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NUMBER 3953

PPL 19

EROMANGA BASIN AND COOPER BASIN

MOORARI 3

TEST REPORTS

Submitted by

Santos Ltd
1994

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MINES AND ENERGY
SOUTH AUSTRALIA

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		MESA NO.
REPORT:	**Quick, R.R., 1983.** Operator's reservoir engineering interpretation of the results of the "pre-frac" [i.e. prior to massive hydraulic fracture treatment] oil production flow/buildup test of the Tirrawarra Sandstone reservoir, conducted over the period 17/4 - 27/6/81 (February 1983).	**3953 R 13** Pgs 82-92
APPENDIX:	Well test data.	Pgs 93-122
REPORT:	**Quick, R.R., 1983.** Operator's reservoir engineering interpretation of the results of the "post-frac"[i.e. after fracture treatment] oil production flow/buildup test of the Tirrawarra Sandstone reservoir, conducted over the period 18/7 - 5/8/81 (February 1983).	**3953 R 14** Pgs 123-133
APPENDIX:	Well test data.	Pgs 134-150
REPORTS:	**Chapman,T. and Bain, G., 1985.** Field maintenance contractor's results of the flowing pressure gradient survey of the Nappamerri Formation gas reservoir producing interval 8726-8748 feet depth KB [the 'Upper' producing zone], conducted over the period 8-9/4/85 (Expertest Pty Ltd).	**3953 R 15** Pgs 151-154
	Robinson, P.A., 1986. Operator's reservoir engineering interpretation of the results of the modified isochronal gas production test of the above Nappamerri Formation gas producing zone, conducted over the period 20-28/12/84 (Santos Ltd Reservoir Engineering Department report no. RE: 138/85, February 1986).	**3953 R 16** Pgs 155-174
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APPENDIX B:	FWS [full well stream] recombination (analysis) report.	Pgs 187-194
APPENDIX C:	Amdel report on fluid analyses.	Pgs 195-204
REPORTS:	**Gillies, A., 1986.** Field maintenance contractor's results of the post - gas injection [from the Nappamerri reservoir] bottomhole pressure falloff test of the Tirrawarra Sandstone oil reservoir producing interval 8726-8748 feet depth KB [the 'Lower' producing zone], conducted over the period 31/7 - 5/8/86 (Expertest Pty Ltd).	**3953 R 17** Pgs 205-219
	Johns, D., 1988. Field maintenance contractor's results of the flowing bottomhole pressure, 48 hour reservoir pressure buildup and static wellbore pressure gradient surveys of the Upper producing zone, conducted over the period 6-9/6/88 (Expertest Pty Ltd).	**3953 R 18** Pgs 220-234

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REPORTS:	**Perry, T., 1986.** Operator's well test data sheet [production separator metered flow] (5/8/86).	**3953 R 19** Pg. 235
	Aldrich, P., 1989. Field testing contractor's electric line results of the flowing bottomhole pressure, stable injection halted reservoir pressure falloff and static wellbore pressure gradient surveys of the Lower producing zone, conducted over the period 23-28/2/89 (Oilserv Australia Ltd).	**3953 R 20** Pgs 236-353

		MESA NO.
REPORTS:	**Campbell, R. and Kurasiak, I., 1989.** Field maintenance contractor's results of the single rate gas production flow test, 96 hour reservoir pressure buildup and static pressure gradient surveys of the Upper producing zone, conducted over the period 6-15/3/89 (Expertest Pty Ltd).	**3953 R 21** Pgs 354-372
	Hay, N., 1990. Field maintenance contractor's results of the post - gas injection [ethane from the Moomba Plant] bottomhole pressure falloff test and static pressure gradient survey of the Lower producing zone, conducted over the period 22-27/4/90 (Expertest Pty Ltd).	**3953 R 22** Pgs 373-386
	Wood, G.R., 1992. Santos Ltd palynological report no. 1992/13 on results of examination of 10 selected Moorari Field Patchawarra Formation full-hole core samples [Moorari 3 data only exerpted and included herein] (July 1992).	**3953 R 23** Pgs 387-391
	Wood, G.R., 1994. Santos Ltd palynological report no. 1994/27 on results of examination of 3 selected Permian full-hole core samples (April 1994).	**3953 R 24** Pg. 392
	Evans, D.A., 1994. Operator's reservoir engineering interpretation of the results of the Tirrawarra Formation pressure falloff surveys conducted in July 1986, February 1989 and April 1990 (Santos Ltd Petroleum Engineering Department report no. PED: 016/94, April 1994).	**3953 R 25** Pgs 393-407
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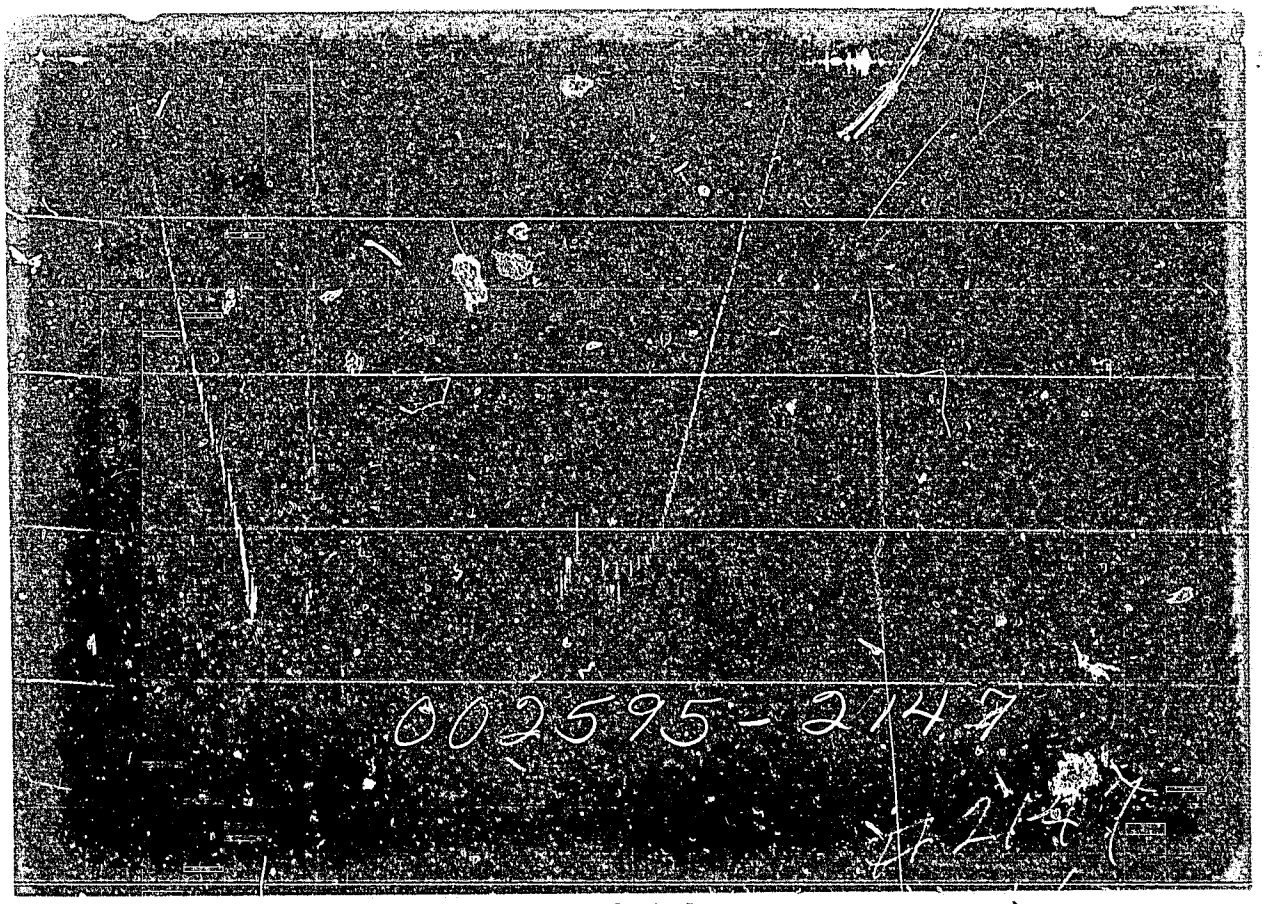
ENVELOPE 3953

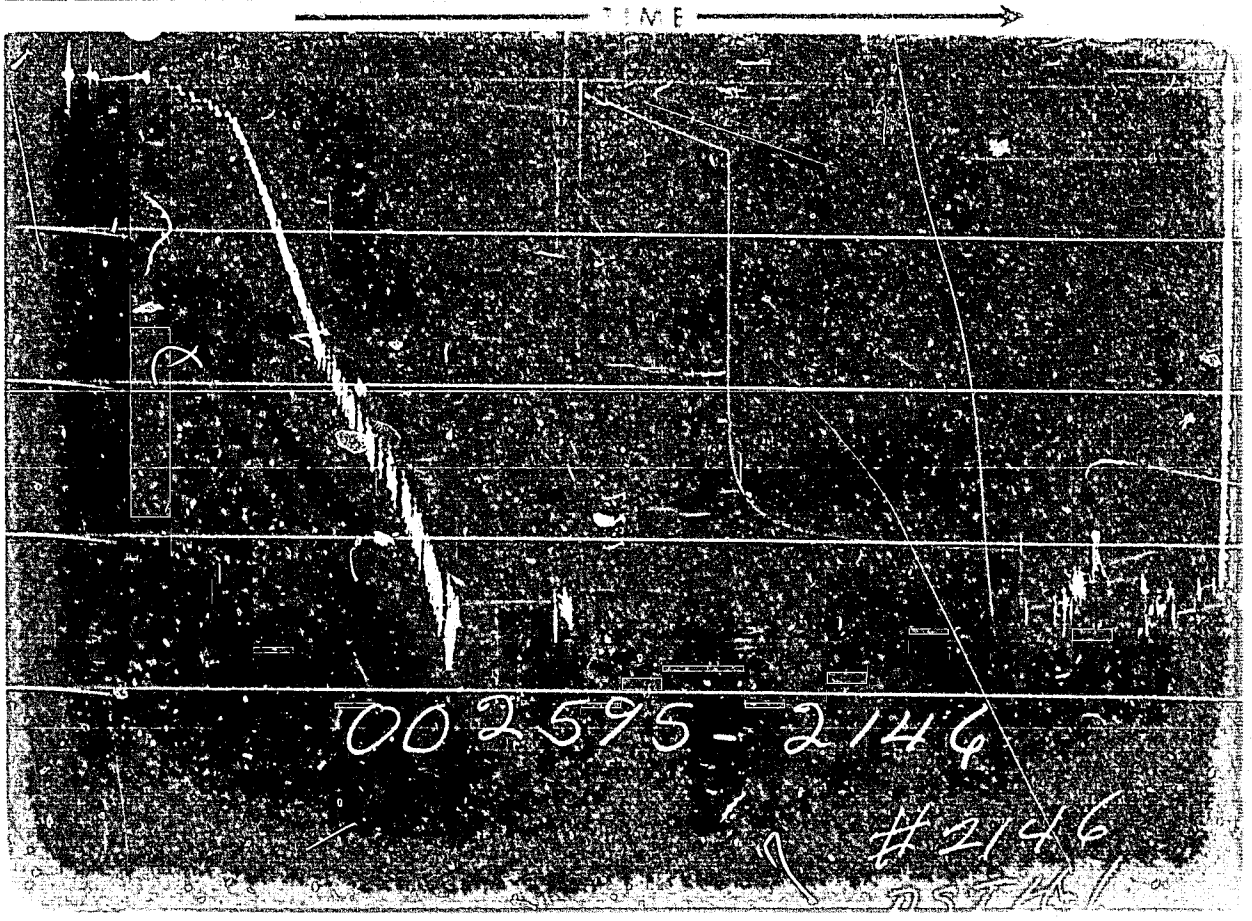
TENEMENT: PPL 19; Eromanga and Cooper Basins

TENEMENT HOLDER: Santos Ltd (operator), Cooper Basin Unit, Bridge Oil Ltd, Reef Oil NL, Basin Oil NL, Delhi Petroleum Pty Ltd,Vamgas Ltd and South Australian Oil and Gas Corp. Pty Ltd

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	Halliburton Services, 1981. Formation testing service report, DST 2 [open hole] (24/1/81).	**3953 R 2** Pgs 8-12
	Halliburton Services, 1981. Formation testing service report, DST 3 [open hole] (25/1/81).	**3953 R 3** Pgs 13-17
	Halliburton Services, 1981. Formation testing service report, DST 4 [open hole] (31/1/81).	**3953 R 4** Pgs 18-23
	Halliburton Services, 1981. Formation testing service report, DST 5 [open hole] (10/2/81).	**3953 R 5** Pgs 24-28
	Halliburton Services, 1981. Formation testing service report, DST 6 [open hole] (12/2/81).	**3953 R 6** Pgs 29-33
	Halliburton Services, 1981. Formation testing service report, DST 7 [open hole] (22/2/81).	**3953 R 7** Pgs 34-40
	Halliburton Services, 1981. Formation testing service report, DST 8(a) [cased hole] (1/3/81).	**3953 R 8** Pgs 41-44
	Halliburton Services, 1981. Formation testing service report, DST 8 (b) [cased hole] (3/3/81).	**3953 R 9** Pgs 45-51
	Halliburton Services, 1981. Formation testing service report, DST 9 [cased hole] (5/3/81).	**3953 R 10** Pgs 52-59
	Savickas, J., 1982. Laboratory contractor's report on the results of a volatile oil properties study of Tirrawarra Sandstone reservoir fluid samples from the oil production test recovery obtained over the period 22-23/6/81 (Core Laboratories, Inc., Singapore, report no. SFL 81056 for Santos, 6/1/82).	**3953 R 11** Pgs 60-78
	Savickas, J., 1982. Laboratory contractor's report on the results of a theoretical stock tank analysis of Tirrawarra Sandstone reservoir fluid samples from the oil production test recovery obtained over the period 22-23/6/81 (Core Laboratories, Inc., Singapore, report no. SFL 81056A for Santos, 21/1/82).	**3953 R 12** Pgs 79-81


002595-2147
#2147
TIME


002595-2146
#2146

0004

FLUID SAMPLE DATA

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

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

Mud Weight _____ vis _____ sec.

Date 1-21-81 Ticket Number 002595
Kind of D.S.T. OPEN HOLE Halliburton Location ADELAIDE
Tester KYM GAUNT Witness BILL STUART
Drilling Contractor O.D.&E DR

EQUIPMENT & HOLE DATA

Formation Tested Birkhead
Elevation - Ft.
Net Productive Interval - Ft.
All Depths Measured From Rotary Kelly Bushing
Total Depth 7096' Ft.
Main Hole/Casing Size 8 1/2"
Drill Collar Length 487' I.D. 2.5"
Drill Pipe Length 6545' I.D. 3.826"
Packer Depth(s) 7060' Ft.
Depth Tester Valve 7039' Ft.

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

Recovered 1285 Feet of API 51° Gravity oil
Recovered 30 Feet of gas and oil cut mud
Recovered _____ Feet of
Recovered _____ Feet of
Recovered _____ Feet of
Recovered _____ Feet of

Remarks See production test data sheet

TEMPERATURE	Gauge No. 2147 Depth: 7044 Ft.	Gauge No. 2146 Depth: 7092' Ft.	Gauge No. Depth: Ft.	TIME (00:00-24:00 hrs.)
Est. °F.	24 Hour Clock	12 Hour Clock	Hour Clock	Tool Opened 15:10
Actual 214 °F.	Blanked Off No	Blanked Off Yes	Blanked Off	Opened Bypass 19:44

		Pressures Field	Pressures Office	Pressures Field	Pressures Office	Pressures Field	Pressures Office	Reported Minutes	Computed Minutes
Initial Hydrostatic		3414.0	3398.1	3416.7	3426.2				
First Period	Flow Initial	15.8	7.8	16.2	4.8			—	—
	Flow Final	441.6	421.1	453.1	451.4			90	90
	Closed in	3015.9	3020.7	3064.1	3051.2			184	181
Second Period	Flow Initial							—	—
	Flow Final								
	Closed in								
Third Period	Flow Initial							—	—
	Flow Final								
	Closed in								
Final Hydrostatic		3382.2	3380.5	3400.6	3416.6			—	—

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FORMATION TEST DATA

LITTLE'S

12

Legal Location Sec. - Twp. - Rng.
Lease Name MOORARI
Well No. 3
Test No. 1
Tested Interval 7060-7096'
Lease Owner/Company Name DELHI/SANTOS
Field Area COOPER BASIN
Meg. From Tester Valve
County
State SOUTH AUSTRALIA

0005

Casing perfs.____ Bottom choke____ Surf. temp____ °F Ticket No. 002595
Gas gravity____ Oil gravity____ GOR____
Spec. gravity____ Chlorides____ ppm Res.____ @____ °F
INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED____

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
09:30					Made up tools and went in hole
14:30					Tagged bottom, made up head and
					manifold
15:10	1/2"				Opened tool with a weak to a moderate
					blow throughout flow period.
16:01	1/2"				Gas to surface with a very orange flame-
16:40	1/2"				2' to 4'. Closed tool
19:44					Pulled packer loose and pull back
					4 stands of drill pipe
20:29					Dropped bar, reversed, circulated and
					pulled out of hole.
01:30					Out of hole.

FORM 182-R1—PRINTED IN U.S.A.

PRODUCTION TEST DATA

LITTLE'S 96672 SM 8/74

1/2

Gauge No.	2147		Depth	7044'		Clock No.	9478		24 hour	Ticket No.	002595					
	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	7.8	.000		421.1											
1	.0508	129.3	.0446*		2682.5											
2	.1017	178.2	.0858		2806.3											
3	.1525	241.3	.1269		2866.6											
4	.2033	302.8	.1681		2904.7											
5	.2542	362.7	.2093		2930.1											
6	.3050	421.1	.2505		2949.2											
7			.2916		2963.4											
8			.3328		2976.1											
9			.3740		2985.7											
10			.4151		2995.2											
11			.4563		3001.5											
12			.4975		3006.3											
13			.5387		3012.7											
14			.5798		3017.5											
15			.6210		3020.7											

Gauge No.	2146		Depth	7092'		Clock No.	7413		hour	12						
0	.000	4.8	.000		451.4											
1	.0998	152.1	.0866*		2733.2											
2	.1997	203.8	.1666		2849.8											
3	.2995	271.8	.2465		2907.5											
4	.3993	333.3	.3265		2940.8											
5	.4992	394.8	.4064		2964.8											
6	.5990	451.4	.4864		2984.0											
7			.5664		2996.7											
8			.6463		3008.0											
9			.7263		3017.6											
10			.8062		3027.2											
11			.8862		3033.6											
12			.9661		3038.4											
13			1.0461		3043.2											
14			1.1260		3048.0											
15			1.2060		3051.2											

Reading Interval 15 12 Minutes

REMARKS: *-13 minutes

9000

SPECIAL PRESSURE DATA

LITTLE'S 96673 75C 8/74

TICKET NO. 002595



	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing				0007
Drill Collars				
Reversing Sub	6"		1.00'	
Water Cushion Valve				
Drill Pipe				
Drill Collars	6 1/4"	2.5"	90.00'	
Handling Sub & Choke Assembly	6 1/4i		.75' X over	
Dual CIP Valve	5"	7/8"	5.01'	
Dual CIP Sampler				
Hydro-Spring Teste	5"	3/4"	5.00'	7039'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.75"	4.10'	7044'
Hydraulic Jar	5"	1.75 "	5.00'	
VR Safety Joint	5"	1.0"	2.78'	
Pressure Equalizing Crossover				
Packer Assembly	7 3/4"	1.53 "	6.12'	7060'
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint	5"	1.5"	4.10'	
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor	5"	2.37 "	26.00'	
Blanked-Off B.T. Running Case	5"	2.4"	4.00'	7092'
Total Depth				7096'

FORM 187–R2 – PRINTED IN U.S.A.

EQUIPMENT DATA

LITTLE'S 111036 75C 7/68

REPLACE
IMAGE
HERE



0009

FLUID SAMPLE DATA

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

	RESISTIVITY	CHLORIDE CONTENT
Recovery Water	_____ @ _____ °F.	_____ ppm
Recovery Mud	_____ @ _____ °F.	_____ ppm
Recovery Mud Filtrate	_____ @ _____ °F.	_____ ppm
Mud Pit Sample	_____ @ _____ °F.	_____ ppm
Mud Pit Sample Filtrate	_____ @ _____ °F.	_____ ppm
Mud Weight	_____	vis _____ sec.

Date 1-24-81 Ticket Number 002596
Kind of D.S.T. OPEN HOLE Halliburton Location ADELAIDE
Tester KIM GAUNT Witness B. HUGES
Drilling Contractor O.D.E. RIG # 5 DR

EQUIPMENT & HOLE DATA

Formation Tested Birkhead
Elevation - Ft.
Net Productive Interval - Ft.
All Depths Measured From Kelly Bushing
Total Depth 7112' Ft.
Main Hole/Casing Size 8 1/2"
Drill Collar Length 456' I.D. 2.5"
Drill Pipe Length 6567' I.D. 3.826"
Packer Depth(s) 7050' Ft.
Depth Tester Valve 7029' Ft.

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

Recovered 4840 Feet of 51° gravity oil
Recovered 35 Feet of oil cut mud
Recovered _____ Feet of _____
Recovered _____ Feet or _____
Recovered _____ Feet of _____

Remarks See production test data sheet
Unable to closed tool, stuck.

TEMPERATURE	Gauge No. 2147	Gauge No. 2146	Gauge No.	TIME (00:00-24:00 hrs.)
	Depth: 7034 Ft.	Depth: 7108 Ft.	Depth: Ft.	Tool Opened 20:36
Est. °F.	48 Hour Clock	72 Hour Clock	Hour Clock	Opened Bypass 10:18
Actual 214 °F.	Blanked Off No	Blanked Off Yes	Blanked Off	

	Pressures		Pressures		Pressures		Reported Minutes	Computed Minutes
	Field	Office	Field	Office	Field	Office		
Initial Hydrostatic	3414.0	3434.7	3416.7	3459.9			—	—
First Period Flow Initial	15.8	29.9	64.7	74.4				
First Period Flow Final	1638.8	1632.4	1673.1	1668.2			822	822
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	3382.2	3383.7	3400.6	3411.8				

Legal Location Sec. - Twp. - Rng.
Lease Name MOORARI Well No. 3 Test No. 2 Tested Interval 7050-7112'
Field Area COOPER BASIN Mea. From Tester Valve
County
State SOUTH AUSTRALIA
Lease Owner/Company Name DELHI/SANTOS

FORM 181-R2 – PRINTED IN U.S.A.

FORMATION TEST DATA

LITTLE'S

12

0310

Casing perfs.____ Bottom choke 3/4" Surf. temp____ °F Ticket No. 002596
Gas gravity____ Oil gravity 51° GOR____
Spec. gravity____ Chlorides____ ppm Res.____ @____ °F
INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED____

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
1-22-81 15:30					Made up tool and went in hole
20:36					Opened tool with a weak to moderate
					blow through out test.
20:56	1/2"				Gas to surface
1-23-81 08:36					Attempted to close tool, stuck.
					Worked and tried to free pipe
1-23-81 10:15					Dropped bar
10:18					Pin broke in reverse circulated sub
					and reverse circulation.
					Worked pipe spot pipe- lax
1-24-81 02:00					Out of hole, laid down tools.

FORM 182-R1—PRINTED IN U.S.A.

PRODUCTION TEST DATA

LITTLE'S 9667A 5M 8/74

1/2

Gauge No. 2147			Depth 7034'			Clock No. 21968			48 hour	Ticket No. 002596'				
	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	29.9													
1	.1379*	298.1													
2	.2726	481.0													
3	.4073	657.2													
4	.5420	833.3													
5	.6766	992.1													
6	.8113	1141.9													
7	.9460	1277.6													
8	1.0806	1406.9													
9	1.2153	1528.3													
10	1.3500	1632.4													
11															
12															
13															
14															
15															

Gauge No. 2146			Depth 7108'			Clock No. 6031			hour 72					
0	.000	74.4												
1	.0929*	325.2												
2	.1838	509.6												
3	.2746	688.1												
4	.3653	861.7												
5	.4561	1020.8												
6	.5469	1171.4												
7	.6377	1312.5												
8	.7285	1442.3												
9	.8192	1559.2												
10	.9100	1668.2												
11														
12														
13														
14														
15														

Reading Interval 82 Minutes

REMARKS: *-84 minutes

0011

FORM 183-R1—PRINTED IN U.S.A.

SPECIAL PRESSURE DATA

LITTLE'S 96673 75C 8/74

TICKET NO. 002596

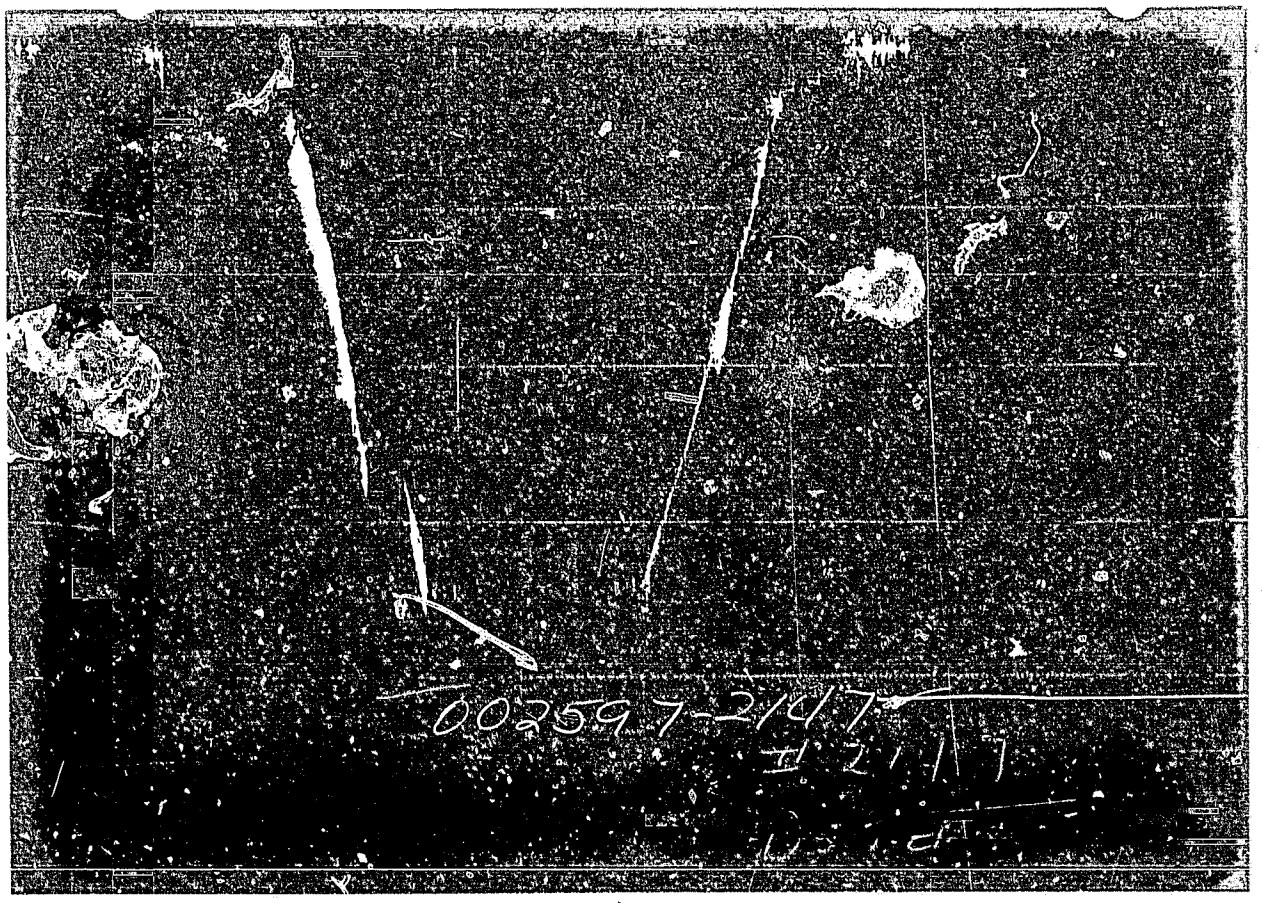


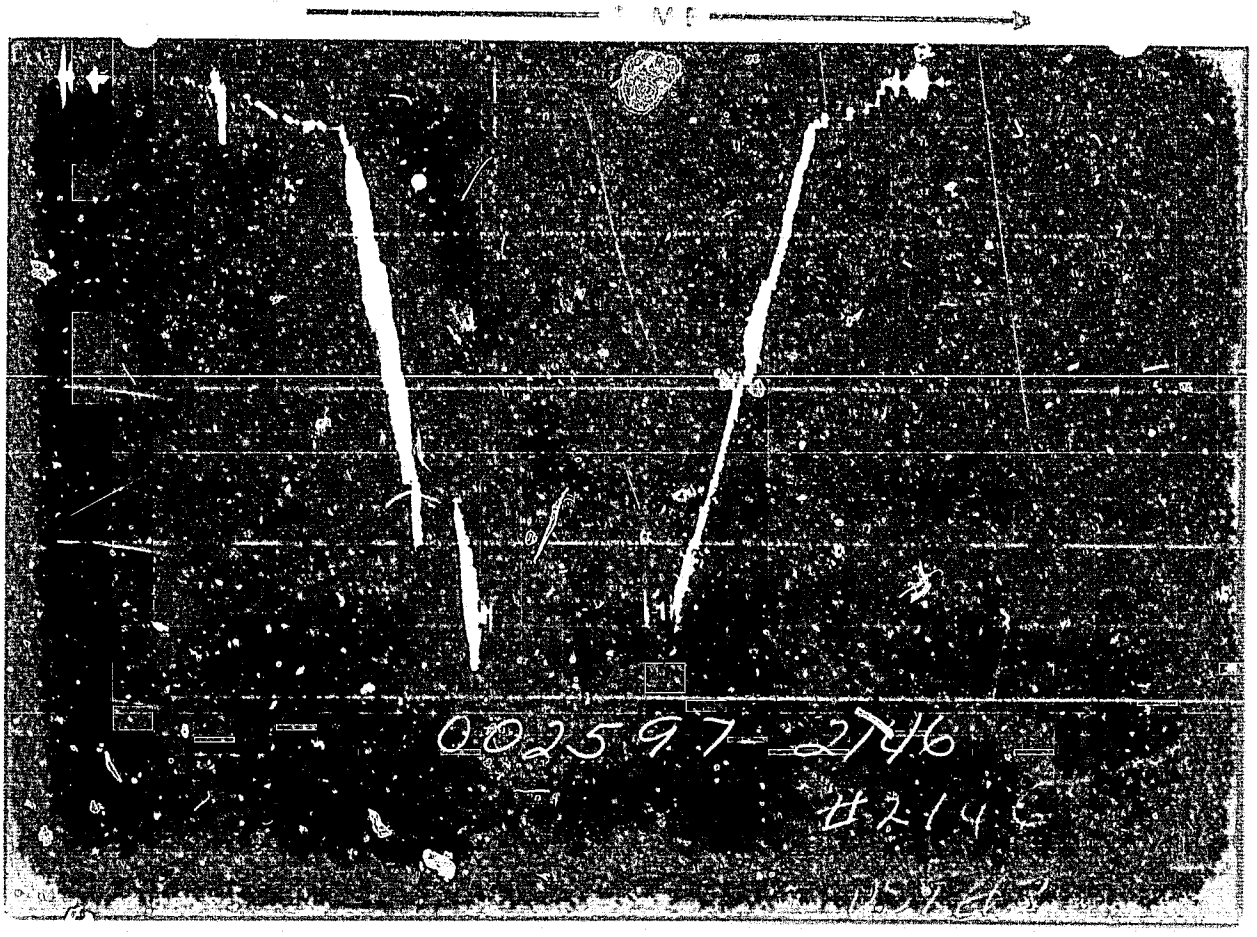
	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing				0012
Drill Collars				
Reversing Sub	6"		1'	
Water Cushion Valve				
Drill Pipe	4 1/2"	3.826 "	6567'	
Drill Collars	6 1/4"	2.5"	456'	
Handling Sub & Choke Assembly	6 1/4"	3.0"	.75' X over	
Dual CIP Valve	5"	.87 "	4.91'	
Dual CIP Sampler				
Hydro-Spring Tester	5"	3/4"	5.01'	7029'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.75"	4.13'	7034'
Hydraulic Jar	5"	1.75 "	5.00'	
VR Safety Joint	5"	1.0"	2.78'	
Pressure Equalizing Crossover				
Packer Assembly	7 3/4"	1.53 "	6.02'	7050'
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint	5"	1.5"	4.30'	
	6"	2.28"	.63' X over	
Side Wall Anchor				
Drill Collars	6 1/4"	2.5"	31.15'	
	6"		.64' X over	
Flush Joint Anchor	5"	2.37"	19.00'	
Blanked-Off B.T. Running Case	5"	2.44"	4.06'	7108'
Total Depth				7112'

FORM 187-R2 – PRINTED IN U.S.A.

EQUIPMENT DATA

LITTLE'S 111036 75C 3/[illegible]


00259.7-2147
#2147


00259.7-2746
#2145

FLUID SAMPLE DATA

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

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

Mud Weight _____ vis _____ sec.

Date 1-25-81 | Ticket Number 002597
Kind of D.S.T. OPEN HOLE | Halliburton Location ADELAIDE
Tester KYM GAUNT | Witness 0014
Drilling Contractor O D E RIG # 5 | sm

EQUIPMENT & HOLE DATA

Formation Tested Birk Head
Elevation - Ft.
Net Productive Interval - Ft.
All Depths Measured From Kelly bushing
Total Depth 7153' Ft.
Main Hole/Casing Size 8½"
Drill Collar Length 271 - 258.7' I.D. 2.5 - 2.764"
Drill Pipe Length 6550' I.D. 3.826"
Packer Depth(s) 7120' Ft.
Depth Tester Valve 7099' Ft.

	TYPE	AMOUNT	Ft.	Depth Back Pres. Valve	Surface Choke	Bottom Choke
Cushion						

Recovered Estimated 10 Feet of mud
Recovered Feet of
Recovered Feet of
Recovered Feet of
Recovered Feet of

Remarks SEE PRODUCT ON TEST DATA SHEET.

Meas. From Tester Valve

TEMPERATURE	Gauge No. 2147	Gauge No. 2146	Gauge No.	TIME (00:00-24:00 hrs.)
	Depth: 7104 Ft.	Depth: 7149 Ft.	Depth: Ft.	Tool Opened 0702
	24 Hour Clock	24 Hour Clock	Hour Clock	
Est. °F.	Blanked Off no	Blanked Off yes	Blanked Off	Opened Bypass 1008
Actual 216 °F.	Pressures	Pressures	Pressures	Reported / Computed

		Field	Office	Field	Office	Field	Office	Minutes	Minutes
Initial Hydrostatic		3433.1	3426.7	3458.3	3456.7			—	—
First Period	Flow Initial	15.8	14.1	35.6	37.1			62	63
	Flow Final	15.8	15.7	35.6	40.4			124	123
	Closed in	1629.3	1638.8	1660.3	1665.0			—	—
Second Period	Flow Initial								
	Flow Final								
	Closed in							—	—
Third Period	Flow Initial								
	Flow Final								
	Closed in							—	—
Final Hydrostatic		3423.6	3418.3	3445.5	3442.3				

FORM 181-82 – PRINTED IN U.S.A.

FORMATION TEST DATA

LITTLE'S

12

Legal Location Sec. - Twp. - Rng.
Lease Name MOORARI | Well No. 3 | Test No. 3
Field Area COOPER BASIN
Tested Interval 7120 - 7153'
County
Lease Owner/Company Name DELHI/SANTOS
State SOUTH AUSTRALIA

Casing perfs._____ Bottom choke 3/4" Surf. temp_____ °F Ticket No. 002597

Gas gravity_____ Oil gravity_____ GOR_____

Spec. gravity_____ Chlorides_____ ppm Res._____ @_____ °F 0015

INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED_____

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
0005 1-25-81					Made up tools and ran in hole
0702					Tool opened with no blow
0804					Rotated and closed tool
1008					Closed hydrospring and pulled out
					of hole
1542					Out of hole - laid down tools.

Gauge No. 2147			Depth 7104'			Clock No. 9474			24 hour	Ticket No. 002597				
	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	14.1	.0000		15.7										
1	.2560	15.7	.0451*		36.2										
2			.0812		70.9										
3			.1173		175.0										
4			.1534		399.0										
5			.1895		679.2										
6			.2256		944.9										
7			.2617		1159.3										
8			.2978		1345.4										
9			.3339		1504.7										
10			.3700		1638.8										
11															
12															
13															
14															
15															

Gauge No. 2146			Depth 7149'			Clock No. 7375			24 hour					
0	.0000	37.2	.0000		40.4									
1	.2060	40.4	.0488*		51.7									
2			.0878		66.3									
3			.1268		106.7									
4			.1658		231.3									
5			.2049		493.5									
6			.2439		803.8									
7			.2829		1070.5									
8			.3219		1304.4									
9			.3609		1500.0									
10			.4000		1665.0									
11														
12														
13														
14														
15														

Reading Interval 12 Minutes

REMARKS: *First interval is equal to 15 minutes.

0016

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FORM 183-RI—PRINTED IN U.S.A.

SPECIAL PRESSURE DATA

LITTLE'S 96673 75C 8/74

TICKET NO. 002597

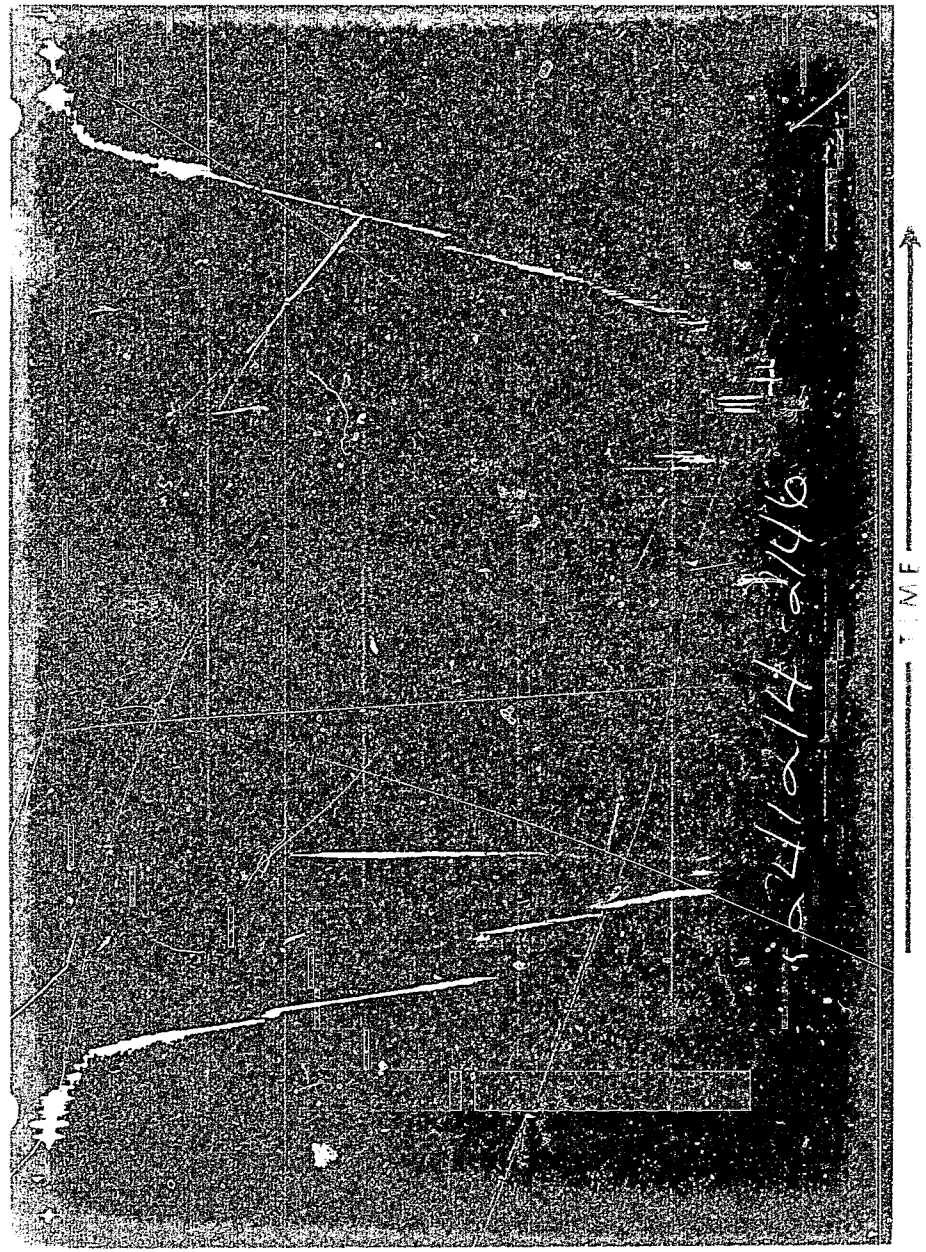


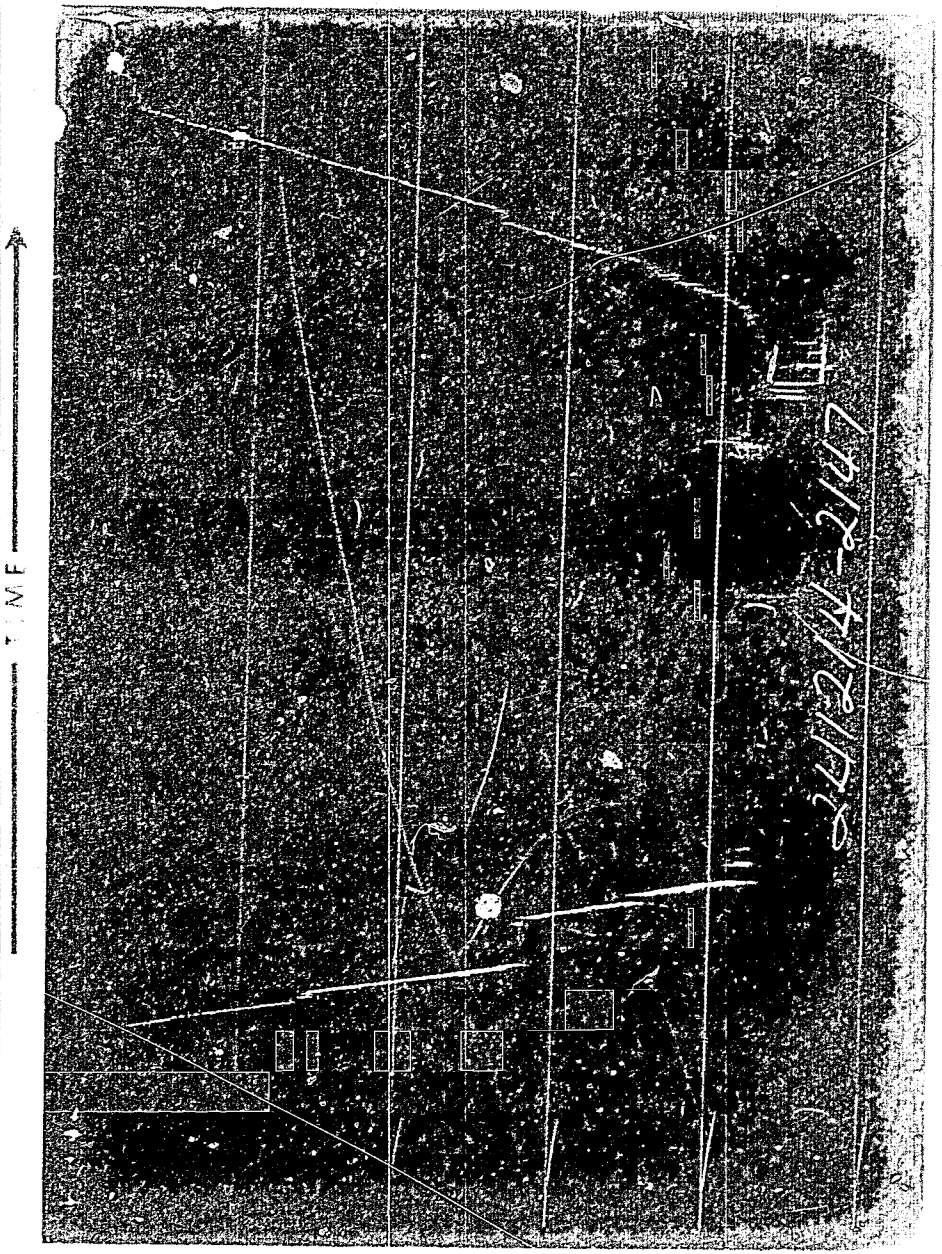
	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing	4½"	2.764"	258.7 heavy wt.	
Drill Collars				0017
Reversing Sub	6"		1'	
Water Cushion Valve				
Drill Pipe	4½"	3.826"	6550'	
Drill Collars	6 1/4"	2.5"	271'	
Handling Sub & Choke Assembly	6 1/4"		.75'	
Dual CIP Valve	5"	.87"	4.91'	
Dual CIP Sampler				
Hydro-Spring Tester	5"	3/4"	5.01'	7099'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.75"	4.13'	7104'
Hydraulic Jar	5"	1.75"	5'	
VR Safety Joint	5"	1"	2.78'	
Pressure Equalizing Crossover				
Packer Assembly	7 3/4"	1.53"	6.02'	7120'
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint	5"	1.5"	4.30'	
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor	5"	2.37"	23'	
blanked-Off B.T. Running Case	5"	2.44"	4.06'	7149'
Total Depth				7153'

FORM 187-P2 - PRINTED IN U.S.A.

EQUIPMENT DATA

LITTLE'S 111036 75C 2/80





0019

FLUID SAMPLE DATA

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

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

Mud Weight 9.2 vis 44 sec.

Date	1-31-81	Ticket Number	241214
Kind of D.S.T.	OPEN HOLE	Halliburton Location	ADELAIDE
Tester	LARKINS	Witness	MR. HUGHES
Drilling Contractor	ODE RIG 45		sm

EQUIPMENT & HOLE DATA

Formation Tested Nappamerrie ? TOOLACHE
Elevation 172.7' Ft.
Net Productive Interval 30' Ft.
All Depths Measured From Rotary kelly bushing
Total Depth 8640' Ft.
Main Hole/Casing Size 8.5"
Drill Collar Length 258.74-271.08' I.D. 2.764 - 2.5"
Drill Pipe Length 8032.28' I.D. 3.826"
Packer Depth(s) 8590' Ft.
Depth Tester Valve 8572.1 Ft.

Cushion TYPE _____ AMOUNT _____ Depth Back Pres. Valve _____ Ft.
Surface Choke 5" Bottom Choke .75"

Recovered	2109.6	Feet of	condensate
Recovered	140.64	Feet of	condensate cut water
Recovered	351.6	Feet of	water
Recovered	210.96	Feet of	gas cut mud
Recovered		Feet of	

Remarks

SEE PRODUCTION TEST DATA SHEET

TEMPERATURE	Gauge No. 2146 Depth: 8573 Ft.		Gauge No. 2147 Depth: 8636 Ft.		Gauge No. Depth: Ft.		TIME (00:00-24:00 hrs.)	
	24 Hour Clock		24 Hour Clock		Hour Clock		Tool Opened 0616	
Est °F.	Blanked Off no		Blanked Off yes		Blanked Off			
Actual 213 °F.	Pressures		Pressures		Pressures		Opened Bypass 1406	
	Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic	4168	4178.4	4194	4191.0				
First Period Flow Initial	1529	1538.4	1607	1619.8			—	—
First Period Flow Final	3048	3072.1	3080	3078.0			168	164
First Period Closed in	3688	3710.8	3700	3700.6			302	306
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	4168	4175.2	4194	4173.5			—	—

FORM 181-82 – PRINTED IN U.S.A.

FORMATION TEST DATA

LITTLE'S

12

Legal Location Sec. - Twp. - Rng.
Field Area: COOPER BASIN
Meas. From Tester Valve
County
State: SOUTH AUSTRALIA

Lease Name: MOORARI
Well No.: 3
Test No.: 4
Tested Interval: 8590 - 8640'
Lease Owner/Company Name: DELHI/SANTOS

Casing perfs.____ Bottom choke____ Surf. temp____ °F Ticket No. 241214

Gas gravity____ Oil gravity____ GOR____

Spec. gravity____ Chlorides____ ppm Res.____ @____ °F

INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED____

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
2300 1-30-81					Loaded "BT'S"
0000 1-31-81					Made up tools and ran in hole
0600					Made up head
0616	1/2"				Opened tool with a weak blow
0617	1/2"				Very strong blow
0618		20			
0620		50			Gas to the surface
0625		80			
0630		65			Plugging
0635		150			Plugging
0640		280			Closed manifold- cleaned choke
0644		340			Opened manifold - mud slugging
0645		380			Flare alight
0650		440			
0655		460			
0700		470			
0705		490			
0710		520			
0715		530			
0720		560			
0725		560			
0730		560			
0735		570			
0740		580			
0745		600			

0021

241214

Casing perfs.____ Bottom choke____ Surf. temp.____ °F Ticket No.____

Gas gravity____ Oil gravity____ GOR____

Spec. gravity____ Chlorides____ ppm Res.____ @____ °F

INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED____

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
0750		560			Slugging
0755		570			
0800	1/2"	590			
0805		600			
0810		600			
0815		580			Slugging
0820		580			Flare alight
0825		600			
0830		600			
0835		610			
0840		610			
0845		620			
0850		600			
0855		620			
0900		620	3.4		
0904					DCIP closed in for CIP
1406					Tool closed and packer pulled
					free
1418					Dropped bar and reverse circulated
					out -pulled out of hole
2245					Tools out and laid down.

PRODUCTION TEST DATA

Gauge No.	2146		Depth:	8573'		Clock No.	7375		24 hour	Ticket No.	241214			
	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	1538.4	.0000		3072.1										
1	.0946*	3092.9	.0860**		3600.6										
2	.1827	3139.4	.1521		3630.9										
3	.2708	3110.5	.2183		3650.1										
4	.3588	3099.3	.2844		3661.3										
5	.4469	3080.1	.3505		3670.9										
6	.5350	3072.1	.4167		3678.9										
7			.4828		3683.7										
8			.5490		3690.0										
9			.6151		3694.8										
10			.6812		3696.4										
11			.7474		3699.6										
12			.8135		3702.8										
13			.8797		3706.0										
14			.9458		3707.6										
15			1.0120		3710.8										

Gauge No.	2147		Depth	8636'	Clock No.	9474	24 hour							
0	.0000	1619.8	.0000		3078.0									
1	.0976*	3078.0	.0874**		3590.7									
2	.1885	3148.0	.1547		3619.4									
3	.2794	3124.1	.2219		3640.1									
4	.3703	3101.8	.2892		3651.2									
5	.4611	3085.9	.3564		3660.8									
6	.5520	3078.0	.4236		3668.7									
7			.4909		3675.1									
8			.5582		3678.3									
9			.6254		3684.7									
10			.6927		3687.8									
11			.7599		3691.0									
12			.8272		3694.2									
13			.8944		3697.4									
14			.9617		3699.0									
15			1.0290		3700.6									
Reading Interval	27		20											

0022

Minutes

REMARKS: *First interval is equal to 29 minutes. ** = 26 minutes.

2

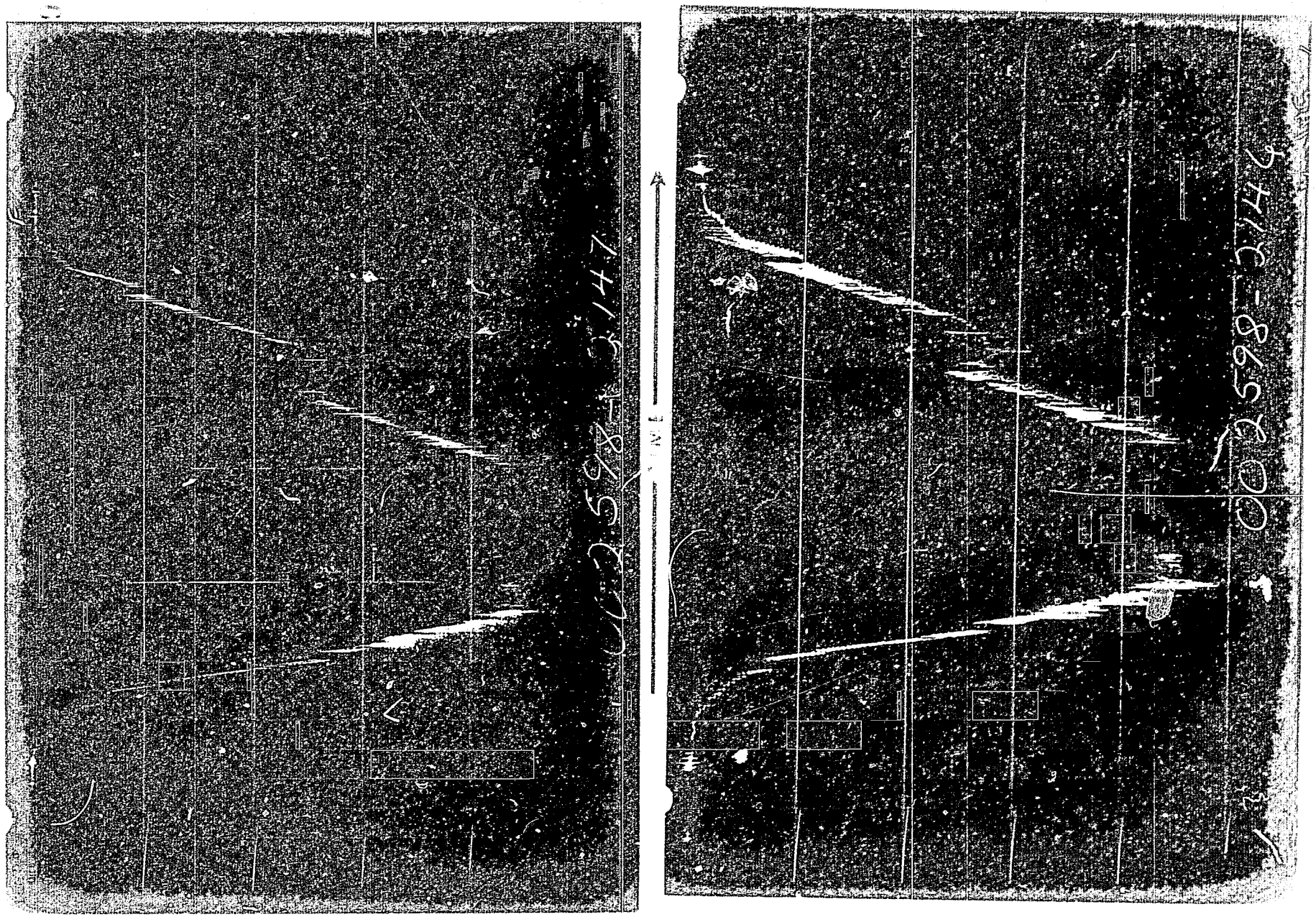
SPECIAL PRESSURE DATA

TICKET NO. 241214



	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing	4.5"	3.826"	8032.28'	
Drill Collars				0023
Reversing Sub	6"	3"	1'	
Water Cushion Valve				
Drill Pipe heavy wt.	4.5"	2.5"	258.74'	
Drill Collars	6.5"	2.5"	271.08'	
Handling Sub & Choke Assembly				
Dual CIP Valve	5"	1.62"	5'	
Dual CIP Sampler				
Hydro-Spring Tester	5"	.75"	5'	8572.1
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.06"	4'	8573'
Hydraulic Jar	5"	1.75"	5'	
VR Safety Joint	5"	1"	2.9'	
Pressure Equalizing Crossover				
Packer Assembly				
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly	7.75"	1.75"	6'	8590'
Anchor Pipe Safety Joint	5"	2.25"	4'	
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor	5"	2.37"	41'	
Blanked-Off B.T. Running Case	5"	2.44"	4'	8636'
Total Depth				8640'

EQUIPMENT DATA



0025

FLUID SAMPLE DATA

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

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

Mud Weight 9.3 vis 40 sec.

Date 2-10-81 | Ticket Number 002598
Kind of D.S.T. OPEN HOLE | Halliburton Location AUSTRALIA
Tester GOETJENS | Witness STUART
Drilling Contractor ODE RIG # 5 DR

EQUIPMENT & HOLE DATA

Formation Tested Patchawarra
Elevation 172.72' Ft.
Net Productive Interval - Ft.
All Depths Measured From Rotary Kelly Bushing
Total Depth 9117' Ft.
Main Hole/Casing Size 8 1/2"
Drill Collar Length 625.62' I.D. 2.5"
Drill Pipe Length 8373.26' I.D. 3.826"
Packer Depth(s) 9026.42'-9034.42' Ft.
Depth Tester Valve 9009.52' Ft.

Cushion TYPE 1020 AMOUNT Water Ft. | Depth Back Pres. Valve | Surface Choke .5" | Bottom Choke .75"

Recovered Feet of
Recovered Feet of
Recovered Feet of
Recovered Feet of
Recovered Feet of

Remarks Gas to surface in 24 minutes after tool opened.

TEMPERATURE	Gauge No. 2147 Depth: 9014.52 Ft.		Gauge No. 2146 Depth: 9113 Ft.		Gauge No. Depth: Ft.		TIME (00:00-24:00 hrs.)	
	24 Hour Clock		24 Hour Clock		Hour Clock		Tool	
Est. °F.	Blanked Off No		Blanked Off Yes		Blanked Off		Opened 15:39	
Actual 236 °F.	Pressures		Pressures		Pressures		Opened Bypass 18:52	
	Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic	4352.4	4353.5	4393.9	4403.0				
First Period Flow Initial	441.6	460.5	582	749.1			—	—
First Period Flow Final	536.2	531.5	582	573.9			64	
First Period Closed in	1212.9	1195.5	1256.4	1227.5			129	
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	4337.6	4335.9	4361.7	4398.7			—	—

Legal Location Sec. - Twp. - Rng.: —
Lease Name: MOORARI
Well No.: 3
Test No.: 5
Field Area: COOPER BASIN
Meas. From Tester Valve: —
Tested Interval: 9034.42-9117'
County: —
State: SOUTH AUSTRALIA
Lease Owner/Company Name: DELHI/SANTOS

FORM 181-82 - PRINTED IN U.S.A.

FORMATION TEST DATA

LITTLE'S

12

Casing perfs.____ Bottom choke____ Surf. temp____ °F Ticket No. 002598
Gas gravity____ Oil gravity____ GOR____
Spec. gravity____ Chlorides____ ppm Res.____ @____ °F
INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED____

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
7:10					Loaded clocks
9:00					Made up tools
10:40					Run in hole
15:30					Made up head
15:38					Packer set
15:39					Opened tool with a weak blow
15:44					Weak blow
15:49					Strong blow
15:51	.5"	5			Moderately strong blow
15:54	"	7			Same
15:59	"	7			Same
16:03	"	7			Gas to surface
16:04	"	5			Decreasing
16:09	"	5			Moderate bubble
16:14					Decreasing
16:19					Same
16:20					Closed choke
16:22					Opened choke, gas still to surface
16:24					Pressure negligible
16:29					Same
16:35					Closed choke
16:36					Opened choke
16:43					Closed tool
18:52					Closed hydrospring and pulled packer loose, pulled out of hole.

Casing perfs.____ Bottom choke____ Surf. temp.____ °F Ticket No. 002598
Gas gravity____ Oil gravity____ GOR____
Spec. gravity____ Chlorides____ ppm Res.____ @____ °F
INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED____

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
21:01					Dropped bar and reverse circulated
					after 40 stands out.
2:30					Tools out and laid down

TICKET NO. 002598

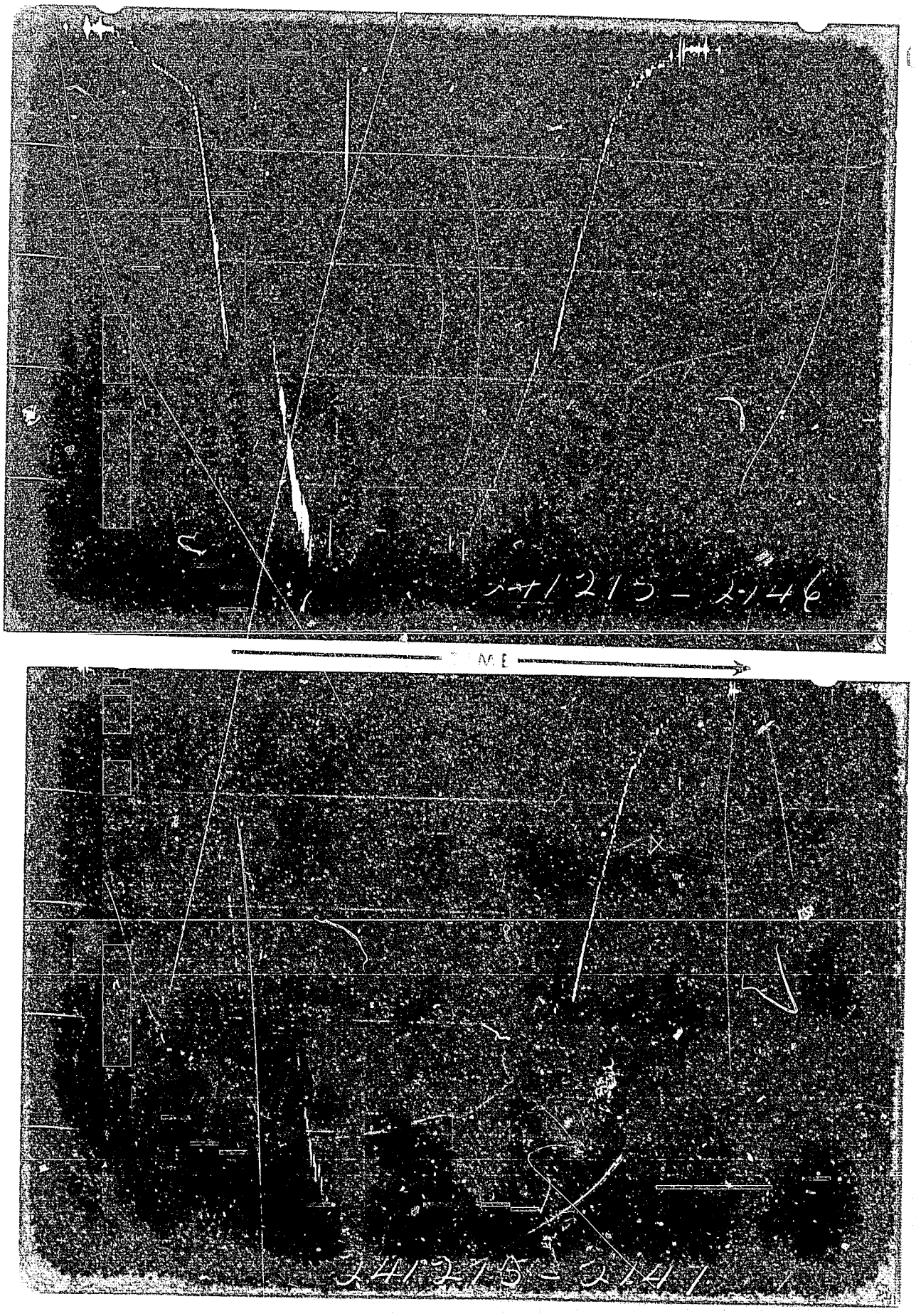


	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing	4.5"	3.826"	8373.26'	0028
Drill Collars	6.5"	2.5 "	594.48'	
Reversing Sub	6"	3"	1.0' Impact sub	
Water Cushion Valve				
Drill Pipe				
Drill Collars	6.5"	2.5 "	31.14'	
Handling Sub & Choke Assembly	6.5"	2.5"	.85'	
Dual CIP Valve	5"	.87"	4.87'	
Dual CIP Sampler				
Hydro-Spring Tester	5"	.75 "	5.02'	9009.52'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	2.25 "	4.12'	9014.52'
Hydraulic Jar	5"	1.75"	5.0'	
VR Safety Joint	5"	1"	2.78'	
Pressure Equalizing Crossover				
Packer Assembly	7.75"	1.53"	6.0'	9026.42'
Distributor	5"	1.68"	2.0'	
Packer Assembly	7.75 "	1.53 "	6.0'	9034.42'
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint	5"	1.5 "	4.0'	
	6"	2.04 "	.64' X over	
	6.5"	2.5"	31.22' Drill Collar	
Packer Assembly				
	7.68"	2.28"	.66'	
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor	5"	2.37"	40.0'	
Blanked-Off B.T. Running Case	5"	2.44"	4.06'	9113'
Total Depth				9117'

FORM 187-R2 - PRINTED IN U.S.A.

EQUIPMENT DATA

LITTLE'S 111036 75C 2/80


24/215 - 2746
24/215 - 2747

0030

FLUID SAMPLE DATA

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

	RESISTIVITY		CHLORIDE CONTENT
Recovery Water	____ @ ____	°F.	____ ppm
Recovery Mud	____ @ ____	°F.	____ ppm
Recovery Mud Filtrate	____ @ ____	°F.	____ ppm
Mud Pit Sample	____ @ ____	°F.	____ ppm
Mud Pit Sample Filtrate	____ @ ____	°F.	____ ppm
Mud Weight	9.4	vis 40	sec.

Date 2-12-81 Ticket Number 241215
Kind of D.S.T. OPEN HOLE Halliburton Location ADELAIDE
Tester MR. LARKINS Witness ???
Drilling Contractor OCEAN DRILLING & EXPLORATION COMPANY RIG #5 IC-DR

EQUIPMENT & HOLE DATA

Formation Tested Patchawarra
Elevation 173' Ft.
Net Productive Interval 52' Ft.
All Depths Measured From Rotary Kelly Bushing
Total Depth 9355' Ft.
Main Hole/Casing Size 8 1/2"
Drill Collar Length 335.74-258.74' I.D. 2.50"-2.764"
Drill Pipe Length 8633.52' I.D. 3.826"
Packer Depth(s) 9257'-9265' Ft.
Depth Tester Valve 9238' Ft.

Cushion TYPE 1300' AMOUNT WATER Ft. Depth Back Pres. Valve Surface Choke .5" Bottom Choke .75"

Recovered 1300 Feet of Water cushion with a trace of condensate - all gas cut
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. 2146 Depth: 9' Ft.	Gauge No. 2147 Depth: 9351' Ft.	Gauge No. Depth: Ft.	TIME (00:00-24:00 hrs.)
	24 Hour Clock	24 Hour Clock	Hour Clock	Tool Opened 06:33
Est. °F.	Blanked Off NO	Blanked Off YES	Blanked Off	Opened Bypass 09:42
Actual 250 °F.	Pressures	Pressures	Pressures	Reported / Computed
	Field / Office	Field / Office	Field / Office	Minutes / Minutes
Initial Hydrostatic	4490 / 4461.7	4592 / 4594.5		— / —
First Period Flow Initial	356 / 428.7	410 / 533.0		— / —
First Period Flow Final	437 / 444.9	473 / 500.0		63 / 62
First Period Closed in	4153 / 4165.5	4178 / 4176.7		126 / 127
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	4490 / 4444.0	4592 / 4581.7		— / —

Legal Location Sec. - Twp. - Rng. ---
Lease Name MOORARI
Well No. 3
Test No. 6
Field Area MOORARI
Tested Interval 9265' - 9355'
County ---
State SOUTH AUSTRALIA
Lease Owner/Company Name DELHI-SANTOS

FORM 181-82 – PRINTED IN U.S.A.

FORMATION TEST DATA

LITTLE'S

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Gauge No.	2146		Depth	9239'		Clock No.	7375		24 hour	Ticket No.	241215			
	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	428.7	.000		444.9										
1	.0393*	393.1	.0032**		731.5										
2	.0720	410.9	.0319		2651.7										
3	.1048	423.9	.0606		3642.1										
4	.1375	432.0	.0893		3814.6										
5	.1703	440.1	.1180		3923.3										
6	.2030	444.9	.1467		3990.4										
7			.1754		4032.1										
8			.2042		4064.3										
9			.2329		4088.4										
10			.2616		4107.7										
11			.2903		4123.7										
12			.3190		4136.6										
13			.3477		4146.3										
14			.3764		4155.9										
15			.4050		4165.5										

Gauge No.	2147		Depth	9351'		Clock No.	9474		24hour					
0	.000	533.0	.000		500.0									
1	.0405*	498.4	.0034**		762.5									
2	.0742	514.1	.0333		2357.5									
3	.1079	492.1	.0634		3476.1									
4	.1416	492.1	.0935		3772.3									
5	.1753	492.1	.1235		3904.4									
6	.2090	500.0	.1536		3987.2									
7			.1836		4036.6									
8			.2137		4070.0									
9			.2437		4097.1									
10			.2738		4116.2									
11			.3038		4133.7									
12			.3339		4144.9									
13			.3639		4157.6									
14			.3940		4167.2									
15			.4240		4176.7									
Reading Interval	10		9										Minutes	

REMARKS: *First interval equal to 12 minutes **=1 minute

0031

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FORM 183-R1—PRINTED IN U.S.A.

SPECIAL PRESSURE DATA

LITTLE'S 96673 75C 8/74

Casing perfs.____ Bottom choke____ Surf. temp____ °F Ticket No. 241215
Gas gravity____ Oil gravity____ GOR____
Spec. gravity____ Chlorides____ ppm Res.____ @____ °F
INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED____

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
22:30					Loaded B.T.'s.
23:00 2-12-81					Made up tools & ran in hole with 1300' water cushion.
06:25					On bottom - head up.
06:33	1/2"				OPened tool with very weak blow.
06:35	"				Very weak blow.
06:40	"				"
06:42	"				Bubble increased to strong.
06:45	"	5			Strong blow.
06:50	"	10			Gas to surface.
06:55	"	15			"
07:00	"	18			"
07:05	"	21			"
07:10	"	23			"
07:15	"	25			"
07:20	"	26			"
07:25	"	27			"
07:30	"	28			"
07:36					Closed tool.
09:42					Pulled free and pulled out of hole.

FORM 182-RI—PRINTED IN U.S.A.

PRODUCTION TEST DATA

LITTLE'S 96672 5M 8/74

TICKET NO. 241215 **0033**



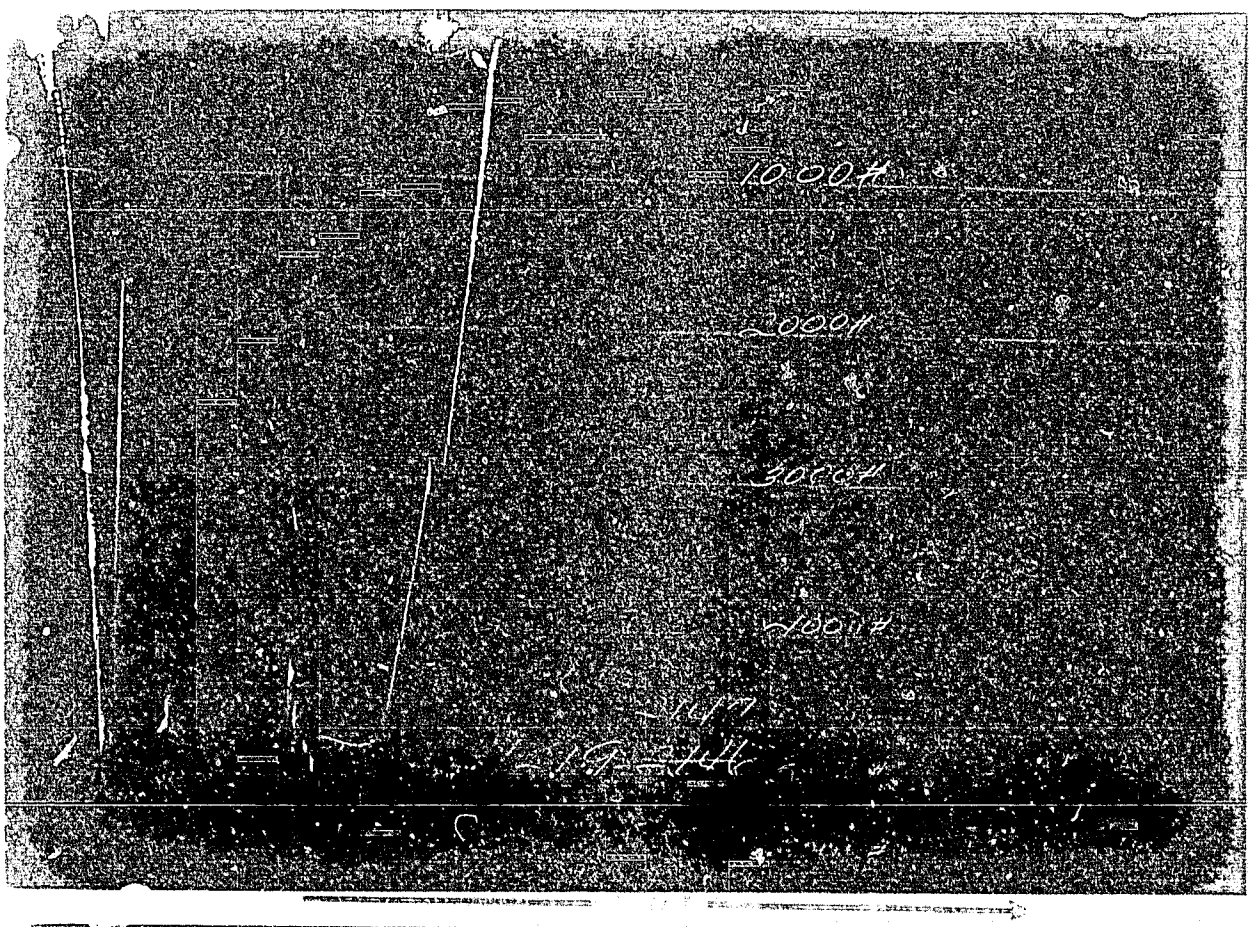
	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing	4.5"	3.826"	8633.52'	
Drill Collars	4.5"	2.764"	258.74'	WEIGHT PIPE
Reversing Sub	6"	3"	1'	
Water Cushion Valve				
Drill Pipe				
Drill Collars	6.5"	2.5"	335.74'	
Handling Sub & Choke Assembly				
Dual CIP Valve	5"	1.62"	5'	
Dual CIP Sampler				
Hydro-Spring Tester	5"	.75"	5'	9238'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.06"	4'	9239'
Hydraulic Jar	5"	1.75"	5'	
VR Safety Joint	5"	1"	2.9'	
Pressure Equalizing Crossover				
Packer Assembly	7.75"	1.75"	6'	9257'
Distributor	5"	1.68"	2'	
Packer Assembly	7.75"	1.75"	6'	9265'
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint	5"	2.25"	4'	
Side Wall Anchor	5.75"	2.5"	.65' X OVER	
Drill Collars	6.5"	2.5"	6236'?	
	5.75"	2.385"	.65' X OVER	
Flush Joint Anchor	5"	2.37"	18'	
Blanked-Off B.T. Running Case	5"	2.44"	4'	9351'
Total Depth				9355'

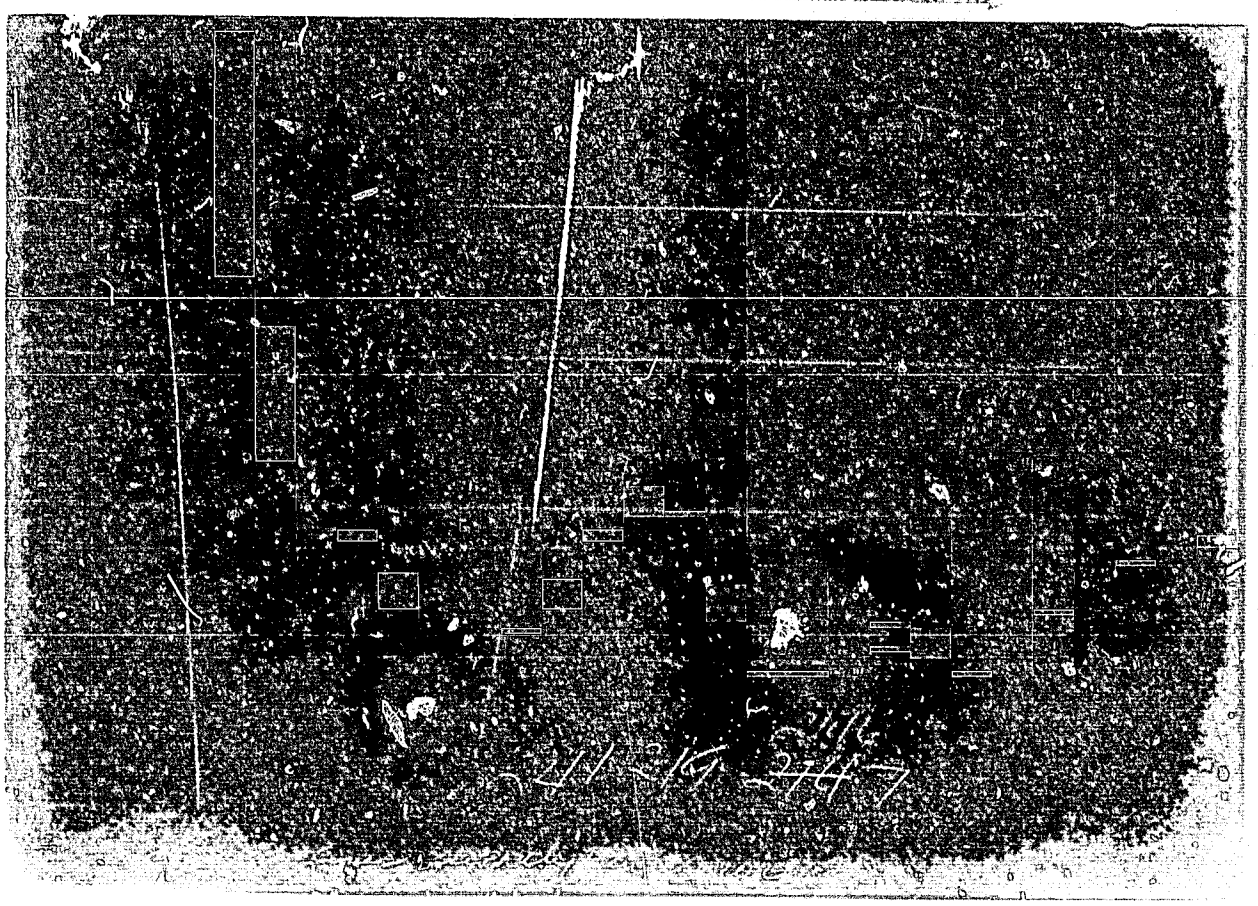
FORM 187-82 — PRINTED IN U.S.A.

EQUIPMENT DATA

LITTLE'S

12


1000#
2000#
3000#
4000#



0035

FLUID SAMPLE DATA

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

	RESISTIVITY	CHLORIDE CONTENT
Recovery Water	____ @ ____ °F.	____ ppm
Recovery Mud	____ @ ____ °F.	____ ppm
Recovery Mud Filtrate	____ @ ____ °F.	____ ppm
Mud Pit Sample	____ @ ____ °F.	____ ppm
Mud Pit Sample Filtrate	____ @ ____ °F.	____ ppm
Mud Weight	9.4 vis	38 sec.

Date 2-12-81 Ticket Number 241219
Kind of D.S.T. OPEN HOLE Halliburton Location ADELAIDE
Tester LARKINS Witness JOHN A. HAMM
Drilling Contractor ODE RIG # 5 sm

EQUIPMENT & HOLE DATA

Formation Tested Tirra Warra
Elevation 172.7' Ft.
Net Productive Interval 153' Ft.
All Depths Measured From Rotary kelly bushing
Total Depth 9676' Ft.
Main Hole/Casing Size 8"
Drill Collar Length 274.2 & 258.7 I.D. 2.5 & 2.764"
Drill Pipe Length 8827' I.D. 3.826"
Packer Depth(s) 9377-9385' Ft.
Depth Tester Valve 9367' Ft.

Cushion TYPE Water AMOUNT 767 Ft. Depth Back Pres. Valve — Surface Choke .5" Bottom Choke .75"

Recovered 24.4 ~~Feet of~~ bbl of water
Recovered 26.6 ~~Feet of~~ bbl of 52 gravity oil
Recovered ____ Feet of ____
Recovered ____ Feet of ____
Recovered ____ Feet of ____

Remarks SEE PRODUCTION TEST DATA SHEET

*See attached incremental pressure sheet

TEMPERATURE	Gauge No. 2147 Depth: 9368' Ft.	Gauge No. 2146 Depth: 9672 Ft.	Gauge No. Depth: Ft.	TIME (00:00-24:00 hrs.)
	49 Hour Clock	48 Hour Clock	Hour Clock	Tool Opened 1952
Est. °F.	Blanked Off no	Blanked Off yes	Blanked Off	Opened Bypass 0253
Actual 258 °F.	Pressures	Pressures	Pressures	

		Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic		4683	4680.9	4719	4863.7				
First Period	Flow Initial	1641	1652.9	1891	1953.5			—	—
	Flow Final	2377	2378.1	2460	2562.5			181	*
	Closed in	4169	4183.1	4210	4352.0			240	*
Second Period	Flow Initial							—	—
	Flow Final								
	Closed in								
Third Period	Flow Initial							—	—
	Flow Final								
	Closed in								
Final Hydrostatic		4554	4600.1	4655	4783.0			—	—

FORM 161-R2 – PRINTED IN U.S.A.

FORMATION TEST DATA

LITTLE'S

(12)

Legal Location Sec. - Twp. - Rng.: —
Field Area: MOORARI
Mea. From Tester Valve: —
County: —
State: SOUTH AUSTRALIA

Lease Name: MOORARI
Well No.: 3
Test No.: 7
Tested Interval: 9385 - 9676'
Lease Owner/Company Name: DELHI/SANTOS

Casing perfs.____ Bottom choke____ Surf. temp____ °F Ticket No. 241219
Gas gravity____ Oil gravity____ GOR____
Spec. gravity____ Chlorides____ ppm Res.____ @____ °F
INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED____

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
1345					Loaded BT's
1400					Made up tools
1705					Finished water cushion-ran in hole
1952	1/2				Opened with very weak blow
1959					Weak increasing to strong
2000	1/2"	7			Strong blow
2005		180			
2006					Gas to the surface
2010		400			
2015		540			
2020		650			
2025		700			
2030		680			
2035		760			
2037					Changed from flare line to separator
2040		860			
2045		850-880			Slugging
2110		900			
2112					Changed orifice plate in separator
2125		1000			
2128					Separator back on line
2140		900			
2155		950			
2210		950			
2225		950			
2253		950			Closed DCIP for CIP period

0037

241219 Page 2

Casing perfs.____ Bottom choke____ Surf. temp.____ °F Ticket No.____

Gas gravity____ Oil gravity____ GOR____

Spec. gravity____ Chlorides____ ppm Res.____ @____ °F

INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED____

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
0253	1/2				Pulled tools free - dropped bar
					and reverse circulated
1315					Out of hole

DELHI/SANTOS
Lease Owner/Company Name

241219
Ticket Number

B.T. 2147
Depth 9308' - 48 Hr.

B.T. 2146
Depth 9672 - 48 Hr.

B.T. _____
Depth _____

Time (minutes)	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time (minutes)	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time (minutes)	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.
FIRST FLOW PERIOD			FIRST FLOW PERIOD					
0		1652.9	0		1953.5			
20		2074.3	20		2341.3			
40		2444.6	40		2605.7			
60		2507.9	60		2681.1			
80		2476.2	80		2660.2			
100		2476.2	100		2663.4			
120		2455.7	120		2634.6			
140		2412.9	140		2597.7			
160		2411.3	160		2597.7			
179.2		2378.1	178.8		2562.5			
CLOSED IN PRESSURE			CLOSED IN PRESSURE					
0		2378.1	0		2562.5			
1		2433.5	1		2873.4			
2		3082.8	2		3173.0			
3		3238.8	3		3277.2			
4		3367.8	4		3365.3			
5		3453.8	5		3479.1			
6		3541.4	6		3560.7			
7		3595.5	7		3626.1			
8		3643.3	8		3691.6			
9		3681.5	9		3739.6			
10		3711.8	10		3792.3			
12		3753.2	12		3853.0			
14		3786.6	14		3899.3			
16		3813.7	16		3937.6			
18		3836.0	18		3968.0			
20		3855.1	20		3990.4			
22		3869.4	22		4009.6			
24		3883.7	24		4025.7			
26		3894.9	26		4038.5			
28		3906.0	28		4053.0			
30		3915.6	30		4065.0			
32		3925.1	32		4075.5			
35		3936.3	35		4090.0			
40		3955.4	40		4110.9			
45		3971.3	45		4130.2			
50		3985.6	50		4144.6			
55		3996.8	55		4159.1			
60		4007.9	60		4170.4			
70		4030.2	70		4191.3			
80		4047.7	80		4210.6			
90		4062.1	90		4226.6			

Remarks: _____

(12)

DELHI/SANTOS
Lease Owner/Company Name

241219 Page 2
Ticket Number

B.T. 2147
Depth 9368 - 48 Hr.

B.T. 2146
Depth 9672' - 48 Hr.

B.T. _____
Depth _____

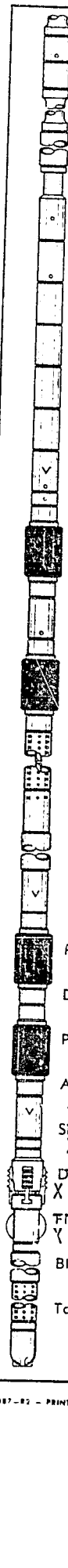
Time (minutes)	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time (minutes)	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time (minutes)	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.
CLOSED IN PERIOD (CONT.)			CLOSED IN PERIOD (CONT.)					
100		4076.4	100		4241.1			
110		4089.2	110		4255.6			
120		4100.3	120		4265.2			
140		4119.5	140		4286.1			
160		4135.3	160		4303.8			
180		4149.7	180		4318.3			
200		4162.4	200		4331.1			
220		4173.5	220		4342.4			
241.3		4183.1	242.3		4352.0			

Remarks: _____

30-2860

(12)

TICKET NO. 241219 **0040**

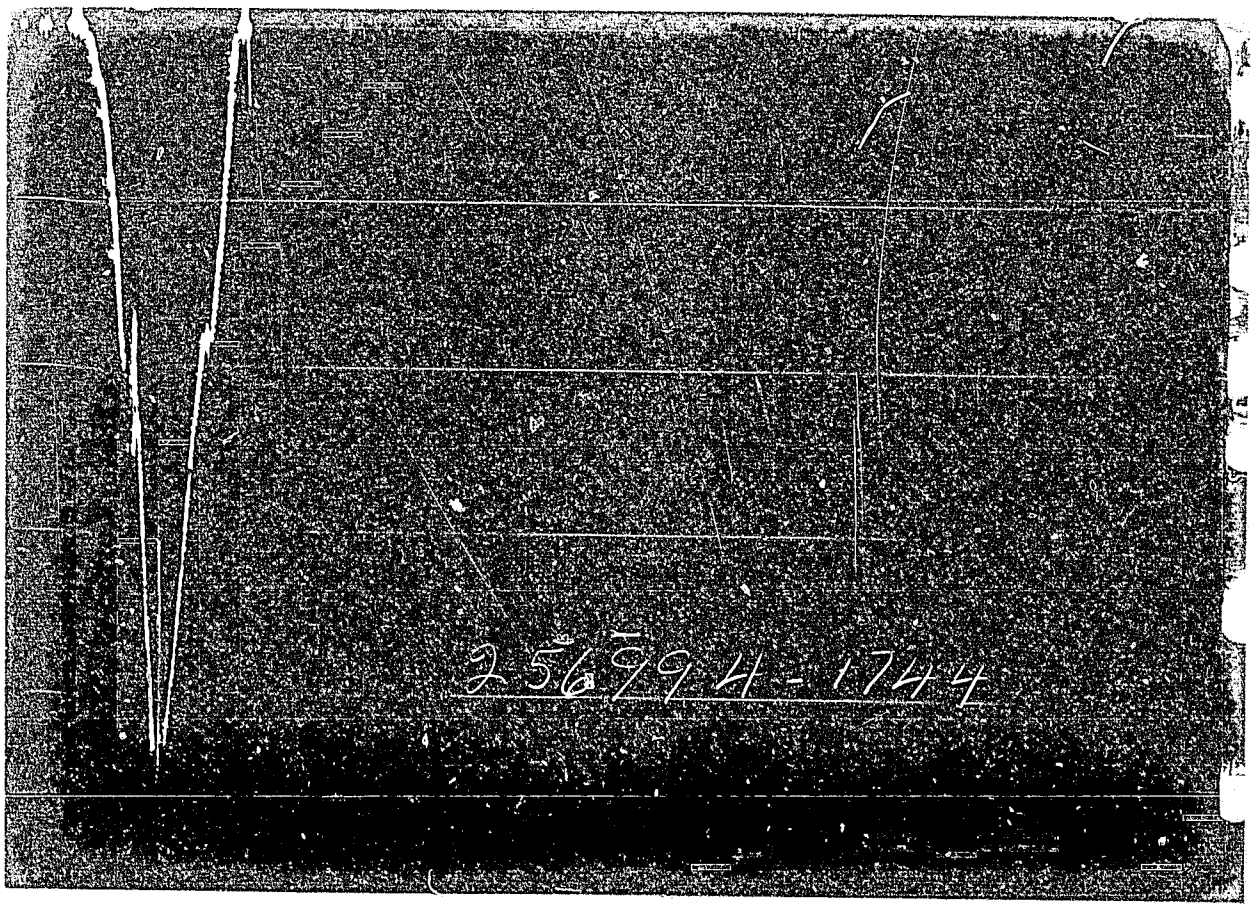


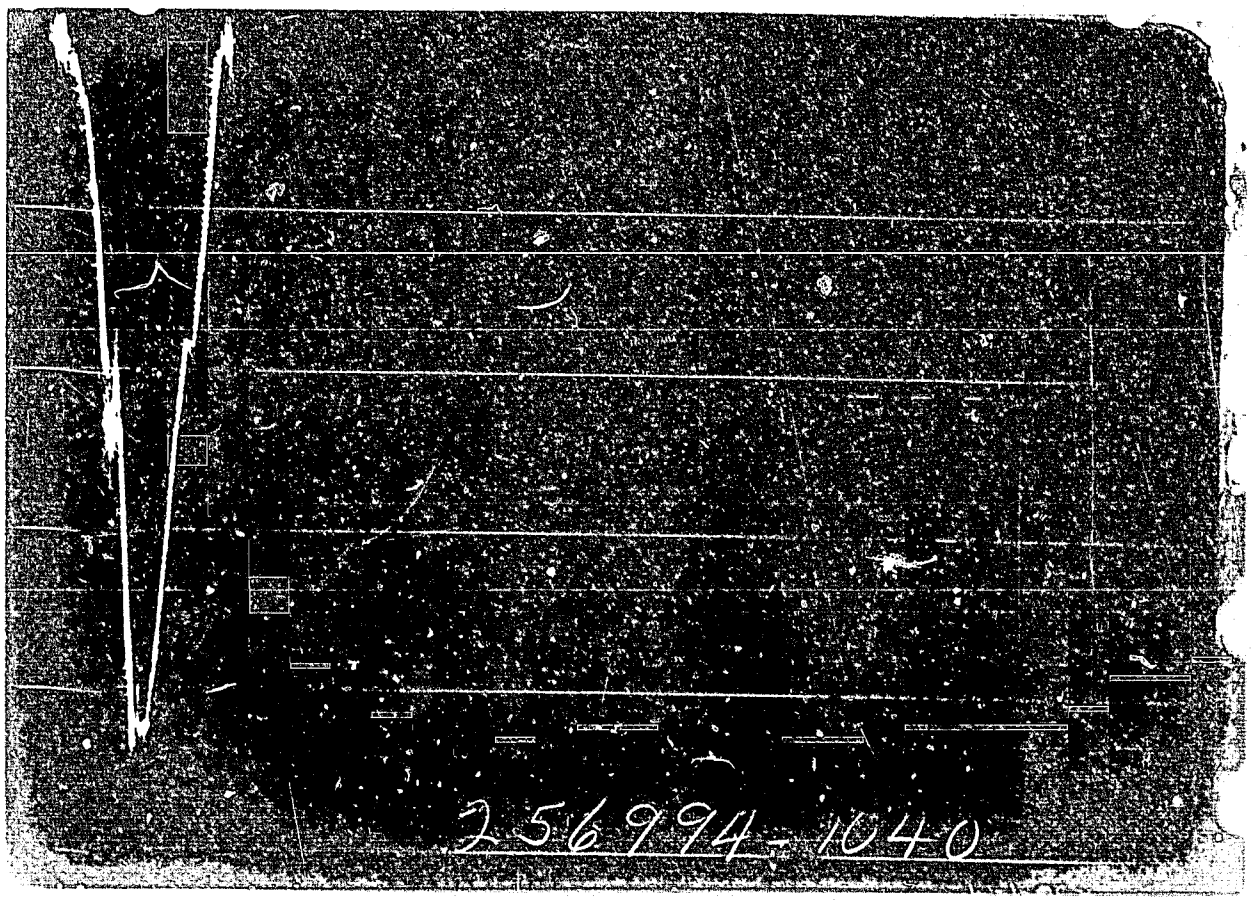
	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing	4.5"	3.826"	8827'	
Drill Collars				
Reversing Sub	6"	3"	1'	
Water Cushion Valve				
~~Drill Pipe~~ heavy wt. pipe	4.5"	2.764"	258.7'	
Drill Collars				
Handling Sub & ~~Choke Assembly~~ X over	6.5"	2.375"	.65'	
Dual CIP Valve	5"	1.62"	5'	
Dual CIP Sampler				
Hydro-Spring Tester	5"	.75"	5'	9367'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.06"	4'	9368'
Hydraulic Jar	5"	1.75"	5'	
VR Safety Joint	5"	1"	2.9'	
Pressure Equalizing Crossover				
Packer Assembly	7.75"	1.75"	6'	9377'
Distributor	5"		2'	
Packer Assembly	7.75"	1.75"	6'	9385'
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint	5"	2.25"	4'	
X over	6"	2.25"	.62'	
~~Side Wall Anchor~~ -- Heavy wt. pipe	4.5"	2.764"	108.52'	
X over	6"	2.25"	1.03'	
~~Drill Collars~~ ----Flush jt. anchor	5"	2.37"	37'	
X over	5.75"	2.5"	.65'	
~~Flush Joint Anchor~~ Heavy wt. pipe	4.5"	2.764"	133.53'	
X over	6"	2"	.65'	
Blanked-Off B.T. Running Case	5"	2.44"	4'	9672'
Total Depth				9676'

FORM 187-R2 — PRINTED IN U.S.A.

EQUIPMENT DATA

LITTLE'S (12)


256994-1744


256994-1040

0042

FLUID SAMPLE DATA

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

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

Mud Weight _____ vis _____ sec.

Date 3-1-81 Ticket Number 256994
Kind of D.S.T. CASED HOLE Halliburton Location ADELAIDE
Tester MARK PARSONS Witness J. HANNA
Drilling Contractor O.D. & E RIG # 5 DR

EQUIPMENT & HOLE DATA

Formation Tested -
Elevation 150' Ft.
Net Productive Interval 8726-8748' 22' Ft.
All Depths Measured From Kelly Bushing
Total Depth ?? Ft.
Main Hole/Casing Size 7"
Drill Collar Length 89.29' I.D. 1 1/2"
Drill Pipe Length ? 8687' Tub I.D. 2.992"
Packer Depth(s) ? 8680' Ft.
Depth Tester Valve 8663' Ft.

Cushion TYPE 600' AMOUNT Water Ft. Depth Back Pres. Valve — Surface Choke 1/2" — Bottom Choke 5/8"

Recovered _____ Feet of _____
Recovered _____ Feet of _____
Recovered _____ Feet of _____
Recovered _____ Feet of _____

Remarks See production test data sheet No packer seat. Q-Questionable

TEMPERATURE	Gauge No. 1744	Gauge No. 1040	Gauge No.	TIME (00:00-24:00 hrs.)
	Depth: 8669.15' Ft.	Depth: 8696.8 Ft.	Depth: Ft.	
	72 Hour Clock	72 Hour Clock	Hour Clock	Tool
Est. °F.	Blanked Off No	Blanked Off Yes	Blanked Off	Opened 3:52
Actual °F.	Pressures	Pressures	Pressures	Opened Bypass 3:59

	Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic		4226.0 Q		4239.6 Q				
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		4226.0 Q		4239.6 Q			—	—

FORM 181-82 — PRINTED IN U.S.A.

FORMATION TEST DATA

LITTLE'S

Legal Location Sec. - Twp. - Rng.: COOPER BASIN
Field Area
Mea. From Tester Valve
County
State: SOUTH AUSTRALIA

Lease Name: MOORARI
Well No.: 3
Test No.: 8(2)
Tested Interval: 8680-TOTAL DEPTH
Lease Owner/Company Name: DELHI/SANTOS

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Casing perfs. _____ Bottom choke _____ Surf. temp _____ °F Ticket No. 256994
Gas gravity _____ Oil gravity _____ GOR _____
Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F
INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED _____

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
3-1-81 10:15					Loaded B.T.s
10:55					Tools made up
11:00					Went in hole.
3:51					Packer set
3:52					Choke closed. Opened tool and lost
					mud in annulus.
3:55					Moderate bubble in water bucket.
3:59					Opened choke, still losing mud.
					Pulled free. Closed tool
8:46					Pulled 40 stands, got mud in tubing.
					Set packer and reversed out
9:00					Tools out of hole.

FORM 182 R1—PRINTED IN U.S.A.

PRODUCTION TEST DATA

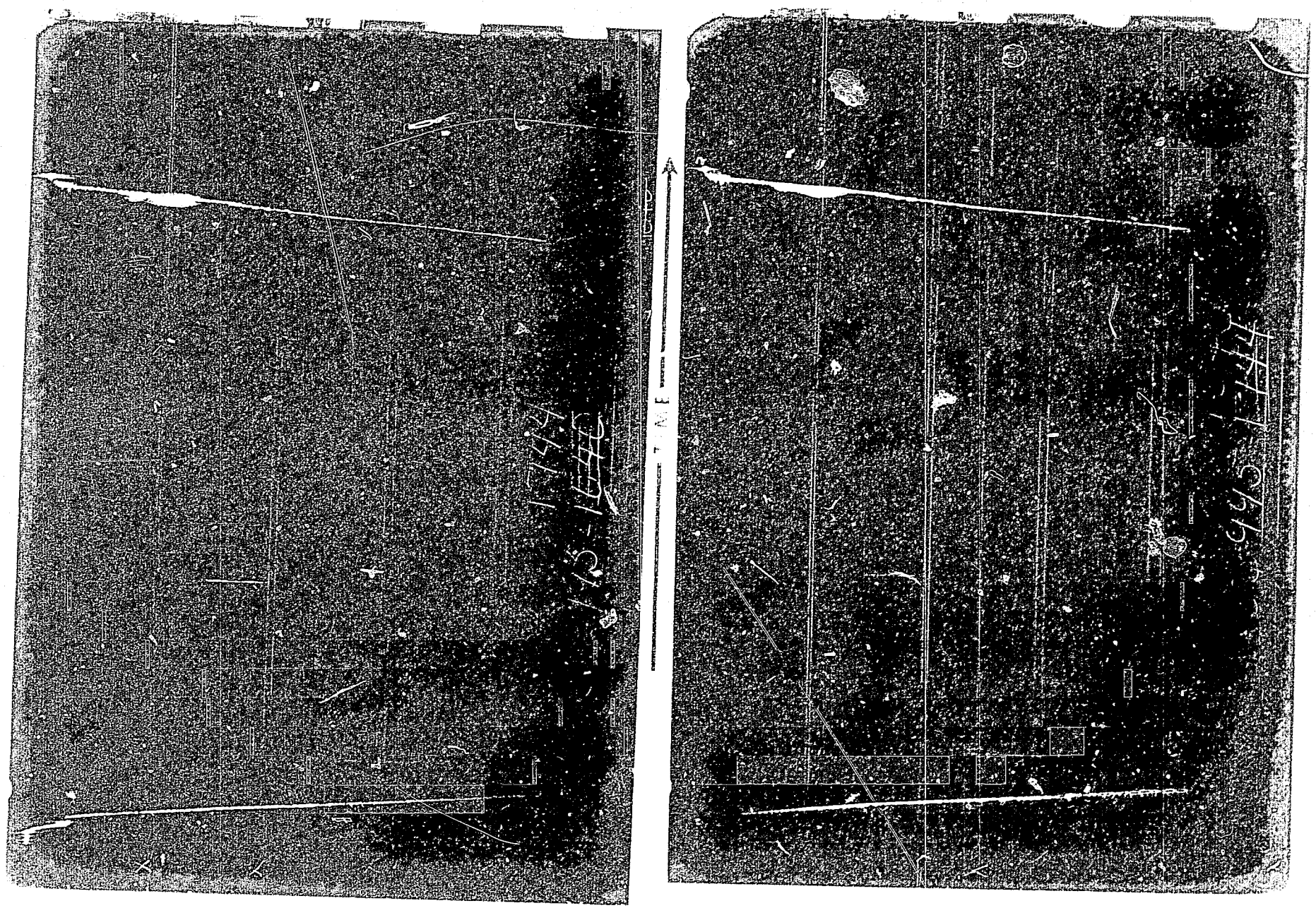
LITTLE'S 96672 5M 8/74

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TICKET NO. 256994 **0044**



	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing				
Drill Collars				
Reversing Sub	3.875"	2.25"	4.33'	
Water Cushion Valve				
Drill Pipe	3 1/2"	2.992"	?8642.82'	Tubing
Drill Collars	4 1/4"	1 1/2"	?89.29'	
Handling Sub & Choke Assembly				
Dual CIP Valve	3.875'	.87"	69.59"	
Dual CIP Sampler				
Hydro-Spring Tester	3.875"	.62"	61.12"	8663'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	3.875"	3.00"	5.92'	8669.15'
Hydraulic Jar				
VR Safety Joint	3.875"	.75"	3.03'	
Pressure Equalizing Crossover				
Packer Assembly				
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor	7.00"	2.44"	3.9'	8680'
Packer Assembly				
Anchor Pipe Safety Joint				
Sirle Wall Anchor				
Drill Collars				
Flush Joint Anchor	3.75"	1.75"	10.00'	
Blanked-Off B.T. Running Case	3.75"	2.5"	4.87'	8696.87'
Total Depth				



0046

FLUID SAMPLE DATA

Sampler Pressure 760 P.S.I.G. at Surface
Recovery: Cu. Ft. Gas 2.7
(approx) cc. Oil Condensate 300 bbls/day
cc. Water
cc. Mud
Tot. Liquid cc.
Gravity ° API @ °F.
Gas/Oil Ratio cu. ft./bbl.

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

Mud Weight 9.6 Brine vis sec.

Date 3-3-81 Ticket Number 256995
Kind of D.S.T. CASED HOLE Halliburton Location ADELAIDE
Tester MR. PARSONS Witness MR. HANNAH
Drilling Contractor O.D.E. RIG #5 bc

EQUIPMENT & HOLE DATA

Formation Tested
Elevation 173' Ft.
Net Productive Interval 8726' - 8748' (22') Ft.
All Depths Measured From Rotary Kelly Bushing
Total Depth 9676' Ft.
Main Hole/Casing Size 7" Casing
Drill Collar Length 89.29' I.D. 1.5"
Drill Pipe Length 8569.44' I.D. 2.992"
Packer Depth(s) 8680' Ft.
Depth Tester Valve 8670' Ft.

Cushion TYPE Water AMOUNT 860 Ft. Depth Back Pres. Valve Surface Choke 1/2" Bottom Choke 5/8"

Recovered Feet of
Recovered Feet of
Recovered Feet of
Recovered Feet of
Recovered Feet of

Meas. From Tester Valve

Remarks SEE PRODUCTION TEST DATA SHEETS.

TEMPERATURE	Gauge No. 1744 Depth: 8673.08' Ft.		Gauge No. 1040 Depth: 8697' Ft.		Gauge No. Depth: Ft.		TIME (00:00-24:00 hrs.)	
	72 Hour Clock		72 Hour Clock		Hour Clock		Tool 3-2-81	
Est. 188 °F.	Blanked Off No		Blanked Off Yes		Blanked Off		Opened 0546	
							Opened 3-4-81	
Actual °F.	Pressures		Pressures		Pressures		Bypass 0546	
	Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic	4198.9	4302.5	4417.2	4322.4				
First Period Flow Initial	707.0	709.8	711.6	721.7				
First Period Flow Final	1454.8	1484.4	1523.3	1495.6			960	962
First Period Closed in	2623.6	3724.1	3811.2	3731.5			1920	1918
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	4184.4	4272.3	4387.6	4291.4				

FORM IE1-R2 – PRINTED IN U.S.A.

FORMATION TEST DATA

LITTLE'S

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Legal Location Sec. - Twp. - Rng. LONG. 140° 07' 52.99"E LAT. 27° 38' 56.08"S
Lease Name MOORARI Well No. 3 Test No. 8(b)
Tested Interval 8680' - 9676'
Field Area COOPER BASIN
County
State SOUTH AUSTRALIA
Lease Owner/Company Name DELHI-SANTOS

Casing perfs.____ Bottom choke .625" Surf. temp.____ °F Ticket No. 256995

Gas gravity____ Oil gravity____ GOR____

Spec. gravity____ Chlorides____ ppm Res.____ @____ °F Page 1

INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED____

Date 3-1-81 Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
2145					B.T.'s loaded
2230					Tools ran in hole
2325					Set packer at approximately 700' to
					test for leaks.
2332					Tool opened with no leaks
2334					Pulled free, ran in hole, waited for
					daylight
3-2-81 0540					Set packer
0546	½"				Tool opened with a very weak bubble in
					water bucket
0549	"				No increase, very weak
0551	"				Slight increase, weak to moderate
0552	"				Strong bubble
0554	"				Strong bubble, still increasing
0556	"	5#			5 PSI, increasing
0557	"	35			Gas to surface
0558	"	60			Still increasing
0558	"	90			Increasing rapidly
0559	"	130			"
0559 ??	"	160			"
0603	"	280			Still increasing
0604	"	300			"
0605	"	380			"
0606	"	450			"
0607	"	500			"
0608	"	520			"

Casing perfs.____ Bottom choke____ Surf. temp____ °F Ticket No. 256995

Gas gravity____ Oil gravity____ GOR____ Page 2

Spec. gravity____ Chlorides____ ppm Res.____ @____ °F

INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED____

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
0612	½"	630#			Sharp increase
0614	"	620			Slow increase
0615	"	650			Slow increase, water cushion nearly all out
0616	"	680			Gradual increase
0618	"				Closed testing head to fix up leaking
					flare line
0623	"				Opened for 15 seconds, then closed
					again, line still leaking
0626	"	950			Opened for 15 seconds, PSI built up,
					closed head again
0642	"	1200			Opened, pressure buildup
0643	"	1150			Gradually decreasing
0645	"	1120			"
0645 ??	"	1100			Surging slightly (bit of water cushion
					left)
0646	"	1050			Pressure steady
0647	"	1020			Pressure dropping again
0648	"	1050			Slight surge in flare line
0649	"	1000			Condensate to surface
0650	"	980			Pressure decreasing
0652	"	920			Increasing slowly
0653	"	950			Pressure steady
0654	"	920-950			Slight surging
0655	"	900			Pressure steady
0659	"	890			Pressure slowly decreasing

Casing perfs.____ Bottom choke____ Surf. temp____ °F Ticket No. 256995
Gas gravity____ Oil gravity____ GOR____
Spec. gravity____ Chlorides____ ppm Res.____ @____ °F Page 3
INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED____

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
0700	½"	850			Pressure slowly decreasing
0704	"	820			"
0705	"	800			"
0709	"	780			"
0711	"	750			"
0713	"	720			Condensate has still a small amount of
					gas cut mud
0716	"	740			Heavy condensate and mud surging to
					surface
0805	"	740			Steady pressure
0815	"	740-760			Slight fluctuation in pressure
0845	"	740-760			"
0950	"	760			Steady pressure
1000	"	760			"
2100	"	760			"
2146	"	760			Pressure steady, shut in tool
3-4-81 0308	"				Dropped circulating bar
0309					Started to reverse circulate
0350					Finished reverse circulating
0546					Tool closed
0547					Packer free, pulled out of hole
1000					Tools out of hole

Gauge No.	1744	Depth	8673.08'	Clock No.	6030	72 hour	Ticket No.	256995	

	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	709.8	.0000		1484.4										
1	(.0480	2595.7)M	.1498		3214.0										
2	.1312	1526.9	.2996		3449.7										
3	.2625	1531.1	.4493		3545.9										
4	.3937	1528.3	.5991		3594.8										
5	.5249	1514.1	.7489		3626.4										
6	.6562	1502.8	.8987		3647.9										
7	.7874	1492.9	1.0485		3666.6										
8	.9186	1488.6	1.1983		3678.1										
9	1.0520	1484.4*	1.3480		3691.0										
10			1.4978		3698.2										
11			1.6476		3706.8										
12			1.7974		3712.6										
13			1.9472		3722.7										
14			2.0970		3724.1										
15															

Gauge No.	1040	Depth	8697'	Clock No.	11660	72 hour

0	.0000	721.7	.0000		1495.6										
1	.0550	2626.4)M	.1514		3224.1										
2	.1326	1539.2	.3029		3460.1										
3	.2652	1543.6	.4543		3554.5										
4	.3978	1540.6	.6057		3603.2										
5	.5304	1524.7	.7571		3635.6										
6	.6630	1514.5	.9086		3657.8										
7	.7956	1505.8	1.0600		3675.5										
8	.9282	1498.5	1.2114		3688.7										
9	1.0630	1495.6*	1.3628		3699.1										
10			1.5143		3707.9										
11			1.6657		3715.3										
12			1.8171		3722.7										
13			1.9685		3728.6										
14			2.1200		3731.5										
15															
Reading Interval	120		137												Minutes

REMARKS: *Interval = 122 minutes M = Maximum flow pressure

0050

P1

FORM 183-RI—PRINTED IN U.S.A.

