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NUMBER 7160/2

PEL 5 AND PEL 6, PATCHAWARRA CENTRAL BLOCK

EROMANGA, SIMPSON AND COOPER BASINS

VARANUS 1

TEST REPORTS

Submitted by

Santos Ltd
1991

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MINES AND ENERGY
SOUTH AUSTRALIA



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Enquiries: Information Services Branch

Mines and Energy South Australia
191 Greenhill Road, Parkside 5063

Telephone: (08) 274 7687
Facsimile: (08) 272 7597

ENVELOPE 7160/2

TENEMENT: PEL 5 and PEL 6, Patchawarra Central Block; Eromanga, Simpson and Cooper Basins

TENEMENT HOLDER: Santos Ltd (operator), Bridge Oil Development Ltd, Delhi Petroleum Pty Ltd, Reef Oil NL, Barcoo Petroleum Pty Ltd, Vamgas Ltd, SAGASCO Resources Ltd and Bridge Oil Ltd

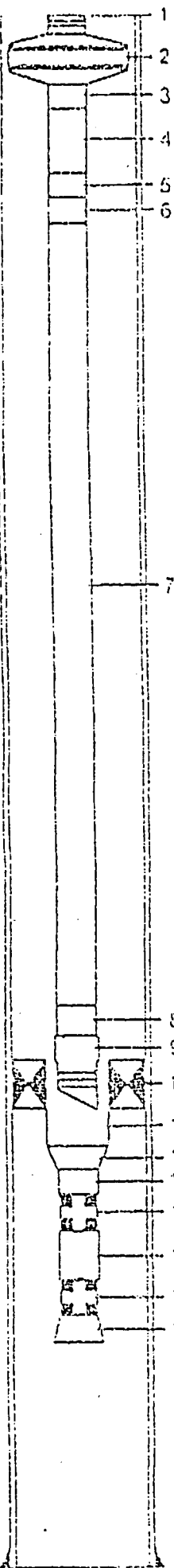
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Kurasiak, I., 1990. Results of flowing gradient survey of Patchawarra Formation perforated interval 9499-9567 feet, run on 15 December 1990 (Expertest Pty Ltd).	7160/2 R 2 Pgs 4-7
Kurasiak, I., Larkin, R. and Hay, N., 1990. Summary and results of Patchawarra producing zone pre-frac, single rate gas production test and reservoir pressure buildup plus extended buildup surveys, with associated flowing and static wellbore pressure gradient surveys, all conducted over the period 19 December 1990 - 1 January 1991 (Expertest Pty Ltd).	7160/2 R 3 Pgs 8-58
Bowyer, P., 1991. Results of static wellbore pressure gradient survey run on 5 March 1991 (Expertest Pty Ltd).	7160/2 R 4 Pgs 59-62
Black, P., 1991. Results of reservoir pressure buildup and static pressure gradient surveys conducted over the period 15-21 December 1991 (Expertest Pty Ltd).	7160/2 R 5 Pgs 63-76
Dowling, N., 1991. Results of flow test plus 4 rate modified isochronal test and buildup survey of the reperforated Patchawarra interval 9195-10075 feet, conducted over the period 6-22 August 1991 (Oilserv Australia Ltd).	7160/2 R 6 Pgs 77-111

