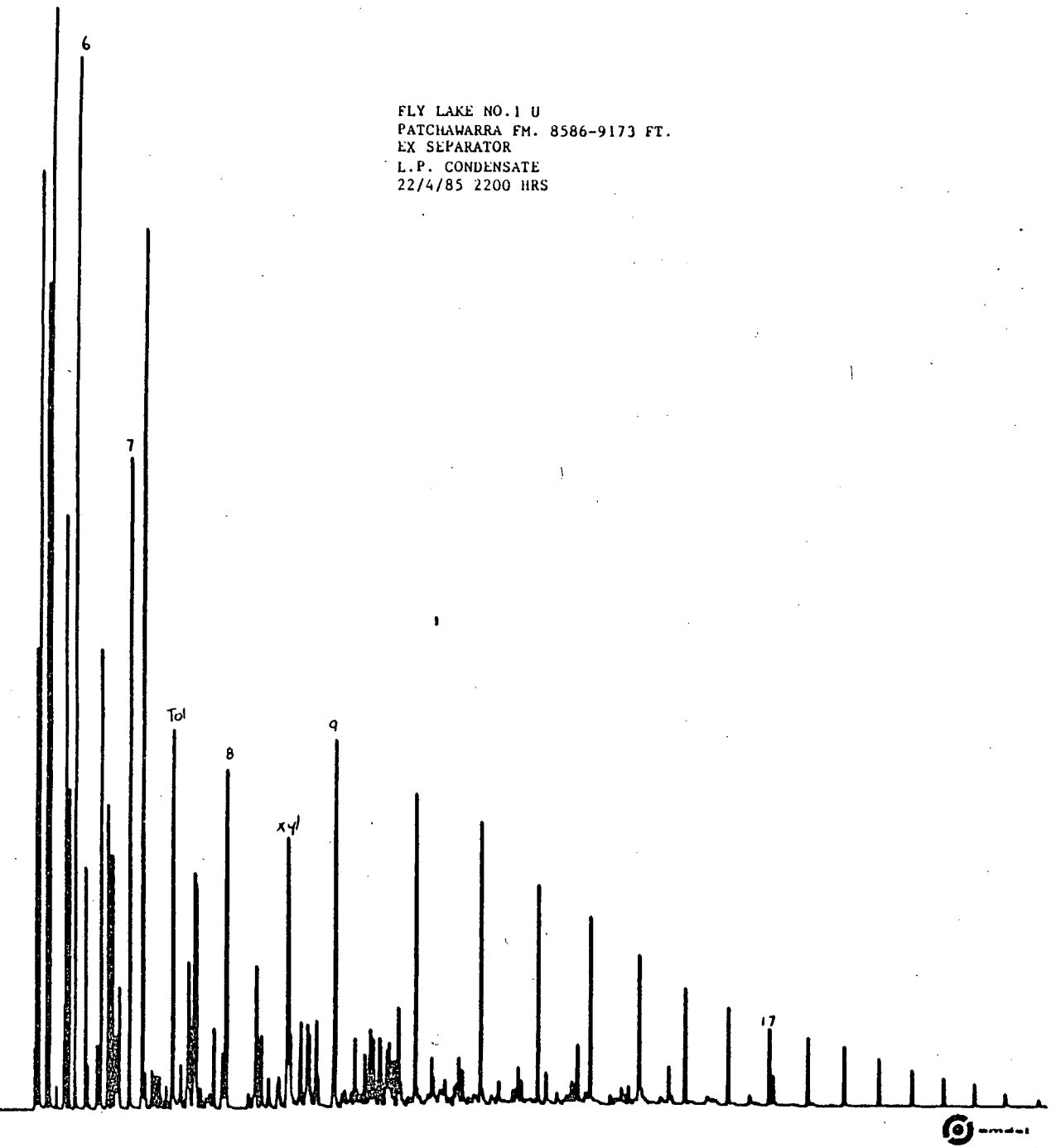
USBM DISTILLATION

boiling range (deg.c)	vol %	sum %	sp gr (15.6 deg)	corr index
RT-50	1.5	1.5	-----	----
50-100	16.0	17.5	0.702	15.5
100-150	34.5	52.0	0.752	21.6
150-200	17.0	69.0	0.787	24.6
200-250	8.5	77.5	0.810	24.6
250-300	8.0	85.5	0.835	27.5

initial boiling point = 44 deg.c
final boiling point = 300 deg.c

weight of distillate = 65.41 gms
weight of residue = 6.32 gms
loss = 3.1 gms
recovery = 95.9 %

FLY LAKE NO.1 U
PATCHAWARRA FM. 8586-9173 FT.
EX SEPARATOR
L.P. CONDENSATE
22/4/85 2200 HRS



000297

AMDEL HIGH PRESSURE LIQUID HYDROCARBON ANALYSIS

FLY LAKE NO.1 UPPER
PATCHAWARRA FM.
430 PSI 115 DEG F.
22/04/85 2350 HRS
-

The sample was released to air temperature and pressure by displacement with saturated brine solution to yield a flash gas and a liquid. The volume of each was measured, both fractions were then analysed chromatographically and the results combined mathematically to give an analysis of the sample as received.
The sample yielded 186 millilitres of liquid and 7.2 litres of gas at 13.6 degrees celsius.

FLASH GAS ANALYSIS

GAS	% MOL VOL
NITROGEN	0.12
CARBON DIOXIDE	21.10
METHANE	20.80
ETHANE	22.85
PROPANE	19.65
I-BUTANE	4.15
N-BUTANE	6.55
I-PENTANE	1.75
N-PENTANE	1.75
HEXANES	0.90
HEPTANES	0.31
OCTANES + HIGHER H'CARBONS	0.14

Calculated gas density (rel air = 1) = 1.318

Calorific value (15.6 deg.c, 760 mm Hg)

Gross = 1667 Btu/cu.ft (62.09 MJ/cu.m)
Nett = 1529 Btu/cu.ft (56.95 MJ/cu.m)

FLY LAKE NO.1 UPPER

LIQUID ANALYSIS

BOILING POINT RANGE (DEG.C)	CARBON NUMBER	M.W.	% BY WEIGHT	MOL %	
-88.6	ETHANE	30.07	0.13	0.48	
-42.1	PROPANE	44.10	1.10	2.70	
-11.7	I-BUTANE	58.12	0.86	1.65	
-0.5	N-BUTANE	58.12	2.45	4.65	
27.9	I-PENTANE	72.15	2.40	3.70	
36.1	N-PENTANE	72.15	3.50	5.35	
36.1-68.9	C-6	86.18	8.20	10.55	
80.0	BENZENE	78.11	0.29	0.42	
68.9-98.3	C-7	100.21	12.95	14.25	
100.9	METHYLCYCLOHEXANE		8.05	9.05	
110.6	TOLUENE		2.65	3.15	
98.3-125.6	C-8		12.65	12.25	
136.1-144.4	ETHYLBENZ.+ XYLENES		3.45	3.60	
125.6-150.6	C-9		10.10	8.70	
150.6-173.9	C-10		8.95	6.95	
173.9-196.1	C-11		4.85	3.40	
196.1-215.0	C-12		3.50	2.30	
215.0-235.0	C-13		3.05	1.80	
235.0-252.2	C-14		2.50	1.40	
252.2-270.6	C-15		1.90	0.99	
270.6-287.8	C-16		1.35	0.66	56.29
287.8-302.8	C-17		1.05	0.47	
302.8-317.2	C-18		1.05	0.45	
317.2-330.0	C-19		0.69	0.28	
330.0-344.4	C-20		0.55	0.21	
344.4-357.2	C-21		0.47	0.17	
357.2-369.4	C-22		0.33	0.12	
369.4-380.0	C-23		0.32	0.11	
380.0-391.1	C-24		0.26	0.09	
391.1-401.7	C-25		0.18	0.06	
401.7-412.2	C-26		0.15	0.04	
412.2-422.2	C-27		0.08	0.02	
>422.2	C-28 + HIGHER H'CARBONS		0.06	0.02	

0 = less than 0.01%

Total Mol. W = 110.65

THE ABOVE BOILING POINT RANGES REFER TO THE NORMAL PARAFFIN HYDROCARBON BOILING IN THAT RANGE. AROMATICS, BRANCHED HYDROCARBONS, NAPHTHENES AND OLEFINS MAY HAVE HIGHER OR LOWER CARBON NUMBERS BUT ARE GROUPED AND REPORTED ACCORDING TO THEIR BOILING POINTS.

Specific gravity = .759 (at 13.6 deg.c)
Specific gravity = .757 (at 15.6 deg.c)
API gravity = 55.4 (at 15.6 deg.c)
Specific gravity of C-8 plus fraction (calc.) = .825 at 15.6 deg.c
Ave. molecular weight of C-8 plus fraction (calc.) = 134 g/mole

FLY LAKE NO.1 UPPER

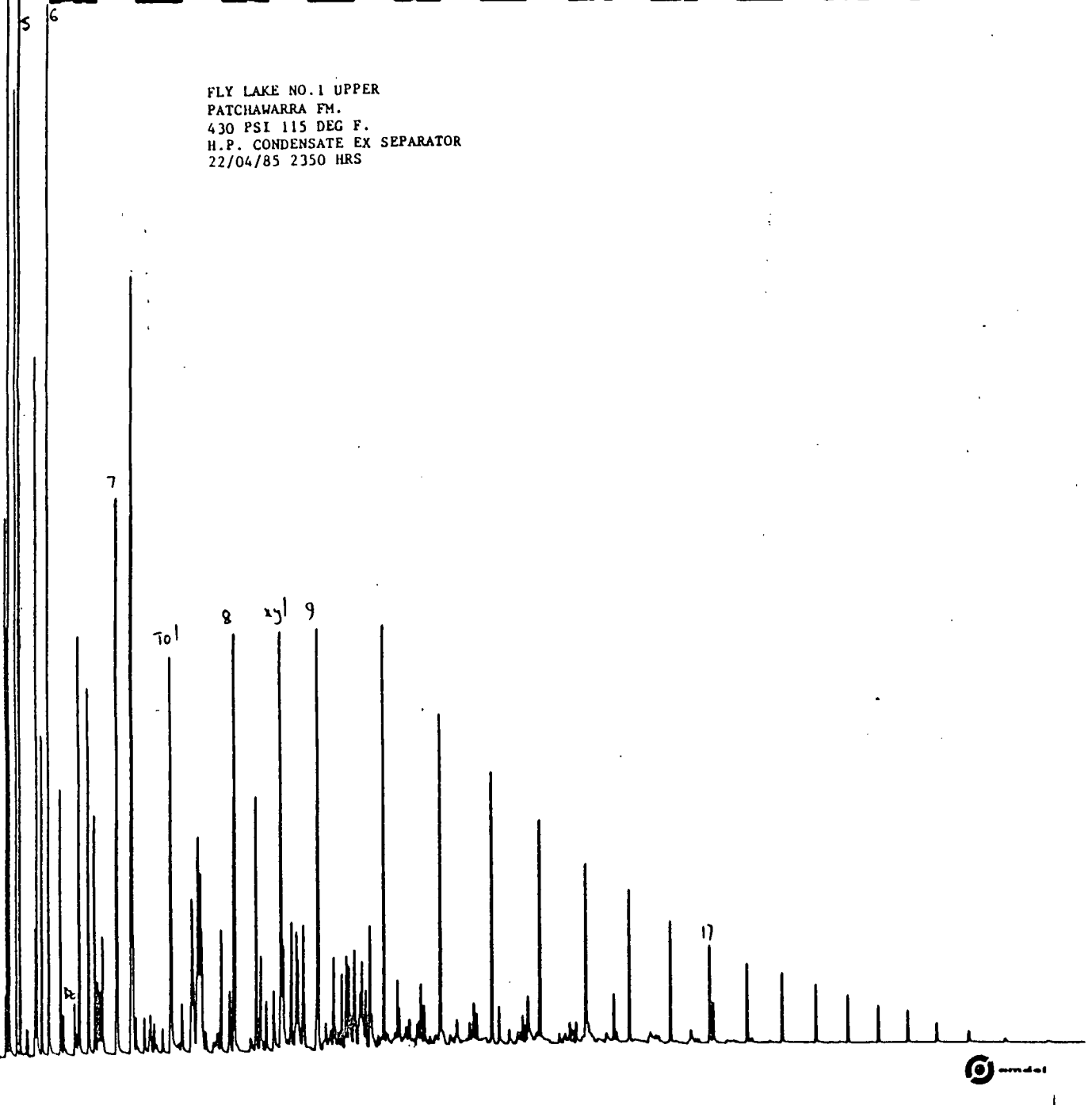
CALCULATED COMPOSITION OF TOTAL SAMPLE AS RECEIVED

BOILING POINT RANGE (DEG.C)	CARBON NUMBER	% BY WEIGHT	MOL %	
-195.8	NITROGEN	0.01	0.02	
-78.5	CARBON DIOXIDE	1.85	4.05	
-164	METHANE	0.67	4.00	
-88.6	ETHANE	1.50	4.80	
-42.1	PROPANE	2.75	6.00	
-11.7	I-BUTANE	1.30	2.10	
-0.5	N-BUTANE	3.00	5.00	
27.9	I-PENTANE	2.50	3.35	
36.1	N-PENTANE	3.50	4.65	
36.1-68.9	C-6	7.75	8.65	
80.0	BENZENE	0.27	0.34	11.99
68.9-98.3	C-7	12.00	11.55	
100.9	METHYLCYCLOHEXANE	7.40	7.30	
110.6	TOLUENE	2.45	2.55	
98.3-125.6	C-8	11.75	9.90	
136.1-144.4	ETHYLBENZ.+ XYLENES	3.20	2.90	
125.6-150.6	C-9	9.30	7.00	
150.6-173.9	C-10	8.25	5.60	
173.9-196.1	C-11	4.50	2.75	
196.1-215.0	C-12	3.25	1.85	
215.0-235.0	C-13	2.80	1.45	
235.0-252.2	C-14	2.30	1.10	
252.2-270.6	C-15	1.75	0.80	
270.6-287.8	C-16	1.25	0.53	
287.8-302.8	C-17	0.95	0.38	45.28
302.8-317.2	C-18	0.95	0.36	
317.2-330.0	C-19	0.64	0.23	
330.0-344.4	C-20	0.50	0.17	
344.4-357.2	C-21	0.43	0.14	
357.2-369.4	C-22	0.30	0.09	
369.4-380.0	C-23	0.29	0.09	
380.0-391.1	C-24	0.24	0.07	
391.1-401.7	C-25	0.16	0.04	
401.7-412.2	C-26	0.13	0.04	
412.2-422.2	C-27	0.08	0.02	
>422.2	C-28 + HIGHER H'CARBONS	0.05	0.01	

0 = less than 0.01%

THE ABOVE BOILING POINT RANGES REFER TO THE NORMAL PARAFFIN HYDROCARBON BOILING IN THAT RANGE.
AROMATICS, BRANCHED HYDROCARBONS, NAPHTHENES AND OLEFINS MAY HAVE HIGHER OR LOWER CARBON NUMBERS BUT ARE GROUPED AND REPORTED ACCORDING TO THEIR BOILING POINTS.

FLY LAKE NO.1 UPPER
PATCHAWARRA FM.
430 PSI 115 DEG F.
H.P. CONDENSATE EX SEPARATOR
22/04/85 2350 HRS



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R37 000302

WIRELINE REPORT

WELL: FLY LAKE # 1 LOWER

DATE: 12TH APRIL 1986

PROGRAM: PATCHAWARRA CENTRAL PRODUCTION TEST

PURPOSE OF WORK: BLIND BOX RUN

REPORT OF WORK PERFORMED:

ARRIVE ON LOCATION AND RIG UP: 082
WIRELINE UNIT AND LUBRICATOR.

13:30 PRESSURE TEST SWAB VALVE AND B.O.P.

14:00 RUN IN HOLE WITH 1.75" BLIND BOX

14:30 TAG BOTTOM @ 9426' KB PULL OUT OF HOLE

15:00 IN LUBRICATOR SECURE WELL FOR FLOW

G. O Chapman

OPERATOR'S SIGNATURE PK

WORK PERFORMED BY: T. CHAPMAN, T. RODDA OF EXPERTEST

RECEIVED
21 APR 1986
DEPT. OF MINES AND ENERGY SECURITY

WELL DATA:

Tubing Size: 2 7/8" FWHP: 781 psi SIWHP:

Sub Surface S.V./Landing Nipple @ S.S.D. @: 9212

"X" Nipple @ 9241' "N"/"[redacted]" Nipple @ 241' APROX other SSV 242' APROX

Min I.D. 1.875" " @ 9241' Packer @ 9213'

Perforated Interval: BASAL PATCHAWARRA s - 9297' - 9311, TIRRAWARRA 9335' - 9385'

Forward to: Petroleum Engineering — Adelaide
Production Department — Moomba

G009

000303

WIRELINE REPORT

WELL: FLY LAKE #1 LOWER

DATE: 13TH APRIL 1986

PROGRAM: PATCHAWARRA CENTRAL PRODUCTION TEST

PURPOSE OF WORK: FLOWING GRADIENT

REPORT OF WORK PERFORMED:

HAVING ACHIEVED STABLE G.O.R. PREPARE TO RUN GRADIENT.

45 RUN IN HOLE WITH TANDUM 5000 psi PRESSURE ELEMENTS TO A MAXIMUM DEPTH OF 9316' KB AS PER PROGRAM

1 OFF BOTTOM PULL OUT OF HOLE.

0 IN LUBRICATOR.

15 DEPRESSURE LUBRICATOR BOTH CHARTS GOOD.

HAND WELL BACK TO PRODUCTION

OPERATOR'S SIGNATURE

WORK PERFORMED BY: T. CHAPMAN, T. RODDA OF EXPERTEST

RECEIVED
21 APR 1986
DEPT. OF MINES AND ENERGY
SECURITY

WELL DATA:

Tubing Size: 2 7/8" FWHP: 554 p.s.i SIWHP:

Sub Surface S.V./Landing Nipple @ S.S.D. @: 9212', 9181'

"X" Nipple @ 9241' "N"/"[illegible]" Nipple @ 241' APROX other SSV 242 APROX

Min I.D. 1.875" " @ 9241' Packer @ 9213'

Perforated Interval: PATCHAWARRA - 9297' - 9311', TIRRAWARRA - 9335' - 9385'

Forward to: **Petroleum Engineering — Adelaide**
Production Department — Moomba

G009

000304

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

** FLYLAKE 1L **

FLOWING PRESSURE GRADIENT

TEST DATE: 13.04.86

	TOP PRESSURE ELEMENT 15451/5650			BOTTOM PRESSURE ELEMENT 15452/5700		
DEPTH (FT.)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)
LUB	0.1920	554.9	----	0.1910	559.4	----
1000	0.2180	629.4	0.0744	0.2155	629.9	0.0704
2000	0.2495	719.5	0.0901	0.2475	721.8	0.0920
3000	0.2830	815.2	0.0958	0.2800	815.2	0.0934
4000	0.3195	919.5	0.1042	0.3160	918.6	0.1034
5000	0.3555	1022.2	0.1028	0.3515	1020.5	0.1019
6000	0.3970	1140.6	0.1184	0.3925	1138.2	0.1177
7000	0.4405	1264.6	0.1240	0.4350	1260.2	0.1220
8000	0.4880	1400.0	0.1354	0.4820	1395.1	0.1349
9000	0.5360	1536.7	0.1367	0.5305	1534.3	0.1392
9316	0.5515	1580.9	0.1397	0.5440	1578.8	0.1408
LUB	0.1910	552.1	----	0.1880	550.8	----

NERAL REMARKS:
OW RATES : GAS = 0.53 MMSCFD OIL = 144.9 BBLS/DAY H2O = 32.6 BBLS/DAY
OKE SIZE = 18/64"

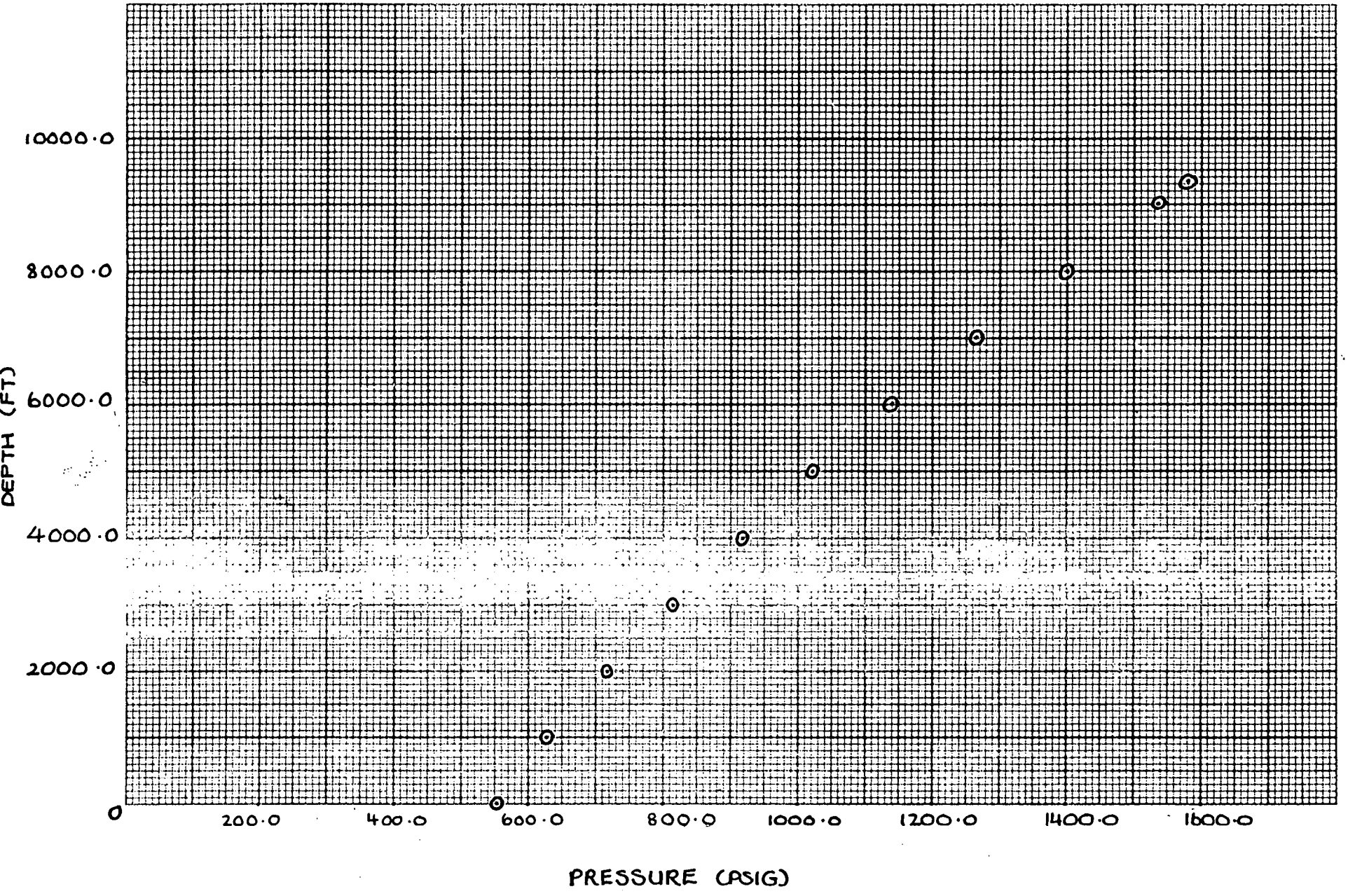
DWT IN: 554
DWT OUT: 550
MAX BHT: 275

ELEMENT 15451/5650 CALIBRATED 27.3.86
ELEMENT 15452/5700 CALIBRATED 27.3.86

RECEIVED
21 APR 1986
DEPT. OF MINES AND ENERGY SECURITY

FLY LAKE # 1L - FLOWING PRESSURE GRADIENT - 13/4/86

ELEMENT # 15451/5650 (TOP)



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Fm 5030

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE
TELEPHONE (08) 354 0488 TELEX AA87183
139 WEST BEACH ROAD MARLESTON SA 5033 POSTAL ADDRESS PO BOX 354 COWANDILLA 5033

SANTOS

FLOWING
STATIC GRADIENT SURVEY

4 LAKE #1 LOWER

OPERATOR T. CHAPMAN.

DATE 13/4/86

BOMB No. 1 DATA

No. 15451 ELEMENT RANGE 5650 psi
R No 12961 x 15 CLOCK DATA A-16080 x 3 HR.
TYLUS 15:15 DISENGAGE 18:00
LUBRICATOR 15:30

BOMB No 2 DATA

ELEMENT No. 15452 ELEMENT RANGE 5700 psi
RECORDER No 12959 CLOCK DATA 2533 x 3 HR.
ENGAGE STYLUS 15:15 DISENGAGE 18:00
BLEED LUBRICATOR 17:45

DWT IN 554 psi
DWT OUT 550 psi

TIME	DEPTH'	DEFLEC-TION	PRESSURE TEMP.	GRADIENT psi/ft	DEPTH'	DEFLEC-TION	PRESSURE TEMP.	GRADIENT psi/ft	STOP LENGTH.	REMARKS
15:30	0	.192	554.9	—	0	.191	559.4	—	15 min	MBHT - 275°F
15:48	1000	.218	629.4	0.0744	1000	.2155	629.9	0.0704	4 min	
15:54	2000	.2495	719.5	0.0901	2000	.2475	721.8	0.0920	4 min	PERFS - 9297'-9311'
16:00	3000	.283	815.2	0.0958	3000	.280	815.2	0.0934	4 min	+ 9335-9385
16:06	4000	.3195	919.5	0.1042	4000	.316	918.6	0.1034	4 min	TIRRAWARRA ZONE.
16:12	5000	.3555	1022.2	0.1028	5000	.3515	1020.5	0.1019	4 min	
16:18	6000	.397	1140.6	0.1184	6000	.8925	1138.2	0.1177	4 min	
16:24	7000	.4405	1264.6	0.1240	7000	.435	1260.2	0.1220	4 min	
16:31	8000	.488	1400.0	0.1354	8000	.482	1395.1	0.1349	4 min	
16:41	9000	.536	1536.7	0.1367	9000	.5305	1534.3	0.1392	4 min	
16:46	9316	.5515	1580.9	0.1397	9316	.546	1578.8	0.1408	15 mn	
17:30	0	.191	552.1	—	0	.188	550.8	—	15 min	

MARKS:

000306

WELL: FLY LAKE # 1 LOWER

TYPE OF TEST: PRODUCTION TEST

SANTOS LTD.
WELL TEST DATA SHEET

DATE: 12TH APRIL 1986

PAGE No: ONE

DATE / TIME	WELLHEAD					GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS				
															GAS	OIL	WATER	TOTAL LIQUID	G.O.R.
	CASING PSI	TUBING PSI	TEMP. °F	CHOKE SIZE INS.	B.S.W. %	PI PSI	HW INS.H_2O	TEMP. °F	ORIFICE SIZE INS.	TANK DIP INS.	TANK PROD BBLS	API GRAVITY @60 °F	TANK DIP INS.	TANK PROD BBLS	FLOW RATE MMSCFD	FLOW RATE BBLS/DAY	FLOW RATE BBLS/DAY	FLOW RATE BBLS/DAY	SCF/BBL
						PATCHAWARRA CENTRAL - PRODUCTION TEST													
12TH APRIL 1986						WELL ON LINE TO SATELLITE													
1544	15	781		18/64		PRESSURE TEST LINES TO SEPERATOR.													
1545	15	644	136	18/64		OPEN WELL ON BYPASS TO FLARE PIT													
1555	15	666	135	18/64		DIVERT FLOW THROUGH SEPERATOR - START TO ESTABLISH LEVELS													
1600	15	580	129	18/64		INCERT 1.5" ORIFICE PLATE INTO GAS FLOW													
1610	15	580	129	18/64		CHANGE PLATE TO 1.750"													
1630	15	625	131	18/64		FLUID LEVELS ESTABLISHED										START TEST			
										.5	TARE		4.5	TARE DIP					
1830	15	594	127	18/64	NA	98	18	113	1.750	12	19.3	47.5	6.5	3.4	.713	231.6	40.8	272.4	3079
2030	15	597	126	18/64	NA	98	13	111	1.750	20.5	14.3		8	2.5	.607	171.1	30.2	201.3	3548
2230	15	566	127	18/64	NA	97	11	111	1.750	30.5	16.8		9.5	2.5	.557	201.6	30.2	231.8	2763
13TH APRIL 1986																			
0230	15	568	127	18/64	NA	97	10	109	1.750	46	27		11	2.5	.532	156	15.1	171.1	3410
0630	15	558	126	18/64	NA	96	10	108	1.750	63.5	29.3	48.4	12.5	2.5	.529	176	15.1	196.1	3005
0630	TEST TOTALS AFTER 14 HRS FLOW = OIL - 106.7, WATER - 13.4, GAS - .342																		
1030	15	561	127	18/64	NA	100	10	113	1.750	80	27.7	49.3	15	4.2	.537	166	25.2	191.2	3235
1430	15	557	131	18/64	NA	103	10	118	1.750	95	25.2	50.2	18	5.0	.542	150.9	30.2	181.1	3592
																			CONT..

OPERATOR: [signature]

000307

WELL: FLY LAKE #1 LOWER

TYPE OF TEST: PRODUCTION TEST

SANTOS LTD.
WELL TEST DATA SHEET

DATE: 13TH APRIL 1986

PAGE No: TWO

DATE / TIME	WELLHEAD					GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS				
															GAS	OIL	WATER	TOTAL LIQUID	G.O.R.
	CASING PSI	TUBING PSI	TEMP. °F	CHOKE SIZE INS.	B.S.W. %	Pf PSI	HW INS.H_2O	TEMP. °F	ORIFICE SIZE INS.	TANK DIP INS.	TANK PROD BBLS	API GRAVITY @60 °F	TANK DIP INS.	TANK PROD BBLS	FLOW RATE MMSCFD	FLOW RATE BBLS/DAY	FLOW RATE BBLS/DAY	FLOW RATE BBLS/DAY	SCF/BBL
13TH	APRIL		1986			ACHIEVED	STABLE			G.O.R - START FLOWING GRADIENT									
1530	15	554	131	18/64	NA	PRESSURE UP LUBRICATOR													
1545	15	553	131	18/64	NA	RUN IN HOLE WITH PRESSURE ELEMENTS													
1700	15	557	131	18/64	NA	RECORDERS AT MPP - 9316' KB													
1700	"	"	"	"	"	100	10	126	1.750	104	15.1	50.1	20	3.4	.530	144.9	50.6	195.5	3658
1700	COLLECT PRESSURISED SAMPLES :- OIL											500 cc		B-126	(1)				
											GAS	500 cc		-083	(1)				
1730	15	550	131	18/64	NA	RECORDERS AT SURFACE - GRADIENT COMPLEATED.													
1730	"	"	"	"	"	100	10	126	1.750						.530				
1730	COLLECT PRESSURISED SAMPLES :- OIL											500 cc		ADL-0-007	(2)				
											GAS	500 cc		116			(2)		
1830	15	555	133	18/64	NA	100	10	113	1.750	110.5	10.9	50.2	20.5	.8	.537	174.4	13.4	187.8	3079
1831	SHUT IN WELL													END OF TEST					
	TEST TOTALS :- OIL - 185.6 Bbls																		
	WATER - 26.8 Bbls. GOR = 3290 scf/stb.																		
	GAS - .610 mmscf																		
	FLOW HOURS - 26																		

OPERATOR: To Clay

000308

WELL [illegible]

TANK:— CAPACITY 356 Bbls
SCALE 1:677 Bbls / IN

SANTOS LTD
FLUID PRODUCTION SHEET

DATE 12TH APRIL 1986
PAGE No. ONE
OPERATOR T. CHAPMAN

DATE / TIME	CUM. TIME	OIL/CONDENSATE PRODUCTION					WATER PRODUCTION					REMARKS
		TANK DIP INS	TANK PROD. BBLS	FLOWRATE BBLS/D	CUM. PROD. BBLS	OIL CONDENSATE GRAVITY °API60F°	TANK DIP INS	TANK PROD. BBLS	FLOWRATE BBLS/D	CUM. PROD. BBLS	SALINITY PPM	
12TH	APRIL 1986				PAT CHAWARRA CENTRAL PROD. TEST.							
16:30	0	.5	TARE	DIP			4.5	TARE	DIP.			
18:30	2	12	19.3	231.6	19.3	47.5	6.5	3.4	40.8	3.4		
20:30	4	20.5	14.3	171.1	33.6		8	2.5	30.2	5.9		
22:30	6	30.5	16.8	201.6	50.4		9.5	2.5	30.2	8.4		
13TH	APRIL 1986											
02:30	10.	46	27	156	77.4		11	2.5	15.1	10.9		
06:30	14	63.5	29.3	176.1	106.7	48.4	12.5	2.5	15.1	13.4		
10:30	18	80	27.7	166	134.4	49.3	15	4.2	25.2	17.6		
14:30	22	95	25.2	150.9	159.6	50.2	18	5.0	30.2	22.6		
17:00	24.5	104	15.1	144.9	174.7	50.1	20	3.4	50.6	26		
18:30	26	110.5	10.9	174.4	185.6	50.2	20.5	.838	13.4	26.8		
					111 bopd.		SHUT IN WELL			END	OF TEST	

000309

CLIENT ... SANTOS

WELL FAY LAKE # 1 LOWER

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

Date 12TH APRIL 1986 Page No. ONE

Operator ... TIM CHAPMAN

Orifice Fitting Type ... DANIEL
Gas Flow Recorder Type ... FOXBORO
Date of Last Calibration ... 5/4/86

Orifice Fitting Size ... 3.068"
Pressure Range ... 0 - 200 PSI
Differential Range ... 0 - 100 INCHES

Gas Specific Gravity ... .9490
Perforated Interval. 9297-9311, 9335-9385
Formation Tested PATCHAWARRA/TIRRAWARRA

Base Conditions = 14.73psi @60°F
☒ Flange Taps ☐ Pipe Taps

TIME DATA		Choke Size 64ths Inch	METER RUN DATA				$\sqrt{Pf \times Hw}$	C' = Fu x Fb x Fg x Ftf x Fpv x Y2							Flow Rate $Q = C' \times \sqrt{Pf \times Hw}$
Date / Time	Elapsed Time Hours		(Pf) Press P.S.I.A.	Diff (Hw) Inches Water	Temp. °F	Plate Size Inches		Fu	Fb	Fg	Ftf	Fpv	Y2	C'	
12TH	APRIL		1986			PATCHAWARRA CENTRAL		PRODUCTION TEST.							
16:30	0	18/64	START TEST												
18:30	2	18/64	113	18	113	1.750	45.1	24	663.42	1.0265	.9526	1.014	1.0012	15806.2	.713
20:30	4	18/64	113	13	111	1.750	38.3	24	663.42	1.0265	.9543	1.016	1.0006	15856.2	.607
22:30	6	18/64	112	11	111	1.750	35.1	24	663.42	1.0265	.9543	1.016	1.0006	15856.2	.557
13TH	APRIL		1986												
02:30	10	18/64	112	10	109	1.750	33.5	24	663.42	1.0265	.9560	1.015	1.0006	15868.8	.532
06:30	14	18/64	111	10	108	1.750	33.3	24	663.42	1.0265	.9568	1.015	1.0006	15882.1	.529
10:30	18	18/64	115	10	113	1.750	33.9	24	663.42	1.0265	.9526	1.016	1.0006	15827.9	.537
14:30	22	18/64	118	10	118	1.750	34.4	24	663.42	1.0265	.9485	1.016	1.0006	15759.8	.542
17:00	24.5	18/64	115	10	126	1.750	33.9	24	663.42	1.0265	.9420	1.014	1.0006	15621.0	.530
18:30	26	18/64	115	10	113	1.750	33.9	24	663.42	1.0265	.9526	1.016	1.0006	15827.9	.537
										SHUT IN WELL			END OF TEST		

E11

000310

WELL TEST DATA SHEET

R38

000310A

WELL: FLY LAKE #1

OPERATOR: WAYNE BUDDLE

DATE (Start Test): 16-4-86

METER RUN I.D.: 97.18/~~102.26~~ mm

TEST SEPARATOR: 200AF FLY LAKE

ORIFICE PLATE: 15.875 mm

TEST LINE: N/A

FLOW COMPUTER CONSTANT: 07770

TO START TEST: TIME PIG LAUNCHED: N/A TIME RECEIVED: N/A

TO END TEST: TIME PIG LAUNCHED: N/A TIME RECEIVED: N/A

	WELLHEAD		SATELLITE DATA								
				LIQUIDS			GAS				
				NOA							
TIME	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
1430	4000	18	N/A	0	0	0	3100	12.5	26		
0750	4100	18	N/A	26.71	0	1.29	3100	12.5	19		
1430	4000	18	N/A	37.31	0	1.86	3000	15	27		
				74.61							
(A) 24 hr	TOTALS (final minus initial)			(B) OIL 37.31	(C) 0	(D) + 1.86	= TOTAL WATER		(E) 3.54 ~~1.86~~		(F) GAS

COMMENTS: CHART DRIVE Stopped At Approximately 0800 for 5 hours. Otherwise test progressed smoothly.

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

Temp: 24
Stat: 3000
Diff: 13.67
Ext: 4249

STF: .783

(1) STOCK TANK OIL ..... 29.21 ..... m³/d

(2) GAS RATE ..... 8.64 ..... x 10³ m³/d

(3) G.O.R. ..... 295.8 ..... m³/m³

(4) WATER RATE ..... 1.77 ..... m³/d

(5) WATER CUT ..... 5.7 ..... %

WHITE: Original to: ADELAIDE PRODUCTION ENGINEERING
YELLOW: 1st Copy to: MOOMBA PRODUCTION DEPARTMENT
OLD GOLD: 2nd Copy to: FIELD SATELLITE OFFICE
PINK: 3rd Copy to: MOOMBA PETROLEUM ENGINEERING

R39

000311

PATCHAWARRA CENTRAL

PRODUCTION TESTING

WP2276G

Objective: To carry out production tests on a number of Patchawarra Central oil wells so that accurate production rates, GOR's and water cuts may be determined. These production tests will be combined with a flowing gradient survey so that bottomhole producing conditions can be quantified.

Wells to be Tested:
Brolga #2L (to be done last)
Tirrawarra #9L, #16L
Fly Lake #1L, #2L, #6L
Moorari #1, #4L, #5L, #6, #7
Woolkina #1

Wellhead Equipment: See attached diagrams

Downhole Equipment: See attached diagrams

Reservoir Pressure: 4000 psi approx.

Reservoir Temperature: 290°F approx.

Contact Personnel: A.D.G. Wenk

Cost Codes: Wireline and well testing:

605/3910/813/030	Tirrawarra
605/3934/813/030	Woolkina
605/3911/813/939	Moorari
605/3912/813/030	Fly Lake
605/3913/813/030	Brolga

RECEIVED
9 JAN 1986
DEPT. OF MINES AND ENERGY SECURITY

Equipment Requirements.

1. Swab valve, wing valve, choke, flow lines, chicksans, stakes, gin pole, separator, gas flare line and 1 frac tank.

2. Caravan and generator, light stands, provisions and fire extinguishers.

3. Wireline unit with the following tools:

   2 x 0-5000 psig pressure elements.
   1 x 120° - 400°F temperature element and one maximum recording thermometer.
   3 x 3 hour clocks.
   Lubricator BOP's, stems, crossovers and associated equipment.

4. Well test associated equipment.

   24 hour recorder to continuously monitor wellhead pressure (0-3000 psig).
   Deadweight pressure tester to monitor wellhead pressure.
   Wellhead thermometers.
   Tank tapes and water finding paste.
   Centrifuge and emulsion breaker.
   Hydrometers.
   24 hour recorder for measurement of gas flow at the separator (differential range 0 - 100").
   Orifice plates for accurate measurement of gas flow at the separator meter run.
   Chart reader for Amerada charts.

PROCEDURE

A. Rigging up Surface Equipment

1. Have a dozer cut a level tank location and build a flare pit if there is not one on site.

2. Rig up wing valve, choke, flowlines, separator, flare lines and frac tank. Ensure flow lines are securely staked down and that the chicksan is chained to the bradenhead.

NOTE: Flow into the tank should be from the top so that a constant head is maintained against the separator. Piping from the tank should allow flow to the burn pit and a loading point for tanker trucks.

3. Pressure test all lines to inlet gate valve of separator to full SIWHP.

4. Rig up caravan and generator.

B. Preliminary

1. Rig up B.O.P.'s, swab valve and lubricator. Check BOP's and pressure test lubricator to full SIWHP.

2. R.I.H. with 1.75" blindbox. Tag PBTD, POH.

See Table I for nipple depths and min. I.D.

C. Flow Test

1. Flow the well through the separator at a FWHP as indicated in Table II. During this flow period, record tubing and annulus pressure (DWT), wellhead temperature, gas flow rate, stock tank oil flow rate, API gravity and BS&W every 2 hours for the first 6 hours and every 4 hours thereafter until the end of the flow period.

2. After 12 hours of stabilized flow, (ie constant GOR) or 36 hours flow, whichever is least, rig up tandem pressure elements (0 - 5000 psi) and one temperature element (120 - 400°F) coupled to 3 hour clocks and zero on bottom bomb. Function check BOP's and pressure test lubricator to full FWHP. Hang in lubricator for 15 minutes and take a DWT reading.

3. RIH and stop at the depths indicated in Table III for 5 minutes at each depth except at MPP. Hang here for 15 minutes.

4. POH and hang in lubricator for 15 minutes. Take a DWT reading.

5. Check the amerada charts for malfunction. If the charts are not good start survey again from step 2, otherwise proceed to step 6.

6. Return well to Production.

7. Ensure that the total amount of water and oil produced during the flow period is recorded.

8. Transfer produced oil to field satellite. Ensure run tickets are forwarded to Product Accounting Clerk - Moomba.

TABLE I

NIPPLE DEPTHS (ft KB)

WELL		'X' NIPPLE	'N' NIPPLE	MIN. I.D. (Inches)
Brolga	2L	9452	-	1.875
Tirrawarra	9L	-	9504	1.791
" "	16L	9547	9558	1.791
Fly Lake	1L	9235	-	1.875
" "	2L	-	9465	1.791
" "	6L	9316	-	1.875
Moorari	1	-	9456	2.205
" "	4L	-	9379	1.791
" "	5L	-	9372	2.205
" "	6	-	9605	2.205
" "	7	9486	9493	2.205
Woolkina	1	-	9774	2.205

TABLE II

FWHP

WELL		FWHP (psig)
Brolga	2L	400
Tirrawarra	9L	400
" "	16L	400
Fly Lake	1L	400
" "	2L	400
" "	6L	400
Moorari	1	1160
" "	4L	10/64" choke
" "	5L	1160
" "	6	400
" "	7	1160
Woolkina	1	700

TABLE III

HANG DEPTHS

WELL:	BROLGA 2L	TIRRA 9L	16L	FLY LAKE 1L	2L	6L
	1000	1000	1000	1000	1000	1000
	2000	2000	2000	2000	2000	2000
	3000	3000	3000	3000	3000	3000
	4000	4000	4000	4000	4000	4000
	5000	5000	5000	5000	5000	5000
	6000	6000	6000	6000	6000	6000
	7000	7000	7000	7000	7000	7000
	8000	8000	8000	8000	8000	8000
	9000	9000	9000	9000	9000	9000
MPP:	9547	9666	9690	9341	9549	9401
	9580	9704	9720	9385	9565	9420

WELL:	MOORARI 1	4L	5L	6	7	WOOLKINA 1
	1000	1000	1000	1000	1000	1000
	2000	2000	2000	2000	2000	2000
	3000	3000	3000	3000	3000	3000
	4000	4000	4000	4000	4000	4000
	5000	5000	5000	5000	5000	5000
	6000	6000	6000	6000	6000	6000
	7000	7000	7000	7000	7000	7000
	8000	8000	8000	8000	8000	8000
	9000	9000	9000	9000	9000	9000
MPP:	9653	9520	9523	9719	9657	9854
	9745	9594	9598	9776	9758	9868

R40

WELL TEST DATA SHEET

000318

WELL: FLY LAKE #1L

OPERATOR: T. SMART

DATE (Start Test): 2 MAY 1986

METER RUN I.D.: 97.18 / ~~102.26~~ mm

TEST SEPARATOR: 200AF

ORIFICE PLATE: Ø 19.05 mm

TEST LINE: N/A

FLOW COMPUTER CONSTANT: .07770

TO START TEST: TIME PIG LAUNCHED: N/A

TIME RECEIVED: N/A

TO END TEST: TIME PIG LAUNCHED: N/A

TIME RECEIVED: N/A

TIME	WELLHEAD		SATELLITE DATA									
				LIQUIDS			GAS					
				NOA								
	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
0940	4000	18/64	N/A	0	0	0	2900	6	18	N/A	N/A
1225	4000	18	"	4.17	0.01	0.12	3100	5.25	23	"	"
0940	3900	18	"	38.35	0.01	2.11	3000	5	20	"	"

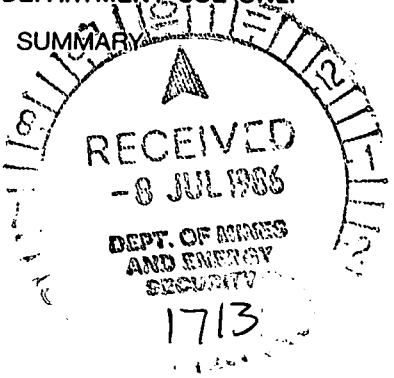
(A) 48 / 24	TOTALS (final minus initial)	(B) OIL 76.42 / ~~38.35~~	(C) 0.01	(D) + 2.11	(E) = TOTAL WATER 4.29 / ~~2.12~~	(F) GAS N/A

COMMENTS: TEST & SEPERATOR RUNNING SMOOTHLY.

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY



Temp: 21.5

Stat 3000

Diff 5.4

Ext: 2823

(1) STOCK TANK OIL

29.83 m³/d

WELL TEST DATA SHEET

000319

WELL: FLY LAKE #1L

OPERATOR: T.SMART

DATE (Start Test): 3.05.86

METER RUN I.D.: 97.18/102.26 mm

TEST SEPARATOR: 200AF (FLY LAKE)

ORIFICE PLATE: ϕ 19.05 mm

TEST LINE: N/A

FLOW COMPUTER CONSTANT: 07770

TO START TEST: TIME PIG LAUNCHED: N/A

TIME RECEIVED: N/A

TO END TEST: TIME PIG LAUNCHED: N/A

TIME RECEIVED: N/A

TIME	WELLHEAD		SATELLITE DATA									
				LIQUIDS			GAS					
				NOA								
	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
0940	3900	18	N/A	38.35	0.01	2.11	3000	5	20	N/A	N/A
1541	4000	18	"	47.61	0.01	2.67	3000	6.25	26	"	"
0940	4000	18	N/A	76.42	0.01	4.28	3000	5	22	N/A	N/A

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
24	(final minus initial)	38.07	0	+ 2.17	= TOTAL WATER 2.17	

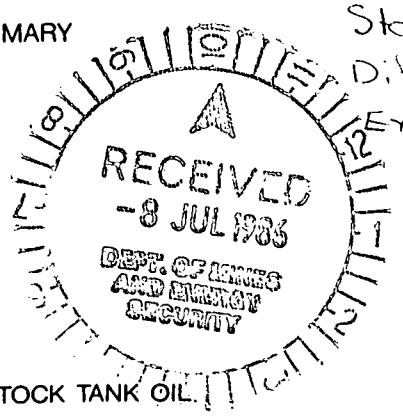
COMMENTS:

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

Temp 22.7
Stat 3000
D.P 5.4
Ex1 1408



(1) STOCK TANK OIL

m³/d

R41

000320

PATCHAWARRA CENTRAL OIL WELL FLOWING PRESSURES & CHOKE ADJUSTMENTS

SURVEY DATE	WELL	SURVEY DEPTH (ft MPP)	F.B.H.P. (psig)	F.T.H.P. (psig)	CHOKE SETTING DURING SURVEY	CHANGE REQUESTED (date)	
20/3/86	Tirra #36	9897	3078	1149	9/64"	N/C	
22/3/86	Tirra #52	9918	3029	984	10/64"	N/C	
23/3/86	Moorari #5L	9523	2789	1166	16/64"	12/64"	23/3
24/3/86	Tirra #44	9957	2715	541	8/64"	6/64"	29/3
25/3/86	Tirra #41	9881	2938	1144	12/64"	10/64"	30/3
27/3/86	Tirra #55	9890	3081	1090	10/64"	N/C	
29/3/86	Moorari #1	9653	3069	1076	6/64"	N/C	
1/4/86	Brolga #2L	9547	1673	358	20/64"	8/64"	1/4
6/4/86	Moorari #5L	9523	2736	1169	20/64"	8/64"	17/4
9/4/86	Tirra #8L	9598	3156	1348	12/64"	N/C	
13/4/86	Fly Lake #1L	9316	1581	554	18/64"	N/C	
14/4/86	Tirra #44	9957	2728	393	7/64	6/64"	

WP 2472G(14)

LA/jfs : 2/5/86

PATCHAWARRA CENTRAL PRODUCTION TESTING

SUMMARY OF RESULTS

WELL	DATE	CHOKE SIZE	F B H P PRESSURE psig	F B H P DEPTH 'KB	SEPARATOR CONDITIONS PRESSURE psig	SEPARATOR CONDITIONS TEMP °F	MEASURED RATES OIL BPD	MEASURED RATES GAS MMSCFD	MEASURED RATES WATER BPD	SEPARATED G.O.R. SCF/BBL MEASURED	SEPARATED G.O.R. SCF/BBL THEORETICAL
Tirrawarra #36	19 - 25/3/86	9/64"	3078	9897	202	86	100.979	0.188	0.359	1862	2270
Tirrawarra #52	21 - 22/3/86	10/64"	3029	9918	38	79	72.023	0.179	0.076	2485	2650
Tirrawarra #44	23 - 24/3/86	8/64"	2715	9957	196	88	39.333	0.032	5.488	801	2280
Tirrawarra #41	25 - 30/3/86	12/64"	2938	9881	44	67	213.189	0.519	4.402	2434	2550
Tirrawarra #55	26 - 27/3/86	10/64"	3081	9890	224	74	117.319	0.218	1.713	1855	2170
Moorari #1	27/3- 3/4/86	6/64"	3069	9653	77	81	33.928	0.099	Nil	2912	2480
Brolga #2L	30/3- 1/4/86	20/64"	1673	9547	113	116	152.847	0.357	28.269	2336	2660
Moorari #5L	5 - 6/4/86	20/64"	2736	9523	364	95	418.014	0.946	8.826	2263	2020
Tirrawarra #8L	8 - 14/4/86	12/64"	3156	9598	116	94	179.287	0.401	Nil	2237	2490
Fly Lake #1L	12 - 13/4/86	18/64"	1581	9316	99	115	170.280	0.561	24.768	3295	2700

NOTE: Theoretical G.O.R. for Tirrawarra, Fly Lake and Brolga wells is calculated from the paper "Production with FBHP's below the Bubble Point Pressure in Tirrawarra Oil Field" written by Chris Tucker 8/11/85.

Theoretical G.O.R. for Moorari wells is calculated from a similar paper for Moorari Field written by Chris Simm.

