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NUMBER 7269/2

PPL 11

EROMANGA BASIN AND COOPER BASIN

MOOMBA 64

TEST REPORTS

Submitted by

Santos Ltd
1992

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MINES and ENERGY
RESOURCES SOUTH
AUSTRALIA



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ENVELOPE 7269/2

TENEMENT: PPL 11; Eromanga and Cooper Basins

TENEMENT HOLDER: Santos Ltd (operator), Cooper Basin Unit, Delhi Petroleum Pty Ltd, Vamgas Ltd and Sagasco Resources Ltd

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	King, G., Kunac, S., Kappler, S. and Coppock, S., 1990. Field testing contractor's results of the post-frac single rate gas production test, 75.6 hour reservoir pressure buildup and static wellbore pressure gradient surveys of the above Toolachee Formation Unit "C" gas reservoir producing zone, conducted over the period 3-17/10/90 (Oilserv Australia Ltd).	7269/2 R 2 Pgs 34-77
	Kunac, S. and Hirst, T., 1991. Field testing contractor's results of the single rate gas production test, 101.25 hour reservoir pressure buildup and flowing plus static wellbore pressure gradient surveys of the Toolachee Unit "C" producing zone, conducted over the period 9-21/3/91 (Oilserv Australia Ltd).	7269/2 R 3 Pgs 78-101
	Karageorgos, J. and Leslie, R., 1991. Field operator's reservoir engineering interpretation of the results of the August 1990 pre-frac and October 1990 post-frac single rate gas production tests and associated reservoir pressure surveys of the Toolachee Unit "C" producing zone (Santos Ltd Petroleum Development Department report no. RE:049/91, August 1991).	7269/2 R 4 Pgs 102-120
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REPORTS:

Potter, B., 1992. Field maintenance contractor's results of the selective single rate gas production test, 62 hour reservoir pressure buildup and flowing plus static wellbore pressure gradient surveys of the commingled Toolachee Unit "C" / Daralingie Beds gas reservoirs producing intervals 7791-7877 and 7970-8144 feet depth KB, conducted over the period 27-30/9/92 (Expertest Pty Ltd).

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Hay, N. and Grindlay, A., 1992. Field maintenance contractor's results of the flowing bottomhole pressure, 96 hour reservoir pressure buildup and static wellbore pressure gradient surveys of the Daralingie Beds gas reservoir isolated producing interval 7945-8180 feet depth KB, conducted over the period 20-26/12/92 (Expertest Pty Ltd).

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8/3/90
 8/3/90
 3/3/90

WELL: MOOMBA #64						SANTOS LTD.										DATE: 17. AUG. 1990				
TYPE OF TEST: SINGLE RATE						WELL TEST DATA SHEET										PAGE No: 1				
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 KPA	TEMP. °C	ORIFICE SIZE INS.	TANK DIP LITRE	TANK PROD M3	API GRAVITY @60 °F	TANK DIP LITRE	TANK PROD M3	GAS FLOW RATE M3/D	OIL FLOW RATE M3/DAY	WATER FLOW RATE M3/DAY	TOTAL LIQUID FLOW RATE M3/DAY	LCR. M3/M3	
0800						SHUT IN WELL, RIG UP WIRE LINE FOR DUMMY RUN														
0830						RUN IN HOLE WITH WEIGHT BAR, SPANG JAR + 1.75 GAUGE														
						CUTTER TO 8651' KB - WITH NO OBSTRUCTIONS														
0915						POW OUT OF HOLE														
0945						IN LUBRICATOR														
0950						RIG DOWN WIRE LINE														
1100						SPOT TEST EQUIPMENT + RIG UP E/LINE														
1526	Ø	11349	-	3/1		PRESSURE UP LUBRICATOR														
1605						BEGIN STATIC GRADIENT, CONTINUE TEST RIG UP.														
2339						END STATIC GRADIENT														
18-AUG-1990						NEW DAY														
0045						PRESSURE TEST LINES + PRE HEAT HEATER.														
0130	Ø	11308				OPEN WELL TO FLARE ON BY-PASS + GRADUALLY OPEN TO 31/64 TH														
0300	Ø	4413	29	31/64		TRIM FLOW THROUGH SEPARATOR.														
0400	Ø	4192	33	31/64		1544	11.95	40	2.25	Ø	Ø		Ø	Ø	89.10	Ø	Ø		CO2 = 24% H2S = 14 PPM	
0430						BEGIN TO DUMP FLUIDS TO TANK.														
0600	Ø	3944	34	31/64		1710	9.71	43	2.25	270	0.04		230	0.23	83.98	0.64	3.68	4.32	0.051	
0800	Ø	3379	35	31/64		1586	22.66	44	1.75	615	0.00		575	0.345	71.32	0.00	4.14	4.14	0.058	
1000	Ø	3075	36	31/64		1551	19.17	46.5	1.75	1000	0.00		960	0.385	64.58	0.00	4.62	4.62	0.072	
1400	Ø	2999	37	31/64		1310	20.92	39.5	1.75	1980	0.09		1850	0.89	62.94	0.54	5.34	5.88	0.093	

OPERATOR: C. KING / S. KUNAC

7/6976 NW

0003

WELL: <u>Moomba 64</u>										SANTOS LTD.										DATE: <u>18-AUG-1990</u>				
TYPE OF TEST: <u>SINGLE RATE</u>										WELL TEST DATA SHEET										PAGE No: <u>2</u>				
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 KPA	TEMP. °C	ORIFICE SIZE INS.	TANK DIP LITRE	TANK PROD M3	API GRAVITY @ 60 °F	TANK DIP LITRE	TANK PROD M3	GAS FLOW RATE M3/D	OIL FLOW RATE M3/DAY	WATER FLOW RATE M3/DAY	TOTAL LIQUID FLOW RATE M3/DAY	LGR M3/M3					
1800	Ø	2923	37.5	3 1/64		1344	18.92	38.5	1.75	1980 2940	0.07		1850 2740	0.89	60.27	0.42	5.34	5.76	0.096					
2200	Ø	2896	38	3 1/64		1379	17.68	42	1.75	3900	0.025	41.7	3675	0.935	58.58	0.15	5.61	5.76	0.098					
19-AUG-1990										NEW DAY														
0200	Ø	2889	38	3 1/64		1448	15.94	41	1.75	4850	0.045		4580	0.905	57.05	0.27	5.43	5.70	0.100					
0600	Ø	2868	38	3 1/64		1586	14.91	38	1.75	5770	0.01		5490	0.91	56.62	0.06	5.46	5.52	0.097					
1000	Ø	2875	39	3 1/64		896	22.41	33	1.75	1090	0.03		1060	1.06	54.70	0.18	6.36	6.54	0.120					
1400	Ø	2875	39.5	3 1/64		621	36.35	35	1.75	2030	0.025		1975	0.915	59.06	0.15	5.49	5.64	0.095					
1400						TAKE 1 ST SET H.P. SAMPLES.																		
1500	Ø	2875	40	3 1/64		621	37.10	34.5	1.75	2270	0.015		2200	0.225	59.73	0.36	5.40	5.76	0.096					
1500						TAKE 2 ND SET H.P. SAMPLES.																		
1800	Ø	2855	39	3 1/64		689	33.37	33.5	1.75	2995	0.04		2885	0.685	59.37	0.32	5.48	5.80	0.098					
2200	Ø	2855	39	3 1/64		724	29.38	34	1.75	3965	0.055		3800	0.915	56.83	0.33	5.49	5.82	0.102					
20/8/1990										NEW DAY														
0200	Ø	2855	39.5	3 1/64		724	27.64	32	1.75	4940	0.055		4720	0.92	55.29	0.33	5.52	5.85	0.106					
0600	Ø	2855	40	3 1/64		752	26.89	32	1.75	5915	0.055		5640	0.92	55.45	0.33	5.52	5.85	0.106					
1000	Ø	2854	40	3 1/64		689	31.62	33	1.75	6890	0.065		6550	0.91	57.83	0.39	5.46	5.85	0.101					
1400	Ø	2854	40.5	3 1/64		689	32.12	31.5	1.75	3210 4200	0.050		2860 3800	0.94	58.44	0.30	5.64	5.94	0.102					
1400						SHUT IN FOR BUILD UP																		
1415	Ø	9515																						
1420	Ø	11377																						

G. KINC / S. KUNAC.

WELL: <u>MOOMBA 6A</u>						 SANTOS LTD. WELL TEST DATA SHEET										DATE: <u>20 AUG 1990</u>									
TYPE OF TEST: <u>SINGLE RATE</u>																					PAGE No: <u>3</u>				
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 KPA	TEMP. °C	ORIFICE SIZE INS.	TANK DIP LITRE	TANK PROD M3	API GRAVITY °80 °F	TANK DIP LITRE	TANK PROD M3	GAS FLOW RATE M3/D	OIL FLOW RATE M3/DAY	WATER FLOW RATE M3/DAY	TOTAL LIQUID FLOW RATE M3/DAY	G.O.R. M3/M3						
1445	Ø	11618																							
1500	Ø	11515																							
1515	Ø	11425																							
1530	Ø	11356																							
1545	Ø	11328																							
1600	Ø	11308																							
1615	Ø	11287																							
1630	Ø	11280																							
1645	Ø	11287																							
1700	Ø	11280																							
1715	Ø	11273																							
1730	Ø	11273																							
1745	Ø	11266																							
1800	Ø	11280																							
2200	Ø	11218																							
21/AUG/1990						NEW DAY																			
0200	Ø	11204																							
0600	Ø	11163																							
1000	Ø	11156																							
1400	Ø	11135																							

OPERATOR C. KING / S. KUNAK

0005

WELL: <u>MOOMBA 64</u>										SANTOS LTD.										DATE: <u>21/- AUG 1990</u>				
TYPE OF TEST: <u>SINGLE RATE</u>										WELL TEST DATA SHEET										PAGE No: <u>A</u>				
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 KPA	TEMP. °C	ORIFICE SIZE INS.	TANK DIP LITRE	TANK PROD M3	API GRAVITY °80 °F	TANK DIP LITRE	TANK PROD M3	GAS FLOW RATE M3/D	OIL FLOW RATE M3/DAY	WATER FLOW RATE M3/DAY	TOTAL LIQUID FLOW RATE M3/DAY	G.O.R. M3/M3					
1800	0	11135																						
2200	0	11135																						
22-AUG-1990																								
0200	0	11149																						
0600	0	11149																						
1000	0	11156																						
1400	0	11156																						
1800	0	11163																						
2200	0	11163																						
23-AUG-1990																								
0200	0	11170																						
0600	0	11170																						
1000	0	11184																						
1218																								
1330	0	11184																						
1331																								
1530																								
1535																								
1537	0	11190																						

NEW DAY

NEW DAY

BEGIN STATIC GRADIENT.

TOOL FAILURE ROLL OUT OF HOLE

IN LUBRICATOR.

DEPRESSURE LUBRICATOR, REMAKE CABLE HEAD,

REDRESS AMARADA WITH 24 HR CLOCK.

PRESSURE UP LUBRICATOR, LEAK AT TOOL TRAP.

DEPRESSURE LUBRICATOR, REPAIR LEAK.

PRESSURE UP LUBRICATOR.

OPERATOR: C. King / S. KUNAK

9000

WELL MOOMBA # 64		SANTOS LTD						DATE 18-AUG-1990					REMARKS
TANK:- CAPACITY 16,000 L/2		SANTOS						PAGE No. 1 OF 2					
SCALE 0-50 L		FLUID PRODUCTION SHEET						OPERATOR OILSERV					
DATE	CUM. TIME	OIL/CONDENSATE PRODUCTION					WATER PRODUCTION						
TIME		TOTAL	TANK PROD.	FLOWRATE	CUM. PROD.	OIL CONDENSATE GRAVITY "API60F"	TANK DIP	TANK PROD.	FLOWRATE	CUM. PROD.	SALINITY		
		LITRES	M ³	M ³ /D	M ³		LITRES	M ³	M ³ /D	M ³	PPM		
0300		Ø					Ø						
0400		Ø					Ø						
0430		Ø					Ø						
0600	0	270	0.04	0.64	0.64		230	0.23	3.68	0.23			
0800		615	0.00	0.00	0.64		575	0.345	4.14	0.575			
1000		1000	0.00	0.00	0.64		960	0.385	4.62	0.960			
1400		1980	0.09	0.54	0.73		1850	0.89	5.34	1.85			
1800		2940	0.07	0.42	0.80		2740	0.89	5.34	2.74			
2200		3900	0.025	0.15	0.825	41.7	3675	0.935	5.61	3.675			
19/8/90													
0200		4850	0.045	0.27	0.87		4580	0.905	5.43	4.58			
0600		5770	0.010	0.06	0.88		5490	0.91	5.46	5.49			
1000	0	1090	0.03	0.18	0.91		1060	1.06	6.36	6.55			
1400		2030	0.025	0.15	0.935		1975	0.915	5.49	7.465			
1500		2270	0.015	0.36	0.950		2200	0.225	5.40	7.69			
1800		2995	0.04	0.32	0.990		2885	0.685	5.48	8.375			
2200		3965	0.055	0.33	1.045		3800	0.915	5.49	9.29			
20/8/90													
0200		4940	0.055	0.33	1.100		4720	0.92	5.52	10.21			
0600		5915	0.055	0.33	1.455		5640	0.92	5.52	11.13			

TANK- CAPACITY 16000 l / 2
SCALE 0-50 l



SANTOS LTD

FLUID PRODUCTION SHEET

DATE 20-AUG-1990

PAGE No. 2 of 2

PAGE NO.
OPERATOR OILSERV.

[illegible]

Test: SINGLE RATE

Interval: 7791' → 7837' KB ^{UNIT "C"} TOOLACHEE Motor Run Size: 3.826

0010

Client: SANTOSWell: MOOMBA #64Test: SINGLE RATETest No: 1Interval: 7791' KB → 7877' KB ^{UNIT "C"} TOOLACHEE Meter Run Size: 3.826

Date	Time	Accum	Gas Gravity Air=1	Orifice diam. Inches	Gas Temp degF	Diff hw "H2O	Static Pf psia	VHw*Pf	Fb	Fg	Y	Ftf	Fpv	C	Gas Rate Q MscfD	Cumulative Production E3/m3
18/8/90																
	0400		0.783	2.250	40	48	224	107.047	1104.67	1.1301	1.0011	0.9602	1.0257	1230.9328	3.162	89.10 3.712
	0600		0.783	2.250	43	39	248	101.225	1104.67	1.1301	1.0008	0.9556	1.0276	1226.8907	2.981	85.98 10.710
	0800		0.783	1.750	44	91	230	149.233	637.83	1.1301	1.0023	0.9541	1.0253	706.7921	2.531	71.32 16.653
	1000		0.783	1.750	46.5	77	225	135.865	637.83	1.1301	1.0020	0.9504	1.0241	702.9774	2.292	22.0348
	1400		0.783	1.750	39.5	84	190	131.139	637.83	1.1301	1.0026	0.9610	1.0220	709.7620	2.234	32.5242
	1800		0.796	1.750	38.5	76	195	126.252	637.83	1.1208	1.0023	0.9625	1.0237	705.9764	2.139	42.5689
	2200		0.796	1.750	42	71	200	123.474	637.83	1.1208	1.0021	0.9571	1.0233	701.6942	2.079	52.3330
19/8/90																
	0200		0.796	1.750	41	64	210	119.928	637.83	1.1208	1.0018	0.9587	1.0248	703.5755	2.025	61.8421
	0600		0.796	1.750	38	57	230	118.109	637.83	1.1208	1.0015	0.9633	1.0280	708.9620	2.010	71.2786
	1000		0.796	1.750	33	90	130	114.130	637.83	1.1208	1.0039	0.9711	1.0170	708.8421	1.942	80.3957
	1400		0.796	1.750	35	146	90	123.655	637.83	1.1208	1.0088	0.9680	1.0120	706.4248	2.096	90.2400
	1500		0.796	1.750	34.5	149	90	124.919	637.83	1.1208	1.0090	0.9687	1.0120	707.1703	2.120	92.7289
	1800		0.796	1.750	33.5	134	100	123.991	637.83	1.1208	1.0074	0.9703	1.0133	708.1085	2.107	100.1499
	2200		0.796	1.750	34	118	105	118.862	637.83	1.1208	1.0062	0.9695	1.0139	707.0862	2.017	109.6215
20/8/90																

0011

OILSERV AUSTRALIA LIMITED

SUBSURFACE PRESSURE CALIBRATION REPORT

CLIENT: SANTOS LTD

CALIBRATION NO: MOOMBA # 64

DATE OF CALIBRATION: 17/08/90

DATE OF LAST CALIBRATION:

OWNER OF GAUGE: OILSERV AUSTRALIA LTD

TYPE OF ELEMENT: RPG-3

PRESS ELEM NO: 53563 RANGE: 0-5000 PSI

RECORDING SECT NO: 46680

DEADWEIGHT TESTER TYPE AND RANGE: CHANDLER 55-1

SERIAL NO: 18731

BASE LINE DRAWN AT ATMOSPHERIC PRESSURE READING $D_0 =$ TEMPERATURE = $^{\circ}\text{F}$ REFERENCE LINE READING $D_r =$ REF PRESSURE =psia TEMPERATURE = $^{\circ}\text{F}$ MAXIMUM TEMPERATURE EXPECTED = $^{\circ}\text{F}$ CALIBRATION TEMPERATURE = 250 $^{\circ}\text{F}$

DRAWING ALL CALIBRATION STEPS WITH (CLOCK/CRANK): CRANK

LEVEL DIFFERENCE $H =$ in ? $\odot p =$ psia (+ when dwt above bellows)SPEC GRAV OF OIL $D =$ Y EQUIVALENT PRESSURE P OF LEVEL DIFFERENCE BETWEEN DWT AND BELLWS: psia

PRESS.	CALIBRATION STEPS							LEAST SQUARES
dwt	Y	KY	YJ	Y * P	$P_c = KY + a$	$c = P - P_c$	CJ	$A = \frac{dP}{dn} = 2750.00$
500	0.1878	0.1878	0.0352	93.90	502.01	-2.01	4.0491	$B = \frac{dY}{dn} = 1.0341$
1000	0.3763	0.1885	0.1416	376.30	1002.68	-2.68	7.1857	$C = \frac{d(YJ)}{dY} = 1.3168$
1500	0.5643	0.1880	0.3184	846.45	1502.02	-2.02	4.0843	$D = \frac{d(YP)}{dY} = 3500.87$
2000	0.7513	0.1870	0.5644	1502.60	1998.70	1.29	1.6763	
2500	0.9394	0.1881	0.8824	2348.50	2498.31	1.68	2.8519	
3000	1.1262	0.1868	1.2683	3378.60	2994.46	5.53	30.6441	
3500	1.3151	0.1889	1.7294	4602.85	3496.19	3.80	14.4773	
4000	1.5038	0.1887	2.2614	6015.20	3997.39	2.60	6.7876	$K = \frac{D-A}{C-B} = 2656.06$
4500	1.6936	0.1898	2.8682	7621.20	4501.51	-1.51	2.2981	
5000	1.8838	0.1902	3.5487	9419.00	5006.69	-6.69	44.8851	$a = A - BK = 3.2031$
								$a = D - CK = 3.2031$
								$Q = \frac{d(C)}{dn} = 11.8940$
27500	10.3416		13.6184	36204.60	$d + = 14.92$		118.9401	
					$d - = -14.92$			

CALIBRATION RESULTS

COMMENTS

 $K = 2656.065$ $D_r - D_0 = Y_r =$ $a + p = 3.203$ $P_r =$

ISO - CHRONAL AND BUILD-UP SURVEY

Date: 17-AUG-1990

Well: MOOMBA 64

Lubricator Data:

Pressure with D.W.T. 11349 KPA

Time Pressured 1646

Time Run in Hole 1605

Time Depressed 1331

Time off Bottom POOH @ 1000

Bomb No. 1 Data

Bomb No. 2 Data

Element No. and Range 8/N: 53563 0-5000 PSI

Recorder No. 8/N: 46680

Clock and Lead Screw Data 8/N: F. 23708 120 HR
SINGLE PITCH L/S.

Engage Stylus Date: 17-AUG-90 Time: 1416

Disengage Date: 23-AUG-90 Time: 1423

Date:

Time:

Date:

Time:

Remarks: MAXIMUM TEMP = 270 °F.

TOTAL TIME IN HOLE = 144 HRS.

Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	Wellhead KPA	Casing KPA	Wellhead Temp. °C	Remarks
17/8	1526		11349	Ø		PRESSURE UP LUB.
	1605					BEGIN STATIC GRADIENT
	2339					END STATIC GRADIENT
18/8	0045					PCS TEST SURFACE EQUIP.
	0130		11308	Ø		OPEN WELL ON 3 1/6" TWS
	0300		4413	Ø	29	
	0400		4192	Ø	33	
	0600		3944	Ø	34	
	0800		3379	Ø	35	
	1000		3075	Ø	36	
	1400		2999	Ø	37	
	1800		2923	Ø	37.5	
	2200		2896	Ø	38	
19/8	0200		2889	Ø	38	
	0600		2868	Ø	38	
	1000		2875	Ø	39	
	1400		2875	Ø	39.5	SURFACE SAMPLES #1
	1500		2875	Ø	40	" " #2
	1800		2855	Ø	39	
	2200		2855	Ø	39	
20/8	0200		2855	Ø	39.5	
	0600		2855	Ø	40	
	1000		2854	Ø	40	
			2851	Ø	40.5	CHARTING END RUN IN ID

SANTOS LTD.

0014

ISO • CHRONAL AND BUILD-UP SURVEY CONTINUATION

Well: MOOMBA 64Date: 20-AUG-1990

Page 2 of 2

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
						<u>400 S/I FOR B/U</u>
20/8	1415		9515	Ø		
	1430		11377	Ø		
	1445		11618	Ø		
	1500		11515	Ø		
	1515		11425	Ø		
	1530		11356	Ø		
	1545		11328	Ø		
	1600		11308	Ø		
	1615		11287	Ø		
	1630		11280	Ø		
	1645		11287	Ø		
	1700		11280	Ø		
	1715		11273	Ø		
	1730		11273	Ø		
	1745		11266	Ø		
	1800		11280	Ø		
	2200		11218	Ø		
21/8	0200		11204	Ø		
	0600		11163	Ø		
	1000		11156	Ø		
	1400		11135	Ø		
	1800		11135	Ø		
	2200		11135	Ø		
22/8	0200		11149	Ø		
	0600		11149	Ø		
	1000		11156	Ø		
	1400		11156	Ø		
	1800		11163	Ø		
	2200		11163	Ø		
23/8	0200		11170	Ø		
	0600		11170	Ø		
	1000		11184	Ø		
	1218					BEGIN STATIC GRADIENT
	1330		11184	Ø		E/L DOWN POOLH.
	1331					IN LUBRICATOR
						DE PRESSURE LUB.

Well: ...MOOMBA...64

Date: 23-AUG-1990

Lubricator Data:

Pressure with D.W.T. 11190 kPa

Time Pressured.....1537.

Time Depressured.....11.20

Time Run in Hole.....1550

Time off Bottom. POOH @ 0500

Bomb No. 1 Data

Bomb No. 2 Data

Element No. and Range	S/N: 53563	0-5,000 PSI
Recorder No.	S/N 46680	
Clock and Lead Screw Data	S/N C-12251	24 HR SINGLE PITCH 4/5
Engage Stylus	Date: 23/8/90	Time: 1445
Disengage	Date: 24/8/90	Time: 1500

Remarks: MAXIMUM B.H.T.

Well-Head Data for Final Build-up

[illegible]



0016

WIRELINE REPORT

WELL: MOOMBA 64

DATE: 17 - AUG - 1990

PROGRAM: SINGLE RATE PRE FRAC

PURPOSE OF WORK: DUMMY RUN WITH 1.75" GAUGE RING

REPORT OF WORK PERFORMED: 0800 SHUT IN WELL, RIG UP W/LINE
0830 R.I.H WITH WEIGHT BAR, SPANG
JAR + 1.75 GAUGE CUTTER TO
8651' KB WITH NO OBSTRUCTION
0915 P.O.O.H.
0945 IN LUB
0950 RIG DOWN W/LINE

OPERATOR'S SIGNATURE

WORK PERFORMED BY: OILSERV OF G. V. L.

WELL DATA:

Tubing Size: 2 7/8 FWHP: - SIWHP: 11349 KPA

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

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

Min I.D. 2.313 " @ 7758.17 KB Packer @ 7690.69 KB

Perforated Interval: 7791' - 7877'

Forward to: Petroleum Engineering - Adelaide
Production Department - Moomba

OILSERV
AUSTRALIA
LTD

CLIENT: SANTOS LTD
WELL: MOOMBA # 64
DATE: 17/8/90

SEQUENCE OF
OPERATIONS
PAGE: 1

DATE/TIME	REMARKS
17/8/90	
1000	Arrive Moomba # 64.
1100	Start E/Line rig up.
1400	Rig up Lubricator tie new rope socket & test tool GRC 56027.
1430	Install Swab valve.
1445	Rig up Lubricator with Tool String check tool to atmosphere.
1526	Pressure up Lubricator.
	Hang in Lubricator for 1 hour.
1605	Start Static Gradient Survey.
1630	R.I.H.
1653	Stop # 1 @ 1000'KB.
1714	Gradient : 0.056 PSI/FT. R.I.H.
1724	Stop # 2 @ 2000'KB.
1746	Gradient: 0.050 PSI/FT. R.I.H.
1758	Stop # 3 @ 3000'KB.
1816	Gradient: 0.047 PSI/FT. R.I.H.
1836	Stop # 4 @ 4000'KB.
1856	Gradient: 0.043 PSI/FT. R.I.H.
1923	Stop # 5 @ 5000'KB.
1942	Gradient: 0.041 PSI/FT. R.I.H.
2004	Stop # 6 @ 6000'KB.
2020	Gradient: 0.039 PSI/FT. R.I.H.
2033	Stop # 7 @ 7000'KB.
2050	Gradient: 0.039 PSI/FT. R.I.H.
2059	Stop # 8 @ 7500'KB.
2114	Gradient : 0.038 PSI/FT. R.I.H.
2122	Stop # 9 @ 7700'KB.
2138	Gradient: 0.040 PSI/FT. R.I.H.
2145	Stop # 10 @ 7800'KB.
2210	Gradient: 0.030 PSI/FT. R.I.H.
2217	Stop # 11 @ 7833'KB. (MPP).
2233	Gradient : 0.090 PSI/FT. R.I.H.
2240	Stop # 12 @ 7880'KB.
2305	Gradient: 0.425 PSI/FT. R.I.H.

cont/2

SEQUENCE OF OPERATIONS CONTINUATION SHEET

PAGE: 2

2313	Stop # 13 @ 7920'KB.
2338	Gradient: 0.050 PSI/FT. End of Static Gradient Survey.
2339	Hang @ 7920'KB. Survey Depth.
18/8/90	
130	Open well to Flow.
19/8/90	Monitor Flow.
20/8/90	Monitor Flow.
1400	Shut in well @ W.V. for Build up BHP 5458.86 BHT 130.
21/8/90	Monitor Build up.
22/8/90	Monitor Build up.
23/8/90	Monitor Build up.
1000	P.O.O.H. Start Static Gradient Survey.
1000	Stop # 13 7920'KB.
1010	P.O.O.H. Gradient : 0.475 PSI/FT.
1019	Stop # 12 7880'KB.
1045	P.O.O.H. Gradient : 0.362 PSI/FT.
1050	Stop # 1 7833'KB.
1134	P.O.O.H. Gradient : 0.030 PSI/FT.
1139	Stop # 10 7800'KB.
1159	P.O.O.H. Gradient: 0.040 PSI/FT.
1204	Stop # 9 7700'KB.
1213	Tool failure down hole due to cable head boot.
1218	P.O.O.H.
1330	Arrive in Lubricator.
1331	Depressure Lubricator, rehead cable, change 'O' rings.
1530	Pressure up Lubricator. Leak at tool trap.
1535	Depressure lubricator fix leak at tool trap.
1537	Pressure up lubricator.
1550	R.I.H.
1720	Hang @ 7920'KB, Survey depth.

cont/3

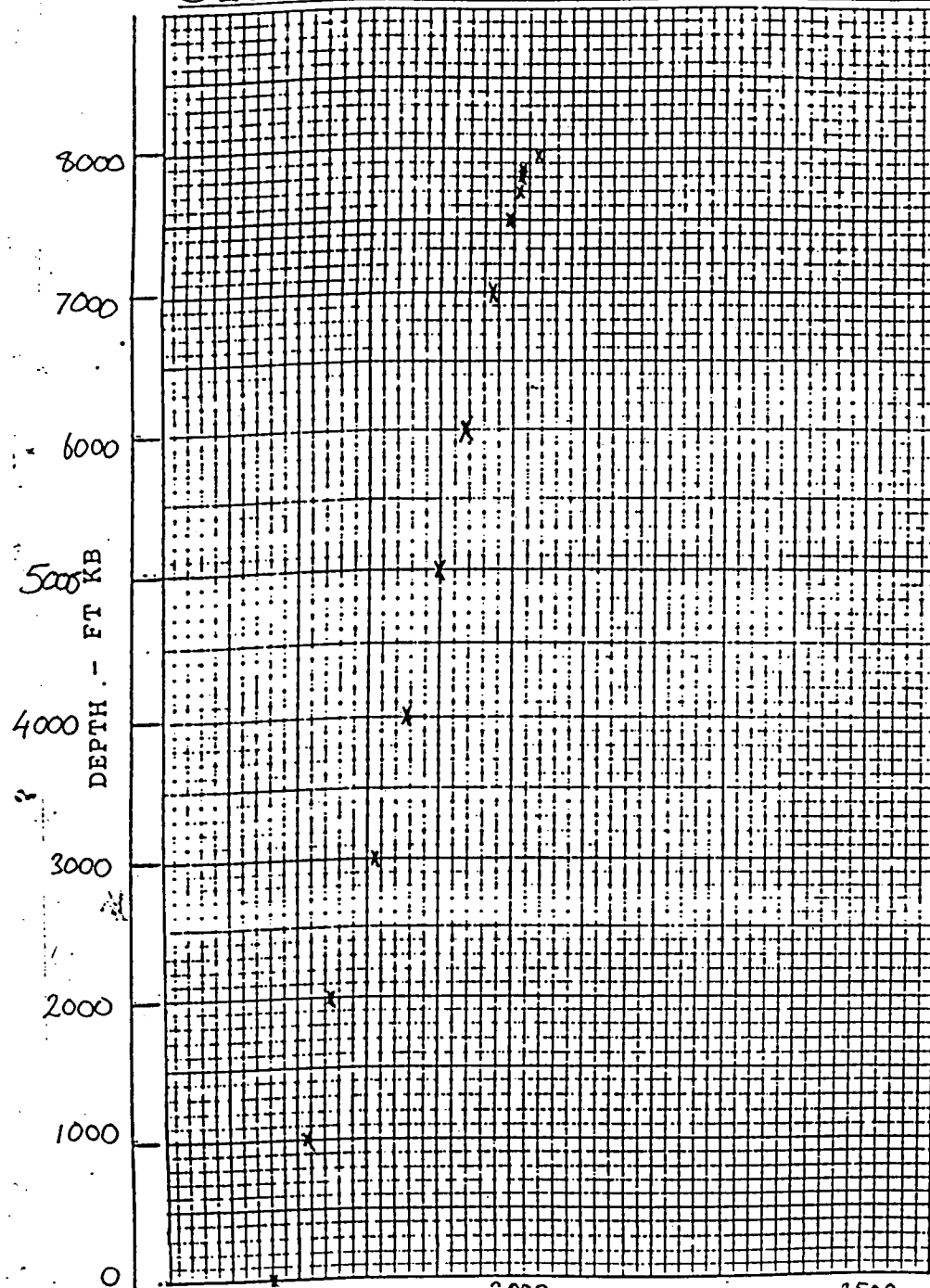
SEQUENCE OF OPERATIONS CONTINUATION SHEET:

PAGE: 3

24/8/90

500	Start Static Gradient Survey.
500	Stop # 13 7920'KB.
510	P.O.O.H. Gradient: 0.500 PSI/FT.
514	Stop # 12 7880'KB
531	P.O.O.H. Gradient : 0.362 PSI/FT.
537	Stop # 11 7833'KB.
607	P.O.O.H. Gradient: 0.030 PSI/FT.
612	Stop # 10 7800'KB.
632	P.O.O.H. Gradient: 0.030 PSI/FT.
637	Stop # 9 7700'KB.
654	P.O.O.H. Gradient: 0.040 PSI/FT.
659	Stop # 8 7500'KB.
721	P.O.O.H. Gradient: 0.038 PSI/FT.
729	Stop # 7 7000'KB.
743	P.O.O.H. Gradient: 0.039 PSI/FT.
757	Stop # 6 6000'KB.
815	P.O.O.H. Gradient: 0.040 PSI/FT.
926	Stop # 5 5000'KB.
843	P.O.O.H. Gradient: 0.042 PSI/FT.
854	Stop # 4 4 000'KB.
914	P.O.O.H. Gradient: 0.045 PSI/FT.
925	Stop # 3 3000'KB.
942	P.O.O.H. Gradient: 0.049 PSI/FT.
951	Stop # 2 2000'KB.
1007	P.O.O.H. Gradient: 0.051 PSI/FT.
1018	Stop # 1 1000'KB.
1034	P.O.O.H. Gradient: 0.057 PSI/FT.
1039	Stop in Lubricator.
1116	End of Static Gradient Survey.
1120	Depressure Lubricator.
1126	End of Test.
1130	Rig down lubricator & equipment.

OILSERV AUSTRALIA LTD



GRADIENT SURVEY REPORT

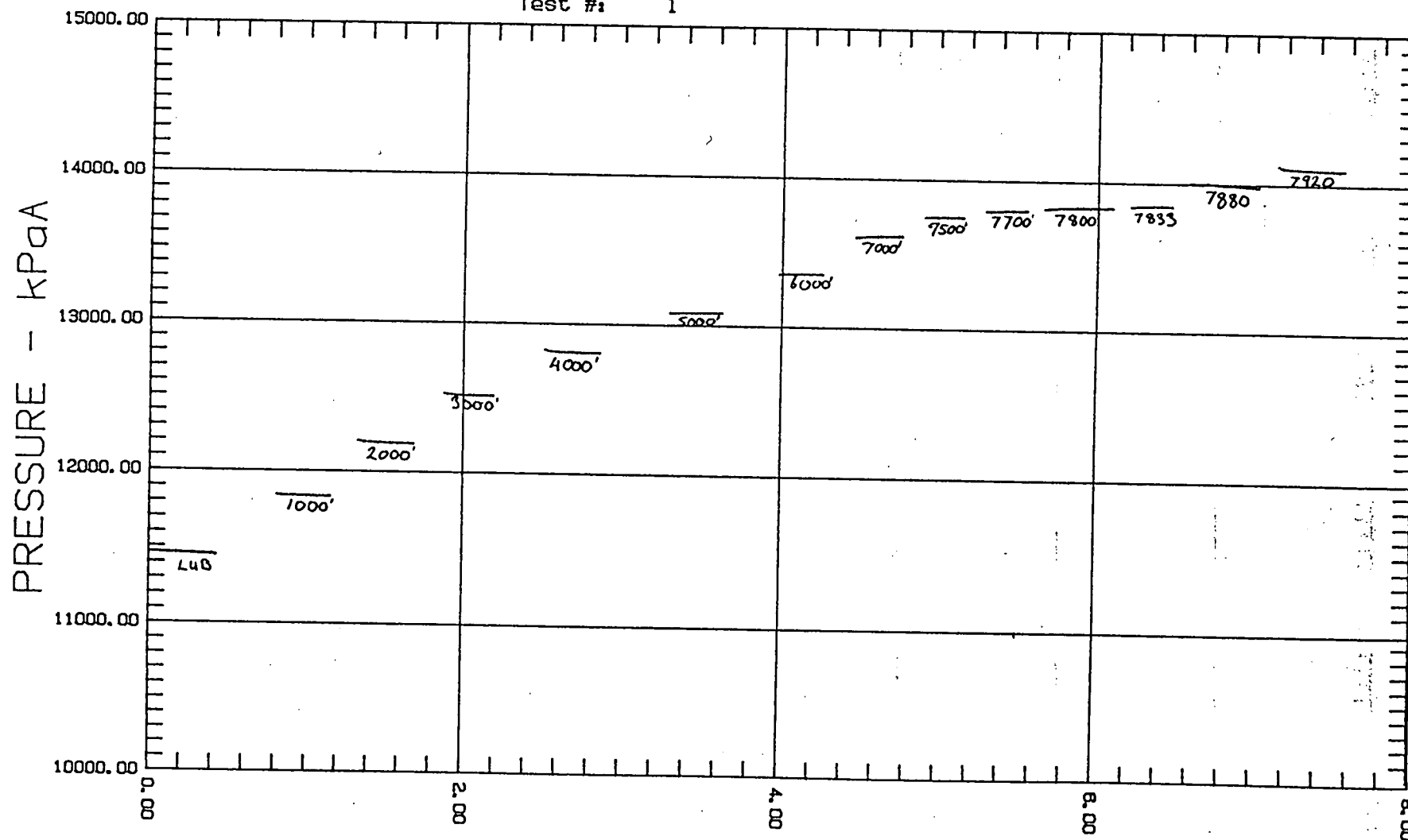
TIME	STOP	DEPTH (KB)	PRESSURE (PSIA)	GRADIENT PSI/FT
15.26 16.30	LUB	14	1661	0.056
16.53 17.14 17.48	1 2	1000 2000	1717 1767	0.05
17.58 18.16	3	3000	1814	0.047
18.36 18.56	4	4000	1857	0.043
19.23 19.42	5	5000	1898	0.041
20.04 20.20	6	6000	1937	0.039
20.33 20.50	7	7000	1976	0.039
20.59 21.14	8	7500	1995	0.038
21.22 21.38	9	7700	2003	0.04
21.45 22.10	10	7800	2006	0.03
22.17 22.33	11	7833	2009	0.09
22.40 23.05	12	7880	2029	0.425
23.13 23.38	13	7920	2031	0.05

WELL: Mbomba # 64DATE: 17-08-90

Plot starting date: 8/17/90
time: 16: 5:20
Gauge S/N 56027

Company: OILSERV AUSTRALIA PTY LTD
Client: SANTOS LTD
Well name: MOOMBA
Well #: # 64
Test #: 1

Location: COOPER BASIN
Operator: G PASZNICKI
Comments: SINGLE RATE FLOW & BUILD UP.
STATIC GRADIENT SURVEY.



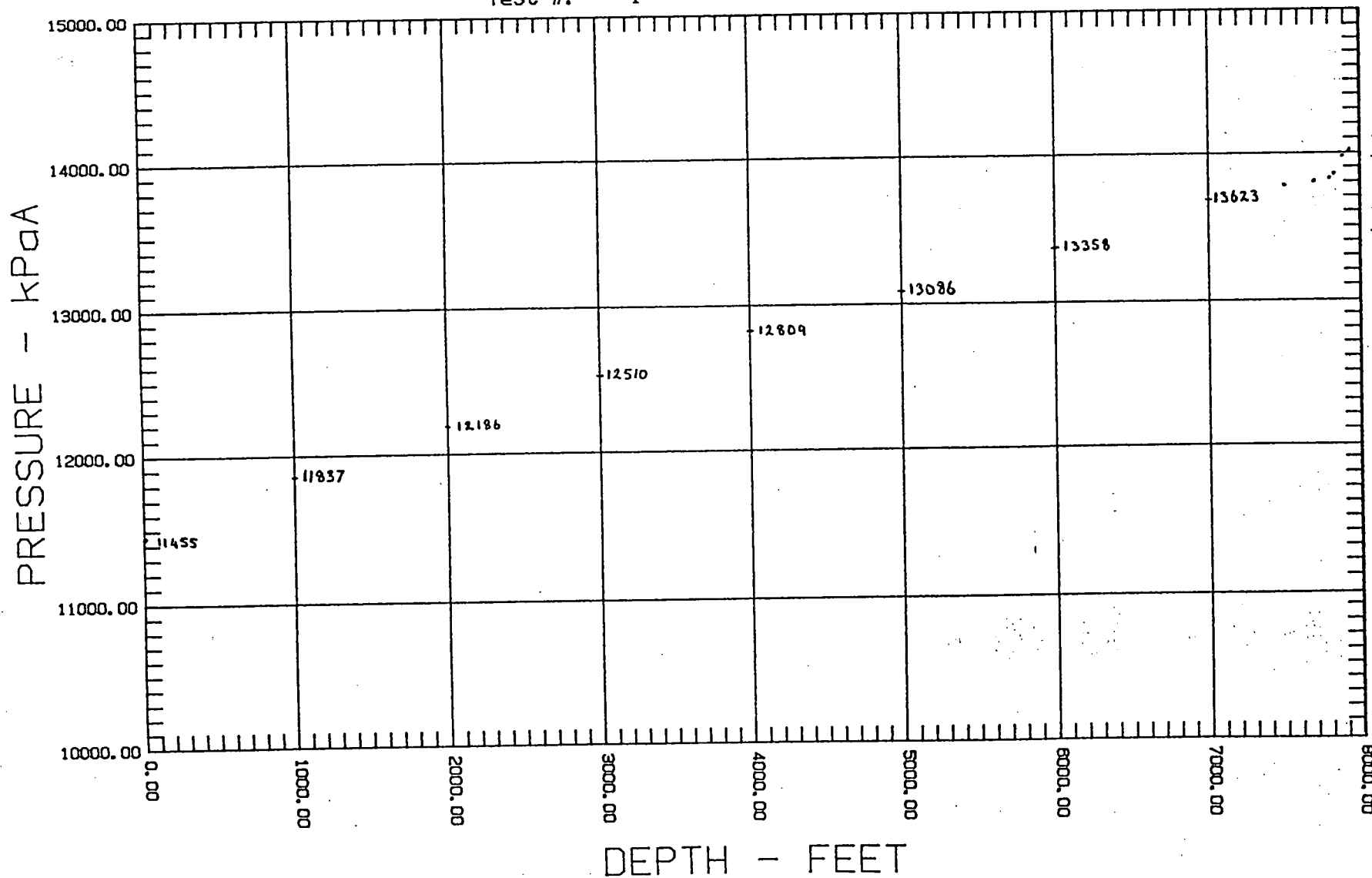
DELTA TIME - HRS

0021

Plot starting date: 8/17/90
time: 16: 5:20
Gauge S/N 56027

Company: OILSERV AUSTRALIA PTY LTD
Client: SANTOS LTD
Well name: MOOMBA
Well #: # 64
Test #: 1

Location: COOPER BASIN
Operator: G PASZNICKI
Comments: SINGLE RATE FLOW & BUILD UP.
STATIC GRADIENT SURVEY.