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DOWNHOLE INSTALLATION

VARANUS #1



ITEM NO.	2 1/2" FRAC STRING - 7" CSG	LENGTH (ft)	DEPTH K.B. (ft)	MIN. I.D. (in)
1	K.B. to top of tubinghead spool	17.00	0.00	
2	C.I.W. F&B-EN 7 1/2" x 2 1/2" AB x 2 1/2" CS Hydril	7.0		
3	Nipple 2 1/2" L80 AB-IJ3SS pin x pin	2.0		
4	1 joint 2 1/2" 6-5# L80 AB-IJ3SS	20.45		
5	Pup joints 2 1/2" 6-5# L80 AB-IJ3SS	15.65		
6	X-over 2 1/2" AB-IJ3SS box x NK3SB pin L80	1.48		
7	28 Joints 2 1/2" 6-5# L80 NK3SB	4012.79		
8	X-over 2 1/2" NK3SB box x AB-IJ3SS pin L80	1.74		
9	Baker model E-22 anchor seal assembly size 80-32, 2 1/2" AB-IJ3SS box	(3-30)		2.406
Permanent Downhole Equipment				
10	7" Baker DB packer size 84-32 4 1/2" AB-IJ3SS	4.08	90.88	
11	Millout extension 4 1/2" AB-IJ3SS pin x pin	5.42		
12	Swage 4 1/2" box x 2 1/2" pin J55 AB-IJ3SS	1.74	9095.16	
14	Pup joint 10' x 2 1/2" 6-5# J55 AB-IJ3SS	9.71		
15	Olis 2 1/2" nipple 711X23103 AB-IJ3SS b x p	.46	9105.83	2.313
16	2 pup joints 10' x 2 1/2" 6-5# J55 AB-IJ3SS	19.50		
17	Olis 2 1/2" nipple 711XN23117 AB-IJ3SS b x p	1.03		2.205
18	Re-entry guide 2 1/2" AB-IJ3SS box x 3 1/2" J55	1.00	9127.36	

PERFORATED INTERVALS:

FORMATION

INTERVAL

GUN:

CHARGES:

SIZE

TYPE

S.P.F.

TYPE

WT(s)

PATCHAWARRA 900' 9499' - 9510' KB
 " 912' 9521' - 9567' KB

2 1/8"

EIJ

6/40"

RDX

22

REMARKS:

2 1/2" KLL BRINE WITH INHIBITOR

ANNULUS FLUID:

INDICATED STRING WEIGHT:

54000 LBS. LESS ON BLOCKS

CALCULATED STRING WEIGHT:

51000 LBS.

SLACK-OFF WEIGHT:

8000 LBS. COMPRESSION

TENSION:

NOT TO SCALE

WELLSITE SUPERVISOR

PROPOSED

DATE OF INSTALLATION

RE-COMPLETION

DRAFTED

DATE

COMPLETION

REVISED

DATE

P.B.T.D. 10240 KB

DHF

CUSTOMER :	SANTOS LTD.	PERFORATIONS:	9499'- 9567'KB	PAGE:	1	OF	1
WELL NAME:	VARANUS #1.	FORMATION :	Patchawarra	DATE:	15.12.90		
TEST TYPE :	Flowing Gradient Survey			OPR :	I. KURASIAK		

[illegible]

ET 102

000

ENV 7160/2

EXPERTEST

WIRELINE & WELL TESTING SERVICE

PO BOX 354 COWANDILLA 5033

PH. (08) 354 0400 TELEX AAB7183

FAX (08) 43 7408

138 RICHMOND ROAD MARLESTON
SOUTH AUSTRALIA 5033

Tested Saturday, 15th December 1990.

CLIENT	LOCATION	FORMATION
Santos Ltd.	VARANUS # 1	PATCHAWARRA

FLOWING PRESSURE GRADIENT REPORT

PRESSURE ELEMENT DATA			
POSITION	SERIAL NO.	RANGE	CALIBRATED
Top	62039	3000	14/12/90
Bottom	57414	3000	14/12/90

WELL DATA	
PARAMETER	VALUE
DWT In	130 PSIG
DWT Out	101 PSIG
Max BHT	280 F.

TOP ELEMENT				BOTTOM ELEMENT		
DEPTH FT. KB	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT
LUB.	0.0700	158.7	----	0.0790	115.3	----
1000	0.0970	189.3	0.031	0.0980	145.0	0.030
1900	0.1110	211.9	0.025	0.1130	168.4	0.026
3000	0.1320	253.9	0.030	0.1420	213.6	0.041
4000	0.1740	313.6	0.060	0.1800	272.8	0.059
5000	0.2210	389.6	0.076	0.2290	349.2	0.076
6000	0.2750	473.7	0.084	0.2840	434.9	0.086
7000	0.3290	564.4	0.091	0.3450	529.9	0.095
8000	0.4100	695.6	0.131	0.4320	665.3	0.135
8500	0.4610	778.2	0.165	0.4850	747.7	0.165
9000	0.5100	857.5	0.159	0.5390	831.7	0.160
9488	0.5860	980.5	0.252	0.6180	954.4	0.257
LUB.	0.0630	134.6	----	0.0650	93.5	----