SPECIAL PRESSURE DATA

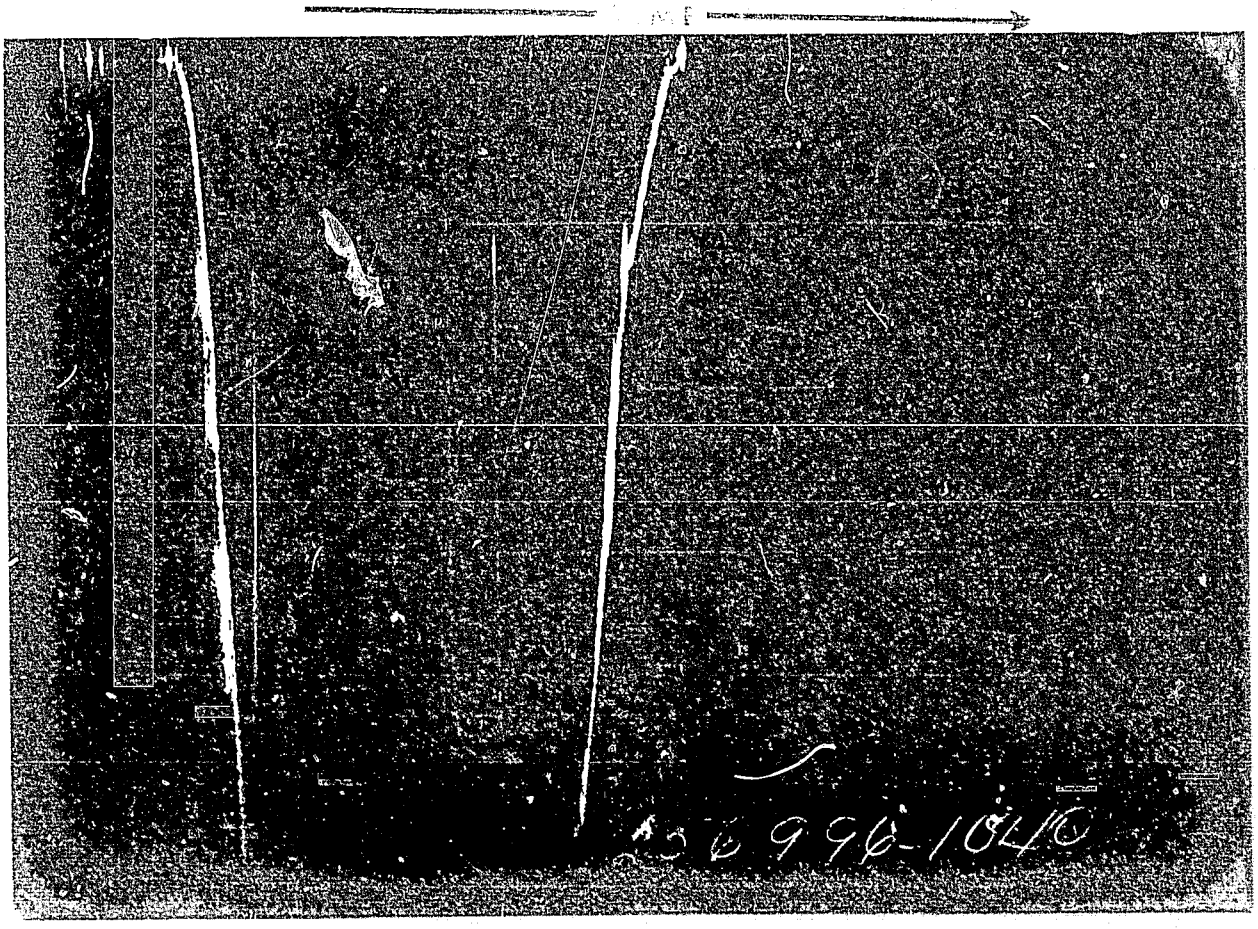
LITTLE'S 96673 75C 8/74

TICKET NO. 256995 0051



	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing				
Drill Collars				
Reversing Sub	4.12"	2.25"	4.33'	
Water Cushion Valve				
Drill Pipe Tubing	3.5"	2.992"	8569.44'	
Drill Collars	4.25"	1.5"	89.29'	
Handling Sub & Choke Assembly				
Dual CIP Valve	3 7/8"	.87"	6.959'	
Dual CIP Sampler				
Hydro-Spring Tester	3.875"	.62"	6.12'	8670'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	3.875"	3"	5.92'	8679.08'
Hydraulic Jar				
VR Safety Joint				
Pressure Equalizing Crossover				
Packer Assembly				
Distributor				
Packer Assembly	6.75"	-	-	8680'
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor	3.75"	1.75"	10'	
Blanked-Off B.T. Running Case	3.875"	3"	4.16'	8697'
Total Depth				9676'





0053

FLUID SAMPLE DATA			
Sampler Pressure	P.S.I.G. at Surface		
Recovery: Cu. Ft. Gas			
cc. Oil			
cc. Water			
cc. Mud			
Tot. Liquid cc.			
Gravity	° API @	°F.	
Gas/Oil Ratio		cu. ft./bbl.	
	RESISTIVITY	CHLORIDE CONTENT	
Recovery Water	@ °F.	ppm	
Recovery Mud	@ °F.	ppm	
Recovery Mud Filtrate	@ °F.	ppm	
Mud Pit Sample	@ °F.	ppm	
Mud Pit Sample Filtrate	@ °F.	ppm	
Mud Weight	9.6	vis sec.	

Date	3-5-81
Ticket Number	256996
Kind of D.S.T.	CASED HOLE
Halliburton Location	ADELAIDE
Tester	M. PARSONS
Witness	G. HUGHES
Drilling Contractor	O. D. E. RIG #5 SM-VT

EQUIPMENT & HOLE DATA			
Formation Tested	-		
Elevation	175'		Ft.
Net Productive Interval	74' (9490'-9568'		Ft.
All Depths Measured From	Rotary Kelly Bushing		
Total Depth	9676'		Ft.
Main Hole/Casing Size	7"		
Drill Collar Length	89.48'	I.D. 1.5"	
Drill Pipe Length	9358.77'	I.D. 2.992"	
Packer Depth(s)	9470'		Ft.
Depth Tester Valve	9458.54'		Ft.

Cushion TYPE WATER AMOUNT 800 Ft. Depth Back Pres. Valve — Surface Choke .5" — Bottom Choke .625"

Recovered — Feet of

Recovered — Feet of

Recovered — Feet of

Recovered — Feet of

Recovered — Feet of

Meas. From Tester Valve

Remarks -SEE PRODUCTION TEST DATA SHEET-

* See attached incremental pressure sheet

TEMPERATURE	Gauge No. 1744 Depth: 9464.5' Ft.		Gauge No. 1040 Depth: 9483.4' Ft.		Gauge No. Depth: Ft.		TIME (00:00-24:00 hrs.)	
	72 Hour Clock		72 Hour Clock		Hour Clock		Tool	
Est. °F.	Blanked Off NO		Blanked Off YES		Blanked Off		Opened 0441	
Actual 210 °F.	Pressures		Pressures		Pressures		Opened Bypass 0024	
	Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic	4573.6	4658.2	4624.3	4691.7				
First Period Flow Initial	226.6	267.1	218.0	229.8			—	—
First Period Flow Final	904.2	919.6	900.0	920.6			714	*
First Period Closed in	-	4249.3	-	4258.4			174	*
Second Period Flow Initial	-	1139.1	-	1112.2			—	—
Second Period Flow Final	-	1241.9	-	1112.2			1	*
Second Period Closed in	4227.7	4288.8	4239.7	4295.1			294	*
Third Period Flow Initial							—	—
Third Period Flow Final								
Third Period Closed in								
Final Hydrostatic	4587.9	4653.2	4609.5	4697.6			—	—

FORM 181-R2 – PRINTED IN U.S.A.

FORMATION TEST DATA

LITTLE'S

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Legal Location Sec. - Twp. - Rng. 27° 33' 56.08" SOUTH 140° 7' 52.99" EAST

Lease Name MOORARI | Well No. 3 | Test No. 9 | Tested Interval 9470'-9676'

Field Area COOPER BASIN

County

State SOUTH AUSTRALIA

Lease Owner/Company Name DELHI/SANTOS LIMITED

Casing perfs.____ Bottom choke____ Surf. temp____ °F Ticket No. 256996
Gas gravity____ Oil gravity____ GOR____
Spec. gravity____ Chlorides____ ppm Res.____ @____ °F
INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED____

Date 3-5-81 Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
3-4-81 1900					Loaded bt.
1930					Tools made up.
5-3-81 2400					Ran tools in hole.
0430					Headed up to manifold.
0437					Set packer.
0441	.5"				Opened tool with very weak bubble.
0442	"				Very weak but gradual increase.
0443	"				" " " " "
0445	"				" " " " "
0447	"				Moderate blow increasing to strong.
0449					Strong blow still increasing gradually.
0454	"				Strong and steady blow.
0515	"				Strong blow with gas to surface.
0634	"				Slight buildup on psi with very light
					trace of condensate.
0646	"				Slight decrease in psi but still
					strong blow.
0649	"				Still slightly decreasing.
0650	"				Very slight increase then steadied out.
0704	"				" " " " " "
0716	"	2			Still increasing.
0733	"	0			Slight decrease.
0741	"	2			Strong blow and increasing in psi.
0750	"	3			Still increasing in psi.
0758	"	5			Steady blow.
0801	"	5			Slight decrease to 5 psi.

Casing perfs._____ Bottom choke_____ Surf. temp_____ °F Ticket No. 256996
Gas gravity_____ Oil gravity_____ GOR_____
Spec. gravity_____ Chlorides_____ ppm Res._____ @_____ °F
INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED_____

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
0803	.5"	6			Increasing to 6 psi.
0809	"	7			Slight increase.
0811	"	6			Slightly increasing.
0814	"	8			Increase in pressure.
0818	"	6			Decreasing.
0819	"	9			Increasing slowly.
0820	"	10			" "
0821	"	14			" "
0842	"	12-14			Slightly surging.
0924	"	20			Increasing slowly.
0956	"	22			" "
1001	"	26			
1007	"	14			Surging.
1009	"	30			Oil slug to surface.
1016	"	20			Decreasing psi, no fluid.
1017	"	30			Oil and water cushion slug to surface.
1029	"	40-50			Increasing.
1035	"	80-90			"
1039	"	110-120			"
1048	"	130			Steady psi.
1103	"	155			Increasing.
1130	"	90			Decreasing.
1205	"	125			Fluctuating with oil and water cushion.
1215	"	95			Slugs coming to surface.
1359	"	95			Pressures fluctuated between 70 and 90.
1403	"	110			Increase in psi.

Casing perfs._____ Bottom choke_____ Surf. temp._____ °F Ticket No. 256996
Gas gravity_____ Oil gravity_____ GOR_____
Spec. gravity_____ Chlorides_____ ppm Res._____ @_____ °F
INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED_____

Date Time a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
1407	.5"	115			Increase in psi.
1440	"	120			Oil surging to surface.
1451	"	115			Decreasing.
1505	"	105			Decreasing with gas and no oil to
					surface.
1511	"	90			Decreasing with only gas to surface.
1621	"	65			Decreasing.
1635	"				Tool shut in.
1744					Dropped reverse circulating valve
					and it didn't work.
1929					Reversed out through dual CIP.
0024					Tools shut in.
0025					Packer free.
0700					Tools out of hole.

FORM 182-RI—PRINTED IN U.S.A.

PRODUCTION TEST DATA

LITTLE'S 96672 3M 8/74

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DELHI SANTOS LIMITED
Lease Owner/Company Name

256996
Ticket Number

B.T. 1744 B.T. 1040 B.T. _____

Depth 9464.5' Depth 9483.4' Depth _____

Time (minutes)	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time (minutes)	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time (minutes)	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.
First flow period			First flow period					
0		267.1	0		229.8			
100		570.0	100		559.7			
200		826.1	200		820.6			
300		1062.9	300		1059.0			
347.1M		1142.9	350.4M		1152.2			
400		933.4	400		962.8			
500		877.7	500		870.4			
600		916.5	600		932.5			
700		880.6	700		875.8			
717.2		919.6	718.1		920.6			
First CIP			First CIP					
0		919.6	0		920.6			
15		4008.4	15		3745.3			
30		4066.9	30		4039.3			
45		4136.7	45		4135.2			
60		4173.5	60		4176.0			
75		4194.4	75		4199.6			
90		4216.3	90		4216.4			
105		4222.9	105		4229.0			
120		4230.7	120		4238.2			
135		4237.5	135		4245.7			
150		4245.4	150		4252.7			
166.3		4249.3	167.5		4258.4			
Second flow period			Second flow period					
0		1139.1	0		1112.2			
3.5		1241.9	3.2		1112.2			
Second CIP			Second CIP					
0		1241.9	0		1112.2			
20		4126.1	20		4053.7			
40		4202.7	40		5203.7			
60		4233.3	60		4238.6			
80		4248.7	80		4253.8			
100		4257.6	100		4264.2			
120		4263.5	120		4270.6			
140		4269.2	140		4275.1			
160		4272.6	160		4280.2			
180		4276.2	180		4283.3			
200		4279.3	200		4286.1			
220		4281.4	220		4288.6			
Second CIP continued			Second cip continued					

Remarks: M=MAXIMUM FLOW

80-2860

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DELHI SANTOS LIMITED
Lease Owner/Company Name

256996
Ticket Number

B.T. 1744 B.T. 1040 B.T. _____

Depth 9464.5' Depth 9483.4' Depth _____

Time (minutes)	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time (minutes)	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time (minutes)	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.
Second	CIP continued		Second	CIP continued				
240		4283.1	240		4290.4			
260		4285.3	260		4291.7			
280		4288.8	280		4294.4			
293.4		4288.8	293.9		4295.1			

Remarks: _____

80-2860

12

TICKET NO. 256996

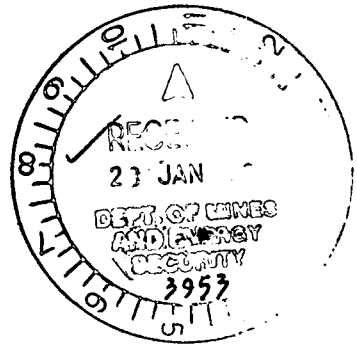


	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing				
Drill Collars				
Reversing Sub	3.5"	2.75"	4.31'	
Water Cushion Valve				
Drill Pipe TUBING	3.5"	2.992"	9358.77'	
Drill Collars	4.25"	1.5"	89.48'	
Handling Sub & Choke Assembly				
Dual CIP Valve	3.875"	.87"	5.98'	
Dual CIP Sampler				
Hydro-Spring Tester	3.875"	.62"	5.06'	9458.54'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	3.875"	3.00"	4.57'	9464.5'
Hydraulic Jar				
VR Safety Joint				
Pressure Equalizing Crossover				
Packer Assembly	5.5"	2.185"	3.61'	9470'
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
X/O	2.8"	1.8"	.56"	
Flush Joint Anchor	3.1"	1.75"	10.00'	
Blanked-Off B.T. Running Case	3.875"	3.00"	4.14'	9483.4
Total Depth				9676'

3953 R11

0060

RESERVOIR FLUID STUDY
for
SANTOS OIL AUSTRALIA LTD
AUSTRALIA



Reservoir Fluid Division

CORE LAB

24A LIM TECK BOO ROAD, SINGAPORE 1953. TELEX: RS21423 TEL: 282 1222

CORE LABORATORIES
Reservoir Fluid Division

M/S SANTOS OIL AUSTRALIA LTD
183 Melbourne Street
North Adelaide 5006
AUSTRALIA

January 6, 1980

ATTENTION : MR H PANACEK/C SELIN

SUBJECT: RESERVOIR FLUID STUDY
MOORARI NO 3
AUSTRALIA
SFL 81056

Gentlemen

Sub-surface fluid samples were collected from the subject well during the period June 22, 1981 to June 23, 1981 and forwarded to our Singapore laboratory for use in a reservoir fluid study. The samples were subjected to preliminary quality checks, the results of which can be on page two.

The sub-surface sample was analysed through heptanes plus using low temperature fractional distillation and routine chromatography. The compositional analysis can be found on page three.

A known volume of the fluid was transferred to a high pressure visual cell and thermally expanded to the reported reservoir temperature of 275°F after which a constant composition expansion was performed. During this analysis the saturation pressure was found to be 2946 psig at 275°F. The resultant volumetric data is reported on page five. The fluid was then repressurised into a single phase and the volume of the sample in the cell was measured at saturated pressure. The fluid was then subjected to a constant volume depletion study. This consisted of several pressure expansion followed by constant pressure displacements with each displacement terminating at the original volume of sample at saturation pressure. The volume of liquid phase was measured throughout this study and is reported on page eleven.

A much larger portion of the fluid was charged to another visual high pressure cell which had been pre-heated to 275°F. The sample was then subjected to another constant volume depletion study as described above. During this analysis, the composition and the gas deviation factors of the equilibrium gas phase were measured. This data is tabulated on pages eight, nine and eleven respectively. This compositional and volumetric data was then used to calculate the quantities of plant products that can be expected from gas phase production as reservoir pressure decline. These calculation were made assuming one million standard cubic feet of gaseous reservoir fluid were originally in phase at bubble point pressure. These results are reported on page ten.

cont..2/-

One set of theoretical flash calculation were performed to simulate surface separator recoveries using separator conditions as shown along with the resulting data on page twelve.

The viscosity of the fluid was measured at 275°F over a wide range of pressure using a rolling ball viscosimenter. The viscosity varied from a minimum of 0.160 centipoise @ saturation pressure to a maximum of 0.582 centipoise at atmospheric pressure. These results can be located on page six of the report.

We wish to thank you for this opportunity to perform this study for you. If you should have any questions regarding this data or if we may be of further assistance, please do not hesitate to contact us.

Very truly yours

John Savickas

JOHN SAVICKAS
Manger
Singapore Reservoir Fluid Laboratory

encl: 7 copies

JS/sl/mh

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering

0063

File SFL 81056

Company SANTOS OIL AUSTRALIA LTD Date Sampled JUNE 23, 1981

Well MOORARI NO 3 State

Field MOORARI Country

FORMATION CHARACTERISTICS

Formation Name	
Date First Well Completed	, 19
Original Reservoir Pressure	PSIG @ Ft.
Original Produced Gas-Oil Ratio	SCF/Bbl
Production Ratio	Bbl/Day
Separator Pressure and Temperature	PSIG °F.
Oil Gravity at 60°F.	°API
Datum	Ft. Subsea
Original Gas Cap	

WELL CHARACTERISTICS

Elevation	Ft.
Total Depth	Ft.
Producing Interval	Ft.
Tubing Size and Depth	In. to Ft.
Productivity Index	Bbl/D/PSI @ Bbl/Day
Last Reservoir Pressure	3899 PSIG @ 9516 Ft.
Date	, 19
Reservoir Temperature	275 °F. @ 9516 Ft.
Status of Well	
Pressure Gauge	
Normal Production Rate	Bbl/Day
Gas-Oil Ratio	SCF/Bbl
Separator Pressure and Temperature	PSIG, °F.
Base Pressure	PSIA
Well Making Water	% Cut

SAMPLING CONDITIONS

Sampled at	Ft.
Status of Well	FLOWING
Gas-Oil Ratio	2087 SCF/Bbl
Separator Pressure and Temperature	*106 PSIG, 49 °F.
Tubing Pressure	PSIG
Casing Pressure	PSIG
Sampled by	
Type Sampler	

REMARKS:

*Average conditions over three day sampling period.

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Petroleum Reservoir Engineering

SUMMARY OF SAMPLES RECEIVED IN LABORATORY

BOTTOM HOLE SAMPLES

Laboratory Bubble Point Pressure

Cylinder Nos	Pressure PSIG	Temperature °F	Sample Vol cc
SN 1042/81	-	-	80
SN 1041/81	2930	275	490
SN 1043/81	2930	275	490

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CORE LABORATORIES
Petroleum Reservoir Engineering

HYDROCARBON ANALYSIS OF RESERVOIR FLUID SAMPLE

Component	Mol Percent	Weight Percent	Density Gm/Cc @ 60°F	°API @ 60°F	Molecular Weight
Hydrogen Sulfide	0.00	0.00			
Carbon Dioxide	17.71	14.03			
Nitrogen	1.31	0.66			
Methane	31.20	9.01			
Ethane	11.84	6.41			
Propane	9.44	7.49			
Iso-Butane	1.68	1.76			
N-Butane	4.62	4.84			
Iso-Pentane	1.32	1.72			
N-Pentane	2.13	2.76			
Hexanes	2.25	3.48			
Heptanes plus	16.50	47.84	0.8129	42.4	161
	100.00	100.00			

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CORE LABORATORIES
Petroleum Reservoir Engineering

File SFL-81056
Well MOORARI NO 3

VOLUMETRIC DATA OF RESERVOIR FLUID SAMPLE

1 Saturation pressure (bubble-point pressure) 2946 PSIG @ 275 °F

2 Specific volume at saturation pressure : ft 3/lb 0.03375 @ 275 °F

3 Thermal expansion of saturated oil @ 5000 PSIG = $\frac{V@\ 275\ ^{o}F}{V@\ 70\ ^{o}F}$ = 1.22487

4 Compressibility of saturated oil @ reservoir temperature : Vol/Vol/PSI:

From 5000 PSIG to 4000 PSIG = 44.17×10^{-6}

From 4000 PSIG to 2946 PSIG = 73.78×10^{-6}

From _____ PSIG to _____ PSIG = _____

From _____ PSIG to _____ PSIG = _____

From _____ PSIG to _____ PSIG = _____

From _____ PSIG to _____ PSIG = _____

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CORE LABORATORIES
Petroleum Reservoir Engineering

PRESSURE-VOLUME RELATIONS OF RESERVOIR FLUID AT 275°F

Pressure PSIG	Relative Volume	Y Function	Density Gm/Cc
5000	0.8815		0.5384
4500	0.8997		0.5275
4000	0.9222		0.5146
3500	0.9511		0.4990
3300	0.9664		0.4911
3200	0.9747		0.4867
3100	0.9836		0.4825
3000	0.9942		0.4774
2946	1.0000		0.4746
2925	1.0037		
2879	1.0159		
2790	1.0389		
2633	1.0850	1.391	
2435	1.1544	1.351	
2228	1.2474	1.294	
1988	1.3873	1.235	
1745	1.5747	1.187	
1469	1.8802	1.131	
1189	2.3512	1.080	
872	3.3018	1.016	
629	4.7203	0.967	

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CORE LABORATORIES
Petroleum Reservoir Engineering

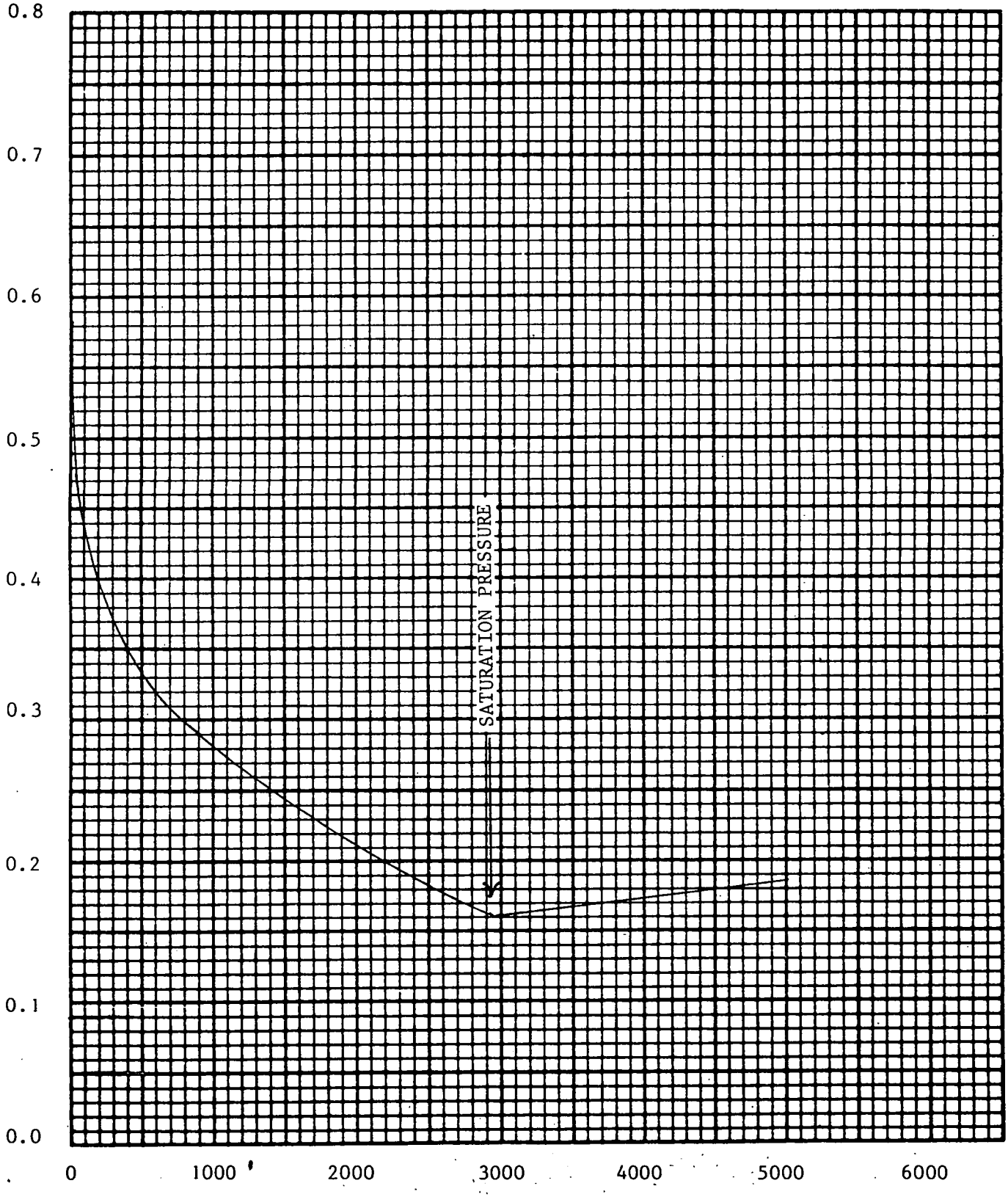
VISCOSITY DATA AT 275°F

Pressure PSIG	Oil Viscosity Centipoise
5000	0.185
4500	0.179
4000	0.174
3500	0.170
3100	0.161
2946	0.160
2900	0.162
2850	0.166
2800	0.168
2600	0.178
2500	0.184
2100	0.208
1700	0.233
1300	0.257
900	0.288
600	0.315
0	0.582

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VISCOSITY OF RESERVOIR FLUID AT 275°F

Company SANTOS OIL AUSTRALIA LTD Formation
Well MOORARI NO 3 State
Field MOORARI Country AUSTRALIA



CORE LABORATORIES
Petroleum Reservoir Engineering

File SFL 81056
Well MOORARI NO 3

DEPLETION STUDY AT 275°F

Hydrocarbon Analyses of Produced Gas Phase - Mol Percent

	Reservoir Pressure - PSIG							
Component	2946	2500	2100	1700	1300	900	600	600*
Hyrogen Sulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Carbon Dioxide	17.71	21.05	22.75	23.02	22.70	21.30	20.14	5.90
Nitrogen	1.31	1.80	1.96	1.94	1.80	1.60	1.46	0.09
Methane	31.20	36.89	38.73	39.86	40.61	40.74	39.74	6.18
Ethane	11.84	12.20	12.85	13.39	13.85	14.74	15.10	5.75
Propane	9.44	9.52	9.28	9.53	9.62	9.99	10.63	8.18
Iso-Butane	1.68	1.60	1.55	1.53	1.54	1.59	1.68	1.92
N-Butane	4.62	4.25	4.01	3.90	3.90	4.10	4.41	6.13
Iso-Pentane	1.32	1.12	1.02	0.93	0.90	0.94	1.05	2.28
N-Pentane	2.13	1.78	1.57	1.41	1.36	1.39	1.56	4.00
Hexanes	2.25	1.78	1.45	1.23	1.10	1.08	1.14	5.18
Heptanes plus	16.50	8.01	4.83	3.26	2.62	2.53	3.09	54.39
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Molecular weight of heptanes plus	161	118	110	106	105	105	107	162
Density of heptanes plus	0.813	0.750	0.744	0.737	0.735	0.735	0.739	0.814

Deviation Factor - Z

Equilibrium gas		0.767	0.783	0.803	0.838	0.884	0.920	
Gas Phase produced - Cumulative percent of initial		10.042	20.503	32.008	43.686	55.767	64.868	

*Composition of equilibrium liquid phase.

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INSTANTANEOUS GPM FROM SMOOTHED PRODUCED GAS PHASE COMPOSITION

	Reservoir Pressure - PSIG						
	2946	2500	2100	1700	1300	900	600
Ethane plus	0	13.442	11.491	10.710	10.481	10.874	11.668
Propane plus	0	10.198	8.075	7.150	6.798	6.955	7.653
Butane plus	0	7.594	5.536	4.542	4.166	4.222	4.744
Pentane plus	0	5.741	3.775	2.822	2.443	2.420	2.816

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CALCULATED CUMULATIVE RECOVERY DURING DEPLETION
(PER MMSCF OF ORIGINAL FLUID)

Reservoir Pressure PSIG	Gas Phase MSCF	Plant Products in Gas Phase- Gallons			
		Ethane	Propane	Butane	Pentane plus
2946	0	0	0	0	0
2500	100.42	326	262	186	577
2100	205.03	683	527	370	971
1700	320.08	1093	827	568	1296
1300	436.86	1523	1135	769	1581
900	557.67	1996	1465	987	1874
600	749.25	2362	1729	1162	2130

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CORE LABORATORIES
Petroleum Reservoir Engineering

SUMMARY OF LIQUID PHASE DATA

Pressure PSIG	Liquid Volume Percent (1)	Relative Liquid Volume (2)	Gas in Solution SCF/BBL(3)	Density Gm/Cc
2946	100.0	4.350	4914	0.4746
2900	87.8	3.819		
2800	76.2	3.314		
2600	65.3	2.840		
2500	62.5	2.719	2753	0.5637
2100	54.8	2.384	2193	0.5943
1700	49.1	2.136	1787	0.6177
1300	43.8	1.905	1620	0.6479
900	39.1	1.701	1329	0.6771
600	35.8	1.557	830	0.6973
0	23.8	1.153		
	at 60°F =	1.000	0	

Properties of Zero psig residual liquid

API	41.1
Specific gravity @ 60/60°F	0.8198
Molecular weight	166

(1) Liquid volume is percentage of hydrocarbon pore space.
(2) Relative liquid volume is barrels of liquid phase at indicated pressure and 275°F of residual oil at 60°F.
(3) Gas in solution is expressed as cubic feet of gas at 14.73 psia and 60°F per barrel of residual oil at 60°F.

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RESULTS OF SEPARATOR CALCULATION USING WELL STREAM COMPOSITION

Primary gas/well stream ratio	506.01	MSCF/MMSCF
Second stage gas/well stream ratio	198.47	MSCF/MMSCF
Tank gas/well stream ratio	59.09	MSCF/MMSCF
Tank liquid/well stream ratio	303.1	Bbl/MMSCF
Primary gas/Tank liquid ratio	1155.7	SCF/Bbl
Second stage gas/tank liquid rate	583.52	SCF/Bbl
Tank gas/tank liquid rate	194.99	SCF/Bbl
Tank liquid gravity at 60°F	51.5	
Formation Volume factor at 2946 psig	2.9027	

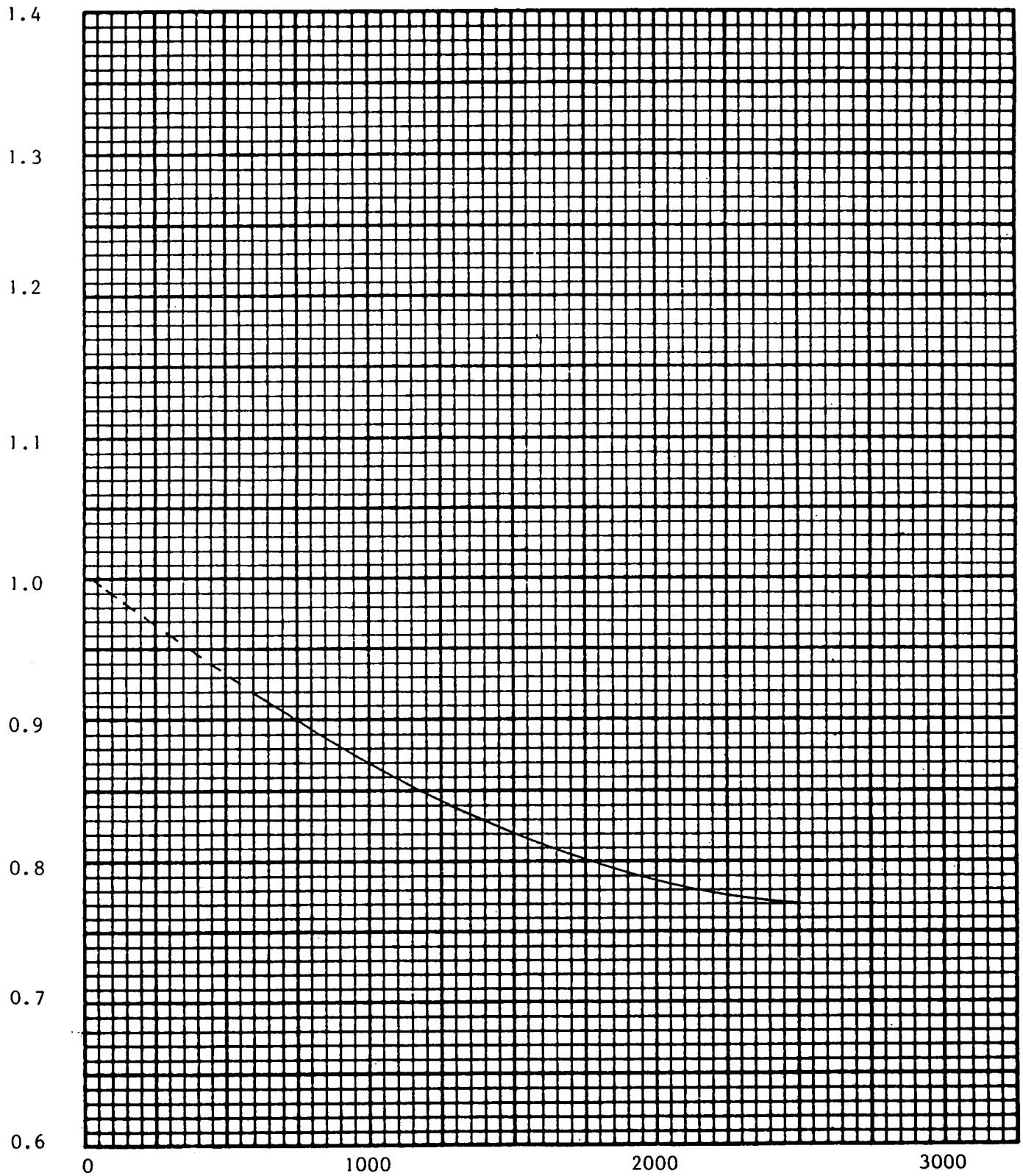
Separator Conditions:-

Primary separator	1000 psig @ 150°F
Secondary separator	110 psig @ 110°F
Stock tank	0 psig @ 80 °F

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DEVIATION FACTOR Z OF GAS PHASE DURING DEPLETION AT 275°F

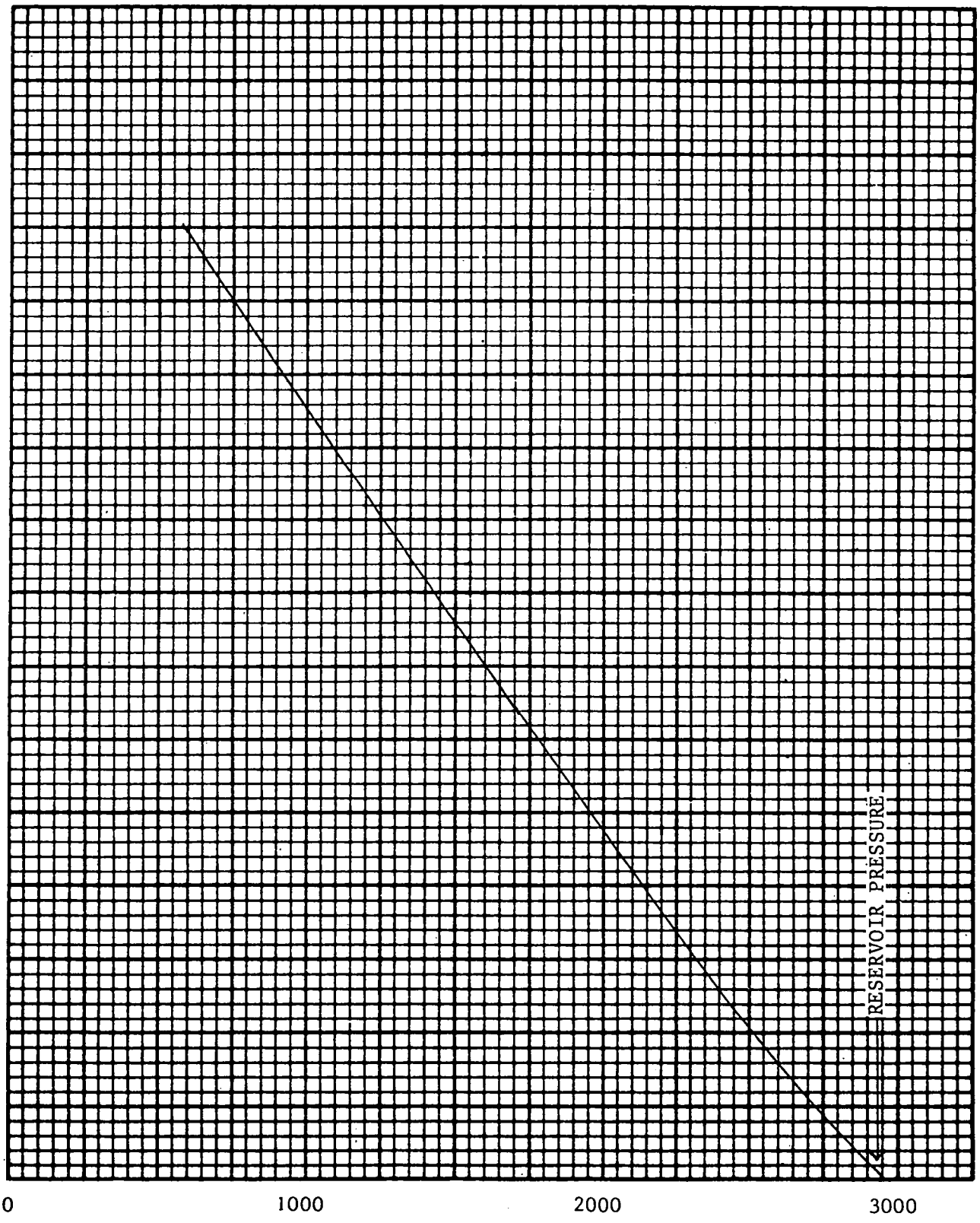
Company SANTOS OIL AUSTRALIA LTD
Formation
Well MOORARI NO 3
State
Field MOORARI
Country AUSTRALIA



VOLUME OF GAS PHASE PRODUCED DURING DEPLETION AT 275°F

0076

Company SANTOS OIL AUSTRALIA LTD
Formation
Well MOORARI NO 3
State
Field MOORARI
Country AUSTRALIA



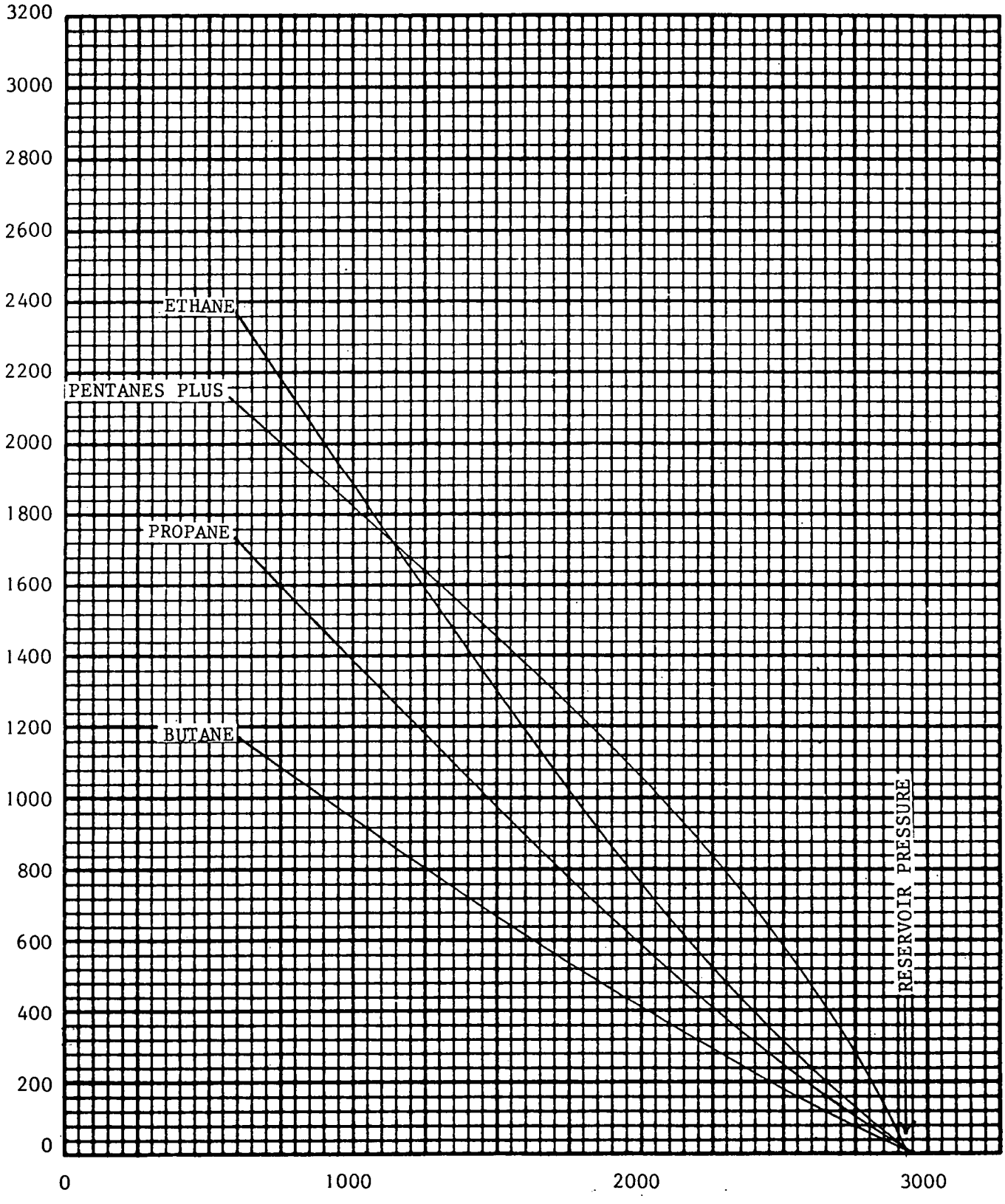
GAS PHASE PRODUCED : PERCENT

PRESSURE : POUNDS PER SQUARE INCH GAUGE

CUMULATIVE RECOVERY - PLANT PRODUCTS IN PRODUCED GAS PHASE

0077

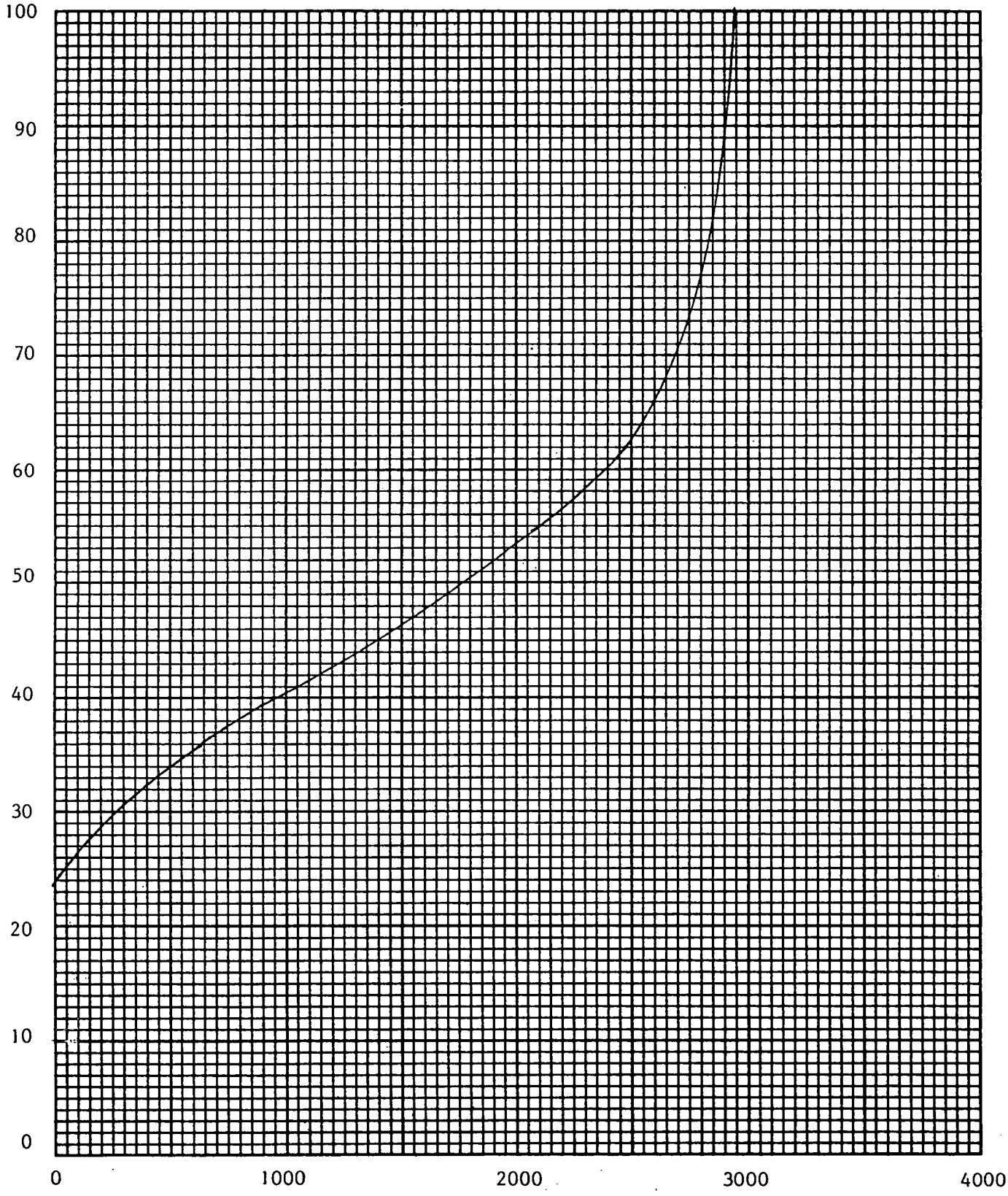
Company SANTOS OIL AUSTRALIA Formation
Well MOORARI NO 3 State
Field MOORARI Country AUSTRALIA



LIQUID VOLUME DURING DEPLETION AT 275°F

0078

Company SANTOS OIL AUSTRALIA LTD
Well MOORARI NO 3
Field MOORARI
Formation
State
Country AUSTRALIA



3953 R12

0079

24A LIM TECK BOO ROAD, SINGAPORE 1953. TELEX: RS21423 TEL: 282 1222

CORE LABORATORIES
Reservoir Fluid Division

M/S SANTOS LTD
183 Melbourne Street
North Adelaide 5006
AUSTRALIA

January 21, 1982

ATTENTION: MR PANACEK/C SELIN

SUBJECT: THEORETICAL STOCK TANK
ANALYSIS
MOORARI 3
AUSTRALIA
SFL 81056A

Gentlemen

After completion of a volatile oil study, there was insufficient sample to conduct experimental separator analysis. Therefore, it was agreed with a representative of your firm to perform a computer model at specified pressures and temperatures and to report composition and density at these condition.

We wish to thank you for the opportunity to be of service to you. If you should require further information or if we can be of any assistance, please do not hesitate to contact us.

Very truly yours

John Savickas

JOHN SAVICKAS
Manager
Singapore Reservoir Fluid Laboratory

encl: 7 copies

JS/sl/mh

CORE LABORATORIES
Petroleum Reservoir Engineering

File SFL 81056A
Well MOORARI 3

sampled Data

THEORETICAL SEPARATOR COMPOSITION

Component	Well Stream	Separator Gas At 550 psig and 100°F	Stock Tank Oil 0 psig @ 60°F	Density
Hydrogen Sulfide	0.00	0.00	0.00	
Carbon Dioxide	17.71	25.09	0.30	
Nitrogen	1.31	2.37	0.00	
Methane	31.20	50.74	0.10	
Ethane	11.84	13.14	0.87	
Propane	9.44	5.99	3.92	
Iso-Butane	1.68	0.63	1.73	
N-Butane	4.62	1.40	6.30	
Iso-Pentane	1.32	0.21	3.12	
N-Pentane	2.13	0.28	5.70	
Hexanes	2.25	0.14	7.94	
Heptanes plus	16.50	0.01	70.02	0.7745*
	100.00	100.00	100.00	

*Density of heptanes plus at 0 psig and 60°F.

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CORE LABORATORIES
Petroleum Reservoir Engineering

File SFL 81056A
Well MOORARI 3

THEORETICAL SEPARATOR COMPOSITION

Component	Well Stream	Separator Gas At 550 psig and 100°F	Separator Gas At 100°F and 40 °F	Stock Tank Oil at 0 psig and 40°F	Density
Hydrogen Sulfide	0.00	0.00	0.00	0.00	
Carbon Dioxide	17.71	25.09	29.95	0.21	
Nitrogen	1.31	2.37	0.44	0.00	
Methane	31.20	50.74	36.99	0.03	
Ethane	11.84	13.14	20.33	0.98	
Propane	9.44	5.99	9.17	5.59	
Iso-Butane	1.68	0.63	0.83	2.35	
N-Butane	4.62	1.40	1.71	8.18	
Iso-Pentane	1.32	0.21	0.21	3.56	
N-Pentane	2.13	0.28	0.26	6.25	
Hexanes	2.25	0.14	0.10	7.91	
Heptanes plus	16.50	0.01	0.01	64.94	0.7658*
	100.00	100.00	100.00	100.00	

*Density of heptanes plus at 0 psig and 40°F.

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3953 R13

0082

MOORARI #3

FLOW/BUILDUP TEST

PRIOR TO FRACTURE TREATMENT

17/4/81 - 27/6/81

By: R.R. Quick

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Field Test Data

WP: 6057A

INTRODUCTION

An extended flow/buildup survey was conducted in Moorari #3 between April and June, 1981. The purpose of this test was to establish permeability - thickness and skin effects prior to the proposed fracture treatment; in this way, the fracture treatment can be best evaluated.

RESULTS

The drawdown portion of the test was not amenable to accurate analysis (see fig #4). The buildup portion of the test was analysed in three ways a "type curve" (log-log) plot was prepared first (fig #1). Then a Horner plot (fig #2) was prepared and finally, an Odeh-Jones (multirate) plot was prepared (fig #3).

The results of the analyses were as follows:

Plot	kh	Skin	P Skin	D.R.	P*	P.I.
Type curve	36md-ft	N/A	N/A	N/A	N/A	N/A
Horner	23.4md-ft	-2.2	-1030psi	0.67	4285psia	0.15 BPD/PS
Odeh-Jones	25.6md-ft	-2.2	-1010psi	0.67	4275psia	0.15 BPD/PS

Note The "type curve" is used for determining the beginning of the semilog straight line for the Horner plot. It should not be relied upon to yield accurate kh or Skin results.

CONCLUSIONS

Although the results from the analysis of the Horner and Odeh-Jones plots are in good agreement, the calculated skin values of -2.2 appear suspicious; it is very likely that the true effective flow capacity is higher than calculated, but the correct slope is masked by multi-layer effects. As the well had not been fracture stimulated at the time the test was conducted, it is highly unlikely the skin effect could be negative.

RECOMMENDATIONS

A similar flow/buildup test should be conducted after the fracture treatment, in order to evaluate that treatment.

DISCUSSION

The well was flowed to clean up on a 16/64" choke for 48 hours (17 April - 19 April 1981); the average rate was 235 BOPD at 969 psig F.W.H.P. with a producing G.O.R. of 2720 cu ft/bbl. The well was then closed in for 97 hours to allow the pressure to return to near reservoir pressure, and the test proper was commenced.

Amerada bombs were run in the hole and the well opened on 16/64" choke at 1245 hours on 24 April 1981: the well was flowed on this choke setting for 154 hours, at an average rate of 288 BOPD, average F.W.H.P. of 943 psig and an average producing G.O.R. of 2350 cu ft/bbl at an average separator pressure of 110 psig.

The well was shut in at 2245 hours, 30th April 1981, and the buildup monitored continuously until 0545 hours on 23 May, 1981 (a total of 535 hours). Due to weather conditions, the bombs could not be retrieved until 1300 hours, 2 June, 1981.

Although the flow capacity and skin, as calculated by the Horner and Odeh-Jones plots, are in very good agreement, they must be considered suspect. The first 7 data points plotted in each case are behaving as a conventional buildup with wellbore storage effects and, possibly, some skin. This is also evident in the "type curve" plot. However, after this time, a second, tighter layer begins to dominate the buildup, preventing the development of the "true" seimlog straight line for the total contributing system.

From the "type curve", it is evident that the data points between 4 and 6 hours probably lie on the correct semilog straight line, and should be analysed for kh and skin. As this data covers a mere two-hour period of the buildup, any attempt at quantitative analysis would be meaningless; suffice to say that the "true" slope is flatter than that shown, and accordingly the "true" kh of the system is higher than calculated, as is the skin (i.e. the "true" skin is probably near zero).

TABLE I

DATA SUMMARY

Common Data

Item	Value	Source
ϕ	0.108	log evaluation
Net Pay	72'	log evaluation
μ	0.09cp	estimated (c.f. Tirrawarra field)
CT	$5 \times 10^{-5} psi^{-1}$	estimated (c.f. Tirrawarra field)
Bo	3 RB/STB	estimated (c.f. Tirrawarra field)
q_{AVE}	288.3 BOPD	calculated from data sheets
q_N	308.5 BOPD	data sheets (last flow rate recorded)
P_{wf}	2254 psia	data sheets (last measured FBHP)
r_w	0.354 ft	bit size

Type Curve

Matched on S=0 line

ΔPm = 305 psi , $P_{Dm} = 10^0$

Δtm = 170 hrs , $t_{Dm} = 10^5$

Horner Plot

P* = 4285 psia

m = 550 psi/cycle

Pwsl = 3090 psia

Odeh-Jones Plot

P* = 4275 psia

m^1 = 530 psi/cycle

α = 2.13

Pwsα = 3138 psia

TABLE II

EQUATION SUMMARY

Common Equations

$$\Delta P_{SKIN} = \frac{mS}{1.151}$$

$$D.R. = \frac{P^*-Pwf}{P^*-Pwf-\Delta P_{SKIN}}$$

$$P.I. = \frac{qN}{P^*-Pwf}$$

Type Curve

$$kh = 141.2\ q_{ave}\ \mu B \frac{PDm}{\Delta Pm\ Pm}$$

Horner Plot

$$kh = \frac{162.6\ q_{ave}\ \mu B}{m}$$

$$S = 1.151\left[\frac{Pwsl-Pwf}{m} - \log\left(\frac{k}{\phi u c_T t_w^2}\right) + 3.228\right]$$

Odeh-Jones Plot

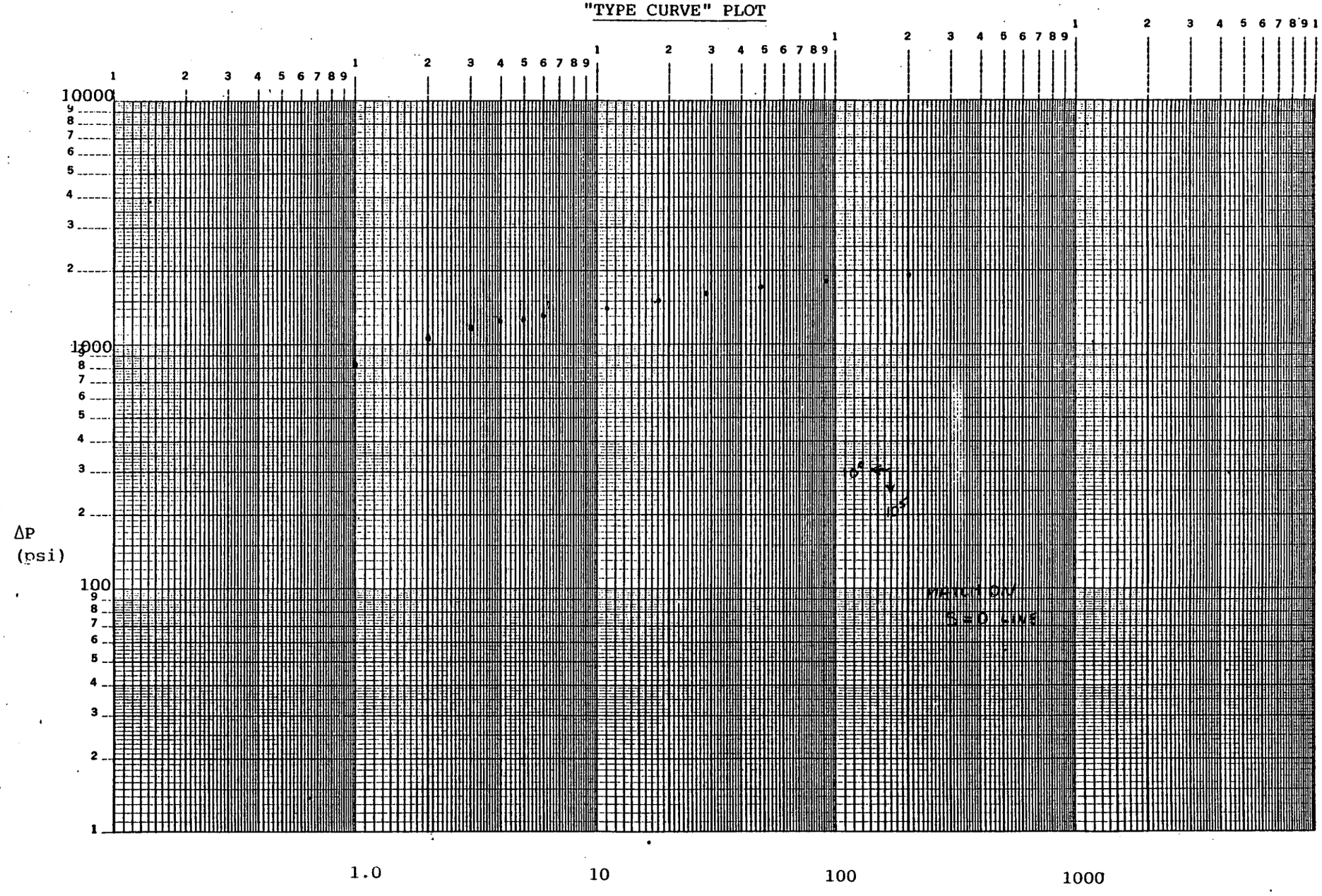
$$kh = \frac{162.6\ q_N\ \mu\ B}{m}$$

$$S = 1.151\left[\frac{Pwsl-Pwf}{m^1} - \log\left(\frac{k}{\phi u c_T r_w^2}\right) + 3.228\right]$$

MOORARI #3 PRE FRAC BUILDUP

"TYPE CURVE" PLOT

Figure 1.



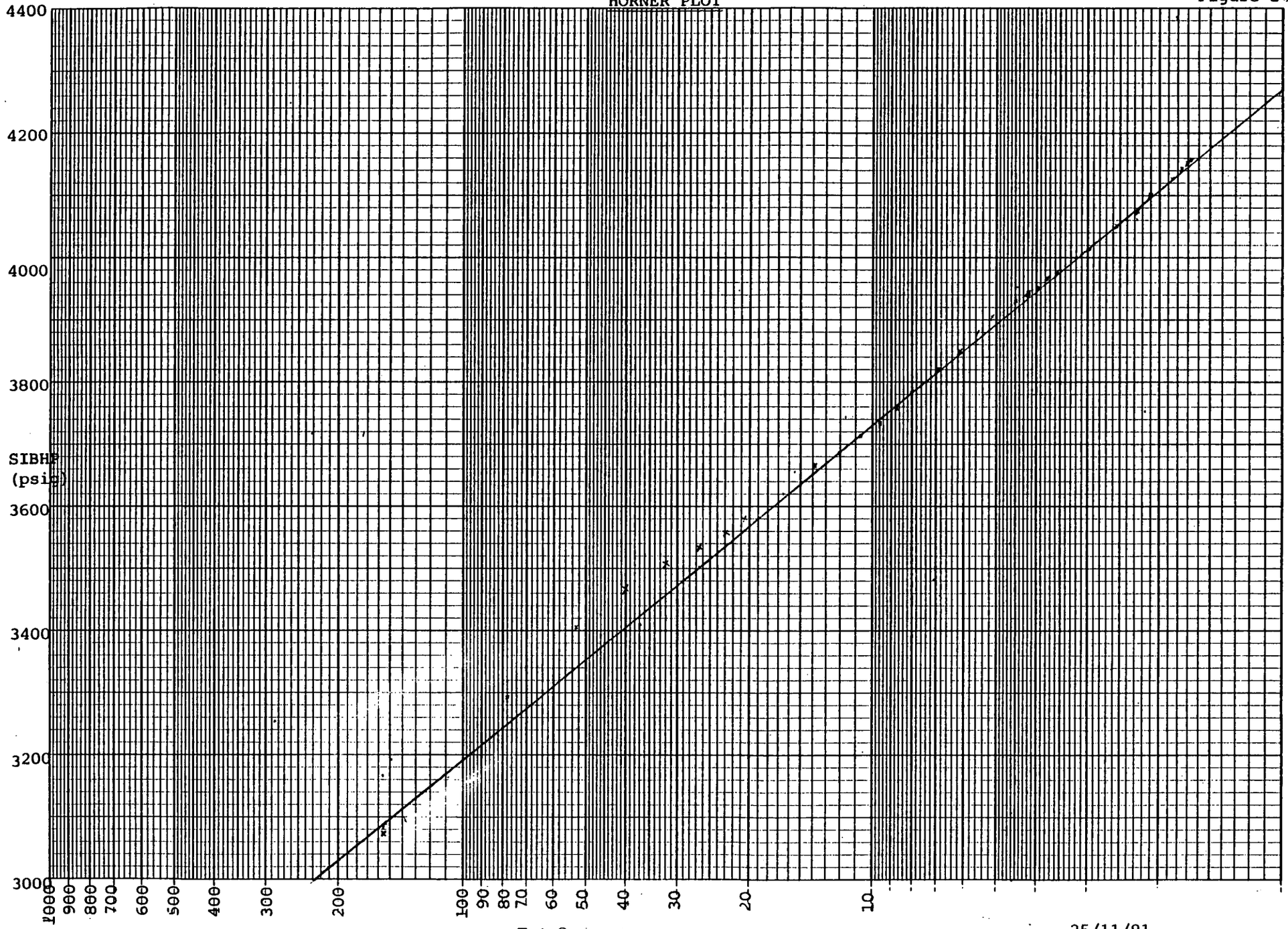
25/11/81

MOORARI #3 PRE FRAC BUILDUP

0090

HORNER PLOT

Figure 2.

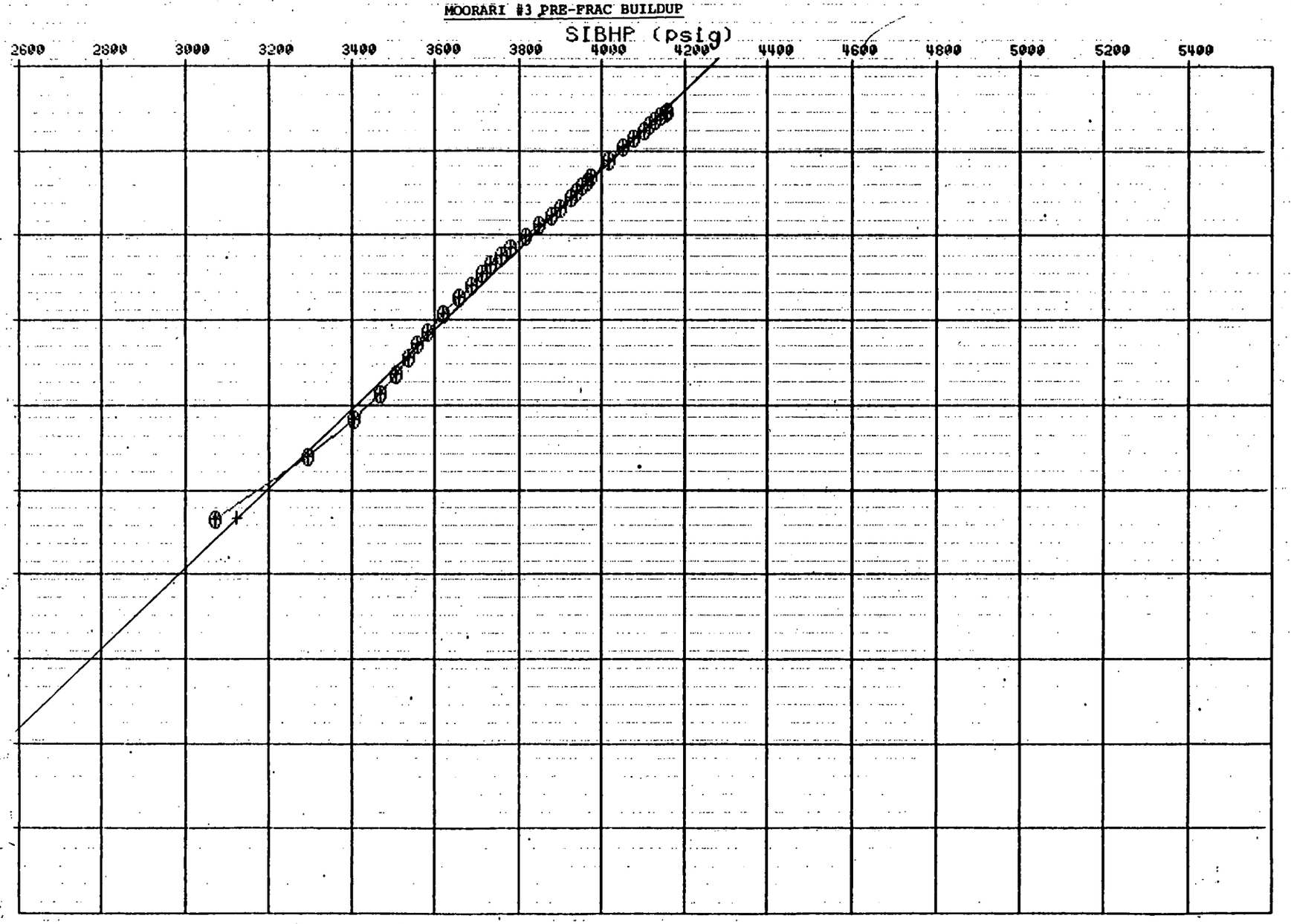


25/11/81

Figure 3.

ODEH - JONES PLOT

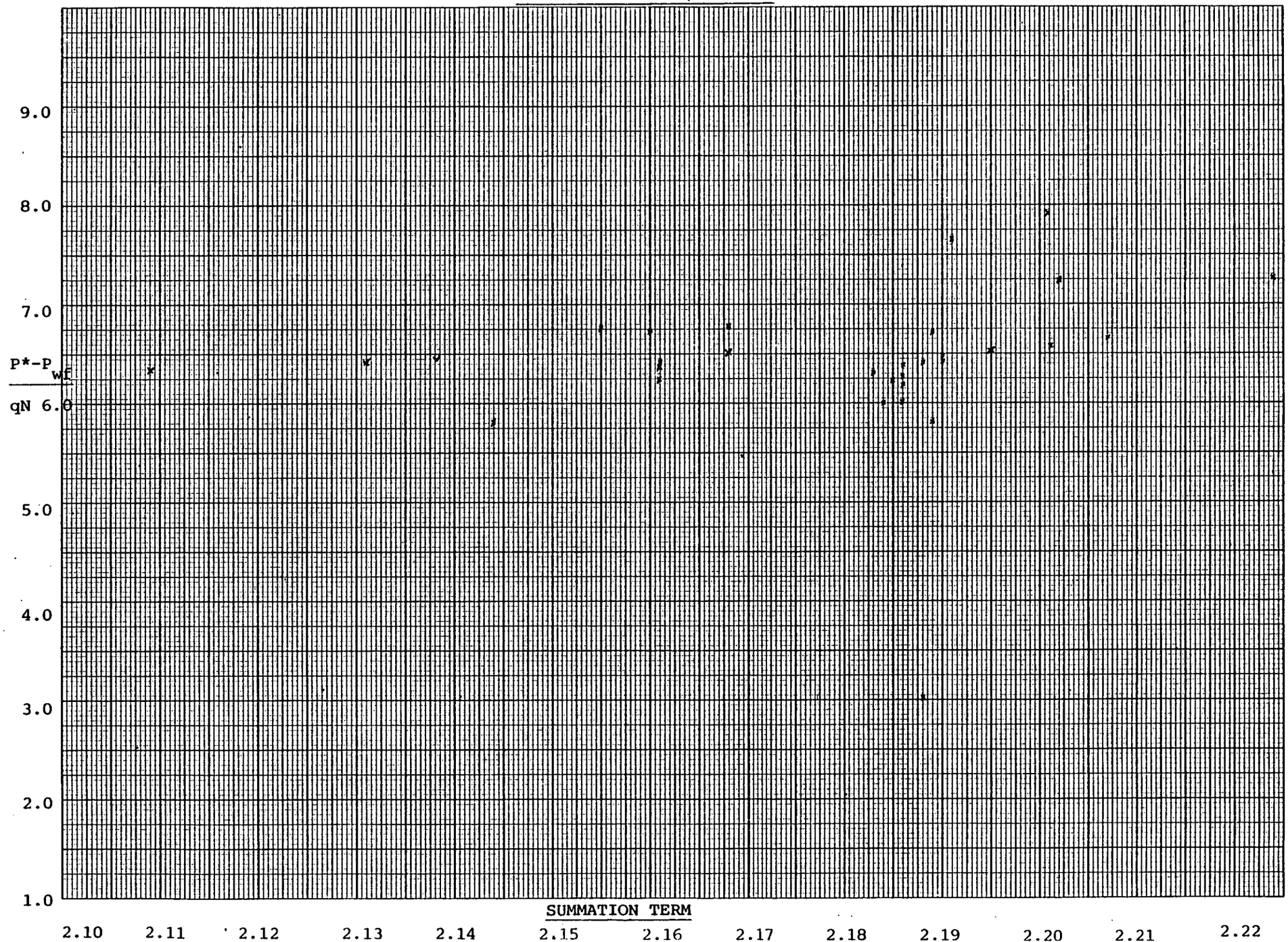
MOORARI #3 PRE-FRAC BUILDUP



0091

Figure 4.

MOORARI #3 PRE FRAC BUILDUP
EARLOUGHER PLOT (DRAWDOWN)



APPENDIX

Moorari #3 — SUMMARY OF WELL TEST DATA — April-June, 1981

Static Reservoir Pressure

17/4/81: Static Gradient.
Element #15830 @ 9494'K.B. = 4351 psig
Element #31720 @ 9500'K.B. = 4348 psig
Maximum Temperature = 275°F @ 9570'K.B.
Mid Point Perfs. = 9516'K.B.

Clean Up Flow

17/4/81 to 19/4/81
F.W.H.P. = 969 psig
Gas Rate = 637.9 MCF/D S.G. = 0.9531 (Taken from Moorari gas pack)
S.T.B.F.P.D. = 319.4 BBLS/D
Oil Rate = 234.6 BBLS/D
Water Rate = 84.8 BBLS/D
G.O.R. = 2719 SCF/BBL

Static Reservoir Pressure

23/4/81: Static Gradient
Element #15830 @ 9494'K.B. = 4252 psig
Element #31720 @ 9500'K.B. = 4252 psig
Maximum Temperature - 275° F @ 9750'K.B.

Flow Test

24/4/81 to 26/4/81
24/4/81: Flowed well on 16/64" choke.
F.W.H.P. = 969 psig
Gas Rate = 672.4 MCF/D S.G. = 0.9531
S.T.B.F.P.D. = 297.7 BBLS/D
Oil Rate = 279.5 BBLS/D
Water Rate = 18.2 BBLS/D
G.O.R. = 2406 SCF/BBL
Average B.S. & W. = 0.7%) Separator Readings
Average Emulsion = 4.4%)
Maximum Bottom Hole Temperature = 280°F.
Element #15830 @ 9448'K.B. = 2673 psig.
Element #31720 @ 9454'K.B. = 2720 psig

26/4/81 to 29/4/81.
26/4/81: Flowed well on 16/64" choke.
F.W.H.P. = 913 psig
Gas Rate = 667.0 MCF/D
S.T.B.F.P.D. = 297.5 BBLS/D.
Oil Rate = 290.8 BBLS/D
Water Rate 6.7 BBLS/D
G.O.R. = 2294 SCF/BBL
Average B.S. & W. = 0.5%) Separator Readings
Average Emulsion = 2.7%)
Element #15830 @ 9456'K.B. = 2467 psig
Element #31720 @ 9460'K.B. = 2462 psig

(Flow Test cont.)

29/4/81 to 30/4/81.
29/4/81: Flowed well on 16/64" choke.
F.W.H.P. = 879 psig
Gas Rate = 707.6 MCF/D.
S.T.B.F.P.D. = 311.2 BBLS/D.
Oil Rate = 304.5 BBLS/D.
Water Rate = 6.7 BBLS/D.
G.O.R. = 2324 SCF/BBL.
Average B.S. & W. = 0.1%)
Average Emulsion = 1.4%) Taken from the Separator
Maximum Bottom Hole Temperature = 275°F
Element #15830 @ 9456'K.B. = 2261 psig
Element #31720 @ 9460'K.B. = 2253'K.B.

Flowing Gradient Survey ran 30/4/81.

Build-Up Survey

30/4/81 to 2/5/81: Build up pressures:-
Element #31720 @ 9354'K.B. after 39.27 hours = 3909 psig
Maximum Bottom Hole Temperature = 280°F.
S.I.W.H.P. after 40 hours = 1791 psig.

2/5/81 to 6/5/81: Build up pressures:-
Element #15830 @ 9354'K.B. after 129.65 hrs. = 4103 psig
Element #31720 @ 9360'K.B. after 129.65 hrs. = 4086 psig
S.I.W.H.P. after 128 hrs. = 1928 psig

6/5/81 to 10/5/81: Build up pressures:-
Element #15830 @ 9354'K.B. after 227.53 hrs. = 4175 psig
Element #31720 @ 9360'K.B. after 227.53 hrs. = 4157 psig
Maximum Bottom Hole Temperature = 278°F

10/5/81 to 14/5/82: Build up pressures:-
Element #15830 @ 9312'K.B. after 323.87 hrs. = 4211 psig
Element #31720 @ 9318'K.B. after 323.87 hrs. = 4201 psig
10/5/81: Hang in the nipple.
Maximum Bottom Hole Temperature = 278°F
S.I.W.H.P. after 325.25 hrs. = 1992 psig

14/5/81 to 18/5/81: Build up pressures:-
Element #15830 @ 9312'K.B. after 419.95 hrs. = 4235 psig
Element #31720 @ 9318'K.B. 419.95 hrs. = 4231 psig
Maximum Bottom Hole Temperature = 275°F

18/5/81 to 2/6/81: Build up pressures:-
Bombs left in hole due to wet weather, clock stopped on Amerada, 23/5/81.
Element #15830 @ 9312'K.B. after 535 hrs. = 4250 psig
Element #31720 @ 9318'K.B. after 535 hrs. = 4239 psig

Static Reservoir Pressure

2/6/81: Static Gradient
Element #15830 @ 9494'K.B. = 4311 psig
Element #31720 @ 9500'K.B. = 4299 psig
Maximum Temperature = 276.37°F @ 9570'K.B.

Moorari #3 SUMMARY OF WELL TEST DATA April-June, 1981

Cumulative Production

17/4/81 to 19/4/81: Clean up Flow.
During this period the total production was:-
Gas = 1748.12 MCF
Oil = 713.9 BBLS G.O.R. = 2449 SCF/BBL
Water = 198.7 BBLS
Total liquids = 912.6 BBLS

24/481 to 30/4/81: Flow Test
During this period the production was:-
Gas = 4579.24 MCF
Oil = 2024.7 BBLS G.O.R. = 2262 SCF/BBL
Water = 76 BBLS
Total Liquids = 2100.7

Total amount of oil shipped to Port Stanvac was 2310 nett barrels.

SANTOS LTD.

OIL WELL TEST RESULTS

0096

Well Name MOORARI #3 Type of Test STATIC GRADIENT Date APRIL 17, 1981

Separator No. 305 Test By G.R.M. & A. G. PETERSON Meter Run I.D. 4.026" Gas S.G. 0.9531 From MOORARI GAS PACK

Date	Time	WELLHEAD DATA				SUBSURFACE DATA		SEPARATOR DATA				FLUID RATES					GOR	Remarks
		Choke Size	SHUT IN Press. (psig)	SHUT IN Temp. (°F)		EL#15830 Press. (psig)	EL#31840 Temp. (°F)	Pf	H.W. ΔP	Temp.	Orifice Size	Gas	Liquid	Oil	Grav. °API	BS&W		
17/4/81	0653		1930		LUB.	1951												Hang in lubricator.
	0730				2000	2521	125.10											
	0755				4000	3057	166.30											
	0820				6000	3550	211.07											
	0847				8000	4024	237.12											
	0911				9000	4252	255.67											
	0932				9200	4289	265.24											
	0942				9300	4309	268.50											Average Gradient =
	0952				9400	4332	271.37											0.2377 psi/ft.
	1002				9500	4351	273.25											
	1012				9570	4374	275											
	1022				9500	4353	274.37											
	1032				9400	4330	273											Hang in lubricator.
	1106		1949		LUB.	1972												

ELEMENT #15830

STATIC PRESSURE GRADIENT

WELL MOOKARI #3

TEST DATE 17/4/81 (0653-1106)

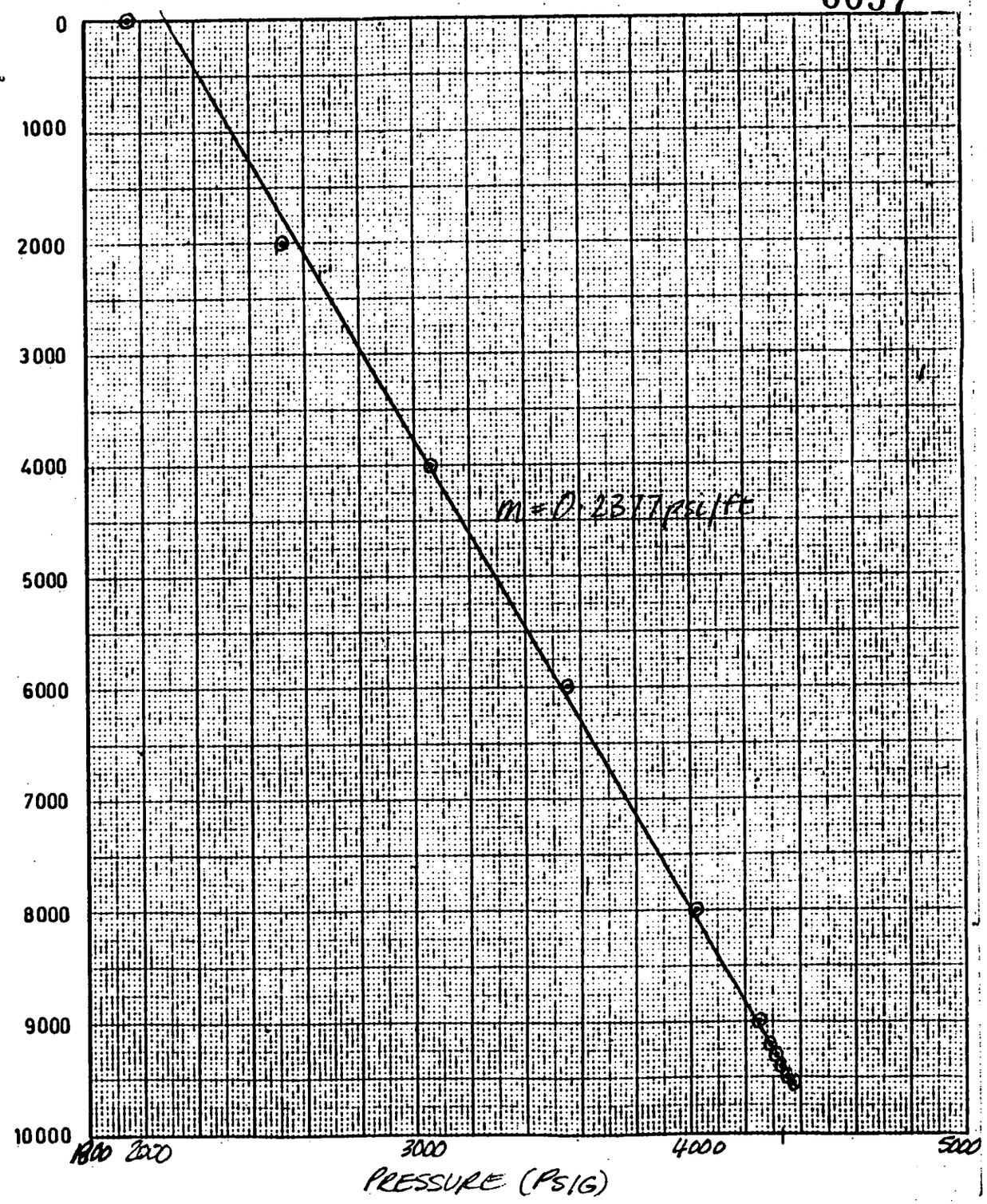
DEPTH (FEET)	PRESSURE (PSIG)	GRADIENT PSI/FT
LUB.	1951	
2000	2521	0.2850
4000	3057	0.2680
6000	3550	0.2465
8000	4024	0.2370
9000	4252	0.2280
9200	4289	0.1850
9300	4309	0.2000
9400	4332	0.2300
9500	4351	0.1900
9570	4374	0.3286
9500	4353	—
9400	4330	—
LUB.	1972	

DEPTH (METRES)	PRESSURE (KPa)	GRADIENT KPa/M
LUB.	13455	
610	17386	6.4470
1219	21083	6.0624
1829	24483	5.5761
2438	27752	5.3612
2743	29324	5.1576
2804	29579	4.1849
2835	29717	4.5242
2865	29876	5.2028
2896	30007	4.2980
2917	30166	7.4333
2896	30021	—
2865	29862	—
LUB.	13600	

LUBRICATOR IN D.W.T. = 1930 PSIG
IN AMERADA = 1951 PSIG
LUBRICATOR OUT D.W.T. = 1949 PSIG
OUT AMERADA = 1972 PSIG

1 PSI/FT. = 22.621 KPa/M

GMJ. 30/4/81



ELEMENT # 31720

STATIC PRESSURE GRADIENT

WELL MOORARI # 3

TEST DATE 17/4/81 (0653-1106)

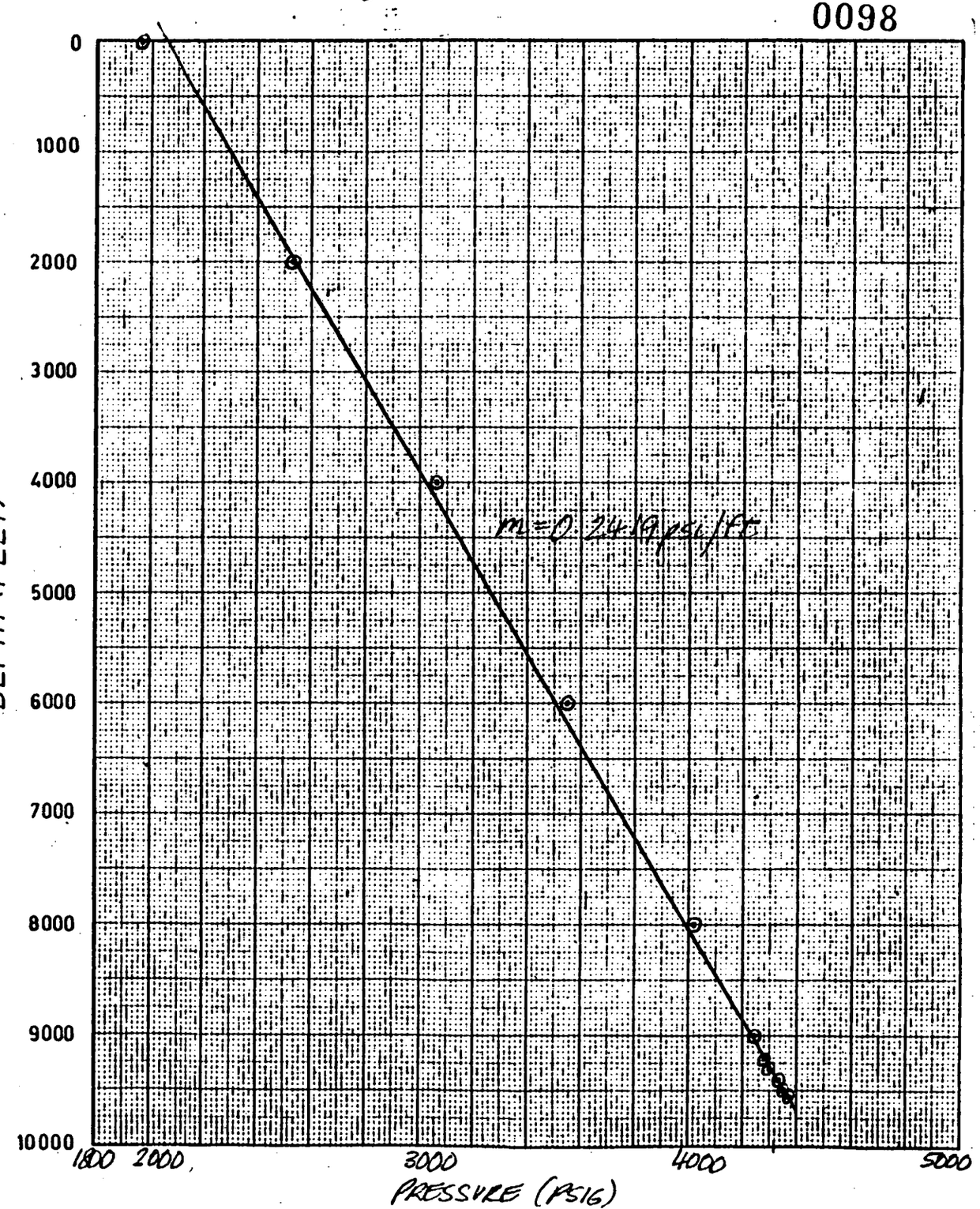
DEPTH (FEET)	PRESSURE (PSIG)	GRADIENT PSI/FT
LWB.	1962	
2000	1528	0·2830
4000	3059	0·2655
6000	3548	0·2495
8000	4015	0·2335
9000	4241	0·2260
9200	4283	0·2100
9300	4305	0·2200
9400	4328	0·2300
9500	4348	0·2000
9570	4371	0·3286
9500	4348	—
9400	4326	—
LWB.	1971	

DEPTH (METRES)	PRESSURE (kPa)	GRADIENT kPa/M
LWB.	13531	
610	17434	6·4017
1219	21097	6·0059
1829	24469	5·6439
2438	27690	5·2820
2743	29248	5·1123
2804	29538	4·7504
2835	29690	4·9766
2865	29848	5·2028
2896	29986	4·5242
2917	30145	7·4333
2896	29986	—
2865	29834	—
LWB.	13593	

LUBRICATOR IN D.W.T. = 1930 PSIG
IN AMERADA = 1962 PSIG
LUBRICATOR OUT D.W.T. = 1949 PSIG
OUT AMERADA = 1971 PSIG

1 PSI/FT = 22.621 kPa/M

JMJ 30/4/81



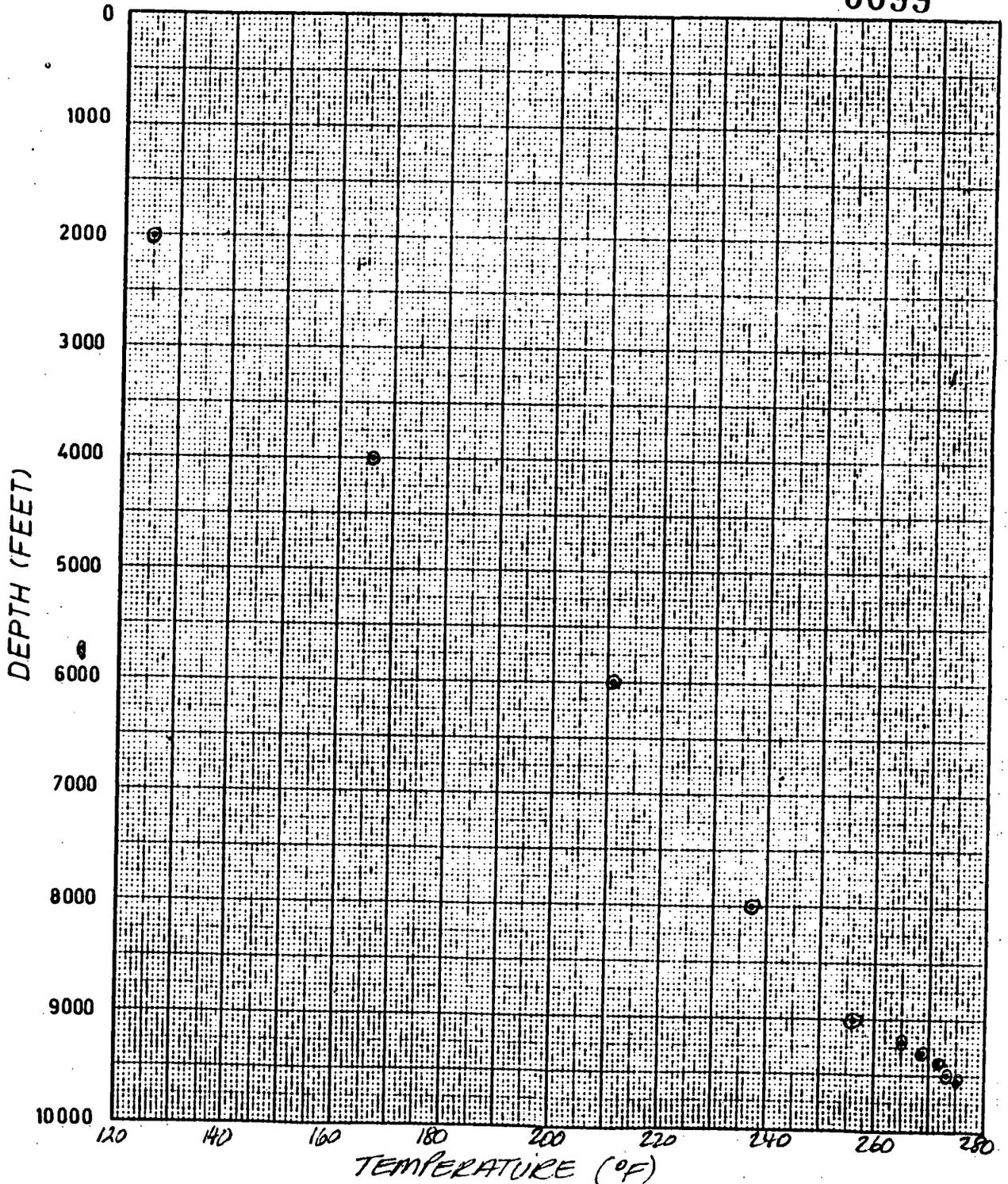
STATIC TEMPERATURE GRADIENT

WELL Moorari #3.

TEST DATE 17/4/81 (0653-1106)

DEPTH (FEET)	TEMP. (°F)	GRADIENT °F /FT
LUB.		
2000	125·10	
4000	166·30	0·0206
6000	211·07	0·0224
8000	237·12	0·0130
9000	255·67	0·0186
9200	265·24	0·0479
9300	268·50	0·0326
9400	271·37	0·0287
9500	273·25	0·0188
9570	275	0·0250
9500	274·87	—
9400	273	—
LUB.		

DEPTH (METRES)	TEMP. (°C)	GRADIENT °C /M
LUB.		
610	51·73	
1219	74·62	0·0376
1829	99·49	0·0408
2438	113·96	0·0238
2743	124·27	0·0338
2804	129·59	0·0872
2835	131·40	0·0584
2865	132·99	0·0530
2896	134·04	0·0339
2917	135·01	0·0462
2896	134·66	—
2865	133·90	—
LUB.		



JMF. 30/4/81

SANTOS LTD.

0100

OIL WELL TEST RESULTS

Well Name MOORARI #3 Type of Test CLEAN-UP FLOW Date APRIL 17th-19th, 1981

Separator No. 305 Test By G.R.M. & A. G. PETERSON Meter Run I.D. 4.026" Gas S.G. 0.9531 From MOORARI GAS PACK

Date	Time	WELLHEAD DATA			SUBSURFACE DATA		SEPARATOR DATA				FLUID RATES					GOR (SCF/BBL)	Remarks
		Choke Size	FLOWING Press. (psig)	FLOWING Temp. (°F)	EL#	EL#	Pf (psi)	H.W. ΔP (ins H_2O)	Temp. (°F)	Orifice Size (ins)	Gas Rate (MCF/D)	Liquid (H_2O) (BBLS/Day)	Oil (BBLS/Day)	Grav. °API	BS&W		
17/4/81	1154	16/64	1949							1.25							
	1354		1055	89													Well opened up.
	1515																
	1554		1010	91													Well put through sep.
	1630		970	91			102	40	63		541.9						
	1740																By pass separator.
																	Faulty Dump controller.
	1818																Well put through sep.
	1930		1030	91			107	47	54		605.6						
	2130		955	89			106	54	51		648.5		261.6			2479	
	2315									1.5							Changed orifice plate.
										1.25							Reinstalled 1.25" orifice
																	flow readings were too
																	low.
18/4/81	0630		969	89			111	30	47		495.5		281.7			1759	
	1030		948	95			106	60	65		673.7	150.9	140.8			4785	
	1048									1.5							Changed orifice plate.
	1430		931	98			105	30	71		684.4		281.7			2430	
	1830		959	95			108	25	61		639.1	70.4	221.3			2888	
	2230		934	95			113	34	55		765.3		291.8			2673	
19/4/81	0630		925	95			114	24	54		646.2	95.5	206.3			3132	
	1030		964	98			107	36	71		756	80.5	211.3			3578	
	1154		938	100			106	20	72		560.6	26.8	214.6			2612	Well shut in for buildup

Well Name MOORARI #3 Type of Test BUILD-UP SURVEY Date APRIL 19th, 1981

Date	Time	WELLHEAD DATA			SUBSURFACE DATA		SEPARATOR DATA				FLUID RATES					GOR	Remarks
		Choke Size	SHUT IN Press. (psig)	SHUT IN Temp. (°F)	EL#	EL#	Pf	H.W. ΔP	Temp.	Orifice Size	Gas	Liquid	Oil	Grav. °API	BS&W		Annulus (psig)
19/4/81	1209		1050	98													940
	1224		1144	98													940
	1239		1215	98													925
	1254		1284	98													925
	1309		1335	95													910
	1324		1377	96													900
	1339		1406	96													900
	1354		1435	96													900

SANTOS LTD.

OIL WELL TEST RESULTS

0102

Well Name MOORARI #3 Type of Test STATIC GRADIENT Date APRIL 23rd, 1981

Separator No. 305 Test By G.R.M. & A. G. PETERSON Meter Run I.D. 4.026" Gas S.G. 0.9531 From MOORARI GAS PACK

Date	Time	WELLHEAD DATA			Dpth.	SUBSURFACE DATA		SEPARATOR DATA				FLUID RATES					GOR	Remarks
		Choke Size	Press.	Temp.	(ft)	EL#31720 Press. (psig)	EL#31840 Temp. (^{o}F)	Pf	H.W. ΔP	Temp.	Orifice Size	Gas	Liquid	Oil	Grav. ^{o}API	BS&W		
23/4/81	1432		1935		LUB.	1956												Hang in lubricator.
	1453				2000	2431	128.67											
	1514			•	4000	2953	167.50											
	1534				6000	3444	210.85											
	1555				8000	3914	237.50											
	1613				9000	4144	255.96											
	1630				9200	4188	266.40											Average Gradient =
	1651				9300	4210	269.75											0.2366 psi/ft.
	1711				9400	4231	272.12											
	1726				9500	4252	274.25											
	1741				9570	4283	275.37											
	1757				9500	4252	275.00											
	1812				9400	4229	273.25											
	1855		1949		LUB.	1978												Hang in lubricator.

ELEMENT #31720

STATIC PRESSURE GRADIENT

WELL MOORARI #3

TEST DATE 23/4/81 (1432-1855)

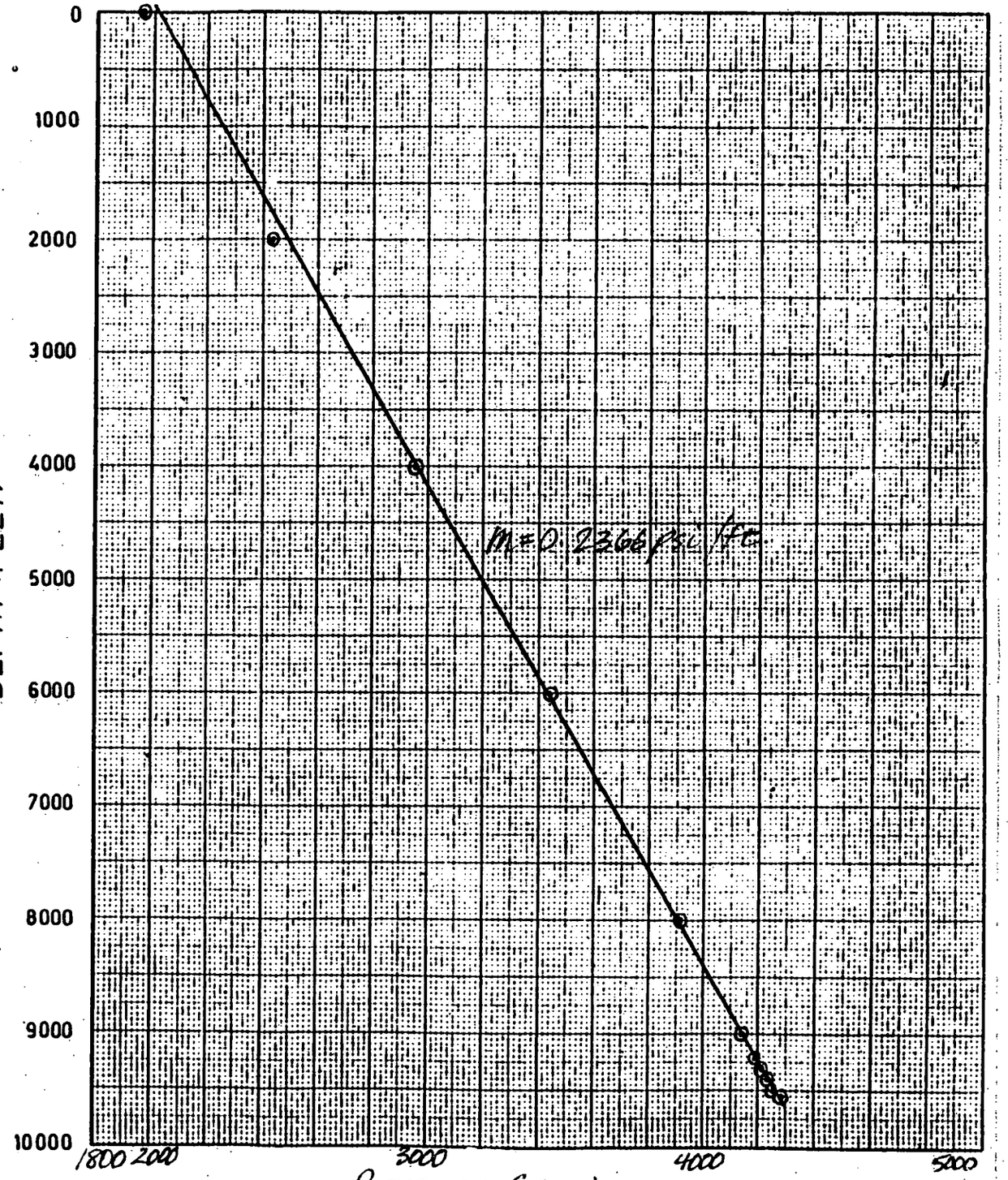
DEPTH (FEET)	PRESSURE (PSIG)	GRADIENT PSI/FT
LUB.	1956	
2000	2431	0.2375
4000	2953	0.2610
6000	3444	0.2455
8000	3914	0.2350
9000	4144	0.2300
9100	4188	0.2200
9300	4210	0.2200
9400	4231	0.2100
9500	4252	0.2100
9570	4283	0.4429
9500	4262	—
9400	4229	—
LUB.	1978	

DEPTH (METRES)	PRESSURE (kPa)	GRADIENT kPa/M
LUB.	13490	
610	16766	5.8725
1219	20366	5.9041
1829	23752	5.5535
2438	26993	5.3159
2743	28579	5.2028
2804	28883	4.9766
2835	29034	4.9766
2865	29179	4.7504
2896	29324	4.7504
2917	29538	10.0188
2896	29324	—
2865	29166	—
LUB.	13641	

LUBRICATOR IN D.W.T. = 1935 PSIG
IN AMERADA = 1956 PSIG
LUBRICATOR OUT D.W.T. = 1949 PSIG
OUT AMERADA = 1978 PSIG

1 PSI/FT = 22.621 kPa/M.

JMJ. 30/4/81



ELEMENT #15830

STATIC PRESSURE GRADIENT

WELL MOORARI #3

TEST DATE 23/4/81 (1432-1856)

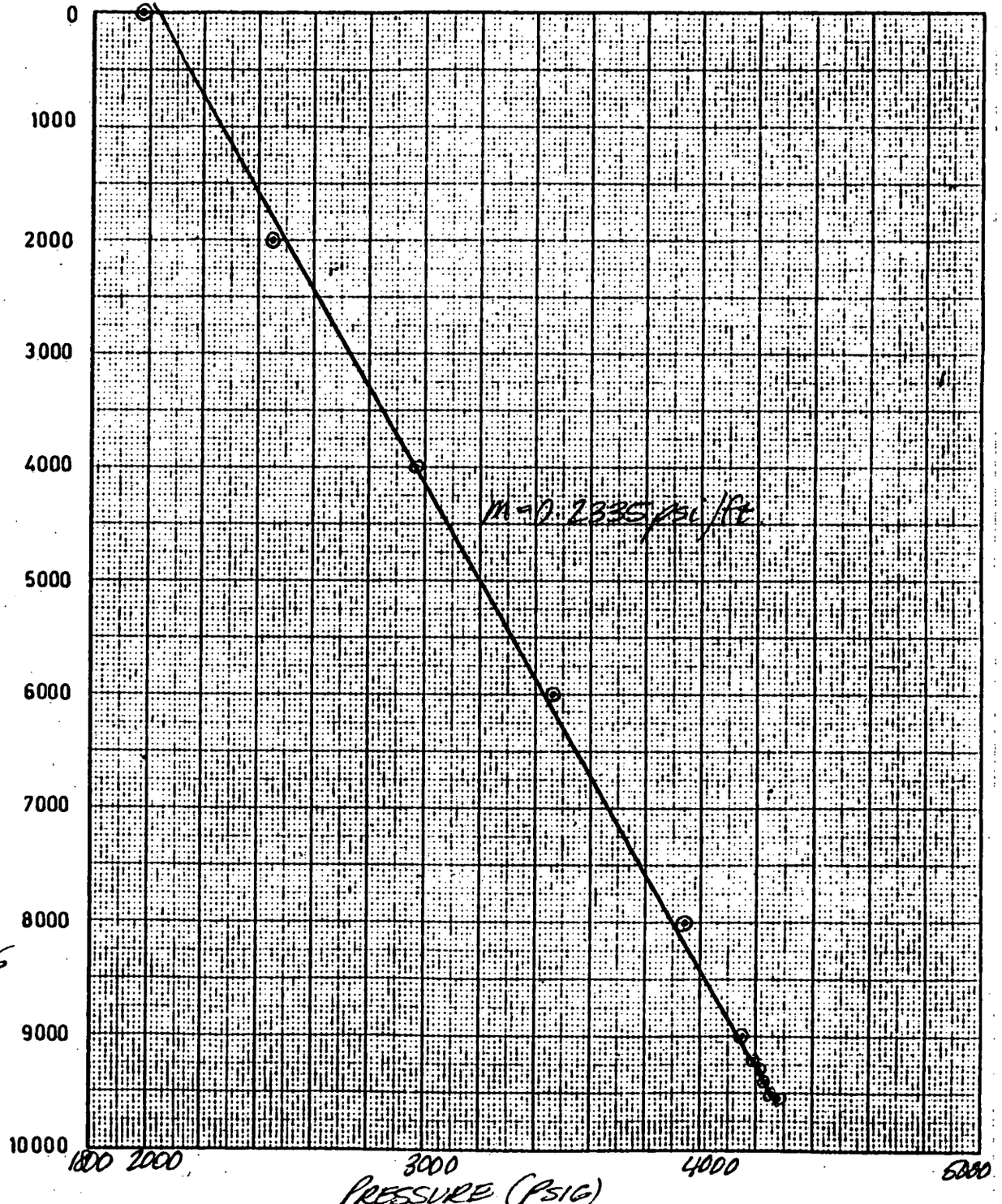
DEPTH (FEET)	PRESSURE (PSIG)	GRADIENT PSI/FT
LUB.	1973	
2000	2449	0·2380
4000	2971	0·2610
6000	3465	0·2470
8000	3937	0·2360
9000	4155	0·2180
9200	4191	0·1800
9300	4211	0·2000
9400	4231	0·2000
9500	4252	0·2100
9570	4283	0·4429
9500	4250	—
9400	4229	—
LUB.	1990	

DEPTH (METRES)	PRESSURE (kPa)	GRADIENT kPa/M
LUB.	13607	
610	16890	6.3838
1219	20490	5.9041
1829	23897	5.5874
2438	27152	5.3386
2743	28655	4.9314
2804	28903	4.0718
2835	29041	4.5242
2865	29179	4.5242
2896	29324	4.7504
2917	29538	10.0188
2896	29310	—
2865	29166	—
LUB.	13724	

LUBRICATOR IN D.W.T. = 1935 PSIG
IN AMERADA = 1973 PSIG
LUBRICATOR OUT D.W.T. = 1969 PSIG
OUT AMERADA = 1990 PSIG

1 PSI/FT = 22.621 KPa/M

JMJ. 30/4/81



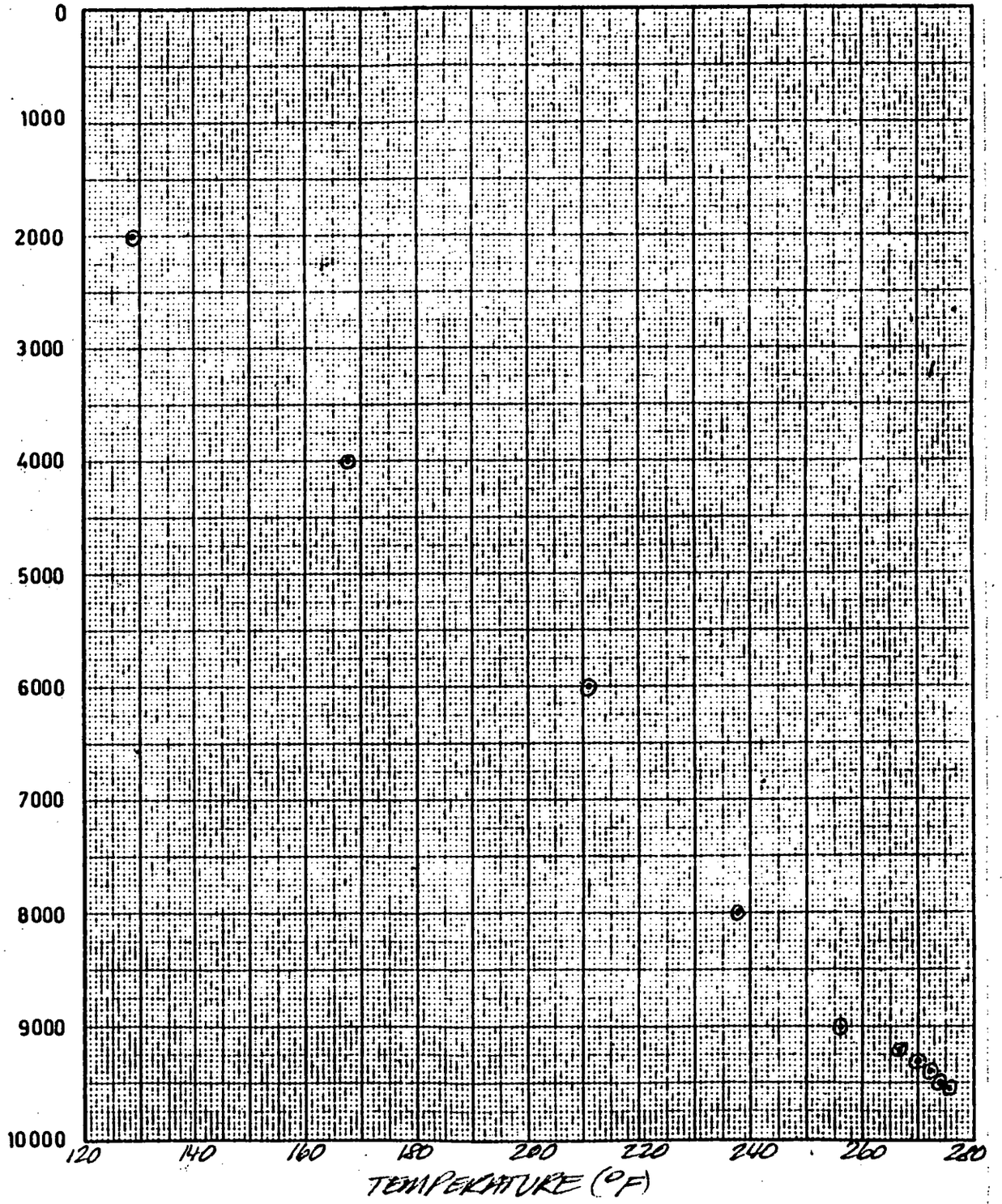
STATIC TEMPERATURE GRADIENT

WELL MOORARI #3

TEST DATE 23/4/81 (1432-1855)

DEPTH (FEET)	TEMP. (°F)	GRADIENT °F/FT
LUB.		
2000	128·67	
4000	167·50	0·0194
6000	210·85	0·0217
8000	237·50	0·0133
9000	255·96	0·0185
9200	266·40	0·0522
9300	269·75	0·0335
9400	272·12	0·0237
9500	274·25	0·0213
9570	275·37	0·0160
9500	275	—
9400	273·25	—
LUB.		