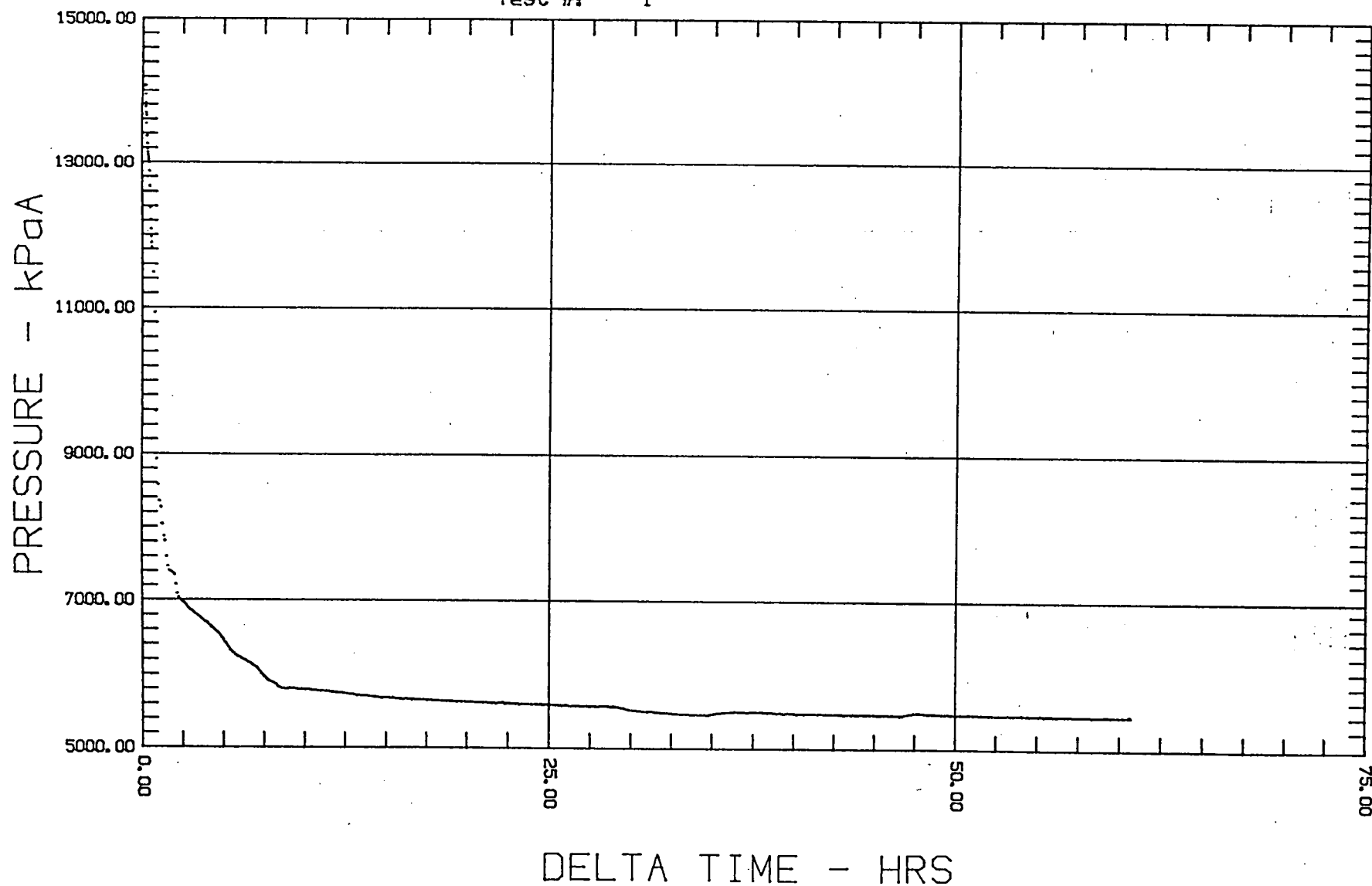
7920 14001
7880 13989
7853 13853
7900 13835
7700 13808
7500 13758

0022

Plot starting date: 8/18/90
time: 1:20:50
Gauge S/N 56027

Company: OILSERV AUSTRALIA PTY LTD
Client: SANTOS LTD
Well name: MOOMBA
Well #: # 64
Test #: 1

Location: COOPER BASIN
Operator: G PASZNICKI
Comments: SINGLE RATE FLOW & BUILD UP.
STATIC GRADIENT SURVEY.



0023

Plot starting date: 8/18/90

time: 1:30: 0

Gauge S/N 56027

Company: OILSERV AUSTRALIA PTY LTD

Client: SANTOS LTD

Well name: MOOMBA

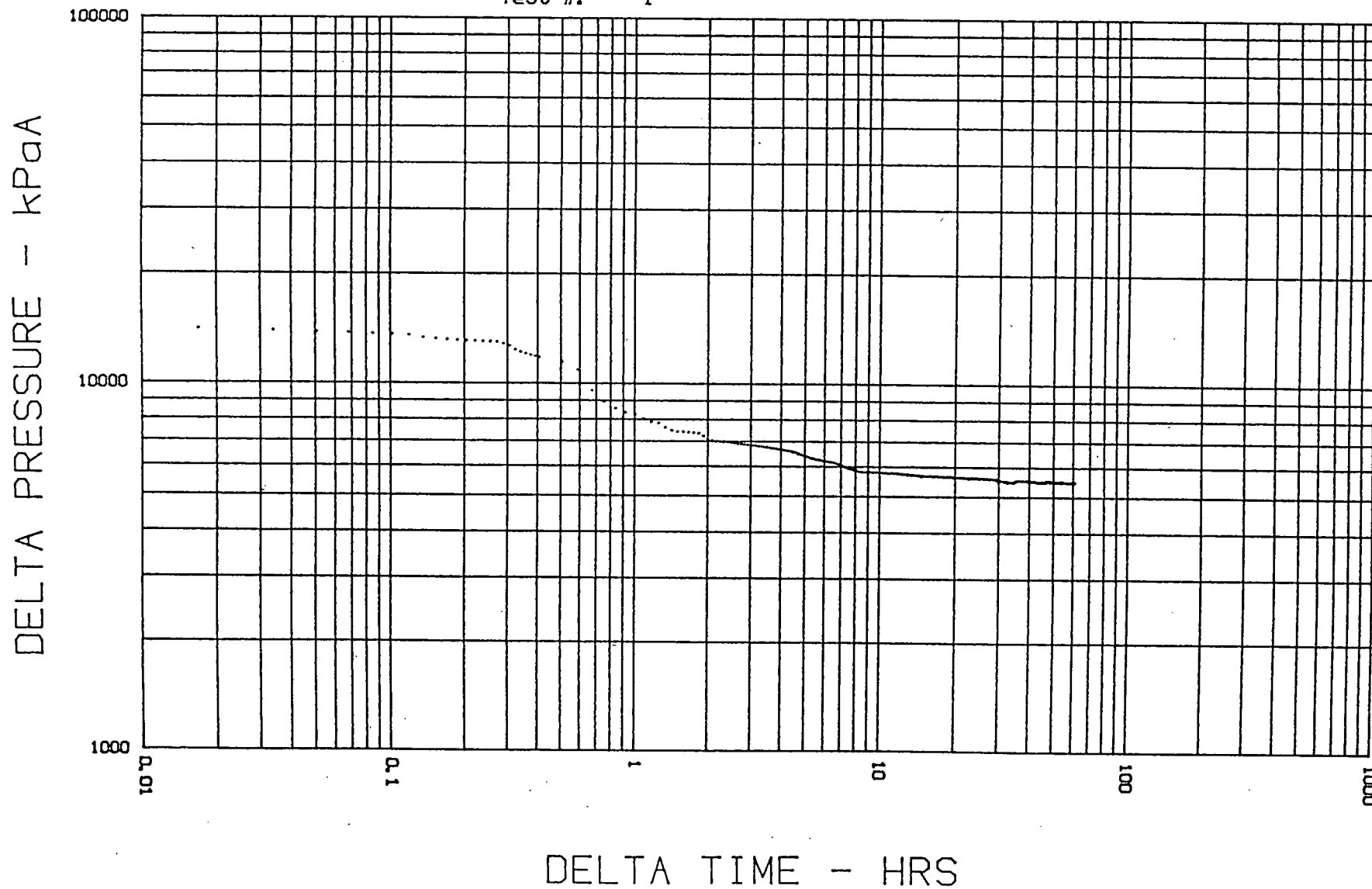
Well #: # 64

Test #: 1

Location: COOPER BASIN

Operator: G PASZNICKI

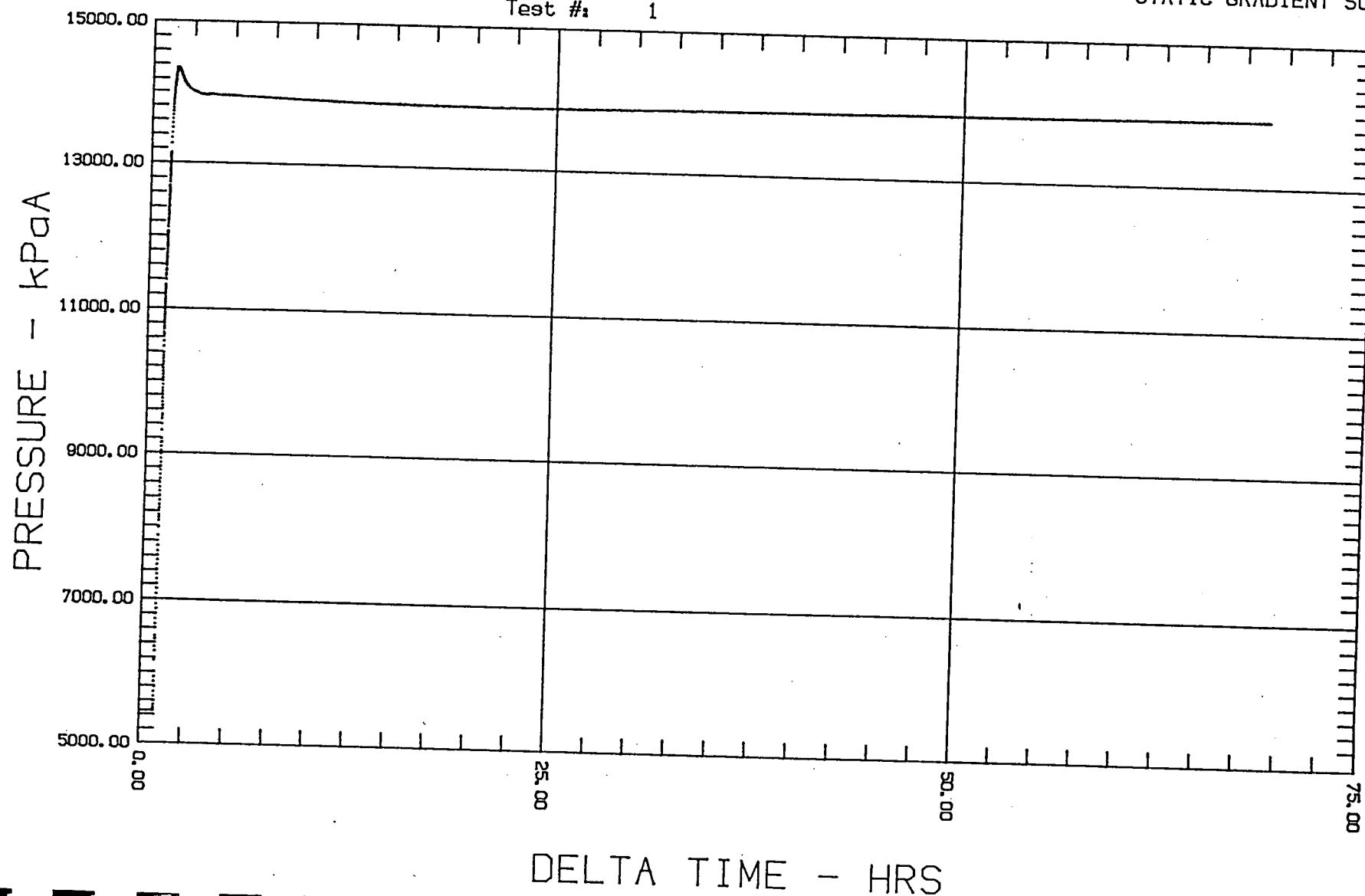
Comments: SINGLE RATE FLOW & BUILD UP.
STATIC GRADIENT SURVEY.



Plot starting date: 8/20/90
time: 13:10:43
Gauge S/N 56027

Company: OILSERV AUSTRALIA PTY LTD
Client: SANTOS LTD
Well name: MOOMBA
Well #: # 64
Test #: 1

Location: COOPER BASIN
Operator: G PASZNICKI
Comments: SINGLE RATE FLOW & BUILD UP.
STATIC GRADIENT SURVEY.

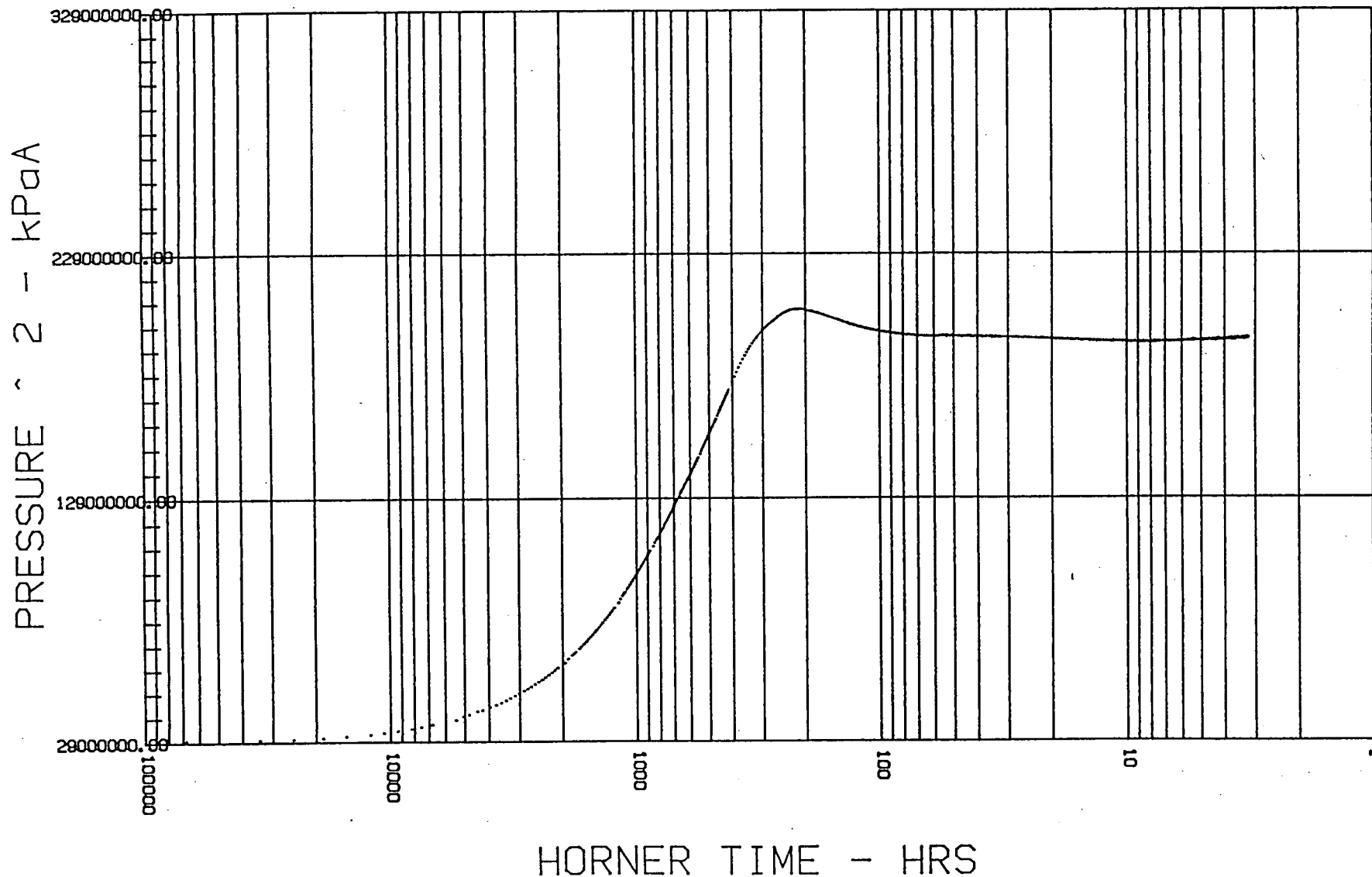


Plot starting date: 8/20/90
time: 13:59:60

Gauge S/N 56027
Flow time: 151.400 HRS

Company: OILSERV AUSTRALIA PTY LTD
Client: SANTOS LTD
Well name: MOOMBA
Well #: # 64
Test #: 1

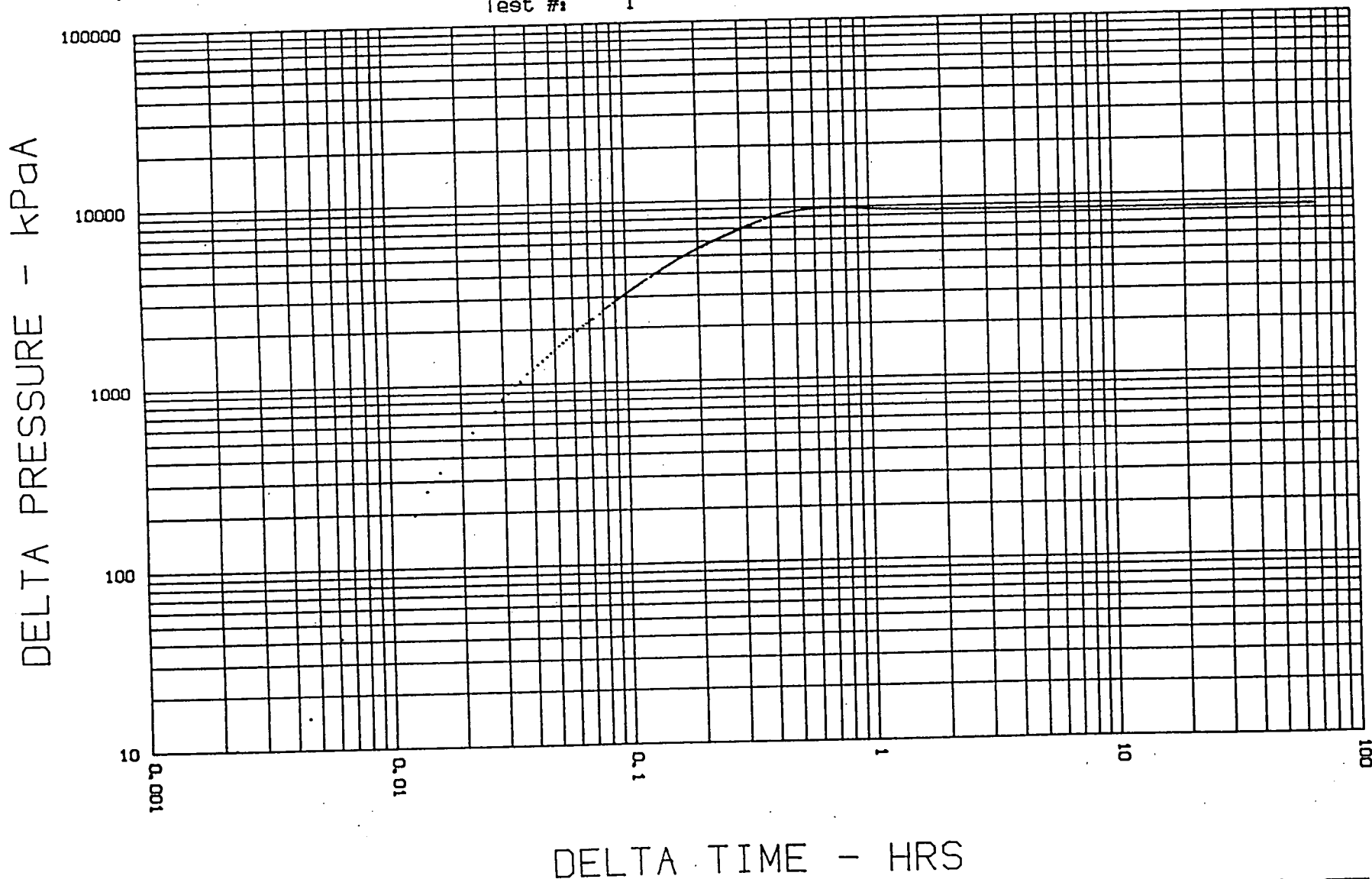
Location: COOPER BASIN
Operator: G PASZNICKI
Comments: SINGLE RATE FLOW & BUILD UP.
STATIC GRADIENT SURVEY.



Plot starting date: 8/20/90
time: 13:59:60
Gauge S/N 56027
Reference pressure: 5458.860 kPaA

Company: OILSERV AUSTRALIA PTY LTD
Client: SANTOS LTD
Well name: MOOMBA
Well #: # 64
Test #: 1

Location: COOPER BASIN
Operator: G PASZNICKI
Comments: SINGLE RATE FLOW & BUILD UP.
STATIC GRADIENT SURVEY.

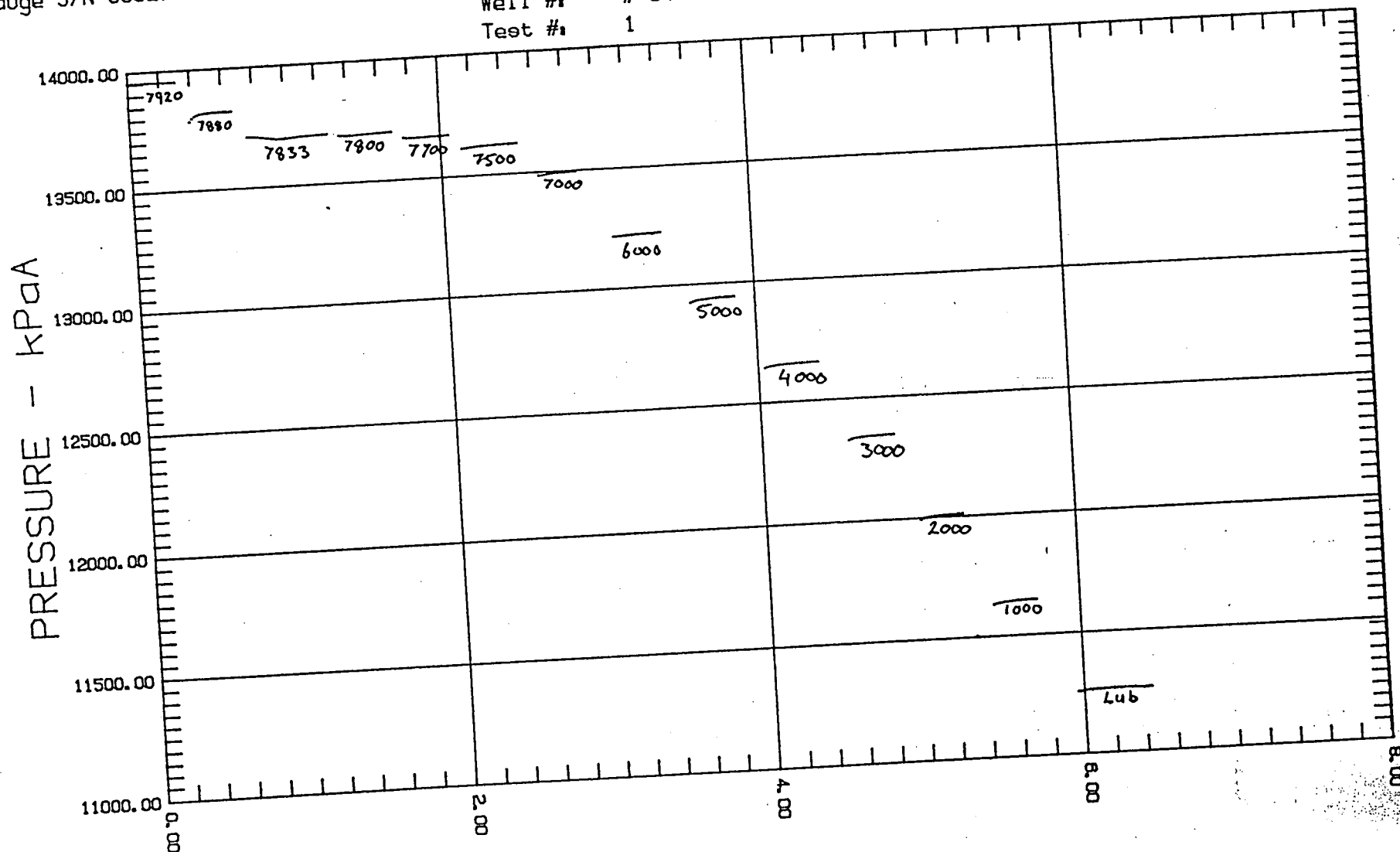


0027

Plot starting date: 8/24/90
time: 4:51:38
Gauge S/N 56027

Company: OILSERV AUSTRALIA PTY LTD
Client: SANTOS LTD
Well name: MOOMBA
Well #: # 64
Test #: 1

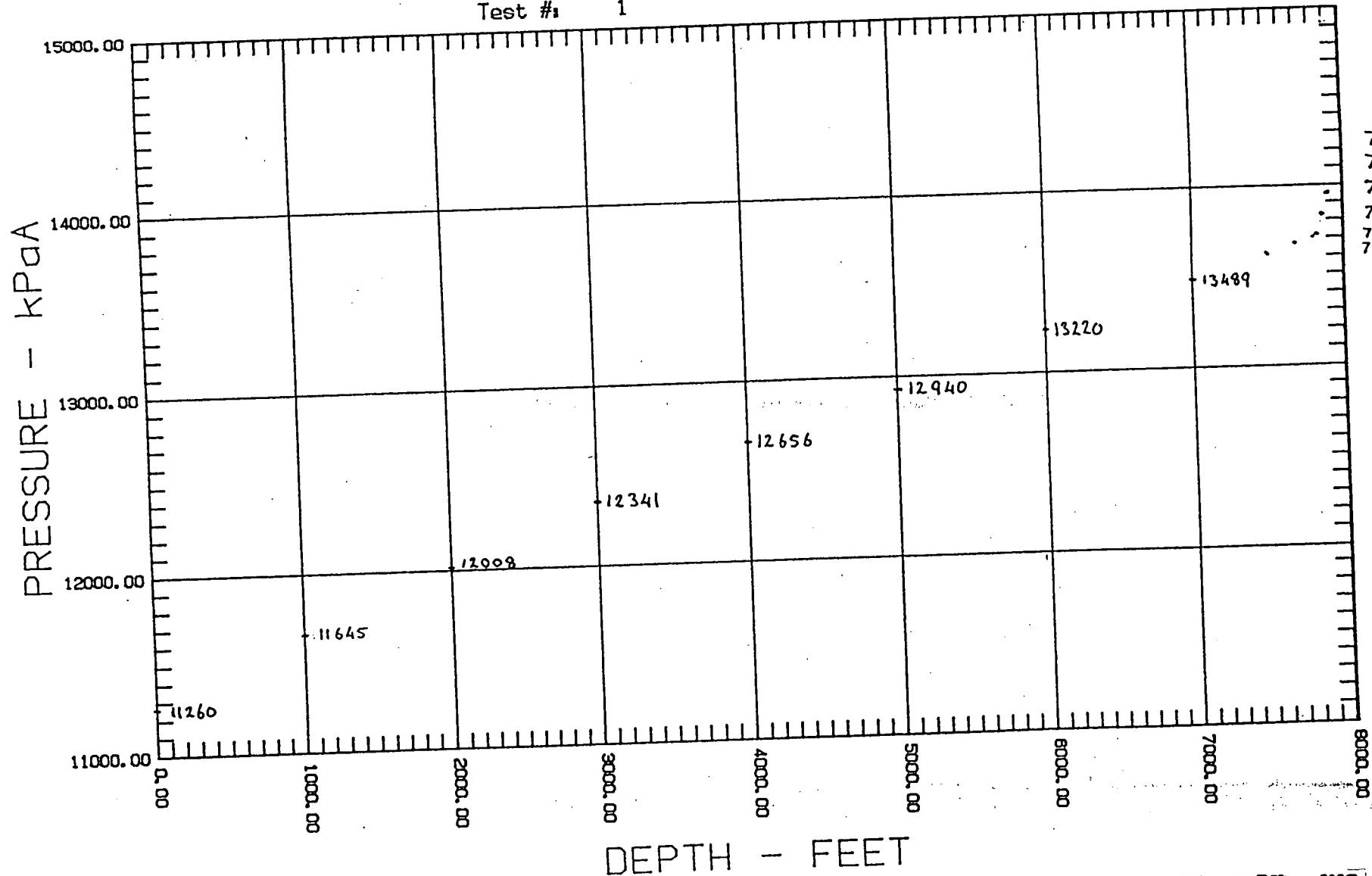
Location: COOPER BASIN
Operator: G PASZNICKI
Comments: SINGLE RATE FLOW & BUILD UP.
STATIC GRADIENT SURVEY.



Plot starting date: 8/24/90
time: 4:51:38
Gauge S/N 56027

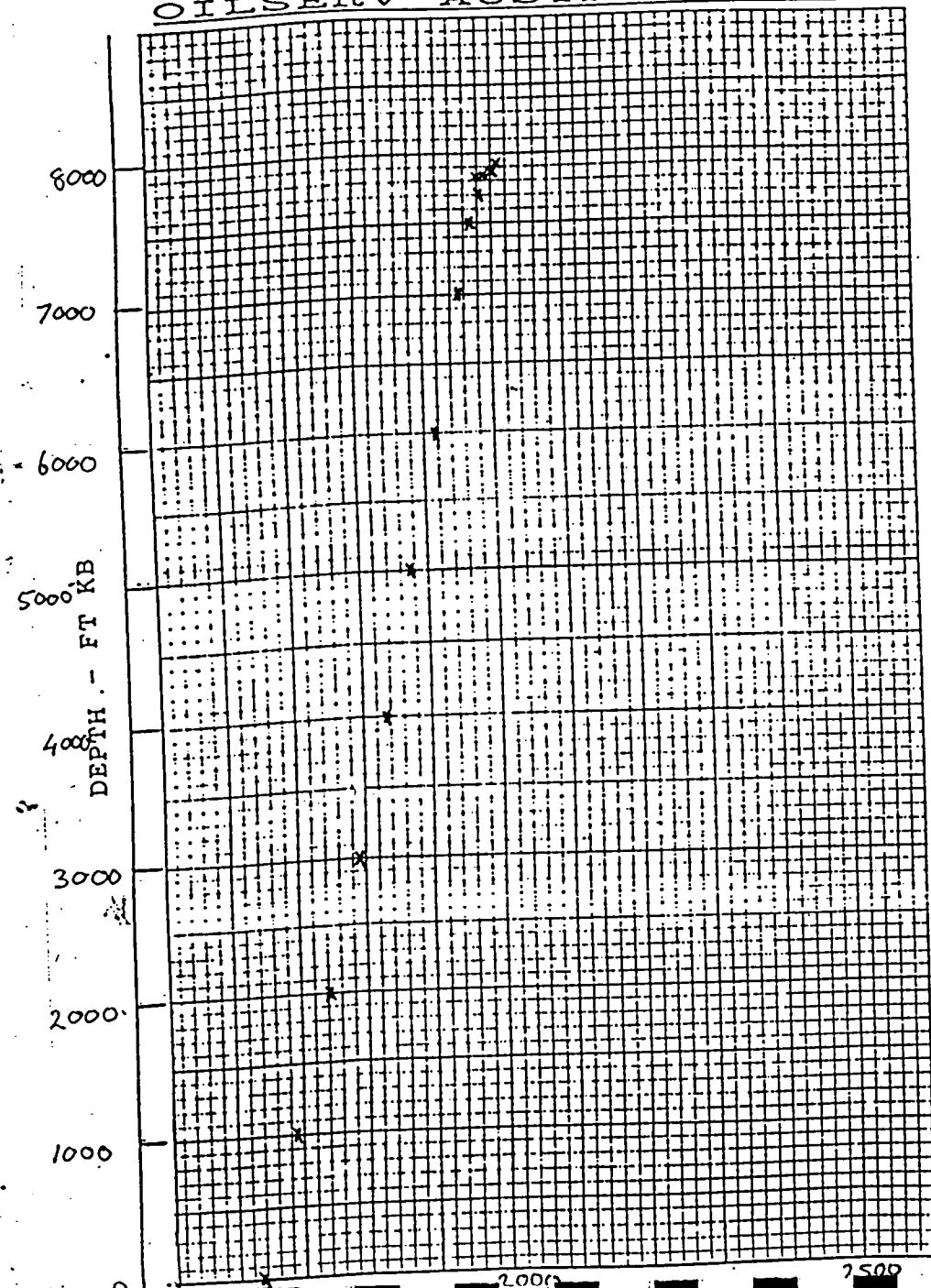
Company: OILSERV AUSTRALIA PTY LTD
Client: SANTOS LTD
Well name: MOOMBA
Well #: # 64
Test #: 1

Location: COOPER BASIN
Operator: G PASZNICKI
Comments: SINGLE RATE FLOW & BUILD UP.
STATIC GRADIENT SURVEY.



7920-13953
7880-13821
7833-13702
7800-13696
7700-1371
7500-13620

OILSERV AUSTRALIA LTD



GRADIENT SURVEY REPORT

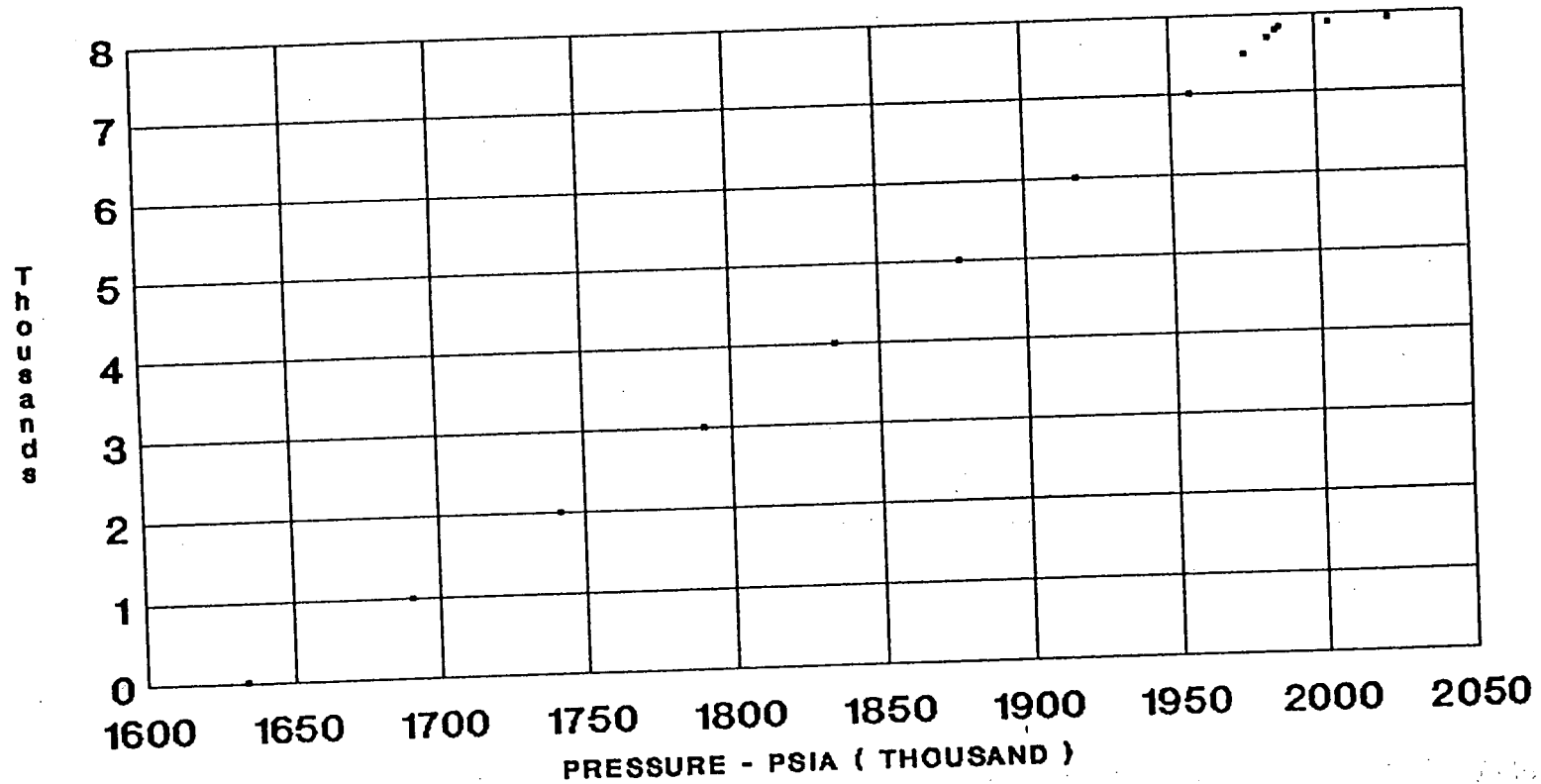
TIME	STOP	DEPTH (KB)	PRESSURE (PSIA)	GRADIENT PSI/FT
0500				
0510	13	7920	2024	0.500
0514				
0531	12	7880	2004	0.362
0537				
0607	11	7833	1987	0.030
0612				
0632	10	7800	1986	0.030
0637				
0654	9	7700	1983	0.040
0659				
0721	8	7500	1975	0.038
0729				
0743	7	7000	1956	0.039
0757				
0815	6	6000	1917	0.040
0826				
0843	5	5000	1877	0.042
0854				
0914	4	4000	1835	0.045
0925				
0942	3	3000	1790	0.049
0951				
1007	2	2000	1741	0.051
1018				
1034	1	1000	1690	0.057
1049				
1116	LuB	14	1633	

WELL: Moomba #64

DATE: 24-08-90

0030

OILSERV AUSTRALIA LTD
STATIC GRADIENT SURVEY
MOOMBA #64



• GRADIENT

CLIENT : SANTOS LTD
GAUGE S/N 56027
OPERATOR : G.PASZNICKI

DATE : 24/08/90

0031

OILSERV AUSTRALIA LTDDOWNHOLE GAUGE REPORTCLIENT: SANTOS LTD WELL NAME/NUMBER: MOOMBA NO 64GAUGE TYPE: GRC SERIAL NUMBER: 56027DATE OF CALIBRATION: 21/1/90 RANGE: 0-10000TYPE OF TEST: SINGLE RATE & TYPE OF WELL: ~~WELL~~/GAS/COND/WATER

BUILD UP

WAS GAUGE CHECKED AGAINST DWT: YES/NOIF YES, PRESSURE DIFFERENTIAL: DEPTH RUN TO: 7920' FT. MAX PRESSURE RECORDED: 13950 ~~PSI~~/KPAHOURS IN HOLE: 128 HRS. MAX TEMP. RECORDED: 130 °F/°CHOURS WELL FLOWING: 60 HRS. NEW ROPE SOCKET: YES/~~NO~~HOURS WELL SHUT IN: 70 HRS. CCL RUN: ~~YES~~/NOPROBLEMS ENCOUNTERED24% CO₂COMMENTS: (FAILURE REPORT)Tool failure down hole due to cable Head boot Rehead cable & changed 'O'
rings.

DISTRIBUTION: 1. TO CLIENT 2. OAL BASE 3. RETAIN ON JOB.

[illegible]

Moomba #64
Summary Of Post-Frac Single Rate Test & Buildup Survey
3rd - 17th October 1990

Static Gradient Survey

Mid Point of Perforations = 7833' KB

06/10/90: Ran static pressure gradient as running in hole with electric line
 Pressure @ MPP = 13717 kPa
 Shut in bottomhole temperature = 131.7 °C

Flow Test

6th - 14th October

06/10/90: Opened well on 16/64" choke @ 1330 hrs
 Many choke adjustments were made before the well was set
 09/10/90: on 26/64" choke @ 1100 hrs
 Tested well on 26/64" choke for 119 hrs

F.T.H.P. (Final)	=	6826	kPa
Separator Pressure	=	1737	kPa
Separator Temperature	=	36	°C
Gas Flow Rate	=	79.018	E3m ³ /d
Oil Flow Rate	=	0.376	m ³ /d
Water Flow Rate	=	17.946	m ³ /d
F.B.H.P. @ 7920' KB	=	9685	kPa
F.B.H.T. @ 7920' KB	=	137.3	°C

14/10/90: Shut well in @ 1000 hrs

Buildup Survey

14th - 17th October

14/10/90: Shut well in @ 1000 hrs for 75.58 hrs buildup
 Pressure @ 7920' KB after 75.58 hrs buildup = 12661 kPa
 Shut in bottomhole temperature = 136.8 °C

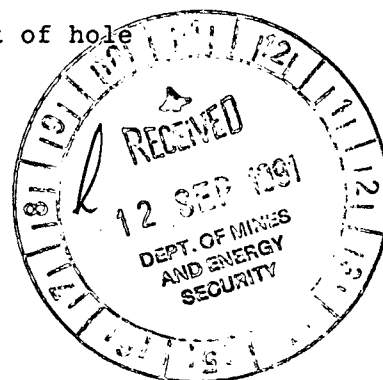
Static Gradient

Mid Point of Perforations = 7833' KB

17/10/90: Ran static pressure gradient as pulling out of hole

1

LGA/ih - 6/3/91
 WP6901G(27)



726912



AUSTRALIA LIMITED

PART A

CLIENT: SANTOS LTD

WELL: MOOMBA NO 64

TEST: SINGLE TEST

WELL: MOOMBA # 64						SANTOS LTD.										DATE: 5/10/90				
TYPE OF TEST: SINGLE RATE						WELL TEST DATA SHEET										PAGE No: 1 OF 10				
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 KPA	TEMP. °C	ORIFICE SIZE INS.	TANK DIP LITRE	TANK PROD M3	API GRAVITY 20.0 °F	TANK DIP LITRE	TANK PROD M3	GAS FLOW RATE M3/D	OIL FLOW RATE M3/DAY	WATER FLOW RATE M3/DAY	TOTAL LIQUID FLOW RATE M3/DAY	G.O.R. M3/M3	
3/10/90																				
1200																				
1230																				
1345																				
4/10/90																				
0930																				
1415																				
5/10/90																				
0600																				
0829																				
0857																				
1002																				
1101																				
1117																				
1400																				
1430	0	11308																		
1734																				
1750	0	11294																		

OPERATOR: S. KUNAC G. KING

WELL: MOOMBA #64

TYPE OF TEST: SINGLE RATE



SANTOS LTD.

WELL TEST DATA SHEET

DATE: 5/10/90.....

PAGE No: 2 OF 10

[illegible]

OPERATOR.....S. KUNAC, C. KING

WELL: MOOMBA # 64										SANTOS LTD.					DATE: 6/10/90						
TYPE OF TEST: SINGLE RATE										WELL TEST DATA SHEET											
WELLHEAD										GAS FLOW DATA			OIL/CONDENSATE PRODUCTION		WATER PRODUCTION		WELL TEST RESULTS				
DATE	CASING KPA	TUBING KPA	TEMP. °C	CHOKE SIZE INS.	B.S.W. %	PI KPA	HW KPA	TEMP. °C	ORIFICE SIZE INS.	TANK DP LITRE	TANK PROD M3	API GRAVITY @ 60 °F	TANK DP LITRE	TANK PROD M3	GAS FLOW RATE M3/D	OIL FLOW RATE M3/DAY	WATER FLOW RATE M3/DAY	TOTAL LIQUID FLOW RATE M3/DAY	L.G.R. M3/M3		
6/10/90																					
2200	0	9067	35.5	20/64"		1379	19.17	35.5	1.50"	1810	0		1800	0.57	44.92	0	6.84	6.84	0.152		
7/10/90																					
0200	0	9012	35	20/64"		1379	22.41	35	1.50"	2640	0.08		2550	0.750	48.63	0.48	4.50	4.98	0.102		
0600	0	9136	36	20/64"		1379	20.92	37	1.50"	3625	0.035		3500	0.950	46.80	0.21	5.70	5.91	0.126		
0715						CONTINUE TO ROCK CHOKE BECAUSE OF OBSTRUCTIONS															
1000	0	9474	37	20/64"		1448	15.44	36	1.50"	4400	0.005		4270	0.770	41.22	0.030	4.62	4.65	0.113		
1000						ROCK CHOKE															
1100						OPEN WELL TO 23/64" CHOKE															
1152						ROCK CHOKE															
1154						CHANGE ORIFICE PLATE															
1158						OPEN WELL TO 24/64" CHOKE															
1200						ENGAGE 1.75" ORIFICE PLATE															
1400	0	8722	40.5	24/64"		1586	16.43	32	1.75"	5840	0.005		5715	1.445	61.86	0.030	8.67	8.70	0.141		
1408						ROCK CHOKE															
1600						CHANGE TANKS 66000.055															
1800	0	8674	41.5	24/64"		1599	17.18	32.5	1.75"	9650	0.035		9615	0.615	63.46	0.420	7.38	7.80	0.123		
1956						ROCK CHOKE															
2200	0	8805	40.5	24/64"		1586	14.19	34	1.75"	1850	0.025		1790	1.175	57.25	0.150	7.05	7.2	0.126		
2205						ROCK CHOKE															

OPERATOR: S. KUNAC, G. KING

WELL: MOOMBA #64.....

TYPE OF TEST: SINGLE RATE



SANTOS LTD.

WELL TEST DATA SHEET

DATE: 7/10/90.....