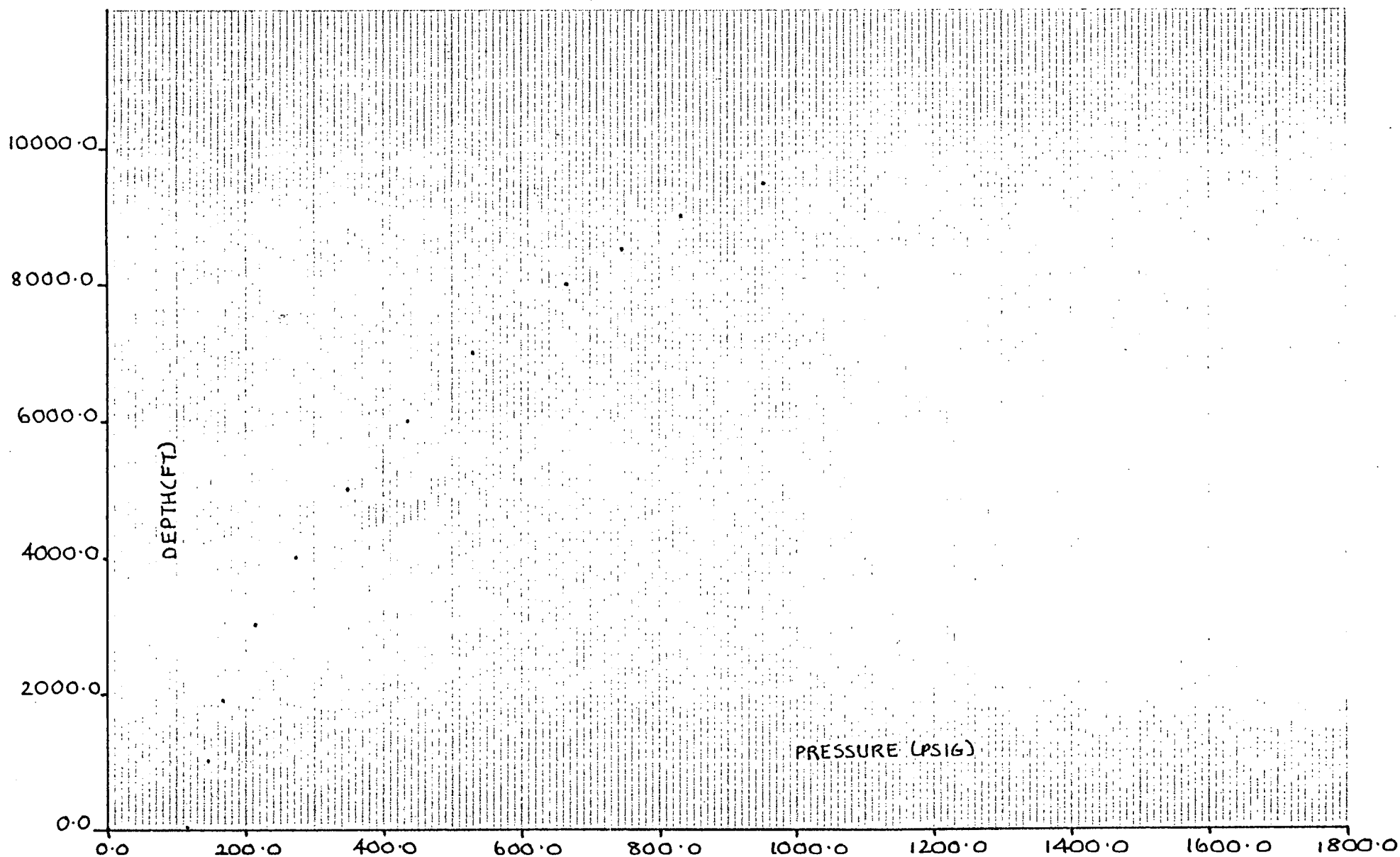
GENERAL REMARKS

WELL FLOWING ON CLEAN UP 24/64" CHOKER SIZE.