WP:2472G(13)

LA/jfs

000321

R 42

WELL TEST DATA SHEET

000322

WELL: FLY LAKE #1 OPERATOR: WAYNE BUDDLE

DATE (Start Test): 7-6-86 METER RUN I.D.: 97.18/~~102.26~~ mm

TEST SEPARATOR: 200 AF ORIFICE PLATE: 19.05 mm

TEST LINE: N/A FLOW COMPUTER CONSTANT: 07770

TO START TEST: TIME PIG LAUNCHED: N/A TIME RECEIVED: N/A

TO END TEST: TIME PIG LAUNCHED: N/A TIME RECEIVED: N/A

	WELLHEAD		SATELLITE DATA									
				LIQUIDS			GAS					
				NOA								
TIME	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m^3	NET WATER m^3	TOTALIZED WATER m^3	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE $m^3 \times 10^3/d$	TOTALIZED FLOW $m^3 \times 10^3$
0745	4100	18	N/A	0	0	0	3150	2.75	16	N/A	N/A
0745	3900	18	N/A	31.77	0	1.99	3000	3.75	15	N/A	N/A
1608	3900	18	N/A	42.57	0	2.92	3000	5.0	21	N/A	N/A
0745	3800	18	N/A	60.69	0	4.35	3000	4.5	12	N/A	N/A

(A)	TOTALS	(B) OIL	(C)	(D)		(E)	(F) GAS
48	(final minus initial)	60.69	0	+ 4.35	= TOTAL WATER	4.35	

COMMENTS:

PRODUCTION ENGINEERING DEPARTMENT USE ONLY 16 °C

CALCULATIONS

SUMMARY Ext: 2334

RECEIVED 26 JUN 1986 DEPT. OF MINES AND ENERGY SECURITY 1713/A

(1) STOCK TANK OIL

23.49 m^3/d

R43

WELL TEST DATA SHEET

000323

WELL: Fly Lake #1 low

OPERATOR: Justin Morley

DATE (Start Test): 25:6:86

METER RUN I.D.: 97.18/102.26 mm

TEST SEPARATOR: 200 AF

ORIFICE PLATE: 19.05 mm

TEST LINE: N/A

FLOW COMPUTER CONSTANT: 07770

TO START TEST: TIME PIG LAUNCHED: N/A

TIME RECEIVED: N/A

TO END TEST: TIME PIG LAUNCHED: N/A

TIME RECEIVED: N/A

	WELLHEAD		SATELLITE DATA									
				LIQUIDS			GAS					
				NOA								
TIME	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
1400	3900	18/64	N/A	0.00	0.00	0.00	3200	0	24	N/A	N/A
0655	3900	18/64	N/A	24.83	0.00	1.18	3200	5.5	11	N/A	N/A
1500	3900	18/64	N/A	36.04	0.00	1.81	3200	4.25	19	N/A	N/A
0742	3900	18/64	N/A	58.53	0.00	3.23	3200	2.75	11.5	N/A	N/A
1400	3900	18/64	N/A	63.96	0.00	3.71	3200	5.0	19	N/A	N/A

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
48hrs.	(final minus initial)	183.36	0.00	+ 9.93	= TOTAL WATER 9.93 m³	N/A

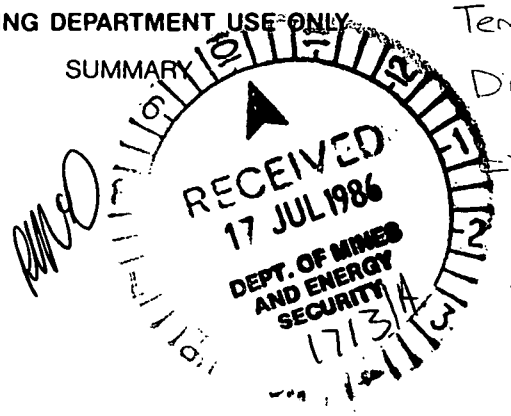
COMMENTS: Seperator running smoothly

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

Temp 17°C
Diff 4
Ext. 2013



(1) STOCK TANK OIL

70.51 m³/d

R44

WELL TEST DATA SHEET

000324

WELL: Hy. Lake #1 Lower

OPERATOR: Justin Morley

DATE (Start Test): 16.7.86

METER RUN I.D.: 97.18/102.26 mm

TEST SEPARATOR: 200 AF

ORIFICE PLATE: 15.875 mm

TEST LINE: N/A

FLOW COMPUTER CONSTANT: 0.7770

TO START TEST: TIME PIG LAUNCHED: N/A

TIME RECEIVED: N/A

TO END TEST: TIME PIG LAUNCHED: N/A

TIME RECEIVED: N/A

TIME	WELLHEAD		SATELLITE DATA								
				LIQUIDS			GAS				
				NOA							
	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
1530	3800	18	N/A	0	0	0	3000	6.0	21	N/A	N/A
0727	3800	18	N/A	25.40	6	1.46	3000	5.0	13	N/A	N/A
1530	3800	18	N/A	37.76	0.00	1.95	31.50	4.0	21	N/A	N/A
0739	3800	18	N/A	63.74	0.00	3.54	3000	4.0	13.5	N/A	N/A
1530	3800	18	N/A	76.36	0.00	4.17	3000	3.75	21.5	N/A	N/A

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
48 hrs	(final minus initial)	203.26	0.00 + 11.12		= TOTAL WATER 214.38	N/A

COMMENTS: Seperator running as per normal

PRODUCTION ENGINEERING DEPARTMENT USE ONLY Ext 2383

CALCULATIONS

SUMMARY

18 °C

AMD

(1) STOCK TANK OIL 78.90 m³/d

Aug 86 1713/A

R45

WELL TEST DATA SHEET

000325

WELL: Fly Lake *1 Low

OPERATOR: Justin Morley

DATE (Start Test): 28:7:86

METER RUN I.D.: 97.18/102.26 mm

TEST SEPARATOR: 200 AF

ORIFICE PLATE: 1905 mm

TEST LINE: N/A

FLOW COMPUTER CONSTANT: 07770

TO START TEST: TIME PIG LAUNCHED: N/A

TIME RECEIVED: N/A

TO END TEST: TIME PIG LAUNCHED: N/A

TIME RECEIVED: N/A

	WELLHEAD		SATELLITE DATA									
				LIQUIDS			GAS					
				NOA								
TIME	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
0845	4400	18	N/A	0.00	0.00	0.00	3800	0.25	11	N/A	N/A
1351	4400	18	N/A	5.40	0.16	0.25	3800	5.0	18	N/A	N/A
0846	4400	18	N/A	26.67	0.26	1.56	3800	3.0	11	N/A	N/A
1555	4400	18	N/A	34.97	0.26	2.15	3800	0.25	19	N/A	N/A
0845	4300	18	N/A	52.45	0.26	3.52	3850	3.0	11	N/A	N/A

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
48hrs	(final minus initial)	19.49	0.94 +	7.48	= TOTAL WATER 8.42	N/A

COMMENTS: Seperator running as per normal

PRODUCTION ENGINEERING DEPARTMENT USE ONLY Ext 2211

CALCULATIONS

SUMMARY

(1) STOCK TANK OIL

44.78 m³/d

R46

000326

WELL TEST DATA SHEET

WELL: Fly Lake #1 OPERATOR: W. Buckle

DATE (Start Test): 2-8-86 METER RUN I.D.: 97.18 / ~~102.26~~ mm

TEST SEPARATOR: Fly Lake 200AF ORIFICE PLATE: 15.875 mm

TEST LINE: FLOW COMPUTER CONSTANT: 07770

TO START TEST: TIME PIG LAUNCHED: N.A TIME RECEIVED: N.A

TO END TEST: TIME PIG LAUNCHED: N.A TIME RECEIVED: N.A

	WELLHEAD		SATELLITE DATA								
				LIQUIDS			GAS				
				NOA							
TIME	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m^3	NET WATER m^3	TOTALIZED WATER m^3	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE $m^3 \times 10^3/d$	TOTALIZED FLOW $m^3 \times 10^3$
09.35	3900	18		0	0	0	3050	5.75	15		
15.52	3900	18		8.43	0	0.22	3000	7.5	20		
09.35	3700	18		33.68	0	2.03	3000	5.75	13		
16.32	3700	18		43.72	0	3.15	2950	6.25	15		
09.35	3800	18		69.05	0	5.09	2950	6.25	10		
(A) 45 hrs	TOTALS (final minus initial)			(B) OIL 69.05	(C) 0	(D) + 5.09	(E) = TOTAL WATER 5.09				(F) GAS

COMMENTS:

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

RECEIVED
22 AUG 1986
DEPT. OF MINES AND ENERGY SECURITY
1713/14

(1) STOCK TANK OIL

26.60 m^3/d

R47

WELL TEST DATA SHEET

000327

WELL: FLY LAKE #1 OPERATOR: F. TASSONE

DATE (Start Test): 9.8.86 METER RUN I.D.: 97.18 / 102.26 mm

TEST SEPARATOR: FLY LAKE AE ORIFICE PLATE: 15.875 mm

TEST LINE: FLOW COMPUTER CONSTANT: 07770

TO START TEST: TIME PIG LAUNCHED: — TIME RECEIVED: —

TO END TEST: TIME PIG LAUNCHED: — TIME RECEIVED: —

TIME	WELLHEAD		SATELLITE DATA									
				LIQUIDS			GAS					
				NOA								
	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
0800	4000	18	17	0	0	0	2900	7.5	12		
1342	4000	18	24	6.96	0.1	47	2900	8.25	21		
0654	4000	18	15	29.41	0.1	214	2900	7.0	9		
1117	4000	18	21	34.05	0.1	248	2900	6.75	19		
0800	4000	18	16	61.41	0.1	425	2900	5.5	13		

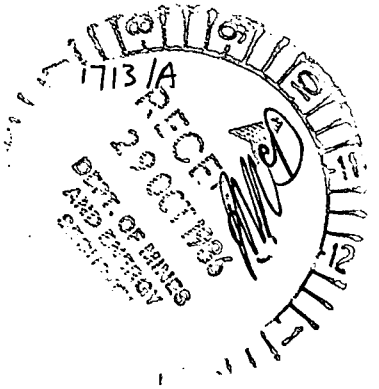
(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
4.7	(final minus initial)	61.41	0.1	+ 4.25	= TOTAL WATER 435 425.1	

COMMENTS:

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY



(1) STOCK TANK OIL

24.35 m³/d

R48

WIRELINE REPORT

000328

CLIENT SANTOS WELL FLY LAKE #1 L

DATE 27/8/86

PROGRAMME PATCHAWARA CENTRAL PRODUCTION TEST

PURPOSE OF WORK BLIND BOX RUN, FLOWING GRADIENT, FLOW & BUILDUP SURVEY.

REPORT OF WORK PERFORMED

27/8/86 0730 - SWI RIG IN SWAB VALVE
1400 - RIG UP W/L UNIT
1430 - PRESSURE TEST EQUIPMENT O.K.
1600 - R.I.H WITH 5' WEIGHT BAR, SPANG JARS AND 1.750" BLIND BOX
1641 - PICKED UP WEIGHT AT 9387' K.B. NO OBSTRUCTIONS.
1641 - P.O.O.H.
1708 - IN LUB.
17.10 - DEPRESSURE LUB, RIG OUT TOOL SPRING. LEAVE UNIT RIGED UP TO RUN FLOWING GRADIENT & FLOW. BUILDUP SURVEY.
30/8/86 PREPARE AMERADA'S
0845 - R.I.H WITH B.H.P GAUGES FOR FLOWING GRADIENT AS PER PROGRAM. (B.H.T N/A)
1120 - DEPRESSURE LUB, RIG OUT B.H.P GAUGES AND CHECK O.K.
1400 - R.I.H. WITH B.H.P/B.HT GAUGES WITH WELL FLOWING ON 18/64" CHOKE TO SURVEY DEPTH OF 9320' K.B. FLOW WELL FOR 3 HRS ON 18/64 CHOKE.

Operator's Signature

WORKED PERFORMED BY S. KUNAC & B. TICKLE OF EXPERTEST

WELL DATA:

Tubing Size 2 7/8" FWHP 535 P.S.I SIWHP 730 P.S.I

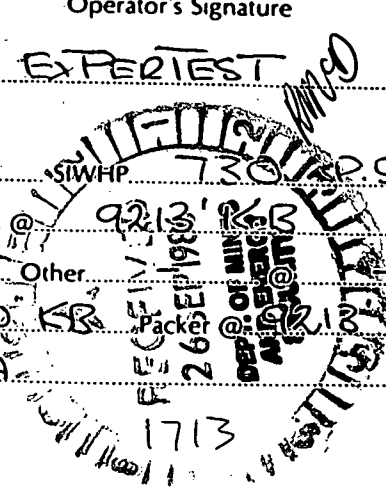
Subsurface S.V./Landing Nipple @ — S.S.D. @ 9213' K.B

'X' Nipple @ 9240' K.B 'N'/'XN' Nipple @ — Other

Min. I.D. 1.875" @ 9240' K.B Packer @ 9218' K.B.

Perforated Interval: 9335' - 9385' TIRRAWARRA

E1



WIRELINE REPORT

000329

CLIENT SANTOS WELL FLY LAKE #1 L

DATE 30/8/86

PROGRAMME PATCHAWARRA CENTRAL PRODUCTION TEST

PURPOSE OF WORK BLIND BOX RUN, FLOWING GRADIENT, FLOW & BUILDUP SURVEY.

REPORT OF WORK PERFORMED W/L REPORT CONTINUED

30/8/86 1425 - ON BOTTOM FLOW WELL FOR 3 HRS ON 18/64 CHOKE

1730 - S.W.I - COMMENCE 180 HR BUILDUP

7/9/86 0913 - P.O.O.H.

0941 - IN LUB

0943 - DEPRESSURE LUB.

CHARTS O.K.

RIG OUT W/L UNIT & RETURN WELL BACK TO PRODUCTION

Operator's Signature

WORKED PERFORMED BY S. KUNAC & B. TICKLE OF EXPERTEST

WELL DATA:

Tubing Size 2 7/8" FWHP 535 P.S.I SIWHP 730 P.S.I

Subsurface S.V./Landing Nipple @ — S.S.D. @ 9213' K.B

'X' Nipple @ 9240' K.B 'N'/'XN' Nipple @ — Other — @ —

Min. I.D. 1.875" @ 9240' K.B Packer @ 9213' K.B

Perforated Interval: 9335' - 9385' TIRRAWARRA.

E1

SANTOS LTD
39 GRENFELL ST
ADELAIDE

SUB-SURFACE PRESSURE SURVEY

CO. SANTOS	RUN 01 FIELD FLY LAKE		WELL 01L
EFF DEPTH	WELL STAT		TOOL HUNG 9308'
CASING 7"	CASING PRESS		ON BOTTOM 1425 30/8
LINER	TUBING PRESS		OFF BOTTOM 0913 7/9
DATE 860907	ELEMENT RANGE 0 - 5153		ZERO POINT
ELEVATION	ZONE		SHUT-IN 1730 30/8
MAX TEMP	PICK-UP		ON-PROD
PERF 9297'-9385'	CAL SER NO. 60322		MPP 9341'
TUBING 2-7/8"			
UNITS ENGLISH	PURPOSE BUILD-UP		

SURVEY DATA

CO. SANTOS RUN 01 FIELD FLY LAKE WELL 01L

TIME	P-I	DP-DT	DTIME	TIME	P-I	DP-DT	DTIME
17:30	1688.1	0.0	0.0	5:30	2500.8	812.7	36.0
17:35	1758.8	70.8	.1	9:30	2508.7	820.6	40.0
17:40	1802.2	114.1	.2	13:30	2517.9	829.9	44.0
17:50	1889.8	201.8	.3	17:30	2525.1	837.0	48.0
18:00	1979.1	291.0	.5	21:31	2532.0	843.9	52.0
18:10	2031.1	343.0	.7	1:30	2540.7	852.6	56.0
18:20	2079.2	391.2	.8	5:31	2546.6	858.5	60.0
18:31	2112.3	424.2	1.0	9:29	2553.7	865.7	64.0
18:45	2145.5	457.4	1.2	13:30	2559.9	871.8	68.0
19:00	2171.8	483.8	1.5	17:30	2565.7	877.7	72.0
19:15	2193.2	505.2	1.7	21:30	2569.3	881.2	76.0
19:31	2208.0	518.9	2.0	1:30	2576.2	888.2	80.0
20:00	2232.9	544.8	2.5	5:29	2581.3	893.3	84.0
20:30	2250.4	562.3	3.0	9:30	2585.6	897.6	88.0
21:00	2265.8	577.7	3.5	13:30	2589.5	901.4	92.0
21:30	2279.4	591.2	4.0	17:30	2595.2	907.3	96.5
22:30	2351.5	663.3	5.0	1:01	2617.8	929.7	120.5
1:30	2393.8	705.6	6.0	5:33	2630.0	942.0	132.5
5:30	2429.2	741.2	16.0	9:00	2638.6	950.6	144.5
13:30	2447.7	759.7	20.0	17:00	2646.5	958.5	156.5
17:30	2465.4	777.4	24.0	1:00	2655.1	967.1	168.5
21:30	2477.4	789.4	28.0	9:13	2680.4	992.3	183.7
1:30	2487.7	799.6	32.0	0:00	0.0	0.0	0.0

SUB IN DWT = 522 PSI / OUT = 1147 PSI
SUB IN AMERADA = 530 PSI / OUT = 1154 PSI

SANTOS LTD
39 GRENFELL ST
ADELAIDE

SUB-SURFACE PRESSURE SURVEY

CO.	SANTOS		RUN 02 FIELD FLY LAKE		WELL 01L
EFF DEPTH			WELL STAT	TOOL HUNG	9314'
CASING 7"		-	CASING PRESS	ON BOTTOM	1425 30/8
LINER		-	TUBING PRESS	OFF BOTTOM	0913 7/9
DATE	860907		ELEMENT RANGE 0 - 5223	ZERO POINT	
ELEVATION			ZONE	SHUT-IN	1730 30/8
MAX TEMP			PICK-UP	ON-PROD	
PERF	9297'-9385'		CAL SER NO. 59451	MPP	9341'
TUBING	2-7/8"	-			
UNITS	ENGLISH		PURPOSE BUILD-UP		

SURVEY DATA

CO. SANTOS			RUN 02 FIELD FLY LAKE		WELL 01L	
TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
17:30	1688.3	0.0	0.0	9:30	2516.3	828.0	40.0
17:35	1750.9	62.6	0.4	13:30	2524.4	836.0	44.0
17:40	1803.8	115.5	1.2	17:30	2531.4	843.0	48.0
17:50	1917.5	229.2	3.1	21:30	2538.6	850.3	52.0
18:01	2002.0	313.6	4.5	1:31	2546.2	857.9	56.0
18:10	2056.4	368.1	5.7	5:31	2552.9	864.5	60.0
18:20	2097.6	409.2	6.8	9:31	2558.9	870.6	64.0
18:30	2129.8	441.5	7.8	13:29	2563.8	875.5	68.0
18:45	2161.7	473.4	9.2	17:30	2569.5	881.2	72.0
19:00	2187.7	499.3	10.5	21:30	2574.5	886.1	76.0
19:15	2204.5	516.1	11.7	1:30	2580.4	892.1	80.0
19:31	2220.5	532.1	12.0	5:30	2584.8	896.5	84.0
20:01	2243.3	555.0	12.5	9:30	2589.5	901.2	88.0
20:30	2260.2	571.9	13.0	13:30	2594.7	906.3	92.0
21:01	2276.8	588.5	13.5	18:00	2600.2	911.9	96.5
21:30	2290.8	602.5	14.0	6:01	2610.0	921.6	108.5
1:31	2362.6	674.3	9.0	18:01	2621.4	933.1	120.5
5:30	2404.7	716.4	12.0	6:00	2630.4	942.1	132.5
9:30	2436.5	748.2	16.0	18:00	2641.0	952.7	144.5
13:30	2456.1	767.8	20.0	6:00	2650.0	961.7	156.5
17:31	2471.0	782.8	24.0	18:00	2656.9	968.6	168.5
21:30	2486.4	798.0	28.0	6:00	2668.8	980.5	180.5
1:30	2497.0	808.7	32.0	9:13	2666.2	977.9	183.7
5:31	2508.0	819.6	36.0	0:00	0.0	0.0	0.0

LUB IN DWT = 522 PSI / OUT = 1147 PSI
LUB IN AMERADA = 527 PSI / OUT = 1146 PSI

Build-Up in minutes

Shut well in @ 1730 hrs 30/8/86	0	3840
	5	4080
	10	4320
	20	4560
	30	4800
	40	5040
	50	5280
	60	5520
	75	5790
	90	6510
	105	7230
	120	7950
	150	8670
	180	9390
	210	10110
	240	10830
	480	11023 ✓ P.O.O.H. 0913 7/9/86
	720	
	960	
	1200	
	1440	
	1680	
	1920	
	2160	
	2400	
	2640	
	2880	
	3120	
	3360	
	3600	

000333

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

** FLY LAKE #1L **

FLOWING PRESSURE GRADIENT

TEST DATE: 30-8-86

	TOP PRESSURE ELEMENT 60322/5000			BOTTOM PRESSURE ELEMENT 59451/5000		
DEPTH (FT.)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)
LUB	0.2080	532.9	----	0.2050	529.3	----
1000	0.2310	592.2	0.0593	0.2270	586.8	0.0575
2000	0.2750	705.6	0.1134	0.2710	701.9	0.1150
3000	0.3190	818.9	0.1133	0.3140	814.3	0.1124
4000	0.3600	924.4	0.1055	0.3540	918.8	0.1045
5000	0.4050	1040.0	0.1157	0.3980	1033.7	0.1150
6000	0.4590	1178.8	0.1387	0.4510	1172.2	0.1384
7000	0.5120	1314.9	0.1361	0.5030	1308.0	0.1358
8000	0.5740	1474.0	0.1591	0.5630	1464.7	0.1567
8500	0.6060	1556.2	0.1642	0.5950	1548.3	0.1671
9000	0.6410	1646.0	0.1796	0.6310	1642.3	0.1880
9341	0.6660	1710.1	0.1881	0.6550	1705.0	0.1838
LUB	0.1980	507.1	----	0.1950	503.1	----

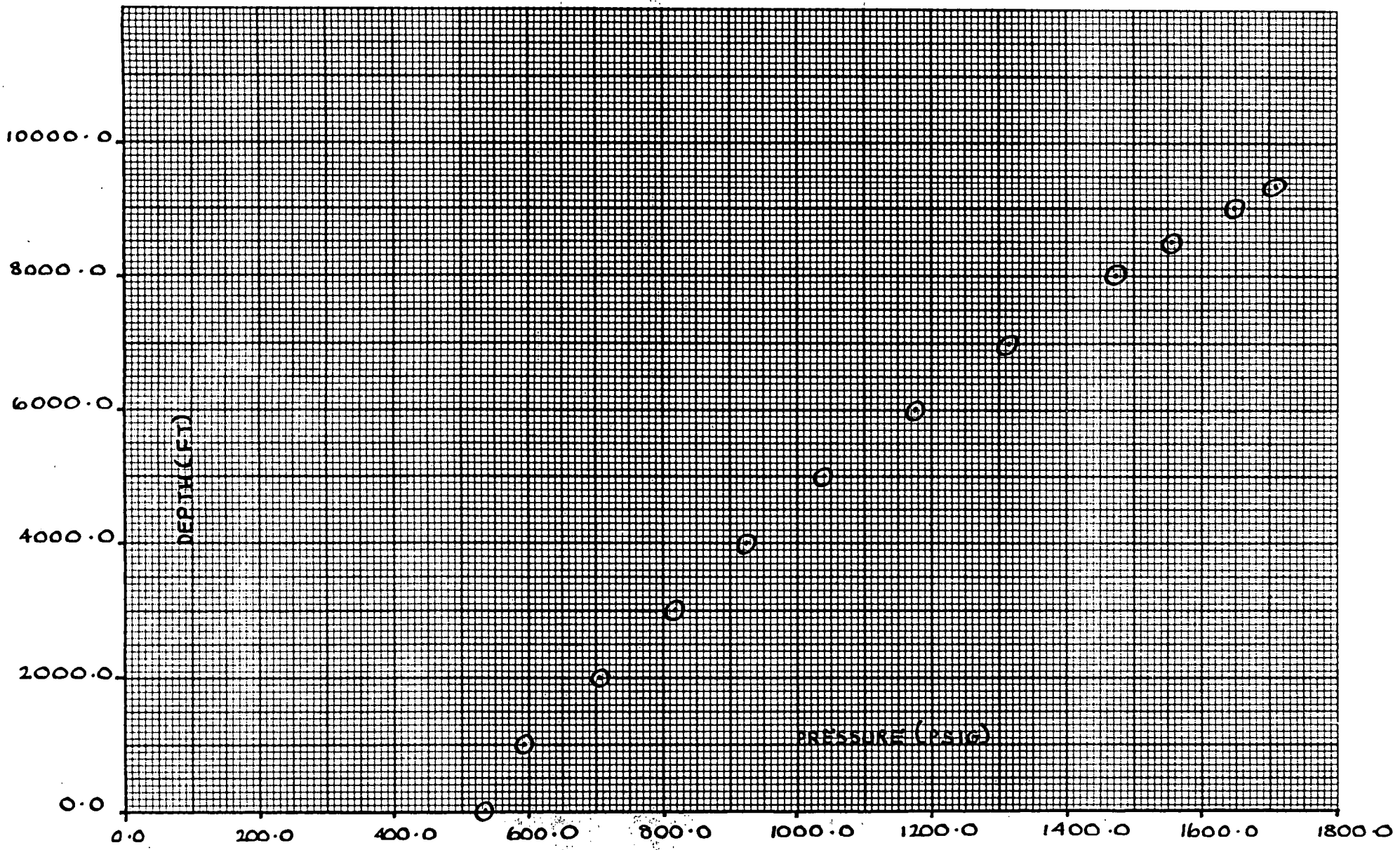
GENERAL REMARKS:
FORM. TIRRAWARRA

DWT IN: 554
DWT OUT: 511
MAX BHT: 274 F

ELEMENT 60322/5000 CALIBRATED 4.8.86
ELEMENT 59451/5000 CALIBRATED 4.8.86

FLY LAKE # 1 LOWER – FLOWING PRESSURE GRADIENT – 30/8/86

ELEMENT # 60322/5000 (TOP)



Fm 5030

000334

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

STATIC GRADIENT SURVEY

CLIENT SANTOS

WELL FLY LAKE #1L

FLOWING OPERATOR R TICKLE & S KUNAC

DATE 30/8/86

BOMB No. 1 DATA

ELEMENT No. 60222 ELEMENT RANGE 5000 PSI

RECORDER No 12952 - 15T.L.S CLOCK DATA 2509 - 3HRS

ENGAGE STYLUS 0817 HRS DISENGAGE 1127 HRS

PRESSURE LUBRICATOR 0830 HRS

BOMB No 2 DATA

ELEMENT No. 59451 ELEMENT RANGE 5000 PSI

RECORDER No 13028 - 15T.L.S CLOCK DATA 2489 - 3HRS

ENGAGE STYLUS 0817 HRS DISENGAGE 1127 HRS

BLEED LUBRICATOR 1120 HRS

DWT IN 554 PSI

DWT OUT 511 PSI

DATE	TIME	DEPTH'	DEFLEC-TION	PRESSURE TEMP.	GRADIENT psi/ft	DEPTH'	DEFLEC-TION	PRESSURE TEMP.	GRADIENT psi/ft	REMARKS
30/8/86	0830	LUB	.208	532.9	-	LUB	.205	529.3	-	15" STOP
	0845	R.I.H	-	-	-	R.I.H	-	-	-	
	0849	1000	.231	592.2	0.0593	1000	.227	586.8	0.0575	5" "
	0858	2000	.275	705.6	0.1134	2000	.271	701.4	0.1150	5" "
	0906	3000	.319	818.9	0.1133	3000	.314	814.3	0.1124	5" "
	0914	4000	.360	924.4	0.1055	4000	.354	918.5	0.1045	5" "
	0922	5000	.405	1040.0	0.1157	5000	.398	1033.7	0.1150	5" "
	0931	6000	.459	1178.8	0.1387	6000	.451	1172.2	0.1384	5" "
	0940	7000	.512	1314.9	0.1361	7000	.503	1308.0	0.1358	5" "
	0949	8000	.575	1474.0	0.1591	8000	.563	1464.7	0.1567	5" "
	0957	8500	.606	1556.2	0.1642	8500	.595	1548.3	0.1671	5" "
	1005	9000	.642	1646.0	0.1796	9000	.630	1642.3	0.1880	5" "
	1013	9341	.666	1710.1	0.1881	9341	.655	1705.0	0.1838	15" "
	1030	P.O.H	-	-	-	P.O.H	-	-	-	
	1105	LUB	.198	507.1	-	LUB	.195	503.1	-	15" "
	CASING PRESSURE			0-PSI						

GENERAL REMARKS: CALIBRATED 4/8/86 AT 290°F

TEMPERATURE ELEMENT N/A

M.B.H.T - 274°F

E4

0000335

000336

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE
TELEPHONE (08) 354 0488 TELEX AA87183
136 RICHMOND ROAD MARLESTON SA 5033 POSTAL ADDRESS: PO BOX 354 COWANDILLA 5033

Well: FLY LAKE # 1 L Date: 30/8/86 - 7/9/86

Lubricator Data: ① 530 1154 ② 527 1146 Operator B. TICKLE & S. KUNAC

Pressure with D.W.T. In 522 P.S.I Out 1147 P.S.I

Time Pressured 1158 HRS (30/8/86) Time Depressured 0943 HRS (7/9/86)

Time Run in Hole 1400 HRS (30/8/86) Time off Bottom 0913 HRS (7/9/86)

	Bomb No. 1 Data TOP	Bomb No. 2 Data MID
Element No. and Range	60322 × 5000 P.S.I	59451 × 5000 P.S.I
Recorder No.	12952 × 15 T.L.S	13028 × 15 T.L.S
Clock and Lead Screw Data	2870 × 180 HRS	2871 × 180 HRS
Engage Stylus	Date: 30/8/86 Time: 11 45 HRS	Date: 30/8/86 Time: 11.45 HRS
Disengage	Date: 7/9/86 Time: 1223 HRS	Date: 7/9/86 Time: 1223 HRS

Remarks: ONE TEMPERATURE ELEMENT USED
ELE - 27793 × 132°F - 445°F, REC - 61002 × 15 T.L.S
CLOCK 2884 × 180 HRS (HANG DEPTH 9320' KB)

Max S.I.B.H. Temp = 289.6°F

Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	Wellhead P.S.I.G.	Casing P.S.I.G.	Wellhead Temp.	Remarks
		FLOW & BUILD UP SURVEY				
30/8/86		PREPARE ANEROIDS.				
	1145	INCASE STYLUS				
	1158	PRESSURE LUB, IN LUB FOR TWO HOURS				
		D.W.T IN	522	C		
	1400	R.I.H TO SURVEY DEPTH WHILE WELL FLOWING				
	1425	ON BOTTOM 9320' K.B.				
		FLOW WELL FOR 3 HRS ON 18/64" CHOKE				
	1730	0	540	C		
	1730	S.I.W.I & RECORD BUILD UP.				
	1735		625	C		
	1740		670	C		
	1750		735	C		
	1800		780	C		
	1810		808	C		
	1820		832	C		
	1830	1	848	C		
	1845		875	C		
	1900		888	C		
	1915		899	C		
	1930	2	909	C		
	2000		933	C		
	2030	3	950	C		

TELEPHONE (08) 354 0488 TELEX AA87183
EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE
138 RICHMOND ROAD MARLESTON SA 5033 POSTAL ADDRESS: PO BOX 354 COWANDILLA 5033

Well: FLY LAKE "1 L" Date: 30/8/86 - 7/9/86

Lubricator Data:

Operator B. TICKLE & S. IGNAC

Pressure with D.W.T. In 522 P.S.I Out 1147 P.S.I

Time Pressured 1158 HRS (30/8/86) Time Depressured 0943 HRS (7/9/86)

Time Run in Hole 1400 HRS (30/8/86) Time off Bottom 0913 HRS (7/9/86)

	Bomb No. 1 Data TOP	Bomb No. 2 Data MID
Element No. and Range	60322 • 5000 P.S.I	59451 • 5000 P.S.I
Recorder No.	12952 • 15 T.L.S	13028 • 15 T.L.S
Clock and Lead Screw Data	2870 • 180 HRS	2871 • 180 HRS
Engage Stylus	Date: 30/8/86 Time: 1145	Date: 30/8/86 Time: 1145
Disengage	Date: 7/9/86 Time: 1223 HRS	Date: 7/9/86 Time: 1223 HRS

Remarks: ONE TEMPERATURE ELEMENT USED
ELE - 27793 • 132°F - 445°F REC - 61002 • 15 T.L.S
CLOCK 2884 • 180 HRS (HANG DEPTH 9320' K.B)

Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	Wellhead P.S.I.G.	Casing P.S.I.G.	Wellhead Temp.	Remarks
			BUILDUP SURVEY CONTINUED			
30/8/86	2100		964	0		
	2130	4	978	0		
31/8/86	0130	8	1033	0		
	0530	12	1036	0		
	0930	16	1063	0		
	1330	20	1072	0		
	1730	24	1077	0		
	2130	28	1080	0		
1/9/86	0130	32	1086	0		
	0530	36	1089	0		
	0930	40	1093	0		
	1330	44	1098	0		
	1730	48	1101	0		
	2130	52	1102	0		
2/9/86	0130	56	1105	0		
	0530	60	1108	0		
	0930	64	1112	0		
	1330	68	1116	0		
	1730	72	1118	0		
	2130	76	1119	0		
3/9/86	0130	80	1120	0		
	0530	84	1120	0		

TELEPHONE (08) 354 0488 TELEX AA87183

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

138 RICHMOND ROAD MARLESTON SA 5033 POSTAL ADDRESS: PO BOX 354 COWANDILLA 5033

Well: FLY LAKE #1 L Date: 30/8/86 - 7/9/86

Lubricator Data:

Operator B. TICKLE & S. KUNAL

Pressure with D.W.T. In 522 P.S.I Out 1147 P.S.I

Time Pressured 1158 HRS (30/8/86) Time Depressured 0943 (7/9/86)

Time Run in Hole 1400 HRS (30/8/86) Time off Bottom 0913 (7/9/86)

	Bomb No. 1 Data TOP	Bomb No. 2 Data MID
Element No. and Range	60322 × 5000 PSI	59451 × 5000 P.S.I
Recorder No.	12952 × 15 T.L.S	13028 × 15 T.L.S
Clock and Lead Screw Data	2870 × 180 HRS	2871 × 180 HRS
Engage Stylus	Date: 30/8/86 Time: 1145	Date: 30/8/86 Time: 1145
Disengage	Date: 7/9/86 Time: 1223 HRS	Date: 7/9/86 Time: 1223 HRS

Remarks: ONE TEMPERATURE ELEMENT USED
ELE - 27793 × 132°F - 445°F REC - 61002 × 15 T.L.S
CLOCK - 2884 × 180 HRS (HANG DEPTH 9320 K.B)

Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	Wellhead P.S.I.G.	Casing P.S.I.G.	Wellhead Temp.	Remarks
		BUILDUP	SURVEY	CONTINUED		
3/9/86	0930	88	1124	0		
	1330	92	1127	0		
	1800	96.5	1128	0		
4/9/86	0600	108.5	1133	0		
	1800	120.5	1136	0		
5/9/86	0600	132.5	1140	0		
	1800	144.5	1141	0		
6/9/86	0600	156.5	1144	0		
	1800	168.5	1146	0		
7/9/86	0600	180.5	1147	0		
	0913	P.O.O.H				
	0941	IN LUB				
	0943	DEPRESSURE LUB				
		CHARTS O.K				
		RIG OUT W/L UNIT & RETURN WELL BACK TO PRODUCTION				

WELL: FLY LAKE #1L
TIRRAWARRA
TYPE OF TEST: FLOW & BUILD-UP

SANTOS LTD.
WELL TEST DATA SHEET

DATE: 25-8-86
PAGE No: 1

DATE / TIME	WELLHEAD					GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS				
															GAS	OIL	WATER	TOTAL LIQUID	G.O.R.
	CASING PSI	TUBING PSI	TEMP. °F	CHOKE SIZE INS.	B.S.W. %	PI PSI	HW INS.H_2O	TEMP. °F	ORIFICE SIZE INS.	TANK DIP INS.	TANK PROD BBLS	API GRAVITY @60 °F	TANK DIP INS.	TANK PROD BBLS	FLOW RATE MMSCFD	FLOW RATE BBLS/DAY	FLOW RATE BBLS/DAY	FLOW RATE BBLS/DAY	SCF/BBL
14:00			WAIT ON FITTERS TO RIG DOWN FLY LAKE #1W																
26-8-86																			
07:30			FITTERS ON LOCATION, RIG DOWN FROM #1W & RIG UP ON FLY LAKE #1L																
			WAIT ON OPERATOR TO SHUT IN WELL TO RIG UP SWAB VALVE																
27-8-86																			
07:30			PRODUCTION OPERATOR ON LOCATION, SHUT IN WELL & RIG UP SWAB VALVE																
07.40	0	730								7"			0"						
07.45	0	736		OPEN	WELL TO FLARE ON BY-PASS														
08:00	0	545		18/64		DIVERT FLOW TO SEP. & TRIM.													
10:00	0	536	129	18/64	N/A	420	70	115	.625"	12"	8.38	52.0	1"	1.677	.345	100.60	20.13	120.72	3395
12:00	0	542	115	18/64	N/A	460	50	113	.625"	15.25"	5.45	52.0	1"	ø	.308	65.40	ø	65.4	4649
14:00	0	533	122	18/64	N/A	465	53	118	.625"	18.5"	5.45	52.0	2"	1.677	.317	65.40	2013	85.53	4785
16:00			R.I.H. WITH 1.75" B.B.																
16:41			TAG PBTD @ 9387'MB & P.O.H.																
17:08			ARRIVE LAB.																
18:00	0	535	136	18/64	N/A	452	68	125	.625"	31.75"	22.22	51.9	2.5"	.839	.350	133.32	5.03	138.35	2675
22:00	0	535	130	18/64	N/A	440	70	118	.625"	40.75"	15.09	49.4	2.75"	.419	.353	90.56	2.52	93.08	3898
28-8-86																			
02:00	0	539	118	18/64	N/A	445	61	111	.625"	46.5"	9.64	49.7	3.25"	.839	.335	57.86	5.03	62.89	5789
06:00	0	547	118	18/64	N/A	450	60	117	.625"	55.0"	14.26	48.9	3.5"	.419	.332	85.53	2.52	88.05	3882

OPERATOR B. TICKLE

000339

WELL: FLY LAKE #1L TIRRAWARRA

TYPE OF TEST: FLOW & BUILD-UP

SANTOS LTD.
WELL TEST DATA SHEET

DATE: 28-8-86

PAGE No: 2

DATE / TIME	WELLHEAD					GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS				
															GAS	OIL	WATER	TOTAL LIQUID	G.O.R.
	CASING PSI	TUBING PSI	TEMP. °F	CHOKE SIZE INS.	B.S.W. %	PI PSI	HW INS.H_2O	TEMP. °F	ORIFICE SIZE INS.	TANK DIP INS.	TANK PROD BBLS	API GRAVITY @60 °F	TANK DIP INS.	TANK PROD BBLS	FLOW RATE MMSCFD	FLOW RATE BBLS/DAY	FLOW RATE BBLS/DAY	FLOW RATE BBLS/DAY	SCF/BBL
10:00	0	540	131	18/64	N/A	450	66	115	.625"	67.25"	20.54	49.0	5.5"	3.35	.349	123.26	20.12	143.38	2831
14:00	0	522	135	18/64	N/A	440	74	118	.625"	73.25"	10.06	48.9	6"	.839	.363	60.37	5.03	65.40	6013
18:00	0	522	141	18/64	N/A	440	70	124	.625"	82.25"	15.09	49.9	7.5"	2.52	.350	90.56	15.09	105.65	3865
22:00	0	543	137	18/64	N/A	465	44	115	.625"	90.0"	13.00	50.2	7.5"	0	.290	77.98	0	77.98	3719
29-8-86																			
02:00	0	536	137	18/64	N/A	460	46	111	.625"	95.5"	9.22	50.2	7.75"	.419	.296	55.34	2.57	57.86	5349
05:30	0	524	138	18/64	N/A	420	51	118	.625	104"	14.25	49.8	8.0"	.419	.294	97.76	2.87	100.63	3007
			23.5	hr	PROD.					CUMMULATIVE			PROD						
		GAS		OIL		H_2O			GAS		OIL		H_2O						
		.317		82.163		7.547			.626		162.653		13.417						
10:00	0	532	126	18/64	N/A	465	44	109	.625	119.25"	25.57	49.6	9.75"	2.93	.293	136.31	15.55	151.86	2149
14:00	0	525	137	18/64	N/A	440	64	118	.625	128.25"	15.09	49.9	11"	2.09	.338	90.56	12.58	103.14	3732
18:00	0	548	137	18/64	N/A	450	60	118	.625	136.75"	8.50	50.2	11.25"	.41	.331	51.00	2.57	53.57	6490
22:00	0	540	127	18/64	N/A	460	30	100	.750	142.5"	9.64	49.6	12"	1.26	.351	57.86	7.55	65.41	6066
30-8-86																			
02:00	0	515	133	18/64	N/A	320	70	113	.750	157"	24.32	49.1	14"	3.35	.442	145.90	20.12	166.02	3029
06:00	0	526	124	18/64	N/A	440	25	102	.750	162"	8.38	49.6	15.5"	2.51	.318	50.31	15.09	65.40	6321
10:00	0	534	120	18/64	N/A	460	23	102	.750	170.25"	13.84	49.9	16.5"	1.68	.307	83.01	10.06	93.07	3698

OPERATOR: B. TICKLE

0003340

WELL: FLY LAKE #1 L

TYPE OF TEST: FLOW & BUILD-UP

SANTOS LTD.
WELL TEST DATA SHEET

DATE: 30-8-86

PAGE No: 3

DATE / TIME	WELLHEAD					GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS				
															GAS	OIL	WATER	TOTAL LIQUID	G.O.R.
	CASING PSI	TUBING PSI	TEMP. °F	CHOKE SIZE INS.	B.S.W. %	PI PSI	HW INS.H_2O	TEMP. °F	ORIFICE SIZE INS.	TANK DIP INS.	TANK PROD BBLS	API GRAVITY @60 °F	TANK DIP INS.	TANK PROD BBLS	FLOW RATE MMSCFD	FLOW RATE BBLS/DAY	FLOW RATE BBLS/DAY	FLOW RATE BBLS/DAY	SCF/BBL
08:45				R.I.H. FOR FLOWING GRAD.															
10:30				P.O.H. (CHARTS GOOD)															
14:00	0	522	126	18/64	N/A	450	30	111	.750	183.25"	2180	48.9	18"	2.52	.341	130.81	15.09	145.90	2606
14:00				R.I.H. WITH TANDEM AMERADAS & TEMP. ELEMENT FOR BUILD-UP															
14:25				HANG @ 9320'MB															
17:30	0	540	133	18/64	N/A	460	26	111	.750	191.5"	13.84	49.4	18.75"	1.26	.322	94.94	7.55	102.49	3392
17:30				SHUT IN WELL FOR BUILD-UP															
17:35	0	625																	
17:40	0	670			11.5	HR PRODUCTION						CUMMULATIVE PRODUCTION							
17:50	0	735		GAS		OIL		H_2O				GAS		OIL		H_2O			
18:00	0	780		.155		49.517		5.457				1.133		303.648		33.553			
18:10	0	808																	
18:20	0	832																	
18:30	0	848																	
18:45	0	875																	
19:00	0	888																	
19:15	0	899																	
19:30	0	909																	
20:00	0	933																	
20:30	0	950																	

000341

WELL: FLY LAKE # 1 L

TYPE OF TEST: FLOW & BUILD-UP

SANTOS LTD.
WELL TEST DATA SHEET

DATE: 30-8-86

PAGE No: 4

DATE / TIME	WELLHEAD					GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS				
	CASING PSI	TUBING PSI	TEMP. °F	CHOKE SIZE INS.	B.S.W. %	PI PSI	HW INS.H_2O	TEMP. °F	ORIFICE SIZE INS.	TANK DIP INS.	TANK PROD BBLS	API GRAVITY @60 °F	TANK DIP INS.	TANK PROD BBLS	GAS FLOW RATE MMSCFD	OIL FLOW RATE BBLS/DAY	WATER FLOW RATE BBLS/DAY	TOTAL LIQUID FLOW RATE BBLS/DAY	G.O.R. SCF/BBL
21:00	0	964																	
21:30	0	978																	
31-8-86																			
01:30	0	1033																	
05:30	0	1036																	
09:30	0	1063																	
13:30	0	1072																	
17:30	0	1077																	
21:30	0	1080																	
1-9-86																			
01:30	0	1086																	
05:30	0	1089																	
09:30	0	1093																	
13:30	0	1098																	
17:30	0	1101																	
7130	0	1102																	
2-9-86																			
01:30	0	1105																	
05:30	0	1108																	
09:30	0	1117																	

0003342

WELL: FLT LAKE # 1L
TIRRAWARRA
TYPE OF TEST: FLOW & BUILD-UP

SANTOS LTD.

WELL TEST DATA SHEET

DATE: 2-9-86

PAGE No: 5

DATE / TIME	WELLHEAD					GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS				
															GAS	OIL	WATER	TOTAL LIQUID	G.O.R.
	CASING PSI	TUBING PSI	TEMP. °F	CHOKE SIZE INS.	B.S.W. %	PI PSI	HW INS.H_2O	TEMP. °F	ORIFICE SIZE INS.	TANK DIP INS.	TANK PROD BBLS	API GRAVITY @60 °F	TANK DIP INS.	TANK PROD BBLS	FLOW RATE MMSCFD	FLOW RATE BBLS/DAY	FLOW RATE BBLS/DAY	FLOW RATE BBLS/DAY	SCF/BBL
13:30	0	1116																	
17:30	0	1118																	
21:30	0	1119																	
3-9-86																			
01:30	0	1120																	
05:30	0	1120																	
09:30	0	1124																	
13:30	0	1127																	
18:00	0	1128																	
4-9-86																			
06:00	0	1133																	
18:00	0	1136																	
5-9-86																			
06:00	0	1140																	
18:00	0	1141																	
6-9-86																			
06:00	0	1144																	
18:00	0	1146																	
7-9-86																			
06:00	0	1147																	

0000343

WELL: FLY LAKE # 1 L
TIRRAWARRA

TYPE OF TEST: FLOW & BUILD-UP

SANTOS LTD.
WELL TEST DATA SHEET

DATE: 7-9-86

PAGE No: 6

DATE / TIME	WELLHEAD					GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS				
															GAS	OIL	WATER	TOTAL LIQUID	G.O.R.
	CASING PSI	TUBING PSI	TEMP. °F	CHOKE SIZE INS.	B.S.W. %	PI PSI	HW INS.H_2O	TEMP. °F	ORIFICE SIZE INS.	TANK DIP INS.	TANK PROD BBLS	API GRAVITY @60 °F	TANK DIP INS.	TANK PROD BBLS	FLOW RATE MMSCFD	FLOW RATE BBLS/DAY	FLOW RATE BBLS/DAY	FLOW RATE BBLS/DAY	SCF/BBL
09:13				P.O.H.															
04:41				ARRIVE LUB.															
04:43				DEPRESSURE LUB.															
				CHARTS O.T.															
				RIG OUT W/L UNIT & RETURN WELL TO PRODUCTION															

OPERATOR R TICKLE

0003444

WELL: FLY LAKE # 1 (TIRRAWARRA) L

OPERATOR: B. TICKLE

SANTOS LTD
WELL TEST DATA
METRIC SUMMARY SHEET

DATE: 27-8-86

PAGE No: 1

DATE / TIME	WELLHEAD						FLUID PRODUCTION				GAS PRODUCTION			
	CASING PSI	CASING KPA	TUBING PSI	TUBING KPA	TEMP °F	TEMP °C	FLOWRATE OIL-COND BBL'S/D	FLOWRATE OIL-COND M3/D	FLOWRATE H20 BBL'S/D	FLOWRATE H20 M3/D	MMSCF/D	Mm3/D	G.O.R. Cu/FT BBL	G.O.R. M3/M3
27:40	0	0	730	5033										
7:45	0	0	736	5074										
8:00	0	0	545	3758										
10:00	0	0	536	3696	129	54	100.6	15.99	20,13	3.20	.345	9,72	3395	607
2:00	0	0	542	3737	115	46	65.4	10.40	ø	ø	.308	8.68	4649	824
4:00	0	0	533	3675	122	50	65.4	10.40	20.13	3.20	.317	8.93	4785	848
6:00	0	0	535	3689	136	58	133.32	21.20	5.03	.80	.350	9.86	2625	465
0:00	0	0	535	3689	130	54	90.56	14.40	2.52	.40	.353	9.95	3898	691
28-8-86 2:00	0	0	539	3716	118	48	57.86	9.20	5.03	.80	.335	9.44	5789	1026
6:00	0	0	547	3771	118	48	85.53	13.60	2.52	.40	.332	9.35	3887	688
2:00	0	0	540	3723	131	55	123.26	19.60	20.13	3.20	.349	9.83	2831	501
4:00	0	0	522	3599	131	55	60.37	9.60	5.03	.80	.363	10.23	6013	1066

CONVERSION FACTORS:

- BBL'S x 0·15899 = M^3
- MMSCF x 28·174 = $10^3 M^3$
- Cu/FT PER BBL x 0·1773 = M^3/M^3
- PSI x 6·895 = KPA
- °C x 9 ÷ 5 + 32 = °F

0003451

WELL: FLY LAKE # 1 L (TIRRAWARRA)

OPERATOR: B. TICHLE

SANTOS LTD
WELL TEST DATA
METRIC SUMMARY SHEET

DATE: 28-8-86

PAGE No: 2

DATE / TIME	WELLHEAD						FLUID PRODUCTION				GAS PRODUCTION			
	CASING FSI	CASING KPA	TUBING PSI	TUBING KPA	TEMP °F	TEMP °C	FLOWRATE OIL-COND BBL'S/D	FLOWRATE OIL-COND M3/D	FLOWRATE H20 BBL'S/D	FLOWRATE H20 M3/D	MMSCF/D	Mm3/D	G.O.R. Cu/FT BBL	G.O.R. M3/M3
18:00	0	0	522	3599	131	61	90.56	14.40	15.09	2.40	.350	9.86	3865	685
22:00	0	0	543	3744	137	58	77.98	12.39	ϕ	ϕ	.290	8.17	3719	659
29-8-86 02:00	0	0	536	3696	137	58	55.34	8.80	2.52	.40	.296	8.34	5349	948
05:30	0	0	524	3613	138	59	97.76	15.54	2.87	.46	.294	8.28	3007	533
10:00	0	0	532	3668	126	52	136.31	21.67	15.55	2.47	.293	8.26	2149	381
14:00	0	0	525	3620	137	58	90.56	14.39	12.58	2.00	.338	9.52	3732	662
18:00	0	0	548	3780	137	58	51.0	8.11	2.52	.40	.331	9.33	6490	1150
22:00	0	0	540	3720	127	53	57.86	9.20	7.55	1.20	.351	9.89	6066	1076
30-8-86 02:00	0	0	515	3550	133	56	145.9	23.20	20.12	3.20	.442	12.45	3029	537
06:00	0	0	526	3627	124	51	50.31	8.00	15.09	2.40	.318	8.60	6321	1121
10:00	0	0	534	3682	120	49	83.01	13.20	10.06	1.60	.307	8.65	3698	656
14:00	0	0	540	3720	133	56	94.94	15.10	7.55	1.20	.322	9.07	3392	601

CONVERSION FACTORS:

- BBL'S x 0·15899 = M^3
- MMSCF x 28·174 = $10^3 M^3$
- Cu/FT PER BBL x 0·1773 = M^3/M^3
- PSI x 6·895 = KPA
- °C x 9 ÷ 5 + 32 = °F

0003346

WELL: FLY LAKE #1L

OPERATOR: TIBRAWARRA B. TICHLE

SANTOS LTD
WELL TEST DATA
METRIC SUMMARY SHEET

DATE: 30-8-86

PAGE No: 3

DATE / TIME	WELLHEAD						FLUID PRODUCTION				GAS PRODUCTION			
	CASING PSI	CASING KPA	TUBING PSI	TUBING KPA	TEMP °F	TEMP °C	FLOWRATE OIL-COND BBL'S/D	FLOWRATE OIL-COND M3/D	FLOWRATE H20 BBL'S/D	FLOWRATE H20 M3/D	MMSCF/D	Mm3/D	G.O.R. Cu/FT BBL	G.O.R. M3/M3
7:30	0	0	540	3720	133	56	94.94	15.10	7.55	1.20	.322	9.07	3392	601
7:35	0	0	625	4309										
7.40	0	0	670	4620										
7:50	0	0	735	5068										
:00	0	0	780	5378										
:10	0	0	808	5570										
:20	0	0	832	5740										
:30	0	0	848	5850										
:45	0	0	875	6030										
900	0	0	888	6120										
1:15	0	0	899	6200										
1:30	0	0	909	6270										

CONVERSION FACTORS:

- BBL'S x 0·15899 = M^3
- MMSCF x 28·174 = $10^3 M^3$
- Cu/FT PER BBL x 0·1773 = M^3/M^3
- PSI x 6·895 = KPA
- °C x 9 ÷ 5 + 32 = °F

000347

WELL: FLY LANE #1 L TIRRAWARRA

OPERATOR: B. TICHLE

SANTOS LTD
WELL TEST DATA
METRIC SUMMARY SHEET

DATE: 30-8-86

PAGE No: 4

DATE / TIME	WELLHEAD						FLUID PRODUCTION				GAS PRODUCTION			
	CASING PSI	CASING KPA	TUBING PSI	TUBING KPA	TEMP °F	TEMP °C	FLOWRATE OIL-COND BBL'S/D	FLOWRATE OIL-COND M^3/D	FLOWRATE H20 BBL'S/D	FLOWRATE H20 M^3/D	MMSCF/D	Mm3/D	G.O.R. Cu/FT BBL	G.O.R. M^3/M^3
20:00	0	0	933	6433										
20:30	0	0	950	6550										
21:00	0	0	964	6647										
21.30	0	0	978	6743										
1-8-86 21:30	0	0	1033	7123										
5:30	0	0	1036	7143										
9:30	0	0	1063	7329										
3:30	0	0	1072	7391										
7:30	0	0	1077	7426										
1.30	0	0	1080	7447										
4-86 1:30	0	0	1086	7488										
5:30	0	0	1089	7509										

CONVERSION FACTORS:

- BBL'S. x 0·15899 = M^3
- MMSCF x 28·174 = 10^3 M^3
- Cu/FT PER BBL x 0·1773 = M^3/M^3
- PSI x 6·895 = KPA
- °C x 9 ÷ 5 + 32 = °F

000348

WELL: FLY LAKE # 1L
TIRRAWARRA
OPERATOR: B. TICKLE

SANTOS LTD
WELL TEST DATA
METRIC SUMMARY SHEET

DATE: 1-9-86
PAGE No: 5

DATE / TIME	WELLHEAD						FLUID PRODUCTION				GAS PRODUCTION			
	CASING PSI	CASING KPA	TUBING PSI	TUBING KPA	TEMP °F	TEMP °C	FLOWRATE OIL-COND BBL'S/D	FLOWRATE OIL-COND M3/D	FLOWRATE H20 BBL'S/D	FLOWRATE H20 M3/D	MMSCF/D	Mm3/D	G.O.R. Cu/FT BBL	G.O.R. M3/M3
29:30	0	0	1093	7536										
3:30	0	0	1098	7571										
7:30	0	0	1101	7591										
31:30	0	0	1102	7598										
1-9-86 21:30	0	0	1105	7619										
5:30	0	0	1108	7640										
4:30	0	0	1112	7667										
3:30	0	0	1116	7695										
7:30	0	0	1118	7709										
1:30	0	0	1119	7716										
1-9-86 1:30	0	0	1120	7722										
5:30	0	0	1120	7722										

CONVERSION FACTORS:

- •BBL'S. x 0·15899 = M^3
- •MMSCF x 28·174 = $10^3 M^3$
- •Cu/FT PER BBL x 0·1773 = M^3/M^3
- •PSI x 6·895 = KPA
- •°C x 9 ÷ 5 + 32 = °F

000349

WELL: FLY LAKE #1L
TIRRAWARRA
OPERATOR: B. TICKLE

SANTOS LTD
WELL TEST DATA
METRIC SUMMARY SHEET

DATE: 3-9-86
PAGE No: 6

DATE / TIME	WELLHEAD						FLUID PRODUCTION				GAS PRODUCTION			
	CASING PSI	CASING KPA	TUBING PSI	TUBING KPA	TEMP °F	TEMP °C	FLOWRATE OIL-COND BBL'S/D	FLOWRATE OIL-COND M3/D	FLOWRATE H20 BBL'S/D	FLOWRATE H20 M3/D	MMSCF/D	Mm3/D	G.O.R. Cu/FT BBL	G.O.R. M3/M3
9:30	0	0	1124	7750										
13:30	0	0	1127	7771										
18:00	0	0	1128	7778										
9-9-86 6:00	0	0	1133	7812										
3:00	0	0	1136	7833										
9-9-86 10:00	0	0	1140	7860										
8:00	0	0	1141	7867										
9-9-86 6:00	0	0	1144	7888										
3:00	0	0	1146	7902										
9-9-86 6:00	0	0	1147	7909										

CONVERSION FACTORS:

- BBL'S x 0·15899 = M^3
- MMSCF x 28·174 = $10^3 M^3$
- Cu/FT PER BBL x 0·1773 = M^3/M^3
- PSI x 6·895 = KPA
- °C x 9 ÷ 5 + 32 = °F

000350

WELL FLY LAKE #1L
TIBRAWARRA

TANK:— CAPACITY 356.BBLS
SCALE 1" / 1.677 BBLS

SANTOS LTD
FLUID PRODUCTION SHEET

DATE 27-8-86
PAGE No. 1
OPERATOR B. TICKLE

DATE / TIME	CUM. TIME	OIL/CONDENSATE PRODUCTION					WATER PRODUCTION					REMARKS
		TANK DIP INS	TANK PROD. BBLS	FLOWRATE BBLS/D	CUM. PROD. BBLS	OIL CONDENSATE GRAVITY °API60F°	TANK DIP INS	TANK PROD. BBLS	FLOWRATE BBLS/D	CUM. PROD. BBLS	SALINITY PPM	
28:00	0	7"					∅"					
0:00	2	12"	8.385	100.67	8.385	52.0	1"	1.677	20.13	1.677		
2:00	4	15.25"	5.450	65.40	13.832	52.0	1"	∅	∅	1.677		
4:00	6	18.5"	5.450	65.40	19.282	52.0	2"	1.677	20.13	3.354		
8:00	10	31.75"	22.220	133.32	41.500	51.9	2.5"	.839	5.03	4.193		
2:00	14	40.75	15.090	90.560	56.590	49.4	2.75"	.419	2.52	4.612		
28-8-86												
2:00	18	46.5"	9.643	57.86	66.233	49.7	3.25"	.839	5.03	5.451		
6:00	22	55.0"	14.255	85.53	80.488	48.9	3.5"	.419	2.52	5.870		
0:00	26	67.25"	20.543	123.26	101.030	49.0	5.5"	3.354	20.12	9.224		
4:00	30	73.25"	10.062	60.372	111.092	48.9	6.0"	.839	5.03	10.063		
8:00	34	82.25"	15.093	90.56	126.185	49.9	7.5"	2.516	15.09	12.579		
2:00	38	90.0"	12.997	77.98	139.182	50.2	7.5"	∅	∅	12.579		
9-8-86												
2:00	42	95.5"	9.224	55.34	148.406	50.2	7.75"	.419	2.52	12.998		
5:30	45.5	104"	14.255	97.76	162.661	49.8	8.0"	.419	2.873	13.417		
2:00	50	119.75"	25.574	136.31	188.235	49.6	9.75"	2.935	15.55	16.352		
4:00	54	128.25	15.093	90.56	203.328	49.9	11.0"	2.096	12.58	18.448		
8:00	58	136.75	14.255	85.53	217.583	50.2	11.25"	.419	2.52	18.867		
2:00	62	142.50	9.643	57.86	227.226	49.2	12.0"	1.258	7.55	20.125		

0003351

WELL FLY LAKE #1 L
TIBRAWARRA

TANK:— CAPACITY 356 BBLS
SCALE 1"/1.677 BBLS

SANTOS LTD
FLUID PRODUCTION SHEET

DATE 30-8-86
PAGE No. 2
OPERATOR B. TICHLE

DATE / TIME	CUM. TIME	OIL/CONDENSATE PRODUCTION					WATER PRODUCTION					REMARKS
		TANK DIP INS	TANK PROD. BBLS	FLOWRATE BBLS/D	CUM. PROD. BBLS	OIL CONDENSATE GRAVITY °API60F°	TANK DIP INS	TANK PROD. BBLS	FLOWRATE BBLS/D	CUM. PROD. BBLS	SALINITY PPM	
22:00	66	157.0"	24.317	145.90	251.543	49.1	14"	3.354	20.12	23.479		
26:00	70	162.0"	8.385	50.31	259.928	49.6	15.5"	2.516	15.09	25.995		
2.00	74	170.25"	13.835	83.02	273.763	49.9	16.5"	1.677	10.06	27.672		
4.00	78	183.25"	21.801	130.81	295.564	48.9	18.0"	2.516	15.09	30.188		
7.30	81.5	191.50	13.835	94.94	309.399	49.4	18.75"	1.258	7.55	31.446		
7.30				S.I.W.								