PAGE No: 4 OF 10

WELL TEST RESULTS

[illegible]

OPERATOR... S. KUNAL G. KING

WELL: MOOMBA #64										SANTOS LTD.										DATE: 9/10/90				
TYPE OF TEST: SINGLE RATE										WELL TEST DATA SHEET										PAGE No: 5 OF 10				
WELLHEAD										GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS					
DATE	CASING KPA	TUBING KPA	TEMP. °C	CHOKE SIZE INS.	B.S.W. %	PI KPA	HW KPA	TEMP. °C	ORIFICE SIZE INS.	TANK DP LITRE	TANK PROD M ³	API GRAVITY @ 60 °F	TANK DP LITRE	TANK PROD M ³	GAS FLOW RATE M 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 /M ³					
9/10 90																								
1000	0	8377	47.5	2 1/4"		1724	16.68	31	1.75"	3360	0.105	43.2	3125	1.535	65.11	0.630	9.210	9.84	0.151					
1100																								
1105																								
1400	0	7178	51	2 1/4"		1724	16.43	36	2.00"	6250	0.025		5990	2.865	85.20	0.150	17.19	17.34	0.204					
1400																								
1800	0	7288	57	2 1/4"		1779	15.94	36.5	2.00"	3000	0.085		2915	2.915	85.15	0.510	17.49	18.00	0.211					
2200	0	7233	52	2 1/4"		1779	15.44	38	2.00"	5830	0.095		5650	2.735	83.56	0.570	16.41	16.98	0.203					
2200																								
10/10 90																								
0200	0	7226	53	2 1/4"		1806	13.94	34	2.00"	2950	0.050		2900	2.900	80.65	0.300	17.40	17.70	0.219					
0600	0	7240	52	2 1/4"		1827	13.45	33	2.00"	5720	0.145		5525	2.625	79.81	0.870	15.75	16.62	0.208					
0600																								
0710																								
1000	0	7240	53.5	2 1/4"		1743	25.40	35.5	1.75"	2825	0.150	42.9	2675	2.675	81.27	0.900	16.05	16.95	0.209					
1400	0	7267	55	2 1/4"		1655	27.89	36	1.75"	5650	0.02		5480	2.805	81.76	0.12	16.23	16.95	0.207					
1400																								
1800	0	7226	55	2 1/4"		1655	27.64	35.5	1.75"	2800	0.058		2750	2.750	81.47	0.300	16.50	16.80	0.206					
2200	0	7281	54	2 1/4"		1655	26.89	34.5	1.75"	5600	0.110		5440	2.64	80.51	0.660	16.14	16.80	0.209					

S.G. = 790 CO₂ = 20% H₂S = 14 PPM, SALINITY = 0 P.P.M.
 A.P.I. = 43.2

OPERATOR: S. KUNAC, G. KIRK

WELL: MOOMBA #64						SANTOS LTD.										DATE: 11/10/90			
TYPE OF TEST: SINGLE DATE						WELL TEST DATA SHEET										PAGE No: 6 OF 10			
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 KPA	TEMP. °C	ORIFICE SIZE INS.	TANK DIP LITRE	TANK PROD M3	API GRAVITY @80 °F	TANK DIP LITRE	TANK PROD M3	GAS FLOW RATE M3/D	OIL FLOW RATE M3/DAY	WATER FLOW RATE M3/DAY	TOTAL LIQUID FLOW RATE M3/DAY	L.G.R. M3/M3
10/10/90																			
2200																			
11/10/90																			
0200	0	7212	53.5	26/64"		1655	24.65	33	1.75"	2940	0.115		2825	2.825	77.29	0.690	16.95	17.64	0.228
0600	0	7191	54.5	26/64"		1689	24.15	35	1.75"	5780	0.020		5645	2.820	76.99	0.120	16.92	17.04	0.221
1000	0	7109	54.5	26/64"		1779	24.15	35	1.75"	3075	0.090	42.7	2985	2.985	79.01	0.540	17.91	18.45	0.234
1000																			
1100	0	7109	55	26/64"		1779	24.40	36	1.75"	3850	0.035		3725	0.740	79.26	0.840	17.76	18.60	0.235
1100																			
1100																			
1400	0	7267	55	26/64"		1779	23.90	37	1.75"	6000	0.005		5870	2.145	78.29	0.040	17.16	17.20	0.220
1400																			
1800	0	7426	54	26/64"		1710	23.16	33	1.75"	2760	0.100		2660	2.660	76.14	0.600	15.96	16.56	0.217
2200	0	7419	53.5	26/64"		1710	22.16	32.5	1.75"	5325	0.040		5185	2.525	74.55	0.240	15.15	15.39	0.206
12/10/90																			
0200	0	7460	53.5	26/64"		1710	20.67	32	1.75"	2670	0.080		2540	2.540	72.06	0.480	15.54	16.02	0.222
0600	0	7467	53	26/64"		1710	19.42	31	1.75"	5210	0.060		5070	2.480	69.98	0.360	14.88	15.24	0.218
0600																			

OPERATOR: S. KUNAC, D. STEPHENS

WELL: MOOMBA #64										SANTOS LTD.					DATE: 12/10/90							
TYPE OF TEST: SINGLE RATE										WELL TEST DATA SHEET					PAGE No: 7 OF 10							
WELLHEAD										GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS			
DATE	CASING KPA	TUBING KPA	TEMP. °C	CHOKE SIZE INS.	B.S.W. %	PI KPA	HW KPA	TEMP. °C	ORIFICE SIZE INS.	TANK DIP LITRE	TANK PROD M3	API GRAVITY @ 60 °F	TANK DIP LITRE	TANK PROD M3	GAS FLOW RATE M3/D	OIL FLOW RATE M3/DAY	WATER FLOW RATE M3/DAY	TOTAL LIQUID FLOW RATE M3/DAY	L.G.R. M3/M3			
12/10/90																						
0720																						
1000	0	6709	55.5	26/64"		1827	25.40	38	1.75"	3610	0.085		3525	3.525	81.65	0.510	21.15	21.66	0.265			
1400	0	6723	57	26/64"		1779	26.64	40	1.75"	7210	0.000		7125	3.600	82.20	0.000	21.60	21.60	0.263			
1400													0									
1800	0	6916	57	26/64"		1758	25.65	38	1.75"	3475	0.080		3395	3.395	80.48	0.480	20.37	20.85	0.259			
2200	0	6923	56	26/64"		1724	24.15	36.5	1.75"	6540	0.010		6500	3.105	77.55	0.060	18.63	18.69	0.241			
2200																						
13/10/90																						
0200	0	7005	56	26/64"		1758	22.41	36.5	1.75"	3300	0.075		3225	3.225	75.43	0.450	19.35	19.80	0.262			
0600	0	6998	55	26/64"		1743	21.91	35	1.75"	6385	0.035		6275	3.050	75.53	0.210	18.30	18.51	0.245			
1000	0	7026	56	26/64"		1724	23.41	38	1.75"	3340	0.090		3250	3.250	76.11	0.540	19.50	20.04	0.263			
1008																						
1400	0	6330	58.5	26/64"		1669	30.63	43	1.75"	7465	0.005		7370	4.120	84.91	0.030	24.72	24.75	0.291			
1400																						
1800	0	6461	59	26/64"		1655	28.98	42.5	1.75"	4075	0.055		4020	4.020	82.19	0.330	24.12	24.45	0.297			
2200	0	6578	57.5	26/64"		1724	25.65	40.5	1.75"	7675	0.070	42.9	7600	3.580	79.31	0.120	21.48	21.60	0.272			

OPERATOR: S. KUNAC, D. STEPHENS

WELL: MOOMBA #64														SANTOS LTD.				DATE: 14/10/90			
TYPE OF TEST: SINGLE RATE														WELL TEST DATA SHEET				PAGE No: 8 OF 10			
WELLHEAD						GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS						
DATE	CASING KPA	TUBING KPA	TEMP. °C	CHOKE SIZE INS.	B.S.W. %	PI KPA	HW KPA	TEMP. °C	ORIFICE SIZE INS.	TANK DIP LITRE	TANK PROD M3	API GRAVITY @60 °F	TANK DIP LITRE	TANK PROD M3	GAS FLOW RATE M3/D	OIL FLOW RATE M3/DAY	WATER FLOW RATE M3/DAY	TOTAL LIQUID FLOW RATE M3/DAY	L.G.R.		
13/10/90																					
2200																					
14/10/90																					
0200	0	6654	57.5	26/64"		1774	24.15	41	1.75"	3650	0.060		3540	3540	78.10	0.360	21.54	21.90	0.280		
0600	0	6805	56.5	26/64"		1758	23.41	38	1.75"	6875	0.040		6775	3.185	76.87	0.240	19.11	19.35	0.252		
0600																					
1000	0	6826	57.5	26/64"		1710	23.90	40	1.75"	3530	0.060		3470	3.470	76.32	0.360	20.82	21.18	0.278		
1000																					
1015	0	9163																			
1030	0	9481																			
1045	0	9701																			
1100	0	9777																			
1115	0	9818																			
1130	0	9867																			
1145	0	9908																			
1200	0	9936																			
1215	0	9956																			
1230	0	9970																			
1245	0	9991																			
1300	0	10005																			

OPERATOR: S. KUNAC, D. STEPHENS

WELL: MOOMBA #64										SANTOS LTD.					DATE: 14/10/90								
TYPE OF TEST: SINGLE RATE										WELL TEST DATA SHEET													
WELLHEAD										GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS				
DATE	CASING KPA	TUBING KPA	TEMP. °C	CHOKE SIZE INS.	B.S.W. %	PI KPA	HW KPA	TEMP. °C	ORIFICE SIZE INS.	TANK DP LITRE	TANK PROD M3	API GRAVITY 280 °F	TANK DP LITRE	TANK PROD M3	GAS FLOW RATE M3/D	OIL FLOW RATE M3/DAY	WATER FLOW RATE M3/DAY	TOTAL LIQUID FLOW RATE M3/DAY	G.O.R. M3/M3				
14/10/90																							
1315	0	10018																					
1330	0	10032																					
1345	0	10046																					
1400	0	10053																					
1800	0	10122																					
2200	0	10156																					
15/10/90																							
0200	0	10170																					
0600	0	10184																					
1000	0	10198																					
1400	0	10205																					
1800	0	10218																					
2200	0	10218																					
16/10/90																							
0200	0	10225																					
0600	0	10225																					
1000	0	10239																					
1400	0	10253																					
1800	0	10253																					

OPERATOR: S. KUNAC, D. STEPHENS

WELL: MOOMBA # 64

TYPE OF TEST: SINGLE RATE



SANTOS LTD.

WELL TEST DATA SHEET

DATE: 17/10/90

PAGE No:.....10 OF 10.....

[illegible]

OPERATOR.....S. KUNAC, D STEPHENS

WELL MOOMBA #64TANK— CAPACITY 16,000 L/S
SCALE 0-50 L

SANTOS LTD

FLUID PRODUCTION SHEET

DATE 6/10/90PAGE No. 1 OF 4OPERATOR OILSERV

DATE TIME	CUM. TIME	OIL/CONDENSATE PRODUCTION					WATER PRODUCTION					REMARKS
		TANK DIP LITRES	TANK PROD. M ³	FLOWRATE M ³ /D	CUM.PROD. M ³	OIL CONDENSATE GRAVITY "API60F"	TANK DIP LITRES	TANK PROD. M ³	FLOWRATE M ³ /D	CUM.PROD. M ³	SALINITY PPM	
6/10/90												
1500		0					0					TRIM FLOW THRU SEPARATOR
1500												FLUID TO SURFACE
1600		0	0	0	0		0	0	0	0		
1800		550	0.000	0.000	0.000		550	0.550	6.600	0.550		
2000		1240	0.010	0.120	0.010		1230	0.680	8.160	1.23	0. P.P.M	
2200		1810	0.000	0.000	0.010		1800	0.570	6.840	1.80		
7/10/90												
0200		2640	0.080	0.480	0.09		2550	0.750	4.500	2.55		
0600		3625	0.035	0.210	0.125		3500	0.950	5.700	3.5		
1000		4400	0.005	0.030	0.130		4270	0.770	4.620	4.27		
1400		5840	0.005	0.030	0.135		5715	1.445	8.670	5.715		
1600		6600	0.055	0.660	0.190		6420	0.705	8.460	6.42		CHANGE TANKS
1800		0/650	0.035	0.420	0.225		0/615	0.615	7.380	7.035		
2200		1850	0.025	0.150	0.250		1790	1.175	7.050	8.21		
8/10/90												
0200		3385	0.125	0.750	0.375		3200	1.410	8.460	9.62		
0600		4680	0.070	0.420	0.445		4425	1.225	7.350	10.845		
1000		6265	0.060	0.360	0.505		5950	1.525	9.150	12.370		

0047

WELL <u>MOOMBA #64</u>	 SANTOS LTD FLUID PRODUCTION SHEET	DATE <u>8/10/90</u>
TANK— CAPACITY <u>16,000 L</u> SCALE <u>0-50 L</u>		PAGE No. <u>2 OF 4</u> OPERATOR <u>OILSERV</u>

DATE TIME	CUM. TIME	OIL/CONDENSATE PRODUCTION					WATER PRODUCTION					REMARKS
		TANK DIP LITRES	TANK PROD. M ³	FLOWRATE M ³ /D	CUM. PROD. M ³	OIL CONDENSATE GRAVITY "API60F"	TANK DIP LITRES	TANK PROD. M ³	FLOWRATE M ³ /D	CUM. PROD. M ³	SALINITY PPM	
8/10/90												CHANGE TANK
1200		6265	0.000	0.000	0.505		5950	0.635	8.220	13.055		
1400		25/1075	0.010	0.120	0.515		0/1040	1.040	12.480	14.095		
1500		2870	0.085	0.510	0.600		2750	1.710	10.260	15.805		
2200		4700	0.060	0.360	0.660		4520	1.770	10.620	17.575		
9/10/90												CHANGE TANK
0200		6285	0.095	0.570	0.755		6010	1.490	8.940	19.065		
0600		0/1720	0.130	0.780	0.885		0/1590	1.590	9.540	20.655		
1000		3360	0.105	0.630	0.990	43.2	3125	1.535	9.210	22.190		CHANGE TANK
1400		0/6250	0.025	0.150	1.015	0	5990	2.865	17.190	25.055		
1800		0/3000	0.085	0.510	1.100		0/2915	2.915	17.490	27.97		CHANGE TANK
2200		5830	0.095	0.570	1.195		5650	2.735	16.410	30.705		
10/10/90												CHANGE TANK
0200		0/2950	0.050	0.300	1.245		0/2900	2.900	17.400	33.605		
0600		5720	0.145	0.870	1.390		5525	2.625	15.750	36.230		
1000		0/2825	0.150	0.900	1.540	42.9	0/2675	2.675	16.050	38.905		CHANGE TANK
1400		5650	0.020	0.120	1.560		5480	2.805	16.830	41.710		
1800		0/2800	0.050	0.300	1.610		0/2750	2.750	16.500	44.460		CHANGE TANK
2200		5600	0.110	0.660	1.720		5440	2.690	16.140	47.150		

003

WELL MOOMBA #64		SANTOS LTD		DATE 11/10/90								
TANK:— CAPACITY 16 000 45		SANTOS		PAGE No. 3 OF 4								
SCALE 0-50L		FLUID PRODUCTION SHEET		OPERATOR OILSERV								
DATE TIME	CUM. TIME	OIL/CONDENSATE PRODUCTION					WATER PRODUCTION					REMARKS
		TANK DIP LITRES	TANK PROD. M ³	FLOWRATE M ³ /D	CUM.PROD. M ³	OIL CONDENSATE GRAVITY "API60F"	TANK DIP LITRES	TANK PROD. M ³	FLOWRATE M ³ /D	CUM.PROD. M ³	SALINITY PPM	
11/10/90												
0200		0/2940	0.115	0.690	1.835		0/2825	2.825	16.950	49.975		CHANGE TANK
0600		5780	0.020	0.120	1.855		5645	2.820	16.920	52.795		1ST SAMPLES
1000		0/3075	0.090	0.540	1.945	42.7	0/2985	2.985	17.910	55.780		2ND SAMPLES
1100		3850	0.035	0.840	1.980		3725	0.740	17.760	56.520		CHANGE TANK
1400		6000	0.005	0.040	1.985		5870	2.145	17.160	58.665		
1800		92760	0.100	0.600	2.085		0/2660	2.660	15.960	61.325		CHANGE TANK
2200		5325	0.040	0.240	2.125		5185	2.525	15.150	63.85		
12/10/90												
0200		0/2670	0.080	0.480	2.205		0/2590	2.590	15.540	66.44		CHANGE TANK
0600		5210	0.060	0.360	2.265		5070	2.480	14.880	68.92		
1000		0/3610	0.085	0.510	2.350		0/3525	3.525	21.150	72.445		CHANGE TANK
1400		7210	0.000	0.000	2.350		7125	3.600	21.600	76.045		
1800		0/3475	0.080	0.480	2.430		0/3395	3.395	20.370	79.44		CHANGE TANK
2200		6590	0.010	0.060	2.440		6500	3.105	18.630	82.545		
13/10/90												
0200		0/3300	0.075	0.450	2.515		0/3225	3.225	19.350	85.77		CHANGE TANK
0600		6385	0.035	0.210	2.550		6275	3.050	18.300	88.820		
1000		0/3340	0.090	0.540	2.640		0/3250	3.250	19.500	92.07		CHANGE TANK
1400		7465	0.005	0.030	2.645		7370	4.120	24.720	96.19		

OILSERV AUSTRALIA

GAS RATE CALCULATION

Test: SINGLE RATEClient: SANTOSWell: MOOMBA #64Interval: TOOLACHEE C 7791'-7877' KB Meter Run Size: 3.826"Test No: 1

Time	Accum	Gas Gravity Air=1	Orifice diam. Inches	Gas Temp degF	Diff hw "H2O	Static Pf psia	VHw*Pf	Fb	Fg	Y	Ftf	Fpv	C	Gas Rate Q MscfD	Cumulative Production MMscfD
SINGLE RATE AND BUILDUP TEST															
5/10/90															
1500															
1510															
1600															
1800															
2000															
2200															
7/10/90															
0200															
0600															
1000															
1200															
1400															
1800															
2200															

SINGLE RATE AND BUILDUP TEST

TRIM FLOW THRU SEPARATOR

ENGAGE 1.50" ORIFICE PLATE

ENGAGE 1.75" ORIFICE PLATE

ILSERV AUSTRALIA

GAS RATE CALCULATION

Test: SINGLE RATE

Client: SANTOS

Well: MOOMBA #64

Test No: 1

Interval: TOOLACHEE C" 7791'-7877' K.B

Meter Run Size: 3.826"

Time	Accum	Gas Gravity Air=1	Orifice diam. Inches	Gas Temp degF	Diff hw "H2O	Static Pf psia	√Hw*Pf	Fb	Fg	Y	Ftf	Fpv	C	Gas Rate Q MscfD	Cumulative Production MMscfD
6/10/90															
0200		790	1.75"	34	66	240	129.662	637.83	1.1251	1.0016	0.9695	1.0301	717.8193	2.234	78.3427
0600		790	1.75"	36.5	68	240	131.612	637.83	1.1251	1.0017	0.9656	1.0292	714.3734	2.256	88.9384
1000		790	1.75"	32	70	245	134.837	637.83	1.1251	1.0017	0.9727	1.0314	721.1481	2.334	99.8967
1400		790	1.75"	31	78	245	142.334	637.83	1.1251	1.0019	0.9743	1.0318	722.7246	2.469	111.4895
1800		790	1.75"	31	77	242	140.599	637.83	1.1251	1.0019	0.9743	1.0314	722.4477	2.438	122.9367
2200		790	1.75"	32	74	250	139.964	637.83	1.1251	1.0017	0.9727	1.0320	721.6463	2.424	134.3195
9/10/90															
0200		790	1.75"	32.5	66	250	132.182	637.83	1.1251	1.0016	0.9703	1.0315	719.3644	2.282	145.0355
0600		790	1.75"	35	66	260	134.656	637.83	1.1251	1.0015	0.9680	1.0322	718.0727	2.321	155.9324
1000		790	1.75"	31	67	250	133.180	637.83	1.1251	1.0016	0.9743	1.0324	722.9706	2.311	166.7834
1105							CHANGE ORIFICE PLATE TO 2.00"								
1400		790	2.00"	36	66	250	132.182	849.41	1.1251	1.0015	0.9664	1.0306	953.2204	3.024	180.9830
1800		790	2.00"	36.5	64	258	132.116	849.41	1.1251	1.0014	0.9656	1.0314	953.1168	3.022	195.1739
2200		790	2.00"	38	62	258	130.036	849.41	1.1251	1.0014	0.9633	1.0309	950.2910	2.966	209.0999

IL SERV AUSTRALIA

GAS RATE CALCULATION

Client: SANTOSWell: MOOMBA #64Test: SINGLE RATETest No: 1Interval: TOOLACHEE C" 7791'-7877' K.B. Meter Run Size: 3-826"

Time	Accum	Gas Gravity Air=1	Orifice diam. Inches	Gas Temp degF	Diff hw "H2O	Static Pf psia	VHw*Pf	Fb	Fg	Y	Ftf	Fpv	C	Gas Rate Q MscfD	Cumulative Production MMscfD
0/10/90															
200		790	2.00"	34	56	262	124.487	849.4	1.125	1.0012	0.9695	1.0328	958.1129	2.863	222.5414
600		790	2.00"	33	54	265	122.904	849.4	1.125	1.0011	0.9711	1.0336	960.3336	2.833	235.8428
710				CHANGE ORIFICE PLATE TO 1.75"											
000		790	1.75"	35.5	102	260	167.34	637.83	1.125	1.0023	0.9672	1.0320	717.9527	2.884	249.3971
400		790	1.75"	36	112	240	168.906	637.83	1.125	1.0028	0.9664	1.0294	715.8383	2.902	263.0132
800		790	1.75"	35.5	111	240	168.152	637.83	1.125	1.0027	0.9672	1.0295	716.5152	2.892	276.5912
2200		790	1.75"	34.5	108	240	165.864	637.83	1.125	1.0027	0.9687	1.0299	717.8586	2.858	290.0096
11/10/90															
0200		790	1.75"	33	99	240	158.803	637.83	1.125	1.0024	0.9711	1.0304	719.8126	2.743	302.8917
0600		790	1.75"	35	97	245	158.726	637.83	1.125	1.0023	0.9680	1.0303	717.3655	2.733	315.7237
1000	1ST SAMPLES	790	1.75"	35	97	258	162.6493	637.83	1.125	1.0022	0.9680	1.0320	718.4167	2.804	328.8922
1100	2ND SAMPLES	790	1.75"	36	98	258	163.486	637.83	1.125	1.0022	0.9664	1.0316	717.0204	2.813	332.1948
1400		790	1.75"	37	96	258	161.809	637.83	1.125	1.0022	0.9648	1.0312	715.5850	2.779	341.9814
1800		790	1.75"	33	93	248	156.313	637.83	1.125	1.0022	0.9711	1.0314	720.3698	2.702	354.6714
2200		790	1.75"	32.5	89	248	152.9149	637.83	1.125	1.0021	0.9719	1.0316	721.0154	2.646	367.0966

IL SERV AUSTRALIA

GAS RATE CALCULATION

Page 4 of 5

Client: SANTOSWell: MOOMBA # 64Test: SINGLE RATETest No: 1Interval: TOOLACHEE "C" 7791-7877 Meter Run Size: 3.826"

Time	Accum	Gas Gravity Air=1	Orifice diam. Inches	Gas Temp degF	Diff hw "H2O	Static Pf psia	VHw*Pf	Fb	Fg	Y	Ftf	Fpv	C	Gas Rate Q MscfD	Cumulative Production MMscfD
2/10/90															
0200		790	1.75"	32	83	248	147.6705	637.83	1.1251	1.0020	0.9727	1.0318	721.6292	2.558	379.1059
0600		790	1.75"	31	78	248	143.1536	637.83	1.1251	1.0019	0.9743	1.0321	722.9847	2.484	390.7697
0000		790	1.75"	38	102	265	168.9155	637.83	1.1251	1.0023	0.9633	1.0317	714.8357	2.898	404.3774
0400		790	1.75"	40	107	258	170.8277	637.83	1.1251	1.0025	0.9602	1.0302	711.6170	2.918	418.0772
0800		790	1.75"	38	103	255	166.6749	637.83	1.1251	1.0024	0.9633	1.0305	714.0752	2.857	431.4905
1200		790	1.75"	36.5	97	250	160.2461	637.83	1.1251	1.0023	0.9656	1.0304	715.6672	2.752	444.4148
3/10/90															
0200		790	1.75"	36.5	90	255	155.8066	637.83	1.1251	1.0021	0.9656	1.0311	715.9466	2.677	456.9860
0600		790	1.75"	35	88	260	155.4871	637.83	1.1251	1.0020	0.9680	1.0322	718.4325	2.681	469.5749
0000		790	1.75"	38	94	250	157.7486	637.83	1.1251	1.0022	0.9633	1.0299	713.5383	2.701	482.2599
0400		790	1.75"	43	123	242	177.7014	637.83	1.1251	1.0030	0.9556	1.0274	706.6451	3.014	496.4123
0800		790	1.75"	42.5	116	240	171.8973	637.83	1.1251	1.0029	0.9564	1.0273	707.0968	2.917	510.1103
1200		790	1.75"	40.5	103	250	165.1278	637.83	1.1251	1.0024	0.9594	1.0291	710.2744	2.815	523.3280
14/10/90															
0200		790	1.75"	41	97	258	162.6493	637.83	1.1251	1.0022	0.9587	1.0299	710.0905	2.772	536.3439

Client: SANTOS

Well: MOOMBA #64

Test: SINGLE RATE

Test No: 1

Interval: TOOLACHEE " 7791'-7877' CB Meter Run Size: 3.826"

[illegible]

OILSERV AUSTRALIA LIMITED

SUBSURFACE PRESSURE CALIBRATION REPORT

CLIENT: SANTOS LTD

DATE OF CALIBRATION: 06/10/90

CALIBRATION NO: MOOMBA # 64

DATE OF LAST CALIBRATION:

OWNER OF GAUGE: OILSERV AUSTRALIA LTD

PRESS ELEM NO: 64773

RANGE: 0-4000 PSI

TYPE OF ELEMENT: RPG-3

RECORDING SECT NO: 46680

DEADWEIGHT TESTER TYPE AND RANGE: CHANDLER 55-1

SERIAL NO: 18731

BASE LINE DRAWN AT ATMOSPHERIC PRESSURE READING $D_0 =$ TEMPERATURE = $^{\circ}\text{F}$ REFERENCE LINE READING $D_r =$ REF PRESSURE =psia TEMPERATURE = $^{\circ}\text{F}$ MAXIMUM TEMPERATURE EXPECTED = 264 $^{\circ}\text{F}$ CALIBRATION TEMPERATURE = 270 $^{\circ}\text{F}$

DRAWING ALL CALIBRATION STEPS WITH (CLOCK/CRANK): CRANK

LEVEL DIFFERENCE $H =$ in ? ϕ p = psia (+ when dwt above bellows)SPEC GRAV OF OIL $D =$

Y

EQUIVALENT PRESSURE P OF LEVEL DIFFERENCE BETWEEN DWT AND BELLOWS:

psia

PRESS. 3 CALIBRATION STEPS

LEAST SQUARES

dwt	Y	KY	YJ	Y * P	YPc = KY+a	c = P-YPc	CJ	A = $\frac{dP}{n}$ = 2312.33
500	0.2350	0.2350	0.0552	117.50	500.02	-0.02	0.0004	B = $\frac{dY}{n}$ = 1.1203
1000	0.4792	0.2442	0.2296	479.20	999.88	0.11	0.0122	C = $\frac{d(YJ)}{n}$ = 1.3755
1500	0.7232	0.2440	0.5230	1084.80	1499.34	0.65	0.4248	D = $\frac{d(YP)}{dY}$ = 2834.60
2000	0.9675	0.2443	0.9360	1935.00	1999.42	0.57	0.3351	K = $\frac{D-A}{C-B}$ = 2046.96
2500	1.2132	0.2457	1.4718	3033.00	2502.35	-2.35	5.5680	a = A-BK = 18.9851
3000	1.4561	0.2429	2.1202	4368.30	2999.56	0.43	0.1876	a = D-CK = 18.9851
3500	1.7000	0.2439	2.8900	5950.00	3498.82	1.17	1.3904	Q = $\frac{d(CJ)}{n}$ = 0.9041
4000	1.9449	0.2449	3.7826	7779.60	4000.12	-0.12	0.0148	
2811	1.3642	-0.580	1.8610	3834.76	2811.45	-0.45	0.2033	
20811	10.0833		13.8696	28582.16	d + = 2.95	d - = -2.95	8.1370	

CALIBRATION RESULTS

COMMENTS

K = 2046.962 Dr - D0 = Yr =
a + p = 18.985 Pr =

MOOMBA #64

Date: 5/10/90
-17/10/90

0056

ator Data:

ure with D.W.T.

Pressured

Run in Hole

11308 K.P.A 5/10/90

1810 HRS 5/10/90

0600 HRS 6/10/90

Time Depressured 1757 HRS 17/10/90

Time off Bottom 1500 HRS 17/10/90

Bomb No. 1 Data

Bomb No. 2 Data

ement No. and Range

64773 x 4000 P.S.I

ecorder No.

46680

Clock and Lead Screw Data

F-23793 x 120 HRS
15 T.L.S

Engage Stylus

Date: 5/10/90 Time: 1747 HRS

Disengage

Date: 18/10/90 Time: 0450 HRS

Remarks:

MAXIMUM BOTTOM HOLE TEMP = 304 °F
 TOTAL TIME IN HOLE = 284 HRS & 20 MINUTES
 CALIBRATED 23/9/90

Well-Head Data for Final Build-up

PAGE 1 OF 5

Date	Time	Hours shut-in Time	Wellhead K.P.A	Casing K.P.A	Wellhead Temp. °C	Remarks
						POST FRAC SINGLE RATE AND BUILDUP TEST
5/10/90	1400					START RIGGING UP ELECTRICAL LINE UNIT
	1430		11308	0		
						SHUT IN TUBING PRESSURE
	1734					FINISH RIGGING UP ELECTRICAL LINE UNIT & AMERADA
	1750		11294	0		PRESSURE TEST TO INLET OF SEPARATOR
	1810		11294	0		
						PRESSURE UP LUB
	1900		11294	0		
	2200		11294	0		
6/10/90						
	0200		11294	0		
	0600		11294	0		
						D.I.H WITH E/LINE, AMERADA START STATIC GRADIENT
	1250					ON HANG DEPTH 7920' K.B, END OF STATIC GRADIENT
	1330		11287	0		
						OPEN WELL TO 19/64" CHOKE
	1340					OPEN WELL TO 20/64" CHOKE
	1350					OPEN WELL TO 23/64" CHOKE
	1430					CLOSE CHOKE TO 21/64"

SANTOS LTD.

ISO - CHRONAL AND BUILD-UP SURVEY CONTINUATION

0057

MOOMBA # 64

Date: 6/10/90

Page 2 of 5

Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	Wellhead K.P.A	Casing K.P.A	Wellhead °C	Remarks
6/10/90	1500		8895	0		
		TRIM	FLOW THRU SEPARATOR			
	1530		8826	0		
	1600		8605	0	33.5	
		CLOSE	CHOKE TO 20/64"			
	1800		8929	0	34.5	
	2000		9019	0	35	
	2200		9067	0	35.5	
7/10/90			9012	0	35	
	0200		9136	0	36	
	0600		9474	0	37	ROCK CHOKE
	1000					
	1100		OPEN WELL TO 23/64" CHOKE			
	1152		ROCK CHOKE			
	1158		OPEN WELL TO 24/64" CHOKE			
	1400		8722	0	40.5	
	1408		ROCK CHOKE			
	1800		8674	0	41.5	
	1956		ROCK CHOKE			
	2200		8805	0	40.5	
	2205		ROCK CHOKE			
	2347		ROCK CHOKE			
8/10/90						
	0200		8529	0	42	
	0508		ROCK CHOKE			
	0600		8384	0	42.5	
	1000		8474	0	44.5	
	1205		ROCK CHOKE			
	1400		8226	0	46.5	
	1800		8336	0	47	
	1803		ROCK CHOKE			
	1852		ROCK CHOKE			
	2200		8322	0	46	
9/10/90						
	0200		8433	0	46.5	
	0200		ROCK CHOKE			

SANTOS LTD.

ISO - CHRONAL AND BUILD-UP SURVEY CONTINUATION

Date: 9/10/90

0058

Well: MOOMBRA #64

Page 3 of 5

Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	Wellhead K.P.A	Casing K.P.A	Wellhead Temp. °C	Remarks
9/10/90						
	0600		8302	0	46	
	1000		8377	0	47.5	
	1100		OPEN WELL TO 26/64"			
	1105		CHANGE ORIFICE PLATE TO 2.00"			
	1400		7178	0	51	
	1800		7288	0	57	
	2200		7233	0	52	
10/10/90						
	0200		7226	0	53	
	0600		7240	0	52	
	1000		7240	0	53.5	
	1400		7267	0	55	
	1800		7226	0	55	
	2200		7281	0	54	
11/10/90						
	0200		7212	0	53.5	
	0600		7191	0	54.5	
	1000		7109	0	54.5	1ST SAMPLES
	1100		7109	0	55	2ND SAMPLES
	1400		7267	0	55	
	1800		7426	0	54	
	2200		7419	0	53.5	
12/10/90						
	0200		7460	0	53.5	
	0600		7467	0	53	
	0720		ROCK CHOICE			
	1000		6709	0	55.5	
	1400		6723	0	57	
	1800		6916	0	57	
	2200		6923	0	56	
13/10/90						
	0200		7005	0	56	
	0600		6998	0	55	
	1000		7026	0	56	
	1008		ROCK CHOICE			

ISO - CHRONAL AND BUILD-UP SURVEY CONTINUATION

Well: MOOMBA # 64

Date: 13/10/90

Page 4 of 5

Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	Wellhead K.P.A	Casing K.P.A	Wellhead Temp. °C	Remarks
13/10/90						
	1400		6330	0	58.5	
	1800		6461	0	59	
	2200		6578	0	57.5	
14/10/90						
	0200		6654	0	57.5	
	0600		6805	0	56.5	
	1000	0	6826	0	57.5	
	1000	SHUT WELL IN, END OF FLOW				188 HRS. FLOW PERIOD
		CONTINUE TO MONITOR BUILDUP				
	1015		9163	0		
	1030		9481	0		
	1045		9701	0		
	1100		9777	0		
	1115		9818	0		
	1130		9867	0		
	1145		9908	0		
	1200		9936	0		
	1215		9956	0		
	1230		9970	0		
	1245		9991	0		
	1300		10005	0		
	1315		10018	0		
	1330		10032	0		
	1345		10046	0		
	1400	4	10053	0		
	1800	8	10122	0		
	2200	12	10156	0		
15/10/90						
	0200	16	10170	0		
	0600	20	10184	0		
	1000	24	10198	0		
	1400	28	10205	0		
	1800	32	10218	0		
	2200	36	10218	0		

Well: MOOMBA # 64

Date: 16/10/90

PAGE 5 of 5

[illegible]



WIRELINE REPORT

0061

WELL: MOOMBA #64

DATE: 5/10/90

PROGRAM: POST FRAC, SINGLE RATE, BUILD UP TEST

PURPOSE OF WORK: BLIND BOX RUN

REPORT OF WORK PERFORMED:

0829 RIG UP SLICKLINE TO PERFORM
DUMMY RUN
0857 R.I.H WITH 1.750' GAGE CUTTER TO
8423' K.B NO OBSTRUCTIONS
1002 P.O.O.H
1101 IN LUB
1117 RIG DOWN W/LINE UNIT

OPERATOR'S SIGNATURE

WORK PERFORMED BY: S. KAPLER OF OILSERV

WELL DATA:

Tubing Size: 2 7/8" FWHP: — SIWHP: 11308 K.PA

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

"X" Nipple @ 7758.17 K.B "N"/"XN" Nipple @ — other —

Min I.D. 2.313 " @ 7758.17 K.B Packer @ —

Perforated Interval: TOOLACHEE UNIT "C" 7791' - 7877' K.B

Forward to: Petroleum Engineering — Adelaide
Production Department — Moomba

ASC II FILE RECORD

STATIC GRADIENT:MO064SGS

FLOW:MO64FLOW

BUILDUP:MO64BUP

STATIC GRADIENT:MO64SGS

OILSERV
AUSTRALIA
LTD

CLIENT: SANTOS LTD
WELL: MOOMBA # 64
DATE: 05/10/90

SEQUENCE OF
OPERATIONS
PAGE: 1

DATE/TIME	REMARKS
05/10/90	
1200	Arrive Moomba # 64 location. Spot Wireline unit & caravan.
1400	Start E/Line rig up, service Grease Injection head, retie rope socket, make up Tool String C/W OCL & GRC EPG-520 S/N 56652 & RPG-3 Amerada, 0-4000PSI with 120 hr clock. function test tool & surface equipment - OK.
1750	Pressure test lines to Separator Inlet valve, to SIWHP.
1810	Open Swab valve & pressure up Lubricator to SIWHP, hang gauge in Lubricator overnight.
06/10/90	
615	THP 11294 kPa, CHP 0 kPa. Gauge reading 11401 kPaA. R.I.H. for Static Gradient Survey.
635	Stop # 1 @ 1000'KB.
657	Gradient: 0.057 PSI/FT.
707	Stop # 2 @ 2000'KB.
729	Gradient: 0.049 PSI/FT.
736	Stop # 3 @ 3000'KB.
759	Gradient: 0.046 PSI/FT.
806	Stop # 4 @ 4000'KB.
828	Gradient: 0.042 PSI/FT.
835	Stop # 5 @ 5000'KB.
855	Gradient: 0.044 PSI/FT.
902	Stop # 6 @ 6000'KB.
923	Gradient: 0.038 PSI/FT.
931	Stop # 7 @ 7000'KB.
953	Gradient: 0.042 PSI/FT.
958	Stop # 8 7500'KB.
1022	Gradient: 0.043 PSI/FT.
1025	Stop # 9 @ 7700'KB.
1046	Gradient: 0.042 PSI/FT. OCL-12 FT.
1048	Stop # 10 @ 7800'KB.

cont/2

SEQUENCE OF EVENTS CONTINUATION SHEET. PAGE: 2

1120 Gradient: 0.0 PSI/FT.
 1121 Stop # 11 @ 7833'KB.
 1222 Gradient: 0.141 PSI/FT.
 1222 Stop # 12 @ 7880'KB.
 1249 Gradient: 0.414 PSI/FT.
 1250 Stop # 13 @ 7920'KB. Hang off at Surey Depth.
 1330 Gradient: 0.439 PSI/FT. FSIBHP 14073 kPa, FSIBHT 138 deg.
 1330 Open well at Wing valve. flow well on $1^8/64$ th" to flare, bypass separator. FSITHP 11287 kPa.
 1340 Increase choke to $2^0/64$ th".
 1350 Increase choke to $2^3/64$ th" & rock ch9ke to clear obstruction.
 1430 Decrease choke to $2^1/64$ th".
 1500 divert flow through separator.
 1600 Decrease choke to $2^0/64$ th".
 07/10/90
 715 Rock choke to clear obstruction.
 1100 Increase choke to $2^2/64$ th".
 1152 Rock choke.
 1158 Increase choke to $2^4/64$ th"
 1408 Rock choke.
 1956 Rock choke.
 2205 Rock choke.
 2347 Rock choke.
 08/10/90
 508 Rock choke.
 1205 Rock choke.
 1803 Rock choke.
 1852 Rock choke.
 09/10/90
 200 Rock choke.
 1100 Increase choke to $2^6/64$ th".
 10/10/90 Monitor flow.
 11/10/90 Monitor flow.
 1000 Take 1st HP surface sample.
 1100 Take 2nd HP surface sample.
 12/10/90
 720 Rock choke to clear obstruction.
 Monitor flow.

cont/3

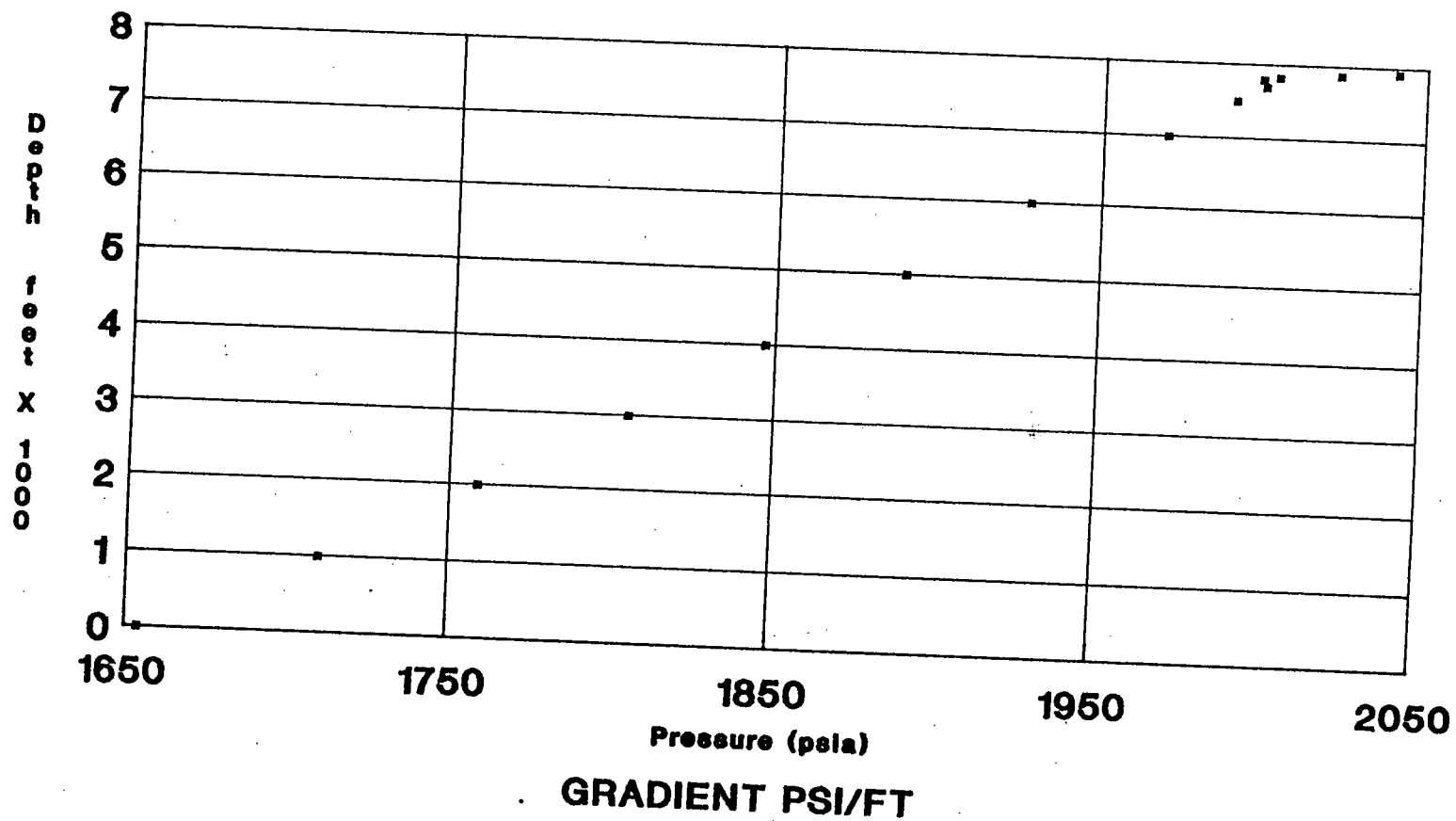
SEQUENCE OF EVENTS CONTINUATION

PAGE: 3

13/10/90	
1000	Rock choke.
	Monitor flow.
14/10/90	Monitor flow.
1000	Shutin well at W.V. for buildup. FFBHP 9785 kPa.
	FFBHT 13. Well flowing 188.5 hours.
2400	Tool giving erratic readings.
15/10/90	
600	Tool giving erratic readings.
700	Tool giving ertic readings.
16/10/90	Monitor buildup.
17/10/90	
1323	P.O.O.H. for Static Gradient Survey.
	FSIBHP 12756 kPa, FSIBHT 137 deg C.
1732	hang in lubricator.
1756	Depressure lubricator.
1759	Tool to atmosphere.
1800	End of Test.