DEPTH (METRES)	TEMP. (°C)	GRADIENT °C/M
LUB		
609	53·71	
1219	75·28	0·0354
1829	99·37	0·0395
2438	114·18	0·0243
2743	124·43	0·0336
2804	130·23	0·0951
2835	132·09	0·0600
2865	133·41	0·0440
2896	134·59	0·0381
2917	135·22	0·0300
2896	135·01	—
2865	134·04	—
LUB.		



GMJ. 30/4/81

SANTOS LTD.

OIL WELL TEST RESULTS

0106

Well Name MOORARI #3 Type of Test FLOW TEST Date APRIL 24th-30th, 1981

Separator No. 305 Test By G.R.M. & A. G. PETERSON Meter Run I.D. 4.026" Gas S.G. 0.9531 From MOORARI GAS PACK

Date	Time	WELLHEAD DATA			Flowing Time (Hrs)	SUBSURFACE DATA			SEPARATOR DATA				FLUID RATES						GOR	Remarks
		Choke Size	FLOWING			EL# 15830 @ 9448' K.B.	EL# 31720 @ 9454' K.B.	EL# 28131 @ 9460' K.B.	Pf (psi)	H.W. ΔP (ins) (H_2O)	Temp. (°F)	Orifice Size (ins)	Gas Rate (MCF/D)	Liquid (BBLS/ DAY)	Oil (BBLS/ DAY)	Grav. °API	BS&W (%)	Emul-sion (%)		
			Press. (psig)	Temp. (°F)		Press. (psig)	Press. (psig)	Press. (psig)												
24/4/81			1951			1988	1960	1941												Hang in lubricator
	1118																			R.I.H.
	1145					4267	4259	4250												Arrived at bomb depth
	1245	16/64	1958		ϕ							1.5								Flow well.
	1255				0.17	3696	3509	3634												Well put through sep.
	1305				0.33	3219	3391	3478												
	1315				0.5	3113	3284	3379												
	1325				0.67	3062	3189	3296												
	1335				0.83	3000	3124	3231												
	1345		1085	91	1	2949	3074	3176	107	34	53		748.5	402	402	53.2	0.01		1862	
	1400				1.25	2900	3008	3112												
	1415				1.5	2853	2963	3062												
	1430				1.75	2817	2920	3020												
	1445		1046	91	2	2774	2885	2984	107	35	53		759.4	241.5	241.5	52.8	1	8	3145	
	1515				2.5	2683	2835	2928												
	1545				3	2635	2777	2879												
	1615				3.5	2611	2722	2845												
	1645		969	93	4	2610	2668	2800	108	28	54		681.3	241.5	241.5	53.7	1	1	2821	
	1715				4.5	2587	2638	2758												
	1745				5	2583	2615	2714												
	1845		970	93	6	2618	2595	2660	113	22	45		622.1	221.3	221.3	53.6	1		2811	
	1945				7	2603	2580	2627												
	2045	16/64	969	93	8	2573	2595	2612	115	24	44	1.5	655.6	301.8	281.7	53.5	-	2	2327	
	2145				9		2543	2605												
	2245				10		2529	2598												
	2345				11		2517	2593												
25/4/81	0045		951	93	12		2522	2580	118	24	43		664	298.5	281.7	54.1	2	8	2357	
	0245				14		2487	2527												
	0445		933	91	16		2469	2507	119	25	43		680.2	291.8	291.8	51.1	Trace	4	2331	
	0645				18		2450	2507												
	0845		945	95	20		2475	2492	110	28	53		687.6	301.8	301.8	52.8	0.1	7	2278	
	1245		947	98	24		2484	2464	103	29	63		672.7	291.8	291.8	52	Trace	1.8	2305	
	1645		948	98	28		2482	2446	104	28	62		664.5	301.8	281.7	52.7	-	2	2359	
	1745				29		2470	2454												Bleed down annulus
																				from 845 psi to
																				500 psi.
	2045		938	96	32		2457	2464	108	26	55		655.9	281.7	231.4	53.2	-	4.6	2834	
26/4/81	0045				36		2472	2469												
	0245		945	95	38				114	25	47		604.4	295.1	288.4	53.7	0.4	7.4	2096	
	0445				40		2466	2479												

Well Name MOORARI #3 Type of Test FLOW TEST Date APRIL 24th-30th, 1981

Date	Time	WELLHEAD DATA			Flowing Time (Hrs)	SUBSURFACE DATA			SEPARATOR DATA				FLUID RATES						GOR (Scf/Bbl)	Remarks
		Choke Size	FLOWING Press. (psig)	FLOWING Temp. (°F)		EL# 15830 @ 9448' K.B. Press. (psig)	EL# 31720 @ 9454' K.B. Press. (psig)	EL# 28131 @ 9460' K.B. Press. (psig)	Pf (psi)	H.W. ΔP (ins) (H_2O)	Temp. (°F)	Orifice Size (ins)	Gas Rate (MCF/D)	Liquid (BBLS/DAY)	Oil (BBLS/DAY)	Grav. °API	BS&W (%)	Emulsion (%)		M.R. = 4.026" S.G. = 0.9531
26/4/81	0845	16/64	950	95	44		2487	2469	109	23	59		616.8	288.4	281.7	53.1	0.2	-	2190	Maximum Bottom Hole Temperature = 280°F.
	1245				48		2507	2454												
	1445		964	102	50				104	26	62		640.3	281.7	275	52.2	0.1	6	2328	
	1600				51.25		2510	2446												
			945				1011	996												P.O.H. and hang in lubricator.

Well Name MOORARI #3 Type of Test FLOW TEST Date APRIL 24th-30th, 1981

Date	Time	WELLHEAD DATA			Flowing Time (Hrs)	SUBSURFACE DATA		Pf (psi)	SEPARATOR DATA			FLUID RATES						GOR (Scf/Bbl)	Remarks
		Choke Size	FLOWING Press. (psig)	FLOWING Temp. (°F)		EL# 15830 @ 9454' K.B. Press. (psig)	EL# 31720 @ 9460' K.B. Press. (psig)		H.W. ΔP (ins H_2O)	Temp. (°F)	Orifice Size (ins)	Gas Rate (MCF/D)	Liquid (bbls/day)	Oil (BBLS/DAY)	Grav. °API	BS&W (%)	Emulsion (%)		M.R. = 4.026" S.G. = 0.9531
		16/64	946			989	988				1.5								Hang in lubricator
	1947				55.03														Hang bombs.
	2045		963	98	56	2522	2517	110	23	50		625.2	275	275	53.2	0.8	-	2273	
	2100				56.25	2522	2517												
	2115				56.5	2527	2524												
	2130				56.75	2530	2525												
	2145				57	2519	2514												
	2215				57.5	2525	2522												
	2245				58	2530	2524												
	2315				58.5	2532	2524												
	2345				59	2532	2527												
27/4/81	0045				60	2527	2522												
	0145				61	2532	2527												
	0245		962	96	62	2539	2535	114	22	49		621.9	268	268	53.8	Trace	0.6	2321	
	0345				63	2574	2565												
	0445				64	2562	2555												
	0645				66	2565	2557												
	0845		976	98	68	2580	2573	110	22	52		610.2	261	261	52.8	0.4	7	2338	
	1045				70	2582	2570												
	1245				72	2590	2586												
	1445		978	102	74	2595	2591	102	23	65		595.3	254.9	254.9	53.2	-	2	2335	
	1530				74.75	2592	2593												Choke plugging.
	1600				75.25	2533	2454				1.75								Changed orifice plate.
	1645		899	102	76	2389	2411	103	17	65		707.6	322	322	52.2	-	4	2198	
	1825				77.67	2359	2381				1.5								Changed orifice plate.
	1845		894	102	78	2381	2403	104	28	55		669.3	301.8	301.8	52.3	0.1	1.6	2218	
	2045		904	104	80	2371	2365	104	29	54		681.9	301.8	301.8	53.2	-	0.1	2259	
28/4/81	0245		913	100	86	2369	2348	104	30	52		695	301.88	301.88	53.6	0.6	-	2302	
	0845		906	96	92	2358	2363	108	28	53	1.5	682.1	295.17	295.17	52.9	0.1	.2	2311	
	1445		923	102	98	2361	2363	107	31	64		706.6	295.17	295.17	52.4	-	2	2394	
	2045		869	98	104	2363	2283	113	28	55		694.5	301.87	295.17	53.7	-	1	2353	
29/4/81	0245		865	96	110	2255	2254	118	27	50		699	321.99	315.29	54.3	-	-	2217	
	0845		851	98	116	2245	2252	119	24	51		660.8	308.58	301.88	52.6	-	8	2189	

Well Name MOORARI #3 Type of Test FLOW TEST Date APRIL 24th-30th, 1981

Date	Time	WELLHEAD DATA			Flowing Time (Hrs)	SUBSURFACE DATA			SEPARATOR DATA				FLUID RATES						GOR (Scf/Bbl)	Remarks
		Choke Size	FLOWING Press. (psig)	FLOWING Temp. (^{o}F)			EL# 15830 @ 9454' K.B. Press (psig)	EL# 31720 @ 9460' K.B. Press (psig)	Pf (psi)	H.W. ΔP (ins) H_2O	Temp. (^{o}F)	Orifice Size (ins)	Gas Rate (MCF/D)	Liquid (BBLS/DAY)	Oil (BBLS/DAY)	Grav. ^{o}API	BS&W (%)	Emulsion (%)		M.R. = 4.026" S.G. = 0.9531
29/4/81	1445	16/64	873	102	122		2231	2249	117	27	61		688.4	288.45	281.75	52.6	-	1.3	2443	
	1558				123.22		2222	2242												P.O.H.
	1638		877		123.88		886	895												Hang in lubricator
	1839		894		125.9		916	905												Hang in lubricator
	2045		843	100	128		2231	2219	113	31	51		733.8	301.88	301.88	53.7	0.1	0.1	2431	
	2245				130		2248	2234												
	0045				132		2240	2214												
30/4/81	0245		863	100	134		2240	2234	113	28	49		698.9	328.7	322	-	0.1	-	2170	
	0445				136		2238	2280												
	0695				138		2281	2280												
	0845		855	100	140		2248	2239	115	26	54		675.2	288.46	281.76	53	0.1	2.6	2396	
	1045				142		2265	2252												
	1245				144		2309	2287												
	1258				144.22		2309	2290												P.O.H.
	1342		912		144.95		943	915												Hang in lubricator
	1445		920	105					119	29	65		715.9	308.5	308.5	-	0.1	1.5	2321	
	2045		880	102					112	24	55		640.4	308.5	308.5	53.6	0.1	-	2076	
	2245		915	100					114	35	53		781.2							Shut well in.
																				Maximum Bottom
																				Hole Temperature =
																				275^{o}F.

Well Name MOORARI #3 Type of Test FLOWING GRADIENT Date APRIL 30th, 1981

Date	Time	WELLHEAD DATA			Depth (ft)	SUBSURFACE DATA		SEPARATOR DATA				FLUID RATES					GOR	Remarks
		Choke Size	FLOWING Press. (psig)	FLOWING Temp.		EL#31720 Press. (psig)	EL#31840 Temp. (^{o}F)	Pf	H.W. ΔP	Temp.	Orifice Size	Gas	Liquid	Oil	Grav. ^{o}API	BS&W		
30/4/81	1513		904		LUB.	920												Hang in lubricator.
	1536				2000	1163	154.24											
	1556				4000	1412	195.70											
	1619				6000	1674	225.53											
	1643				8000	1998	251.90											
	1703				9000	2151	265.53											
	1719				9250	2183	267.71											
	1740				9400	2231	268.25											
	1756				9500	2259	268.62											
	1816				9570	2295	274.37											
	1831				9500	2254	269											
	1847				9400	2226	268.5											
	1932		845		LUB.	872												Hang in lubricator.

ELEMENT #15830

FLOWING PRESSURE GRADIENT

WELL MOOKARI #3

TEST DATE 30/4/81 (1513-1932)

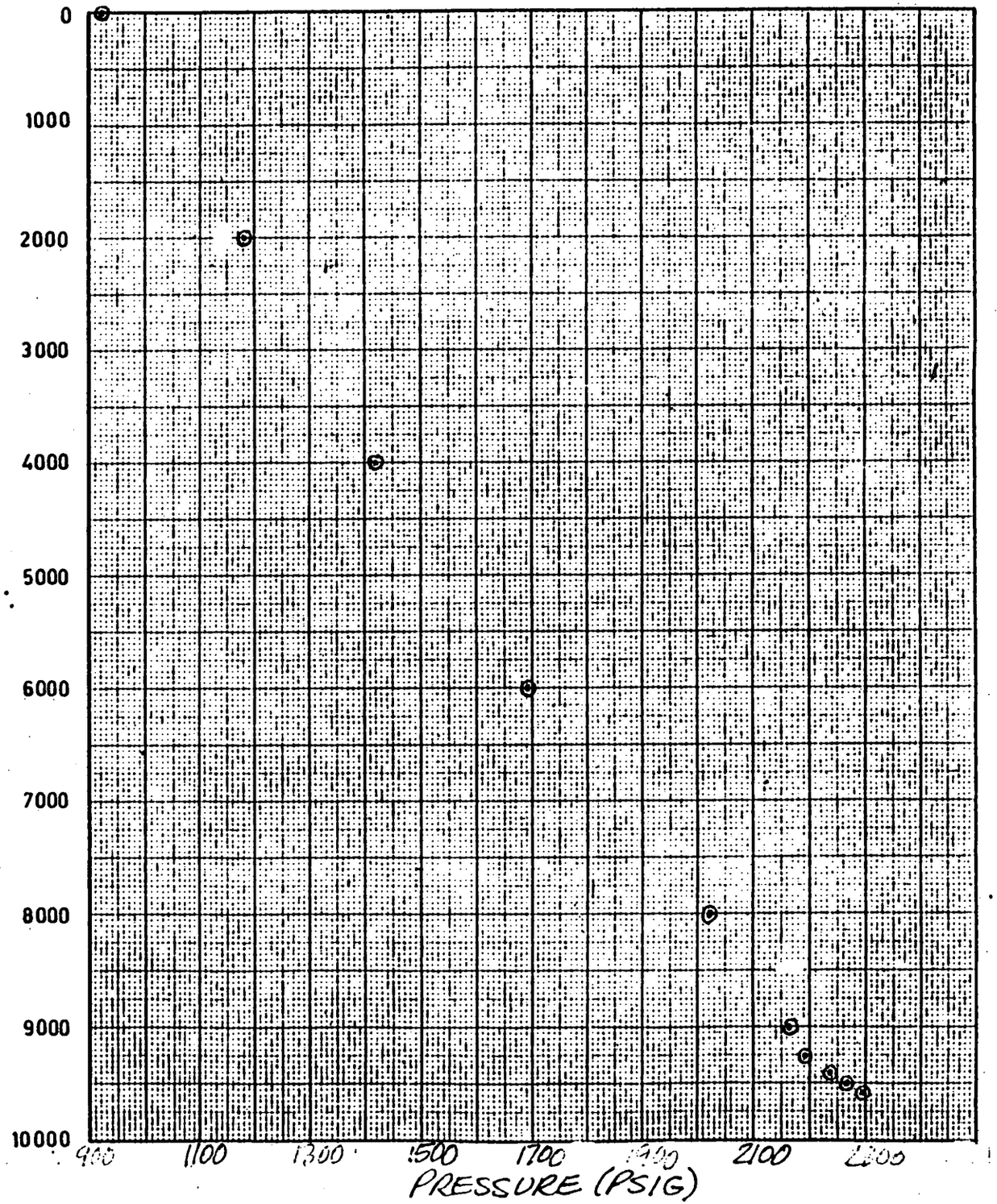
DEPTH (FEET)	PRESSURE (PSIG)	GRADIENT PSI/FT
LUB.	924	
2000	1180	0.1280
4000	1423	0.1215
6000	1689	0.1330
8000	2017	0.1640
9000	2157	0.1400
9250	2188	0.1240
9400	2235	0.3133
9500	2266	0.3100
9570	2294	0.4000
9500	2261	—
9400	2237	—
LUB.	869	

DEPTH (METRES)	PRESSURE (kPa)	GRADIENT kPa/M
LUB.	6372	
610	8138	2.8955
1219	9814	2.7485
1829	11648	3.0086
2438	13910	3.7098
2743	14876	3.1669
2819	15090	2.8050
2865	15414	7.0872
2896	15628	7.0125
2917	15821	9.0484
2896	15593	—
2865	15428	—
LUB.	5993	

LUBRICATOR IN D.W.T. = 904 PSIG.
IN AMERADA = 924 PSIG.
LUBRICATOR OUT D.W.T. = 845 PSIG.
OUT AMERADA = 869 PSIG.

1 PSI/FT = 22.621 kPa/M.

GMJ. 8/5/81



ELEMENT # 31720

FLOWING PRESSURE GRADIENT

WELL MOORARI #3

TEST DATE 30/4/81 (1513-1932)

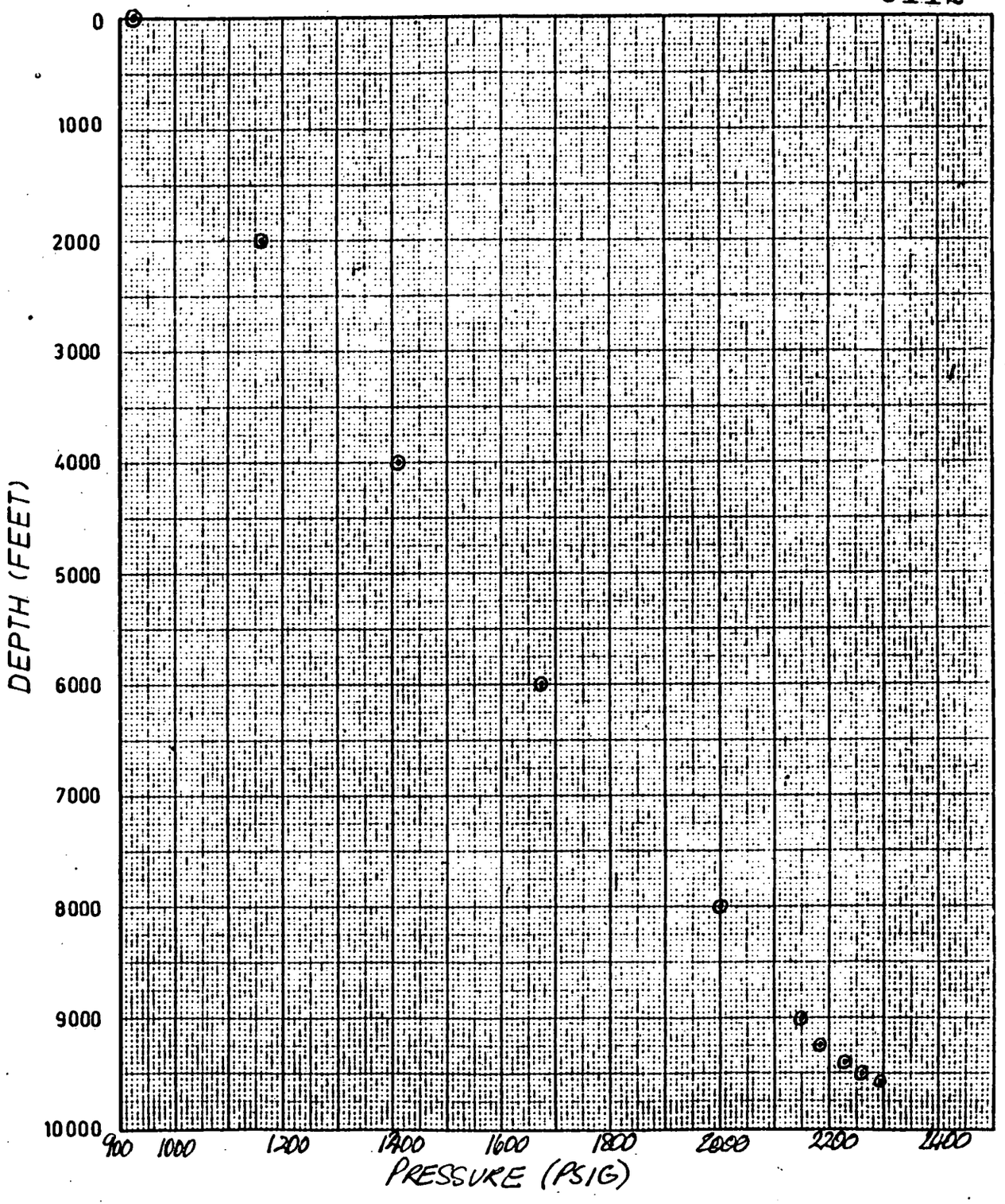
DEPTH (FEET)	PRESSURE (PSIG)	GRADIENT PSI/IFT
LUB.	920	
2000	1163	0.1215
4000	1412	0.1245
6000	1674	0.1310
8000	1998	0.1620
9000	2151	0.1530
9250	2183	0.1280
9400	2231	0.3200
9500	2259	0.2800
9570	2295	0.5143
9500	2254	—
9400	2226	—
LUB.	872	

DEPTH (METRES)	PRESSURE (kPa)	GRADIENT kPa/M
LUB.	6345	
610	8021	2.7485
1219	9738	2.8163
1829	11545	2.9634
2438	13779	3.6646
2743	14834	3.4610
2819	15055	2.8955
2865	15386	7.2387
2896	15579	6.3339
2917	15828	11.6340
2896	15545	—
2865	15352	—
LUB.	6014	

LUBRICATOR IN D.W.T. = 904 psig
IN AMERADA = 920 psig
LUBRICATOR OUT D.W.T. = 845 psig
OUT AMERADA = 872 psig

1 PSI/FT = 22.621 kPa

GMJ. 11/5/81



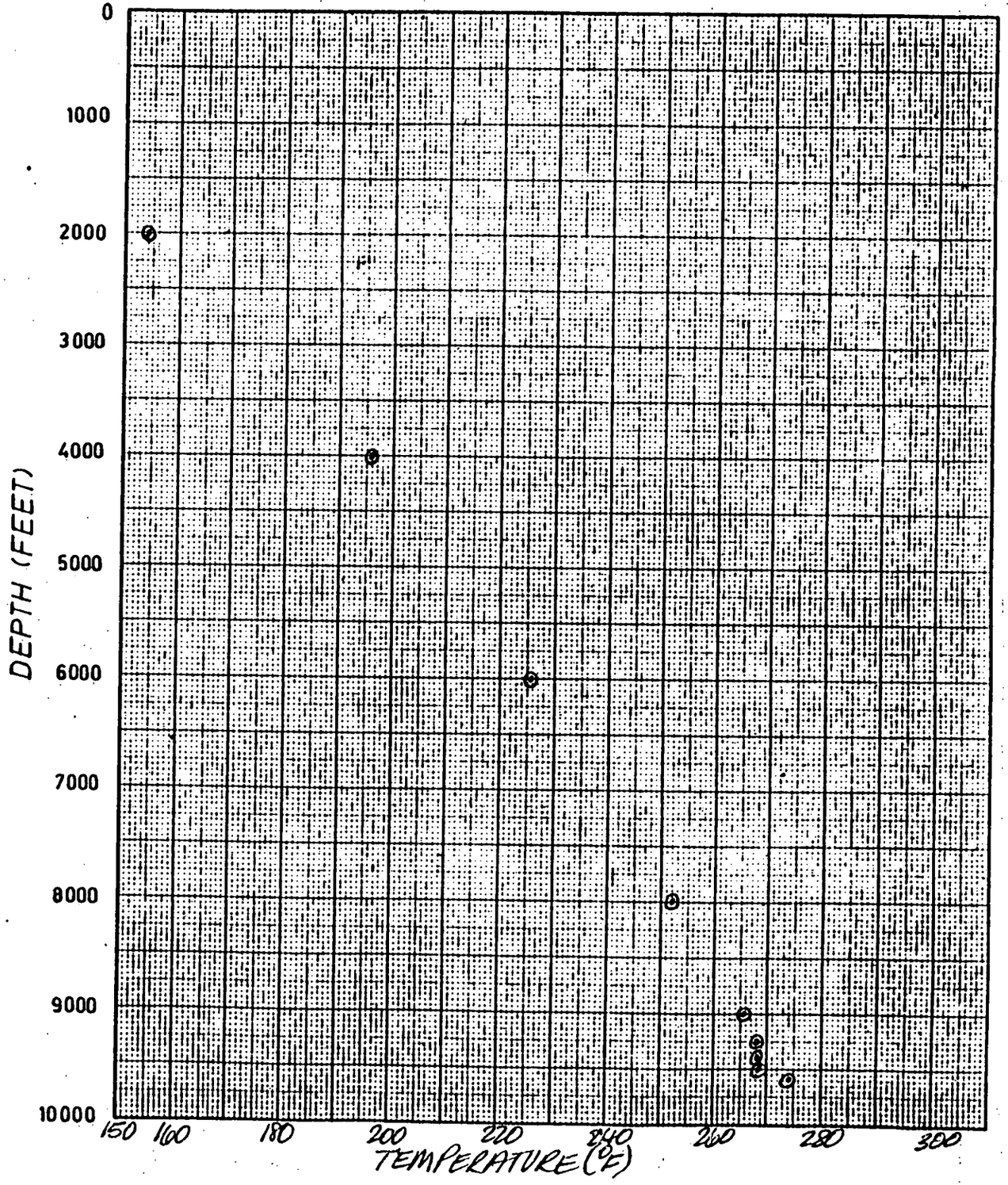
FLOWING TEMPERATURE GRADIENT

WELL MOORARI #3

TEST DATE 30/4/81 (1513 - 1932)

DEPTH (FEET)	TEMP. (°F)	GRADIENT °F/FT
LUB.		
2000	154·24	
4000	195·70	0·0207
6000	225·53	0·0149
8000	251·90	0·0132
9000	265·63	0·0136
9250	267·71	0·0087
9400	268·25	0·0036
9500	268·62	0·0037
9570	274·37	0·0821
9500	269	—
9400	268·5	—
LUB.		

DEPTH (METRES)	TEMP. (°C)	GRADIENT °C/M
LUB.		
610	67·92	
1219	90·95	0·0378
1829	107·53	0·0272
2438	122·18	0·0241
2743	129·75	0·0248
2819	130·96	0·0159
2865	131·26	0·0065
2896	131·47	0·0068
2917	134·66	0·1519
2896	131·68	—
2865	131·40	—
LUB.		



GMJ 11/5/81

SANTOS LTD.

0114

OIL WELL TEST RESULTS

Well Name MOORARI #3 Type of Test BUILD UP SURVEY Date APRIL 30th-JUNE 2nd, 1981

Separator No. 305 Test By G.R.M. & A. G. PETERSON Meter Run I.D. 4.026" Gas S.G. 0.9531 From MOORARI GAS PACK

Date	Time	WELLHEAD DATA SHUT IN W/H Press. (psig)	Casing Press. (psig)	W/H Temp. (°F)	Shut In Time (Hrs)	SUBSURFACE DATA EL#31720 @ 9354'KB Press. (psig)	EL#28131 @ 9360'KB Press. (psig)	SEPARATOR DATA Pf	H.W. ΔP	Temp.	Orifice Size	FLUID RATES Gas	Liquid	Oil	Grav. °API	BS&W	GOR	Remarks
30/4/81			885			905	876											
	2151					N/A	2269											Hang in lubricator.
	2245	915	500	100	ϕ													Hang bombs.
	2255	1025	500	91	0.17	2483	2380											Shut well in.
	2305	1090	500	87	0.33	2641	2457											
	2315	1150	500	87	0.5	2789	2551											
	2325	1202	500	80	0.67	2905	2647											
	2335	1243	500	78	0.83	2996	2719											
	2345	1277	500	77	1	3074	2781											
	2355	1306	500	73	1.17	3129	2851											
1/5/81	0005	1330	500	71	1.33	3174	2894											
	0015	1348	500	69	1.5	3212	2948											
	0025	1365	500	68	1.67	3244	2997											
	0035	1380	500	68	1.83	3274	3034											
	0045	1395	500	66	2	3293	3066											
	0115	1431	500	64	2.5	3353	3150											
	0145	1470	500	60	3	3403	3207											
	0215	1490	500	59	3.5	3439	3254											
	0245	1505	500	57	4	3468	3289											
	0345	1525	500	55	5	3506	3353											
	0445	1540	500	53	6	3534	3402											
	0545	1560	500	53	7	3557	3438											
	0645	1567	450	51	8	3580	3467											
	0845	1594	450	51	10	3620												Element #28131 only a 12 hr. clock.
	1045	1618	450	-	12	3656												
	1245	1638	450	-	14	3686												
	1445	1657	450	-	16	3713												
	1645				18	3734												
	1845	1689	450	-	20	3760												
	2045				22	3782												
	2245	1713	450		24													
2/5/81	0045				26	3820												
	0245	1745	450		28													
	0445				30	3851												
	0645	1757	445		32													
	0845				34	3880												Maximum B.H.T. = 280°F
	1045	1778	445		36													
	1245				38	3904												
	1401				39.27	3909												
	1438	1791			38.89	1818	1805											P.O.H.
	1445	1791	445		40													Hang in lubricator.

Well Name MOORARI #3 Type of Test BUILD UP SURVEY Date APRIL 30th-JUNE 2nd, 1981

Date	Time	WELLHEAD DATA			Shut In Time (Hrs)	SUBSURFACE DATA		SEPARATOR DATA				FLUID RATES					GOR	Remarks
		SHUT IN				EL#15830 @ 9354'KB Press. (psig)	EL#31720 @ 9360'KB Press. (psig)	Pf	H.W. ΔP	Temp.	Orifice Size	Gas	Liquid	Oil	Grav. °API	BS&W		M.R. = 4.026" S.G. = 0.9531
		W/H Press. (psig)	Casing Press. (psig)	W/H Temp. (°F)														
2/5/81	1551	1795				1826	1813											Hang in lubricator
	1654																	R.I.H. Hang bombs.
	1728				42.73													Hang bombs.
	1845	1798	440		44	3946	3929											
	2245	1809	440		48	3961	3942											
3/5/81	0245	1822	440		52	3973	3953											
	0695	1828	440		56	3982	3965											
	1045	1840	420		60	3992	3975											
	1445	1850	425		64	4002	3986											
	1845	1855	425		68	4012	3993											
	2245	1862	425		72	4019	4001											
4/5/81	0245	1867	425		76	4024	4009											
	0645	1872	420		80	4032	4016											
	1045	1881	420		84	4040	4024											
	1445	1887	420		88	4045	4029											
	1845	1891	420		92	4053	4035											
	2245	1895	420		96	4058	4042											
5/5/81	0245	1902	410		100	4063	4049											
	0645	1904	410		104	4070	4052											
	1045	1910	410		108	4075	4057											
	1445	1915	410		112	4080	4063											
	1845	1917	410		116	4085	4070											
	2245	1921	410		120	4091	4075											
6/5/81	0245	1927	400		124	4096	4080											
	0645	1928	400		128	4101	4083											
	0824				129.65	4103	4086											P.O.H.
	0858	1929				1972	1957											Hang in lubricator.
	0940																	Bleed down.
	1045	1927	400		132													
	1120																	Engage stylus.
	1131	1927				1961	1938											Pressure lubricator.
	1201																	R.I.H.
	1338				134.88													Hang bombs
	1445				136	4124	4096											P.O.H.
	1645	1921	400		138													
	1845				140	4124	4101											
	2245				144	4130	4105											
7/5/81	0245				148	4132	4105											
	0645				152	4134	4109											
	0800	1938	400		153.25													
	1045				156	4137	4113											
	1445				160	4140	4116											

Well Name MOORARI #3 Type of Test BUILD UP SURVEY Date APRIL 30th-JUNE 2nd, 1981

Date	Time	WELLHEAD DATA SHUT IN W/H Press. (psig)	Casing Press. (psig)	W/H Temp. (°F)	SHUT IN TIME (Hrs)	SUBSURFACE DATA EL#15830 @ 9354'KB Press. (psig)	EL#31720 @ 9360'KB Press. (psig)	SEPARATOR DATA Pf	H.W. ΔP	Temp.	Orifice Size	FLUID RATES Gas	Liquid	Oil	Grav. °API	BS&W	GOR	Remarks M.R. = 4.026" S.G. = 0.9531
7/5/81	1800	1945	400		163.25													
	1845				164	4142	4119											
	2245				168	4145	4121											
8/5/81	0245				172	4145	4123											
	0630	1950	400		175.75													
	0645				176	4147	4124											
	1045				180	4149	4127											
	1445				184	4151	4129											
	1845				188	4153	4132											
	2015	1960	400		189.5													
	2245				192	4155	4136											
9/5/81	0245				196	4157	4139											
	0540	1966	400		198.92													
	0645				200	4160	4142											
	1045				204	4160	4142											
	1445				208	4163	4144											
	1845				212	4165	4147											
	2030	1969	400		213.75													
	2245				216	4168	4152											Maximum B.H.T. = 278°F.
10/5/81	0245				220	4170	4154											
	0645				224	4173	4157											
	0700				224.25													
	0945				227	4173	4157											R.I.H.
	1017				227.53	4175	4157											Pick up bombs
	1052	1972				2014	1996											Hang in lubricator.
	1154																	Depressure lubricator.
	1211																	Disengage stylus.
	1249	1969				2010	1980											
	1357																	R.I.H.
	1453				232.13													Hang bombs.
	1545				233	4188	4162											
	2245				240	4195	4168											
11/5/81	0645				248	4198	4172											
	1445				256	4199	4175											
	2145	1982	400		263													
	2245				264	4201	4177											
12/5/81	0645				272	4201	4180											
	0800	1983	400		273.25													
	1445				280	4203	4183											Maximum B.H.T. = 278°F
	2030	1985	400		285.75													
	2245				288	4204	4185											
13/5/81	0645				296	4206	4190											
	0750	1988	400		297.08													

Well Name MOORARI #3 Type of Test BUILD UP SURVEY Date APRIL 30th-JUNE 2nd, 1981

Date	Time	WELLHEAD DATA			SHUT IN TIME (Hrs)	SUBSURFACE DATA		SEPARATOR DATA				FLUID RATES					GOR	Remarks
		SHUT IN				EL#15830 @ 9312'KB	EL#31720 @ 9318'KB	Pf	H.W. ΔP	Temp.	Orifice Size	Gas	Liquid	Oil	Grav. °API	BS&W		M.R. = 4.026" S.G. = 0.9531
		W/H Press. (psig)	Casing Press. (psig)	W/H Temp. (°F)		Press. (psig)	Press. (psig)											
13/5/81	1445				304	4206	4193											
	1540	1992	400		304.92													
	2245				312	4209	4196											
14/5/81	0645				320	4211	4200											
	1007				323.37	4211	4201											R.I.H.
	1037				323.87	4211	4201											Pick up bombs & P.O.H.
	1100	1992	400		324.25													
	1107	1992				2030	2016											Hang in lubricator.
	1149																	Depressure lubricator.
	1158																	Disengage stylus.
	1223	1991				2017	1996											Pressure lubricator.
	1335																	R.I.H.
	1416				327.52													Hang bombs.
	1445				328	4219	4203											
	1530	1991	400		328.75													
15/5/81	0045				338	4222	4207											
	0842	1994	350		340.05													
	1045				348	4223	4211											
	1500	1998	350		352.25													
	2045				358	4224	4213											
16/5/81	0645				368	4224	4214											
	0847	1997	375		370.03													
	1500	1998	375		376.25													Maximum B.H.T. = 275°F
	1645				378	4227	4217											
17/5/81	0245				388	4227	4221											
	1245				398	4229	4224											
	1445	2003	350		400													
	2245				408	4231	4227											
18/5/81	0845				418	4234	4231											
	0930				418.75													
	0942				418.95	4235	4231											R.I.H.
	1042				419.95	4235	4231											Pick up bombs & P.O.H.
	1113	1998				2042	2029											Hang in lubricator.
	1140																	Depressure lubricator.
	1212	2004				2037	2004											Pressure lubricator.
	1230	1995	350															
	1318																	R.I.H.
	1450				424.08	4094	4048											Hang bombs.
	1545				425	4249	4221											
19/5/81	0145				435	4249	4221											
	1145				445	4249	4224											
	1407	1999	375		447.37													

Well Name MOORARI #3 Type of Test BUILD UP SURVEY Date APRIL 30th-JUNE 2nd, 1981

Date	Time	WELLHEAD DATA			SHUT IN TIME (Hrs)	SUBSURFACE DATA		SEPARATOR DATA				FLUID RATES					GOR	Remarks
		SHUT IN				EL#15830 @ 9317'KB	EL#31720 @ 9318'KB	Pf	H.W. ΔP	Temp.	Orifice Size	Gas	Liquid	Oil	Grav. °API	BS&W		M.R. = 4.026" S.G. = 0.9531
		W/H Press. (psig)	Casing Press. (psig)	W/H Temp. (°F)		Press. (psig)	Press. (psig)											
	2145				455	4249	4225											
20/5/81	0745				465	4247	4226											
	1311	1998	375		470.43													
	1745				475	4247	4226											
21/5/81	0345				485	4247	4229											
	1345				495	4245	4231											
	2345				505	4247	4232											
22/5/81	0945				515	4247	4236											
	1945				525	4247	4238											
23/5/81	0545				535	4250	4239										)	
																	)	Bombs left in hole due
																	)	to wet weather
																	)	
2/6/81	1242				541.95													Off bottom.
	1307	2010				N/A	N/A											Hang in lubricator.
	1308																	Depressure lubricator.

SANTOS LTD.

0119

OIL WELL TEST RESULTS

Well Name MOORARI #3 Type of Test STATIC GRADIENT Date JUNE 2nd, 1981

Separator No. 305 Test By G.R.M. & A. A. MICHELL Meter Run I.D. 4.026" Gas S.G. 0.9531 From MOORARI GAS PACK

Date	Time	WELLHEAD DATA			Depth	SUBSURFACE DATA		SEPARATOR DATA				FLUID RATES					GOR	Remarks
		Choke Size	SHUT IN			EL#31720	EL#31840	Pf	H.W. ΔP	Temp.	Orifice Size	Gas	Liquid	Oil	Grav. °API	BS&W		
			Press. (psig)	Temp. (°F)	(ft)	Press. (psig)	Temp. (°F)											
2/6/81	1434		2010		LUB	2023												Hang in lubricator.
	1504				RIH													R.I.H.
	1511				2000	2475	126.12											
	1533				4000	2995	166.90											
	1555				6000	3491	211.97											
	1616				8000	3958	237.98											
	1635				9000	4188	256.40											Average Gradient =
	1652				9200	4229	268.12											0.238 psi/ft.
	1723				9300	4253	270.75											
	1741				9400	4276	272.87											
	1757				9500	4299	274.75											
	1811				9570	4319	276.37											
	1844				9500	4301	275.62											
	1900				9400	4280	274.12											
	1944		2010		LUB	2044												Hang in lubricator.

GL# 15830

STATIC PRESSURE GRADIENT

WELL MEKAH #3

TEST DATE 2/6/81 (1434-1944)

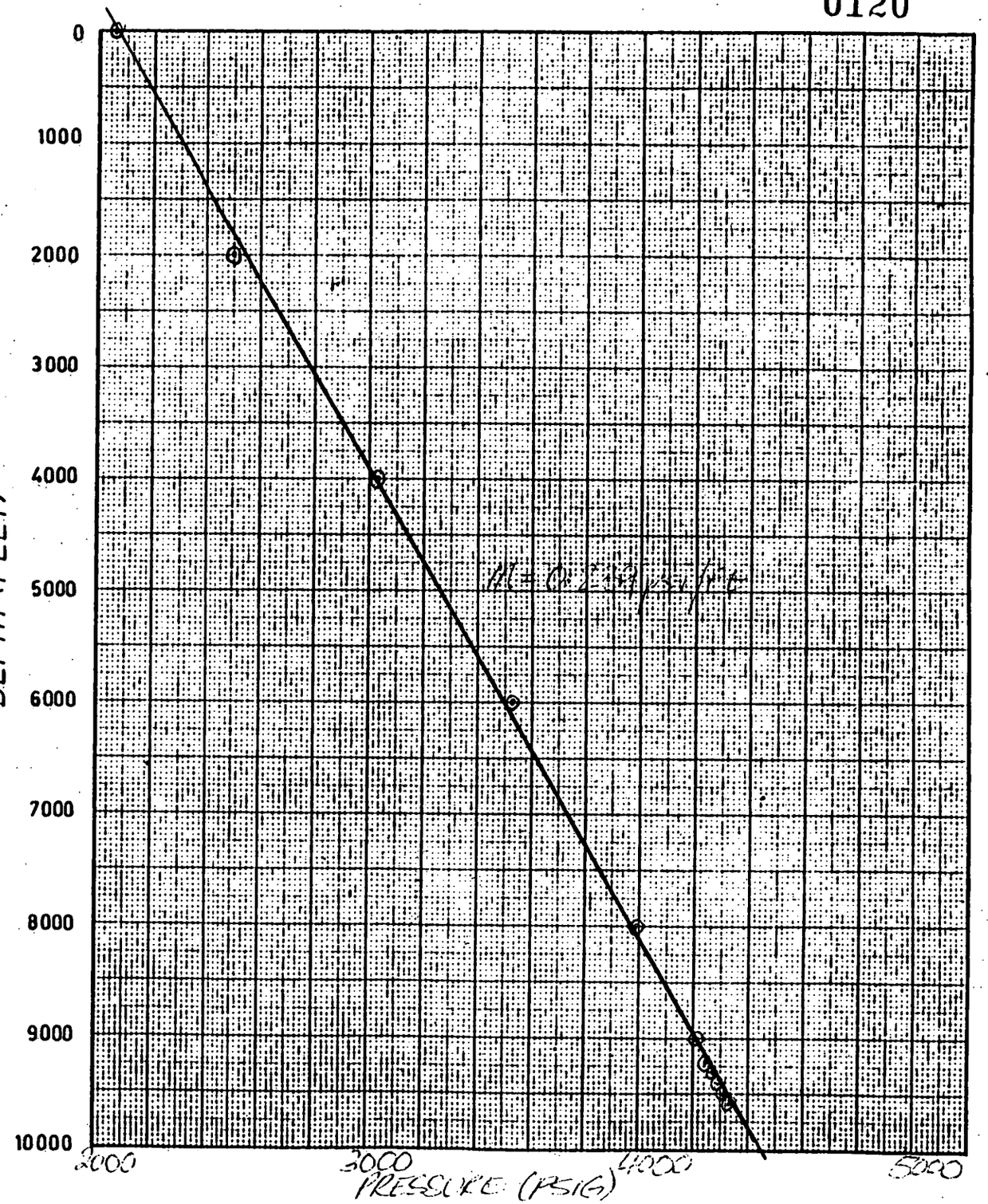
DEPTH (FEET)	PRESSURE (PSIG)	GRADIENT PSI/FT
LUB	2047	
2000	2502	0.225
4000	3027	0.2625
6000	3525	0.2490
8000	3914	0.2345
9000	4211	0.2170
9200	4247	0.1800
9300	4268	0.2100
9400	4288	0.2000
9500	4311	0.2300
9570	4327	0.2286
9500	4314	—
9400	4293	—
LUB	2057	

DEPTH (METRES)	PRESSURE (kPa)	GRADIENT kPa/M
LUB	14117	
610	17255	5.1463
1219	20876	5.9380
1829	24810	5.6326
2438	27546	5.3046
2743	29041	4.9088
2804	29290	4.0718
2835	29434	4.7504
2865	29575	4.5242
2896	29731	5.2028
2917	29841	5.1712
2896	29752	—
2865	29607	—
LUB	14186	

LUBRICATOR IN — D.W.T. = 2010 PSIG
IN — AMERADA = 2047 PSIG
LUBRICATOR OUT — D.W.T. = 2010 PSIG
OUT — AMERADA = 2057 PSIG

1 PSI/FT = 22.621 kPa/M

JMT 12/6/81



EL# 81720

STATIC PRESSURE GRADIENT

WELL MOORARI #3

TEST DATE 2/6/81 (1434-1944)

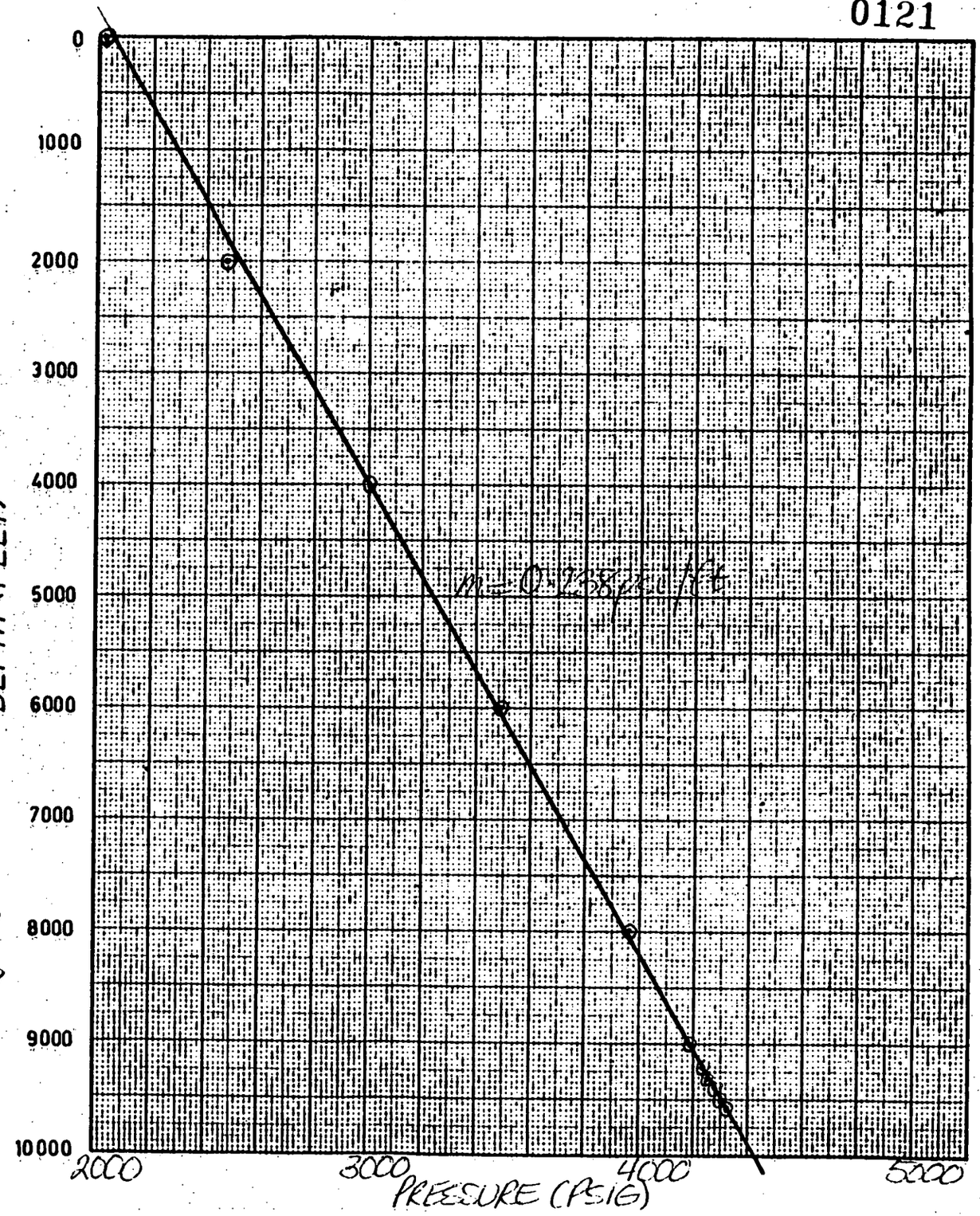
DEPTH (FEET)	PRESSURE (PSIG)	GRADIENT PSI/FT
LUB.	2023	
2000	2475	0.2260
4000	2995	0.2600
6000	3491	0.2480
8000	3958	0.2335
9000	4188	0.2300
9200	4229	0.2050
9300	4253	0.2400
9400	4276	0.2300
9500	4299	0.2300
9570	4319	0.2857
9500	4301	—
9400	4280	—
LUB.	2044	

DEPTH (METRES)	PRESSURE (kPa)	GRADIENT kPa/M
LUB.	13952	
610	17069	5.1123
1219	20665	5.8815
1829	24076	5.6100
2438	27297	5.2820
2743	28883	5.2028
2804	29166	4.6373
2835	29331	5.4290
2865	29490	5.2028
2896	29648	5.2028
2917	29786	6.4628
2896	29662	—
2865	29517	—
LUB.	14097	

LUBRICATOR IN D.W.T. = 2010 PSIG
IN AMERADA = 2023 PSIG
LUBRICATOR OUT D.W.T. = 2010 PSIG
OUT AMERADA = 2044 PSIG

1 PSI/FT = 22.621 kPa/M.

GMJ 12/6/81



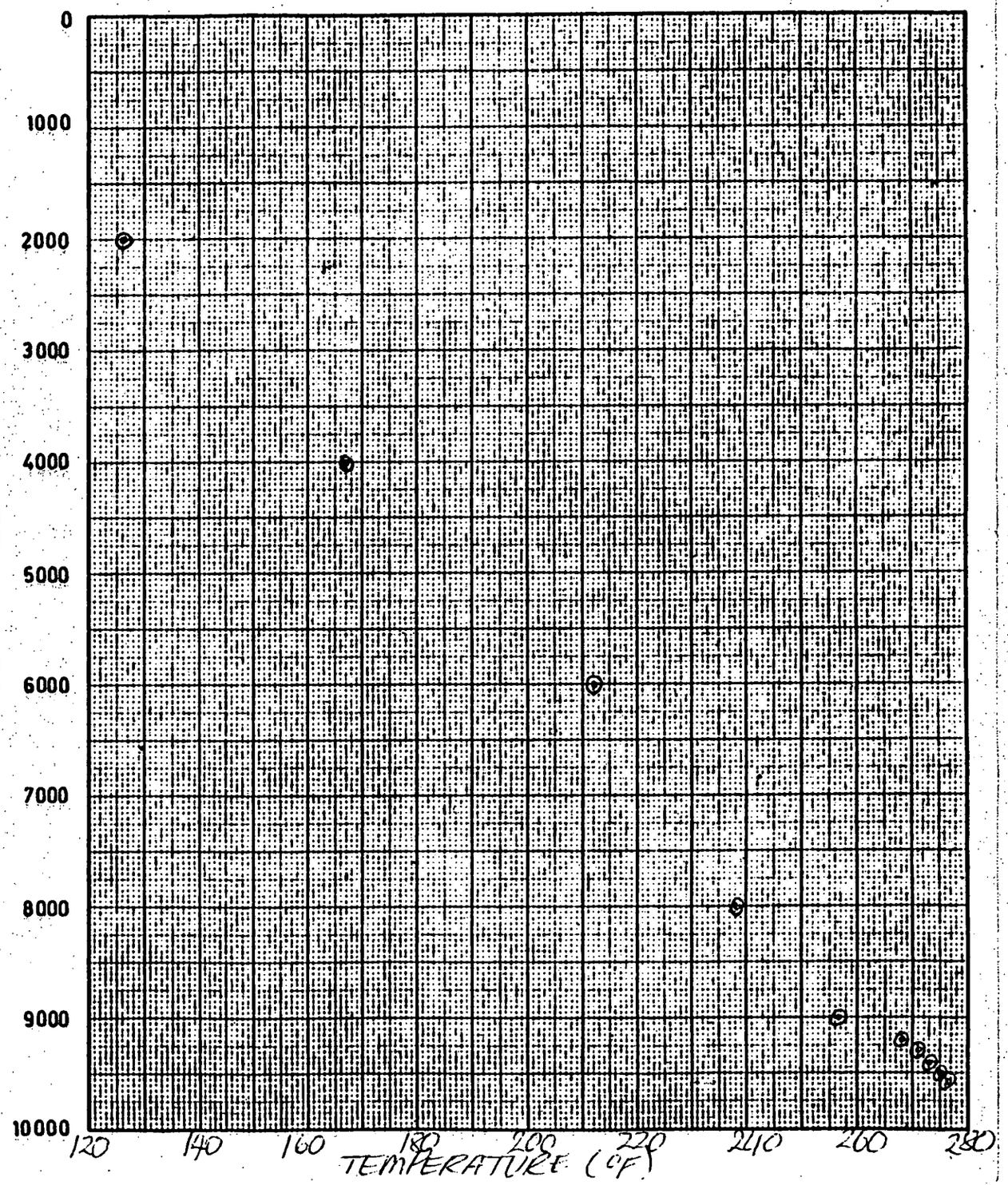
STATIC TEMPERATURE GRADIENT

WELL MOORARI #3

TEST DATE 2/6/81 (1434-1944)

DEPTH (FEET)	TEMP (°F)	GRADIENT °F/FT
LUB.		
2000	126.12	
4000	166.90	0.0204
6000	211.97	0.0225
8000	237.98	0.0130
9000	256.40	0.0184
9200	268.12	0.0586
9300	270.75	0.0263
9400	272.87	0.0212
9500	274.75	0.0188
9570	276.37	0.0231
9500	275.62	—
9400	274.12	—
LUB.		

DEPTH (METRES)	TEMP (°C)	GRADIENT °C/M
LUB.		
610	62.29	
1219	74.95	0.0372
1829	99.99	0.0410
2438	114.44	0.0237
2743	124.68	0.0336
2804	131.19	0.1067
2835	132.65	0.0471
2865	133.83	0.0393
2896	134.87	0.0335
2917	135.77	0.0429
2896	135.36	—
2865	134.52	—
LUB.		



AM 7 12/6/81

3953 R14

WP: 6059A

0123

MOORARI #3

FLOW/BUILDUP TEST

POST FRACTURE TREATMENT

18TH JULY, 1981 - 5TH AUGUST, 1981.

BY: R.R. QUICK

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I WELL TEST DATA SHEETS

INTRODUCTION

An extended production test was conducted in the well between 17th April and 2nd June, 1981. The purpose of this test was to evaluate the flow capacity and skin of the well prior to the fracture treatment. After the fracture treatment had been conducted, the well was then retested (between 18th July, 1981 and 5th August, 1981) to assess the change, if any, to the flow capacity and skin and, hence, to evaluate the fracture treatment.
This report presents that evaluation.

RESULTS

As can be seen from the multirate drawndown plot (Figure #4), there is considerable "scatter" in the data: an analysis was performed on this data, but should not be considered reliable. It has been included for comparison with the buildup analyses. The buildup portion of the test was analysed in three ways:

A "type curve" (log - log) plot was prepared first (Figure #1), then a Horner plot (Figure #2) was prepared and, finally, an Odeh-Jones (multirate) plot was prepared (Figure #3).

The results of these analyses were as follows:

Plot	kh	Skin	Pskin	D.R.	P*	P.I.
EARLOUGHER	35	-5.0	N/A	N/A	N/A	N/A
"TYPE CURVE"	82	-5	N/A	N/A	N/A	N/A
HORNER	92.4	-2.6	-553	0.67	4241	0.55
ODEH-JONES	85.6	-3.3	-898	0.56	4242	0.55

NOTE

The "type curve" is for determining the beginning of the semilog straight line for the Horner plot. It should not be relied upon to yield accurate kh or skin results.

CONCLUSIONS

1. The fracture treatment conducted on the subject well was very successful, with the productivity index (P.I.) increasing almost four fold, from 0.15 BOPD/psi to 0.55 BOPD/psi.

2. Reservoir pressure, as calculated from the post-frac analysis, is 33 psi less than that calculated from the pre-frac analysis: this is probably due to extrapolation and/or Amerada bomb errors and, in the writer's view, has little significance.

RECOMMENDATIONS

1. The fracture treatment was an undoubted success and should be seriously considered as a viable stimulation treatment for any well requiring stimulation.

DISCUSSION

1. As the rate varied significantly during the flow period (refer Appendix), the Odeh-Jones plot should yield the most accurate estmates of kh and skin.

2. From the "type curve" plot, an abnormality is evident at shutin times greater than fourteen hours. Account must be taken of this fact when analysing the Horner plot. As this abnormality is possibly due to both multirate and multilayer effects, care should also be exercised when analysing the Odeh-Jones plot.

3. In both the Horner and Odeh-Jones plots, considerable deviation from the "correct" straight line occurred at long shutin times; hence, on each plot, a second line (line B) has been used to determine the reservoir pressure.

4. The flow capacity as determined from this test is much greater than that determined from the pre-frac test (86 md.ft. compared to 26 md.ft). As a fracture treatment can not affect the matrix permeability, there is an obvious inconsistency in the results from the two tests. It is the writer's view that the reason for this inconsistency is that the analysis of the first test was in error, a possibility stated in that report. This view is further substantiated by the calculation of a negative skin (-2.2) in the analysis of that first test, a most unlikely occurrence in a well that had not been fracture treated at that time. The primary cause of this error was, almost certainly, the presence of two layers (at least) in the system: multilayer effects are evident from the Odeh-Jones plot (Figure #3) constructed for this report as well.

5. The fracture treatment was very successful, with the best measure of productivity, the productivity index, increasing from 0.15 BOPD/psi to 0.55 BOPD/psi, an increase of almost four fold.

6. The average reservoir pressure calculated from the results of this test is 33 psi less than those calculated from the previous test. There are two possible causes of this. The first is the nature of both the Horner and Odeh-Jones plots for this post frac test. It is quite possible that the graphs could continue to curve upwards, ultimately pointing at a higher reservoir pressure. The second possible reason is the inherent inaccuracy of the Amerada bombs themselves.

TABLE I

DATA SUMMARY

Common Data

Item	Value	Source
ϕ	0.108	log evaluation
Net Pay	72'	log evaluation
μ	0.09CP	estimated (cf Tirrawarra Oil)
C_T	$5 \times 10^{-5} psi^{-1}$	estimated (cf Tirrawarra Oil)
B_o	3 RB/STB	estimated (cf Tirrawarra Oil)
q_{AVE}	515.5 BOPD	calculated from data sheets
q_N	618 BOPD	last recorded flow rate
P_{wf}	3110 psia	last FBHP recorded
r_w	0.354'	bit size

Earlougher Plot

m" = 1.26
b" = -0.83

Type Curve

Matched on S = -5 line
ΔP_m = 240 psi $P_{Dm} = 10^0$
Δt_m = 2.8 hrs. $t_{Dm} = 10^6$

Horner Plot

P* = 4241 psia
m = 245.0 psi/cycle
P_{WSI} = 3561 psia

Odeh-Jones Plot

P* = 4242 psia
m' = 317
α = 2.096
$P_{WS\alpha}$ = 3501 psia

TABLE II

EQUATION SUMMARY

Common Equations

$$\Delta P_{skin} = \frac{m\ S}{1.151}$$

$$D.R. = \frac{P^* - P_{wf}}{P^* - P_{wf} - \Delta P_{skin}}$$

$$P.I. = \frac{q_N}{P^* - P_{wf}}$$

Earlougher Plot

$$kh = \frac{162.6\ \mu\ B}{m''}$$

$$S = 1.151\ \left[\frac{b''}{[\ m''} - \log\ \left(\frac{k}{(\phi\mu C_T r_w^{\ 2})}\right) + 3.228\ \right]$$

Type Curve

$$kh = 141.2\ q_{ave}\ \mu\ B\ \frac{P_{Dm}}{\Delta Pm}$$

Horner Plot

$$kh = \frac{162.6\ q_{ave}\ \mu\ B}{m}$$

$$S = 1.151\ \left[\frac{P_{ws1} - P_{wf}}{[\ m} - \log\ \left(\frac{k}{(\phi\mu C_T r_w^{\ 2})}\right) + 3.228\ \right]$$

Odeh-Jones Plot

$$kh = \frac{162.6\ q_n\ \mu\ B}{m'}$$

$$S = 1.151\ \left[\frac{P_{wsa} - P_{wf}}{[\ m'} - \log\ \left(\frac{k}{(\phi\mu C_T r_w^{\ 2})}\right) + 3.228\ \right]$$

Figure 1.

MOORARI #3

BUILDUP POST FRAC

"TYPE CURVE"

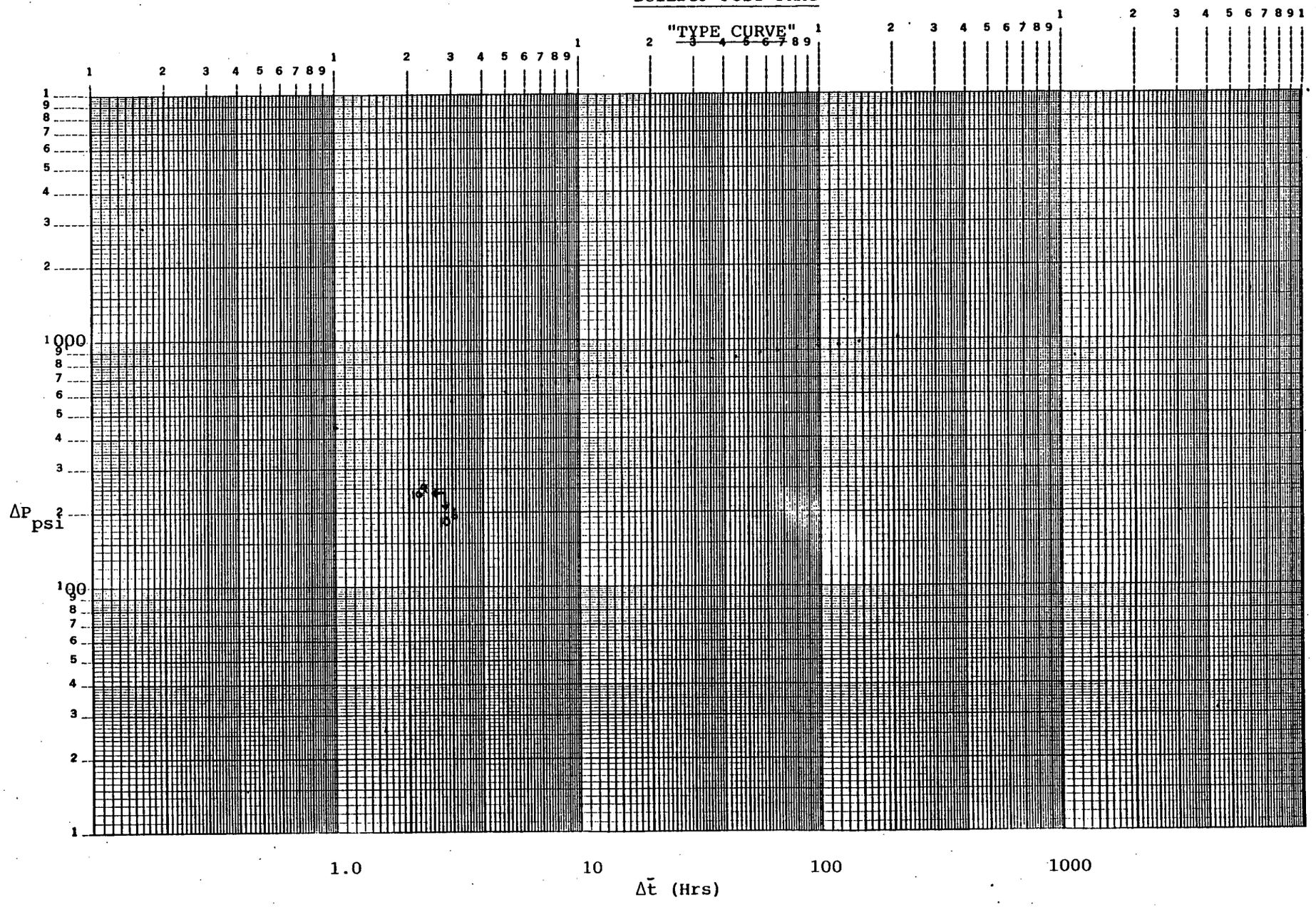
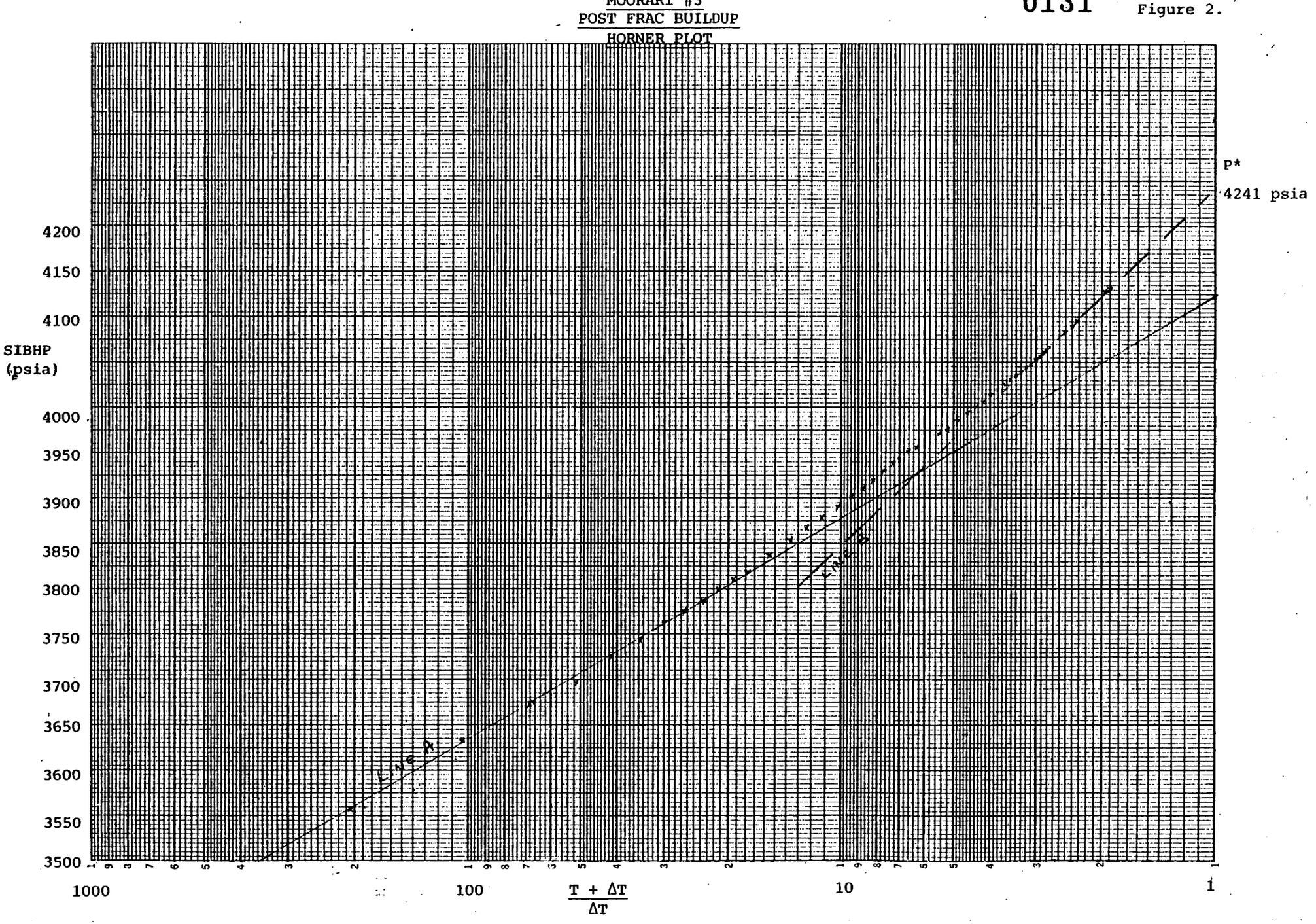


Figure 2.


MOORARI #3
POST FRAC BUILDUP
HORNER PLOT
p*
4241 psia
4200
4150
4100
SIBHP
(psia)
4000
3950
3900
3850
3800
3750
3700
3650
3600
3550
3500
1000
100
10
1
T + ΔT
ΔT

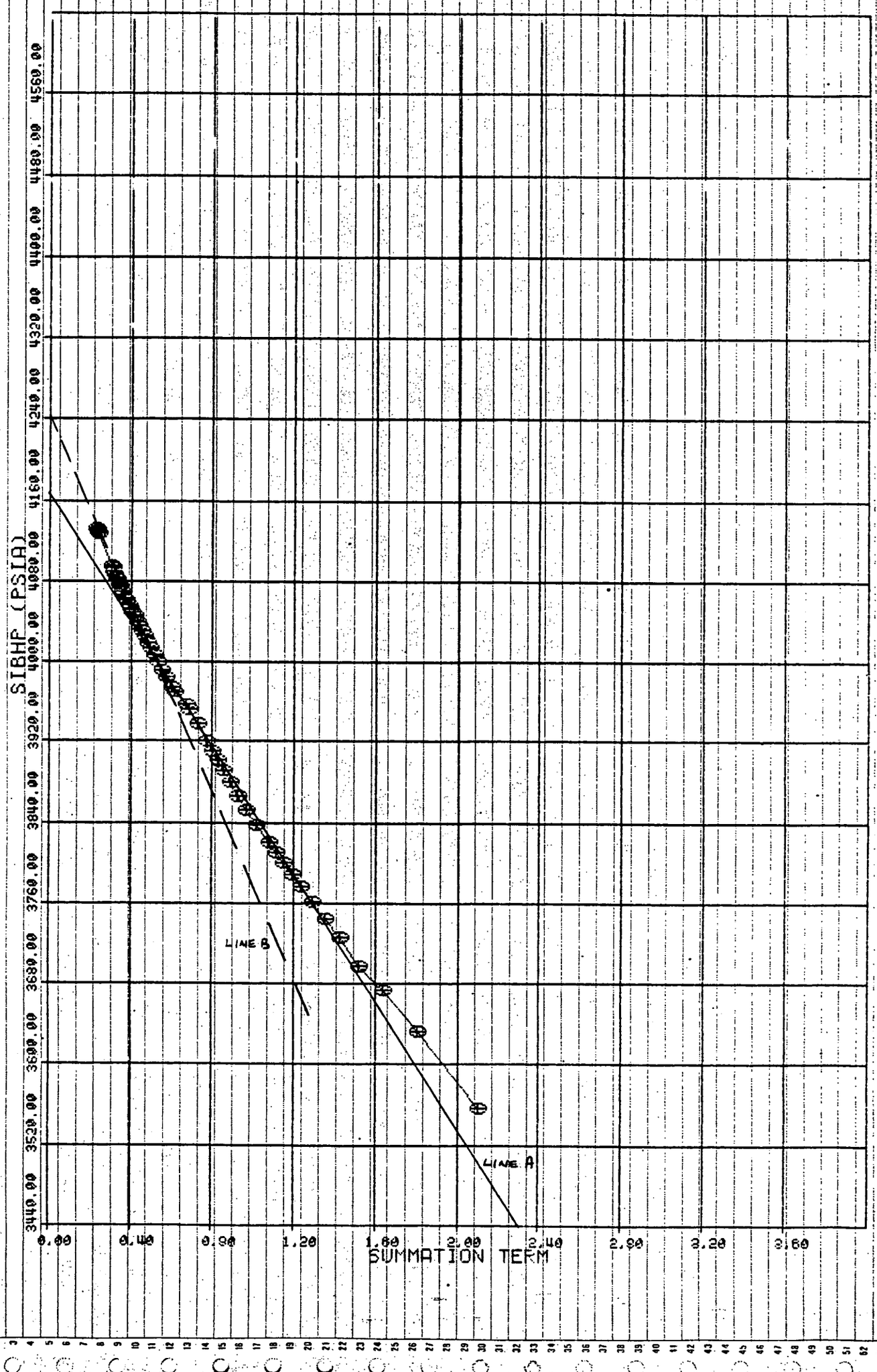
MOORARI #3

ODEH-JONES PLOT

POST FRAC BUILDUP

0132

Figure 3



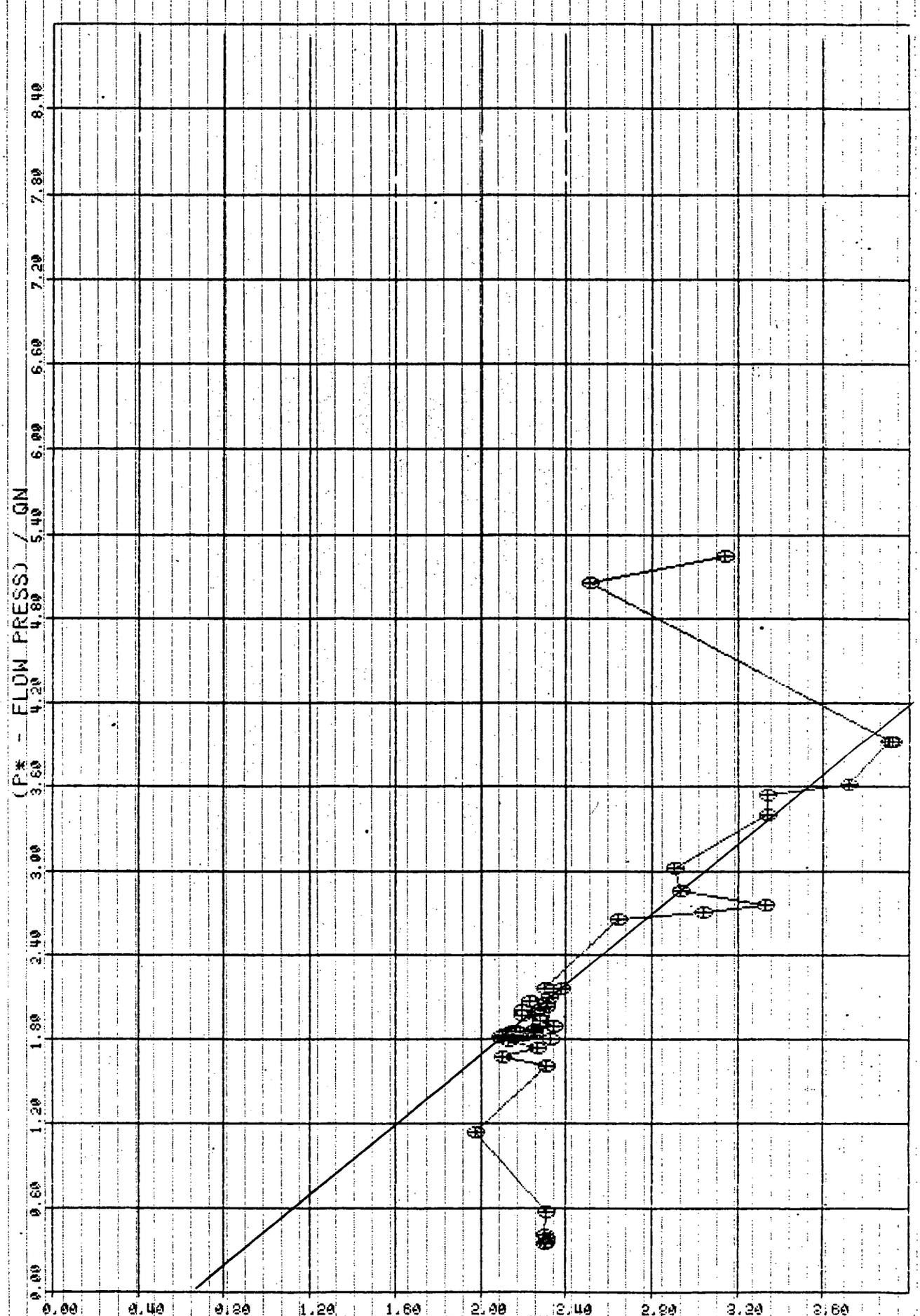
MOORARI #3

EARLOUGHER PLOT (MULTIRATE)

POST FRAC DRAWDOWN

0133

Figure 4.



APPENDIX

MOORARI #3 SUMMARY OF WELL TEST DATA JULY 17TH-AUGUST 5TH, 1981.

NOTE: WELL FRACCED JUNE 28, 1981

Static Reservoir Pressure

17/7/81: Static Gradient (Mid Point Perfs. - 9516' KB)
Element # 21820 @ 9520' KB = 4338 psia) Average Gradient
Element # 21821 @ 9520' KB = 4329 psia) = 0.4140 psia/ft.
Maximum Bottomhole Pressure = 271°F.

Flow Test

18/7/81 to 26/7/81
18/7/81: Opened well up @ 1200 hrs. on 18/64" choke. Had trouble with choke blocking with water and frac materials. Continually changing choke thoughout the test due to frac sand.
S.G. = 0.9531 (Moorari Gas Pac).
F.W.H.P. = 1198 psia
Gas Rate = 1152 mmcf/day) G.O.R. = 2606 scf/bbl
Oil Rate = 442 bbls/day)
Total Liquid = 674 bbls/day
B.S.&W. = 1.1%
Element # 21820 @ 9454' KB = 3440 psia
Element # 21821 @ 9460' KB = 3416 psia
Maximum Bottomhole Temperature = 255°F

Flowing Gradient ran: 26/7/81

Build-up Survey

26/7/81 to 5/8/81 - Buildup pressures after 228.9 hrs.
Element # 21820 @ 9319' KB = 4144.8 psia
Element # 21821 @ 9325' KB = 4133.0 psia

SANTOS LTD.

OIL WELL TEST RESULTS

0135

Well Name MOORARI #3 Type of Test STATIC GRADIENT Date JULY 17TH, 1981.

Separator No. 305 Test By GRM&A/ G. PETERSON Meter Run I.D. 4.026" Gas S.G. 0.9531 From MOORARI GAS PAC

Date	Time	Choke Size	Pressure (psia)	Depth (ft)		SUBSURFACE DATA El# 21820 Press. (psia)	El# 21821 Press. (psia)	El# 31840 Temp. (°F)	SEPARATOR DATA Pf	H.W. ΔP	Temp.	Orifice Size	FLUID RATES Gas	Liquid	Oil	Grav. °API	BS&W	GOR	Remarks
17/7/81	1540		438	Lub.		428	422	-											Hang in lubricator.
	1602			2000		1216	1211	123											
	1613			4000		2031	2014	163											
	1624			6000		2877	2863	211											
	1636			8000		3716	3715	235											
	1645			9000		4130	4125	254											Average Gradient
	1651			9200		4207	4203	267											= 0.414 psia/ft.
	1707			9300		4247	4243	269											
	1713			9400		4288	4283	271											
	1719			9500		4329	4322	268											
	1724			9520		4338	4329	269											
	1729			9500		4331	4323	268											
	1734			9400		4290	4285	271											
	1807		441	Lub.		447	438	-											Hang in lubricator

STATIC PRESSURE GRADIENT

(ELEMENT # 21820)

WELL MOORARI #3

TEST DATE 17/7/81 (1540-1807)

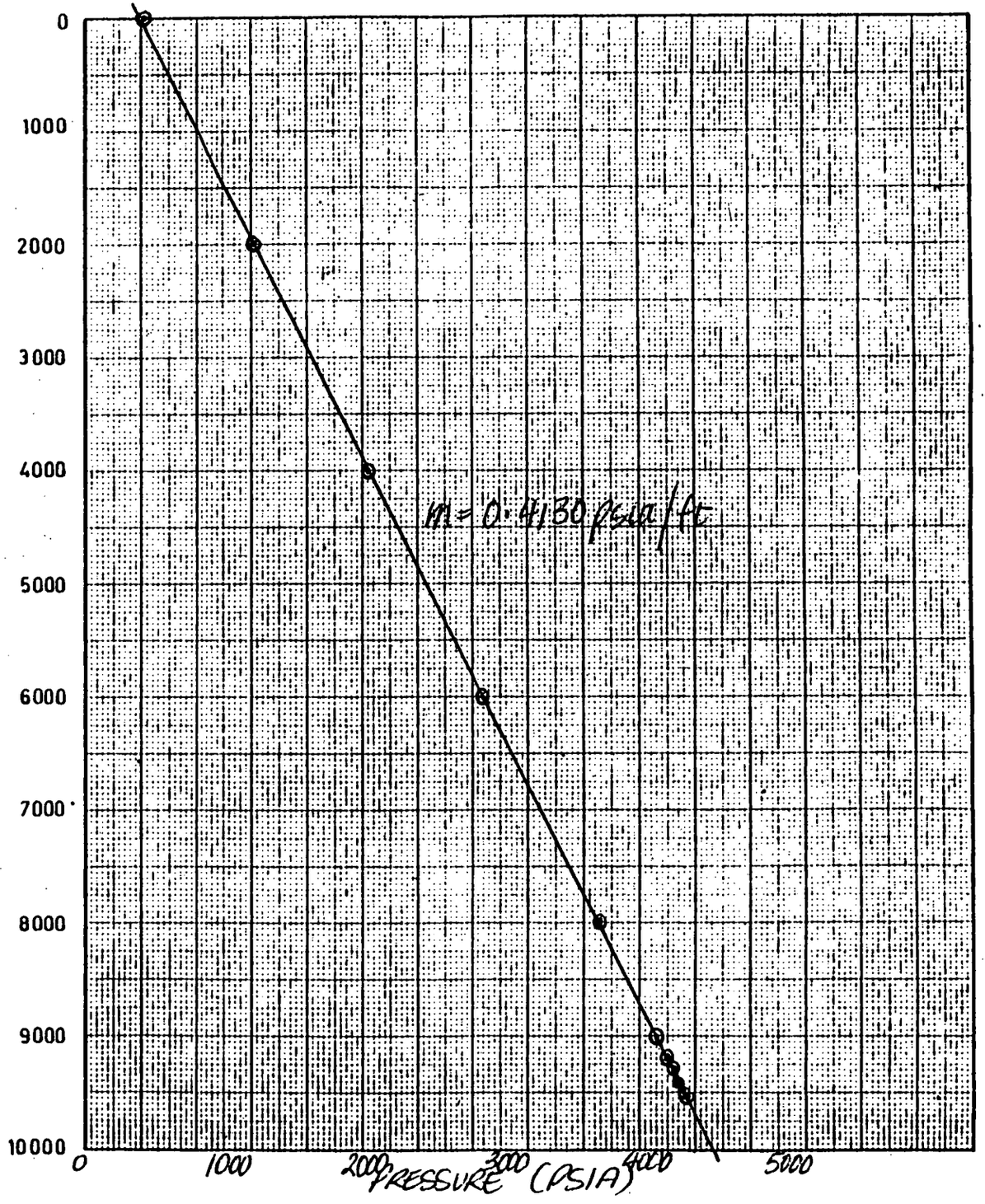
DEPTH (FEET)	PRESSURE (PSIA)	GRADIENT PSIA/FT
LUB.	428	
2000	1216	0·3940
4000	2031	0·4075
6000	2877	0·4225
8000	3716	0·4195
9000	4130	0·4140
9200	4207	0·3850
9300	4247	0·4000
9400	4288	0·4100
9500	4329	0·4100
9520	4338	0·4500
9500	4331	—
9400	4290	—
LUB.	447	

DEPTH (METRES)	PRESSURE (kPa ABS.)	GRADIENT kPa ABS/M
LUB.	2952	
610	8386	8·9127
1219	14007	9·2181
1829	19841	9·5574
2438	25628	9·4895
2743	28483	9·3651
2804	29014	8·7091
2835	29290	9·0484
2865	29572	9·2746
2896	29856	9·2746
2902	29917	10·1795
2896	29869	—
2865	29586	
LUB.	3083	

LUBRICATOR IN D.W.T. = 438 PSIA
IN AMERADA = 428 PSIA
LUBRICATOR OUT D.W.T. = 441 PSIA
OUT AMERADA = 447 PSIA

1 PSIA/FT = 22·621 kPa ABS./M.

JMJ. 10/8/81



STATIC PRESSURE GRADIENT

(ELEMENT # 21821)

WELL MOORARI #3

TEST DATE 17/7/81 (1540 - 1807)

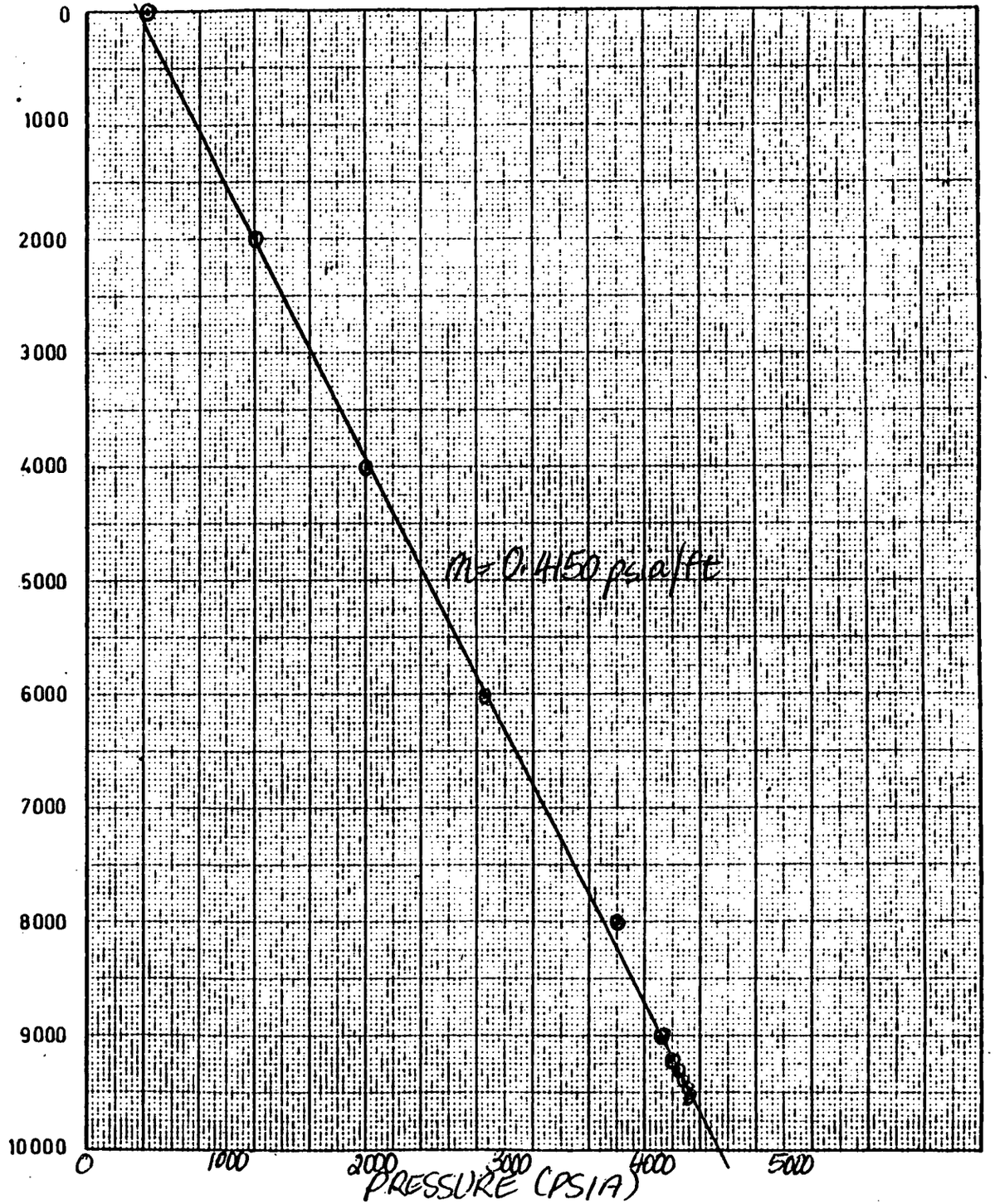
DEPTH (FEET)	PRESSURE (PSIA)	GRADIENT PSIA/FT
LUB.	422	
2000	1211	0·3945
4000	2014	0·4015
6000	2863	0·4245
8000	3715	0·4260
9000	4125	0·4100
9200	4203	0·3900
9300	4243	0·4000
9400	4283	0·4000
9500	4322	0·3900
9520	4329	0·3500
9500	4323	—
9400	4285	—
LUB.	438	

DEPTH (METRES)	PRESSURE (kPaABS.)	GRADIENT kPaABS/M
LUB.	2910	
610	8352	8·9240
1219	13890	9·0823
1829	19745	9·6026
2438	25621	9·6365
2743	28448	9·2746
2804	28986	8·8222
2835	29262	9·0484
2865	29538	9·0484
2896	29807	8·8222
2902	29855	7·9174
2896	29814	—
2865	29552	—
LUB.	3021	

LUBRICATOR IN D.W.T. = 438 PSIA.
IN AMERADA = 422 PSIA.
LUBRICATOR OUT D.W.T. = 441 PSIA.
OUT AMERADA = 438 PSIA

1 PSIA/FT = 22.621 kPaABS/M.

GMJ. 10/8/81



STATIC TEMPERATURE GRADIENT

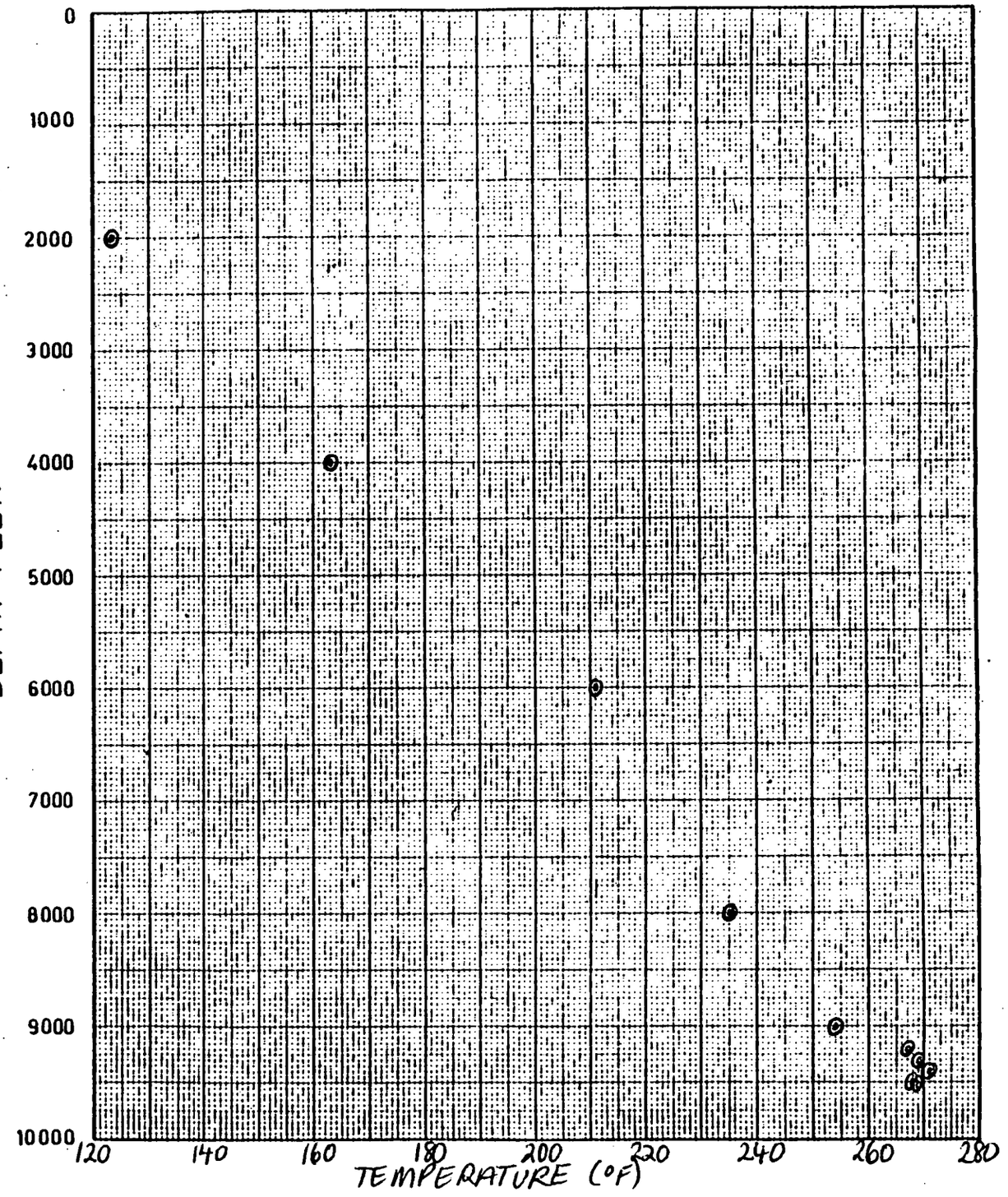
WELL: MOORARI #3

TEST DATE 17/7/81 (1540-1807)

DEPTH (FEET)	TEMP (°F)	GRADIENT °F/FT
LUB.		
2000	123	
4000	163	0·020
6000	211	0·024
8000	235	0·012
9000	254	0·019
9200	267	0·065
9300	269	0·020
9400	271	0·020
9500	268	—
9520	269	0·050
9500	268	—
9400	271	—
LUB.		

DEPTH (METRES)	TEMP (°C)	GRADIENT °C/M
LUB.		
910	50·6	
1219	72·8	0·0365
1829	99·5	0·0438
2438	112·8	0·0218
2743	123·3	0·0344
2804	130·6	0·1197
2835	131·7	0·0355
2865	132·8	0·0367
2896	131·1	—
2902	131·7	0·1000
2896	131·1	—
2865	132·8	—
LUB.		

JMJ 10/8/81



SANTOS LTD.

OIL WELL TEST RESULTS

Well Name MOORARI #3 Type of Test FLOW TEST Date JULY 18TH-26TH, 1981.

Separator No. 305 Test By GRM&A/ G. PETERSON Meter Run I.D. 4.026" Gas S.G. 0.9531 From MOORARI GAS PAC

Date	Time	WELLHEAD DATA			Flowing Time (Hrs)	SUBSURFACE DATA			SEPARATOR DATA				FLUID RATES						Remarks
		Choke Size	Flowing Press. (psia)	Flowing Temp. (°F)		El# 21820 @9448 Press. (psia)	El# 21821 @9454 Press. (psia)	El# 21379 @9460 Press. (psia)	Pf (psia)	H.W. ΔP (ins) (H_2O)	Temp. (°F)	Orifice Size (ins)	Gas (MCF/D)	Liquid (BBLS/D)	Oil (BBLS/D)	Grav. °API	BS&W (%)		Emulsion noted.
18/7/81			443			437.6	428.3	432.8											Hang in Lubricator.
	1100					4300.0	4300.4	4306.9											Hang Bombs.
	1200	18/64			Ø							1.75							Open well up
	1215	24/64			0.25	4245.6	4247.6	4226.4											Choke blocking with frac
																			sand. Changed choke.
	1230	17/64			0.5	4156.2	4157.8	4253.3											Changed choke.
	1240	20/64			0.67	4151.2	4148.7	4207.8											Producing water/frac
																			materials. Change choke.
	1245				0.75	4136.6	4140.2	4164.7				1.00							Changed orifice plate.
	1300				1	4137.3	4138.5	4164.9											
	1315	26/64			1.25	4172.2	4170.2	4152.1											Changed choke.
	1330	30/64			1.5	4109.5	4126.9	4148.0											Changed choke.
	1350				1.83	4069.1	4069.5	4140.4				0.5							Changed orifice place
	1418	28/64			2.3	3877.7	3871.5	4173.3											Changed choke
	1428				2.47	3899.1	3903.4	4149.9				1.25							Changed orifice plate
	1434	30/64			2.57	3854.3	3857.1	4142.3											Changed choke
	1500	24/64	340	100	3	3805.0	3798.0	4140.9	75	14	90		248	1330					Changed choke
	1600		483	100	4	3903.4	3902.2	4066.8	75	10	91		209	927					
	1700		520	113	5	3767.8	3762.8	3890.9	75	23	98		314	1209					
	1730	28/64			5.5	3718.0	3702.9	3880.7											Bypassed separator.
																			Changed choke.
	1750	30/64			5.83	3475.1	3452.6	3851.4											Changed choke.
	1900		378	131	7	3144.4	3126.6	3905.0											
	2015	26/64			8.25	2889.9	2883.4												Changed choke.
	2100	24/64	565	136	9	2864.2	2834.6												Changed choke.
	2230	20/64			10.5	2869.5	2865.9												Changed choke.

Well Name MOORARI #3 Type of Test FLOW TEST Date JULY 18TH - 26TH, 1981.

Date	Time	WELLHEAD DATA			Flowing Time (Hrs)	SUBSURFACE DATA			SEPARATOR DATA				FLUID RATES					GOR	Remarks
		Choke Size	Flowing Press. (psia)	Flowing Temp. (^{o}F)		El# 21820 @9448 Press. (psia)	El# 21821 @9454 Press. (psia)		Pf (psia)	H.W. ΔP (ins H_2O)	Temp. (^{o}F)	Orifice Size (ins)	Gas (MCF/D)	Liquid (Total) (bbls/d)	Oil (bbls/d)	Grav. ^{o}API	BS&W %	(SCF/ BBL)	M/R = 4.026" S.G. = 0.9531 Emulsion noted.
18/7/81	2400	20/64	838	129	12	3104.3	3092.7												
19/7/81	0030				12.5	3132.4	3119.2												Turned well through separator for 1 hour.
	0100		845	131	13	3122.7	3100.2												
	0130		855	127	13.5	3109.3	3090.1		79	52	105	1.75	957	725	239			4004	Changed orifice plate
	0200	16/64	862	127	14	3203.4	3220.2												Changed choke.
	0300		1013	123	15	3346.1	3341.5												
	0400		1003	123	16	3363.8	3360.2												
	0500		1019	123	17	3347.5	3330.2												
	0600		1037	118	18	3323.7	3310.7												
	0700		1042	116	19	3290.9	3287.2												
	0800		1045	116	20	3286.2	3278.0												
	0900		1055	118	21	3267.5	3242.7												
	1100	20/64	1089	111	23	3093.2	2996.2												Changed choke.
	1200		925	116	24	2883.0	2857.8												Attempted to put well through separator.
	1230	16/64			24.5	3037.8	3090.1												Changed choke.
	1400		1127	109	26	3211.4	3117.1												Turned well through separator.
	1600		1083	113	28	3139.9	3123.2		84	68	83		1151	705	282			4082	Bypassed separator.
	1630	14/64			28.5	3220.6	3132.9												Changed choke.
	1800		1186	114	30	3285.5	3273.7												Turned well through separator.
	2000		1189	102	32	3260.4	3244.1		84	50	72		1001	564	299			3348	Bypassed separator.
	2030	12/64			32.5	3342.8	3359.5												Changed choke.
	2200		1272	109	34	3378.4	3360.7												Turned well through separator.
	2400		1228	109	36	3360.7	3344.1		96	35	71		901	483					Bypass separator.
20/7/81	0400		1245	102	40	3331.9	3321.1												
	0700	10/64	1271	95	43	3542.5	3539.9												Changed choke.
	0900		1492	97	45	3691.3	3670.8					1.25							Turned well through separator. Changed orifice plate.
	1100	14/64	1602	91	47	3290.9	3241.7		87	21	52		340	201	154			2208	Bypassed separator.
	1200				48	3152.0	3130.6												Changed choke.
	1300		1132	107	49	3115.7	3097.6												
	1600		1154	102	52	Clock Stopped	3094.6												Turned well through separator.

Well Name MOORARI #3 Type of Test FLOW TEST Date JULY 18TH - 26TH, 1981.

Date	Time	WELLHEAD DATA			FLOWING TIME (HRS)	SUBSURFACE DATA			SEPARATOR DATA				FLUID RATES					GOR	Remarks
		Choke Size	Flowing Press. (psia)	Flowing Temp. (°F)		El# @9448' Press. (psia)	El# @9454 Press. (psia)		Pf (psia)	H.W. ΔP (ins H_2O)	Temp. (°F)	Orifice Size (ins)	Gas (MCF/D)	Liquid (Total) (BBLS/D)	Oil (BBLS/D)	Grav. °API	BS&W %	(SCF/BBL)	M/R = 4.026" SG = 0.9531 Emulsion noted
20/7/81	1800		1154	102	54		3124.7		103	72	70	1.75	1335			51.4			Changed orifice plate.
	2200		1186	102	58	Clock	Clock		101	73	67		1334						
21/7/81	0200		1188	96	62	Stopped	Stopped		106	72	67		1359						
	0600		1144	105	66				109	88	69		1519	564		52.2			
	0630				66.5							2.25							Changed orifice plate.
	1000		1140	102	70				101	40	63		1710						
			1140			1176.8	1158.2												Hang in lubricator
	1035																		Disengage stylus.

Well Name MOORARI #3 Type of Test FLOW TEST Date JULY 18TH-26TH, 1981.

Date	Time	WELLHEAD DATA			Flowing Time (Hrs)	SUBSURFACE DATA			SEPARATOR DATA				FLUID RATES					GOR (SCF/BBL)	Remarks
		Choke Size	Flowing Press. (psia)	Flowing Temp. (°F)		EI# 21820 @9454' Press. (psia)	EI# 21821 @9460' Press. (psia)		Pf (psia)	H.W. ΔP (ins) (H_2O)	Temp. (°F)	Orifice Size (ins)	Gas (MCF/D)	Liquid (BBLS/D)	Oil (BBLS/D)	Grav. °API	BS&W (%)		M/R = 4.026" S.G. = 0.9531 Emulsion Noted.
21/7/81						1128.5	1126.3												Hang in lubricator
	1404	14/64			74.07							2.25							Hang bombs
	1800		1203	116	78	3114.1	3117.0		101	25	59		1360	553.7	464	50.6		2931	
	2200		1219	116	82	3094.7	3100.2		104	28	58		1463		554	51.8		2641	
22/7/81	0200		1190	118	86	2936.4	3020.1		104	28	53		1470	564.7	464	51.9		3168	
	0600		1120	120	90	2905.5	2908.5		104	44	63		1820	725.7	605	52		3008	
	1000		1172	122	94	2873.2	2843.8		99	64	67		2124	756	655	51.6		3243	
	1400		1195	125	98	2899.6	2891.9		97	63	72		2075	725.7	625	50.8		3320	
	1800		1284	125	102	3006.5	2983.4		94	50	65		1835	655.1	585	51.5		3136	
	1900	10/64			103	3104.6	3057.1							564.4	443				Changed choke.
	1908				103.13	3105.3	3090.7					1.75							Changed orifice plate
	2000	8/64	1413	122	104	3245.3	3199.2		103	53	51		1171		484			2419	Changed choke.
	2100	9/64	1565	113	105	3451.0	3397.3		89	12	48		521		161			3236	Changed choke.
	2106	8/64			105.1	3479.7	3467.1												Changed choke.
	2121				105.35	3484.5	3469.0					1.25							Changed orifice plate.
	2200		1611	113	106	3509.9	3493.6		93	46	42		524		282	54.5		1858	
23/7/81	0600		1686	100	114	3632.6	3632.3		102	58	33		623		202	53.5		3084	
	1000		1703	98	118	3682.8	3679.3		99	32	36		455	202	197			2310	
	1400		1740	104	122	3748.1	3742.7		97	22	52		368		141	54.1	3	2610	
	1604				124.07	3764.2	3762.3												Shut well in to replace choke.
	1631	12/64			124.52	3840.6	3848.9												Changed choke.
	1800		1780	95	126	3807.3	3800.0		96	16	51		312			54.5	2		
	2200		1817	91	130	3815.1	3845.3		103	10	48		257		101	54.4	2	2545	
24/7/81	0200		1811	86	134	3780.7	3839.9		108	12	36		293		111			2640	
	0600		1801	79	138	3840.1	3858.6		111	8	30		244		140			1743	
	0700	14/64			139	3787.5	3844.2												Changed choke.
	0730	16/64			139.5	3765.1	3819.4												Changed choke.
	1000		1744	86	142	3746.5	3773.4		111	30	30		471		172	55.1	3	2738	
	1005	18/64			142.08	3750.7	3759.5												Changed choke.
	1100				143	3544.8	3754.5					2.00							Changed orifice plate.
	1220	20/64			144.33	3481.9	3717.7												Changed choke.
	1400		1400	100	146	3452.4	3385.5		101	36	42		1384		435	54.5	2	3182	
	1700	21/64	1415	102	149	3368.0	3462.8		98	24	48		1026		448		2	2290	Changed choke.
	1800		1346	102	150	3338.2	3359.4		98	41	48		1337		437	53.9	2	3059	
	1920	22/64			151.33	3258.0	3319.9												Changed choke.
	2030	23/64			152.50	3186.1	3246.4					2.25							Changed choke and orifice plate.
	2130	22/64			153.50	3169.8	3166.8												Changed choke.
	2200		1297	107	154	3210.9	3149.2		108	34	60		1639		954	53.5	2.1	1718	
25/7/81	0200		1327	113	158	3191.5	3165.8		115	26	54		1492		582	53.5	2	2563	
	0600		1241	111	162	3155.7	3173.9		115	26	60		1482		576	54	0.3	2573	

Well Name MOORARI #3 Type of Test FLOW TEST Date JULY 18TH-26TH, 1981.

Date	Time	WELLHEAD DATA			Flowing Time (Hrs)	SUBSURFACE DATA			SEPARATOR DATA				FLUID RATES					GOR	Remarks
		Choke Size	Flowing Press. (psia)	Flowing Temp. (°F)		El# 21820 @9454 Press. (psia)	El# 21821 @9460 Press. (psia)		Pf (psia)	H.W. ΔP (ins) (H_2O)	Temp. (°F)	Orifice Size (ins)	Gas (MCF/D)	Liquid (BBLS/D)	Oil (BBLS/D)	Grav. °API	BS&W (%)	(SCF/BBL)	M/R = 4.026" S.G. = 0.9531 Emulsion noted.
25/7/81	1000		1373	114	166	3146.0	3149.2		105	26	60	2.25	1414		653	54.3	0.2	2165	
	1400		1295	115	170	3163.7	3140.7		102	24	54		1347		614	52.9	0.1	2194	
	1800		1400	116	174		3127.9		108	32	60		1590		603	53.2	0.2	2637	
	2200		1408	116	178	Clock	3159.2		115	28	60		1538		597		0.1	2576	
26/7/81	0200		1396	116	182	Stopped	3126.5		120	30	60		1627		567		0.2	2869	
	0600		1385	116	186		3111.8		126	30	60		1634		546	52.8	0.1	2993	
	0900				189		3055.2												Off bottom.
	0934					1355.5	1346.5												Hang in Lubricator
	1000		1355	127					108	44	66		1850		565	52.8	0.1	3274	
	1034																		
	1400		1310	127					123	30	70		1631		624	52	0.1	2614	
	1800		1375	127					132	32	72		1744		618	52	0.1	2822	
	2200		1390	127					126	30	72		1649		624	52.5	0.1	2643	Shut well in for buildup survey.
																			Maximum bottomhole temperature = 255°F.