000352

CLIENT .SANTOS.....

WELL .FLY LAKE # 1 4.....

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

Date .27-8-86.... Page No. ....1.....

Operator ....B. TICHLE.....

Orifice Fitting Type DANIEL SENIOR...
Gas Flow Recorder Type FOXBORO.....
Date of Last Calibration ...10-6-86.....

Orifice Fitting Size ...3.068".....
Pressure Range ...0-1500 PSI.....
Differential Range ...0-200" Hw.....

Gas Specific Gravity. .9490.....
Perforated Interval. ...9335'-9385'.....
Formation Tested ...TIRRAWARRA.....

Base Conditions = 14.73psi @ 60°F
☒ Flange Taps ☐ Pipe Taps

TIME DATA		Choke Size 64ths Inch	METER RUN DATA				$\sqrt{Pf \times Hw}$	$C' = Fu \times Fb \times Fg \times Ftf \times Fpv \times Y2$							Flow Rate $Q = C' \times \sqrt{Pf \times Hw}$
Date / Time	Elapsed Time Hours		(Pf) Press P.S.I.A.	Diff (Hw) Inches Water	Temp. °F	Plate Size Inches		Fu	Fb	Fg	Ftf	Fpv	Y2	C'	
08:00	0	18/64				.625									
10:00	2	18/64	434.73	70	115	.625	174.445	24	78.625	1.0265	.9510	1.0736	1.0011	1979.837	.345
12:00	4	18/64	474.73	50	113	.625	154.067	24	78.625	1.0265	.9526	1.0832	1.0007	2000.276	.308
14:00	6	18/64	479.73	53	118	.625	159.454	24	78.625	1.0265	.9485	1.0813	1.0007	1988.129	.317
18:00	10	18/64	466.73	68	125	.625	178.151	24	78.625	1.0265	.9428	1.0748	1.0010	1964.78	.350
22:00	14	18/64	454.73	70	118	.625	178.413	24	78.625	1.0265	.9485	1.0761	1.0010	1979.195	.353
28-8-86															
02:00	18	18/64	459.73	61	111	.625	167.462	24	78.625	1.0265	.9543	1.0812	1.0009	2000.293	.335
06:00	22	18/64	464.73	60	117	.625	166.984	24	78.625	1.0265	.9493	1.0790	1.0009	1985.392	.332
10:00	26	18/64	464.73	66	115	.625	175.135	24	78.625	1.0265	.9510	1.0790	1.0009	1991.119	.349
14:00	30	18/64	454.73	74	118	.625	183.439	24	78.625	1.0265	.9485	1.0761	1.0011	1979.311	.363
18:00	34	18/64	454.73	70	124	.625	178.413	24	78.625	1.0265	.9436	1.0730	1.0010	1963.260	.350
22:00	38	18/64	479.73	44	115	.625	145.286	24	78.625	1.0265	.9510	1.0831	1.0006	1996.368	.290
29-8-86															
02:00	42	18/64	474.73	46	111	.625	147.775	24	78.625	1.0265	.9543	1.0845	1.0006	2005.752	.296
05:30	45.5	18/64	434.73	51	118	.625	148.900	24	78.625	1.0265	.9485	1.0721	1.0008	1971.288	.294
10:00	50	18/64	480.73	44	109	.625	145.286	24	78.625	1.0265	.9560	1.0869	1.0006	2013.865	.293
14:00	54	18/64	454.73	64	118	.625	170.595	24	78.625	1.0265	.9485	1.0761	1.0009	1979.021	.338
18:00	58	18/64	464.73	60	118	.625	166.984	24	78.625	1.0265	.9485	1.0782	1.0009	1982.640	.331
22:00	62	18/64	474.73	30	100	.750	119.339	24	113.50	1.0265	.9636	1.0918	1.0004	2944.635	.351

E11

000353

CLIENT ..SANTOS.....

WELL ....FLY LAKE #1L....

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

Date ..30-8-86..... Page No. ..2.....

Operator ..B. TICKLE.....

Orifice Fitting Type DANIEL SENIOR.....
Gas Flow Recorder Type FOXBORO.....
Date of Last Calibration ..10-6-86.....

Orifice Fitting Size ..3.068".....
Pressure Range ..0-1500 PSI.....
Differential Range ..0-200" W.G.....

Gas Specific Gravity.....9690.....
Perforated Interval..9335-9385'.....
Formation Tested ....TIRRAWARRA.....

Base Conditions = 14.73psi @ 60°F
☒ Flange Taps ☐ Pipe Taps

TIME DATA		Choke Size 64ths Inch	METER RUN DATA				$\sqrt{Pf \times Hw}$	$C' = Fu \times Fb \times Fg \times Ftf \times Fpv \times Y2$							Flow Rate $Q = C' \times \sqrt{Pf \times Hw}$
Date / Time	Elapsed Time Hours		(Pf) Press P.S.I.A.	Diff (Hw) Inches Water	Temp. °F	Plate Size Inches		Fu	Fb	Fg	Ftf	Fpv	Y2	C'	
02:00	66	18/64	335	70	113	.75	156.464	24	113.56	1.0265	.9526	1.0577	1.0013	2872.629	.442
06:00	70	18/64	455	25	102	.75	108.366	24	113.56	1.0265	.9619	1.0892	1.0004	2932.128	.318
10:00	74	18/64	474	23	102	.75	104.443	24	113.56	1.0265	.9619	1.0904	1.0003	2935.315	.307
14:00	78	18/64	465	30	111	.75	118.076	24	113.56	1.0265	.9543	1.0823	1.0004	2890.626	.341
17:30	81.5	18/64	475	26	111	.75	111.099	24	113.56	1.0265	.9543	1.0845	1.0004	2896.362	.322
					SHUT IN WELL										

E11

000354

R49 000355

WELL TEST DATA SHEET

WELL: #1 OPERATOR: Ftasco

DATE (Start Test): 8.10.86 METER RUN I.D.: 97.18/102.26 mm

TEST SEPARATOR: F2/LAKE ORIFICE PLATE: .750 mm

TEST LINE: FLOW COMPUTER CONSTANT:

TO START TEST: TIME PIG LAUNCHED: 1600 TIME RECEIVED: 0700

TO END TEST: TIME PIG LAUNCHED: TIME RECEIVED:

TIME	WELLHEAD		SATELLITE DATA								
				LIQUIDS			GAS				
				NOA							
	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
0739	3800	18	20	0	0	0	3000	6.25	19	—	—
1239	3800	18	28	5.63	0	0033	3000	6.75	32	—	—
0739	3800	18	19	29.13	0	0.190	3000	5	17	—	—

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
24	(final minus initial)	29.13	0	+ 0.190	= TOTAL WATER 190	

COMMENTS:

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

(1) STOCK TANK OIL

22.77 m³/d

WELL TEST DATA SHEET

000356

WELL: 1

OPERATOR: F.T.A.S.S.O.S.

DATE (Start Test): 9.10.86

METER RUN I.D.: 97.18/~~102 6~~ mm

TEST SEPARATOR: FLY LAKE

ORIFICE PLATE: .750 mm

TEST LINE: –

FLOW COMPUTER CONSTANT: –

TO START TEST: TIME PIG LAUNCHED: –

TIME RECEIVED: –

TO END TEST: TIME PIG LAUNCHED: –

TIME RECEIVED: –

TIME	WELLHEAD		SATELLITE DATA								
				LIQUIDS			GAS				
				NOA							
	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
0740	3800	18	19	29.79	0	0.194	3000	7.5	17		
1252	3800	18	25	35.94	0	0.236	3100	7.5	23		
0740	3800	18	18	59.19	0	0.398	3100	8	16		

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
24	(final minus initial)	~~59.19~~ 30.06	0	+0.398	= TOTAL WATER ~~.398~~ .208	–

COMMENTS: 30.06

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

RECEIVED 29 OCT 1986 DEPT. OF MINES AND ENERGY SECURITY 1713/A

(1) STOCK TANK OIL 23.31 m³/d

WELL TEST DATA SHEET

000357

WELL: 1 OPERATOR: ESSO

DATE (Start Test): ~~8~~ 10.10.86 METER RUN I.D.: 97.18/~~102.26~~ mm

TEST SEPARATOR: FLY LATE ORIFICE PLATE: .750 mm

TEST LINE: - FLOW COMPUTER CONSTANT: .....

TO START TEST: TIME PIG LAUNCHED: - TIME RECEIVED: -

TO END TEST: TIME PIG LAUNCHED: - TIME RECEIVED: -

	WELLHEAD		SATELLITE DATA									
				LIQUIDS			GAS					
				NOA								
TIME	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
0740	3700	18	18	59.30	0	0.398	3100	7.5	16		
0748	3800	18	22	89.96	0	0.591	3000	7.5	20		
				30.77							
(A)	TOTALS		(B) OIL	(C)	(D)	(E)					(F) GAS
24	(final minus initial)		89.96	0	0.591	= TOTAL WATER 591 - 193					

COMMENTS: .....

.....

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

(1) STOCK TANK OIL

16.83 m³/d

WELL TEST DATA SHEET

000358

WELL: 1

OPERATOR: F. TAYLOR

DATE (Start Test): 8/11/10/86

METER RUN I.D.: 97.18/102.26 mm

TEST SEPARATOR: FL/LAKE

ORIFICE PLATE: .750 mm

TEST LINE: –

FLOW COMPUTER CONSTANT: –

TO START TEST: TIME PIG LAUNCHED: –

TIME RECEIVED: –

TO END TEST: TIME PIG LAUNCHED: –

TIME RECEIVED: –

TIME	WELLHEAD		SATELLITE DATA									
				LIQUIDS			GAS					
				NOA								
	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
0748	4750	18	22	89.97	0	0.600	3000	7	20		
1130	4750	18	27	94.94	0	0.617	3200	7	25.		
0748	4750	18	22	119.58	0	0.771	3150	3.75	20		

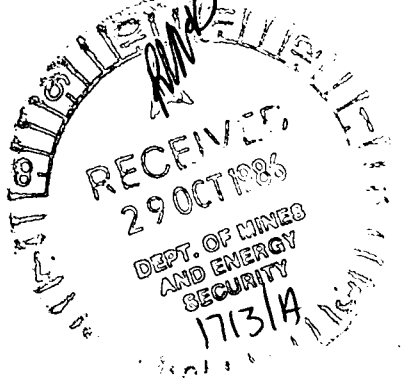
(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
.24..	(final minus initial)	119.58	0	+0.771	= TOTAL WATER .771	

COMMENTS: 29.62

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY



(1) STOCK TANK OIL

24.09 m³/d

WELL TEST DATA SHEET

000359

WELL: 1 OPERATOR: F. TASSONE

DATE (Start Test): 12/8/10/86 METER RUN I.D.: 97.18/102.26 mm

TEST SEPARATOR: FLY LAKE ORIFICE PLATE: 750 mm

TEST LINE: - FLOW COMPUTER CONSTANT: -

TO START TEST: TIME PIG LAUNCHED: - TIME RECEIVED: -

TO END TEST: TIME PIG LAUNCHED: - TIME RECEIVED: -

TIME	WELLHEAD		SATELLITE DATA									
				LIQUIDS			GAS					
				NOA								
	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
0750	3850	18	22	119.68	0	0.771	3150	4	20		
1528	3850	18	32	130.89	0	0.837	3150	7	30		
0750	3850	18	25	152.33	0	0.966	3150	5	23		
(A) 24	TOTALS (final minus initial)			(B) OIL 152.33	(C) 0	(D) 0.966		(E) = TOTAL WATER 966			(F) GAS

COMMENTS:

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

(1) STOCK TANK OIL

m³/d

WELL TEST DATA SHEET

000360

WELL: FLY LAKE #1 UPPER. OPERATOR: ESSO

DATE (Start Test): ~~8~~ 14 10 86 METER RUN I.D.: 97.18 / ~~102.26~~ mm

TEST SEPARATOR: AF 200 ORIFICE PLATE: .750 mm

TEST LINE: – FLOW COMPUTER CONSTANT: –

TO START TEST: TIME PIG LAUNCHED: – TIME RECEIVED: –

TO END TEST: TIME PIG LAUNCHED: – TIME RECEIVED: –

	WELLHEAD		SATELLITE DATA								
				LIQUIDS			GAS				
				NOA							
TIME	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
0758	3900	18	26	152.46	0	966	3100	5	23		
0758	3900	18	21	182.78	0	1127	3400	6.25	18		

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
.24	(final minus initial)	~~182.78~~ 30.45	0	+ .1127	= TOTAL WATER .1127	

COMMENTS:

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

RECEIVED 29 OCT 1986 DEPT. OF MINES AND ENERGY SECURITY 1713/A

(1) STOCK TANK OIL 23.71 m³/d

000361

WELL TEST DATA SHEET

WELL: FLY LAKE #1 UPPER OPERATOR: SANTOS

DATE (Start Test): 15/10/86 METER RUN I.D.: 97.18/~~102.6~~ mm

TEST SEPARATOR: AF 200 ORIFICE PLATE: .750 mm

TEST LINE: - FLOW COMPUTER CONSTANT: -

TO START TEST: TIME PIG LAUNCHED: - TIME RECEIVED: -

TO END TEST: TIME PIG LAUNCHED: - TIME RECEIVED: -

TIME	WELLHEAD		SATELLITE DATA								
				LIQUIDS			GAS				
				NOA							
	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
0800	3800	18	21	182.79	0	1127	3400	6	18		
1336	3800	18	27	190.11	0	1176	3400	5	25		
0800	3800	18	22	213.22	0	1334	3300	2.5	20		

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
24	(final minus initial)	~~213.22~~ 30.44	0	+ 1334	= TOTAL WATER 1334	-

COMMENTS: -

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

(1) STOCK TANK OIL

23.35 m³/d

WELL TEST DATA SHEET

000362

WELL: FLY LAKE #1 UPPER OPERATOR: ESSO

DATE (Start Test): ~~8~~ 16.10.86 METER RUN I.D.: 97.18 / ~~102.26~~ mm

TEST SEPARATOR: AF 200 ORIFICE PLATE: .750 mm

TEST LINE: — FLOW COMPUTER CONSTANT: —

TO START TEST: TIME PIG LAUNCHED: — TIME RECEIVED: —

TO END TEST: TIME PIG LAUNCHED: — TIME RECEIVED:

TIME	WELLHEAD		SATELLITE DATA								
				LIQUIDS			GAS				
				NOA							
	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
0810	3800	18	22	213.33	0	133.6	3300	5.75	20		
1327	3800	18	29	220.70	0	137.2	3400	2.75	27		
0710	3800	18	23	244.40	0	155.1	3100	5.75	20		

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
.23	(final minus initial)	~~244.40~~ 31.18	0	+ 155.1	= TOTAL WATER 155.1	

COMMENTS:

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

(1) STOCK TANK OIL

25.13 m³/d

R50

000363

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

** FLY LAKE #1 LOWER **

FLOWING PRESSURE GRADIENT

TEST DATE: 16.10.86

	TOP PRESSURE ELEMENT 22316/4075			BOTTOM PRESSURE ELEMENT 29323/3950		
DEPTH (FT.)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)
LUB	0.2610	536.2	----	0.2720	536.2	----
1000	0.3160	650.4	0.1142	0.3200	631.9	0.0957
2000	0.3540	729.3	0.0789	0.3690	729.7	0.0977
3000	0.4030	831.1	0.1018	0.4190	829.4	0.0997
4000	0.4570	943.3	0.1122	0.4750	941.1	0.1117
5000	0.5120	1057.6	0.1143	0.5330	1056.8	0.1157
6000	0.5710	1180.2	0.1226	0.5930	1176.5	0.1197
7000	0.6420	1327.8	0.1476	0.6680	1326.1	0.1496
8000	0.7110	1471.3	0.1435	0.7400	1469.7	0.1436
9000	0.7900	1635.6	0.1643	0.8220	1633.1	0.1635
9341	0.8220	1702.2	0.1952	0.8560	1700.9	0.1987
LUB	0.2530	519.6	----	0.2640	520.3	----

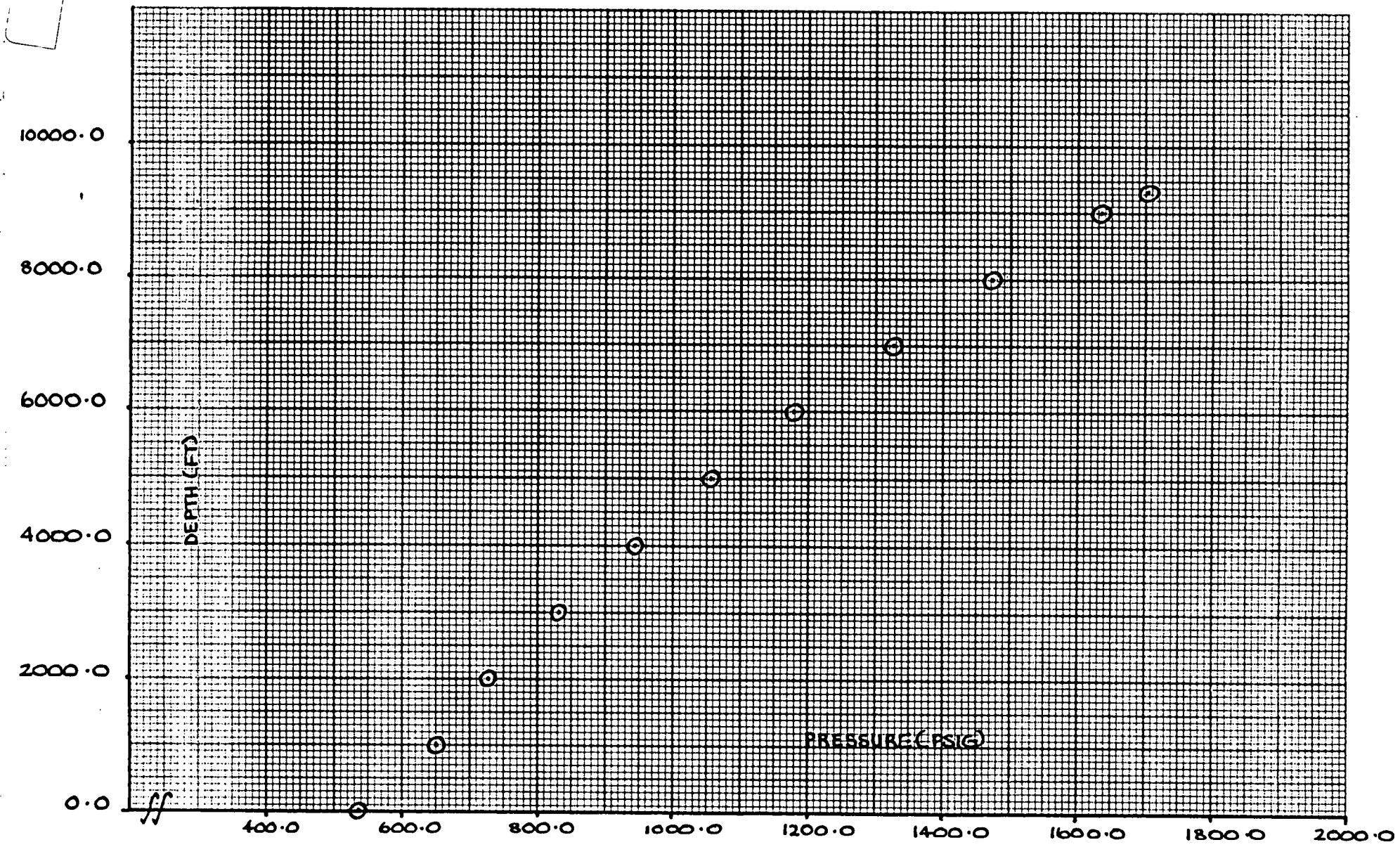
GENERAL REMARKS:
WELL ON TEST THROUGH THE SATELLITE ON A 18/64 CHOKE
RATES OIL= 206.88BBLS/D WATER= 12.93BBLS/D GAS= 0 MMCFD
SURFACE PRESURE 528PSI WHILE ELEMENTS AT 9341 KB

DWT IN: 539
DWT OUT: 516
MAX BHT: 274 F

ELEMENT 22316/4075 CALIBRATED 12.10.86
ELEMENT 29323/3950 CALIBRATED 12.10.86

RECEIVED
13 NOV 1986
DEPT. OF MINES AND ENERGY SECURITY
1713

FLY LAKE # 1 LOWER — FLOWING PRESSURE GRADIENT — 16/10/86
ELEMENT # 22316/4075 (TOP)



0003364

WELL NAME: FLYLAKE #1 LOWER

STATIC GRADIENT SURVEY

DATE: 16:10:86

BOMB No. 1 DATA

LEMENT No. 22316 ELEMENT RANGE: 4075

ECORDER No. 14929 CLOCK DATA: 25509x3Hr

NGAGE STYLUS: 12.54 DISENGAGE: 15:48

BOMB No. 2 DATA

ELEMENT No. 29323 ELEMENT RANGE: 3950

RECORDER No. 12963 CLOCK DATA: 25510x3Hr

ENGAGE STYLUS: 12.54 DISENGAGE: 15:49

LUBRICATOR DATA

PRESSURE WITH D.W.T.: 539 OUT 516 PSI

TIME PRESSURED: 13:00

TIME DEPRESSURED: 15:42

DATE	TIME	DEPTH *	DEFLECTION	PRESSURE TEMP.	GRADIENT psi/ft	DEPTH *	DEFLECTION	PRESSURE TEMP.	GRADIENT psi/ft	REMARKS
10:86	13:00	LUB				LUB				10mins
	13:14	1000				1000				5
	13:24	2000				2000				5
	13:33	3000				3000				5
	13:43	4000				4000				5
	13:53	5000				5000				5
	14:03	6000				6000				5
	14:13	7000				7000				5
	14:23	8000				8000				5
	14:33	9000				9000				5
	14:40	9341				9341				15
	15:32	LUB				LUB				10mins
										MBHT = 274°F

000365

neral Comments :

G010

000366

WIRELINE REPORT

WELL: FLYLAKE #1 LOWER

DATE: 16.10.86

PROGRAM: Flowing Gradient

PURPOSE OF WORK: well evaluation

REPORT OF WORK PERFORMED:

07:50 Arrive on location
08:15 Pressure test B.O.P's
08:40 R.I.H. with 1.75" blind box
09:11 Tag bottom at 9388'KB
09:15 P.O.H.
09:40 In lub Tub: 510psi Cas: 0psi
Prepare pressure elements for flowing gradient
13:10 R.I.H. with pressure elements Tub: 539psi Cas: 0psi
14:40 Reach bottom stop at 9341' Tub: 588psi Cas: 0psi
14:55 P.O.H.
15:32 Back in lub Tub: 516psi Cas: 0psi
Choke size = 18/64
MBHT = 274°F

G R Peterson
OPERATOR'S SIGNATURE

WORK PERFORMED BY: G. PETERSON OF EXPERTEST

WELL DATA:

Tubing Size: 2 7/8" FWHP: 539psi ~~SIWHP:~~

Sub Surface S.V./Landing Nipple @ ..... S.S.D. @: 9212'

"X" Nipple @ 9240' "N"/"XN" Nipple @ ..... other .....

Min I.D. 1.675" @ 9240' Packer @ 9213' & 6500'

Perforated Interval: Basal Patchawarra 9297'-9311' Tirrawarra 9335'-93

Forward to: Petroleum Engineering — Adelaide
Production Department — Moomba

000367

WELL TEST DATA SHEET

WELL: FLY LAKE # 1 OPERATOR: T. POWELL

DATE (Start Test): 5-10-86 METER RUN I.D.: 97.18/~~102.20~~ mm

TEST SEPARATOR: 200 A.F. ORIFICE PLATE: 19.05 mm

TEST LINE: — FLOW COMPUTER CONSTANT: —

TO START TEST: TIME PIG LAUNCHED: — TIME RECEIVED: —

TO END TEST: TIME PIG LAUNCHED: — TIME RECEIVED: —

TIME	WELLHEAD		SATELLITE DATA									
				LIQUIDS			GAS					
				NOA								
	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
16.10.86											
0715				244.51	0	15.54	3100	6.75	20		
17.10.86											
0800	3800	18		278.43	0	17.66	3050	5	22		

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
24 3/4 HRS	(final minus initial)	33.92	0 +	2.12	= TOTAL WATER 2.12	

COMMENTS: OIL DUMP V/V PASSING AND IS NOT MAINTAINING CORRECT OIL LEVEL M.S.R. RAISED

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

(1) STOCK TANK OIL

..... m³/d

WELL TEST DATA SHEET

RS1 000368

WELL: FLY LAKE # 1 OPERATOR: T. POWELL

DATE (Start Test): 17-10-86 METER RUN I.D.: 97.18/~~102.26~~ mm

TEST SEPARATOR: 200 A.F. ORIFICE PLATE: 19.05 mm

TEST LINE: — FLOW COMPUTER CONSTANT: —

TO START TEST: TIME PIG LAUNCHED: — TIME RECEIVED: —

TO END TEST: TIME PIG LAUNCHED: — TIME RECEIVED: —

	WELLHEAD		SATELLITE DATA								
				LIQUIDS			GAS				
				NOA							
TIME	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
16.10.86											
0715				244.~~51~~ 40	0	15.54	3100	6.75	20		
17.10.86											
0800	3800	18		278.43	0	17.66	3050	5	22		

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
24 3/4 hrs	(final minus initial)	33.92 34.03	0	+ 2.12	= TOTAL WATER 2.12	

COMMENTS: OIL DUMP V/V PASSING AND IS NOT MAINTAINING CORRECT OIL LEVEL M.S.R. RAISED

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

(1) STOCK TANK OIL

25.60 m³/d

WELL TEST DATA SHEET

000369

WELL: FLYLAKE 1c

OPERATOR: T. POWER

DATE (Start Test): 24.10.86

METER RUN I.D.: 97.18 / ~~102.26~~ mm

TEST SEPARATOR: FLYLAKE 200 A.F.

ORIFICE PLATE: 19.05 mm

TEST LINE: —

FLOW COMPUTER CONSTANT: —

TO START TEST: TIME PIG LAUNCHED: —

TIME RECEIVED: —

TO END TEST: TIME PIG LAUNCHED: —

TIME RECEIVED: —

TIME	WELLHEAD		SATELLITE DATA									
				LIQUIDS			GAS					
				NOA								
	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
24.10.86											
1330	3800	18	—	0	0	0	3300	4.5	26	—	—
25.10.86											
1330	3800	18	—	24.29	0	2.27	3200	4.5	25	—	—

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
24	(final minus initial)	24.29	0	+ 2.27	= TOTAL WATER 2.27	—

COMMENTS:

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

(1) STOCK TANK OIL

18.88 m³/d

WELL TEST DATA SHEET

000370

WELL: FLYLAKE # 1 OPERATOR: T. PEVERL

DATE (Start Test): 25.10.86 METER RUN I.D.: 97.18/102.26 mm

TEST SEPARATOR: 200 A.F ORIFICE PLATE: 19.05 mm

TEST LINE: — FLOW COMPUTER CONSTANT: —

TO START TEST: TIME PIG LAUNCHED: — TIME RECEIVED: —

TO END TEST: TIME PIG LAUNCHED: — TIME RECEIVED: —

TIME	WELLHEAD		SATELLITE DATA									
				LIQUIDS			GAS					
				NOA								
	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
25.10.86											
1330	3800	18	—	0	0	0	3200	5	26	—	—
26.10.86											
1030	3800	18	—	22.85	0	1.8	3400	4	20	—	—

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
21	(final minus initial)	22.85	0 +	1.8	= TOTAL WATER 1.8	

COMMENTS:

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

(1) STOCK TANK OIL

20.17 m³/d

WELL TEST DATA SHEET

000371

WELL: FLYLAKE # 1 LOWER

OPERATOR: T. POWELL

DATE (Start Test): 26.10.86

METER RUN I.D.: 97.18/102.26 mm

TEST SEPARATOR: FLYLAKE 200 AF

ORIFICE PLATE: 19.05 mm

TEST LINE: —

FLOW COMPUTER CONSTANT: —

TO START TEST: TIME PIG LAUNCHED: —

TIME RECEIVED: —

TO END TEST: TIME PIG LAUNCHED: —

TIME RECEIVED: —

TIME	WELLHEAD		SATELLITE DATA									
				LIQUIDS			GAS					
				NOA								
	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
26.10.86											
1030	3800	18	—	0	0	0	3300	3.75	20	—	—
27.10.86											
1030	3800	18	—	21.88	.03	2.10	3200	4.5	22	—	—
(A)	TOTALS (final minus initial)		(B) OIL	(C)	(D)	(E) = TOTAL WATER					(F) GAS
			21.88	.03	+ 2.10	2.13					—

COMMENTS:

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

(1) STOCK TANK OIL

16.89 m³/d

RS2 000372

WELL TEST DATA SHEET

WELL: Fly Lake #1 low

OPERATOR: J. Marley

DATE (Start Test): 13.11.86

METER RUN I.D.: 97.18 / 102.26 mm

TEST SEPARATOR: 200 AF

ORIFICE PLATE: 19.05 mm

TEST LINE: N/A

FLOW COMPUTER CONSTANT: 07770

TO START TEST: TIME PIG LAUNCHED: N/A

TIME RECEIVED: N/A

TO END TEST: TIME PIG LAUNCHED: N/A

TIME RECEIVED: N/A

	WELLHEAD		SATELLITE DATA								
				LIQUIDS			GAS				
				NOA							
TIME	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
1240	3700	18	N/A	0	0	0	3300	0	30	N/A	N/A
0733	3900	18	N/A	18.96	0.01	0.90	3400	2.25	23	N/A	N/A
1245	3900	18	N/A	24.27	0.01	1.27	3300	1.75	32	N/A	N/A

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
24hr.	(final minus initial)	~~43.23~~ 24.27	0.02	+ 2.17	= TOTAL WATER ~~2.19~~ 1.28	NA

COMMENTS: Seperator running smoothly

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

RECEIVED
11 DEC 1986
DEPT. OF MINES AND ENERGY SECURITY
1713/A

(1) STOCK TANK OIL

18.84 m³/d

R53

WELL TEST DATA SHEET

000373

WELL: FLY LAKE #1 OPERATOR: T. PERRY

DATE (Start Test): 24.11.86 METER RUN I.D.: 97.18/~~102.26~~ mm

TEST SEPARATOR: FLY LAKE ORIFICE PLATE: 19.05.1 mm

TEST LINE: FLOW COMPUTER CONSTANT: 07170

TO START TEST: TIME PIG LAUNCHED: N/A TIME RECEIVED: N/A

TO END TEST: TIME PIG LAUNCHED: N/A TIME RECEIVED: N/A

	WELLHEAD		SATELLITE DATA									
				LIQUIDS			GAS					
				NOA								
TIME	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
10.00	3700	18		0	0	0	3200	1.75	30		
14.00	3700	18		4.09	0	0.07	3200	4.00	34		
08.00	3800	18		23.22	0	0.72	3200	3.00	26		
10.00	3800	18		25.25	0	0.80	3200	3.50	30		

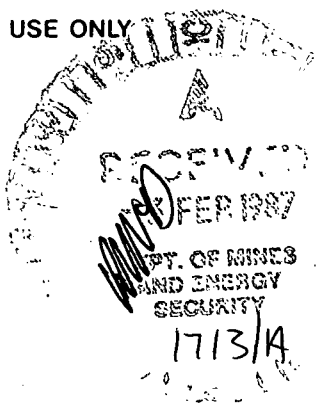
(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
24	(final minus initial)	25.25	0 +	0.80	= TOTAL WATER 0.80	

COMMENTS: DAY 1 OF 48 HR TEST

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY



(1) STOCK TANK OIL

19.77 m³/d

RS4 000374

WELL TEST DATA SHEET

WELL: Fly Lake #1 OPERATOR: Graham Bennett

DATE (Start Test): 14-12-86 METER RUN I.D.: 97.18 / ~~102.26~~ mm

TEST SEPARATOR: Fly Lake ORIFICE PLATE: .750 inches ~~mm~~

TEST LINE: FLOW COMPUTER CONSTANT: 07770

TO START TEST: TIME PIG LAUNCHED: — TIME RECEIVED: —

TO END TEST: TIME PIG LAUNCHED: — TIME RECEIVED: —

TIME	WELLHEAD		SATELLITE DATA									
				LIQUIDS			GAS					
				NOA								
	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m^3	NET WATER m^3	TOTALIZED WATER m^3	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE $m^3 \times 10^3/d$	TOTALIZED FLOW $m^3 \times 10^3$
0815	3700	18		0	0	0	3150	4.5	23	—	—
1240				4.48	.01	.01	3150	4.0	30	—	—
0815				24.10	.01	.91	3130	3.7	24		

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
24	(final minus initial)	24.10	.01 + .91		= TOTAL WATER .92	

COMMENTS:

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

26

CALCULATIONS

SUMMARY

RECEIVED 13 FEB 1987 DEPT OF MINES AND ENERGY BRISBANE 1713/A

(1) STOCK TANK OIL

..... m^3/d

RSS

WIRELINE REPORT

000375

WELL: FLY LAKE #1

DATE: 23-1-87

PROGRAM: BLIND BOX RUN ARIOR TO FLOWING GRADIENT

PURPOSE OF WORK: TO ENSURE TUBING IS CLEAR OF OBSTRUCTIONS

REPORT OF WORK PERFORMED:

0930 : ARRIVE ON LEASE RIG UP WIRELINE EQUIPMENT

1030 : R.I.H WITH 1.75" BLIND BOX

1100 TAG BOTTOM AT 9370' KB

1105 P.O.OH

1200 ARRIVE IN LUBRICATOR

1210 : DE-PRESSURISE LUBRICATOR

: RIG DOWN TOOL STRING PREPARE AMERADAS FOR FLOWING GRADIENT

OPERATOR'S SIGNATURE

MB Mueller

WORK PERFORMED BY: M. MUELLER OF EXPERTEST

WELL DATA:

Tubing Size: 2 7/8 FWHP: 566 KPA SIWHP: -

Sub Surface S.V./Landing Nipple @ 11X1 9216-9242 S.S.D. @:

"X" Nipple @ "N"/"XN" Nipple @ other

Min I.D. 1.875" 9216'-9242' @ Packer @ 8500'41-8502'24 @ 9213-7216.91'

Perforated Interval:

Forward to: Petroleum Engineering — Adelaide
Production Department — Moomba

RECEIVED
18 FEB 1987
DEPT. OF MINES AND ENERGY SECURITY
1713

*O/6382

5504

000376

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

** FLY LAKE 1L **

FLOWING PRESSURE GRADIENT

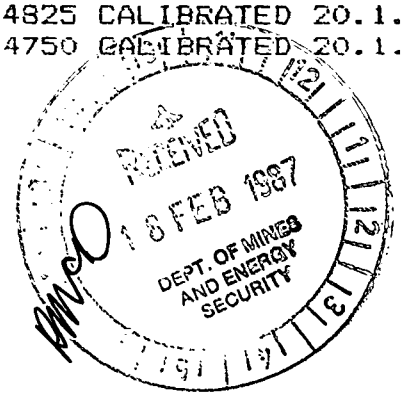
TEST DATE: 23-1-87

	TOP PRESSURE ELEMENT 21379/4825			BOTTOM PRESSURE ELEMENT 21821/4750		
DEPTH (FT.)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)
LUB	0.2260	561.3	----	0.2300	548.5	----
1000	0.2700	670.0	0.1088	0.2760	658.3	0.1098
2000	0.2960	734.3	0.0642	0.3040	725.0	0.0668
3000	0.3390	840.5	0.1062	0.3490	832.3	0.1072
4000	0.3910	968.8	0.1284	0.4030	960.8	0.1286
5000	0.4420	1094.7	0.1259	0.4540	1082.2	0.1214
6000	0.4930	1220.6	0.1259	0.5090	1213.1	0.1309
7000	0.5450	1348.9	0.1283	0.5630	1341.7	0.1286
8000	0.6140	1519.2	0.1703	0.6340	1511.0	0.1693
9000	0.6750	1669.9	0.1506	0.6980	1663.8	0.1528
9341	0.7080	1751.4	0.2390	0.7340	1749.8	0.2524
LUB	0.2140	531.6	----	0.2230	531.8	----

ENERAL REMARKS:

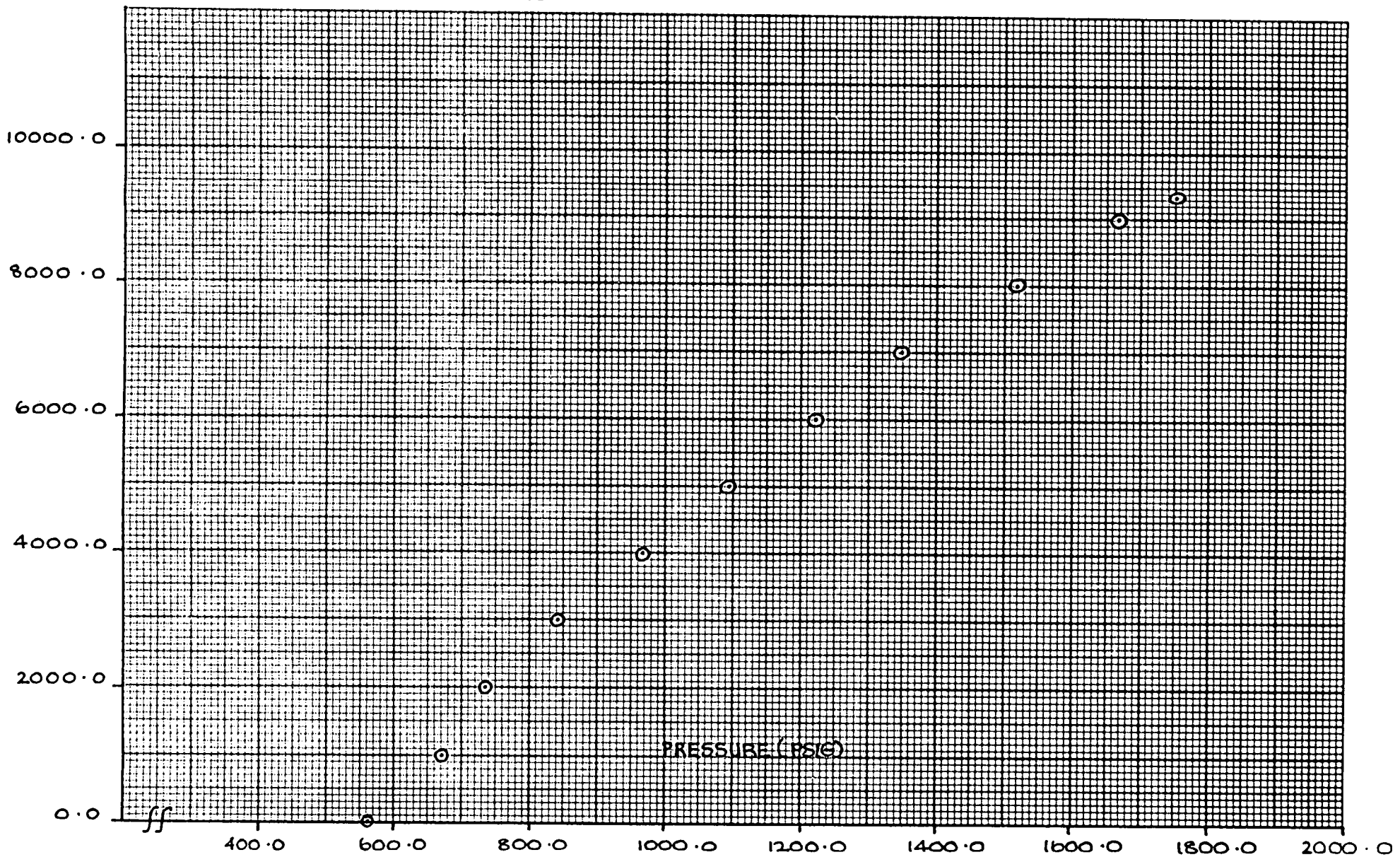
DWT IN: 566
DWT OUT: 537
MAX BHT: 278 F

ELEMENT 21379/4825 CALIBRATED 20.1.87
ELEMENT 21821/4750 CALIBRATED 20.1.87



FLY LAKE # 1 LOWER — FLOWING PRESSURE GRADIENT — 23/1/87

ELEMENT # 21379/4825 (TOP)



000377

Fm 5030

WELL NAME: FLY LAKE #1 — FLOWING GRADIENT SURVEY — DATE: 23-1-87

BOMB No. 1 DATA

ELEMENT No. 21379 — ELEMENT RANGE: 4825 PSI
RECORDER No. 59288 — CLOCK DATA: A 12046 - 3 HR
ENGAGE STYLUS: 1410 — DISENGAGE: 1635

BOMB No. 2 DATA

ELEMENT No. 21821 — ELEMENT RANGE: 4750
RECORDER No 14619 — CLOCK DATA: A 16087 - 3 HR
ENGAGE STYLUS: 1410 — DISENGAGE: 1635

LUBRICATOR DATA

PRESSURE WITH D.W.T: IN 566 OUT 537
TIME PRESSURED: 1428
TIME DEPRESSURED: 1626

DATE	TIME	DEPTH *	DEFLECTION	PRESSURE TEMP.	GRADIENT psi/ft	DEPTH *	DEFLECTION	PRESSURE TEMP.	GRADIENT psi/ft	REMARKS
23-1										
	1428	LUB	.226			LUB	.230			10 MINS
	1431	1000	.270			1000	.276			5
	1439	2000	.296			2000	.304			↑
	1447	3000	.339			3000	.369			
	1455	4000	.391			4000	.403			
	1503	5000	.442			5000	.454			
	1511	6000	.493			6000	.509			
	1519	7000	.545			7000	.563			
	1527	8000	.614			8000	.634			↓
	1535	9000	.675			9000	.698			5
	1542	9341	.708			9341	.734			10
	1616	LUB	.214			LUB	.223			10
										MBHT 278 °F
										Gradient was run in conjuction with Santos initial production test
										Test counter attached

General Comments:

FILED
RECEIVED
FEB 1987
DEPT. OF MINES AND ENERGY SECURITY

000378

R56

WELL TEST DATA SHEET

000379

WELL: FLY LAKE # 1 LOWER

OPERATOR: C BRUHN

DATE (Start Test): 23.1.87

METER RUN I.D.: 97.18 / ~~102.20~~ mm

TEST SEPARATOR: FLY LAKE SATELLITE

ORIFICE PLATE: 19.05 mm

TEST LINE:

FLOW COMPUTER CONSTANT:

TO START TEST: TIME PIG LAUNCHED: NA

TIME RECEIVED: NA

TO END TEST: TIME PIG LAUNCHED:

TIME RECEIVED:

TIME	WELLHEAD		SATELLITE DATA									
				LIQUIDS			GAS					
				NOA								
	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
23.1.87	NA										
1300		18		0	0	0	3150	5.0	32		
24.1.87	NA										
1300		18		25.99	0	1.83	3150	5.5	35		
25.1.87	NA										
1300		18		51.10	0	4.20	3100	4.75	35		

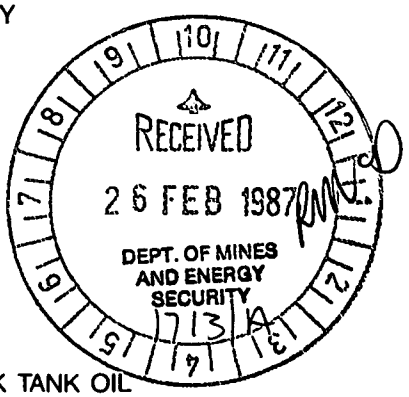
(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
48	(final minus initial)	51.10	0	+ 4.20	= TOTAL WATER 4.20	

COMMENTS: TESTED 23.1.87 IN CONJUNCTION WITH EXPERTEST FLOWING GRADIANT, 48HR TEST COMPLETED

PRODUCTION ENGINEERING DEPARTMENT USE ONLY 2545

CALCULATIONS

SUMMARY



(1) STOCK TANK OIL

..... m³/d

R57

WELL TEST DATA SHEET

000380

WELL: FLY LAKE * 1 L

OPERATOR: C.BRUHN

DATE (Start Test): 27-1-87

METER RUN I.D.: 97.18 / ~~102.26~~ mm

TEST SEPARATOR: FLY LAKE SATELLITE

ORIFICE PLATE: 19.05 mm

TEST LINE:

FLOW COMPUTER CONSTANT: N.A

TO START TEST: TIME PIG LAUNCHED: N.A

TIME RECEIVED: N.A

TO END TEST: TIME PIG LAUNCHED:

TIME RECEIVED:

TIME	WELLHEAD		SATELLITE DATA									
				LIQUIDS			GAS					
				NOA								
	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
27·1·87											
1400	NA	18		0	0	0	3100	4·25	27		
28·1·87	NA	18		24·79	0	1·83	3100	6·15	28		
1400											
29·1·87	NA	18		51·49	0	3·66	3150	5·75	32		
1630									29		

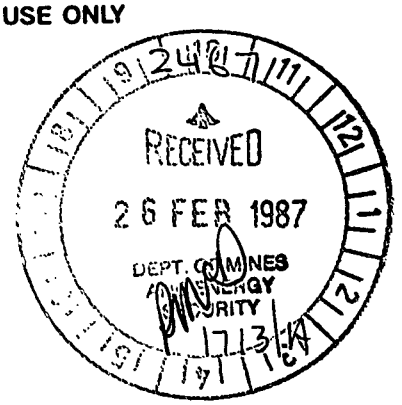
(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
50 ½	(final minus initial)	51·49	0	+ 3·66	= TOTAL WATER 3·66	

COMMENTS: FTP NA DUE TO EXPERTEST SWAB VALVE INSTALLED ON WELL HEAD — TEST EXCEEDED 48 HR PERIOD DUE TO WORK LOAD.

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY



(1) STOCK TANK OIL

..... m³/d

R58

000381

ROLLING BOTTOMHOLE PRESSURE SURVEY GAS CALCULATION SHEET

WELL: Fly Lake # 1 Upper

ORIFICE SIZE: 53.975 mm 2.125 " ✓

LINE SIZE: 97.180 mm 3.826 " ✓

Pf = 4300 kPa

T = 68 °C

Diff = 34 kPa

Cumulative Production to end of February = 211.497 $m^3 \times 10^6$

Number of hours online in February = 672

Production in February = 4.754 $m^3 \times 10^6$

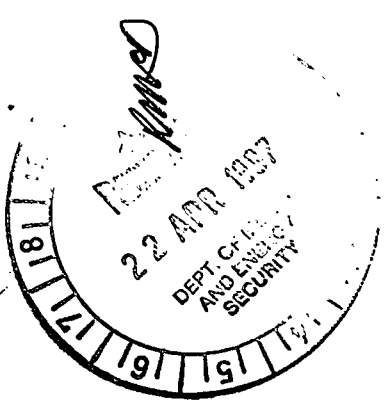
∴ Average flow rate in February = (4.754/672) x 24 = 0.170 $m^3 \times 10^6/d$

Number of days online in March before Shut In 1500 hrs 27 / 3 /87
= 26.5 days

∴ Production up to 1500hrs 27 / 3 /87 = 0.170 x 26.5 = 4.505 $m^3 \times 10^6$

Total cumulative production = 211.497 + 4.505
= 216.002 $m^3 \times 10^6$
= 7666.775 mmscf

Flow rate just prior to Shut In = 0.183 $m^3 \times 10^6$ ✓
= 6.504 mmscf/d ✓



1713

WP 2946G(13)
LGA/jfs : 8/12/86

SANTOS LTD
39 GRENFELL ST
ADELAIDE

SUB-SURFACE PRESSURE SURVEY

CO. SANTOS			RUN 01 FIELD FLY LAKE	WELL 01U	
EFF DEPTH			WELL STAT	TOOL HUNG	8519'
CASING 7"		-	CASING PRESS	ON BOTTOM	0800 27/3
LINER		-	TUBING PRESS	OFF BOTTOM	0700 31/3
DATE	870331		ELEMENT RANGE 0 - 4027	ZERO POINT	
ELEVATION			ZONE	SHUT-IN	1500 27/3
MAX TEMP			PICK-UP	ON-PROD	
PERF		-	CAL SER NO. 22418	MPP	
TUBING 2-3/8"		-			
UNITS	ENGLISH		PURPOSE BUILD-UP		

SURVEY DATA

CO. SANTOS — RUN 01 FIELD FLY LAKE — WELL 01U

TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
15:00	2065.7	0.0	0.0	15:54	2459.5	393.8	.9
15:01	2120.2	54.5	.0	16:10	2468.0	402.2	1.2
15:02	2243.4	177.6	.0	16:30	2478.6	412.8	1.5
15:05	2328.8	263.0	.1	16:53	2490.7	425.0	1.9
15:08	2366.4	300.7	.1	17:35	2503.8	438.1	2.6
15:10	2381.6	315.9	.2	18:47	2518.6	452.8	3.8
15:13	2392.7	326.9	.2	20:40	2532.8	467.1	5.7
15:14	2401.4	335.6	.2	3:14	2554.9	489.2	12.2
15:17	2407.8	342.1	.3	9:31	2569.6	503.8	18.5
15:20	2414.5	348.7	.3	19:18	2583.5	517.8	28.3
15:23	2422.4	356.6	.4	5:34	2592.9	527.2	38.6
15:26	2429.2	363.4	.4	17:50	2600.9	535.1	50.8
15:32	2437.4	371.7	.5	8:58	2607.9	542.2	66.0
15:37	2444.0	378.3	.6	0:08	2613.4	547.6	81.1
15:41	2448.8	383.1	.7	7:00	2617.2	551.5	88.0
15:46	2453.4	387.6	.8	0:00	0.0	0.0	0.0

LUB IN DWT = 656 PSI / OUT = 1872 PSI
LUB IN AMERADA = 644 PSI / OUT = 1866 PSI

SANTOS LTD
39 GRENFELL ST
ADELAIDE

SUB-SURFACE PRESSURE SURVEY

CO. SANTOS		RUN 02 FIELD FLY LAKE		WELL 01U	
EFF DEPTH		WELL STAT		TOOL HUNG	8525'
CASING 7"	-	CASING PRESS		ON BOTTOM	0800 27/3
LINER	-	TUBING PRESS		OFF BOTTOM	0700 31/3
DATE	870331	ELEMENT RANGE	0 - 4147	ZERO POINT	
ELEVATION		ZONE		SHUT-IN	1500 27/3
MAX TEMP		PICK-UP		ON-PROD	
PERF	-	CAL SER NO.	22308	MPP	
TUBING 2-3/8"	-				
UNITS	ENGLISH	PURPOSE	BUILD-UP		

SURVEY DATA

CO. SANTOS — RUN 02 FIELD FLY LAKE — WELL 01U

TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
15:00	2053.7	0.0	0.0	16:19	2482.3	428.6	1.3
15:01	2197.9	144.2	.0	17:52	2515.5	461.8	2.9
15:02	2363.5	309.8	.0	22:20	2551.2	497.5	7.3
15:04	2417.5	363.8	.1	6:40	2578.4	524.7	15.7
15:19	2421.0	367.3	.3	16:17	2597.6	543.9	25.3
15:20	2445.8	392.1	.3	7:43	2616.8	563.1	40.7
15:33	2445.6	391.9	.6	23:02	2627.9	574.2	56.0
15:33	2459.6	405.9	.6	17:43	2638.0	584.3	74.7
15:47	2462.4	408.7	.8	7:00	2644.9	591.2	88.0

LUB IN DWT = 656 PSI / OUT = 1872 PSI
LUB IN AMERADA = 643 PSI / OUT = 1871 PSI

SANTOS LTD.