9900

OILSERV AUSTRALIA LTD
STATIC GRADIENT SURVEY
MOOMBA #64



CLIENT : SANTOS LTD
GAUGE S/N 56652
OPERATOR : S.COPPOCK

DATE : 6/10/90

OILSERV AUSTRALIA LTD

GRADIENT SURVEY REPORT

DATA

TIME START RUN	TIME STOP RUN	STOP	DEPTH (KB)	PRESSURE (PSIA)	GRADIENT PSI/FT
	0615		LUBRICATOR 4	1654	
0635	0657	1	1000	1710	0.057
0707	0729	2	2000	1759	0.049
0736	0759	3	3000	1805	0.046
0806	0828	4	4000	1847	0.042
0835	0855	5	5000	1890	0.044
0902	0923	6	6000	1928	0.038
0931	0953	7	7000	1970	0.042
0958	1022	8	7500	1991	0.043
1025	1046	9	7700	2000	0.042
1048	1120	10	7800	1999	0.0
1121	1222	11	7833	2004	0.141
1222	1249	12	7880	2024	0.141
1250	1330	13	7920	2041	0.439

WELL: MOOMBA NO 64

DATE: 6 / 10 / 90

CLIENT: SANTOS LTD

GRADIENT CONDUCTED WHILE : ~~(P.O.O.M.)~~ (R.I.H)

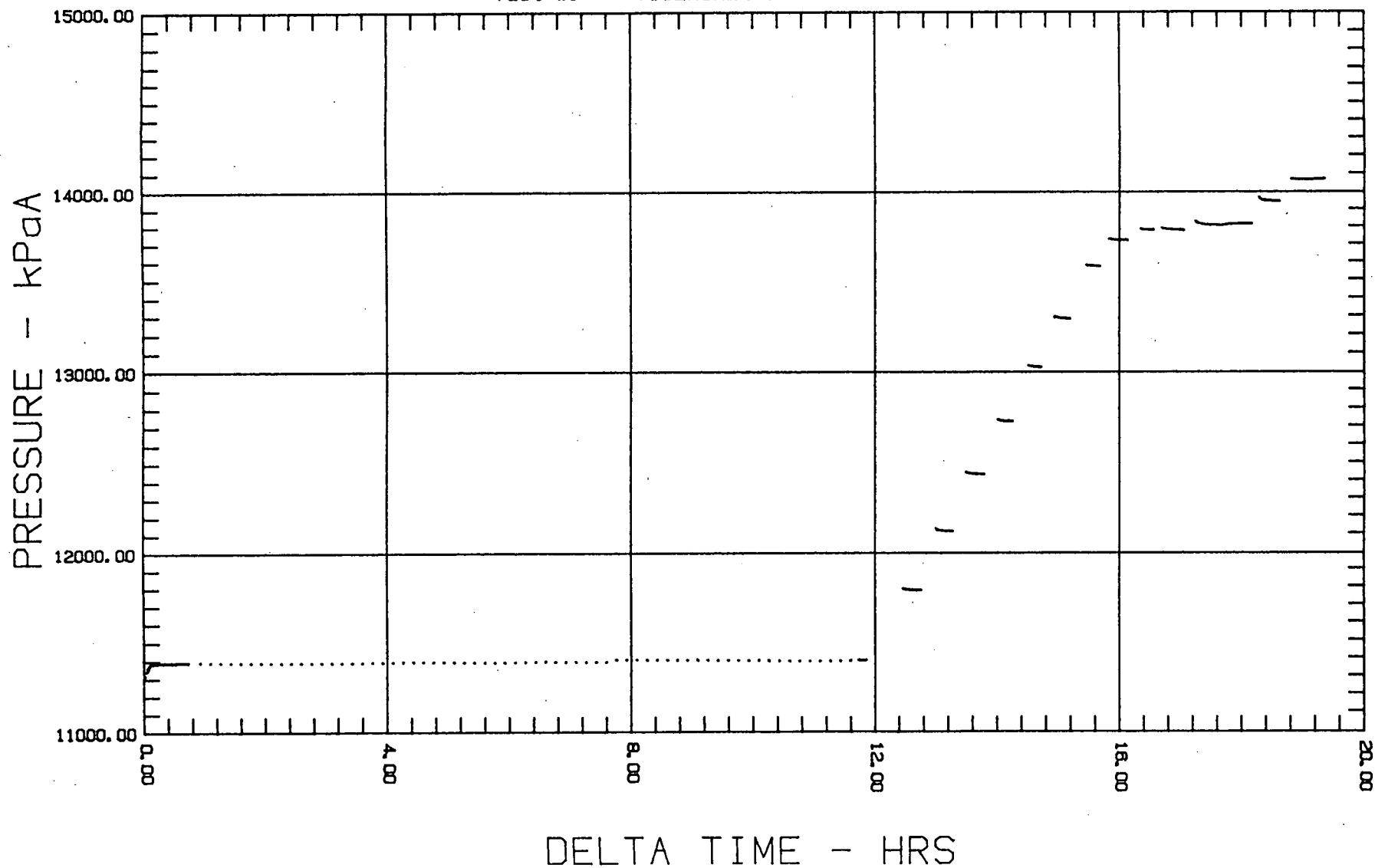
0068

Plot starting date: 10/ 5/90
time: 18:10: 3

Gauge S/N

Company: OILSERV AUSTRALIA LTD.
Client: SANTOS LTD.
Well name: MOOMBA
Well #: 64
Test #: TOOLACHEE SANDS

Location: COOPER BASIN
Operator: S. COPPOCK.
Comments: SINGLE RATE FLOW & BUILD UP.
STATIC GRADIENT SURVEY. R. I. H.

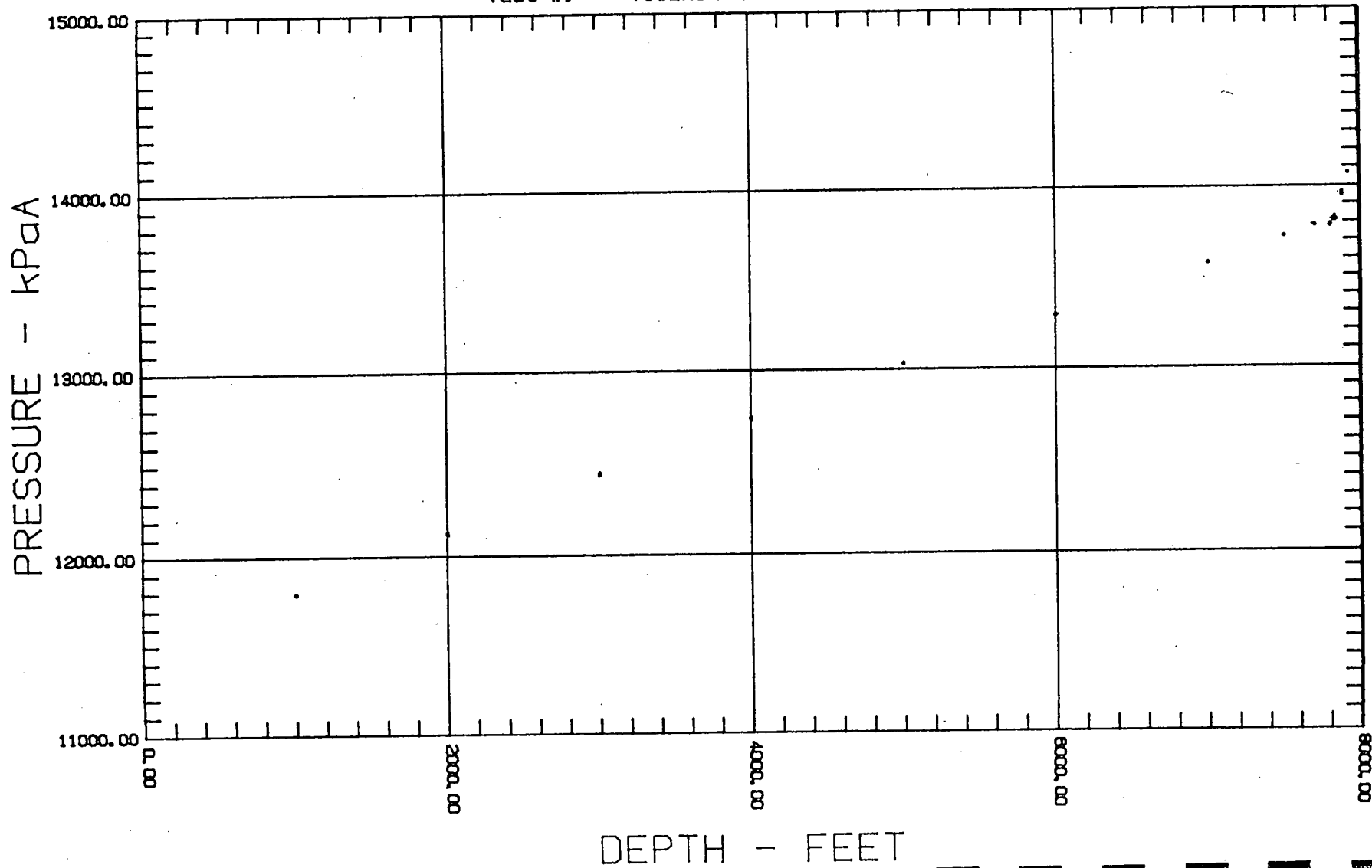


0069

Plot starting date: 10/ 8/90
time: 5: 4:47
Gauge S/N

Company: OILSERV AUSTRALIA LTD.
Client: SANTOS LTD.
Well name: MOOMBA
Well #: 84
Test #: TOOLACHEE SANDS

Location: COOPER BASIN
Operator: S. COPPOCK.
Comments: SINGLE RATE FLOW & BUILD UP.
STATIC GRADIENT SURVEY. R. I. H.



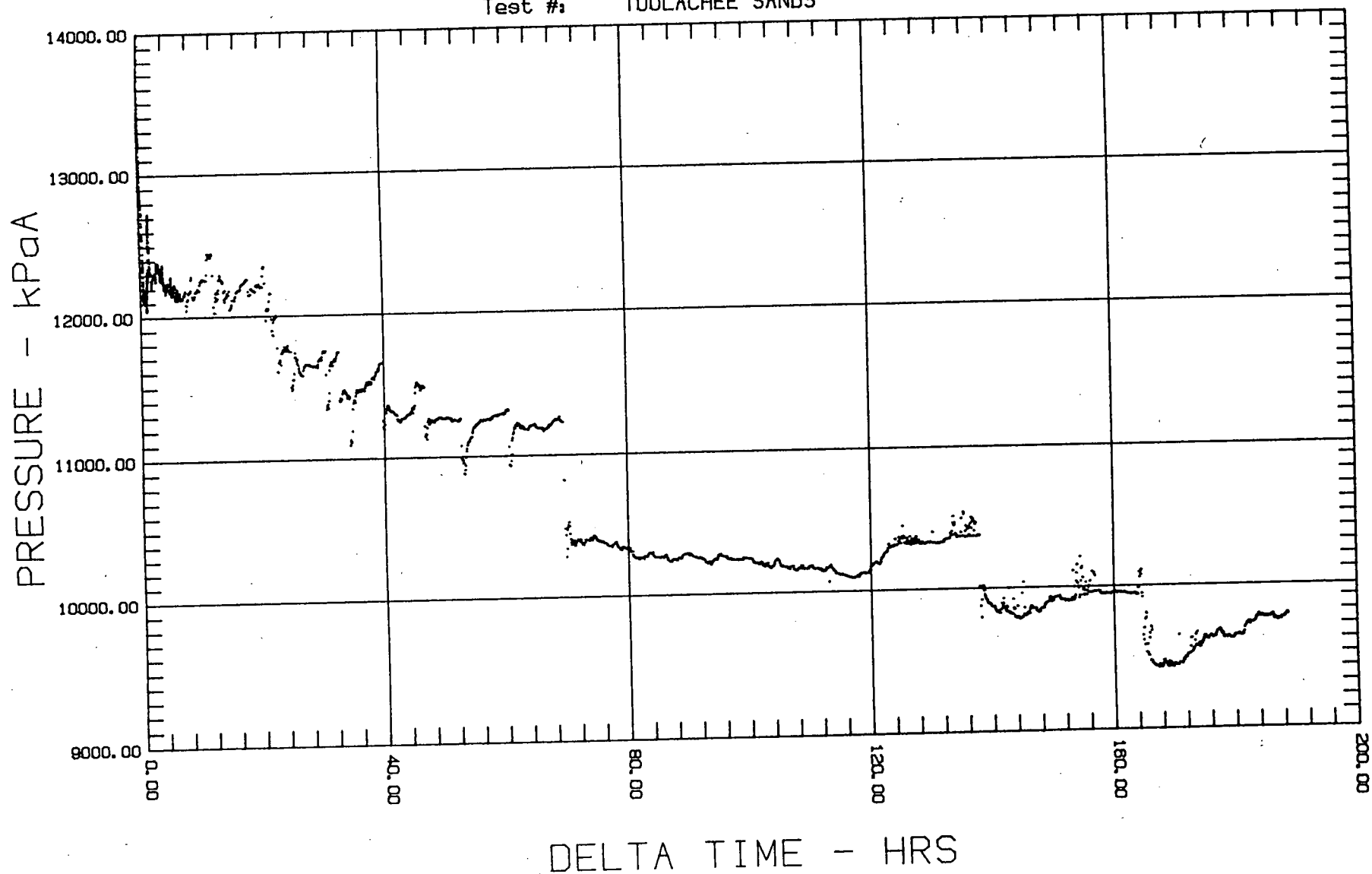
0070

Plot starting date: 10/ 6/90
time: 13:30: 7

Gauge S/N

Company: OILSERV AUSTRALIA LTD.
Client: SANTOS LTD.
Well name: MOOMBA
Well #: 64
Test #: TOOLACHEE SANDS

Location: COOPER BASIN
Operator: S. COPPOCK.
Comments: SINGLE RATE FLOW & BUILD UP.
SINGLE RATE FLOW ON 28/64TH".



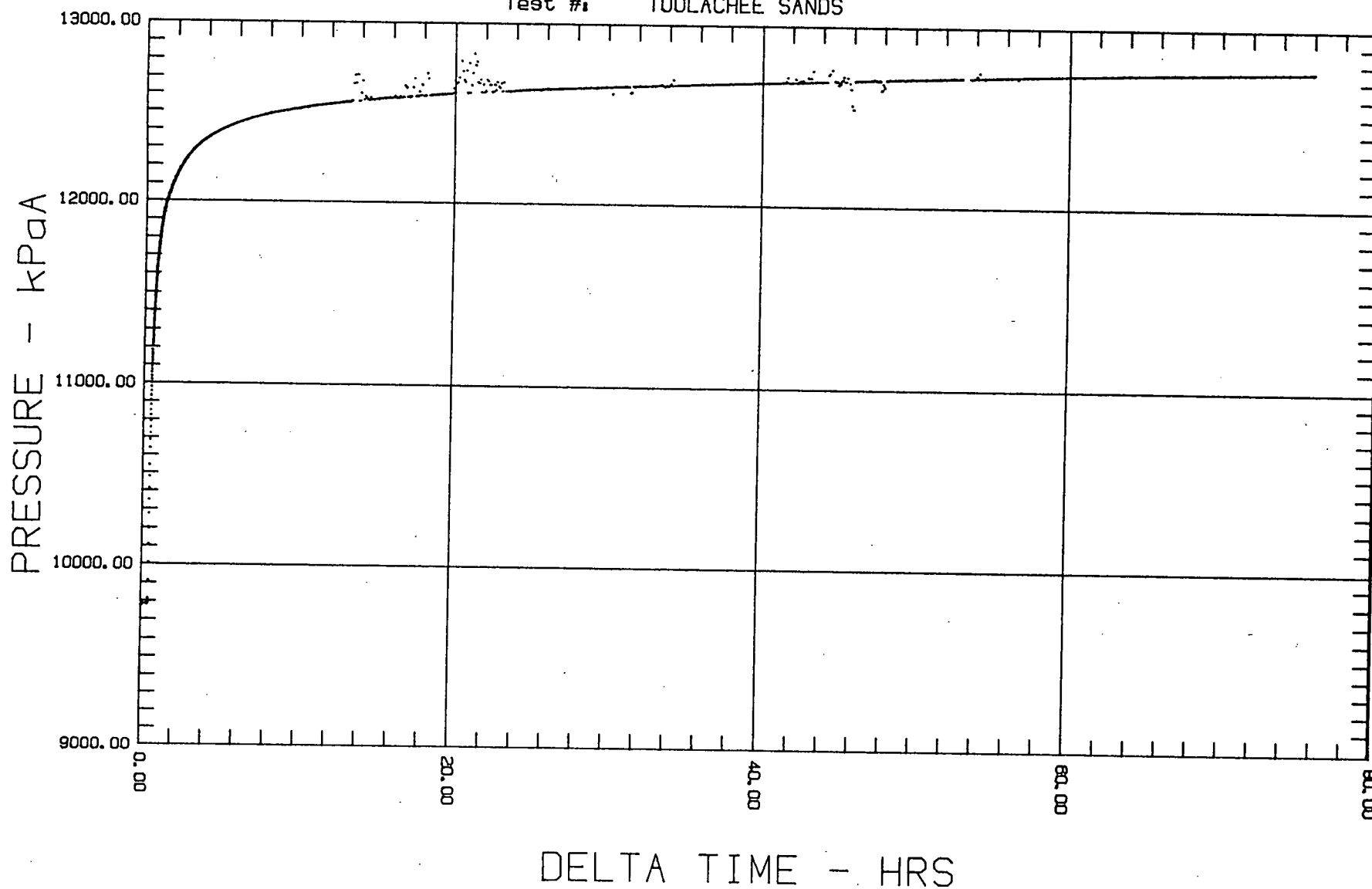
0071

Plot starting date: 10/14/90
time: 9:34:51

Gauge S/N

Company: OILSERV AUSTRALIA LTD.
Client: SANTOS LTD.
Well name: MOOMBA
Well #: 64
Test #: TOOLACHEE SANDS

Location: COOPER BASIN
Operator: S. COPPOCK.
Comments: SINGLE RATE FLOW & BUILD UP.
STATIC GRADIENT SURVEY. R.I.H.



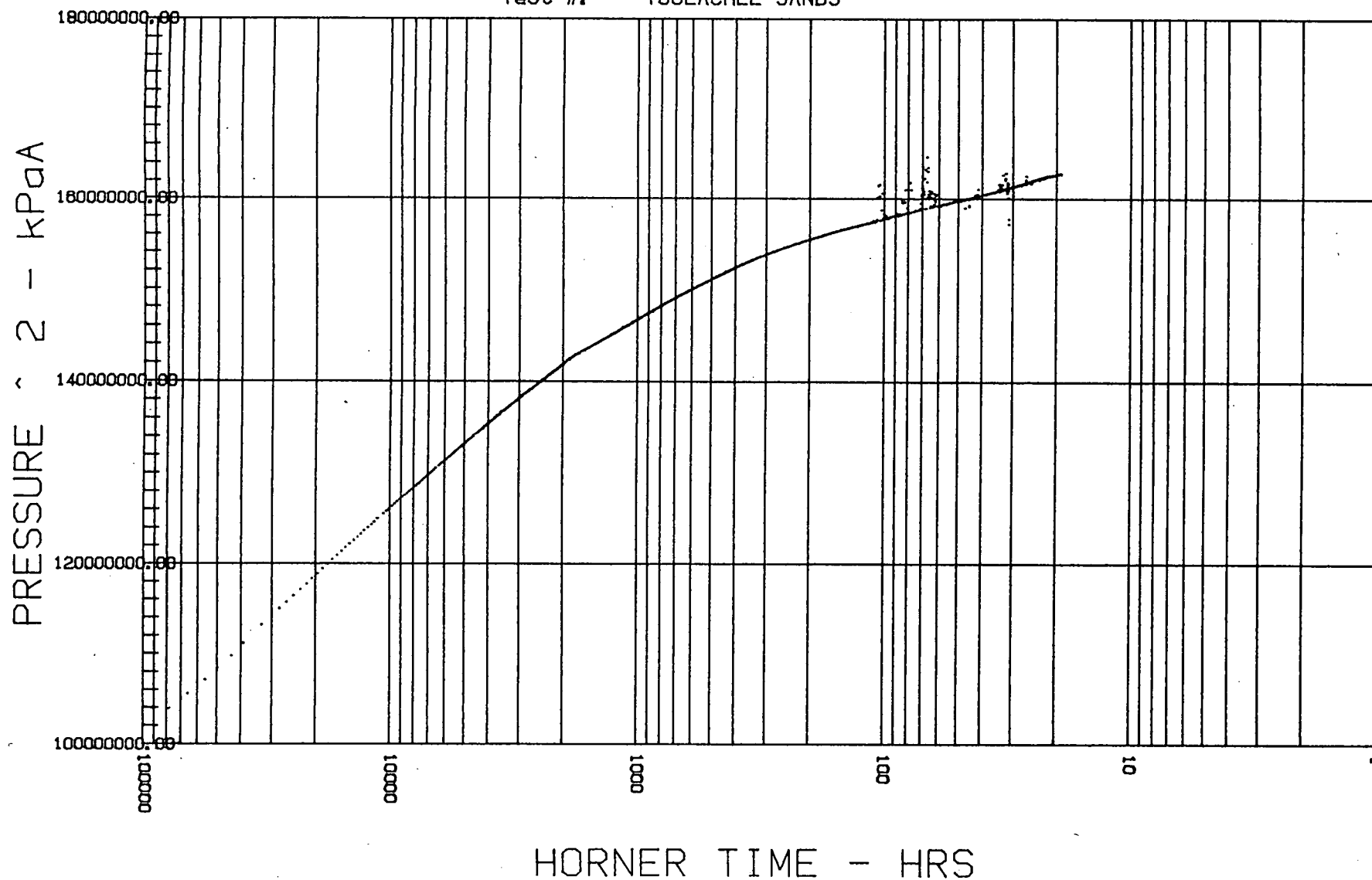
0072

Plot starting date: 10/14/90
time: 10: 0: 3

Gauge S/N
Flow time: 1374.170 HRS

Company: OILSERV AUSTRALIA LTD.
Client: SANTOS LTD.
Well name: MOOMBA
Well #: 64
Test #: TOOLACHEE SANDS

Location: COOPER BASIN
Operator: S. COPPOCK.
Comments: SINGLE RATE FLOW & BUILD UP.
STATIC GRADIENT SURVEY. R.I.H.



0073

Plot starting date: 10/14/90
time: 10: 0: 3

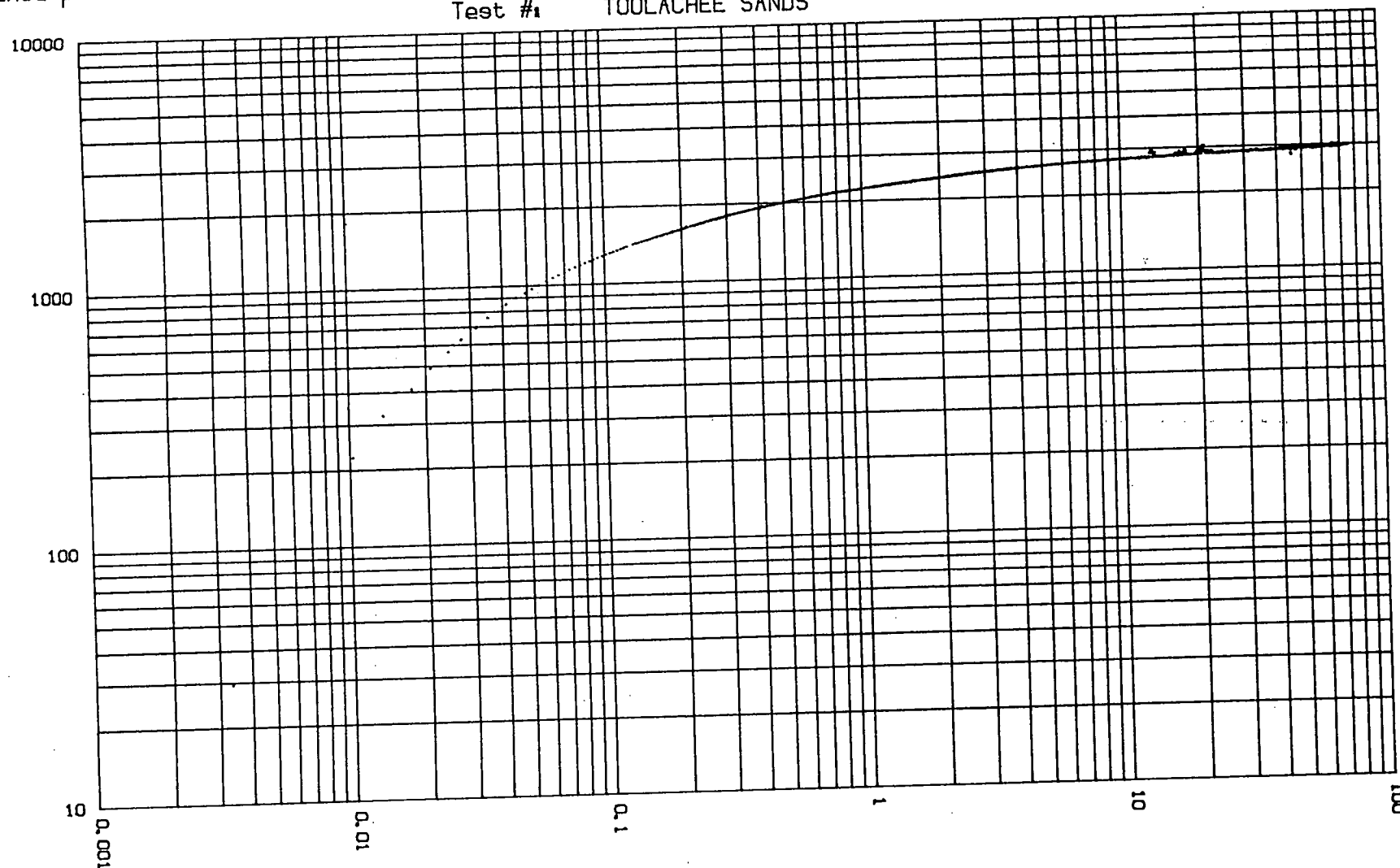
Gauge S/N

Reference pressure: 9785.130 kPaA

Company: OILSERV AUSTRALIA LTD.
Client: SANTOS LTD.
Well name: MOOMBA
Well #: 64
Test #: TOOLACHEE SANDS

Location: COOPER BASIN
Operator: S. COPPOCK.
Comments: SINGLE RATE FLOW & BUILD UP.
STATIC GRADIENT SURVEY. R.I.H.

DELTA PRESSURE - kPaA



DELTA TIME - HRS

OILSERV AUSTRALIA LTD

GRADIENT SURVEY REPORT

DATA

[illegible]

WELL: MOOMBA NO 64

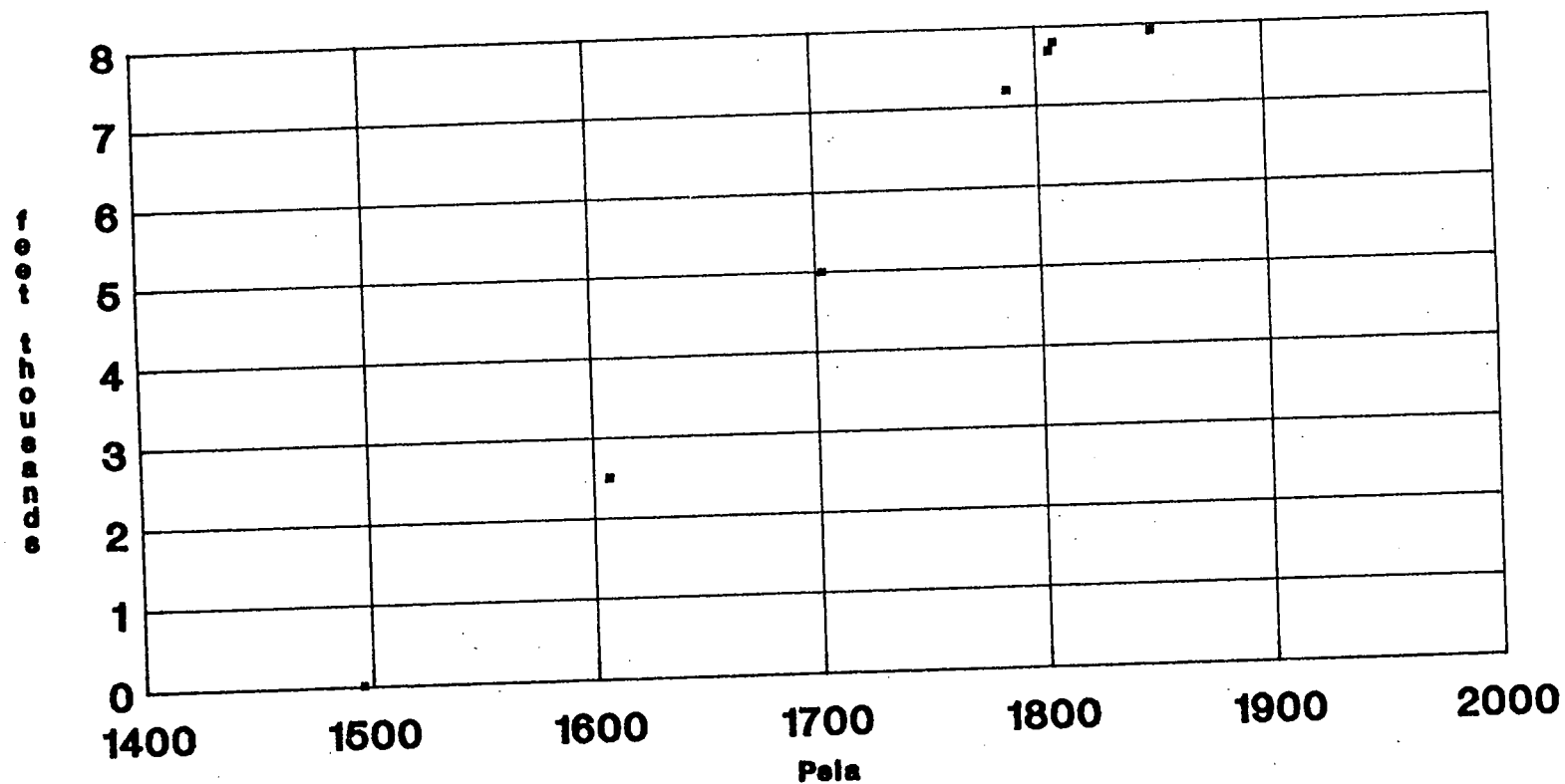
DATE: 12/1/90

CLIENT: SANTOS LTD

GRADIENT CONDUCTED WHILE : (P.O.O.H) (R.I.H)

0075

OILSERV AUSTRALIA LTD
STATIC GRADIENT SURVEY
MOOMBA #64



▪ GRADIENT

CLIENT : SANTOS LTD
GAUGE 8/N 58852
OPERATOR : G.PASZNICKI

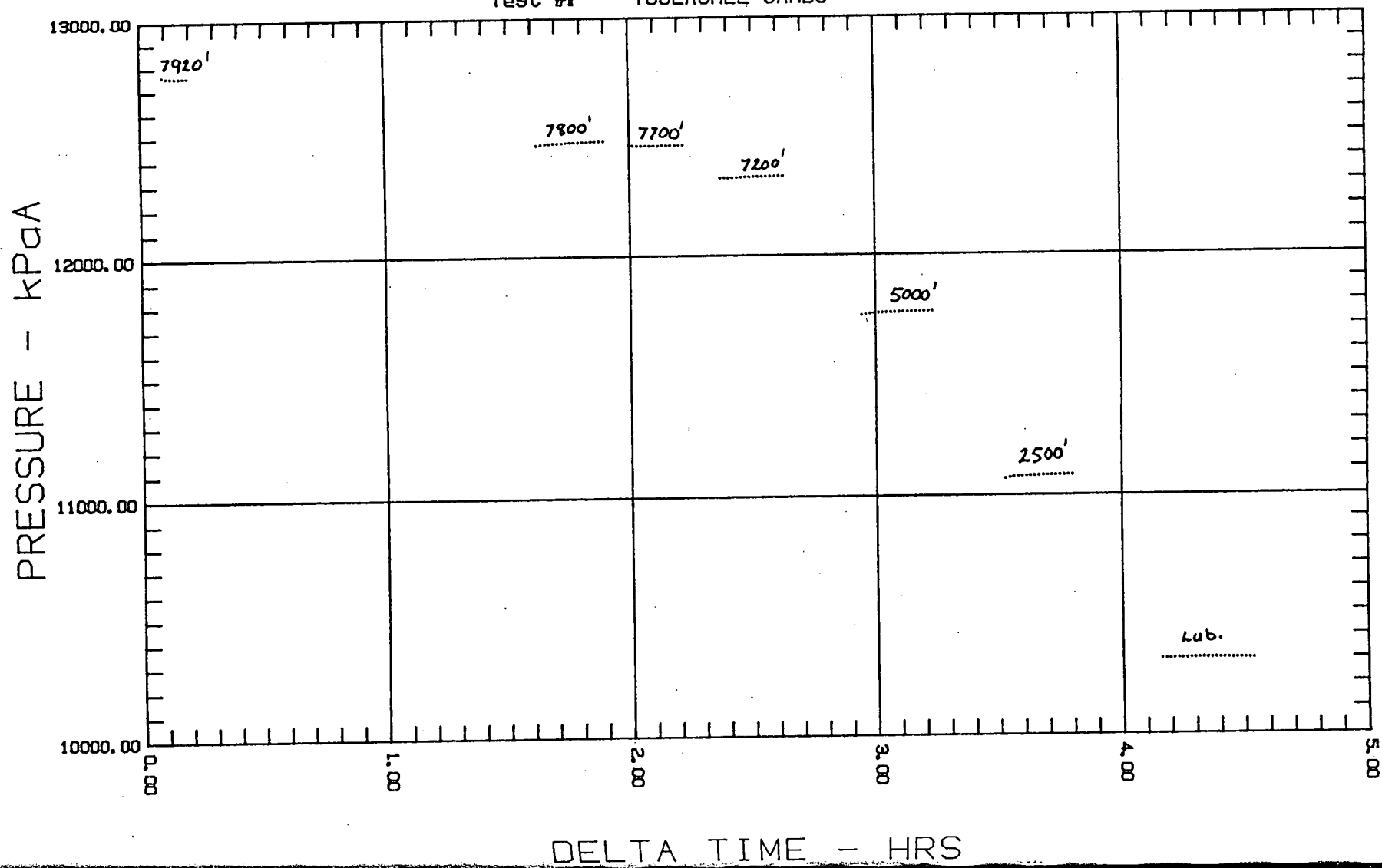
DATE : 17/10/90

0076

Plot starting date: 10/17/90
time: 13:23:43
Gauge S/N 56852

Company: OILSERV AUSTRALIA LTD.
Client: SANTOS LTD.
Well name: MOOMBA
Well #: 64
Test #: TOOLACHEE SANDS

Location: COOPER BASIN
Operator: S. COPPOCK.
Comments: SINGLE RATE FLOW & BUILD UP.
STATIC GRADIENT SURVEY. R.I.H.



OILSERV AUSTRALIA LTD
DOWNHOLE GAUGE REPORT

CLIENT: SANTOS LTD WELL NAME/NUMBER: MOOMBA NO 64

GAUGE TYPE: GRC EPG-520 SERIAL NUMBER: 56652

DATE OF CALIBRATION: 4/2/90 RANGE: 0-10000PSI

TYPE OF TEST: SINGLE RATE TYPE OF WELL: ~~W~~/GAS/COND/WATER

WAS GAUGE CHECKED AGAINST DWT: YES/~~W~~

IF YES, PRESSURE DIFFERENTIAL:

DEPTH RUN TO: 7920 FT. MAX PRESSURE RECORDED: 1240 ~~1240~~ KPA

HOURS IN HOLE: 348 HRS. MAX TEMP. RECORDED: 138 ~~138~~ °C

HOURS WELL FLOWING: 188 HRS. NEW ROPE SOCKET: YES/~~W~~

HOURS WELL SHUT IN: 139 HRS. OCL RUN: YES/~~W~~

PROBLEMS ENCOUNTERED

No problems

COMMENTS: (FAILURE REPORT)

No problems

DISTRIBUTION: 1. TO CLIENT 2. OAL BASE 3. RETAIN ON JOB.

Moomba #64
Summary Of Single Rate Test & Buildup Survey
9th - 21st March 1991

Flow Test

10th - 17th March

10/03/91: Well flowing on 100% choke @ 0846 hrs
 Turned flow through separator @ 1307 hrs
 Established liquid levels @ 1430 hrs
 Tested well on 100% choke for 154.5 hrs in total

Flowing rates averaged over first 119.5 hrs of flow period

F.T.H.P. (Final)	=	6081	kPa
Separator Pressure (Final)	=	6081	kPa
Separator Temperature (Final)	=	47	°C
* Gas Flow Rate	=	53.076	E3 m ³ /d
			(corrected for S.G. measured during sampling)
Condensate Flow Rate	=	0.129	m ³ /d
Water Flow Rate	=	6.717	m ³ /d

Element #53563 @ 7748' KB @ 1405 hrs 15/3/91 = 8627 kPa

Element #52582 @ 7754' KB @ 1405 hrs 15/3/91 = 8463 kPa

* Note gas rate varied from 85 to 40 E3 m³/d

15/03/91: Decreased separator pressure @ 1405 hrs
 Following rates averaged over remaining 35 hours of flow period

F.T.H.P. (Final)	=	4723	kPa
Separator Pressure (Final)	=	4689	kPa
Separator Temperature (Final)	=	48.5	°C
Gas Flow Rate	=	49.393	E3 m ³ /d
			(not corrected for S.G. as samples taken before separator pressure reduced)
Condensate Flow Rate	=	NIL	m ³ /d
Water Flow Rate	=	14.040	m ³ /d

Element #53563 @ 7748' KB @ 0100 hrs 17/3/91 = 7577 kPa

Element #52582 @ 7754' KB @ 0100 hrs 17/3/91 = 7282 kPa

17/03/91: Shut well in @ 0100 hrs

Flowing Gradient Survey

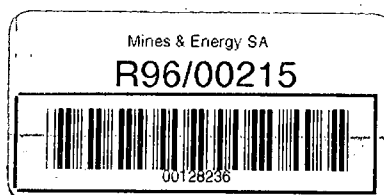
Mid Point of Perforations = 7834' KB

13/03/91: Ran flowing pressure gradient survey

Element #53563 @ MPP = 8598 kPa

Element #52582 @ MPP = 8581 kPa

Flowing bottomhole temperature = 266.8°F = 130.4°F



Cont...

7269/2

Buildup Survey

17th - 21st March

17/03/91: Shut well in @ 0100 hrs for 101.25 hrs buildup
Element #53563 @ 7748' KB after 101.25 hrs buildup = 11273 kPa
Element #52582 @ 7754' KB after 101.25 hrs buildup = 11041 kPa
Shut in bottomhole temperature = 274.1°F = 134.5°C

21/03/91: POOH @ 0615 hrs

Static Gradient Survey

Mid Point of Perforations = 7834' KB

21/03/91: Ran static pressure gradient survey
Element #53563 @ MPP = 11368 kPa
Element #52582 malfunctional

End of survey.