SANTOS LTD.

0144

OIL WELL TEST RESULTS

Well Name MOORARI #3 Type of Test FLOWING GRADIENT Date July 26th. 1981

Separator No. 305 Test By GRM&A/ A. Michell Meter Run I.D. 4.026 Gas S.G. 0.9531 From MOORARI GAS PAC.

Date	Time	WELLHEAD DATA			Depth (ft)	SUBSURFACE DATA			SEPARATOR DATA				FLUID RATES					GOR	Remarks
		Choke Size	Pressure (psia)			EL# 21820 Press. (psia)	EL# 21821 Press. (psia)	EL# 31840 Temp. (°F)	Pf	H.W. ΔP	Temp.	Orifice Size	Gas	Liquid	Oil	Grav. °API	BS&W		
26/7/81	1123		1355		LUB	1348.5	1348.9	-											Hang in lubricator
	1138																		R.I.H.
	1146				2000	1665.0	1659.6	178											
	1156				4000	2004.9	1999.0	213											
	1207				6000	2357.5	2353.9	238											
	1219				8000	2731.6	2727.0	258											
	1228				9000	2923.6	2921.3	266											
	1235				9300	2990.2	2986.7	269											
	1251				9400	3002.7	2995.0	270											
	1257				9500	3020.0	3027.0	270											
	1312				9555	3052.0	3050.2	270											
	1317				9500	3030.7	3029.6	270											
	1323				9400	N/A	N/A	270											unable to read due to noise
	1400		1380		LUB	1382.0	1382.6	-											Hang in lubricator.

FLOWING PRESSURE GRADIENT

ELEMENT #21820

WELL MOORARI #3

TEST DATE 26/7/81 (1123 – 1400)

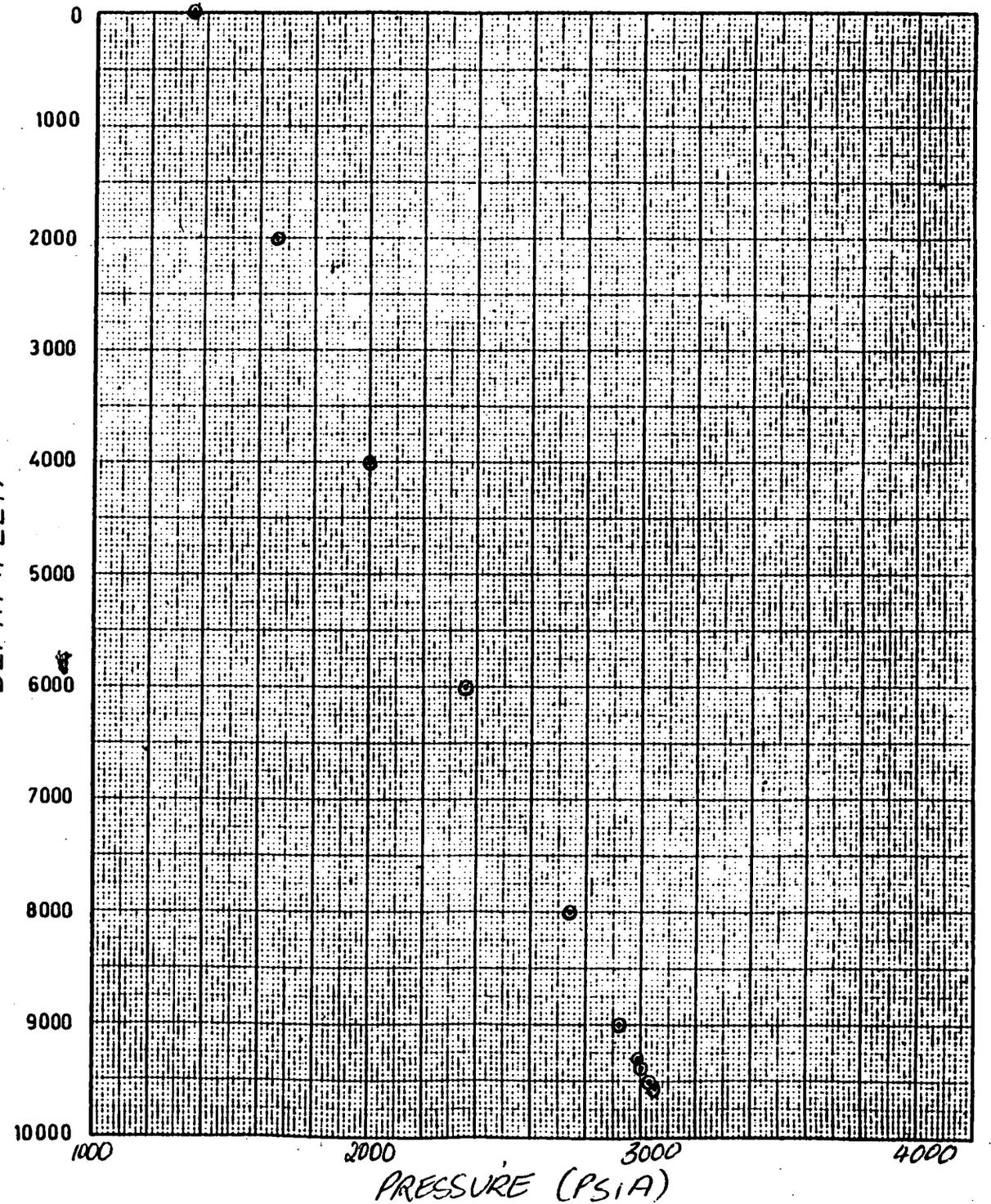
DEPTH (FEET)	PRESSURE (PSIA)	GRADIENT PSIA/FT
LUB.	1348·5	—
2000	1665·0	0·1583
4000	2004·9	0·1699
6000	2357·5	0·1763
8000	2731·6	0·1871
9000	2923·6	0·1920
9300	2990·2	0·2220
9400	3002·7	0·1250
9500	3030·0	0·2730
9555	3052·0	0·4000
9500	3030·7	—
9400	N/A.	—
LUB.	1382·0	—

DEPTH (METRES)	PRESSURE (KPa ABS.)	GRADIENT KPa ABS/M
LUB.	9300	—
610	11483	3·5809
1219	13827	3·8433
1829	16259	3·9881
2438	18839	4·2324
2743	20163	4·3432
2835	20622	5·0219
2865	20708	2·8276
2896	20897	6·1755
2912	21048	9·0484
2896	20901	—
2865	N/A.	—
LUB.	9531	—

LUBRICATOR IN D.W.T. = 1355 PSIA
IN AMERADA = 1348·5 PSIA.
LUBRICATOR OUT D.W.T. = 1380 PSIA
OUT AMERADA = 1382·0 PSIA.

1 PSIA/FT = 22·621 kPa ABS./M.

JMJ 11/8/81



FLOWING PRESSURE GRADIENT

ELEMENT # 21821

WELL MOORARI #3

TEST DATE 26/7/81 (1123-1400)

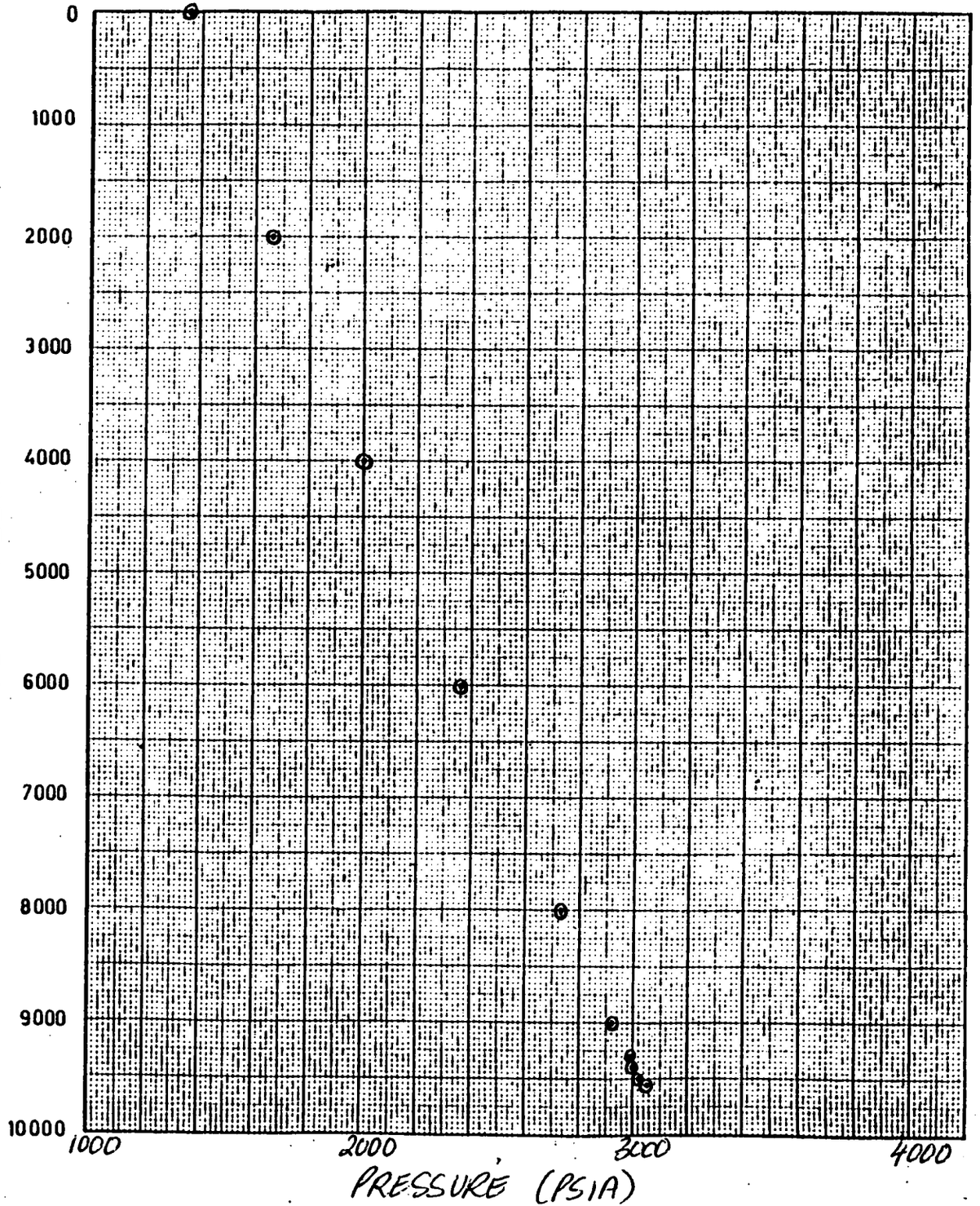
DEPTH (FEET)	PRESSURE (PSIA)	GRADIENT PSIA/FT
LWB.	1348.9	—
2000	1659.6	0.1553
4000	1999.0	0.1697
6000	2353.9	0.1774
8000	2727.0	0.1865
9000	2921.3	0.1943
9300	2986.7	0.2180
9400	2995.0	0.0830
9500	3027.0	0.3200
9555	3050.2	0.4218
9600	3029.6	—
9400	N/A.	—
LWB.	1382.6	—

DEPTH (METRES)	PRESSURE (KPa ABS)	GRADIENT KPa ABS/M
LWB.	9303	—
610	11445	3.5130
1219	13786	3.8388
1829	16234	4.0130
2438	18807	4.2188
2743	20147	4.3953
2835	20598	4.9314
2865	20655	1.8775
2896	20876	7.2387
2912	21036	9.5415
2896	20894	—
2865	N/A	—
LWB.	9535	—

LUBRICATOR IN D.W.T. = 1355 PSIA
IN AMERADA = 1348.9 PSIA
LUBRICATOR OUT D.W.T. = 1380 PSIA
OUT AMERADA = 1382.6 PSIA

1 PSIA/FT = 22.621 KPa ABS./M.

JMF 11/8/81



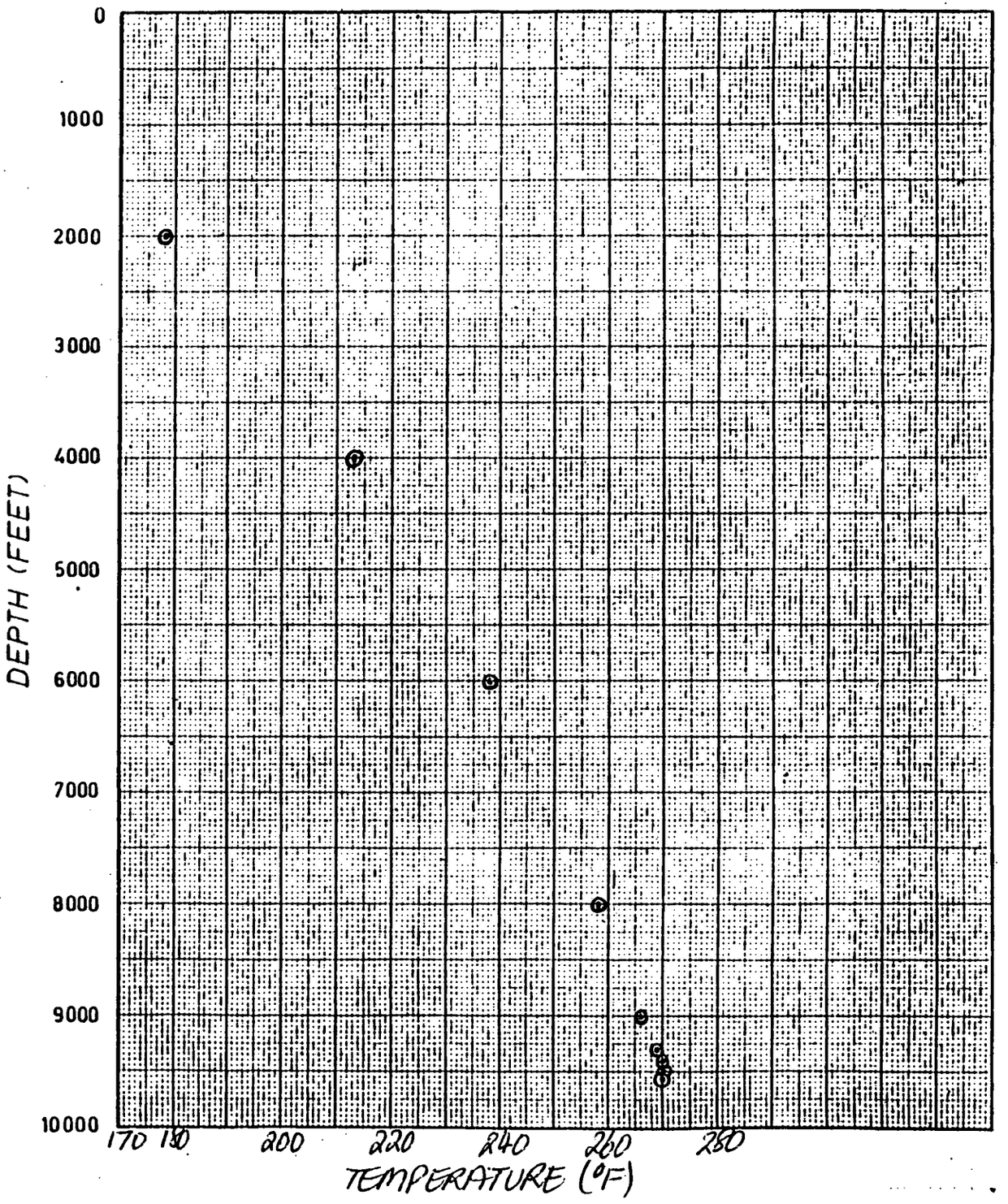
FLOWING TEMPERATURE GRADIENT

WELL MOORARI #3

TEST DATE 26/7/81 (1123-1400)

DEPTH (FEET)	TEMP. (°F)	GRADIENT °F /FT
LUB.	—	—
2000	178	—
4000	213	0.0175
6000	238	0.0125
8000	258	0.0100
9000	266	0.0080
9300	269	0.0100
9400	270	0.0100
9500	270	—
9555	270	—
9500	270	—
9400	270	—
LUB.		—

DEPTH (METRES)	TEMP. (°C)	GRADIENT °C /M
LUB.	—	—
610	81.1	—
1219	100.6	0.0320
1829	114.4	0.0226
2438	125.6	0.0184
2743	130.0	0.0144
2835	131.7	0.0185
2865	132.2	0.0167
2896	132.2	—
2912	132.2	—
2896	132.2	—
2865	132.2	—
LUB.	—	—



JMJ 11/8/81

SANTOS LTD.

OIL WELL TEST RESULTS

Well Name MOORARI #3 Type of Test BUILD-UP Date July 26th-Aug. 5th, 1981

Separator No. 305 Test By GRM&A/ A. Michell Meter Run I.D. 4.026 Gas S.G. 0.9531 From MOORARI GAS PAC.

Date	Time	WELLHEAD DATA			SUBSURFACE DATA			SEPARATOR DATA				FLUID RATES					GOR	Remarks
		Shut - in time hours	Shut in Press. (psia)	Shut in Temp (°F)	EL# 21820 @9368' Press. (psia)	EL# 21821 @9374' Press. (psia)	EL# 21379 @9380' Press. (psia)	Pf	H.W. ΔP	Temp.	Orifice Size	Gas	Liquid	Oil	Grav. °API	BS&W		
26/7/81	1745		1375		1369.2	1366.8	1376.3											Pressure lubricator
	1850																	R.I.H.
	1932				3059.4	3059.4	3080.1											Hang bombs on wire
	2200	0																Shut well in
	2210	0.17	1515	124	3361.4	3291.9	3173.9											
	2220	0.33	1585	117	3361.4	3395.9	3326.4											
	2230	0.5	1620	113	3496.3	3461.9	3398.3											
	2240	0.67	1650	111	3497.4	3503.0	3436.3											
	2250	0.83	1670	108	3554.3	3531.7	3460.4											
	2300	1	1683	104	3555.2	2556.5	3492.0											
	2310	1.17	1694	100	3589.6	3575.9	3514.9											
	2320	1.33	1704	97	3591.8	3590.6	3536.3											
	2330	1.5	1712	93	3613.2	3603.8	3553.3											
	2340	1.67	1720	93	3616.3	3614.2	3568.4											
	2400	2	1732	86	3635.2	3633.0	3589.8											
27/7/81	0020	2.33	1742	84	3651.9	3648.8	3605.8											
	0040	2.67	1750	80	3665.6	3661.3	3618.7											
	0100	3	1757	77	3677.9	3672.7												
	0130	3.5	1766	73	3689.4	3689.2												
	0200	4	1775	71	3705.2	3697.0												
	0300	5	1786	68	3726.4	3725.0												
	0400	6	1797	64	3746.7	3744.1												
	0500	7			3763.7	3761.6												
	0600	8	1814	61	3776.4	3776.0												
	0700	9	1828	59	3788.0	3788.0												
	0800	10	1840		3800.5	3800.0												
	0900	11			3812.5	3811.1												
	1000	12	1850		3822.9	3820.5												
	1200	14	1860		3840.4	3837.8												
	1400	16			3856.6	3853.6												
	1600	18			3871.5	3866.6												
	1800	20	1875		3885.2	3879.8												
	2000	22			3897.2	3891.4												
	2200	24	1888		3908.5	3901.6												
	2400	26			3917.9	3910.8												
28/7/81	0200	28	1899			3920.0												
	0600	32	1909		clock	3937.5												
	1000	36	1916		stopped	3951.0												
	1148					3955.9												Off bottom
	1217		1927		1947.6	1934.6												Hang in lubricator
	1247																	Depressure lubricator.

Well Name MOORARI #3 Type of Test BUILD-UP Date July 26th-Aug. 5th 1981

Date	Time	WELLHEAD DATA				SUBSURFACE DATA			SEPARATOR DATA				FLUID RATES					GOR	Remarks
		Shut-in time (hrs)	Shut in Press. (psia)	Shut in Temp. (°F)		EL# 21820 @9319' Press (psia)	EL# 21821 @9325' Press. (psia)		Pf	H.W. ΔP	Temp.	Orifice Size	Gas	Liquid	Oil	Grav. °API	BS&W		
28/7/81	1344		1928			1901.4	1889.1												Pressure lubricator.
	1400		1928																
	1429																		R.I.H.
	1507	41.12																	Hang bombs in 'N' nipple
	1900	45				3958.3	3969.6												
	2200	48				3966.1	3975.3												
29/7/81	0200	52				3975.3	3984.8												
	0600	56				3983.7	3991.9												
	1000	60				3998.1	4000.4												
	1400	64				4003.8	4007.2												
	1800	68				4011.6	4014.3												
	2200	72				4017.0	4019.5												
30/7/81	0200	76				4023.4	4025.2												
	0600	80				4028.1	4031.1												
	1000	84				4033.5	4035.8												
	1400	88				4036.6	4039.3												
	1800	92				4042.5	4045.0												
	2200	96				4046.0	4048.6												
31/7/81	0200	100				4050.3	4052.8												
	0600	104				4054.7	4055.7												
	1000	108				4058.8	4060.4												
	1400	112				4062.3	4062.5												
	1800	116					4066.6												
	2200	120				clock	4069.4												
1/8/81	0200	124					4074.2												
	0600	128				stopped	4076.6												
	1000	132					4081.1												
	1400	136					4083.7												
	1800	140					4086.1												
	2200	144					4089.2												
2/8/81	0200	148					4092.5												
	0600	152					4095.1												
	0845	154.75					4096.1												Pressure lubricator +RIH
																			Latch onto bombs, unable
																			to pull, wire parted.
3/8/81	1420																		RIH with fishing string +
																			POH with bombs.
	1444																		De-pressure lubricator.
4/8/81	1414		2009			2016.3	1987.3												Pressure lubricator
	1445																		RIH

Well Name MOORARI #3 Type of Test BUILD-UP Date July 26th-Aug. 5th 1981

Date	Time	WELLHEAD DATA			SUBSURFACE DATA		SEPARATOR DATA				FLUID RATES					GOR	Remarks
		Shut-in time (hrs)	Shut in Press (psia)	Shut in Temp. (°F)	EL# 21820 @9319' Press. (psia)	EL# 21821 @9325' Press. (psia)	Pf	H.W. ΔP	Temp.	Orifice Size	Gas	Liquid	Oil	Grav. °API	BS&W		
4/8/81	1517	209.28															Hang bombs in 'N' nipple
	1600	210			4135.4	4127.0											
	1800	212			4136.6	4127.5											
	2200	216			4139.2	4128.5											
5/8/81	0200	220			4141.8	4130.1											
	0600	224			4144.4	4131.6											
	0800	226			4144.4	4131.8											
	1000	228			4144.8	4133.0											
	1054	228.9			4144.8	4133.0											P.O.H.
	1121		2013		2048.3	2027.6											Hang in lubricator.
	1153																De-pressure lubricator.

3953 R15 0151

WIRELINE REPORT

WELL: MOORARI # 3 UPPER

DATE: 9th APRIL 1985

PROGRAM: PATCHAWARRA CENTRAL FLOWING BOTTOM HOLE PRESSURE SURVEY

PURPOSE OF WORK: TO ENSURE THAT THE GOOD WELLS ARE PRODUCING ABOVE 3100 PSIG

REPORT OF WORK PERFORMED:

8/4/85 ARRIVE ON LOCATION
RIG UP 082 WIRELINE UNIT AND LUBRICATOR
RUN IN HOLE WITH 1.75" BLIND BOX AND TAG END TUBING @ 8699' KB.
PULL OUT OF HOLE AND SECURE THE WELL FOR THE NIGHT

9/4/85 ARRIVE ON LOCATION AND PREPARE TO RUN GRADIENT
RUN IN HOLE WITH TANDUM 5000 PSI PRESSURE ELEMENTS TO A
MAXIMUM DEPTH OF 8697' KB AS PER PROGRAM
PULL OUT OF HOLE BOTH CHARTS GOOD
RIG DOWN 082 WIRELINE UNIT AND LUBRICATOR
MOVE TO NEXT LOCATION

T. Chapman

OPERATOR'S SIGNATURE

WORK PERFORMED BY: T. CHAPMAN / G. BAIN OF EXPERTEST

WELL DATA:

Tubing Size: 2 3/8" FWHP: 1455 psi SIWHP:

Sub Surface ~~SSSV~~/Landing Nipple @ 8662' S.S.D. @:

"X" Nipple @ "N"/~~"X"~~ Nipple @ 8671' other

Min I.D. 1.791" @ 8671' Packer @ 8648'

Perforated Interval: NAPPAMERRI 8726' - 8748'

Forward to: Petroleum Engineering — Adelaide
Production Department — Moomba

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

** MOORARI 3 UPPER **

FLOWING PRESSURE GRADIENT

TEST DATE: 9.4.1985

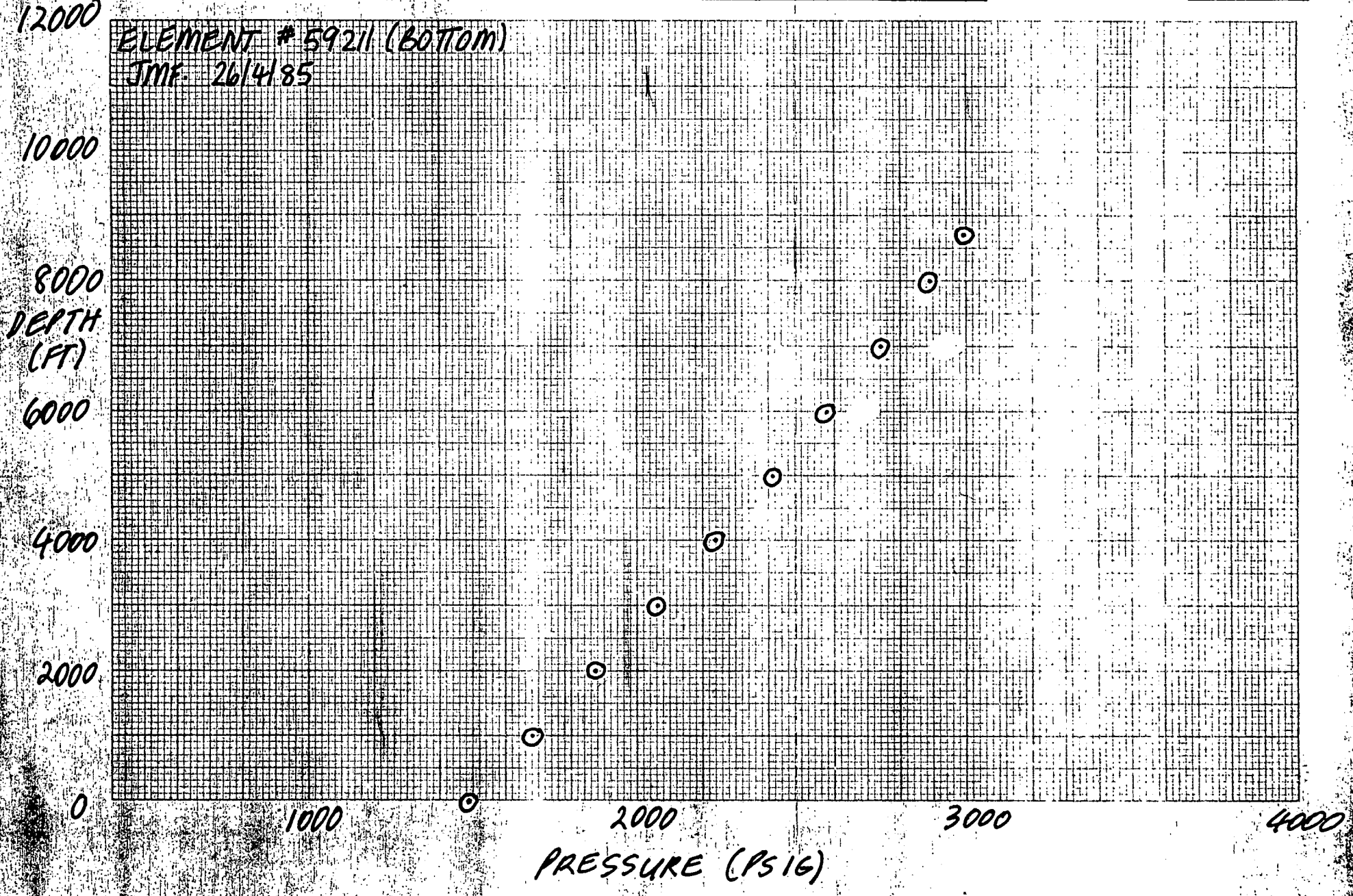
	TOP PRESSURE ELEMENT 60322/5000			BOTTOM PRESSURE ELEMENT 59211/5000		
DEPTH (FT.)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)
LUB	0.5810	1486.6	----	0.5770	1488.6	----
1000	0.6570	1680.6	0.1940	0.6530	1683.8	0.1951
2000	0.7340	1877.3	0.1967	0.7260	1870.9	0.1872
3000	0.8040	2056.2	0.1789	0.7990	2057.9	0.1870
4000	0.8750	2237.8	0.1816	0.8690	2237.1	0.1792
5000	0.9420	2409.3	0.1715	0.9360	2408.5	0.1714
6000	1.0060	2573.3	0.1640	1.0020	2577.2	0.1687
7000	1.0690	2734.9	0.1616	1.0640	2735.7	0.1585
8000	1.1280	2886.4	0.1515	1.1230	2886.4	0.1508
8697	1.1690	2991.7	0.1512	1.1640	2991.2	0.1503
LUB	0.5800	1484.0	----	0.5790	1493.8	----

GENERAL REMARKS:
THE CLOCK ON THE BOTTOM ELEMENT STOPPED FOR APPROX. 5 MINUTES BETWEEN 2000 FEET AND 3000 FEET.

DWT IN: 1455
DWT OUT: 1490
MAX BHT: 253

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

MOORARI #3 UPPER — FLOWING PRESSURE GRADIENT — 9/4/85



WELL TEST DATA SHEET

WELL: Moorari #3V. OPERATOR: R. Kelly

DATE (Start Test): 9.4.85 METER RUN I.D.: 97.18/~~102.26~~ mm

TEST SEPARATOR: N.A ORIFICE PLATE: .750" mm

TEST LINE: N.A FLOW COMPUTER CONSTANT: .07768

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
0730	N/A	19	-	0	0	0	4480	22.5	24		
1600	N/A	19	-	10.4	0	0	4200	15.25	32		
0730	N/A	19	-	29.92	0	0	4200	10.0	21		

(A)	TOTALS	(B) OIL	(C)	(D)	(E)	(F) GAS
24	(final minus initial)	29.92	0	+ 0	= TOTAL WATER 0	-

COMMENTS: 24 HOUR TEST FOR EXPANTEST FLOWING GRADIENT TEST.

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

SUMMARY

(1) STOCK TANK OIL

m³/d

3953 R16

WP4367N

0155

SANTOS LIMITED
RESERVOIR ENGINEERING DEPARTMENT
MOORARI #3U, NAPPAMERRI FORMATION
MODIFIED ISOCHRONAL TEST
20TH DECEMBER - 28TH DECEMBER 1984.

Report No. RE:138/85
Author: P.A. Robinson
Date: February 1986.



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2.	CONCLUSIONS AND RECOMMENDATIONS	2
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4.	DISCUSSION	4
5.	ISOCHRONAL CALCULATIONS	5

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1. Horner Build up Plot
2. Back Pressure Plot

TABLES

1. Horner data
2. Reservoir and Geological Parameters
3. Modified Isochronal Test Data
4. Calculated Properties of Separator Gas

APPENDIX A

Well Test Summary Sheets
Static Temperature Survey
Static Pressure Survey

APPENDIX B

FWS Recombination Report

APPENDIX C

Amdel Report on Fluid Analyses

1. INTRODUCTION

Moorari #3 was drilled in January 1981 and completed as a single oil producer from the Tirrawarra Formation. In July 1984 the well was recompleted as a dual completion to allow gas production from the (Upper) Nappamerri Formation and gas injection into the Tirrawarra Formation. Although net pay is mapped in two Nappamerri sands, the 86-9 and the 87-9, only the 87-9 sand was perforated in Moorari #3 as the 86-9 sand has 49% water saturation.

Moorari #3 Upper came on line in October 1984 and in December 1984 a modified isochronal was run to determine the well deliverability and reservoir parameters.

The results of the modified isochronal are tabulated in Table 2 along with the relevant geological parameters. A FWS recombination of separator gas and liquid samples taken during the isochronal testing is provided in Appendix B.

2. CONCLUSIONS AND RECOMMENDATIONS

1. The isochronal pressures of this test are affected by the pressure recorders being held within the tubing during the test. Hence the extended flow (stabilised) point is coincident with the transient line (Figure 2). The calculation of the Absolute Open Flow Potential makes no allowance for this error and is, therefore, approximate.

2. The build up data and interpretation are valid.

3. The separator samples taken during the extended flow period are not in equilibrium with each other and the completed FWS recombination is therefore non-representative of the true FWS composition.

4. The currently accepted FWS composition for Moorari Nappamerri should not be changed.

3. RESULTS

Gas and condensate samples were taken during the test and the recombined analysis is shown in Appendix B.

The build up pressure data were converted to pseudo pressures using GASPAC and have been interpreted using a Horner analysis as shown in Figure 1. The results of the Horner analysis are shown below. Deliverability calculations using the back pressure plot were inappropriate for this test for reasons outlined in the Discussion section. An LIT analysis was attempted as shown in the Calculations section, but it was not possible to calculate an AOF due to a negative 'b' coefficient. Similarly, the deliverability calculation using the p^2 approach indicated an 'n' factor of 1.52 which is uninterpretable. The resultant AOF calculation must therefore, be regarded as an approximate estimate only.

Flow Capacity	43.1 md-ft
Permeability	2.0 md
Reservoir pressure @ 8676'KB (Horner)	3895 psia
Reservoir pressure @ 8737'KB (mpp), p*	3906 psia
Absolute Open flow Potential (approximate)	2 MMCFD
Apparent Skin Factor, S'	6.2
Turbulence Co-efficient	non interpretable
Gas rate (extended flow)	1.59 MMCFD
Condensate rate (extended flow)	211 BOPD

4. DISCUSSION

Moorari #3U is completed as the short string of a dual completion. It is not possible to run wireline tools (including pressure recorders) beyond the end of the tubing in the short string. Therefore, because the pressure recorder of this isochronal test was actually inside the tubing, the recorded pressures during the flow periods were affected by the turbulent effect of the gas passing between the tubing and the recorder.

Nevertheless, an attempt has been made to interpret the data using both the P^2 and the LIT (Laminar Inertial Turbulence) approaches. The calculation sheets using the LIT method are included in the Calculation section. The negative 'b' that was calculated prohibited any AOF from being calculated and so a P^2 approach was also tried. The back pressure plot (Figure 2) indicates that the extended flow point lies on the transient (non-stabilised) line. Normally, the extended flow point is displaced to the left and above the transient line; greater displacement indicates more turbulence.

Therefore, Figure 2 indicates that the extended flow point is non-stabilised. Similarly, the back pressure slope ($\frac{1}{n} = 0.66$) indicates an artificial or non-physical result as $2 < \frac{1}{n} < 1$ Using this slope resulted in a calculated AOF of 2.4 MMCFD, but for the above reasons decimal place accuracy cannot be justified and thus an AOF of 2 MMCFD is considered a reasonable approximation.

5. ISOCHRONAL CALCULATIONS

Cumulative Prod to 20/12/84, Total Raw Gas

Total Raw gas =	$137.57 \times 10^3 m^3$	24/10/84 - 1/11/84
+	$253.96 \times 10^3 m^3$	1/11/84 - 30/11/84
+	$613.92 \times 10^3 m^3$	1/12/84 - 31/12/84
	$1005.45 \times 10^3 m^3$	

$= 35.69 \times 10^6$ MMCF

Effective producing time, teff

$$teff = \frac{\text{cumulative production}}{\text{last producing rate}}$$

$$teff = \frac{35.69 \times 10^6 \times 0.8 \times 24}{1.274 \times 10^6} \text{ hrs}$$

(where 0.8 is the gas molar ratio to convert raw gas to separator gas rates).

$= 538$ hrs.

0162

CASE 1: FLOW THROUGH METER RUN

Run No.	Hw (inches in water)	Pf (psig)	Size Orifice Plate (inches)	Ft (°F)
1	147	295	0.500	124
2	51	305	1.000	86
3	122	315	1.000	83
4	100	340	1.250	96
5	80	345	1.250	96

Taken from Inj-Gas Gaspac using separator gas composition:-

Specific Gravity = 1.07
TC = 479.9 °R
PC = 754.3 psia
CO2 CONTENT = 24.55) mole %

Meter Run = 3.826 ins

FLOW THROUGH METER RUN DOWNSTREAM OF SEPARATOR (Continued)

Run No.	Q (MMscfd)
1	.305
2	.768
3	1.210
4	1.765
5	1.593

Note: Flow rates have been converted to raw gas rates by dividing by the molar gas shrinkage (0.8).

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GAS WELL DELIVERABILITY TEST CALCULATIONS
(Base Conditions = 14.65 psia and 60°F)

0163

WELL NAME: Moorari # 3 Upper DATE: December 20th - 26th/1984 ELEMENT NO: 59211 DEPTH TESTED: 8676' KB
DWT IN: 2102 psig OUT: 2045 psig
LUB IN: 2092.4 psig OUT: 2061.3 psig

SIMPLIFIED ANALYSIS

	Duration (hours)	Sandface Pressure (psia)	Cal.	Meas.	Δp^2 ($\times 10^6$ psia^2)	Flow Rate (Mmscfd) *	H/Carbon Prod. (BBLS/D)	Water Prod. (BBLS/D)	REMARKS
Initial Shut In	19	3757.1		X	/	/	/	/	$q = C(\bar{p}_R^2 - p_{wf}^2)^n$
Flow 1	4	3300.6		X	3.222	.305	33.6	Nil	slope n = 1.521
Shut In	4	3724.0		X	/	/	/	/	$\bar{p}_R$ = 3895 psia
Flow 2	4	2868.5		X	5.640	.768	93.9	Nil	$C = \frac{q}{(\bar{p}_R^2 - p_{wf}^2)^n}$
Shut In	4	3695.2		X	/	/	/	/	
Flow 3	3.75	2347.1		X	8.146	1.210	154.3	6.7	$= 2.874 \times 10^{71}$
Shut In	4	3675.5		X	/	/	/	/	AOF (MMscfd)
Flow 4	4	1780.7		X	10.338	1.766	234.8	6.7	= 2.40
Extended Flow	24	2016.0		X	9.774	1.593	218.5	Nil	
Final Shut In	60.13			X	/	/	/	/	

* Note flow rates have been corrected to raw gas flow rates by dividing by the gas molar ratio of 0.8.

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GAS WELL DELIVERABILITY TEST CALCULATIONS
(Base Conditions = 14.65 psia and 60°F)

0164

LIT (ψ) ANALYSIS

	Duration (hours)	Sandface Pressure (psia)	ψ ($\times 10^6$ psia^2/cp)	$\Delta\psi$ ($\times 10^6$ psia^2/cp)	Flow Rate (q) (MMscfd)	$\Delta\psi/q$	q^2	$\Delta\psi - bq^2$
Initial Shut In	19	3757.1	761.7	/	/	/	/	
Flow 1	4	3300.6	635.0	126.7	.305	415.4	0.093	NOT
Shut In	4	3724.0	752.6	/	/	/	/	INTERPRETABLE
Flow 2	4	2868.5	515.6	246.1	.768	320.4	0.590	-
Shut In	4	3695.2	744.6	/	/	/	/	
Flow 3	3.75	2347.1	374.9	386.8	1.210	319.7	1.464	-
Shut In	4	3675.5	739.1	/	/	/	/	
Flow 4	4	1780.7	231.7	530.0	1.765	300.3	3.115	-
Total=	/	/	/	1289.6	4.048	1355.8	5.262	
Extended Flow	24	2016.0	289.0	472.7	1.593	296.7	2.538	-
Final Shut In				/	/	/	/	

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GAS WELL DELIVERABILITY TEST CALCULATIONS

0165

L.I.T. (Ψ) ANALYSIS

DISCARDED POINT 2

N = 3 $\bar{\Psi}_R$ = 800.0 MMpsia²/cp

$$a, a_t = \frac{\Sigma\frac{\Delta\Psi}{q}\ \Sigma q^2 - \Sigma q\ \Sigma\Delta\Psi}{N\ \Sigma q^2 - \Sigma q\ \Sigma q} = 434.3$$

$$b = \frac{N\Sigma\ \Delta\Psi - \Sigma q\ \Sigma\frac{\Delta\Psi}{q}}{N\ \Sigma q^2 - \Sigma q\ \Sigma q} = -81.5$$

(EXTENDED FLOW)

$\Delta\Psi$ = 472.7 q = 1.593 b = -81.5

$$a = \frac{\Delta\Psi - bq^2}{q} = 426.6$$

A.O.F. = n/a MMSCFD

Total Volume of Gas Produced During Test = 2.25 MMSCF raw gas

Condensate = 315.3 Bbls

Water = 8.4 Bbls

REMARKS

RESULTS

TRANSIENT FLOW: $\bar{\Psi}_R - \Psi_{wf} = a_t q + bq^2$

i.e. 800.0 $- \Psi_{wf} =$ 434.3 q + -81.5 q^2

STABLIZED FLOW: $\bar{\Psi}_R - \Psi_{wf} = aq + bq^2$

i.e. 800.0 $- \Psi_{wf} =$ 426.6 q + -81.5 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 = n/a MMscfd

Interpreted by: P.A.ROBINSON Date: NOVEMBER, 1985

GAS WELL DELIVERABILITY TEST

RESULTS OF ISOCHRONAL 'LIT' ANALYSIS

WELL NAME: MOORARI #3U FORMATION: NAPPAMERRI DATE OF TEST 23-26/12/198

DATUM DEPTH: _____ DEPTH TESTED: 8676' K.B.

PRESSURE BUILD-UP INFORMATION

EXTRAPOLATED PRESSURE P^* = _____ x 10^3 psia²

= _____ psia

ψ^* = 800 x 10^6 psia²/cp

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

$m(\psi)$ = 48 x 10^6 psia²/cp/cycle

WELL AND TEST PARAMETERS

Porosity ϕ = 13.5% Viscosity μ = 0.0339 cp

Compressibility C_t = 0.153 x 10^{-3} well radius r_w = 0.354 ft.

Well drainage r_e = _____ thickness h = 21 ft.

Final flow rate q = 1.593 MMcfd Temperature T = 762 °R

Sandface press. P_{wf} = 2016 psia Press 1 hr P_1 = 3416 psia

ψ_{wf} = 285.0 x 10^6 psia²/cp ψ_1 = 667 x10^6 psia²/cp

BACK PRESSURE COEFFICIENTS

$$\Delta\psi = aq + bq^2$$

a = 426.6 x 10^6 psia²/cp/MMcfd

b = -81.5 x 10^6 psia²/cp/MMcfd

FLOW CAPACITY

$$kh = \frac{1.632 \times 10^6}{m} qT = 41.3 \text{ md-ft}$$

PERMEABILITY

$$k = \frac{kh}{h} = 2.0 \text{ md}$$

APPARENT SKIN

$$S' = 1.151\left[\frac{\psi_1 - \psi_o}{m} - \log\left(\frac{k}{\phi\mu C_t r_w^2}\right) + 3.23\right] = 6.2$$

TURBULENCE COEFFICIENT

$$D = \frac{b\,kh}{1.417 \times 10^6 T} = -5.2 \text{ MMcfd}^{-1}$$

TRUE SKIN

$$S = S' - Dq = *$$

* not interpretable.

FIGURES

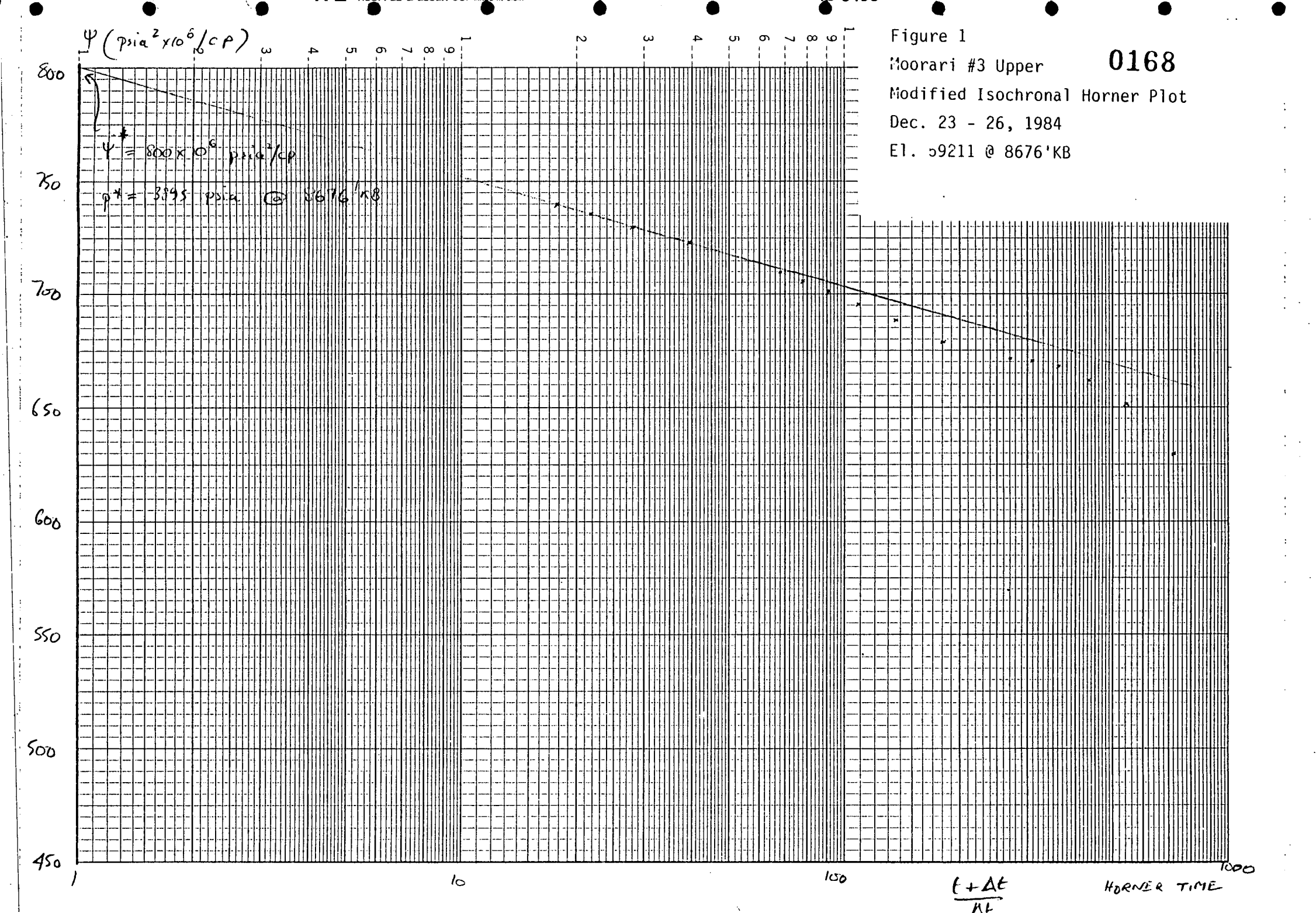


Figure 1

Moorari #3 Upper

0168

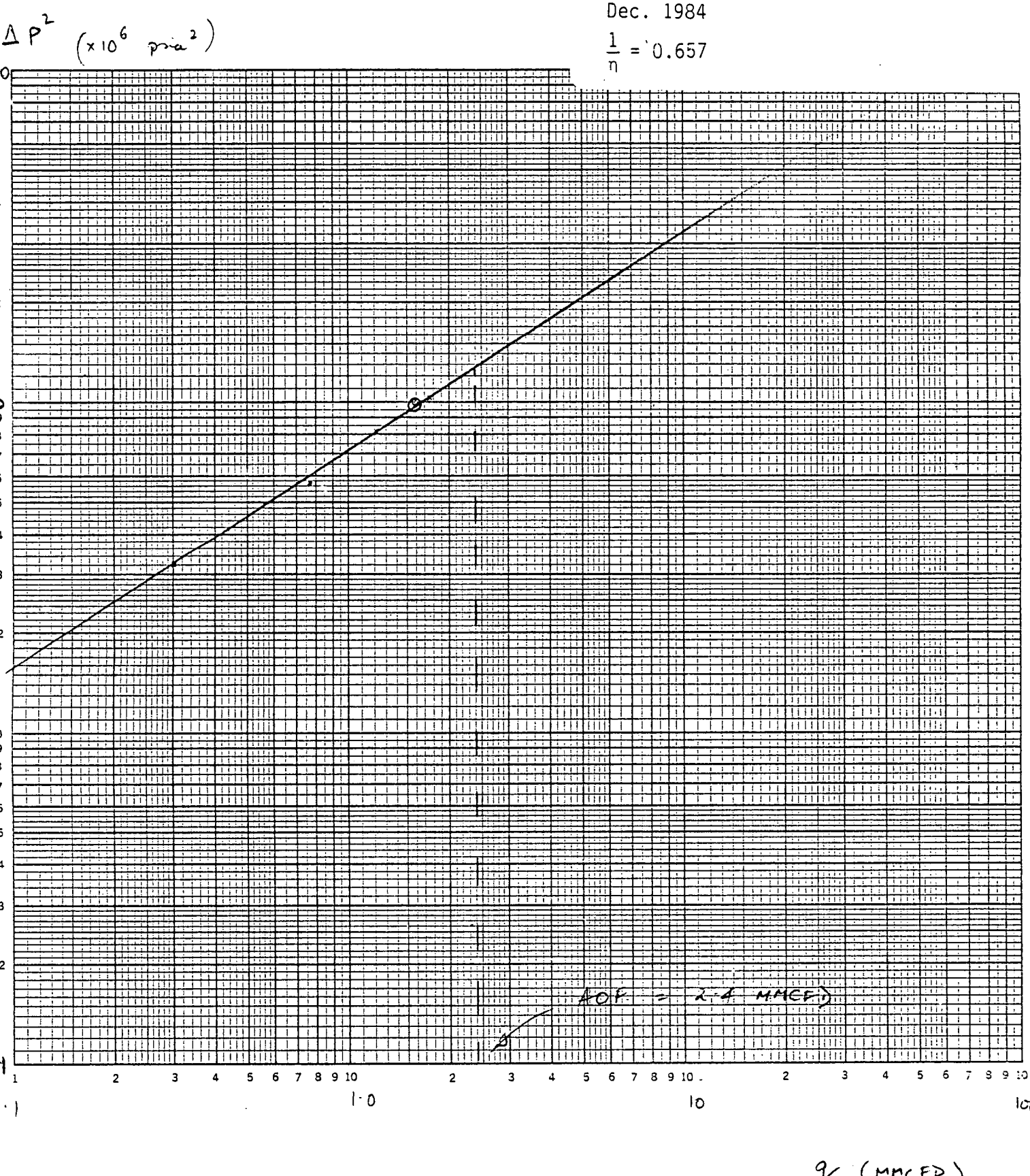
Modified Isochronal Horner Plot

Dec. 23 - 26, 1984

El. 9211 @ 8676'KB

0169

Figure 2
Moorari #3U
Back Pressure Plot
Isochronal
Dec. 1984
$\frac{1}{n} = 0.657$



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TABLES

HORNER PLOT TABLE 1

0171

P (psia)	ΔP (psia)	Ψ ($1x10^6$ $psia^2$/cp)	ΔΨ ($1x10^6$ $psia^2$/cp)	Δt (hours)	$\frac{T+\Delta t}{\Delta T}$
2016	0	289.0	-	0	-
2691	676	467.3	178.4	0.25	2153
3135	1119	588.9	299.9	0.5	1077
3282	1266	629.7	340.7	0.75	718
3361	1345	651.6	362.6	1	539
3399	1383	662.2	373.2	1.25	431
3421	1405	668.3	379.3	1.5	360
3429	1413	670.6	381.6	1.75	308
3432	1416	671.3	382.4	2	270
3460	1444	679.3	390.3	3	180.3
3491	1475	688.0	399.0	4	135.5
3518	1502	695.3	406.3	5	108.6
3539	1523	701.3	412.3	6	90.7
3555	1539	705.8	416.8	7	77.9
3569	1553	709.6	420.6	8	68.3
3619	1603	723.5	434.6	14	39.4
3642	1626	729.9	440.9	20	27.9
3664	1648	735.9	446.9	26	21.7
3679	1663	740.0	451.0	32	17.8

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TABLE 2

MOORARI #3 UPPER

0172

RESERVOIR PARAMETERS

	Units	MODIFIED ISOCRONAL 8726' - 8748'KB 20th - 28th Dec. 1984
Extended Flow Rate, q	MMSCFD	1.59
Analysis Method		Horner (Ψ)
AOF	MMSCFD	2 (estimated)
Flow Capacity, kh	md-ft	41.3
Permeability, k	md	2.0
Apparent Skin Factor, s'		6.2
Reservoir Pressure, p*	psia @ 8676'KB	3895
Mid Point of Perforations	KB'	8737
T (formation temperature)	302°F	Temperature Gradient Survey

GEOLOGICAL PARAMETERS

Parameter	Value	Source
Sw (water saturation)	0.392	sand summary sheets
Ø (Formation porosity)	0.135	sand summary sheets
h (net pay)	21 ft	Sand summary sheets
Cg (gas compressibility)	$0.153 \times 10^{-3} psi^{-1}$	GASPAC

Perforations 8726 - 8748'KB at 2 s.p.f.

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TABLE 3

MOORARI #3 UPPER

MODIFIED ISOCHRONAL TEST

STATIC RESERVOIR PRESSURE

20/12/84: Ran static gradient survey at 8688' KB
Element 59211 (Top) = 3730.3 psig
Element 60321 (Bottom) = 3726.9 psig
ave gradient = 0.178 psia/ft
Maximum Bottom Hole Temperature = 302°F

FOUR RATE ISOCHRONAL

21 - 22/12/84

CHOKE (1/64")	FLOW RATE (MMCFD)	DURATION (hrs)	FBHP (psia)
8	0.244	4	3300.6
10	0.614	4	2868.5
12	0.968	3.75	2347.1
16	1.412	4	1780.7

EXTENDED FLOW

22-23//12/84: Duration of flow = 24 hrs
Choke Size = 14/64"
Flow Rate = 1.274 MMSCFD
Final Flowing Bottom Hole Pressure = 2016.0 psia @ 8676'KB
Flowing Tubing Pressure = 1100 psig
Condensate Rate = 211 BBLS/DAY
Water Rate = NIL

BUILD-UP TEST

Shut well in at 2100 hrs, 26/12/84 for 60 hrs.
Clocks stopped after 32 hrs
Final recorded pressure = 3664.0 psig.

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TABLE 4

CALCULATED PROPERTIES OF SEPARATOR GAS

0174

FIELD/WELL MOORARI #3U
FORMATION NAPPAMERRI
DATUM DEPTH
SOURCE GAS ANALYSIS HP Separator Gas DATE: Dec.84 Isochronal
SOURCE TEMPERATURE Sep. Temp = 99°F
SOURCE PRESSURE Sep. Press = 345 psia

COMPONENT	MOLE %	Mole WT	Mole % x Mole Wt.(COMPONENT)	T_c	MOLE % x T_c	P_c (COMPONENT)	MOLE % x P_c
N_2+	1.20	28.0	34	227.29	275	493.0	592
CO_2	24.54	44.0	1080	547.59	13443	1071.0	26293
C_1	45.48	16.0	728	353.06	15609	667.8	30385
C_2	13.60	30.0	408	549.78	7477	707.8	9626
C_3	8.40	44.1	370	665.70	5592	616.3	5177
iC_4	1.50	58.1	87	734.67	1102	529.1	794
nC_4	2.05	58.1	119	765.34	1569	550.7	1129
iC_5	0.75	72.2	54	828.79	622	490.4	368
nC_5	0.71	72.2	51	845.39	600	488.6	347
C_6	0.77	86.2	66	913.39	703	436.9	336
C_7	0.71	100.2	71	972.49	690	396.8	282
C_8+	0.29	128.3	37	1070.37	310	332.0	96
	100.00		(M.W. Gas = 31.05)	T_c = 479.9 R		(P_c = 754.3psia)	

SG gas = $\frac{\text{MW Gas}}{\text{MW Air}}$

= $\frac{31.05}{28.96}$ = 1.07

BY: P.A. ROBINSON
APPROVED:
DATE: 25/10/85

WP4367N(13)
PAR/mc
4/11/85

APPENDIX A

Well Test Summary Sheets
Static Temperature Survey
Static Pressure Survey

WP: 3372N

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WELL TEST SUMMARY

0176 Page 1.

WELL: Moorari # 3 Upper
TESTED BY: B. Hatt (Expertest)
CASING SIZE: 7 ins
TUBING SIZE: 2-3/8

LOCATION: Lat.: 27° 33' 56.08" S Long: 140° 07 ' 52.99" E
PERFORATIONS: 8726 - 8748 ft
WEIGHT: 23, 26 & 29 lb/ft
WEIGHT: 4.7 lb/ft

DATE: December 20th - 26th/1984 FIELD Nappamerri
PRODUCING THROUGH: tubing Formation
GRADE: J55, N80 & P110
GRADE: J55

DESCRIPTION OF TEST

INITIAL SHUT IN PERIOD

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing psig	Casing psig	Temp. °F	
20/12/84	1137		2177			Ran static gradient survey
						Max. bottom hole temp. = 302°F
	1530					Opened well to establish rate
	1800	0				Shut well in
21/12/84	1300	19	2125	840		Opened well on 1st rate

Flow Period
Run No.: 1 Duration of Run: 4 Hours. Orifice Size: 0.500 ins
Flow Well On: 8/64" Choke. Meter Run: 3.826 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
21/12/84	1300	0	2125	840						
	1330	0.5	1715	833	91	290	134	113	Nil	Nil
	1400	1	1728	"	"	"	138	116	"	"
	1430	1.5	1738	841	"	295	146	121	80.5	"
	1500	2	1775	"	"	"	150	126	Nil	"
	1600	3	1770	"	"	300	156	"	80.5	"
	1700	4	1790	"	90	295	147	124	40.3	"

0177

2ND SHUT IN PERIOD

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing psig	Casing psig	Temp. °F	
21/12/84	1700	0	1790	841	90	Shut well in
	1715	0.25	1940	"		
	1730	0.5	2084	"		
	1800	1	2107	"		
	1830	1.5	2115	"		
	1900	2	2116	"		
	2000	3	2117	"		
	2100	4	"	"		Opened well on 2nd rate

Run No.: 2 Duration of Run: 4 Hours. Orifice Size: 1.000 ins
Flow Well On: 10/64" Choke. Meter Run: 3.826 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
21/12/84	2100	0	2117	841	90					
	2130	0.5	1570	812	81	305	58	108	120.8	Nil
	2200	1	1500	"	"	"	56	104	80.5	"
	2230	1.5	1495	"	"	"	"	100	"	"
	2300	2	1515	"	"	"	52	96	"	
	2400	3	1500	834	79	"	"	90	"	"
22/12/84	0100	4	1497	841	"	"	51	86	120.8	"

3RD SHUT IN PERIOD

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing psig	Casing psig	Temp. °F	
22/12/84	0100	0	1497	841	79	Shut well in
	0115	0.25	1760	"		
	0130	0.5	1910	"		
	0200	1	1970	"		
	0230	1.5	2005	"		
	0300	2	2050	"		
	0400	3	2080	"		
	0500	4	"	"		Opened well on 3rd rate

Run No.: 3 Duration of Run: 3.75 Hours. Orifice Size: 1.000 ins
Flow Well On: 12/64" Choke. Meter Run: 3.826 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
22/12/84	0500		2080	841						
	0501		Shut well in to repair leak							
	0515	0	Opened well							
	0530	0.25	1395	812	72	320	164	101	120.8	Nil
	0600	0.75	1220	841	"	315	133	96	201.3	"
	0630	1.25	1244	"	73	"	128	91	161.0	"
	0700	1.75	1252	"	"	"	123	86	"	"
	0800	2.75	1250	"	82	"	"	81	120.8	40.3
	0900	3.75	"	"	86	"	122	83	161.0	Nil

4TH SHUT IN PERIOD

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing psig	Casing psig	Temp. °F	
22/12/84	0900	0	1250	841	86	Shut well in
	0915	0.25	1659	"		
	0930	0.5	1864	"		
	1000	1	1980	"		
	1030	1.5	2020	"		
	1100	2	2050	"		
	1200	3	2060	"		
	1300	4	2065	"		Opened well on 4th rate

Run No.: 4 Duration of Run: 4 Hours. Orifice Size: 1.250 ins
Flow Well On: 16/64" Choke. Meter Run: 3.826 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
22/12/84	1300	0	2065	841						
	1330	0.5	1010	"	99	335	116	111	201.2	40.3
	1400	1	922	"	"	"	96	108	281.7	Nil
	1430	1.5	945	"	"	340	105	103	201.2	"
	1500	2	957	"	97	"	104	100	241.5	"
	1600	3	960	"	"	345	101	99	"	"
	1700	4	"	856	"	340	100	96	"	"

5TH SHUT IN PERIOD

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing psig	Casing psig	Temp. °F	
22/12/84	1700	0	960	856	97	Shut well in
	1715	0.25	1460	"		
	1730	0.5	1717	"		
	1800	1	1932	"		
	1830	1.5	1970	"		
	1900	2	2005	"		
	2000	3	2010	"		
	2100	4	2012	"		Opened well on 5th rate

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WELL TEST SUMMARY
FINAL STABILIZATION FLOW PERIOD

0181

Run No.: 5 Duration of Run: 24 Hours. Orifice Size: 1.250 ins
Flow Well On: 14/64" Choke. Meter Run: 3.826 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
22/12/84	2100	0	2012	856						
	2130	0.5	1140	"	84	340	95	104	322.0	Nil
	2200	1	1065	848	"	"	80	96	161.0	"
	2300	2	1084	"	"	335	76	88	241.5	"
	2400	3	1094	856	82	"	"	82	"	"
23/12/84	0100	4	1099	"	"	330	75	80	"	"
	0200	5	1097	"	"	"	76	79	161.0	"
	0300	6	"	"	"	"	75	77	201.2	"
	0500	8	1095	"	79	"	"	"	241.5	"
	0700	10	"	"	"	"	"	"	201.2	1.7
	0900	12	1104	"	95	335	78	89	"	Nil
	1100	14	1109	863	104	340	80	97	"	"
	1500	18	1112	870	106	345	83	104	"	"
	1900	22	1114	877	100	"	"	101	"	"
	2100	24	"	"	95	"	80	96	241.5	"

SANTOS LTD.
WELL TEST SUMMARY
FINAL BUILD-UP PERIOD

0182

Date	Time	Shut in Period (Hours)	Tubing Pressure psig	Casing Pressure psig	Wellhead Temp. °F	REMARKS
23/12/84	2100	0	1114	877	95	Shut well in
	2115	0.25	1605	870		
	2130	0.5	1775			
	2145	0.75	1855	"		
	2200	1	1890	"		
	2215	1.25	1910	"		
	2230	1.5	1915	863		
	2245	1.75	1920	"		
	2300	2	1926	"		
	2400	3	1935	856		
24/12/84	0100	4	1942	848		
	0200	5	1955	841		
	0300	6	1970	834		
	0400	7	1983	827		
	0500	8	1977	812		
	1100	14	2055	805		
	1700	20	2040	761		
	2300	26	2025	740		
25/12/84	0500	32	2022	732		
	1100	38	"	"		
	1300	40	"	"		
26/12/84	0900	60	2045	761		
	0908	60.13	"			P.O.H. - End of test

SANTOS LTD.
WELL TEST SUMMARY
FINAL BUILD-UP, SUBSURFACE PRESSURES

0183

ELEMENT NO. 59211 BOMB DEPTH 8676 'KB DWTin = 2101 psig/out = 2045 psig
LUBin = 2092.4 psig/out = 2061.3 psig

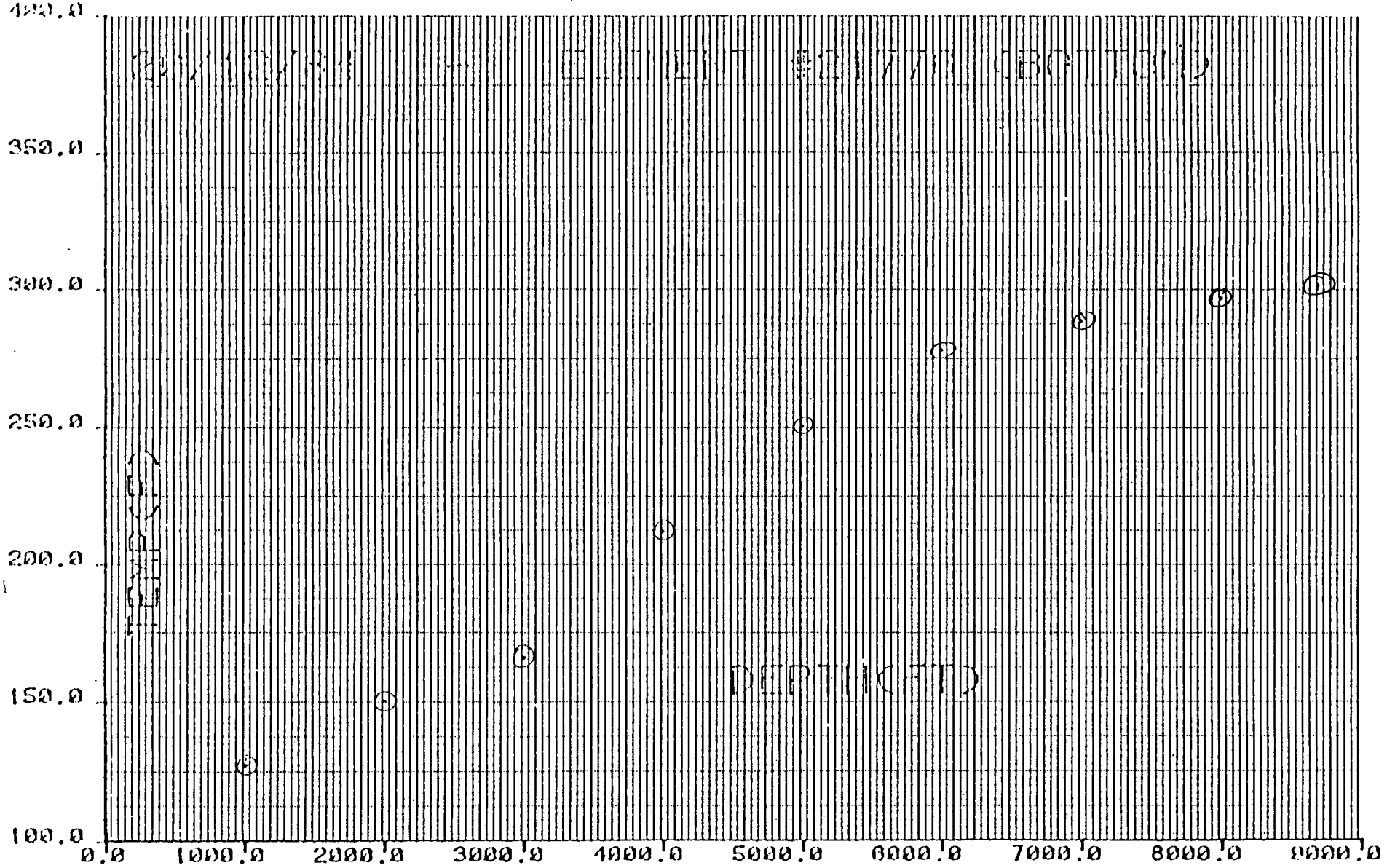
Date	Time	Shut In Time (Hours)	PRESSURE psig	PRESSURE psia x10³	T + θ / θ	REMARKS
23/12/84	2100	0	2001.3	4064	= 0	Shut well in
	2115	0.25	2676.8	7244	2153	
	2130	0.5	3120.0	9826	1077	
	2145	0.75	3267.2	10771	718	
	2200	1	3346.0	11294	539	
	2215	1.25	3384.1	11552	431	
	2230	1.5	3405.9	11700	359	
	2245	1.75	3414.4	11758	306.4	
	2300	2	3417.0	11776	270	
	2400	3	3445.6	11973	180.3	
24/12/84	0100	4	3476.7	12190	135.5	
	0200	5	3502.9	12373	108.6	
	0300	6	3524.9	12528	90.7	
	0400	7	3540.7	12641	77.9	
	0500	8	3554.7	12740	68.3	
	1100	14	3604.7	13100	39.4	
	1700	20	3627.5	13265	27.9	
	2300	26	3649.2	13424	21.7	
25/12/84	0500	32	3664.0	13532	17.8	
	1100	38				
	1300	40	clock	clock		
26/12/84	0900	60				
	0908	60.13	stopped	stopped		P.O.H. - end of test

T = Cumulative Prod./last Prod. rate before shut in

$= \frac{35.69 \times 10^6 \times 0.8 \times 24}{1.274 \times 10^6}$

= 538 hours

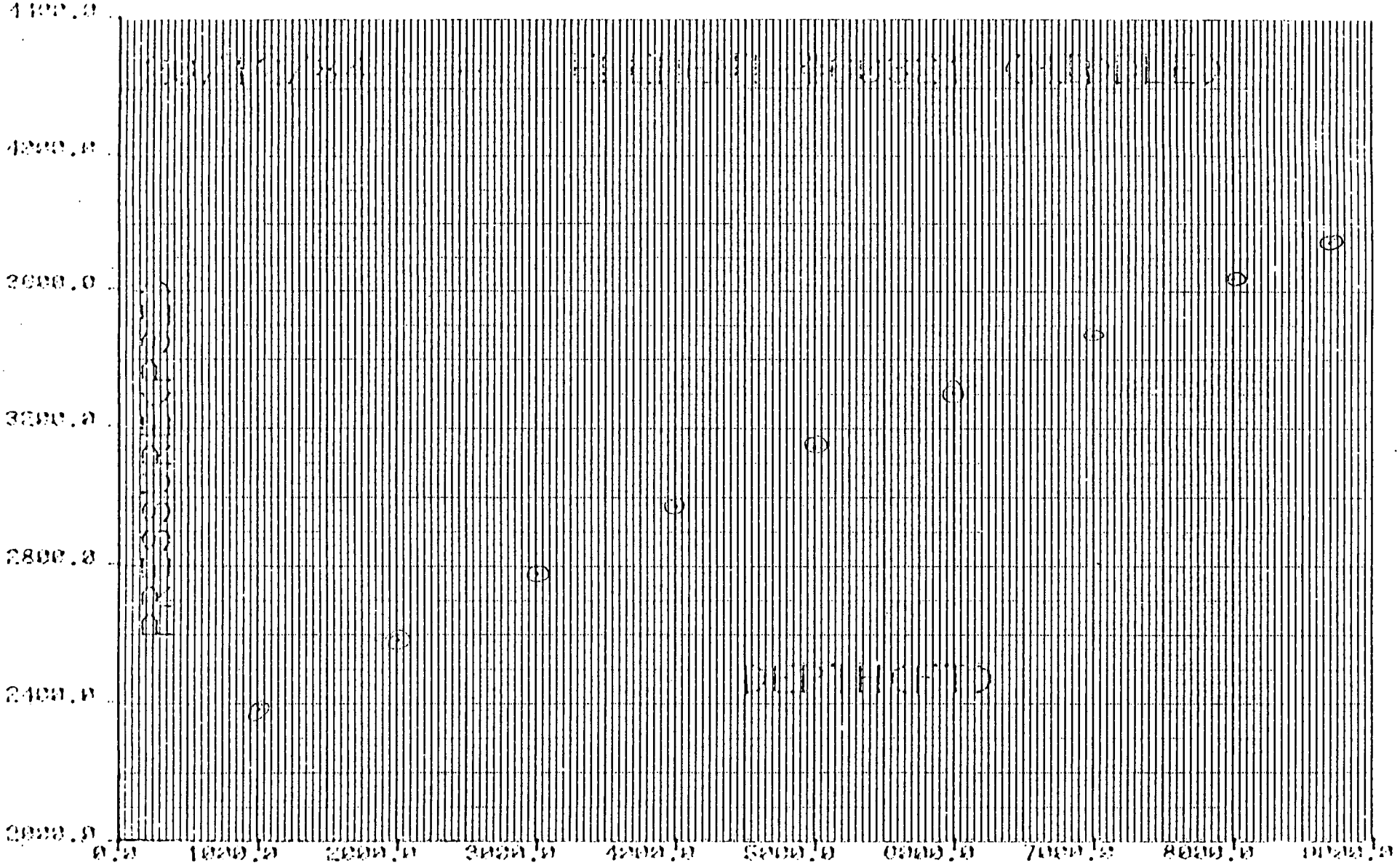
MOORARI #3 UPPER - STATIC TEMPERATURE GRADIENT



MOORARI #3 UPPER - STATIC PRESSURE GRADIENT



MOORART #3 UPPER - STATIC PRESSURE GRADIENT



APPENDIX B

FWS Recombination of Separator Samples taken during Isochronal Testing 20/12/84 - 28/12/84

1. Method

Separator gas and liquid samples taken during the Isochronal Test of Moorari #3U were sent to AMDEL for analysis (see Appendix D for fluid analysis). The low pressure gas and liquid were mathematically combined to form the high pressure liquid. To check for internal consistency of the samples, a log k vs $(Tc)^2$ plot was made from the compositions of the high pressure liquid and high pressure gas (see Table II and Figure 1). Inspection of Figure 1 shows that the HP separator gas and liquid are not in equilibrium with each other. It is likely that the sample size was too small and was non-representative of the true FWS composition. However, in spite of this, a recombination of the samples as analysed by AMDEL has been completed. No recommendation is made to change the existing FWS analysis.

The experimentally determined volumes of flash (low pressure) gas and liquid were converted to molar feed rates by the field measured gas and condensate rates. It was assumed that the low pressure liquid would have the same molecular weight and specific gravity as the stock tank condensate. The full well stream composition was derived by multiplying the HP gas composition and the HP liquid composition by the respective fluid molar ratios and summing.

The full well stream obtained from the mathematical recombination was compared with the currently accepted FWS composition, as shown in Table I.

2. Results and Conclusions

a) The log k vs $(Tc)^2$ plot indicates that the sample is not internally consistent.

b) The recombined FWS analysis is considered invalid in spite of the results being close to the currently accepted values.

c) No recommendation is made to change the currently accepted FWS as shown in Table I.

3. Calculations

HP Liquid Analysis

	Mol%	M.W.	Mol % x MW
C_2	.11	30.0	3
C_3	1.75	44.1	77
iC_4	2.05	58.1	119
iC_4	5.70	58.1	331
iC_5	5.95	72.2	430
nC_5	7.70	72.2	556
C_6	13.85	86.2	1194
C_7	15.70	100.2	1573
C_{8+}	47.19	133.0	6276
			MW = 105.6

Weight of liquid sample = S.G x vol

= .748 x 50

= 37.4 gm

No. of mols of liquid = $\frac{\text{wt}}{\text{M.W.}}$

= $\frac{37.4}{105.6}$

= 0.354 gm-mols

Flash Gas Analysis

No. of mols of gas = $\frac{\text{density of air x vol of gas}}{\text{M.W. air}}$

= $\frac{0.0122 \times 550}{28.96}$

= 0.232 gm mols.

Shrinkage = $\frac{\text{no of mols of liquid}}{\text{no of mols of gas + liquid}}$

= $\frac{0.354}{0.232 + 0.354}$

= 0.604

No. of mols of HP separator gas produced during day

$$= \frac{1.315 \times 10^6}{380.86}$$

$$= \underline{3454 \text{ lb mols gas}}$$

No. of mols of HP separator liquid produced during day

$$= \frac{\text{Stock Tank BOPD} \times 5.6146 \times \rho}{\text{Shrinkage} \times \text{M.W. (stock tank oil)}}$$

$$= \frac{211.3 \times 5.6146 \times 0.748 \times 62.4}{0.604 \times 105.6}$$

$$= \underline{868 \text{ lb mols liquid}}$$

$$\text{Gas molar ratio} = \frac{3454}{3454 + 868}$$

$$= \underline{0.80}$$

$$\therefore \text{ liquid molar ratio} = 1 - 0.80$$

$$= \underline{0.20}$$

The recombined FWS composition was then calculated by multiplying the HP liquid mol % by the liquid molar ratio and the HP gas mol % by the gas molar ratio for each component as shown in Table I.

TABLE I

Component	HP Liquid Mol %	HP Gas Mol %	Recombined FWS	Currently Accepted FWS Composition
N_2	0.05	1.20	0.97	0.80
CO_2	2.65	24.54	20.16	17.79
C_1	4.05	45.48	37.19	41.12
C_2	8.05	13.60	12.49	13.38
C_3	13.75	8.40	9.47	10.01
iC_4	5.00	1.50	2.20	2.07
nC_4	8.50	2.05	3.34	3.16
iC_5	5.00	0.75	1.60	1.27
nC_5	5.75	0.71	1.72	1.36
C_6	8.86	0.77	2.39	1.74
C_7	9.65	0.71	2.50	1.84
C_{8+}	28.69	0.29	5.97	5.46
	100.00	100.00	100.00	100.00

WP4367N(19)
PAR/mc
4/11/85

TABLE II

Component	HP Separator Condensate (Xi) Mol %	HP Separator Gas (Yi) Mol %	K = Yi/Xi
N_2	0.05	1.20	24.0
CO_2	2.65	24.54	9.3
C_1	4.05	45.48	11.2
C_2	8.05	13.60	1.69
C_3	13.75	8.40	0.61
iC_4	5.00	1.50	0.30
nC_4	8.50	2.05	0.24
iC_5	5.00	0.75	0.15
nC_5	5.75	0.71	0.12
C_6	8.86	0.77	0.087
C_7	9.65	0.71	0.074
C_{8+}	28.69	0.29	0.010
	100.00	100.00	

WP4367N(20)
PAR/mc
4/11/85

FIGURE 1

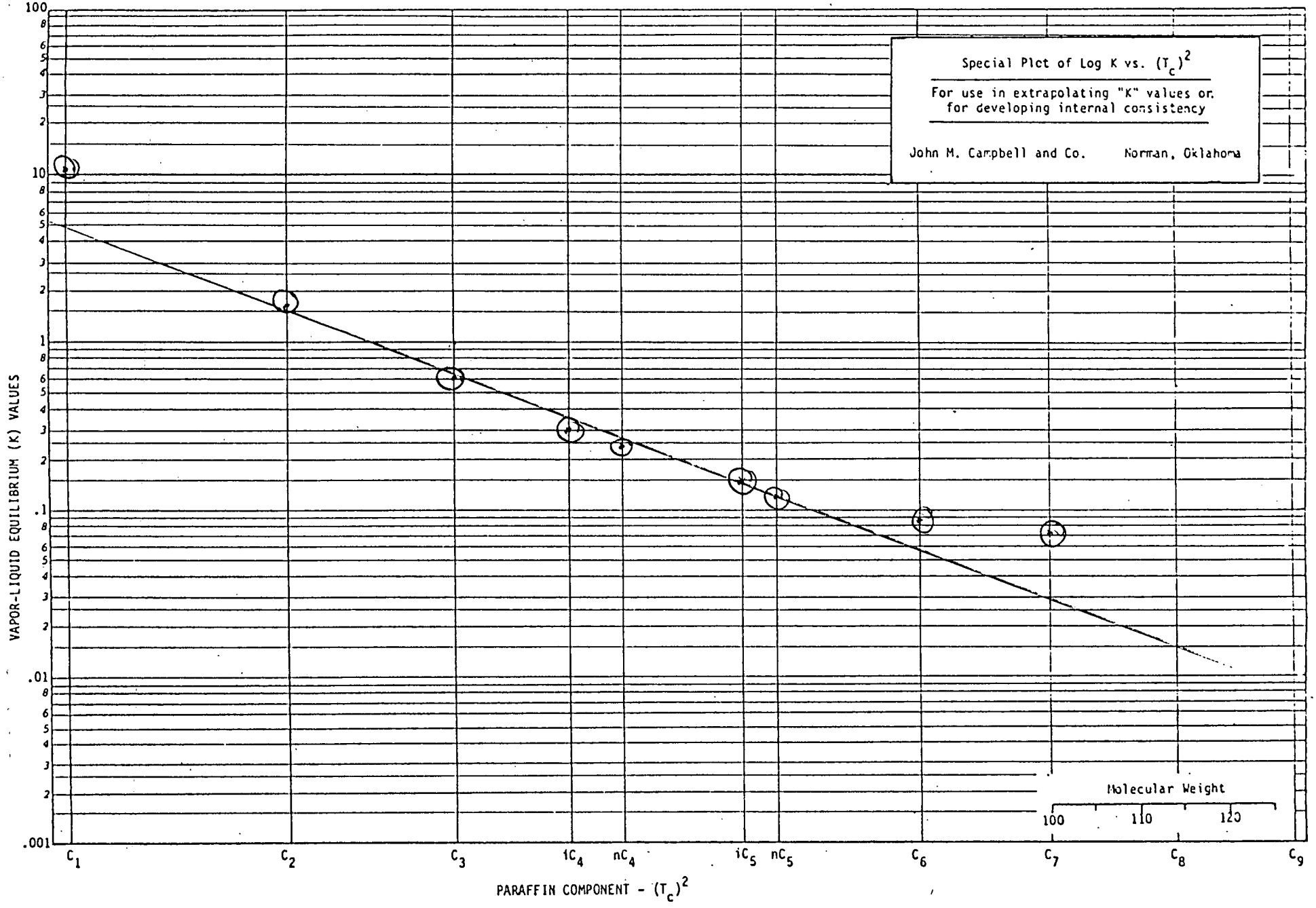


Figure 6.4 Example of Log K vs. T_c^2

APPENDIX C

AMDEL Report

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

0196

23 April 1985

FS 3/520/0

WELL NAME: Moorari #34
TYPE OF ANALYSIS: Gas + Cond.
COPIES SENT: 2/5/85
(WELL FILE) ✓
RESERVOIR ENG: B. Anderson

Santos Limited
GPO Box 2319
ADELAIDE SA 5001

Attention: Mr A. Wenk

REPORT F 2864/85

YOUR REFERENCE: 000148

IDENTIFICATION: Tirrawarra No. 21, Tirrawarra No. 43 U, Moorari No. 3 l
and Fly Lake No. 7

MATERIAL: Gas, condensate and oil

DATE RECEIVED: 14 January 1985

WORK REQUIRED: R1.1, 2.1, 2.2, 2.3, 2.5

Investigation and Report by: P. Marty and A. Koutrouzas

Chief - Fuels Section: Dr Brian Steveson

Brian Steveson.

for Dr William G. Spencer
Manager, Mineral and Materials Sciences Division

cap

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Perth, W.A.
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Telex: Amdel AA94893
Sydney, N.S.W.
Telephone (02) 439 7735
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Townsville
Queensland 4814

AMDEL HIGH PRESSURE LIQUID HYDROCARBON ANALYSIS

MOORARI NO.3 U
NAPPAMERRI FM.
8726-8748 FT.
345 psi 99 deg.F
2000 HRS 23/12/84

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 50 millilitres of liquid and 5.5 litres of gas at 21.5 degrees celsius.

FLASH GAS ANALYSIS

GAS	% MOL VOL
NITROGEN	0.12
CARBON DIOXIDE	6.75
METHANE	10.30
ETHANE	20.35
PROPANE	32.25
I-BUTANE	9.55
N-BUTANE	12.80
I-PENTANE	3.50
N-PENTANE	2.75
HEXANES	1.05
HEPTANES	0.30
OCTANES + HIGHER H'CARBONS	0.27

Calculated gas density (rel air = 1) = 1.52

Calorific value (15.6 deg.c, 760 mm Hg)

Gross = 2341 Btu/cu.ft (87.19 MJ/cu.m)
Nett = 2152 Btu/cu.ft (80.15 MJ/cu.m)

MOORARI NO.3 U

LIQUID ANALYSIS

BOILING POINT RANGE (DEG.C)	CARBON NUMBER	% BY WEIGHT	MOL %
-88.6	ETHANE	0.03	0.11
-42.1	PROPANE	0.73	1.75
-11.7	I-BUTANE	1.10	2.05
-0.5	N-BUTANE	3.10	5.70
27.9	I-PENTANE	4.05	5.95
36.1	N-PENTANE	5.25	7.70
36.1-68.9	C-6	11.25	13.75
80.0	BENZENE	0.08	0.10
68.9-98.3	C-7	14.90	15.70
100.9	METHYLCYCLOHEXANE	7.90	8.50
110.6	TOLUENE	1.20	1.40
98.3-125.6	C-8	12.85	11.90
136.1-144.4	ETHYLBENZ.+ XYLENES	1.90	1.90
125.6-150.6	C-9	9.30	7.65
150.6-173.9	C-10	7.75	5.75
173.9-196.1	C-11	4.90	3.30
196.1-215.0	C-12	2.90	1.80
215.0-235.0	C-13	2.10	1.20
235.0-252.2	C-14	1.60	0.84
252.2-270.6	C-15	1.50	0.76
270.6-287.8	C-16	1.05	0.49
287.8-302.8	C-17	0.76	0.34
302.8-317.2	C-18	0.78	0.32
317.2-330.0	C-19	0.57	0.23
330.0-344.4	C-20	0.47	0.18
344.4-357.2	C-21	0.43	0.15
357.2-369.4	C-22	0.38	0.13
369.4-380.0	C-23	0.33	0.11
380.0-391.1	C-24	0.27	0.08
391.1-401.7	C-25	0.17	0.05
401.7-412.2	C-26	0.15	0.04
412.2-422.2	C-27	0.13	0.04
>422.2	C-28 + HIGHER H'CARBONS	0.06	0.02

$C_{8+} = 47.9\%$

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.

Specific gravity = .743 (at 21.5 deg.c)
Specific gravity = .748 (at 15.6 deg.c)
API gravity = 57.7 (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.) = 133 g/mole

MOORARI NO.3 U

H.P Liq.

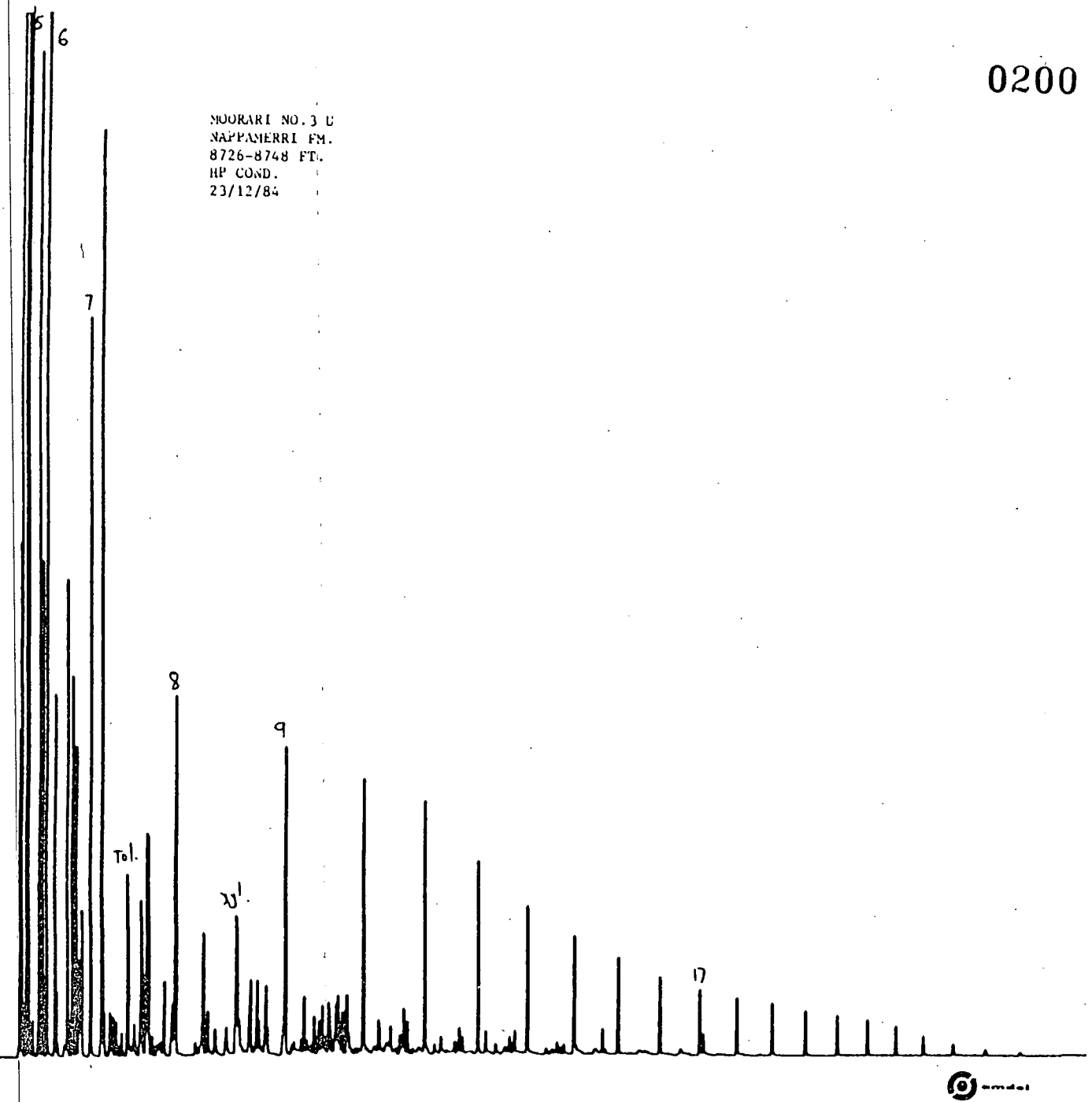
CALCULATED COMPOSITION OF TOTAL SAMPLE AS RECEIVED

BOILING POINT RANGE (DEG.C)	CARBON NUMBER	% BY WEIGHT	MOL %
-195.8	NITROGEN	0.02	0.05
-78.5	CARBON DIOXIDE	1.45	2.65
-164	METHANE	0.80	4.05
-88.6	ETHANE	2.95	8.05
-42.1	PROPANE	7.45	13.75
-11.7	I-BUTANE	3.55	5.00
-0.5	N-BUTANE	6.05	8.50
27.9	I-PENTANE	4.45	5.00
36.1	N-PENTANE	5.10	5.75
36.1-68.9	C-6	9.30	8.80
80.0	BENZENE	0.06	0.06
68.9-98.3	C-7	11.85	9.65
100.9	METHYLCYCLOHEXANE	6.20	5.15
110.6	TOLUENE	0.96	0.85
98.3-125.6	C-8	10.25	7.30
136.1-144.4	ETHYLBENZ.+ XYLENES	1.50	1.15
125.6-150.6	C-9	7.30	4.65
150.6-173.9	C-10	6.10	3.50
173.9-196.1	C-11	3.85	2.00
196.1-215.0	C-12	2.25	1.10
215.0-235.0	C-13	1.65	0.73
235.0-252.2	C-14	1.25	0.51
252.2-270.6	C-15	1.20	0.46
270.6-287.8	C-16	0.83	0.30
287.8-302.8	C-17	0.60	0.20
302.8-317.2	C-18	0.62	0.20
317.2-330.0	C-19	0.45	0.14
330.0-344.4	C-20	0.37	0.11
344.4-357.2	C-21	0.34	0.09
357.2-369.4	C-22	0.30	0.08
369.4-380.0	C-23	0.26	0.07
380.0-391.1	C-24	0.21	0.05
391.1-401.7	C-25	0.13	0.03
401.7-412.2	C-26	0.12	0.03
412.2-422.2	C-27	0.10	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.

0200


MOORARI NO.3 D
NAPPAMERRI FM.
8726-8748 FT.
HP COND.
23/12/84
5
6
7
8
9
Tol.
Xyl.
17

AMDEL

LIQUID HYDROCARBON ANALYSIS

MOORARI NO.3 U
NAPPAMERRI FM.
8726-8748 FT.
EX SIGHT GLASS
2000 HRS 23/12/84

BOILING POINT RANGE (DEG.C)	CARBON NUMBER	% BY WEIGHT	MOL %
-88.6	ETHANE	0.02	0.07
-42.1	PROPANE	1.15	2.65
-11.7	I-BUTANE	1.85	3.25
-0.5	N-BUTANE	4.90	8.60
27.9	I-PENTANE	5.15	7.25
36.1	N-PENTANE	6.30	8.90
36.1-68.9	C-6	11.55	13.65
80.0	BENZENE	0.10	0.13
68.9-98.3	C-7	13.95	14.15
100.9	METHYLCYCLOHEXANE	7.20	7.45
110.6	TOLUENE	1.10	1.20
98.3-125.6	C-8	11.30	10.05
136.1-144.4	ETHYLBENZ.+ XYLENES	1.75	1.70
125.6-150.6	C-9	7.95	6.30
150.6-173.9	C-10	6.95	4.95
173.9-196.1	C-11	4.40	2.85
196.1-215.0	C-12	3.00	1.80
215.0-235.0	C-13	2.10	1.15
235.0-252.2	C-14	1.75	0.90
252.2-270.6	C-15	1.55	0.74
270.6-287.8	C-16	1.10	0.49
287.8-302.8	C-17	0.82	0.35
302.8-317.2	C-18	0.84	0.34
317.2-330.0	C-19	0.64	0.24
330.0-344.4	C-20	0.49	0.18
344.4-357.2	C-21	0.44	0.15
357.2-369.4	C-22	0.40	0.13
369.4-380.0	C-23	0.35	0.11
380.0-391.1	C-24	0.31	0.09
391.1-401.7	C-25	0.21	0.06
401.7-412.2	C-26	0.13	0.04
412.2-422.2	C-27	0.11	0.03
>422.2	C-28 + HIGHER H'CARBONS	0.14	0.04

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)= 135 gm/mol

Specific gravity of C-8 plus fraction (calc)= .847 at 15.6 deg.c)

PHYSICAL PROPERTIES

MOORARI NO.3 U
NAPPAMERRI FM.
8726-8748 FT.
EX SIGHT GLASS
2000 HRS 23/12/84

Kinematic viscosity = 1.05 centistokes (at 37.8 deg.c)

Pour point = -9 (deg.c)

B.S. & W. = TRACE %

Specific Gravity (15.6 deg.C)= 0.740

API Gravity (15.6 deg.C)= 59.7

USBM DISTILLATION

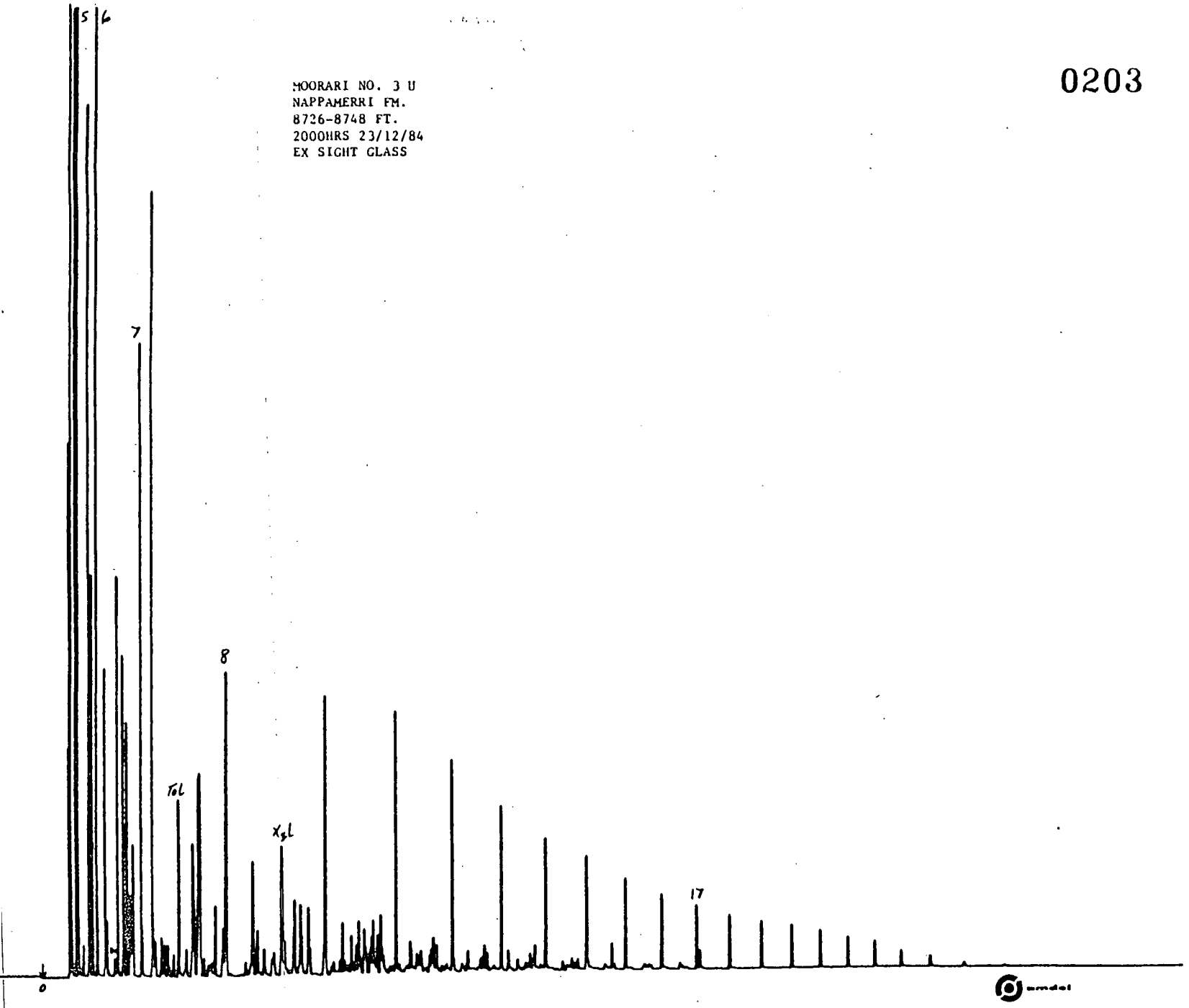
boiling range (deg.c)	vol %	sum %	sp gr (15.6 deg)	corr index
RT-50	2.0	2.0	-----	----
50-100	27.5	29.5	0.687	8.4
100-150	25.5	55.0	0.743	17.4
150-200	13.5	68.5	0.776	19.4
200-250	7.0	75.5	0.803	21.3
250-300	6.0	81.5	0.825	22.8

initial boiling point = 37 deg.c
final boiling point = 300 deg.c

weight of distillate = 59.36 gms
weight of residue = 12.28 gms
loss = 1.6 gms
recovery = 97.8 %

MOORARI NO. 3 U
NAPPAMERRI FM.
8726-8748 FT.
2000HRS 23/12/84
EX SIGHT GLASS

0203



0204 Amdel Report 2864/85

AMDEL GAS ANALYSIS SERVICE

MOORARI #3UPPER
8726-8748
NAPPAMERRI FORMATION
METER RUN 23/12/84 2000 Hrs

GAS	MOL %
OXYGEN PLUS ARGON	<.01
NITROGEN	1.20
CARBON DIOXIDE	~~24.55~~ 24.54
METHANE	~~45.50~~ 45.48
ETHANE	13.60
PROPANE	8.40
I-BUTANE	1.50
N-BUTANE	2.05
I-PENTANE	0.75
N-PENTANE	0.71
HEXANE	0.77
HEPTANES	0.71
OCTANES AND HIGHER	0.29
(0= LESS THAN 0.01%)	100.03 100.00 %

CALCULATED GAS DENSITY ✓
(AIR = 1): 1.07

CALORIFIC VALUE (15.6 DEG C, 760 MM HG):

GROSS: 1180 BTU/CU.FT (43.95 MJ/CU.M)
NETT: 1077 BTU/CU.FT (40.1 MJ/CU.M)

All results calculated on an air and water free basis

3953 R17

0205

MOORARI #3 LOWER

SUMMARY OF PRESSURE FALL-OFF SURVEY

31st July - 5th August 1986

Injection Test

31st July

31/7/86: Opened well on 32/64" choke @ 1700 hrs
Injected for 6 hours on 32/64" choke
F.T.H.P. = 3914 psig
F.T.H.T. = 60°F
Injection Rate = 4659.578 Kg/hour
Element # 27617 @ 9270'KB = 5605.2 psig
Shut well in @ 2300 hrs

Pressure Fall-Off Test

31st July - 5th August

31/7/86: Shut well in @ 2300 hrs for 103.08 hrs
Element # 27617 @ 9270'KB after 103.08 hours of fall-off = 4614.2 psig

Please note only the second pressure element could be read as the first element had a clock malfunction and the recorder section pressured up.

RECEIVED
29 SEP 1986
DEPT. OF MINES & ENERGY
3953

WP2472G(75)
LGA/arw
29th August 1986

SANTOS LTD
39 GRENFELL ST
ADELAIDE

SUB-SURFACE PRESSURE SURVEY

CO.	SANTOS		RUN 01 FIELD	MOORARI	WELL 03L
EFF DEPTH			WELL STAT		TOOL HUNG 9270'
CASING		-	CASING PRESS		ON BOTTOM 1640 31/7
LINER		-	TUBING PRESS		OFF BOTTOM 0605 5/8
DATE	860805		ELEMENT RANGE	0 - 5758	ZERO POINT
ELEVATION			ZONE		SHUT-IN 2300 31/7
MAX TEMP			PICK-UP		ON-PROD
PERF		-	CAL SER NO.	27617	MPP
TUBING		-			
UNITS	ENGLISH		PURPOSE	PRESSURE FALL-OFF TEST	

SURVEY DATA

CO. SANTOS RUN 01 FIELD MOORARI WELL 03L

TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
23:00	5605.2	0.0	0.0	9:00	4772.1	-833.1	10.0
23:16	4942.2	-663.0	.3	13:00	4751.0	-854.2	14.0
23:30	4918.3	-686.9	.5	17:00	4736.3	-869.0	18.0
23:45	4901.9	-703.4	.8	21:01	4722.6	-882.6	22.0
0:00	4888.2	-717.0	1.0	1:00	4711.6	-893.7	26.0
0:15	4879.8	-725.5	1.2	5:01	4702.5	-902.7	30.0
0:30	4872.2	-733.1	1.5	9:00	4694.0	-911.2	34.0
0:45	4863.4	-741.8	1.7	13:00	4685.8	-919.4	38.0
1:01	4857.2	-748.0	2.0	17:00	4678.5	-926.8	42.0
1:15	4851.9	-753.3	2.2	21:00	4671.7	-933.5	46.0
1:30	4845.7	-759.5	2.5	1:00	4666.1	-939.1	50.0
1:45	4841.6	-763.7	2.7	4:59	4660.5	-944.7	54.0
2:00	4837.1	-768.2	3.0	9:00	4654.9	-950.4	58.0
2:15	4832.9	-772.3	3.2	13:00	4649.8	-955.4	62.0
2:30	4829.6	-775.7	3.5	17:00	4644.8	-960.5	66.0
2:45	4825.7	-779.5	3.7	21:00	4642.0	-963.2	70.0
3:00	4823.2	-782.0	4.0	1:00	4637.3	-968.0	74.0
3:15	4819.6	-785.6	4.2	5:00	4634.5	-970.7	78.0
3:30	4816.3	-789.0	4.5	9:00	4630.1	-975.2	82.0
3:45	4812.7	-792.6	4.7	13:00	4627.3	-977.9	86.0
4:00	4810.5	-794.7	5.0	17:01	4624.6	-980.7	90.0
4:15	4808.0	-797.2	5.2	21:00	4621.8	-983.4	94.0
4:30	4805.0	-800.2	5.5	1:00	4617.7	-987.6	98.0
4:45	4802.3	-803.0	5.7	5:00	4614.9	-990.3	102.0
5:00	4800.7	-804.6	6.0	6:05	4614.2	-991.1	103.1

LUB IN DWT = 3877 PSI
LUB IN AMERADA = 3880 PSI / OUT = 3206 PSI

Shut In Time in Minutes

0207

Shut Well In @ 2300 hrs 31/7/86	0	2040
	15	2280
	30	2520
	45	2760
	60	3000
	75	3240
	90	3480
	105	3720
	120	3960
	135	4200
	150	4440
	165	4680
	180	4920
	195	5160
	210	5400
	225	5640
	240	5880
	255	6120
	270	6185 P.O.O.H. 0605 hrs 5/8/86
	285	
	300	
	315	
	330	
	345	
	360	
	600	
	840	
	1080	
	1320	
	1560	
	1800	

BUILD-UP SURVEY

0208

Well: Moorhead 3 Lower Injection Infill Date: 5/5/66

Lubricator Data: ① unreadable. ② 3880 3206

Pressure with D.W.T. 3477 psi

Time Pressured 1311 5/7/66 Time Depressured 0949 on 5/9/66

Time Run in Hole 1600 5/7/66 Time off Bottom 0605 5/8/66

	Bomb No. 1 Data	Bomb No. 2 Data
Element No. and Range	27616 x 5680	27617 x 5680
Recorder No.	14629 x 15 TC's	13029 x 15 TC's
Clock and Lead Screw Data	No 1 x 120 HR	15693 x 120 HR.
Engage Stylus	Date: 5/7/66 Time: 1311	Date: 5/7/66 Time: 1311
Disengage	Date: 5/8/66 Time: 0909	Date: 5/8/66 Time: 0909

Remarks: Bomb No 1 did not run due to Recorder section packing up and clock trouble.

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

PRESSURE FALL OFF TEST

WELL: MAHARI 3 LOWER INJECTION WELL

TYPE OF TEST:

SANTOS LTD.
WELL TEST DATA SHEET

DATE: 3/7/88

PAGE No: 1

DATE / TIME	WELLHEAD					GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS				
															GAS	OIL	WATER	TOTAL LIQUID	
	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	
3/7		RIG UP		HIGH		PRESSURE			LUB, B.O.P's			AND	LINE		LINE	EQUIPMENT			
1300		PRESSURE		TEST		LUBRICATOR		TO	3800 PSI										
1354		PRESSURE		UP		LUBRICATOR													
1500	1435	3877																	
1600	1435	3877		ROD		IN HOLE		WITH	TWO	x	5680	PSI	PRESSURE		ELEMENT'S				
				WITH		MAXIMUN		READING		THERMOMETER.									
1640		HANGING		AT		9270 FT		KB.											
1700	1435	3877	66	32/64			COMPUTER		MONITORING			SYSTEM			KG/HOUR				4429.183
1800	1435	3889	61	32/64															4501.924
1900	1435	3899	59	32/64															4569.203
2000	1435	3922	59	32/64															4710.125
2100	1435	3936	59	32/64															4777.07
2200	1435	3935	57	32/64															4779.832
2300	1435	3949	57	32/64															4849.709
2300		SHUT	IN	WELL	TO	MONITOR		PRESSURE	FALL OFF.										
2315	1435	3332																	
2330	1435	3310																	
2345	1435	3300																	
1200	1435	3295																	

OPERATOR: A. GILLIES

PRESSURE FALL OFF TEST

WELL: MOORARI 3LOWER

TYPE OF TEST:

SANTOS LTD.
WELL TEST DATA SHEET

DATE: 11/8/86

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
1/8																			
0015	1435	3289																	
0030	1435	3285																	
0045	1435	3280																	
0100	1435	3276																	
0115	1450	3274																	
0130	1450	3271																	
0145	1450	3270																	
0200	1450	3267																	
0215	1450	3265																	
0230	1450	3264																	
0245	1450	3262																	
0300	1450	3261																	
0315	1450	3260																	
0330	1450	3258																	
0345	1450	3257																	
0400	1450	3256																	
0415	1450	3255																	
0430	1450	3253																	
0445	1450	3252																	

OPERATOR: A. GILLIES

PRESSURE FALL OFF TEST

WELL: MAARABI 3 LOWER

TYPE OF TEST:

SANTOS LTD.

WELL TEST DATA SHEET

DATE: 1/8/86

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. %	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
1/8																			
0500	1450	3251																	
0900	1486	3237																	
1300	1493	3230																	
1700	1509	3223																	
2100	1508	3215																	
2/8																			
0100	1508	3209																	
0500	1508	3203																	
0900	1508	3199																	
1300	1522	3196																	
1700	1522	3191																	
2100	1522	3186																	
3/8																			
0100	1522	3183																	
0500	1522	3178																	
0900	1522	3174																	
1300	1522	3172																	
1700	1522	3168																	
2100	1522	3165																	

OPERATOR: A. GILLIES

→ PRESSURE FALL OFF TEST

WELL: MOORARI 3 LOWER

TYPE OF TEST:

SANTOS LTD.
WELL TEST DATA SHEET

DATE: 4/8/86

PAGE No: 4

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
4/8																			
0100	1522	3162																	
0500	1522	3159																	
0900	1522	3158																	
1300	1522	3155																	
1700	1537	3153																	
2100	1537	3150																	
5/8																			
0100	1537	3147																	
0500	1537	3144																	
0605	1537	3144		PULL		OUT	OF	HOLE											
0642				BOMBS		IN	LUB.												
0847	1537.	3144		DEPRESS		. LUB													
					ELEMENT		NO.	27616 × 5680		DID	NOT	FUCTION		DUE	TO	BOMBS			
						PRESSURING		UP		INSIDE		RECORDER		SECTION					
					OTHER	CHARTS		O.K.											