000384

ISO - CHRONAL AND BUILD-UP SURVEY

Well: F/V LAKE #1 UPPER PATCHAWARRA FORMATION Date: 27-3-87

Lubricator Data: ① 644 1866
② 643 1871

Pressure with D.W.T. IN 656 PSI OUT 1872 PSI

Time Pressured 0630 27-3-87 Time Depressured 0830 - 31/3/87

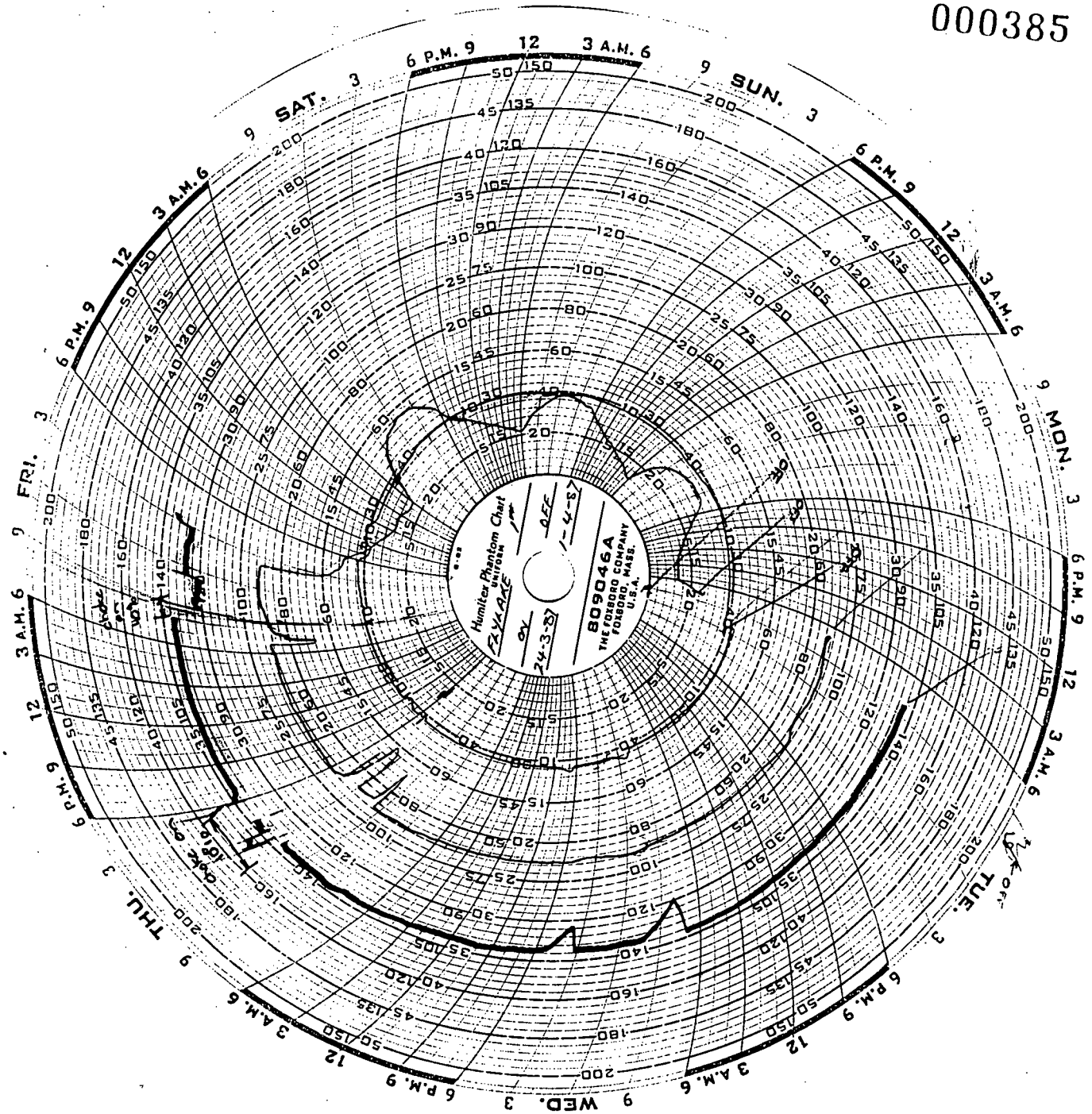
Time Run in Hole 0730 27-3-87 Time off Bottom 0700 - 31/3/87

	Bomb No. 1 Data	Bomb No. 2 Data
Element No. and Range	22418 x 4000 PSI	22308 x 4100 PSI
Recorder No.	14926	54652
Clock and Lead Screw Data	28647 x 96 HR 1STLS	28648 x 96 HR 1STLS
Engage Stylus	Date: 27-3-87 Time: 0:620	Date: 27-3-87 Time: 06:20 -
Disengage	Date: 31-3-87 Time: 0840	Date: 31-3-87 Time: 0840

Remarks: CHOKE CUT BACK TO 10% TO RUN BOMBS IN HOLE OPEN WELL TO 40% WIRE WENT SLACK SEEMED FLOW TO STRONG LIFTING BOMBS / OPERATOR ERROR BY SETTING BOMBS ON BAR @ END OF TUBING & SLACK OFF ON STRING WEIGHT / PULL UP SLACK & HANG @ 8525' KB OPEN CHOKE 100%

Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	Wellhead P.S.I.G.	Casing P.S.I.G.	Wellhead Temp.	Remarks
27-3-87	0800	FLOWING				BOMBS ON BOTTOM
	1100		650	18	122	CHOKE @ 100%
	1200		653	18	134	
	1300		655	18	138	
	1400		659	18	138	
	1500	FLOWING	634	19	138	
		SHUT IN WELL FOR 84 HR BUILD UP.				
		ALL BUILD UP DATA ON METRIC SUMMARY SHEET				
31-3-87	0700		1873	10		PULL OUT OF HOLE
	0730					IN LUB
	0830		1872	10		DEPRESSURE LUB
		CLOCKS RUN OUT ON BOTTOM				
		END OF B.H.P. SURVEY.				



Meter run 97.180
OP 53.975

WELL: FLY LAKE #1 UPPER

OPERATOR: J. HOFF

SANTOS LTD
WELL TEST DATA
METRIC SUMMARY SHEET

DATE: 26-3-87

PAGE No: ONE OF 7

DATE / TIME	WELLHEAD						FLUID PRODUCTION				GAS PRODUCTION			
	CASING PSI	CASING KPA	TUBING PSI	TUBING KPA	TEMP °F	TEMP °C	FLOWRATE OIL-COND BBL'S/D	FLOWRATE OIL-COND M3/D	FLOWRATE H20 BBL'S/D	FLOWRATE H20 M3/D	MMSCF/D	Mm3/D	G.O.R. Cu/FT BBL	G.O.R. M3/M3
MARCH-26TH-87			B.H.P.	Survey			PATCHAWARRA FORMATION							
300							ARRIVE ON LOCATION START TO RIG UP WIRE LINE							
330							FIELD OP. SHUT IN WELL TO INSTALL SWAB VALVE							
400							WELL ON LINE @ 100% CHOKE CONTINUE TO RIG UP 1.75 BLIND BOX							
							LEAVE LOCATION TO FLY LAKE #6 TO INSTALL SWAB VALVE & RIG IN OTHER W/L UNIT.							
600							CUT CHOKE BACK TO 10% TO ALLOW TOOL STRING TO R.I.H.							
640							TAG @ 8525' PULL OUT OF HOLE							
700							ARRIVE IN LUB RUN WELL ON 100% CHOKE & RIG OUT 1.75 BLIND BOX							
MARCH-27-87							PREPARE AMERADA'S FOR B.H.P. SURVEY.							
630	18	124	654	4509			PRESSURE LUB FOR B.H.P. SURVEY							
730	18	124	656	4523			RUN IN HOLE							
800							BOMBS SET ON BAR @ END OF TUBING & WIEGHT SLACKED OFF							

CONVERSION FACTORS:

- BBL'S x 0·15899 = M^3
- MMSCF x 28·174 = $10^3 M^3$
- Cu/FT PER BBL x 0·1773 = M^3/M^3
- PSI x 6·895 = KPA
- °C x 9 ÷ 5 + 32 = °F

000386

WELL: ...Fly Lake #1 Upper.....

OPERATOR: ..J. Hoff.....

SANTOS LTD
WELL TEST DATA
METRIC SUMMARY SHEET

DATE: 27-3-87.....

PAGE No: Two of 7.....

DATE / TIME	WELLHEAD						FLUID PRODUCTION				GAS PRODUCTION			
	CASING PSI	CASING KPA	TUBING PSI	TUBING KPA	TEMP °F	TEMP °C	FLOWRATE OIL-COND BBL'S/D	FLOWRATE OIL-COND M^3/D	FLOWRATE H20 BBL'S/D	FLOWRATE H20 M^3/D	MMSCF/D	Mm^3/D	G.O.R. Cu/FT BBL	G.O.R. M^3/M^3
MARCH 27-87 B.H.P. SURVEY PATCHAWARRA FORMATION.														
0805							OPEN CHOKE TO 40% LOSE WEIGHT ON WIRE INDICATING BOMBS FLOATING							
0830							CANNOT FLOW MORE THAN 40% CHOKE							
1030	18	124	714	4923	122	50	ERROR MADE IN HANGING BOMBS: SET ON BAR @ END OF TUBING & LINE WEIGHT							
1050			715	4930			WAS SLACKEN OFF PICK UP WEIGHT & HANG @ 8525' KB OPEN CHOKE 100%							
1100			650	4482	122	50								
1130			652	4495	134	57								
1200			653	4502	134	57								
1230			654	4509	142	61								
1300			655	4516	138	59								
1330			655	4516	140	60								
1400	18	124	659	4543	138	59								

CONVERSION FACTORS:

- BBL'S x 0·15899 = M^3
- MMSCF x 28·174 = $10^3 M^3$
- Cu/FT PER BBL x 0·1773 = M^3/M^3
- PSI x 6·895 = KPA
- °C x 9 ÷ 5 + 32 = °F

0003387

PETENG 007

WELL: FLY LAKE #1 UPPER

OPERATOR: J. HOFF

SANTOS LTD
WELL TEST DATA
METRIC SUMMARY SHEET

DATE: 27-3-87

PAGE No: THREE OF 7

DATE / TIME	WELLHEAD						FLUID PRODUCTION				GAS PRODUCTION			
	CASING FSI	CASING KPA	TUBING PSI	TUBING KPA	TEMP °F	TEMP °C	FLOWRATE OIL-COND BBL'S/D	FLOWRATE OIL-COND M3/D	FLOWRATE H2O BBL'S/D	FLOWRATE H2O M3/D	MMSCF/D	Mm3/D	G.O.R. Cu/FT BBL	G.O.R. M3/M3
MARCH-27TH-87				B. H. P. SURVEY			PATCHAWARRA FORMATION							
1430	18	124	661	4557	142	61								
1500	19	131	634	4371	138	59		SHUT IN WELL FOR 84 HR Build UP.						
1515	19	131	1760	12135										
1530	19	131	1778	12259										
1545	19	131	1785	12307										
1600	18	124	1793	12362										
1615	18	124	1797	12390										
1630	18	124	1799	12404										
1645	17	117	1805	12445										
1700	16	110	1809	12473										
1715	16	110	1811	12486										

CONVERSION FACTORS:

- BBL'S x 0·15899 = M3
- MMSCF x 28·174 = 10³ M3
- Cu/FT PER BBL x 0·1773 = M3/M3
- PSI x 6·895 = KPA
- °C x 9 ÷ 5 + 32 = °F

000388

PETENG 007

WELL: Fly Lake #1 Upper

OPERATOR: J. Hoff

SANTOS LTD
WELL TEST DATA
METRIC SUMMARY SHEET

DATE: 27-3-87

PAGE No: Four of 7

DATE / TIME	WELLHEAD						FLUID PRODUCTION				GAS PRODUCTION			
	CASING PSI	CASING KPA	TUBING PSI	TUBING KPA	TEMP °F	TEMP °C	FLOWRATE OIL-COND BBL'S/D	FLOWRATE OIL-COND M3/D	FLOWRATE H20 BBL'S/D	FLOWRATE H20 M3/D	MMSCF/D	Mm3/D	G.O.R. Cu/FT BBL	G.O.R. M3/M3
MARCH - 27TH - 87				B.H.P. Survey			PATCHAWARRA FORMATION							
1730	16	110	1814	12507										
1745	16	110	1816	12521										
1800	16	110	1818	12535										
1815	16	110	1820	12548										
1830	16	110	1822	12562										
1845	16	110	1823	12569										
1900	16	110	1823	12569										
2300	14	96	1834	12645										
MARCH - 28TH - 87														
0300	14	96	1840	12687										
0700	12	82	1844	12714										

CONVERSION FACTORS:

- BBL'S x 0·15899 = M^3
- MMSCF x 28·174 = $10^3 M^3$
- Cu/FT PER BBL x 0·1773 = M^3/M^3
- PSI x 6·895 = KPA
- °C x 9 ÷ 5 + 32 = °F

000389

PETENG 007

WELL: FLY LAKE #1 UPPER

OPERATOR: T. HOFF

SANTOS LTD
WELL TEST DATA
METRIC SUMMARY SHEET

DATE: 28-3-87

PAGE No: FIVE OF 7

DATE / TIME	WELLHEAD						FLUID PRODUCTION				GAS PRODUCTION			
	CASING PSI	CASING KPA	TUBING PSI	TUBING KPA	TEMP °F	TEMP °C	FLOWRATE OIL-COND BBL'S/D	FLOWRATE OIL-COND M3/D	FLOWRATE H20 BBL'S/D	FLOWRATE H20 M3/D	MMSCF/D	Mm3/D	G.O.R. Cu/FT BBL	G.O.R. M3/M3
MARCH-28TH-87				B.H.P. SURVEY			PATCHAWARRA FORMATION.							
1100	14	96	1848	12742										
1500	14	96	1854	12783										
1900	14	96	1857	12801										
2300	11	76	1858	12810										
MARCH-29TH-87														
0300	11	76	1859	12817										
0700	10	69	1860	12824										
1100	10	69	1861	12831										
1500	10	69	1862	12838										
1900	10	69	1862	12838										
2300	10	69	1867	12873										

CONVERSION FACTORS:

- •BBL'S x 0·15899 = M^3
- •MMSCF x 28·174 = $10^3 M^3$
- •Cu/FT PER BBL x 0·1773 = M^3/M^3
- •PSI x 6·895 = KPA
- •°C x 9 ÷ 5 + 32 = °F

000390

PETENG 007

WELL: ...Fly Lake #1 Upper....
OPERATOR: ...J. Hoff.....

SANTOS LTD
WELL TEST DATA
METRIC SUMMARY SHEET

DATE: 30-3-87.....
PAGE No: ...Six of 7.....

DATE / TIME	WELLHEAD						FLUID PRODUCTION				GAS PRODUCTION			
	CASING PSI	CASING KPA	TUBING PSI	TUBING KPA	TEMP °F	TEMP °C	FLOWRATE OIL-COND BBL'S/D	FLOWRATE OIL-COND M3/D	FLOWRATE H20 BBL'S/D	FLOWRATE H20 M3/D	MMSCF/D	Mm3/D	G.O.R. Cu/FT BBL	G.O.R. M3/M3
MARCH-30TH-87							B.H.P. SURVEY PATCHAWARRA FORMATION							
0300	10	69	1867	12873										
0700	10	69	1869	12887										
1100	10	69	1868	12880										
1500	10	69	1868	12880										
1900	10	69	1869	12886										
2300	10	69	1869	12886										
MARCH-31ST-87														
0300	10	69	1871	12893			← TOTAL OF 84 HRS SHUT IN							
0700	10	69	1872	12907			PULL BOMBS OUT OF HOLE CLOCKS RUN OUT ON BOTTOM							
0730							IN LUB							
0830	10	69	1872	12907			DEPRESSURE LUB CHARTS O.K. PREPARE TO RUN STATIC GRADIENT							

CONVERSION FACTORS:

- BBL'S x 0·15899 = M3
- MMSCF x 28·174 = 10^3 M3
- Cu/FT PER BBL x 0·1773 = M3/M3
- PSI x 6·895 = KPA
- °C x 9 ÷ 5 + 32 = °F

0003391

WELL: ...Fly. Lake #1 Upper.....

OPERATOR: ..J. Hoff.....

SANTOS LTD
WELL TEST DATA
METRIC SUMMARY SHEET

DATE: 31-3-87.....

PAGE No: Seven of 7....

DATE / TIME	WELLHEAD						FLUID PRODUCTION				GAS PRODUCTION			
	CASING PSI	CASING KPA	TUBING PSI	TUBING KPA	TEMP °F	TEMP °C	FLOWRATE OIL-COND BBL'S/D	FLOWRATE OIL-COND M3/D	FLOWRATE H20 BBL'S/D	FLOWRATE H20 M3/D	MMSCF/D	Mm3/D	G.O.R. Cu/FT BBL	G.O.R. M3/M3
March-31st-87				B.H.P. Survey			Patchawarra Formation							
0900							Pressure Lub for static gradient as per Programme							
0915	10	69	1872	12907			Run in Hole							
1033							Pullout of Hole							
1105	10	69	1872	12907			Depressure Lub Charts OK.							
1330							Hand well back to Production							

CONVERSION FACTORS:

- BBL'S x 0·15899 = M3
- MMSCF x 28·174 = 10³ M3
- Cu/FT PER BBL x 0·1773 = M3/M3
- PSI x 6·895 = KPA
- °C x 9 ÷ 5 + 32 = °F

000392

PETENG 007

WIRELINE REPORT

000393

WELL: Fly Lake #1 upper Patchawarra Formation

DATE: 26-3-87

PROGRAM: B.H.P. Survey

PURPOSE OF WORK: To drift Tubing + Tag End of Tubing on S.S.

REPORT OF WORK PERFORMED: 13:00 Arrive on Location start Rig in w/l Equipment. 13:30 Shut in well to install swab valve 14:00 well back on line @ 100% choke Rig up 1.75 Blind Box Leave Location to install swab valve + Rig up w/l on Fly Lake #6. 1600 - Run in Hole with 1.75 Blind Box choke well back to 10% To Allow Tool string to Run in Hole no obstructions 16:40 To Hang Depth 8525'KB. Pull out of Hole 1700 Arrive in Lub Rig out 1.75 Blind Box Prepare Amerada's for B.H.P. Survey

27-3-87 0:730 - Run in Hole For B.H.P. As per Programme

31-3-87 0700 - Pull Bombs out of Hole

0900 - Run Static & Radient as per Programme.

1130 - Rig out wire line Hand well back to Production

1330 - Hand well back to Production

OPERATOR'S SIGNATURE

WORK PERFORMED BY: J. Hoff OF Expertest

WELL DATA:

Tubing Size: 2 3/8 FWHP: 656 PSI SIWHP: 1872 PSI

Sub Surface S.V./Landing Nipple @ S.S.D. @:

"X" Nipple @ "N"/"XN" Nipple @ 8521'KB other

Min I.D. 1.875 " @ 8521'KB Packer @ 8500'KB

Perforated Interval: 8586' → 9173'

Forward to: Petroleum Engineering — Adelaide
Production Department — Moomba

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

** FLY LAKE #1 UPPER **

STATIC PRESSURE GRADIENT

TEST DATE: 31/3/87

	TOP PRESSURE ELEMENT 22418/4000			BOTTOM PRESSURE ELEMENT 22308/4100		
DEPTH (FT.)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)
LUB	0.9370	1863.0	----	0.9000	1872.7	----
1000	0.9820	1953.6	0.0906	0.9430	1961.8	0.0891
2000	1.0260	2042.2	0.0887	0.9860	2050.8	0.0891
3000	1.0700	2131.0	0.0887	1.0280	2137.8	0.0870
4000	1.1140	2219.8	0.0888	1.0710	2226.9	0.0891
5000	1.1570	2306.7	0.0869	1.1140	2316.0	0.0891
6000	1.2000	2393.7	0.0870	1.1550	2400.9	0.0849
7000	1.2440	2482.8	0.0891	1.1970	2487.9	0.0870
8000	1.2880	2572.0	0.0892	1.2400	2576.9	0.0891
8400	1.3050	2606.5	0.0862	1.2560	2610.1	0.0828
8525	1.3110	2618.7	0.0974	1.2610	2620.4	0.0828
LUB	0.9390	1867.0	----	0.9030	1878.9	----

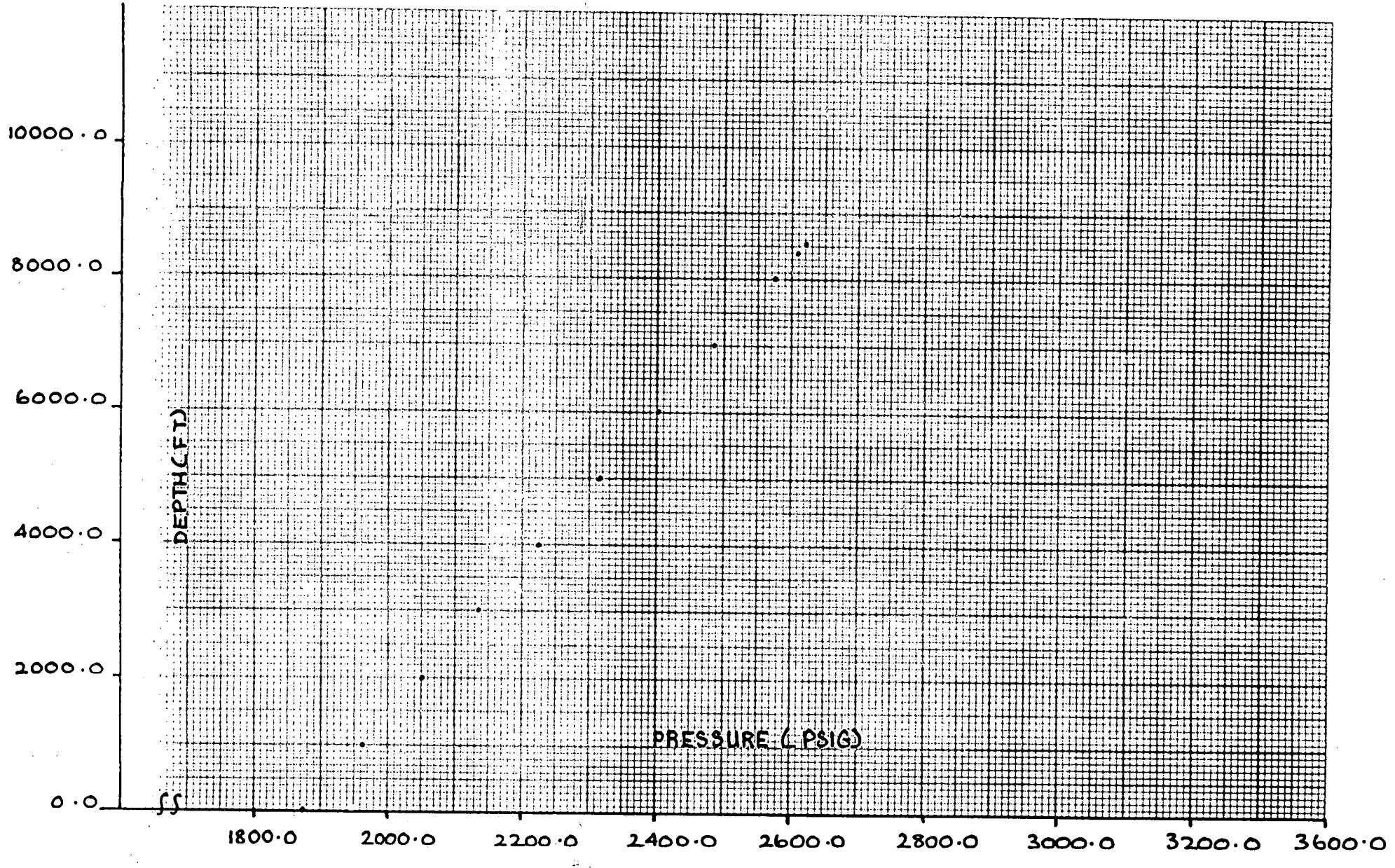
GENERAL REMARKS:
STATIC DONE AFTER BHP SURVEY WELL HAD BEEN SHUT IN FOR 90 hrs

DWT IN: 1872
DWT OUT: 1872
MAX BHT: 290 F

ELEMENT 22418/4000 CALIBRATED 24.3.87
ELEMENT 22308/4100 CALIBRATED 24.3.87

FLY LAKE # 1 UPPER STATIC PRESSURE GRADIENT 31/3/87

ELEMENT # 22308/4100 (BOT)



000395

Fm 5030

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

STATIC GRADIENT SURVEY

CLIENT SANTOS LTD.

WELL FLY LAKE #1 UPPER

OPERATOR J. HOFF

DATE 31-3-87

BOMB No. 1 DATA

ELEMENT No. 22418 ELEMENT RANGE 4000PSI

RECORDER No 14926 CLOCK DATA 2530 x 3HR.

ENGAGE STYLUS 0854 DISENGAGE 1110

PRESSURE LUBRICATOR 0900

BOMB No 2 DATA

ELEMENT No. 22308 ELEMENT RANGE 4100PSI

RECORDER No 54652 CLOCK DATA 2360 x 3HR

ENGAGE STYLUS 0854 DISENGAGE 1110

BLEED LUBRICATOR 1105

DWT IN 1872 PSI

DWT OUT 1872 PSI

DATE	TIME	DEPTH'	DEFLEC-TION	PRESSURE TEMP.	GRADIENT psi/ft	DEPTH'	DEFLEC-TION	PRESSURE TEMP.	GRADIENT psi/ft	REMARKS
31-3-87	0900	LUB	.937	1863	—	LUB	.900	1872.7	—	
	0919	1000	.982	1953.6	.0906	1000	.943	1961.8	.0891	MBHT. 290°F
	0927	2000	1.026	2042.2	.0887	2000	.986	2050.8	.0891	
	0935	3000	1.070	2131.0	.0887	3000	1.028	2137.8	.0870	
	0943	4000	1.114	2219.8	.0888	4000	1.071	2226.9	.0891	
	0951	5000	1.157	2306.7	.0869	5000	1.114	2316.0	.0891	
	0959	6000	1.200	2393.7	.0870	6000	1.155	2400.9	.0849	
	1007	7000	1.244	2482.8	.0891	7000	1.197	2487.9	.0870	
	1015	8000	1.288	2572.0	.0892	8000	1.240	2576.9	.0891	
	1022	8400	1.305	2606.5	.0862	8400	1.256	2610.1	.0928	
	1028	8525	1.311	2618.7	.0974	8525	1.261	2620.4	.0828	
	1049	LUB	.939	1867.0	—	LUB	.903	1878.9	—	

GENERAL REMARKS: WELL SHUT IN 90HRS PRIOR TO STATIC GRADIENT

E4

000396

R59

000397

WIRELINE REPORT

WELL: Fly Lake #1 Lower

DATE: 27-04-87.

PROGRAM: Flowing Gradient Surveys — Pateke Waarra Central

PURPOSE OF WORK: Well Evaluation.

REPORT OF WORK PERFORMED: 27th April 1987

12:45 on location & commenced rig up of the wire line unit

13:36 Well shutin to fit a swob valve.

13:43 Well back on line completed rig up, & test BOP's

28th April 1987.

08:30 RIH with a 1.75" Blind box.

09:04 Pick up made at 9402'KB POH.

09:23 Depressure the Lubricator & rig to carry out the Flowing gradient survey.

12:11 Completed the Shutin Gradient Survey

12:45 Rigged out and Well left secure.

OPERATOR'S SIGNATURE

WORK PERFORMED BY: G Peterson & R Campbell OF Expertest

WELL DATA:

Tubing Size: 2 7/8 FWHP: 560 PSI SIWHP:

Sub Surface S.V./Landing Nipple @ Yes S.S.D. @: Yes

"X" Nipple @ Yes ~~"N"/"XN"~~ Nipple @ other

Min I.D. 1.875 " @ Packer @ 9213

Perforated Interval: 9335' - 9385' & 9297' - 9311'

Forward to: Petroleum Engineering — Adelaide
Production Department — Moomba

1713

G009

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

** FLY LAKE #1 LOWER **

FLOWING PRESSURE GRADIENT

TEST DATE: 28.04.87

	TOP PRESSURE ELEMENT 28541/5000			BOTTOM PRESSURE ELEMENT 28903/5200		
DEPTH (FT.)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)
LUB	0.2089	561.5	----	0.2180	561.7	----
1000	0.2378	640.6	0.0790	0.2487	641.7	0.0800
2000	0.2779	750.2	0.1096	0.2895	748.1	0.1063
3000	0.3145	850.2	0.1000	0.3300	853.6	0.1055
4000	0.3650	988.3	0.1380	0.3809	986.2	0.1327
5000	0.4160	1127.6	0.1393	0.4349	1127.0	0.1408
6000	0.4691	1272.7	0.1451	0.4904	1271.7	0.1447
7000	0.5260	1428.1	0.1554	0.5498	1426.6	0.1549
8000	0.5840	1586.5	0.1584	0.6110	1586.3	0.1597
9000	0.6524	1773.4	0.1869	0.6815	1770.3	0.1840
9341	0.6760	1837.9	0.1891	0.7050	1831.6	0.1799
LUB	0.2009	539.6	----	0.2099	540.6	----

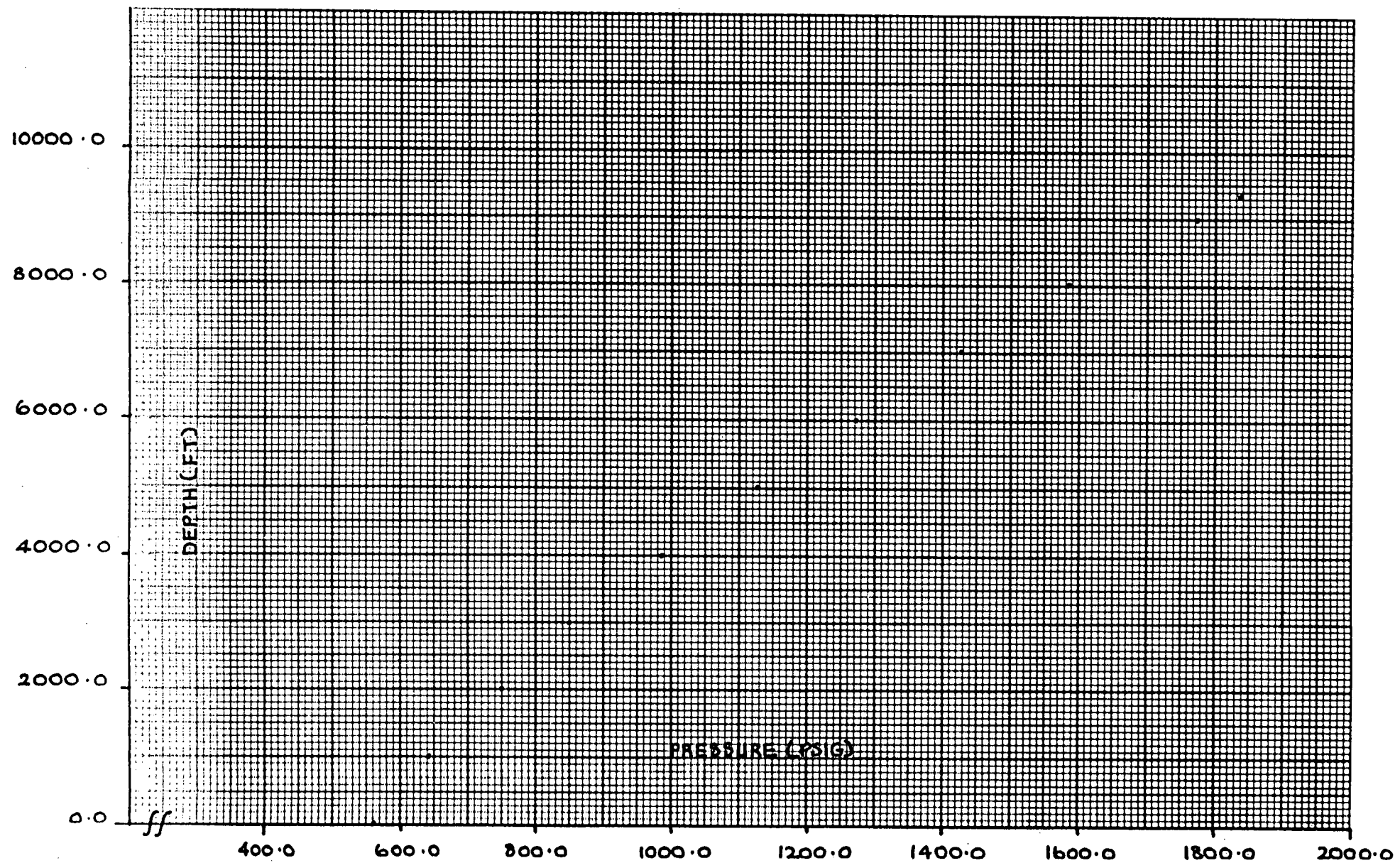
GENERAL REMARKS:
WELL FLOWING ON 18/64" CHOKE

DWT IN: 560
DWT OUT: 538
MAX BHT: 276

ELEMENT 28541/5000 CALIBRATED 2.12.86
ELEMENT 28903/5200 CALIBRATED 2.12.86

FLY LAKE # 1 LOWER – FLOWING PRESSURE GRADIENT – 28/4/87

ELEMENT # 28541/5000 (TOP)



000399

Fm 5030

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

CLIENT Santos "FLOWING" ~~STATIC~~ GRADIENT SURVEY

WELL Fly Lake #1 Lower. OPERATOR G Peterson. DATE 28-04-87.

BOMB No. 1 DATA		BOMB No 2 DATA		
ELEMENT No. 28541	ELEMENT RANGE 5000 PSI	ELEMENT No. 28903	ELEMENT RANGE 5200 PSI	DWT IN 560 PSI
RECORDER No 12951 x15 TLS	CLOCK DATA 2402	RECORDER No 2279 x 15 TLS	CLOCK DATA 2530	DWT OUT 538 PSI
ENGAGE STYLUS 09:32	DISENGAGE 12:19	ENGAGE STYLUS 09:32	DISENGAGE 12:19	
PRESSURE LUBRICATOR 09:38 HR		BLEED LUBRICATOR 12:11 HR		

DATE	TIME	DEPTH'	DEFLECTION	PRESSURE TEMP.	GRADIENT psi/ft	DEPTH'	DEFLECTION	PRESSURE TEMP.	GRADIENT psi/ft	REMARKS
28th	April 1987.									
	09:38	Lub								15 min stop made
	09:57	1000'								5 min stop made
	10:05	2000'								" " " "
	10:13	3000'								" " " "
	10:21	4000'								" " " "
	10:30	5000'								" " " "
	10:39	6000'								" " " "
	10:47	7000'								" " " "
	10:56	8000'								" " " "
	11:05	9000'								" " " "
	11:12	9341'								15 min stop made
	11:56	Lub.								" " " "

GENERAL REMARKS: M.B.H.T. = 276°F Casing Presure remained at 29 PSI over the Survey.

Well head Temp :- 138°F Surface pressures while elements @ 9341'KB 530 PSI

E4

000400

WELL TEST DATA SHEET

000401

WELL: FLYLAKE #1 LOWER

OPERATOR: PAUL R. WILLIAMS

DATE (Start Test): 27.IV.87

METER RUN I.D.: 97.18/~~102.26~~ mm

TEST SEPARATOR: AF 200

ORIFICE PLATE: 12.07 mm

TEST LINE: —

FLOW COMPUTER CONSTANT: 07770

TO START TEST: TIME PIG LAUNCHED: —

TIME RECEIVED: —

TO END TEST: TIME PIG LAUNCHED: —

TIME RECEIVED: —

		WELLHEAD		SATELLITE DATA									
					LIQUIDS			GAS					
					NOA								
	TIME	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
27.IV	1400	3800	18	NA	0.0	0.0	0.0	3300	12.0	26	NA	NA
28.IV	0720	3800	18	NA	17.10	0.06	0.117	3300	20.0	18	NA	NA
28.IV	1400	3800	18	NA	24.10	0.07	0.174	3300	4.5	23	NA	NA

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
24	(final minus initial)	24.10	0.07	+ 0.174	= TOTAL WATER 0.244	NA

COMMENTS: 24HR TEST ONLY AS EXPERTEST REQUIRE WELL SHUT IN TOMORROW MORNING TO REMOVE SWAB VALVE.

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

(1) STOCK TANK OIL ..... m³/d

(2) GAS RATE ..... x 10³ m³/d

(3) G.O.R. ..... m³/m³

(4) WATER RATE ..... m³/d

(5) WATER CUT ..... %

WHITE: Original to: ADELAIDE PRODUCTION ENGINEERING
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OLD GOLD: 2nd Copy to: FIELD SATELLITE OFFICE
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H015

WELL TEST DATA SHEET

R60

000402

WELL: FLYLAKE #1 LOWER

OPERATOR: PAUL R. WILLIAMS

DATE (Start Test): 27.IV.87

METER RUN I.D.: 97.18/~~102.20~~ mm

TEST SEPARATOR: AF 200

ORIFICE PLATE: 12.07 mm

TEST LINE: —

FLOW COMPUTER CONSTANT: 97770

TO START TEST: TIME PIG LAUNCHED: —

TIME RECEIVED: —

TO END TEST: TIME PIG LAUNCHED: —

TIME RECEIVED: —

		WELLHEAD		SATELLITE DATA									
					LIQUIDS			GAS					
					NOA								
	TIME	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
27.IV	1400	3800	18	NA	0.0	0.0	0.0	3300	12.0	26	NA	NA
28.IV	0720	3800	18	NA	17.10	0.06	0.117	3300	20.0	18	NA	NA
28.IV	1400	3800	18	NA	24.10	0.07	0.174	3300	4.5	23	NA	NA

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
24	(final minus initial)	24.10	0.07	+ 0.174 = TOTAL WATER	0.244	NA

COMMENTS: 24HR TEST ONLY AS EXPERTEST REQUIRE WELL SHUT IN TOMORROW MORNING TO REMOVE SWAB VALVE.

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

1713/A

(1) STOCK TANK OIL ..... 18.59 ..... m³/d

(2) GAS RATE ..... 9.16 ..... x 10³ m³/d

(3) G.O.R. ..... 492.73 ..... m³/m³

(4) WATER RATE ..... 0.24 ..... m³/d

(5) WATER CUT ..... ~~00~~ 1.3 ..... %

0771

H015

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WELL TEST DATA SHEET

000403

WELL: FLYLAKE #1 LOWER

OPERATOR: PAUL R. WILLIAMS

DATE (Start Test): 26:IV:87

METER RUN I.D.: 97.18/~~102.20~~ mm

TEST SEPARATOR: 200 AF

ORIFICE PLATE: 12.07 mm

TEST LINE: —

FLOW COMPUTER CONSTANT: 07770

TO START TEST: TIME PIG LAUNCHED: —

TIME RECEIVED: —

TO END TEST: TIME PIG LAUNCHED: —

TIME RECEIVED: —

		WELLHEAD		SATELLITE DATA									
					LIQUIDS			GAS					
					NOA								
	TIME	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
26·IV	1330	3800	18	NA	0.0	0.0	0.0	3300	4.5	27	NA	NA
27·IV	0755	3800	18	NA	17.78	0.08	0.105	3300	15.2	18	NA	NA
27·IV	1330	3800	18	NA	23.13	0.09	0.158	3300	17.5	25	NA	NA

(A)	TOTALS	(B) OIL	(C)	(D)		(E)	(F) GAS
24	(final minus initial)	23.13	0.09	+ 0.158	= TOTAL WATER	0.248	NA

COMMENTS: 24 HR TEST ONLY AS EXPERTEST DOING FLOWING GRADIENT IN CONJUCTION WITH NEXT TEST

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

1713/A

(1) STOCK TANK OIL 17.87 m³/d

(2) GAS RATE 8.74 x 10³ m³/d

(3) G.O.R. 489.45 m³/m³

(4) WATER RATE 0.23 m³/d

(5) WATER CUT 1.3 %

H015

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WELL TEST DATA SHEET

000404

WELL: FLYLAKE #1 LO. OPERATOR: P.R. WILLIAMS

DATE (Start Test): 14.4.87 METER RUN I.D.: ~~97.16~~ / 102.26 mm

TEST SEPARATOR: 200 AF ORIFICE PLATE: 12.70 mm

TEST LINE: — FLOW COMPUTER CONSTANT: 07770

TO START TEST: TIME PIG LAUNCHED: — TIME RECEIVED: —

TO END TEST: TIME PIG LAUNCHED: 0700 TIME RECEIVED: 1043

		WELLHEAD		SATELLITE DATA									
					LIQUIDS			GAS					
					NOA								
	TIME	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
15.4	1030	3800	18	NA	20.50	.01*	.34	3300	22.5	23	NA	NA
16.4	0645	3800	18	NA	40.03	.02*	2.64	3300	12.5	15	NA	NA
16.4	1030	3800	18	NA	44.77	.02*	3.15	3300	5.0	22	NA	NA

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
24	(final minus initial)	24.27	.01*	+ 2.19	= TOTAL WATER 2.20	NA

COMMENTS: THIS SHEET #2 OF 48 HR TEST.

* SUSPECT WATER METER.

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

1713/A

(1) STOCK TANK OIL 17.27 m³/d

(2) GAS RATE 9.42 x 10³ m³/d

(3) G.O.R. 545.7 m³/m³

(4) WATER RATE 1.52 m³/d

(5) WATER CUT 8.4 %

0.772

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H015

WELL TEST DATA SHEET

182. 000405

WELL: Fly Lake #1

OPERATOR: Graham Bennetts

DATE (Start Test): 14-4-87

METER RUN I.D.: 97.18/102.26 mm

TEST SEPARATOR: Fly Lake

ORIFICE PLATE: 12.7 mm

TEST LINE:

FLOW COMPUTER CONSTANT: 07770

TO START TEST: TIME PIG LAUNCHED: 0715

TIME RECEIVED: 1030

TO END TEST: TIME PIG LAUNCHED:

TIME RECEIVED:

TIME	WELLHEAD		SATELLITE DATA								
				LIQUIDS			GAS				
				NOA							
	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
1030	3750	18	N.A.	0	0	0	3300	17.5	26		
1330				0	0	.34	3300	2.5	33		
0700				17.4	.01	.34	3300	11.3	18		
1030				20.50	.01	.34	3300	22.5	23		

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
24	(final minus initial)	20.50	.01	+ .34	= TOTAL WATER .35	

COMMENTS:

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

(1) STOCK TANK OIL ..... m³/d

(2) GAS RATE ..... x 10³ m³/d

(3) G.O.R. ..... m³/m³

(4) WATER RATE ..... m³/d

(5) WATER CUT ..... %

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H015

WELL TEST DATA SHEET

000406

WELL: Fly Lake #1. OPERATOR: J. MORLEY G. BENNETTS

DATE (Start Test): 8-4-87 METER RUN I.D.: ~~07 10~~ / 102.26 mm

TEST SEPARATOR: Fly Lake ORIFICE PLATE: 12.70 mm

TEST LINE: FLOW COMPUTER CONSTANT: 07770

TO START TEST: TIME PIG LAUNCHED: — TIME RECEIVED: 0

TO END TEST: TIME PIG LAUNCHED: — TIME RECEIVED: —

	WELLHEAD		SATELLITE DATA									
				LIQUIDS			GAS					
				NOA								
TIME	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS kPa	DIFF. PRESS kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
1400	4000	16	N.A.	17.81	0	1.16	3600	11.0	26		
1715				20.02	0	1.46	3600	10.0	25		
0715				29.96	0	1.73	3600	5.0	15		
1400				34.03	0	2.21	3600	10.0	26		
0715				47.11	0	3.14	3600	7.50	17		
1400				52.20	0	3.62	3600	6.0	25		
(A) 48	TOTALS (final minus initial)			(B) OIL 34.39	(C) 0	(D) 2.46	= (E) TOTAL WATER 2.46				(F) GAS

COMMENTS:

PRODUCTION ENGINEERING DEPARTMENT USE ONLY 34

CALCULATIONS

SUMMARY

1713/14

(1) STOCK TANK OIL ..... m³/d

(2) GAS RATE ..... x 10³ m³/d

(3) G.O.R. ..... m³/m³

(4) WATER RATE ..... m³/d

(5) WATER CUT ..... %

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H015

R61

000407

WIRELINE REPORT

WELL: FLY LAKE #1 UPPER

DATE: 6/5/87

PROGRAM: FLOWING GRADIENT SECURITY.

PURPOSE OF WORK: ENSURE TUBING + PERFS CLEAR OF OBSTRUCTIONS.

REPORT OF WORK PERFORMED: 1430 Rig Up Wireline Unit + Swab Valve
1620 Rig Up 1.75" Blind Box and Tool String
1620 R.I.H with Blind Box 1588 Thawing psi
1650 T.B.G @ 8525' KB P.O.O.H
1705 Dep Lubricator. Tubing 16.16 psi Pressure Tool String
To Run Tandem B.H.P. Gauges.
6/3/87
1000 R.I.H with B.H.P Gauges for Flowing Gradient.
1036 Pinch Nbl Back To 5/64 Choke To Run Gradios
1117 on Bottom @ 8525' KB
1132 P.O.O.H Tubing 1329 psi
1346 Depressure Lubricator
Charts O.K. Hand Back To Prod

OPERATOR'S SIGNATURE

WORK PERFORMED BY: R. CAMPBELL OF EXPERT.

WELL DATA:

Tubing Size: 2 3/8 FWHP: 1322 SIWHP: N/A

Sub Surface S.V./Landing Nipple @ ..... S.S.D. @: .....

"X" Nipple @ ..... "N"/"XN" Nipple @ 8521' KB. other .....

Min I.D. ..... " @ ..... Packer @ 8500.4' KB

Perforated Interval: 9335'-9385' KB.