SUB-SURFACE PRESSURE SURVEY

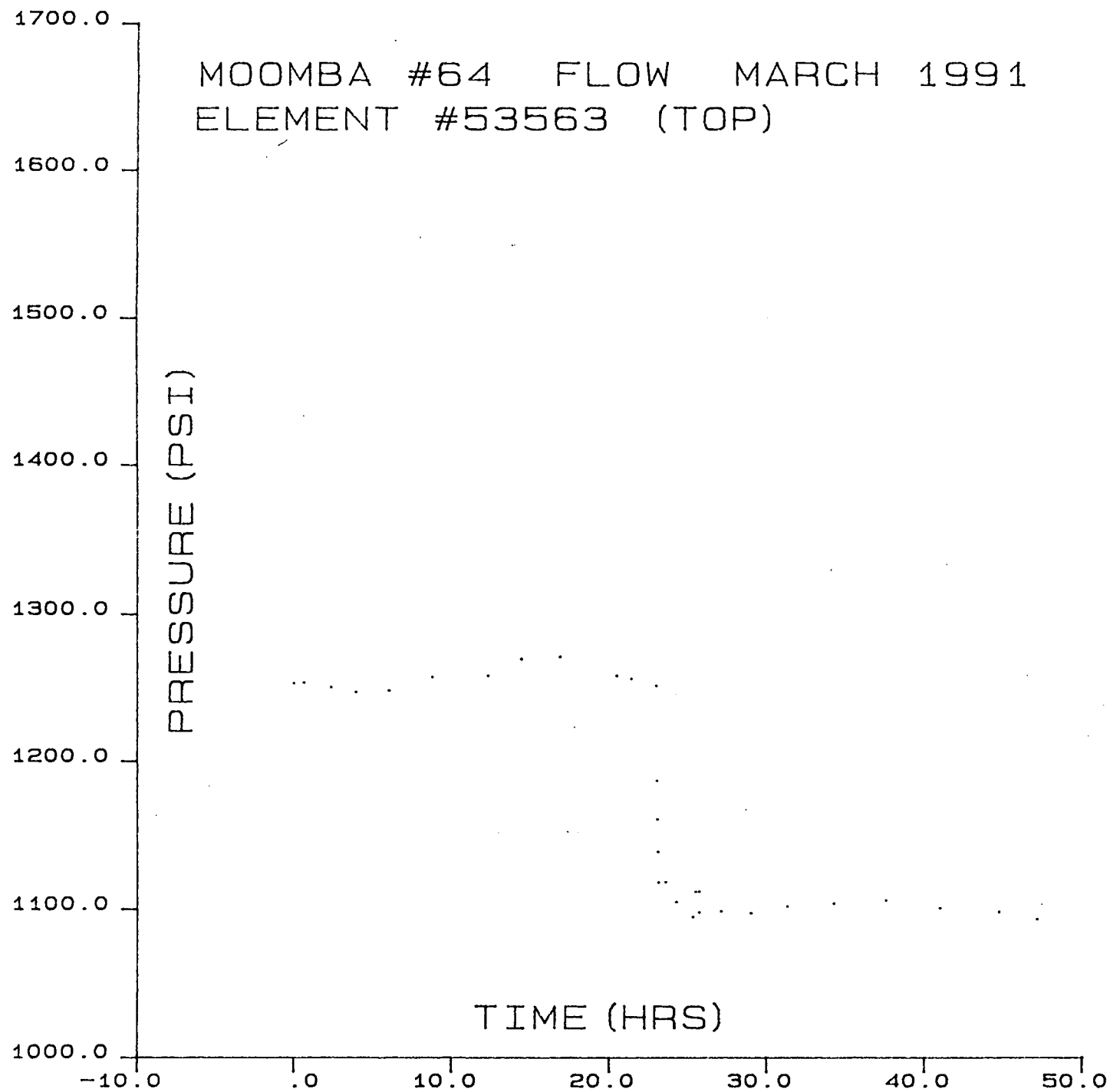
CO.		RUN 03 FIELD MOOMBA	WELL 64
EFF DEPTH		WELL STAT	TOOL HUNG 7748'
CASING	-	CASING PRESS	ON BOTTOM 1505 14/3
LINER	-	TUBING PRESS	OFF BOTTOM 1415 16/3
DATE	910316	ELEMENT RANGE 0 - 5296	ZERO POINT
ELEVATION		ZONE	SHUT-IN
MAX TEMP		PICK-UP	ON-PROD
PERF	-	CAL SER NO. 53563	MPP
TUBING	-		
UNITS	ENGLISH	PURPOSE	FLOW

SURVEY DATA

CO.	TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
	15:05	1252.8	1252.8	.0	14:13	1118.2	1118.2	23.1
	15:43	1253.5	1253.5	.6	14:40	1118.4	1118.4	23.6
	17:26	1250.1	1250.1	2.3	15:21	1104.9	1104.9	24.3
	19:01	1246.9	1246.9	3.9	16:24	1094.8	1094.8	25.3
	21:06	1248.3	1248.3	6.0	16:34	1111.7	1111.7	25.5
	23:52	1257.4	1257.4	8.8	16:48	1111.9	1111.9	25.7
	3:24	1258.4	1258.4	12.3	16:48	1097.9	1097.9	25.7
	5:31	1270.0	1270.0	14.4	18:12	1098.8	1098.8	27.1
	7:59	1271.6	1271.6	16.9	20:06	1097.1	1097.1	29.0
	11:34	1258.0	1258.0	20.5	22:25	1102.0	1102.0	31.3
	12:30	1256.0	1256.0	21.4	1:22	1103.9	1103.9	34.3
	14:05	1251.2	1251.2	23.0	4:40	1106.0	1106.0	37.6
	14:07	1186.9	1186.9	23.0	8:05	1100.6	1100.6	41.0
	14:08	1160.8	1160.8	23.1	11:49	1097.7	1097.7	44.7
	14:12	1139.0	1139.0	23.1	14:15	1092.9	1092.9	47.2

LUB IN DWT = 895 PSI / OUT = 687 PSI
 LUB IN AMERADA = 882 PSI / OUT = 687 PSI

MOOMBA #64 FLOW MARCH 1991
ELEMENT #53563 (TOP)



SUB-SURFACE PRESSURE SURVEY

CO.		RUN 01 FIELD MOOMBA	WELL 64
EFF DEPTH		WELL STAT	TOOL HUNG 7748'
CASING	-	CASING PRESS	ON BOTTOM 1839 16/3
LINER	-	TUBING PRESS	OFF BOTTOM 0615 21/3
DATE	910321	ELEMENT RANGE 0 - 5296	ZERO POINT
ELEVATION	-	ZONE	SHUT-IN 0100 17/3
MAX TEMP	-	PICK-UP	ON-PROD
PERF	-	CAL SER NO. 53563	MPP
TUBING	-		
UNITS	ENGLISH	PURPOSE	BUILD-UP

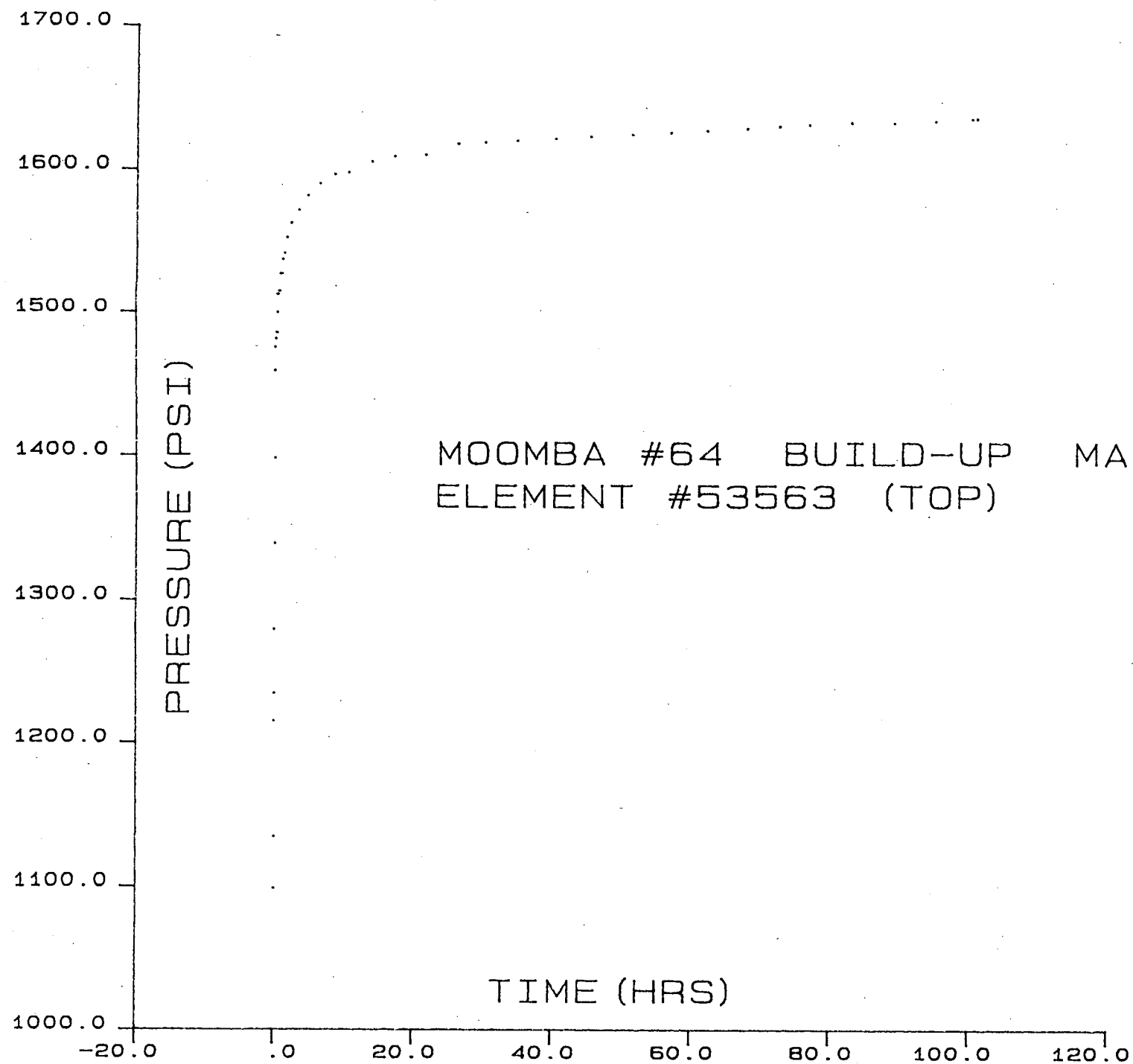
SURVEY DATA

CO.	TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
	1:00	1098.9	1098.9	.0	4:28	1571.6	1571.6	3.5
	1:00	1134.5	1134.5	.0	5:44	1581.1	1581.1	4.7
	1:01	1214.9	1214.9	.0	7:31	1589.8	1589.8	6.5
	1:03	1234.2	1234.2	.0	9:39	1596.1	1596.1	8.7
	1:05	1279.0	1279.0	.1	11:37	1597.7	1597.7	10.6
	1:07	1339.2	1339.2	.1	15:00	1604.9	1604.9	14.0
	1:07	1397.9	1397.9	.1	18:16	1608.7	1608.7	17.3
	1:07	1458.9	1458.9	.1	22:43	1609.8	1609.8	21.7
	1:08	1475.0	1475.0	.1	3:24	1617.6	1617.6	26.4
	1:16	1481.1	1481.1	.3	7:20	1618.7	1618.7	30.3
	1:22	1485.3	1485.3	.4	11:56	1619.9	1619.9	34.9
	1:26	1485.3	1485.3	.4	17:27	1621.3	1621.3	40.4
	1:29	1499.3	1499.3	.5	22:30	1622.6	1622.6	45.5
	1:29	1512.2	1512.2	.5	4:33	1624.2	1624.2	51.6
	1:36	1512.3	1512.3	.6	10:06	1625.6	1625.6	57.1
	1:43	1514.7	1514.7	.7	15:20	1627.0	1627.0	62.3
	1:48	1514.7	1514.7	.8	21:06	1628.5	1628.5	68.1
	1:49	1527.1	1527.1	.8	1:45	1629.7	1629.7	72.8
	1:59	1527.1	1527.1	1.0	6:04	1630.8	1630.8	77.1
	2:06	1527.2	1527.2	1.1	12:09	1632.4	1632.4	83.1
	2:09	1537.5	1537.5	1.1	18:14	1631.9	1631.9	89.2
	2:26	1541.8	1541.8	1.4	0:14	1633.4	1633.4	95.2
	2:46	1552.4	1552.4	1.8	5:32	1634.8	1634.8	100.5
	3:21	1562.6	1562.6	2.4	6:15	1635.0	1635.0	101.3

LUB IN DWT = 687 PSI / OUT = 1360 PSI

LUB IN AMERADA = 681 PSI / OUT = 1358 PSI

PLEASE NOTE CHART HAS STAIRSTEPPING CHARACTERISTICS.



SUB-SURFACE PRESSURE SURVEY

CO.		RUN 04 FIELD MOOMBA	WELL 64
EFF DEPTH		WELL STAT	TOOL HUNG 7754'
CASING	-	CASING PRESS	ON BOTTOM 1505 14/3
LINER	-	TUBING PRESS	OFF BOTTOM 1415 16/3
DATE	910316	ELEMENT RANGE 0 - 5244	ZERO POINT
ELEVATION		ZONE	SHUT-IN
MAX TEMP		PICK-UP	ON-PROD
PERF	-	CAL SER NO. 52582	MPP
TUBING	-		
UNITS	ENGLISH	PURPOSE	FLOW

SURVEY DATA

CO.	TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
	15:05	1237.1	1237.1	.0	14:22	1073.3	1073.3	23.3
	15:52	1232.1	1232.1	.8	14:25	1080.7	1080.7	23.3
	16:53	1231.9	1231.9	1.8	14:29	1090.1	1090.1	23.4
	17:48	1227.9	1227.9	2.7	14:40	1096.6	1096.6	23.6
	20:16	1221.6	1221.6	5.2	14:55	1089.3	1089.3	23.8
	22:08	1226.8	1226.8	7.1	15:49	1078.1	1078.1	24.7
	0:17	1234.4	1234.4	9.2	16:55	1072.7	1072.7	25.8
	2:37	1234.1	1234.1	11.5	17:02	1087.4	1087.4	26.0
	4:03	1232.1	1232.1	13.0	17:10	1068.2	1068.2	26.1
	4:25	1247.0	1247.0	13.3	18:32	1077.8	1077.8	27.5
	6:21	1246.7	1246.7	15.3	21:33	1076.1	1076.1	30.5
	8:53	1246.4	1246.4	17.8	0:37	1075.7	1075.7	33.5
	11:16	1236.2	1236.2	20.2	3:49	1080.5	1080.5	36.7
	13:05	1230.4	1230.4	22.0	7:49	1080.0	1080.0	40.7
	14:05	1227.4	1227.4	23.0	12:12	1071.9	1071.9	45.1
	14:12	1155.7	1155.7	23.1	14:15	1063.7	1063.7	47.2
	14:18	1088.0	1088.0	23.2	0:00	.0	.0	.0

LUB IN DWT = 895 PSI / OUT = 687 PSI
 LUB IN AMERADA = 901 PSI / OUT = 687 PSI

SUB-SURFACE PRESSURE SURVEY

CO.		RUN 02 FIELD MOOMBA	WELL 64
EFF DEPTH		WELL STAT	TOOL HUNG 7754'
CASING	-	CASING PRESS	ON BOTTOM 1839 16/3
LINER	-	TUBING PRESS	OFF BOTTOM 0615 21/3
DATE	910321	ELEMENT RANGE 0 - 5244	ZERO POINT
ELEVATION		ZONE	SHUT-IN 0100 17/3
MAX TEMP		PICK-UP	ON-PROD
PERF	-	CAL SER NO. 52582	MPP
TUBING	-		
UNITS	ENGLISH	PURPOSE	BUILD-UP

SURVEY DATA

CO.	RUN 02 FIELD MOOMBA				WELL 64			
TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME	
1:00	1056.2	1056.2	.0	4:44	1523.9	1523.9	3.7	
1:03	1076.3	1076.3	.0	5:44	1529.7	1529.7	4.7	
1:04	1101.5	1101.5	.1	6:31	1534.8	1534.8	5.5	
1:04	1136.9	1136.9	.1	7:31	1538.7	1538.7	6.5	
1:05	1178.0	1178.0	.1	8:40	1545.7	1545.7	7.7	
1:05	1204.5	1204.5	.1	10:07	1549.5	1549.5	9.1	
1:06	1225.1	1225.1	.1	12:35	1553.6	1553.6	11.6	
1:08	1245.0	1245.0	.1	15:08	1556.1	1556.1	14.1	
1:09	1275.1	1275.1	.1	17:41	1558.0	1558.0	16.7	
1:10	1311.4	1311.4	.2	19:40	1563.0	1563.0	18.7	
1:12	1338.8	1338.8	.2	22:16	1565.2	1565.2	21.3	
1:14	1368.1	1368.1	.2	1:08	1567.4	1567.4	24.1	
1:16	1388.2	1388.2	.3	4:30	1566.1	1566.1	27.5	
1:18	1404.6	1404.6	.3	7:46	1568.0	1568.0	30.8	
1:21	1415.3	1415.3	.4	10:54	1571.1	1571.1	33.9	
1:25	1428.8	1428.8	.4	13:30	1571.4	1571.4	36.5	
1:28	1437.6	1437.6	.5	15:42	1576.2	1576.2	38.7	
1:34	1449.1	1449.1	.6	18:33	1576.1	1576.1	41.6	
1:38	1458.4	1458.4	.6	22:44	1575.8	1575.8	45.7	
1:45	1466.2	1466.2	.8	3:06	1575.8	1575.8	50.1	
1:53	1474.4	1474.4	.9	7:21	1580.6	1580.6	54.4	
2:09	1481.3	1481.3	1.1	12:03	1582.4	1582.4	59.0	
2:21	1490.2	1490.2	1.3	16:33	1584.5	1584.5	63.5	
2:29	1496.1	1496.1	1.5	20:50	1584.5	1584.5	67.8	
2:38	1496.6	1496.6	1.6	1:07	1585.9	1585.9	72.1	
2:47	1502.4	1502.4	1.8	5:46	1588.6	1588.6	76.8	
2:59	1504.6	1504.6	2.0	10:22	1589.2	1589.2	81.4	
3:11	1506.8	1506.8	2.2	15:07	1590.0	1590.0	86.1	
3:22	1509.8	1509.8	2.4	20:48	1594.7	1594.7	91.8	
3:48	1516.8	1516.8	2.8	2:14	1596.8	1596.8	97.2	

0086

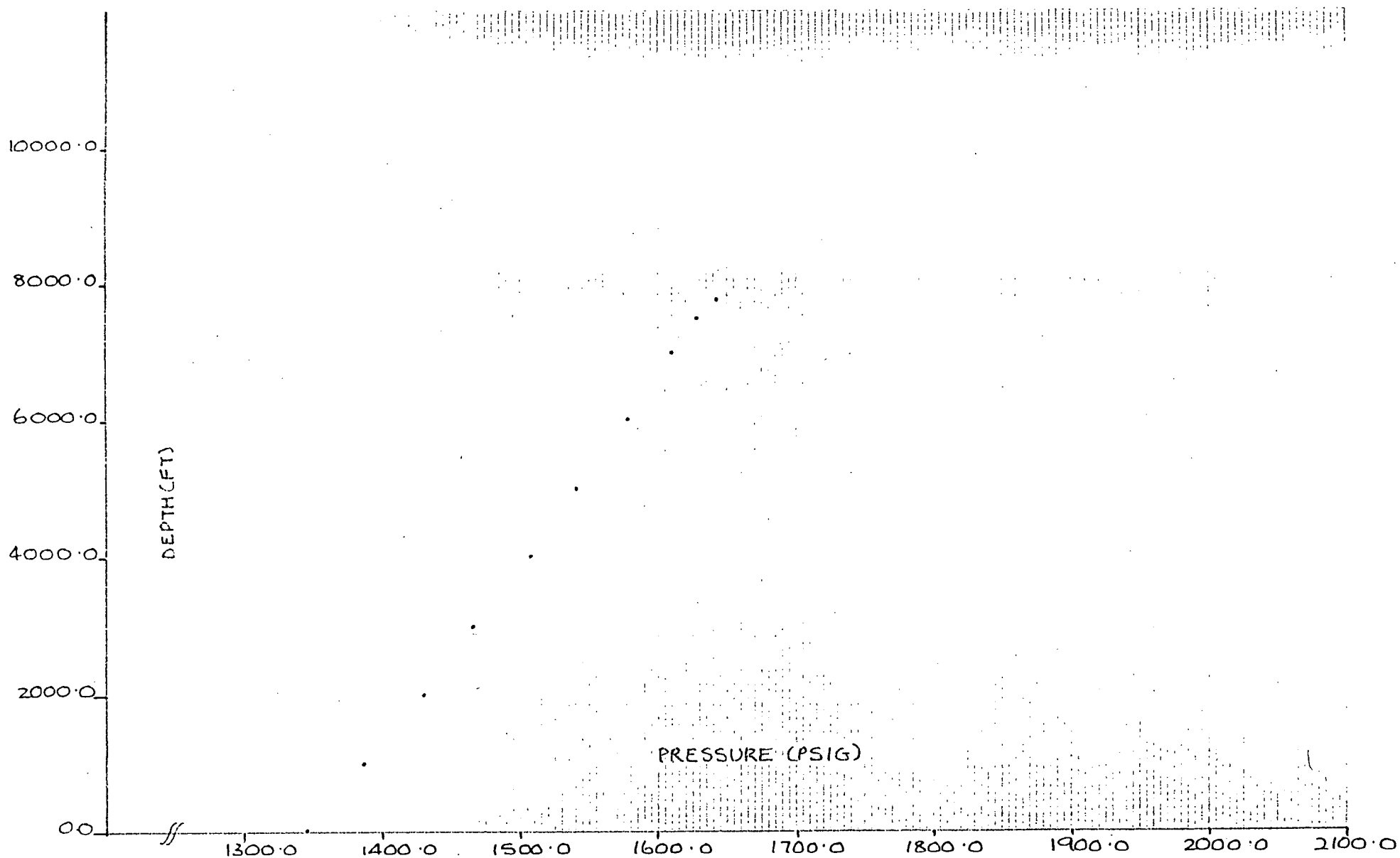
SURVEY DATA

CO.	RUN 02 FIELD MOOMBA				WELL 64			
	TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
	5:41	1599.9	1599.9	100.7	6:15	1601.3	1601.3	101.3

LUB IN DWT = 687 PSI / OUT = 1360 PSI

LUB IN AMERADA = 670 PSI / OUT = 1364 PSI

MOOMBA # 64 — STATIC PRESSURE GRADIENT — 21/3/91
ELEMENT # 53563/5000 (TOP)

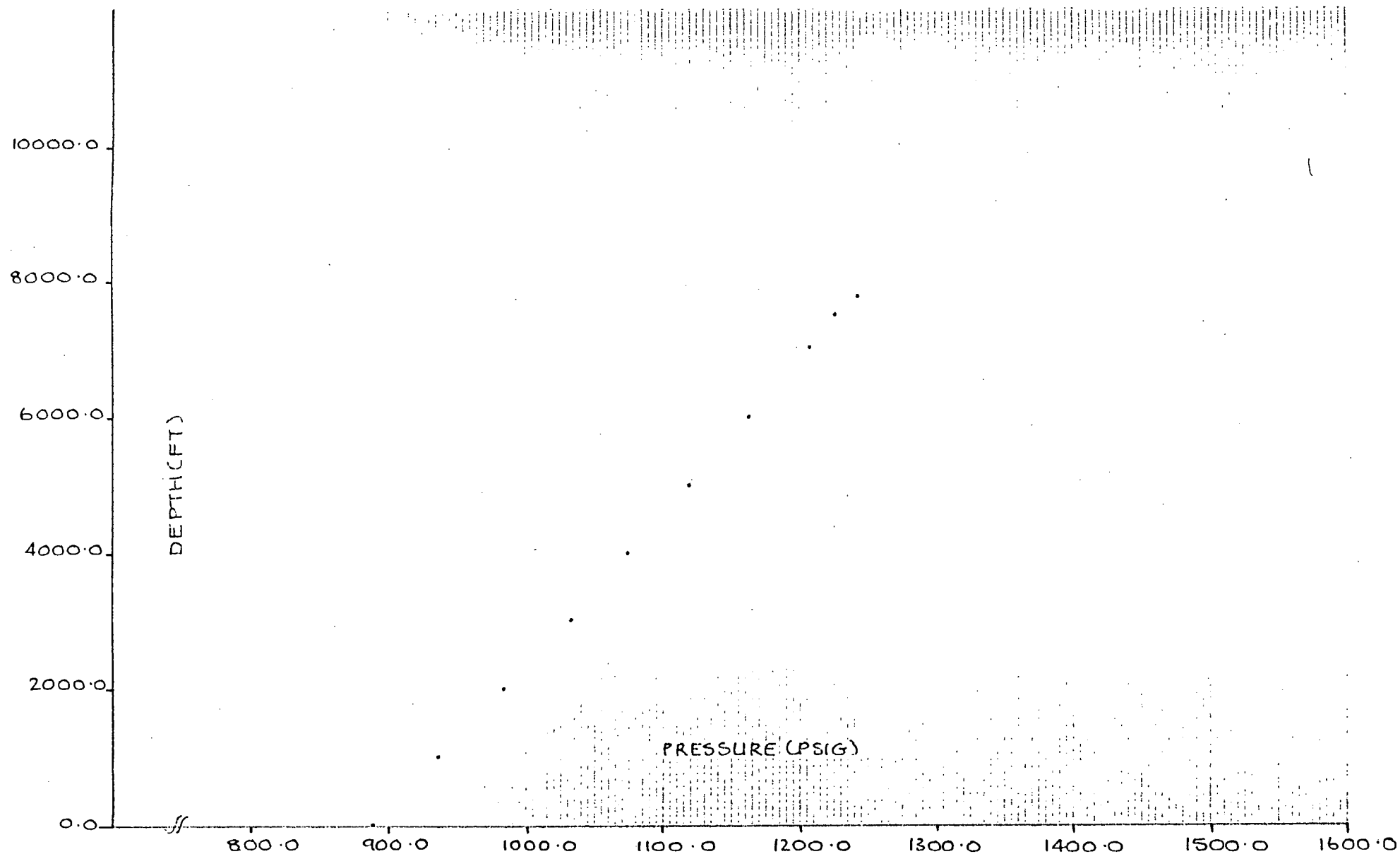


MOOMBA # 64

FLOWING PRESSURE GRADIENT

13/3/91

ELEMENT # 53563 / 5000 (TOP)



WELL: <u>Moomba #64</u>						SANTOS LTD.										DATE: <u>9.3.81</u>				
TYPE OF TEST: <u>Single Rate</u>						WELL TEST DATA SHEET										PAGE No: <u>1 of 10</u>				
DATE TIME	WELLHEAD					GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS					
	CASING K.P.A.	TUBING K.P.A.	TEMP. °C	CHOKE SIZE INS.	B.S.W. %	PI K.P.A.	HW K.P.A.	TEMP. °C	ORIFICE SIZE INS.	TANK D.P. LITRE	TANK PROD M3	API GRAVITY °60 °F	TANK D.P. LITRE	TANK PROD M3	GAS FLOW RATE M3/D	OIL.. FLOW RATE M3/D	WATER FLOW RATE M3/D	TOTAL LIQUID FLOW RATE M3/D	L.G.P. M3/M3	
1130						Arrive on Location														
						Spot all Testing Equipment														
						Spot Accommodation														
1500						Rig Swab Valve on to Well														
1509						Well Back On Line														
1530						Handover Well from Production to Petroleum														
						Rig Up Slick Line Unit														
						Rig Up Chart Recorder and Deadweight														
						Commence Rig Up for Blind Box Run														
10-3-81																				
0846	0	3751		100%		Pressure Up Lubricator for Dummy Run														
0855						Run In Hole with 1.75" Gauge Ring														
0953						Tag PBTD @ 8421' KB and Pull Out of Hole														
1100						Arrive in Lubricator and Depressure														
1300	0	3827		100%		Pressure Test Flow Lines														
1302						Turn Well to Bypass Separator														
1305						Pressure Test Separator														
1307						Turn flow through Separator and Trim														
1400	0	3978	49.5	100%		3792	11.45	49	2.00						104.5					
1430						Establish Liquid Levels and Trim														

OPERATOR: HIRST

6809

WELL: <u>Moomba #64</u>						SANTOS LTD.										DATE: <u>10.3.91</u>									
TYPE OF TEST: <u>Single Rate</u>						WELL TEST DATA SHEET															PAGE No: <u>2 of 10</u>				
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 KPA	TEMP. °C	ORIFICE SIZE INS.	TANK DP LITRE	TANK PROD M3	API GRAVITY @ 60 °F	TANK DP LITRE	TANK PROD M3	GAS FLOW RATE M3/D	OIL FLOW RATE M3/D	WATER FLOW RATE M3/D	TOTAL LIQUID FLOW RATE M3/D	L.G.R.						
1600	0	5206	50	100%		5240	6.47	50	2.00	475	0.035		440	0.44	94.0										
1800	0	5978	49	100%		5999	4.48	48.5	2.00	560	0.00		540	0.10	85.0	0.00	1.20	1.20	0.014						
2000	0	6102	48.5	100%		6102	3.73	47	2.00	1055	0.06		960	0.42	78.8	0.72	5.04	5.76	0.073						
2200	0	6178	48	100%		6102	2.99	46	2.00	1560	0.015		1450	0.49	70.7	0.18	5.88	6.06	0.086						
11.3.91																									
0200	0	6171	47	100%		6102	2.99	45	2.00	2190	0.005		2075	0.625	70.9	0.03	3.75	3.78	0.053						
0600	0	6171	46.5	100%		6102	2.49	44	2.00	2900	0.045		2740	0.665	64.9	0.27	3.99	4.26	0.066						
1000	0	6205	42.5	100%		6205	2.74	45	2.00	3690	0.03		3500	0.76	68.6	0.18	4.56	4.74	0.069						
1400	0	6184	48.5	100%		6184	2.74	47	2.00	4500	0.01		4300	0.80	68.0	0.06	4.80	4.86	0.071						
1800	0	6136	46	100%		6136	2.74	46	2.00	5350	0.00		5150	0.85	67.9	0.00	5.10	5.10	0.075						
2200	0	6136	46	100%		6102	2.49	44.5	2.00	6350	0.075		6075	0.925	64.8	0.45	5.55	6.00	0.093						
12.3.91																									
0200	0	4654	46	100%		4551	3.98	44	2.00	0/1000	0.03		0/970	0.970	69.0	0.18	5.82	6.00	0.087						
0600	0	5461	45	100%		5378	2.49	45	2.00	2810	0.08		2700	1.73	60.0	0.48	10.38	10.86	0.181						
0730	0	5964	47	100%		5895	1.49	43	2.00	3350	0.04		3200	0.50	49.4	0.64	8.00	8.64	0.175						
0730						Turn Flow Back on Line - Bypass Separator																			
						Depressure Separator and Lines - Rig up to Flare																			
0830	0	6061		100%		Turn Flow Through Separator to Flare																			
0836						Hi-Lo closes Shutting in Well. Reopen and lock open																			
0845	0	6068		100%		Turn Flow Through Separator to Flare																			

OPERATOR: HIRST

0690

WELL: <u>Moomba #64</u>						SANTOS LTD.										DATE: <u>12-3-91</u>				
TYPE OF TEST: <u>Single Rate</u>						WELL TEST DATA SHEET										PAGE No: <u>3 of 10</u>				
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 KPA	TEMP. °C	ORIFICE SIZE INS	TANK DP LITRE	TANK PROD M ³	API GRAVITY @60 °F	TANK DP LITRE	TANK PROD M ³	GAS FLOW RATE E3/M ³	OIL FLOW RATE M ³ /D	WATER FLOW RATE M ³ /D	TOTAL LIQUID FLOW RATE M ³ /D	L.G.R. M ³ /M ³	
1000	0	6171	47	100%		6171	11.95	44	1.25	3650	0.00		3500	0.30	53.8	0.00	5.76	5.76	0.107	
1400	0	6157	48.5	100%		6171	13.20	47	1.25	4650	0.00		4500	1.00	56.0	0.00	6.00	6.00	0.107	
1800	0	6102	47.5	100%		6102	13.45	46	1.25	5650	0.00		5500	1.00	56.3	0.00	6.00	6.00	0.107	
2200	0	6171	46	100%		6171	11.95	43.5	1.25	6680	0.00		6530	1.03	53.8	0.00	6.18	6.18	0.115	
13-3-91																				
0200	0	6205	46	100%		6205	10.96	44	1.25	350 1490	0.00		75 1115	1.04	51.7	0.00	6.24	6.24	0.121	
0600	0	6137	45	100%		6137	10.46	42	1.25	2600	0.00		2225	1.11	50.4	0.00	6.66	6.66	0.132	
1000	0	6137	46.5	100%		6137	10.96	44.5	1.25	3800	0.00		3445	1.20	51.1	0.00	7.20	7.20	0.141	
1226	0	6198	47	100%		Pressure Up Lubricator														
1241	-	-	-	-	-	Run In Hole Ameradas - Commence Flowing Gradient Survey														
1400	0	6198	47.5	100%		6198	10.96	46	1.25	4890	0.00		4535	1.09	50.9	0.00	6.54	6.54	0.128	
1407	-	-	-	-	-	Pull Out Of Hole														
1443	-	-	-	-	-	Arrive In Lubricator														
1458	0	5964	47	100%		Depressure Lubricator														
1800	0	5964	46.5	100%		5964	11.45	45	1.25	6240	0.015		5870	1.335	51.3	0.09	8.01	8.10	0.158	
2200	0	6068	46	100%		6068	9.71	44	1.25	350 1650	0.00		150 1450	1.30	47.9	0.00	7.80	7.80	0.163	
14-3-91																				
0200	0	6261	46	100%		6240	7.97	45	1.25	2890	0.045		2675	1.195	44.0	0.27	7.17	7.44	0.169	
0600	0	6302	44.5	100%		6309	7.22	41.5	1.25	4050	0.01		3825	1.15	42.6	0.06	6.90	6.96	0.163	
1000	0	6309	46	100%		6309	7.97	44	1.25	5250	0.00		5025	1.20	44.4	0.00	7.20	7.20	0.162	

OPERATOR: HIRST

0091

WELL: <u>Moomba #64</u>						SANTOS LTD.										DATE: <u>14-3-91</u>				
TYPE OF TEST: <u>Single Rate</u>						WELL TEST DATA SHEET										PAGE NO: <u>4 of 10</u>				
DATE TIME	WELLHEAD					GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS					
	CASING K.P.A	TUBING K.P.A	TEMP. °C	CHOKE SIZE INS	B.S.W. %	PI K.P.A	HW K.P.A	TEMP. °C	ORIFICE SIZE INS	TANK DIP LITRE	TANK PROD M3	API GRAVITY @60 °F	TANK DIP LITRE	TANK PROD M3	GAS FLOW RATE M3/D	OIL FLOW RATE M3/D	WATER FLOW RATE M3/D	TOTAL LIQUID FLOW RATE M3/D	L.G.P.	
1147	0	6171	46	100%		Pressure Up Lubricator														
1400	0	6137	47.5	100%		6171	8.47	46.5	1.250	6390	0.090		6075	1.050	44.95	0.540	6.30	6.84	0.152	
1415	0	6137	47.5	100%		P.I.H WITH AMERADA'S														
1500	0	6081	47.5	100%		6171	8.47	46.5	1.250	6735	0.000		6420	0.345	44.80	0.000	8.28	8.28	0.185	
1505	0	6081	47.5	100%		ON HANG DEPTH 7760' K.B														
1600	0	6081	47.5	100%		6206	8.47	46.5	1.250	1275	0.000		475	0.425	44.95	0.000	10.20	10.20	0.227	
1700	0	6033	47	100%		6137	8.72	46	1.250	1575	0.000		1200	0.300	45.57	0.000	7.20	7.20	0.159	
1800	0	6026	46.5	100%		6102	8.47	46.5	1.250	2000	0.000		1625	0.425	44.50	0.000	10.20	10.20	0.229	
1900	0	6040	46	100%		6068	8.47	45	1.250	2350	0.000		1975	0.350	44.54	0.000	8.40	8.40	0.189	
2000	0	6033	46	100%		6068	8.47	44.5	1.250	2725	0.000		2350	0.375	44.61	0.000	9.00	9.00	0.202	
2100	0	6012	46	100%		6033	8.22	44	1.250	3125	0.000		2750	0.400	43.87	0.000	9.60	9.60	0.219	
2200	0	6012	46	100%		6033	7.97	44	1.250	3500	0.000		3125	0.375	43.20	0.000	9.00	9.00	0.208	
2300	0	6012	46	100%		6033	7.97	45	1.250	3825	0.000		3450	0.325	43.06	0.000	7.80	7.80	0.181	
2400	0	6006	46	100%		6102	7.72	44	1.250	4250	0.000		3875	0.425	42.81	0.00	10.20	10.20	0.238	
15/3/91																				
0100	0	6033	45.5	100%		6068	7.47	43	1.250	4580	0.000		4205	0.330	42.10	0.00	7.92	7.92	0.188	
0200	0	6040	45.5	100%		6068	7.47	43.5	1.250	4940	0.00		4565	0.360	42.03	0.00	8.64	8.64	0.206	
0300	0	6047	45	100%		6033	7.47	43	1.250	5290	0.00		4915	0.350	41.95	0.00	8.40	8.40	0.200	
0400	0	6054	45	100%		6068	7.47	43.5	1.250	5645	0.00		5270	0.355	42.03	0.00	8.52	8.52	0.203	
0500	0	6185	45	100%		6137	6.72	42	1.250	6075	0.00		5700	0.430	42.03	0.00	10.32	10.32	0.246	

OPERATOR: S. KUNAC

0092

WELL: MOOMBA #64						SANTOS LTD.										DATE: 15/3/91			
TYPE OF TEST: SINGLE RATE						WELL TEST DATA SHEET										PAGE No: 5 OF 10			
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 K-PA	HW K-PA	TEMP. °C	ORIFICE SIZE INS.	TANK DP LITRE	TANK PROD M ³	API GRAVITY °60 °F	TANK DP LITRE	TANK PROD M ³	GAS FLOW RATE E3/440	OIL FLOW RATE M ³ /D	WATER FLOW RATE M ³ /D	TOTAL LIQUID FLOW RATE M ³ /D	L.G.R.
15/3/91																			
0600	O	6185	45	100%		6137	6.72	43	1.250"	6425	0.00		6050	0.350	40.22	0.00	8.40	8.40	0.209
0700	O	6199	46	100%		6171	6.72	44	1.250"	6750	0.00		6375	0.325	40.76	0.00	7.80	7.80	0.191
0700						COLLECT 1ST SET OF SAMPLES, 14 P GAS # 091, L.P H2O 1x500 ^{cc}													
0800	O	6199	46	100%		6137	6.97	44.5	1.250"	7075	0.00		6700	0.325	40.76	0.00	7.80	7.80	0.191
0800						COLLECT 2ND SET OF SAMPLES, H.P GAS # 114, L.P H2O 1x500 ^{cc}													
0900	O	6199	46	100%		6206	6.97	45	1.250"	1080 1400	0.00		800 1120	0.320	40.98	0.00	7.68	7.68	0.187
1000	O	6164	46.5	100%		6206	7.22	45.5	1.250"	1740	0.00		1460	0.340	41.64	0.00	8.16	8.16	0.196
1100	O	6137	47	100%		6171	7.47	46	1.250"	2150	0.00		1870	0.410	42.15	0.00	9.84	9.84	0.233
1200	O	6116	47.5	100%		6137	7.72	47	1.250"	2440	0.00		2160	0.290	42.57	0.00	6.96	6.96	0.163
1300	O	6095	47.5	100%		6137	7.97	47	1.250"	2930	0.00		2550	0.390	43.25	0.00	9.36	9.36	0.216
1400	O	6081	48	100%		6137	7.97	47	1.250"	3210	0.00		2930	0.380	43.01	0.00	9.12	9.12	0.212
1405						DECREASE SEPARATOR PRESSURE TO APPROXIMATELY 4700 K-PA.													
1425						ENGAGE 1.250" O/P													
1600	O	4647	48.5	100%		4654	16.43	48	1.250"	4420	0.00		4140	1.210	52.67	0.00	14.52	14.52	0.276
1800	O	4654	48	100%		4654	15.94	47	1.250"	5895	0.00		5415	1.275	52.00	0.00	15.30	15.30	0.294
2000	O	4654	48	100%		4689	15.19	46.5	1.250"	6725	0.00		6445	1.030	51.04	0.00	12.36	12.36	0.242
2200	O	4702	48.5	100%		4723	14.44	48	1.250"	100 1225	0.00		9 1125	1.125	49.79	0.00	13.50	13.50	0.271
2400	O	4723	48	100%		4758	14.44	47.5	1.250"	2390	0.00		2290	1.165	50.06	0.00	13.90	13.90	0.279

OPERATOR: S. KUNAC

0093

WELL: MOOMBA # 64

TYPE OF TEST: SINGLE RATE



SANTOS LTD.

WELL TEST DATA SHEET

DATE: 16/3/91

PAGE No: 6 OF 10

DATE TIME	WELLHEAD					GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS				
	CASING	TUBING	TEMP.	CHOKE	B.S.W.	PI	HW	TEMP.	ORIFICE	TANK	TANK	API	TANK	TANK	GAS	OIL	WATER	TOTAL	L.G.R.
	KPA	KPA	°C	SIZE	%	KPA	KPA	°C	SIZE	DP	PROD	GRAVITY	DP	PROD	FLOW	FLOW	FLOW	FLOW	M3/M3
				INS.					INS	LITRE	M3	@60 °F	LITRE	M3	RATE	RATE	RATE	RATE	
16/3/91																			
0200	0	4792	48	100%		4758	13.94	47	1.250"	3445	0.00		3345	1.055	49.25	0.00	12.66	12.66	0.257
0400	0	4792	48	100%		4758	13.70	47	1.250"	4475	0.00		4375	1.030	48.80	0.00	12.36	12.36	0.253
0600	0	4805	48	100%		4792	13.45	46.5	1.250"	5600	0.00		5500	1.125	48.62	0.00	13.50	13.50	0.278
0800	↑	4805	48.5	↑		4792	13.45	46.5	1.250	6650	0.00		6550	1.050	48.62		12.60	12.60	0.257
1000		4792	49.5			4758	13.94	48.5	1.250	50/1150	0.00		0/1100	1.100	49.06		13.20	13.20	0.269
1200		4792	50.5			4758	14.44	50	1.250	2240	0.00		2190	1.09	49.74		13.08	13.08	0.263
1200						CHANGE O.P. TO 1.000"													
1400		4737	51			4723	35.11	50	1.000	3350	0.00		3300	1.11	49.15		13.32	13.32	0.271
1415						P.O.H TO SERVICE AMERADAS													
1501						IN LUBRICATOR													
1523		4737	50.5			DEPRESSURE LUBRICATOR													
1600		4737	50.5			4758	35.36	49.5	1.000	4450	0.00		4400	1.10	49.59		13.20	13.20	0.266
1720						PRESSURE UP LUBRICATOR													
1750		4723	50			R.I.H													
1800		4723	49.5			4689	35.11	48.5	1.000	5500	0.00		5450	1.05	49.13		12.60	12.60	0.256
1839						HANG GAUGES AT 7760' UG													
2000		4689	49			4654	34.86	48	1.000	6600	0.00		6550	1.10	48.81		13.20	13.20	0.270
2200	Y	4689	50	Y		4654	33.86	49	1.000	300/1315	0.00		0/1075	1.075	47.99		12.90	12.90	0.269
2400	0	4702	49.5	100%		4654	32.87	48	1.000	2470	0.00		2170	1.095	47.39	0.00	13.14	13.14	0.277

OPERATOR.....

0094

TYPE OF TEST:.....SINGLE RATE.....



SANTOS LTD.

WELL TEST DATA SHEET

DATE: 17/3/91

PAGE No: 7 OF 10

[illegible]

OPERATOR.....

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WELL: MOOMBA No. 64.....						SANTOS LTD. WELL TEST DATA SHEET										DATE: 17/3/91.....			
TYPE OF TEST: SINGLE RATE.....						PAGE No: 8 OF 10.....													

DATE TIME	WELLHEAD					GAS FLOW DATA				OIL/CONDENSATE PRODUCTION			WATER PRODUCTION		WELL TEST RESULTS				
	CASING	TUBING	TEMP.	CHOKE	B.S.W.	PI	HW	TEMP.	ORIFICE	TANK	TANK	API	TANK	TANK	GAS	OIL	WATER	TOTAL	L.G.R.
	KPA	KPA	°C	SIZE INS.	%	KPA	KPA	°C	SIZE INS.	DP LITRE	PROD M3	GRAVITY °80 °F	DP LITRE	PROD M3	FLOW RATE M3/D	FLOW RATE M3/D	FLOW RATE M3/D	FLOW RATE M3/D	
0400	0	8936		S/1															
0415	↑	8929		↑															
0430		8929																	
0445		8943																	
0500		8964																	
0600		9019																	
1000		9164																	
1400		9212																	
1800		9232																	
2200		9246																	
18/3/91																			
0200		9260																	
0600		9274																	
1000		9288																	
1400		9301																	
1800		9308																	
2200		9315																	
19/3/91																			
0200	✓	9322		✓															
0600	0	9322		S/1															

OPERATOR.....

9600

WELL: MOOMBA No. 64 TYPE OF TEST: SINGLE RATE						SANTOS LTD. WELL TEST DATA SHEET										DATE: 19/3/91 PAGE No: 9 OF 10				
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 KPA	TEMP. °C	ORIFICE SIZE INS.	TANK DP LITRE	TANK PROD M3	API GRAVITY °60 °F	TANK DP LITRE	TANK PROD M3	GAS FLOW RATE E3/M3/D	OIL.. FLOW RATE M3/D	WATER FLOW RATE M3/D	TOTAL LIQUID FLOW RATE M3/D	L.G.R.	
1000	0	9322		S/1																
1400	↑	9357		↑																
1800		9350																		
2200		9350																		
20/3/91																				
0200		9350																		
0600		9350																		
1000		9357																		
1400		9357																		
1800		9363																		
2200		9363																		
21/3/91																				
0200		9363																		
0600		9363																		
0615		9370				P.O.O. H														
0707						ARRIVE IN LUBRICATOR														
0905		9377				CLOSE SWAB & DEPRESSURE. LUBRICATOR														
0910						UNSTAB LUBRICATOR & REDRESS AMERADAS FOR STATIC GRADIENT SURVEY WITH 3HR CABLES														
1044	↑	9377		↑		STAB LUBRICATOR ON WELLHEAD														
1047	0			S/1		OPEN SWAB VALVE & PRESSURE UP LUBRICATOR. HANG IN LUBRICATOR														

OPERATOR.....

0097

TYPE OF TEST:.....SINGLE RATE.....



WELL TEST DATA SHEET

DATE: 21/3/91.....

PAGE No:.....10 OF 10.....

[illegible]

OPERATOR.....

897

WELL NAME: MOOMBA No. 64

STATIC GRADIENT SURVEY

DATE: 21/3/91

TOP
BOMB No. 1 DATA

ELEMENT No. 53563 ELEMENT RANGE: 0-5000 PSI
RECORDER No. 46680 CLOCK DATA: 687 - 3HR SP
ENGAGE SYLUS: 1028 HR 21/3/91 DISENGAGE: 1356 HR 21/3/91

MIDDLE
BOMB No. 2 DATA

ELEMENT No. 52582 ELEMENT RANGE: 0-5000 PSI
RECORDER No. 73358 CLOCK DATA: 18548 - 3HR SP
ENGAGE SYLUS: 1026 HR DISENGAGE: 1353 HR

1360 1361
LUBRICATOR DATA

PRESSURE WITH D.W.T.: 9377 kPa, 9384 kPa
TIME PRESSURED: 1047 HR, 21/3/91
TIME DEPRESSURED: 1332 HR, 21/3/91

DATE	TIME	DEPTH'	DEFLECTION	PRESSURE TEMP.	GRADIENT psi/ft	DEPTH'	DEFLECTION	PRESSURE TEMP.	GRADIENT psi/ft	REMARKS
21/3/91										
	1107	LUB	0.5092	1346.14	0	LUB	0.5188	1370.39	0	SITHP (DWT) 1360 PSIG
	1127	1000	0.5250	1387.95	0.0424	1000	0.5339	1409.89	0.0401	
	1138	2000	0.5409	1430.03	0.0421	2000	0.5481	1447.02	0.0371	
	1149	3000	0.5545	1466.02	0.0360	3000	0.5610	1480.76	0.0337	
	1201	4000	0.5699	1506.78	0.0408	4000	0.5728	1511.62	0.0309	
	1213	5000	0.5828	1540.92	0.0341	5000	0.5832	1538.82	0.0272	
	1223	6000	0.5965	1577.18	0.0363	6000	0.5935	1565.76	0.0269	
	1233	7000	0.6089	1609.99	0.0328	7000	0.6038	1592.70	0.0269	
	1240	7500	0.6152	1626.67	0.0334	7500	0.6079	1603.42	0.0214	
	1253	7760	0.6217	1643.87	0.0662	7760	0.6122	1614.67	0.0433	
	1332	LUB	N/A			LUB	0.5175	1366.99	0.0320	SITHP (DWT) 1361 PSIG

N.B. MIDDLE BOMB DATA IS INCORRECT -
SUSPECT WELL FLUID INVASION OF
RECORDING SECTION.