OPERATOR: A. GILLIES

WELL: Moorari Blower

OPERATOR: A. Gillies

SANTOS LTD
WELL TEST DATA
METRIC SUMMARY SHEET

DATE: 31/7/86

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
31/7														
1700	1435	9893	3677	26739	66	19								
1800	"	"	3889	26812	61	16								
1900	"	"	3899	26881	59	15								
2000	"	"	3922	27040	59	15								
2100	"	"	3930	27095	59	15								
2200	"	"	3935	27129	57	14								
2300	"	"	3949	27226	57	14								
2300		SHUT	IN	WELL	TO	MONITOR	PRESSURE	FALL	OFF					
2315	1435	9893	3332	22972										
2330	"		3310	22820										
2345	"		3300	22751										

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

WELL: Moorari Blower

OPERATOR: A. Gillies

SANTOS LTD
WELL TEST DATA
METRIC SUMMARY SHEET

DATE: 31/7/86

PAGE No: 2

DATE / TIME	WELLHEAD						FLUID PRODUCTION				GAS PRODUCTION			
	CASING PSI	CASING KPA	TUBING PSI	TUBING KPA	TEMP .0F	TEMP 0C	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
31/7														
1200	1435	9893	3295	22717										
1/8														
0015	"		3289	22676										
0030	"		3285	22648										
0045	"		3280	22613										
0100	1435	9893	3276	22586										
0115	1450	9997	3274	22572										
0130	"	"	3271	22551										
0145	"	"	3270	22545										
0200	"	"	3267	22524										
0215	1450	9997	3265	22510										

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

WELL: Moorara 3 Lower

OPERATOR: A. Gillies

SANTOS LTD
WELL TEST DATA
METRIC SUMMARY SHEET

DATE: 11/8/86

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 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
11/8														
0230	1450	9997	3264	22503										
0245	"	"	3262	22489										
0300	"	"	3261	22482										
0315	"	"	3260	22476										
0330	"	"	3258	22462										
0345	"	"	3257	22455										
0400	"	"	3256	22448										
0415	"	"	3255	22441										
0430	"	"	3253	22427										
0445	"	"	3252	22420										
0500	1450	9997	3251	22414										

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

WELL: Moorari Flower

OPERATOR: D. Gillies

SANTOS LTD
WELL TEST DATA
METRIC SUMMARY SHEET

DATE: 1/8/86

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
1/8														
0900	1486	10245	3237	22317										
1300	1493	10293	3230	22269										
1700	1508	10396	3223	22220										
2100	"	"	3215	22165										
2/8														
0100	"	"	3209	22124										
0500	"	"	3203	22083										
0900	1508	10396	3199	22055										
1300	1522	10493	3196	22034										
1700	1522	10493	3191	22000										
2100	1522	10493	3186	21965										

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

WELL: MOORARI 3 LOWER

OPERATOR: A. GILLIES

SANTOS LTD
WELL TEST DATA
METRIC SUMMARY SHEET

DATE: 3/8/86

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
3/8														
0100	1522	10493	3183	21945										
0500	"	"	3174	21910										
0900	"	"	3174	21883										
1300	"	"	3172	21869										
1700	"	"	3168	21841										
2100	"	"	3165	21821										
4/8														
0100	"	"	3162	21800										
0500	"	"	3159	21779										
0900	"	"	3158	21772										
1300	1522	10493	3155	21752										

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

WELL: MOORARI 3 LOWER

OPERATOR: A. GILLIES

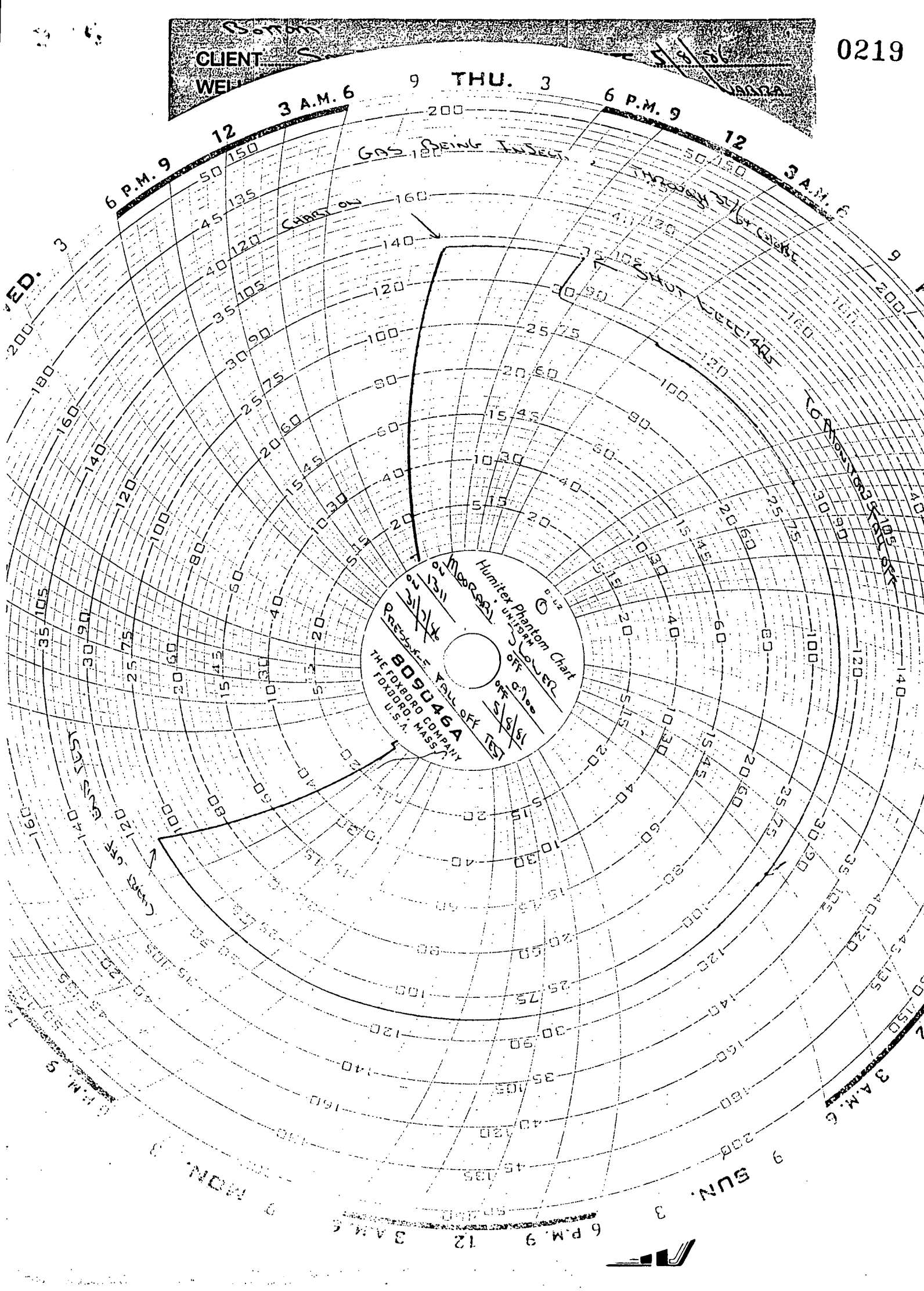
SANTOS LTD
WELL TEST DATA
METRIC SUMMARY SHEET

DATE: 4/8/86

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 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
4/8														
1700	1537	10596	3153	21738										
2100	"	"	3150	21717										
5/8														
0100	"	"	3147	21696										
0500	"	"	3144	21676										
0605	1537	"	3144	21676	PULL	OUT	OF HOLE							
0642					BOMB'S		IN LUB							
0847	1537	10596	3144	21676	DE-	PRESS	LUB							

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


CLIENT
THU.
3 A.M. 6
6 P.M. 9
12
Humiter Phantom Chart
UNIFORM
OFF
FAIL OFF
Test
809046A
THE FOXBORO COMPANY
FOXBORO, MASS.
U.S.A.

3953 R18

0220

ROLLING BOTTOMHOLE PRESSURE SURVEY GAS CALCULATION SHEET

WELL: Moorari # 3 Upper

ORIFICE SIZE: 50·800 mm 2·000 "

LINE SIZE: 97·180 mm 3·826 "

Pf = 2400 kPa

T = 19 °C

Diff = 1 kPa

Cumulative Production to end of May = 19·255 $m^3 \times 10^6$ ✓

Number of hours online in May = 733 ✓

Production in May = 0·684 $m^3 \times 10^6$ ✓

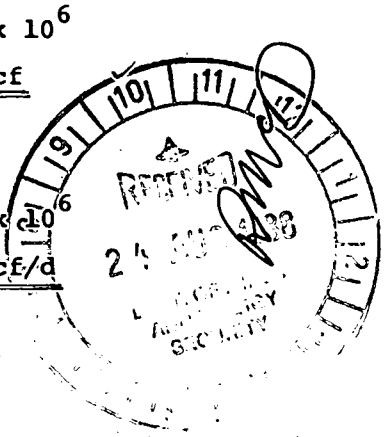
∴ **Average flow rate in** May = $(0.684/733) \times 24$ = 0·022 $m^3 \times 10^6/d$

Number of days online in June **before Shut In** 1300 hrs 6 / 6 /88
= 5·54 days.

∴ **Production up to** 1300 hrs 6 / 6 /88 = 5.54 x 0·022 = 0·124 $m^3 \times 10^6$

Total cumulative production = 19·255 + 0·124
= 19·379 $m^3 \times 10^6$
= 687·842 mmscf

Flow rate just prior to Shut In = 0·021 $m^3 \times 10^6$
= 0·746 mmscf/d



3953

WP 2946G(13)
LGA/jfs : 8/12/86

SANTOS LTD
39 GRENFELL ST
ADELAIDE

SUB-SURFACE PRESSURE SURVEY

CO. SANTOS		RUN 02 FIELD MOORARI	WELL 03U
EFF DEPTH		WELL STAT	TOOL HUNG 8674'
CASING	-	CASING PRESS	ON BOTTOM 0950 6/6
LINER	-	TUBING PRESS	OFF BOTTOM 0500 9/6
DATE	880609	ELEMENT RANGE 0 - 5744	ZERO POINT
ELEVATION		ZONE	SHUT-IN 1300 6/6
MAX TEMP		PICK-UP	ON-PROD
PERF	-	CAL SER NO. 27616	MPP
TUBING	-		
UNITS	ENGLISH	PURPOSE BUILD-UP	

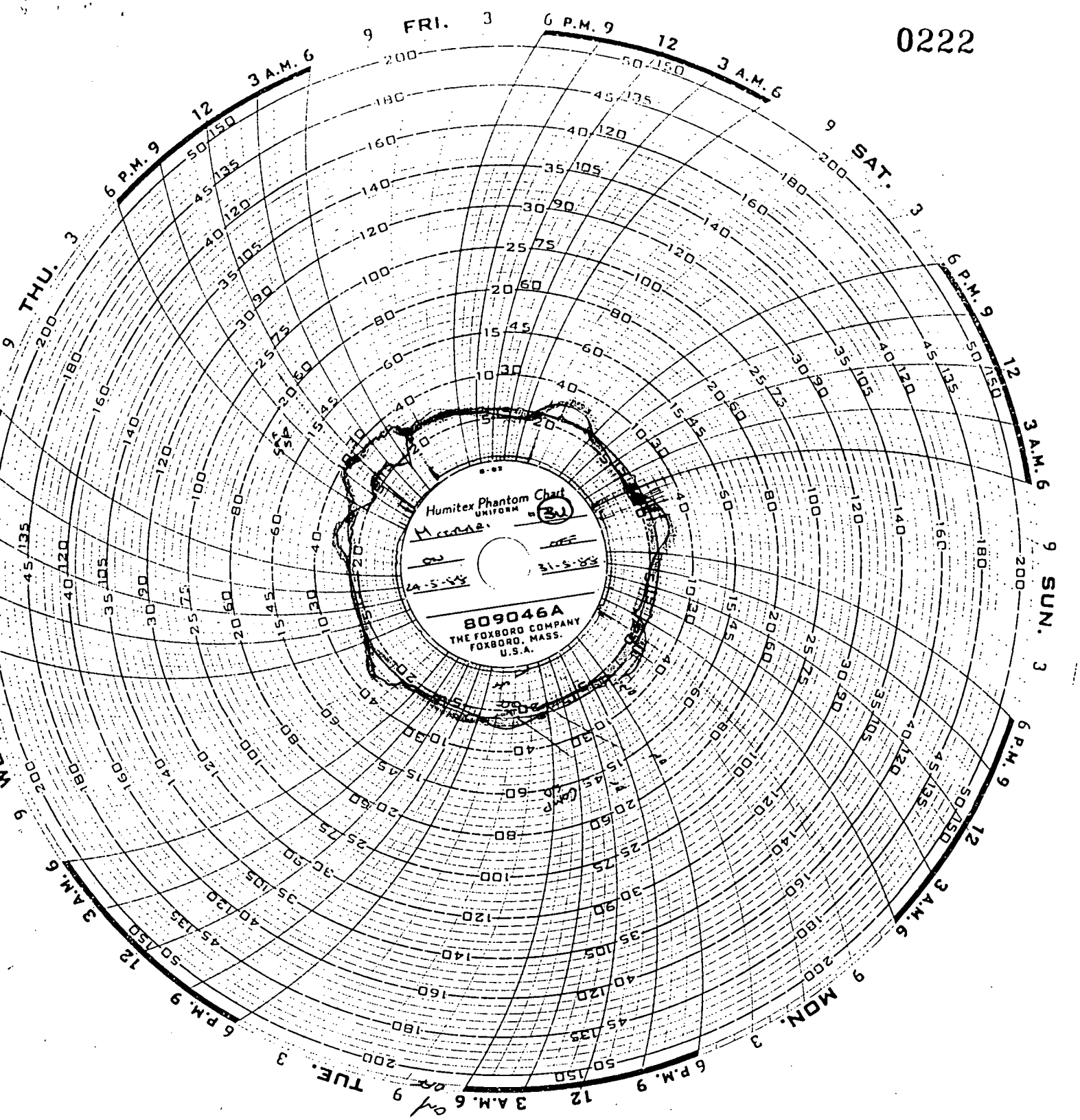
SURVEY DATA

CO. SANTOS RUN 02 FIELD MOORARI WELL 03U

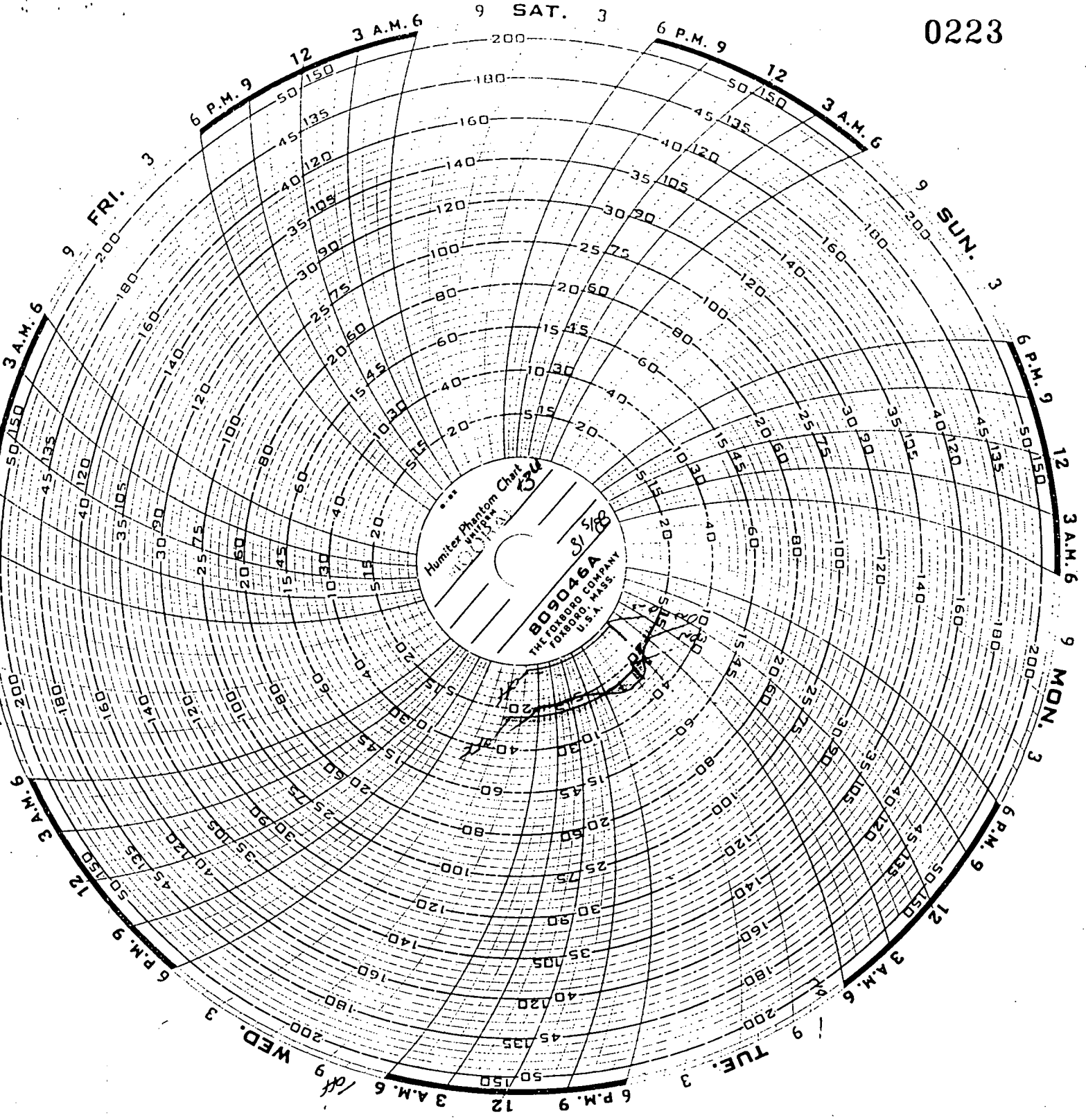
TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
13:00	924.2	0.0	0.0	16:43	1985.5	1061.3	3.7
13:02	992.5	68.3	.0	17:11	2018.8	1094.6	4.2
13:05	1068.5	144.3	.1	17:25	2030.7	1106.5	4.4
13:09	1139.0	214.8	.2	18:12	2024.6	1100.4	5.2
13:13	1223.4	299.2	.2	19:18	2012.2	1087.9	6.3
13:19	1311.2	387.0	.3	20:55	2027.4	1103.2	7.9
13:24	1384.4	460.2	.4	22:52	2063.9	1139.7	9.9
13:30	1448.6	524.4	.5	0:25	2093.9	1169.7	11.4
13:39	1523.7	599.5	.6	3:33	2147.3	1223.1	14.6
13:55	1636.3	712.0	.9	6:14	2191.1	1266.9	17.2
14:05	1683.7	759.5	1.1	10:46	2260.1	1335.9	21.8
14:14	1725.1	800.9	1.2	15:04	2328.1	1403.9	26.1
14:25	1762.7	838.5	1.4	16:07	2338.4	1414.2	27.1
14:37	1798.8	874.6	1.6	19:25	2362.7	1438.5	30.4
14:52	1827.7	903.5	1.9	23:37	2398.0	1473.7	34.6
15:04	1851.7	927.5	2.1	5:59	2439.9	1515.7	41.0
15:17	1873.4	949.2	2.3	13:34	2481.0	1556.7	48.6
15:33	1895.0	970.8	2.5	22:53	2519.2	1595.0	57.9
15:47	1912.6	988.4	2.8	5:00	2537.4	1613.2	64.0
16:07	1935.0	1010.8	3.1	0:00	0.0	0.0	0.0

LUB IN DWT = 333 PSI / OUT = 1365 PSI
LUB IN AMERADA = 333 PSI / OUT = 1361 PSI

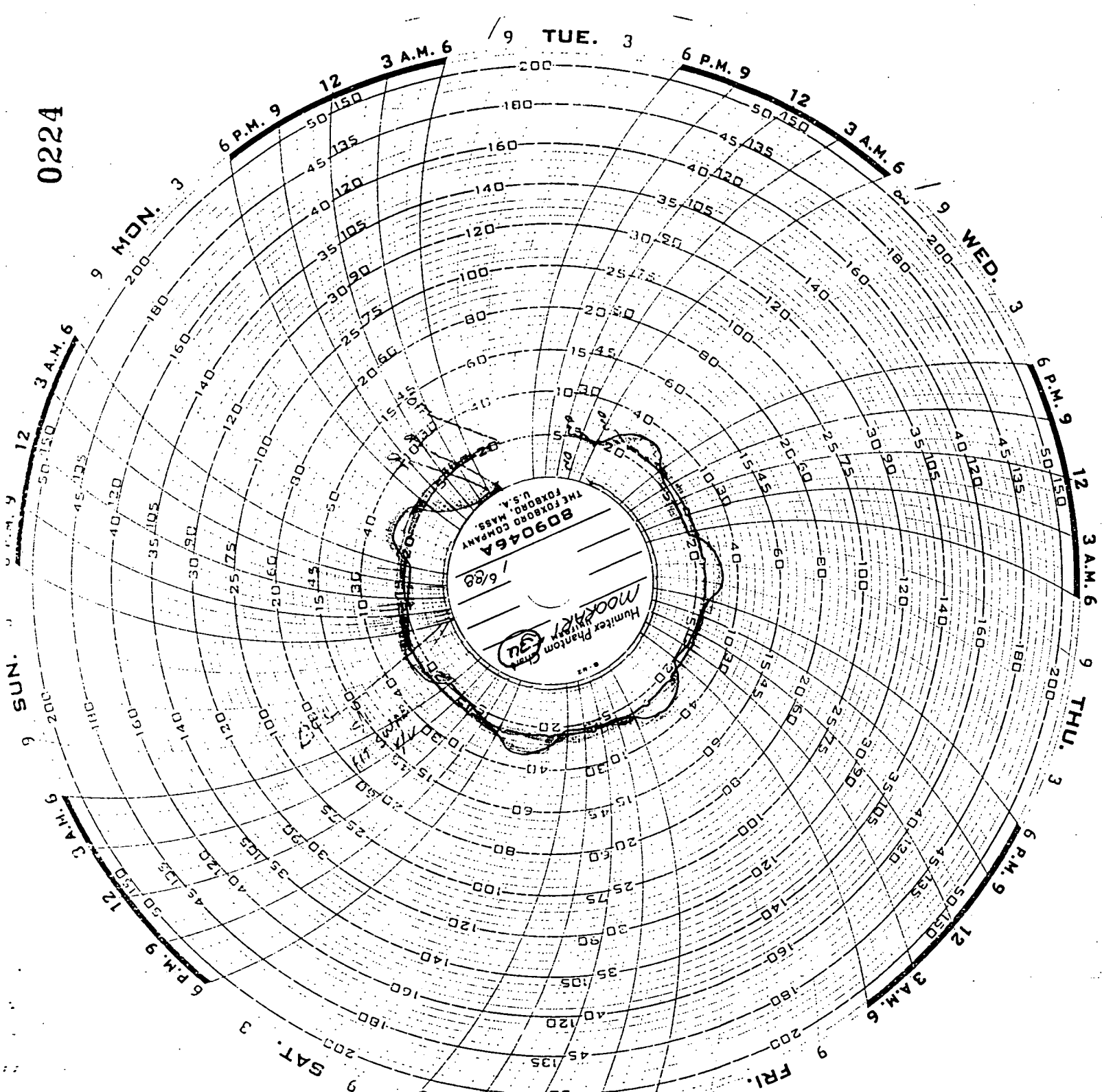
0222



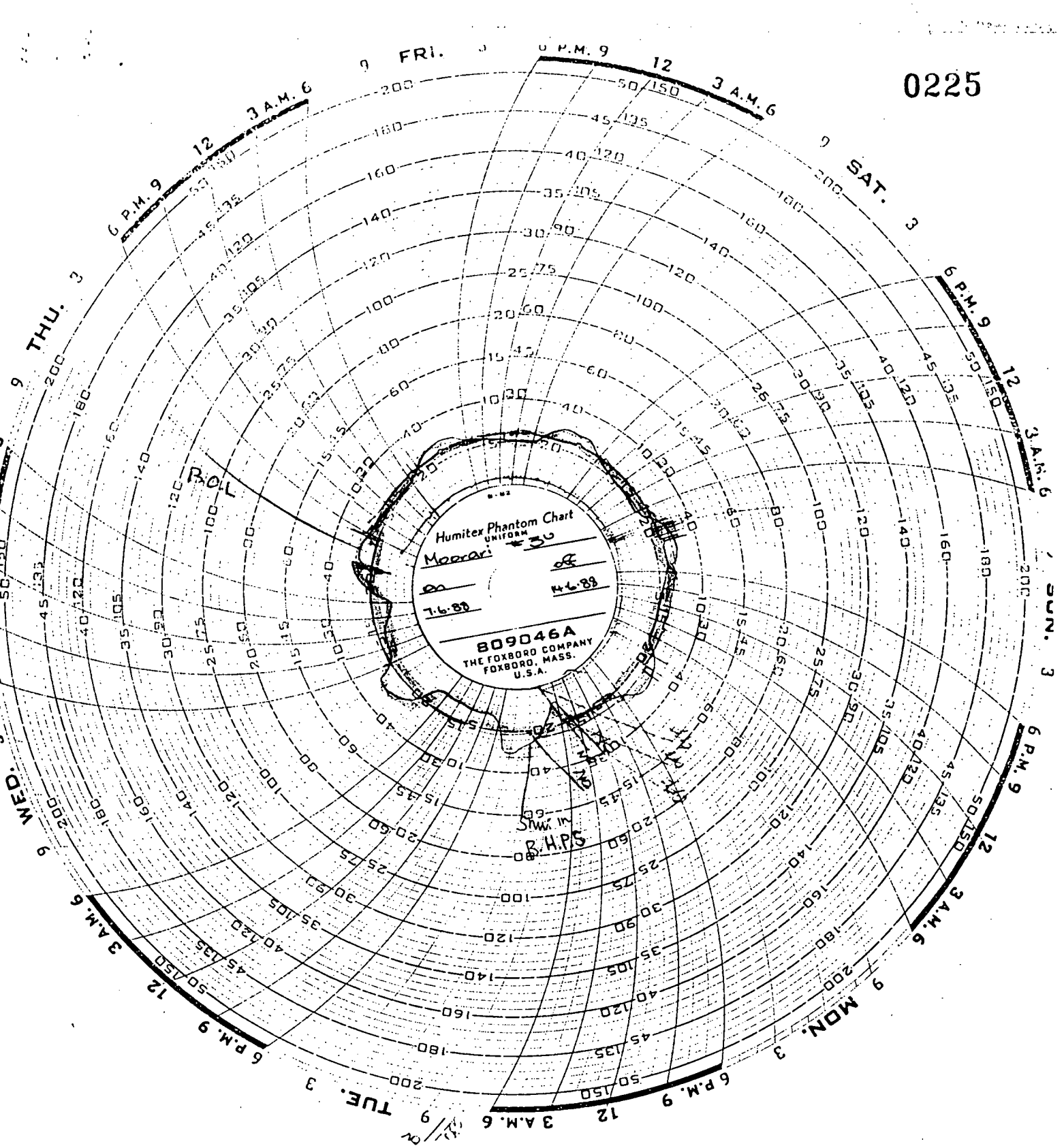
07.23 24/5/88 - 07.25 31/5/88



07.25 31/5/88 - 07.14 1/6/88



07.14 11/6/88- 07.45 8/9/88



7/6/88 - 07.15 14/6/88.

0226

ISO - CHRONAL AND BUILD-UP SURVEY

Well: Moorari # 3 Upper Date: 6-6-88

Lubricator Data: ① clock failed ② 333 1361

Pressure with D.W.T. in 2296 kpa (333 PSI) out 9411 kpa. (1366 PSI)

Time Pressured 0828 Time Depressured 0618.

Time Run in Hole 0928 Time off Bottom 0500.

	Bomb No. 1 Data	Bomb No. 2 Data
Element No. and Range	27617 x 5675 psi	27616 x 5700 psi
Recorder No.	13029 x 15 hrs	14629 x 15 hrs
Clock and Lead Screw Data	E 19381 x 72 hr.	E 19382 x 72 hr.
Engage Stylus	Date: 6-6-88 Time: 0816.	Date: 6-6-88 Time: 0816.
Disengage	Date: 9-6-88 Time: 0627	Date: 9-6-88. Time: 0627.

Remarks: Well flowing on 100% choke during 3hr flow period. Temp ele used — ele 22819 x 190° / 398°F. Rec 2829B x 15 hrs clock E19383 x 72 hr.

Well-Head Data for Final Build-up SIBH Temp = 211°F

Date	Time	Hours shut-in Time	Wellhead KPA	Casing KPA	Wellhead Temp. °C	Remarks
6-6-88	0950		2296	6800	21	ELEMENTS HANGING @ 8680'KB ON WIRE AS PER PROGRAM
	1000		2302	6800	22	
	1030		2309	6800	23	
	1100		2309	6800	25	
	1130		2316	6700	27	
	1200		2309	6700	29	
	1230		2302	6700	26	
	1300		2309	6700	29	SHUT WELL IN.
9-6-88	0518					ELEMENTS IN LUB HANG 1 HR.
	0618		9411	6400	9	
*NB ⊙	Refer	wellhead data sheet		For Build up information		
	Clock # E 19381	x 72 hr		Ran Fast.		

WELL: Moorari # 3 Upper.

TYPE OF TEST: BHP

SANTOS LTD.

WELL TEST DATA SHEET

DATE: 6.6.88

PAGE No: 1 (ONE)

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 100%	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
6.6	88																		
0645						Rig up w/l unit													
0705						R.I.H with 1.75" Blind Box. Pick ups done every 1000' to ensure tubing not corked sca														
0745						Tag Stop Bar @ 8692' KB POOH.														
0800						In lub. - Remove tool string, Prepare to Run 2 press elements 1 Temp element.														
0828						Pressure lub														
0928	6800	2296	21	100		RIH with elements.													
0950	6800	2296	22	100		Hang Elements @ 8680 KB on wire as per program.													
1000	6800	2302	22	100															
1030	6800	2309	23	100															
1100	6800	2309	25	100															
1130	6700	2316	27	100															
1200	6700	2309	29	100															
1230	6700	2302	26	100															
1300	6700	2309	29	100		Shut well in for 48 HR Build up.													
1315	6800	3950	30																
1330	6800	4698	27																
1345	6800	5157	30																
1400	6800	5481	29																
1415	6800	5688	29																

OPERATOR: Dalebrens (Expertest)

WELL: Moran #3 Upper

TYPE OF TEST: BHP.

SANTOS LTD.
WELL TEST DATA SHEET

DATE: 6.6.88.

PAGE No: 2 (two)

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 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
6.6.88						Continue	Build up			Survey.									
1430	6800	5902	29																
1445	6800	6074	27																
1500	6800	6239	28																
1515	6800	6308	27																
1530	6800	6446	26																
1545	6700	6584	25																
1600	6700	6701	25																
1615	6700	6791	24																
1630	6700	6860	22																
1645	6700	6971	22																
1700	6700	7032	20																
2100	6700	7398	9																
7.6.88																			
0100	6700	7818	6																
0500	6700	8101	4	WELL HEAD CHART CHANGED															
0900	N/A		WORKING AT BADGA #2 LOWER.																
1300	6400	8515	29																
1700	6400	8832	22																
2100	6400	8860	12																

OPERATOR: Dale Johns

WELL: Moorari # 3 Upper

TYPE OF TEST: BHP

SANTOS LTD.
WELL TEST DATA SHEET

DATE: 8.6.88

PAGE No: 3 (THREE)

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 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
8.6 88						Continue Build up.													
0100	6400	8929	11																
0500	6400	8997	12			Well Head Chart Changed.													
0900	6400	9080	12																
1300	6400	9184	29																
1700	6400	9246	22																
2100	6400	9273	15																
9.6. 88																			
0100	6400	9363	13																
0500	6400	9411	10			Pull Bombs. End of Build up.													
0518						In Lub.													
0618	6400	9411	9			Depress Lub. - Prepare to Run Static Gradient.													
0705						Press Lub for Static Gradient.													
0720	6400	9390	10			RIH with elements.													
0832						@ 8680' KB													
0847	6400	9390	12			POOH													
0905						Lub													
0920	6400	9404	15			Depress Lub - End of Survey							Rig out w/l unit.						

OPERATOR: Dale Hurs

0230

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

** MOORARI #3 UPPER **

STATIC PRESSURE GRADIENT

TEST DATE: 9.6.88

	TOP PRESSURE ELEMENT 27617/5675			BOTTOM PRESSURE ELEMENT 27616/5700		
DEPTH (FT.)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)	DEFLECTION (INCHES)	PRESSURE (PSIG)	GRADIENT (PSI/FT)
LUB	0.4720	1362.6	----	0.4680	1357.8	----
1000	0.5000	1443.0	0.0804	0.4950	1435.4	0.0776
2000	0.5270	1520.6	0.0776	0.5240	1518.6	0.0833
3000	0.5590	1612.5	0.0919	0.5550	1607.6	0.0890
4000	0.5890	1698.6	0.0861	0.5870	1699.4	0.0918
5000	0.6680	1925.5	0.2268	0.6650	1923.0	0.2236
6000	0.7480	2155.1	0.2297	0.7460	2155.0	0.2321
7000	0.8110	2336.0	0.1809	0.8090	2335.5	0.1805
8000	0.8580	2471.0	0.1350	0.8570	2473.0	0.1375
8500	0.8800	2534.1	0.1264	0.8790	2536.1	0.1261
8680	0.8880	2557.1	0.1276	0.8860	2556.1	0.1114
LUB	0.4760	1374.1	----	0.4720	1369.3	----

GENERAL REMARKS:
LUB PRESS IN KPA

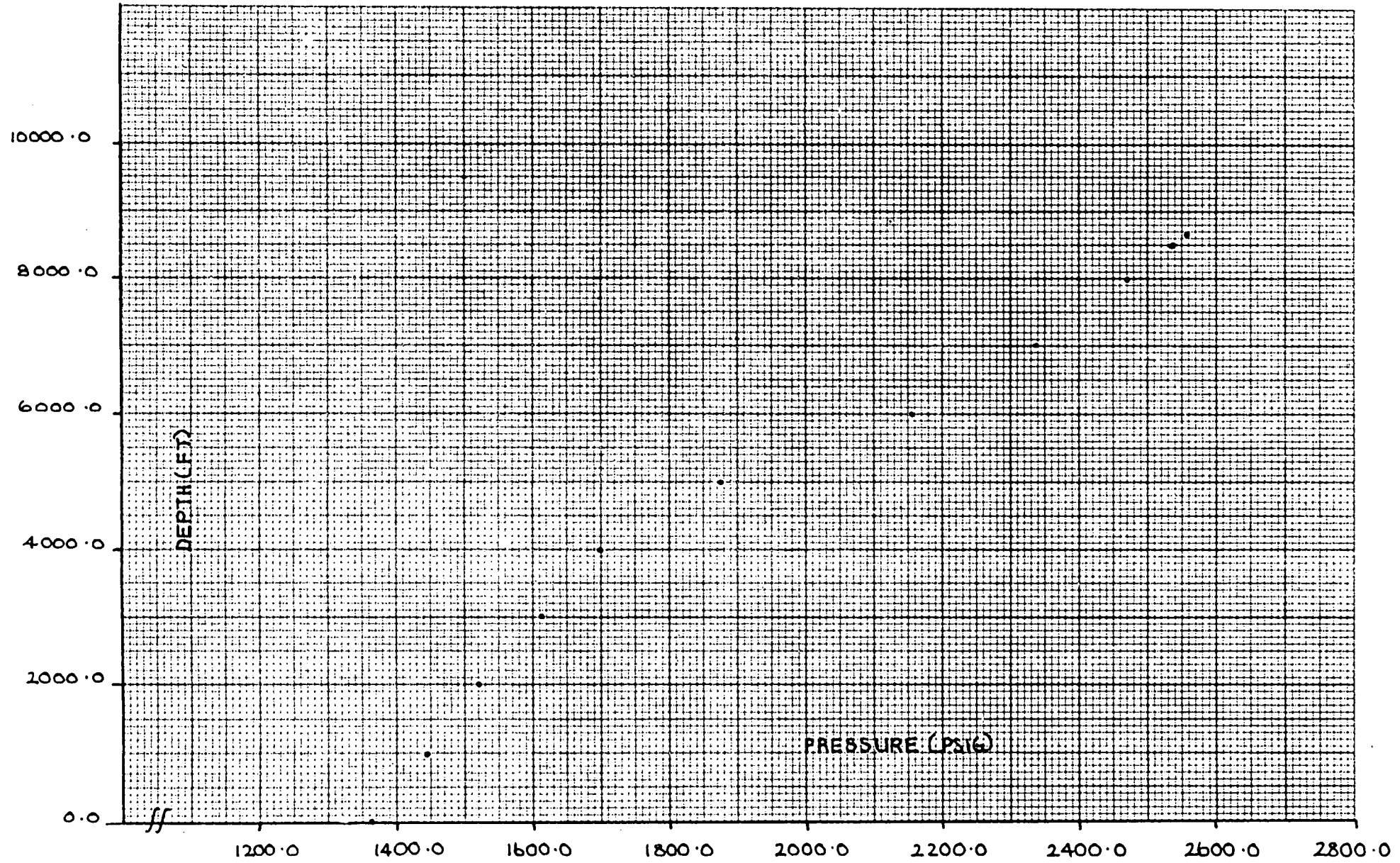
DWT IN: 9390 1362
DWT OUT: 9404 1364
MAX BHT: TEMP ELE USED 205°F

ELEMENT 27617/5675 CALIBRATED 11.4.88
ELEMENT 27616/5700 CALIBRATED 11.4.88

MOORARI # 3 UPPER — STATIC PRESSURE GRADIENT — 9/6/88

0231

ELEMENT # 27617/5675 (TOP)



Fm 3030

WELL NAME: Moorari #3 upper

STATIC GRADIENT SURVEY

DATE: 9.6.88

BOMB No. 1 DATA

ELEMENT No. 27617 ELEMENT RANGE: 5675psi

RECORDER No. 13029 x 15TS CLOCK DATA: A12047 x 3HR

ENGAGE STYLUS: 0657 DISENGAGE: 0927

BOMB No. 2 DATA

ELEMENT No. 27616 ELEMENT RANGE: 5700psi

RECORDER No. 14629 x 15 CLOCK DATA: 2509 x 3HR

ENGAGE STYLUS: 0657 DISENGAGE: 0927

LUBRICATOR DATA

PRESSURE WITH D.W.T: IN 9390kpa OUT 9404

TIME PRESSURED: 0705

TIME DEPRESSURED: 0920 0232

DATE	TIME	DEPTH'	DEFLECTION	PRESSURE TEMP.	GRADIENT psi/ft	DEPTH'	DEFLECTION	PRESSURE TEMP.	GRADIENT psi/ft	REMARKS
9.6.88	0720	0				0				R.I.H
	0723	1000				1000				Hang 5 min
	0731	2000				2000				
	0739	3000				3000				
	0747	4000				4000				
	0755	5000				5000				
	0803	6000				6000				
	0811	7000				7000				
	0819	8000				8000				
	0826	8500				8500				Hang 15 min
	0832	8680				8680				POOH
	0847	8580				8580				Hang 15 min
	0902	0				0				

Dale Johns of Expertest.

General Comments: Temp ele used - ele 2389 x 190/398°F Ele calibrated 11.4.88 @ 29°C.
ree 38928 x 15TS
clock 2509 x 3HR

G010

0233

WIRELINE REPORT

WELL: Moorari 1 A 3 Upper

DATE: 9.6.88

PROGRAM: B.H.P. Surveys

PURPOSE OF WORK: Run S.G.S.

REPORT OF WORK PERFORMED:

0720 R.I.H. with Elements for static Gradient Survey
0832 C. 8680' KB - Bottom Stop
0847 POOH
0905 Lub
0920 Depress Lub - Good charts
1030 Rig out w/l unit Hand well over to production

OPERATOR'S SIGNATURE

WORK PERFORMED BY: Dale Johns / Stuart Taylor OF Expertest

WELL DATA:

Tubing Size: 2 3/8 FWHP: SIWHP: 9404 kpa

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

"X" Nipple @ 8662 "N"/~~"XN"~~ Nipple @ 8671' other

Min. I.D. 1.791" @ 8671' Packer @ 8606' / 8656'

Perforated Interval: 8716' - 8748' (Nappamerri)

Forward to: Petroleum Engineering - Adelaide
Production Department - Moomba

H008

0234

WIRELINE REPORT

WELL: Moorari # 3 Upper

DATE: 6.6.88

PROGRAM: Bottom hole pressure Survey

PURPOSE OF WORK: Tag PBTD - Run Elements as Per Program

REPORT OF WORK PERFORMED:

5-6-88 - 1645 - Shut well in RI Swab Valve
1700 - Back on line 100% choke
6-6-88 0645 - Rig up W/L unit
0705 - R.I.H with 1.75" Blind Box doing pick ups every 1000'
0745 - Tag Stop Bar @ 8692' KB POOH
0800 - In lub. Remove tool string prepare to run elements.
0828 - Pressure lub - Elements in lub
0928 - RIH with elements
0950 - @ 8680 KB Bombs hanging as per program
1300 - S.W.I For Build up
9-6-88 0500 - Pull Bombs End of Build up period
0618 - Depress lub good chart Prepare to Run S.G.S

OPERATOR'S SIGNATURE

WORK PERFORMED BY: Dale Johns / Stuart Taylor OF Expertest

WELL DATA:

Tubing Size: 2 3/8 FWHP: SIWHP: 9404 kpa

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

"X" Nipple @ 8662' "N"/"~~N~~" Nipple @ 8671' other

Min. I.D. 1.791" @ 8671' Packer @ 8606' / 8656'

Perforated Interval: 8726' - 8748' (Nappamerri)

Forward to: Petroleum Engineering - Adelaide
Production Department - Moomba

H008

		MESA NO.
REPORT:	**Quick, R.R., 1983.** Operator's reservoir engineering interpretation of the results of the "pre-frac" [i.e. prior to massive hydraulic fracture treatment] oil production flow/buildup test of the Tirrawarra Sandstone reservoir, conducted over the period 17/4 - 27/6/81 (February 1983).	**3953 R 13** Pgs 82-92
APPENDIX:	Well test data.	Pgs 93-122
REPORT:	**Quick, R.R., 1983.** Operator's reservoir engineering interpretation of the results of the "post-frac"[i.e. after fracture treatment] oil production flow/buildup test of the Tirrawarra Sandstone reservoir, conducted over the period 18/7 - 5/8/81 (February 1983).	**3953 R 14** Pgs 123-133
APPENDIX:	Well test data.	Pgs 134-150
REPORTS:	**Chapman,T. and Bain, G., 1985.** Field maintenance contractor's results of the flowing pressure gradient survey of the Nappamerri Formation gas reservoir producing interval 8726-8748 feet depth KB [the 'Upper' producing zone], conducted over the period 8-9/4/85 (Expertest Pty Ltd).	**3953 R 15** Pgs 151-154
	Robinson, P.A., 1986. Operator's reservoir engineering interpretation of the results of the modified isochronal gas production test of the above Nappamerri Formation gas producing zone, conducted over the period 20-28/12/84 (Santos Ltd Reservoir Engineering Department report no. RE: 138/85, February 1986).	**3953 R 16** Pgs 155-174
APPENDIX A:	Well test summary sheets, plus results of static (wellbore) temperature and pressure (gradient) surveys.	Pgs 175-186
APPENDIX B:	FWS [full well stream] recombination (analysis) report.	Pgs 187-194
APPENDIX C:	Amdel report on fluid analyses.	Pgs 195-204
REPORTS:	**Gillies, A., 1986.** Field maintenance contractor's results of the post - gas injection [from the Nappamerri reservoir] bottomhole pressure falloff test of the Tirrawarra Sandstone oil reservoir producing interval 8726-8748 feet depth KB [the 'Lower' producing zone], conducted over the period 31/7 - 5/8/86 (Expertest Pty Ltd).	**3953 R 17** Pgs 205-219
	Johns, D., 1988. Field maintenance contractor's results of the flowing bottomhole pressure, 48 hour reservoir pressure buildup and static wellbore pressure gradient surveys of the Upper producing zone, conducted over the period 6-9/6/88 (Expertest Pty Ltd).	**3953 R 18** Pgs 220-234

CONTENTS OF VOLUME TWO

REPORTS:	**Perry, T., 1986.** Operator's well test data sheet [production separator metered flow] (5/8/86).	**3953 R 19** Pg. 235
	Aldrich, P., 1989. Field testing contractor's electric line results of the flowing bottomhole pressure, stable injection halted reservoir pressure falloff and static wellbore pressure gradient surveys of the Lower producing zone, conducted over the period 23-28/2/89 (Oilserv Australia Ltd).	**3953 R 20** Pgs 236-353

		MESA NO.
REPORTS:	**Campbell, R. and Kurasiak, I., 1989.** Field maintenance contractor's results of the single rate gas production flow test, 96 hour reservoir pressure buildup and static pressure gradient surveys of the Upper producing zone, conducted over the period 6-15/3/89 (Expertest Pty Ltd).	**3953 R 21** Pgs 354-372
	Hay, N., 1990. Field maintenance contractor's results of the post - gas injection [ethane from the Moomba Plant] bottomhole pressure falloff test and static pressure gradient survey of the Lower producing zone, conducted over the period 22-27/4/90 (Expertest Pty Ltd).	**3953 R 22** Pgs 373-386
	Wood, G.R., 1992. Santos Ltd palynological report no. 1992/13 on results of examination of 10 selected Moorari Field Patchawarra Formation full-hole core samples [Moorari 3 data only exerpted and included herein] (July 1992).	**3953 R 23** Pgs 387-391
	Wood, G.R., 1994. Santos Ltd palynological report no. 1994/27 on results of examination of 3 selected Permian full-hole core samples (April 1994).	**3953 R 24** Pg. 392
	Evans, D.A., 1994. Operator's reservoir engineering interpretation of the results of the Tirrawarra Formation pressure falloff surveys conducted in July 1986, February 1989 and April 1990 (Santos Ltd Petroleum Engineering Department report no. PED: 016/94, April 1994).	**3953 R 25** Pgs 393-407
APPENDIX 1.1:	February 1989 static gradient survey (after Pg. 408).	Pg. 409
APPENDIX 1.2:	February 1989 pressure survey input data.	Pgs 410-411
APPENDIX 1.3:	February 1989 injection time calculations.	Pg. 412
APPENDIX 2.1:	April 1990 static gradient survey.	Pg. 413
APPENDIX 2.2:	April 1990 pressure survey input data.	Pgs 414-415
APPENDIX 2.3:	April 1990 injection time calculations.	Pg. 416

END OF CONTENTS

0235

WELL TEST DATA SHEET

WELL: MOORARI #3 UPPER

OPERATOR: T. PERRY

DATE (Start Test): 5.8.86

METER RUN I.D.: 97.18/~~102.26~~ mm

TEST SEPARATOR: MOORARI

ORIFICE PLATE: 44.5 mm

TEST LINE:

FLOW COMPUTER CONSTANT: 07768

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
16.00	13400	3%	17	0	0	0	2700	12	17		
07.30	12600	5%	7	1.42	00	0	2800	15	3		
11.00	10400	7%	10	2.31	33.91	0.18	2500	0	10		
(A) 19	TOTALS (final minus initial)		(B) OIL 2.31	(C) 33.91	(D) 0.18	(E) = TOTAL WATER 34.09					(F) GAS

COMMENTS:

PRODUCTION ENGINEERING DEPARTMENT USE ONLY

CALCULATIONS

Oil:-

$2.31 \times 0. \times \frac{24}{19} =$

SUMMARY

(1) STOCK TANK OIL

m³/d

OILSERV AUSTRALIA LIMITED

INDEX

SECTION	DESCRIPTION
1	Sequence of Operations. Linear Plot of Test.
2	Pressure Temperature Printout R.I.H. & Stable Injection Linear Plots.
3	Pressure Temperature Printout Buildup Linear Plots Horner Plots Log, Log & Semilog Plots
4	Pressure Temperature Printout Static Gradient Survey Linear Plots
5	Wellhead Charts.

Client : SANTOS LIMITED

Well : MOORARI # 3 LOWER

Test : ELECTRIC LINE

Date : FEBRUARY 23, 1989.

Section # 1

SEQUENCE OF OPERATIONS &
LINEAR PLOT OF TEST

By: OILSERV AUSTRALIA LIMITED
242 GLEN OSMOND ROAD
FULLARTON SA 5063

TELEPHONE (08) 338 1630
TELEX AA 88713
FACSIMILE (08) 79 6351

OILSERV AUSTRALIA LIMITED

SEQUENCE OF OPERATIONS

FOR

MOORARI # 3 LOWER

TIME	OPERATIONS
23/2/89	
1200	Arrive location, proceed with crew change activity.
1715	Start rog-up.
2030	Secure lease.
24/2/89	
0715	Well shut-in.
1745	Well returned to flow, swab valve installed.
1210	Begin survey - flowing
1620	Hang @ 9250 K>B>
2000	Injection shut-in, begin fall-off survey.
25/2/89	Monitor survey
26/3/89	Monitor survey.
27/2/89	
0000	Monitor survey.
1130	Receive orders - P.O.O.H. with gradient survey.
1830	Survey complete begin rig-down.
2030	Secure lease.
28/2/89	
0600	Complete rig down.
1000	Begin move to Tirrawarra # 16 lower.

SURFACE DEAD WEIGHT RECORDINGS

TIME	INJ RATE	PRESSURE KPA	TEMP oC	COMP PRESS PSI	TEMP oF	DWT PRESS PSI
1700	5061	41033	101.43	294.60	33.5	4280
1730	4990			293.14	35.5	4250
2800	4930			292.78	34	4260
1830	4806			292.03	34	4270
1900	4743			291.43	33	4232
1930	4678			291.09	32.5	4222
2000	4308			289.23	31.5	4170
2015					31.5	3860
2030					31	3830
2045					31.5	3824
2100					31.5	3820
2115					30	3814
2130					30	3808
2145					30	3804
220			30			3798
2215			29.5			3795
2230			29.5			3792
2245			29.5			3789
2300			29			3785
2315			28.5			3781
2330			28.5			3777
2345			28			3775
25/2/89						
0000			28			3771
0400			24			3750
0800			30			3732
1200			48.5			3723
1600			46			3706
2000			35.5			3692
2400			28			3680
0400			26			3670
0800			29			3660
1200			44			3654
1600			46			3647
2000			35			3640
2400			28			3634
0400			25			3620

Section # 2

PRESSURE TEMPERATURE PRINTOUT & R . I . H . & STABLE FLOW LINEAR PLOTS

By: OILSERV AUSTRALIA LIMITED
242 GLEN OSMOND ROAD
FULLARTON SA 5063

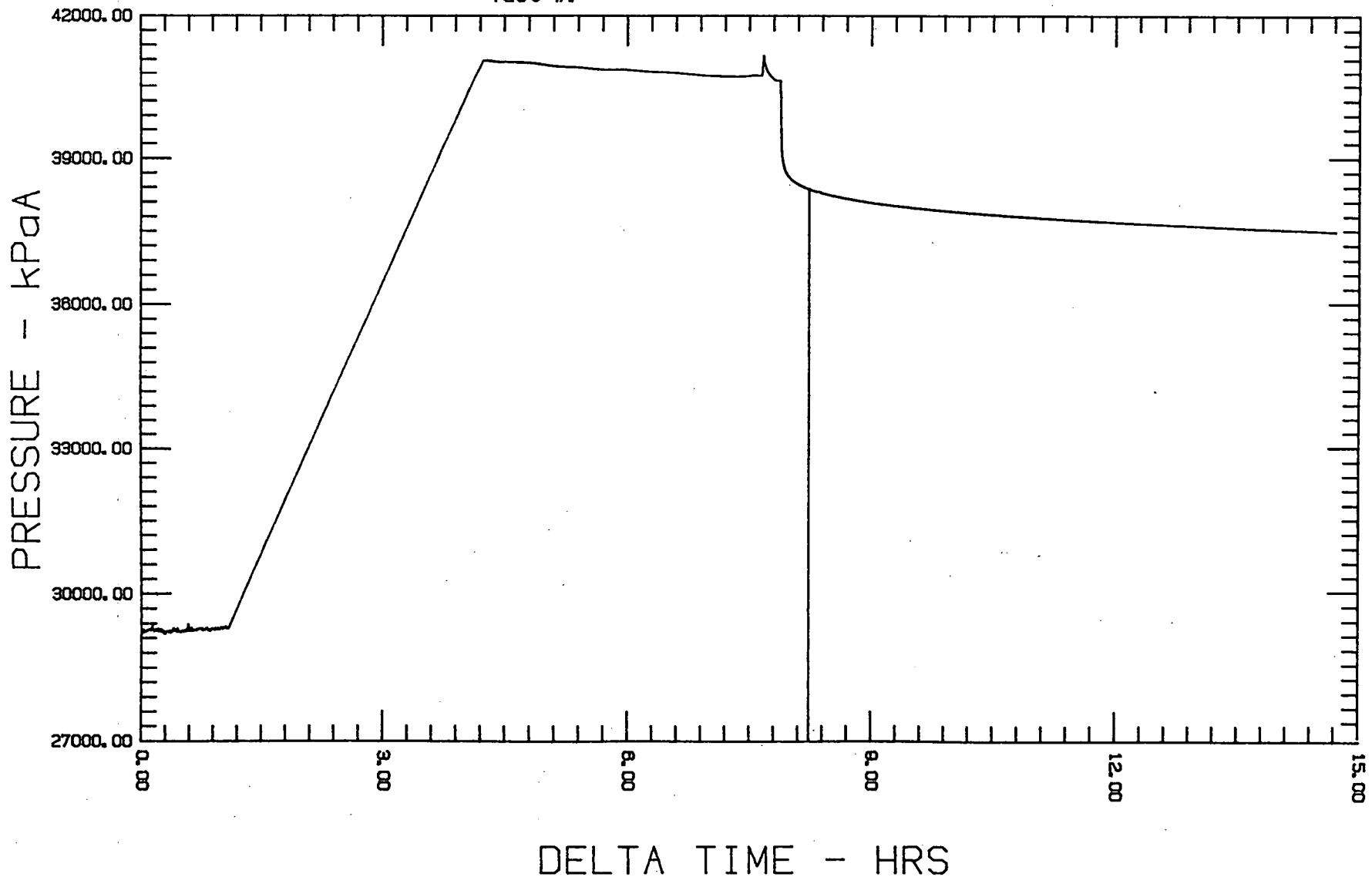
TELEPHONE (08) 338 1630
TELEX AA 88713
FACSIMILE (08) 79 6351

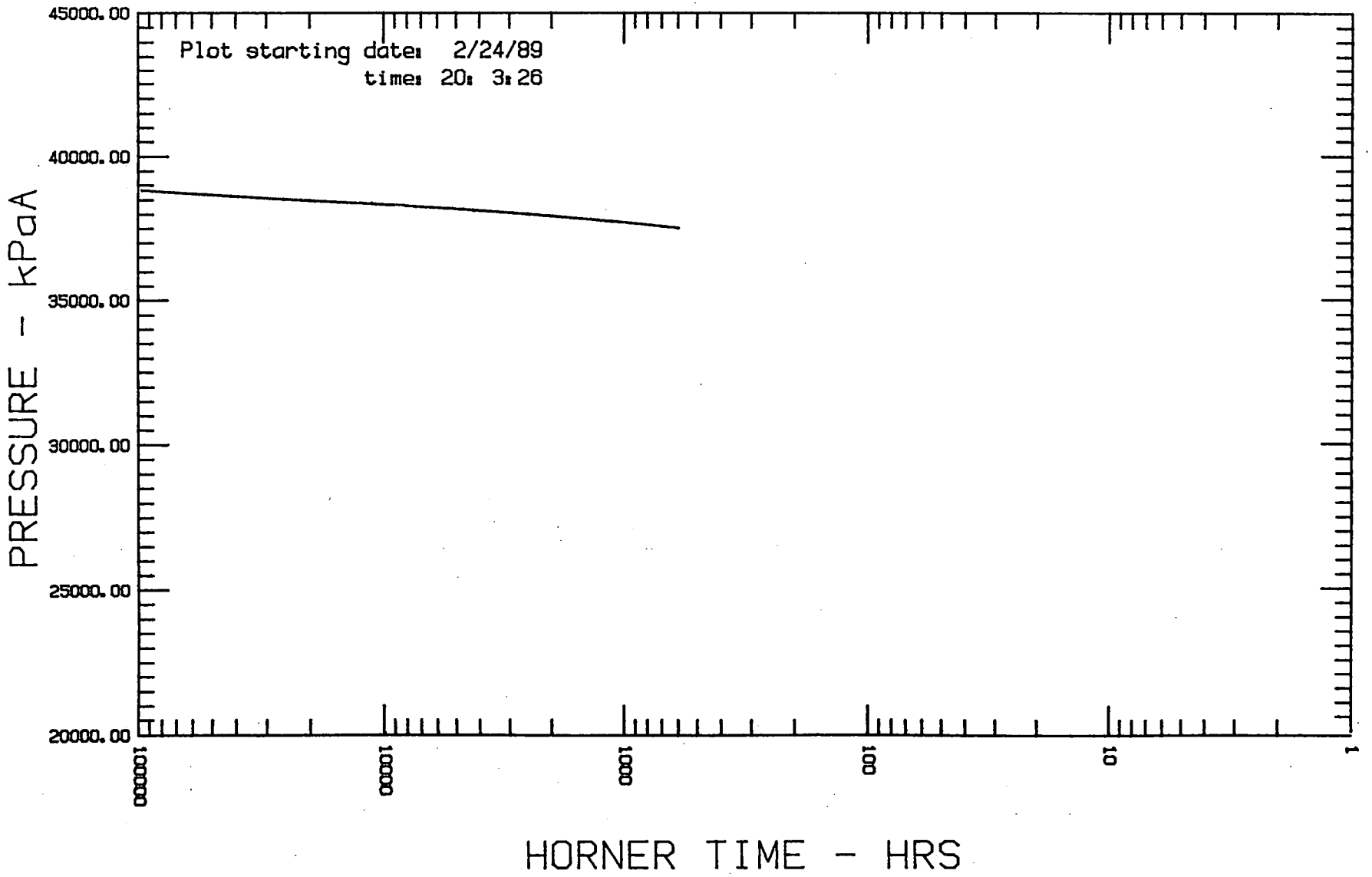
Plot starting date: 2/24/89
time: 12:10:26

Gauge S/N

Company:
Client: SANTOS
Well name: Moorari
Well #: 3 LOWER
Test #:

Location:
Operator:
Comments:



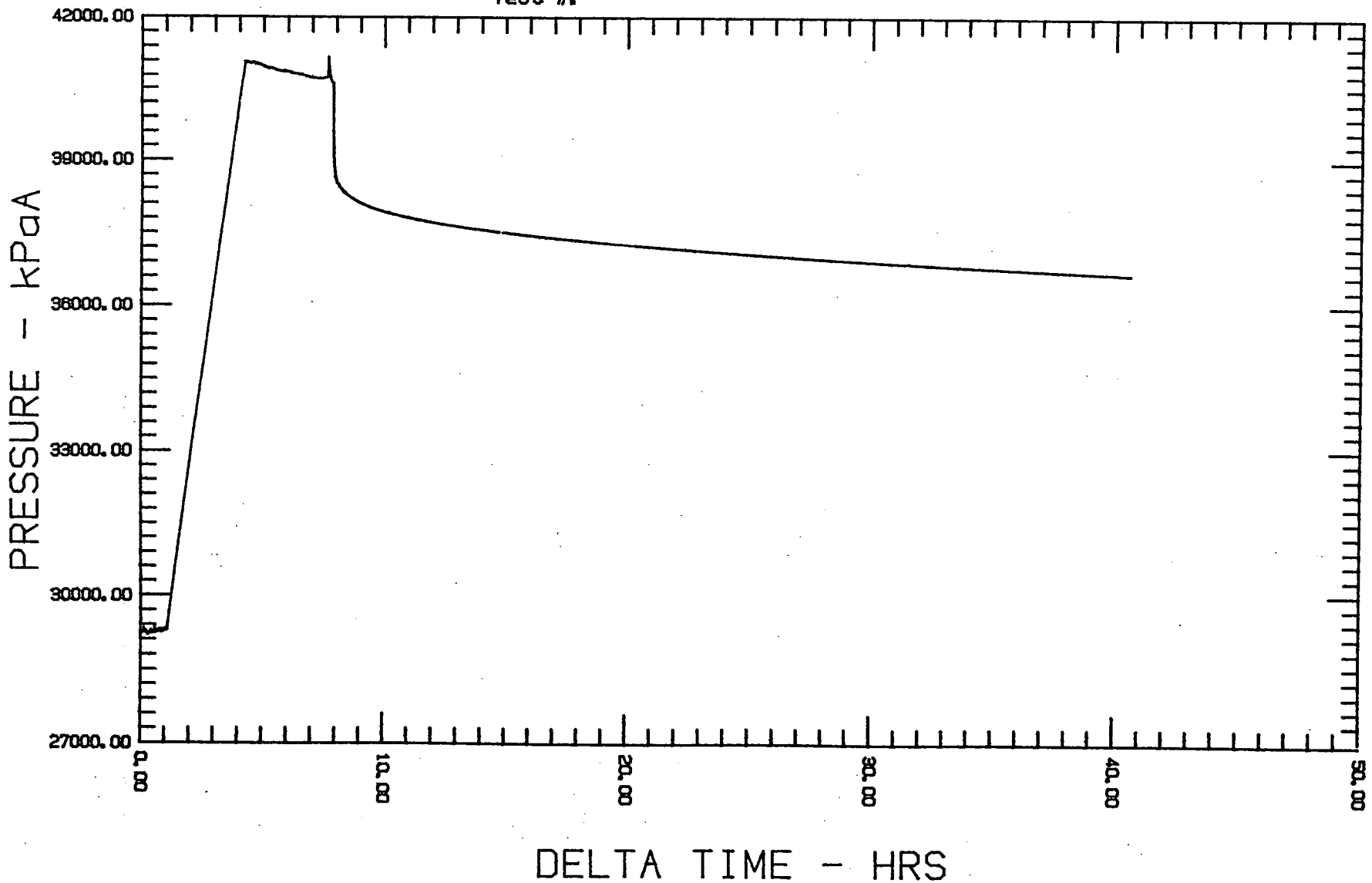

Plot starting date: 2/24/89
time: 20: 3:26
45000.00
40000.00
35000.00
30000.00
25000.00
20000.00
PRESSURE - kPaA
.0001
.001
.01
.1
1
HORNER TIME - HRS

Plot starting date: 2/24/89
time: 12:10:26

Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MOORARI
Well #: 3 LOWER
Test #:

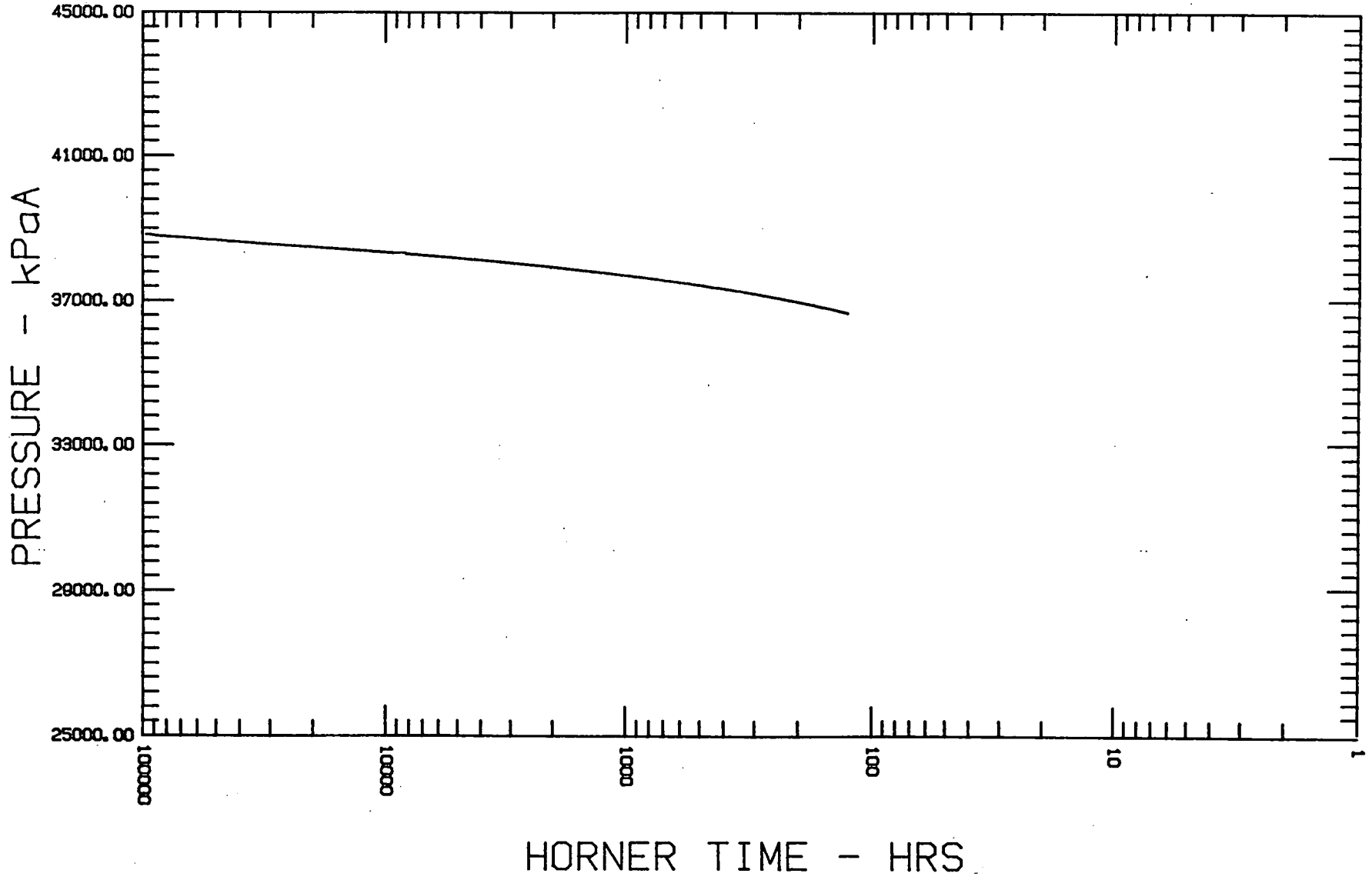
Location: COOPER BASIN
Operator: P. ALDRICH
Comments: STABLE INJECTION WITH PRESSURE FALL-OFF



Plot starting date: 2/24/89
time: 20: 3:26
Gauge S/N
Flow time: 4100.000 HRS

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MOORARI
Well #: 3 LOWER
Test #:

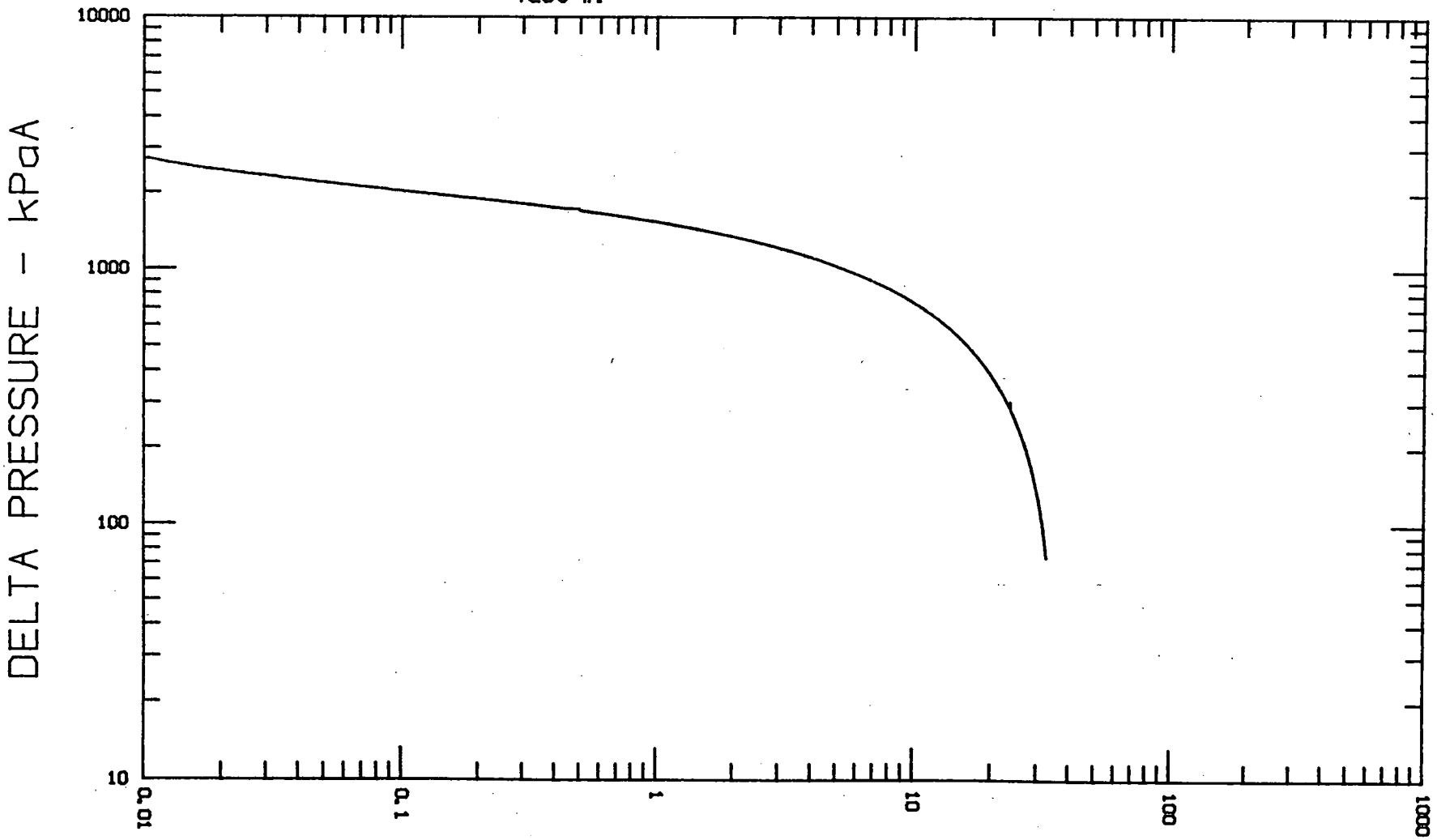
Location: COOPER BASIN
Operator: P. ALDRICH
Comments: STABLE INJECTION WITH PRESSURE FALL-OFF



Plot starting date: 2/24/89
time: 20: 3:26
Gauge S/N
Reference pressure: 36600.000 kPaA

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MOORARI
Well #: 3 LOWER
Test #:

Location: COOPER BASIN
Operator: P. ALDRICH
Comments: STABLE INJECTION WITH PRESSURE FALL-OFF

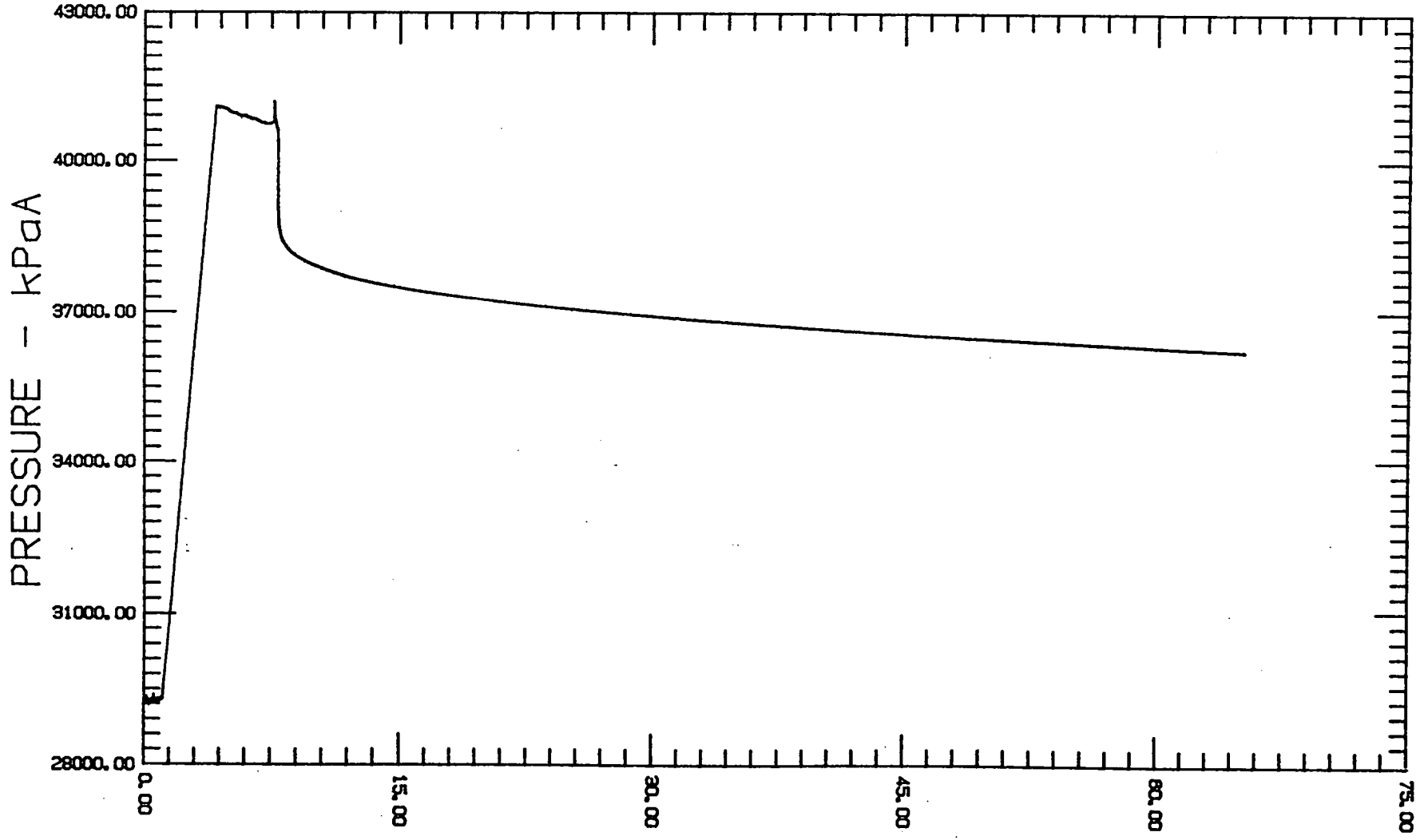


Plot starting date: 2/24/89
time: 12:10:26

Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MOORARI
Well #: 3 LOWER
Test #:

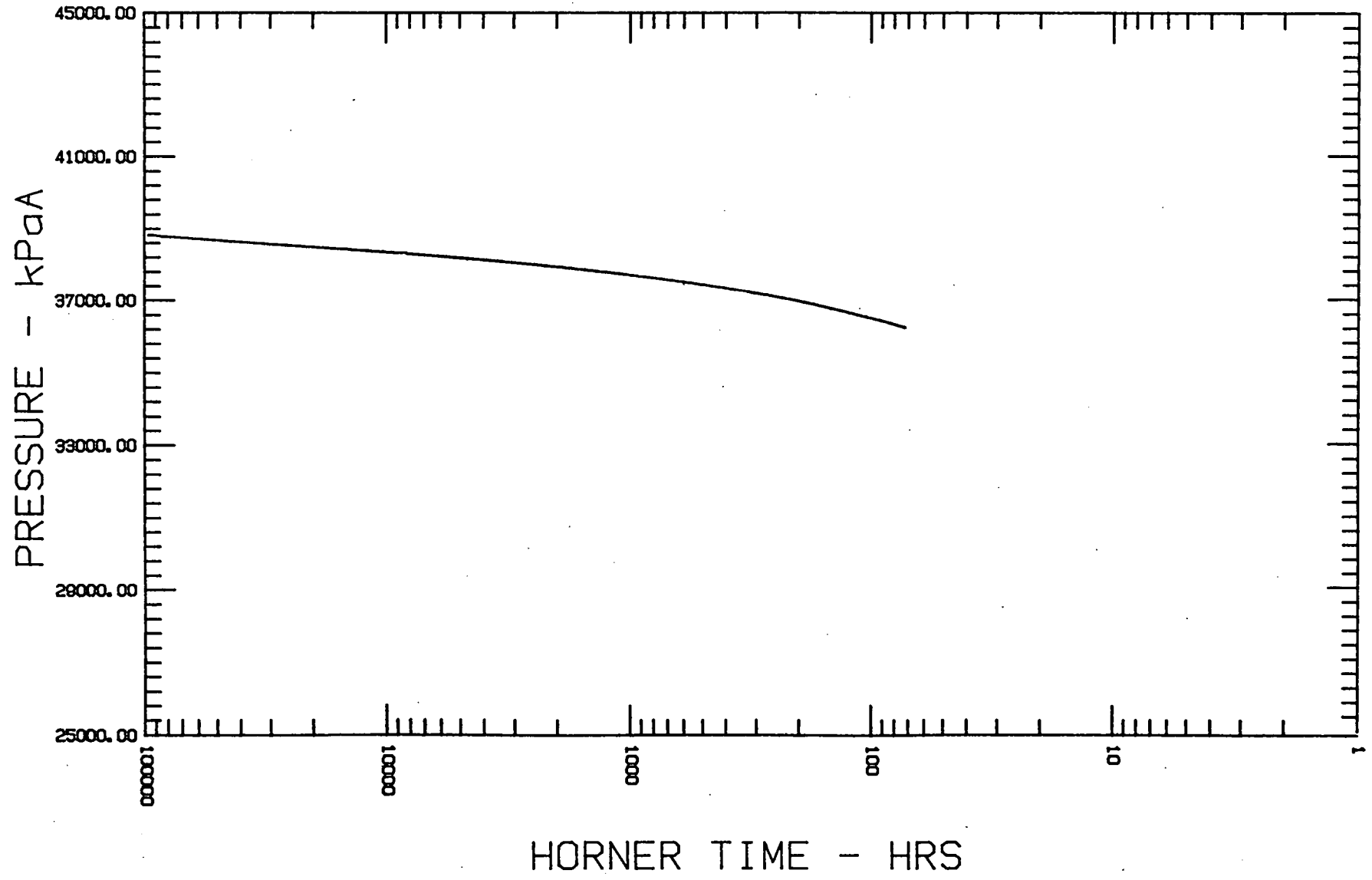
Location: COOPER BASIN
Operator: P. ALDRICH
Comments: STABLE INJECTION WITH PRESSURE FALL-OFF



Plot starting date: 2/24/89
time: 20: 3:26
Gauge S/N
Flow time: 4100.000 HRS

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MOORARI
Well #: 3 LOWER
Test #:

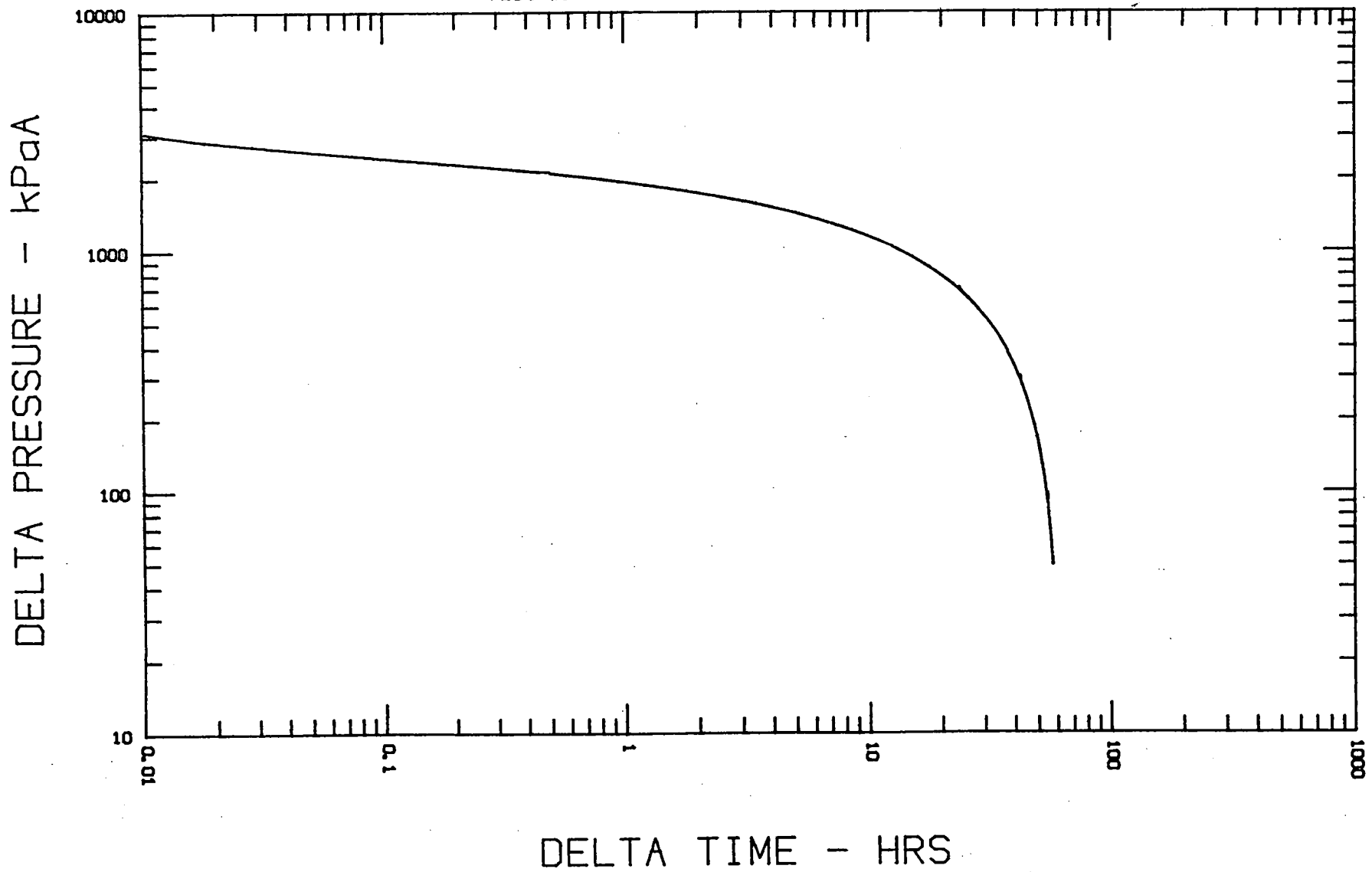
Location: COOPER BASIN
Operator: P. ALDRICH
Comments: STABLE INJECTION WITH PRESSURE FALL-OFF



Plot starting date: 2/24/89
time: 20: 3:26
Gauge S/N
Reference pressure: 36200.000 kPaA

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MOORARI
Well #: 3 LOWER
Test #:

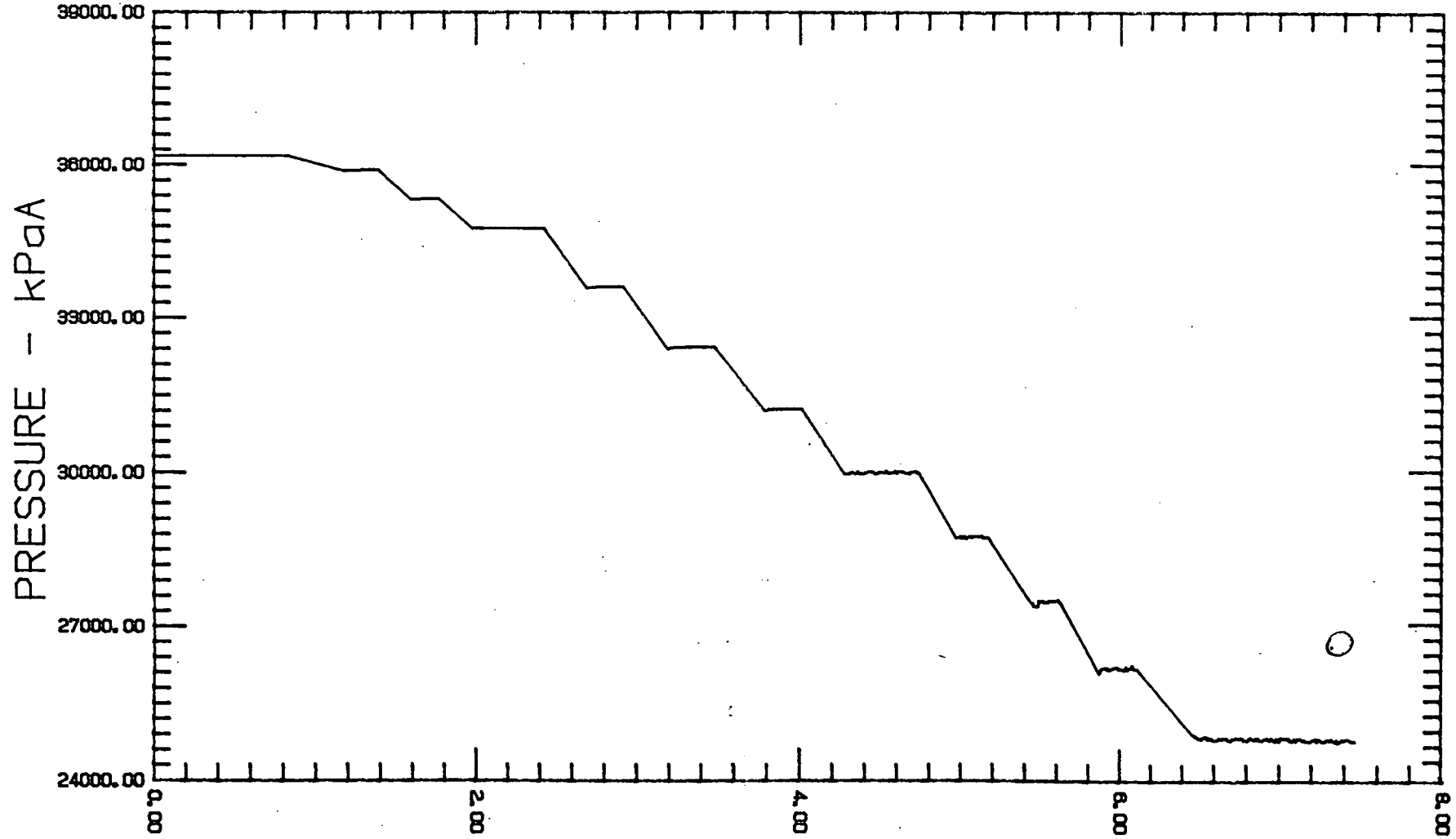
Location: COOPER BASIN
Operator: P. ALDRICH
Comments: STABLE INJECTION WITH PRESSURE FALL-OFF



Plot starting date: 2/27/89
time: 10:59:16
Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MOORARI
Well #: 3 LOWER
Test #:

Location: COOPER BASIN
Operator: P. ALDRICH
Comments: STABLE INJECTION WITH PRESSURE FALL-OFF



*** EPG CALIBRATION DATA ***
EPG SN # 73864

DATE CALIBRATED: 2/19/89 PAGE 10
PRESSURE RANGE: 10000 PSI
GAUGE TYPE: 520

PRESSURE EQUATION COEFFICIENTS

TEMPERATURE	32.110 'F	99.458 'F	150.851 'F
A[0]	-4.10006738061E 04	-2.93489540052E 04	-3.05166224995E 04
A[1]	1.62893434903E 01	1.09228828426E 01	1.15107883426E 01
A[2]	-3.32210000000E-03	-2.49360000000E-03	-2.58840000000E-03
A[3]	2.93750000000E-07	2.51080000000E-07	2.56150000000E-07

TEMPERATURE CORRECTION COEFFICIENTS

B[0]	-1.08288448951E 00	-1.07693742780E 00	-1.07672322963E 00
B[1]	2.40598091270E-05	2.23123438330E-05	2.23583025910E-05

PRESSURE EQUATION COEFFICIENTS

TEMPERATURE	199.469 'F	250.111 'F	298.838 'F
A[0]	-2.86245682744E 04	-2.96882265795E 04	-2.56884345294E 04
A[1]	1.06859203076E 01	1.12829309168E 01	9.53663498495E 00
A[2]	-2.46510000000E-03	-2.56880000000E-03	-2.31090000000E-03
A[3]	2.49980000000E-07	2.55880000000E-07	2.43240000000E-07

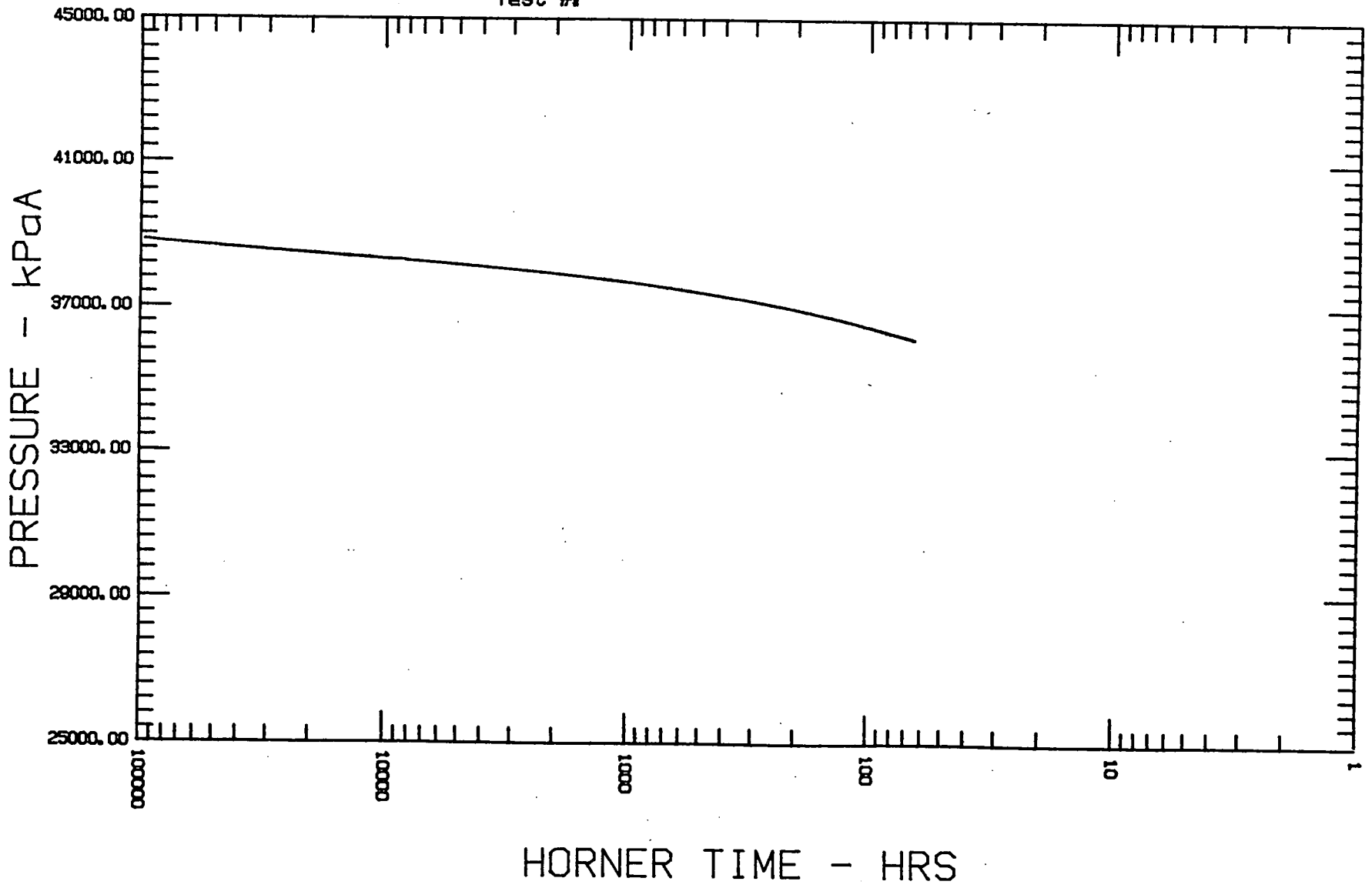
TEMPERATURE CORRECTION COEFFICIENTS

B[0]	-1.07482829589E 00	-1.07335722032E 00	-1.07034953321E 00
B[1]	2.19394764910E-05	2.17314461000E-05	2.07966074940E-05

Plot starting date: 2/24/89
time: 20: 3:26
Gauge S/N
Flow time: 4100.000 HRS

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MOORARI
Well #: 3 LOWER
Test #:

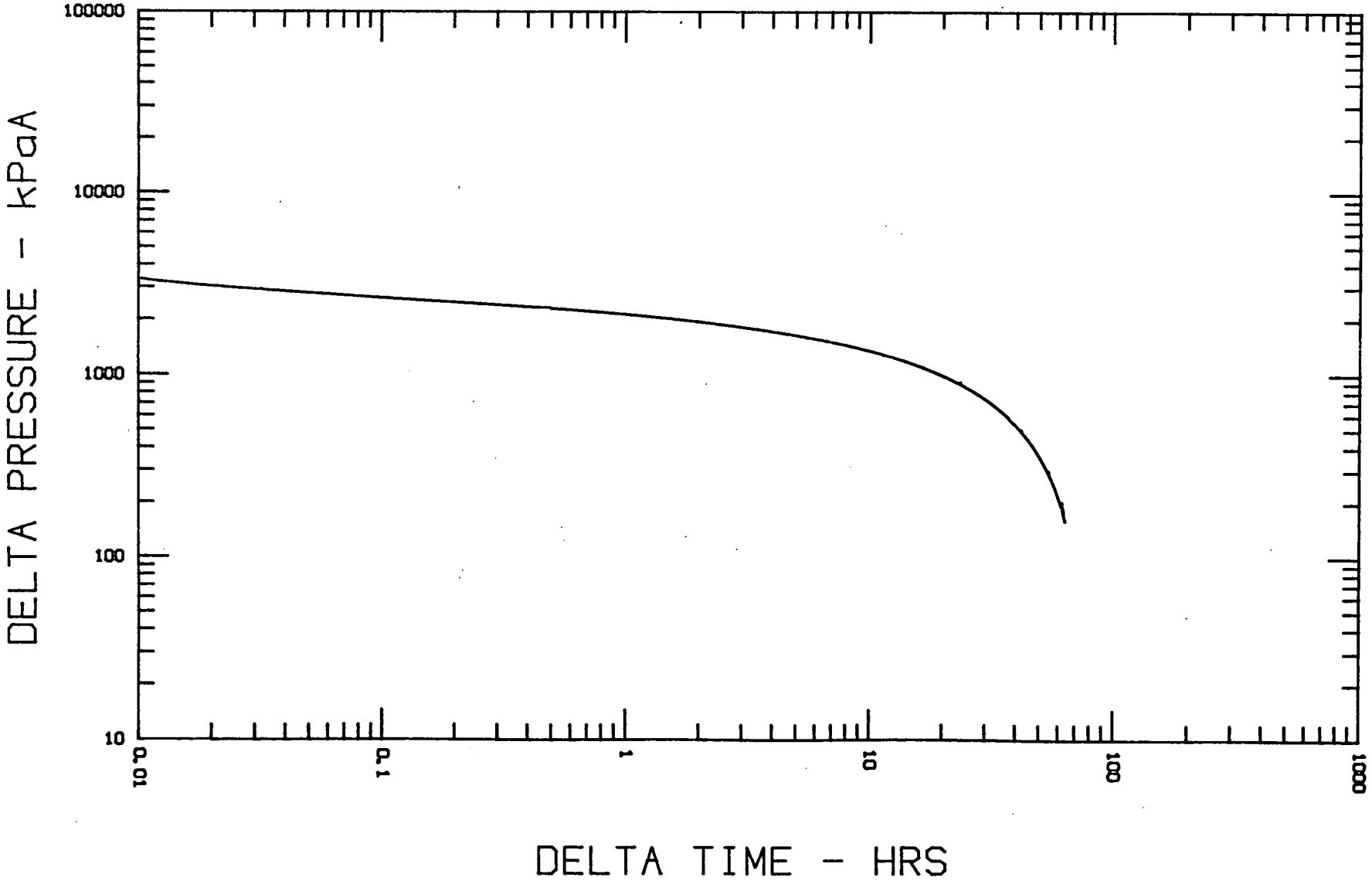
Location: COOPER BASIN
Operator: P. ALDRICH
Comments: STABLE INJECTION WITH PRESSURE FALL-OFF



Plot starting date: 2/24/89
time: 20: 3:26
Gauge S/N
Reference pressure: 36000.000 kPaA

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MOORARI
Well #: 3 LOWER
Test #:

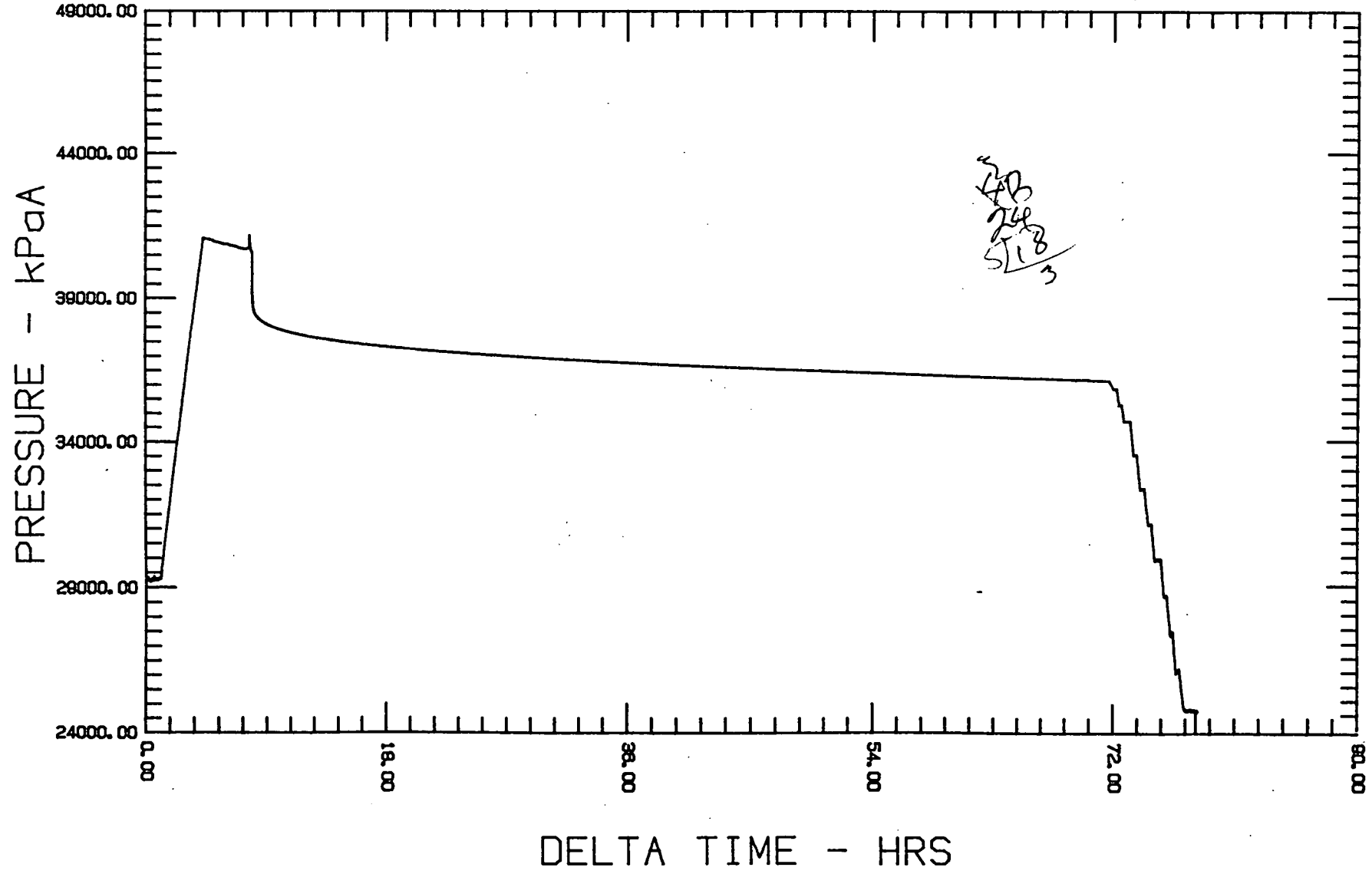
Location: COOPER BASIN
Operator: P. ALDRICH
Comments: STABLE INJECTION WITH PRESSURE FALL-OFF



Plot starting date: 2/24/89
time: 12:10:26
Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MOORARI
Well #: 3 LOWER
Test #:

Location: COOPER BASIN
Operator: P. ALDRICH
Comments: STABLE INJECTION WITH PRESSURE FALL-OFF



*** EPG CALIBRATION DATA ***
EPG SN # 73864

0254

DATE CALIBRATED: 2/19/89 PAGE 4
PRESSURE RANGE: 10000 PSI
GAUGE TYPE: 520

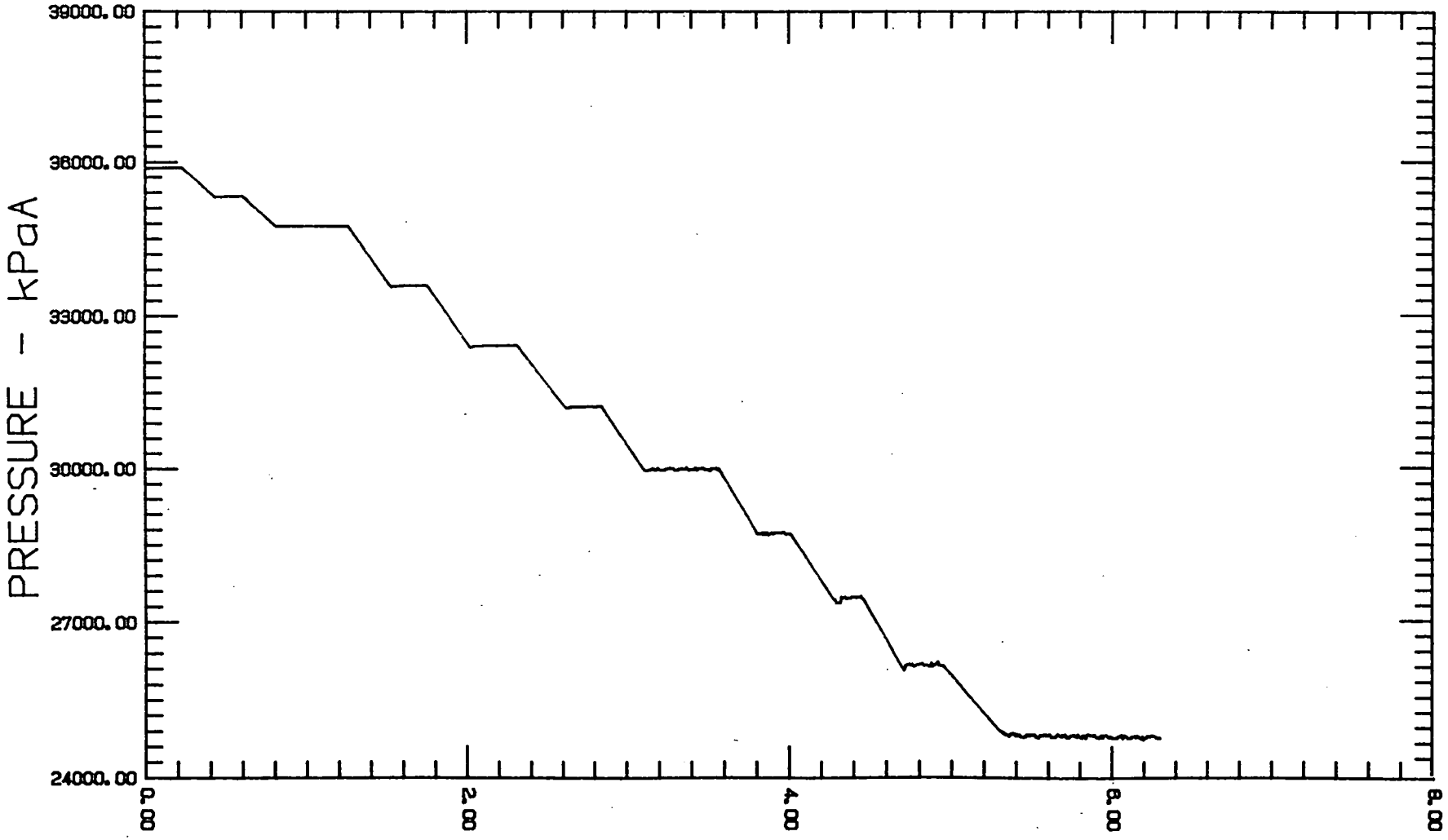
TEMPERATURE: 100.00 'F

PRESS	FREQUENCY	PRESSURE (ABSOLUTE)	CALCULATED PRESS.	DIFFERENCE (PSI)
1	5919.860	14.70	14.46	-0.24
2	5936.520	145.50	144.90	-0.60
3	6047.880	1044.40	1045.30	0.90
4	6164.615	2043.20	2044.11	0.91
5	6274.985	3042.00	3042.30	0.30
6	6379.720	4040.80	4039.80	-1.00
7	6479.620	5039.60	5038.49	-1.11
8	6575.140	6038.50	6037.93	-0.57
9	6666.705	7037.40	7038.10	0.70
10	6754.540	8036.40	8037.35	0.95
11	6839.010	9035.40	9036.05	0.65
12	6920.335	10034.30	10033.41	-0.89

Plot starting date: 2/27/89
time: 12: 9:22
Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MOORARI
Well #: 3 LOWER
Test #:

Location: COOPER BASIN
Operator: P. ALDRICH
Comments: STABLE INJECTION WITH PRESSURE FALL-OFF

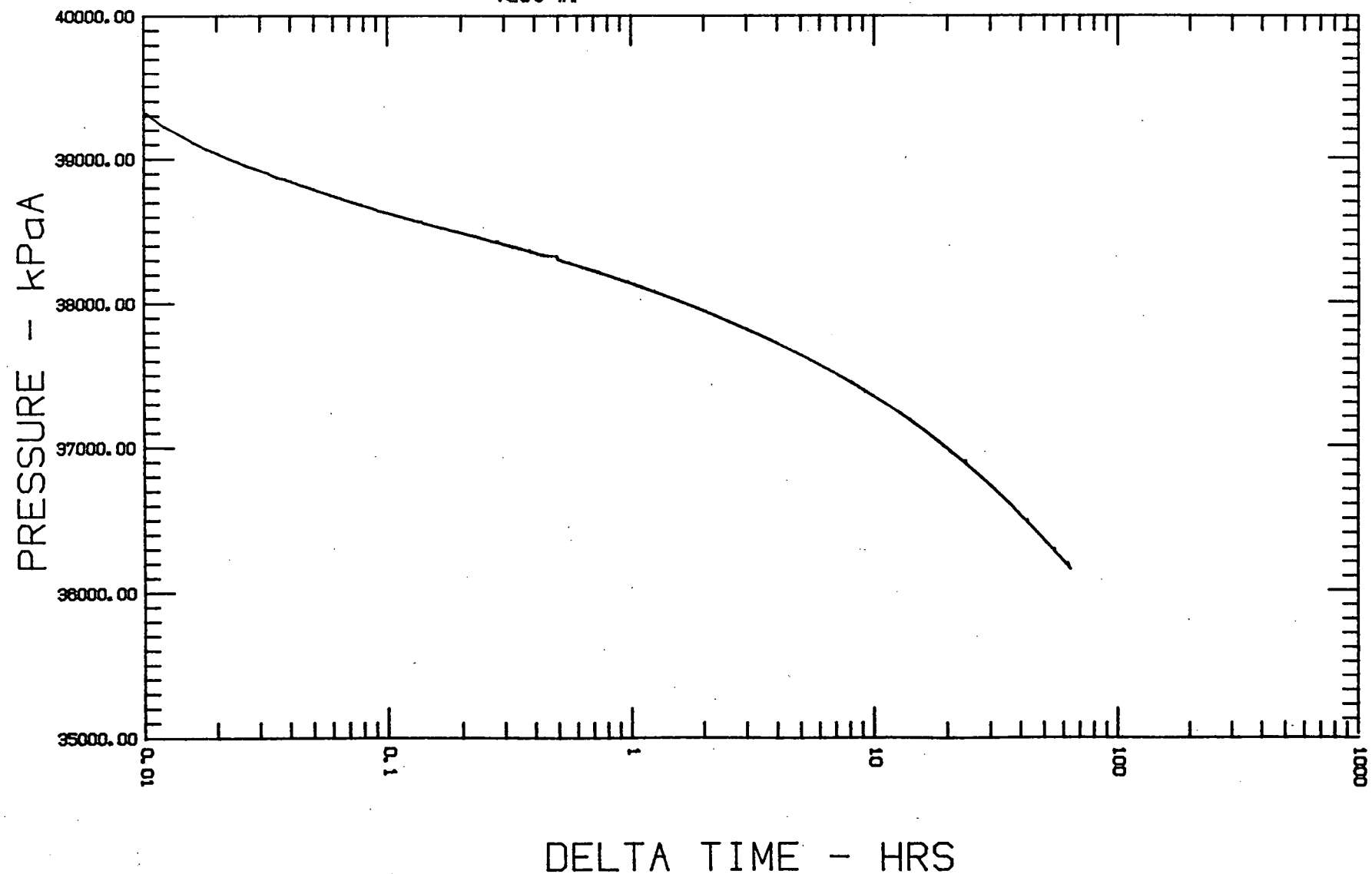


Plot starting date: 2/24/89
time: 20: 3:26

Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MOORARI
Well #: 3 LOWER
Test #:

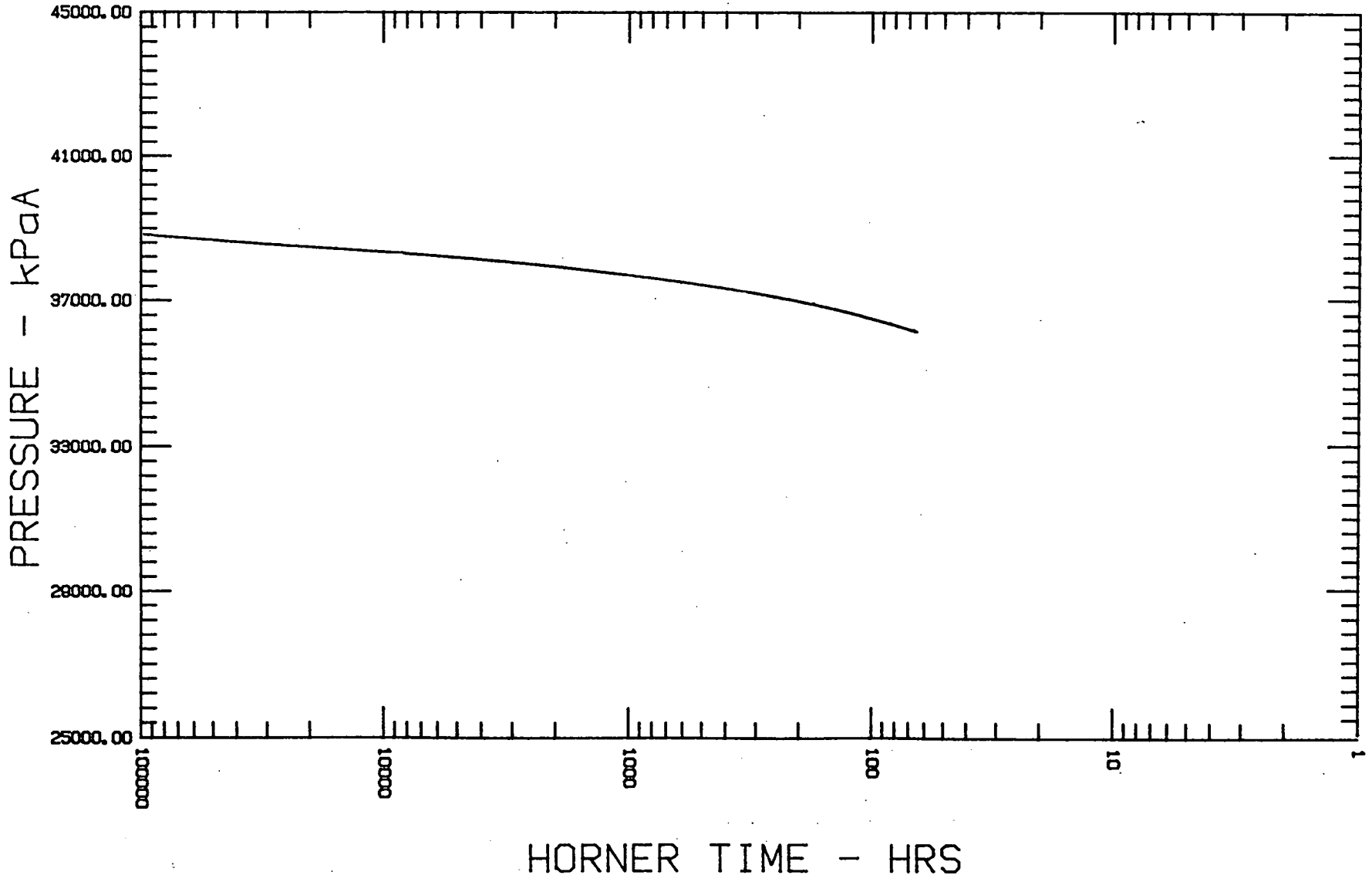
Location: COOPER BASIN
Operator: P. ALDRICH
Comments: STABLE INJECTION WITH PRESSURE FALL-OFF



Plot starting date: 2/24/89
time: 20: 3:26
Gauge S/N
Flow time: 4100.000 HRS

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MOORARI
Well #: 3 LOWER
Test #:

Location: COOPER BASIN
Operator: P. ALDRICH
Comments: STABLE INJECTION WITH PRESSURE FALL-OFF



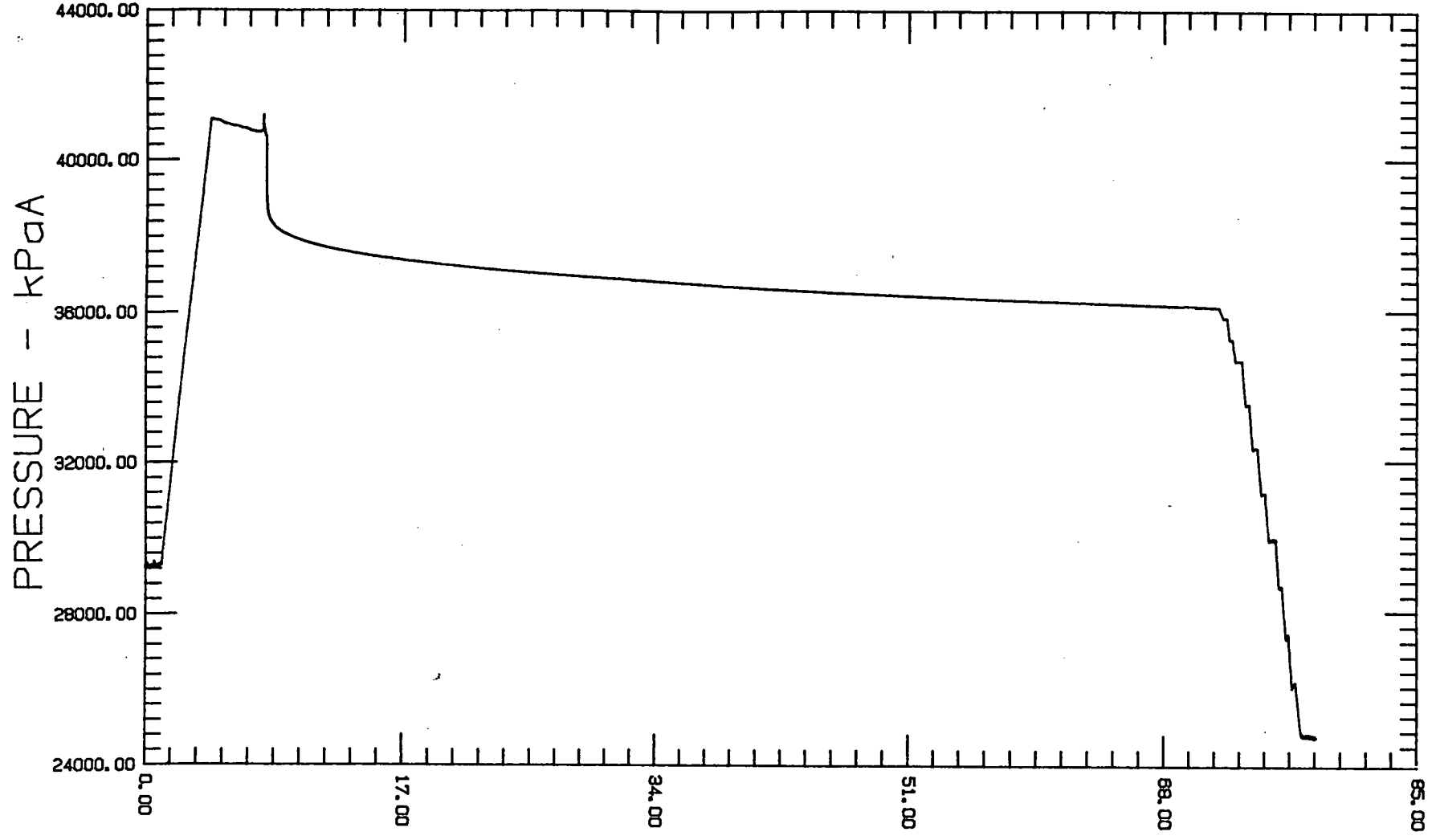
Plot starting date: 2/24/89
time: 12:10:26

Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MOORARI
Well #: 3 LOWER
Test #:

Location: COOPER BASIN
Operator: P. ALDRICH
Comments: STABLE INJECTION WITH PRESSURE FALL-OFF

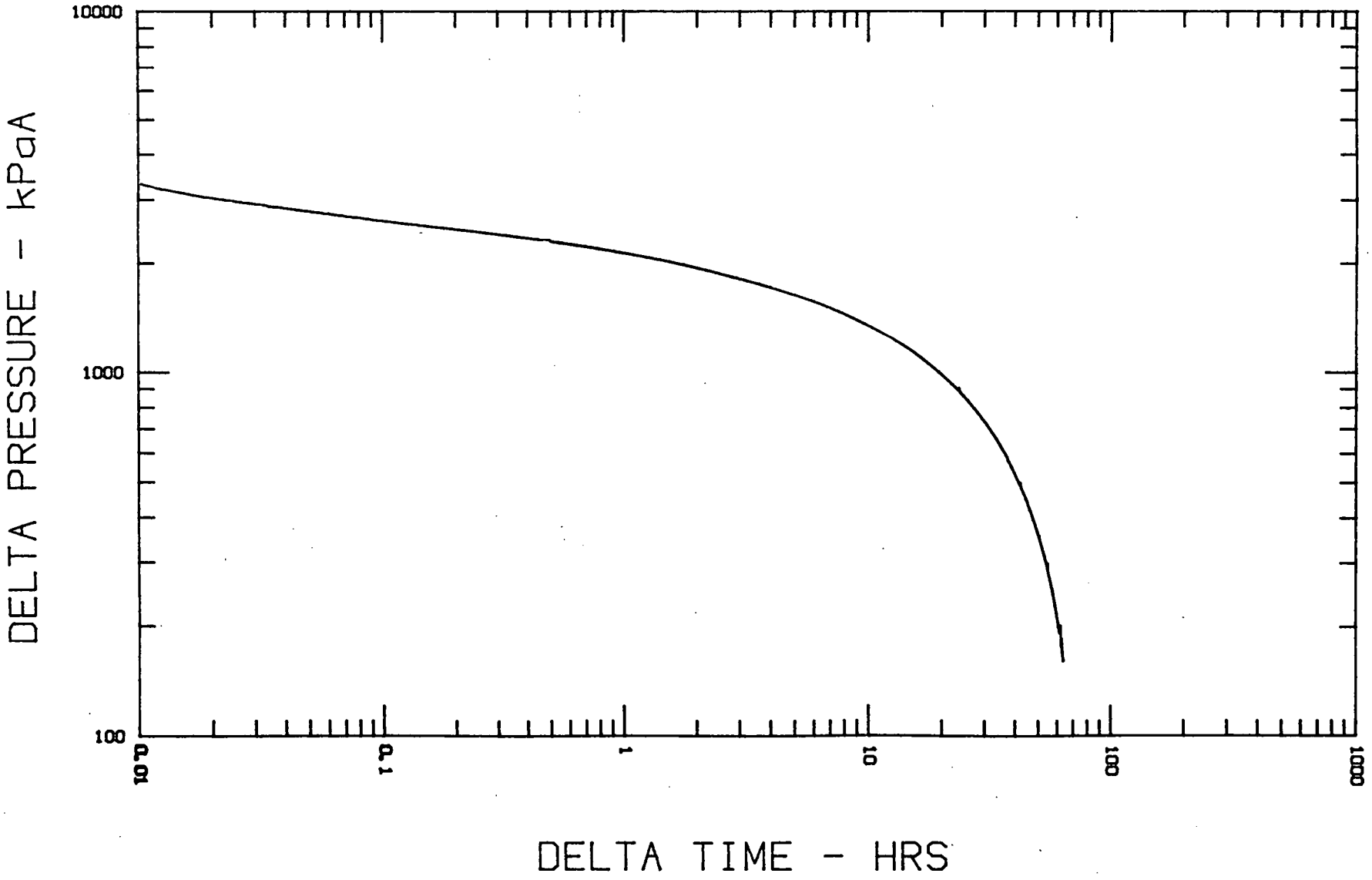
0258



Plot starting date: 2/24/89
time: 20: 3:26
Gauge S/N
Reference pressure: 36000.000 kPaA

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MOORARI
Well #: 3 LOWER
Test #:

Location: COOPER BASIN
Operator: P. ALDRICH
Comments: STABLE INJECTION WITH PRESSURE FALL-OFF

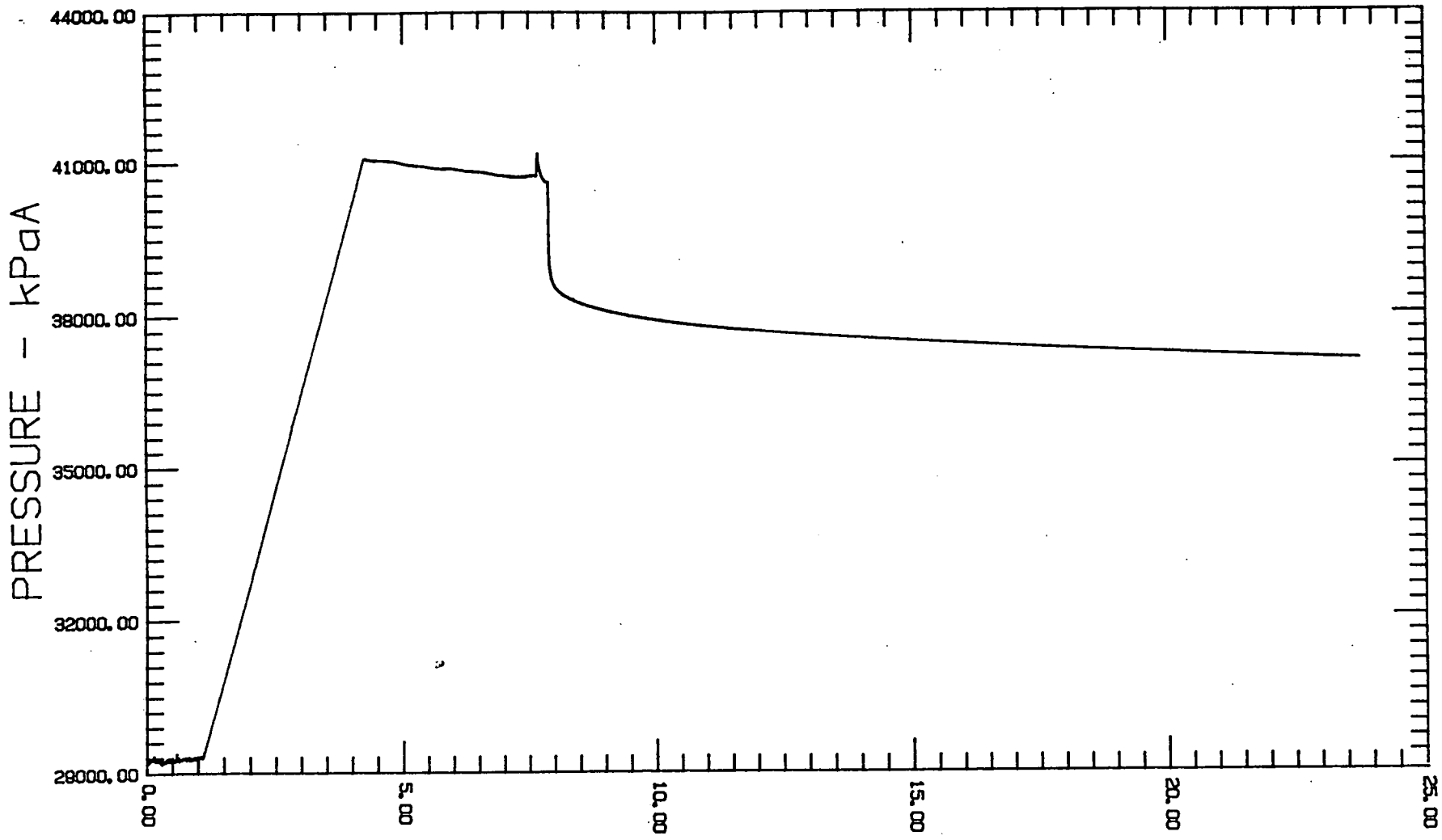


Plot starting date: 2/24/89
time: 12:10:26

Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MOORARI
Well #: 3 LOWER
Test #:

Location: COOPER BASIN
Operator: P. ALDRICH
Comments: STABLE INJECTION WITH PRESSURE FALL-OFF

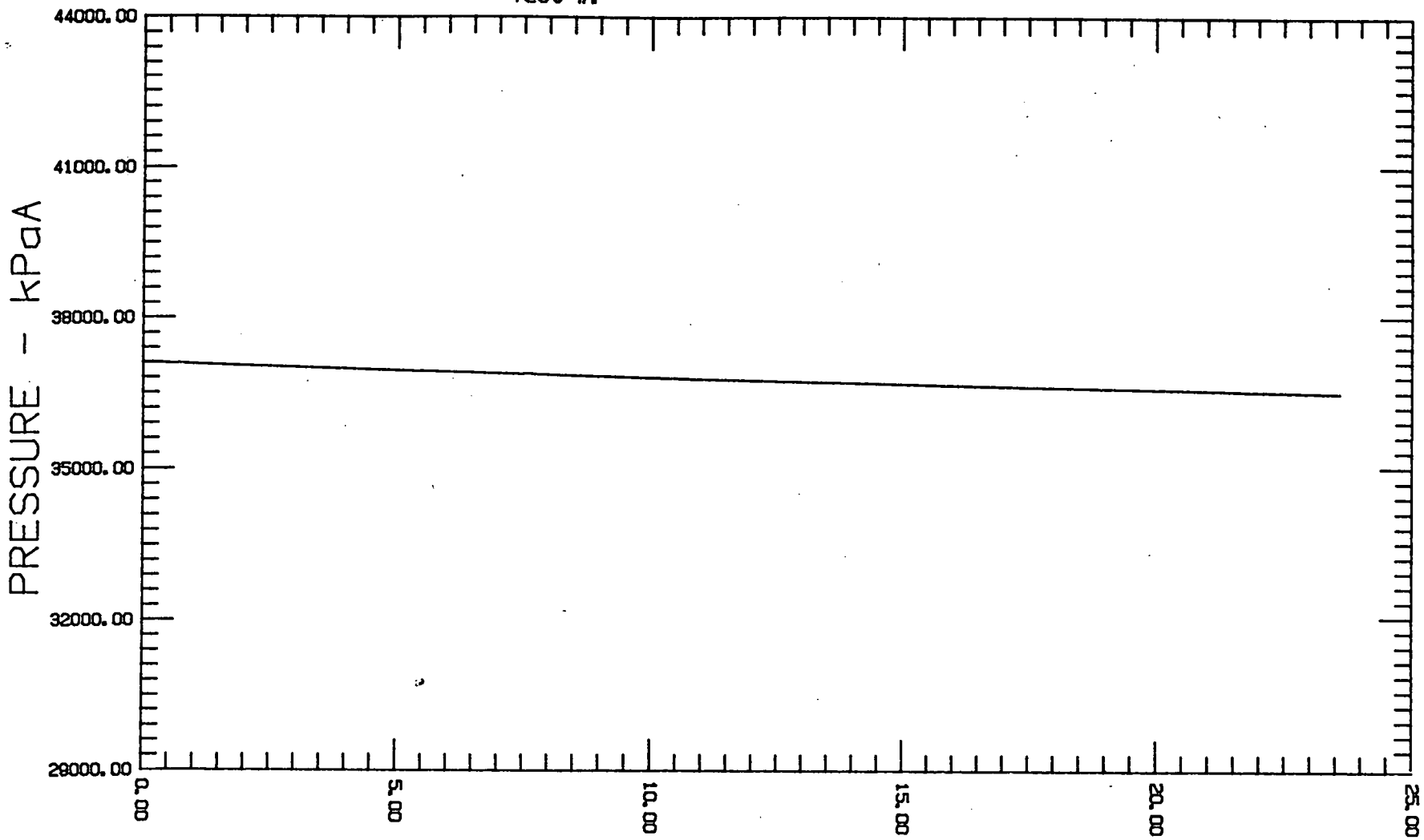


Plot starting date: 2/25/89
time: 12: 3:15

Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MOORARI
Well #: 3 LOWER
Test #:

Location: COOPER BASIN
Operator: P. ALDRICH
Comments: STABLE INJECTION WITH PRESSURE FALL-OFF

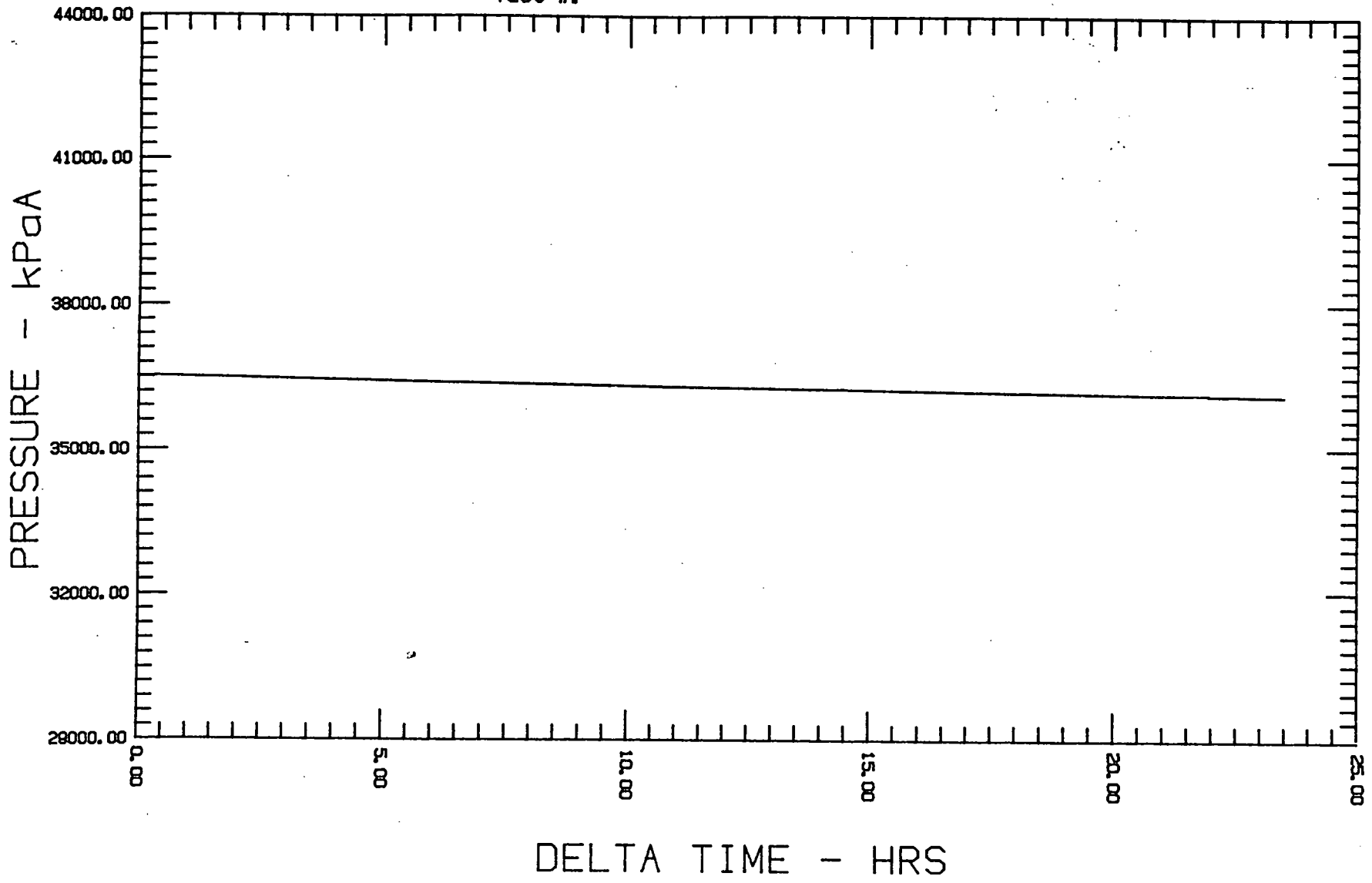


Plot starting date: 2/26/89
time: 12:21:24

Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MOORARI
Well #: 3 LOWER
Test #:

Location: COOPER BASIN
Operator: P. ALDRICH
Comments: STABLE INJECTION WITH PRESSURE FALL-OFF

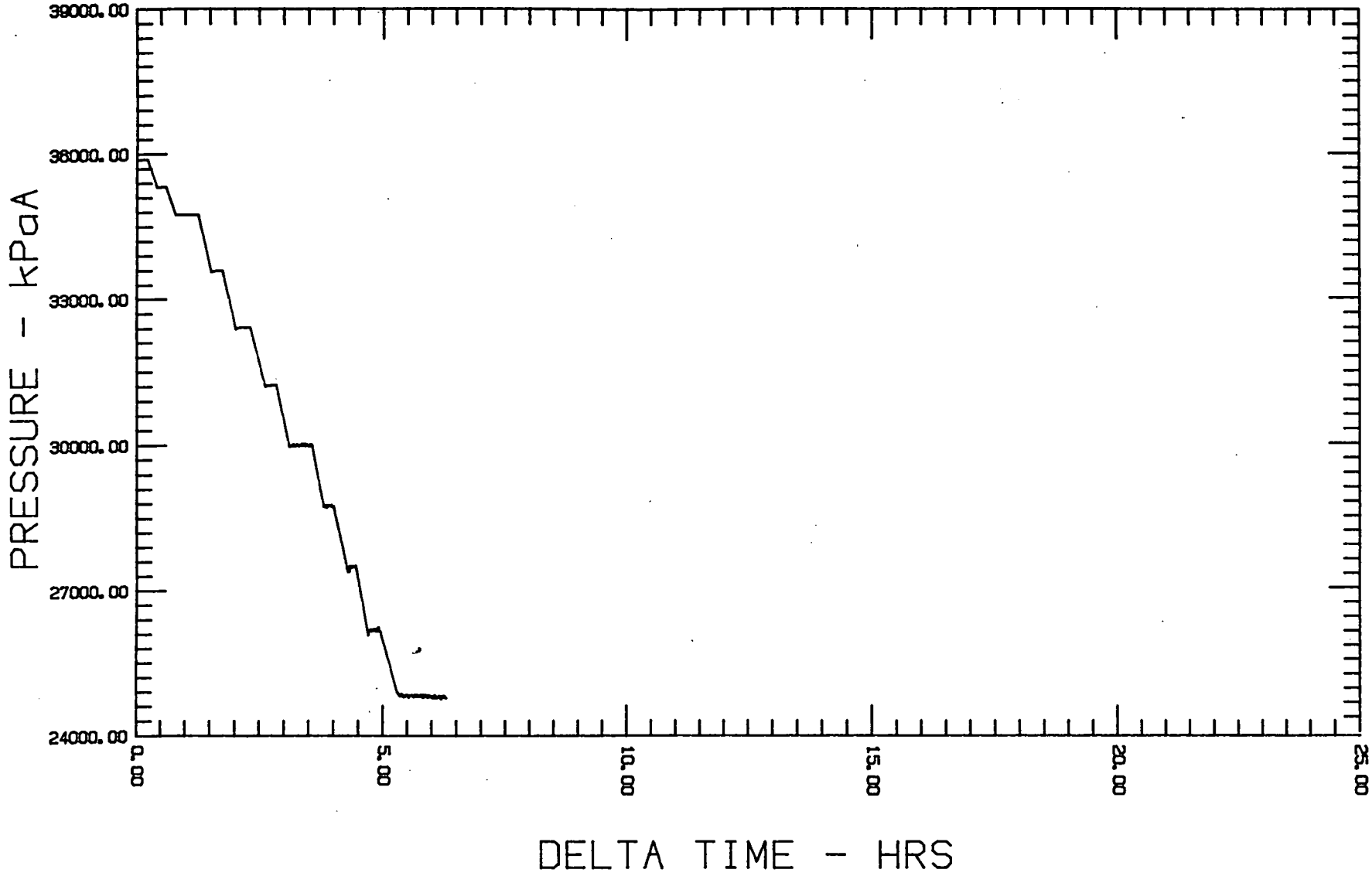


Plot starting date: 2/27/89
time: 12: 9:22

Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MOORARI
Well #: 3 LOWER
Test #:

Location: COOPER BASIN
Operator: P. ALDRICH
Comments: STABLE INJECTION WITH PRESSURE FALL-OFF



Section # 3

PRESSURE TEMPERATURE PRINTOUT & BUILDUP LINEAR PLOTS

By: OILSERV AUSTRLIA LIMITED
242 GLEN OSMOND ROAD
FULLARTON SA 5063

TELEPHONE (08) 338 1630
TELEX AA 88713
FACSIMILE (08) 79 6351

COMPANY: OILSERV AUSTRALIA LTD

CLIENT: SANTOS LTD

GAUGE NUMBER: 73864

WELL NAME: MOORARI

WELL NUMBER: 3 LOWER

TEST NUMBER:

LOCATION: COOPER BASIN

TEST OPERATOR: P.ALDRICH

COMMENTS: STABLE INJECTION WITH PRESSURE FALL-OFF

POSITION	GAUGE SERIAL NUMBER
1	
2	
3	
4	

PAGE START DATE: 2/24/89 GAUGE S/N:

DATA FILE: 3

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
20: 3:26	0.0000	40406.04		
20: 3:30	0.0011		102.00	
20: 3:35	0.0025	40271.42		
20: 3:38	0.0033		102.00	
20: 3:41	0.0042	39860.41		
20: 3:44	0.0050		101.99	
20: 3:49	0.0064	39607.31		
20: 3:53	0.0075		101.97	
20: 3:55	0.0081	39440.14		
20: 4: 6	0.0111		101.92	
20: 4: 3	0.0103	39317.47		
20: 4: 6	0.0111		101.92	
20: 4:10	0.0122	39225.23		
20: 4:14	0.0133		101.90	
20: 4:18	0.0144	39158.60		
20: 4:20	0.0150		101.88	
20: 4:24	0.0161	39109.53		
20: 4:29	0.0175		101.88	
20: 4:31	0.0181	39068.73		
20: 4:43	0.0214		101.88	
20: 4:39	0.0203	39035.39		
20: 4:43	0.0214		101.88	
20: 4:46	0.0222	39004.35		
20: 4:49	0.0231		101.89	
20: 4:54	0.0244	38978.05		
20: 4:57	0.0253		101.90	
20: 5: 0	0.0261	38955.66		
20: 5: 4	0.0272		101.92	
20: 5: 8	0.0283	38936.01		
20: 5:15	0.0303		101.93	
20: 5: 8	0.0283	38936.01		
20: 5:15	0.0303		101.93	
20: 5:24	0.0328	38899.09		
20: 5:29	0.0342		101.97	
20: 5:29	0.0342	38881.96		
20: 5:37	0.0364		102.00	
20: 5:34	0.0356	38870.85		
20: 5:42	0.0378		102.01	
20: 5:44	0.0383	38857.19		
20: 5:48	0.0394		102.02	
20: 5:52	0.0406	38842.11		
20: 5:54	0.0411		102.04	
20: 5:59	0.0425	38829.38		
20: 6: 2	0.0433		102.06	
20: 6: 5	0.0442	38818.82		
20: 6:10	0.0456		102.07	
20: 6:13	0.0464	38808.10		
20: 6:17	0.0475		102.09	
20: 6:20	0.0483	38797.62		
20: 6:24	0.0494		102.11	

PAGE START DATE: 2/24/89 GAUGE S/N:

DATA FILE: 3

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
20: 6:28	0.0506	38787.04		
20: 6:30	0.0511		102.12	
20: 6:34	0.0522	38777.51		
20: 6:38	0.0533		102.14	
20: 6:42	0.0544	38768.38		
20: 6:45	0.0553		102.16	
20: 6:49	0.0564	38760.13		
20: 6:53	0.0575		102.18	
20: 6:55	0.0581	38751.65		
20: 6:59	0.0592		102.19	
20: 7: 4	0.0606	38743.49		
20: 7: 7	0.0614		102.21	
20: 7:11	0.0625	38735.53		
20: 7:14	0.0633		102.22	
20: 7:18	0.0644	38728.23		
20: 7:22	0.0656		102.24	
20: 7:24	0.0661	38721.31		
20: 7:29	0.0675		102.25	
20: 7:32	0.0683	38714.36		
20: 7:36	0.0694		102.27	
20: 7:39	0.0703	38707.25		
20: 7:43	0.0714		102.28	
20: 7:47	0.0725	38700.43		
20: 7:49	0.0731		102.30	
20: 7:54	0.0744	38694.53		
20: 7:58	0.0756		102.31	
20: 8: 1	0.0764	38688.52		
20: 8: 4	0.0772		102.32	
20: 8: 8	0.0783	38682.59		
20: 8:16	0.0806		102.34	
20: 8: 8	0.0783	38682.59		
20: 8:16	0.0806		102.34	
20: 8:26	0.0833	38670.08		
20: 8:29	0.0842		102.37	
20: 8:26	0.0833	38670.08		
20: 8:38	0.0867		102.39	
20: 8:36	0.0861	38662.54		
20: 8:43	0.0881		102.40	
20: 8:43	0.0881	38657.03		
20: 8:48	0.0894		102.40	
20: 8:52	0.0906	38650.20		
20: 8:54	0.0911		102.41	
20: 8:58	0.0922	38641.73		
20: 9: 2	0.0933		102.43	
20: 9: 6	0.0944	38639.10		
20: 9: 9	0.0953		102.44	
20: 9:13	0.0964	38634.54		
20: 9:17	0.0975		102.45	
20: 9:19	0.0981	38631.09		
20: 9:23	0.0992		102.46	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
20: 9:28	0.1006	38626.88		
20: 9:31	0.1014		102.47	
20: 9:35	0.1025	38622.37		
20: 9:38	0.1033		102.48	
20: 9:42	0.1044	38618.29		
20: 9:46	0.1056		102.49	
20: 9:48	0.1061	38614.82		
20: 9:53	0.1075		102.50	
20: 9:56	0.1083	38610.87		
20:10: 0	0.1094		102.51	
20:10: 3	0.1103	38606.53		
20:10: 7	0.1114		102.52	
20:10:11	0.1125	38602.47		
20:10:13	0.1131		102.53	
20:10:18	0.1144	38598.88		
20:10:22	0.1156		102.54	
20:10:25	0.1164	38595.10		
20:10:28	0.1172		102.55	
20:10:31	0.1181	38591.65		
20:10:36	0.1194		102.56	
20:10:40	0.1206	38587.94		
20:10:43	0.1214		102.58	
20:10:46	0.1222	38584.47		
20:10:50	0.1233		102.59	
20:10:53	0.1242	38581.32		
20:10:57	0.1253		102.60	
20:11: 1	0.1264	38577.92		
20:11: 5	0.1275		102.60	
20:11: 7	0.1281	38574.46		
20:11:16	0.1306		102.62	
20:11: 7	0.1281	38574.46		
20:11:16	0.1306		102.62	
20:11:25	0.1331	38567.26		
20:11:28	0.1339		102.64	
20:11:30	0.1344	38564.72		
20:11:37	0.1364		102.66	
20:11:35	0.1358	38564.77		
20:11:41	0.1375		102.66	
20:11:44	0.1383	38565.07		
20:11:47	0.1392		102.66	
20:11:51	0.1403	38555.88		
20:11:55	0.1414		102.67	
20:11:59	0.1425	38552.98		
20:12: 1	0.1431		102.68	
20:12: 6	0.1444	38550.75		
20:12:10	0.1456		102.69	
20:12:12	0.1461	38547.51		
20:12:16	0.1472		102.70	
20:12:20	0.1483	38545.59		
20:12:24	0.1494		102.71	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
20:12:27	0.1503	38542.12		
20:12:31	0.1514		102.72	
20:12:35	0.1525	38539.54		
20:12:37	0.1531		102.72	
20:12:41	0.1542	38537.31		
20:12:45	0.1553		102.73	
20:12:49	0.1564	38534.84		
20:12:52	0.1572		102.74	
20:12:55	0.1581	38532.40		
20:13: 0	0.1594		102.75	
20:13: 4	0.1606	38529.71		
20:13: 6	0.1611		102.76	
20:13:10	0.1622	38527.49		
20:13:14	0.1633		102.77	
20:13:17	0.1642	38525.26		
20:13:21	0.1653		102.78	
20:13:25	0.1664	38522.66		
20:13:29	0.1675		102.79	
20:13:31	0.1681	38520.73		
20:13:35	0.1692		102.79	
20:13:40	0.1706	38518.00		
20:13:42	0.1711		102.80	
20:13:46	0.1722	38515.87		
20:13:50	0.1733		102.81	
20:13:54	0.1744	38513.65		
20:13:58	0.1756		102.82	
20:14: 0	0.1761	38511.48		
20:14: 5	0.1775		102.83	
20:14: 8	0.1783	38509.53		
20:14:15	0.1803		102.83	
20:14:15	0.1803	38505.55		
20:14:28	0.1839		102.85	
20:14:15	0.1803	38505.55		
20:14:28	0.1839		102.85	
20:14:30	0.1844	38502.23		
20:14:38	0.1867		102.87	
20:14:35	0.1858	38500.25		
20:14:41	0.1875		102.87	
20:14:44	0.1883	38500.37		
20:14:48	0.1894		102.87	
20:14:51	0.1903	38496.59		
20:14:55	0.1914		102.88	
20:14:59	0.1925	38494.97		
20:15: 1	0.1931		102.89	
20:15: 5	0.1942	38492.73		
20:15: 9	0.1953		102.90	
20:15:13	0.1964	38490.60		
20:15:16	0.1972		102.91	
20:15:19	0.1981	38488.66		
20:15:24	0.1994		102.91	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
20:15:28	0.2006	38486.97		
20:15:30	0.2011		102.92	
20:15:34	0.2022	38484.74		
20:15:38	0.2033		102.93	
20:15:41	0.2042	38483.45		
20:15:45	0.2053		102.94	
20:15:49	0.2064	38480.92		
20:15:53	0.2075		102.94	
20:15:55	0.2081	38479.48		
20:15:59	0.2092		102.95	
20:16: 4	0.2106	38477.33		
20:16: 6	0.2111		102.96	
20:16:10	0.2122	38475.43		
20:16:14	0.2133		102.97	
20:16:18	0.2144	38473.68		
20:16:22	0.2156		102.98	
20:16:24	0.2161	38472.26		
20:16:29	0.2175		102.98	
20:16:32	0.2183	38470.30		
20:16:35	0.2192		102.99	
20:16:39	0.2203	38468.35		
20:16:43	0.2214		103.00	
20:16:47	0.2225	38466.61		
20:16:49	0.2231		103.01	
20:16:54	0.2244	38464.85		
20:16:58	0.2256		103.01	
20:17: 0	0.2261	38463.08		
20:17: 5	0.2275		103.02	
20:17: 8	0.2283	38461.65		
20:17:15	0.2303		103.03	
20:17:15	0.2303	38463.29		
20:17:27	0.2336		103.04	
20:17:15	0.2303	38463.29		
20:17:27	0.2336		103.04	
20:17:30	0.2344	38455.70		
20:17:37	0.2364		103.06	
20:17:34	0.2356	38457.99		
20:17:42	0.2378		103.07	
20:17:44	0.2383	38453.68		
20:17:48	0.2394		103.07	
20:17:52	0.2406	38451.17		
20:17:54	0.2411		103.08	
20:17:59	0.2425	38449.88		
20:18: 2	0.2433		103.08	
20:18: 5	0.2442	38448.10		
20:18: 9	0.2453		103.09	
20:18:13	0.2464	38446.75		
20:18:17	0.2475		103.10	
20:18:19	0.2481	38444.82		
20:18:24	0.2494		103.10	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
20:18:28	0.2506	38443.24		
20:18:31	0.2514		103.11	
20:18:34	0.2522	38441.47		
20:18:38	0.2533		103.12	
20:18:42	0.2544	38440.18		
20:18:46	0.2556		103.13	
20:18:49	0.2564	38438.56		
20:18:53	0.2575		103.13	
20:18:56	0.2583	38437.13		
20:18:59	0.2592		103.14	
20:19: 4	0.2606	38435.30		
20:19: 7	0.2614		103.15	
20:19:11	0.2625	38434.02		
20:19:14	0.2633		103.15	
20:19:18	0.2644	38432.71		
20:19:22	0.2656		103.16	
20:19:24	0.2661	38430.92		
20:19:29	0.2675		103.17	
20:19:32	0.2683	38429.45		
20:19:36	0.2694		103.18	
20:19:39	0.2703	38427.73		
20:19:43	0.2714		103.18	
20:19:47	0.2725	38426.53		
20:19:49	0.2731		103.19	
20:19:54	0.2744	38424.77		
20:19:58	0.2756		103.20	
20:20: 1	0.2764	38423.73		
20:20: 4	0.2772		103.20	
20:20: 8	0.2783	38421.75		
20:20:13	0.2797		103.21	
20:20:16	0.2806	38426.46		
20:20:27	0.2836		103.22	
20:20:16	0.2806	38426.46		
20:20:32	0.2850		103.24	
20:20:28	0.2839	38417.46		
20:20:37	0.2864		103.24	
20:20:33	0.2853	38416.36		
20:20:41	0.2875		103.25	
20:20:43	0.2881	38415.78		
20:20:48	0.2894		103.25	
20:20:52	0.2906	38413.62		
20:20:55	0.2914		103.25	
20:20:58	0.2922	38412.55		
20:21: 2	0.2933		103.26	
20:21: 6	0.2944	38411.22		
20:21:10	0.2956		103.27	
20:21:13	0.2964	38409.87		
20:21:17	0.2975		103.28	
20:21:20	0.2983	38407.94		
20:21:23	0.2992		103.28	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
20:21:28	0.3006	38406.71		
20:21:31	0.3014		103.29	
20:21:35	0.3025	38405.55		
20:21:38	0.3033		103.30	
20:21:42	0.3044	38404.22		
20:21:46	0.3056		103.30	
20:21:48	0.3061	38402.68		
20:21:53	0.3075		103.31	
20:21:56	0.3083	38401.26		
20:22: 0	0.3094		103.31	
20:22: 3	0.3103	38399.80		
20:22: 6	0.3111		103.32	
20:22:11	0.3125	38398.52		
20:22:13	0.3131		103.33	
20:22:17	0.3142	38397.64		
20:22:21	0.3153		103.34	
20:22:25	0.3164	38396.53		
20:22:28	0.3172		103.34	
20:22:31	0.3181	38395.06		
20:22:36	0.3194		103.35	
20:22:40	0.3206	38393.60		
20:22:42	0.3211		103.36	
20:22:46	0.3222	38392.42		
20:22:50	0.3233		103.36	
20:22:54	0.3244	38391.58		
20:22:57	0.3253		103.37	
20:23: 1	0.3264	38389.85		
20:23: 5	0.3275		103.38	
20:23: 7	0.3281	38388.94		
20:23:15	0.3303		103.38	
20:23:16	0.3306	38389.53		
20:23:27	0.3336		103.39	
20:23:16	0.3306	38389.53		
20:23:27	0.3336		103.39	
20:23:30	0.3344	38384.73		
20:23:36	0.3361		103.41	
20:23:35	0.3358	38384.21		
20:23:41	0.3375		103.42	
20:23:44	0.3383	38384.40		
20:23:47	0.3392		103.42	
20:23:51	0.3403	38381.24		
20:23:55	0.3414		103.43	
20:23:59	0.3425	38380.31		
20:24: 1	0.3431		103.43	
20:24: 5	0.3442	38378.50		
20:24:10	0.3456		103.44	
20:24:12	0.3461	38377.55		
20:24:16	0.3472		103.45	
20:24:20	0.3483	38376.62		
20:24:24	0.3494		103.46	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
20:24:27	0.3503	38376.27		
20:24:30	0.3511		103.46	
20:24:35	0.3525	38374.23		
20:24:37	0.3531		103.47	
20:24:41	0.3542	38372.92		
20:24:45	0.3553		103.47	
20:24:49	0.3564	38371.80		
20:24:52	0.3572		103.48	
20:24:55	0.3581	38370.37		
20:25: 0	0.3594		103.49	
20:25: 4	0.3606	38369.18		
20:25: 6	0.3611		103.49	
20:25:10	0.3622	38368.09		
20:25:14	0.3633		103.50	
20:25:18	0.3644	38367.25		
20:25:21	0.3653		103.51	
20:25:25	0.3664	38366.20		
20:25:29	0.3675		103.51	
20:25:31	0.3681	38364.75		
20:25:35	0.3692		103.52	
20:25:40	0.3706	38363.65		
20:25:43	0.3714		103.53	
20:25:46	0.3722	38362.48		
20:25:50	0.3733		103.53	
20:25:54	0.3744	38361.16		
20:25:58	0.3756		103.54	
20:26: 0	0.3761	38360.53		
20:26: 5	0.3775		103.55	
20:26: 8	0.3783	38359.59		
20:26:14	0.3800		103.55	
20:26:15	0.3803	38363.75		
20:26:28	0.3839		103.56	
20:26:15	0.3803	38363.75		
20:26:28	0.3839		103.56	
20:26:29	0.3842	38355.46		
20:26:38	0.3867		103.58	
20:26:34	0.3856	38352.80		
20:26:41	0.3875		103.59	
20:26:44	0.3883	38353.02		
20:26:48	0.3894		103.58	
20:26:51	0.3903	38352.60		
20:26:54	0.3911		103.59	
20:26:59	0.3925	38351.68		
20:27: 1	0.3931		103.60	
20:27: 5	0.3942	38350.83		
20:27: 9	0.3953		103.60	
20:27:13	0.3964	38349.67		
20:27:16	0.3972		103.61	
20:27:19	0.3981	38348.22		
20:27:24	0.3994		103.62	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
20:27:28	0.4006	38347.09		
20:27:30	0.4011		103.62	
20:27:34	0.4022	38346.03		
20:27:38	0.4033		103.63	
20:27:42	0.4044	38345.15		
20:27:45	0.4053		103.64	
20:27:49	0.4064	38344.50		
20:27:53	0.4075		103.64	
20:27:55	0.4081	38343.05		
20:27:59	0.4092		103.65	
20:28: 4	0.4106	38341.92		
20:28: 7	0.4114		103.66	
20:28:10	0.4122	38340.85		
20:28:14	0.4133		103.66	
20:28:18	0.4144	38340.00		
20:28:22	0.4156		103.67	
20:28:24	0.4161	38338.80		
20:28:29	0.4175		103.67	
20:28:32	0.4183	38338.37		
20:28:35	0.4192		103.68	
20:28:39	0.4203	38336.75		
20:28:43	0.4214		103.69	
20:28:47	0.4225	38335.68		
20:28:49	0.4231		103.69	
20:28:53	0.4242	38334.81		
20:28:58	0.4256		103.70	
20:29: 0	0.4261	38333.62		
20:29: 4	0.4272		103.70	
20:29: 8	0.4283	38332.66		
20:29:15	0.4303		103.71	
20:29: 8	0.4283	38332.66		
20:29:15	0.4303		103.71	
20:29:25	0.4331	38330.01		
20:29:29	0.4342		103.73	
20:29:25	0.4331	38330.01		
20:29:38	0.4367		103.74	
20:29:35	0.4358	38332.66		
20:29:43	0.4381		103.74	
20:29:44	0.4383	38332.66		
20:29:48	0.4394		103.74	
20:29:52	0.4406	38327.05		
20:33: 1	0.4931		104.00	
20:33: 8	0.4950	38321.28		
20:33:11	0.4958		103.89	
20:33:18	0.4978	38303.43		
20:33:21	0.4986		103.89	
20:33:28	0.5006	38300.64		
20:33:32	0.5017		103.90	
20:33:40	0.5039	38298.26		
20:33:43	0.5047		103.91	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
20:33:51	0.5069	38296.21		
20:33:55	0.5081		103.92	
20:34: 1	0.5097	38294.52		
20:34: 5	0.5108		103.93	
20:34:12	0.5128	38294.09		
20:34:16	0.5139		103.94	
20:34:22	0.5156	38291.67		
20:34:26	0.5167		103.94	
20:34:34	0.5189	38290.01		
20:34:37	0.5197		103.95	
20:34:45	0.5219	38288.86		
20:34:49	0.5231		103.97	
20:34:56	0.5250	38287.59		
20:34:59	0.5258		103.98	
20:35: 6	0.5278	38286.08		
20:35:10	0.5289		103.99	
20:35:16	0.5306	38284.89		
20:35:20	0.5317		103.99	
20:35:27	0.5336	38283.82		
20:35:31	0.5347		104.00	
20:35:39	0.5369	38282.31		
20:35:42	0.5378		104.01	
20:35:50	0.5400	38280.99		
20:35:52	0.5406		104.02	
20:36: 0	0.5428	38279.88		
20:36: 4	0.5439		104.03	
20:36:10	0.5456	38278.69		
20:36:15	0.5469		104.04	
20:36:21	0.5486	38277.59		
20:36:29	0.5508		104.05	
20:36:33	0.5519	38276.13		
20:36:44	0.5550		104.06	
20:36:33	0.5519	38276.13		
20:36:49	0.5564		104.07	
20:36:55	0.5581	38278.49		
20:36:58	0.5589		104.08	
20:37: 5	0.5608	38272.58		
20:37: 9	0.5619		104.09	
20:37:15	0.5636	38271.55		
20:37:20	0.5650		104.10	
20:37:26	0.5667	38270.21		
20:37:30	0.5678		104.11	
20:37:38	0.5700	38269.08		
20:37:41	0.5708		104.12	
20:37:49	0.5731	38267.95		
20:37:51	0.5736		104.13	
20:37:59	0.5758	38266.76		
20:38: 3	0.5769		104.14	
20:38: 9	0.5786	38265.78		
20:38:14	0.5800		104.15	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
20:38:20	0.5817	38264.37		
20:38:24	0.5828		104.16	
20:38:31	0.5847	38263.22		
20:38:35	0.5858		104.17	
20:38:43	0.5881	38262.09		
20:38:45	0.5886		104.18	
20:38:54	0.5911	38260.93		
20:38:57	0.5919		104.18	
20:39: 4	0.5939	38259.76		
20:39: 8	0.5950		104.19	
20:39:14	0.5967	38258.84		
20:39:19	0.5981		104.20	
20:39:25	0.5997	38257.50		
20:39:29	0.6008		104.21	
20:39:37	0.6031	38256.19		
20:39:39	0.6036		104.22	
20:39:48	0.6061	38255.22		
20:39:50	0.6067		104.23	
20:39:58	0.6089	38254.13		
20:40: 2	0.6100		104.24	
20:40: 9	0.6119	38252.93		
20:40:13	0.6131		104.24	
20:40:19	0.6147	38251.77		
20:40:24	0.6161		104.25	
20:40:30	0.6178	38250.65		
20:40:34	0.6189		104.26	
20:40:42	0.6211	38249.53		
20:40:44	0.6217		104.28	
20:40:52	0.6239	38248.54		
20:40:59	0.6258		104.28	
20:41: 3	0.6269	38247.48		
20:41:14	0.6300		104.29	
20:41: 3	0.6269	38247.48		
20:41:19	0.6314		104.30	
20:41:24	0.6328	38245.22		
20:41:28	0.6339		104.31	
20:41:36	0.6361	38244.16		
20:41:39	0.6369		104.32	
20:41:46	0.6389	38243.31		
20:41:49	0.6397		104.32	
20:41:57	0.6419	38242.00		
20:42: 1	0.6431		104.34	
20:42: 8	0.6450	38240.89		
20:42:12	0.6461		104.34	
20:42:19	0.6481	38239.90		
20:42:22	0.6489		104.35	
20:42:29	0.6508	38238.81		
20:42:33	0.6519		104.36	
20:42:39	0.6536	38237.64		
20:42:43	0.6547		104.37	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
20:42:51	0.6569	38236.63		
20:42:54	0.6578		104.38	
20:43: 2	0.6600	38235.68		
20:43: 6	0.6611		104.38	
20:43:13	0.6631	38234.31		
20:43:16	0.6639		104.39	
20:43:23	0.6658	38233.42		
20:43:27	0.6669		104.40	
20:43:33	0.6686	38232.41		
20:43:38	0.6700		104.41	
20:43:45	0.6719	38231.23		
20:43:48	0.6728		104.42	
20:43:56	0.6750	38230.24		
20:44: 0	0.6761		104.43	
20:44: 7	0.6781	38229.28		
20:44:10	0.6789		104.43	
20:44:18	0.6811	38228.03		
20:44:21	0.6819		104.44	
20:44:28	0.6839	38227.16		
20:44:31	0.6847		104.45	
20:44:38	0.6867	38226.19		
20:44:42	0.6878		104.46	
20:44:50	0.6900	38225.20		
20:44:53	0.6908		104.47	
20:45: 1	0.6931	38224.07		
20:45: 3	0.6936		104.48	
20:45:11	0.6958	38222.98		
20:45:15	0.6969		104.48	
20:45:21	0.6986	38222.11		
20:45:29	0.7008		104.49	
20:45:32	0.7017	38221.27		
20:45:44	0.7050		104.50	
20:45:32	0.7017	38221.27		
20:45:49	0.7064		104.51	
20:45:55	0.7081	38218.76		
20:45:57	0.7086		104.52	
20:46: 6	0.7111	38217.94		
20:46: 9	0.7119		104.52	
20:46:16	0.7139	38217.26		
20:46:20	0.7150		104.53	
20:46:26	0.7167	38216.09		
20:46:30	0.7178		104.54	
20:46:37	0.7197	38215.11		
20:46:41	0.7208		104.55	
20:46:49	0.7231	38213.97		
20:46:51	0.7236		104.56	
20:47: 0	0.7261	38212.87		
20:47: 2	0.7267		104.56	
20:47:10	0.7289	38211.98		
20:47:14	0.7300		104.57	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
20:47:20	0.7317	38211.02		
20:47:25	0.7331		104.58	
20:47:31	0.7347	38210.03		
20:47:35	0.7358		104.59	
20:47:43	0.7381	38209.04		
20:47:45	0.7386		104.59	
20:47:54	0.7411	38208.13		
20:47:56	0.7417		104.60	
20:48: 4	0.7439	38207.12		
20:48: 8	0.7450		104.61	
20:48:15	0.7469	38206.11		
20:48:19	0.7481		104.62	
20:48:25	0.7497	38205.15		
20:48:30	0.7511		104.63	
20:48:36	0.7528	38204.16		
20:48:40	0.7539		104.63	
20:48:48	0.7561	38203.25		
20:48:50	0.7567		104.64	
20:48:58	0.7589	38202.25		
20:49: 1	0.7597		104.65	
20:49: 9	0.7619	38201.43		
20:49:13	0.7631		104.66	
20:49:19	0.7647	38200.25		
20:49:24	0.7661		104.67	
20:49:30	0.7678	38199.47		
20:49:34	0.7689		104.68	
20:49:41	0.7708	38198.37		
20:49:44	0.7717		104.68	
20:49:51	0.7736	38197.61		
20:49:59	0.7758		104.69	
20:50: 3	0.7769	38196.72		
20:50:14	0.7800		104.70	
20:50: 3	0.7769	38196.72		
20:50:19	0.7814		104.71	
20:50:24	0.7828	38194.88		
20:50:28	0.7839		104.71	
20:50:35	0.7858	38193.61		
20:50:39	0.7869		104.72	
20:50:45	0.7886	38192.92		
20:50:49	0.7897		104.73	
20:50:57	0.7919	38191.96		
20:51: 0	0.7928		104.73	
20:51: 8	0.7950	38190.79		
20:51:12	0.7961		104.74	
20:51:19	0.7981	38190.01		
20:51:22	0.7989		104.75	
20:51:29	0.8008	38189.04		
20:51:33	0.8019		104.75	
20:51:39	0.8036	38188.22		
20:51:44	0.8050		104.76	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
20:51:50	0.8067	38187.21		
20:51:54	0.8078		104.77	
20:52: 2	0.8100	38186.43		
20:52: 5	0.8108		104.78	
20:52:13	0.8131	38185.46		
20:52:16	0.8139		104.79	
20:52:24	0.8161	38184.46		
20:52:27	0.8169		104.79	
20:52:34	0.8189	38183.55		
20:52:38	0.8200		104.80	
20:52:44	0.8217	38182.68		
20:52:49	0.8231		104.81	
20:52:56	0.8250	38181.72		
20:52:59	0.8258		104.82	
20:53: 7	0.8281	38180.90		
20:53: 9	0.8286		104.82	
20:53:18	0.8311	38180.07		
20:53:21	0.8319		104.83	
20:53:28	0.8339	38179.08		
20:53:32	0.8350		104.84	
20:53:39	0.8369	38178.30		
20:53:43	0.8381		104.84	
20:53:49	0.8397	38177.32		
20:53:53	0.8408		104.85	
20:54: 1	0.8431	38176.53		
20:54: 3	0.8436		104.86	
20:54:12	0.8461	38175.64		
20:54:14	0.8467		104.87	
20:54:22	0.8489	38174.83		
20:54:30	0.8511		104.87	
20:54:33	0.8519	38173.77		
20:54:43	0.8547		104.88	
20:54:33	0.8519	38173.77		
20:54:48	0.8561		104.89	
20:54:55	0.8581	38172.18		
20:54:58	0.8589		104.90	
20:55: 6	0.8611	38171.27		
20:55: 8	0.8617		104.90	
20:55:16	0.8639	38170.56		
20:55:20	0.8650		104.91	
20:55:27	0.8669	38169.55		
20:55:31	0.8681		104.92	
20:55:38	0.8700	38168.56		
20:55:41	0.8708		104.93	
20:55:48	0.8728	38167.78		
20:55:51	0.8736		104.93	
20:56: 0	0.8761	38166.88		
20:56: 2	0.8767		104.94	
20:56:10	0.8789	38166.08		
20:56:13	0.8797		104.95	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
20:56:21	0.8819	38165.18		
20:56:25	0.8831		104.96	
20:56:31	0.8847	38164.38		
20:56:36	0.8861		104.96	
20:56:42	0.8878	38163.56		
20:56:46	0.8889		104.97	
20:56:54	0.8911	38162.66		
20:56:56	0.8917		104.98	
20:57: 4	0.8939	38161.79		
20:57: 7	0.8947		104.98	
20:57:15	0.8969	38160.97		
20:57:19	0.8981		104.99	
20:57:26	0.9000	38160.20		
20:57:30	0.9011		105.01	
20:57:36	0.9028	38159.45		
20:57:40	0.9039		105.01	
20:57:47	0.9058	38158.64		
20:57:50	0.9067		105.01	
20:57:57	0.9086	38157.68		
20:58: 1	0.9097		105.01	
20:58: 9	0.9119	38156.79		
20:58:12	0.9128		105.02	
20:58:20	0.9150	38155.81		
20:58:24	0.9161		105.03	
20:58:30	0.9178	38155.23		
20:58:34	0.9189		105.03	
20:58:41	0.9208	38154.24		
20:58:45	0.9219		105.04	
20:58:51	0.9236	38153.57		
20:59: 0	0.9261		105.05	
20:59: 3	0.9269	38153.02		
20:59:14	0.9300		105.06	
20:59: 3	0.9269	38153.02		
20:59:19	0.9314		105.07	
20:59:25	0.9331	38151.25		
20:59:28	0.9339		105.07	
20:59:35	0.9358	38150.22		
20:59:39	0.9369		105.08	
20:59:45	0.9386	38149.50		
20:59:50	0.9400		105.09	
20:59:56	0.9417	38148.47		
21: 0: 0	0.9428		105.09	
21: 0: 8	0.9450	38147.81		
21: 0:11	0.9458		105.10	
21: 0:19	0.9481	38147.03		
21: 0:21	0.9486		105.11	
21: 0:29	0.9508	38146.12		
21: 0:33	0.9519		105.12	
21: 0:39	0.9536	38145.41		
21: 0:44	0.9550		105.12	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
21: 0:50	0.9567	38144.60		
21: 0:54	0.9578		105.13	
21: 1: 1	0.9597	38143.77		
21: 1: 5	0.9608		105.14	
21: 1:13	0.9631	38142.99		
21: 1:15	0.9636		105.15	
21: 1:24	0.9661	38142.10		
21: 1:27	0.9669		105.15	
21: 1:34	0.9689	38141.54		
21: 1:38	0.9700		105.16	
21: 1:44	0.9717	38140.74		
21: 1:49	0.9731		105.16	
21: 1:55	0.9747	38139.93		
21: 2:47	0.9892		105.20	
21: 2:50	0.9900	38137.75		
21: 3:15	0.9969		105.22	
21: 3:19	0.9981	38134.88		
21: 3:44	1.0050		105.23	
21: 3:48	1.0061	38132.33		
21: 4:13	1.0131		105.25	
21: 4:16	1.0139	38130.56		
21: 4:41	1.0208		105.27	
21: 4:46	1.0222	38128.27		
21: 5:11	1.0292		105.29	
21: 5:14	1.0300	38126.04		
21: 5:40	1.0372		105.31	
21: 5:43	1.0381	38124.15		
21: 6: 8	1.0450		105.32	
21: 6:12	1.0461	38122.36		
21: 6:38	1.0533		105.34	
21: 6:41	1.0542	38120.08		
21: 7: 6	1.0611		105.36	
21: 7:10	1.0622	38118.29		
21: 7:35	1.0692		105.38	
21: 7:38	1.0700	38116.47		
21: 8: 4	1.0772		105.40	
21: 8: 7	1.0781	38114.24		
21: 8:32	1.0850		105.41	
21: 8:36	1.0861	38112.33		
21: 9: 1	1.0931		105.44	
21: 9: 5	1.0942	38110.63		
21: 9:30	1.1011		105.45	
21: 9:34	1.1022	38108.31		
21: 9:59	1.1092		105.47	
21:10: 2	1.1100	38106.44		
21:10:28	1.1172		105.49	
21:10:31	1.1181	38104.91		
21:10:56	1.1250		105.50	
21:11: 0	1.1261	38102.67		
21:11:25	1.1331		105.52	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
21:11:29	1.1342	38101.11		
21:11:54	1.1411		105.54	
21:11:58	1.1422	38098.79		
21:12:23	1.1492		105.56	
21:12:27	1.1503	38097.11		
21:12:52	1.1572		105.57	
21:12:55	1.1581	38095.26		
21:13:20	1.1650		105.59	
21:13:24	1.1661	38093.38		
21:13:49	1.1731		105.61	
21:13:53	1.1742	38091.64		
21:14:18	1.1811		105.63	
21:14:22	1.1822	38089.83		
21:14:47	1.1892		105.65	
21:14:51	1.1903	38087.85		
21:15:16	1.1972		105.66	
21:15:19	1.1981	38086.28		
21:15:44	1.2050		105.68	
21:15:48	1.2061	38084.05		
21:16:13	1.2131		105.69	
21:16:16	1.2139	38082.61		
21:16:42	1.2211		105.71	
21:16:46	1.2222	38081.30		
21:17:11	1.2292		105.73	
21:17:15	1.2303	38079.18		
21:17:40	1.2372		105.75	
21:17:43	1.2381	38077.30		
21:18: 8	1.2450		105.76	
21:18:13	1.2464	38075.37		
21:18:37	1.2531		105.78	
21:18:41	1.2542	38074.05		
21:19: 6	1.2611		105.79	
21:19:10	1.2622	38072.26		
21:19:35	1.2692		105.81	
21:19:39	1.2703	38070.48		
21:20: 4	1.2772		105.83	
21:20: 7	1.2781	38068.60		
21:20:32	1.2850		105.84	
21:20:36	1.2861	38067.06		
21:21: 1	1.2931		105.86	
21:21: 5	1.2942	38065.51		
21:21:30	1.3011		105.88	
21:21:34	1.3022	38063.74		
21:21:59	1.3092		105.90	
21:22: 3	1.3103	38062.20		
21:22:28	1.3172		105.91	
21:22:31	1.3181	38060.29		
21:22:56	1.3250		105.92	
21:23: 0	1.3261	38058.74		
21:23:25	1.3331		105.94	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
21:23:29	1.3342	38056.97		
21:23:54	1.3411		105.96	
21:23:58	1.3422	38055.17		
21:24:23	1.3492		105.97	
21:24:27	1.3503	38053.47		
21:24:52	1.3572		105.99	
21:24:55	1.3581	38051.94		
21:25:20	1.3650		106.01	
21:25:24	1.3661	38050.39		
21:25:49	1.3731		106.02	
21:25:53	1.3742	38048.37		
21:26:18	1.3811		106.04	
21:26:22	1.3822	38047.08		
21:26:46	1.3889		106.06	
21:26:51	1.3903	38045.82		
21:27:16	1.3972		106.07	
21:27:19	1.3981	38043.90		
21:27:44	1.4050		106.08	
21:27:48	1.4061	38042.36		
21:28:13	1.4131		106.10	
21:28:16	1.4139	38040.77		
21:28:42	1.4211		106.12	
21:28:46	1.4222	38039.48		
21:29:11	1.4292		106.13	
21:29:15	1.4303	38037.78		
21:29:40	1.4372		106.15	
21:29:43	1.4381	38036.22		
21:30: 8	1.4450		106.16	
21:30:12	1.4461	38034.69		
21:30:37	1.4531		106.18	
21:30:41	1.4542	38033.21		
21:31: 6	1.4611		106.19	
21:31:10	1.4622	38031.39		
21:31:35	1.4692		106.21	
21:31:39	1.4703	38030.10		
21:32: 4	1.4772		106.23	
21:32: 7	1.4781	38028.57		
21:32:32	1.4850		106.24	
21:32:36	1.4861	38027.00		
21:33: 1	1.4931		106.26	
21:33: 5	1.4942	38025.10		
21:33:30	1.5011		106.27	
21:33:34	1.5022	38023.81		
21:33:59	1.5092		106.29	
21:34: 3	1.5103	38022.41		
21:34:28	1.5172		106.30	
21:34:31	1.5181	38020.85		
21:34:57	1.5253		106.32	
21:35: 0	1.5261	38019.28		
21:35:25	1.5331		106.33	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
21:35:29	1.5342	38017.97		
21:35:54	1.5411		106.34	
21:35:58	1.5422	38016.63		
21:36:23	1.5492		106.36	
21:36:27	1.5503	38014.97		
21:36:52	1.5572		106.37	
21:36:55	1.5581	38013.44		
21:37:21	1.5653		106.38	
21:37:24	1.5661	38011.83		
21:37:49	1.5731		106.40	
21:37:53	1.5742	38010.32		
21:38:18	1.5811		106.42	
21:38:21	1.5819	38008.97		
21:38:46	1.5889		106.43	
21:38:51	1.5903	38007.60		
21:39:16	1.5972		106.45	
21:39:19	1.5981	38006.38		
21:39:45	1.6053		106.46	
21:39:48	1.6061	38004.78		
21:40:13	1.6131		106.47	
21:40:17	1.6142	38003.17		
21:40:43	1.6214		106.49	
21:40:46	1.6222	38001.85		
21:41:11	1.6292		106.51	
21:41:15	1.6303	38000.19		
21:41:40	1.6372		106.52	
21:41:44	1.6383	37999.01		
21:42: 9	1.6453		106.53	
21:42:12	1.6461	37997.43		
21:42:37	1.6531		106.55	
21:42:41	1.6542	37996.56		
21:43: 6	1.6611		106.56	
21:43:10	1.6622	37995.23		
21:43:35	1.6692		106.58	
21:43:39	1.6703	37993.56		
21:44: 4	1.6772		106.60	
21:44: 8	1.6783	37992.38		
21:44:33	1.6853		106.60	
21:44:36	1.6861	37990.69		
21:45: 1	1.6931		106.62	
21:45: 4	1.6939	37990.35		
21:45:30	1.7011		106.63	
21:45:34	1.7022	37988.05		
21:45:59	1.7092		106.65	
21:46: 3	1.7103	37986.43		
21:46:28	1.7172		106.66	
21:46:32	1.7183	37985.53		
21:46:57	1.7253		106.68	
21:47: 0	1.7261	37983.97		
21:47:25	1.7331		106.69	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
21:47:28	1.7339	37982.21		
21:47:54	1.7411		106.71	
21:47:58	1.7422	37980.89		
21:48:23	1.7492		106.72	
21:48:27	1.7503	37979.73		
21:48:52	1.7572		106.74	
21:48:56	1.7583	37978.55		
21:49:21	1.7653		106.75	
21:49:24	1.7661	37977.28		
21:49:49	1.7731		106.76	
21:49:52	1.7739	37975.57		
21:50:18	1.7811		106.78	
21:50:21	1.7819	37974.39		
21:50:46	1.7889		106.79	
21:50:51	1.7903	37973.30		
21:51:16	1.7972		106.81	
21:51:20	1.7983	37971.77		
21:51:45	1.8053		106.82	
21:51:48	1.8061	37970.19		
21:52:13	1.8131		106.83	
21:52:16	1.8139	37969.39		
21:52:42	1.8211		106.85	
21:52:46	1.8222	37967.54		
21:53:11	1.8292		106.86	
21:53:15	1.8303	37966.59		
21:53:40	1.8372		106.88	
21:53:44	1.8383	37965.38		
21:54: 9	1.8453		106.89	
21:54:12	1.8461	37963.76		
21:54:37	1.8531		106.90	
21:54:40	1.8539	37962.67		
21:55: 6	1.8611		106.91	
21:55:10	1.8622	37961.86		
21:55:35	1.8692		106.93	
21:55:39	1.8703	37960.19		
21:56: 4	1.8772		106.94	
21:56: 8	1.8783	37958.95		
21:56:33	1.8853		106.95	
21:56:36	1.8861	37957.33		
21:57: 1	1.8931		106.97	
21:57: 4	1.8939	37956.46		
21:57:30	1.9011		106.98	
21:57:34	1.9022	37955.09		
21:57:59	1.9092		106.99	
21:58: 3	1.9103	37953.67		
21:58:28	1.9172		107.01	
21:58:32	1.9183	37952.84		
21:58:57	1.9253		107.02	
21:59: 0	1.9261	37951.21		
21:59:25	1.9331		107.03	

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DATA FILE: 5

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
21:59:28	1.9339	37950.24		
21:59:54	1.9411		107.05	
21:59:58	1.9422	37948.91		
22: 0:23	1.9492		107.06	
22: 0:26	1.9500	37947.30		
22: 0:51	1.9569		107.07	
22: 0:56	1.9583	37946.35		
22: 1:21	1.9653		107.08	
22: 1:24	1.9661	37945.37		
22: 1:49	1.9731		107.10	
22: 1:52	1.9739	37944.24		
22: 2:18	1.9811		107.11	
22: 2:21	1.9819	37942.71		
22: 2:46	1.9889		107.13	
22: 2:50	1.9900	37941.51		
22: 3:15	1.9969		107.13	
22: 3:20	1.9983	37940.22		
22: 3:45	2.0053		107.14	
22: 3:48	2.0061	37938.97		
22: 4:14	2.0133		107.16	
22: 4:16	2.0139	37938.22		
22: 4:42	2.0211		107.17	
22: 4:45	2.0219	37936.37		
22: 5:10	2.0289		107.19	
22: 5:14	2.0300	37935.68		
22: 5:39	2.0369		107.20	
22: 5:44	2.0383	37934.46		
22: 6: 9	2.0453		107.21	
22: 6:12	2.0461	37933.18		
22: 6:38	2.0533		107.22	
22: 6:40	2.0539	37931.96		
22: 7: 6	2.0611		107.23	
22: 7:10	2.0622	37930.73		
22: 7:34	2.0689		107.25	
22: 7:39	2.0703	37929.36		
22: 8: 4	2.0772		107.26	
22: 8: 8	2.0783	37927.93		
22: 8:33	2.0853		107.27	
22: 8:36	2.0861	37927.03		
22: 9: 2	2.0933		107.28	
22: 9: 4	2.0939	37925.67		
22: 9:30	2.1011		107.29	
22: 9:34	2.1022	37924.81		
22: 9:58	2.1089		107.31	
22:10: 3	2.1103	37923.83		
22:10:28	2.1172		107.32	
22:10:32	2.1183	37922.51		
22:10:57	2.1253		107.33	
22:11: 1	2.1264	37921.53		
22:11:26	2.1333		107.34	

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DATA FILE: 5

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
22:11:28	2.1339	37920.79		
22:11:54	2.1411		107.36	
22:11:58	2.1422	37919.29		
22:12:22	2.1489		107.37	
22:12:26	2.1500	37918.28		
22:12:51	2.1569		107.39	
22:12:56	2.1583	37916.81		
22:13:21	2.1653		107.40	
22:13:25	2.1664	37915.52		
22:13:50	2.1733		107.41	
22:13:52	2.1739	37914.71		
22:14:18	2.1811		107.42	
22:14:21	2.1819	37913.88		
22:14:46	2.1889		107.44	
22:14:50	2.1900	37912.55		
22:15:15	2.1969		107.45	
22:15:20	2.1983	37911.26		
22:15:45	2.2053		107.46	
22:15:49	2.2064	37910.05		
22:16:14	2.2133		107.47	
22:16:16	2.2139	37908.82		
22:16:42	2.2211		107.48	
22:16:45	2.2219	37907.57		
22:17:10	2.2289		107.50	
22:17:15	2.2303	37906.78		
22:17:40	2.2372		107.51	
22:17:44	2.2383	37905.47		
22:18: 9	2.2453		107.52	
22:18:13	2.2464	37904.19		
22:18:38	2.2533		107.53	
22:18:40	2.2539	37903.73		
22:19: 6	2.2611		107.54	
22:19: 9	2.2619	37902.77		
22:19:34	2.2689		107.56	
22:19:39	2.2703	37901.23		
22:20: 4	2.2772		107.57	
22:20: 8	2.2783	37900.35		
22:20:33	2.2853		107.58	
22:20:37	2.2864	37899.05		
22:21: 2	2.2933		107.59	
22:21: 4	2.2939	37898.34		
22:21:30	2.3011		107.60	
22:21:33	2.3019	37897.00		
22:21:58	2.3089		107.62	
22:22: 3	2.3103	37895.77		
22:22:28	2.3172		107.62	
22:22:32	2.3183	37894.48		
22:22:56	2.3250		107.64	
22:23: 1	2.3264	37893.59		
22:23:26	2.3333		107.65	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
22:23:28	2.3339	37892.59		
22:23:54	2.3411		107.66	
22:23:57	2.3419	37891.35		
22:25:36	2.3694		107.69	
22:25:42	2.3711	37887.44		
22:26:47	2.3892		107.72	
22:26:44	2.3883	37884.82		
22:27:39	2.4036		107.74	
22:27:45	2.4053	37882.58		
22:28:39	2.4203		107.77	
22:28:46	2.4222	37880.26		
22:29:40	2.4372		107.79	
22:29:48	2.4394	37878.08		
22:30:43	2.4547		107.81	
22:30:49	2.4564	37875.86		
22:31:54	2.4744		107.85	
22:31:49	2.4731	37873.75		
22:32:44	2.4883		107.87	
22:32:52	2.4906	37871.61		
22:33:46	2.5056		107.89	
22:33:53	2.5075	37869.51		
22:34:46	2.5222		107.91	
22:34:53	2.5242	37867.43		
22:35:48	2.5394		107.93	
22:35:55	2.5414	37864.97		
22:37: 0	2.5594		107.96	
22:36:55	2.5581	37862.87		
22:37:50	2.5733		107.98	
22:37:57	2.5753	37860.92		
22:38:51	2.5903		108.01	
22:38:59	2.5925	37858.82		
22:39:54	2.6078		108.03	
22:40: 0	2.6094	37856.74		
22:40:55	2.6247		108.05	
22:41: 0	2.6261	37854.67		
22:41:55	2.6414		108.07	
22:42: 3	2.6436	37852.34		
22:42:57	2.6586		108.09	
22:43: 4	2.6606	37850.43		
22:43:58	2.6756		108.12	
22:44: 4	2.6772	37848.42		
22:44:59	2.6925		108.14	
22:45: 6	2.6944	37846.29		
22:46: 1	2.7097		108.16	
22:46: 6	2.7111	37844.35		
22:47: 1	2.7264		108.18	
22:47: 8	2.7283	37842.27		
22:48: 2	2.7433		108.21	
22:48:10	2.7456	37840.43		
22:49: 3	2.7603		108.23	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
22:49:10	2.7622	37838.55		
22:50: 5	2.7775		108.24	
22:50:11	2.7792	37836.14		
22:51: 6	2.7944		108.26	
22:51:12	2.7961	37834.35		
22:52: 8	2.8117		108.29	
22:52:15	2.8136	37832.44		
22:53: 9	2.8286		108.31	
22:53:15	2.8303	37830.40		
22:54: 9	2.8453		108.33	
22:54:17	2.8475	37828.50		
22:55:12	2.8628		108.35	
22:55:18	2.8644	37826.49		
22:56:13	2.8797		108.37	
22:56:18	2.8811	37824.64		
22:57:13	2.8964		108.39	
22:57:21	2.8986	37822.50		
22:58:15	2.9136		108.42	
22:58:21	2.9153	37820.75		
22:59:15	2.9303		108.43	
22:59:22	2.9322	37818.71		
23: 0:17	2.9475		108.45	
23: 0:24	2.9494	37816.85		
23: 1:19	2.9647		108.47	
23: 1:25	2.9664	37814.88		
23: 2:20	2.9817		108.49	
23: 2:26	2.9833	37813.00		
23: 3:20	2.9983		108.52	
23: 3:28	3.0006	37811.15		
23: 4:21	3.0153		108.54	
23: 4:29	3.0175	37809.25		
23: 5:24	3.0328		108.55	
23: 5:29	3.0342	37807.48		
23: 6:25	3.0497		108.58	
23: 6:30	3.0511	37805.52		
23: 7:26	3.0667		108.60	
23: 7:33	3.0686	37803.62		
23: 8:27	3.0836		108.62	
23: 8:34	3.0856	37801.91		
23: 9:28	3.1006		108.64	
23: 9:35	3.1025	37800.21		
23:10:30	3.1178		108.66	
23:10:36	3.1194	37798.12		
23:11:31	3.1347		108.67	
23:11:36	3.1361	37796.32		
23:12:31	3.1514		108.69	
23:12:39	3.1536	37794.48		
23:13:32	3.1683		108.71	
23:13:40	3.1706	37792.75		
23:14:34	3.1856		108.74	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
23:14:40	3.1872	37791.09		
23:15:35	3.2025		108.76	
23:15:41	3.2042	37789.13		
23:16:37	3.2197		108.77	
23:16:43	3.2214	37787.46		
23:17:38	3.2367		108.79	
23:17:44	3.2383	37785.70		
23:18:39	3.2536		108.81	
23:18:46	3.2556	37783.89		
23:19:39	3.2703		108.84	
23:19:47	3.2725	37782.18		
23:20:42	3.2878		108.85	
23:20:48	3.2894	37780.29		
23:21:43	3.3047		108.87	
23:21:48	3.3061	37778.73		
23:22:43	3.3214		108.89	
23:22:51	3.3236	37776.97		
23:23:45	3.3386		108.91	
23:23:51	3.3403	37775.08		
23:24:45	3.3553		108.93	
23:24:52	3.3572	37773.40		
23:25:48	3.3728		108.94	
23:25:54	3.3744	37771.66		
23:26:49	3.3897		108.96	
23:26:54	3.3911	37769.82		
23:27:49	3.4064		108.98	
23:27:57	3.4086	37768.14		
23:28:50	3.4233		109.00	
23:28:58	3.4256	37766.53		
23:29:52	3.4406		109.02	
23:29:59	3.4425	37764.77		
23:30:54	3.4578		109.04	
23:30:59	3.4592	37763.01		
23:31:55	3.4747		109.05	
23:32: 1	3.4764	37761.53		
23:32:56	3.4917		109.07	
23:33: 3	3.4936	37759.75		
23:33:56	3.5083		109.09	
23:34: 3	3.5103	37758.05		
23:34:57	3.5253		109.11	
23:35: 5	3.5275	37756.48		
23:36: 0	3.5428		109.13	
23:36: 5	3.5442	37754.78		
23:37: 0	3.5594		109.14	
23:37: 6	3.5611	37753.08		
23:38: 1	3.5764		109.16	
23:38: 9	3.5786	37751.46		
23:39: 3	3.5936		109.18	
23:39: 9	3.5953	37749.74		
23:40: 4	3.6106		109.20	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
23:40:10	3.6122	37748.38		
23:41: 6	3.6278		109.21	
23:41:12	3.6294	37746.54		
23:42: 7	3.6447		109.23	
23:42:13	3.6464	37744.87		
23:43: 8	3.6617		109.25	
23:43:15	3.6636	37743.24		
23:44: 8	3.6783		109.27	
23:44:16	3.6806	37741.73		
23:45:10	3.6956		109.29	
23:45:16	3.6972	37740.00		
23:46:11	3.7125		109.30	
23:46:17	3.7142	37738.51		
23:47:12	3.7294		109.32	
23:47:19	3.7314	37737.06		
23:48:14	3.7467		109.34	
23:48:20	3.7483	37735.29		
23:49:14	3.7633		109.36	
23:49:21	3.7653	37733.79		
23:50:15	3.7803		109.38	
23:50:23	3.7825	37732.21		
23:51:18	3.7978		109.39	
23:51:24	3.7994	37730.42		
23:52:19	3.8147		109.41	
23:52:24	3.8161	37728.96		
23:53:19	3.8314		109.42	
23:53:27	3.8336	37727.23		
23:54:21	3.8486		109.44	
23:54:28	3.8506	37725.92		
23:55:22	3.8656		109.46	
23:55:28	3.8672	37724.37		
23:56:23	3.8825		109.48	
23:56:30	3.8844	37722.84		
23:57:25	3.8997		109.49	
23:57:31	3.9014	37721.32		
23:58:25	3.9164		109.51	
23:58:32	3.9183	37719.62		
23:59:26	3.9333		109.53	
23:59:34	3.9356	37718.08		
0: 0:28	3.9506		109.55	
0: 0:34	3.9522	37716.86		
0: 1:29	3.9675		109.56	
0: 1:35	3.9692	37715.19		
0: 2:30	3.9844		109.58	
0: 2:37	3.9864	37713.69		
0:13:35	4.1692		109.75	
0:13:57	4.1753	37696.22		
0:23:33	4.3353		109.90	
0:23:54	4.3411	37682.15		
0:33:30	4.5011		110.04	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
0:33:51	4.5069	37668.37		
0:43:29	4.6675		110.18	
0:43:49	4.6731	37655.23		
0:53:26	4.8333		110.32	
0:53:46	4.8389	37642.27		
1: 3:23	4.9992		110.50	
1: 3:45	5.0053	37630.42		
1:13:21	5.1653		110.57	
1:13:41	5.1708	37617.32		
1:23:18	5.3311		110.69	
1:23:39	5.3369	37605.30		
1:33:17	5.4975		110.80	
1:33:37	5.5031	37593.60		
1:43:14	5.6633		110.92	
1:43:34	5.6689	37582.07		
1:53:11	5.8292		111.03	
1:53:33	5.8353	37570.81		
2: 3: 9	5.9953		111.13	
2: 3:30	6.0011	37559.84		
2:13: 6	6.1611		111.23	
2:13:27	6.1669	37548.94		
2:23: 5	6.3275		111.34	
2:23:25	6.3331	37538.39		
2:33: 1	6.4931		111.43	
2:33:23	6.4992	37527.94		
2:42:59	6.6592		111.52	
2:43:21	6.6653	37517.62		
2:52:57	6.8253		111.62	
2:53:18	6.8311	37507.77		
3: 2:54	6.9911		111.70	
3: 3:15	6.9969	37497.92		
3:12:53	7.1575		111.79	
3:13:13	7.1631	37488.29		
3:22:49	7.3231		111.88	
3:23:10	7.3289	37478.85		
3:32:48	7.4894		111.96	
3:33: 9	7.4953	37469.45		
3:42:45	7.6553		112.04	
3:43: 5	7.6608	37460.23		
3:52:42	7.8211		112.12	
3:53: 4	7.8272	37451.16		
4: 2:40	7.9872		112.19	
4: 3: 0	7.9928	37442.29		
4:12:37	8.1531		112.27	
4:12:58	8.1589	37433.47		
4:22:36	8.3194		112.35	
4:22:56	8.3250	37424.81		
4:32:33	8.4853		112.42	
4:32:53	8.4908	37416.30		
4:42:30	8.6511		112.49	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
4:42:52	8.6572	37407.83		
4:52:29	8.8175		112.56	
4:52:49	8.8231	37399.46		
5: 2:25	8.9831		112.62	
5: 2:46	8.9889	37391.32		
5:12:24	9.1494		112.69	
5:12:45	9.1553	37383.14		
5:22:21	9.3153		112.75	
5:22:41	9.3208	37375.31		
5:32:18	9.4811		112.82	
5:32:40	9.4872	37367.32		
5:42:17	9.6475		112.87	
5:42:37	9.6531	37359.47		
5:52:14	9.8133		112.94	
5:52:34	9.8189	37352.84		
6: 2:12	9.9794		113.00	
6: 2:33	9.9853	37344.09		
6:12: 9	10.1453		113.06	
6:12:29	10.1508	37336.59		
6:22: 6	10.3111		113.12	
6:22:28	10.3172	37329.07		
6:32: 5	10.4775		113.17	
6:32:25	10.4831	37321.63		
6:42: 1	10.6431		113.23	
6:42:22	10.6489	37314.42		
6:52: 0	10.8094		113.29	
6:52:21	10.8153	37307.21		
7: 1:56	10.9750		113.34	
7: 2:17	10.9808	37299.98		
7:11:54	11.1411		113.39	
7:12:16	11.1472	37292.90		
8:32:31	12.4847		113.70	
8:32:33	12.4853	37239.77		
8:32:45	12.4886		113.72	
8:32:41	12.4875	37239.88		
8:32:45	12.4886		113.72	
8:32:48	12.4894	37239.49		
8:43:43	12.6714		113.83	
8:44: 3	12.6769	37231.28		
8:53:39	12.8369		113.87	
8:54: 1	12.8431	37224.42		
9: 3:38	13.0033		113.91	
9: 3:58	13.0089	37217.89		
9:13:35	13.1692		113.96	
9:13:55	13.1747	37211.47		
9:23:33	13.3353		114.00	
9:23:54	13.3411	37205.11		
9:33:30	13.5011		114.04	
9:33:51	13.5069	37198.94		
9:43:27	13.6669		114.08	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
9:43:49	13.6731	37192.86		
9:53:26	13.8333		114.22	
9:53:46	13.8389	37187.96		
10: 3:23	13.9992		114.16	
10: 3:43	14.0047	37180.56		
10:13:21	14.1653		114.20	
10:13:41	14.1708	37174.59		
10:23:18	14.3311		114.24	
10:23:39	14.3369	37168.61		
10:33:15	14.4969		114.28	
10:33:37	14.5031	37162.63		
10:43:14	14.6633		114.32	
10:43:34	14.6689	37156.72		
10:53:11	14.8292		114.35	
10:53:31	14.8347	37150.90		
11: 3: 9	14.9953		114.45	
11: 3:30	15.0011	37145.94		
11:13: 6	15.1611		114.43	
11:13:27	15.1669	37139.36		
11:23: 4	15.3272		114.47	
11:23:25	15.3331	37133.61		
11:33: 1	15.4931		114.51	
11:33:23	15.4992	37128.03		
11:42:59	15.6592		114.54	
11:43:20	15.6650	37122.34		
11:52:57	15.8253		114.57	
11:53:18	15.8311	37116.74		
12: 2:54	15.9911		114.60	
12: 3:15	15.9969	37111.16		
12:12:52	16.1572		114.63	
12:13:13	16.1631	37105.54		
12:22:49	16.3231		114.66	
12:23:10	16.3289	37100.03		
12:32:48	16.4894		114.69	
12:33: 8	16.4950	37094.63		
12:42:45	16.6553		114.72	
12:43: 5	16.6608	37089.11		
12:52:42	16.8211		114.76	
12:53: 4	16.8272	37083.83		
13: 2:40	16.9872		114.77	
13: 3: 0	16.9928	37078.23		
13:12:37	17.1531		114.81	
13:12:58	17.1589	37072.98		
13:22:36	17.3194		114.84	
13:22:56	17.3250	37067.70		
13:32:33	17.4853		114.87	
13:32:53	17.4908	37062.49		
13:42:30	17.6511		114.90	
13:42:52	17.6572	37057.29		
13:52:28	17.8172		114.93	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
13:52:49	17.8231	37052.17		
14: 2:25	17.9831		114.96	
14: 2:46	17.9889	37046.92		
14:12:24	18.1494		114.99	
14:12:44	18.1550	37041.91		
14:22:21	18.3153		115.02	
14:22:41	18.3208	37036.86		
14:32:18	18.4811		115.05	
14:32:40	18.4872	37031.84		
14:42:16	18.6472		115.07	
14:42:37	18.6531	37026.79		
14:52:14	18.8133		115.10	
14:52:34	18.8189	37021.83		
15: 2:12	18.9794		115.13	
15: 2:32	18.9850	37016.88		
15:12: 9	19.1453		115.15	
15:12:29	19.1508	37011.86		
15:22: 6	19.3111		115.18	
15:22:28	19.3172	37006.94		
15:32: 4	19.4772		115.20	
15:32:25	19.4831	37002.08		
15:42: 1	19.6431		115.23	
15:42:22	19.6489	36997.19		
15:52: 0	19.8094		115.26	
15:52:20	19.8150	36992.28		
16: 1:56	19.9750		115.29	
16: 2:17	19.9808	36987.46		
16:11:54	20.1411		115.31	
16:12:16	20.1472	36982.58		
16:21:52	20.3072		115.33	
16:22:13	20.3131	36977.61		
16:31:49	20.4731		115.36	
16:32:10	20.4789	36973.04		
16:41:48	20.6394		115.38	
16:42: 8	20.6450	36968.19		
16:51:45	20.8053		115.41	
16:52: 5	20.8108	36963.55		
17: 1:42	20.9711		115.43	
17: 2: 4	20.9772	36958.86		
17:11:40	21.1372		115.45	
17:12: 1	21.1431	36954.23		
17:21:38	21.3033		115.48	
17:21:58	21.3089	36949.47		
17:31:36	21.4694		115.51	
17:31:56	21.4750	36945.04		
17:41:33	21.6353		115.53	
17:41:54	21.6411	36940.45		
17:51:30	21.8011		115.56	
17:51:52	21.8072	36935.89		
18: 1:28	21.9672		115.58	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
18: 1:49	21.9731	36931.33		
18:11:25	22.1331		115.61	
18:11:46	22.1389	36926.84		
18:21:24	22.2994		115.63	
18:21:44	22.3050	36922.39		
18:31:21	22.4653		115.65	
18:31:41	22.4708	36917.96		
18:41:18	22.6311		115.67	
18:41:40	22.6372	36913.50		
18:51:16	22.7972		115.69	
18:51:37	22.8031	36909.06		
19: 1:13	22.9631		115.71	
19: 1:34	22.9689	36904.64		
19:11:12	23.1294		115.74	
19:11:32	23.1350	36900.37		
19:21: 8	23.2950		115.76	
19:21:29	23.3008	36895.89		
19:31: 6	23.4611		115.78	
19:31:28	23.4672	36891.62		
19:41: 4	23.6272		115.80	
19:41:24	23.6328	36903.28		
19:51: 1	23.7931		115.83	
19:51:23	23.7992	36883.06		
20: 1: 0	23.9594		115.84	
20: 1:20	23.9650	36878.74		
20:10:56	24.1250		115.86	
20:11:17	24.1308	36874.49		
20:20:55	24.2914		115.88	
20:21:16	24.2972	36870.15		
20:30:52	24.4572		115.90	
20:31:13	24.4631	36865.93		
20:40:49	24.6231		115.92	
20:41:11	24.6292	36861.69		
20:50:48	24.7894		115.95	
20:51: 8	24.7950	36857.55		
21: 0:44	24.9550		115.96	
21: 1: 5	24.9608	36853.33		
21:10:43	25.1214		115.98	
21:11: 4	25.1272	36849.19		
21:20:40	25.2872		115.99	
21:21: 0	25.2928	36844.98		
21:30:37	25.4531		116.01	
21:30:59	25.4592	36840.90		
21:40:36	25.6194		116.03	
21:40:56	25.6250	36836.91		
21:50:32	25.7850		116.05	
21:50:53	25.7908	36832.75		
22: 0:31	25.9514		116.07	
22: 0:51	25.9569	36828.70		
22:10:28	26.1172		116.09	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
22:10:48	26.1228	36824.65		
22:20:25	26.2831		116.09	
22:20:47	26.2892	36820.47		
22:30:24	26.4494		116.11	
22:30:44	26.4550	36816.44		
22:40:20	26.6150		116.12	
22:40:41	26.6208	36812.38		
22:50:19	26.7814		116.14	
22:50:39	26.7869	36808.41		
23: 0:16	26.9472		116.16	
23: 0:36	26.9528	36804.42		
23:10:13	27.1131		116.18	
23:10:35	27.1192	36800.52		
23:20:12	27.2794		116.20	
23:20:32	27.2850	36797.82		
23:30: 9	27.4453		116.21	
23:30:29	27.4508	36792.57		
23:40: 7	27.6114		116.22	
23:40:28	27.6172	36788.63		
23:50: 4	27.7772		116.24	
23:50:24	27.7828	36784.77		
0: 0: 1	27.9431		116.26	
0: 0:23	27.9492	36780.94		
0:10: 0	28.1094		116.28	
0:10:20	28.1150	36777.06		
0:19:56	28.2750		116.29	
0:20:17	28.2808	36773.23		
0:29:55	28.4414		116.38	
0:30:16	28.4472	36770.33		
0:39:51	28.6069		116.32	
0:40:13	28.6131	36765.55		
0:49:49	28.7731		116.34	
0:50:11	28.7792	36761.74		
0:59:48	28.9394		116.37	
1: 0: 8	28.9450	36758.00		
1: 9:44	29.1050		116.38	
1:10: 5	29.1108	36754.25		
1:19:43	29.2714		116.40	
1:20: 4	29.2772	36750.41		
1:29:40	29.4372		116.41	
1:30: 0	29.4428	36746.76		
1:39:37	29.6031		116.43	
1:39:59	29.6092	36743.04		
1:49:35	29.7692		116.44	
1:49:55	29.7747	36739.37		
1:59:32	29.9350		116.46	
1:59:53	29.9408	36735.65		
2: 9:31	30.1014		116.47	
2: 9:52	30.1072	36731.97		
2:19:28	30.2672		116.49	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
2:19:49	30.2731	36728.27		
2:29:25	30.4331		116.50	
2:29:47	30.4392	36726.93		
2:39:24	30.5994		116.52	
2:39:44	30.6050	36720.97		
2:49:20	30.7650		116.53	
2:49:41	30.7708	36717.36		
2:59:19	30.9314		116.55	
2:59:40	30.9372	36713.70		
3: 9:15	31.0969		116.57	
3: 9:36	31.1028	36710.13		
3:19:14	31.2633		116.58	
3:19:35	31.2692	36706.60		
3:29:12	31.4294		116.59	
3:29:31	31.4347	36703.01		
3:39: 8	31.5950		116.61	
3:39:30	31.6011	36699.39		
3:49: 6	31.7611		116.63	
3:49:28	31.7672	36695.85		
3:59: 3	31.9269		116.64	
3:59:24	31.9328	36692.28		
4: 9: 2	32.0933		116.66	
4: 9:23	32.0992	36688.81		
4:18:59	32.2592		116.67	
4:19:19	32.2647	36685.34		
4:28:56	32.4250		116.69	
4:29:18	32.4311	36681.81		
4:38:54	32.5911		116.70	
4:39:15	32.5969	36678.37		
4:48:51	32.7569		116.72	
4:49:12	32.7628	36674.87		
4:58:50	32.9233		116.73	
4:59:10	32.9289	36671.37		
5: 8:48	33.0894		116.75	
5: 9: 8	33.0950	36667.98		
5:18:44	33.2550		116.76	
5:19: 6	33.2611	36664.47		
5:28:43	33.4214		116.78	
5:29: 4	33.4272	36661.13		
5:38:39	33.5869		116.79	
5:39: 0	33.5928	36657.72		
5:48:38	33.7533		116.81	
5:48:59	33.7592	36654.26		
5:58:35	33.9192		116.82	
5:58:55	33.9247	36650.96		
6: 8:32	34.0850		116.83	
6: 8:54	34.0911	36647.48		
6:18:31	34.2514		116.84	
6:18:51	34.2569	36644.17		
6:28:27	34.4169		116.86	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
6:28:48	34.4228	36640.81		
6:38:26	34.5833		116.87	
6:38:46	34.5889	36637.44		
6:48:23	34.7492		116.88	
6:48:43	34.7547	36634.14		
6:58:20	34.9150		116.89	
6:58:42	34.9211	36630.72		
7: 8:19	35.0814		116.90	
7: 8:39	35.0869	36627.34		
7:18:15	35.2469		116.92	
7:18:36	35.2528	36624.03		
7:28:14	35.4133		116.93	
7:28:34	35.4189	36620.83		
7:38:11	35.5792		116.94	
7:38:31	35.5847	36617.52		
7:48: 8	35.7450		116.96	
7:48:30	35.7511	36614.30		
7:58: 6	35.9111		116.98	
7:58:27	35.9169	36611.03		
8: 8: 4	36.0772		116.99	
8: 8:24	36.0828	36607.78		
8:18: 2	36.2433		117.00	
8:18:23	36.2492	36604.55		
8:27:59	36.4092		117.01	
8:28:19	36.4147	36601.31		
8:37:56	36.5750		117.03	
8:38:18	36.5811	36599.59		
8:47:55	36.7414		117.04	
8:48:15	36.7469	36594.89		
8:57:51	36.9069		117.05	
8:58:12	36.9128	36591.67		
9: 7:50	37.0733		117.06	
9: 8:11	37.0792	36588.45		
9:17:48	37.2394		117.07	
9:18: 8	37.2450	36585.27		
9:27:44	37.4050		117.09	
9:28: 6	37.4111	36577.96		
9:37:43	37.5714		117.12	
9:38: 3	37.5769	36573.79		
9:47:39	37.7369		117.14	
9:48: 0	37.7428	36570.55		
9:57:38	37.9033		117.15	
9:57:59	37.9092	36567.24		
10: 7:35	38.0692		117.17	
10: 7:55	38.0747	36564.25		
10:17:32	38.2350		117.18	
10:17:54	38.2411	36560.92		
10:27:30	38.4011		117.20	
10:27:51	38.4069	36557.81		
10:37:27	38.5669		117.21	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
10:37:48	38.5728	36554.71		
10:47:26	38.7333		117.22	
10:47:46	38.7389	36551.69		
10:57:23	38.8992		117.30	
10:57:43	38.9047	36549.39		
11: 7:21	39.0653		117.25	
11: 7:42	39.0711	36545.45		
11:17:19	39.2314		117.26	
11:17:40	39.2372	36542.36		
11:27:15	39.3969		117.27	
11:27:37	39.4031	36539.30		
11:37:14	39.5633		117.29	
11:37:34	39.5689	36536.25		
12:21: 4	40.2939		117.31	
12:21:24	40.2994	36523.25		
12:41:25	40.6331		117.36	
12:41:46	40.6389	36516.74		
12:51:22	40.7989		117.36	
12:51:43	40.8047	36513.68		
13: 1:19	40.9647		117.37	
13: 1:41	40.9708	36510.75		
13:11:18	41.1311		117.39	
13:11:38	41.1367	36507.67		
13:21:14	41.2967		117.40	
13:21:35	41.3025	36504.78		
13:31:13	41.4631		117.41	
13:31:34	41.4689	36501.75		
13:41:10	41.6289		117.42	
13:41:30	41.6344	36498.74		
13:51: 7	41.7947		117.43	
13:51:29	41.8008	36495.87		
14: 1: 6	41.9611		117.44	
14: 1:26	41.9667	36492.82		
14:11: 2	42.1267		117.45	
14:11:23	42.1325	36491.01		
14:21: 1	42.2931		117.47	
14:21:22	42.2989	36488.24		
14:30:58	42.4589		117.48	
14:31:18	42.4644	36484.19		
14:40:56	42.6250		117.49	
14:41:17	42.6308	36481.32		
14:50:54	42.7911		117.50	
14:51:14	42.7967	36478.58		
15: 0:50	42.9567		117.51	
15: 1:12	42.9628	36475.66		
15:10:49	43.1231		117.52	
15:11:10	43.1289	36472.64		
15:20:45	43.2886		117.53	
15:21: 6	43.2944	36469.92		
15:30:44	43.4550		117.54	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
15:31: 5	43.4608	36467.19		
15:40:41	43.6208		117.55	
15:41: 1	43.6264	36464.26		
15:50:38	43.7867		117.56	
15:51: 0	43.7928	36461.39		
16: 0:36	43.9528		117.57	
16: 0:57	43.9586	36458.54		
16:10:33	44.1186		117.58	
16:10:54	44.1244	36455.67		
16:20:32	44.2850		117.59	
16:20:53	44.2908	36452.71		
16:30:29	44.4508		117.60	
16:30:49	44.4564	36449.98		
16:40:26	44.6167		117.61	
16:40:48	44.6228	36447.20		
16:50:24	44.7828		117.63	
16:50:45	44.7886	36444.34		
17: 0:21	44.9486		117.64	
17: 0:42	44.9544	36441.45		
17:10:20	45.1150		117.65	
17:10:41	45.1208	36438.54		
17:20:18	45.2811		117.66	
17:20:38	45.2867	36435.77		
17:30:14	45.4467		117.67	
17:30:36	45.4528	36433.24		
17:40:13	45.6131		117.68	
17:40:34	45.6189	36430.31		
17:50: 9	45.7786		117.68	
17:50:30	45.7844	36427.44		
18: 0: 8	45.9450		117.70	
18: 0:29	45.9508	36424.65		
18:10: 5	46.1108		117.71	
18:10:25	46.1164	36421.94		
18:20: 2	46.2767		117.71	
18:20:24	46.2828	36419.07		
18:30: 1	46.4431		117.72	
18:30:21	46.4486	36416.40		
18:39:57	46.6086		117.73	
18:40:18	46.6144	36413.62		
18:49:56	46.7750		117.75	
18:50:16	46.7806	36410.99		
18:59:53	46.9408		117.76	
19: 0:13	46.9464	36408.17		
19: 9:50	47.1067		117.77	
19:10:12	47.1128	36405.46		
19:19:49	47.2731		117.78	
19:20: 9	47.2786	36402.74		
19:29:45	47.4386		117.79	
19:30: 6	47.4444	36400.09		
19:39:44	47.6050		117.79	

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DATA FILE: 6

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
19:40: 5	47.6108	36397.29		
19:49:41	47.7708		117.80	
19:50: 1	47.7764	36394.55		
19:59:38	47.9367		117.81	
20: 0: 0	47.9428	36391.96		
20: 9:37	48.1031		117.82	
20: 9:58	48.1089	36389.24		
20:19:34	48.2689		117.84	
20:19:54	48.2744	36386.62		
20:29:32	48.4350		117.85	
20:29:53	48.4408	36383.87		
20:39:29	48.6008		117.84	
20:39:49	48.6064	36381.03		
20:49:26	48.7667		117.86	
20:49:48	48.7728	36378.42		
20:59:25	48.9331		117.87	
20:59:45	48.9386	36375.69		
21: 9:21	49.0986		117.88	
21: 9:42	49.1044	36373.06		
21:19:20	49.2650		117.97	
21:19:41	49.2708	36371.57		
21:29:18	49.4311		117.90	
21:29:38	49.4367	36367.77		
21:39:14	49.5967		117.90	
21:39:36	49.6028	36365.21		
21:49:13	49.7631		117.91	
21:49:33	49.7686	36362.57		
21:59: 9	49.9286		117.92	
21:59:30	49.9344	36359.93		
22: 9: 8	50.0950		117.93	
22: 9:29	50.1008	36357.28		
22:19: 5	50.2608		117.94	
22:19:25	50.2664	36354.67		
22:29: 3	50.4269		117.95	
22:29:24	50.4328	36352.07		
22:39: 0	50.5928		117.96	
22:39:21	50.5986	36349.49		
22:48:57	50.7586		117.96	
22:49:19	50.7647	36346.87		
22:58:55	50.9247		117.97	
22:59:16	50.9306	36344.24		
23: 8:53	51.0908		117.98	
23: 9:13	51.0964	36341.65		
23:18:51	51.2569		117.99	
23:19:12	51.2628	36339.11		
23:28:48	51.4228		118.00	
23:29: 9	51.4286	36336.57		
23:38:45	51.5886		118.01	
23:39: 7	51.5947	36334.03		
23:48:44	51.7550		118.02	

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DATA FILE: 7

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
23:49: 4	51.7606	36331.41		
23:58:41	51.9208		118.03	
23:59: 1	51.9264	36328.92		
0: 8:39	52.0869		118.03	
0: 9: 0	52.0928	36326.45		
0:18:36	52.2528		118.04	
0:18:57	52.2586	36323.84		
0:28:33	52.4186		118.05	
0:28:55	52.4247	36321.28		
0:38:31	52.5847		118.06	
0:38:52	52.5906	36318.75		
0:48:29	52.7508		118.07	
0:48:49	52.7564	36316.35		
0:58:27	52.9169		118.07	
0:58:48	52.9228	36313.81		
1: 8:24	53.0828		118.11	
1: 8:45	53.0886	36311.79		
1:18:21	53.2486		118.09	
1:18:43	53.2547	36308.80		
1:28:19	53.4147		118.10	
1:28:40	53.4206	36306.32		
1:38:17	53.5808		118.11	
1:38:37	53.5864	36303.75		
1:48:15	53.7469		118.11	
1:48:35	53.7525	36301.32		
1:58:12	53.9128		118.12	
1:58:33	53.9186	36298.95		
2: 8: 9	54.0786		118.13	
2: 8:31	54.0847	36296.44		
2:18: 8	54.2450		118.14	
2:18:29	54.2508	36293.93		
2:28: 5	54.4108		118.15	
2:28:25	54.4164	36291.46		
2:38: 3	54.5769		118.16	
2:38:24	54.5828	36288.97		
2:48: 0	54.7428		118.16	
2:48:21	54.7486	36297.64		
2:57:57	54.9086		118.17	
2:58:19	54.9147	36284.13		
3: 7:56	55.0750		118.18	
3: 8:16	55.0806	36281.63		
3:17:53	55.2408		118.19	
3:18:13	55.2464	36279.22		
3:27:51	55.4069		118.20	
3:28:11	55.4125	36276.71		
3:37:48	55.5728		118.20	
3:38: 9	55.5786	36274.30		
3:47:45	55.7386		118.21	
3:48: 7	55.7447	36271.97		
3:57:44	55.9050		118.22	

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DATA FILE: 7

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
3:58: 4	55.9106	36269.48		
4: 7:41	56.0708		118.23	
4: 8: 1	56.0764	36267.15		
4:17:39	56.2369		118.24	
4:18: 0	56.2428	36264.74		
4:27:36	56.4028		118.25	
4:27:57	56.4086	36262.40		
4:37:33	56.5686		118.26	
4:37:55	56.5747	36259.96		
4:47:31	56.7347		118.27	
4:47:52	56.7406	36257.58		
4:57:29	56.9008		118.27	
4:57:49	56.9064	36255.24		
5: 7:27	57.0669		118.28	
5: 7:48	57.0728	36252.87		
5:18:14	57.2467		118.29	
5:18:20	57.2483	36251.67		
5:19:26	57.2667		118.28	
5:19:22	57.2656	36251.02		
5:20:17	57.2808		118.28	
5:20:23	57.2825	36250.72		
5:21:18	57.2978		118.29	
5:21:25	57.2997	36250.68		
5:22:18	57.3144		118.29	
5:22:26	57.3167	36250.45		
5:23:21	57.3319		118.29	
5:23:26	57.3333	36250.20		
5:24:31	57.3514		118.29	
5:24:27	57.3503	36250.02		
5:25:23	57.3658		118.29	
5:25:30	57.3678	36249.51		
5:25:23	57.3658		118.29	
5:25:30	57.3678	36249.51		
5:26:24	57.3828		118.29	
5:26:30	57.3844	36249.38		
5:36:58	57.5589		118.29	
5:37:19	57.5647	36245.80		
5:46:55	57.7247		118.30	
5:47:15	57.7303	36243.44		
5:56:52	57.8906		118.31	
5:57:14	57.8967	36241.06		
6: 6:51	58.0569		118.31	
6: 7:11	58.0625	36238.71		
6:16:47	58.2225		118.33	
6:17: 8	58.2283	36236.33		
6:26:46	58.3889		118.33	
6:27: 6	58.3944	36234.02		
6:36:43	58.5547		118.34	
6:37: 3	58.5603	36231.65		
6:46:40	58.7206		118.34	