RECEIVED
30 MAR 1987
DEPT. OF MINES AND ENERGY SECURITY

Forward to: Petroleum Engineering — Adelaide
Production Department — Moomba

G009

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

** FLY LAKE #1 UPPER **

FLOWING PRESSURE GRADIENT

TEST DATE: 6/3/87

	TOP PRESSURE ELEMENT 29322/3950			BOTTOM PRESSURE ELEMENT 22420/4250		
DEPTH (FT.)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)
LUB	0.3160	633.7	----	0.2960	622.3	----
1000	0.7530	1506.2	0.8726	0.7050	1496.5	0.8742
2000	0.8080	1616.2	0.1100	0.7560	1606.0	0.1095
3000	0.8560	1712.3	0.0960	0.8000	1700.5	0.0946
4000	0.9030	1806.4	0.0941	0.8450	1797.4	0.0968
5000	0.9270	1854.5	0.0481	0.8690	1849.0	0.0517
6000	0.9810	1962.7	0.1082	0.9190	1956.8	0.1078
7000	1.0340	2069.0	0.1063	0.9700	2066.9	0.1101
7500	1.0610	2123.2	0.1084	0.9960	2123.1	0.1123
8000	1.0890	2179.4	0.1124	1.0220	2179.3	0.1124
8400	1.1110	2223.6	0.1105	1.0430	2224.7	0.1136
8525	1.1190	2239.7	0.1286	1.0500	2239.9	0.1212
LUB	0.7790	1558.2	----	0.6360	1348.5	----

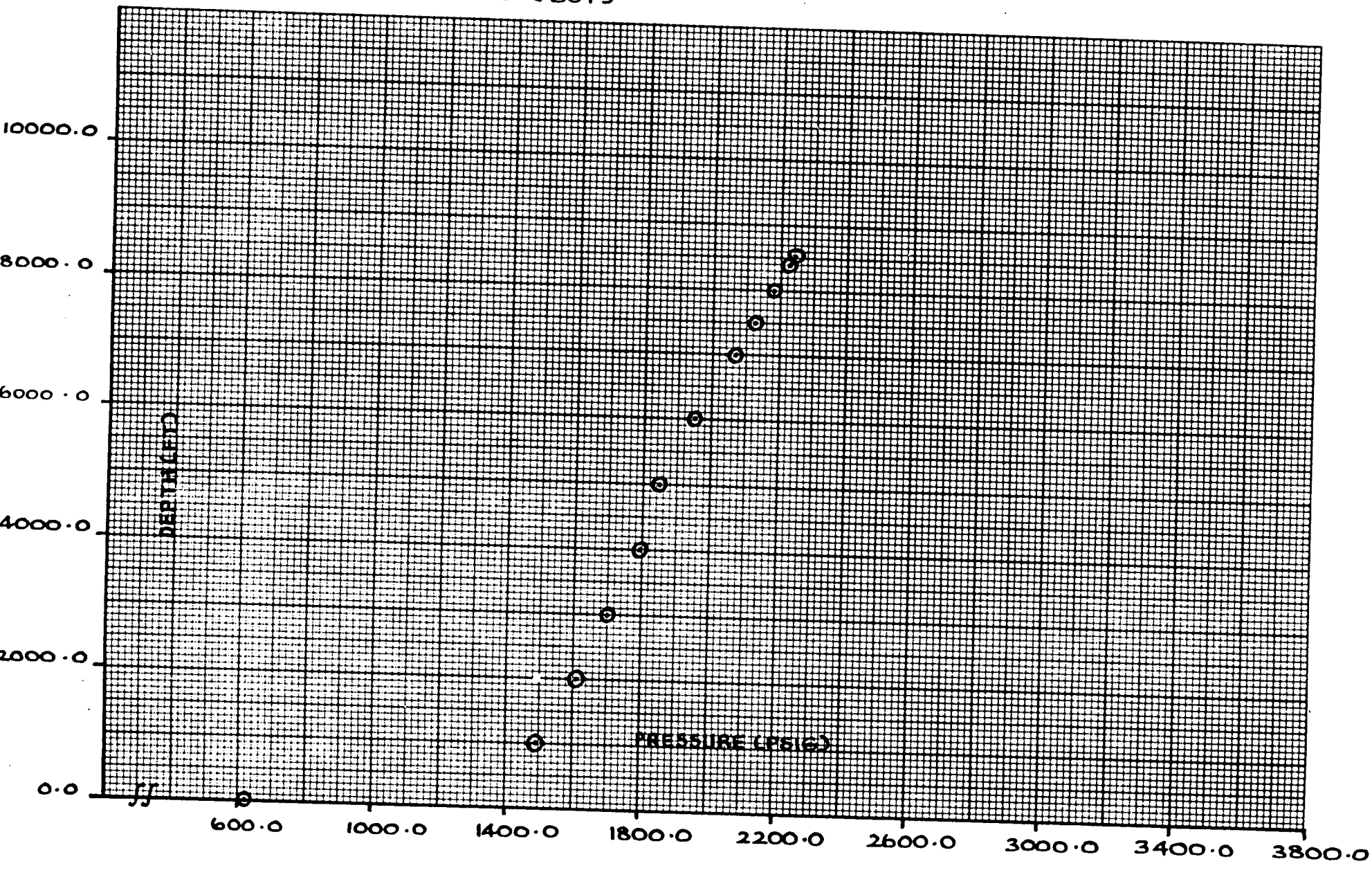
ENERAL REMARKS:
T SURFACE 100% CHOKE AT 1,000 FT 5% CHOKE

DWT IN: 649
DWT OUT: 1346
MAX BHT: 256oF

ELEMENT 29322/3950 CALIBRATED 25.1.87
ELEMENT 22420/4250 CALIBRATED 25.1.87

FLY LAKE # 1 UPPER – FLOWING PRESSURE GRADIENT – 6/3/87

ELEMENT # 22420/4250 (BOT)



000409

R 62

000410

ROLLING BOTTOMHOLE PRESSURE SURVEY GAS CALCULATION SHEET

WELL: Fly Lake # 1 Upper

ORIFICE SIZE: 53.975 mm 2.125 "

LINE SIZE: 97.180 mm 3.826 "

Pf = 3600 kPa

T = 61 °C

Diff = 28.8 kPa

Cumulative Production to end of July = 291.990 $m^3 \times 10^6$

Number of hours online in July = 728

Production in July = 4.457 $m^3 \times 10^6$

Average flow rate in July = $(4.457/728) \times 24$ = 0.147 $m^3 \times 10^6/d$ ✓

Number of days online in August before Shut In 1530 hrs 11 / 8 /88
= 10.5 days

Production up to 1530 hrs 11 / 8 /88 = 0.147 x 10.5 = 1.544 $m^3 \times 10^6$

Total cumulative production = 291.990 + 1.544

= 293.534 $m^3 \times 10^6$

= 10418.678 mmscf ✓

Flow rate just prior to Shut In = 0.155 $m^3 \times 10^6$

= 5.516 mmscf/d ✓

1713

WP 2946G(13)
LGA/jfs : 8/12/86

SANTOS LTD
39 GRENFELL ST
ADELAIDE

SUB-SURFACE PRESSURE SURVEY

CO. SANTOS		RUN 01 FIELD FLY LAKE		WELL 01U	
EFF DEPTH		WELL STAT		TOOL HUNG	8514'
CASING	-	CASING PRESS		ON BOTTOM	1126 11/8
LINER	-	TUBING PRESS		OFF BOTTOM	0638 14/8
DATE	880811	ELEMENT RANGE	0 - 3130	ZERO POINT	
ELEVATION		ZONE		SHUT-IN	1530 11/8
MAX TEMP	254	PICK-UP		ON-PROD	
PERF	-	CAL SER NO.	56431	MPP	
TUBING	-				
UNITS	ENGLISH	PURPOSE	BUILD-UP		

SURVEY DATA

CO. SANTOS RUN 01 FIELD FLY LAKE WELL 01U

TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
15:30	1784.7	0.0	0.0	16:31	2198.5	413.7	1.0
15:31	1837.9	53.2	.0	16:43	2206.5	421.8	1.2
15:31	1973.8	189.0	.0	17:00	2213.9	429.1	1.5
15:31	2070.6	285.8	.0	17:27	2226.2	441.5	2.0
15:32	2110.1	325.3	.0	18:02	2236.8	452.0	2.5
15:34	2126.2	341.5	.1	19:08	2251.7	467.0	3.6
15:37	2132.2	347.5	.1	20:37	2263.8	479.0	5.1
15:40	2138.1	353.4	.2	22:53	2276.4	491.7	7.4
15:43	2142.1	357.3	.2	2:10	2288.5	503.7	10.7
15:46	2147.8	363.0	.3	5:34	2296.6	511.9	14.1
15:49	2154.1	369.4	.3	11:44	2306.7	521.9	20.2
15:51	2159.8	375.1	.3	18:52	2315.2	530.4	27.4
15:56	2167.7	383.0	.4	3:44	2325.8	541.0	36.2
16:01	2173.1	388.4	.5	13:58	2334.0	549.2	46.5
16:05	2177.2	392.4	.6	1:38	2341.7	556.9	58.1
16:13	2185.4	400.7	.7	6:38	2344.3	559.6	63.1
16:19	2191.7	407.0	.8	0:00	0.0	0.0	0.0

LUB IN DWT = 570 PSI / OUT = 1662 PSI
LUB IN AMERADA = 559 PSI / OUT = 1677 PSI

SANTOS LTD
39 GRENFELL ST
ADELAIDE

SUB-SURFACE PRESSURE SURVEY

CO. SANTOS		RUN 02 FIELD FLY LAKE		WELL 01U	
EFF DEPTH		WELL STAT		TOOL HUNG	8520'
CASING	-	CASING PRESS		ON BOTTOM	1126 11/8
LINER	-	TUBING PRESS		OFF BOTTOM	0638 14/8
DATE	880811	ELEMENT RANGE	0 - 3132	ZERO POINT	
ELEVATION		ZONE		SHUT-IN	1530 11/8
MAX TEMP	254	PICK-UP		ON-PROD	
PERF	-	CAL SER NO.	56428	MPP	
TUBING	-				
UNITS	ENGLISH	PURPOSE	BUILD-UP		

SURVEY DATA

CO. SANTOS — RUN 02 FIELD FLY LAKE — WELL 01U

TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
15:30	1786.1	0.0	0.0	16:17	2185.8	399.7	.8
15:31	1851.3	65.2	.0	16:33	2196.3	410.2	1.0
15:32	1918.4	132.3	.0	16:56	2209.6	423.5	1.4
15:32	1992.8	206.7	.0	17:33	2224.0	437.9	2.0
15:35	2057.7	271.6	.1	18:10	2235.1	449.0	2.7
15:36	2088.4	302.2	.1	19:23	2250.9	464.8	3.9
15:38	2102.8	316.7	.1	21:11	2263.6	477.5	5.7
15:40	2116.7	330.6	.2	23:24	2274.3	488.2	7.9
15:42	2128.0	341.9	.2	3:34	2286.6	500.5	12.1
15:44	2136.6	350.5	.2	8:47	2296.8	510.7	17.3
15:47	2144.3	358.2	.3	13:50	2302.8	516.7	22.3
15:49	2151.0	364.9	.3	19:30	2310.0	523.9	28.0
15:53	2158.5	372.4	.4	3:28	2319.7	533.6	36.0
15:58	2164.3	378.2	.5	12:46	2326.1	540.0	45.3
16:02	2170.1	383.9	.5	0:08	2335.0	548.9	56.6
16:06	2176.0	389.9	.6	6:38	2340.5	554.4	63.1

LUB IN DWT = 570 PSI / OUT = 1662 PSI
LUB IN AMERADA = 557 PSI / OUT = 1677 PSI

FLY LAKE #1 UPPER

150 lbs.
97.180 mm I.D
CMA1

26 7 88

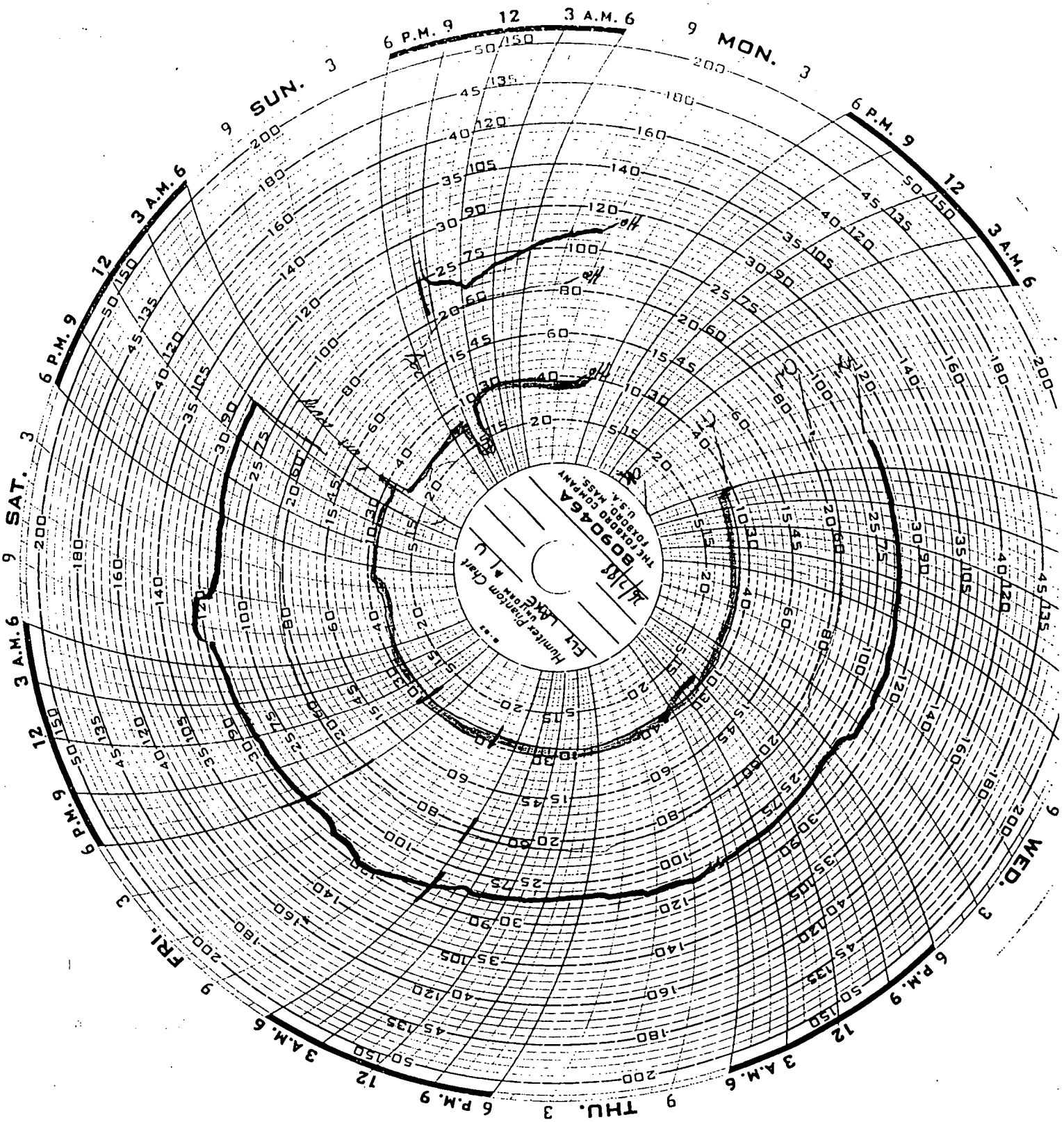
53.975 mm

L 88654

1145 1 8 88

1/4 305

000413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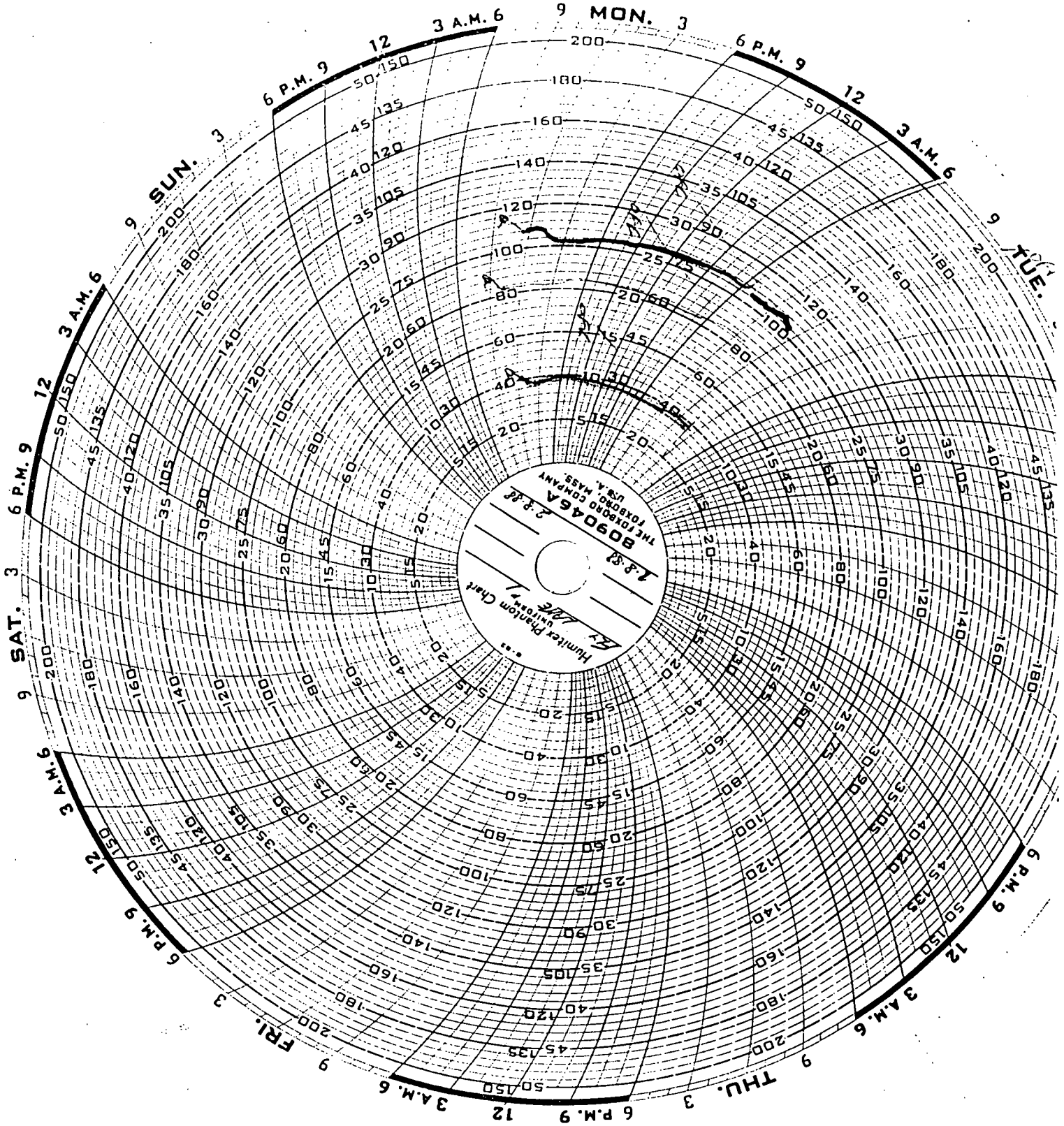
Humiter Phantom Chart
Elt. Lake
THE FOXBORO COMPANY
FOXBORO, MASS.
U.S.A.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THE FOXBORO COMPANY
FOXBORO, MASS. U.S.A.
809046A

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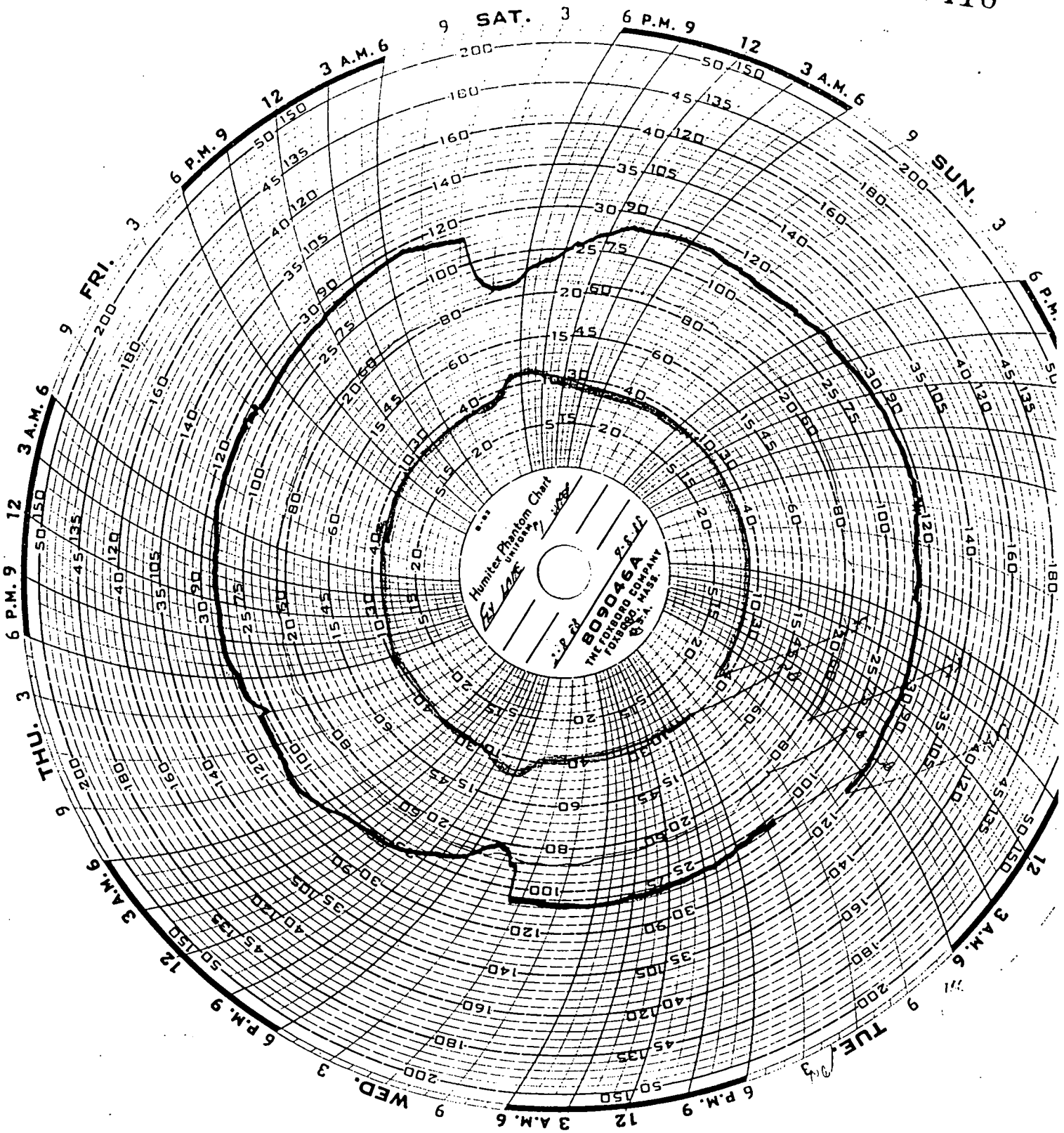
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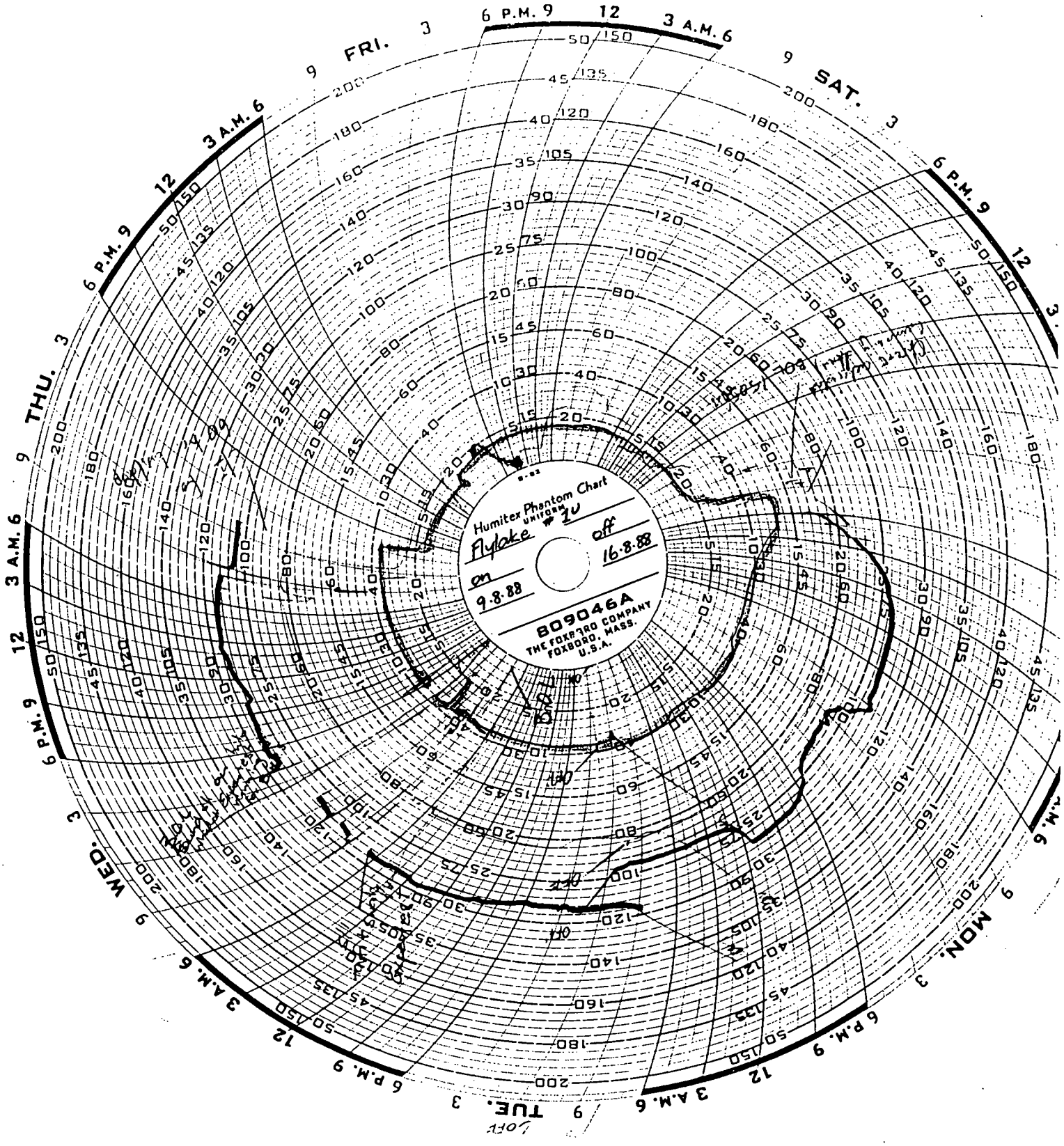
Humiter Phantom Chart
809046A
THE FOXBORO COMPANY
FOXBORO, MASS.
U.S.A.


Humiter Phantom Chart
UNIGAS #2U
Flylake
on
9.8.88
off
16.8.88
809046A
THE FOXBORO COMPANY
FOXBORO, MASS.
U.S.A.
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SAT. 9 3
SUN. 9 3
MON. 9 3
TUE. 9 3
WED. 9 3
THU. 9 3
FRI. 9 3

ISO - CHRONAL AND BUILD-UP SURVEY PAGE 1 OF 3.

Well: FLY LAKE # 1 UPPER. Date: 11 | 08 | 88.

Lubricator Data: ① 559 1677
② 557 1677

Pressure with D.W.T. 3930 KPA(570 PSIG) CASING 200 KPA / 11458 KPA (1662 PSIG)

Time Pressured 09:45 11 | 08 | 88 Time Depressured 08:05 14 | 08 | 88.

Time Run in Hole 10:45 11 | 08 | 88 Time off Bottom 06:38 14 | 08 | 88

	Bomb No. 1 Data	Bomb No. 2 Data
Element No. and Range	56431 x 3000 PSI	56428 x 3000 PSI
Recorder No.	14929 x 15 TLS	14620 x 15 TLS
Clock and Lead Screw Data	E-19381 ~~x 15 TLS~~ x 72 HRS	E-15241 x 72 HRS
Engage Stylus	Date: 11 | 08 | 88 Time: 09:30	Date: 11 | 08 | 88 Time: 09:30
Disengage	Date: 14 | 08 | 88 Time: 08:15.	Date: 14 | 08 | 88 Time: 08:15.

Remarks: MAXIMUM BOTTOM HOLE THERMOMETER RUN - 254°F.

Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	KPA Wellhead ~~P.S.I.G.~~	KPA Casing ~~P.S.I.G.~~	°C. Wellhead Temp.	Remarks
11/3	09:45					PRESS LUB.
	10:45		3930	200	54	R.I.H.
		* TO RUN	IN HOLE	CHOKED	WELL BACK TO 40%	
	11:26	ARRIVE	AT HANG	DEPTH OF 8520' KB.		
		WELL BACK ON	LINE 100%	CHOKE.		
	11:30		3930	200	50	START TEST.
	12:00		3909		56	
	12:30		3909		53	
	13:00		3909		52	
	13:30		3909		51	
	14:00		3909		50	
	14:30		3930		55	
	15:00		3930		50	
	15:30	0	3930		56	SHUT WELL IN FOR
	15:45	0.25	10790		35	60 HR BUILD UP
	16:00	0.50	10928		33	
	16:15	0.75	10976		29	
	16:30	1	10976		28	
	16:45	1.25	11011		27	
	17:00	1.5	11066		26	
	17:15	1.75	11080		25	
	17:30	2	11094		25	
						CONT ON PAGE # 2.

ISO - CHRONAL AND BUILD-UP SURVEY

Well:..... Date:.....

Lubricator Data:

Pressure with D.W.T.....

Time Pressured..... Time Depressured.....

Time Run in Hole..... Time off Bottom.....

	Bomb No. 1 Data		Bomb No. 2 Data	
Element No. and Range				
Recorder No.				
Clock and Lead Screw Data				
Engage Stylus	Date:	Time:	Date:	Time:
Disengage	Date:	Time:	Date:	Time:

Remarks:.....

.....

.....

Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	KPA Wellhead ~~P.S.I.G.~~	KPA Casing ~~P.S.I.G.~~	°C. Wellhead Temp.	Remarks
11/8	17:45	2.25	11128	200	25	
	18:00	2.50	11128		25	
	18:15	2.75	11135		24	
	18:30	3	11149		23	
	18:45	3.25	11156		22	
	19:00	3.50	11169		22	
	19:15	3.75	11183		21	
	19:30	4	11190		21	
		CONTINUE ON 4 HOUR READING.				
	23:30	8	11307		18	
12/8	03:30	12	11321		13	
	07:30	16	11390		~~26~~ 15	
	11:30	20	11411		26	
	15:30	24	11411		29	
	19:30	28	11411		24	
	23:30	32	11417		18	
						CONT ON PAGE # 3

ISO - CHRONAL AND BUILD-UP SURVEY

Well: ..... Date: .....

Lubricator Data:

Pressure with D.W.T. .....

Time Pressured ..... Time Depressured .....

Time Run in Hole ..... Time off Bottom .....

	Bomb No. 1 Data		Bomb No. 2 Data	
Element No. and Range				
Recorder No.				
Clock and Lead Screw Data				
Engage Stylus	Date:	Time:	Date:	Time:
Disengage	Date:	Time:	Date:	Time:

Remarks: .....

.....

.....

Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	KPA Wellhead ~~P.S.I.G.~~	KPA Casing ~~P.S.I.G.~~	°C. Wellhead Temp.	Remarks
13/3.	03:30	36	11417	200	17	
	07:30	40	11424		19.	
	11:30	44	11445		25	
	15:30	48	11445		29.	
	19:30	52	11445		22.	
	23:30	56	11458		19	
14/3	03:30	60	11458		16	
	06:38	63:08	11458		18	P.O.O.H.
	07:05	Arrive Lub.		↓		
	08:05		11458	200	19.	Depart Lub.
		RUN STATIC GRADIENT.				

WELL NAME: FLY LAKE #1 UPPER

STATIC GRADIENT SURVEY

DATE: 14/08/88

BOMB No. 1 DATA

ELEMENT No: 56431 ELEMENT RANGE: 0 - 3000 PSI
RECORDER No: 14929 x 15 TCS CLOCK DATA: 2297 x 3 HR
ENGAGE STYLUS: 09:44 DISENGAGE: 12:25

BOMB No. 2 DATA

ELEMENT No: 56428 ELEMENT RANGE: 0-3000 PSI
RECORDER No: 14620 x 15 TCS CLOCK DATA: 2387 x 3 HR
ENGAGE STYLUS: 09:44 DISENGAGE: 12:25

LUBRICATOR DATA

PRESSURE WITH D.W.T: 1661 PSI (IN)
TIME PRESSURED: 09:52
TIME DEPRESSURED: 12:15

DATE	TIME	DEPTH	DEFLECTION	PRESSURE TEMP.	GRADIENT psi/ft	DEPTH	DEFLECTION	PRESSURE TEMP.	GRADIENT psi/ft	STOPS IN MINS REMARKS
8/8	09:52	LUB	1.068	1668	-	LUB	1.0655	1666.4	-	15.
	10:13	1000	1.1178	1747	0.0782	1000	1.116	1745.6	0.0792	5.
	10:22	2000	1.1687	1827	0.0800	2000	1.165	1822.5	0.0769	5
	10:31	3000	1.2183	1904.9	0.0780	3000	1.2146	1900.3	0.0778	5.
	10:39	4000	1.2672	1981.8	0.0769	4000	1.2635	1977	0.0767	5
	10:47	5000	1.318	2061.7	0.0798	5000	1.3132	2054.9	0.0779	5
	10:55	6000	1.3675	2139.4	0.0778	6000	1.363	2133	0.0781	5
	11:03	7000	1.4178	2218.5	0.0790	7000	1.4132	2211.7	0.0787	5
	11:11	8000	1.4708	2301.7	0.0832	8000	1.4650	2292.8	0.0812	5
	11:19	8520	1.4980	2344.3	0.0821	8520	1.4928	2336.4	0.0838	15 HANG DEPTH OF SURVEY
	11:34	POW	OUT	OF	HOLE					
	12:00	LUB	1.0755	1680.6	-	LUB	1.0699	1673.3	-	15

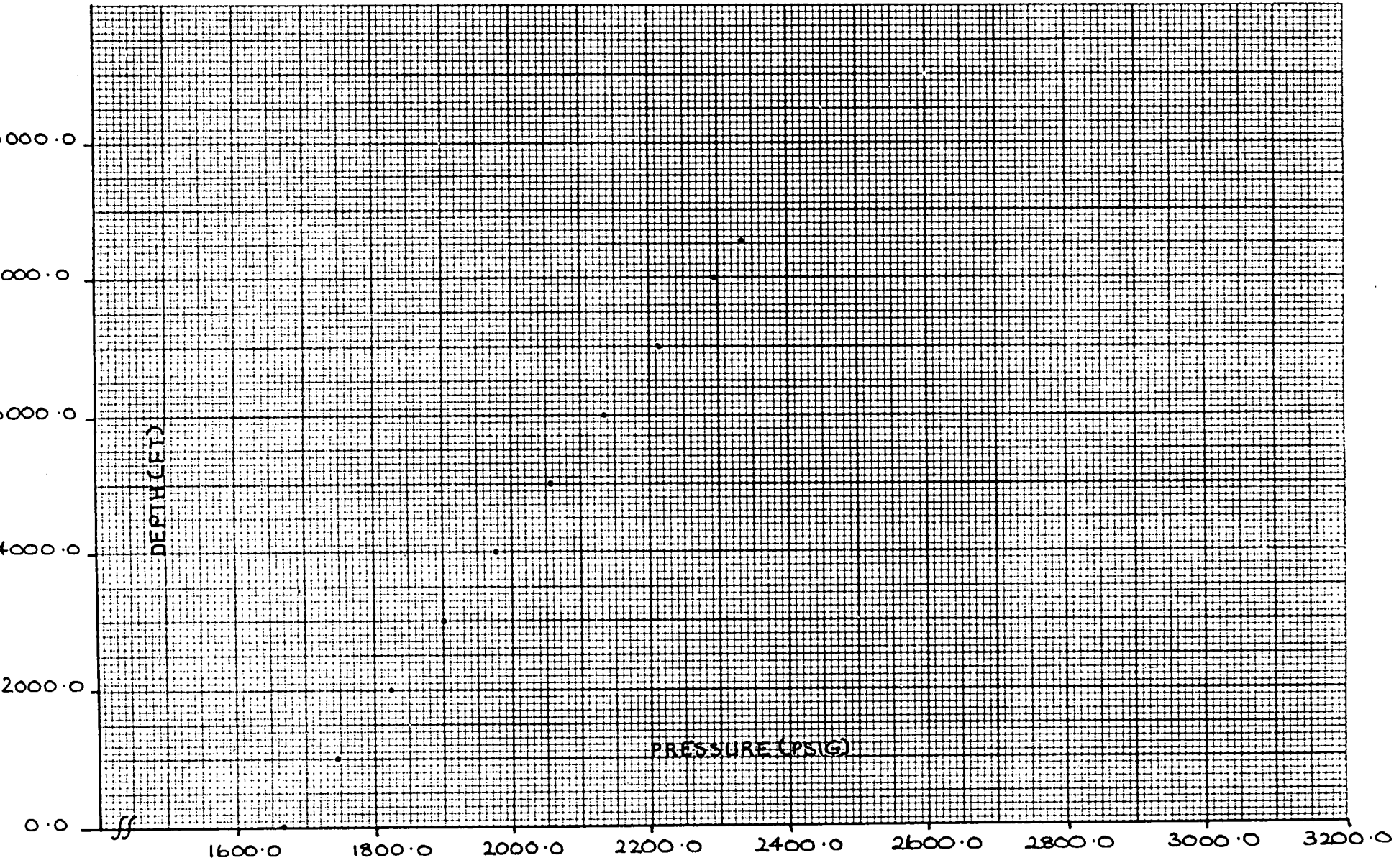
D.W.T OUT = 1663 PSI
MBHT = 254°F.

General Comments:

000421

FLY LAKE # 1 UPPER – STATIC PRESSURE GRADIENT – 14/8/88

ELEMENT # 56428 / 3000 (BOT)



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EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

** FLY LAKE #1 UPPER **

STATIC PRESSURE GRADIENT

TEST DATE: 14-8-88

	TOP PRESSURE ELEMENT 56431/3000			BOTTOM PRESSURE ELEMENT 56428/3000		
DEPTH (FT.)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)
LUB	1.0680	1668.8	----	1.0655	1666.4	----
1000	1.1178	1747.0	0.0782	1.1160	1745.6	0.0792
2000	1.1687	1827.0	0.0800	1.1650	1822.5	0.0769
3000	1.2183	1904.9	0.0780	1.2146	1900.3	0.0778
4000	1.2672	1981.8	0.0769	1.2635	1977.0	0.0767
5000	1.3180	2061.7	0.0798	1.3132	2054.9	0.0779
6000	1.3675	2139.4	0.0778	1.3630	2133.0	0.0781
7000	1.4178	2218.5	0.0790	1.4132	2211.7	0.0787
8000	1.4708	2301.7	0.0832	1.4650	2292.8	0.0812
8520	1.4980	2344.3	0.0821	1.4928	2336.4	0.0838
LUB	1.0755	1680.6	----	1.0699	1673.3	----

ERAL REMARKS:

DWT IN: 1661
DWT OUT: 1663
MAX BHT: 254 F

ELEMENT 56431/3000 CALIBRATED 11.3.88
ELEMENT 56428/3000 CALIBRATED 11.3.88

000424

WIRELINE REPORT

WELL: FLY LAKE # 1 UPPER.

DATE: 10/08/88

PROGRAM: BOTTOM HOLE PRESSURE SURVEY.

PURPOSE OF WORK: DUMMY RUN.

REPORT OF WORK PERFORMED:

09'.00 HRS ARRIVE ON LOCATION. S.W.I. AND RIG IN SWAB VALVE.

09'.16 HRS WELL BACK ON LINE.

12'.15. HRS R.I.H. WITH 1.750" BLIND BOX. CHOKE WELL BACK TO 50%.

12'.42 HRS TAG. COLLAR STOP AT 8525' K.B. P.O.O.H.

13'.00 HRS ARRIVE LUB - PREPARE ELEMENTS FOR SURVEY.

15'.02 HRS R I H WITH ELEMENT - CHOKE WELL BACK TO 40% - WELL SHUTS IN ON HI-LO. P.O.O.H. SECURE WELL.

ELEMENT TO BE RUN 11/08/88.

A. Smith.
OPERATOR'S SIGNATURE

WORK PERFORMED BY: A. SMITH. OF EXPERTEST.

WELL DATA:

Tubing Size: 2 3/8" FWHP: 4100 KPA. SIWHP: —.

Sub Surface S.V./Landing Nipple @ — S.S.D. @: —

"X" Nipple @ — "N" ~~"XN"~~ Nipple @ 8521' other —

Min I.D. 1.875" " @ 8521' Packer @ 8500'

Perforated Interval: 8586' — 9170' PATCHAWARRA.

Forward to: Petroleum Engineering — Adelaide
Production Department — Moomba

5504

R 63

000425

FLY LAKE #1 LOWER

SUMMARY OF PRODUCTION TEST & FLOWING GRADIENT SURVEY

19TH - 20TH DECEMBER 1988

Production Test

19th - 20th December

19/12/88: Started test @ 1400 hrs on 18/64" choke.
Flowed well on 18/64" choke for 23 hours.

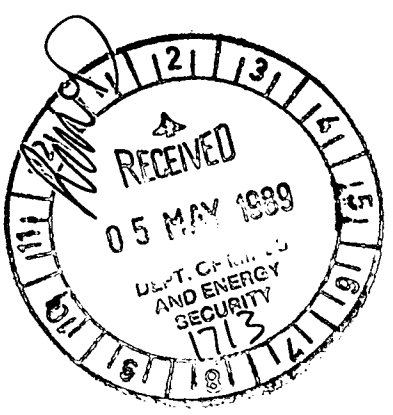
FTHP	=	3326	kPa
Separator Pressure	=	3025	kPa
Separator Temperature	=	48	°C
Gas Flow Rate	=	6.809	10^3 m^3/d
Oil Production	=	15.613	m^3/d
Water Production	=	3.192	m^3/d
GOR	=	436	m^3/m^3

20/12/88: Shut well in @ 1300 hrs.

Flowing Reservoir Pressure

Mid Point of Perforations = 9341' KB

20/12/88: Ran flowing pressure gradient.
Element # 27616 @ MPP = 11468 kPa.
Element # 27617 @ MPP = 11511 kPa.
Maximum flowing bottomhole temperature = 174° C.



LGA/ih - 14/2/89
WP4412G(90)

000426

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

WIRELINE REPORT

CLIENT SANTOS WELL FLY LAKE # 1 LOWER.

DATE 19·12·88

PROGRAMME BLIND BOX RUN & FLOWING GRADIENT.

PURPOSE OF WORK

REPORT OF WORK PERFORMED

19·12·88

1400: RIG UP WIRELINE UNIT.

20·12·88

0850: RUN IN HOLE WITH 1.75" BLIND BOX.

0916: TAG PBTD @ 9352' KB. NO OBSTRUCTIONS

NOTE: TAG DEPTH 37' BELOW PREVIOUS TAG DEPTH.

0918: PULL OUT OF HOLE

0932: IN LUB.

10:15: RUN FLOWING GRADIENT SEE ATTACHED GRADIENT REPORT.

1230: RIG DOWN WIRELINE UNIT END SURVEY

M B Mueller
Operator's Signature

WORKED PERFORMED BY M MUELLER OF EXPERTEST.

WELL DATA:

Tubing Size 2 7/8 FWHP 3325 KPA SIWHP -

Subsurface S.V./Landing Nipple @ S.S.D. @

'X' Nipple @ 'N'/'XN' Nipple @ Other @

Min. I.D. @ Packer @

Perforated Interval:

E1

WELL: FLY LAKE 1L

TYPE OF TEST: SINGLE RATE

SANTOS LTD.
WELL TEST DATA SHEET

DATE: 19 DEC 88

PAGE No: 1 OF 1

DATE / TIME	WELLHEAD					GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS				
															GAS	OIL	WATER	TOTAL LIQUID	G.O.R.
	CASING KPA	TUBING KPA	TEMP. C	CHOKE SIZE INS.	B.S.W. %	PI KPA	HW INS.H_2O	TEMP. C	ORIFICE SIZE INS.	TANK DIP INS.	TANK PROD m^3	API GRAVITY @60 °F	TANK DIP INS.	TANK PROD m^3	FLOW RATE $10^3 m^3/D$	FLOW RATE m^3 DAY	FLOW RATE m^3 DAY	FLOW RATE m^3 DAY	m^3/m^3
19 DEC 88																			
0800						RIG IN TEST EQUIPMENT.													
1340						FLOW WELL THROUGH SEP (INLINE)														
1400	25								.750	Ø	TARE	DIP.	Ø				LEVELS UP START TEST.		
1600	25	3434	49	18/64		3061	15	50	"	4.75	1.26		1.25	.33	6.649	15.12	3.96	19.08	440
1800	25	3254	48	"		3047	14	48	"	9.5	1.26		2.5	.33	6.451	15.12	3.96	19.08	427
2000	25	3247	48	"		3020	14	45	"	14.5	1.33		3.5	.26	6.451	15.96	3.12	19.08	406
2200	25	3288	49	"		3020	17	49	"	19.5	1.33		4.0	.13	7.043	15.96	1.56	17.52	441
20 DEC 88																			
0200	25	3330	53	"		2999	20	45	"	27.25	2.06		6.0	.53	7.692	12.36	3.18	15.54	622
0600	25	3357	53	"		2965	18	45	"	37.50	2.73		8.0	.53	7.241	16.38	3.18	19.56	442
1000	25	3323	49	"		3034	15	48	"	49.25	3.13		9.75	.47	6.649	18.78	2.82	21.60	354
1015						RUN FLOWING GRADIENT. SEE ATTACHED GRADIENT REPORT.													
1300	25	3392	50	"		3034	19	50	"	56.25	1.86		11.50	.47	7.438	14.88	2.82	17.70	500
						RIG DOWN END SURVEY.													
											TES PRODUCTION TOTALS					GAS		6668	$10^3 m^3$
																OIL		1496	m^3
																WATER		3.05	m^3

0004427

WELL FLY LAKE #1L

TANK:— CAPACITY 57 m^3

SCALE 1:266 m^3

SANTOS LTD

FLUID PRODUCTION SHEET

DATE 19.12.88

PAGE No. 1 OF 1

OPERATOR M MUELLER

DATE / TIME	CUM. TIME	OIL/CONDENSATE PRODUCTION					WATER PRODUCTION					REMARKS
		TANK DIP INS	TANK PROD. m^3	FLOWRATE m^3/D	CUM. PROD. m^3	OIL CONDENSATE GRAVITY °API60F°	TANK DIP INS	TANK PROD. m^3	FLOWRATE m^3/D	CUM. PROD. m^3	SALINITY PPM	
19 DEC 88												
1400		Ø					Ø					TARE DIP
1600	2	4.75	1.26	15.12	1.26		1.25	.33	3.96	.33		
1800	4	9.5	1.26	15.12	2.52		2.5	.33	3.96	.66		
2000	6	14.5	1.33	15.96	3.85		3.5	.26	3.12	.92		
2200	8	19.5	1.33	15.96	5.18		4.0	.13	1.56	1.05		
20 DEC 88												
0200	12	27.25	2.06	12.36	7.24		6.0	.53	3.18	1.58		
0600	16	37.50	2.73	16.38	9.97		8.0	.53	3.18	2.11		
1000	20	49.25	3.13	18.78	13.10		9.75	.47	2.82	2.58		
1300	23	56.25	1.86	14.88	14.96		11.50	.47	2.82	3.05		
				SWI END SURVEY								

000428

CLIENT ....SANTOS.....

WELL ....FLY LAKE 1.L.....

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

Date ..19-12-88... Page No. ...1...of.....

Operator ....M MUELLER.....

Orifice Fitting Type .....DANIELS SR...
Gas Flow Recorder Type ....FOXBORO.....
Date of Last Calibration .....6-12-88.....

Orifice Fitting Size ....2.90.....
Pressure Range .....0-1500 psi.....
Differential Range.....0-100 ins.....

Gas Specific Gravity.....9490.....
Perforated Interval.....
Formation Tested ...TIRRA.....

Base Conditions = 14.73psi @ 60°F
☒ Flange Taps ☐ Pipe Taps

TIME DATA		Choke Size 64ths Inch	METER RUN DATA				$\sqrt{Pf \times Hw}$	$C' = Fu \times Fb \times Fg \times Ftf \times Fpv \times Y2$							Flow Rate $Q = C' \times \sqrt{Pf \times Hw}$
Date / Time	Elapsed Time Hours		(Pf) Press P.S.I.A.	Diff (Hw) Inches Water	Temp. °F	Plate Size Inches		Fu	Fb	Fg	Ftf	Fpv	Y2	C'	
19. DEC. 88															
1600	2	8/64	459	15	122	.750	82.9515	24	113.69	1.0265	.9452	1.0748	1.0002	2846.3224	.236
1800	4	"	457	14	118	"	79.9639	"	"	"	.9485	1.0765	1.0002	2860.7231	.229
2000	6	"	453	14	113	"	79.6129	"	"	"	.9526	1.0785	1.0002	2878.3536	.229
2200	8	"	453	17	120	"	87.7292	"	"	"	.9469	1.0747	1.0002	2850.9378	.250
20 DEC 88															
0200	12	"	450	20	113	"	94.8399	"	"	"	.9526	1.0778	1.0003	28769068	.273
0600	16	"	445	18	113	"	89.4714	"	"	"	.9526	1.0768	1.0003	2874.0017	.257
1000	20	"	455	15	118	"	82.8890	"	"	"	.9485	1.0761	1.0002	2859.6818	.236
1300	23	"	455	19	122	"	92.9509	"	"	"	.9452	1.0740	1.0003	2844.4053	.264
		ave:	453		117			END SURVEY.							
									Total Gas Prod:		6.668 $10^3 m^3$		correct S.G	$= \frac{28.761}{28.964}$	$= 0.9910$
									S.G. correction:		6.668 x	1.0015 /	1.0265		
										=	6.525		over 23 Hours flow		
									∴ Rate	=	6.809	✓			

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000429

000430

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

** FLY LAKE 1L **

FLOWING PRESSURE GRADIENT

TEST DATE: 20-12-88

	TOP PRESSURE ELEMENT 27616/5700			BOTTOM PRESSURE ELEMENT 27617/5675		
DEPTH (FT.)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)
LUB	0.1610	473.0	----	0.1650	481.1	----
1000	0.1930	566.0	0.0930	0.1970	573.6	0.0925
2000	0.2290	670.5	0.1045	0.2320	674.7	0.1011
3000	0.2620	766.1	0.0956	0.2660	772.9	0.0982
4000	0.3050	890.6	0.1244	0.3090	897.0	0.1241
5000	0.3460	1009.0	0.1185	0.3500	1015.2	0.1183
6000	0.3930	1144.6	0.1356	0.3980	1153.6	0.1384
7000	0.4380	1274.3	0.1297	0.4420	1280.4	0.1268
8000	0.4950	1438.4	0.1641	0.4990	1444.6	0.1642
8500	0.5240	1521.8	0.1668	0.5280	1528.1	0.1670
9000	0.5550	1611.0	0.1782	0.5600	1620.3	0.1843
9300	0.5710	1656.9	0.1533	0.5750	1663.5	0.1440
LUB	0.1560	458.5	----	0.1610	469.5	----

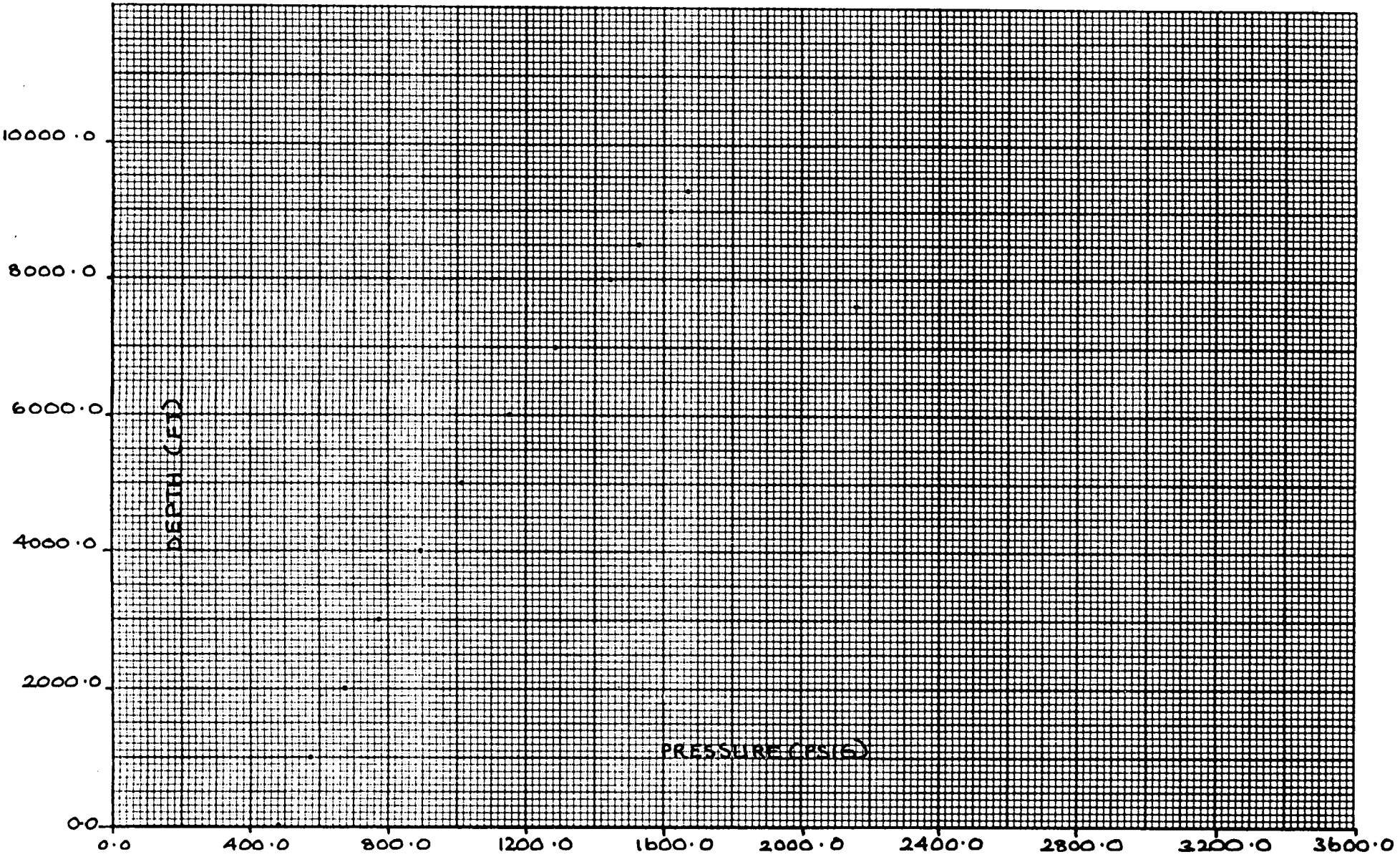
ENERAL REMARKS:
SSING 25 KPA CHOKE 18/64

DWT IN: 503
DWT OUT: 492
MAX BHT: TEMP ELEMENT RUN

ELEMENT 27616/5700 CALIBRATED 14.12.88
ELEMENT 27617/5675 CALIBRATED 14.12.88

FLY LAKE # 1 LOWER – FLOWING PRESSURE GRADIENT – 20/12/88

ELEMENT # 27617 / 5675 (BOT)



EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

CLIENT SANTOS

FLOWING GRADIENT SURVEY

WELL FLY LAKE # 1 LOWER. OPERATOR M MUELLER. DATE 20.12.88.

BOMB No. 1 DATA

ELEMENT No. 27616 ELEMENT RANGE 5700 PSI.
RECORDER No 14629 CLOCK DATA 2530 × 3HR.
ENGAGE STYLUS 1003 DISENGAGE 1233
PRESSURE LUBRICATOR 1015

BOMB No 2 DATA

ELEMENT No. 27617 ELEMENT RANGE 5675 PSI.
RECORDER No 13029 CLOCK DATA 2297 × 3HR.
ENGAGE STYLUS 1003 DISENGAGE 1233
BLEED LUBRICATOR 1323

DWT IN 3468 KPA
DWT OUT 3392 KPA

DATE	TIME	DEPTH'	DEFLEC-TION	PRESSURE TEMP.	GRADIENT psi/ft	DEPTH'	DEFLEC-TION	PRESSURE TEMP.	GRADIENT psi/ft	REMARKS
	1015	LUB				LUB				15 MINUTES.
	1030	RIH				RIH				
	1032	1000				1000				5
	1039	2000				2000				5
	1046	3000				3000				5
	1053	4000				4000				5
	1100	5000				5000				5
	1107	6000				6000				5
	1114	7000				7000				5
	1121	8000				8000				5
	1127	8500				8500				5
	1133	9000				9000				5
	1139	9300				9300				15 SURFACE PRESSURE @ BOTTOM STOP KPA
	1154	POOH				POOH				
	1210	LUB				LUB				15

GENERAL REMARKS: CASING: 25 KPA CHOKE: 18/64. : TEMP ELEMENT ALSO RUN.

E4

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R64

000433

TELEPHONE (08) 354 0488 · TELEX AA87183

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

138 RICHMOND ROAD MARLESTON SA 5033 POSTAL ADDRESS: PO BOX 354 COWANDILLA 5033

WIRELINE REPORT

CLIENT SANTOS WELL FLY LAKE #1 LOWER

DATE 30-11-89

PROGRAMME BLIND BOX RUN.

PURPOSE OF WORK TO ENSURE TUBING IS FREE OF ANY OBSTRUCTION FOR FLOWING GRADIENT SURVEY.

REPORT OF WORK PERFORMED 30TH NOVEMBER 1989.

1600: S.W.I & RIG IN SWAB VALVE.

1605: WELL BACK ON LINE.

1ST DECEMBER 1989.

1115: ARRIVE ON LOCATION & RIG UP WIRELINE EQUIPMENT.

1155: PRESSURE TEST EQUIPMENT & R.I.H WITH 1.75" GAUGE RING.

1215: @ P.B.T.D 9337'KB, (TUBING CLEAR) & POOH.

1235: @ SURFACE, RIG OUT TOOLSTRING & PREPARE ELEMENTS FOR FLOWING GRADIENT SURVEY.

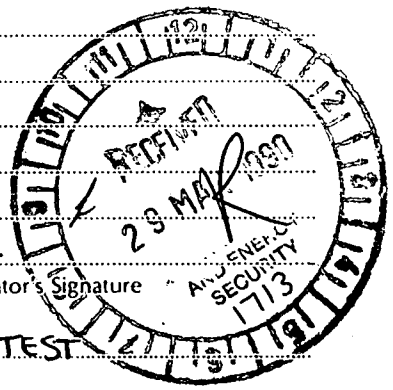
1258: R.I.H WITH 2 PRESSURE ELEMENTS & M.B.H THERMOMETER FOR GRADIENT SURVEY. (WELL FLOWING @ NORMAL RATE 15/64").

1350: @ BOTTOM STOP MPP 9341'KB.

1405: P.O.O.H.

1419: @ LUBRICATOR.

1434: DEPRESSURE LUBRICATOR, DISENGAGE STYLUS, RECOVER CHARTS, (GOOD), S.W.I, RIG DOWN WIRELINE EQUIPMENT & HAND WELL BACK TO PRODUCTION.



Operator's Signature

WORKED PERFORMED BY A.SMITH OF EXPERTEST

WELL DATA:

Tubing Size 2 7/8" FWHP 2572 KPA SIWHP

Subsurface S.V./Landing Nipple @ S.S.D. @ 9210'KB

'X' Nipple @ 'N'/'XN' Nipple @ 9235'KB Other @

Min. I.D. 1.875" @ 9235'KB. Packer @ 9213'KB

Perforated Interval: TIRRAWARRA F.M 9335'KB. → 9385'KB.