General Comments:

0100



WIRELINE REPORT

0101

WELL: Moomba #64

DATE: 10-3-91

PROGRAM: Single Rate Flow and BuildUp

PURPOSE OF WORK: Dummy Run

REPORT OF WORK PERFORMED:

0846 Pressure Up Lubricator
0855 Run In Hole with 1.75" Gauge Ring
0953 Tag PBTD @ 8421' KB and P.O.O.H.
1100 Arrive in Lubricator and Depressure

String free of Obstructions.

Anthony M. Hirst
OPERATOR'S SIGNATURE

WORK PERFORMED BY: T. Hirst OF OilServ

WELL DATA:

Tubing Size: 2 7/8" FWHP: 3751 kpa SIWHP: N/A

Sub Surface S.V./Landing Nipple @ S.S.D. @ 7639.35 & 7720.12

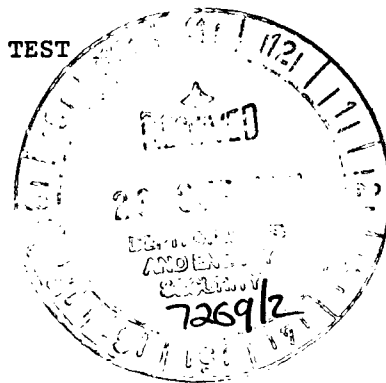
"X" Nipple @ "N"/"XN" Nipple @ 7917.68 other

Min I.D. 2.313 @ 7639.35 & 7720 Packer @ 7681.82 & 7906.00

Perforated Interval: 7791 - 7877' KB

Forward to: Petroleum Engineering — Adelaide
Production Department — Moomba

SANTOS LTD.
PETROLEUM DEVELOPMENT DEPARTMENT
A.C.N. 007 550 923
MOOMBA 64
TOOLACHEE UNIT 'C'
PRE-FRAC SINGLE RATE FLOW AND BUILDUP TEST
17TH-24TH AUGUST 1990
AND
POST-FRAC SINGLE RATE FLOW AND BUILDUP TEST
3RD TO 17TH OCTOBER, 1990
Report: RE:049/91
Author: J. Karageorgos/R. Leslie
Date: August, 1991



8050N(1)



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Up front knowledge of fracture techniques and longer term production data are required to evaluate the productivity of the low permeability reserves and the associated recovery factors in Moomba and Big Lake. Almost 50% of the gas contained in Moomba, Moomba North and Big Lake is in the low permeability layers. Moomba 64 was one of the seven wells included as a low permeability connection in the 1990 Firm Budget.

Moomba 64 was drilled in January/February, 1990 to appraise the lateral extent of the Toolachee Unit 'C', Daralingie 79-7, 80-8 and Epsilon 84-2, 84-7 gas sands. A number of DST's and RFT's were performed to appraise each formation and to evaluate completion proposals.

DST 1 was conducted over the Toolachee Unit 'C' and flowed gas at a rate of 2.2 MMscf/d at 435 psia FTHP. DST 2 was conducted over the Epsilon sands and flowed gas at a rate of 0.175 MMscf/d at 50 psia FTHP. DST 3 was conducted over the Daralingie sands and flowed gas at a rate of 4.85 MMscf/d at 875 psia FTHP. DST 4 was a misrun and DST 5 was RTSTM.

The well was only completed over the Toolachee Unit 'C' during August 1990 in readiness for the fracture stimulation.

Also during August 1990, prior to the well coming on-line, a pre-frac single rate and build-up test was performed in order to determine reservoir parameters of the Toolachee Unit 'C' for use in fracture design.

The pre-frac single rate and build up test was uninterpretable due to cross-flow effects.

During September 1990 the well was fracture stimulated. A total of 140,000 lbs of 20/40 Carbolite and 36,000 lbs of 16/20 Carbolite was pumped with Versagel HT1600/HT1500 fluid.

In October 1990, a post-frac single rate and build-up test was run to determine the success of the fracture and to obtain values of reservoir pressure, kh, skin and well deliverability.

The well came online in October 1990 at 3.9 MMscf/d at 1230 psia FTHP at 20% choke. The choke wasn't removed until the end of November 1990 where it flowed 3.2 MMscf/d at 580 psia FTHP at 100% choke.

0105

In February 1991, the well was recompleted as a tandem producer and the Upper and Lower Daralingie were perforated in June 1991.

This report presents the results and conclusions arising from the Pre-Frac and Post-Frac tests on Moomba 64, Toolachee Unit 'C'.

The results from the pre-frac and post-frac tests are summarised below.

	PRE-FRAC TEST	POST-FRAC TEST
KB	110'	110'
Date	August, 1990	October, 1990

RESERVOIR PARAMETERS

flow Capacity (md-ft)	N/A	190
permeability (md)	N/A	3.8
apparent skin	N/A	-0.82
true skin	N/A	N/A
flowrate (MMscf/day)	2.15	2.8
FTHP (psia)	430	1005
condensate (bbls/MMscf)	0.84	0.9
water (bbls/MMscf)	16.24	40.3
gauge depth ('KB)	7920	7920
depth MPP ('KB)	7833	7833
datum ('KB) (7750'SS)	7860	7860
extrapolated pressure (psia)	N/A	2041
reservoir pressure MPP (psia)	N/A	2004
reservoir pressure datum (psia)	N/A	2016
cumulative production (Bcf)	-	-

RESERVOIR GEOMETRY

model type	N/A	Well bore storage and skin
well bore storage coefficient	N/A	115.9

a) Pre-Frac Single Rate and Build-Up Test

The pre-frac test was uninterpretable due to large cross flow effects.

b) Post-Frac Single Rate and Build-Up Test

The increase in gas rate from 2.15 MMscf/d at FTHP of 430 psia to 2.8 MMscf/d at FTHP of 1005 psia indicates that the fracture stimulation was partially successful although the fracture was not evident from the test.

There may be crossflow effects masking the fracture, where the tighter 75-8, 76-1, 76-4 sands are feeding the more permeable 76-2 sand (Figure 2).

The water/gas ratio increased from 16.2 to 40.3 bbls/MMscf once the well was fracture stimulated. The increase in water/gas ratio may be partially responsible for the poorer than expected fracture success. The well has continued to perform poorly with the water/gas ratio increasing to approximately 70 bbls/MMscf in January, 1991 and declining to 45 bbls/MMscf in March, 1991. The likely source is the Toolachee Unit 'C' water contaminated with recompletion fluid from the February, 1991 workover as well as mud filtrate and/or frac fluid.

All flank wells should be reviewed carefully before a fracture stimulation decision is made due to a possibility of producing formation water.

- a. The pressure buildup test conducted in March 1991 should be analysed which may show better fracture behaviour since the well will have had more time to clean up.
- b. An LET should be run in August, 1991, complete with all fluid samples.
- c. Review future water analysis and meter run Rw's to determine if formation water is being produced.

a) General

The pre-frac and post-frac single rate and build-up tests were analysed using the ECL WELTEST computer package.

The geological data of the tested interval is contained in Figure 2.

Compositional data from Moomba South Toolachee was used in the test (Appendix C1).

b) Pre-Frac Single Rate and Build-Up Test

The pre-frac test began on 17th August, 1990, where the well was flowed for 59 hours at 2.15 MMscf/d and shut-in for 68 hours for the final buildup. The pressure data (bomb hung at 7920'KB) from the final shut-in was analysed for reservoir parameters. This test is uninterpretable due to crossflow effects (Appendix A1).

c) Post-Frac Single Rate and Build-Up Test

The post-frac test began on 3rd August 1990, where the well was flowed for 119 hours at 2.8 MMscf/d and shut-in for 75.58 hours for the final build-up. The pressure data (bomb hung at 7920'KB) from the final shut-in was analysed for reservoir parameters (Appendix B).

Various hydraulic fracture models were used in an attempt to model this post-frac test but were unsuccessful as the log-log plot (Appendix B1) shows no significant indication that a fracture actually exists. Thus a wellbore storage model was used to match the data (Appendices B2 and B3).

Looking at the log-log plot, no linear flow regime is seen as there may be crossflow effects masking the fracture. Sand 76-2 is depleted at a pressure of approximately 1640 psig while the other sands 75-8, 76-1, 76-4 are at a pressure at approximately 2980 psig, 3340 psig and 3560 psig respectively. It may be possible that these tighter sands are feeding the more permeable layer.

A pressure build-up test conducted in March, 1991 will be analysed and may show better fracture behaviour since the well has been on-line since November, 1990 and will have had more time to clean up. 0110

A reservoir pressure of 1872 psia (7920'KB) was extrapolated from the last few pressure points on the Horner time plot (Appendix B3) but is less than the pressure obtained from the static gradient of 2041 psia (7920'KB). This was due to the well not having enough time to build up and would be expected with the presence of high pressure sands. A pressure of 2041 psia at 7920'KB could be considered a conservative average reservoir pressure for the perforated interval in Moomba 64.

The water/gas ratio increased from 16.24 bbls/MMscf to 40.3 bbls/MMscf once the well was fracture stimulated. This increase in water/gas ratio may also be partially responsible for the poorer than expected fracture success. LET's performed in November 1990 and January 1991 indicate that the water/gas ratio increased to 71.2 bbls/MMscf and 68.8 bbls/MMscf respectively. In March, 1991 the water/gas ratio was 45 bbls/MMscf.

Water analyses from August, 1990 to March, 1991 indicate that the water being produced is probably formation water from the Toolachee Unit 'C' but is contaminated by the recompletion fluid from the February, 1991 workover (Appendix C2). The stiff diagrams and resistivity values fluctuate with time. Recompletion fluid as well as mud filtrate and/or frac fluid is still being produced (see March, 1991 stiff diagram) as it is postulated that the fluids may have travelled a considerable distance from the wellbore along the high permeability streak in the 76-2 sand. Future analyses will continue to be reviewed. An LET should be run as soon as possible and gas and water samples should be taken.

The bottom perforation in Moomba 64 is 77 feet above the field average gas water contact in the Toolachee Unit 'C'. As it is along the flank the fracture may have intersected the original gas water contact. More likely though is that formation water has travelled up a high permeability streak in the depleted 76-2 sand (1637 psig RFT). Since this condition could possibly exist in any flank well they should be reviewed carefully before a fracture decision is made.

6. TABLES

WELL: MCOMBA 64

KB: 110'
MPP: 7833'

DRILLED: Jan/Feb 1990

COMPLETED:

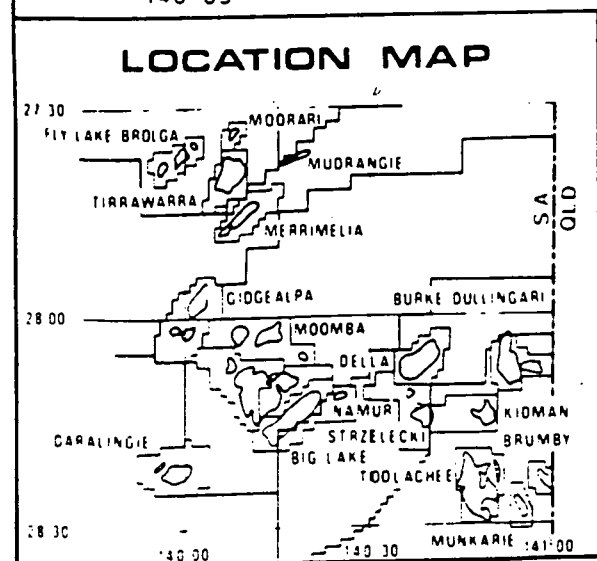
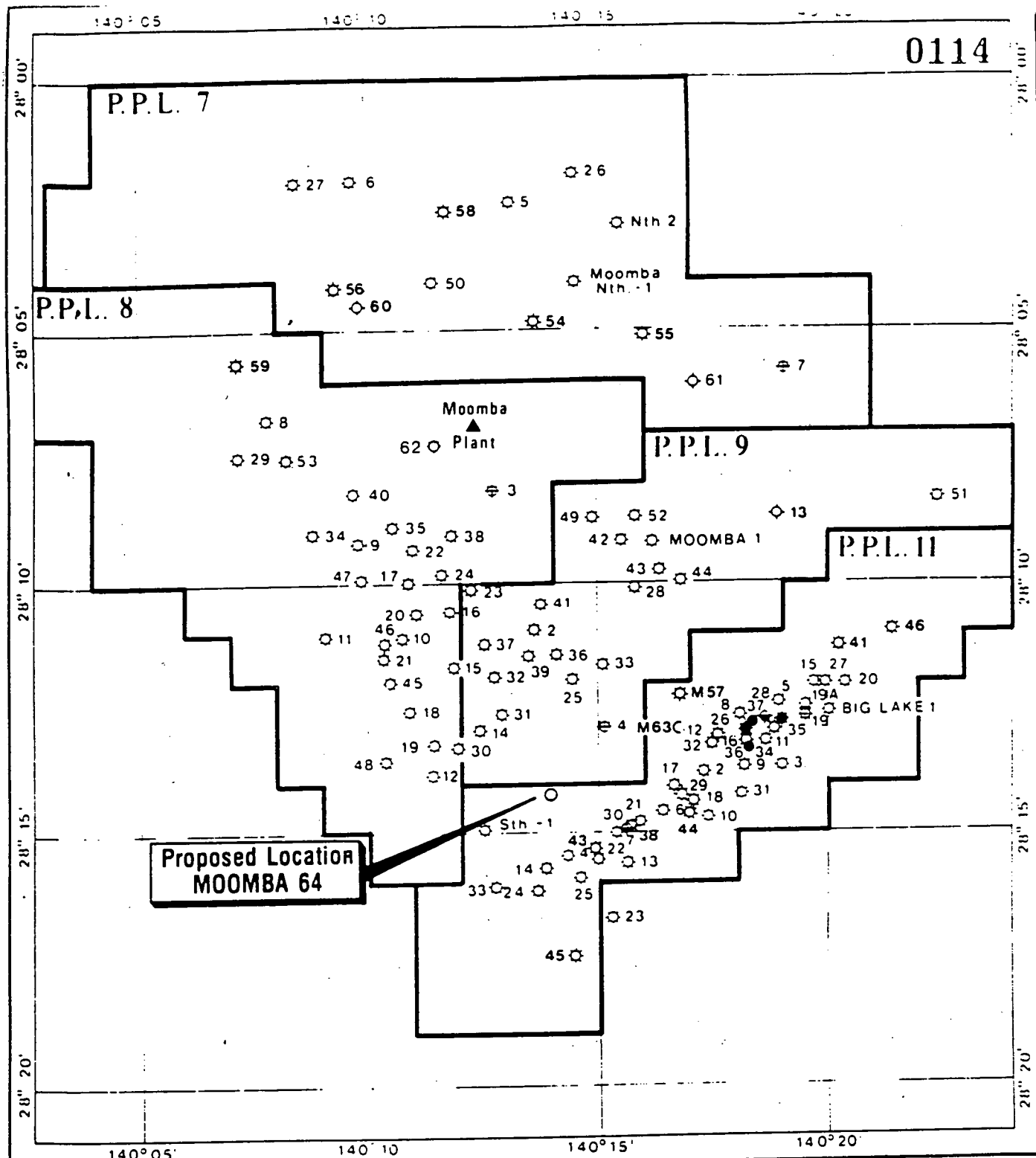
ON-LINE: October 1990

DATE	TEST	FORM ^N	INTER 'KB	PERFS 'KB	DATUM 'KB	$\bar{P}$ psia	z	P/z psia	kh mD-ft	h ft	k mD	s'	q MMscf/d	FIHP psia	Gp Bcf	P/z OGIP Bcf
16/2/90	DST 1	Tool C	7770 -7863' KB-DR	—	—	—	—	—	—	—	—	—	2.2	435	—	—
19/2/90	DST 2	Epsilon	8370' -8421' KB-DR	—	—	2662 at 8347' KB-DR	—	—	6.4	—	0.6	—	0.175	50	—	—
23/2/90	DST 3	Dara Beds	8132' -8170' KB-DR	—	—	2392 at 8143' KB-DR	—	—	748.2	—	74.8	20.3	4.83	875	—	—
25/2/90	DST 4	Tool	7638' -7666' KB-DR	—	—	—	—	—	—	—	—	—	misrun	—	—	—
25/2/90	DST 5	Tool	7636' -7664' KB-DR	—	—	—	—	—	—	—	—	—	RTSTM	0-100	—	—
Aug 90	Pre-Frac SRT BU	Tool C	7791- 7877' KB	7791-7803 7809-7824 7829-7842 7852-7877	7860	N/A	—	—	N/A	50	N/A	N/A	2.15	430	—	—
Oct 90	Post-Frac SRT BU	Tool C	7791' -7877' KB	7791-7803 7809-7824 7829-7842 7852-7877	7860	2016	—	—	190	50	3.8	-0.82	2.8	1005	—	—

Table 1

0112

7. FIGURES



SANTOS LIMITED

MOOMBA/BIG LAKE FIELDS

MOOMBA 64

LOCATION MAP

SCALE 1:200 000

0 1 2 3 4 5 6 7 8

KILOMETRES

Fig. 1

FIGURE 2 (1)

Moomba #64
MSFL-SLS Log
KB 110'

DST 4: 7638-7666 (Lgr.)
MORC (Coker Col.)

DST 5: 7636-7664 (Lgr.)
GTS @ RTSTM
WTS @ 170 BPD
Rec: 4970' GCW
(RW = 1.41 @ 74°F)

0115

Toolachee

7607'
(-7497')

74-2.5

74-4

75-2

75-4

75-8

8' 11.6%
w 31.8%

76-1

13' 13.7%
w 28.8%

76-2

10' 10.2%
w 49.5%

7800

7700

7800

Toolachee

Coal 7634'
(-7524')

NBU 23' H to
prognosis

3299 psig

NBU
NBU

DST 1: 7776-7869 (Lgr.)
GTS @ 2.2 MMCFD
Rec: Lost.

2985 psig

2971 psig

3336 psig

1637 psig

1638 psig

3560 psig

3481 psig

Todochee fm
KB 110'

75-8 → 8

76-1 → 13

76-2 → 10

76-4
NP 7'
Ø 12.2%
Sw 31.0%

76-5
NP 12'
Ø 10.7%
Sw 36.9%

76-8 →

77-0 →

77-1
NP 7'
Ø 8.7%
Sw 56.0%

79-4.5 →

79-7 →

7800

7900

8000

9

Sands perforated
prior to fracture
stimulation.

Tool C 75-8
76-1
76-2
76-4

Sands perforated
after fracture
stimulation

Data 79-4
79-7
LDB 80-3

$$\phi_{ave} = 0.12$$

$$S_{w,ave} = 0.3$$

$$h = 50 \text{ feet}$$

2985 psig
2971 psig

3336 psig

1637 psig
1638 psig

3560 psig

3481 psig
GWC @
-7844'
(7954')

Daralingie
7941' (-7831'
60' H
to prog.

3640 psig

Corralingie Basin
MSFL-SLS Log.
KB 110'

0117

60'H to
prog.

3515 psig

3640 psig

DST 3: 8132'-8170' (Lgr.)
GTS @ 4.7 MMCFD
Rec: Lost.

1915 psig

2344 psig

48'H
to prog.

19-4.5
NP 14'
Ø 11.9%
Sw 23.6%

79-7
NP 23'
Ø 7.1%
Sw 39.9%

80-8
NP 10'
Ø 11.6%
Sw 36.2%

Roseneath
Sh.
8166'
(-8056')

8000

8100

8200

3

Moomba # 64
Epsilon Fm
MSFL-SS Log
KB 110'

DST 2: 8372'-8423' (Lgr.)
GTS @ 0.177 MMCFD
Rec: Lost

Epsilon
8402'
(-8292')

84-2
NP 11'
Ø 8.9%
Sw 47.2%

84-7
NP 5'
Ø 9.9%
Sw 26.3%

28' H to

prog.
2626 psig
2650 psig

Core 1: 8401'-8423'
Cut 22' (Lgr)
Rec: 20'6" (94%)

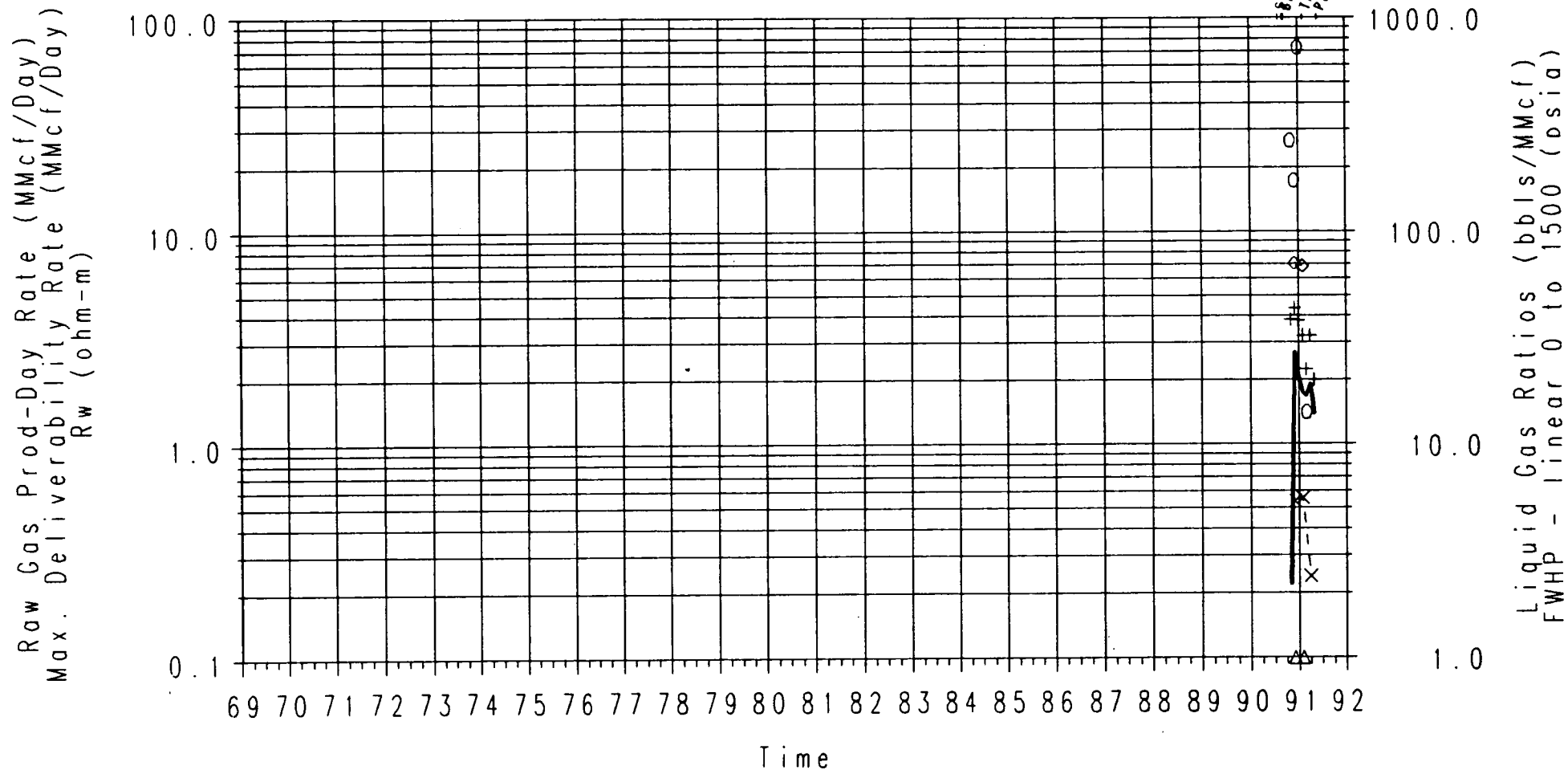
3890 psig

3x S/F

8500

8600

MOOMBA
S. CENTRAL
WELL # 064



SANTOS

KEY : Δ CGR $\diamond$ WGR + Deliv x R_w o FWHP

18:49 09/07/91

FIGURE 2
6110

8. APPENDICES

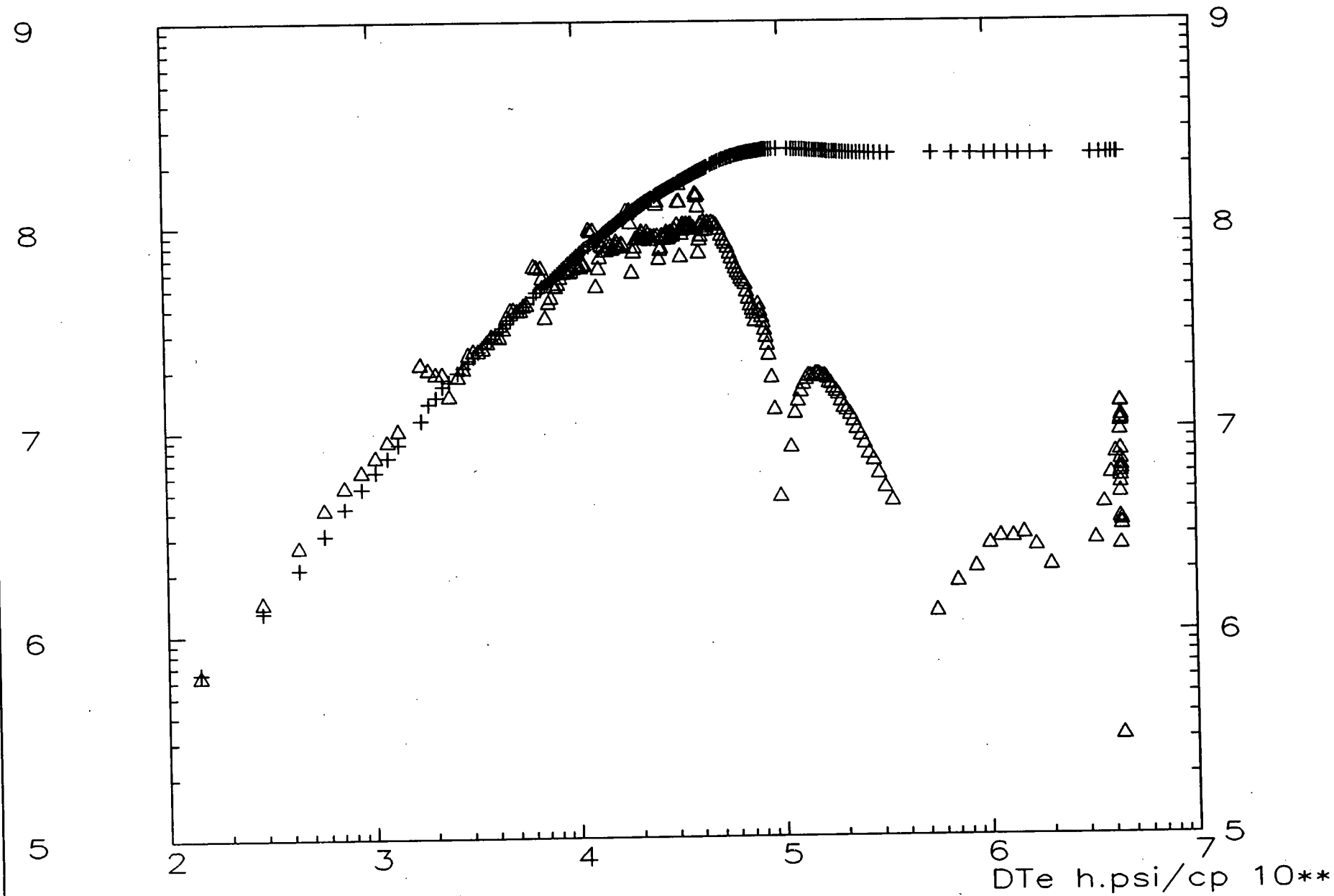
A1. PRE-FRAC SINGLE RATE AND BUILDUP ANALYSIS

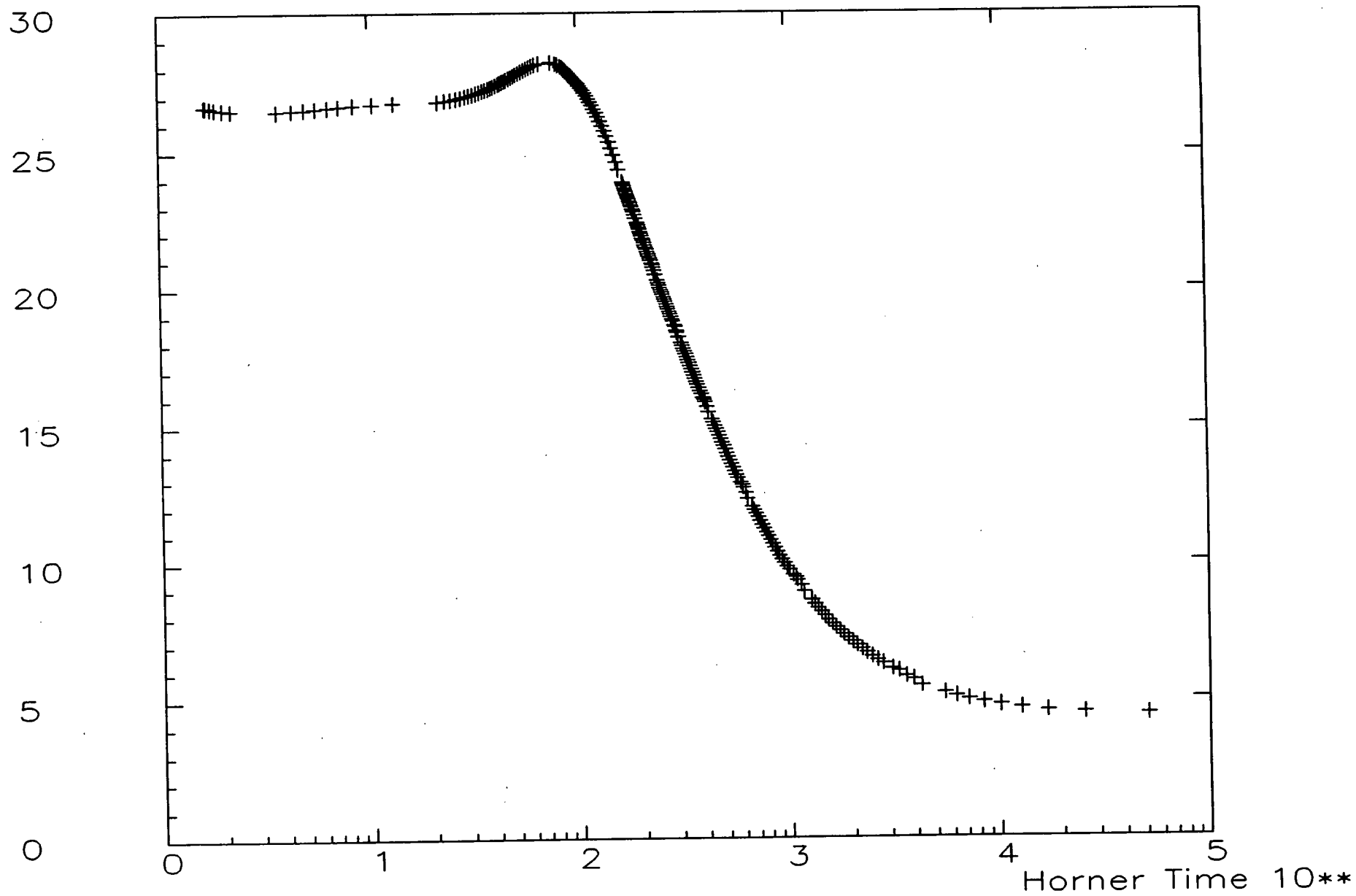
MOOMBA

Test 1 (17 AUG 1990)

DP psi2/cp 10**

Derivative P psi2/cp 10**



$P \text{ psi}^2/\text{cp} \times 10^{**7}$ 

A2. WELLTEST DATA

PARAMS

```

'FIELDNAM' 'MOOMBA
'WELLNAME' 'MOOMBA 64
'TESTNUM' 1 /
'TESTDATE' 17 8 1990 /
'PHASE' 'GAS /
'ANALYSIS' /
'UNITCONV' 'FIELD /
'NUMWELLS' 1 /
'NUMLAYER' 1 /
'NUMPOINT' 2000 /
/

```

PVTGAS 'FIELD '

```

'TRES' 264.2000 /
'TSTD' 60.00000 /
'PSTD' 14.70000 /
'TIMECALC' 'PSEUDO' /
'TABLE'
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400.0000 0.980400 0.014710
600.0000 0.971840 0.014970
800.0000 0.964190 0.015320
1000.000 0.957520 0.015550
1200.000 0.951870 0.015770
1400.000 0.947310 0.016080
1600.000 0.943850 0.016430
1800.000 0.941510 0.016810
2000.000 0.940300 0.017200
2200.000 0.940200 0.017580
2400.000 0.941190 0.017980
2600.000 0.943220 0.018370
2800.000 0.946270 0.018770
3000.000 0.950260 0.019200
3200.000 0.955140 0.019670
3400.000 0.960860 0.020150
3600.000 0.967340 0.020620
3800.000 0.974540 0.021100
4000.000 0.982380 0.021570
4200.000 0.990820 0.022050
4400.000 0.999800 0.022520
4600.000 1.009280 0.023020
4800.000 1.019210 0.023510
5000.000 1.029550 0.024010
/

```

WELPROP 'FIELD '

```

'RADIUS' 0.354000 /
'THICKNES' 50.00000 /
'PORO' 0.120000 /
'ROCKCOMP' 0.451E-05 /
'WATSAT' 0.300000 /
'WATCOMP' 0.432E-05 /
/

```

PRESSURE 'FIELD '

-- MOOMBA

Test 1 (17 AUG 1990)

'UNITS' 'Hours ' 'psia ' /

'DATA'

0126

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60.5050000	812.3089
60.5070000	818.1525
60.5090000	825.5964
60.5110000	834.7677
60.5130000	844.7873
60.5150000	854.6283
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60.5190000	874.8127
60.5210000	885.7889
60.5260000	909.1670
60.5280000	926.8246
60.5300000	935.1059
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60.6340000	1397.782
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60.7300000	1677.925
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60.7370000	1693.469
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60.7410000	1701.227
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60.7450000	1709.927
60.7470000	1714.054
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60.7610000	1743.193
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60.7760000	1771.516
60.7790000	1778.061
60.7810000	1783.627
60.7820000	1786.864
60.7840000	1788.994

60.7870000	1794.330
60.7890000	1797.688
60.7910000	1801.470
60.7930000	1805.270
60.7950000	1808.897
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60.7990000	1815.886
60.8010000	1819.588
60.8030000	1823.279
60.8050000	1826.703
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60.8150000	1844.008
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60.8190000	1850.587
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60.8260000	1861.301
60.8280000	1866.813
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60.8840000	1949.760
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60.9240000	1995.648
60.9320000	2003.195
60.9400000	2010.046
60.9480000	2016.448
60.9560000	2022.386
60.9640000	2027.906
60.9720000	2033.054
60.9800000	2037.902
60.9880000	2042.538
60.9960000	2046.839
61.0040000	2051.057
61.0120000	2054.933
61.0200000	2058.382
61.0280000	2061.565
61.0360000	2064.439
61.0440000	2067.204
61.0520000	2069.743
61.0600000	2072.003
61.0680000	2074.893
61.0760000	2077.595
61.0840000	2080.016
61.0920000	2082.301
61.1000000	2084.365

61.1080000	2086.241
61.1160000	2087.959
61.1240000	2089.463
61.1400000	2091.986
61.1560000	2093.735
61.1880000	2095.404
61.2680000	2093.838
61.3000000	2091.911
61.3240000	2090.149
61.3480000	2088.293
61.3720000	2086.264
61.3960000	2084.204
61.4200000	2082.081
61.4440000	2079.983
61.4680000	2077.999
61.4920000	2076.037
61.5160000	2074.061
61.5400000	2072.195
61.5640000	2070.358
61.5880000	2068.658
61.6120000	2066.904
61.6360000	2065.357
61.6600000	2063.840
61.6920000	2061.946
61.7240000	2060.222
61.7560000	2058.562
61.7880000	2057.034
61.8280000	2055.381
61.8680000	2053.823
61.9160000	2052.083
61.9640000	2050.514
62.0200000	2048.896
62.0840000	2047.285
62.1480000	2045.818
62.2280000	2044.335
62.3160000	2042.841
62.4220000	2041.369
62.5580000	2039.870
62.7280000	2038.397
64.1900000	2036.940
65.2540000	2035.352
66.4990000	2033.857
67.6610000	2032.395
68.7400000	2030.942
70.2340000	2029.455
71.8110000	2027.934
73.8860000	2026.472
77.2060000	2025.015
97.1260000	2026.500
104.347000	2027.958
112.398000	2029.433
118.789000	2030.911
125.844000	2032.382
125.927000	2032.402
126.093000	2032.381
126.259000	2032.373
126.425000	2032.402
126.669000	2032.417
126.752000	2032.444
126.835000	2032.448
126.840000	2032.449
126.923000	2032.463
127.006000	2032.493
127.089000	2032.516
127.250000	2032.508
127.332000	2032.549

127.499000	2032.510
127.665000	2032.546
127.748000	2032.556
127.831000	2032.572
128.002000	2032.638
128.251000	2032.661
128.334000	2032.667

/
RATE

'FIELD '

'UNITS' 'Hours' 'Mscf/day' /

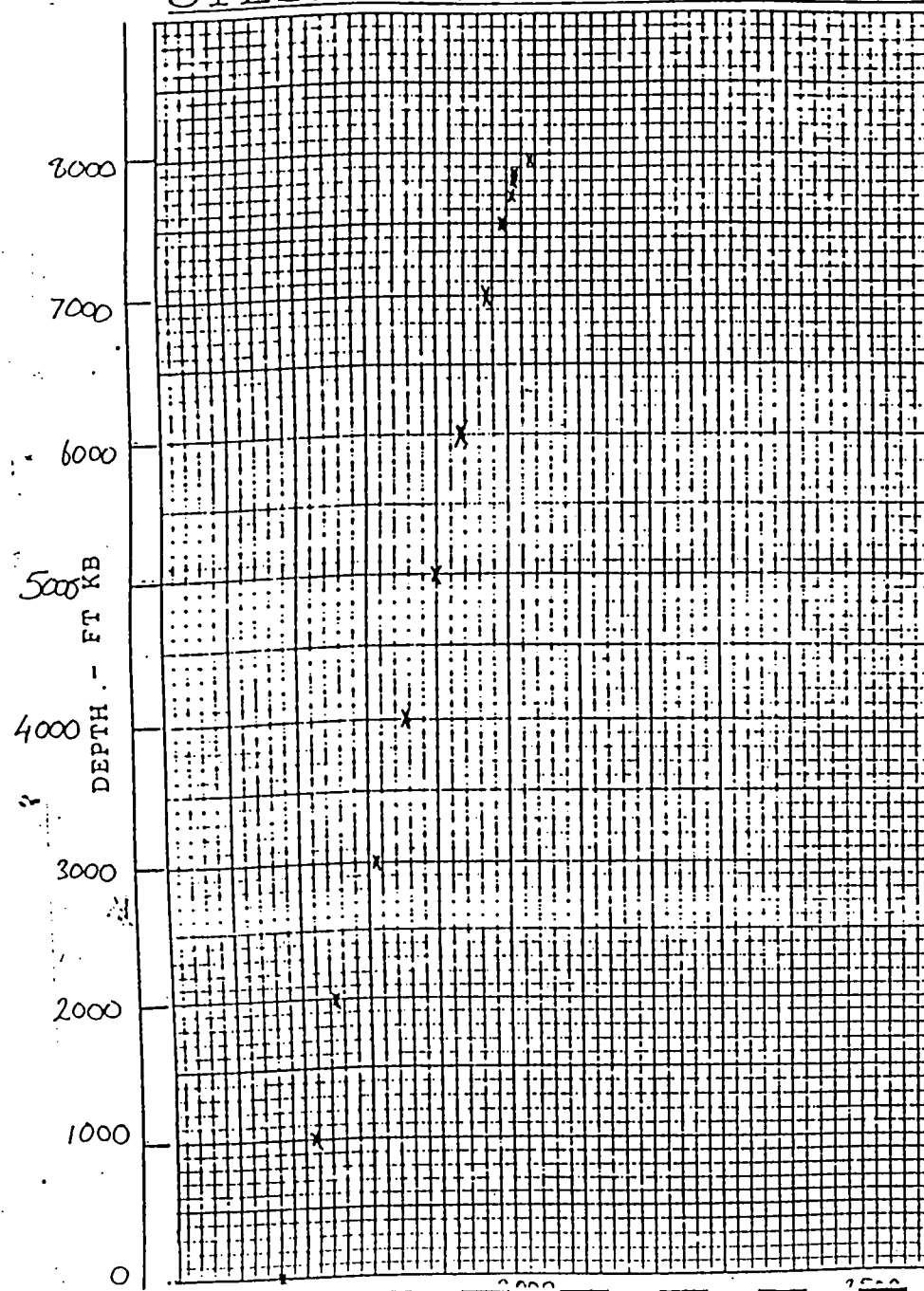
'DATA'

0.00000000	2155.000
60.5030000	0.000000
128.334000	0.000000

/
END

A3. STATIC GRADIENT

OILSERV AUSTRALIA LTD



GRADIENT SURVEY REPORT

TIME	STOP	DEPTH (KB)	PRESSURE (PSIA)	GRADIENT PSI/FT
15.26				
16.30	448	14	1661	0.056
16.53	1	1000	1717	0.05
17.14				
17.24	2	2000	1767	
17.58				
18.16	3	3000	1814	0.047
18.36				
18.56	4	4000	1857	0.043
19.23				
19.42	5	5000	1898	0.041
20.04				
20.20	6	6000	1937	0.039
20.33				
20.50	7	7000	1976	0.039
20.59				
21.14	8	7500	1995	0.038
21.22				
21.38	9	7700	2003	0.04
21.45				
22.10	10	7800	2006	0.03
22.17				
22.33	11	7833	2009	0.09
22.40				
23.05	12	7880	2029	0.425
23.13				
23.38	13	7920	2031	0.05