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DATA FILE: 7

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
6:47: 2	58.7267	36229.30		
6:56:39	58.8869		118.35	
6:56:59	58.8925	36227.02		
7: 6:35	59.0525		118.36	
7: 6:56	59.0583	36224.74		
7:16:34	59.2189		118.36	
7:16:54	59.2244	36222.34		
7:26:30	59.3844		118.37	
7:26:51	59.3903	36220.04		
7:36:28	59.5506		118.38	
7:36:50	59.5567	36217.68		
7:46:26	59.7167		118.38	
7:46:46	59.7222	36215.31		
7:56:23	59.8825		118.39	
7:56:44	59.8883	36213.04		
8: 6:22	60.0489		118.40	
8: 6:43	60.0547	36210.75		
8:16:19	60.2147		118.41	
8:16:39	60.2203	36208.39		
8:26:16	60.3806		118.42	
8:26:38	60.3867	36206.09		
8:36:15	60.5469		118.43	
8:36:35	60.5525	36203.86		
8:46:11	60.7125		118.43	
8:46:32	60.7183	36201.48		
8:56:10	60.8789		118.44	
8:56:31	60.8847	36199.29		
9: 6: 7	61.0447		118.44	
9: 6:28	61.0506	36196.98		
9:16: 4	61.2106		118.45	
9:16:26	61.2167	36194.74		
9:26: 3	61.3769		118.46	
9:26:23	61.3825	36192.43		
10:16:30	62.2178		118.44	
9:26:23	61.3825	36192.43		
10:16:30	62.2178		118.45	
10:16:32	62.2183	36200.61		
10:16:36	62.2194		118.50	
10:16:32	62.2183	36200.60		
10:16:36	62.2194		118.50	
10:16:39	62.2203	36182.20		
10:16:50	62.2233		118.50	
10:16:39	62.2203	36182.20		
10:29:24	62.4328		118.50	
10:29:45	62.4386	36178.01		
10:39:20	62.5983		118.50	
10:39:41	62.6042	36175.82		
10:49:19	62.7647		118.51	
10:49:40	62.7706	36184.65		
10:59:16	62.9306		118.52	

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DATA FILE: 7

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
10:59:36	62.9361	36171.28		
11: 9:13	63.0964		118.52	
11: 9:35	63.1025	36169.03		
11:19:12	63.2628		118.53	
11:19:33	63.2686	36166.81		
11:29: 9	63.4286		118.54	
11:29:29	63.4342	36164.56		
11:39: 7	63.5947		118.55	
11:39:28	63.6006	36162.33		
11:49: 4	63.7606		118.55	
11:49:24	63.7661	36160.49		

COMPANY: OILSERV AUSTRALIA LTD

CLIENT: SANTOS LTD

GAUGE NUMBER: 73864

WELL NAME: MOORARI

WELL NUMBER: 3 LOWER

TEST NUMBER:

LOCATION: COOPER BASIN

TEST OPERATOR: P.ALDRICH

COMMENTS: STABLE INJECTION WITH PRESSURE FALL-OFF

POSITION	GAUGE SERIAL NUMBER
1	
2	
3	
4	

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DATA FILE: 1

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
12:10:26	0.0000		46.57	
12:10:30	0.0011	29199.73		
12:10:58	0.0089		48.87	
12:11: 0	0.0094	29194.94		
12:11:24	0.0161		47.72	
12:11:29	0.0175	29252.85		
12:11:54	0.0244		48.14	
12:11:56	0.0250	29271.17		
12:12:23	0.0325		44.04	
12:12:25	0.0331	29232.02		
12:12:50	0.0400		45.31	
12:12:54	0.0411	29245.60		
12:13:19	0.0481		44.27	
12:13:24	0.0494	29234.99		
12:13:48	0.0561		45.83	
12:13:53	0.0575	29251.40		
12:14:18	0.0644		45.75	
12:14:20	0.0650	29250.39		
12:14:47	0.0725		45.31	
12:14:49	0.0731	29245.06		
12:15:14	0.0800		46.57	
12:15:18	0.0811	29266.36		
12:15:43	0.0881		46.16	
12:15:47	0.0892	29262.99		
12:16:12	0.0961		46.11	
12:16:16	0.0972	29263.84		
12:16:41	0.1042		47.43	
12:16:44	0.1050	29278.62		
12:17:11	0.1125		45.93	
12:17:13	0.1131	29264.30		
12:17:38	0.1200		48.14	
12:17:43	0.1214	29282.58		
12:18: 8	0.1283		47.83	
12:18:11	0.1292	29276.52		
12:18:36	0.1361		46.97	
12:18:41	0.1375	29342.67		
12:19: 6	0.1444		46.73	
12:19: 9	0.1453	29274.63		
12:19:35	0.1525		45.17	
12:19:37	0.1531	29260.59		
12:20: 2	0.1600		44.02	
12:20: 6	0.1611	29249.37		
12:20:31	0.1681		44.88	
12:20:35	0.1692	29259.58		
12:21: 0	0.1761		46.27	
12:21: 5	0.1775	29274.34		
12:21:30	0.1844		46.36	
12:21:33	0.1853	29275.78		
12:21:59	0.1925		44.51	
12:22: 1	0.1931	29253.13		

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DATA FILE: 1

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
12:22:26	0.2000		46.15	
12:22:30	0.2011	29265.87		
12:22:55	0.2081		48.37	
12:22:59	0.2092	29288.55		
12:23:24	0.2161		46.46	
12:23:29	0.2175	29251.67		
12:23:54	0.2244		47.09	
12:23:57	0.2253	29275.77		
12:24:23	0.2325		45.47	
12:24:25	0.2331	29261.18		
12:24:50	0.2400		43.70	
12:24:54	0.2411	29243.22		
12:25:19	0.2481		46.98	
12:25:23	0.2492	29273.13		
12:25:48	0.2561		43.40	
12:25:53	0.2575	29237.94		
12:26:18	0.2644		44.53	
12:26:21	0.2653	29252.80		
12:26:46	0.2722		44.29	
12:26:49	0.2731	29246.11		
12:27:14	0.2800		44.25	
12:27:18	0.2811	29206.57		
12:27:43	0.2881		44.40	
12:27:47	0.2892	29199.39		
12:28:12	0.2961		45.82	
12:28:16	0.2972	29190.61		
12:28:41	0.3042		46.05	
12:28:45	0.3053	29226.81		
12:29:11	0.3125		45.26	
12:29:13	0.3131	29225.30		
12:29:38	0.3200		45.58	
12:29:42	0.3211	29231.04		
12:30: 7	0.3281		44.56	
12:30:11	0.3292	29222.91		
12:30:36	0.3361		45.71	
12:30:41	0.3375	29237.58		
12:31: 6	0.3444		45.94	
12:31: 9	0.3453	29243.15		
12:31:35	0.3525		45.77	
12:31:37	0.3531	29243.81		
12:32: 2	0.3600		42.92	
12:32: 6	0.3611	29220.56		
12:32:31	0.3681		43.27	
12:32:35	0.3692	29228.01		
12:33: 0	0.3761		45.40	
12:33: 5	0.3775	29250.10		
12:33:30	0.3844		44.23	
12:33:33	0.3853	29242.58		
12:33:59	0.3925		43.82	
12:34: 1	0.3931	29239.94		

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DATA FILE: 1

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
12:34:26	0.4000		48.16	
12:34:30	0.4011	29281.49		
12:34:55	0.4081		48.62	
12:34:59	0.4092	29288.64		
12:35:24	0.4161		45.92	
12:35:29	0.4175	29262.94		
12:35:54	0.4244		46.02	
12:35:57	0.4253	29260.38		
12:36:23	0.4325		46.18	
12:36:25	0.4331	29263.85		
12:36:50	0.4400		43.31	
12:36:54	0.4411	29236.12		
12:37:19	0.4481		48.46	
12:37:23	0.4492	29292.04		
12:37:48	0.4561		46.53	
12:37:53	0.4575	29270.61		
12:38:17	0.4642		44.00	
12:38:21	0.4653	29246.15		
12:38:46	0.4722		44.56	
12:38:49	0.4731	29241.56		
12:39:14	0.4800		44.79	
12:39:18	0.4811	29235.12		
12:39:43	0.4881		44.77	
12:39:47	0.4892	29234.27		
12:40:13	0.4964		44.96	
12:40:17	0.4975	29237.12		
12:40:41	0.5042		45.80	
12:40:45	0.5053	29245.17		
12:41:11	0.5125		45.78	
12:41:13	0.5131	29248.78		
12:41:39	0.5203		44.51	
12:41:42	0.5211	29239.70		
12:42: 7	0.5281		44.01	
12:42:11	0.5292	29235.70		
12:42:36	0.5361		44.26	
12:42:41	0.5375	29241.48		
12:43: 5	0.5442		44.98	
12:43: 9	0.5453	29253.37		
12:43:35	0.5525		43.11	
12:43:37	0.5531	29239.75		
12:44: 3	0.5603		45.50	
12:44: 6	0.5611	29269.71		
12:44:31	0.5681		43.42	
12:44:35	0.5692	29253.47		
12:45: 0	0.5761		45.03	
12:45: 4	0.5772	29271.98		
12:45:29	0.5842		44.45	
12:45:33	0.5853	29381.90		
12:45:59	0.5925		44.69	
12:46: 1	0.5931	29272.26		

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DATA FILE: 1

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
12:46:27	0.6003		43.21	
12:46:30	0.6011	29255.68		
12:46:55	0.6081		45.04	
12:46:59	0.6092	29276.06		
12:47:24	0.6161		45.35	
12:47:28	0.6172	29280.55		
12:47:53	0.6242		47.82	
12:47:57	0.6253	29306.64		
12:48:23	0.6325		43.84	
12:48:26	0.6333	29254.63		
12:48:51	0.6403		44.60	
12:48:54	0.6411	29261.49		
12:49:19	0.6481		44.43	
12:49:23	0.6492	29260.47		
12:49:48	0.6561		45.50	
12:49:52	0.6572	29267.74		
12:50:17	0.6642		45.57	
12:50:21	0.6653	29270.84		
12:50:46	0.6722		44.56	
12:50:50	0.6733	29262.24		
12:51:15	0.6803		44.80	
12:51:18	0.6811	29266.12		
12:51:43	0.6881		44.51	
12:51:48	0.6894	29266.19		
12:52:12	0.6961		46.03	
12:52:16	0.6972	29282.92		
12:52:41	0.7042		45.04	
12:52:45	0.7053	29274.26		
12:53:11	0.7125		46.37	
12:53:14	0.7133	29289.38		
12:53:39	0.7203		46.44	
12:53:42	0.7211	29289.29		
12:54: 7	0.7281		46.46	
12:54:11	0.7292	29291.17		
12:54:36	0.7361		46.50	
12:54:40	0.7372	29287.61		
12:55: 5	0.7442		46.29	
12:55: 9	0.7453	29287.59		
12:55:35	0.7525		45.20	
12:55:38	0.7533	29278.27		
12:56: 3	0.7603		47.20	
12:56: 6	0.7611	29300.48		
12:56:31	0.7681		44.05	
12:56:35	0.7692	29270.99		
12:57: 0	0.7761		45.03	
12:57: 4	0.7772	29281.02		
12:57:29	0.7842		44.64	
12:57:33	0.7853	29277.49		
12:57:59	0.7925		45.03	
12:58: 2	0.7933	29280.39		

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DATA FILE: 1

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
12:58:27	0.8003		44.07	
12:58:30	0.8011	29272.47		
12:58:55	0.8081		45.92	
12:58:59	0.8092	29291.43		
12:59:24	0.8161		45.92	
12:59:28	0.8172	29294.78		
12:59:53	0.8242		47.32	
12:59:57	0.8253	29308.43		
13: 0:23	0.8325		46.06	
13: 0:26	0.8333	29282.48		
13: 0:51	0.8403		44.76	
13: 0:54	0.8411	29266.71		
13: 1:19	0.8481		43.70	
13: 1:23	0.8492	29258.89		
13: 1:48	0.8561		45.28	
13: 1:52	0.8572	29276.19		
13: 2:17	0.8642		43.69	
13: 2:21	0.8653	29259.43		
13: 2:46	0.8722		44.73	
13: 2:50	0.8733	29276.04		
13: 3:15	0.8803		45.12	
13: 3:18	0.8811	29283.53		
13: 3:43	0.8881		46.09	
13: 3:47	0.8892	29293.16		
13: 4:12	0.8961		45.29	
13: 4:16	0.8972	29288.52		
13: 4:41	0.9042		44.91	
13: 4:45	0.9053	29283.64		
13: 5:10	0.9122		44.47	
13: 5:14	0.9133	29278.29		
13: 5:39	0.9203		44.42	
13: 5:42	0.9211	29279.29		
13: 6: 7	0.9281		46.84	
13: 6:11	0.9292	29305.91		
13: 6:36	0.9361		46.00	
13: 6:40	0.9372	29298.56		
13: 7: 5	0.9442		45.06	
13: 7: 9	0.9453	29290.91		
13: 7:34	0.9522		44.73	
13: 7:38	0.9533	29288.12		
13: 8: 3	0.9603		46.47	
13: 8: 6	0.9611	29307.20		
13: 8:31	0.9681		43.80	
13: 8:35	0.9692	29283.05		
13: 9: 0	0.9761		43.91	
13: 9: 4	0.9772	29286.10		
13: 9:29	0.9842		44.92	
13: 9:33	0.9853	29297.23		
13: 9:58	0.9922		44.71	
13:10: 2	0.9933	29298.50		

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DATA FILE: 1

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
13:10:27	1.0003		46.94	
13:10:30	1.0011	29320.84		
13:10:56	1.0083		46.36	
13:10:59	1.0092	29316.75		
13:11:24	1.0161		45.08	
13:11:28	1.0172	29301.02		
13:11:53	1.0242		46.08	
13:11:56	1.0250	29314.00		
13:12:22	1.0322		45.46	
13:12:26	1.0333	29308.81		
13:12:51	1.0403		44.72	
13:12:54	1.0411	29305.46		
13:13:20	1.0483		45.27	
13:13:23	1.0492	29311.86		
13:13:48	1.0561		47.03	
13:13:52	1.0572	29331.35		
13:14:17	1.0642		46.30	
13:14:20	1.0650	29324.84		
13:14:46	1.0722		44.26	
13:14:50	1.0733	29305.16		
13:15:15	1.0803		44.63	
13:15:18	1.0811	29309.52		
13:15:44	1.0883		44.80	
13:15:47	1.0892	29299.30		
16:24:41	4.2375		101.37	
16:24:45	4.2386	41074.88		
16:25:12	4.2461		101.37	HANG @ 9250'
16:25:13	4.2464	41074.87		
16:25:45	4.2553		101.39	
16:25:41	4.2542	41072.16		
16:26: 7	4.2614		101.39	
16:26:10	4.2622	41071.69		
16:26:35	4.2692		101.40	
16:26:40	4.2706	41070.95		
16:27: 5	4.2775		101.40	
16:27: 9	4.2786	41070.60		
16:27:34	4.2856		101.40	
16:27:37	4.2864	41069.85		
16:28: 2	4.2933		101.40	
16:28: 5	4.2942	41069.53		
16:28:31	4.3014		101.41	
16:28:34	4.3022	41068.65		
16:29: 0	4.3094		101.40	
16:29: 4	4.3106	41067.57		
16:29:29	4.3175		101.41	
16:29:33	4.3186	41066.95		
16:29:58	4.3256		101.41	
16:30: 1	4.3264	41066.08		
16:30:26	4.3333		101.41	
16:30:29	4.3342	41064.99		

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DATA FILE: 1

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
16:30:55	4.3414		101.41	
16:30:59	4.3425	41063.97		
16:31:24	4.3494		101.41	
16:31:28	4.3506	41063.98		
16:31:53	4.3575		101.41	
16:31:57	4.3586	41062.22		
16:32:22	4.3656		101.42	
16:32:25	4.3664	41061.53		
16:32:50	4.3733		101.42	
16:32:54	4.3744	41060.45		
16:33:19	4.3814		101.42	
16:33:23	4.3825	41060.02		
16:33:48	4.3894		101.42	
16:33:52	4.3906	41059.45		
16:34:16	4.3972		101.42	
16:34:21	4.3986	41058.72		
16:34:46	4.4056		101.42	
16:34:49	4.4064	41057.99		
16:35:14	4.4133		101.42	
16:35:18	4.4144	41057.22		
16:35:43	4.4214		101.42	
16:35:46	4.4222	41057.25		
16:36:12	4.4294		101.42	
16:36:16	4.4306	41056.83		
16:36:40	4.4372		101.42	
16:36:45	4.4386	41056.08		
16:37:10	4.4456		101.43	
16:37:13	4.4464	41055.68		
16:37:38	4.4533		101.43	
16:37:42	4.4544	41055.10		
16:38: 7	4.4614		101.43	
16:38:10	4.4622	41055.59		
16:49: 3	4.6436		101.43	
16:38:10	4.4622	41055.59		
16:49: 3	4.6436		101.43	
16:49: 5	4.6442	41052.00		
16:49:10	4.6456		101.43	
16:49: 5	4.6442	41050.00		
16:49:10	4.6456		101.43	
16:49:11	4.6458	41048.38		
16:49:15	4.6469		101.43	
16:49:11	4.6458	41048.38		
16:49:15	4.6469		101.43	
16:49:19	4.6481	41047.74		
16:49:22	4.6489		101.43	
16:49:19	4.6481	41047.74		
16:49:22	4.6489		101.43	
16:49:25	4.6497	41047.77		
16:49:29	4.6508		101.43	
16:49:25	4.6497	41047.77		

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
16:49:29	4.6508		101.43	
16:49:35	4.6525	41047.53		
16:49:46	4.6556		101.43	
16:49:35	4.6525	41047.53		
16:49:46	4.6556		101.43	
16:49:49	4.6564	41047.04		
16:49:52	4.6572		101.43	
16:49:49	4.6564	41047.04		
16:49:52	4.6572		101.43	
16:49:55	4.6581	41047.68		
16:49:59	4.6592		101.43	
16:49:55	4.6581	41047.68		
16:49:59	4.6592		101.43	
16:50: 1	4.6597	41047.70		
16:50: 5	4.6608		101.43	
16:50: 1	4.6597	41047.70		
16:50: 5	4.6608		101.43	
16:50: 9	4.6619	41047.70		
16:50:11	4.6625		101.43	
16:50: 9	4.6619	41047.70		
16:50:11	4.6625		101.43	
16:50:14	4.6633	41047.06		
16:50:19	4.6647		101.43	
16:50:14	4.6633	41047.06		
16:50:19	4.6647		101.43	
16:50:20	4.6650	41047.70		
16:50:24	4.6661		101.43	
16:50:20	4.6650	41047.70		
16:50:24	4.6661		101.43	
16:50:27	4.6669	41047.06		
16:51:25	4.6831		101.43	
16:51:30	4.6844	41047.80		
16:51:55	4.6914		101.42	
16:51:59	4.6925	41045.58		
16:52:24	4.6994		101.42	
16:52:26	4.7000	41044.93		
16:52:53	4.7075		101.42	
16:52:55	4.7081	41043.88		
16:53:20	4.7150		101.43	
16:53:24	4.7161	41043.45		
16:53:49	4.7231		101.43	
16:53:54	4.7244	41042.42		
16:54:19	4.7314		101.42	
16:54:23	4.7325	41041.65		
16:54:48	4.7394		101.43	
16:54:50	4.7400	41041.31		
16:55:17	4.7475		101.43	
16:55:19	4.7481	41040.74		
16:55:44	4.7550		101.43	
16:55:48	4.7561	41039.45		

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
16:56:13	4.7631		101.43	
16:56:18	4.7644	41038.85		
16:56:43	4.7714		101.43	
16:56:46	4.7722	41038.27		
16:57:11	4.7792		101.43	
16:57:16	4.7806	41037.41		
16:57:41	4.7875		101.43	
16:57:43	4.7881	41037.05		
16:58:10	4.7956		101.43	
16:58:12	4.7961	41036.08		
16:58:37	4.8031		101.43	
16:58:41	4.8042	41034.92		
16:59: 6	4.8111		101.43	
16:59:10	4.8122	41034.21		
16:59:35	4.8192		101.43	
16:59:40	4.8206	41033.50		
17: 0: 5	4.8275		101.43	
17: 0: 7	4.8281	41032.52		
17: 0:34	4.8356		101.43	
17: 0:36	4.8361	41031.51		
17: 1: 1	4.8431		101.43	
17: 1: 6	4.8444	41030.32		
17: 1:30	4.8511		101.43	
17: 1:35	4.8525	41028.89		
17: 2: 0	4.8594		101.43	
17: 2: 4	4.8606	41026.78		
17: 2:29	4.8675		101.43	
17: 2:31	4.8681	41025.34		
17: 2:58	4.8756		101.43	
17: 3: 0	4.8761	41023.78		
17: 3:25	4.8831		101.44	
17: 3:30	4.8844	41021.51		
17: 3:54	4.8911		101.44	
17: 3:59	4.8925	41019.72		
17: 4:24	4.8994		101.44	
17: 4:28	4.9006	41017.19		
17: 4:53	4.9075		101.44	
17: 4:55	4.9081	41015.50		
17: 5:22	4.9156		101.44	
17: 5:24	4.9161	41013.44		
17: 5:49	4.9231		101.44	
17: 5:54	4.9244	41010.94		
17: 6:19	4.9314		101.44	
17: 6:23	4.9325	41008.65		
17: 6:48	4.9394		101.44	
17: 6:52	4.9406	41006.60		
17: 7:17	4.9475		101.44	
17: 7:19	4.9481	41004.67		
17: 7:46	4.9556		101.44	
17: 7:49	4.9564	41002.63		

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
17: 8:14	4.9633		101.45	
17: 8:18	4.9644	41000.20		
17: 8:43	4.9714		101.45	
17: 8:47	4.9725	40998.10		
17: 9:12	4.9794		101.45	
17: 9:16	4.9806	40995.94		
17: 9:41	4.9875		101.45	
17: 9:43	4.9881	40993.83		
17:10:10	4.9956		101.45	
17:10:13	4.9964	40991.77		
17:10:38	5.0033		101.45	
17:10:41	5.0042	40989.57		
17:11: 6	5.0111		101.45	
17:11:11	5.0125	40987.75		
17:11:36	5.0194		101.45	
17:11:40	5.0206	40985.59		
17:12: 5	5.0275		101.45	
17:12: 7	5.0281	40984.03		
17:12:34	5.0356		101.45	
17:12:36	5.0361	40982.47		
17:13: 1	5.0431		101.46	
17:13: 5	5.0442	40980.68		
17:13:30	5.0511		101.46	
17:13:35	5.0525	40978.58		
17:14: 0	5.0594		101.45	
17:14: 4	5.0606	40976.75		
17:14:29	5.0675		101.46	
17:14:31	5.0681	40975.80		
17:14:58	5.0756		101.46	
17:15: 0	5.0761	40972.69		
17:15:25	5.0831		101.46	
17:15:29	5.0842	40971.48		
17:15:54	5.0911		101.46	
17:15:59	5.0925	40970.09		
17:16:24	5.0994		101.46	
17:16:28	5.1006	40968.61		
17:16:53	5.1075		101.46	
17:16:55	5.1081	40967.53		
17:17:22	5.1156		101.46	
17:17:25	5.1164	40966.04		
17:17:49	5.1231		101.46	
17:17:54	5.1244	40964.38		
17:18:19	5.1314		101.47	
17:18:23	5.1325	40962.99		
17:18:48	5.1394		101.47	
17:18:52	5.1406	40961.91		
17:19:17	5.1475		101.46	
17:19:19	5.1481	40960.34		
17:19:46	5.1556		101.47	
17:19:49	5.1564	40959.32		

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
17:20:13	5.1631		101.47	
17:20:18	5.1644	40958.39		
17:20:43	5.1714		101.47	
17:20:47	5.1725	40957.32		
17:21:12	5.1794		101.47	
17:21:16	5.1806	40955.89		
17:21:41	5.1875		101.47	
17:21:43	5.1881	40954.70		
17:22:10	5.1956		101.47	
17:22:12	5.1961	40953.21		
17:22:37	5.2031		101.47	
17:22:41	5.2042	40952.75		
17:23: 6	5.2111		101.48	
17:23:11	5.2125	40951.36		
17:23:36	5.2194		101.47	
17:23:40	5.2206	40950.59		
17:24: 5	5.2275		101.47	
17:24: 7	5.2281	40950.06		
17:24:34	5.2356		101.47	
17:24:36	5.2361	40949.58		
17:25: 1	5.2431		101.48	
17:25: 5	5.2442	40948.19		
17:25:30	5.2511		101.48	
17:25:35	5.2525	40947.83		
17:26: 0	5.2594		101.48	
17:26: 4	5.2606	40946.76		
17:26:29	5.2675		101.48	
17:26:31	5.2681	40946.03		
17:26:58	5.2756		101.48	
17:27: 0	5.2761	40946.06		
17:27:25	5.2831		101.49	
17:27:29	5.2842	40945.44		
17:27:54	5.2911		101.48	
17:27:59	5.2925	40945.05		
17:28:24	5.2994		101.49	
17:28:28	5.3006	40944.38		
17:28:53	5.3075		101.49	
17:28:55	5.3081	40944.08		
17:29:22	5.3156		101.49	
17:29:24	5.3161	40943.03		
17:29:49	5.3231		101.50	
17:29:54	5.3244	40942.70		
17:30:19	5.3314		101.50	
17:30:23	5.3325	40942.34		
17:30:48	5.3394		101.49	
17:30:52	5.3406	40941.93		
17:31:17	5.3475		101.49	
17:31:19	5.3481	40941.55		
17:31:46	5.3556		101.50	
17:31:48	5.3561	40941.61		

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
17:32:13	5.3631		101.50	
17:32:18	5.3644	40940.63		
17:32:43	5.3714		101.50	
17:32:47	5.3725	40940.27		
17:33:11	5.3792		101.50	
17:33:16	5.3806	40939.60		
17:33:41	5.3875		101.50	
17:33:43	5.3881	40939.08		
17:34:10	5.3956		101.51	
17:34:12	5.3961	40938.06		
17:34:37	5.4031		101.51	
17:34:41	5.4042	40937.14		
17:35: 6	5.4111		101.50	
17:35:11	5.4125	40936.39		
17:35:35	5.4192		101.51	
17:35:40	5.4206	40934.98		
17:36: 5	5.4275		101.50	
17:36: 7	5.4281	40934.41		
17:36:34	5.4356		101.51	
17:36:36	5.4361	40932.88		
17:37: 1	5.4431		101.51	
17:37: 5	5.4442	40931.78		
17:37:30	5.4511		101.51	
17:37:34	5.4522	40930.04		
17:37:59	5.4592		101.51	
17:38: 4	5.4606	40928.62		
17:38:29	5.4675		101.51	
17:38:31	5.4681	40927.23		
17:38:58	5.4756		101.51	
17:39: 0	5.4761	40925.69		
17:39:25	5.4831		101.52	
17:39:29	5.4842	40924.44		
17:39:54	5.4911		101.52	
17:39:58	5.4922	40922.34		
17:40:24	5.4994		101.52	
17:40:28	5.5006	40920.87		
17:40:53	5.5075		101.52	
17:40:56	5.5083	40919.04		
17:41:22	5.5156		101.52	
17:41:24	5.5161	40918.03		
17:41:49	5.5231		101.52	
17:41:54	5.5244	40916.31		
17:42:19	5.5314		101.53	
17:42:23	5.5325	40914.20		
17:42:48	5.5394		101.52	
17:42:52	5.5406	40912.72		
17:43:17	5.5475		101.52	
17:43:20	5.5483	40911.84		
17:43:46	5.5556		101.53	
17:43:48	5.5561	40909.81		

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
17:44:13	5.5631		101.53	
17:44:18	5.5644	40908.57		
17:44:42	5.5711		101.53	
17:44:46	5.5722	40907.18		
17:45:11	5.5792		101.53	
17:45:16	5.5806	40905.75		
17:45:41	5.5875		101.53	
17:45:44	5.5883	40904.73		
17:46:10	5.5956		101.54	
17:46:12	5.5961	40903.19		
17:46:37	5.6031		101.54	
17:46:41	5.6042	40901.90		
17:47: 6	5.6111		101.54	
17:47:10	5.6122	40900.87		
17:47:35	5.6192		101.54	
17:47:40	5.6206	40899.07		
17:48: 5	5.6275		101.55	
17:48: 8	5.6283	40898.66		
17:48:34	5.6356		101.55	
17:48:36	5.6361	40896.59		
17:49: 1	5.6431		101.55	
17:49: 5	5.6442	40895.99		
17:49:30	5.6511		101.55	
17:49:34	5.6522	40894.56		
17:49:59	5.6592		101.55	
17:50: 4	5.6606	40893.49		
17:50:29	5.6675		101.55	
17:50:32	5.6683	40892.99		
17:50:58	5.6756		101.55	
17:51: 0	5.6761	40892.51		
17:51:25	5.6831		101.55	
17:51:29	5.6842	40891.42		
17:51:54	5.6911		101.56	
17:51:59	5.6925	40890.39		
17:52:24	5.6994		101.56	
17:52:28	5.7006	40889.36		
17:52:53	5.7075		101.56	
17:52:56	5.7083	40887.97		
17:53:22	5.7156		101.56	
17:53:24	5.7161	40887.98		
17:53:49	5.7231		101.56	
17:53:53	5.7242	40887.25		
17:54:18	5.7311		101.56	
17:54:23	5.7325	40886.54		
17:54:48	5.7394		101.56	
17:54:52	5.7406	40885.84		
17:55:17	5.7475		101.56	
17:55:20	5.7483	40886.47		
17:55:46	5.7556		101.57	
17:55:48	5.7561	40885.50		

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
17:56:13	5.7631		101.57	
17:56:17	5.7642	40885.22		
17:56:42	5.7711		101.57	
17:56:46	5.7722	40884.90		
17:57:11	5.7792		101.57	
17:57:16	5.7806	40884.92		
17:57:41	5.7875		101.58	
17:57:44	5.7883	40885.06		
17:58:10	5.7956		101.58	
17:58:12	5.7961	40884.57		
17:58:37	5.8031		101.58	
17:58:41	5.8042	40884.98		
17:59: 6	5.8111		101.58	
17:59:10	5.8122	40884.98		
17:59:35	5.8192		101.58	
17:59:40	5.8206	40884.67		
18: 0: 4	5.8272		101.58	
18: 0: 8	5.8283	40885.13		
18: 0:34	5.8356		101.58	
18: 0:36	5.8361	40884.62		
18: 1: 1	5.8431		101.59	
18: 1: 5	5.8442	40884.73		
18: 1:30	5.8511		101.59	
18: 1:34	5.8522	40885.09		
18: 1:59	5.8592		101.59	
18: 2: 4	5.8606	40885.47		
18: 2:28	5.8672		101.59	
18: 2:32	5.8683	40886.30		
18: 2:58	5.8756		101.59	
18: 3: 0	5.8761	40886.32		
18: 3:26	5.8833		101.59	
18: 3:29	5.8842	40886.27		
18: 3:54	5.8911		101.59	
18: 3:58	5.8922	40886.59		
18: 4:23	5.8992		101.59	
18: 4:28	5.9006	40886.96		
18: 4:52	5.9072		101.60	
18: 4:56	5.9083	40887.41		
18: 5:21	5.9153		101.60	
18: 5:24	5.9161	40887.45		
18: 5:50	5.9233		101.60	
18: 5:53	5.9242	40887.41		
18: 6:18	5.9311		101.60	
18: 6:23	5.9325	40887.37		
18: 6:48	5.9394		101.60	
18: 6:51	5.9403	40887.02		
18: 7:16	5.9472		101.60	
18: 7:20	5.9483	40886.93		
18: 7:46	5.9556		101.60	
18: 7:48	5.9561	40886.99		

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
18: 8:14	5.9633		101.61	
18: 8:17	5.9642	40886.77		
18: 8:42	5.9711		101.61	
18: 8:46	5.9722	40886.06		
18: 9:11	5.9792		101.61	
18: 9:15	5.9803	40885.36		
18: 9:40	5.9872		101.61	
18: 9:44	5.9883	40884.45		
18:10:10	5.9956		101.61	
18:10:13	5.9964	40883.93		
18:10:38	6.0033		101.61	
18:10:41	6.0042	40882.21		
18:11: 6	6.0111		101.61	
18:11:10	6.0122	40880.42		
18:11:35	6.0192		101.61	
18:11:39	6.0203	40879.02		
18:12: 4	6.0272		101.61	
18:12: 8	6.0283	40877.28		
18:12:34	6.0356		101.61	
18:12:37	6.0364	40875.74		
18:13: 2	6.0433		101.61	
18:13: 5	6.0442	40874.04		
18:13:30	6.0511		101.61	
18:13:34	6.0522	40872.26		
18:13:59	6.0592		101.61	
18:14: 3	6.0603	40870.82		
18:14:28	6.0672		101.61	
18:14:32	6.0683	40869.50		
18:14:58	6.0756		101.62	
18:15: 1	6.0764	40867.97		
18:15:26	6.0833		101.62	
18:15:29	6.0842	40866.98		
18:15:54	6.0911		101.62	
18:15:58	6.0922	40865.56		
18:16:23	6.0992		101.62	
18:16:27	6.1003	40864.55		
18:16:52	6.1072		101.62	
18:16:56	6.1083	40863.39		
18:17:22	6.1156		101.62	
18:17:25	6.1164	40861.87		
18:17:50	6.1233		101.63	
18:17:53	6.1242	40860.71		
18:18:18	6.1311		101.63	
18:18:23	6.1325	40858.93		
18:18:47	6.1392		101.63	
18:18:51	6.1403	40857.50		
18:19:16	6.1472		101.63	
18:19:20	6.1483	40856.26		
18:19:46	6.1556		101.63	
18:19:49	6.1564	40854.74		

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
18:20:14	6.1633		101.63	
18:20:17	6.1642	40853.29		
18:20:42	6.1711		101.64	
18:20:46	6.1722	40851.55		
18:21:11	6.1792		101.64	
18:21:15	6.1803	40850.12		
18:21:40	6.1872		101.64	
18:21:44	6.1883	40849.10		
18:22:10	6.1956		101.64	
18:22:13	6.1964	40847.57		
18:22:38	6.2033		101.65	
18:22:41	6.2042	40845.95		
18:23: 6	6.2111		101.65	
18:23:10	6.2122	40844.53		
18:23:35	6.2192		101.64	
18:23:39	6.2203	40843.80		
18:24: 4	6.2272		101.65	
18:24: 8	6.2283	40842.45		
18:24:34	6.2356		101.65	
18:24:37	6.2364	40841.43		
18:25: 2	6.2433		101.65	
18:25: 5	6.2442	40840.32		
18:25:30	6.2511		101.65	
18:25:34	6.2522	40839.25		
18:25:59	6.2592		101.65	
18:26: 3	6.2603	40838.56		
18:26:28	6.2672		101.65	
18:26:32	6.2683	40837.39		
18:26:58	6.2756		101.66	
18:27: 1	6.2764	40836.93		
18:27:26	6.2833		101.66	
18:27:29	6.2842	40835.83		
18:27:54	6.2911		101.66	
18:27:58	6.2922	40835.12		
18:28:23	6.2992		101.66	
18:28:27	6.3003	40834.44		
18:28:52	6.3072		101.66	
18:28:55	6.3081	40833.90		
18:29:21	6.3153		101.67	
18:29:25	6.3164	40833.91		
18:29:50	6.3233		101.67	
18:29:53	6.3242	40833.09		
18:30:18	6.3311		101.67	
18:30:22	6.3322	40832.77		
18:30:47	6.3392		101.67	
18:30:51	6.3403	40831.68		
18:31:16	6.3472		101.67	
18:31:20	6.3483	40830.88		
18:31:45	6.3553		101.67	
18:31:49	6.3564	40830.91		

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
18:32:14	6.3633		101.67	
18:32:17	6.3642	40829.92		
18:32:43	6.3714		101.68	
18:32:46	6.3722	40829.28		
18:33:11	6.3792		101.68	
18:33:15	6.3803	40827.83		
18:33:40	6.3872		101.68	
18:33:44	6.3883	40827.88		
18:34: 9	6.3953		101.68	
18:34:13	6.3964	40826.89		
18:34:38	6.4033		101.69	
18:34:41	6.4042	40825.82		
18:35: 7	6.4114		101.69	
18:35:10	6.4122	40825.50		
18:35:35	6.4192		101.69	
18:35:39	6.4203	40825.11		
18:36: 4	6.4272		101.69	
18:36: 8	6.4283	40824.35		
18:36:33	6.4353		101.69	
18:36:37	6.4364	40823.86		
18:37: 2	6.4433		101.69	
18:37: 5	6.4442	40823.76		
18:37:31	6.4514		101.69	
18:37:34	6.4522	40823.08		
18:37:59	6.4592		101.69	
18:38: 3	6.4603	40822.71		
18:38:28	6.4672		101.69	
18:38:31	6.4681	40822.37		
18:38:57	6.4753		101.69	
18:39: 1	6.4764	40821.85		
18:39:26	6.4833		101.70	
18:39:30	6.4844	40821.34		
18:39:55	6.4914		101.70	
18:39:58	6.4922	40820.62		
18:40:23	6.4992		101.70	
18:40:28	6.5006	40820.27		
18:40:53	6.5075		101.70	
18:40:56	6.5083	40819.34		
18:41:21	6.5153		101.70	
18:41:25	6.5164	40818.85		
18:41:50	6.5233		101.71	
18:41:54	6.5244	40818.63		
18:42:19	6.5314		101.71	
18:42:22	6.5322	40817.92		
18:42:47	6.5392		101.71	
18:42:51	6.5403	40817.20		
18:43:16	6.5472		101.71	
18:43:20	6.5483	40816.35		
18:43:45	6.5553		101.71	
18:43:49	6.5564	40815.86		

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
18:44:14	6.5633		101.72	
18:44:18	6.5644	40814.50		
18:44:43	6.5714		101.71	
18:44:46	6.5722	40813.36		
18:45:11	6.5792		101.72	
18:45:15	6.5803	40811.98		
18:45:40	6.5872		101.72	
18:45:44	6.5883	40810.77		
18:46: 9	6.5953		101.72	
18:46:13	6.5964	40809.78		
18:46:38	6.6033		101.73	
18:46:42	6.6044	40808.55		
18:47: 7	6.6114		101.73	
18:47:10	6.6122	40807.12		
18:47:35	6.6192		101.72	
18:47:39	6.6203	40805.68		
18:48: 4	6.6272		101.73	
18:48: 8	6.6283	40804.14		
18:48:33	6.6353		101.73	
18:48:37	6.6364	40802.59		
18:49: 2	6.6433		101.73	
18:49: 6	6.6444	40800.78		
18:49:31	6.6514		101.73	
18:49:34	6.6522	40799.75		
18:49:59	6.6592		101.73	
18:50: 3	6.6603	40797.57		
18:50:28	6.6672		101.73	
18:50:31	6.6681	40796.46		
18:50:57	6.6753		101.74	
18:51: 1	6.6764	40794.95		
18:51:26	6.6833		101.74	
18:51:30	6.6844	40793.05		
18:51:55	6.6914		101.74	
18:51:58	6.6922	40792.02		
18:52:23	6.6992		101.74	
18:52:27	6.7003	40790.55		
18:52:52	6.7072		101.74	
18:52:56	6.7083	40789.31		
18:53:21	6.7153		101.74	
18:53:25	6.7164	40786.76		
18:53:50	6.7233		101.75	
18:53:54	6.7244	40785.36		
18:54:19	6.7314		101.75	
18:54:22	6.7322	40784.29		
18:54:47	6.7392		101.75	
18:54:51	6.7403	40782.48		
18:55:16	6.7472		101.75	
18:55:20	6.7483	40781.13		
18:55:45	6.7553		101.75	
18:55:49	6.7564	40779.63		

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
18:56:14	6.7633		101.75	
18:56:18	6.7644	40778.26		
18:56:43	6.7714		101.76	
18:56:46	6.7722	40777.27		
18:57:11	6.7792		101.76	
18:57:15	6.7803	40775.49		
18:57:40	6.7872		101.76	
18:57:44	6.7883	40774.01		
18:58: 9	6.7953		101.76	
18:58:13	6.7964	40773.01		
18:58:38	6.8033		101.76	
18:58:42	6.8044	40770.93		
18:59: 7	6.8114		101.76	
18:59:10	6.8122	40769.50		
18:59:35	6.8192		101.76	
18:59:39	6.8203	40768.10		
19: 0: 4	6.8272		101.77	
19: 0: 8	6.8283	40766.88		
19: 0:33	6.8353		101.77	
19: 0:36	6.8361	40764.83		
19: 1: 1	6.8431		101.77	
19: 1: 6	6.8444	40762.84		
19: 1:31	6.8514		101.77	
19: 1:34	6.8522	40762.13		
19: 2: 0	6.8594		101.77	
19: 2: 3	6.8603	40760.40		
19: 2:28	6.8672		101.77	
19: 2:31	6.8681	40759.20		
19: 2:57	6.8753		101.78	
19: 3: 0	6.8761	40757.67		
19: 3:25	6.8831		101.78	
19: 3:30	6.8844	40756.22		
19: 3:55	6.8914		101.78	
19: 3:58	6.8922	40754.11		
19: 4:24	6.8994		101.78	
19: 4:27	6.9003	40753.37		
19: 4:52	6.9072		101.79	
19: 4:55	6.9081	40752.61		
19: 5:21	6.9153		101.79	
19: 5:24	6.9161	40752.65		
19: 5:49	6.9231		101.79	
19: 5:54	6.9244	40751.37		
19: 6:19	6.9314		101.80	
19: 6:23	6.9325	40750.70		
19: 6:48	6.9394		101.79	
19: 6:51	6.9403	40749.98		
19: 7:16	6.9472		101.80	
19: 7:20	6.9483	40749.13		
19: 7:45	6.9553		101.80	
19: 7:49	6.9564	40748.66		

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DATA FILE: 2

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
19: 8:14	6.9633		101.80	
19: 8:18	6.9644	40747.60		
19: 8:43	6.9714		101.80	
19: 8:47	6.9725	40746.89		
19: 9:12	6.9794		101.81	
19: 9:15	6.9803	40745.50		
19: 9:40	6.9872		101.81	
19: 9:44	6.9883	40745.17		
19:10: 9	6.9953		101.81	
19:10:13	6.9964	40744.14		
19:10:38	7.0033		101.81	
19:10:42	7.0044	40743.47		
19:11: 7	7.0114		101.82	
19:11:11	7.0125	40742.80		
19:11:36	7.0194		101.82	
19:11:39	7.0203	40742.07		
19:12: 4	7.0272		101.82	
19:12: 7	7.0281	40741.62		
19:12:33	7.0353		101.82	
19:12:36	7.0361	40740.65		
19:13: 1	7.0431		101.83	
19:13: 6	7.0444	40739.73		
19:13:31	7.0514		101.83	
19:13:35	7.0525	40739.38		
19:14: 0	7.0594		101.83	
19:14: 3	7.0603	40738.70		
19:14:28	7.0672		101.83	
19:14:31	7.0681	40738.23		
19:14:57	7.0753		101.84	
19:15: 0	7.0761	40737.23		
19:15:25	7.0831		101.84	
19:15:30	7.0844	40736.32		
19:15:55	7.0914		101.84	
19:15:59	7.0925	40735.61		
19:16:24	7.0994		101.84	
19:16:27	7.1003	40734.88		
19:16:52	7.1072		101.84	
19:16:55	7.1081	40734.68		
19:17:21	7.1153		101.84	
19:17:25	7.1164	40734.20		
19:17:50	7.1233		101.84	
19:17:54	7.1244	40733.19		
19:18:19	7.1314		101.85	
19:18:23	7.1325	40732.51		
19:18:48	7.1394		101.85	
19:18:51	7.1403	40731.44		
19:19:16	7.1472		101.85	
19:19:19	7.1481	40731.18		
19:19:45	7.1553		101.85	
19:19:49	7.1564	40730.67		

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
19:20:14	7.1633		101.85	
19:20:18	7.1644	40729.41		
19:20:43	7.1714		101.86	
19:20:47	7.1725	40728.74		
19:21:12	7.1794		101.85	
19:21:15	7.1803	40727.99		
19:21:40	7.1872		101.86	
19:21:43	7.1881	40727.13		
19:22: 9	7.1953		101.86	
19:22:13	7.1964	40726.12		
19:22:38	7.2033		101.86	
19:22:42	7.2044	40725.92		
19:23: 6	7.2111		101.87	
19:23:11	7.2125	40724.96		
19:23:36	7.2194		101.87	
19:23:39	7.2203	40724.59		
19:24: 4	7.2272		101.87	
19:24: 7	7.2281	40723.66		
19:24:33	7.2353		101.87	
19:24:36	7.2361	40723.72		
19:25: 1	7.2431		101.88	
19:25: 5	7.2442	40722.94		
19:25:30	7.2511		101.88	
19:25:35	7.2525	40722.26		
19:26: 0	7.2594		101.88	
19:26: 3	7.2603	40721.88		
19:26:28	7.2672		101.88	
19:26:31	7.2681	40722.23		
19:26:57	7.2753		101.88	
19:27: 0	7.2761	40721.22		
19:27:25	7.2831		101.88	
19:27:29	7.2842	40721.26		
19:27:54	7.2911		101.88	
19:27:59	7.2925	40720.91		
19:28:24	7.2994		101.88	
19:28:27	7.3003	40720.89		
19:28:53	7.3075		101.88	
19:28:55	7.3081	40720.77		
19:29:21	7.3153		101.89	
19:29:25	7.3164	40720.82		
19:29:50	7.3233		101.89	
19:29:54	7.3244	40721.34		
19:30:19	7.3314		101.89	
19:30:23	7.3325	40721.69		
19:30:48	7.3394		101.89	
19:30:51	7.3403	40721.73		
19:31:17	7.3475		101.89	
19:31:19	7.3481	40722.42		
19:31:45	7.3553		101.89	
19:31:49	7.3564	40722.97		

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DATA FILE: 3

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
19:32:14	7.3633		101.90	
19:32:18	7.3644	40722.91		
19:32:43	7.3714		101.90	
19:32:47	7.3725	40723.62		
19:33:12	7.3794		101.90	
19:33:15	7.3803	40723.25		
19:33:41	7.3875		101.90	
19:33:43	7.3881	40724.12		
19:34: 9	7.3953		101.90	
19:34:13	7.3964	40724.66		
19:34:37	7.4031		101.91	
19:34:41	7.4042	40725.51		
19:35: 6	7.4111		101.90	
19:35:11	7.4125	40725.83		
19:35:36	7.4194		101.91	
19:35:40	7.4206	40726.58		
19:36: 5	7.4275		101.91	
19:36: 7	7.4281	40727.84		
19:36:33	7.4353		101.91	
19:36:36	7.4361	40728.41		
19:37: 1	7.4431		101.91	
19:37: 5	7.4442	40728.79		
19:37:30	7.4511		101.92	
19:37:35	7.4525	40729.58		
19:38: 0	7.4594		101.92	
19:38: 4	7.4606	40730.60		
19:38:29	7.4675		101.92	
19:38:31	7.4681	40731.62		
19:38:57	7.4753		101.92	
19:39: 0	7.4761	40732.14		
19:39:25	7.4831		101.92	
19:39:29	7.4842	40732.46		
19:39:54	7.4911		101.92	
19:39:59	7.4925	40733.53		
19:40:24	7.4994		101.92	
19:40:28	7.5006	40734.26		
19:40:53	7.5075		101.92	
19:40:55	7.5081	40735.31		
19:41:21	7.5153		101.93	
19:41:24	7.5161	40735.86		
19:41:49	7.5231		101.93	
19:41:54	7.5244	40736.89		
19:42:19	7.5314		101.93	
19:42:23	7.5325	40737.52		
19:42:48	7.5394		101.93	
19:42:52	7.5406	40737.94		
19:43:17	7.5475		101.93	
19:43:19	7.5481	40738.53		
19:43:45	7.5553		101.93	
19:43:48	7.5561	40739.06		

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DATA FILE: 3

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
19:44:13	7.5631		101.93	
19:44:18	7.5644	40740.13		
19:44:43	7.5714		101.94	
19:44:47	7.5725	40740.16		
19:45:12	7.5794		101.94	
19:45:16	7.5806	40740.53		
19:45:41	7.5875		101.94	
19:45:43	7.5881	40741.21		
19:46: 9	7.5953		101.94	
19:46:12	7.5961	40741.75		
19:46:37	7.6031		101.94	
19:46:41	7.6042	40741.66		
19:47: 6	7.6111		101.94	
19:47:11	7.6125	40742.02		
19:47:35	7.6192		101.94	
19:47:40	7.6206	40742.02		
19:48: 5	7.6275		101.94	
19:48: 7	7.6281	40737.16		
19:48:33	7.6353		101.95	
19:48:36	7.6361	40738.72		
19:49: 1	7.6431		101.95	
19:49: 5	7.6442	40738.96		
19:49:30	7.6511		101.95	
19:49:35	7.6525	40739.32		
19:49:59	7.6592		101.95	
19:50: 4	7.6606	40819.09		
19:50:29	7.6675		101.97	
19:50:31	7.6681	41039.39		
19:50:57	7.6753		101.98	
19:51: 0	7.6761	41172.53		
19:51:25	7.6831		101.95	
19:51:30	7.6844	41042.73		
19:51:55	7.6914		101.90	
19:51:59	7.6925	40990.35		
19:52:24	7.6994		101.89	
19:52:28	7.7006	40936.25		
19:52:53	7.7075		101.89	
19:52:55	7.7081	40895.53		
19:53:21	7.7153		101.89	
19:53:24	7.7161	40861.90		
19:53:49	7.7231		101.90	
19:53:54	7.7244	40833.46		
19:54:19	7.7314		101.91	
19:54:23	7.7325	40807.11		
19:54:48	7.7394		101.91	
19:54:52	7.7406	40783.66		
19:55:17	7.7475		101.92	
19:55:19	7.7481	40762.21		
19:55:45	7.7553		101.93	
19:55:48	7.7561	40743.11		

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DATA FILE: 3

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
19:56:13	7.7631		101.93	
19:56:18	7.7644	40725.88		
19:56:43	7.7714		101.94	
19:56:46	7.7722	40709.96		
19:57:11	7.7792		101.94	
19:57:16	7.7806	40695.38		
19:57:41	7.7875		101.95	
19:57:43	7.7881	40681.76		
19:58:10	7.7956		101.95	
19:58:12	7.7961	40669.41		
19:58:37	7.8031		101.96	
19:58:41	7.8042	40658.57		
19:59: 6	7.8111		101.97	
19:59:10	7.8122	40647.61		
19:59:35	7.8192		101.97	
19:59:40	7.8206	40637.66		
20: 0: 5	7.8275		101.97	
20: 0: 7	7.8281	40628.26		
20: 3:16	7.8806		102.00	
20: 3:20	7.8817	40622.04		
20: 3:30	7.8844		102.00	
20: 3:26	7.8833	40406.04		

COMPANY: OILSERV AUSTRALIA LTD

CLIENT: SANTOS LTD

0332

GAUGE NUMBER: 73864

WELL NAME: MOORARI

WELL NUMBER: 3 LOWER

TEST NUMBER:

LOCATION: COOPER BASIN

TEST OPERATOR: P.ALDRICH

COMMENTS: STABLE INJECTION WITH PRESSURE FALL-OFF

POSITION	GAUGE SERIAL NUMBER
1	
2	
3	
4	

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DATA FILE: 7

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
12: 9:22	0.0000		114.07	STOP @ 9000'
12: 9:20	-0.0006	35880.24		
12: 9:47	0.0069		114.02	
12: 9:51	0.0081	35879.79		
12:10:16	0.0150		113.99	
12:10:20	0.0161	35880.98		
12:10:45	0.0231		113.97	
12:10:49	0.0242	35882.46		
12:11:14	0.0311		113.94	
12:11:18	0.0322	35883.89		
12:11:43	0.0392		113.92	
12:11:46	0.0400	35884.88		
12:12:11	0.0469		113.89	
12:12:15	0.0481	35885.89		
12:12:40	0.0550		113.87	
12:12:44	0.0561	35886.62		
12:13: 9	0.0631		113.85	
12:13:13	0.0642	35888.11		
12:13:38	0.0711		113.83	
12:13:42	0.0722	35888.52		
12:14: 7	0.0792		113.82	
12:14:10	0.0800	35888.99		
12:14:35	0.0869		113.80	
12:14:39	0.0881	35889.41		
12:15: 4	0.0950		113.78	
12:15: 8	0.0961	35890.12		
12:15:33	0.1031		113.76	
12:15:36	0.1039	35890.39		
12:16: 1	0.1108		113.74	
12:16: 6	0.1122	35890.35		
12:16:31	0.1192		113.74	
12:16:34	0.1200	35891.09		
12:17: 0	0.1272		113.73	
12:17: 3	0.1281	35891.21		
12:17:28	0.1350		113.71	
12:17:33	0.1364	35891.35		
12:17:58	0.1433		113.70	
12:18: 1	0.1442	35891.53		
12:18:26	0.1511		113.69	
12:18:30	0.1522	35891.90		
12:18:55	0.1592		113.68	
12:18:58	0.1600	35891.95		
12:19:24	0.1672		113.67	
12:19:27	0.1681	35891.80		
12:19:52	0.1750		113.66	
12:19:56	0.1761	35891.98		
12:20:21	0.1831		113.65	
12:20:25	0.1842	35892.40		
12:20:50	0.1911		113.64	
12:20:54	0.1922	35892.30		

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
12:21:19	0.1992		113.64	
12:21:23	0.2003	35892.43		
12:21:48	0.2072		113.63	
12:21:51	0.2081	35892.34		
12:22:16	0.2150		113.62	
12:22:20	0.2161	35892.26		
12:22:45	0.2231		113.62	
12:22:49	0.2242	35892.55		
12:34:57	0.4264		105.77	
12:35: 0	0.4272	35320.45		
12:35:25	0.4342		105.78	
12:35:29	0.4353	35321.31		
12:35:54	0.4422		105.79	
12:35:58	0.4433	35322.95		
12:36:23	0.4503		105.80	
12:36:27	0.4514	35323.56		
12:36:52	0.4583		105.81	
12:36:55	0.4592	35325.15		
12:37:21	0.4664		105.82	
12:37:24	0.4672	35325.95		
12:37:49	0.4742		105.82	
12:37:53	0.4753	35326.33		
12:38:18	0.4822		105.83	
12:38:21	0.4831	35327.42		
12:38:47	0.4903		105.83	
12:38:51	0.4914	35327.88		
12:39:16	0.4983		105.83	
12:39:19	0.4992	35328.13		
12:39:45	0.5064		105.83	
12:39:48	0.5072	35328.46		
12:40:13	0.5142		105.83	
12:40:18	0.5156	35329.10		
12:40:43	0.5225		105.83	
12:40:46	0.5233	35329.14		
12:41:11	0.5303		105.83	
12:41:15	0.5314	35329.41		
12:41:41	0.5386		105.83	
12:41:44	0.5394	35329.39		
12:42: 9	0.5464		105.82	
12:42:12	0.5472	35329.44		
12:42:37	0.5542		105.82	
12:42:41	0.5553	35329.41		
12:43: 6	0.5622		105.82	
12:43:10	0.5633	35329.38		
12:43:35	0.5703		105.82	
12:43:39	0.5714	35330.07		
12:44: 5	0.5786		105.82	
12:44: 8	0.5794	35330.08		
12:44:33	0.5864		105.82	
12:44:36	0.5872	35329.78		

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
12:45: 1	0.5942		105.82	
12:45: 5	0.5953	35329.73		
12:45:30	0.6022		105.82	
12:45:34	0.6033	35329.67		
12:57:53	0.8086		105.29	STOP @ 8000'
12:57:54	0.8089	34754.44		
12:58:19	0.8158		105.27	
12:58:23	0.8169	34750.17		
12:58:48	0.8239		105.27	
12:58:50	0.8244	34750.71		
12:59:17	0.8319		105.26	
12:59:19	0.8325	34750.66		
12:59:44	0.8394		105.26	
12:59:48	0.8406	34750.71		
13: 0:13	0.8475		105.26	
13: 0:18	0.8489	34751.02		
13: 0:43	0.8558		105.26	
13: 0:46	0.8567	34751.28		
13: 1:11	0.8636		105.26	
13: 1:14	0.8644	34751.83		
13: 1:41	0.8719		105.25	
13: 1:43	0.8725	34752.34		
13:17:14	1.1311		105.22	
13:17:17	1.1319	34750.13		
13:17:53	1.1419		105.22	stop @ 8000'
13:17:38	1.1378	34753.55		
13:18:11	1.1469		105.22	
13:18:15	1.1481	34751.56		
13:18:40	1.1550		105.22	
13:18:44	1.1561	34750.54		
13:19: 9	1.1631		105.22	
13:19:13	1.1642	34750.50		
13:19:38	1.1711		105.22	
13:19:41	1.1719	34750.40		
13:20: 7	1.1792		105.22	
13:20:10	1.1800	34750.06		
13:20:35	1.1869		105.21	
13:20:39	1.1881	34750.03		
13:21: 4	1.1950		105.21	
13:21: 8	1.1961	34749.96		
13:21:33	1.2031		105.21	
13:21:37	1.2042	34749.94		
13:22: 2	1.2111		105.22	
13:22: 5	1.2119	34749.71		
13:22:31	1.2192		105.21	
13:22:34	1.2200	34749.68		
13:22:59	1.2269		105.21	
13:23: 3	1.2281	34749.64		
13:23:28	1.2350		105.21	
13:23:31	1.2358	34749.42		

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
13:23:57	1.2431		105.21	
13:24: 1	1.2442	34749.92		
13:24:26	1.2511		105.21	
13:24:30	1.2522	34749.30		
13:24:55	1.2592		105.21	
13:24:58	1.2600	34749.30		
13:40:53	1.5253		97.65	
13:40:56	1.5261	33574.83		
13:41:26	1.5344		97.58	STOP @ 7000'
13:41:24	1.5339	33583.85		
13:41:50	1.5411		97.55	
13:41:54	1.5422	33580.75		
13:42:19	1.5492		97.52	
13:42:23	1.5503	33582.82		
13:42:48	1.5572		97.49	
13:42:52	1.5583	33585.17		
13:43:17	1.5653		97.46	
13:43:20	1.5661	33586.51		
13:43:45	1.5731		97.44	
13:43:49	1.5742	33588.22		
13:44:14	1.5811		97.41	
13:44:18	1.5822	33589.33		
13:44:43	1.5892		97.39	
13:44:47	1.5903	33590.50		
13:45:13	1.5975		97.37	
13:45:16	1.5983	33591.16		
13:45:41	1.6053		97.35	
13:45:44	1.6061	33592.15		
13:46: 9	1.6131		97.34	
13:46:13	1.6142	33592.57		
13:46:38	1.6211		97.32	
13:46:42	1.6222	33592.98		
13:47: 7	1.6292		97.30	
13:47:11	1.6303	33593.68		
13:47:36	1.6372		97.28	
13:47:40	1.6383	33594.47		
13:48: 5	1.6453		97.27	
13:48: 8	1.6461	33594.72		
13:48:33	1.6531		97.26	
13:48:37	1.6542	33594.95		
13:49: 2	1.6611		97.25	
13:49: 6	1.6622	33595.10		
13:49:31	1.6692		97.24	
13:49:35	1.6703	33595.31		
13:50: 0	1.6772		97.23	
13:50: 4	1.6783	33596.19		
13:50:29	1.6853		97.22	
13:50:32	1.6861	33595.76		
13:50:57	1.6931		97.21	
13:51: 1	1.6942	33595.99		

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
13:51:26	1.7011		97.20	
13:51:30	1.7022	33596.17		
13:51:55	1.7092		97.19	
13:51:59	1.7103	33596.67		
13:52:25	1.7175		97.19	
13:52:28	1.7183	33596.58		
13:52:53	1.7253		97.18	
13:52:56	1.7261	33596.60		
13:53:21	1.7331		97.17	
13:53:25	1.7342	33596.46		
13:53:50	1.7411		97.17	
13:53:54	1.7422	33596.40		
13:54:19	1.7492		97.16	
13:54:23	1.7503	33596.78		
14:10:56	2.0261		86.79	STOP @ 6000'
14:10:38	2.0211	32398.59		
14:11:17	2.0319		86.73	
14:11:21	2.0331	32404.48		
14:11:46	2.0400		86.69	
14:11:50	2.0411	32408.47		
14:12:16	2.0483		86.65	
14:12:19	2.0492	32410.55		
14:12:44	2.0561		86.63	
14:12:47	2.0569	32413.10		
14:13:12	2.0639		86.60	
14:13:16	2.0650	32415.13		
14:13:41	2.0719		86.57	
14:13:45	2.0731	32416.54		
14:14:10	2.0800		86.55	
14:14:15	2.0814	32417.95		
14:14:40	2.0883		86.53	
14:14:43	2.0892	32419.39		
14:15: 9	2.0964		86.50	
14:15:11	2.0969	32420.12		
14:15:36	2.1039		86.49	
14:15:40	2.1050	32421.27		
14:16: 5	2.1119		86.47	
14:16: 9	2.1131	32422.07		
14:16:34	2.1200		86.44	
14:16:39	2.1214	32422.13		
14:17: 4	2.1283		86.43	
14:17: 7	2.1292	32423.17		
14:17:33	2.1364		86.41	
14:17:35	2.1369	32423.98		
14:18: 0	2.1439		86.40	
14:18: 4	2.1450	32424.34		
14:18:29	2.1519		86.39	
14:18:34	2.1533	32424.49		
14:18:59	2.1603		86.37	
14:19: 3	2.1614	32424.65		

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DATA FILE: 7

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
14:19:28	2.1683		86.36	
14:19:31	2.1692	32424.83		
14:19:57	2.1764		86.35	
14:19:59	2.1769	32425.19		
14:20:24	2.1839		86.35	
14:20:28	2.1850	32425.36		
14:20:53	2.1919		86.33	
14:20:58	2.1933	32425.53		
14:21:23	2.2003		86.32	
14:21:27	2.2014	32425.76		
14:21:51	2.2081		86.32	
14:21:55	2.2092	32425.80		
14:22:21	2.2164		86.31	
14:22:23	2.2169	32426.18		
14:22:48	2.2239		86.30	
14:22:52	2.2250	32426.21		
14:23:17	2.2319		86.30	
14:23:21	2.2331	32426.14		
14:23:46	2.2400		86.29	
14:23:51	2.2414	32426.36		
14:24:15	2.2481		86.28	
14:24:19	2.2492	32426.88		
14:24:45	2.2564		86.28	
14:24:47	2.2569	32426.34		
14:25:13	2.2642		86.27	
14:25:16	2.2650	32426.81		
14:25:41	2.2719		86.27	
14:25:45	2.2731	32426.78		
14:26:10	2.2800		86.27	
14:26:14	2.2811	32426.35		
14:26:39	2.2881		86.26	
14:26:43	2.2892	32426.50		
14:27: 9	2.2964		86.26	
14:27:11	2.2969	32427.00		
14:27:37	2.3042		86.26	
14:27:40	2.3050	32426.42		
14:28: 5	2.3119		86.25	
14:28: 9	2.3131	32426.66		
14:46:46	2.6233		73.86	STOP @ 5000'
14:46:32	2.6194	31204.57		
14:47: 5	2.6286		73.82	
14:47: 9	2.6297	31208.31		
14:47:34	2.6367		73.79	
14:47:36	2.6372	31211.28		
14:48: 3	2.6447		74.34	
14:48: 5	2.6453	31220.13		
14:48:30	2.6522		73.74	
14:48:35	2.6536	31214.90		
14:48:59	2.6603		73.71	
14:49: 4	2.6617	31216.26		

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
14:49:29	2.6686		73.69	
14:49:33	2.6697	31217.27		
14:49:58	2.6767		73.66	
14:50: 0	2.6772	31218.65		
14:50:27	2.6847		73.63	
14:50:29	2.6853	31219.20		
14:50:54	2.6922		73.61	
14:50:59	2.6936	31220.03		
14:51:24	2.7006		73.58	
14:51:28	2.7017	31220.67		
14:51:53	2.7086		73.56	
14:51:57	2.7097	31220.98		
14:52:22	2.7167		73.53	
14:52:24	2.7172	31221.41		
14:52:51	2.7247		73.51	
14:52:54	2.7256	31221.61		
14:53:19	2.7325		73.49	
14:53:23	2.7336	31221.98		
14:53:23	2.7336	31221.98		
14:53:48	2.7406		73.46	
14:53:52	2.7417	31222.40		
14:54:17	2.7486		73.44	
14:54:21	2.7497	31222.15		
14:54:46	2.7567		73.42	
14:54:48	2.7572	31222.59		
14:55:15	2.7647		73.40	
14:55:18	2.7656	31222.85		
14:55:43	2.7725		73.38	
14:55:46	2.7733	31222.65		
14:56:11	2.7803		73.37	
14:56:16	2.7817	31222.96		
14:56:41	2.7886		73.35	
14:56:45	2.7897	31223.40		
14:57:10	2.7967		73.33	
14:57:14	2.7978	31222.86		
14:57:39	2.8047		73.31	
14:57:41	2.8053	31223.27		
14:58: 7	2.8125		73.30	
14:58:10	2.8133	31223.10		
14:58:35	2.8203		73.28	
14:58:40	2.8217	31223.29		
14:59: 5	2.8286		73.27	
14:59: 9	2.8297	31222.86		
14:59:34	2.8367		73.26	
14:59:38	2.8378	31223.35		
15: 0: 3	2.8447		73.24	
15: 0: 5	2.8453	31223.18		
15:16:11	3.1136		62.63	STOP @ 4000'
15:15:57	3.1097	29982.67		
15:16:29	3.1186		62.29	

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DATA FILE: 8

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
15:16:33	3.1197	29979.54		
15:16:58	3.1267		62.09	
15:17: 2	3.1278	29979.60		
15:17:28	3.1350		62.65	
15:17:31	3.1358	29987.11		
15:17:56	3.1428		62.91	
15:18: 0	3.1439	29991.03		
15:18:25	3.1508		63.77	
15:18:28	3.1517	30000.83		
15:18:53	3.1586		64.41	
15:18:57	3.1597	30008.84		
15:19:22	3.1667		63.16	
15:19:26	3.1678	29997.58		
15:19:51	3.1747		62.13	
15:19:55	3.1758	29989.04		
15:20:20	3.1828		62.85	
15:20:24	3.1839	29996.47		
15:20:49	3.1908		64.53	
15:20:52	3.1917	30013.70		
15:21:17	3.1986		62.42	
15:21:21	3.1997	29993.79		
15:21:46	3.2067		62.05	
15:21:50	3.2078	29990.75		
15:22:15	3.2147		61.24	
15:22:19	3.2158	29991.13		
15:22:44	3.2228		61.79	
15:22:48	3.2239	29989.02		
15:23:13	3.2308		61.58	
15:23:16	3.2317	29987.68		
15:23:42	3.2389		62.97	
15:23:45	3.2397	30001.46		
15:24:10	3.2467		63.12	
15:24:14	3.2478	30003.13		
15:24:39	3.2547		64.33	
15:24:43	3.2558	30015.25		
15:25: 8	3.2628		64.14	
15:25:12	3.2639	30013.86		
15:25:37	3.2708		63.59	
15:25:40	3.2717	30008.43		
15:26: 6	3.2789		64.27	
15:26: 9	3.2797	30015.43		
15:26:34	3.2867		63.57	
15:26:38	3.2878	30008.86		
15:27: 3	3.2947		61.63	
15:27: 6	3.2956	29989.92		
15:27:32	3.3028		61.43	
15:27:36	3.3039	29988.50		
15:28: 1	3.3108		62.02	
15:28: 4	3.3117	29994.19		
15:28:30	3.3189		62.85	

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DATA FILE: 8

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
15:28:33	3.3197	30002.71		
15:28:58	3.3267		62.47	
15:29: 3	3.3281	29998.64		
15:29:28	3.3350		63.46	
15:29:31	3.3358	30008.58		
15:30: 6	3.3456		62.97	ANNULUS ACCIDEN
15:29:38	3.3378	30014.22		
15:30:29	3.3519		64.32	TALY OPENED BY
15:30:26	3.3511	30003.77		
15:30:57	3.3597		62.38	FIELD OPERATOR.
15:30:55	3.3592	30002.55		
15:31:27	3.3681		66.25	
15:31:25	3.3675	30029.22		
15:31:51	3.3747		63.10	
15:31:55	3.3758	30005.98		
15:32:20	3.3828		62.89	
15:32:24	3.3839	30003.48		
15:32:49	3.3908		62.15	
15:32:53	3.3919	29996.16		
15:33:18	3.3989		63.02	
15:33:21	3.3997	30004.73		
15:33:46	3.4067		63.37	
15:33:50	3.4078	30008.21		
15:34:15	3.4147		63.45	
15:34:19	3.4158	30008.98		
15:34:44	3.4228		65.13	
15:34:48	3.4239	30025.64		
15:35:13	3.4308		62.59	
15:35:17	3.4319	30000.14		
15:35:42	3.4389		64.05	
15:35:45	3.4397	30014.90		
15:36:10	3.4467		64.45	
15:36:14	3.4478	30018.53		
15:36:39	3.4547		63.92	
15:36:43	3.4558	30013.65		
15:37: 8	3.4628		64.60	
15:37:12	3.4639	30020.37		
15:37:37	3.4708		64.76	
15:37:41	3.4719	30021.56		
15:38: 6	3.4789		63.22	
15:38: 9	3.4797	30006.74		
15:38:34	3.4867		62.40	
15:38:38	3.4878	29998.64		
15:39: 3	3.4947		63.02	
15:39: 6	3.4956	30004.30		
15:39:32	3.5028		62.77	
15:39:36	3.5039	30001.83		
15:40: 1	3.5108		60.71	
15:40: 5	3.5119	29981.30		
15:40:30	3.5189		63.45	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
15:40:33	3.5197	30008.36		
15:40:58	3.5267		63.83	
15:41: 2	3.5278	30012.09		
15:41:27	3.5347		64.07	
15:41:31	3.5358	30014.68		
15:41:56	3.5428		63.52	
15:42: 0	3.5439	30009.17		
15:42:25	3.5508		64.94	
15:42:29	3.5519	30023.10		
15:42:54	3.5589		63.04	
15:42:57	3.5597	30003.92		
15:43:22	3.5667		63.92	
15:43:26	3.5678	30013.00		
15:57:52	3.8083		56.59	STOP @ 2000'
15:57:37	3.8042	28752.42		
15:58: 9	3.8131		56.97	
15:58:13	3.8142	28759.67		
15:58:38	3.8211		56.26	
15:58:40	3.8217	28756.07		
15:59: 7	3.8292		56.85	
15:59: 9	3.8297	28763.35		
15:59:34	3.8367		54.25	
15:59:38	3.8378	28739.69		
16: 0: 3	3.8447		56.23	
16: 0: 8	3.8461	28760.88		
16: 0:33	3.8531		54.23	
16: 0:36	3.8539	28742.72		
16: 1: 1	3.8608		55.87	
16: 1: 6	3.8622	28760.27		
16: 1:31	3.8692		53.82	
16: 1:33	3.8697	28740.97		
16: 2: 0	3.8772		54.59	
16: 2: 2	3.8778	28749.61		
16: 2:27	3.8847		55.51	
16: 2:31	3.8858	28759.08		
16: 2:56	3.8928		54.92	
16: 3: 0	3.8939	28754.19		
16: 3:25	3.9008		54.24	
16: 3:30	3.9022	28748.16		
16: 3:55	3.9092		55.47	
16: 3:57	3.9097	28761.21		
16: 4:24	3.9172		55.17	
16: 4:26	3.9178	28758.67		
16: 4:51	3.9247		55.49	
16: 4:55	3.9258	28762.20		
16: 5:20	3.9328		55.45	
16: 5:24	3.9339	28761.74		
16: 5:49	3.9408		56.22	
16: 5:54	3.9422	28769.36		
16: 6:19	3.9492		55.46	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
16: 6:21	3.9497	28762.51		
16: 6:48	3.9572		56.14	
16: 6:50	3.9578	28769.27		
16: 7:15	3.9647		56.74	
16: 7:20	3.9661	28775.22		
16: 7:44	3.9728		54.00	
16: 7:49	3.9742	28748.45		
16: 8:14	3.9811		54.12	
16: 8:18	3.9822	28749.92		
16: 8:43	3.9892		54.80	
16: 8:45	3.9897	28756.93		
16: 9:12	3.9972		54.08	
16: 9:14	3.9978	28750.36		
16: 9:39	4.0047		54.72	
16: 9:44	4.0061	28756.54		
16:25:43	4.2725		48.20	STOP @ 2000'
16:25:57	4.2764	27466.71		
16:26:20	4.2828		47.87	
16:26:23	4.2836	27465.05		
16:26:55	4.2925		41.14	
16:26:51	4.2914	27401.65		
16:27:17	4.2986		41.98	
16:27:20	4.2994	27409.80		
16:27:45	4.3064		41.03	
16:27:49	4.3075	27401.73		
16:28:14	4.3144		41.01	
16:28:19	4.3158	27403.22		
16:28:44	4.3228		50.89	
16:28:47	4.3236	27502.55		
16:29:13	4.3308		49.70	
16:29:16	4.3317	27491.39		
16:29:41	4.3386		50.39	
16:29:45	4.3397	27499.43		
16:30:10	4.3467		51.24	
16:30:14	4.3478	27507.86		
16:30:39	4.3547		48.83	
16:30:43	4.3558	27484.66		
16:31: 8	4.3628		49.50	
16:31:12	4.3639	27491.99		
16:31:37	4.3708		49.11	
16:31:40	4.3717	27488.51		
16:32: 5	4.3786		49.29	
16:32: 9	4.3797	27490.88		
16:32:34	4.3867		50.66	
16:32:38	4.3878	27504.95		
16:33: 3	4.3947		50.16	
16:33: 7	4.3958	27499.86		
16:33:32	4.4028		50.21	
16:33:36	4.4039	27500.65		
16:34: 1	4.4108		49.96	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
16:34: 4	4.4117	27498.55		
16:34:29	4.4186		49.69	
16:34:32	4.4194	27495.85		
16:34:58	4.4267		50.72	
16:35: 1	4.4275	27506.54		
16:35:26	4.4344		50.54	
16:35:31	4.4358	27504.59		
16:35:56	4.4428		51.84	
16:36: 0	4.4439	27517.79		
16:36:25	4.4508		49.03	
16:36:28	4.4517	27489.95		
16:36:53	4.4586		47.33	
16:36:56	4.4594	27473.37		
16:52: 4	4.7117		40.13	STOP @ 1000'
16:51:40	4.7050	26090.71		
16:52:15	4.7147		41.66	
16:52:16	4.7150	26157.66		
16:52:41	4.7219		43.76	
16:52:44	4.7228	26178.60		
16:53:10	4.7300		44.17	
16:53:14	4.7311	26184.50		
16:53:39	4.7381		44.72	
16:53:43	4.7392	26191.64		
16:54: 8	4.7461		43.49	
16:54:12	4.7472	26180.45		
16:54:37	4.7542		44.59	
16:54:40	4.7550	26192.64		
16:55: 5	4.7619		42.01	
16:55: 9	4.7631	26167.65		
16:55:34	4.7700		42.52	
16:55:38	4.7711	26173.80		
16:56: 3	4.7781		42.84	
16:56: 7	4.7792	26177.44		
16:56:32	4.7861		43.71	
16:56:36	4.7872	26186.86		
16:57: 1	4.7942		43.05	
16:57: 4	4.7950	26180.62		
16:57:29	4.8019		44.74	
16:57:33	4.8031	26198.05		
16:57:58	4.8100		44.66	
16:58: 1	4.8108	26196.94		
16:58:27	4.8181		45.36	
16:58:31	4.8192	26204.90		
16:58:55	4.8258		43.29	
16:59: 0	4.8272	26184.28		
16:59:25	4.8342		42.84	
16:59:28	4.8350	26180.16		
16:59:53	4.8419		43.01	
16:59:57	4.8431	26182.19		
17: 0:22	4.8500		42.86	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
17: 0:26	4.8511	26180.98		
17: 0:51	4.8581		41.03	
17: 0:55	4.8592	26162.80		
17: 1:20	4.8661		41.62	
17: 1:24	4.8672	26168.69		
17: 1:49	4.8742		45.77	
17: 1:52	4.8750	26209.94		
17: 2:17	4.8819		41.36	
17: 2:21	4.8831	26166.10		
17: 2:46	4.8900		42.87	
17: 2:50	4.8911	26181.06		
17: 3:15	4.8981		43.52	
17: 3:19	4.8992	26188.01		
17: 3:44	4.9061		43.56	
17: 3:48	4.9072	26188.25		
17: 4:13	4.9142		48.53	
17: 4:16	4.9150	26237.32		
17: 4:41	4.9219		43.44	
17: 4:45	4.9231	26187.13		
17: 5:10	4.9300		42.60	
17: 5:14	4.9311	26178.81		
17: 5:39	4.9381		41.97	
17: 5:43	4.9392	26173.11		
17: 6: 8	4.9461		42.23	
17: 6:12	4.9472	26175.06		
17:27:24	5.3006		50.30	HANG IN LUB.
17:27:10	5.2967	24908.29		
17:27:43	5.3058		51.02	
17:27:47	5.3069	24895.48		
17:28:12	5.3139		49.74	
17:28:14	5.3144	24871.10		
17:28:40	5.3217		50.58	
17:28:43	5.3225	24869.22		
17:29: 9	5.3297		48.68	
17:29:13	5.3308	24842.37		
17:29:38	5.3378		49.67	
17:29:42	5.3389	24845.41		
17:30: 7	5.3458		48.73	
17:30:11	5.3469	24830.90		
17:30:36	5.3539		47.75	
17:30:39	5.3547	24816.23		
17:31: 4	5.3617		50.44	
17:31: 8	5.3628	24838.79		
17:31:33	5.3697		51.16	
17:31:37	5.3708	24842.57		
17:32: 2	5.3778		52.77	
17:32: 6	5.3789	24855.69		
17:32:31	5.3858		52.25	
17:32:35	5.3869	24847.64		
17:33: 0	5.3939		49.84	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
17:33: 3	5.3947	24821.57		
17:33:28	5.4017		51.50	
17:33:31	5.4025	24836.24		
17:33:56	5.4094		50.19	
17:34: 1	5.4108	24821.38		
17:34:26	5.4178		51.60	
17:34:30	5.4189	24833.73		
17:34:55	5.4258		49.18	
17:34:59	5.4269	24808.09		
17:35:24	5.4339		48.32	
17:35:26	5.4344	24798.57		
17:35:52	5.4417		49.03	
17:35:55	5.4425	24804.17		
17:36:20	5.4494		49.68	
17:36:25	5.4508	24809.87		
17:36:50	5.4578		49.78	
17:36:54	5.4589	24810.17		
17:37:19	5.4658		52.00	
17:37:23	5.4669	24831.94		
17:37:48	5.4739		51.34	
17:37:50	5.4744	24824.89		
17:38:16	5.4817		51.01	
17:38:19	5.4825	24821.05		
17:38:44	5.4894		52.17	
17:38:49	5.4908	24832.32		
17:39:14	5.4978		51.54	
17:39:18	5.4989	24825.45		
17:39:43	5.5058		52.47	
17:39:47	5.5069	24834.03		
17:40:12	5.5139		51.61	
17:40:15	5.5147	24825.54		
17:40:40	5.5217		49.28	
17:40:44	5.5228	24802.00		
17:41: 9	5.5297		49.02	
17:41:13	5.5308	24798.93		
17:41:38	5.5378		48.02	
17:41:42	5.5389	24787.87		
17:42: 7	5.5458		51.07	
17:42:11	5.5469	24817.87		
17:42:36	5.5539		51.35	
17:42:39	5.5547	24820.36		
17:43: 4	5.5617		51.89	
17:43: 8	5.5628	24825.20		
17:43:33	5.5697		52.67	
17:43:37	5.5708	24831.98		
17:44: 2	5.5778		52.18	
17:44: 6	5.5789	24826.07		
17:44:31	5.5858		52.29	
17:44:35	5.5869	24826.53		
17:45: 0	5.5939		51.99	

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REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
17:45: 3	5.5947	24822.50		
17:45:29	5.6019		53.01	
17:45:31	5.6025	24832.12		
17:45:57	5.6097		52.74	
17:46: 1	5.6108	24828.99		
17:46:26	5.6178		50.25	
17:46:30	5.6189	24803.29		
17:46:55	5.6258		50.25	
17:46:59	5.6269	24803.29		
17:47:24	5.6339		49.90	
17:47:27	5.6347	24799.55		
17:47:53	5.6419		49.65	
17:47:55	5.6425	24796.82		
17:48:21	5.6497		52.24	
17:48:25	5.6508	24822.59		
17:48:49	5.6575		54.11	
17:48:54	5.6589	24840.75		
17:49:19	5.6658		53.04	
17:49:23	5.6669	24829.81		
17:49:48	5.6739		52.56	
17:49:51	5.6747	24824.99		
17:50:17	5.6819		51.65	
17:50:19	5.6825	24815.79		
17:50:45	5.6897		53.51	
17:50:49	5.6908	24834.24		
17:51:14	5.6978		51.78	
17:51:18	5.6989	24816.64		
17:51:43	5.7058		53.79	
17:51:47	5.7069	24836.63		
17:52:12	5.7139		50.40	
17:52:16	5.7150	24802.90		
17:52:41	5.7219		50.36	
17:52:44	5.7228	24801.97		
17:53: 9	5.7297		50.57	
17:53:13	5.7308	24803.61		
17:53:38	5.7378		51.93	
17:53:42	5.7389	24817.41		
17:54: 7	5.7458		52.78	
17:54:11	5.7469	24825.22		
17:54:36	5.7539		52.55	
17:54:40	5.7550	24822.95		
17:55: 5	5.7619		53.90	
17:55: 8	5.7628	24836.30		
17:55:33	5.7697		52.18	
17:55:36	5.7706	24819.13		
17:56: 1	5.7775		51.26	
17:56: 6	5.7789	24809.86		
17:56:31	5.7858		53.76	
17:56:35	5.7869	24834.71		
17:57: 0	5.7939		52.21	

PAGE START DATE: 2/27/89 GAUGE S/N: 0348

DATA FILE: 8

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
17:57: 4	5.7950	24818.66		
17:57:29	5.8019		50.70	
17:57:31	5.8025	24803.51		
17:57:57	5.8097		49.37	
17:58: 0	5.8106	24790.72		
17:58:25	5.8175		52.37	
17:58:30	5.8189	24819.59		
17:58:55	5.8258		51.86	
17:58:59	5.8269	24814.14		
17:59:24	5.8339		49.35	
17:59:28	5.8350	24788.56		
17:59:53	5.8419		54.20	
17:59:55	5.8425	24837.42		
18: 0:21	5.8497		54.20	
18: 0:24	5.8506	24836.47		
18: 0:49	5.8575		54.32	
18: 0:54	5.8589	24837.04		
18: 1:19	5.8658		53.43	
18: 1:23	5.8669	24827.58		
18: 1:48	5.8739		53.37	
18: 1:52	5.8750	24826.65		
18: 2:17	5.8819		53.80	
18: 2:19	5.8825	24831.10		
18: 2:45	5.8897		54.38	
18: 2:48	5.8906	24836.36		
18: 3:13	5.8975		51.04	
18: 3:18	5.8989	24803.16		
18: 3:43	5.9058		51.47	
18: 3:47	5.9069	24807.14		
18: 4:11	5.9136		49.66	
18: 4:16	5.9150	24788.77		
18: 4:41	5.9219		50.96	
18: 4:43	5.9225	24801.93		
18: 5: 9	5.9297		52.88	
18: 5:12	5.9306	24820.55		
18: 5:37	5.9375		50.15	
18: 5:41	5.9386	24793.61		
18: 6: 7	5.9458		52.84	
18: 6:11	5.9469	24819.75		
18: 6:36	5.9539		53.29	
18: 6:40	5.9550	24824.54		
18: 7: 5	5.9619		53.71	
18: 7: 8	5.9628	24828.79		
18: 7:33	5.9697		52.55	
18: 7:36	5.9706	24816.34		
18: 8: 1	5.9775		50.52	
18: 8: 6	5.9789	24797.00		
18: 8:31	5.9858		51.68	
18: 8:35	5.9869	24808.23		
18: 9: 0	5.9939		49.80	

PAGE START DATE: 2/27/89 GAUGE S/N: 0349

DATA FILE: 8

REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE 'C	COMMENTS
18: 9: 4	5.9950	24789.57		
18: 9:29	6.0019		49.37	
18: 9:31	6.0025	24785.61		
18: 9:57	6.0097		49.00	
18:10: 0	6.0106	24781.99		
18:10:25	6.0175		48.72	
18:10:30	6.0189	24780.07		
18:10:55	6.0258		48.51	
18:10:59	6.0269	24777.33		
18:11:24	6.0339		50.59	
18:11:28	6.0350	24798.35		
18:11:53	6.0419		51.38	
18:11:55	6.0425	24806.55		
18:12:21	6.0497		51.09	
18:12:24	6.0506	24803.22		
18:12:49	6.0575		53.28	
18:12:54	6.0589	24825.42		
18:13:19	6.0658		47.89	
18:13:23	6.0669	24771.44		
18:13:48	6.0739		51.44	
18:13:52	6.0750	24807.47		
18:14:17	6.0819		52.10	
18:14:19	6.0825	24814.22		
18:14:46	6.0900		50.87	
18:14:48	6.0906	24802.38		
18:15:13	6.0975		48.56	
18:15:18	6.0989	24779.10		
18:15:43	6.1058		49.00	
18:15:46	6.1067	24783.84		
18:16:11	6.1136		48.17	
18:16:16	6.1150	24775.90		
18:16:41	6.1219		49.91	
18:16:43	6.1225	24793.81		
18:17:10	6.1300		50.50	
18:17:13	6.1308	24799.70		
18:17:38	6.1378		51.17	
18:17:42	6.1389	24805.73		
18:18: 6	6.1456		49.79	
18:18:11	6.1469	24792.28		
18:18:36	6.1539		51.77	
18:18:40	6.1550	24811.66		
18:19: 5	6.1619		51.00	
18:19: 7	6.1625	24799.21		
18:19:34	6.1700		49.62	
18:19:36	6.1706	24790.95		
18:20: 1	6.1775		47.63	
18:20: 6	6.1789	24770.84		
18:20:30	6.1856		49.46	
18:20:35	6.1869	24789.36		
18:21: 0	6.1939		46.08	

PAGE START DATE: 2/27/89 GAUGE S/N: 0350

DATA FILE: 9

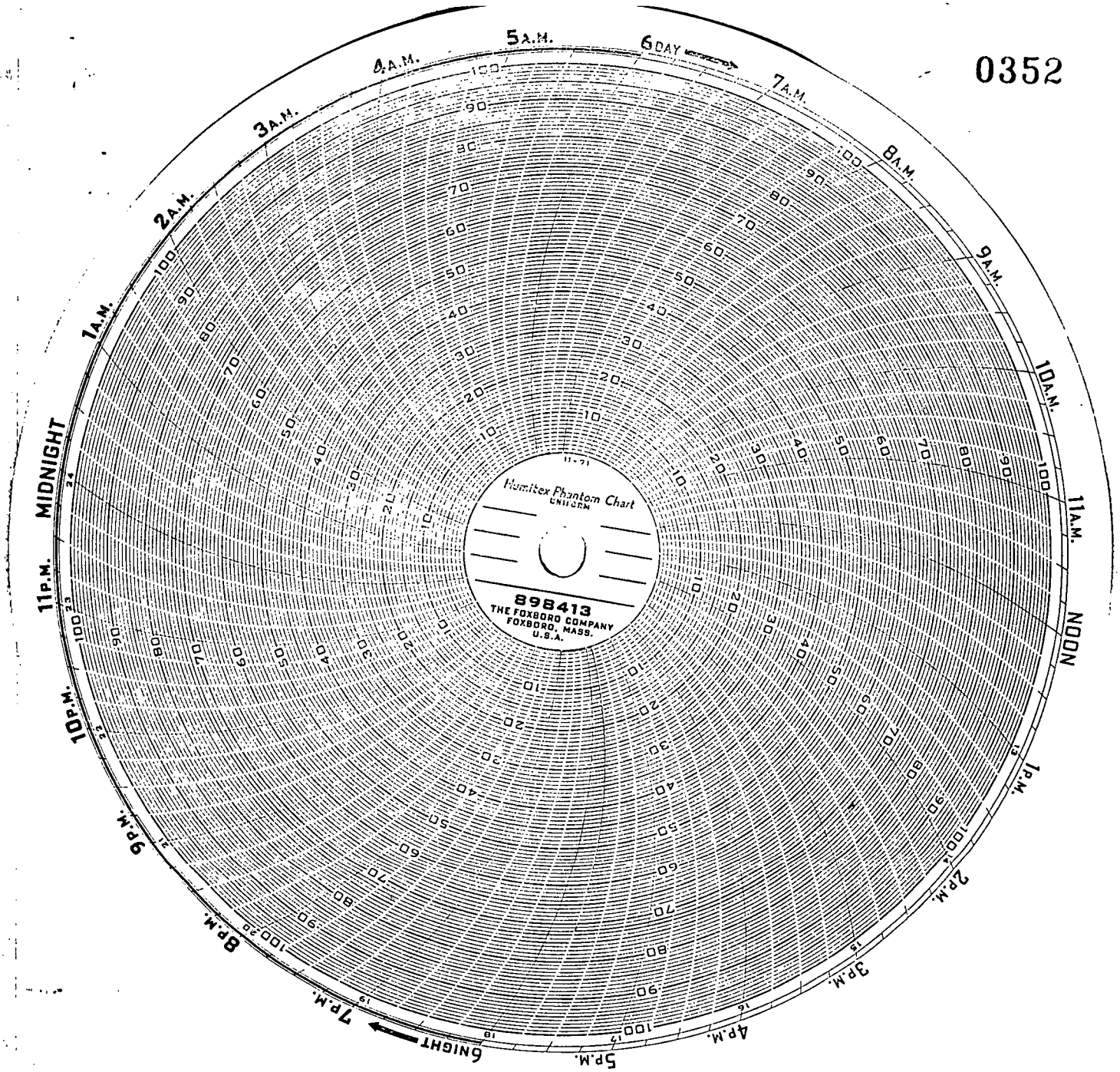
REAL TIME	DELTA TIME HRS	PRESSURE kPaA	TEMPERATURE °C	COMMENTS
18:21: 4	6.1950	24755.42		
18:21:29	6.2019		47.53	
18:21:31	6.2025	24770.11		
18:21:58	6.2100		48.16	
18:22: 0	6.2106	24776.36		
18:22:25	6.2175		51.45	
18:22:30	6.2189	24808.47		
18:22:54	6.2256		50.54	
18:22:59	6.2269	24799.73		
18:23:24	6.2339		51.02	
18:23:28	6.2350	24804.24		
18:23:53	6.2419		51.77	
18:23:55	6.2425	24811.37		
18:24:22	6.2500		51.42	
18:24:24	6.2506	24808.78		
18:24:49	6.2575		51.67	
18:24:53	6.2586	24810.35		
18:25:18	6.2656		50.92	
18:25:23	6.2669	24802.60		
18:25:48	6.2739		49.43	
18:25:52	6.2750	24787.48		
18:26:17	6.2819		49.27	
18:26:19	6.2825	24786.07		
18:26:46	6.2900		48.84	
18:26:48	6.2906	24780.86		
18:27:13	6.2975		48.58	
18:27:17	6.2986	24777.75		

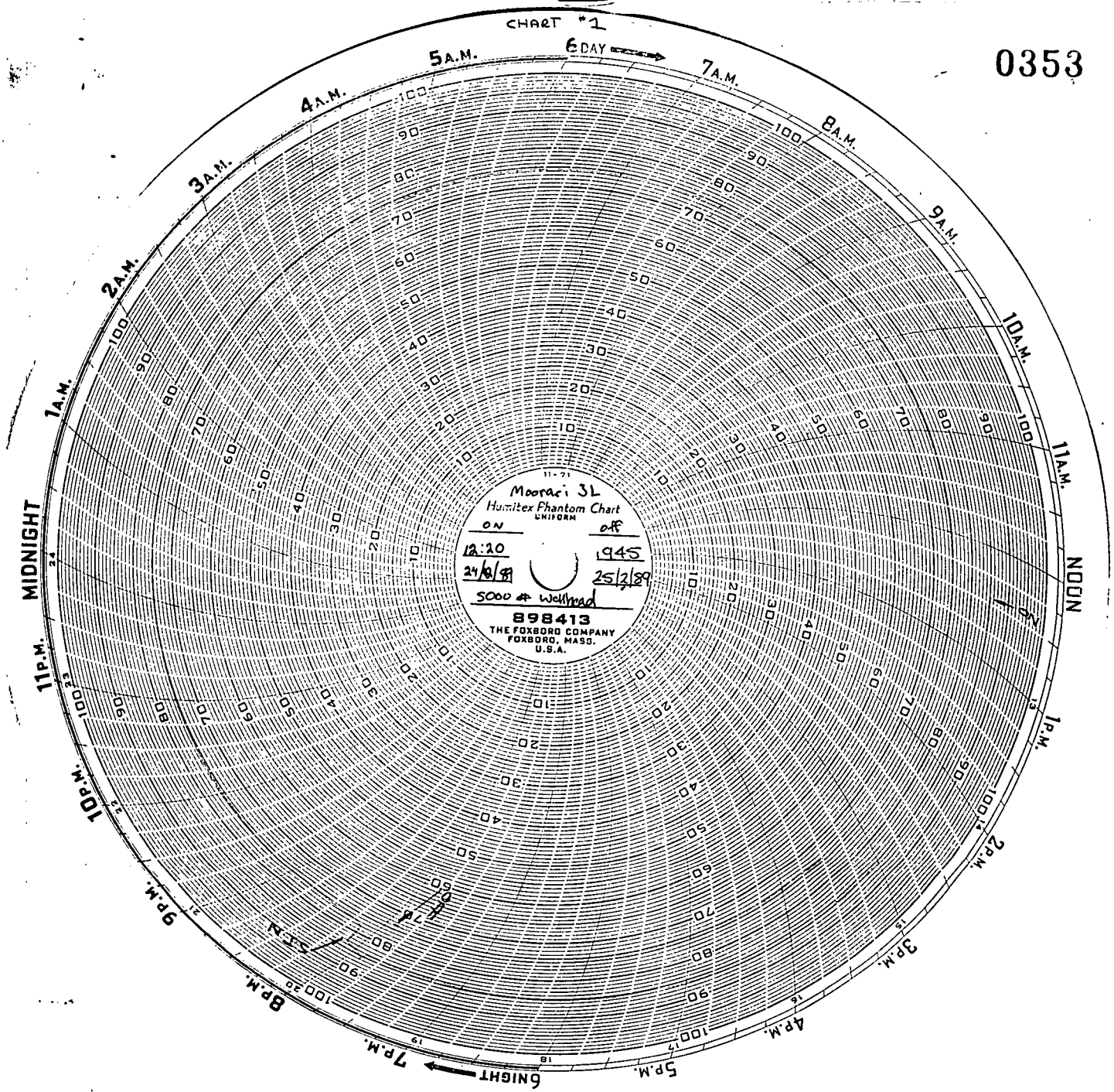
Section # 5

WELLHEAD RECORDER CHARTS

By: OILSERV AUSTRALIA LIMITED
242 GLEN OSMOND ROAD
FULLARTON SA 5063

TELEPHONE (08) 338 1630
TELEX AA 88713
FACSIMILE (08) 79 6351


5A.M.
6DAY
7A.M.
8A.M.
9A.M.
10A.M.
11A.M.
NOON
1P.M.
2P.M.
3P.M.
4P.M.
5P.M.
6NIGHT
7P.M.
8P.M.
9P.M.
10P.M.
11P.M.
MIDNIGHT
1A.M.
2A.M.
3A.M.
4A.M.
Humitex Phantom Chart
UNIFORM
898413
THE FOXBORO COMPANY
FOXBORO, MASS.
U.S.A.


CHART #1
6 DAY
5A.M.
7A.M.
4A.M.
8A.M.
3A.M.
9A.M.
2A.M.
10A.M.
1A.M.
11A.M.
MIDNIGHT
NOON
11P.M.
1P.M.
10P.M.
2P.M.
9P.M.
3P.M.
8P.M.
4P.M.
7P.M.
5P.M.
6NIGHT
11-71
Moorari 3L
Humitex Phantom Chart
UNIFORM
ON
OFF
12:20
1945
24/2/89
25/2/89
5000 # Wellmead
898413
THE FOXBORO COMPANY
FOXBORO, MASS.
U.S.A.

MOORARI #3 UPPER

SUMMARY OF SINGLE RATE TEST & BUILD-UP SURVEY

6TH - 15TH MARCH 1989

Flow Test

6th - 11th March

7/3/89: Opened well on 22/64" choke @ 1140 hrs.

8/3/89: Choke reduced to 20/64" @ 0645 hrs.

Flowed well on 20/64" choke for 74.75 hrs.

F.T.H.P.	=	2363	kPa
Separator Pressure	=	896	kPa
Separator Temperature	=	20	°C
Gas Flow Rate	=	15.256	$10^3 m^3/d$
Condensate Rate	=	8.879	m^3/d
Water Rate	=	0.405	m^3/d

9/3/89: Well shut in for 1 hour @ 1830 hrs.

11/3/89: Shut well in @ 1030 hrs.

Element #21379 @ 8674' KB @ 1030 hrs = 5359 kPa

Element #21821 @ 8680' KB @ 1030 hrs = 5453 kPa

Build-Up Survey

11th - 15th March

11/3/89: Shut well in @ 1030 hrs for 96 hours build-up.

Element #21379 @ 8674' KB after 96 hrs build-up = 17041 kPa

Element #21821 @ 8680' KB after 96 hrs build-up = 17078 kPa

15/3/89: P.O.O.H. @ 1030 hrs.



Static Reservoir Pressure

15/3/89: Ran static pressure gradient

Element #21379 @ 8680' KB = 17157 kPa

Element #21821 @ 8680' KB = 17157 kPa

Maximum shut in bottomhole temperature = 236°F

LGA/ih - 17/5/89
WP5242G(29)

SANTOS LTD
39 GRENFELL ST
ADELAIDE

0355

SUB-SURFACE PRESSURE SURVEY

CO. SANTOS
EFF DEPTH
CASING
LINER -
DATE - 890310
ELEVATION
MAX TEMP
PERF
TUBING -
UNITS - ENGLISH

RUN 01 FIELD MOORARI
WELL STAT
CASING PRESS
TUBING PRESS
ELEMENT RANGE 0 - 4968
ZONE
PICK-UP
CAL SER NO. 21379

WELL 03U
TOOL HUNG 8674'
ON BOTTOM 1725 10/3
OFF BOTTOM 1030 15/3
ZERO POINT
SHUT-IN
ON-PROD 1030 11/3
MPP

PURPOSE BUILD-UP

SURVEY DATA

CO. SANTOS — RUN 01 FIELD MOORARI — WELL 03U

TIME	P-T	DP-DT	DTIME
10:30	777.3	0.0	0.0
10:31	817.8	40.5	.0
10:33	868.0	90.7	.1
10:35	929.8	152.4	.1
10:38	991.0	213.6	.1
10:42	1061.0	283.7	.2
10:45	1116.3	339.0	.3
10:49	1162.5	385.2	.3
10:52	1211.4	434.1	.4
0:58	1275.8	498.5	.5
1:03	1329.3	552.0	.6
1:08	1364.0	586.7	.6
1:13	1404.4	627.1	.7
:20	1443.3	666.0	.8
:26	1482.5	705.2	.9
:35	1526.3	749.0	1.1
:43	1562.8	785.5	1.2
53	1593.6	816.2	1.4
02	1625.3	848.0	1.5
11	1654.2	876.8	1.7
19	1673.9	896.5	1.8
30	1701.2	923.9	2.0
0	1721.9	944.6	2.2
1	1745.0	967.7	2.3
0	1764.0	986.7	2.5
8	1773.4	996.0	2.6
9	1784.7	1007.4	2.8
	1789.6	1012.3	3.1
	1793.3	1016.0	3.4
	1793.3	1016.0	3.7
	14:17	1787.4	1010.0	3.8
	14:28	1779.7	1002.4	4.0
	14:45	1777.0	999.7	4.2
	15:09	1777.0	999.7	4.7
	15:34	1785.1	1007.8	5.1
	15:59	1794.2	1016.9	5.5
	16:26	1804.6	1027.2	5.9
	16:52	1815.6	1038.3	6.4
	17:19	1826.7	1049.4	6.8
	18:04	1847.9	1070.6	7.6
	18:59	1870.5	1093.2	8.5
	20:04	1896.4	1119.1	9.6
	21:08	1921.0	1143.7	10.6
	21:57	1939.2	1161.9	11.4
	22:55	1959.7	1182.4	12.4
	0:41	1994.7	1217.3	14.2
	2:56	2041.3	1263.9	16.4
	5:41	2091.3	1314.0	19.2
	7:21	2117.7	1340.3	20.9
	9:20	2142.3	1365.0	22.8
	11:27	2171.4	1394.1	25.0
	13:43	2197.5	1420.2	27.2
	16:50	2228.3	1451.0	30.3
	20:19	2260.9	1483.5	33.8
	2:38	2306.2	1528.8	40.1
	8:34	2342.3	1565.0	46.1
	17:46	2380.1	1602.8	55.3
	3:36	2412.4	1635.1	65.1
	14:17	2436.1	1658.8	75.8
	2:25	2460.4	1683.1	87.9

CO. SANTOS

SURVEY DATA

RUN 01 FIELD MOORARI

TIME	P-T	DP-DT	DTIME
10:30	2471.5	1694.2	96.0

WELL 03U

TIME	P-T	DP-DT	DTIME
0:00	0.0	0.0	0.0

LUB IN DWT = 333 PSI / OUT = 1405 PSI
LUB IN AMERADA = 320 PSI / OUT = 1403 PSI

SANTOS LTD
39 GRENFELL ST
ADELAIDE

SANTOS
DEPTH
NG
R
890310
TION
EMP
ENGLISH

SUB-SURFACE PRESSURE SURVEY

RUN 02 FIELD MOORARI
WELL STAT
CASING PRESS
TUBING PRESS
ELEMENT RANGE 0 - 5132
ZONE
PICK-UP
CAL SER NO. 21821

WELL 03U
TOOL HUNG 8680'
ON BOTTOM 1725 10/3
OFF BOTTOM 1030 15/3
ZERO POINT
SHUT-IN
ON-PROD 1030 11/3
MPP

PURPOSE BUILD-UP

SURVEY DATA

RUN 02 FIELD MOORARI

DTIME	TIME	P-T	DP-DT	DTIME
0.0	14:07	1795.0	1004.1	3.6
.0	14:24	1799.2	1008.3	3.9
.1	14:40	1791.7	1000.8	4.2
.1	15:16	1791.4	1000.5	4.8
.1	16:05	1798.3	1007.4	5.6
.2	16:56	1818.6	1027.7	6.4
.2	18:02	1848.3	1057.4	7.5
.3	19:20	1881.7	1090.8	8.8
.3	20:32	1911.2	1120.3	10.0
.4	21:37	1935.6	1144.7	11.1
.5	22:58	1966.2	1175.3	12.5
.6	1:03	2008.1	1217.2	14.6
.6	3:38	2058.5	1267.6	17.1
.7	5:51	2097.4	1306.5	19.4
.8	9:40	2151.2	1360.3	23.2
.9	12:52	2192.7	1401.8	26.4
1.0	16:24	2227.5	1436.5	29.9
1.1	20:23	2263.7	1472.8	33.9
1.3	23:38	2287.0	1496.1	37.1
1.4	3:26	2314.1	1523.1	40.9
1.6	8:22	2344.6	1553.6	45.9
1.7	15:28	2372.4	1581.5	53.0
1.9	23:36	2398.8	1607.9	61.1
2.2	9:18	2418.4	1627.4	70.8
2.4	17:55	2455.0	1664.1	79.4
2.6	3:10	2469.3	1678.3	88.7
2.8	10:30	2476.9	1686.0	96.0
3.2	0:00	0.0	0.0	0.0

TOS

P-T	DP-DT
790.9	0.0
833.3	42.4
882.5	91.6
931.5	140.5
972.5	181.6
1019.6	228.7
1056.0	265.0
1102.4	311.5
150.8	359.9
199.1	408.2
251.9	461.0
300.8	509.9
356.5	565.6
89.1	598.2
29.1	638.2
68.3	677.4
1.0	710.1
5.6	735.7
9.8	768.9
.7	799.8
.7	829.8
.1	861.2
8	892.9
0	930.1
7	954.8
8	979.9
4	998.4
2	1004.3

3 PSI / OUT = 1405 PSI
337 PSI / OUT = 1415 PSI

WELL: MOORARI #3 UPPER.

TYPE OF TEST: S.R.T. & B.U.

SANTOS LTD.
WELL TEST DATA SHEET

DATE: 6TH MARCH 89

PAGE No: 1 (ONE)

DATE / TIME	WELLHEAD					GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS				
	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 M3	API GRAVITY @60 °F	TANK DIP INS.	TANK PROD M3	GAS FLOW RATE 10^3M^3/D	OIL FLOW RATE M^3/DAY	WATER FLOW RATE M^3/DAY	TOTAL LIQUID FLOW RATE M^3/DAY	L.G.R $M^3/10^6M^3$
6.3.89	MOORARI #3 UPPER: SINGLE RATE TEST & BUILD UP SURVEY.																		
1430	SPOT SEPARATOR & TEST TANK ON LOCATION: UNABLE TO CONTINUE RIG UP: STAND																		
	BY FOR RIG TO VACAT LOCATION.																		
6.3.89																			
1340	ARRIVED ON LOCATION: RIG UP FLOW LINES: CHOKE MANIFOLD: WIRE LINE UNIT																		
1600	COMPLETED RIG UP. OF ALL TEST EQUIPMENT.																		
1925	N/A.	10618			PRESSURE TEST FLOW LINE & CHOKE MANIFOLD														
2000					OPEN WELL TO ATMOSPHERE ON 18/64 INS VARIABLE CHOKE ON BYPASS OF														
					VESSEL														
2010					SHUT WELL IN: 2" DVC VALVES ON MANIFOLD PASSING														
7.3.89			0700 HRS		RETURN TO MOOMBA FOR REDRESS KITS														
1030	REDRESS AND PACK WITH GREASE TWO DVC 2" VALVES ON MANIFOLD																		
1115		10687			PRESSURE TEST TO MANIFOLD														
1140		10687		22/64	OPEN WELL TO ATMOSPHER ON BYPASS OF SEPARATOR FOR CLEAN UP														
1200	4874	6474		"															
1215	4909	5378	33	"															
1230	4916	4826	34	"															
1300	4929	4061	34	"															
1330	4936	3888	34	"															
1400	4916	3785	34	"															

WELL: MOORARI "B" UPPER

TYPE OF TEST: S.R.T. & B.U.

SANTOS LTD.
WELL TEST DATA SHEET

DATE: 7TH MARCH 89

PAGE No: 2 (TWO)

DATE / TIME	WELLHEAD					GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS				
	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	GAS FLOW RATE M^3/DAY	OIL FLOW RATE M^3/DAY	WATER FLOW RATE M^3/DAY	TOTAL LIQUID FLOW RATE M^3/DAY	L.G.R M^3/M^3
7.3.89	MOORARI "B" UPPER: SINGLE RATE TEST & BUILD UP SURVEY.																		
1430	4964	3654	35	22/64															
1530	4971	3371	35	"															
1600		3240				TRIM FLOW THROUGH SEPARATOR													
1610							ENGAGE	1.25	ORIFICE PLATE										
1620						FLUID LEVEL OBTAINED IN VESSEL 1630 HRS *START TEST*													
1630	4936	3130	32	"		1344	54	24	1.250	1.5	TANK TABLE		.5		21.959				
1830	4943	2854	32	"		1447	43	23	"	7.5	1.596		.5	ø	20.541	19.152	ø	19.152	932
1830						REDUCE SEPARATOR PRESSURE.													
2230	4950	2564	27	"		1379	37	18	"	23	4.123		.5	ø	18.815	24.738	ø	24.738	1314
8.3.89																			
0230	4929	2447	26	"		1413	35	17	"	34	2.926		.5	ø	18.643	17.556	ø	17.556	941
0630	4888	2371	26	"		1379	35	18	"	41.5	1.995		2.5	.532	18.296	11.97	3.192	15.162	828
0645				20/64		1034	REDUCED CHOKE & SEPARATOR PRESSURE.												
1050	4916	2633	28	"		965	45	18	"	49	1.995		2.5	ø	16.949	11.97	ø	11.97	706
1450	4936	2551	30	"		965	45	20	"	56	1.862		2.5	ø	16.857	11.172	ø	11.172	662
1850	4944	2496	31.5	"		965	44	23	"	62.25"	1.662		3.25"	.199	16.853	9.975	1.97	11.94	709
							Reduced separator pressure.												
2250	4895	2461	30	"		896	44	17.5	"	68.75"	1.729		3.5"	.067	16.173	10.374	.399	10.773	666
				See	next page.														