E1

EXPERTEST
WIRELINE & WELL TESTING SERVICE
PO BOX 354 COWANDILLA 5033
PH. (08) 354 0488 TELEX AA87183
FAX (08) 43 7408
138 RICHMOND ROAD MARLESTON
SOUTH AUSTRALIA 5033

000434

Tested Friday, 1st December 1989.

CLIENT	LOCATION	FORMATION
Santos Ltd.	FLY LAKE#1LOWER	TIRRAWARRA

FLOWING PRESSURE GRADIENT REPORT

PRESSURE ELEMENT DATA

POSITION	SERIAL NO.	RANGE	CALIBRATED
Top	28904	5200	24/11/89
Bottom	15451	5650	24/11/89

WELL DATA

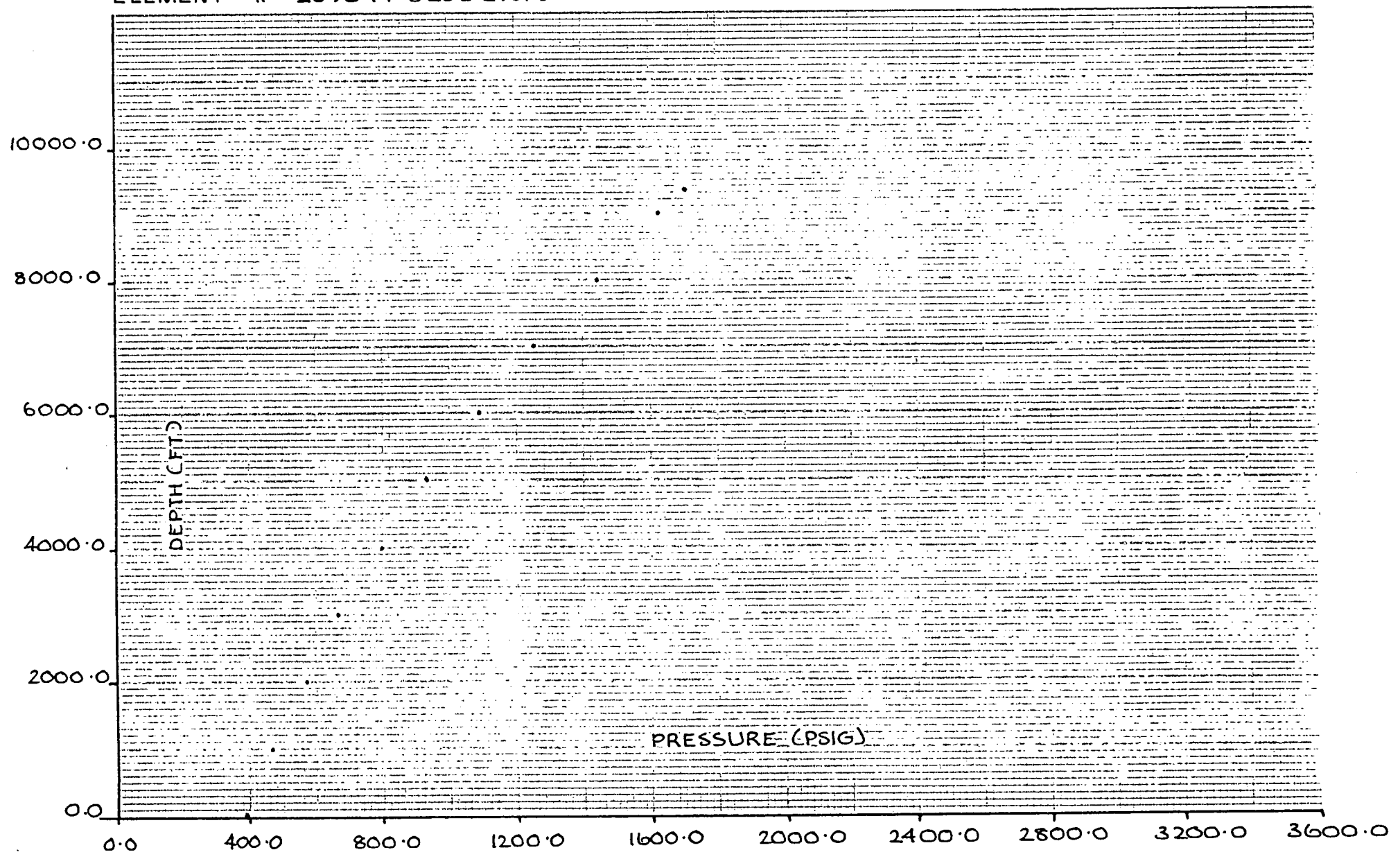
PARAMETER	VALUE
CWT In	373PSI
CWT Out	375PSI
Max BHT	275 F

	TOP ELEMENT			BOTTOM ELEMENT		
DEPTH FT KB	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT
LUB.	0.1510	388.9	-----	0.1510	366.6	-----
1000	0.1800	463.1	0.074	0.1810	442.9	0.076
2000	0.2220	570.7	0.108	0.2240	562.2	0.109
3000	0.2590	665.6	0.095	0.2620	648.9	0.097
4000	0.3110	798.9	0.133	0.3140	781.2	0.132
5000	0.3620	929.7	0.131	0.3660	913.6	0.132
6000	0.4230	1086.3	0.157	0.4280	1071.5	0.158
7000	0.4870	1250.6	0.164	0.4940	1239.6	0.168
8000	0.5610	1440.8	0.190	0.5690	1430.8	0.191
9000	0.6330	1625.9	0.185	0.6420	1617.0	0.186
9341	0.6640	1705.6	0.234	0.6750	1701.2	0.247
LUB.	0.1460	376.1	-----	0.1460	353.9	-----

GENERAL REMARKS

FLY LAKE # 1 LOWER — FLOWING PRESSURE GRADIENT — 1/12/89

ELEMENT # 28904/5200 (TOP)



000435

Fm 5030

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE
TELEPHONE (08) 354 0488 TELEX AA87183
138 RICHMOND ROAD MARLESTON SA 5033 POSTAL ADDRESS: PO BOX 354 COMANDILLA 5033

STATIC GRADIENT SURVEY

CLIENT SANTOS

WELL FLY LAKE #1 LOWER

OPERATOR A SMITH

DATE 1-12-89

BOMB No. 1 DATA

ELEMENT No. 28904 ELEMENT RANGE 5200 PSI
RECORDER No 12979 CLOCK DATA 2509 x 3HR
ENGAGE STYLUS 1238 DISENGAGE 1436
PRESSURE LUBRICATOR 1243

BOMB No 2 DATA

ELEMENT No. 15451 ELEMENT RANGE 5650 PSI
RECORDER No 12961 CLOCK DATA 2180 x 3HR
ENGAGE STYLUS 1238 DISENGAGE 1436
BLEED LUBRICATOR 1434

DWT IN 2572 KPA
DWT OUT 2586 KPA

DATE	TIME	DEPTH'	DEFLEC-TION	PRESSURE TEMP.	GRADIENT psi/ft	DEPTH'	DEFLEC-TION	PRESSURE TEMP.	GRADIENT psi/ft	REMARKS
1ST DECEMBER 1989				KPA				KPA		
	1243	LUB	·151	2681		LUB	·151	2528		PRESSURE LUBRICATOR.
	1258	R.I.H				R.I.H				RUN IN HOLE.
	1259	1000	·180			1000	·181			
	1304	2000	·222			2000	·224			
	1310	3000	·259			3000	·262			
	1316	4000	·311			4000	·314			
	1321	5000	·362			5000	·366			
	1327	6000	·423			6000	·428			
	1333	7000	·487			7000	·494			
	1339	8000	·561			8000	·569			
	1345	9000	·633			9000	·642			
	1350	9341	·664	11760		9341	·675	11730		M.P.P. SURFACE 2434 KPA
	1405	P.OOH.				P.O.H.				PULL OUT OF HOLE.
	1419	LUB	·146	2593		LUB	·146	2440		@ LUBRICATOR
	1434	BLEED				BLEED				DEPRESSURE LUBRICATOR.

GENERAL REMARKS: M.B.H. TEMPERATURE 135 °C / CASING = Ø KPA

E4

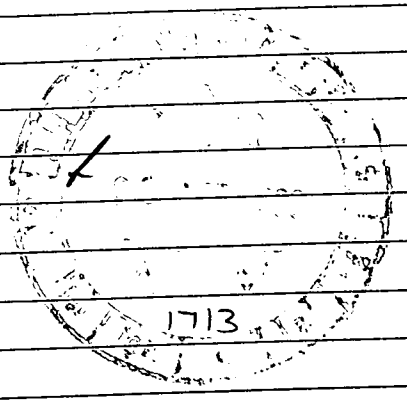
000436

EXPERTEST PTY. LTD.

SEQUENCE OF EVENTS

CUSTOMER : SANTOS	PERFORATIONS:	PAGE: 1 OF
WELL NAME: FLY LAKE #1. LOWER	FORMATION : Turrawarra	DATE: 1-5-90
TEST TYPE : FLOWING GRADIENT		OPR :

DATE/TIME	DESCRIPTION OF EVENTS
1ST MAY 1990.	
13:50	ARRIVE ON LOCATION, S.W.I, RIG UP SWAB VALVE & WIRELINE EQUIPMENT.
14:35	PRESSURE TEST & O.K, R.I.H WITH 1.75" BLIND BOX TO P.B.T.D.
14:50	TAG P.B.T.D @ 9395' KB, TUBING & PERFORATIONS CLEAR & P.O.O.H.
15:20	@ LUBRICATOR, WELL BACK ON LINE & SECURE LOCATION.
2 MAY.	
1500	ON LOCATION.
	RIG IN 2 x 4000 PSI AMERADA GAUGES.
1535	PRESS LUBRICATOR.
1545	R.I.H. TO PERFORM F.G.S.
1638	HANG AT BOTTOM STOP AT 9341' KB.
1648	POOH.
1708	GAUGES AT SURFACE.
1718	DEPRESSURE LUBRICATOR, RECOVER GOOD CHARTS.
1745	R.D. M.O.



RGS

000437

ET 102

000438

EXPERTEST
WIRELINE & WELL TESTING SERVICE
PO BOX 354 COWANDILLA 5033
PH. (08) 354 0488 TELEX AA87163
FAX (08) 43 7408
138 RICHMOND ROAD MARLESTON
SOUTH AUSTRALIA 5033

Tested Wednesday, 2nd May 1990.

CLIENT	LOCATION	FORMATION
Santos Ltd.	FLY LAKE #1L	0

FLOWING PRESSURE GRADIENT REPORT

PRESSURE ELEMENT DATA

POSITION	SERIAL NO.	RANGE	CALIBRATED
Top	22420	4250	20/ 2/90
Bottom	21372	4050	20/ 2/90

WELL DATA

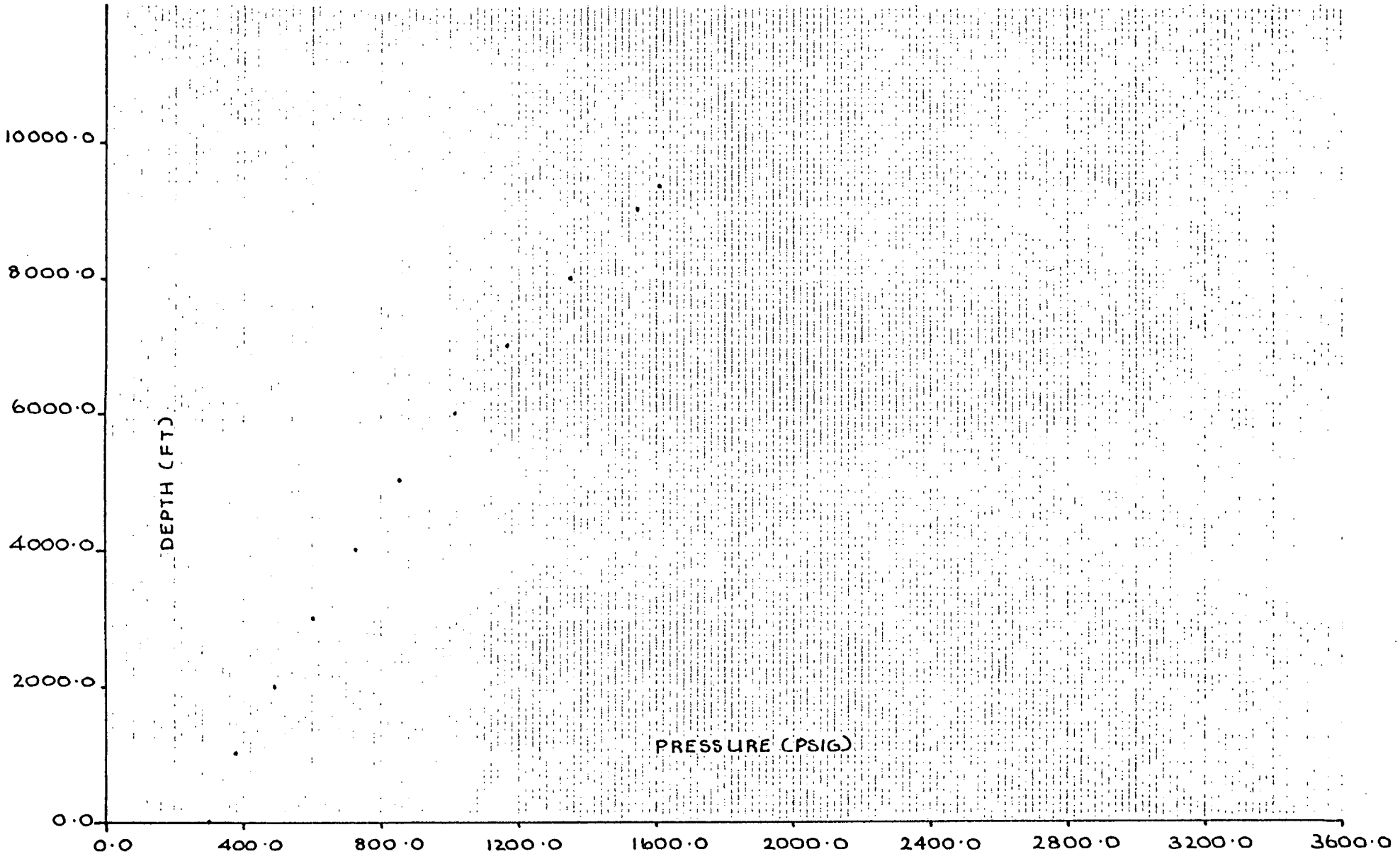
PARAMETER	VALUE	
DWT In	2109KPA	306
DWT Out	2192 KPA	318
Max BHT	270 F	

	TOP ELEMENT			BOTTOM ELEMENT		
DEPTH FT KB	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT
LUB.	0.1520	301.6	-----	0.1550	294.9	-----
1000	0.1880	377.5	0.076	0.1960	377.7	0.083
2000	0.2400	487.2	0.110	0.2500	486.6	0.109
3000	0.2940	601.1	0.114	0.3060	599.5	0.113
4000	0.3540	727.9	0.127	0.3720	732.7	0.133
5000	0.4130	852.8	0.125	0.4340	857.7	0.125
6000	0.4900	1016.1	0.163	0.5130	1017.1	0.159
7000	0.5600	1164.9	0.149	0.5890	1170.5	0.153
8000	0.6450	1346.2	0.181	0.6780	1350.2	0.180
9000	0.7370	1543.1	0.197	0.7750	1546.3	0.196
9341	0.7660	1605.3	0.183	0.8050	1606.9	0.178
LUB.	0.1620	322.7	-----	0.1660	317.1	-----

GENERAL REMARKS

16/64" CHOKE

FLY LAKE # 1 LOWER — FLOWING PRESSURE GRADIENT — 2/5/90
ELEMENT # 22420/4250 (TOP) — 16/64" CHOKE



000439

WELL TEST DATA SHEET

000440

WELL: FLY LAKE #1 OPERATOR: R.E. BALLARD

DATE (Start Test): 14 Apr 90 METER RUN I.D.: 97.18/102.26 mm

TEST SEPARATOR: FLY LAKE ORIFICE PLATE: 19.05 mm

TEST LINE: — FLOW COMPUTER CONSTANT: —

TO START TEST: TIME PIG LAUNCHED: — TIME RECEIVED: —

TO END TEST: TIME PIG LAUNCHED: — TIME RECEIVED: —

		WELLHEAD		SATELLITE DATA									
					LIQUIDS			GAS					
					NOA								
	TIME	FTP kPa	CHOKE SIZE 64ths	SEP. OIL TEMP °C	NET OIL m³	NET WATER m³	TOTALIZED WATER m³	STATIC PRESS. kPa	DIFF. PRESS. kPa	TEMP. °C	INDICATED FLOW RATE m³ x 10³/d	TOTALIZED FLOW m³ x 10³
14/4	1315	2200	16	—	0	—	0	1800	4.5	28	—	—
16/4	1405	2100	16	—	26.10	—	2.81	1800	3	23	—	—
17/4	0900	2000	16	—	36.14	—	3.48	1800	2.5	18	—	—

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
67.75	(final minus initial)	36.14	0 +	3.48 = TOTAL WATER	3.48	

COMMENTS:

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

(1) STOCK TANK OIL ..... m³/d

(2) GAS RATE ..... x 10³ m³/d

(3) G.O.R. ..... m³/m³

(4) WATER RATE ..... m³/d

(5) WATER CUT ..... %

WHITE: Original to: ADELAIDE PRODUCTION ENGINEERING
YELLOW: 1st Copy to: MOOMBA PRODUCTION DEPARTMENT
OLD GOLD: 2nd Copy to: FIELD SATELLITE OFFICE
PINK: 3rd Copy to: MOOMBA PETROLEUM ENGINEERING

EXPERTEST PTY. LTD.

BHP/BHT GAUGE RUN DATA

CUSTOMER : SANTOS
WELL NAME: FLY LAKE # 1L
TEST TYPE : F.G.S.

PERFORATIONS:
FORMATION :

PAGE: 1 OF
DATE: 2.5.90
OPR : RAM.

GAUGE DATA	UPPER PRESSURE GAUGE	LOWER PRESSURE GAUGE	TEMPERATURE GAUGE	RUN DATA	TIME (HOURS)	TUBING PRESSURE (~~PSI~~/KPa)	ANNULUS PRESSURE (PSI/KPa)
ELEMENT SERIAL NO.	22420	21372	—	DATE : 2.5.90			
ELEMENT RANGE psi	4250	4050		PRESSURE LUBRICATOR :	1535		
RECORDING SECTION SERIAL NO.	54651	59790		RUN IN HOLE :	1545	2109	0.
DATE OF CALIBRATION:	20.2.90	20.2.90		ON DEPTH AT : 9341 FT/~~M~~	1638		
CLOCK SERIAL NO.	2279	2180.		DATE : 2.5.90			
CLOCK RANGE hr.	3	3		PULL OUT OF HOLE :	1648	2192	0
LEAD SCREW TYPE tls.	15	15		AT SURFACE :	1708		
				DEPRESSURE LUBRICATOR :	1718	2192	0
ENGAGE STYLUS DATE 2.5.90 TIME	1524	1524		MAXIMUM BHT AT 9341 FT/M = 270 °F/~~C~~			
DISENGAGE STYLUS DATE 2.5.90 TIME	1730	1730		N.B. ALL DEPTHS ARE MEASURED FROM K.B.			

DATE	TIME	REMARKS
		BOTTOM HOLE PRESSURES AT 9341 ' KB. TOP GAUGE - 1605.3 psi
		BOTTOM GAUGE - 1608.9 psi
		16/64" CHOKE.

000441

R66

000442

EXPERTEST

WIRELINE & WELL TESTING SERVICE

PO BOX 354 COWANDILLA 5033

PH. (08) 354 0466 TELEX AA67103
FAX (08) 43 7408

138 RICHMOND ROAD MARLESTON
SOUTH AUSTRALIA 5033

Tested Friday, 12th October 1990.

CLIENT	LOCATION	FORMATION
Santos Ltd.	FLY LAKE 1 L	TIRRAWARRA

FLOWING PRESSURE GRADIENT REPORT

PRESSURE ELEMENT DATA			
POSITION	SERIAL NO.	RANGE	CALIBRATED
Top	29321	4000	17/ 9/90
Bottom	29323	3950	17/ 9/90

WELL DATA	
PARAMETER	VALUE
DWT In	314 PSIG
DWT Out	300 PSIG
Max BHT	276 F

	TOP ELEMENT			BOTTOM ELEMENT		
DEPTH FT KB	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT
TUB.	0.1540	304.0	-----	0.1560	306.8	-----
1000	0.2000	395.3	0.093	0.2060	404.3	0.098
2000	0.2540	505.9	0.109	0.2600	511.9	0.108
3000	0.3160	631.0	0.125	0.3220	635.3	0.124
4000	0.3730	746.0	0.115	0.3790	749.9	0.114
5000	0.4430	887.1	0.141	0.4510	892.3	0.144
6000	0.5193	1040.3	0.153	0.5260	1041.9	0.150
7000	0.5870	1187.5	0.157	0.6050	1198.3	0.158
8000	0.6830	1390.3	0.194	0.7020	1392.6	0.193
9000	0.7870	1580.4	0.190	0.7960	1580.1	0.187
9369	0.8270	1661.1	0.274	0.8390	1665.8	0.238
TUB.	0.1520	303.8	-----	0.1530	298.3	-----

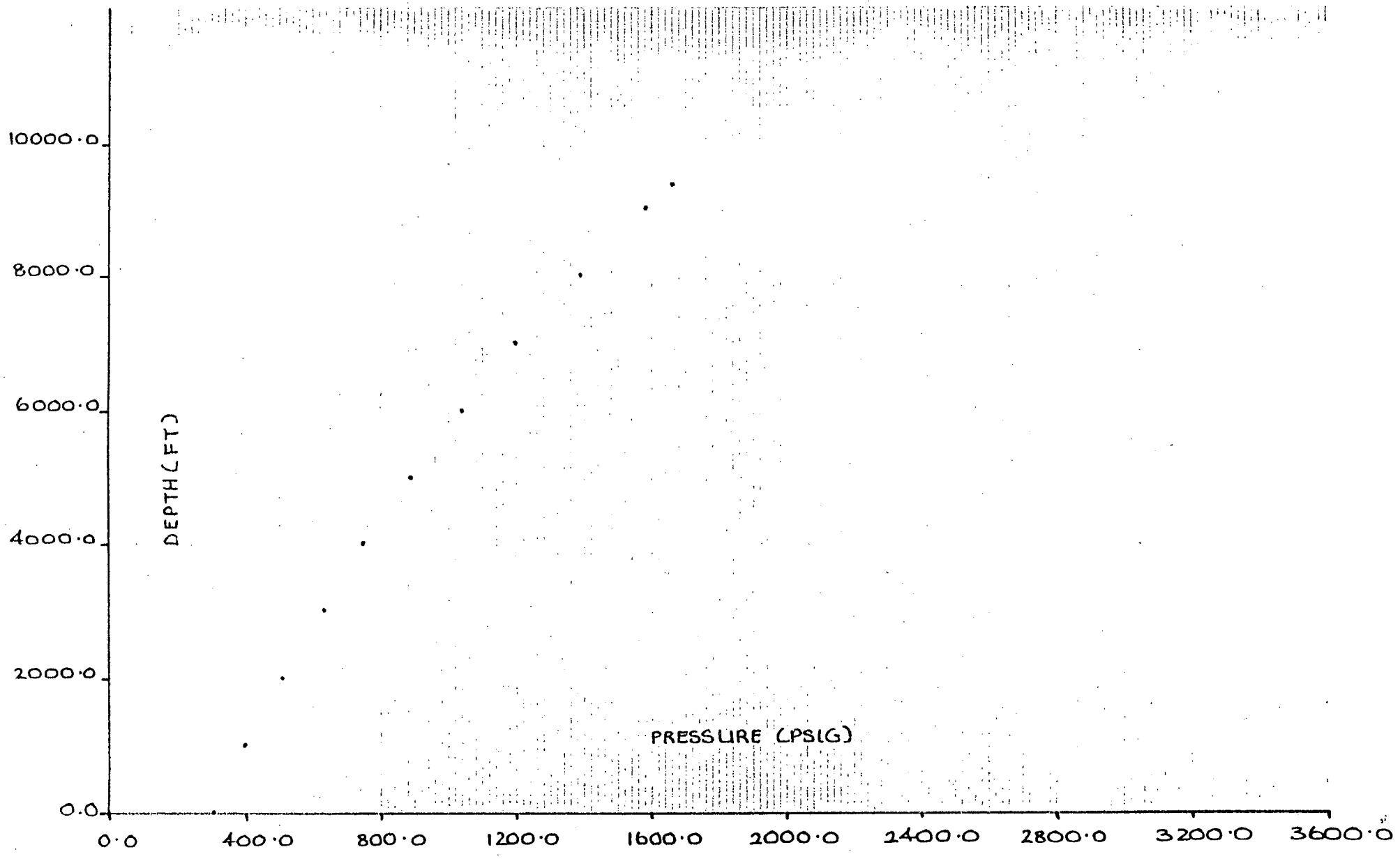
ORIGINAL REMARKS
CHOKE 15/64.

LC 6/3/91

env. 1713

RMD 5/3/91

FLY LAKE # 1 LOWER — FLOWING PRESSURE GRADIENT — 12/10/90
ELEMENT # 29321/4000 (TOP)



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EXPERTEST PTY. LTD.

SEQUENCE OF EVENTS

CUSTOMER : SANTOS P.E.
WELL NAME: FLY LAKE 91 L
TEST TYPE : Flowing Gradient

PERFORATIONS: 9335 - 9385
FORMATION : TIRRA.

PAGE: 1 OF
DATE: 12.10.90
OPR : R. LARKIN

DATE/TIME	DESCRIPTION OF EVENTS
Oct 12/90	
0800	TRAVEL to LOCATION. ROADS IN VERY bad CONDITION.
0940	ON Location.
0945	Shut IN to Fit SWAB valve.
0957	Back ON line 16/64 choke. Rig up WIRE LINE.
1055	R.I.H. 1.75" BLIND Box. Tubing 2158 KPA Casing 317 KPA.
	TAG FILL at 9374' KB. 21' higher than last Run
	ON 1.5.90. 11' OF PERFS COVERED
11:15	POOH. PREPARE PRES. gauges FOR F.G.S.
12:05	R.I.H Tubing 2165 KPA CASING 338 KPA.
13:10	Bottom stop at 9360' KB. Tubing 2096 KPA.
13:25	POOH
13:55	Dep. Lub Tubing 2069 KPA. Casing 365 KPA.
	CHARTS good Rig Down.
14:30	Shut IN. REMOVE SWAB valve.
14:40	BACK ON LINE.
	RETURNED to PRODUCTION.

000444

ET 102

ROLLING BOTTOMHOLE PRESSURE SURVEY GAS CALCULATION SHEET R67

000445

WELL: Fly Lake # 1Upper

ORIFICE SIZE: 31.750 mm 1.250 "

LINE SIZE: 97.180 mm 3.826 "

Pf = 2800 kPa

T = 52 °C

Diff = 2.3 kPa

Cumulative Production to end of May '91 = 407.3 $m^3 \times 10^6$ ✓

Number of hours online in May '91 = 30.7 days ✓

Production in May '91 = 1.3018 $m^3 \times 10^6$ ✓

Average flow rate in May '91 = (1.3018/30.7) ~~x 24~~ = 0.042 $m^3 \times 10^6/d$ ✓

Number of days online in June before Shut In 1730 hrs 14/ 6 /91
= 13.729

Production up to 1730 hrs 14/ 6 /91 = 13.729 x 0.042 = 0.577 $m^3 \times 10^6$

Total cumulative production = 0.577 + 407.3
= 407.877 $m^3 \times 10^6$
= 14477.173 mmscf ✓

Flow rate just prior to Shut In = 0.013 $m^3 \times 10^6$
= 0.457 mmscf/d ✓

WP 2946G(13)
LGA/jfs : 8/12/86

1713

SUB-SURFACE PRESSURE SURVEY

CO.		RUN 02 FIELD FLY LAKE		WELL 01U	
EFF DEPTH		WELL STAT		TOOL HUNG	8490'
CASING	-	CASING PRESS		ON BOTTOM	1338 14/6
LINER	-	TUBING PRESS		OFF BOTTOM	0830 19/6
DATE	910619	ELEMENT RANGE	0 - 3219	ZERO POINT	
ELEVATION		ZONE		SHUT-IN	1730 14/6
MAX TEMP	248 C	PICK-UP		ON-PROD	
PERF	-	CAL SER NO.	62039	MPP	
TUBING	-				
UNITS	ENGLISH	PURPOSE	BUILD-UP		

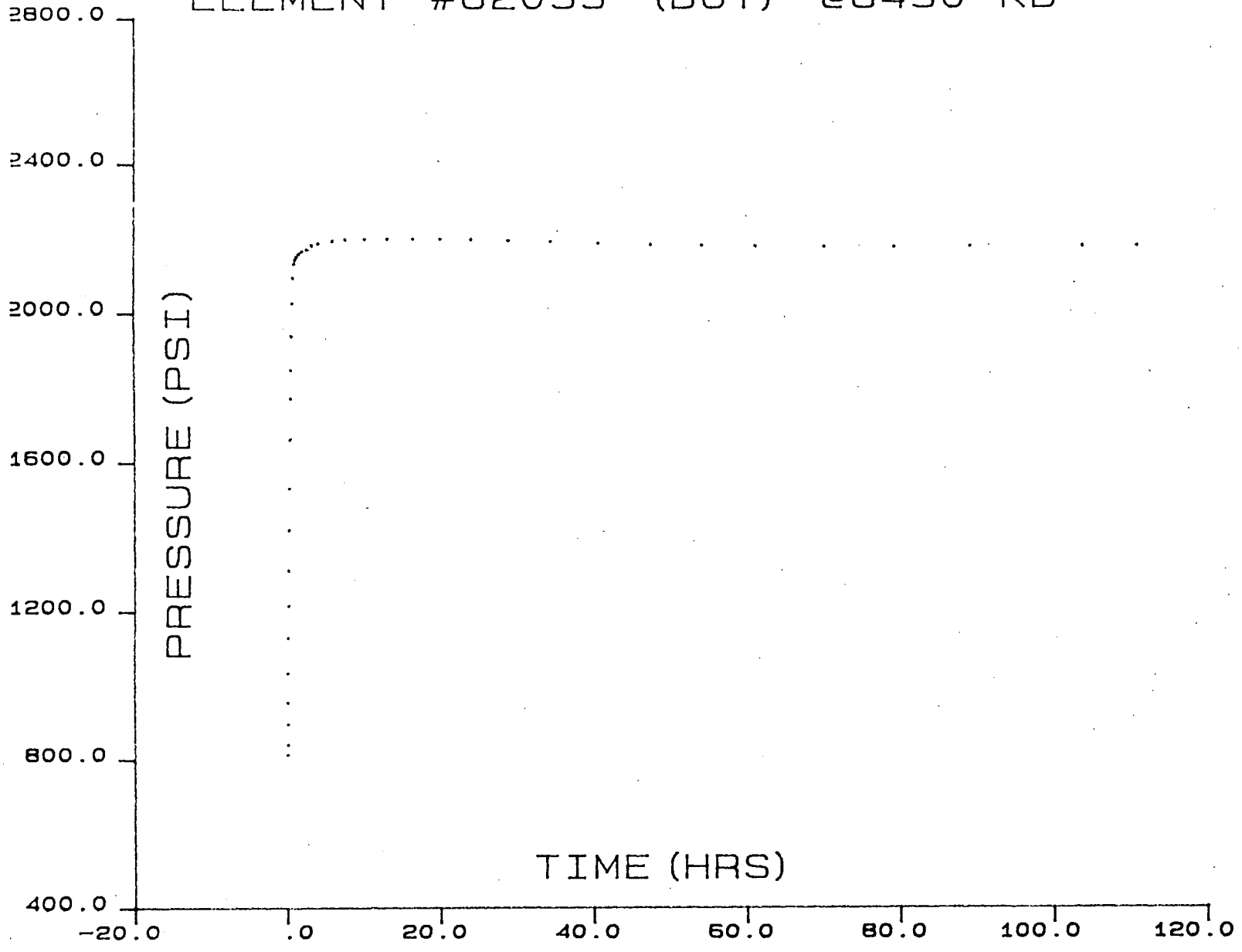
SURVEY DATA

CO. RUN 02 FIELD FLY LAKE WELL 01U

TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
17:30	812.4	812.4	.0	20:05	2171.4	2171.4	2.6
17:33	839.0	839.0	.1	20:48	2181.7	2181.7	3.3
17:34	896.1	896.1	.1	21:37	2186.4	2186.4	4.1
17:34	955.2	955.2	.1	23:28	2192.7	2192.7	6.0
17:36	1034.6	1034.6	.1	1:10	2196.7	2196.7	7.7
17:38	1129.4	1129.4	.1	3:42	2197.4	2197.4	10.2
17:42	1214.4	1214.4	.2	6:40	2197.6	2197.6	13.2
17:43	1311.1	1311.1	.2	9:59	2197.7	2197.7	16.5
17:47	1417.0	1417.0	.3	13:35	2196.5	2196.5	20.1
17:51	1528.0	1528.0	.4	17:35	2194.3	2194.3	24.1
17:56	1661.2	1661.2	.4	22:28	2192.0	2192.0	29.0
18:02	1771.0	1771.0	.5	3:57	2188.5	2188.5	34.5
18:05	1847.1	1847.1	.6	10:11	2185.1	2185.1	40.7
18:10	1939.6	1939.6	.7	17:01	2180.4	2180.4	47.5
18:18	2026.3	2026.3	.8	23:43	2178.9	2178.9	54.2
18:22	2095.0	2095.0	.9	6:42	2176.7	2176.7	61.2
18:30	2132.1	2132.1	1.0	15:42	2174.4	2174.4	70.2
18:37	2143.3	2143.3	1.1	0:50	2174.6	2174.6	79.3
18:49	2150.4	2150.4	1.3	10:45	2178.5	2178.5	89.2
19:07	2158.4	2158.4	1.6	1:23	2179.0	2179.0	103.9
19:32	2165.3	2165.3	2.0	8:30	2178.8	2178.8	111.0

LUB IN DWT = 401 PSI / OUT = 1540 PSI
LUB IN AMERADA = 400 PSI / OUT = 1546 PSI

FLY LAKE #1U BUILD-UP JUNE 1991
ELEMENT #62039 (BOT) @8490'KB



SUB-SURFACE PRESSURE SURVEY

CO.		RUN 01 FIELD FLY LAKE		WELL 01U	
EFF DEPTH		WELL STAT		TOOL HUNG	8484'
CASING	-	CASING PRESS		ON BOTTOM	1338 14/6
LINER	-	TUBING PRESS		OFF BOTTOM	0830 19/6
DATE	910619	ELEMENT RANGE	0 - 3121	ZERO POINT	
ELEVATION		ZONE		SHUT-IN	1730 14/6
MAX TEMP	248 F	PICK-UP		ON-PROD	
PERF	-	CAL SER NO.	28515	MPP	
TUBING	-				
UNITS	ENGLISH	PURPOSE	BUILD-UP		

SURVEY DATA

CO. RUN 01 FIELD FLY LAKE WELL 01U

TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
17:30	801.9	801.9	.0	19:32	2151.3	2151.3	2.0
17:32	860.7	860.7	.0	19:57	2156.4	2156.4	2.4
17:33	919.3	919.3	.1	20:49	2166.8	2166.8	3.3
17:34	1016.8	1016.8	.1	21:52	2171.1	2171.1	4.4
17:37	1132.7	1132.7	.1	23:28	2176.9	2176.9	6.0
17:40	1246.1	1246.1	.2	0:47	2179.2	2179.2	7.3
17:41	1321.7	1321.7	.2	3:25	2182.3	2182.3	9.9
17:42	1398.2	1398.2	.2	6:14	2181.7	2181.7	12.7
17:45	1483.8	1483.8	.2	9:17	2181.1	2181.1	15.8
17:47	1568.9	1568.9	.3	13:59	2180.2	2180.2	20.5
17:50	1678.4	1678.4	.3	18:18	2181.5	2181.5	24.8
17:56	1775.8	1775.8	.4	0:18	2176.8	2176.8	30.8
18:00	1896.7	1896.7	.5	6:36	2174.3	2174.3	37.1
18:07	2013.0	2013.0	.6	13:42	2169.9	2169.9	44.2
18:14	2068.8	2068.8	.7	0:35	2165.0	2165.0	55.1
18:18	2103.6	2103.6	.8	9:00	2164.8	2164.8	63.5
18:28	2127.3	2127.3	1.0	19:21	2161.4	2161.4	73.8
18:35	2132.6	2132.6	1.1	5:37	2161.9	2161.9	84.1
18:44	2138.5	2138.5	1.2	15:56	2163.4	2163.4	94.4
18:56	2142.3	2142.3	1.4	0:46	2163.8	2163.8	103.3
19:10	2146.4	2146.4	1.7	8:30	2165.2	2165.2	111.0

LUB IN DWT = 401 PSI / OUT = 1540 PSI
LUB IN AMERADA = 395 PSI / OUT = 1537 PSI

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE
PO BOX 354 COWANDILLA 5033
PH. (08) 354 0488 TELEX AA87183
FAX (08) 43 7408
138 RICHMOND ROAD MARLESTON
SOUTH AUSTRALIA 5033

Tested Wednesday, 19th June 1991.

CLIENT	LOCATION	FORMATION
Santos Ltd.	Fil Lake # 1 U	Patchawarra

STATIC PRESSURE GRADIENT REPORT

PRESSURE ELEMENT DATA

POSITION	SERIAL NO.	RANGE	CALIBRATED
Top	28515	3000	9/ 6/91
Bottom	62039	3000	9/ 6/91

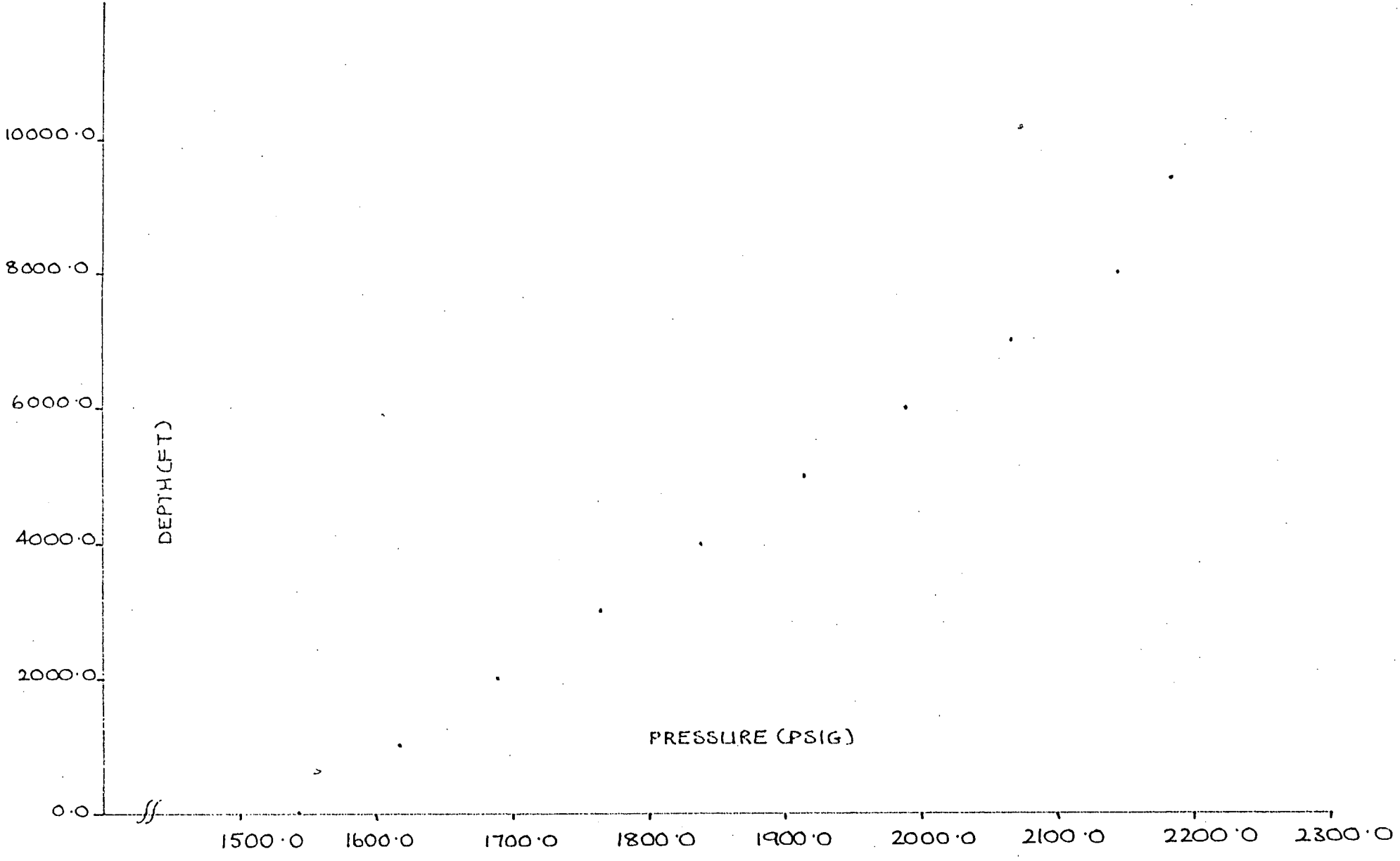
WELL DATA

PARAMETER	VALUE
DWT In	1539 PSIG
DWT Out	1542 PSIG
Max BHT	426 F

	TOP ELEMENT			BOTTOM ELEMENT		
DEPTH FT KB	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT
LUB.	0.9940	1540.9	-----	0.9560	1542.7	-----
1000	1.0390	1611.0	0.070	1.0020	1616.7	0.074
2000	1.0870	1685.0	0.075	1.0470	1689.0	0.072
3000	1.1335	1758.2	0.072	1.0940	1764.6	0.076
4000	1.1820	1833.7	0.076	1.1390	1836.9	0.072
5000	1.2290	1906.9	0.073	1.1870	1914.0	0.077
6000	1.2770	1981.7	0.075	1.2330	1987.9	0.074
7000	1.3250	2056.5	0.075	1.2820	2066.6	0.079
8000	1.3710	2128.2	0.072	1.3300	2143.8	0.077
9490	1.3990	2171.9	0.029	1.3550	2183.9	0.027
LUB.	0.9930	1539.4	-----	0.9565	1543.5	-----

GENERAL REMARKS

FLY LAKE # 1 UPPER — STATIC PRESSURE GRADIENT — 19/6/91
ELEMENT # 62039 / 3000 (BOT)



EXPERTEST PTY. LTD.

BHP/BHT GAUGE RUN DATA

CUSTOMER : SANTOS LTD
WELL NAME: FLY LAKE #1 UPPER
TEST TYPE : STATIC GRADIENT

PERFORATIONS: 8591'-9170' KB
FORMATION : PATCHAWARRA

PAGE: 1 OF 1
DATE: 19-6-91
OPR : N. HUGHES

GAUGE DATA	UPPER PRESSURE GAUGE	LOWER PRESSURE GAUGE	TEMPERATURE GAUGE
ELEMENT SERIAL NO.	28515	62039	N/A
ELEMENT RANGE PSI	3000	3000	
RECORDING SECTION SERIAL NO.	13027	34083	
DATE OF CALIBRATION:	9-6-91	9-6-91	
CLOCK SERIAL NO.	M 1838	K1850	
CLOCK RANGE	31HR	31HR	
LEAD SCREW TYPE	15 TGS	15 TGS	
ENGAGE STYLUS DATE 19-6-91 TIME	11:34	11:34	
DISENGAGE STYLUS DATE 19-6-91 TIME	13:42	13:42	

RUN DATA	TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)
DATE : 19-6-91			
PRESSURE LUBRICATOR :	11:42	10611	10611
RUN IN HOLE :	11:57	10611	10611
ON DEPTH AT : 9490 FT/M	12:57	10611	10611
DATE : 19-6-91			
PULL OUT OF HOLE :	13:07		
AT SURFACE :	13:22	10632	10632
DEPRESSURE LUBRICATOR :	13:37	10632	10632

MAXIMUM BHT AT 9490 FT/M = 246 °F/C

N.B. ALL DEPTHS ARE MEASURED FROM K.B.

DATE	TIME	REMARKS

000451

ET 108

EXPERTEST PTY. LTD.

BHP/BHT GAUGE RUN DATA

CUSTOMER : SANTOS LTD
WELL NAME: FLY LAKE #1 UPPER
TEST TYPE : B.H.P. SURVEY

PERFORATIONS: 8591' - 9120' MD
FORMATION : PATCHAWARRA

PAGE: 1 OF 1
DATE: 14-6-91
OPR : N. MAY

GAUGE DATA	UPPER PRESSURE GAUGE	LOWER PRESSURE GAUGE	TEMPERATURE GAUGE
ELEMENT SERIAL NO.	28515	62039	N/A
ELEMENT RANGE P.S.I	3000	3000	
RECORDING SECTION SERIAL NO.	13027	34083	
DATE OF CALIBRATION:	4-6-91	4-6-91	
CLOCK SERIAL NO.	F-15685	F-15693	
CLOCK RANGE	120HR	120 HR	
LEAD SCREW TYPE	15 TLS	15 TLS	
ENGAGE STYLUS DATE 14-6-91 TIME	10:25	10:25	
DISENGAGE STYLUS DATE 19-6-91 TIME	11:26	11:26	

RUN DATA	TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)
DATE : 14-6-91		401	
PRESSURE LUBRICATOR :	10:40	2765	3000
RUN IN HOLE :	13:15	2763	3000
ON DEPTH AT : 8490 FT/M	13:38	2772	3000
DATE : 19-6-91			
PULL OUT OF HOLE :	08:30	1061S	1061S
AT SURFACE :	08:47	1061S	1061S
DEPRESSURE LUBRICATOR :	11:20	1061S	1061S

MAXIMUM BHT AT 8490 FT/M = 248 °F/@ 1540

N.B. ALL DEPTHS ARE MEASURED FROM K.B.

DATE	TIME	REMARKS	IN / OUT	RUN
			Top : 395/ 1537	01
14/6	1730	S.W.I.	Bot : 400/ 1546	02

000452

ET 108

EXPERTEST PTY. LTD.

SEQUENCE OF EVENTS

CUSTOMER : SANTOS LTD	PERFORATIONS: 8591' - 9170' KB	PAGE: 1 OF 2
WELL NAME: FLY LAKE 19 / UPPER	FORMATION : PATCHAWARRA	DATE: 13-6-91
TEST TYPE : B.H.P. SURVIEY		OPR : N. HAY

DATE/TIME	DESCRIPTION OF EVENTS
13-6-91	
16:00	ARRIVE ON LOCATION
16:15	SHUT WELL IN TO RIG UP SWAB VALVE
16:40	WELL BACK ON LINE ON 100% CHOKE
	RIG UP WIRELINE UNIT
14-6-91	
09:15	ARRIVE BACK ON LOCATION
09:20	R.I.H. WITH 1.75" BLIND
09:24	TAG OBSTRUCTION AT 664' KB JAR THROUGH OBSTRUCTION
	R.I.H TO 8525' KB
10:00	P.O.O.H.
10:20	ARRIVE BACK IN LUB
	RIG UP 2X3000 P.S.I PRESSURE ELEMENTS COUPLED TO 120 HR CLOCK
10:40	PRESSURE UP LUB
12:15	DEPRESSURE LUB
13:15	PRESSURE UP LUB AND R.I.H.
13:38	HANG ELEMENTS AT 8490' KB
17:30	SHUT WELL IN FOR BUILD-UP
19-6-91	
08:30	P.O.O.H
08:47	ARRIVE IN LUB AND DEPRESSURE LUB
09:50	PRESSURE UP LUB
11:20	DEPRESSURE LUB AND RECOVER CHARTS
	REDRESS ELEMENTS WITH CHARTS AND 3HR CLOCKS FOR STATIC GRADIENT

000453

ET 102

EXPERTEST PTY. LTD.

SEQUENCE OF EVENTS

CUSTOMER : SANTOS LTD	PERFORATIONS: 8591' - 9170' KB	PAGE: 2 OF 2
WELL NAME: FLY LAKE # 1 UPPER	FORMATION : PATCHAWARRA	DATE: 19-6-91
TEST TYPE : B.H.P. SURVEY		OPR : N. HAY

DATE/TIME	DESCRIPTION OF EVENTS
19-6-91	
11:42	PRESSURE UP LUB
11:52	DEPRESSURE LUB
11:57	PRESSURE UP LUB AND R.I.H. FOR GRADIENT SURVEY
13:07	P.O.O.H
13:22	ARRIVE IN LUB AND DEPRESSURE LUB
13:27	PRESSURE UP LUB
13:37	DEPRESSURE LUB AND RECOVER CHARTS. GOOD CHARTS
	RIG DOWN WIRELINE SURVEY COMPLETED

000454

ET 102

EXPERTEST PTY. LTD.

TEST RESULTS

CUSTOMER : SANTOS LTD
WELL NAME : ELY LAKE 4 / UPPER
TEST TYPE : B.H.P. SURVEY

PERFORATIONS: 8591' - 9170' KB
FORMATION : PATCHAWARRA

DATE : 14-6-91
OPR : N. HAY

TIME		WELLHEAD DATA						FLOW RATES			CUMULATIVE PRODUCTION				
DATE / TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD $m^3 10^3/D$	OIL BPD m^3/D	WATER BPD m^3/D	GAS MMSCF $m^3 10^3$	OIL BBLS m^3	WATER BBLS m^3		
14-6-91															
13:15		2765	3000	48	R.I.H. WITH 2X3000 P.S.I. PRESSURE ELEMENTS COUPLED TO 120HR CLOCKS										
13:35		2772	3000	45	HANG. ELEMENTS AT 8490' KB WELL FLOWING ON 100% CHOKE										
14:00		2772	3000	46	100%										
14:30		2772	3000	45	"										
15:00		2765	3000	45	"										
15:30		2765	3000	45	"										
16:00		2778	3000	45	"										
16:30		2778	3000	45	"										
17:00		2778	3000	45	"										
17:30	0	2778	3000	45	SHUT WELL IN										
17:45		7722	7400	35											
18:00	.5	10149	10000	30											
18:15	.75	10418	10400	28											
18:30	1	10466	10400	28											
18:45	1.25	10480	10450	26											
19:00	1.5	10494	10450	24											
19:15	1.75	10508	10480	22											
19:30	2	10515	10480	22											
19:45	2.25	10522	10490	20											
20:00	2.5	10528	10490	21											
20:15	2.25	10535	10490	20											

000455

ET 104

EXPERTEST PTY. LTD.

TEST RESULTS

CUSTOMER : SANTOS LTD
WELL NAME: FLY LAKE # 1 UPPER
TEST TYPE : B.H.P. SURVEY

PERFORATIONS: 8591' - 9170' KB
FORMATION : PATCHAWARRA

PAGE: 2 OF 3
DATE: 14-6-91
OPR : N. HAY

TIME		WELLHEAD DATA						FLOW RATES			CUMULATIVE PRODUCTION				
DATE / TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD $m^3 10^3/D$	OIL BPD m^3/D	WATER BPD m^3/D	GAS MMSCF $m^3 10^3$	OIL BBLS m^3	WATER BBLS m^3		
14-6-91															
20:30	3	10542	10500	20											
20:45	3.25	10542	10500	20											
21:00	3.5	10549	10500	20											
21:15	3.75	10556	10530	20											
21:30	4	10563	10530	20											
15-6-91															
00:30	8	10604	10600	16											
05:30	12	10632	10600	15											
09:30	16	10673	10670	13											
13:30	20	10701	10701	24											
17:30	24	1			← 5	NO READING TAKEN CREW IN MOOMBA									
21:30	28														
16-6-91															
01:30	32	10708	10708	20											
05:30	36	10349	10349	17											
09:30	40	10411	10411	24											
13:30	44	10673	10673	30											
17:30	48	10666	10666	24											
21:30	52	10666	10666	24											
17-6-91															
01:30	56	10659	10659	20											

000456

ET 104

EXPERTEST PTY. LTD.