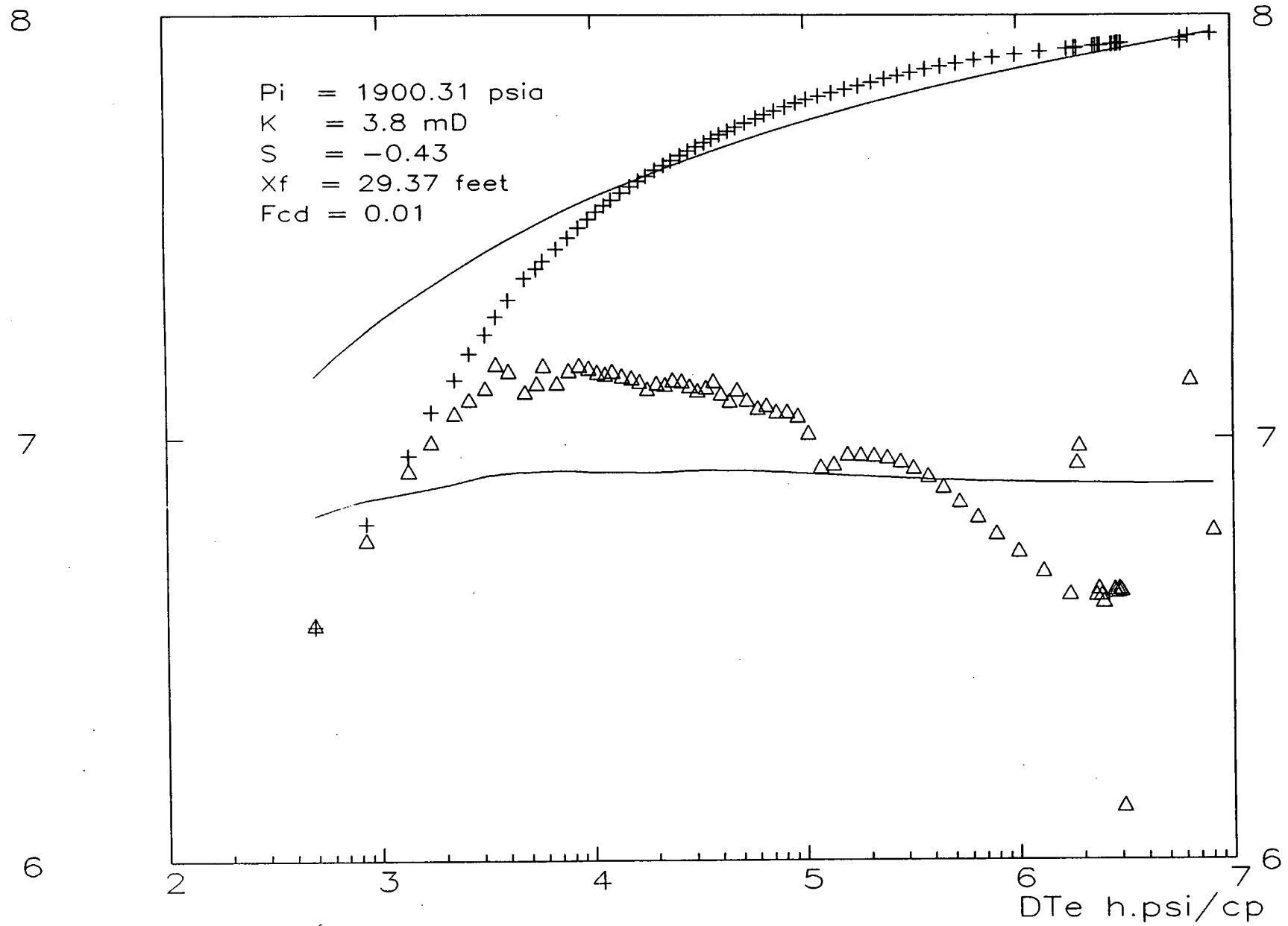
WELL: Moomba # 64

DATE: 17-08-90

**B1. POST-FRAC PRESSURE BUILD-UP ANALYSIS
HYDRAULIC FRACTURE MODEL**

MOOMBA

Test 1 (3 OCT 1990)

DP psi²/cp 10**Derivative P psi²/cp 10**

B2. POST-FRAC MODEL RESULTS
WELLBORE STORAGE AND SKIN

MODEL :
Homogeneous

INNER BOUNDARY :
Wellbore Storage Skin

OUTER BOUNDARY :
Infinite Reservoir

0136

Test Seq: Shut-in 1 len 74 : Fitted 1 to 74 : Total Superposition

Match Accuracy (RMS error) : 8.1 psi : Accuracy achieved

							Range in Optimiser
Initial Reservoir Pressure Pi	:	1921.21	psia	:	1600.0	to	2400.0
Reservoir Permeability k	:	3.8	mD	:	3.8	to	3.8
Total Skin Factor S	:	-0.82		:	-4.0	to	1.0
Cd exp(2S)	:	2.238E+01					
Dim'less Wellbore Storage (Cd)	:	115.91		:	1.0	to	190.0
Wellbore Storage (C)	:	0.02	bbl/psi				

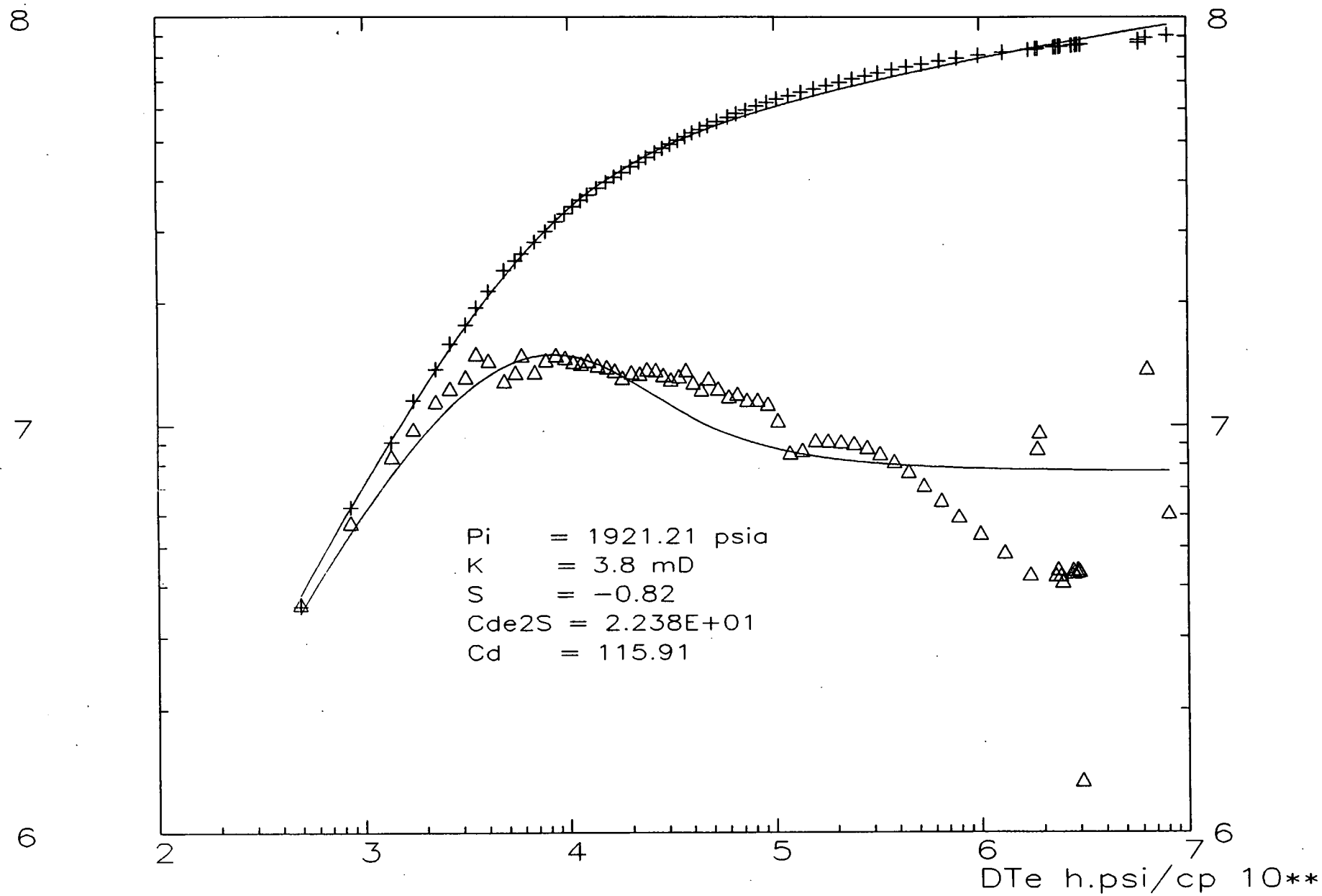
**B3. POST-FRAC PRESSURE BUILD-UP ANALYSIS
WELLBORE STORAGE AND SKIN MODEL**

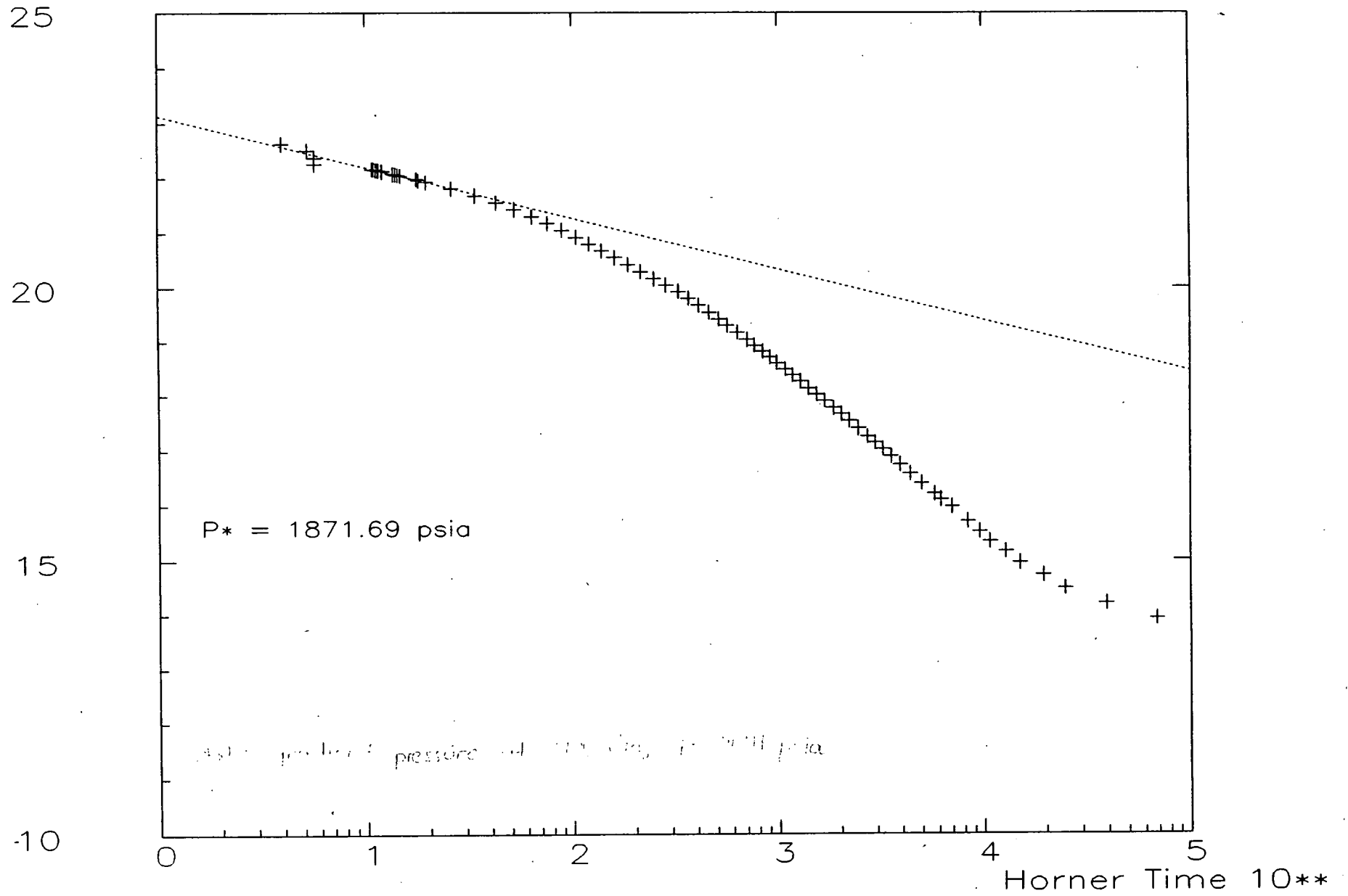
MOOMBA

Test 1 (3 OCT 1990)

DP psi2/cp 10**

Derivative P psi2/cp 10**



$P \text{ psi}^2/\text{cp} \times 10^{**7}$ 

B4 WELLTEST DATA

PARAMS

```

'FIELDNAM' 'MOOMBA
'WELLNAME' 'MOOMBA 64
'TESTNUM' 1 /
'TESTDATE' 3 10 1990 /
'PHASE' 'GAS /
'ANALYSIS' /
'UNITCONV' 'FIELD /
'NUMWELLS' 1 /
'NUMLAYER' 1 /
'NUMPOINT' 2000 /
/

```

PVTGAS 'FIELD '

```

'TRES' 279.1400 /
'TSTD' 60.00000 /
'PSTD' 14.70000 /
'TIMECALC' 'PSEUDO' /
'TABLE'
200.0000 0.989810 0.014500
400.0000 0.980400 0.014710
600.0000 0.971840 0.014970
800.0000 0.964190 0.015320
1000.000 0.957520 0.015550
1200.000 0.951870 0.015770
1400.000 0.947310 0.016080
1600.000 0.943850 0.016430
1800.000 0.941510 0.016810
2000.000 0.940300 0.017200
2200.000 0.940200 0.017580
2400.000 0.941190 0.017980
2600.000 0.943220 0.018370
2800.000 0.946270 0.018770
3000.000 0.950260 0.019200
3200.000 0.955140 0.019670
3400.000 0.960860 0.020150
3600.000 0.967340 0.020620
3800.000 0.974540 0.021100
4000.000 0.982380 0.021570
4200.000 0.990820 0.022050
4400.000 0.999800 0.022520
4600.000 1.009280 0.023020
4800.000 1.019210 0.023510
5000.000 1.029550 0.024010
/

```

WELPROP 'FIELD '

```

'RADIUS' 0.354000 /
'THICKNES' 50.00000 /
'PORO' 0.120000 /
'ROCKCOMP' 0.451E-05 /
'WATSAT' 0.300000 /
'WATCOMP' 0.432E-05 /
/

```

PRESSURE 'FIELD '

— MOOMBA

Test 1 (3 OCT 1990)

'UNITS' 'Hours ' 'psia ' /

0.00000000	3000.000
188.503000	1418.843
188.507000	1437.281
188.510000	1451.290
188.514000	1465.783
188.517000	1478.335
188.521000	1489.934
188.524000	1500.813
188.528000	1510.005
188.531000	1519.281
188.535000	1528.886
188.541000	1542.751
188.546000	1549.392
188.549000	1554.907
188.556000	1564.505
188.563000	1573.500
188.570000	1581.324
188.577000	1588.397
188.584000	1594.648
188.591000	1600.292
188.598000	1605.547
188.608000	1612.626
188.619000	1619.000
188.629000	1624.780
188.640000	1629.861
188.654000	1636.299
188.668000	1641.925
188.682000	1647.262
188.699000	1653.325
188.716000	1658.666
188.734000	1663.820
188.756000	1669.331
188.776000	1674.337
188.798000	1679.392
188.826000	1684.414
188.853000	1689.414
188.891000	1695.851
188.938000	1701.985
188.979000	1707.264
189.032000	1713.026
189.095000	1719.291
189.165000	1725.297
189.242000	1731.206
189.347000	1736.694
189.472000	1742.124
189.621000	1747.904
189.787000	1753.405
189.986000	1759.113
190.210000	1764.639
190.468000	1770.059
190.766000	1775.335
191.153000	1780.961
191.612000	1786.389
192.190000	1791.700
192.997000	1797.373
193.997000	1802.575
195.496000	1808.236
197.662000	1813.820
200.744000	1819.110
201.827000	1820.570
202.160000	1821.610
204.992000	1824.295
205.493000	1824.827
205.992000	1825.344
206.409000	1825.733

208.874000	1827.842
209.041000	1827.985
209.791000	1828.543
209.958000	1828.680
210.457000	1829.075
211.124000	1829.593
211.351000	1829.604
235.792000	1833.664
235.876000	1838.747
240.933000	1844.278
259.480000	1849.485

/

RATE	'FIELD'	
'UNITS'	'Hours'	'Mscf/day' /
'DATA'		
	0.00000000	2805.000
	188.503000	0.000000
	259.480000	0.000000

/

END

B5. STATIC GRADIENT

OILSERV AUSTRALIA LTD

GRADIENT SURVEY REPORT

DATA

TIME START RUN	TIME STOP RUN	STOP	DEPTH (KB)	PRESSURE (P81A)	GRADIENT P81/FT
	0615		LUBRICATOR 4	1654	
0635	0657	1	1000	1710	0.057
0707	0729	2	2000	1759	0.049
0736	0759	3	3000	1805	0.046
0806	0828	4	4000	1847	0.042
0835	0855	5	5000	1890	0.044
0902	0923	6	6000	1928	0.038
0931	0953	7	7000	1970	0.042
0958	1022	8	7500	1991	0.043
1025	1046	9	7700	2000	0.042
1048	1120	10	7800	1999	0.0
1121	1222	11	7833	2004	0.141
1222	1249	12	7880	2024	0.141 0.425
1250	1330	13	7920	2041	0.439 0.425

WELL: MOOMBA NO 64

DATE: 6 / 10 / 90

CLIENT: SANTOS LTD

GRADIENT CONDUCTED WHILE: ~~(P81A)~~ (R.I.H)

B6. PRESSURE CONVERSION TABLE

Project: Moomba 64
Subject: Post Frac Single Rate and Build Up
Date: October 1990
By: JJK
Sheet 1 of 1

		KB	=	110	'		
Pextrap	=	2041.0 (psia)		d gauge	=	7920	'KB
Pmpp	=	2004.0 (psia)		d mpp	=	7833	'KB
DP	=	-37.0		d z	=	-87	'
Pdatum	=	2013.3 (psia)		d datum	=	7860	'KB
DP	=	11.3		(d datum	=	7750	'SS)
				d z	=	27	'

C1. COMPOSITIONAL DATA

OPTIONS

CALCULATE SPECIFIC GRAVITY, PSEUDO-CRITICAL TEMPERATURE AND PRESSURE?	YES
USE DEFAULT VALUES FOR FINAL HYDROCARBON PROPERTIES?	NO
USE RESERVOIR TEMPERATURE FOR FIRST PVT TABLE?	YES
USE AVERAGE TUBING TEMPERATURE FOR SECOND PVT TABLE?	NO
USE GATH. SYSTEM TEMPERATURE FOR THIRD PVT TABLE?	NO
CALCULATE PVT TABLE(S)?	YES
PRINT PVT TABLE(S)?	YES
PLOT POTENTIAL?	NO

GAS PROPERTIES

CONSTITUENTS :	MOLE PERCENT
NITROGEN :	0.250
CO2 :	15.930
...	...
METHANE :	78.750
ETHANE :	3.950
PROPANE :	0.730
I-BUTANE :	0.080
N-BUTANE :	0.120
I-PENTANE :	0.030
N-PENTANE :	0.040
HEXANE :	0.040
HEPTANE :	0.070
OCTANE + :	0.110
TOTAL :	100.000

MOLECULAR WEIGHT OF OCTANE +	=	128.300
PSEUDO-CRITICAL TEMPERATURE OF OCTANE +	=	1070.37 DEG. R
PSEUDO-CRITICAL PRESSURE OF OCTANE +	=	332.0 PSIA
MOLECULAR WEIGHT	=	21.59
SPECIFIC GRAVITY	=	0.7455
PSEUDO-CRITICAL TEMPERATURE	=	388.3 DEG. R
PSEUDO-CRITICAL PRESSURE	=	731.4 PSIA
RESERVOIR TEMPERATURE = 289.0 DEG. F	=	748.7 DEG. R
MAXIMUM PRESSURE FOR PVT TABLES	=	5000. PSIA
PRESSURE INCREMENT FOR PVT TABLES	=	100. PSI

PVT TABLE AT RESERVOIR

TEMPERATURE = 289 DEG. F = 749. DEG. R

PRESSURE PSIA	Z	COMPRESS. PSIA(-1) X 10(-3)	VISCOSITY CP	POTENTIAL PSIA(2)/CP X 10(6)	PRESSURE GRADIENT PSI/FT	P/Z PSIA
14.65	0.99923	68.31190	0.01440			
100.00	0.99482	10.05120	0.01442	0.696	0.00188	100.52
200.00	0.98981	5.04956	0.01450	2.788	0.00378	202.06
300.00	0.98501	3.38112	0.01460	6.269	0.00569	304.57
400.00	0.98040	2.54590	0.01471	11.131	0.00763	408.00
500.00	0.97601	2.04389	0.01482	17.357	0.00957	512.29
600.00	0.97184	1.70844	0.01497	24.941	0.01154	617.39
700.00	0.96790	1.46811	0.01518	33.832	0.01352	723.22
800.00	0.96419	1.28719	0.01532	44.008	0.01551	829.71
900.00	0.96073	1.14585	0.01543	55.498	0.01751	936.79
1000.00	0.95752	1.03220	0.01555	68.286	0.01952	1044.37
1100.00	0.95456	0.93865	0.01566	82.361	0.02154	1152.36
1200.00	0.95187	0.86018	0.01577	97.722	0.02356	1260.67
1300.00	0.94945	0.79349	0.01593	114.313	0.02559	1369.21
1400.00	0.94731	0.73549	0.01608	132.108	0.02762	1477.87
1500.00	0.94544	0.68497	0.01624	151.079	0.02965	1586.57
1600.00	0.94385	0.64037	0.01643	171.168	0.03168	1695.19
1700.00	0.94254	0.60064	0.01662	192.337	0.03371	1803.64
1800.00	0.94151	0.56498	0.01681	214.562	0.03573	1911.82
1900.00	0.94076	0.53276	0.01700	237.812	0.03775	2019.64
2000.00	0.94030	0.50347	0.01720	262.061	0.03975	2126.99
2100.00	0.94011	0.47671	0.01739	287.281	0.04175	2233.78
2200.00	0.94020	0.45215	0.01758	313.444	0.04373	2339.93
2300.00	0.94056	0.42952	0.01778	340.513	0.04570	2445.36
2400.00	0.94119	0.40859	0.01798	368.457	0.04766	2549.98
2500.00	0.94208	0.38917	0.01818	397.245	0.04960	2653.71
2600.00	0.94322	0.37111	0.01837	426.849	0.05152	2756.50
2700.00	0.94462	0.35426	0.01857	457.242	0.05342	2858.28
2800.00	0.94627	0.33851	0.01877	488.395	0.05530	2959.00
2900.00	0.94815	0.32376	0.01897	520.280	0.05716	3058.60
3000.00	0.95026	0.30993	0.01920	552.852	0.05900	3157.04
3100.00	0.95259	0.29693	0.01944	586.039	0.06082	3254.28
3200.00	0.95514	0.28470	0.01967	619.812	0.06261	3350.29
3300.00	0.95790	0.27319	0.01991	654.144	0.06439	3445.04
3400.00	0.96086	0.26232	0.02015	689.009	0.06613	3538.51
3500.00	0.96401	0.25207	0.02039	724.382	0.06786	3630.68
3600.00	0.96734	0.24238	0.02062	760.237	0.06955	3721.54
3700.00	0.97085	0.23321	0.02086	796.553	0.07123	3811.08
3800.00	0.97454	0.22453	0.02110	833.305	0.07288	3899.29
3900.00	0.97838	0.21631	0.02134	870.471	0.07450	3986.18
4000.00	0.98238	0.20851	0.02157	908.030	0.07610	4071.74
4100.00	0.98653	0.20111	0.02181	945.961	0.07767	4155.99
4200.00	0.99082	0.19409	0.02205	984.244	0.07922	4238.91
4300.00	0.99525	0.18742	0.02228	1022.860	0.08075	4320.54
4400.00	0.99980	0.18107	0.02252	1061.789	0.08225	4400.86
4500.00	1.00448	0.17503	0.02277	1101.003	0.08373	4479.91
4600.00	1.00928	0.16928	0.02302	1140.477	0.08518	4557.69
4700.00	1.01419	0.16381	0.02327	1180.196	0.08661	4634.23
4800.00	1.01921	0.15858	0.02351	1220.142	0.08802	4709.52
4900.00	1.02433	0.15361	0.02376	1260.302	0.08940	4783.60
5000.00	1.02955	0.14885	0.02401	1300.661	0.09076	4856.49

1850 0.941135 0.54887 0.016905

2000 0.94030 0.50347 0.01720

P4 2355 PSH
7832
K 0.001 mD
K 0.2 mD

Ex. P
2541
Flow Core 848
Perm 24 mD

Ex. P
1PX) 2298 23
Flow Core 313-3 116
Perm 33-1 11-7

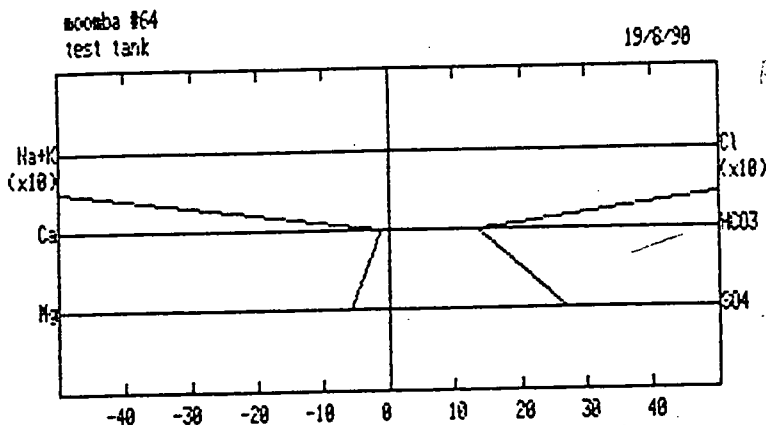
C2. STIFF DIAGRAMS

MOONBA LABORATORY - WATER ANALYSIS REPORT

0152

REGISTRATION NUMBER : WC390

STIFF DIAGRAM



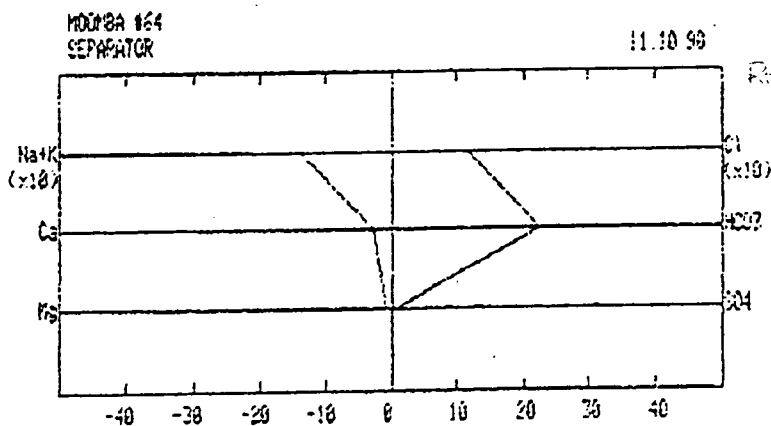
Resistivity = 0.17 ohm-cm
@ 25°C

PREFRAC
WGR 16

MOONBA LABORATORY - WATER ANALYSIS REPORT

REGISTRATION NUMBER : WC493

STIFF DIAGRAM



Resistivity = 0.27 ohm-cm
@ 25°C

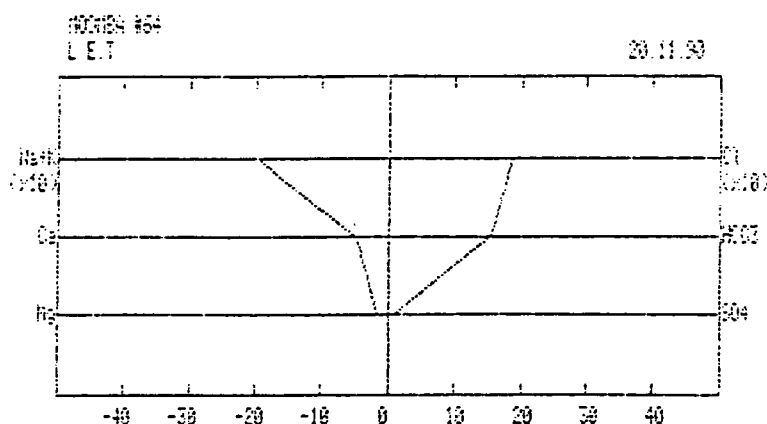
POST FRAC
WGR 40

248

REGISTRATION NUMBER : WD 564

STIFF DIAGRAM

0153



Refr. $\epsilon_2 = 0.001$ (mm/mm)
Refr. $\epsilon_2 = 0.001$

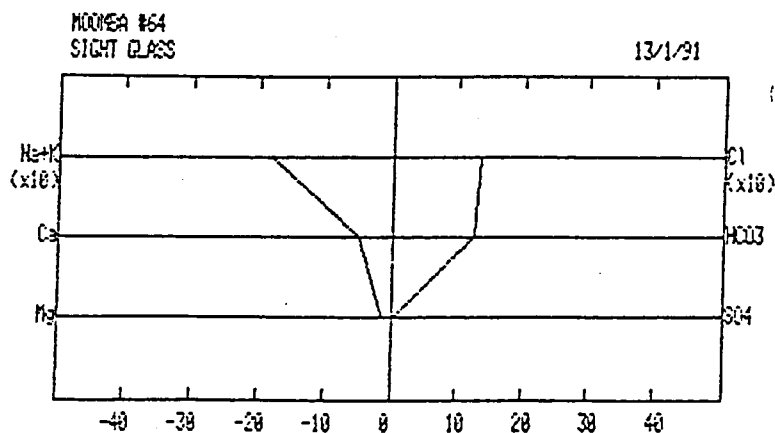
POST FRAC
WGR 71 BBL/MMSCF

ATOS Ltd.

UMBA LABORATORY - WATER ANALYSIS REPORT

REGISTRATION NUMBER : WD062

STIFF DIAGRAM



Refr. $\epsilon_2 = 0.001$ (mm/mm)
Refr. $\epsilon_2 = 0.001$

POST FRAC
WGR 69 BBL/MMSCF

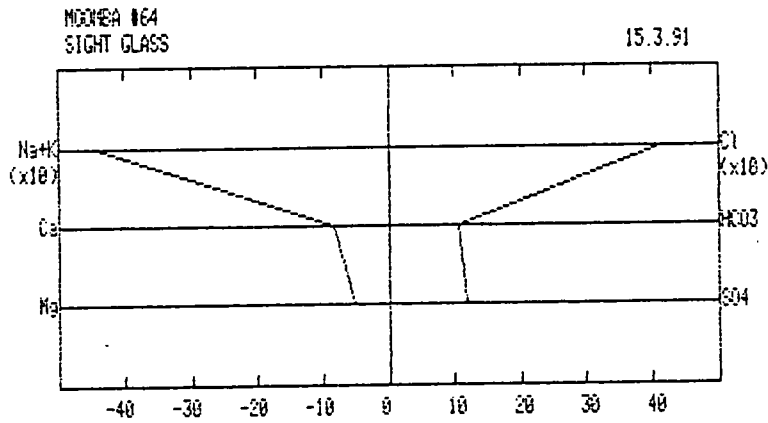
MOOMBA LABORATORY - WATER ANALYSIS REPORT

0154

REGISTRATION NUMBER : WD102

STIFF DIAGRAM

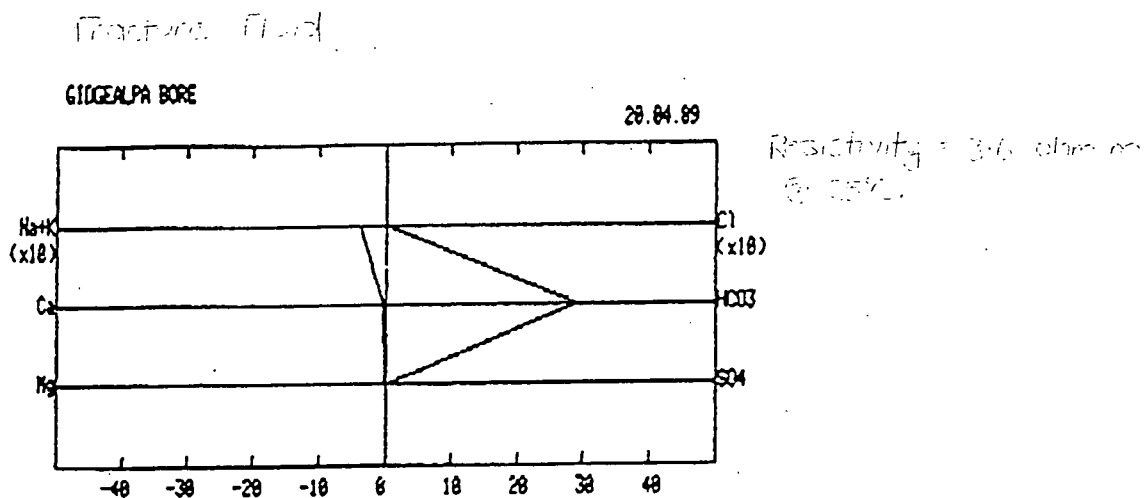
post frac



Resistivity = 0.124 Mm/cm
@ 25°C

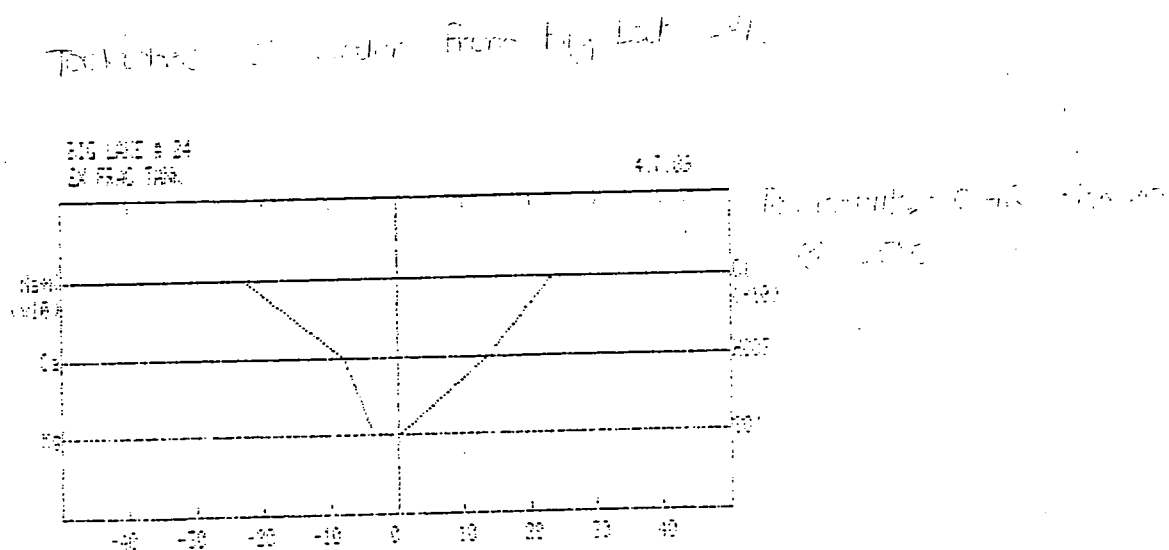
POST FRAC, POST
RECOMPLETION TOTAL
WGR 45 BBLS/MMSCF
(NO NO ADDITIONAL PERFS)

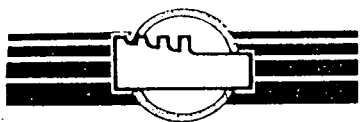
STIFF DIAGRAM



STIFF DIAGRAM

STIFF DIAGRAM





SEQUENCE OF EVENTS

CUSTOMER : Santos Ltd

PERFORATIONS: 7791'-7877' / 7970'-8144'

PAGE: 1 OF 2

WELL NAME: Moomba # 64

FORMATION : Toolachee / Darlingsie

DATE: 27th Sept 1992

TEST TYPE : Selective Single Rate and Build up

OPR : B. Potter

DATE/TIME	DESCRIPTION OF EVENTS
27 th sept 1992	
0900	Arrive Location. Moomba field shut in.
0915	Shut in well, Fit swab valve
0930	Rig up wireline unit and Test equipment.
1030	R.I.H with 1.75" BB
1105	obstruction @ 7673' KB. Report Details to Moomba.
1115	P.O.O.H.
1140	At surface, shut swab valve. Continue Rig in of test equipment.
1430	Pressure test lines and vessel to 660 psi.
1530	Moomba field on line, Divert flow through separator 100% choke
1600	Commence Test, monitor pressures and flow rates. Gas in line
28 th sept 1992	
0600	Continue to monitor flow rates.
1400	Prepare gauges for flowing Gradient Survey.
1443	R.I.H with B.H.P. Gauges and Perform F.G.S.
1557	Bottom Gradient stop @ 7620' KB. * Modified Hang depth.
1631	At surface with B.H.P. Gauges. Both charts good.
1700	Secure wire line unit.
29 th sept 1992	
1500	Wireline crew arrive location. Rig up unit.
1530	R.I.H with 2.19" Gauge Ring.
1600	Tag obstruction @ 7692' KB. P.O.O.H.
1645	R.I.H with 2.22" L.I.B. choke back well to 20%
1715	At surface with L.I.B. Return choke to 100%. Continue to monitor Rates.

0156

SEQUENCE OF EVENTS

CUSTOMER : Santos Ltd

PERFORATIONS: 7791'-7877' / 7970'-8144'

PAGE: 2 OF 2

WELL NAME: Maamba # 64

FORMATION : Toolachee / Daralingie

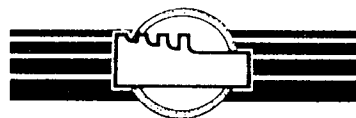
DATE: 30th sept 1992

TEST TYPE : Selective Single Rate

OPR : B. Potter

[illegible]

EXPERTEST PTY. LTD.



FIELD READINGS

CUSTOMER : Santos Ltd

PERFORATIONS: 7791'-7877'/7970'-8144'

PAGE: 1 OF 3

WELL NAME: Moomba # 64

FORMATION : Toolachee / Daralingie

DATE: 27th Sept 1992

TEST TYPE : Selective Single Rate and Build up

OPR : B. Potter

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/GM)	OIL (IN/GM)	OIL API GRAVITY @ 60°F	WATER (IN/GM)	
27th sept 1992															
0900		Arrive location. Moomba field shut in													
0915		shut in well, fit swab valve													
0930		Rig up wireline unit and test equipment													
1030		R.I.H 1.75" BB.													
1105		Obstruction @ 7673' KB. Report Details to Moomba.													
1115		P.O.O.H.													
1140		At surface, shut swab valve. Continue Rig in Test Equipment.													
1430		Pressure Test line and vessel to SIWHP.													
1530		4640	103	64°	100	Moomba field back on line.									
		Divert flow through separator. Gas in line.													
1600	0	4723	110	64	100	Commence Test.									
1800	2	4716	103	64		-	1.375	652	63	144	2.5	1.0		1.5	
2000		4640	103	63				640	66	142	7.0	1.0		6.0	
2200	6	4599	103	63				632	67	142	9.5	1.0		8.5	
28th sept 1992															
0200		4585	103	63				630	67	138	16.75	1.0		15.75	
0600	14	4537	103	64				620	68	136	24.0	1.0		23.0	
0800		4516	103	64				625	68	135	27.5	1.0		26.5	
1000		4378	103	63				605	74	131	30.25	1.0		29.25	
1200	20	4427	103	64				615	72	136	34.0	1.0		33.0	

0158

0158

EXPERTEST PTY. LTD.

FIELD READINGS

CUSTOMER : Santos Ltd

PERFORATIONS: 7791'-7877'/7970'-8144' PAGE: 2 OF 3

WELL NAME: Moomba # 64

FORMATION : Toolachee/Daralingie

DATE: 28th Sept 1992

TEST TYPE : Selective Single Rate and Build up.

OPR : B. Potter

TIME		WELLHEAD DATA					SEPARATOR DATA				LIQUID PRODUCTION			
DATE	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/GM)	OIL (IN/GM)	OIL API GRAVITY @ 60°F	WATER (IN/GM)
28 th Sept 1992														
1400	22	4427	103	62	100	-	1.375"	620	72	136	38.5	1.0		37.5
		Prepare Gauges for flowing Gradient.												
1443		R.I.H with B.H.P. gauges and perform F.G.S.												
1557		Bottom Gradient stop @ 7620' KB * Modified Hang depth.												
1600	24	4420	103	64	1		1	614	70	138	42.5	1.0		41.5
1631		At surface with B.H.P. gauges. Both charts good. Secure w/L unit.												
1800	26	4516	103	64				620	67	140	45.25	1.0		44.25
2000		4516	103	65				625	68	142	49.25	1.0		48.25
2200		4468	103	58				615	68	129	53.0	1.0		52.0
29 th Sept 1992														
0200		4489	103	58				620	67	131	60.0	1.0		59.0
0600	38	4220	103	61				575	81	133	67.75	1.0		66.75
0800		4144	103	58				570	84	133	71.75	1.0		70.75
1000		4116	103	61				570	85	136	75.75	1.0		74.75
1200		4185	103	63				575	81	140	79.25	1.0		78.25
1400		4309	103	62				600	74	140	83.25	1.0		82.25
1530		Wireline crew R.I.H with 2.19" Gauge Rings.												
1600	48	4413	103	62	↓		↓	615	66	136	86.5	1.0		85.5
		Tag obstruction @ 7692' KB. P.O.O.H.												
1645		R.I.H with 2.22" L.I.B. choke well back to 20%												
1715		At surface with L.I.B. Choke back to 100%												

0159

FIELD READINGS

CUSTOMER : Santos Ltd

PERFORATIONS: 7791'-7877' / 7970'-8144'

PAGE: 3 OF 3

WELL NAME: Moomba # 64

FORMATION : Toolachee / Dargalingie

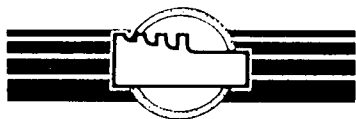
DATE: 29th Sept 1992

TEST TYPE : Selective single Rate

OPR : B. Potter

[illegible]

EXPERTEST PTY. LTD.



LIQUID PRODUCTION

CUSTOMER : Santos Ltd

PERFORATIONS: 7791'-7877' / 7970'-8144'

PAGE: 1 OF 2

WELL NAME: Moomba # 64

FORMATION : Toolachee / Daralingie

DATE: 27th sept 1992

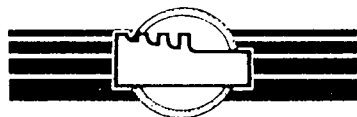
TEST TYPE : Selective Single Rate and Build up.

OPR : B. Potter

TANK NUMBER	#1 = #57	TANK CAPACITY	#1 = 56.6	bbls/m ³	TANK SCALE	#1 = 1" = 0.267m ³	bbls/in - m ³ /cm	OIL API GRAVITY = @ 60°F				
	#2 =		#2 =	bbls/m ³		#2 =	bbls/in - m ³ /cm					
DATE TIME	FLOW TIME (HOURS)	TANK USED (NUMBER)	TOTAL TANK DIP (IN/CM)	OIL/CONDENSATE PRODUCTION				WATER PRODUCTION				
				TANK DIP (IN/CM)	TANK PRODUCTION (BBLs/m ³)	FLOW RATE (BPD/m ³ D)	CUMULATIVE PRODUCTION (BBLs/m ³)	TANK DIP (IN/CM)	TANK PRODUCTION (BBLs/m ³)	FLOW RATE (BPD/m ³ D)	CUMULATIVE PRODUCTION (BBLs/m ³)	
27 th sept 1992												
1600	0	# 57	1.0	1.0	Initial oil dip			0.0	Initial	water Dip.		
1800	2		2.5	1.0	-	-	-	1.5	.401	4.81	.401	
2000			7.0	1.0	-	-	-	6.0	1.201	14.42	1.602	
2200	6		9.5	1.0	-	-	-	8.5	.667	8.01	2.269	
28 th sept 1992												
0200			16.75	1.0	-	-	-	15.75	1.936	11.61	4.205	
0600	14		24.0	1.0	-	-	-	23.0	1.936	11.61	6.141	
0800			27.5	1.0	-	-	-	26.5	.935	11.21	7.076	
1000			30.25	1.0	-	-	-	29.25	.734	8.81	7.810	
1200	20		34.0	1.0	-	-	-	33.0	1.001	12.01	8.811	
1400			38.5	1.0	-	-	-	37.5	1.201	14.42	10.012	
1600	24		42.5	1.0	-	-	-	41.5	1.068	12.82	11.080	
1800			45.25	1.0	-	-	-	44.25	.734	8.81	11.814	
2000			49.25	1.0	-	-	-	48.25	1.068	12.82	12.882	
2200			53.0	1.0	-	-	-	52.0	1.001	12.01	13.883	
29 th sept 1992												
0200				60.0	1.0	-	-	-	59.0	1.869	11.21	15.752
0600	38	67.75		1.0	-	-	-	66.75	2.069	12.42	17.821	
0800		71.75		1.0	-	-	-	70.75	1.068	12.82	18.889	

0161

EXPERTEST PTY. LTD.