WELL: MORRARI # 3

TYPE OF TEST: S.R.T. + B.U.

SANTOS LTD.
WELL TEST DATA SHEET

DATE: 9 of March 1989

PAGE No: 3

DATE / TIME	WELLHEAD					GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS				
															GAS	OIL	WATER	TOTAL LIQUID	L.G.R.
	CASING kPa	TUBING kPa	TEMP. °C	CHOKE SIZE INS.	B.S.W. %	PI	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	$m^3/10^6 m^3$
				9 of March			1989												
0230	4882	2420	29	20/64		896	42	17	1.25"	75"	1.662		3.5"	0	15.820	9.925	0	9.925	631
0630	4847	2379	28	20/64		931	39.5	17	1.25"	81.75"	1.795		3.5"	0	15.651	10.773	0	10.773	688
1030	4847	2358	32	20/64		758	51	22	1.25"	87.75"	1.596		4.25"	.199	15.808	9.576	1.197	10.773	681
1430	4826	2358	36	20/64		689	57	26	1.25"	92.5"	1.263		4.5"	.066	15.808	7.581	.399	7.980	504
1830	4771	2309	35	20/64		758	51	23	1.25"	98.25"	1.530		4.5"	0	15.773	9.177	0	9.177	584
1830	4771	2309	35	Shut well in to remove rig parts from location.															
1908	4771	5509	34	Open well by pass separator.															
1930	4709	2413	33	trim flow through separator.															
2230	4702	2337	31	20/64		827	43.5	20	1.25"	102.75"	1197		4.5"	0	15.326	9.576	0	9.576	625
				10 of March			1989												
0230	4757	2275	31	20/64		827	41	19	1.25"	108.25"	1.463		4.75"	.066	14.915	8.778	.399	9.177	615
0630	4723	2255	30	20/64		862	39	18	1.25"	114.25"	1.596		4.75"	0	14.824	9.576	0	9.576	643
1030	4723	2255	33	20/64		827	40.5	19	1.25"	119.00"	1.264		5"	.066	14.824	7.581	.399	7.980	538
13.35		Run in hole with blind box																	
1414		on bottom at 8689' KB																	
1415		Pull out of hole.																	
1438		At surface. Prepare gauges.																	
1430	4709	2551	37	20/64		862	39	19	1.25"	124.75"	1530		5.25"	.066	14.855	9.177	.399	9576	645
1500		2248		Pressure up lubricator.															

WELL: MOORARI # 3UP.

TYPE OF TEST: S.R.T. + B.up.

SANTOS LTD.
WELL TEST DATA SHEET

DATE: 10.03.89

PAGE No: 4

DATE / TIME	WELLHEAD					GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS				
															GAS	OIL	WATER	TOTAL LIQUID	L.G.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	$10^6 m^3/m^3$
				10 of March. 1989															
1700	4689	2296	34	Run in hole with two pressure elements.															
1725	4689	2296	34	On bottom at 8680 'KB.															
1830	4640	2275	33	29/64		965	34	26	1.250"	128.25"	.931		6"	.199	14.448	5.586	1.197	6.783	469
2830	4585	2241	31	20/64		1034	29	21	1.250"	132.5"	1.130		6.25"	.066	14.032	6.783	.399	7.182	512
				11 of March 1989															
0230	4557	2241	30	20/64		1034	26	20	1.250"	137"	1.197		6.5"	.066	13.321	7.182	.399	7.581	569
0630	4592	2241	30	20/64		1034	27	18	1.250"	142.5"	1.463		7"	.133	13.655	8.778	.798	9.576	701
1030	4558	2255	32	20/64		931	32	21	1.250"	147.75"	1.396		7".	0	13.931	8.378	0	8.378	601
1030			Shut well in for 96 hr. build up.												Cum. prod. of gas = 58.669 $10^3 m^3$				
1045	4551	4171	30												Cum. prod. of oil = 38.851 m^3				
1100	4537	5102	31												Cum. prod. of H_2O = 1.698 m^3				
1115	4537	5695	35																
1130	4557	6054	36																
1145	4530	6378	38																
1200	4516	6702	39																
1215	4516	6874	39																
1230	4502	7033	40																
1300	4496	7322	42																
1330	4496	7391	45																

OPERATOR

WELL: MOORARI #3 4P

TYPE OF TEST: SRT + B.U.

SANTOS LTD.
WELL TEST DATA SHEET

DATE: 11.03.89

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 kPa	TUBING kPa	TEMP. °C	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
					11 of March			1989											
1400	4482	7529	45																
1430	4433	7584	46																
1500	4433	7688	49																
1530	4440	7757	49																
1600	4433	7860	47																
1630	4433	7964	45																
1830	4406	8343	37																
2230	4364	8591	27																
					12 of March			1989											
0230	4330	8798	26																
0630	4302	9025	25																
1030	N/A	9184	39																
1430	4288	9281	47																
1830	4227	9356	35																
2230	4206	9412	30																
					13 of March			1989.											
0230	4178	9446	24																
0630	4157	9494	24																
0945	4157	9549	25																

0363

WELL: MOORARI #3 WP

TYPE OF TEST: SRT + BU

SANTOS LTD.
WELL TEST DATA SHEET

DATE: 13.03.89

PAGE No: 6

DATE / TIME	WELLHEAD					GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS				
	CASING kPa	TUBING kPa	TEMP. °C	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
					13 of March 1989														
0945			Move out of location due to rain.																
					14 of March 1989														
			Out of location due to rain																
					15 of March 1989														
0830	3930	9674	18																
1030	3937	9674	20		Off bottom.														
1102					In lubricator.														
1312	3937	9687	23		Depressure lubricator. Charts OK.														
1350					Run in hole for Static gradient.														
1600					Rig down wireline unit and secure well.														
					End of test.														

WELL MOORARI "3 UPPER

TANK:— CAPACITY .....
SCALE 1"=2.266m³

SANTOS LTD

FLUID PRODUCTION SHEET

0364

DATE 7TH MARCH 89
PAGE No. 1 (ONE)
OPERATOR R. Compere

DATE / TIME	CUM. TIME	OIL/CONDENSATE PRODUCTION					WATER PRODUCTION					REMARKS
		TANK DIP INS	TANK PROD. m³	FLOWRATE m³/D	CUM. PROD. m³	OIL CONDENSATE GRAVITY °API60F°	TANK DIP INS	TANK PROD. m³	FLOWRATE m³/d	CUM. PROD. m³	SALINITY PPM	
7.3.89												
1630	0	1.5	TANK TARE DIP.				.5					
1830	2	7.5	1.596	19.152	1.596		"					
2230	6	23	4.123	24.738	5.719		"					
8.3.89												
0230	10	34	2.926	17.556	8.645		"					
0630	14	41.5	1.995	11.97	10.64		2.5	.532	3.192	.532		
1030	18	49	1.995	11.97	12.635		"			.532		
1430	22	56	1.862	11.172	14.497		"			.532		
1830	26	62.25"	1.662	9.975	16.159		3.25"	.199	1.197	.731		
2230	30	68.75"	1.729	10.374	17.888		3.5"	.067	.399	.737		
		9 of March 1989.										
0230	34	75"	1.662	9.975	19.550		3.5"	0	0	.737		
0630	38	81.75"	1.795	10.773	21.295		3.5"	0	0	.737		
1030	42	87.75"	1.596	9.576	22.891		4.25"	.199	1.197	.936		
1430	46	92.5"	1.263	7.581	24.154		4.5"	.066	.399	1.002		
1830	50	98.25"	1.530	9.177	25.684		4.5"	0	0	1.002		
1830		Shut well in.										
1930	50	Open well and trim flow through separator.										
2230	53	102.75"	1.197	9.576	26.881		4.5"	0	0	1.002		

WELL MOORARI #3 up

TANK:— CAPACITY .....
SCALE 1" = 266 m³

SANTOS LTD

FLUID PRODUCTION SHEET

0365

DATE 10 of March 1989

PAGE No. 2. (two)

OPERATOR I. KURASIAK

DATE / TIME	CUM. TIME	OIL/CONDENSATE PRODUCTION					WATER PRODUCTION					REMARKS
		TANK DIP INS	TANK PROD. m3	FLOWRATE m3/D	CUM. PROD. m3	OIL CONDENSATE GRAVITY °API60F°	TANK DIP INS	TANK PROD. m3	FLOWRATE m3/D	CUM. PROD. m3	SALINITY PPM	
			10 of	March	1989							
0230	57	108.25"	1.463	8.778	28.344		4.75"	.066	.399	1.068		
0630	61	114.25"	1.596	9.576	29.940		4.75"	0	0	1.068		
1030	65	119.00"	1.264	7.581	31.204		5"	.066	.399	1.135		
1430	69	124.75"	1.530	9.177	32.734		5.25"	.066	.399	1.201		
1830	73	128.25"	.931	5.586	33.665		6"	.199	1.197	1.400		
2230	77	132.5"	1.130	6.783	34.795		6.25"	.066	.399	1.466		
			11 of	March	1989							
0230	81	137"	1.197	7.182	35.992		6.5"	.066	.398	1.565		
0630	85	142.5"	1.463	8.778	37.455		7"	.133	.798	1.698		
1030	89	147.75"	1.396	8.378	38.851		7"	0	0	1.698		
1030		Shut well in		for	build up.							

8.9 / 7.1 L

26.268

CLIENT SANTOS LTD

WELL MOORARI #3 UPPER

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

Date 7TH MARCH 89 Page No. 1 (ONE)

Operator R. CAMPBELL

Orifice Fitting Type DANIEL SNR
Gas Flow Recorder Type FOXBORO
Date of Last Calibration 6.12.88

Orifice Fitting Size 2.900"
Pressure Range 0-1500 PSI
Differential Range 0-100 INCHES

Gas Specific Gravity 1.3412
Perforated Interval 8726' → 8748' KB
Formation Tested NAPPAMERRI

Base Conditions = 14.73psi @ 60°F
☒ Flange Taps ☐ Pipe Taps

TIME DATA		Choke Size 64ths Inch	METER RUN DATA				√Pf x Hw	C' = Fu x Fb x Fg x Ftf x Fpv x Y2							Flow Rate Q = C' x √Pf x Hw MMSCF/D
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'	
7.3.89															
1630	0	22/64	209.73	54	75.2	1.250	106.42096	24	523.632	.86348	.98570	1.10606	1.00168	7329.000	.7794
1830	2	"	224.73	45	73.4	"	98.30254	"	"	"	.98736	1.11875	1.00121	7417.370	.7291
2250	6	"	214.73	37	64.4	"	89.13479	"	"	"	.99580	1.12052	1.00109	7491.701	.6678
8.3.89															
0230	10	"	219.73	35	62.6	"	87.69578	"	"	"	.99751	1.12674	1.00101	7545.657	.6617
0630	14	22/64	214.73	35	64.4	"	86.69227	"	"	"	.99580	1.12052	1.00103	7491.259	.6494
1030	18	20/64	154.73	45	64.4	"	85.44369	"	"	"	99580	1.07749	1.00184	7209.439	.6016
1430	22	"	154.73	45	68	"	83.44369	"	"	"	.99240	1.07536	1.00184	7170.595	.5983
1830	26	"	154.73	44	73	"	83.5710	"	"	"	.9877	1.0774	1.0018	7149.6959	.5975
2230	30	"	144.73	44	63.5	"	79.8005	"	"	"	.9967	1.0741	1.0019	7193.2177	.5740
				9 of March 1989											
0230	34	"	144.73	42	62.6	"	77.9658	"	"	"	.9975	1.0746	1.0018	7202.2978	.5615
0630	38	"	149.73	39.5	62.6	"	76.9047	"	"	"	.9975	1.0779	1.0017	7223.3427	.5555
1030	42	"	124.73	51	71.6	"	79.7573	"	"	"	.9890	1.0580	1.0026	7030.1065	.5611
1430	46	"	114.73	57	78.8	"	80.8679	"	"	"	.9824	1.0499	1.0032	6939.4484	.5611
1830	50	"	124.73	51	73.4	"	79.7573	"	"	"	.9874	1.0572	1.0026	7019.2470	.5598
1830		Shut well in.													
1930	50	"	Open well and trim flow through separator.												
2230	53	"	134.73	43.5	68	"	76.5556	"	"	"	.9924	1.0654	1.0020	7105.6867	.5439

E11

CLIENT ....SANTOS. LTP.....

WELL . MOORARI #8. HP.....

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

Date .10. of. March. 89 Page No. ....2.....

Operator ... I. ...K.urasiak.....

Orifice Fitting Type ... Daniel Senior. Orifice Fitting Size ....2.900".... Gas Specific Gravity. . . 1.3412 ..... Base Conditions = 14.73psi @60°F

Gas Flow Recorder Type .. Fox.box..... Pressure Range ..... 0-1500. PSI.... Perforated Interval. 8726'-8748' KB .. ☒ Flange Taps ☐ Pipe Taps

Date of Last Calibration .... 6..12..89..... Differential Range ....0-100 "of H2O .. Formation Tested . . . NAPPAMERRI .....

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'	
				10	of March		1989								MMSCF/D.
0230	57	29/64	134.73	41	66.2	1.250"	74.3231	24	323.632	.86348	.9941	1.0663	1.0019	7122.9617	.5294
0630	61	29/64	139.73	39	64.4	1.250"	73.8205	"	"	"	.9958	1.0703	1.0018	7161.0705	.5286
1030	65	20/64	134.73	40.5	66.2	1.250"	73.8686	"	"	"	.9941	1.0663	1.0019	7122.7939	.5261
1430	69	20/64	139.73	39	66.2	1.250"	73.8205	"	"	"	.9941	1.0694	1.0018	7142.3590	.5272
1830	73	20/64	154.73	34	78.8	1.250"	72.5315	"	"	"	.9824	1.0717	1.0014	7070.7695	.5128
2230	77	20/64	164.73	29	69.8	1.250"	69.1171	"	"	"	.9907	1.0833	1.0011	7205.9083	.4980
				11	of March		1989								
0230	81	20/64	164.73	26	68	1.250"	65.4445	"	"	"	.9924	1.0845	1.0010	7225.4399	.4728
0630	85	20/64	164.73	27	64.4	1.250"	66.6912	"	"	"	.9958	1.0870	1.0010	7267.2966	.4846
1030	89	20/64	149.73	32	69.8	1.250"	69.2197	"	"	"	.9907	1.0736	1.0014	7143.3615	.4944
1030	Shut well in for build up.														
														ave:	0.5415

HEM

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE
TELEPHONE (08) 384 0488 TELEX AA87163
129 RICHMOND ROAD MARLESTON SA 5033 POSTAL ADDRESS: PO BOX 384 COMMONDILLA 5033

WIRELINE REPORT

CLIENT Santos WELL Moorari #3 upper

DATE

PROGRAMME Single rate test and build up

PURPOSE OF WORK RIH B/Box to ensure tubing clear

REPORT OF WORK PERFORMED

3/3/89 13:15 Rig up W/L unit with 1.75 B/Box
13:35 RIH 1.75" B/Box tag bar at 8689' kB.
14:38 Lub

14:45 prepare 2 pressure elements and 1 Max Bott hole thermometer.
15:00 pressure lub and hang there for 2 Hours.
17:00 RIH with pressure elements prior to shuting well in.
17:25 Hanging at 8680' kB for flow and Build up.

15.03.89 10.30 P.O.O.H. Charts O.K.
Prepare elements for static gradient survey.
1350 R.I.H. two elements for S. gradient.
1453 P.O.O.H: Charts O.K.
1600 Rig down wire line unit and secure well.

Operator's Signature

WORKED PERFORMED BY I KURASIAK. OF Expertest

WELL DATA:

Tubing Size 2 3/8 FWHP SIWHP

Subsurface S.V./Landing Nipple @ 8662 / 8671 Vargo S.S.D. @

'X' Nipple @ 'N'/'XN' Nipple @ 8662 Other @

Min. I.D. 1.791 @ Packer @ 8645

Perforated Interval: 8726'-8738' 8742'-8748'

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

Tested Wednesday, 15th March 1989.

CLIENT	LOCATION	FORMATION
Santos Ltd.	MOORARI 3 up.	NAPPAMERRI

STATIC PRESSURE GRADIENT REPORT

PRESSURE ELEMENT DATA

POSITION	SERIAL NO.	RANGE	CALIBRATED
Top	21379	4825	20/ 8/88
Bottom	21821	4750	20/ 8/88

WELL DATA

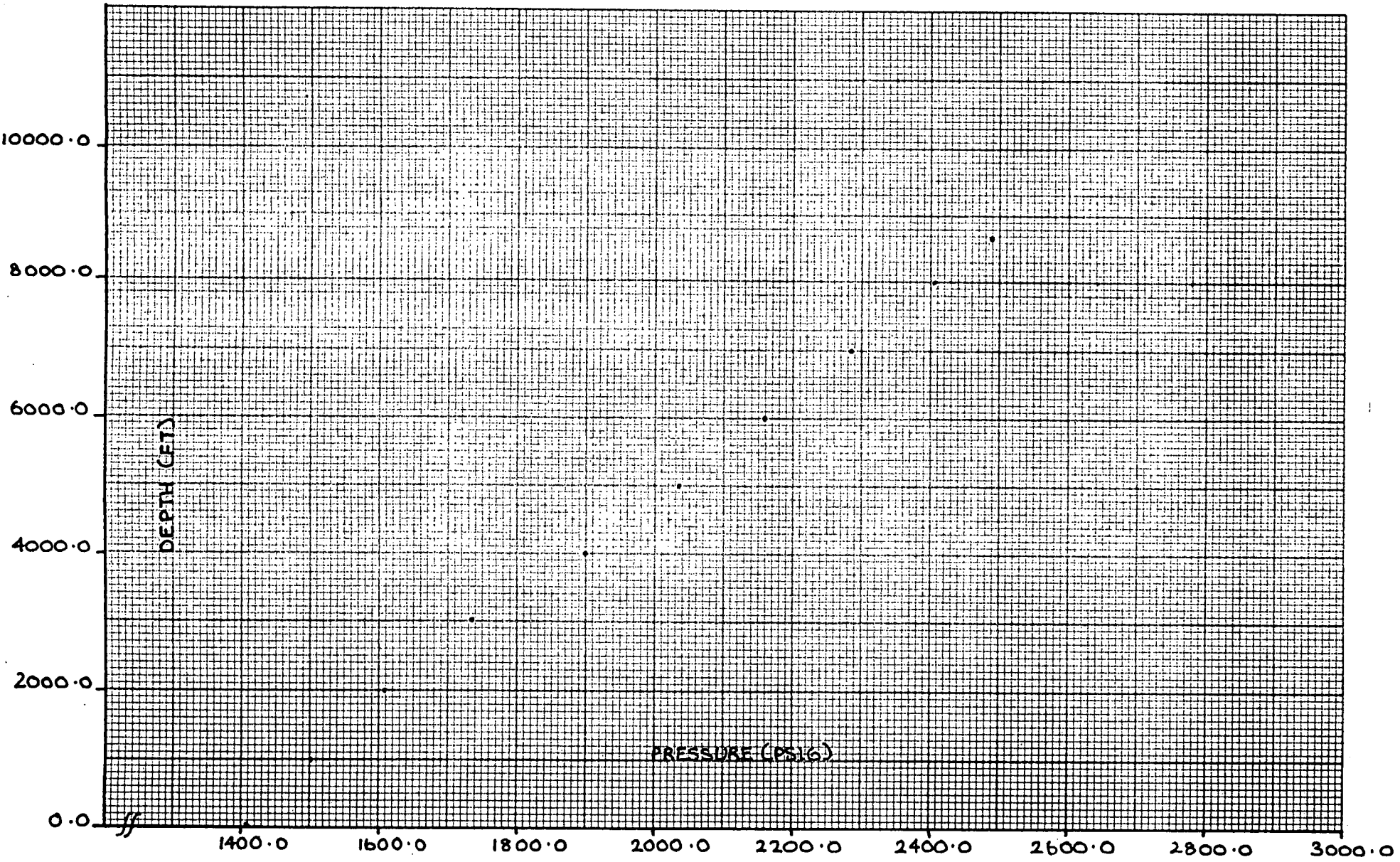
PARAMETER	VALUE
DWT In	1405 PSI
DWT Out	1400 PSI
Max BHT	236 F

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.	0.5690	1416.7	-----	0.5610	1408.5	-----
1000	0.6040	1503.1	0.086	0.5980	1501.3	0.093
2000	0.6470	1609.2	0.106	0.6410	1609.1	0.108
3000	0.6970	1732.5	0.123	0.6910	1734.5	0.125
4000	0.7630	1895.4	0.163	0.7560	1897.7	0.163
5000	0.8190	2033.6	0.138	0.8110	2035.8	0.138
6000	0.8700	2159.5	0.126	0.8600	2158.9	0.123
7000	0.9200	2283.0	0.124	0.9100	2284.6	0.126
000	0.9690	2404.2	0.121	0.9580	2405.3	0.121
680	1.0030	2488.3	0.124	0.9910	2488.3	0.122
UB.	0.5660	1409.3	-----	0.5620	1411.0	-----

GENERAL REMARKS

MOORARI # 3 UPPER – STATIC PRESSURE GRADIENT – 15/3/89

ELEMENT # 21821/4750 (BOT)



EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE

0371

STATIC GRADIENT SURVEY

CLIENT SANTOS LTD.

WELL MOORARI #3 UP. Form: NAPPAMERRI

OPERATOR I. KURASIAK.

DATE 15.03.89

BOMB No. 1 DATA

ELEMENT No. 21379 ELEMENT RANGE 4805 PSI

RECORDER No 59288 x 14 HRS CLOCK DATA 2509 x 3 HRS.

ENGAGE STYLUS 1324 HRS DISENGAGE 1534 hrs

PRESSURE LUBRICATOR 1340 hrs.

BOMB No 2 DATA

ELEMENT No. 21821 ELEMENT RANGE 4750 hrs.

RECORDER No 14619 x 14 HRS CLOCK DATA 2431 X 3 HRS.

ENGAGE STYLUS 1324 HRS DISENGAGE 1534 HRS

BLEED LUBRICATOR 1534 HRS

DWT IN 1405 PSI

DWT OUT 1400 PSI

DATE	TIME	DEPTH'	DEFLEC-TION	PRESSURE TEMP.	GRADIENT psi/ft	DEPTH'	DEFLEC-TION	PRESSURE TEMP.	GRADIENT psi/ft	REMARKS
15.03.89	1340	0				0				
	1350	RIH				RIH				
	1354	1000				1000				
	1400	2000				2000				
	1406	3000				3000				
	1413	4000				4000				
	1419	5000				5000				
	1425	6000				6000				
	1431	7000				7000				
	1437	8000				8000				
	1443	8680				8680				
	1453	POOH				POOH				
	1524	Lub				Lub.				

GENERAL REMARKS:

E4

EXPERTEST PTY LTD
WIRELINE & WELL TESTING SERVICE
136 WEST BEACH ROAD MARLESTON SA 5033 POSTAL ADDRESS: PO BOX 354 COMANDILLA 5033
TELEPHONE (08) 354 0488 TELEX AA87183

0372

Well: MOORARI # 3 up. Form: Nappamerri Date: 10.03.89 - 15.03.89

Lubricator Data: ① 320 / 1403 ② 337 / 1415 Operator I. KURYSIAK.

Pressure with D.W.T. In 10.03.89 2296 kPA (333) Out 15.03.89 9687 kPa (1405)

Time Pressured 10.03.89 at 1500 HRS. Time Depressured 15.03.89 13.12 Hrs.

Time Run in Hole 10.03.89 at 1700 HRS Time off Bottom 15.03.89 10.30 Hrs

	Bomb No. 1 Data	Bomb No. 2 Data
Element No. and Range	21379 x 4825 PSI	21821 x 4750 PSI
Recorder No.	59288 x 14 TLS	14619 x 14 TLS
Clock and Lead Screw Data	24709 x 120 HRS	24580 x 120 HRS
Engage Stylus	Date: 10.03.89 Time: 1446 HRS	Date: 10.03.89 Time: 1446 HRS
Disengage	Date: 15.03.89 Time: 1321 Hrs	Date: 15.03.89 Time: 1321 Hrs.

Remarks:

Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	Wellhead kPa	Casing kPa	Wellhead Temp. °C	Remarks
10.03.89	1735		2296	4689	34	On bottom at 6680'KB.
11.03.89	1030		2255	4558	32	Shut well in
		For build up data see "WELL TEST DATA SHEET" pages no. 4; 5; 6;				
15.03.89	1030		9674	3937	20	Off bottom
	1102					In lub.
	1312		9687	3937	23	Dep. lub.
			Charts	O.K.		

SANTOS

CALCULATION SHEET

CALC. No. ..... DATE 5/10/90

PROJECT INJECTION RATE CALCULATION 0373

SUBJECT MOORARI # 3 LOWER

BY L. AMOS SHEET ..... OF .....

0045-10/89

* Shut well in 1400 hrs 23/4/90

* 24 hour injection total measured @ 0700 hrs each day.

* Injection weight of Ethane for 24hr period 0700 22/4 - 0700 23/4 = 100,000 kg.

Kg x 28.4×10^{-6} = mmscf

$\therefore$ 100,000 Kg/day x 28.4×10^{-6} = mmscf/d

$\Rightarrow$ = 2.840 mmscf/d

= 80.014 E3 m^3/d

* Injection weight of Ethane for 24hr period 0700 23/4 - 0700 24/4 = 33,333 kg.

Shut well in @ 1400 hrs 23/4/90

$\therefore$ Flow time of 7 hours

$\Rightarrow$ 33,333 x 28.4×10^{-6} x 24/7 = 3.246 mmscf/d

= 91.443 E3 m^3/d

LV 6/3/91

pmvd 5/3/91

ENV 3953

SUB-SURFACE PRESSURE SURVEY

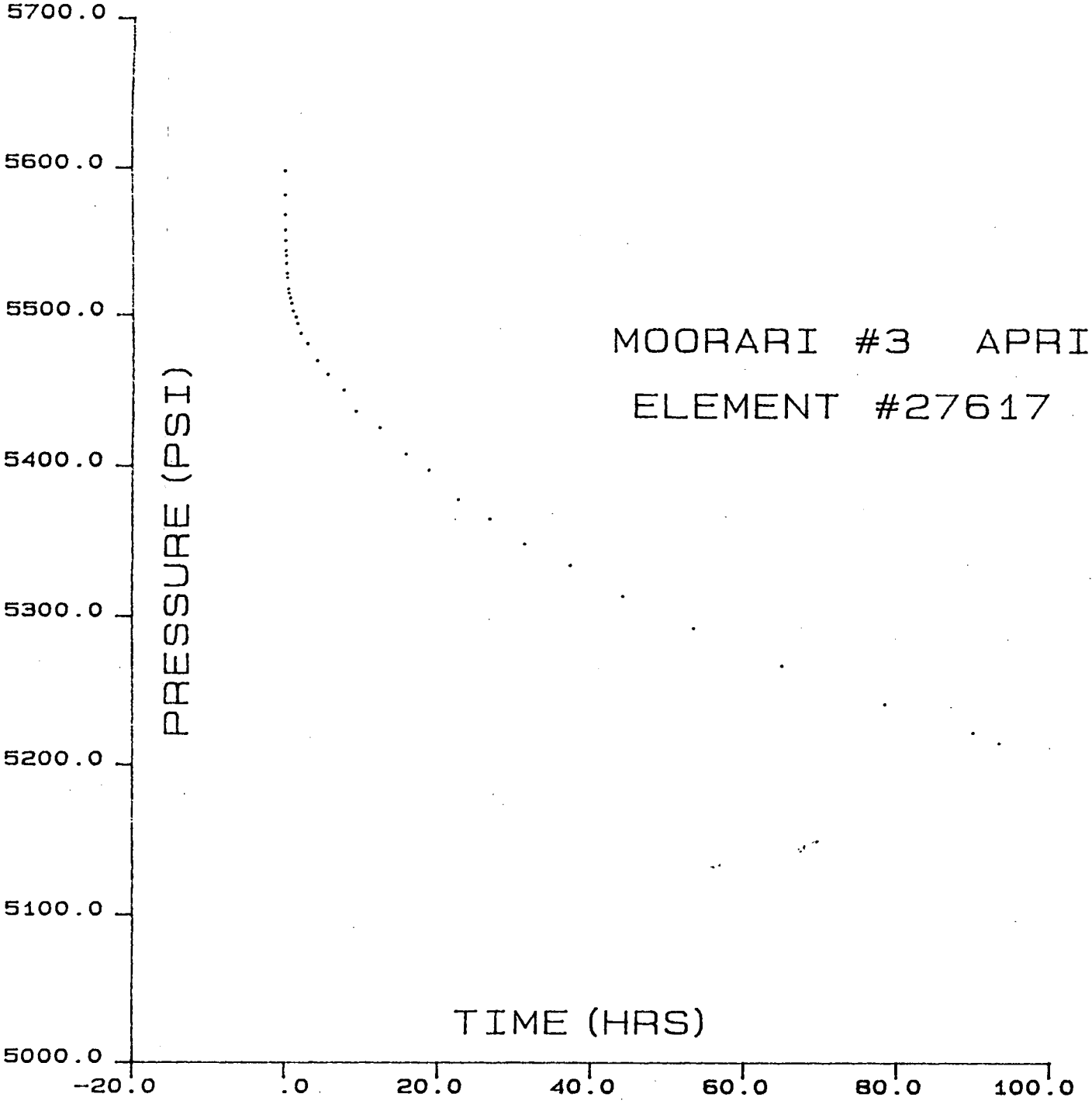
CO.		RUN 01 FIELD MOORARI		WELL 03	
EFF DEPTH		WELL STAT		TOOL HUNG	9208'
CASING	-	CASING PRESS		ON BOTTOM	1137 23/4
LINER	-	TUBING PRESS		OFF BOTTOM	1130 27/4
DATE	900423	ELEMENT RANGE	0 - 5770	ZERO POINT	
ELEVATION		ZONE		SHUT-IN	1400 23/4
MAX TEMP	259°F	PICK-UP		ON-PROD	
PERF	-	CAL SER NO.	27617	MPP	
TUBING	-				
UNITS	ENGLISH	PURPOSE	PRESSURE FALL-OFF		

SURVEY DATA

CO. RUN 01 FIELD MOORARI WELL 03

TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
14:00	5597.9	5597.9	.0	16:56	5480.9	5480.9	2.9
14:00	5581.8	5581.8	.0	18:13	5469.5	5469.5	4.2
14:01	5568.5	5568.5	.0	19:36	5460.8	5460.8	5.6
14:03	5558.4	5558.4	.0	21:42	5450.1	5450.1	7.7
14:04	5551.2	5551.2	.1	23:15	5435.9	5435.9	9.3
14:07	5544.6	5544.6	.1	2:23	5425.2	5425.2	12.4
14:08	5541.1	5541.1	.1	5:48	5407.8	5407.8	15.8
14:12	5535.9	5535.9	.2	8:47	5397.3	5397.3	18.8
14:16	5529.3	5529.3	.3	12:36	5378.2	5378.2	22.6
14:20	5526.1	5526.1	.3	16:46	5365.0	5365.0	26.8
14:28	5517.8	5517.8	.5	21:22	5348.6	5348.6	31.4
14:32	5514.9	5514.9	.5	3:20	5334.3	5334.3	37.3
14:41	5511.2	5511.2	.7	10:13	5313.9	5313.9	44.2
14:51	5508.0	5508.0	.8	19:28	5292.0	5292.0	53.5
15:04	5502.9	5502.9	1.1	7:01	5266.4	5266.4	65.0
15:25	5498.6	5498.6	1.4	20:30	5240.8	5240.8	78.5
15:39	5494.6	5494.6	1.6	8:03	5221.8	5221.8	90.0
16:03	5487.7	5487.7	2.0	11:30	5215.1	5215.1	93.5

LUB IN DWT = 3986 PSI / OUT = 3561 PSI
LUB IN AMERADA = 3969 PSI / OUT = 3609 PSI


MOORARI #3 APRIL 1990
ELEMENT #27617 (TOP)
PRESSURE (PSI)
5700.0
5600.0
5500.0
5400.0
5300.0
5200.0
5100.0
5000.0
TIME (HRS)
-20.0
.0
20.0
40.0
60.0
80.0
100.0

SUB-SURFACE PRESSURE SURVEY

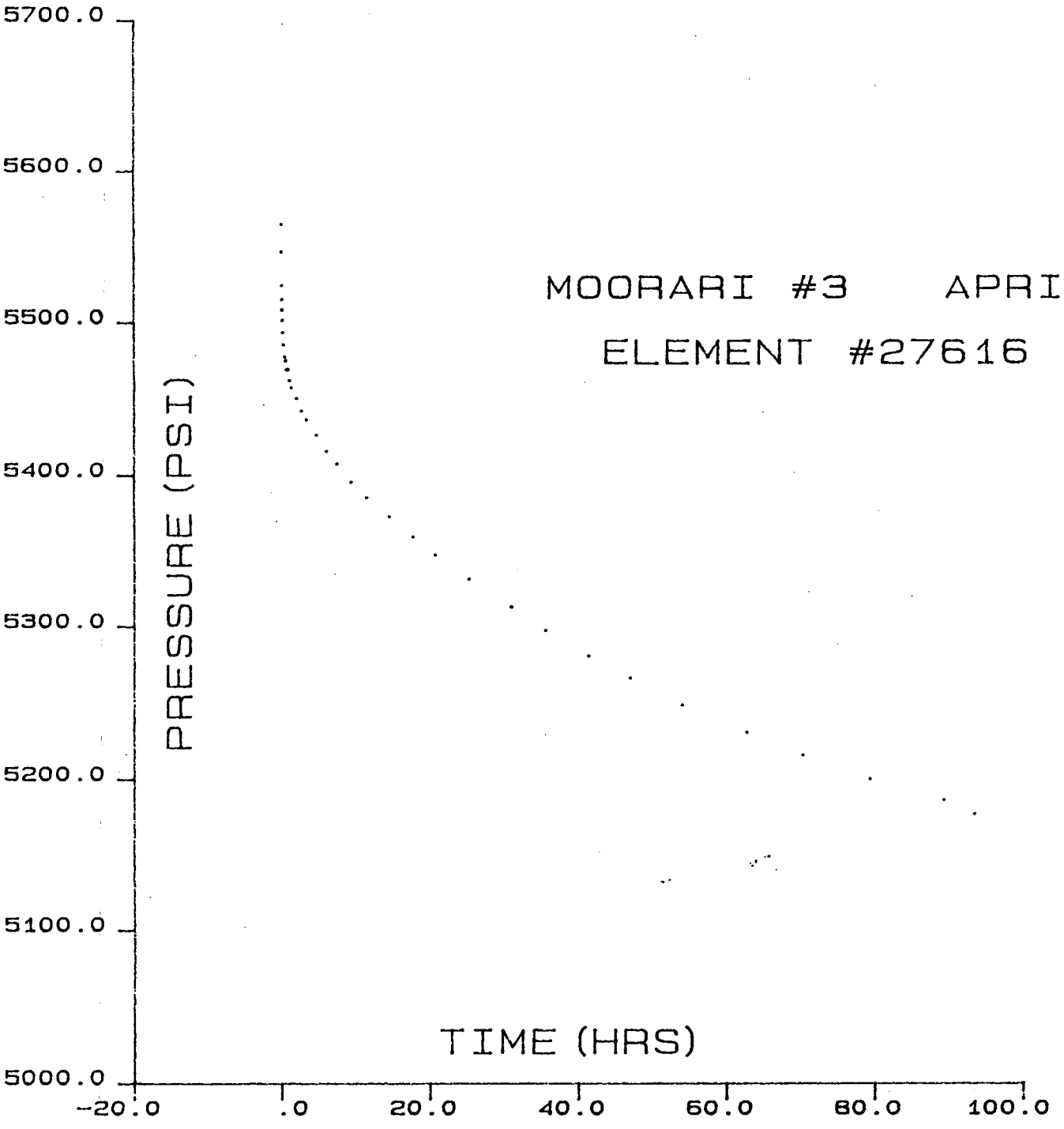
CO.		RUN 02 FIELD MOORARI		WELL 03	
EFF DEPTH		WELL STAT		TOOL HUNG	9214'
CASING	-	CASING PRESS		ON BOTTOM	1137 23/4
LINER	-	TUBING PRESS		OFF BOTTOM	1130 27/4
DATE	900427	ELEMENT RANGE	0 - 5741	ZERO POINT	
ELEVATION		ZONE		SHUT-IN	1400 23/4
MAX TEMP	259°F	PICK-UP		ON-PROD	
PERF	-	CAL SER NO.	27616	MPP	
TUBING	-				
UNITS	ENGLISH	PURPOSE	PRESSURE FALL-OFF		

SURVEY DATA

CO. RUN 02 FIELD MOORARI WELL 03

TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
14:00	5565.1	5565.1	.0	20:03	5416.0	5416.0	6.1
14:00	5547.2	5547.2	.0	21:30	5407.9	5407.9	7.5
14:01	5524.9	5524.9	.0	23:25	5395.7	5395.7	9.4
14:01	5514.9	5514.9	.0	1:29	5385.6	5385.6	11.5
14:04	5508.3	5508.3	.1	4:32	5372.8	5372.8	14.5
14:06	5501.6	5501.6	.1	7:44	5359.4	5359.4	17.7
14:11	5493.8	5493.8	.2	10:42	5347.1	5347.1	20.7
14:16	5485.6	5485.6	.3	15:15	5331.3	5331.3	25.3
14:26	5477.6	5477.6	.4	21:00	5312.8	5312.8	31.0
14:34	5474.9	5474.9	.6	1:38	5297.4	5297.4	35.6
14:43	5469.8	5469.8	.7	7:25	5280.4	5280.4	41.4
14:54	5469.8	5469.8	.9	13:02	5266.1	5266.1	47.0
15:03	5462.7	5462.7	1.1	20:05	5248.4	5248.4	54.1
15:20	5457.9	5457.9	1.3	4:47	5231.0	5231.0	62.8
15:59	5450.8	5450.8	2.0	12:22	5215.8	5215.8	70.4
16:39	5442.6	5442.6	2.6	21:25	5200.2	5200.2	79.4
17:20	5437.0	5437.0	3.3	7:25	5186.1	5186.1	89.4
18:41	5426.5	5426.5	4.7	11:30	5176.8	5176.8	93.5

LUB IN DWT = 3986 PSI / OUT = 3561 PSI
LUB IN AMERADA = 3966 PSI / OUT = 3603 PSI


MOORARI #3 APRIL 1990
ELEMENT #27616 (BOT)
PRESSURE (PSI)
5700.0
5600.0
5500.0
5400.0
5300.0
5200.0
5100.0
5000.0
TIME (HRS)
-20.0
.0
20.0
40.0
60.0
80.0
100.0

EXPERTEST
WIRELINE & WELL TESTING SERVICE
PO BOX 354 COURANDILLA 5033
PH. (08) 354 0488 TELEX AA87183
FAX (08) 43 7408
138 RICHMOND ROAD MARLESTON
SOUTH AUSTRALIA 5033

Tested Friday, 27th April 1990.

CLIENT	LOCATION	FORMATION
Santos Ltd.	Moorari # 3	Tirrawarra

STATIC PRESSURE GRADIENT REPORT

PRESSURE ELEMENT DATA			
POSITION	SERIAL NO.	RANGE	CALIBRATED
Top	27617	5675	24/ 2/89
Bottom	27616	5700	24/ 2/89

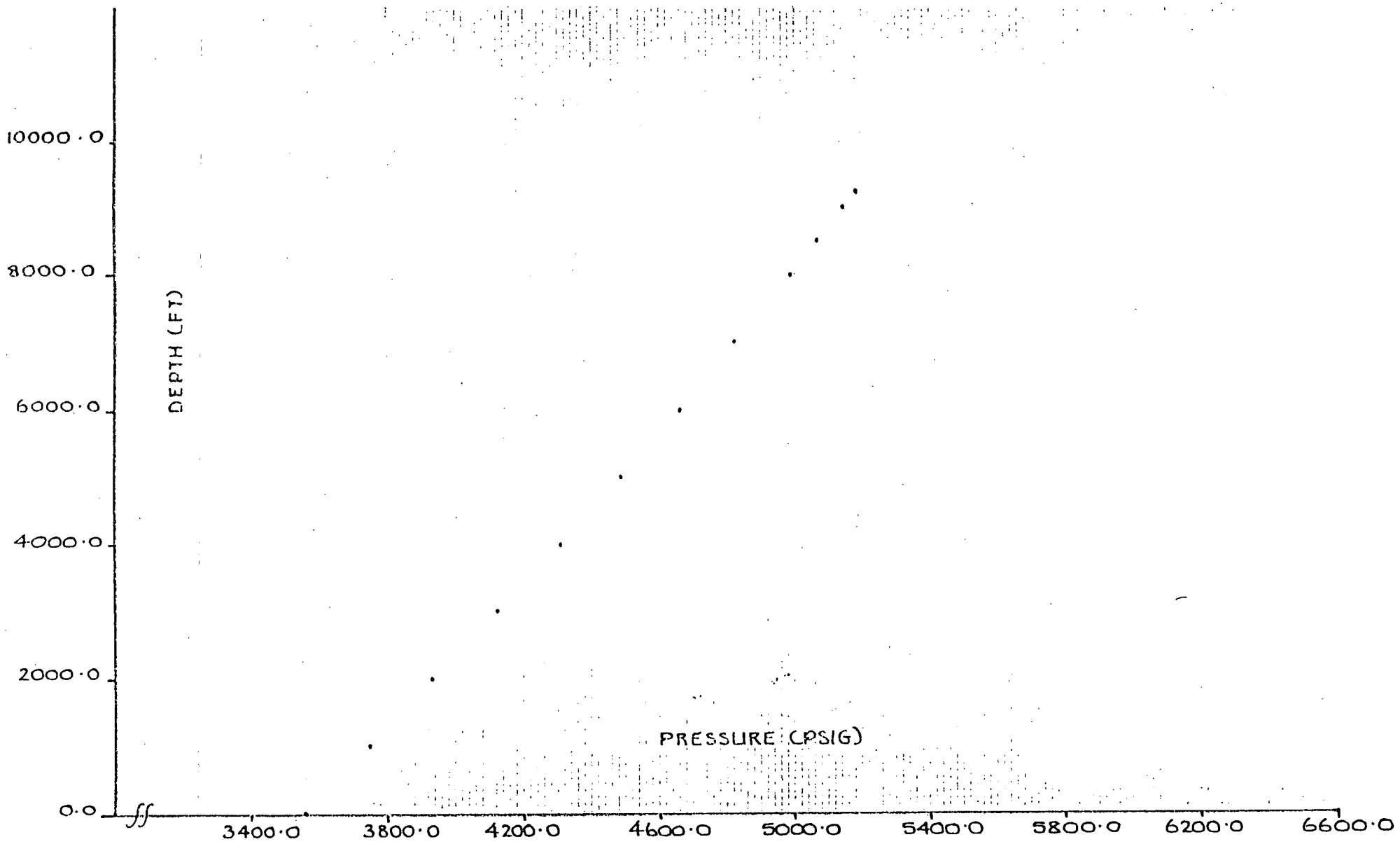
WELL DATA	
PARAMETER	VALUE
DWT In	3561 PSI
DWT Out	3560 PSI
Max BHT	258 °F

	TOP ELEMENT			BOTTOM ELEMENT		
DEPTH FT KB	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT
LUB.	1.2410	3575.8	-----	1.2390	3560.3	-----
1000	1.3050	3760.1	0.184	1.3050	3749.5	0.189
2000	1.3710	3950.1	0.190	1.3700	3935.8	0.186
3000	1.4370	4140.1	0.190	1.4360	4125.0	0.189
4000	1.5000	4321.2	0.181	1.5000	4308.3	0.183
5000	1.5620	4499.3	0.178	1.5620	4485.8	0.178
6000	1.6220	4671.4	0.172	1.6230	4660.3	0.175
7000	1.6800	4837.5	0.166	1.6800	4823.1	0.163
8000	1.7380	5003.3	0.166	1.7380	4988.6	0.166
8500	1.7650	5080.3	0.154	1.7650	5065.5	0.154
9000	1.7920	5157.3	0.154	1.7930	5145.2	0.159
9220	1.8040	5191.5	0.155	1.8050	5179.3	0.155
LUB.	1.2500	3601.7	-----	1.2490	3589.0	-----

GENERAL REMARKS

TEMP ELE 22821/139 395 F CLOCK A/16085 3HR

MOORARI # 3 — STATIC PRESSURE GRADIENT — 27/4/90
ELEMENT # 27616/5700(BOT)



0380

EXPERTEST PTY. LTD.

BHP/BHT GAUGE RUN DATA

CUSTOMER : SANTOS
WELL NAME: MOORARI #3
TEST TYPE : STATIC GRADIENT

PERFORATIONS: 9404'-9564'
FORMATION : TIRRAWARRA
REINJECTION WELL

PAGE: 1 OF 1
DATE: 27-4-90
OPR : N. HAY

GAUGE DATA	UPPER PRESSURE GAUGE	LOWER PRESSURE GAUGE	TEMPERATURE GAUGE
ELEMENT SERIAL NO.	27617	27616	228231
ELEMENT RANGE PSI	5674	5700	139-395
RECORDING SECTION SERIAL NO.	13029	14629	705455
DATE OF CALIBRATION: 24-2-89			
CLOCK SERIAL NO.	1	2	A-16085
CLOCK RANGE HR	3	3	3
LEAD SCREW TYPE	15	15	15
ENGAGE STYLUS DATE 27-4-90 TIME	14:17	14:17	14:17
DISENGAGE STYLUS DATE 27-4-90 TIME	16:29	16:29	16:29

RUN DATA	TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)
DATE : 27-4-90			
PRESSURE LUBRICATOR :	14:27		
RUN IN HOLE :	14:37	2453'3	22257
ON DEPTH AT : 9220 FT/M	15:46	2453'3	
DATE : 27-4-90			
PULL OUT OF HOLE :	15:56		
AT SURFACE :	16:13		
DEPRESSURE LUBRICATOR :	16:23	2453'46	2225'7
MAXIMUM BHT AT FT/M = °F/C			
N.B. ALL DEPTHS ARE MEASURED FROM K.B.			

DATE	TIME	REMARKS

BHP/BHT GAUGE RUN DATA

EXPERTEST PTY. LTD.

CUSTOMER : SANTOS
WELL NAME: MOORARI #3
TEST TYPE : PRESSURE FALL-OFF

PERFORATIONS: 9404'-9564'
FORMATION : TIRRAWARRA
REINJECTION WELL

PAGE: 1 OF .
DATE: 23-4-90
OPR : N HAY

GAUGE DATA	UPPER PRESSURE GAUGE	LOWER PRESSURE GAUGE	TEMPERATURE GAUGE
ELEMENT SERIAL NO.	27617	27616	22821
ELEMENT RANGE PSI	5674	5700	139°-395°
RECORDING SECTION SERIAL NO.	13029	14629	70545
DATE OF CALIBRATION: 24-2-89			
CLOCK SERIAL NO.	F-15685	6	F-15693
CLOCK RANGE HR	120	120	120
LEAD SCREW TYPE	15	15	15
ENGAGE STYLUS DATE 23-4-90 TIME	09:00	09:00	09:00
DISENGAGE STYLUS DATE 27-4-90 TIME	14:09	14:09	14:09

RUN DATA		TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)
DATE	: 23-4-90			
PRESSURE LUBRICATOR	: "	09:13	(3986)	
RUN IN HOLE	: "	11:15	27483	16893
ON DEPTH AT	: 9220' FT/M	11:37	27490	16913
DATE	: 27-4-90			
PULL OUT OF HOLE	: "	11:30	245580	22257
AT SURFACE	: "	11:50		
DEPRESSURE LUBRICATOR	: "	14:00	245553 (3561)	22257
MAXIMUM BHT AT FT/M = °F/C				
N.B. ALL DEPTHS ARE MEASURED FROM K.B.				

DATE	TIME	REMARKS
		IN / OUT
		① 3969 / 3609
		② 3966 / 3603
23/4/90	1400	Shut well.
		SIBH Temp = 259° F

FIELD READINGS

EXPERTEST PTY. LTD.

CUSTOMER : SANTOS
WELL NAME: MOORARI #3
TEST TYPE : PRESSURE FALL-OFF

PERFORATIONS: 9404'-9564
FORMATION : TIRRAWARRA.
REINJECTION WELL

PAGE: 1 OF 4
DATE: 22-4-90
OPR : N. HAY

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 (%)	K.G PER HR	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)
22-4-90														
10:00		ARRIVE ON LOCATION INSTALL JIM POLE ON WELL HEAD												
10:45		SHUT WELL AND RIG UP SWAB VALVE												
11:10		WELL BACK ON LINE AND RIG UP WIRELINE UNIT												
12:25		R.I.H WITH 1.75" BLIND BOX TO 9220'KB AS PER PROGRAMME												
12:40		P.O.O.H												
13:00		AT SURFACE WITH BLIND BOX												
		THE TURBINE METER COMPUTER AT THE WELL IS NOT WORKING												
		STANDBY FOR COMPUTER REPLACEMENT												
23-4-90														
08:00		INSTALL NEW COMPUTER TO THE TURBINE METER												
		THE COMPUTER OPERATING OK												
08:45		RIG UP TANDEN PRESSURE ELEMENTS AND ONE TEMPERATURE ELEMENT												
09:13		HANG ELEMENTS IN LUB												
11:15		27483 16893 R.I.H.												
11:37		HANG AT 9220'KB												
11:37		27490	16913	27°	14/64		6192.4							
12:00		26718	16817	28°	"		6304.9							
12:30		26787	15314	28°	"		6076.7							
13:00		26842	14493	28°	"		5819.8							
13:30		26856	14169	28°	"		5619.7							

EXPERTEST PTY. LTD.

FIELD READINGS

CUSTOMER : SANTOS
WELL NAME: MOORARI #3
TEST TYPE : PRESSURE FALL-OFF
PERFORATIONS: 9404' - 9564
FORMATION : TIRRAWARRA
REINJECTION WELL
PAGE: 2 OF 4
DATE: 23-4-90
OPR : N. HAY

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 (%)	KG PER HR	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)
23-4-90					14/64		5589.5	SHUT WELL IN						
14:00	0	26842	13776	28°										
14:15		26304	14238	28°										
14:30		26249	14638	29°										
14:45		26214	15121	29°										
15:00	1	26187	15465	29°										
15:15		26173	15775	29°										
15:30		26159	16031	29°										
15:45		26139	16286	30°										
16:00	2	26125	16534	30°										
16:15		26104	16713	30°										
16:30		26090	16899	30°										
16:45		26077	17086	31°										
17:00	3	26063	17189	31°										
17:15		26077	17286	29°										
17:30		26097	17375	27°										
17:45		26111	17478	24°										
18:00	4	26063	17575	24°										
22:00	8	24532	19168	19°										
24-4-90														
02:00	12	25795	19816	17°										
06:00	16	25684	20333	15°										

FIELD READINGS

EXPERTEST PTY. LTD.

CUSTOMER : SANTOS
WELL NAME: MOORARI #3
TEST TYPE : PRESSURE FALL-OFF

PERFORATIONS: 9404' - 9564
FORMATION : TIRRAWARRA
REINJECTION WELL

PAGE: 3 OF 4
DATE: 24-4-90
OPR : N. HAY

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)
24-4-90														
10:00	20	25608	20774	25°										
14:00	24	25573	21133	29°										
18:00	28	25470	21361	25°										
22:00	32	25394	21533	19										
25-4-90														
02:00	36	25311	21657	16°										
06:00	40	25228	21774	14°										
10:00	44	25144	21905	24°										
14:00	48	25152	22029	26°										
18:00	52	25098	22119	22°										
22:00	56	25039	22157	17°										
26-4-90														
02:00	60	24980	22167	15°										
06:00	64	24898	22174	11°										
10:00	68	24863	22195	20°										
14:00	72	24821			← READING TAKEN FROM CHART									
18:00	76	24780	22271	19°										
22:00	80	24705	22250	14°										
27-4-90														
02:00	84	24663	22250	11°										
06:00	88	24622	22243	9°										

FIELD READINGS

EXPERTEST PTY. LTD.

CUSTOMER : SANTOS
WELL NAME: MOORARI #3
TEST TYPE : PRESSURE FALL-OFF

PERFORATIONS: 9404' - 9564'
FORMATION : TIRRAWARRA
REINJECTION WELL

PAGE: 4 OF 4
DATE: 27.4.90
OPR : N. HAY

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)
27.4.90														
10:00	92	24559	22257	14										
11:30		P.O.O.H WITH ELEMENTS												
11:50		ARRIVE IN LUB												
14:00	96	24553	22257	DEPRESSURE LUB										
		GOOD CHARTS												
14:37		R.I.H. WITH ELEMENT FOR STATIC GRADIENT												
16:13		ARRIVE BACK IN LUB GOOD CHARTS												
		RIG DOWN PROGRAM COMPLETED												
16:40			22257	BLEED OF PRESSURE FROM ANNULUS										
17:00			689	SHUT ANNULUS IN										

XPERTEST PTY. LTD.

SEQUENCE OF EVENTS

CUSTOMER : SANTOS
WELL NAME: MOORARI # 3
TEST TYPE : PRESSURE FALL-OFF
PERFORATIONS: 9404' - 9564'
FORMATION : TIRRAWARRA
REINJECTION WELL
PAGE: 1 OF
DATE: 22-4-90
OPR : N. HAY

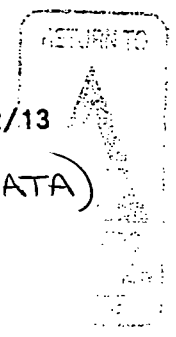
DATE/TIME	DESCRIPTION OF EVENTS
22-4-90	
10:00	ARRIVE ON LOCATION
	INSTALL JIM POLE ON WELL HEAD
10:45	SHUT WELL IN AND RIG UP SWAB VALVE
11:10	WELL BACK ON LINE AND RIG UP WIRELINE UNIT
12:25	R.I.H WITH 1.75" BLIND BOX TO 9220' KB. AS PER PROGRAMME
12:40	P.O.O.H
13:00	AT SURFACE WITH BLIND BOX
	THE TURBINE METER COMPUTER AT THE WELL IS NOT WORKING
	STANDBY FOR COMPUTER REPLACEMENT
23-4-90	
08:00	INSTALL NEW COMPUTER TO THE TURBINE METER
	THE COMPUTER OPERATING OK
08:45	RIG UP TANDEM PRESSURE ELEMENTS AND ONE TEMPERATURE ELEMENT
09:13	HANG ELEMENTS IN LUB
11:15	R.I.H
11:37	HANG AT 9220' MB
14:00	SHUT WELL IN
27-4-90	
11:30	P.O.O.H WITH ELEMENTS
14:37	R.I.H FOR STATIC GRADIENT
16:13	ARRIVE BACK IN LUB. GOOD CHART PROGRAM COMPLETED
16:40	BLEED DOWN ANNULUS TO 689 KPA

→ ENV 3953

0387

G.R. WOOD
JULY, 1992.

886101



PALYNOLOGICAL REPORT NO. 1992/13

(MOORARI ~~FIELD~~ 3 DATA)

SANTOS LTD.

INTRODUCTION

Ten core samples from Moorari Nos. 1, 2 & 3 have been examined palynologically to determine the palynostratigraphy of the Patchawarra Formation. Palynostratigraphic results are presented on Table 1 and a chart depicting the palynostratigraphical scheme adopted and the known relationships of the palynostratigraphy to the rock units is presented on Chart 1. Range charts of the species identified in this study are presented in Appendix 1.

G.R. WOOD

SANTOS LIMITED

PALYNOSTRATIGRAPHICAL DATA

0389

MOORARI NO. 3

REPORT NO. 1992/13

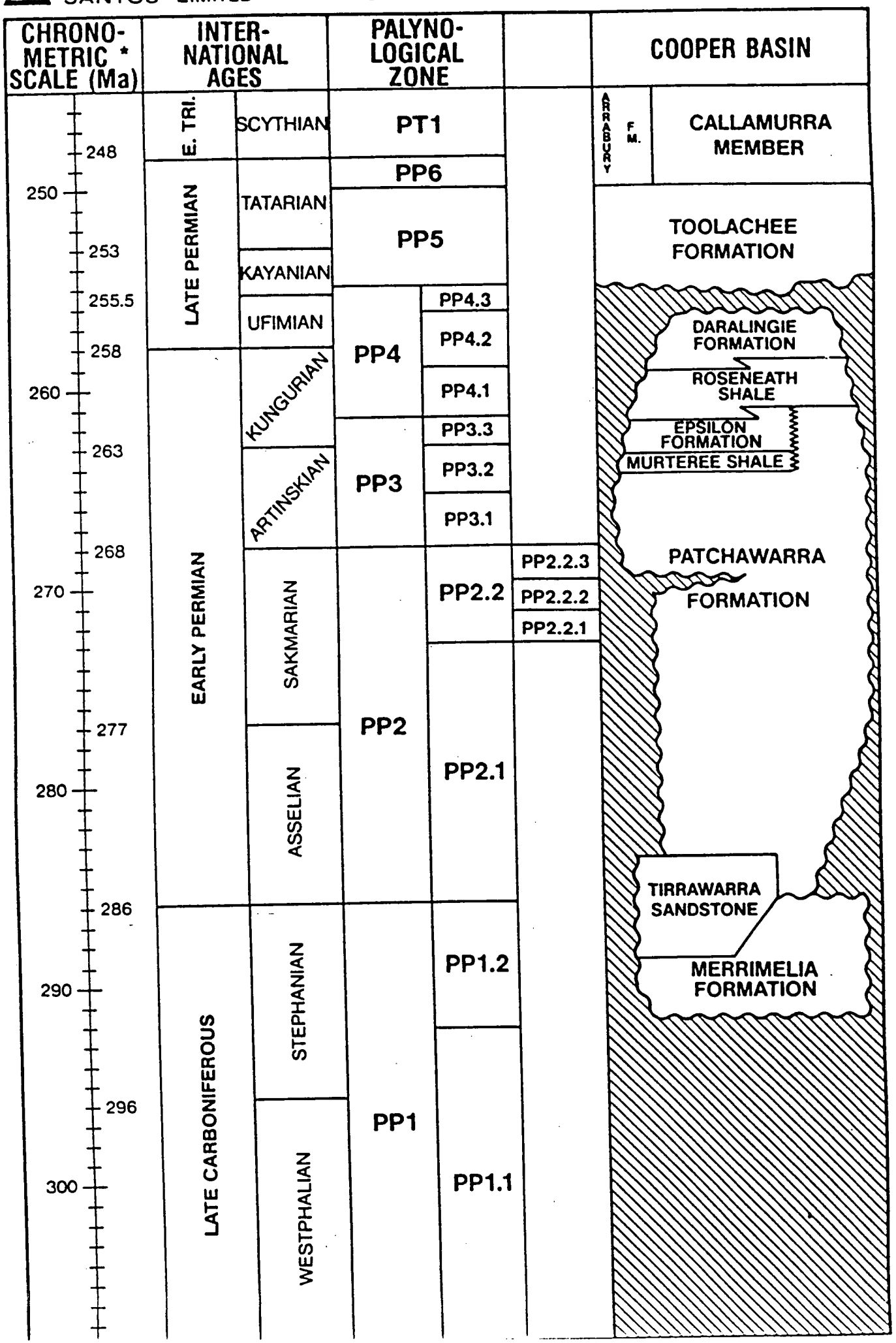
SAMPLE	DEPTH feet metres	PALYNOSTRATIGRAPHICAL UNIT [age]	INFERRED STRATIGRAPHICAL UNIT	REWORKED PALYNOMORPH %	REWORKED PALYNOMORPH AGE	PRESERVATION	YIELD	DIVERSITY	REMARKS
FHC	9053	?PP2.2.3 [EARLY PERMIAN]	?UPPER PATCHAWARRA FM			FAIR	LOW	V.LOW	Bisaccate pollen abundant, Gondisporites spp prominent, ?I. robusta present.
FHC	9062	PERMIAN	-			FAIR	V.LOW	EXT.LOW	Very sparse assemblage. Bisaccate pollen common, cryptogams rare. No index forms noted.
FHC	9068	PERMIAN	-			FAIR	V.LOW	EXT.LOW	Extremely sparse assemblage predominantly bisaccate pollen and apiculate spores. No index forms noted.
FHC	9075	PERMIAN	-			FAIR	EXT.LOW	EXT.LOW	Extremely sparse, restricted assemblage. Bisaccate pollen and M. triradiatus prominent. No index forms noted.

See text for additional comments

LATE CARBONIFEROUS/PERMIAN PALYNOSTRATIGRAPHY OF THE COOPER BASIN

SANTOS LIMITED

0390



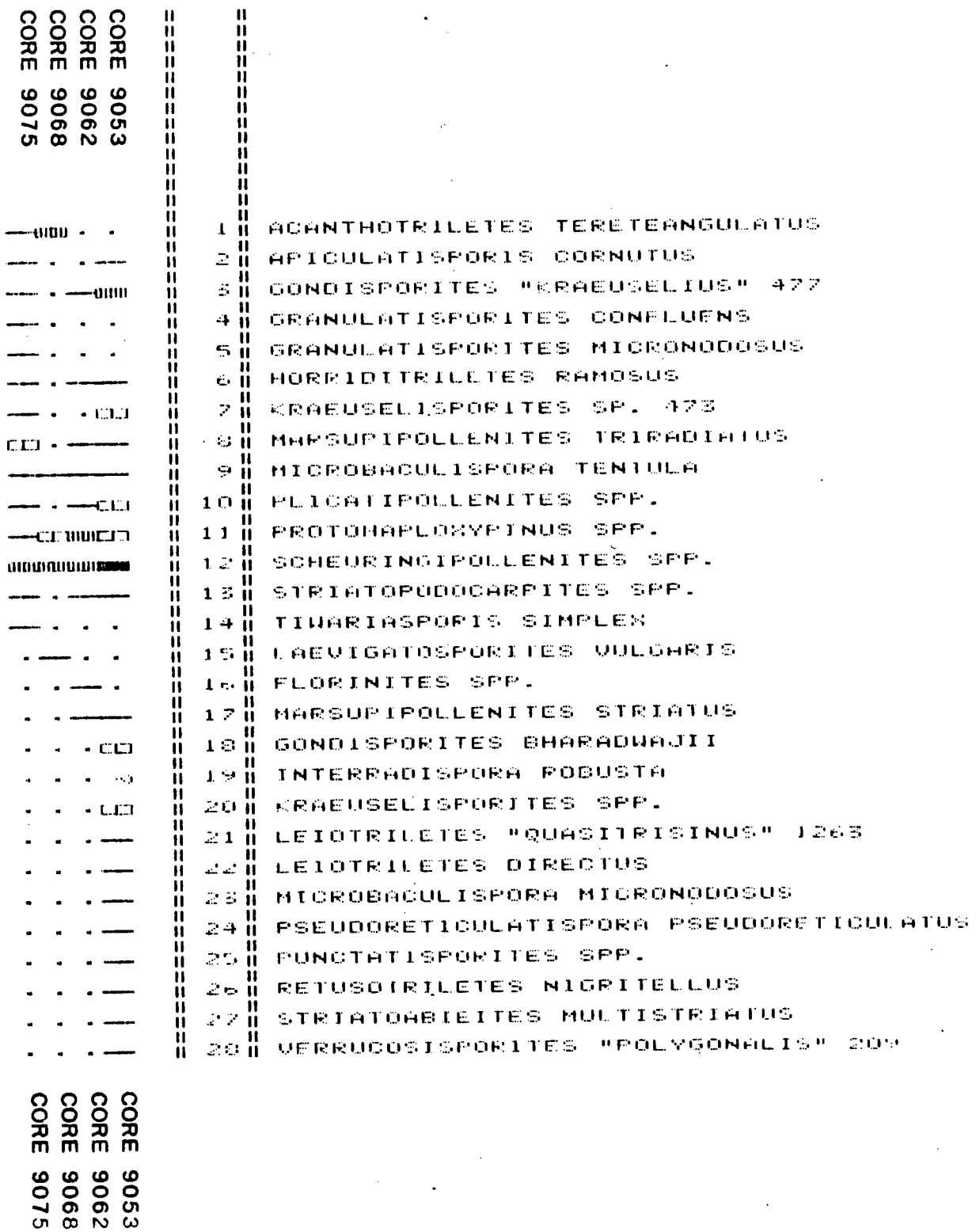
MOORARI NO.3 PERMIAN RANGE CHART

RANGE CHART OF GRAPHIC ABUNDANCES BY LOWEST APPEARANCE

0391

Key to Symbols

—	= Very Rare
—□	= Rare
—□□	= Few
—□□□	= Common
■	= Abundant
?	= Questionably Present
.	= Not Present



0392 ENV 3953

SANTOS LIMITED

PALYNOSTRATIGRAPHICAL DATA

MOORARI No. 3 | REPORT No. 1994/27 | G.R. WOOD, APRIL 1994 |

SAMPLE	DEPTH feet metres	PALYNOSTRATIGRAPHICAL UNIT [age]	INFERRED STRATIGRAPHICAL UNIT	REWORKED PALYNOMORPH %	REWORKED PALYNOMORPH AGE	PRESERV-ATION	YIELD	DIVERSITY	REMARKS
FHC 4	9411.00	PP2.1 [EARLY PERMIAN]	UPPERMOST TIRRAWARRA OR PATCHAWARRA FM			FAIR	E.LOW	E.LOW	Extremely sparse assemblage. M. tentula, A. cornutus and P. pseudoreticulata present.
FHC 4	9429.00	?PP1.2.2 [EARLY PERMIAN]	TIRRAWARRA SST			FAIR	V.LOW	V.LOW	Restricted assemblage. Monosaccate pollen frequent, M. tentula prominent. A. cornutus, N. ramosus and ?G. confluens present.
FHC 5	9500.50	PP1.2, ?PP1.2.1	TIRRAWARRA SST OR MERRIMELIA FM			FAIR	E.LOW	E.LOW	Extremely sparse assemblage. Monosaccate pollen prominent, M. tentula and V. andersonii present.

See text for additional comments

SANTOS LIMITED
A.C.N. 007550923

PETROLEUM ENGINEERING DEPARTMENT
SOUTH AUSTRALIA

MOORARI 3 TIRRAWARRA FORMATION PRESSURE FALL OFF SURVEYS JULY 1986, FEBRUARY 1989 & APRIL 1990

Report: PED: 016/94
Author: D A Evans
Date: April 1994

RECEIVED
12 MAY 1994
DEPT. OF MINES AND ENERGY SECURITY
3953

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3. **Conclusions**
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8. **Figures**

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   1.2 February 1989 Semi-Log Plot

   2.1 April 1990 Log-Log Plot

   2.2 April 1990 Semi-Log Plot

   3 Map of Moorari/Woolkina Field

9. **Appendices**

   1.1 February 1989 Static Gradient Survey

   1.2 February 1989 Pressure Survey Input Data

   1.3 February 1989 Injection Time Calculations

   2.1 April 1990 Static Gradient Survey

   2.2 April 1990 Pressure Survey Input Data

   2.3 April 1990 Injection Time Calculations

1. Introduction

Moorari 3 was spudded in December 1980. Oil shows were obtained from the Birkhead and Tirrawarra; gas was detected in the Nappamerri, Toolachee and Patchawarra formations. The well was subsequently completed over the Tirrawarra 97-0 and production tested.

Initially the 97-0 sand was perforated over the interval 9490' - 9564' KB and flowed 87 BOPD through a 1/2" choke. Additional perforations in the 97-0 sand (9468' - 9486' KB) yielded a total flow rate of 300 BOPD on a 1/4" choke. The well was then suspended.

In June 1981, the 97-0 sand was fracture stimulated resulting in a post frac rate of 600 BOPD on a 22/64" choke. The well was then brought on line in October 1981.

In July 1984 the well was recompleted as a dual Nappamerri gas producer/Tirrawarra injector. Injection began immediately and production of gas from the Nappamerri commenced in October 1984.

Moorari 1 was worked over in May 1986 and pressures from a cased hole test indicated that the 96-0 was not receiving pressure support from injection in Moorari 3L. Based on this information, it was assumed that the fracture stimulation of the 97-0 had not penetrated the 96-0 sand in Moorari 3L. As a result, the 96-0 sand was perforated. Following perforation injection was only marginally improved.

In November 1989 the well was recompleted to a single Tirrawarra well to allow fracture stimulation of the 96-0 sand . A solid bull plug was installed over the 97-0 and a diverta frac run to limit growth downwards. The 96-0 was fracced in December 1989. Post frac the bull plug could not be removed due to an obstruction at 9239' (expansion joint). Further attempts to remove the bull plug in 1990 and 1991 failed to pass the obstruction.

Since July 1986 three pressure fall off surveys have been conducted. The tests were performed in July 1986, February 1989 and April 1990 combined with static gradient surveys. This report presents the results of these tests.

2. Summary

July 1986 Survey

This test was performed during the period 18 to 23 July 1986. The well was shut in at 1600 hours on 18/7/86 with Amerada gauges run to a depth of 9270 feet KB. Gauges were pulled after 112.3 hours and both found to be overranged hence no pressure data was recorded.

February 1989 Survey

From 23 to 28 February 1989, pressure fall off and static gradient surveys were conducted on Moorari 3. This tested the Tirrawarra 96-0 and 97-0 sands. Average injection rate prior to shut-in was 4.788 MMscf/d.

The well was shut-in at 2000 hours on the 24 February for a total of 63.75 hours. Bottom hole pressure depleted from 5957 psia to 5245 psia (@ 9250' KB) during this time. Static gradient survey results indicated a pressure of 5204 psia @ 9000' KB.

Bilinear flow dominated the pressure derivative response as seen on the log-log plot (characterised by a 1/4 slope through the derivative). Due to the absence of radial flow, no reservoir parameters (other than an estimate of P*) could be calculated. Extrapolated reservoir pressure was 4681 psia at the element depth of 9250' KB.

April 1990 Survey

A pressure fall off survey was conducted on Moorari 3 from 22 to 27 April 1990 with a static gradient survey run at the completion of the shut-in period. Following fracture stimulation of the 96-0 sand, injection recommenced on the 11 January 1990 and was maintained until shut-in for the April 1990 pressure fall off survey. The average injection rate from January to shut-in at April was 4.301 MMscf/d.

The well was shut-in on 23 April at 1400 hours for 93.5 hours. Pressure depleted from 5580 psia to 5192 psia (@ 9214' KB) during the shut-in period. A static gradient survey run post 93.5 hour shut-in yielded a pressure of 5194 psia @ 9220' KB.

A fracture flow regime is clearly visible on the log-log plot derivative with no radial flow period distinguishable. Therefore no accurate calculation of reservoir parameters other than an estimation of reservoir pressure (4738 psia @ 9214' KB) was possible from the semi-log plot.

3. Conclusions

Fracture bilinear flow dominated the February 1989 test (which tested both the 96-0 and 97-0) indicating that the 97-0 was the dominant sand. Due to the absence of radial flow the fracture must be in the order of magnitude of the test radius (approximately 450 feet). The radius of investigation was calculated based on the permeability of the 1981 post frac test (refer to Appendix 1.2 for calculation).

The December 1989 fracture stimulation of the Tirrawarra 96-0 was successful. This is supported by a 1/2 slope in the log-log plot derivative from the April 1990 survey indicating linear flow. The pressure response indicates that the fracture is in contact with the wellbore. Parallel faults have been ruled out as the nearest boundary is mapped at approximately 3000 feet west of the wellbore which would exceed the radius of investigation of the test.

Accurate calculation of reservoir parameters in both tests was not possible due to the dominance of bilinear flow in the February 1989 survey and linear flow throughout the April 1990 pressure fall off survey.

4. Recommendations

A future pressure fall off survey with a shut-in time in the order of two weeks to obtain more data and reduce the extent of extrapolation.

Using surface readout gauges to monitor the data as the test is progressed (to determine sufficient data is obtained for interpretation).

5. Discussion

General

For gas injection in miscible projects, the unit mobility ratio method of interpretation can be applied (as described in chapter 8 of "Pressure Build-up and Flow Tests in Wells" by Matthews & Russell). This assumes that the radius of investigation is gas filled and that the expansion of the solvent and oil outside the gas are neglected. The last assumption is justified as gas has a much higher compressibility.

Pressure survey data was interpreted using EPS PAN version 2.1 well testing software.

July 1986 Survey

Due to both gauges being over-ranged no bottom hole pressure data was recorded therefore no interpretation was possible.

February 1989 Survey

Total injection time was calculated using Pinson and Kazemi which calculates the time to reach pseudosteady state (tpss). This resulted in a time to pseudosteady state of 6016 hours as compared to an estimated producing time of 21,256 hours, hence the tpss value was used (tpss < tp). The input file and injection time calculations are located in Appendix 1.2 and 1.3 respectively.

The pressure derivative response on the log-log plot indicated fracture bilinear flow characterised by a 1/4 slope (Figure 1.1). Due to the dominance of bilinear flow throughout the data, no reservoir parameters can be calculated.

The final recorded bottom hole pressure prior to shut in was 5957 psia which depleted to 5245 psia (@ 9250' KB) after 63.75 hours shut-in. Extrapolated reservoir pressure was estimated from the semi-log plot (Figure 1.2) as 4681 psia (at 9250' KB).

E-line gauges were used for this survey and the static gradient was conducted on the trip out of hole. A bottom hole pressure of 5204 psia was recorded at the gauge depth of 9000' KB which is consistent with the final shut-in pressure when corrected to 9250' KB. The static gradient was calculated as 0.164 psi/ft at 9000' KB (Appendix 1.1).

April 1990 Survey

A multi-rate injection profile was used in the input file. This reflects changes in the average monthly injection rates, since injection was re-established post frac. These rates were calculated based on the total injected volume for the month divided by the number of days 'on line'. Actual producing time (post frac) was used as this was less than the time to pseudosteady state. The input data and injection time calculations are located in Appendices 2.2 and 2.3 respectively.

Diagnostic plots were used to identify the flow regime response produced from the recorded data. Inspection of the log-log plot (Figure 2.1) revealed a 1/2 slope through the pressure derivative. This response is indicative of fracture linear flow. Due to the absence of a distinct radial flow period, reservoir parameters could not be calculated.

The final recorded bottom hole pressure prior to shut in was 5570 psia and after 93.5 hours shut-in the pressure had depleted to 5192 psia at the element depth of 9214' KB. Extrapolated reservoir pressure was estimated from the semi-log plot (Figure 2.2) as 4738 psia (at 9214' KB).

At the completion of the shut-in the gauges were redressed and a static pressure gradient survey was conducted. The results from the survey are located in Appendix 2.1. A bottom hole pressure of 5192 psia was recorded at the element depth of 9220' KB which is consistent with the final shut-in pressure mentioned above. The static gradient was calculated as 0.155 psi/ft at 9220' KB.

6. References

"Pressure Build-up and Flow Tests in Wells" Matthews & Russell.

"Advances in Well Test Analysis" Earlougher.

Table

Moorari 3 Tirrawarra Pressure Survey History

Table

Moorari 3L - Tirrawarra Formation

Spudded: 29 December 1980 Perforations: 9404' - 9564' KB

Datum Depth: 9400 feet SS, 9573.7' KB ← use this for all tests

KB: 173.7 feet

kh = k.

Date of Test	Type of Test	Sand(s)	Gauge Depth (feet KB)	kh (md.ft)	h (feet)	k (md)	S'	Xf (feet)	Fcd	P* at Gauge Depth (psia)	P* at Datum (psia)	Productivity Index (BPD/psi)	Static Gradient (psi/ft)
17/04 - 27/06/81	Pre Frac SRT/BU	97-0	9318	23.4	72	0.33	-2.2	-	-	4285	4339	0.15	0.21
18/07 - 05/08/81	Post Frac SRT/BU	97-0	9325	92.4	72	1.28	-2.6	-	-	4241	4341	0.55	0.4
18/07 - 23/07/86	*Bottom Hole Pressure Fall Off Survey	97-0	9270	N/A	67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
23/02 - 28/02/89	**Bottom Hole Pressure Fall Off Survey	96-0, 97-0	9250	-	82	-	-	-	-	4681	4734	-	0.164
22/04 - 27/04/90	***Bottom Hole Pressure Fall Off Survey	96-0	9214	-	15	-	-	-	-	4738	4794	-	0.155

* No results were obtained from this survey as the Amerada gauges were overranged hence no bottom hole pressures were recorded.

**No interpretation was possible due to fracture bi-linear flow.

***This test was conducted post fracture stimulation of the 96-0 in November/December 1989. No accurate reservoir parameters calculated due to linear flow. The 97-0 sand was isolated by a solid bull plug which has since remained downhole due to an obstruction at 9239' KB (expansion joint).

Note: Moorari 3 was ceased production from the Tirrawarra in mid 1984 and was immediately re-commissioned as an injection well.

Figures

Figure 1.1: February 1989 Log-Log Derivative Plot

Figure 1.2: February 1989 Semi-Log Plot

Figure 2.1: April 1990 Log-Log Derivative Plot

Figure 2.2: April 1990 Semi-Log Plot

Figure 3: Map of Moorari/Woolkina Field

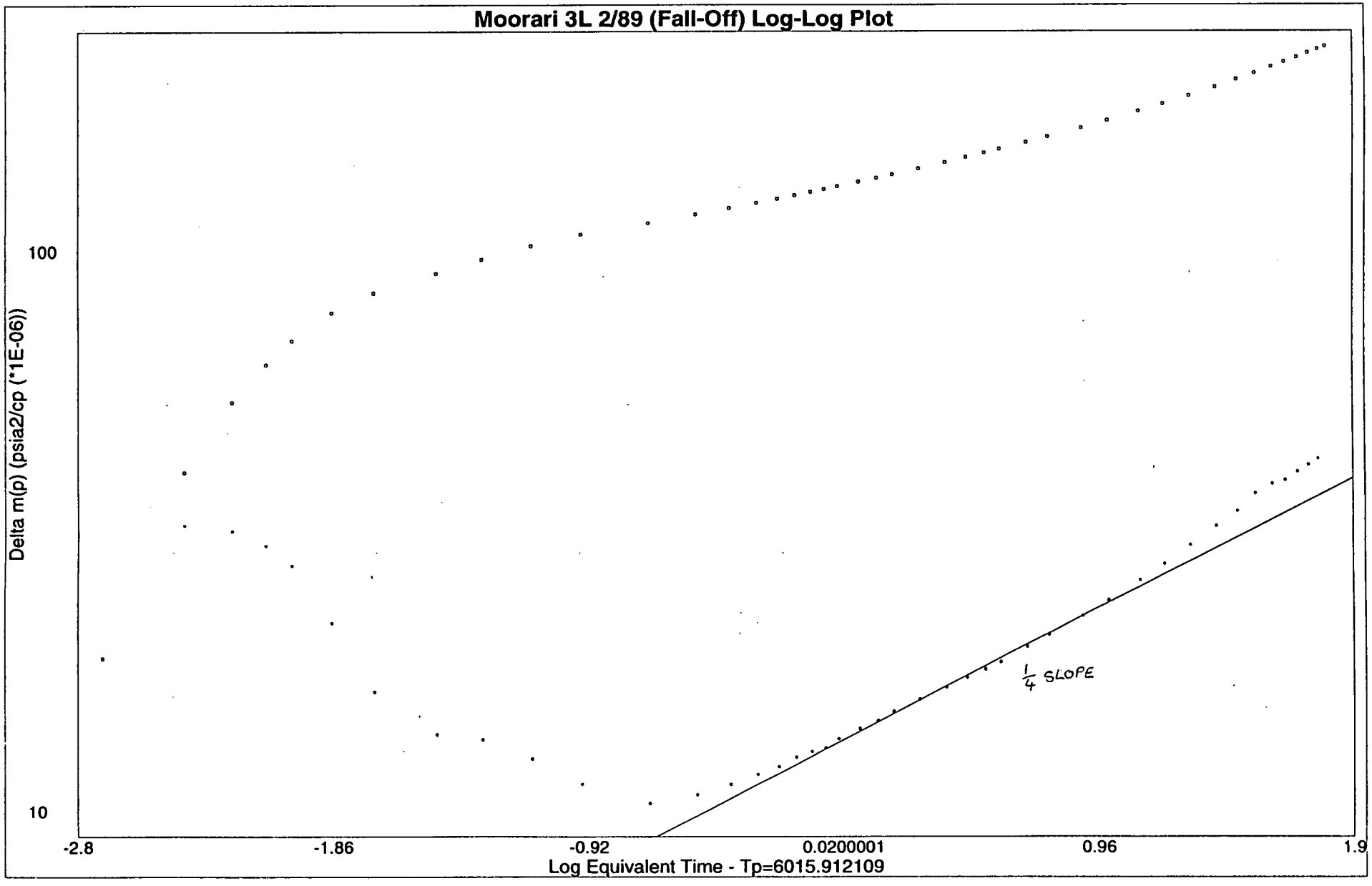
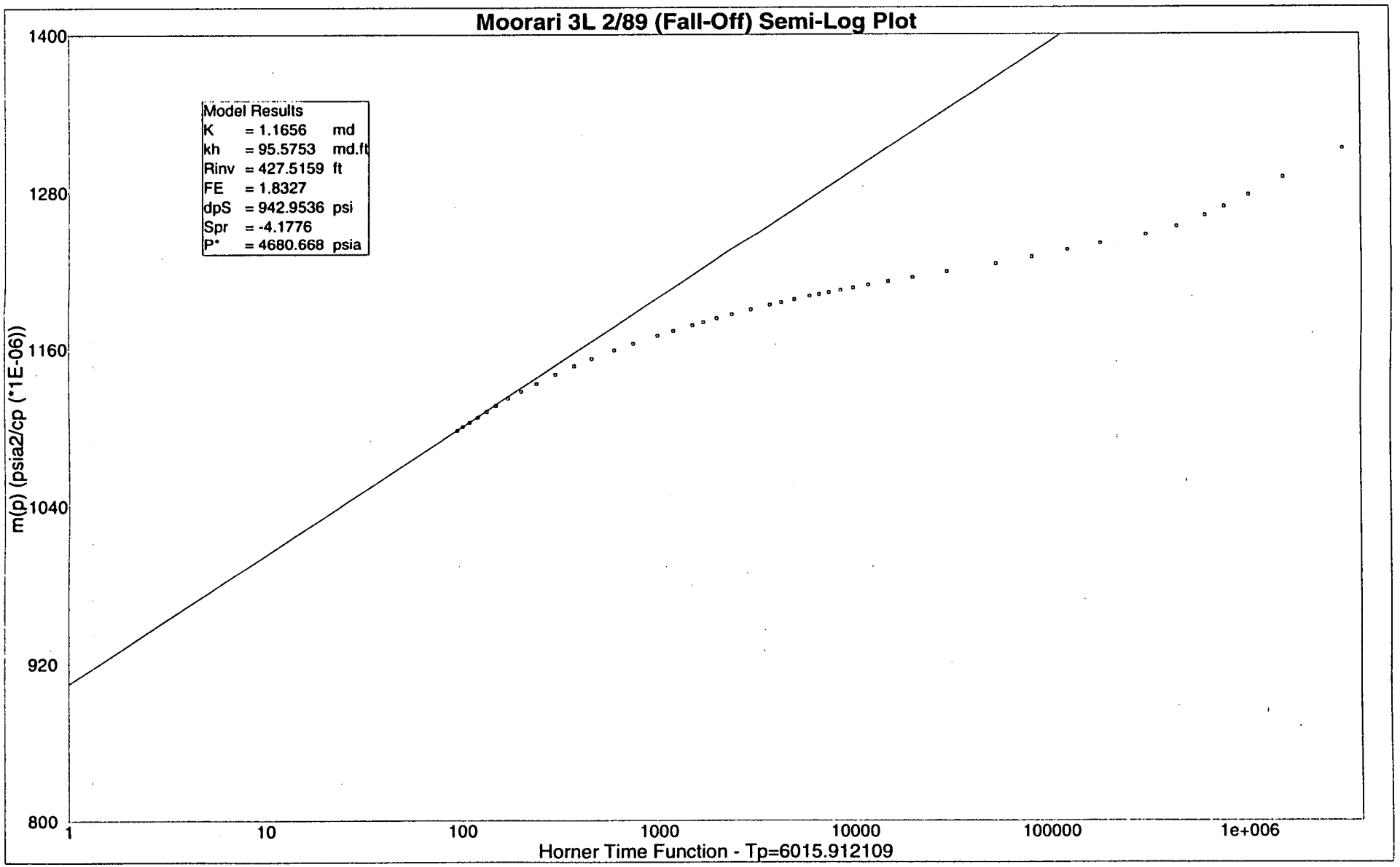


Figure 1.1

0403



Plot represents extrapolation to P* only. Reservoir parameters are not valid due to absence of a radial flow period.

Figure 1.2

Figure 2.1

0405

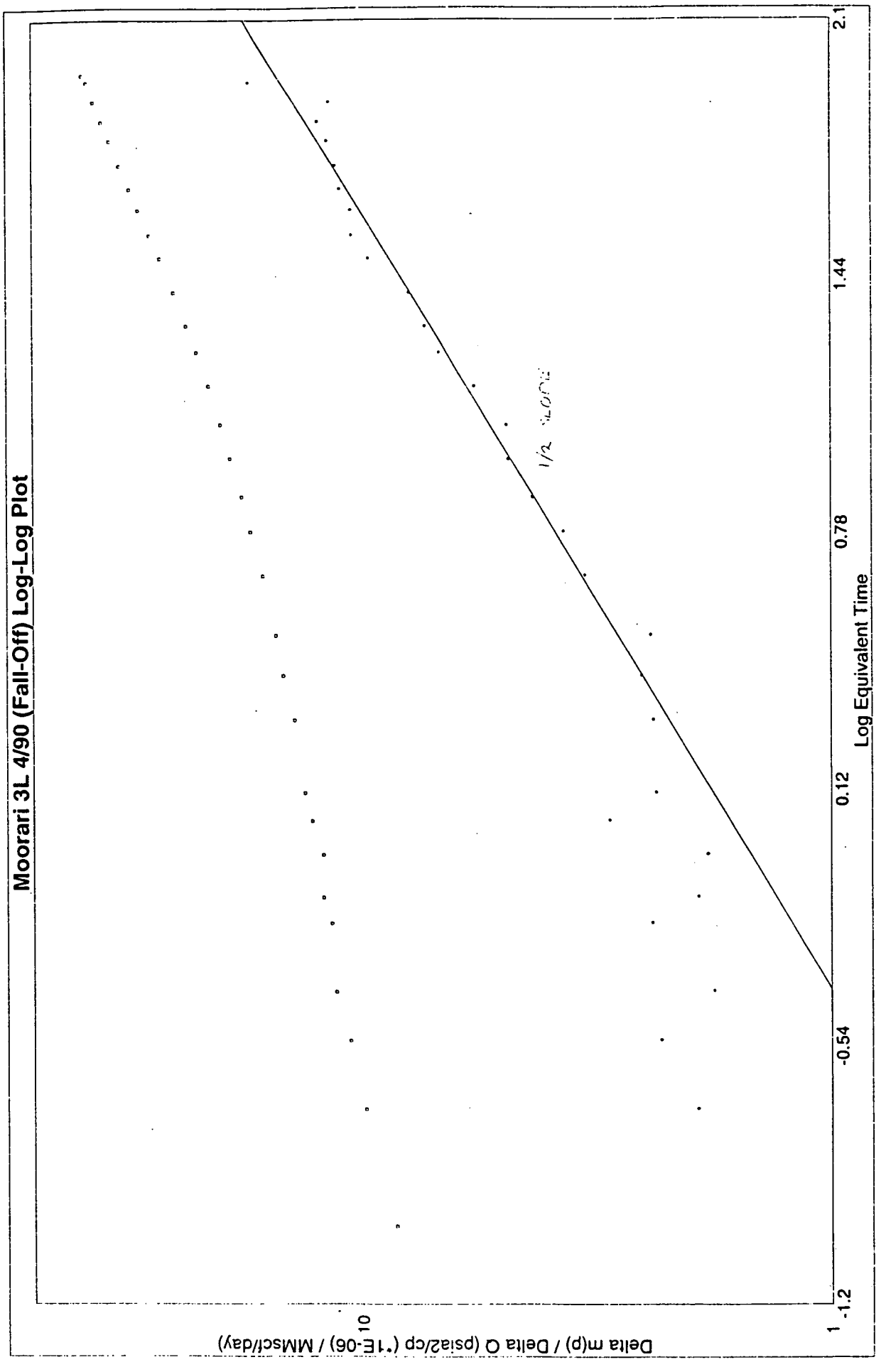
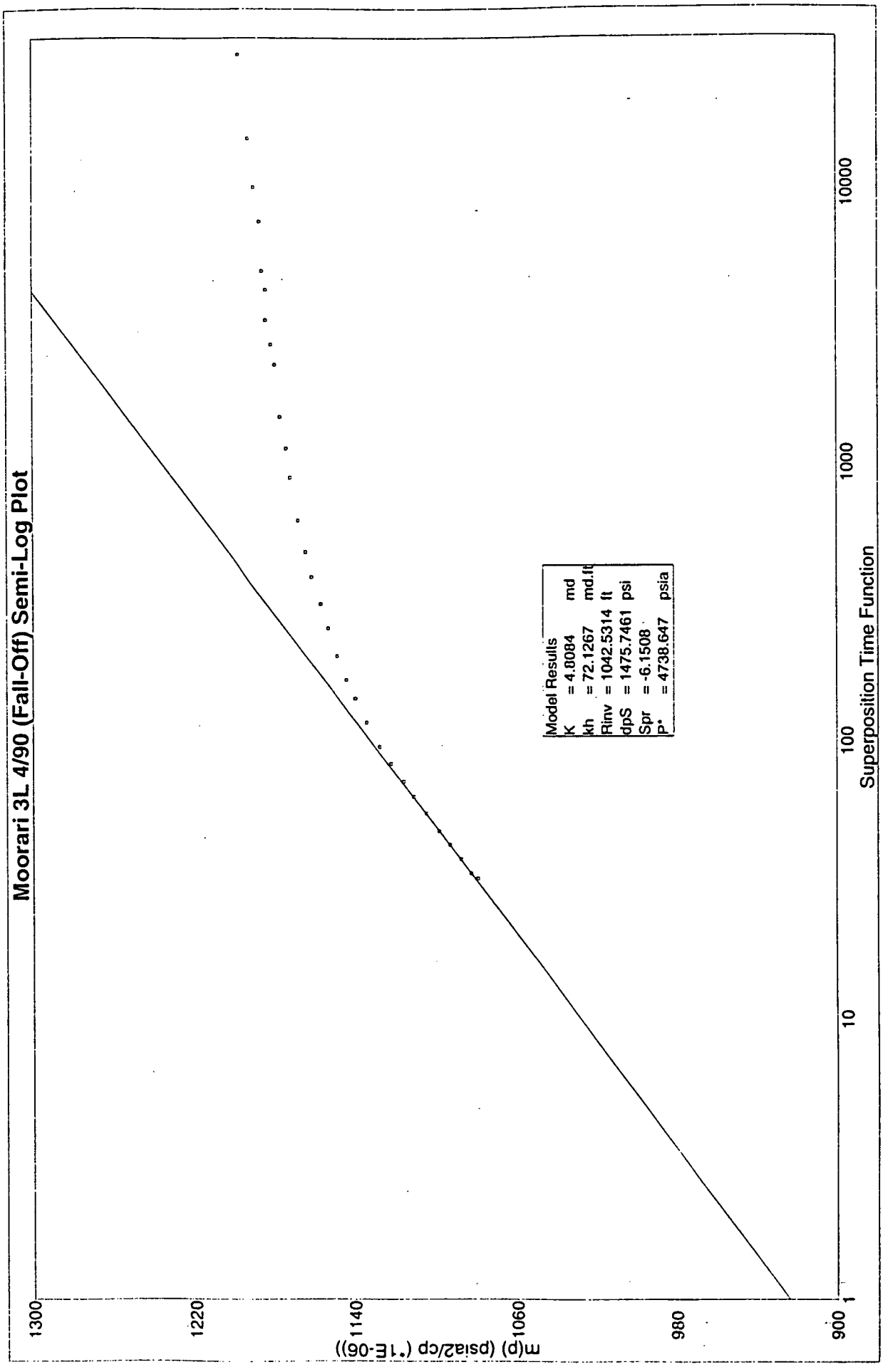
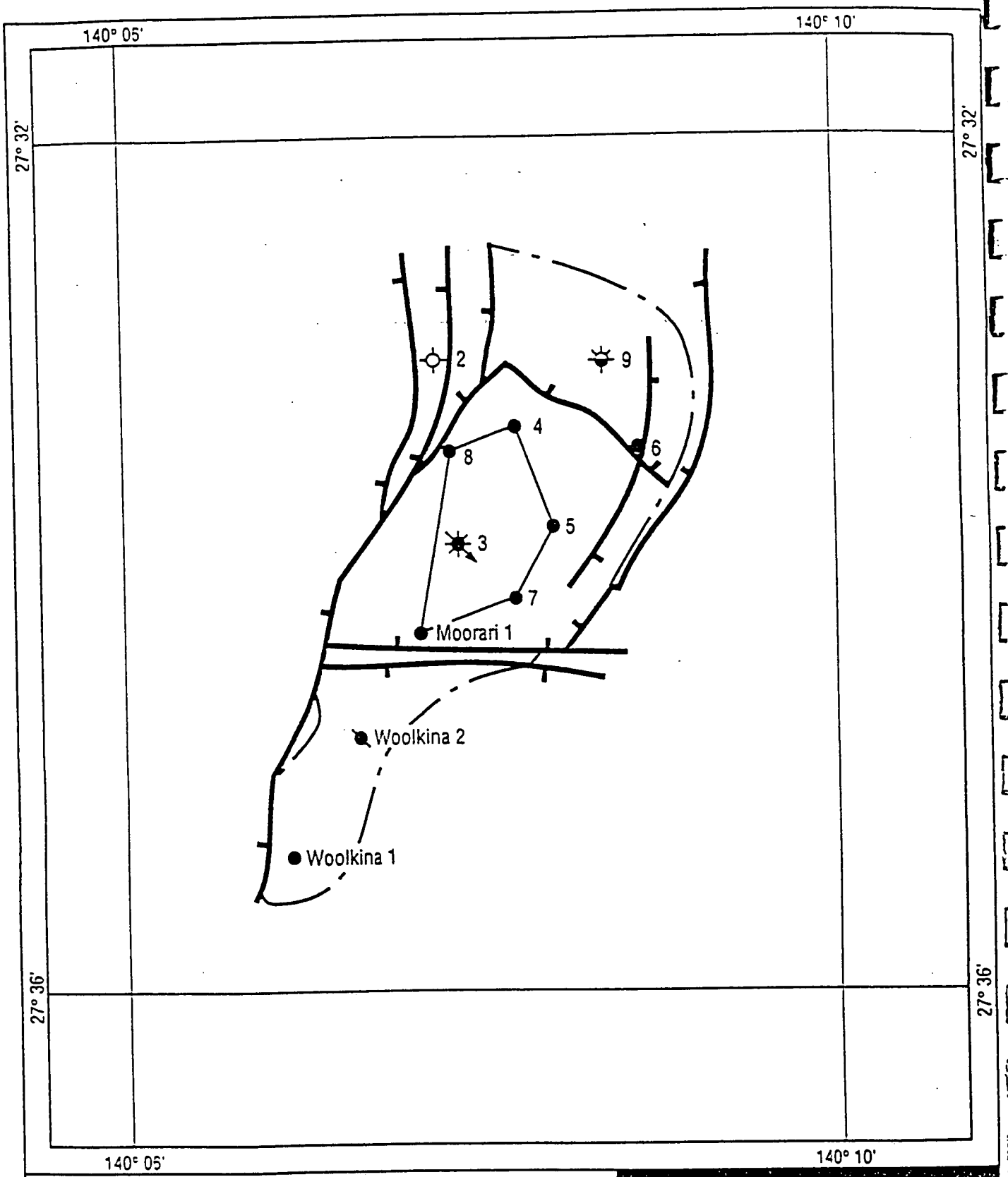


Figure 2.2


Moorari 3L 4/90 (Fall-Off) Semi-Log Plot
m(p) (psia2/cp ('1E-06))
1300
1220
1140
1060
980
900
1
10
100
1000
10000
Superposition Time Function
Model Results
K = 4.8084 md
kh = 72.1267 md.ft
Rinv = 1042.5314 ft
dpS = 1475.7461 psi
Spr = -6.1508
P* = 4738.647 psia


140° 05'
140° 10'
27° 32'
27° 36'
2
9
4
8
6
5
3
7
Moorari 1
Woolkina 2
Woolkina 1
INJECTOR WELL
OIL WELL
SUSPENDED OIL WELL
SANTOS LTD
A.C.N. 007 550 923
COOPER BASIN DEVELOPMENT
P.E.L. 5&6, SOUTH AUSTRALIA
PATCHAWARRA CENTRAL BLOCK
MOORARI/WOOLKINA FIELD
1994 FIRM BUDGET
DEVELOPMENT PLAN
0
1
2
KILOMETRES

Appendices

Appendix 1.1: February 1989 Static Gradient Survey

Appendix 1.2: February 1989 Pressure Survey Input Data

Appendix 1.3: February 1989 Injection Time Calculations

Appendix 2.1: April 1990 Static Gradient Survey

Appendix 2.2: April 1990 Pressure Survey Input Data

Appendix 2.3: April 1990 Injection Time Calculations

Appendix 1.1

Moorari 3L Static Gradient SurveyConducted 27 February 1989		
Depth ' KB	Pressure psia	Gradient psi/ft.
2000	4170.15	-
4000	4347.49	0.089
5000	4524.66	0.177
6000	4697.8	0.173
7000	4869.66	0.172
8000	5038.77	0.169
9000	5202.63	0.164

Moorari 3L February 1989 Pressure Fall Off Survey

Input Data File

Well	Moorari 3 Lower	
Field	Moorari	
Date of Test	23 - 28 February 1989	
Test	Pressure Fall Off Survey & SGS	
Gauge Type	Amerada	
Gauge Number	N/A	
Gauge Depth	9250' KB	
Formation	Tirrawarra	
Sands	96-0, 97-0	
Total Perforated Interval	9404' - 9564' KB	
KB	174'	
Reservoir Description		
Fluid Type	Gas	
Well Orientation	Vertical	
Number of wells	1	
Number of layers	1	
Layer Parameters Data		
Water saturation	0.277	
Gas saturation	0.723	
Formation compressibility	4.5718	e-6 psi-1
Total system compressibility	9.8265	e-5 psi-1
Initial Layer pressure	4300.0	psia
Temperature	735.0	deg F
Well radius	0.354	ft
Porosity	0.116	fraction
Formation thickness	82	ft
Fluid Parameters Data		
Gas gravity	1.064	sp grav
Gas density	18.8092	lb/ft3
Gas viscosity	0.0300022	cp
Gas formation volume factor	4.3208	e-3 ft3/scf
Water density	58.5139	lb/ft3
Water viscosity	0.1798	cp
Water formation volume factor	1.0658	RB/STB
Initial Z-factor	0.892	
Gas compressibility	1.3666	e-4 psi-1
Water compressibility	3.6329	e-6 psi-1
Composition		
N2	0.084	fraction
CO2	0.000	
C1	0.030	
C2	0.885	
C3	0.001	
C4+	0.000	
Layer Correlations		
Ug Correlation	Carr et al	

Moorari 3L February 1989 Pressure Fall Off Survey

Pressure & Rate Data Files

Rate Data

Time hours	Rate MMscf/d
0.0	4.788
6015.912	0.000

Pressure Data

Time hours	Pressure psia
0.000	4300.00
6012.279	5957.41
6012.359	5955.97
6012.680	5953.48
6012.730	5953.06
6012.830	5951.61
6013.029	5945.35
6013.131	5942.00
6013.349	5936.59
6013.541	5934.81
6013.859	5928.34
6014.029	5929.20
6014.349	5920.80
6014.529	5920.48
6014.859	5911.20
6015.029	5909.34
6015.349	5904.59
6015.590	5908.86
6015.680	5908.74
6015.730	5937.30
6015.740	5926.52
6015.779	5912.06
6015.791	5906.79
6015.801	5904.48
6015.810	5902.37
6015.820	5900.39
6015.824	5898.60
6015.832	5897.03
6015.840	5895.44
6015.849	5894.00
6015.857	5892.63
6015.910	5891.73
6015.912	5860.40
6015.914	5840.88

Pressure Data cont.

Time hours	Pressure psia
6015.916	5781.26
6015.918	5744.56
6015.920	5720.31
6015.922	5702.52
6015.926	5679.48
6015.932	5661.61
6015.945	5641.84
6015.961	5627.12
6015.986	5612.17
6016.025	5598.29
6016.113	5582.06
6016.213	5570.42
6016.313	5561.78
6016.418	5554.40
6016.516	5548.59
6016.613	5543.53
6016.715	5538.73
6016.813	5534.67
6016.918	5530.63
6017.117	5523.63
6017.318	5517.58
6017.518	5512.13
6017.918	5502.58
6018.420	5492.51
6018.912	5484.04
6019.422	5476.34
6019.898	5469.91
6020.918	5457.83
6021.922	5447.59
6023.904	5430.55
6025.896	5416.30
6028.920	5398.00
6031.908	5382.52
6035.893	5364.58
6040.873	5345.12
6045.854	5328.06
6050.832	5312.84
6056.211	5297.25
6060.865	5285.39
6066.012	5273.18
6070.992	5262.21
6075.801	5252.26
6079.678	5244.64

Radius of Investigation:

Rinv = 0.029 x ((k x t)/(porosity x viscocity x Ct))*1/2 feet

Rinv = 0.029 x ((1.28 x 63.7)/(0.116 x 0.0300022 x 9.8265e-5))*1/2

Rinv = 448 feet

Appendix 1.3

February 1989 Pressure Fall Off Survey

Variable	Data	Source Of Data
Sands:	96-0 & 97-0	
Porosity:	11.6%	Logs
Viscosity:	0.0300022	Calculated via correlations in PAN.
Ct:	9.8265E-5 1/psi	Calculated via correlations in PAN.
k:	1.28 md	From Moorari 3L Post Frac Test July 1981.
(tda)pss:	0.175	For fractured reservoirs.
Last rate prior to shut-in:	-4.788 MMscf/d	From test data.
CUM injection volume (Sep '86 - Feb '89):	4240.47 MMscf	From PRIS EOR injection summary.
Area:	33,929,201 ft*2	Estimated from maps based on distance to nearest well.

Calculation For Time to Pseudosteady State (tpss):

$$tpss = \frac{porosity \times viscosity \times Ct \times Area \times (tda)pss}{0.0002637 \times k} \text{ hours}$$

$$tpss = \frac{0.116 \times 0.0300022 \times 9.8265E\text{-}5 \times 33,929,201 \times 0.175}{0.0002637 \times 1.28}$$

tpss = 6015.91 hours

Actual Injection Time (tp)actual:

(tp)actual = Total hours injection (since July 1986 survey) is approximately 22,600 hours.

Calculation For Estimated Injection Time (tp):

$$tp = \frac{CUM\ Injection \times 24}{Last\ Recorded\ Rate} \text{ hours}$$

$$tp = \frac{4240.47 \times 24}{4.788}$$

tp = 21,255.5 hours

As tpss < tp and (tp)actual, tpss was used as the injection time in the data file.

EXPERTEST

Tested Friday, 27th April 1990.

CLIENT	LOCATION	FORMATION
Santos Ltd.	Mocrari # 3	Tirrawarra

STATIC PRESSURE GRADIENT REPORT

PRESSURE ELEMENT DATA

POSITION	SERIAL NO.	RANGE	CALIBRATED
Top	27817	5675	24/ 2/89
Bottom	27816	5700	24/ 2/89

WELL DATA

PARAMETER	VALUE
CWT In	3551 PSI
CWT Out	3580 PSI
Max SHT	258 °F

	TOP ELEMENT			BOTTOM ELEMENT		
DEPTH FT KB	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT
LUB.	1.2410	3575.8	-----	1.2390	3550.3	-----
1000	1.3050	3760.1	0.184	1.3050	3749.5	0.189
2000	1.3710	3950.1	0.190	1.3700	3935.8	0.186
3000	1.4370	4140.1	0.190	1.4360	4125.0	0.189
4000	1.5000	4321.2	0.181	1.5000	4308.3	0.183
5000	1.5620	4499.3	0.178	1.5620	4485.8	0.178
6000	1.6220	4671.4	0.172	1.6230	4660.3	0.175
7000	1.6800	4837.5	0.166	1.6800	4823.1	0.163
8000	1.7380	5003.3	0.166	1.7380	4988.6	0.166
8500	1.7650	5080.3	0.154	1.7650	5065.5	0.154
9000	1.7920	5157.3	0.154	1.7930	5145.2	0.159
9220	1.8040	5191.5	0.155	1.8050	5179.3	0.155
LUB.	1.2500	3601.7	-----	1.2430	3589.0	-----

GENERAL REMARKS

TEMP ELE 22821/139 395 F CLOCK A/16085 3HR

Moorari 3L April 1990 Pressure Fall Off Survey

Input Data File

Well	Moorari 3 Lower	
Field	Moorari	
Date of Test	22 - 27 April 1990	
Test	Pressure Fall Off Survey & SGS	
Gauge Type	Amerada	
Gauge Number	27616	
Gauge Depth	9214' KB	
Formation	Tirrawarra	
Sands	96-0	
Total Perforated Interval	9404' - 9564' KB	
KB	174'	
Reservoir Description		
Fluid Type	Gas	
Well Orientation	Vertical	
Number of wells	1	
Number of layers	1	
Layer Parameters Data		
Water saturation	0.277	
Gas saturation	0.723	
Formation compressibility	4.5718	e-6 psi-1
Total system compressibility	9.8265	e-5 psi-1
Initial Layer pressure	4300.0	psia
Temperature	735.0	deg F
Well radius	0.354	ft
Porosity	0.118	fraction
h= Formation thickness	15.0	ft
Fluid Parameters Data		
Gas gravity	1.064	sp grav
Gas density	18.8092	lb/ft3
Gas viscosity	0.0300022	cp
Gas formation volume factor	4.3208	e-3 ft3/scf
Water density	58.5139	lb/ft3
Water viscosity	0.1798	cp
Water formation volume factor	1.0658	RB/STB
Initial Z-factor	0.892	
Gas compressibility	1.3666	e-4 psi-1
Water compressibility	3.6329	e-6 psi-1
Composition		
N2	0.084	fraction
CO2	0.000	
C1	0.030	
C2	0.885	
C3	0.001	
C4+	0.000	
Layer Correlations		
Ug Correlation	Carr et al	

Moorari 3L April 1990 Pressure Fall Off Survey

Pressure & Rate Data Files

Rate Data

Time hours	Rate MMscf/d
0.0	0.000
480.0	-4.907
1176.0	-4.373
1920.0	-4.091
2462.0	-3.833
2555.5	0.000

Monthly Injection Volumes

Month	Volume Injected MMscf
January	98.14
February	126.82
March	115.96
April (prior to shut-in)	86.57

Pressure Data

Time hours	Pressure psia
0.0	4300.00
480.0	5630.00
1176.0	5630.00
1920.0	5620.00
2462.0	5613.00
2462.1	5522.95
2462.2	5508.45
2462.3	5500.25
2462.4	5492.25
2462.6	5489.55
2462.7	5484.45
2462.9	5484.45
2463.1	5477.35
2463.3	5472.55
2464.0	5465.45
2464.6	5457.25
2465.3	5451.65
2466.7	5441.15
2468.1	5430.65
2469.5	5422.55
2471.4	5410.35
2473.5	5400.25
2476.5	5387.45
2479.7	5374.05
2482.7	5361.75
2487.3	5345.95
2493.0	5327.45
2497.6	5312.05
2503.4	5295.05
2509.0	5280.75
2516.1	5263.05
2524.8	5245.65
2532.4	5230.45
2541.4	5214.85
2551.4	5200.75
2555.5	5191.45

Appendix 2.3

April 1990 Pressure Fall Off Survey

Variable	Data	Source Of Data
Sand:	96-0	
Porosity:	11.8%	Logs
Viscosity:	0.0300022	Calculated via correlations in PAN.
Ct:	9.8265E-5 1/psi	Calculated via correlations in PAN.
k:	1.28 md	From Moorari 3L Post Frac Test July 1981.
(tda)pss:	0.175	For fractured reservoirs.
Last rate prior to shut-in:	-3.833 MMscf/d	From test data.
CUM injection volume (Jan '90 - Apr '90):	427.49 MMscf	From PRIS EOR injection summary.
Area:	33,929,201 ft*2	Estimated from maps based on distance to nearest well.

Calculation For Time to Pseudosteady State (tpss):

$$tpss = \frac{\text{porosity x viscosity x Ct x Area x (tda)pss}}{0.0002637 \times k} \text{ hours}$$

$$tpss = \frac{0.118 \times 0.0300022 \times 9.8265E\text{-}5 \times 33,929,201 \times 0.175}{0.0002637 \times 1.28}$$

tpss = 6015.91 hours

Actual Injection Time (tp)actual:

(tp)actual = Total hours injection post frac to shut-in = 2462 hours

Calculation For Estimated Injection Time (tp):

$$tp = \frac{\text{CUM Injection x 24}}{\text{Last Recorded Rate}} \text{ hours}$$

$$tp = \frac{427.49 \times 24}{3.833}$$

tp = 2,676.7 hours

(tp)actual is approximately equal to tp which are both less than tpss.

Therefore (tp)actual was used in the input file.