TEST RESULTS

CUSTOMER : SANTOS LTD
WELL NAME : FLY LAKE 1 / UPPER
TEST TYPE : B.H.P. SURVIEY

PERFORATIONS: 8591' - 9170' MD
FORMATION : PATCHAWARRA

PAGE: 3 OF 3
DATE: 17-6-91
OPR : N HAY

TIME		WELLHEAD DATA						FLOW RATES			CUMULATIVE PRODUCTION				
DATE / TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD $m^3 10^3/D$	OIL BPD m^3/D	WATER BPD m^3/D	GAS MMSCF $m^3 10^3$	OIL BBLS m^3	WATER BBLS m^3		
17-6-91															
05:30	60	10639	10634	17											
09:30	64	10632	10632	25											
13:30	68	10632	10632	26											
17:30	72	10625	10625	25											
21:30	76	10618	10618	22											
18-6-91															
01:30	80	10618	10618	20											
05:30	84	10763	10763	17											
09:30	88	10763	10763	23											
13:30	92	10618	10618	23											
17:30	96	10625	10625	24											
21:30	100	10611	10611	20											
19-6-91															
01:30	104	10618	10618	19											
05:30	108	10625	10625	17											
09:30	112	10618	10618	21		P.O.O.H.		SURVIEY	COMPLETED						

000457

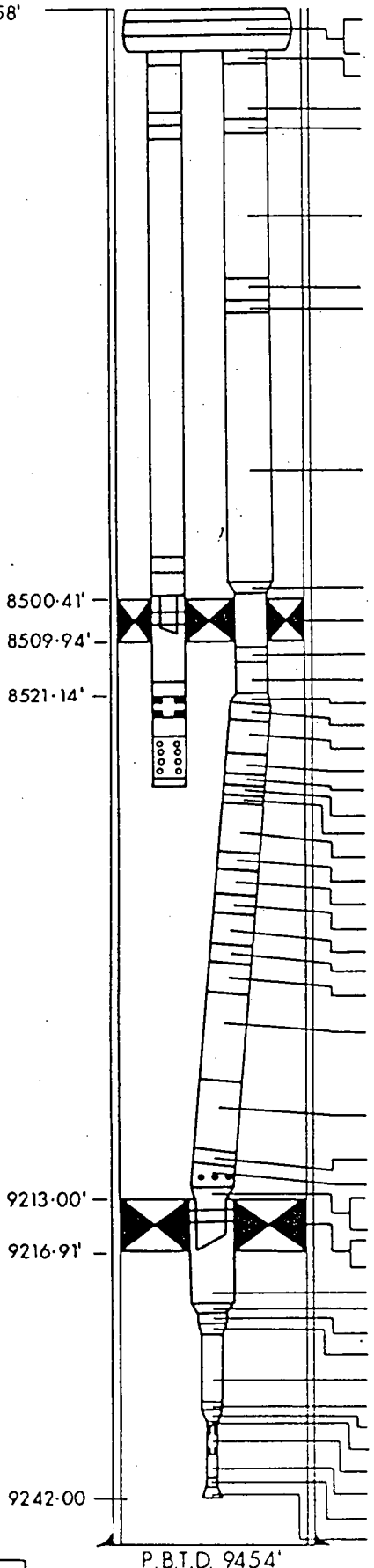
ET 104

000458

DOWNHOLE INSTALLATION

Well: Fly Lake – 1

K.B. to top of bradenhead spool 19·58'



Cameron split hanger c/w 2⅞" ABDSS box down and 2⅞" CS hydril box up
2⅞" ABDSS pin × pin
1 joint 2⅞" 6·5 # ABDSS J55 tubing
2' × 2⅞" pup joint ABDSS 6·5 #

7 joints 2⅞" 6·5 # ABDSS J55 tubing

2⅞" Otis flow nipple 11 FN255
2⅞" Otis SSSV nipple 11×38

265 joints 2⅞" 6·5 # ABDSS J55 tubing

Cross over 2⅞" ABDSS × 2⅜" EUE pin
7" Baker A5 dual packer. Size 47C2
Cross over 2⅜" NU box × 2⅜" EUE pin
10' × 2⅜" 4·7 # EUE J55 pup joint
Cross over 2⅞" EUE × 2⅜" EUE
2 joints 2⅞" 6·5 # J55 EUE tubing
5 × 20' and 2 × 10' Blast joints 2⅞" EUE
1 joint 2⅞" 6·5 # EUE J55 tubing
10' × 2⅞" 6·5 # EUE J55 pup joint
8' × 2⅞" 6·5 # EUE J55 pup joint
4' × 2⅞" 6·5 # EUE J55 pup joint
7 × 20' × 2⅞" EUE blast joints
3 joints 2⅞" 6·5 # EUE J55 tubing
4' × 2⅞" 6·5 # EUE J55 pup joint
2 × 10' × 2⅞" 6·5 # EUE J55 pup joints
1 × 20' and 1 × 10' blasts joints 2⅞" EUE
2 joints 2⅞" 6·5 # EUE J55 tubing
2 × 10' × 2⅞" 6·5 # EUE J55 pup joints

2 × 20' and 1 × 10' blast joints 2⅞" EUE

1 joint 2⅞" 6·5 # J55 EUE tubing

Cross over 2⅜" × 2⅞" EUE
Otis sliding sleeve 121X01
Baker G22 locator seal assembly, size 81-32, 2⅜" EUE box up
7" Baker 84 DB32 packer c/w 4½" LT&C box down
4½" LT&C pin × pin millout extension
4½" LT&C box × 3½" EUE pin crossover
3½" J55 EUE collar
3½" EUE pin × 2⅞" EUE pin crossover
2⅞" 6·5 # EUE J55 pup joint
2⅞" EUE J55 collar
2⅞" EUE pin × 2⅜" EUE pin crossover
2⅜" EUE J55 collar
Otis 11X1 landing nipple (Min. I.D. = 1·875")
2⅜" 6·5 # J55 EUE pup joint
2⅜" J55 EUE collar
2⅜" EUE pin × 2⅞" EUE pin crossover

PERFORATIONS

Tirrawarra

9335' - 9385' — 4 shots/foot

Basal Patchawarra

9297' - 9311' — 4 shots/foot

Patchawarra

8586' - 8608'
8632' - 8635'
8668' - 8696'
8768' - 8793'
8816' - 8827'
8833' - 8845'
8863' - 8872' — 4 shots/foot

8872' - 8882' — 5 shots/foot

8882' - 8888'
9025' - 9035'
9138' - 9173' — 4 shots/foot

REPERFORATED 30·3·1984

Basal Patchawarra

9297' - 9311' — 1 DP jet/foot

Patchawarra

8591' - 8606'
8632' - 8635'
8675' - 8694'
8770' - 8791'
8820' - 8827'
8838' - 8845' — 2 Hyperjets/foot

8872' - 8882' — 1 Hyperjets/foot

9138' - 9160'
9163' - 9165'
9168' - 9170' — 2 Hyperjets/foot

PROPOSED RE/COMPLETION	
RE/COMPLETION AS RUN	
NOT TO SCALE	

DESIGNED	M. Niesingh/ D.R. Hahn
DRAFTED	D.Dean
DATE	4th May 1984

EXPERTEST PTY. LTD.

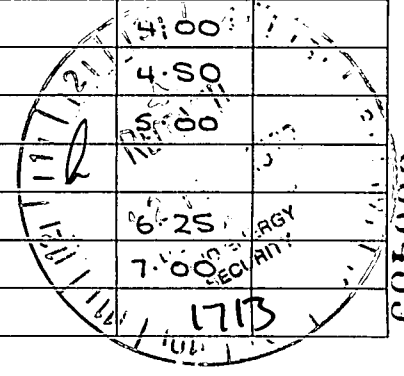
FIELD READINGS

CUSTOMER : SANTOS LTD.
WELL NAME: FLY LAKE #1 LOWER
TEST TYPE : PRODUCTION TEST

PERFORATIONS: 9297' → 9385' KB.
FORMATION : Basal Patch./Tirrawarra

PAGE: ONE OF TWO
DATE: 20TH OCTOBER 1991
OPR : T. CHAPMAN

TIME		WELLHEAD DATA					SEPARATOR DATA				LIQUID PRODUCTION				
DATE / TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/~~KPa~~)	ANNULUS PRESSURE (~~PSI~~/KPa)	WELLHEAD TEMP (~~°F~~/°C)	CHOKE SIZE	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF PRESS. (IN WC)	GAS TEMP (~~°C~~)	TOTAL LIQUID (IN/~~CM~~)	OIL (IN/~~CM~~)	OIL API GRAVITY @ 60°F	WATER (IN/~~CM~~)	
20TH	OCTOBER 1991	WELL STATUS : FLOWING INLINE TO PRODUCTION ON 16/64 CHOKE													
13:00		310	4400	45	16/64		PRESSURE TEST SWAB VALVE, B.O.P'S AND LUBRICATOR								
15:00		312	4400	45			RUN IN HOLE WITH 1.75" BLIND BOX								
15:21							TAG BOTTOM @ 9378' KB / P.OOH.						Qg	4.143 E3m³/d	
15:45		310	4400	45			ARRIVE BACK AT SURFACE						Qo =	12.015 m3/d	
21ST	OCTOBER 1991												Qw =	2.595 m3/d	
07:45		325	4400	41	16/64		PRESSURE TEST FLOW LINES AND SEPERATOR.						Sep.P =	1741 KPa	
09:00							START SURVEY						Sep.T. =	34.7°C	
09:00	0	323	4400	42	16/64		.500	DIVERT FLOW TO FLARE							
09:30							CHANGE TO .750" ORIFACE PLATE.								
10:00	1	302	4400	43	16/64		.750	240	15	41	5.50"	5.25"	TARE	.25"	DIP.
10:00							CHANGE TO .625" ORIFACE PLATE.								
11:00	2	312	4400	47	16/64		.625	245	25	43	9.50	8.50	57.0	1.00	
13:00	4	327	4400	48	16/64		.625	244	25	45	14.25	12.00		2.25	
15:00	6	325	4400	48	16/64		.625	230	27	44	19.00	15.75		3.25	
17:00	8	330	4400	49	16/64		.625	274	25	43	24.00	20.00		4.00	
19:00	10	350	4400	44	16/64		.625	310	25	41	28.50	24.00		4.50	
21:00	12	328	4400	42	16/64		.625	250	20	35	31.00	26.00		5.00	
22ND	OCTOBER 1991														
01:00	16	331	4400	40	16/64		.625	300	12	28	38.50	32.25		6.25	
05:00	20	344	4400	38	16/64		.625	300	10	25	45.500	38.50		7.00	



R68

000459

ET 103

EXPERTEST PTY. LTD.

FIELD READINGS

CUSTOMER : SANTOS LTD.
WELL NAME: FLY LAKE # 1 LOWER.
TEST TYPE : PRODUCTION TEST

PERFORATIONS: 9297' → 9385' KB.
FORMATION : Basal Patch. / TIRRAWARRA

PAGE: TWO OF TWO
DATE: 22ND OCTOBER 1991
OPR : T. CHAPMAN.

TIME		WELLHEAD DATA					SEPARATOR DATA				LIQUID PRODUCTION				
DATE / TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/~~KPa~~)	ANNULUS PRESSURE (~~PSI~~/KPa)	WELLHEAD TEMP (~~°F~~/°C)	CHOKE SIZE	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF PRESS. (IN WC)	GAS TEMP (°~~F~~)	TOTAL LIQUID (IN/~~CM~~)	OIL (IN/~~CM~~)	OIL API GRAVITY @ 60°F	WATER (IN/~~CM~~)	
22ND	OCTOBER 1991														
07:00	22	320	4400	39	16/64		.625	255	20	27	50.00	42.00		8.00	
09:00	24	320	4400	39	16/64		.625	254	18	31	55.00	46.00		9.00	
11:00	26	294	4400	40	16/64		.625	240	21	35	59.50	49.50		10.00	
13:00	28	303	4400	43	16/64		.625	220	25	37	64.75	53.75		11.00	
15:00	30	276	4400	43	16/64		.625	225	25	39	70.00	58.00		12.00	
17:00	32	305	4400	43	16/64		.625	230	24	38	74.25	61.25		13.00	
19:00	34	323	4500	43	16/64		.625	270	30	31	78.00	64.25		13.75	
21:00	36	296	4500	43	16/64		.625	250	24	30	82.75	68.50		14.25	
23RD	OCTOBER 1991														
01:00	40	327	4500	42	16/64		.625	288	15	26	93.75	77.750		16.00	
05:00	44	339	4500	41	16/64		.625	300	10	25	99.50	82.500		17.00	
07:00	46	308	4400	35	16/64		.625	221	27	29	103.75	86.000		17.75	
09:00	48	290	4400	35	16/64		.625	210	30	33	109.75	91.00		18.75	
10:15		320	4400	37	16/64		PRESS UP LUBRICATOR FOR SURFACE STOP OF FLOWING GRADIENT								
10:30		291	4400	38	16/64		RUN IN HOLE WITH TANDUM 4000 PSI B.H.P RECORDERS.								
11:00	50	317	4500	40	16/64		.625	210	37	38	114.50	94.75		19.75	
11:54		310	4500	41	16/64		ARRIVE AT MAXIMUM GRADIENT DEPTH OF 9360' KB. — 10 MIN STOP.								
12:29		310	4500	42	16/64		ARRIVE AT SURFACE — FINAL SURFACE STOP.								
12:44		310	4500	39	16/64		DEPRESSURE LUBRICATOR — CHARTS GOOD.								
13:00	52	289	4500	42	16/64		.625	230	29	40	119.50	99.00		20.50	
13:00							SHUT IN THE WELL — END OF SURVEY.								

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000460

EXPERTEST PTY. LTD.

TEST RESULTS

CUSTOMER : SANTOS LTD.
WELL NAME: FLY LAKE #1 LOWER.
TEST TYPE : PRODUCTION TEST
PERFORATIONS: 9297' → 9385' KB.
FORMATION : BASAL PATCH. / TIRRAWARRA
PAGE: ONE OF TWO
DATE: 20TH OCTOBER 1991
OPR : T. CHAPMAN

TIME		WELLHEAD DATA				SEPERATOR		FLOW RATES			CUMULATIVE PRODUCTION			RATIOS	
DATE / TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (~~PSI~~/KPa)	ANNULUS PRESSURE (~~PSI~~/KPa)	WELLHEAD TEMP (~~°F~~/°C)	CHOKE SIZE	PRESSURE (~~PSI~~/KPa)	TEMP (~~°F~~/°C)	GAS ~~MMSCFD~~ $m^3 10^3/D$	OIL ~~BPD~~ m^3/D	WATER ~~BPD~~ m^3/D	GAS ~~MMSCF~~ $m^3 10^3$	OIL ~~BBLS~~ m^3	WATER ~~BBLS~~ m^3		LGR $m^3/10^6 m^3$
20TH	OCTOBER 1991	WELL STATUS:				FLOWING INLINE TO PRODUCTION ON 16/64 CHOKE									
13:00		2138	4400	45	16/64			PRESSURE TEST B.O.P'S AND LUBRICATOR							
15:00		2151	4400	45				RUN PROGRAMMED 1.750" DRIFT RUN							
15:21		2138	4400	45				TAG "FILL" AT 9378' KB – PULL OUT OF HOLE							
15:45		2138	4400	45				SECURE WIRE LINE UNIT							
		TEST	RISER	VALUE	SIEZED CLOSED – RIG UP SEPERATOR TO FLOW TO FLARE										
21ST	OCTOBER 1991														
07:45		2241	4400	41	16/64	1758	–	PRESSURE TEST FLOW LINES TO PRODUCTION LINE PRESSURE							
09:00	0	2227	4400	42				DIVERT FLOW THROUGH SEPERATOR TO FLARE – START SURVEY.							
10:00	1	2082	4400	43	16/64	1655	41	4.899	0	0	.204	0	0		–
11:00	2	2151	4400	47		1689	43	4.410	20.826	4.866	.388	.868	.200		5812.2
13:00	4	2255	4400	48		1682	45	4.381	11.214	4.005	.753	1.803	.534		3473.9
15:00	6	2241	4400	48		1586	44	4.428	12.015	3.204	1.122	2.804	.801		3437.0
17:00	8	2275	4400	49		1889	43	4.672	13.617	2.403	1.511	3.939	1.001		3428.9
19:00	10	2413	4400	44		2138	41	5.004	12.816	1.602	1.928	5.007	1.135		2881.3
21:00	12	2262	4400	42		1724	35	4.050	6.408	1.602	2.266	5.541	1.269		1977.8
22ND	OCTOBER 1991														
01:00	16	2282	4400	40	16/64	2069	28	3.511	10.013	2.003	2.851	7.209	1.603		3422.1
05:00	20	2372	4400	38		2069	25	3.227	10.013	1.202	3.389	8.878	1.803		3475.1
07:00	22	2206	4400	39		1758	27	4.163	11.214	3.204	3.736	9.813	2.070		3463.4

ET 104

000491

EXPERTEST PTY. LTD.

TEST RESULTS

CUSTOMER : SANTOS LTD.
WELL NAME: FLY LAKE #1 LOWER
TEST TYPE : PRODUCTION TEST
PERFORATIONS: 9297' → 9385' KB.
FORMATION : BASAL PATCH. / TIRRAWARRA
PAGE: TWO OF TWO
DATE: 22ND OCTOBER 1991
OPR : T. CHAPMAN.

TIME		WELLHEAD DATA				SEPERATOR.		FLOW RATES			CUMULATIVE PRODUCTION			RATIOS	
DATE / TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (~~PSI~~/KPa)	ANNULUS PRESSURE (~~PSI~~/KPa)	WELLHEAD TEMP (~~°F~~/°C)	CHOKE SIZE	PRESSURE (~~PSI~~/KPa)	TEMP (~~°F~~/°C)	GAS ~~MMSCFD~~ $m^3 10^3/D$	OIL ~~BPD~~ m^3/D	WATER ~~BPD~~ m^3/D	GAS ~~MMSCF~~ $m^3 10^3$	OIL ~~BBLS~~ m^3	WATER ~~BBLS~~ m^3		L.G.R. $m^3/10^6 m^3$
22ND	OCTOBER 1991														
09:00	24	2206	4400	39	16/64	1751	31	3.907	12.816	3.204	4.062	10.881	2.337		4100.3
11:00	26	2027	4400	40		1655	35	4.064	11.214	3.204	4.400	11.816	2.604		3547.7
13:00	28	2089	4400	43		1517	37	4.222	13.617	3.204	4.752	12.951	2.871		3984.1
15:00	30	1903	4400	43		1551	39	4.256	13.617	3.204	5.107	14.086	3.138		3952.3
17:00	32	2103	4400	43		1586	38	4.226	10.413	3.204	5.459	14.954	3.405		3222.2
19:00	34	2227	4500	43		1862	31	5.210	9.612	2.403	5.893	15.755	3.605		2306.1
21:00	36	2041	4500	43		1724	30	4.486	13.617	1.602	6.267	16.890	3.739		3392.6
23RD	OCTOBER 1991														
01:00	40	2255	4500	42	16/64	1986	26	3.856	14.819	2.804	6.910	19.360	4.206		4570.0
05:00	44	2337	4500	41		2069	25	3.227	7.610	1.602	7.447	20.628	4.473		2854.5
07:00	46	2124	4400	35		1524	29	4.476	11.214	2.403	7.820	21.563	4.673		3042.2
09:00	48	2000	4400	35		1448	33	4.560	16.020	3.204	8.200	22.898	4.940		4215.8
10:15		2206	4400	37		PRESS. UP LUBRICATOR FOR SURFACE STOP OF FLOWING GRADIENT									
10:30		2006	4400	38		RUN IN THE HOLE WITH TANDUM 4000 PSI B.H.PRESSURE RECORDERS									
11:00	50	2186	4400	40		1448	38	5.019	12.015	3.204	8.618	23.899	5.207		3032.3
11:54		2138	4400	41		ARRIVE AT MAXIMUM GRADIENT DEPTH OF 9360' KB. — FINAL STOP.									
12:04		2206	4400	42		PULL OUT OF THE HOLE									
12:29		2206	4400	42		ARRIVE IN LUBRICATOR FOR FINAL SURFACE STOP.									
12:44		2137	4400	39		DEPRESSURE THE LUBRICATOR — CHARTS GOOD.									
13:00	52	1993	4400	42		1586	40	4.625	13.617	2.403	9.003	25.034	5.407		3463.8
13:00			SHUT IN THE WELL — END OF SURVEY												

ET 104

000462

EXPERTEST PTY. LTD.

LIQUID PRODUCTION

CUSTOMER : SANTOS LTD.
WELL NAME: FLY LAKE #1 LOWER.
TEST TYPE : PRODUCTION TEST.

PERFORATIONS: 9297' → 9385' KB.
FORMATION : BASAL PATCH / TIRRAWARRA

PAGE: ONE OF TWO
DATE: 21ST OCTOBER 1991
OPR : T. CHAPMAN

TANK NUMBER #1 = 63 / #2 =
TANK CAPACITY #1 = 56.6 ~~bbls~~/m³ / #2 = bbls/m³
TANK SCALE #1 = .267 m³/in ~~bbls/in - m³/cm~~ / #2 = bbls/in - m³/cm
OIL API GRAVITY = 57 @ 60°F

DATE / TIME	FLOW TIME (HOURS)	TANK USED (NUMBER)	TOTAL TANK DIP (IN/CM)	OIL/CONDENSATE PRODUCTION				WATER PRODUCTION			
				TANK DIP (IN/CM)	TANK PRODUCTION (BBLS/m³)	FLOW RATE (BPD/m³D)	CUMULATIVE PRODUCTION (BBLS/m³)	TANK DIP (IN/CM)	TANK PRODUCTION (BBLS/m³)	FLOW RATE (BPD/m³D)	CUMULATIVE PRODUCTION (BBLS/m³)
21ST	OCTOBER 1991										
09:00	0	#1	5.500	5.250	TARE	DIP.		.250	TARE	DIP.	
10:00	1	↓	5.500	5.250	0	0	↓ 0	.250	0	0	0
11:00	2		9.500	8.500	.868	20.826	.868	1.000	.200	4.806	.200
13:00	4		14.250	12.000	.935	11.214	1.803	2.250	.334	4.005	.534
15:00	6		19.000	15.750	1.001	12.015	2.804	3.250	.267	3.204	.801
17:00	8		24.000	20.000	1.135	13.617	3.939	4.000	.200	2.403	1.001
19:00	10		28.500	24.000	1.068	12.816	5.007	4.500	.134	1.602	1.135
21:00	12		31.000	26.000	.534	6.408	5.541	5.000	.134	1.602	1.269
22ND	OCTOBER	1991									
01:00	16	#1	38.500	32.250	1.669	10.013	7.209	6.250	.334	2.003	1.603
05:00	20		45.500	38.500	1.669	10.013	8.878	7.000	.200	1.202	1.803
07:00	22		50.000	42.000	.9345	11.214	9.813	8.000	.267	3.204	2.070
09:00	24		55.000	46.000	1.068	12.816	10.881	9.000	.267	3.204	2.337
11:00	26		59.500	49.500	.9345	11.214	11.816	10.000	.267	3.204	2.604
13:00	28		64.750	53.750	1.1348	13.617	12.951	11.000	.267	3.204	2.871
15:00	30		70.000	58.000	1.135	13.617	14.086	12.000	.267	3.204	3.138
17:00	32		74.250	61.250	.868	10.413	14.954	13.000	.267	3.204	3.405
19:00	34		78.000	64.250	.801	9.612	15.755	13.750	.200	2.403	3.605
21:00	36		82.750	68.500	1.135	13.617	16.890	14.250	.134	1.602	3.739

000463

EXPERTEST PTY. LTD.

LIQUID PRODUCTION

CUSTOMER : SANTOS LTD.
WELL NAME: FLY LAKE # 1 LOWER.
TEST TYPE : PRODUCTION TEST

PERFORATIONS: 9297' → 9385' KB.
FORMATION : Basal Patch. / Tirrawarra.

PAGE: TWO OF TWO
DATE: 23RD ~~OCTOBER~~ 1991
OPR : T. CHAPMAN.

TANK NUMBER	#1 = 63	TANK CAPACITY	#1 = 56.6 bbls/m³	TANK SCALE	#1 = .267 m³/in ~~bbls/in - m³/cm~~	OIL API GRAVITY = 57 @ 60°F
	#2 =		#2 = bbls/m³		#2 = bbls/in - m³/cm	

DATE / TIME	FLOW TIME (HOURS)	TANK USED (NUMBER)	TOTAL TANK DIP (IN/~~CM~~)	OIL/CONDENSATE PRODUCTION				WATER PRODUCTION			
				TANK DIP (IN/~~CM~~)	TANK PRODUCTION (~~BBLS~~/m³)	FLOW RATE (~~BPD~~/m³D)	CUMULATIVE PRODUCTION (~~BBLS~~/m³)	TANK DIP (IN/~~CM~~)	TANK PRODUCTION (~~BBLS~~/m³)	FLOW RATE (~~BPD~~/m³D)	CUMULATIVE PRODUCTION (~~BBLS~~/m³)
23RD	OCTOBER 1991										
01:00	40	#1	93.750	77.750	2.470	14.819	19.360	16.000	.467	2.804	4.206
05:00	44		99.500	82.500	1.268	7.610	20.628	17.000	.267	1.602	4.473
07:00	46		103.750	86.000	.9345	11.214	21.563	17.750	.200	2.403	4.673
09:00	48		109.750	91.000	1.335	16.020	22.898	18.750	.267	3.204	4.940
11:00	50		114.500	94.750	1.001	12.015	23.899	19.750	.267	3.204	5.207
13:00	52		119.500	99.000	1.135	13.617	25.034	20.500	.200	2.403	5.407
			SHUT IN THE WELL — END OF SURVEY.								
					Qo = 12.015 m³/day						
					Qw = 2.595 m³/day						

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000464

EXPERTEST PTY. LTD.

GAS FLOW CALCULATIONS

CUSTOMER : SANTOS LTD.	PERFORATIONS: 9297' → 9385' KB.	PAGE: TWO OF TWO
WELL NAME: FLY LAKE # 1 LOWER	FORMATION : Basal Patch. / Tirrawarra	DATE: 23RD OCTOBER 1991
TEST TYPE : PRODUCTION TEST		OPR : T. CHAPMAN.

ORIFICE METER TYPE: DANIEL SENIOR	STATIC PRESSURE RANGE : 0 – 1500 PSIG	GAS SPECIFIC GRAVITY (SG) = .9490 (TIRRA.)
METER RUN SIZE : 2.900"	DIFFERENTIAL PRESS. RANGE: 0 – 100 IN WC	FG $\sqrt{(1/SG)}$ = 1.0265
SEPARATOR NO : #238	STANDARD CONDITIONS : 14.73 PSI @ 60°F	C_2 (FU × FG) = 24.636

DATE / TIME	FLOW TIME (HOURS)	CHOKE SIZE	STATIC PRESS P_F (PSIA)	DIFF PRESS H_W (IN WC)	GAS FLOW TEMP (°F)	ORIF. PLATE SIZE (IN)	$\sqrt{(P_F \times H_W)}$	$C_1 = F_B \times F_{TF} \times F_{PV} \times Y_2$				C_1	C ($C = C_1 \times C_2$)	GAS FLOW RATE $Q = \sqrt{(P_F \times H_W)} \times C$	
								F_B	F_{TF}	F_{PV}	Y_2			(MMSCFD)	($m^3 10^3/D$)
23RD OCTOBER 1991															
01:00	40	16/64	303	15	79	.625	67.417	78.687	.9822	1.0607	1.0003	82.006	2020.32	.136	3.856
05:00	44	16/64	315	10	77	.625	56.125	78.687	.9840	1.0644	1.0002	82.437	2030.96	.114	3.227
07:00	46	16/64	236	27	84	.625	79.825	78.687	.9777	1.0441	1.0008	80.388	1980.47	.158	4.476
09:00	48	16/64	225	30	91	.625	82.158	78.687	.9715	1.0400	1.0009	79.569	1960.29	.161	4.560
11:00	50	16/64	225	37	99	.625	91.241	78.687	.9645	1.0380	1.0011	78.863	1942.90	.177	5.019
13:00	52	16/64	245	29	104	.625	84.291	78.687	.9602	1.0404	1.0008	78.673	1938.21	.163	4.625
13:00							SHUT IN THE WELL ~ END OF SURVEY								
													ave:	0.151	4.250
			SepP = 268 psia				25.33% CO_2								
			SepT = 94 °F				1.96% N_2								
			Mol Wt = 28.989												
			S.G. = 1.0009												
			FG = 0.9996												
			Corrected rate	= ave rate × 0.9996 / 1.0265											
				= 0.151 × 0.9996 / 1.0265											
				= 0.147 mmscf/d =			4.143	E3m3/d	✓						

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000465

EXPERTEST PTY. LTD.

GAS FLOW CALCULATIONS

CUSTOMER : SANTOS LTD.
WELL NAME: FLY LAKE #1 LOWER.
TEST TYPE : PRODUCTION TEST

PERFORATIONS: 9297' → 9385' KB.
FORMATION : Basal Patch./TIRRAWARRA

PAGE: ONE OF TWO
DATE: 21ST OCTOBER 1991
OPR : T. CHAPMAN.

ORIFICE METER TYPE: DANIEL SENIOR
METER RUN SIZE : 2.900"
SEPARATOR NO : #238

STATIC PRESSURE RANGE : 0 - 1500 PSIG
DIFFERENTIAL PRESS. RANGE: 0 - 100 IN WC
STANDARD CONDITIONS : 14.73 PSI @ 60°F

GAS SPECIFIC GRAVITY (SG) = .9490 (TIRRA)
FG $\sqrt{(1/SG)}$ = 1.0265
C_2 (FU × FG) = 24.636

DATE / TIME	FLOW TIME (HOURS)	CHOKE SIZE	STATIC PRESS P_F (PSIA)	DIFF PRESS H_W (IN WC)	GAS FLOW TEMP (°F)	ORIF. PLATE SIZE (IN)	$\sqrt{(P_F \times H_W)}$	$C_1 = F_B \times F_{TF} \times F_{PV} \times Y_2$				C_1	C ($C = C_1 \times C_2$)	GAS FLOW RATE $Q = \sqrt{(P_F \times H_W)} \times C$	
								F_B	F_{TF}	F_{PV}	Y_2			(MMSCFD)	($m^3 10^3$/D)
21ST	OCTOBER	1991													
09:00	0	16/64	-	-	-	.500		START	SURVEY.						
10:00	1	16/64	255	15	106	.750	61.847	113.690	.9585	1.0417	1.0004	113.564	2797.82	.173	4.899
11:00	2	16/64	260	25	109	.625	80.623	78.687	.9560	1.0418	1.0006	78.420	1931.99	.156	4.410
13:00	4	16/64	259	25	113	.625	80.467	78.687	.9526	1.0406	1.0006	78.056	1923.01	.155	4.381
15:00	6	16/64	245	27	111	.625	81.333	78.687	.9543	1.0387	1.0007	78.055	1922.99	.156	4.428
17:00	8	16/64	289	25	109	.625	85.000	78.687	.9560	1.0470	1.0006	78.807	1941.52	.165	4.672
19:00	10	16/64	325	25	106	.625	90.139	78.687	.9585	1.0548	1.0005	79.592	1960.86	.177	5.004
21:00	12	16/64	265	20	95	.625	72.801	78.687	.9680	1.0467	1.0005	79.765	1965.14	.143	4.050
22ND	OCTOBER	1991													
01:00	16	16/64	315	12	82	.625	61.482	78.687	.9795	1.0622	1.0003	81.887	2017.40	.124	3.511
05:00	20	16/64	315	10	77	.625	56.125	78.687	.9840	1.0644	1.0002	82.437	2030.96	.114	3.227
07:00	22	16/64	270	20	81	.625	73.485	78.687	.9804	1.0524	1.0005	81.228	2001.16	.147	4.163
09:00	24	16/64	269	18	88	.625	69.585	78.687	.9741	1.0498	1.0004	80.502	1983.28	.138	3.907
11:00	26	16/64	255	21	95	.625	73.178	78.687	.9680	1.0448	1.0005	79.619	1961.534	.144	4.064
13:00	28	16/64	235	25	99	.625	76.649	78.687	.9645	1.0399	1.0007	78.974	1945.632	.149	4.222
15:00	30	16/64	240	25	102	.625	77.460	78.687	.9619	1.0400	1.0007	78.774	1940.716	.150	4.256
17:00	32	16/64	245	24	100	.625	76.681	78.687	.9636	1.0415	1.0007	79.021	1946.800	.149	4.226
19:00	34	16/64	285	30	88	.625	92.466	78.687	.9741	1.0532	1.0007	80.782	1990.170	.184	5.210
21:00	36	16/64	265	24	86	.625	79.750	78.687	.9759	1.0496	1.0006	80.648	1986.891	.159	4.486

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EXPERTEST PTY. LTD.

BHP/BHT GAUGE RUN DATA

CUSTOMER : SANTOS LTD.	PERFORATIONS: 9297' → 9385' KB.	PAGE: ONE OF ONE
WELL NAME: FLY LAKE #1 LOWER.	FORMATION : Basal Patch. / Tirrawarra.	DATE: 23RD OCTOBER 1991
TEST TYPE : PRODUCTION TEST		OPR : T. CHAPMAN.

GAUGE DATA	UPPER PRESSURE GAUGE	LOWER PRESSURE GAUGE	TEMPERATURE GAUGE
ELEMENT SERIAL NO.	850207	850208	
ELEMENT RANGE PSIG.	4075	4100	
RECORDING SECTION SERIAL NO.	K 3433	K 3434	
DATE OF CALIBRATION:			
CLOCK SERIAL NO.	A 15012	A 16087	
CLOCK RANGE HOUR	3	3	
LEAD SCREW TYPE TURNS	15	15	
ENGAGE STYLUS DATE 23-10-91 TIME	10:12	10:12	
DISENGAGE STYLUS DATE 23-10-91 TIME	12:49	12:49	

RUN DATA	TIME (HOURS)	TUBING PRESSURE (~~PSI~~/KPa)	ANNULUS PRESSURE (~~PSI~~/KPa)
DATE : 23-10-91			
PRESSURE LUBRICATOR :	10:15	2206	4400
RUN IN HOLE :	10:30	2006	4400
ON DEPTH AT : 9360 FT/~~M~~	11:54	2137	4500
DATE : 23-10-91			
PULL OUT OF HOLE :	12:04	2206	4500
AT SURFACE :	12:29	2206	4500
DEPRESSURE LUBRICATOR :	12:44	2137	4500
MAXIMUM BHT AT 9360 FT/~~M~~ = 274 °F/~~C~~			
N.B. ALL DEPTHS ARE MEASURED FROM K.B.			

DATE	TIME	REMARKS
23-10-91		WELL STATUS : FLOWING THROUGH SEPERATOR TO FLARE ON 16/64 – SIMULATING INLINE CONDITIONS
		SEE SEQUENCE OF EVENTS PAGE OF THIS REPORT.

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000467

EXPERTEST PTY. LTD.	SEQUENCE OF EVENTS		
	CUSTOMER : SANTOS LTD.	PERFORATIONS: 9297' → 9385' KB.	PAGE: ONE OF TWO
	WELL NAME: FLY LAKE #1 LOWER	FORMATION : BASAL PATCH. / TIRRAWARRA	DATE: 20TH OCTOBER 1991
	TEST TYPE : PRODUCTION TEST		OPR : T. CHAPMAN

DATE/TIME	DESCRIPTION OF EVENTS
20.10.91	WELL STATUS : FLOWING INLINE TO PRODUCTION ON 16/64 ths CHOKE
10:30	ARRIVE ON LOCATION — POSITION WIRE LINE UNIT AND SURFACE TEST EQUIPMENT
11:15	SHUT IN THE WELL TO FIT SWAB VALVE — PRESSURE TEST GOOD.
11:37	BRING WELL BACK ON LINE
	FIELD OPERATOR ATTEMPTS TO FREE SIEZED DOWN STREAM TEST RISER VALVE
	RIG UP WIRELINE UNIT AND B.O.P's — PRESSURE TEST OK.
	RIG UP SEPERATOR FLOW LINES TO FLOW INLINE (as per programme)
15:00	PRESSURE UP LUBRICATOR AND RUN IN THE HOLE WITH 1.75" BLIND BOX FOR PROGRAMMED DRIFT RUN.
15:21	TAG BOTTOM AT 9378' KB — TUBING CLEAR — PULL OUT OF THE HOLE
15:45	ARRIVE AT SURFACE — SECURE THE WELL
	FIELD OPERATOR UNABLE TO FREE SIEZED VALVE — RETURNS TO TIRRAWARRA.
16:10	RIG UP TO FLOW TO FLARE — DRIVE TO TIRRAWARRA TO REPORT (too much static on Codan Radio)
	ORGANIZE FIELD OPERATOR TO START SURVEY IN THE MORNING. AT 08:00 HRS.
21.10.91	
07:00	COMPLETE RIGGING UP SEPERATOR CONTROLES AND METERS.
07:45	PRESSURE TEST SEPERATOR FLOW LINES, MANIFOLD AND VESSAL TO FLOWING LINE PRESSURE.
08:00	FIELD OPERATOR DELAYED BY GAS INJECTION PROBLEMS IN TIRRAWARRA FIELD.
08:45	FIELD OPERATOR ARRIVES ON LOCATION
09:00	DIVERT FLOW FROM PRODUCTION, THROUGH SEPERATOR AND FLOW TO FLARE.
	SET BACK PRESSURE TO SIMULATE PRODUCTION LINE PRESSURE (APROX 1750 KPA)
	INSTALL .500" ORIFACE PLATE IN GAS METER RUN
	FLOW TO SET FLUID LEVELS IN SEPERATOR.

000468

EXPERTEST PTY. LTD.

SEQUENCE OF EVENTS

CUSTOMER : SANTOS LTD	PERFORATIONS: 8586 - 9385	PAGE: 1 OF 1
WELL NAME: FLY LAKE 1	FORMATION : TIRRAWARRA, PATCHAWARRA	DATE: 1.7.92
TEST TYPE : FLOWING GRADIENT SURVEY		OPR : G. GRANT.

DATE/TIME	DESCRIPTION OF EVENTS
12.15	ARRIVE FLY LAKE 1. (GANTRY ROUND WELL HEAD)
12.30	RIG UP ON LONG STRING LUB. BOP + SWAB VALVE.
14.20	R.I.H 1.75 GAUGE CUTTER. TIGHT SPOT 9224 KB WORK CLEAR
	TAG TD 9376' KB P.O.O.H.
15.10	O.O.H.
	RIG UP CHIDESAN FROM ADJ CHOKE ON WING VALVE ON LONG SIDE
	TO FLARE LINE
	SECURE WELL
16.45	LEAVE LOCATION.

RECEIVED 14 DEC 1992 DEPT. OF MINES AND ENERGY SECURITY

R69 0004469

EXPERTEST PTY. LTD.

SEQUENCE OF EVENTS

CUSTOMER : SANTOS LTD	PERFORATIONS: 8586 - 9173	PAGE: 1 OF 1
WELL NAME: FLY LAKE 1 (SHORT) UPPER	FORMATION : BASAL PATCHAWARRA.	DATE: 2.7.92
TEST TYPE : FLOWING GRADIENT SURVEY.		OPR : G. GRANT

DATE/TIME	DESCRIPTION OF EVENTS
14.00	R.I.G UP LUB B.O.P + SWAB VALVE
	PUT ON ADJ CHOKE ON FLOW WING
	S.I.T.H.P 345 psi.
14.45	R.I.H 1.75 gauge ring TAG OBSTRUCTION AT 8450' KB JAR
	DOWN MAKE NO PROGRESS. P.O.O.H.
15.50	AT SURFACE.
	SECURE WELL
16.10	TRAVEL BACK TO MOOMBA

000470

ET 102

EXPERTEST PTY. LTD.

SEQUENCE OF EVENTS

CUSTOMER : SANTOS LTD	PERFORATIONS: 9297 - 9335	PAGE: 1 OF 1
WELL NAME: FLY LAKE 1 (LOWER LONG)	FORMATION : TIRRAWARRA	DATE: 2-7-92
TEST TYPE : FLOWING GRADIENT SURVEY	BASAL PATCHAWARRA	OPR : G. GRANT

DATE/TIME	DESCRIPTION OF EVENTS
09.30	OPEN UP WELL ON LONG STRING ON 8/64 ADJ CHOKE. AND FLARE OFF
09.35	SITHP 223 psi FLOWING PRESSURE 177 psi
09.40	194 psi FLOWING
09.45	OPEN UP TO 14/64 245 psi
10.00	300 psi FLOWING. SURFACE.
10.15	330 psi "
10.30	351 psi. "
10.45	373 psi "
11.00	398 psi "
12.00	402 psi "
12.30	370 psi "
13.00	328 psi "
13.30	325 psi "
11.20	R.I.H 2 PRESSURE ELEMENTS + 1 TEMP ELEMENT TO 9341 KB M.P.
13.01	AT SURFACE
13.22	B/O GAUGES AND CHECK CHARTS OK
14.00	RIG DOWN FROM LONG STRING. SECURE WELL. REMOVE ADJ CHOKE.

0004771

ET 102

EXPERTEST PTY. LTD.

BHP/BHT GAUGE RUN DATA

CUSTOMER : SANTOS LTD

WELL NAME: FLY LAKE 1 (LONG)

TEST TYPE : FLOWING GRADIENT SURVEY.

PERFORATIONS: 9297 - 9385

FORMATION : BASAL PATCHAWARRA TIRRAWARRA

PAGE: 1 OF 1

DATE: 2.7.92

OPR : G. GRANT

GAUGE DATA	UPPER PRESSURE GAUGE	LOWER PRESSURE GAUGE	TEMPERATURE GAUGE
ELEMENT SERIAL NO.	22420	21372	63256
ELEMENT RANGE	0-4250	0-4050	95-471 F
RECORDING SECTION SERIAL NO.	54651	59790	30929
DATE OF CALIBRATION:	19.8.91	19.8.91	
CLOCK SERIAL NO.	K1850	K1838	K3054
CLOCK RANGE	3 hr	3 hr	3hr
LEAD SCREW TYPE	15 T.G.S	15.T.G.S	15.T.G.S
ENGAGE STYLUS DATE TIME	10.53	10.53	10.53
DISENGAGE STYLUS DATE TIME	13.37	13.37	13.37

RUN DATA	TIME (HOURS)	TUBING PRESSURE (PSI/~~KPa~~)	ANNULUS PRESSURE (PSI/KPa)
DATE : 2.7.92	11.05	398	N/A.
PRESSURE LUBRICATOR :	11.05	398	"
RUN IN HOLE :	11.30	400	"
ON DEPTH AT : 9341 ~~KB~~ FT/~~M~~	12.33	380	"
DATE : 2.7.92			
PULL OUT OF HOLE :	12.43	370	"
AT SURFACE :	13.01	330	"
DEPRESSURE LUBRICATOR :	13.32	325	"
MAXIMUM BHT AT FT/M = °F/C			
N.B. ALL DEPTHS ARE MEASURED FROM K.B.			

DATE	TIME	REMARKS
2.7.92	11.20	WELL FLOWING ON 14/64 ADJ CHOKE.

000472

ET 108

EXPERTEST

WIRELINE & WELL TESTING SERVICE

PO BOX 354 COWANDILLA 5033

PH. (08) 354 0488 TELEX AA87183
FAX (08) 43 7408

138 RICHMOND ROAD MARLESTON
SOUTH AUSTRALIA 5033

Tested Thursday, 2nd July 1992.

CLIENT	LOCATION	FORMATION
Santos Ltd.	Fly Lake #1 LS	Tirrawarra

Lower

FLOWING PRESSURE GRADIENT REPORT

PRESSURE ELEMENT DATA			
POSITION	SERIAL NO.	RANGE	CALIBRATED
Top	22420	4250	19/ 8/91
Bottom	21372	4050	19/ 8/91

WELL DATA	
PARAMETER	VALUE
DWT In	400 PSIG
DWT Out	330 PSIG
Max BHT	N/A

	TOP ELEMENT			BOTTOM ELEMENT		
DEPTH FT KB	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT
LUB.	0.1890	384.0	-----	0.1970	389.2	-----
1000	0.2400	491.6	0.108	0.2500	495.7	0.107
2000	0.2860	588.9	0.097	0.3000	596.2	0.101
3000	0.3320	686.3	0.097	0.3490	694.7	0.099
4000	0.3750	777.5	0.091	0.3940	785.7	0.091
5000	0.4260	885.8	0.108	0.4470	891.9	0.107
6000	0.5330	1113.9	0.228	0.5600	1119.7	0.228
7000	0.6420	1347.1	0.233	0.6760	1353.8	0.234
8000	0.7700	1622.0	0.275	0.8100	1624.8	0.271
9000	0.8960	1893.9	0.272	0.9440	1896.4	0.272
9341	0.9420	1993.4	0.292	0.9920	1993.9	0.286
LUB.	0.1350	270.3	-----	0.1440	282.8	-----

GENERAL REMARKS
Well flowing on 14/64 adj choke

EXPERTEST PTY. LTD.

SEQUENCE OF EVENTS

CUSTOMER : SANTOS LTD	PERFORATIONS: 8586-9173	PAGE: 1 OF 1
WELL NAME: FLY LAKE 1 UPPER	FORMATION : PATCHAWARRA	DATE: 3.7.92
TEST TYPE : FLOWING GRADIENT SURVEY.		OPR : G. GRANT

DATE/TIME	DESCRIPTION OF EVENTS
09.00	R.U. UP CHRISTENSENS TO FLARE LINE S.I.T.H.P 350 psi. UNABLE TO GET ANNULUS PRESSURE
09.10	OPEN UP WELL TO FLARE ON 8/64 323 psi
09.15	OPEN UP ADT CHOKE 16/64 FLOWING PRESSURE 198 psi
09.30	FLOWING PRESSURE 154 psi.
09.45	" " 95
10.00	" " 59
10.15	" " 55
10.30	" " 56
10.45	" " 56.
11.00	R.I.H 2 PRESSURE ELEMENTS + TEMP. 5 MIN STOPS EVERY 1000'. 10 MINS ON DEPTH. 8440' KB.
11.30	FLOWING PRESSURE 43 psi
12.00	" " 44 psi
13.05	" " 46 psi. B/O GAUGES SOME TAR ON BOTTOM TEMP GAUGE CHARTS OK CHANGE OVER TOOL STRING
13.35	R.I.H 1.85 L.I.B TAG OBSTRUCTION AT 641 KB. P.O.O.H.
14.00	B/O L.I.B. SOME CALCIUM ON L.I.B. WAIT ON MOOMBA FOR GO AHEAD.
15.05	R.I.H 1.85 BROACH JAR THRU 641 TIGHT TO 700' KB CLEAR TUBING.
15.25	R.I.H 1.85 L.I.B TAG OBSTRUCTION 8427 KB OVER PULL 100 lbs P.O.O.H B/O L.I.B. MARKS ON SIDE SCORED. MARKS ON CENTRE OF L.I.B OF SAND. SECURE WELL
16.20	TRAVEL BACK TO MOOMBA.

ET 102

000474

EXPERTEST PTY. LTD.

BHP/BHT GAUGE RUN DATA

CUSTOMER : SANTOS LTD | PERFORATIONS: 8586 - 9173 | PAGE: 1 OF 1

WELL NAME: FLY LAKE 1 UPPER | FORMATION : PATCHAWARRA | DATE: 3.7.92

TEST TYPE : FLOWING GRADIENT SURVEY | OPR : G. GRANT

GAUGE DATA	UPPER PRESSURE GAUGE	LOWER PRESSURE GAUGE	TEMPERATURE GAUGE	RUN DATA	TIME (HOURS)	TUBING PRESSURE (PSI/~~KPa~~)	ANNULUS PRESSURE (PSI/KPa)
ELEMENT SERIAL NO.	22420	21372	63256	DATE : 3.7.92			
ELEMENT RANGE	4250	4050	95-421 f	PRESSURE LUBRICATOR :	10.45	56	N/A
RECORDING SECTION SERIAL NO.	54651	59790	30929	RUN IN HOLE :	11.00	54	
DATE OF CALIBRATION:	19.8.91	19.8.91		ON DEPTH AT : 8440 ' FT/M	12.14	45	
CLOCK SERIAL NO.	K1850	K1838	K3056	DATE : 3.7.92			
CLOCK RANGE	3hr	3hr	3hr	PULL OUT OF HOLE :	12.25	39	
LEAD SCREW TYPE	15 T.L.S	15.T.L.S	15.T.L.S	AT SURFACE :	12.43	36	
				DEPRESSURE LUBRICATOR :	12.58	32	
ENGAGE STYLUS DATE TIME	10.32	10.32	10.32	MAXIMUM BHT AT FT/M = °F/C			
DISENGAGE STYLUS DATE TIME	13.11	13.11	13.11	N.B. ALL DEPTHS ARE MEASURED FROM K.B.			

DATE	TIME	REMARKS
3.7.92	11.00	WELL FLOWING ON 14/64 ADJ CHOKE

ET 108

000475

000476

EXPERTEST LTD

WIRELINE & WELL TESTING SERVICE

PO BOX 354 COWANDILLA-5033

PH. (08) 354 0488 TELEX AA87183
FAX (08) 43 7408

138 RICHMOND ROAD MARLESTON
SOUTH AUSTRALIA 5033

Tested Friday, 3rd July 1992.

CLIENT	LOCATION	FORMATION
Santos Ltd.	Fly lake #1 us	Patchawarra

upper.

FLOWING PRESSURE GRADIENT REPORT

PRESSURE ELEMENT DATA

POSITION	SERIAL NO.	RANGE	CALIBRATED
Top	22420	4250	19/ 8/91
Bottom	21372	4050	19/ 8/91

WELL DATA

PARAMETER	VALUE
DWT In	54 PSIG
DWT Out	36 PSIG
Max BHT	N/A

	TOP ELEMENT			BOTTOM ELEMENT		
DEPTH FT KB	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT
LUB.	0.0240	37.2	-----	0.0240	42.2	-----
1000	0.0230	35.1	-0.002	0.0220	38.1	-0.004
2000	0.0250	39.3	0.004	0.0230	40.2	0.002
3000	0.0250	39.3	0.000	0.0240	42.2	0.002
4000	0.0570	106.4	0.067	0.0580	110.3	0.068
5000	0.2670	548.7	0.442	0.2800	556.0	0.446
6000	0.4870	1015.7	0.467	0.5120	1022.9	0.467
7000	0.6940	1458.6	0.443	0.7310	1465.0	0.442
8000	0.9050	1913.4	0.455	0.9530	1914.7	0.450
8440	0.9940	2106.1	0.438	1.0490	2109.7	0.443
LUB.	0.0170	22.6	-----	0.0140	22.1	-----

GENERAL REMARKS

Well flowing on 14/64 adj choke

EXPERTEST PTY. LTD.

SEQUENCE OF EVENTS

CUSTOMER : SANTOS LTD	PERFORATIONS: 8586 - 9173	PAGE: 1 OF 1
WELL NAME: FLY LAKE 1 UPPER	FORMATION : PATCHAWARRA	DATE: 4.7.92
TEST TYPE : DRIFT RUN		OPR : G. GRANT

DATE/TIME	DESCRIPTION OF EVENTS
10.20	ONTIVE SITE. CUT 20' WIRE OFF T/E NEW R/S CHECK T/S.
11.00	R.I.H 1.70 REAMER 95 S.I.T.H.P JAR DOWN THRU TIGHT SPOT 3200 KB. TAG OBSTRUCTION 8502 KB JAR DOWN NO PROGRESS
12.30	P.O.O.H. SECURE WELL
13.00	TRAVEL TO TIRRA 38 (RIG JOB)

000477

ET 102

EXPERTEST PTY. LTD.

SEQUENCE OF EVENTS

CUSTOMER : SANTOS LTD	PERFORATIONS: 8586 - 9173	PAGE: 1 OF 1
WELL NAME: ELY LAKE 1 UPPER	FORMATION : PATCHAWARRA.	DATE: 6.7.92
TEST TYPE : Drift Run.		OPR : G. GRANT

DATE/TIME	DESCRIPTION OF EVENTS
10.25	ARRIVE LOCATION.
	CUT 20' WIRE OFF TIE NEW R/S CHANGE T/S TO 1.25
	S.I.T.H.P 125 psi
10.50	R.I.H 1.5 G.I.B TAG OBSTRUCTION AT 8486' W/L 8506 KB
	B/O G.I.B. SIDES marked like scale slight mark IN CENTRE off
	.700 hole looks like TUBING full of calcium
11.45	R.I.H 1.45 REAMER TAG OBSTRUCTION 8506' KB JAR DOWN. NO
	OVER PULL. MAKE NO DEPTH. P.O.O.H
13.20	R.I.H 1.8 Broach TAPERED DOWN TO .900 JAR DOWN AT 8506 KB.
	P.O.O.H. slight INDICATION OF CALCIUM on broach
14.30	ADD MORE 1¼ STEM 11'
14.20	R.I.H 1.45 REAMER JAR DOWN 8506 KB No Progress. P.O.O.H
15.15	CHANGE T/S TO 1½ 11" STEM
15.25	R.I.H 1.7 REAMER TAPERED DOWN TO .700 JAR DOWN MAKE NO
	Progress P.O.O.H
16.45	Secure Well leave TO TRAVEL BACK TO Moomba.