LIQUID PRODUCTION

CUSTOMER : Santos Ltd

PERFORATIONS: 7791'-7877'/7970'-8144'

PAGE: 2 OF 2

WELL NAME: Moomba # 64

FORMATION : Toolachee/Daralingie

DATE: 29th Sept 1992

TEST TYPE : Selective Single Rate and Build up

OPR : B. Potter

TANK

#1 = # 57

TANK

#1 = 56.6

bbls/m³

TANK

#1 = 1" = 0.267 m³bbls/in - m³/cm

OIL API GRAVITY = @ 60°F

NUMBER

#2 =

CAPACITY

#2 =

bbls/m³

SCALE

#2 =

bbls/in - m³/cm

DATE

FLOW

TANK

TOTAL

OIL/CONDENSATE PRODUCTION

WATER PRODUCTION

TIME

(HOURS)

USED

(NUMBER)

TANK DIP

(IN/CM)

TANK
DIP
(IN/CM)TANK
PRODUCTION
(BBLs/m³)FLOW
RATE
(BPD/m³D)CUMULATIVE
PRODUCTION
(BBLs/m³)TANK
DIP
(IN/CM)TANK
PRODUCTION
(BBLs/m³)FLOW
RATE
(BPD/m³D)CUMULATIVE
PRODUCTION
(BBLs/m³)29th Sept 1992

1000

42

57

75.75

1.0

-

-

-

74.75

1.068

12.82

19.957

1200

1400

1600

48

1800

2000

2200

30th Sept 1992

0200

0600

62

Test completed.

0162

EXPERTEST PTY. LTD.			GAS FLOW CALCULATIONS													
			CUSTOMER : Santos Ltd				PERFORATIONS: 7791'-7877' / 7970'-8144'				PAGE: 1 OF 2					
			WELL NAME: Moomba # 64				FORMATION : Toolachee / Daralingie				DATE: 27th sept 1992					
			TEST TYPE : Selective Single Rate and Build up								OPR : B. Potter					
ORIFICE METER TYPE: Daniels Snn			STATIC PRESSURE RANGE : 0-1500 PSIG				GAS SPECIFIC GRAVITY (SG) = 0.7699									
METER RUN SIZE : 2.900"			DIFFERENTIAL PRESS. RANGE: 0-100 IN WC				FG $\sqrt{(I/SG)}$ = 1.1396									
SEPARATOR NO : 238			STANDARD CONDITIONS : 14.73 PSI @ 60°F				C ₂ (FU x FG) = 27.352									
DATE TIME	FLOW TIME (HOURS)	CHOKE SIZE %	STATIC PRESS P _F (PSIA)	DIFF PRESS H _W (IN WC)	GAS FLOW TEMP (°F)	ORIF. PLATE SIZE (IN)	$\sqrt{(P_F \times H_W)}$	C ₁ = F _B x F _{TF} x F _{PV} x Y ₂				C ₁	C (C = C ₁ x C ₂)	GAS FLOW RATE Q = $\sqrt{(P_F \times H_W) \times C}$		
								F _B	F _{TF}	F _{PV}	Y ₂			(MMSCFD)	(m ³ 10 ³ /D)	
27th Sept	1992															
1600	0	100	Commence Test.													
1800	2		667	63	144	1.375"	204.95	395.80	.9278	1.0569	1.0005	388.406	10623.8	2.177	61.65	
2000			655	66	142		207.88		.9294	1.0566	1.0006	388.939	10638.4	2.211	62.62	
2200	6		647	67	142		208.16		.9294	1.0559	1.0006	388.678	10631.3	2.213	62.66	
28th Sept	1992															
0200			645	67	138		207.84		.9325	1.0572	1.0006	390.452	10679.8	2.219	62.85	
0600	14		635	68	136		207.75		.9340	1.0570	1.0006	391.041	10695.9	2.222	62.92	
0800			640	68	135		208.57		.9348	1.0578	1.0006	391.684	10713.5	2.234	63.27	
1000			620	74	131		214.15		.9380	1.0574	1.0007	392.880	10746.2	2.301	65.16	
1200	20		630	72	136		212.93		.9340	1.0565	1.0007	390.883	10691.6	2.276	64.47	
1400			635	72	136		213.78		.9340	1.0570	1.0007	391.056	10696.3	2.286	64.75	
1600	24		629	70	138		209.79		.9325	1.0557	1.0006	389.917	10665.1	2.237	63.36	
1800			635	67	140		206.22		.9309	1.0555	1.0006	389.191	10645.3	2.195	62.16	
2000			640	68	142		208.57		.9294	1.0552	1.0006	388.450	10625.0	2.216	62.75	
2200			630	68	129		206.93		.9396	1.0592	1.0006	394.176	10781.6	2.231	63.18	
29th Sept	1992															
0200			635	67	131		206.22		.9380	1.0589	1.0006	393.397	10760.3	2.218	62.83	
0600	38	↓	590	81	133	↓	218.56	↓	.9364	1.0537	1.0008	390.903	10692.1	2.336	66.17	

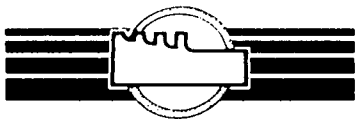
0163

CUSTOMER :	Santos Ltd	PERFORATIONS:	7791'-7877'/7970'-8144'	PAGE:	2	OF	2
WELL NAME:	moomba # 64	FORMATION :	Toolachee/Daralingie	DATE:	27 th sept 1992		
TEST TYPE :	Selective single Rate and Build up			OPR :	B. Potter		

ORIFICE METER TYPE: Daniels Snr	STATIC PRESSURE RANGE : 0-1500 PSIG	GAS SPECIFIC GRAVITY (SG) = 0.7699
METER RUN SIZE : 2.900"	DIFFERENTIAL PRESS. RANGE: 0-100 IN WC	FG $\sqrt{(1/SG)}$ = 1.1396
SEPARATOR NO : 238	STANDARD CONDITIONS : 14.73 PSI @ 60°F	C ₂ (FU x FG) = 27.352

0164

EXPERTEST PTY. LTD.



TEST RESULTS

CUSTOMER : Santos Ltd

PERFORATIONS: 7791-7877 / 7970-8144

PAGE: 1 OF 2

WELL NAME: Moomba #64

FORMATION : Toolachee / Daralingie

DATE: 27th Sept 1992

TEST TYPE : Single rate and

Build up.

OPR : B. Potter

TIME		WELLHEAD DATA				Separator		FLOW RATES			CUMULATIVE PRODUCTION			L.G.R. m ³ /10 ⁶ m ³
DATE TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE %	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD m ³ /10 ³ /D	OIL BPD m ³ /D	WATER BPD m ³ /D	GAS MMSCF m ³ /10 ³	OIL BBLS m ³	WATER BBLS m ³	
27 th Sept 1992														
1600	0	4723	110	64	100	Commence Test.								
1800	2	4716	103	64		4496	62	61.65	-	4.81		-	4.401	78
2000		4640	103	63		4413	61	62.62	-	14.42		-	1.602	230
2200	6	4599	103	63		4358	61	62.66	-	8.01		-	2.269	128
28 th Sept 1992														
0200		4585	103	63		4344	59	62.85	-	11.61		-	4.205	185
0600	14	4537	103	64		4275	58	62.92	-	11.61	36.48	-	6.141	185
0800		4516	103	64		4309	57	63.27	-	11.21		-	7.076	177
1000		4378	103	63		4171	55	65.16	-	8.81		-	7.810	135
1200	20	4427	103	64		4240	58	64.47	-	12.01		-	8.811	187
1400		4427	103	62		4275	58	64.75	-	14.42		-	10.012	223
1430		Perform F.G.S. see B.H.P report for Details.												
1600	24	4420	103	64		4234	59	63.36	-	12.82		-	11.080	202
1800		4516	103	64		4275	60	62.16	-	8.81		-	11.814	142
2000		4516	103	65		4309	61	62.75	-	12.82		-	12.882	204
2200		4468	103	58		4240	54	63.18	-	12.01		-	13.883	190
29 th Sept 1992														
0200		4489	103	58		4275	55	62.83	-	11.21		-	15.752	178
0600	38	4220	103	61		3965	56	66.17	-	12.42	100.29	-	17.821	188
0800		4144	103	58		3930	56	67.07	-	12.82		-	18.889	191

0165

TEST RESULTS

CUSTOMER : Santos Ltd

PERFORATIONS: 7791'-7877' / 7970'-8144'

PAGE: 2 OF 2

WELL NAME: Moomba # 64

FORMATION : Toolachee / Daralingie

DATE: 29th Sept 1992

TEST TYPE : Selective Single Rate and Build up

OPR : B. Potter

[illegible]

PERFORATIONS: 7791'- 7877' / 7970'- 8144'

WELL NAME: Moomba # 64

FORMATION : Toolachee / Daralingie

DATE: 28th sept 1992

TEST TYPE : Flowing Gradient

OPR : B. Potter

GAUGE DATA		UPPER PRESSURE GAUGE	LOWER PRESSURE GAUGE	TEMPERATURE GAUGE	RUN DATA	TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)
ELEMENT SERIAL NO.		850207	850208	292.17	DATE : 28.9.92			
ELEMENT RANGE (PSI)		4075	4100	135°-378°F	PRESSURE LUBRICATOR :	1428	4482	103
RECORDING SECTION SERIAL NO.		K3433	K3434	12952	RUN IN HOLE :	1443	4447	↓
DATE OF CALIBRATION: @ 290°F		6.3.92	6.3.92		ON DEPTH AT : 7620 FT/M	1557	4420	
CLOCK SERIAL NO.		A-12046	A-16087	A-16084	DATE : 28.9.92			
CLOCK RANGE		3 hr	3hr	3hr	PULL OUT OF HOLE :	1612	4447	
LEAD SCREW TYPE		15 TLS	15 TLS	15 TLS	AT SURFACE :	1631	4482	↓
					DEPRESSURE LUBRICATOR :	1646	4516	
ENGAGE STYLUS	DATE 28.9.92	TIME 1418	1418	1418	MAXIMUM BHT AT FT/M = °F/C			
DISENGAGE STYLUS	DATE 28.9.92	TIME 1652	1652	1652	N.B. ALL DEPTHS ARE MEASURED FROM K.B.			

[illegible]

PETROLEUM ENGINEERING DEPARTMENT



DOWNHOLE INSTALLATION

MOOMBA 64



ITEM NO.	DESCRIPTION	LENGTH (ft)	DEPTH K.B. (ft)	MIN. I.D. (in)
1	K.B. to top of tubinghead spool	12.70	0.00	
2	C.I.W. FBB-EN 7'1/16" x 2 7/8" AB x 2 7/8" CS Hydril	0.70		
3	Nipple 2 7/8" J55 AB-IJ3SS pin x pin	0.32		
4	1 joint 2 7/8" 6.5# J55 AB-IJ3SS	31.63		
5	2 7/8" 6.5# J55 AB-IJ3SS pups 1 x 12', 10', 6', & 4'	30.94		
6	241 joints 2 7/8" 6.5# J55 AB-IJ3SS tubing	7563.06		
7	Otis 2 7/8" 121XDH23110 (closed) ss AB-IJ3SS	3.55	7639.35	2.313
8	1 joint 2 7/8" 6.5# J55 AB-IJ3SS	31.18		
9	Pup joint 8' x 2 7/8" 6.5# J55 AB-IJ3SS	7.74		
10	Baker model FH pkr size 47B4 2 7/8" AB-IJ3SS	7.01	7681.82	2.420
11	1 joint 2 7/8" 6.5# J55 AB-IJ3SS	31.29		
12	Otis 2 7/8" 121XDH23110 sliding sleeve (open)	3.55	7720.12	2.313
13	2 joints 2 7/8" 6.5# J55 AB-IJ3SS	62.37		
14	2 10' blast joints 2 7/8" AB-IJ3SS	19.63		
15	4 20' blast joints 2 7/8" AB-IJ3SS	79.11		
16	Pup joints 2 7/8" 6.5# J55 AB-IJ3SS 2 x 6' & 1 x 10'	21.22		
17	Baker G-22 80-32 locator seal assembly	(2.84)		
18				
19	Permanent Downhole Equipment			
20	Baker DB packer size 84-32 4 1/2" AB-IJ	4.08	7906.00	
21	Millout extension 4 1/2" AB-IJ3SS pin x pin	5.88		
22	Swage 4 1/2" box x 2 7/8" pin J55 AB-IJ3SS	1.72		
23	Otis 2 7/8" nipple 711XN23117 AB-IJ3SS	1.05	7917.68	
24	Re-entry guide 2 7/8" AB-IJ x 3 1/2" J55	1.00		
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PERFORATED INTERVALS:

GUN:

CHARGES:

FORMATION	INTERVAL	SIZE	TYPE	S.P.F.	TYPE	WT(g)
TOOLACHEE UNIT C						
75-8	7791' - 7803'	5"	CSG	6	120°	22
76-1	7809' - 7824'	5"	CSG	6	120°	22
76-2	7829' - 7842'	5"	CSG	6	120°	22
76-4/5	7852' - 7877'	5"	CSG	6	120°	22
Lower Caralingie Beds	8144' - 8160'	2-1/8"	Ener	4	0°	
216/21	8022' - 8050'					
	8051' - 8070'					

REMARKS:

Attempt was made to spot inhibited fluid in annulus and

ANNULUS FLUID: not contaminate Toolachee - estimate 50% annulus inhibited

INDICATED STRING WEIGHT: 52,000# (tubing not fully bouyant)

CALCULATED STRING WEIGHT: 44,713#

SLACK-OFF WEIGHT: 9,000#

TENSION: Fish: 30.8' 2 1/8" E' strip + ccl + wt bar + cablehead

NOT TO SCALE

WELLSITE SUPERVISOR

M. Dunne

PROPOSED

DATE OF INSTALLATION

13/2/1991

RE-COMPLETION

✓

DRAFTED

E. Coppins

DATE 7/5/1991

COMPLETION

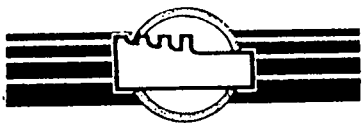
REVISED

G. Soulmatiss

DATE 3/5/1991

P.B.T.D. 8421' KB

EXPERTEST PTY. LTD.



SEQUENCE OF EVENTS

CUSTOMER : SANTOS

PERFORATIONS: 7945' - 8180'

PAGE: 1 OF 2

WELL NAME: MOOMBA # 64

FORMATION : DARALINGIE

DATE: 20-12-92

TEST TYPE : B.H.P

OPR: N. HAM

DATE/TIME	DESCRIPTION OF EVENTS
20-12-92	
14:30	ARRIVE ON LOCATION & SHUT WELL IN TO RIG UP SWAB VALVE
14:40	WELL BACK ON LINE ON 100% CHOKIE
	RIG UP WIRELINE UNIT & TOOL STRING
16:10	R.I.H. WITH 1.75" BLIND BOX TO 7630' MB
16:30	P.O.O.H.
16:48	BACK AT SURFACE & RETURN TO MOOMBA OVERNIGHT
21-12-92	
14:20	RIG UP 2X4000 P.S.I PRESSURE ELEMENTS & ONE TEMPERATURE COUPLED TO 120HR CLOCKS
14:50	HANG ELEMENTS IN LUB & PRESSURE UP
15:50	DEPRESSURE LUB
16:50	PRESSURE UP LUB & R.I.H.
17:14	AT HANG DEPTH 7620' MB
22-12-92	
10:00	SHUT WELL IN 96HR BUILD-UP
23-12-92	
14:00	CREW ON LOCATION SAFETY MEETING HELD.
	MONITOR BUILD-UP.
24-12-92	
0600	CONTINUE TO MONITOR BUILD-UP. (SAFETY MEETING HELD).
0620	DEPART LOCATION FOR MOORARI FLOWING GRADIENTS
25-12-92	
0600	CONTINUE TO MONITOR BUILD-UP (SAFETY MEETING HELD)

PERFORATIONS

WELL NAME: MOONBA # 64

TEST TYPE : B. H. P. SURVEY

FORMATION : SARALINGIE

DATE: 25.12.92

OPR: *A. Grindway*

01

EXPERTEST PTY. LTD.



BHP/BHT GAUGE RUN DATA

CUSTOMER : SANTOS

PERFORATIONS: 7945' - 8180'

PAGE 1 OF 1

WELL NAME: MOOMBA # 64

FORMATION: DARALINGIE

DATE 21-12-92

TEST TYPE: B.H.P

OPR: N HAY

GAUGE DATA

UPPER
PRESSURE
GAUGELOWER
PRESSURE
GAUGETEMPERATURE
GAUGE

RUN DATA

TIME
(HOURS)TUBING
PRESSURE
(PSI/KPa)ANNULUS
PRESSURE
(PSI/KPa)

ELEMENT SERIAL NO.

22420

21372

63256

DATE

21-12-92

ELEMENT RANGE

P.S.I

4250

4050

95° - 471°F

PRESSURE LUBRICATOR

14:50

6619

96

RECORDING SECTION SERIAL NO.

54651

59780

30929

RUN IN HOLE

16:50

6612

96

DATE OF CALIBRATION:

@ 290°F

9.9.92

9.9.92

10.4.84

ON DEPTH AT

7620 FT/M

17:14

6612

96

CLOCK SERIAL NO.

42578

24703

24580

DATE

26-12-92

CLOCK RANGE

HR

120

120

120

PULL OUT OF HOLE

1000

8860

69

LEAD SCREW TYPE

T45

15

15

15

AT SURFACE

1030

8860

69

DEPRESSURE LUBRICATOR

1236

8867

69

ENGAGE STYLUS

DATE

21-12-92

TIME

14:42

14:42

14:42

MAXIMUM BHT AT

FT/M = 264* °F / TEMP ELEMENT.

DISENGAGE STYLUS

DATE

26-12-92

TIME

12:43

12:43

12:43

N.B. ALL DEPTHS ARE MEASURED FROM K.B.

(1286)

DATE

TIME

REMARKS

22-12-92

10:00

SHUT WELL IN 96 HR BUILD-UP

IN / OUT

BOT 947 / 1277

26-12-92

1000

P.O.O.H END BUILD-UP PERIOD.

1036

DEPRESSURE LUBRICATOR FOR 1 HOUR.

* Impossible to determine baseline

1136

PRESSURE UP LUBRICATOR FOR 1 HOUR.

∴ accuracy ± 10°F.

1236

DEPRESSURE LUBRICATOR.

* NOTE: TOP CLOCK STOPPED APPROX. 1/3 WAY INTO BUILD-UP



0171

EXPERTEST PTY. LTD.



BHP/BHT GAUGE RUN DATA

CUSTOMER : SANTOS LTD

PERFORATIONS: 7945' - 8180'

PAGE: 1 OF 1

WELL NAME: MOOMBA #64

FORMATION: DARALINGIE

DATE: 26.12.92

TEST TYPE: STATIC GRADIENT

OPR: A. GRINDLEY

GAUGE DATA

UPPER
PRESSURE
GAUGELOWER
PRESSURE
GAUGETEMPERATURE
GAUGE

RUN DATA

TIME
(HOURS)TUBING
PRESSURE
(PSI/KPa)ANNULUS
PRESSURE
(PSI/KPa)

ELEMENT SERIAL NO.

22420

21372

63256

DATE

26.12.92

ELEMENT RANGE

4250 PSI

4050 PSI

95° - 471°F

PRESSURE LUBRICATOR

1330

8867

69

RECORDING SECTION SERIAL NO.

54651

59780

30929

RUN IN HOLE

1345

8867

69

DATE OF CALIBRATION:

290°F

9.9.92

9.9.92

10.4.84

ON DEPTH AT

7620 FT/M

1433

8867

69

CLOCK SERIAL NO.

2509

25511

25509

DATE

26.12.92

CLOCK RANGE

3 HRS

3 HRS

3 HRS

PULL OUT OF HOLE

1448

8867

69

LEAD SCREW TYPE

15 TLS

15 TLS

15 TLS

AT SURFACE

1508

8867

69

DEPRESSURE LUBRICATOR

1523

8867

69

ENGAGE STYLUS

DATE

26.12.92

TIME

1323

1323

1323

MAXIMUM BHT AT

FT/M =

°F/C

TEMP ELEMENT.

DISENGAGE STYLUS

DATE

26.12.92

TIME

1531

1531

1531

N.B. ALL DEPTHS ARE MEASURED FROM K.B.

DATE

TIME

REMARKS

26.12.92

1330

PRESSURE UP LUBRICATOR FOR 10 MINUTES

1340

DEPRESSURE FOR 5 MINUTES.

1345

PRESSURE UP PRIOR TO R.I.H.

1508

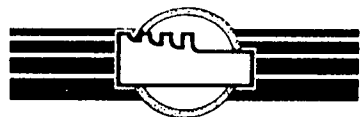
DEPRESSURE LUBRICATOR FOR 5 MINUTES

1513

PRESSURE LUBRICATOR FOR 10 MINUTES.

0172

EXPERTEST PTY. LTD.



FIELD READINGS

CUSTOMER : SANTOS

PERFORATIONS: 7945' - 8180'

PAGE: 1 OF 2

WELL NAME: MOOMBA #64

FORMATION : DARALINGII

DATE: 20-12-92

TEST TYPE : B.H.P

OPR :

TIME		WELLHEAD DATA					SEPARATOR DATA				LIQUID PRODUCTION			
DATE	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)
20-12-92														
14:30		ARRIVE ON LOCATION & SHUT WELL IN TO RIG UP SWAB VALVE												
14:40		WELL BACK ON LINE ON 100% CHOKIE												
		RIG UP WIRELINE UNIT & TOOL STRING												
16:10		R.I.H WITH 1.75" BLIND BOX TO 7630' KB												
16:30		P.O.O.H												
16:48		BACK AT SURFACE & RETURN TO MOOMBA OVERNIGHT												
21-12-92														
14:20		RIG UP 2X4000 P.S.I PRESSURE ELEMENTS & ONE TEMPERATURE ELEMENT COMPU'D TO 120HR CLOCK												
14:50		960	14	60	100%			HAVE ELEMENTS IN LUB & PRESSURE UP						
15:50		956	14	58	"			DEPRESSURE LUB						
16:50		959	14	61	"			PRESSURE UP LUB & R.I.H.						
17:14		959	14	61	"			AT HANG DEPTH 7620' KB						
18:00		900	14	61	"									
18:00		CREW NOW ON RGST BREAK OVERNIGHT ALL READING TAKEN FROM RECORDER TO 06:00												
22:00		685			"									
22-12-92														
02:00		673			100%									
06:00		669	14	60	"									
08:00		665	14	62	"									
10:00	0	667	14	63	"			SHUT WELL IN 96HR BUILD-UP						
10:15	25	1131	14	46										

0173



TEST RESULTS

CUSTOMER: SANTOS

PERFORATIONS: 7945' - 8180'

PAGE 1 OF 3

WELL NAME: MOOMBA # 64

FORMATION: DARALINGIE

DATE: 21-12-92

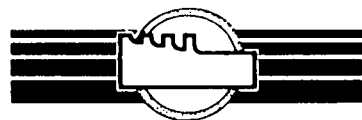
TEST TYPE: B.H.P

OPR: N. HAY

TIME		WELLHEAD DATA				FLOW RATES					CUMULATIVE PRODUCTION						
DATE TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD m³10³/D	OIL BPD m³/D	WATER BPD m³/D	GAS MMSCF m³10³	OIL BBLS m³	WATER BBLS m³				
21-12-92																	
		RIG UP 2X4000 P.S.I PRESSURE ELEMENTS & OIL TEMP ELEMENT COUPLED TO 120 HR CLOCKS															
14:50		6619	96	60	100%	HANG ELEMENTS IN LUB											
16:50		6612	96	61	"	R.I.H.											
17:14		6612	96	61	"	AT HANG DEPTH 7620' MB											
18:00		6205	96	61	"												
18:00		CREW ON REST BREAK READING TAKEN FROM RECORDER															
22:00		4724			100%												
22-12-92																	
02:00		4640			100%												
06:00		4612	96	60	"												
08:00		4585	96	62	"												
10:00	0	4598	96	62	"	SHUT WELL IN											
10:15	.25	7798	96	46													
10:30	.5	7784	96	40													
10:45	.75	7770	89	38													
11:00	1	7798	89	37													
11:15	1.25	7846	89	36													
11:30	1.5	7874	89	38													
11:45	1.75	7908	89	38													
12:00	2	7929	89	38													
12:15	2.25	7963	89	39													

0174

0174



TEST RESULTS

CUSTOMER : SANTOS

PERFORATIONS: 7945' - 8180'

PAGE 2 OF 3

WELL NAME: MOOMBA # 64

FORMATION: DARABINGH

DATE: 22-12-92

TEST TYPE: B.H.P

OPR: N. HAY

TIME

WELLHEAD DATA

FLOW RATES

CUMULATIVE PRODUCTION

DATE TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD m ³ /D	OIL BPD m ³ /D	WATER BPD m ³ /D	GAS MMSCF m ³ /D	OIL BBLS m ³	WATER BBLS m ³		
22-12-92															
12:30	2.5	7984	89	40											
12:45	2.75	7998	89	40											
13:00	3	8032	89	40											
13:15	3.25	8060	89	40											
13:30	3.5	8094	89	40											
13:45	3.75	8115	89	41											
14:00	4	8138	89	40											
18:00	8	8398	82												
22:00	12	8660													
23-12-92															
02:00	16	8653													
06:00	20	8653	68												
10:00	24	8688	—	—											
14:00	28	8715	76	43											
18:00	32	8743	69	48											
22:00	36	8743													
24-12-92															
02:00	40	8743													
06:00	44	8750	69	24											
10:00	48	8757	—	—											
14:00	52	8764	—	—											

CREW ON REST BREAK READING TAKEN FROM RECORDER TO 06:00

READINGS FROM CHART. CREW IN MOOMBA

CREW ON REST BREAK

TAKEN FROM CHART.

TAKEN FROM CHART.

READINGS FROM CHART. CREW AT MOORAI

" " " " " "

0175

TEST RESULTS

CUSTOMER : SANTOS LTD

PERFORATIONS: 7945'—8/80'

PAGE: 3 OF 3

WELL NAME: MOOMBA #64

FORMATION : SARALINGIE

DATE: 24.12.92

TEST TYPE : *Review - NA*

OPR *A. GRINSLEY*

[illegible]



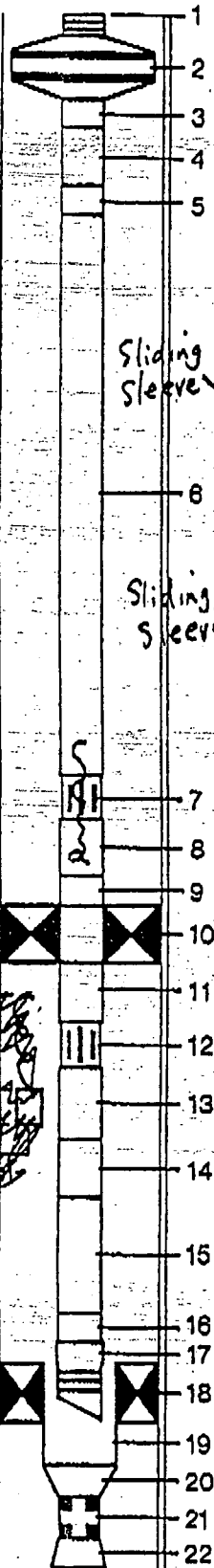
PETROLEUM ENGINEERING DEPARTMENT

0177 Page 1 of 2

DOWNHOLE INSTALLATION

MOOMBA 64

147



ITEM NO.	DESCRIPTION	LENGTH (ft)	DEPTH K.B. (ft)	MIN. I.D. (in)
1	K.B. to top of tubinghead spool	12.70	0.00	
2	C.I.W. FBB-EN 7 1/16" x 2 7/8" AB x 2 7/8" CS Hydril	0.70		
3	Nipple 2 7/8" J55 AB-IJ3SS pin x pin	0.32		
4	1 joint 2 7/8" 6.5# J55 AB-IJ3SS BH3	31.63		
5	2 7/8" 6.5# J55 AB-IJ3SS pups 1 x 12', 10', 6', & 4'	30.94		
6	241 joints 2 7/8" 6.5# J55 AB-IJ3SS tubing	7563.06		
7	Otis 2 7/8" 121XDH23110 AB-IJ3SS AB-IJ3SS	3.55	7639.35	2.313
8	1 joint 2 7/8" 6.5# J55 AB-IJ3SS BH3	31.18		
9	Pup joint 8' x 2 7/8" 6.5# J55 AB-IJ3SS BH3	7.74		
10	Baker model FH pkr size 47B4 2 7/8" AB-IJ3SS	7.01	7681.82	2.420
11	1 joint 2 7/8" 6.5# J55 AB-IJ3SS BH3	31.29		
12	Otis 2 7/8" 121XDH23110 AB-IJ3SS AB-IJ3SS	3.55	7720.12	2.313
13	2 joints 2 7/8" 6.5# J55 AB-IJ3SS BH3	62.37		
14	2 10' blast joints 2 7/8" AB-IJ3SS BH3	19.63		
15	4 20' blast joints 2 7/8" AB-IJ3SS BH3	79.11		
16	Pup joints 2 7/8" 6.5# J55 AB-IJ3SS 2 x 6' & 1 x 10'	21.22		
17	Baker G-22 80-32 locator seal assembly	(2.84)		
	<u>Permanent Downhole Equipment</u>			
18	Baker DB packer size 84-32 4 1/2" AB-IJ	4.08	7906.00	
19	Millout extension 4 1/2" AB-IJ3SS pin x pin	5.88		
20	Swage 4 1/2" box x 2 7/8" pin J55 AB-IJ3SS	1.72		
21	Otis 2 7/8" nipple 711XN23117 AB-IJ3SS	1.05	7917.68	
22	Re-entry guide 2 7/8" AB-IJ x 3 1/2" J55	1.00		
	Bottom of Tailpipe		7919.73	
FSH	30-8' x 2 1/8" Enerjet strip + CCL + Wt bar + cablehead			

PERFORATED INTERVALS:

GUN:

CHARGES:

FORMATION	INTERVAL	SIZE	TYPE	S.P.F.	TYPE	WT(g)
TOOLACHEE UNIT C						
75-8	7791' - 7803'	5"	CSG	6	120°	22
76-1	7809' - 7824'	5"	CSG	6	120°	22
76-2	7829' - 7842'	5"	CSG	6	120°	22
76-4/5	7852' - 7877'	5"	CSG	6	120°	22
Lower Daralinge Beds	(2/6/91)					
80-8	8144' - 8160'	2 1/8"	E/jets	4	0°	
79-7	8022' - 8050'	2 1/8"	E/jets	4	0°	
79-4	7954' - 7970'	2 1/8"	E/jets	4	0°	

REMARKS:

Attempt was made to spot inhibited fluid in annulus and

ANNULUS FLUID:

not contaminate Toolachee - estimate 50% annulus inhibited

INDICATED STRING WEIGHT:

52,000# (tubing not fully bouyant)

CALCULATED STRING WEIGHT:

44,713#

SLACK-OFF WEIGHT:

9,000#

TENSION:

NOT TO SCALE

WELLSITE SUPERVISOR

M. Dunne

PROPOSED

DATE OF INSTALLATION

13/2/1991

RE-COMPLETION

✓

DRAFTED

E. Coppins

DATE 7/5/1991

COMPLETION

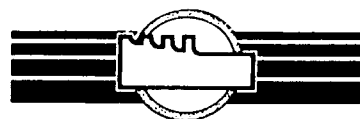
REVISED

G. Soulmatlis

DATE 3/5/1991

P.B.T.D. 8421' KB

EXPERTEST PTY. LTD.



FIELD READINGS

CUSTOMER: *SANTOS LTD*PERFORATIONS: *7945' - 8180'*PAGE: *2* OF *2*WELL NAME: *MOOMBA # 64*FORMATION: *DARALINGIE*DATE: *22-12-92*TEST TYPE: *B.H.P*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)	
<i>22-12-92</i>															
<i>10:30</i>	<i>.5</i>	<i>1129</i>	<i>14</i>	<i>40</i>											
<i>10:45</i>	<i>.75</i>	<i>1127</i>	<i>13</i>	<i>38</i>											
<i>11:00</i>	<i>1</i>	<i>1131</i>	<i>13</i>	<i>37</i>											
<i>11:15</i>	<i>1.25</i>	<i>1138</i>	<i>13</i>	<i>36</i>											
<i>11:30</i>	<i>1.5</i>	<i>1142</i>	<i>13</i>	<i>38</i>											
<i>11:45</i>	<i>1.75</i>	<i>1147</i>	<i>13</i>	<i>38</i>											
<i>12:00</i>	<i>2</i>	<i>1150</i>	<i>13</i>	<i>38</i>											
<i>12:15</i>	<i>2.25</i>	<i>1155</i>	<i>13</i>	<i>39</i>											
<i>12:30</i>	<i>2.5</i>	<i>1158</i>	<i>13</i>	<i>40</i>											
<i>12:45</i>	<i>2.75</i>	<i>1160</i>	<i>13</i>	<i>40</i>											
<i>13:00</i>	<i>3</i>	<i>1165</i>	<i>13</i>	<i>40</i>											
<i>13:15</i>	<i>3.25</i>	<i>1169</i>	<i>13</i>	<i>40</i>											
<i>13:30</i>	<i>3.5</i>	<i>1174</i>	<i>13</i>	<i>40</i>											
<i>13:45</i>	<i>3.75</i>	<i>1177</i>	<i>13</i>	<i>41</i>											
<i>14:00</i>	<i>4</i>	<i>1180</i>	<i>13</i>	<i>40</i>											
<i>18:00</i>	<i>8</i>	<i>1218</i>	<i>12</i>												
<i>18:00</i>		<i>CREW ON REST BREAK READING TAKEN FROM RECORDER TO 06:00</i>													
<i>22:00</i>	<i>12</i>	<i>1256</i>	<i>11</i>												
<i>23-12-92</i>															
<i>02:00</i>	<i>16</i>	<i>1255</i>	<i>11</i>												
<i>06:00</i>	<i>20</i>	<i>1255</i>	<i>10</i>												
		<i>SEE TEST RESULTS SHEETS FOR FURTHER READINGS</i>													

0178

SUB-SURFACE PRESSURE SURVEY

CO.		RUN 10 FIELD MOOMBA	WELL 64
EFF DEPTH		WELL STAT	TOOL HUNG 7614'
CASING	-	CASING PRESS	ON BOTTOM 1714 21/12
LINER	-	TUBING PRESS	OFF BOTTOM 1000 26/12
DATE	921226	ELEMENT RANGE 0 - 4067	ZERO POINT
ELEVATION		ZONE	SHUT-IN 1000 22/12
MAX TEMP $\approx 264^{\circ}\text{F}$		PICK-UP	ON-PROD
PERF	-	CAL SER NO. 21372	MPP
TUBING	-		
UNITS	ENGLISH	PURPOSE	BHP

SURVEY DATA

CO. RUN-10 FIELD MOOMBA				WELL-64			
TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
10:00	1048.5	1048.5	.0	2:24	1512.4	1512.4	40.4
10:02	1082.2	1082.2	.0	9:36	1515.4	1515.4	47.6
10:03	1173.0	1173.0	.1	16:10	1520.6	1520.6	54.2
10:05	1259.8	1259.8	.1	23:56	1521.1	1521.1	61.9
10:07	1310.4	1310.4	.1	7:42	1531.4	1531.4	69.7
10:09	1341.7	1341.7	.1	15:20	1529.4	1529.4	77.3
10:11	1351.0	1351.0	.2	23:04	1532.3	1532.3	85.1
10:14	1354.2	1354.2	.2	7:16	1534.2	1534.2	93.3
10:22	1348.1	1348.1	.4	10:00	1537.0	1537.0	96.0
10:33	1341.8	1341.8	.6	5:33	1253.4	1253.4	-15.6
10:39	1337.1	1337.1	.6	4:58	1191.2	1191.2	-15.0
10:52	1347.0	1347.0	.9	4:24	1135.3	1135.3	-14.4
11:06	1353.6	1353.6	1.1	3:34	1092.9	1092.9	-13.6
11:28	1361.6	1361.6	1.5	2:20	1075.7	1075.7	-12.3
11:52	1369.2	1369.2	1.9	1:48	1072.5	1072.5	-11.8
12:33	1379.7	1379.7	2.6	1:37	1119.7	1119.7	-11.6
13:38	1394.6	1394.6	3.6	1:12	1168.6	1168.6	-11.2
15:00	1415.7	1415.7	5.0	0:37	1198.0	1198.0	-10.6
17:26	1455.4	1455.4	7.4	0:07	1207.3	1207.3	-10.1
18:35	1473.1	1473.1	8.6	0:30	1184.3	1184.3	-9.5
19:55	1476.6	1476.6	9.9	1:16	1125.2	1125.2	-8.7
22:33	1486.6	1486.6	12.6	2:06	1067.5	1067.5	-7.9
3:24	1494.1	1494.1	17.4	3:37	1053.8	1053.8	-6.4
7:33	1500.3	1500.3	21.5	6:25	1053.1	1053.1	-3.6
13:22	1506.9	1506.9	27.4	9:00	1050.0	1050.0	-1.0
19:10	1512.9	1512.9	33.2	10:00	1049.7	1049.7	.0

LUB IN DWT = 960 PSI / OUT = 1286 PSI
 LUB IN AMERADA = 947 PSI / OUT = 1277 PSI

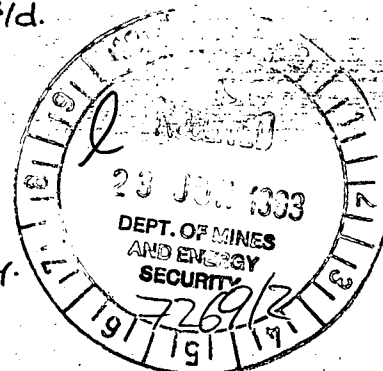
SWI @ 1000hrs 22/12/92 $\Rightarrow$ assume well on line 21.417 days in Dec.

Nov Total Gas cum = 62.8 E6m³

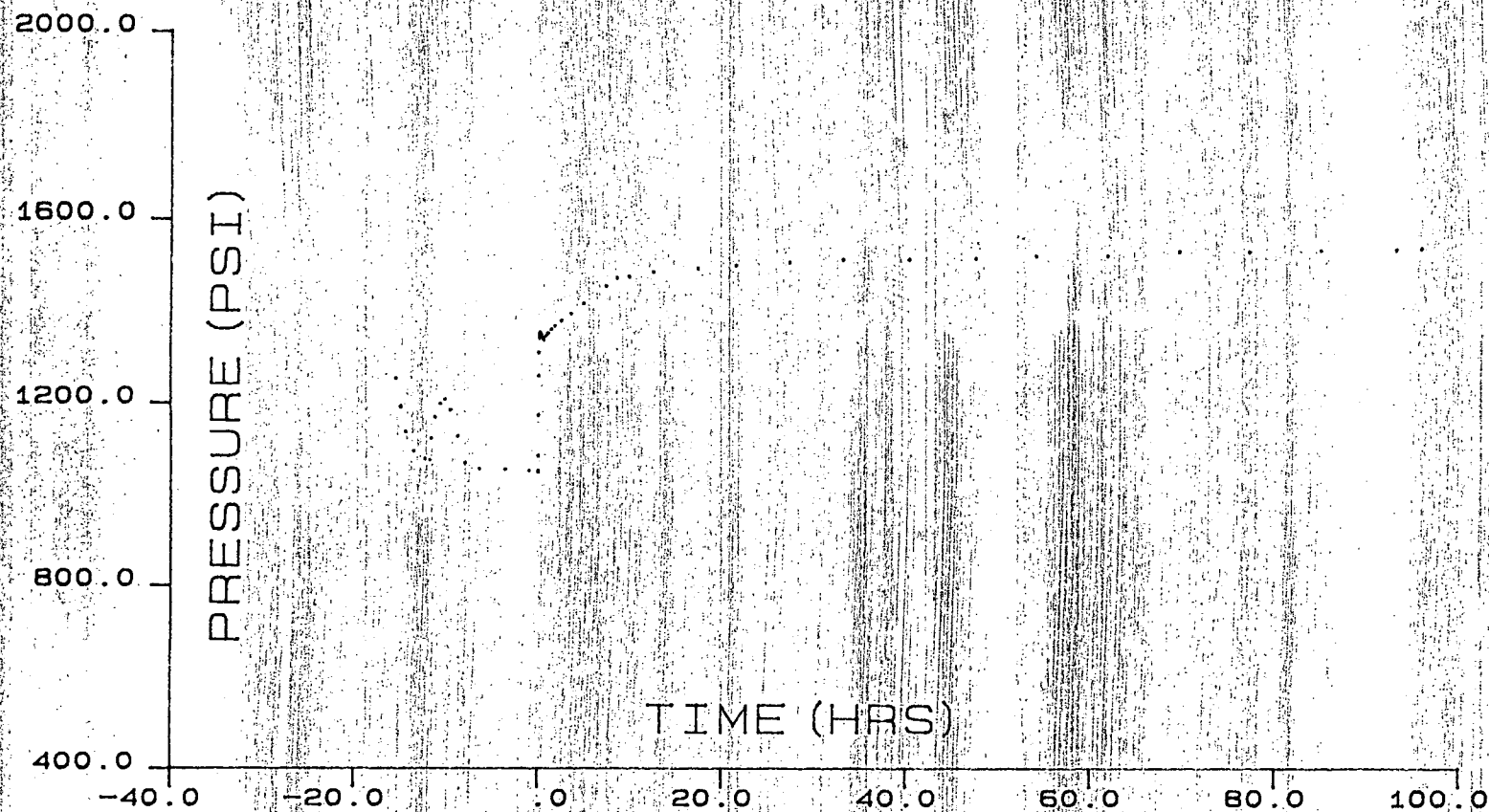
Nov mean gas daily = 78.8 E3m³/d = 0.0788 E6m³/d.

$\therefore$ Total gas Cum upto S/I = $(21.417 \times 0.0788) + 62.8$
 = 64.488 E6m³ ✓

Assume Q_g prior to S/I = November mean gas daily.
 = 78.8 E3m³/d ✓



MOOMBA #64 BHP DECEMBER 1992
ELEMENT #21372 (BOT) @7614'KB



WIRELINE & WELL TESTING SERVICE

PO BOX 354 COWANDILLA 5033

PH. (08) 354 0488 TELEX AAB7183

FAX (08) 43 7408

138 RICHMOND ROAD MARLESTON

SOUTH AUSTRALIA 5033

Tested Saturday, 26th December 1992.

CLIENT	LOCATION	FORMATION
SANTOS LTD.	MOOMBA #64	DARALINGIE

STATIC PRESSURE GRADIENT REPORT

PRESSURE ELEMENT DATA			
POSITION	SERIAL NO.	RANGE	CALIBRATED
Top	22420	4250	9/ 9/92
Bottom	21372	4050	9/ 9/92

WELL DATA	
PARAMETER	VALUE
DWT In	1286 PSIG
DWT Out	1286 PSIG
Max BHT	TEMP EL

DEPTH FT. KB	TOP ELEMENT			BOTTOM ELEMENT		
	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT
LUB.	0.6070	1275.5	---	0.6360	1277.4	---
1000	0.6250	1314.0	0.038	0.6540	1313.8	0.036
2000	0.6420	1350.3	0.036	0.6720	1350.1	0.036
3000	0.6580	1384.5	0.034	0.6890	1384.4	0.034
4000	0.6740	1418.7	0.034	0.7060	1418.8	0.034
5000	0.6900	1452.9	0.034	0.7220	1451.1	0.032
6000	0.7050	1485.0	0.032	0.7390	1485.4	0.034
7000	0.7210	1519.3	0.034	0.7550	1517.8	0.032
7500	0.7280	1534.3	0.030	0.7640	1536.0	0.036
7620	0.7300	1538.6	0.036	0.7660	1540.0	0.034
LUB.	0.6020	1264.9	---	0.6350	1275.4	---

GENERAL REMARKS

TEMPERATURE ELEMENT ALSO RUN.

MOOMBA # 64 — STATIC PRESSURE GRADIENT — 26/12/92
ELEMENT # 21372/4050 (BOT)