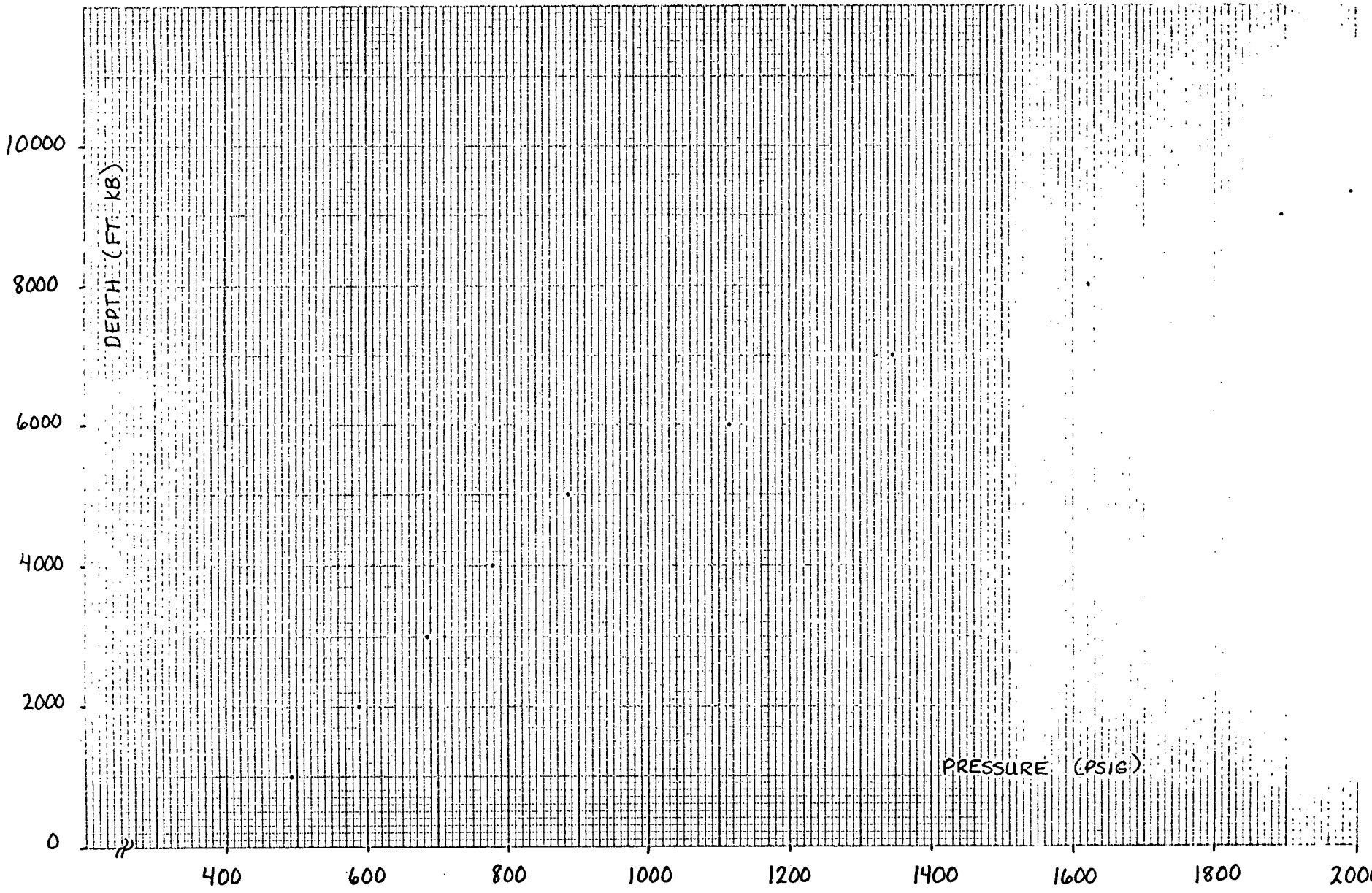
000478

ET 102

Fm 5030

FLY LAKE # 1 (LONG) - TIRRAWARRA FORMATION - FLOWING PRESSURE GRADIENT

02/07/92 ELEMENT # 22420 (TOP)

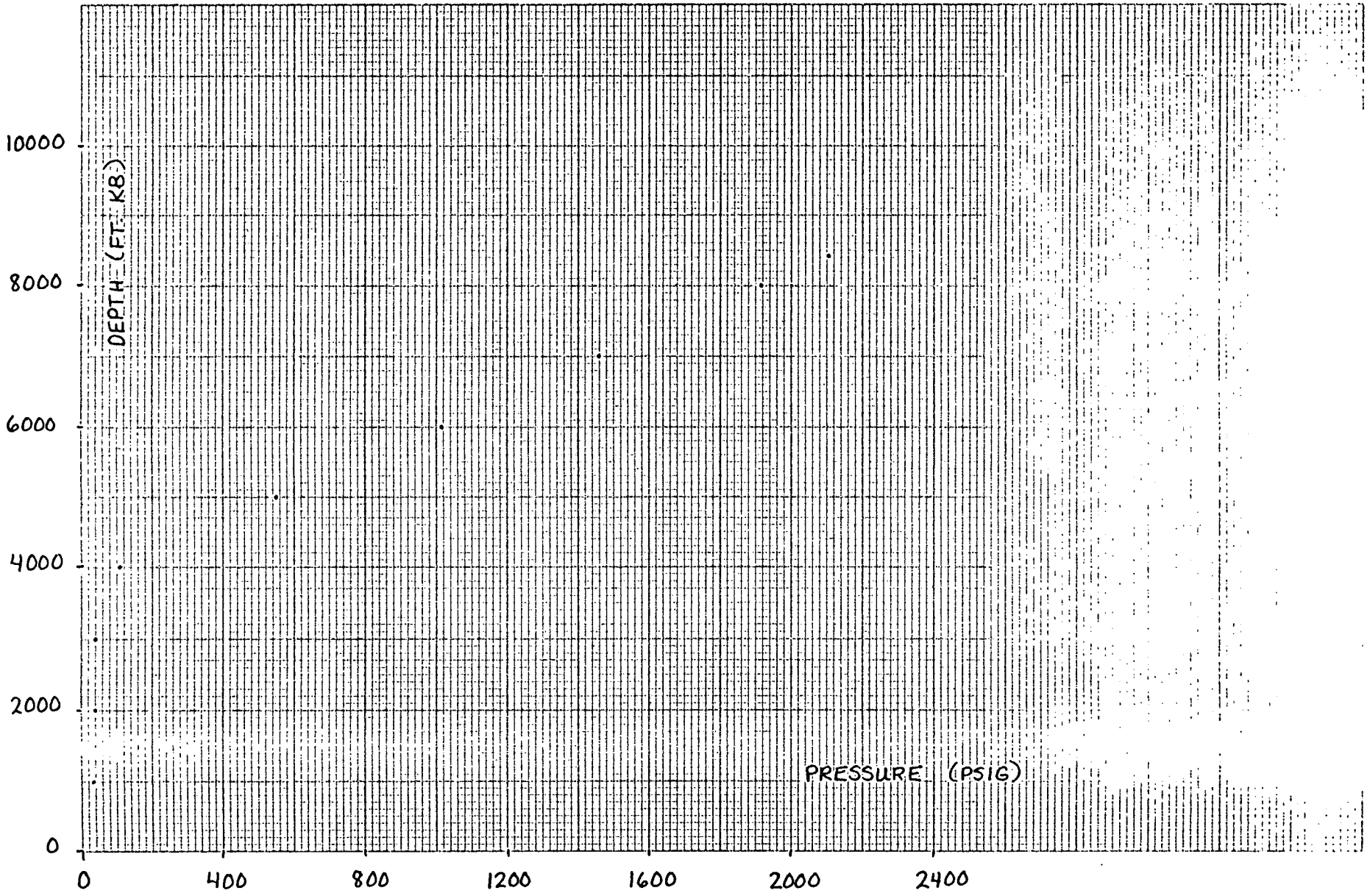


0004479

Fm 6030

FLY LAKE # 1 UPPER (SHORT) - PATCHAWARRA FORMATION - FLOWING PRESSURE GRADIENT

03/07/92 ELEMENT # 22420 (TOP)



000480

SUB-SURFACE TEMPERATURE SURVEY 000481

CO. SANTOS			RUN 02 FIELD FLY LAKE		WELL 1LS
EFF DEPTH			WELL STAT		TOOL HUNG
CASING		-	CASING PRESS		ON BOTTOM
LINER		-	TUBING PRESS		OFF BOTTOM
DATE	920702		ELEMENT RANGE	94 - 472	ZERO POINT
ELEVATION			ZONE		SHUT-IN
MAX TEMP			PICK-UP		ON-PROD
PERF		-	CAL SER NO.	63256	MPP
TUBING		-			
UNITS	ENGLISH		PURPOSE	TEMPERATURE GRADIENT - LONG STRING	

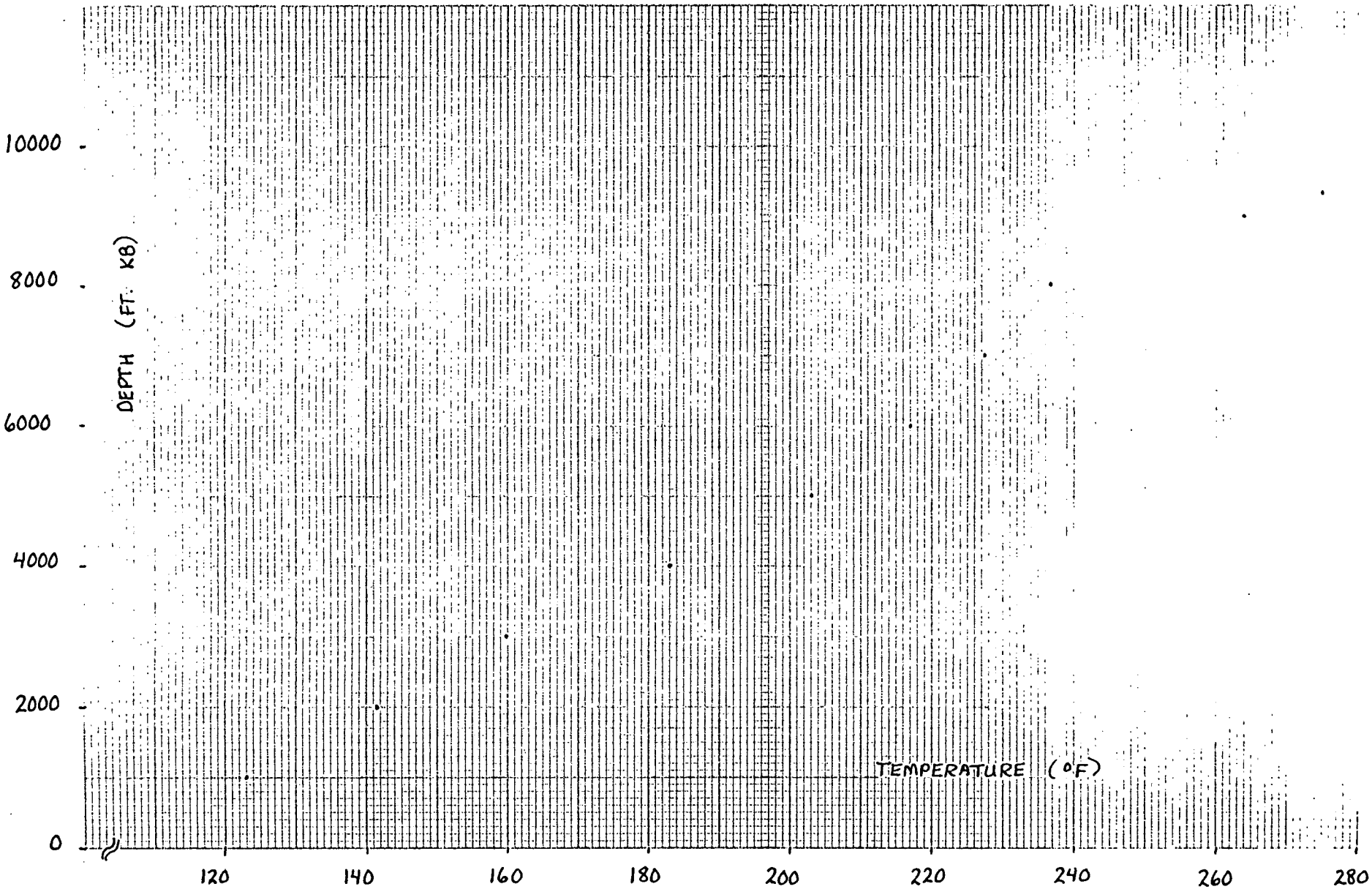
SURVEY DATA

CO. SANTOS — RUN 02 FIELD FLY LAKE — WELL 1LS

TIME	P-T	DP-DT	DEPTH (FT. KB)	DTIME	TIME	P-T	DP-DT	DEPTH (FT. KB)	DTIME
11:29	122.9	122.9	1000	.1	12:08	217.1	217.1	6000	.8
11:39	141.5	141.5	2000	.3	12:15	227.4	227.4	7000	.9
11:46	159.8	159.8	3000	.4	12:22	236.8	236.8	8000	1.0
11:53	183.0	183.0	4000	.6	12:31	263.9	263.9	9000	1.2
12:00	202.6	202.6	5000	.7	12:42	275.0	275.0	9341	1.4

FLY LAKE # 1 - FLOWING TEMPERATURE GRADIENT - 02/07/92.

LONG STRING ELEMENT # 63256



000482

000483

SUB-SURFACE TEMPERATURE SURVEY

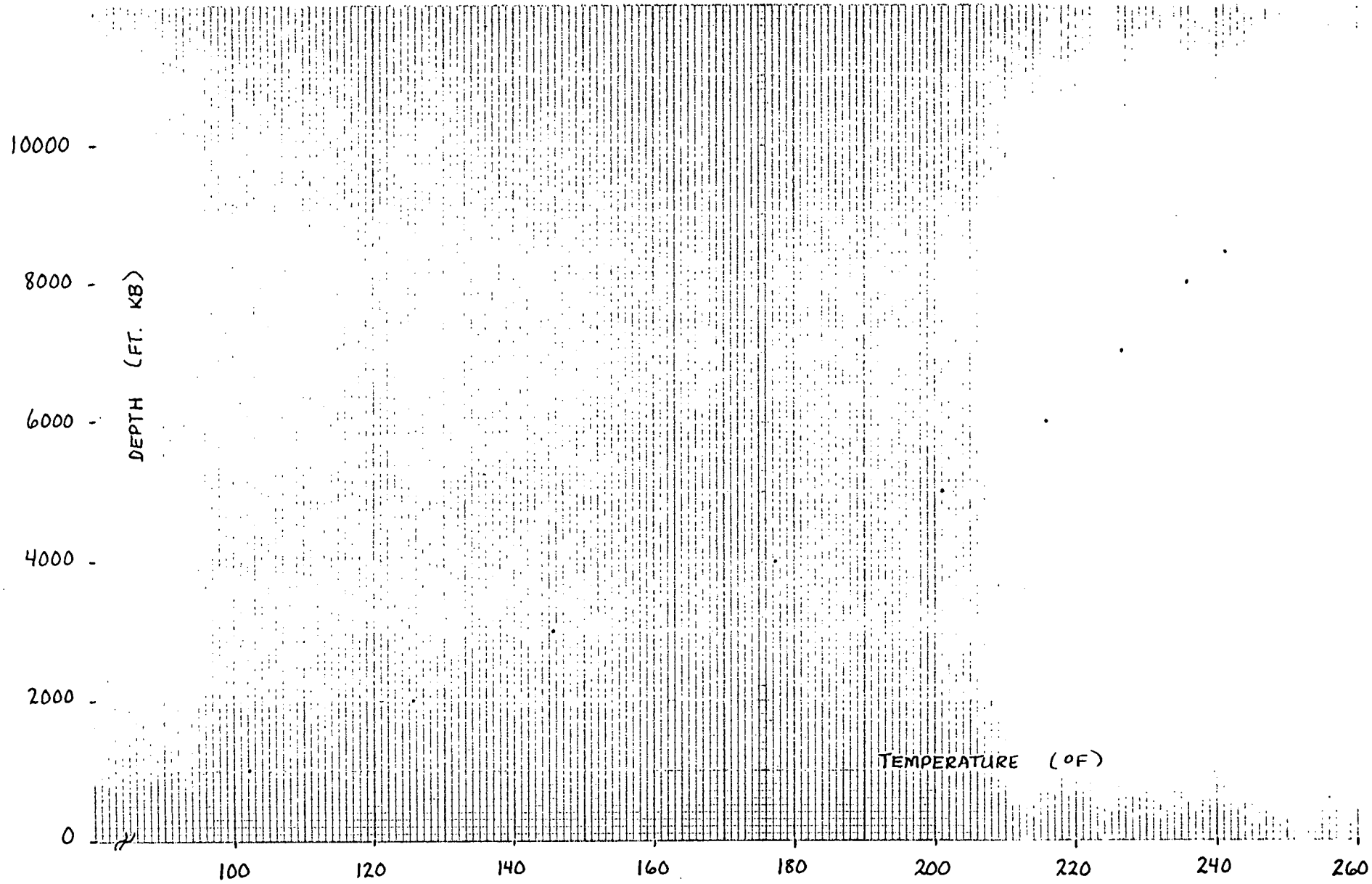
CO. SANTOS		RUN 01	FIELD FLY LAKE	WELL 1US	
EFF DEPTH		WELL STAT		TOOL HUNG	
CASING	-	CASING PRESS		ON BOTTOM	
LINER	-	TUBING PRESS		OFF BOTTOM	
DATE	920703	ELEMENT RANGE	94 - 472	ZERO POINT	
ELEVATION		ZONE		SHUT-IN	
MAX TEMP		PICK-UP		ON-PROD	
PERF	-	CAL SER NO.	63256	MPP	
TUBING	-				
UNITS	ENGLISH	PURPOSE	TEMPERATURE GRADIENT - SHORT STRING		

SURVEY DATA

CO. SANTOS		DEPTH (FT. KB)	RUN 01 FIELD FLY LAKE			WELL 1US	DEPTH (FT. KB)
TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
11:05	102.2	102.2 1000	.1	11:49	215.8	215.8 6000	.8
11:14	125.5	125.5 2000	.2	11:58	226.4	226.4 7000	1.0
11:22	145.5	145.5 3000	.4	12:08	235.7	235.7 8000	1.1
11:32	177.2	177.2 4000	.5	12:22	241.2	241.2 8440	1.4
11:41	201.1	201.1 5000	.7	0:00	.0	.0	.0

FLY LAKE # 1 - FLOWING TEMPERATURE GRADIENT - 03/07/92

SHORT STRING ELEMENT # 63256



EXPERTEST PTY. LTD.

SEQUENCE OF EVENTS

CUSTOMER : SANTOS LTD		PERFORATIONS: 8591' - 9151'	PAGE: 1 OF 3
WELL NAME: FLY LAKE # 1		FORMATION : PATCHAWARRA	DATE: 27TH NOVEMBER 1993
TEST TYPE : B.H.P.S. & S.G.S.			OPR : B. HULL

DATE/TIME	DESCRIPTION OF EVENTS
27TH NOVEMBER 1993.	
08:20	ARRIVE ON LOCATION - WELL FLOWING @ 100% CHOKE.
08:30	SHUT WELL IN - FIT SWAB VALVE & PRESSURE TEST TO FULL SHUT IN WELLHEAD PRESSURE.
08:43	WELL BACK ON LINE @ 100% CHOKE.
09:20	RIG IN WIRELINE EQUIPMENT WITH 1.75" BLIND BOX FOR DRIFT RUN.
10:10	ATTEMPT TO RUN IN HOLE WITH 1.75" BLIND BOX - UNABLE TO PASS THROUGH WELLHEAD. -
10:20	REDUCE WELL TO 10% CHOKE.
10:25	RUN IN HOLE WITH 1.75" BLIND BOX. - RUN TO 1000' K.B. - TOOLSTRING WEIGHT VERY LIGHT.
10:31	SHUT WELL IN - CONTINUE DRIFT RUN - PERFORMING PICK UPS EVERY 1000'.
11:04	TAG CEMENT ON BRIDGE PLUG @ GAUGE RING DEPTH OF 9210' K.B.
11:07	PULL OUT OF HOLE.
11:30	ARRIVE @ SURFACE WITH TOOLSTRING & DEPRESSURE LUBRICATOR.
11:35	WELL BACK ON LINE @ 100% CHOKE.
14:23	PREPARE 2x3000 psi GAUGES + 1x M.R.H.T TO 120 hr CLOCKS.
14:30	GAUGES IN LUBRICATOR & PRESSURE LUBRICATOR.
15:30	DEPRESSURE LUBRICATOR.
16:25	REDUCE WELL TO 5% CHOKE
16:30	PRESSURE LUBRICATOR & RUN IN HOLE.
16:55	ARRIVE AT HANG DEPTH OF 9200' K.B.
17:00	WELL BACK ON LINE @ 100% CHOKE.
	FLOW WELL OVERNIGHT - MONITOR FLOW.

R-20

0004485

EXPERTEST PTY. LTD.

SEQUENCE OF EVENTS

CUSTOMER : SANTOS LTD	PERFORATIONS: 8591' - 9151'	PAGE: 2 OF 3
WELL NAME: FLY LAKE #1	FORMATION : PATCHAWARRA	DATE: 28th NOVEMBER 1993
TEST TYPE : B.H.P.S. & S.G.S.		OPR : B. HULL

DATE/TIME	DESCRIPTION OF EVENTS
28th NOVEMBER 1993.	
08:00	SHUT WELL IN FOR 96 hr BUILD UP.
	MONITOR BUILD UP.
11:00	CREW TO MOOMBA.
29th NOVEMBER 1993.	
	CONTINUE TO MONITOR BUILD UP.
30th NOVEMBER 1993	
	CONTINUE TO MONITOR BUILD UP
1ST DECEMBER 1993	
	CONTINUE TO MONITOR BUILD UP
2ND DECEMBER 1993	
08:00	PULL OUT OF HOLE
08:30	ARRIVE AT SURFACE WITH GAUGES & DEPRESSURE LUBRICATOR.
09:30	PRESSURE LUBRICATOR.
10:30	DEPRESSURE LUBRICATOR & RECOVER CHARTS - CHARTS OK.
10:46	PREPARE 2x 3000 psi GAUGES & 1x M.B.H.T. TO 3hr CLOCKS
10:50	GAUGES IN LUBRICATOR & PRESSURE LUBRICATOR
11:00	DEPRESSURE LUBRICATOR
11:05	PRESSURE LUBRICATOR & RUN IN HOLE.
12:37	ARRIVE @ HANG DEPTH OF 9200' K.B.
12:47	PULL OUT OF HOLE.
13:12	ARRIVE AT SURFACE WITH GAUGES & DEPRESSURE LUBRICATOR

ET 102

0004486

EXPERTEST PTY. LTD.

SEQUENCE OF EVENTS

CUSTOMER : SANTOS LTD	PERFORATIONS: 8591'- 9151'	PAGE: 3 OF 3
WELL NAME: FLY LAKE # 1	FORMATION : PATCHAWARRA	DATE: 2ND DECEMBER 1993
TEST TYPE : B.H.P.S. & S.G.S.		OPR : B. HULL

DATE/TIME	DESCRIPTION OF EVENTS
3CD DECEMBER 1993	
13:17	PRESSURE LUBRICATOR.
13:27	DEPRESSURE LUBRICATOR & RECOVER CHARTS - CHARTS OK.
13:40	RIG DOWN WIRELINE EQUIPMENT.
14:30	SECURE LEASE & HAND WELL BACK TO PRODUCTION.

ET 102

00004871

EXPERTEST PTY. LTD.

FIELD READINGS

CUSTOMER : SANTOS LTD
WELL NAME: FLY LAKE # 1
TEST TYPE : B.H.P.S. & S.G.S.
PERFORATIONS: 8591' - 9151'
FORMATION : PATCHAWARRA
PAGE: 1 OF 4
DATE: 27TH NOVEMBER 1993
OPR : B. HULL

TIME		WELLHEAD DATA					SEPARATOR DATA				LIQUID PRODUCTION				
DATE / TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/~~KPa~~)	ANNULUS PRESSURE (PSI/~~KPa~~)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE %	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF PRESS. (IN WC)	GAS TEMP (°F)	TOTAL LIQUID (IN/CM)	OIL (IN/CM)	OIL API GRAVITY @ 60°F	WATER (IN/CM)	
27TH	NOVEMBER 1993														
08:20					100		ARRIVE ON LOCATION - WELL FLOWING @ 100% CHOKE.								
08:30							SHUT WELL IN & FIT SWAB VALVE & PRESSURE TEST TO F.S.I.W.H.P.								
08:43							WELL BACK ON LINE @ 100% CHOKE.								
09:20							RIG IN WIRELINE EQUIPMENT WITH 1.75" BLIND BOX FOR DRIFT RUN.								
10:10							ATTEMPT TO RUN IN HOLE WITH 1.75" BLIND BOX - UNABLE TO PASS								
					100		THROUGH WELLHEAD.								
10:20					10		REDUCE WELL TO 10% CHOKE.								
10:25					10		RUN IN HOLE WITH 1.75" BLIND BOX - RUN TO 1000' K.B. - TOOLSTRING								
							WEIGHT VERY LIGHT.								
10:31					0		SHUT WELL IN - CONTINUE DRIFT RUN - PERFORMING PICK UPS EVERY 1000'.								
11:04							TAG CEMENT ON BRIDGE PLUG @ GAUGE RING DEPTH OF 9210' K.B.								
11:07							PULL OUT OF HOLE.								
11:30					0		ARRIVE @ SURFACE WITH TOOLSTRING & DEPRESSURE LUBRICATOR.								
11:35					100		WELL BACK ON LINE @ 100% CHOKE.								
14:23							PREPARE 2 x 3000 psi GAUGES & 1 x M.B.H.T. TO 120hr CLOCKS.								
14:30		323	136				GAUGES IN LUBRICATOR & PRESSURE LUBRICATOR.								
15:30		326	137		100		DEPRESSURE LUBRICATOR.								
16:25		325	137		5		REDUCE WELL TO 5% CHOKE.								
16:30		589	149		5		PRESSURE LUBRICATOR & RUN IN HOLE.								
16:55		720	148		5		ARRIVE @ HANG DEPTH OF 9200' K.B.								
17:00	0	720	147		100		WELL BACK ON LINE @ 100% CHOKE.								

ET 103

0004488

EXPERTEST PTY. LTD.

FIELD READINGS

CUSTOMER : SANTOS LTD
WELL NAME: FLY LAKE # 1
TEST TYPE : B.H.P.S. & S.G.S.

PERFORATIONS: 8591' - 9151'
FORMATION : PATCHAWARRA

DATE: 27th NOVEMBER 1993
OPR : R. HULL

TIME		WELLHEAD DATA					SEPARATOR DATA				LIQUID PRODUCTION				
DATE / TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/~~KPa~~)	ANNULUS PRESSURE (PSI/~~KPa~~)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE %	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF PRESS. (IN WC)	GAS TEMP (°F)	TOTAL LIQUID (IN/CM)	OIL (IN/CM)	OIL API GRAVITY @ 60°F	WATER (IN/CM)	
27th NOVEMBER 1993															
17:30		324	142		100										
18:00	1	326	147												
28th NOVEMBER 1993															
06:00	13	324	157												
08:00	15	327	169		100	SHUT WELL IN FOR 96 hr BUILD UP									
08:05		695	182												
08:10		974	175												
08:15		1143	167												
08:30		1247	112												
08:45		1268	92												
09:00	1	1296	76												
09:15		1310	55												
09:30		1325	28												
09:45		1339	23												
10:00	2	1352	18												
10:15		1357	17												
10:30		1364	12												
10:45		1369	12												
11:00	3	1376	12			CREW TO MOOMBA									
11:15		1377				READINGS TAKEN FROM CHART									
11:30		1381													

ET 103

000489

EXPERTEST PTY. LTD.

FIELD READINGS

CUSTOMER : SANTOS LTD
WELL NAME: FC1 LAKE #1
TEST TYPE : B.H.P.S. & S.G.S.
PERFORATIONS: 8541' - 9151'
FORMATION : PATCHAWARRA
PAGE: 3 OF 4
DATE: 28TH NOVEMBER 1993
OPR : B. HULL

TIME		WELLHEAD DATA					SEPARATOR DATA				LIQUID PRODUCTION				
DATE / TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/~~KPa~~)	ANNULUS PRESSURE (PSI/~~KPa~~)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF PRESS. (IN WC)	GAS TEMP (°F)	TOTAL LIQUID (IN/CM)	OIL (IN/CM)	OIL API GRAVITY @ 60°F	WATER (IN/CM)	
28TH NOVEMBER 1993															
11:45		1384	8												
12:00	4	1388													
16:00	8	1392													
18:00	10	1395													
29TH NOVEMBER 1993															
06:00	22	1409	8												
10:00	26	1417	7												
14:00	30	1434	6												
18:00	34	1385	6												
30TH NOVEMBER 1993															
06:00	46	1440	5												
10:00	50	1443	5												
14:00	54	1446	5												
18:00	58	1450	5												
1ST DECEMBER 1993															
06:00	70	1454	0												
10:00	74	1454	0												
14:00	78	1455	0												
18:00	82	1455	0												
2ND DECEMBER 1993															
06:00	94	1456	0												

READINGS TAKEN FROM CHART.

ET 103

000490

EXPERTEST PTY. LTD.

FIELD READINGS

CUSTOMER : SANTOS LTD
WELL NAME: FLY LAKE #1
TEST TYPE : B.H.P.S. & S.G.S.
PERFORATIONS: 8591' - 9151'
FORMATION : PATCHAWARRA
PAGE: 4 OF 4
DATE: 2ND NOVEMBER 1993
OPR : B. HULL

TIME		WELLHEAD DATA					SEPARATOR DATA				LIQUID PRODUCTION				
DATE / TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/~~KPa~~)	ANNULUS PRESSURE (PSI/~~KPa~~)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF PRESS. (IN WC)	GAS TEMP (°F)	TOTAL LIQUID (IN/CM)	OIL (IN/CM)	OIL API GRAVITY @ 60°F	WATER (IN/CM)	
2ND DECEMBER 1993															
08:00	96					BUILD UP PERIOD COMPLETE									
08:00		1456	0			PULL OUT OF HOLE									
08:30		1456	↑			ARRIVE @ SURFACE WITH GAUGES & DEPRESSURE LUBRICATOR.									
09:30		1458				PRESSURE LUBRICATOR									
10:30		1456				DEPRESSURE LUBRICATOR & RECOVER CHARTS - CHARTS OK.									
10:46						PREPARE 2x3000 PSI GAUGES & 1x MBHT TO 3HR CLOCKS									
10:50		1498				GAUGES IN LUBRICATOR & PRESSURE LUBRICATOR.									
11:00		1498				DEPRESSURE LUBRICATOR									
11:05		1498				PRESSURE LUBRICATOR & RUN IN HOLE									
12:37		1500				ARRIVE AT HANG DEPTH OF 9200' K.B.									
12:47		1500				PULL OUT OF HOLE									
13:12		1499				ARRIVE @ SURFACE WITH GAUGES & DEPRESSURE LUBRICATOR									
13:17		1499	↓			PRESSURE LUBRICATOR.									
13:27		1498	0			DEPRESSURE LUBRICATOR & RECOVER CHARTS - CHARTS OK.									
13:40						RIG DOWN WIRELINE EQUIPMENT.									
14:30						SECURE LEASE & HAND WELL BACK TO PRODUCTION.									

ET 103

0004491

EXPERTEST PTY. LTD.

TEST RESULTS

CUSTOMER : SANTOS LTD
WELL NAME: FLY LAKE #1
TEST TYPE : B.H.P.S. & S.G.S.
PERFORATIONS: 8591'-9151'
FORMATION : PATCHAWARRA

DATE: 27TH NOVEMBER 1993
OPR : B. HULL

TIME		WELLHEAD DATA						FLOW RATES			CUMULATIVE PRODUCTION			
DATE / TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (~~PSI~~/KPa)	ANNULUS PRESSURE (~~PSI~~/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE %	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD $m^3 10^3/D$	OIL BPD m^3/D	WATER BPD m^3/D	GAS MMSCF $m^3 10^3$	OIL BBLS m^3	WATER BBLS m^3	
27TH NOVEMBER 1993														
08:20					100									ARRIVE ON LOCATION - WELL FLOWING @ 100% CHOKE
08:30					↕									SHUT WELL IN • FIT SWAB VALVE • PRESSURE TEST TO F.S.I.W.H.P.
08:43					↕									WELL BACK ON LINE @ 100% CHOKE
09:20					↕									RIG IN WIRELINE EQUIPMENT WITH 1.75" BLIND BOX FOR DRIFT RUN.
10:10					↕									ATTEMPT TO RUN IN HOLE WITH 1.75" BLIND BOX - UNABLE TO
					100									PASS THROUGH WELLHEAD.
10:20					10									REDUCE WELL TO 10% CHOKE.
10:25					10									RUN IN HOLE WITH 1.75" BLIND BOX - RUN TO 1000' K.B.
														TOOLSTRING WEIGHT VERY LIGHT.
10:31					0									SHUT WELL IN - CONTINUE DRIFT RUN - PERFORMING PICKUPS EVERY 1000'.
11:04					↕									TAG CEMENT ON BRIDGE PLUG @ GAUGE RING DEPTH OF 9210' K.B.
11:07					↕									PULL OUT OF HOLE.
11:30					0									ARRIVE AT SURFACE WITH TOOLSTRING • DEPRESSURE LUBRICATOR.
11:35					100									WELL BACK ON LINE @ 100% CHOKE.
14:23					↕									PREPARE 2x 3000 PSI GAUGES • 1x M.R.H.T. TO 120 HR CLOCKS.
14:30		2227	937		↕									GAUGES IN LUBRICATOR • PRESSURE LUBRICATOR.
15:30		2248	944		100									DEPRESSURE LUBRICATOR
16:25		2241	944		5									REDUCE WELL TO 5% CHOKE.
16:30		4061	1027		5									PRESSURE LUBRICATOR • RUN IN HOLE
16:55		4964	1020		5									ARRIVE @ HANG DEPTH OF 9200' K.B.
17:00	0	4964	1013		100									WELL BACK ON LINE @ 100% CHOKE.

ET 104

U004492

EXPERTEST PTY. LTD.

TEST RESULTS

CUSTOMER : SANTOS LTD
WELL NAME: FLY LAKE # 1
TEST TYPE : B.H.P.S. & S.G.S.

PERFORATIONS: 8591' - 9151'
FORMATION : PATCHAWARRA

DATE: 27th NOVEMBER 93
OPR : B. HULL

TIME		WELLHEAD DATA						FLOW RATES			CUMULATIVE PRODUCTION				
DATE / TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (~~PSI~~/KPa)	ANNULUS PRESSURE (~~PSI~~/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE %	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD $m^3 10^3/D$	OIL BPD m^3/D	WATER BPD m^3/D	GAS MMSCF $m^3 10^3$	OIL BBLS m^3	WATER BBLS m^3		
27th NOVEMBER 1993															
17:30		2234	979		100										
18:00	1	2247	1013												
28th NOVEMBER 1993															
06:00	13	2234	1082												
08:00	15	2254	1165			SHUT WELL IN FOR 96 hr BUILD UP.									
08:05		4792	1254												
08:10		6715	1206												
08:15		7881	1151												
08:30		8598	772												
08:45		8742	634												
09:00	1	8935	524												
09:15		9032	379												
09:30		9135	193												
09:45		9232	158												
10:00	2	9322	124												
10:15		9356	117												
10:30		9404	82												
10:45		9439	82												
11:00	3	9487	82.			CREW TO MOOMBA.									
11:15		9494				READINGS TAKEN FROM CHART.									
11:30		9522													

T 104

0004493

EXPERTEST PTY. LTD.

TEST RESULTS

CUSTOMER : SANTOS LTD
WELL NAME: FL-1 LAKE #1
TEST TYPE : B.H.P.S. & S.G.S.

PERFORATIONS: 8591' - 9151'
FORMATION : PATCHAWARRA

DATE: 28TH NOVEMBER 1993
OPR : B. HULL.

TIME		WELLHEAD DATA						FLOW RATES			CUMULATIVE PRODUCTION				
DATE / TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (~~PSI~~/KPa)	ANNULUS PRESSURE (~~PSI~~/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD $m^3 10^3/D$	OIL BPD m^3/D	WATER BPD m^3/D	GAS MMSCF $m^3 10^3$	OIL BBLS m^3	WATER BBLS m^3		
28TH NOVEMBER 1993															
11:45		9542			READINGS TAKEN FROM CHART.										
12:00	4	9570													
16:00	8	9597													
18:00	10	9618													
29TH NOVEMBER 1993															
06:00	22	9715	55												
10:00	26	9770	55												
14:00	30	9887	55												
18:00	34	9549	41												
30TH NOVEMBER 1993															
06:00	46	9928	34												
10:00	50	9949	34												
14:00	54	9970	34												
18:00	58	9997	34												
1ST DECEMBER 1993															
06:00	70	10025	0												
10:00	74	10025													
14:00	78	10032													
18:00	82	10032													
2ND DECEMBER 1993															
06:00	94	10039	0												

ET 104

EXPERTEST PTY. LTD.

TEST RESULTS

CUSTOMER : SANTOS LTD
WELL NAME: FLY LAKE #1
TEST TYPE : B.H.P.S. & S.G.S.

PERFORATIONS: 8591'- 9151'
FORMATION : PATCHAWARRA

DATE: 2ND DECEMBER 1993
OPR : B. HULL

TIME		WELLHEAD DATA						FLOW RATES			CUMULATIVE PRODUCTION				
DATE / TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (~~PSI~~/KPa)	ANNULUS PRESSURE (~~PSI~~/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD $m^3 10^3/D$	OIL BPD m^3/D	WATER BPD m^3/D	GAS MMSCF $m^3 10^3$	OIL BBLS m^3	WATER BBLS m^3		
2ND DECEMBER 1993															
08:00	96					BUILD UP PERIOD COMPLETE.									
08:00		10039	0			PULL OUT OF HOLE									
08:30		10039				ARRIVE AT SURFACE WITH GAUGES & DEPRESSURE LUBRICATOR									
09:30		10053				PRESSURE LUBRICATOR									
10:30		10039				DEPRESSURE LUBRICATOR & RECOVER CHARTS - CHARTS OK.									
10:46						PREPARE 2x3000 psi GAUGES & 1x M.B.H.T. TO 3HR CLOCKS.									
10:50		10328				GAUGES IN LUBRICATOR & PRESSURE LUBRICATOR.									
11:00		10328				DEPRESSURE LUBRICATOR									
11:05		10328				PRESSURE LUBRICATOR & RUN IN HOLE									
12:37		10342				ARRIVE @ HANG DEPTH OF 9200' K.B.									
12:47		10342				PULL OUT OF HOLE									
13:12		10335				ARRIVE @ SURFACE WITH GAUGES & DEPRESSURE LUBRICATOR									
13:17		10335				PRESSURE LUBRICATOR.									
13:27		10328				DEPRESSURE LUBRICATOR & RECOVER CHARTS - CHARTS OK.									
13:40						RIG DOWN WIRELINE EQUIPMENT									
14:30			0			SECURE LEASE & HAND WELL BACK TO PRODUCTION									

ET 104

000495

EXPERTEST PTY. LTD.

BHP/BHT GAUGE RUN DATA

CUSTOMER : SANTOS LTD.	PERFORATIONS: 8591'- 9151'	PAGE: 1 OF 2
WELL NAME: FLY LAKE # 1	FORMATION : PATCHAWARRA	DATE: 27TH NOVEMBER 1993
TEST TYPE : B.H.P.S. + S.G.S.		OPR : B. HULL

GAUGE DATA	UPPER PRESSURE GAUGE	LOWER PRESSURE GAUGE	TEMPERATURE GAUGE
ELEMENT SERIAL NO.	56431	56428	
ELEMENT RANGE psi	3000	3000	
RECORDING SECTION SERIAL NO.	14929	13029	
DATE OF CALIBRATION: @ 290° F	13:12:93	13:12:93	
CLOCK SERIAL NO.	4	1	
CLOCK RANGE hrs	120	120	
LEAD SCREW TYPE L.T.S.	15	15	
ENGAGE STYLUS DATE 27·11·93 TIME	14:23	14:23	
DISENGAGE STYLUS DATE 2·12·93 TIME	10:33	10:33	

RUN DATA		TIME (HOURS)	TUBING PRESSURE (~~PSI~~/KPa)	ANNULUS PRESSURE (~~PSI~~/KPa)
DATE	: 27·11·93			
PRESSURE LUBRICATOR	:	14:30	2227	937
RUN IN HOLE	:	16:30	4061	1027
ON DEPTH AT	: 9200 FT/~~M~~	16:55	4964	1020
DATE	:			
PULL OUT OF HOLE	: 2·12·93	08:00	10039	0
AT SURFACE	:	08:30	10039	0
DEPRESSURE LUBRICATOR	:	10:30	10053	0
MAXIMUM BHT AT 9200 FT/~~M~~ = 292 °F/~~C~~				
N.B. ALL DEPTHS ARE MEASURED FROM K.B.				

DATE	TIME	REMARKS
		NOTE: WELL CHOKED BACK TO 5% CHOKE TO RUN IN HOLE WITH AMERADA'S.

ET 108

000496

SUB-SURFACE PRESSURE SURVEY

CO. SANTOS			RUN 01 FIELD FLY LAKE		WELL 1
EFF DEPTH			WELL STAT	TOOL HUNG	9194'KB
CASING		-	CASING PRESS	ON BOTTOM	1655 27/11
LINER		-	TUBING PRESS	OFF BOTTOM	0800 2/12
DATE	931128		ELEMENT RANGE 0 - 3108	ZERO POINT	
ELEVATION			ZONE	SHUT-IN	0800 28/11
MAX TEMP	292		PICK-UP	ON-PROD	
PERF		-	CAL SER NO. 56431	MPP	
TUBING		-			
UNITS	ENGLISH		PURPOSE BHP		

SURVEY DATA

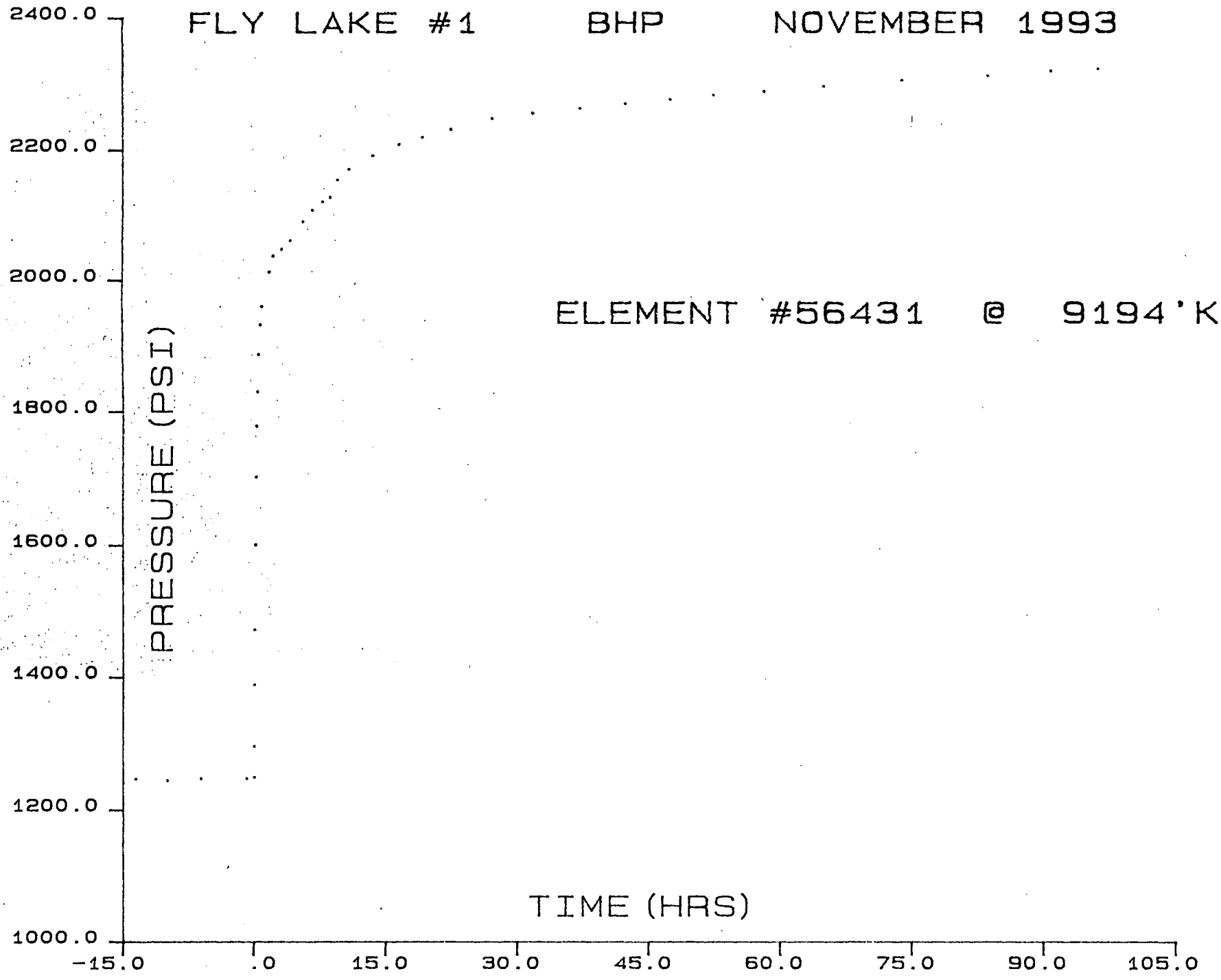
CO. SANTOS RUN 01 FIELD FLY LAKE WELL 1

TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
START S/I 8:00	1248.7	1248.7	.0	21:31	2191.4	2191.4	13.5
8:01	1296.1	1296.1	.0	0:28	2208.1	2208.1	16.5
8:02	1389.1	1389.1	.0	3:08	2219.1	2219.1	19.1
8:05	1472.9	1472.9	.1	6:24	2231.9	2231.9	22.4
8:09	1601.7	1601.7	.1	11:05	2248.2	2248.2	27.1
8:13	1703.2	1703.2	.2	15:41	2256.0	2256.0	31.7
8:17	1779.4	1779.4	.3	21:06	2262.9	2262.9	37.1
8:23	1830.2	1830.2	.4	2:16	2270.0	2270.0	42.3
8:32	1887.7	1887.7	.5	7:22	2276.6	2276.6	47.4
8:45	1933.4	1933.4	.7	12:17	2283.0	2283.0	52.3
8:57	1961.5	1961.5	1.0	18:04	2287.8	2287.8	58.1
9:45	2013.2	2013.2	1.7	0:50	2295.4	2295.4	64.8
10:12	2037.7	2037.7	2.2	9:42	2304.6	2304.6	73.7
11:09	2047.6	2047.6	3.1	19:31	2311.9	2311.9	83.5
12:08	2061.0	2061.0	4.1	2:40	2318.5	2318.5	90.7
13:32	2092.2	2092.2	5.5	8:00	2321.4	2321.4	96.0 END S/I
14:37	2109.3	2109.3	6.6	- 5:37	1246.4	1246.4	-13.6
15:46	2122.0	2122.0	7.8	- 1:56	1244.4	1244.4	-9.9
16:39	2129.4	2129.4	8.6	1:54	1247.6	1247.6	-6.1
17:28	2154.4	2154.4	9.5	7:10	1247.5	1247.5	-.8
18:47	2170.3	2170.3	10.8	0:00	.0	.0	.0

LUBRICATOR; IN: 323 psi / OUT: 1458 psi
AMERADA: 320 psi / OUT: 1470 psi

ELEMENT #56428 was also run but failed.

CUMULATIVE PRODUCTION BEFORE S/I
October cumulative = 437.4 E6m3
October mean gas daily = 63.1 E3m3/d = 0.0631 E6m3/d
Cumulative before S/I = (days before S/I x mean gas)+ cum.
= (27.333 x 0.0631)+ 437.4
= 439.1 E6m3


FLY LAKE #1 BHP NOVEMBER 1993
ELEMENT #56431 @ 9194'KB
PRESSURE (PSI)
2400.0
2200.0
2000.0
1800.0
1600.0
1400.0
1200.0
1000.0
TIME (HRS)
-15.0
.0
15.0
30.0
45.0
60.0
75.0
90.0
105.0

EXPERTEST PTY. LTD.

BHP/BHT GAUGE RUN DATA

CUSTOMER : SANTOS LTD
WELL NAME: FLY LAKE #1
TEST TYPE : S.G.S.
PERFORATIONS: 8591' - 9151'
FORMATION : PATCHAWARRA
PAGE: 2 OF 2
DATE: 2nd DECEMBER 1993
OPR : B. HULL

GAUGE DATA	UPPER PRESSURE GAUGE	LOWER PRESSURE GAUGE	TEMPERATURE GAUGE
ELEMENT SERIAL NO.	S6431	S6428	
ELEMENT RANGE PSI	3000	3000	
RECORDING SECTION SERIAL NO.	14929	13029	
DATE OF CALIBRATION: @ 290°F	13:12:93	13:12:93	
CLOCK SERIAL NO.	A-16080	A-12047	
CLOCK RANGE hrs	3	3	
LEAD SCREW TYPE L.T.S.	15	15	
ENGAGE STYLUS DATE 2.12.93 TIME	10:46	10:46	
DISENGAGE STYLUS DATE 2.12.93 TIME	13:32	13:32	

RUN DATA	TIME (HOURS)	TUBING PRESSURE (~~PSI~~/KPa)	ANNULUS PRESSURE (~~PSI~~/KPa)
DATE : 2.12.93			
PRESSURE LUBRICATOR :	10:50	10328	0
RUN IN HOLE :	11:05	10328	
ON DEPTH AT : 9200 FT/M	12:37	10342	
DATE : 2.12.93			
PULL OUT OF HOLE :	12:47	10342	
AT SURFACE :	13:12	10335	
DEPRESSURE LUBRICATOR :	13:27	10328	0
MAXIMUM BHT AT 9200 FT/M = 292 °F/C			
N.B. ALL DEPTHS ARE MEASURED FROM K.B.			

DATE	TIME	REMARKS

ET 108

000499

EXPERTEST PTY. LTD.

STATIC PRESSURE GRADIENT SURVEY

Location: FLY LAKE #1 Tested: 2nd December 1993.

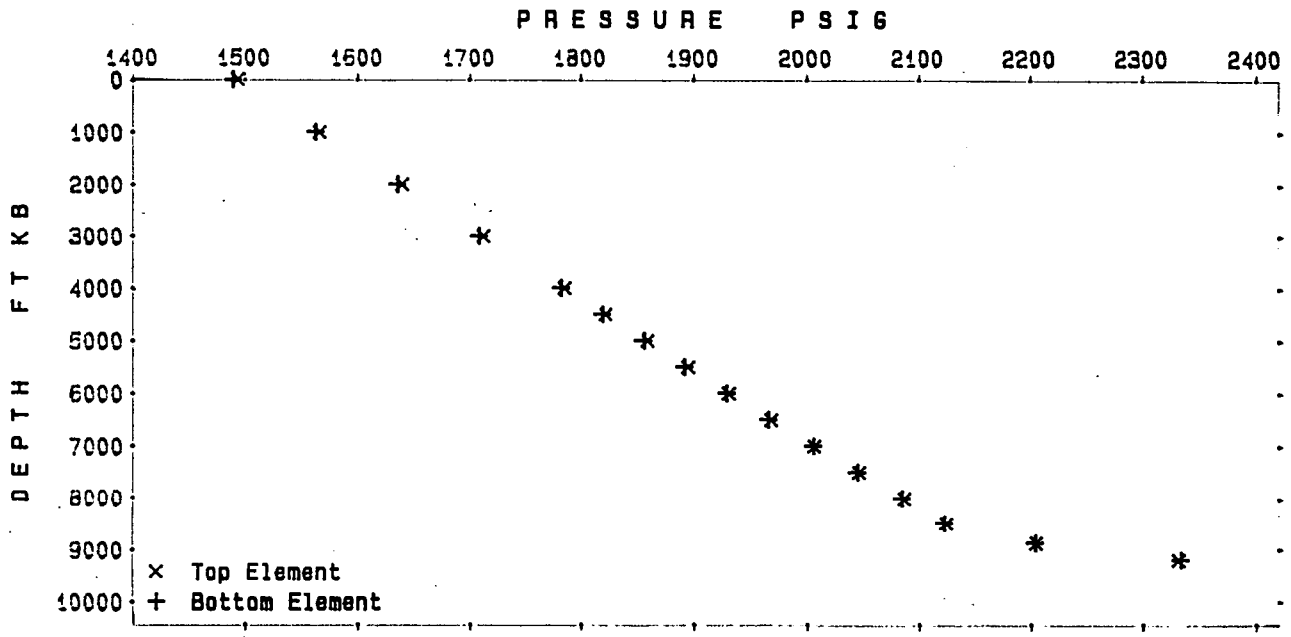
Formation: PATCHAWARRA Client: SANTOS LTD.

PRESSURE ELEMENT DATA

Position	Serial No	Range	Calibrated
Top	56431	3000	13/11/93
Bottom	56429	3000	13/11/93

WELL DATA

DWT In	1498 PSIG
DWT Out	1498 PSIG
Max BHT	292 DEG F



Depth FT KB	TOP ELEMENT Deflection Inches	TOP ELEMENT Pressure PSIG	TOP ELEMENT Gradient PSI/FT	BOTTOM ELEMENT Deflection Inches	BOTTOM ELEMENT Pressure PSIG	BOTTOM ELEMENT Gradient PSI/FT
LUB.	0.9650	1493.2	-	0.9600	1488.4	-
1000	1.0115	1565.6	0.072	1.0070	1561.7	0.073
2000	1.0590	1639.6	0.074	1.0540	1635.1	0.073
3000	1.1055	1712.0	0.072	1.1005	1707.7	0.073
4000	1.1525	1785.2	0.073	1.1480	1781.8	0.074
4500	1.1760	1821.8	0.073	1.1715	1818.5	0.073
5000	1.2000	1859.2	0.075	1.1950	1855.2	0.073
5500	1.2230	1895.0	0.072	1.2180	1891.2	0.072
6000	1.2460	1930.8	0.072	1.2420	1928.6	0.075
6500	1.2700	1968.1	0.075	1.2655	1965.3	0.073
7000	1.2945	2006.3	0.076	1.2910	2005.2	0.080
7500	1.3200	2046.0	0.079	1.3160	2044.2	0.078
8000	1.3460	2086.4	0.081	1.3415	2084.0	0.080
8500	1.3705	2124.6	0.076	1.3660	2122.3	0.076
8882	1.4220	2204.7	0.210	1.4180	2203.5	0.213
9200	1.5035	2331.6	0.399	1.5010	2333.2	0.408
LUB.	0.9655	1493.9	-	0.9610	1490.0	-

GENERAL REMARKS

Env 1713

A.C.S. Laboratories Pty. Ltd.

ANALYTICAL RESULTS

Samples from: Santos Limited
Area: S.A.
Samples of: Water
Preparation: None
Batch No.: A 4684

Sheet No.: 1
Date: 11.2.83

SAMPLES WILL BE DISPOSED OF AFTER TWO MONTHS UNLESS WE ARE OTHERWISE ADVISED

Sample Description	1.	2.
pH	5.96	6.86
Ca ppm	245	123
Mg ppm	225	70
Na ppm	12500	3800
K ppm	3940	770
Cl ppm	21730	6600
CO_3 ppm	<1	<1
HCO_3 ppm	540	490
SO_4 ppm	2630	175
NO_3 ppm	<1	<1
T.D.S. ppm By gravimetry	42000	11970
Conductivity umhos/cm	>10000	>10000
Conductivity on x10 dilution umhos/cm	6700	2400
Fe ppm	250	130

1. Well: Flylake 1 Lower. Fluid: Water. Date: 12.11.82.
Wellhead Data: Time-1650. F.T.P. Psi- 1165.
Choke Size- 12/64. F.T.T. °F- 104.
Separator Data: Press Psi- 91. Temp °F- 78.
Rates: Gas-.56. Oil- 241.4. Water- 40.2.
S.I.T.P. (kpa): 1762.
Sample Pt.: Stock Tank.

2. Well: Tirrawarra 19. Fluid: Water. Date: 10.11.82.
Formation: Tirrawarra. Perforations: 9655-9751.
Wellhead Data: Time- 1800. F.T.P. Psi- 789.
Choke Size- 12/64. F.T.T. °F- 98.
Separator Data: Press Psi- 310. Temp °F- 98.
Rates: Gas- .215. Liquid: 115. Water- 78.
S.I.T.P. (Psi): 1559. Date/Time: 7.11.82. 1345 hrs.
Sample Pt.: Stock Tank.

ANALYTICAL METHODS: Gravimetry, Titrimetry, Colorimetry and AAS.

NATA