DOWNHOLE TUBE FAILURE ON TOP ELEMENT

DISREGARD TOP ELEMENT RESULTS

VARANUS # 1 — FLOWING PRESSURE GRADIENT — 15/12/90
ELEMENT # 57414/3000 (BOT)



90000

LTD.	PERFORATIONS:
#1	FORMATION :
1.1	Summary

PAGE: 1 OF 1

DATE: 15.12.90

OPR : I. KURASIAK

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.		62039	57414		DATE : 15.12.90			
ELEMENT RANGE		3000 PSI	3000 PSI		PRESSURE LUBRICATOR :	1050	827	N/A
RECORDING SECTION SERIAL NO.		70543	12959		RUN IN HOLE :	1125	896	N/A
DATE OF CALIBRATION:		14.12.90	14.12.90		ON DEPTH AT : 9488' KBFTM	1225	662	N/A
CLOCK SERIAL NO.		A15012	A-16081		DATE : 15.12.90			
CLOCK RANGE		3 HR	3 HR		PULL OUT OF HOLE :	1235	662	N/A
LEAD SCREW TYPE		15 TLS	15 TLS		AT SURFACE :	1256	N/A	N/A
					DEPRESSURE LUBRICATOR :	1321	696	N/A
ENGAGE STYLUS	DATE 15.12.90	TIME 1045	1045		MAXIMUM BHT AT 9488' KBFTM = 280 °F or 138 °C			
DISENGAGE STYLUS	DATE 15.12.90	TIME 1336	1336		N.B. ALL DEPTHS ARE MEASURED FROM K.B.			

[illegible]

Varanus #1
Summary Of Pre-Frac Single Rate Test & Buildup Survey
19th December 1990 - 1st January 1991

Flowing Reservoir Pressure

Mid Point of Perforations = 9533' KB

21/12/90: Ran flowing pressure gradient survey
 Element #15451 @ MPP = 9494 kPa
 Element #28904 @ MPP = 9565 kPa
 Flowing bottomhole temperature = 130°C

Single Rate Test

19th - 24th December

19/12/90: Opened well on 24/64" choke @ 1520 hrs. Trimmed through separator.
 Cut choke to 16/64" @ 1600 hrs and started test.
 Tested well on 16/64" choke for 110 hours

F.T.H.P. (Final)	=	1454	kPa
Separator Pressure	=	644	kPa
Separator Temperature	=	34	°C
Gas Flow Rate	=	2.948	E ³ m ³ /d
Oil Flow Rate	=	NIL	m ³ /d
Water Flow Rate	=	0.424	m ³ /d

24/12/90: Shut well in @ 0600 hrs
 Element #15451 @ 9474' KB @ 0600 hrs = 11246 kPa
 Element #28904 @ 9480' KB @ 0600 hrs = 11265 kPa

Buildup Survey

24th December 1990 - 1st January 1991

24/12/90: Shut well in @ 0600 hrs for 196.5 hours buildup
 Element #15451 @ 9474' KB after 196.5 hours buildup = 24857 kPa
 Element #28904 @ 9480' KB after 196.5 hours buildup = 25449 kPa
 Shut in bottomhole temperature = 134°C
 01/01/91: P.O.O.H. @ 1030 hrs.

Static Reservoir Pressure

Mid Point of Perforations = 9533' KB

28/12/90: Ran static pressure gradient survey
 Element #15451 @ MPP = 24175 kPa
 Element #28904 @ MPP = 24236 kPa
 Shut in bottomhole temperature = 140°C

01/01/91: Ran static gradient survey
 Element #15451 @ MPP = 25412 kPa
 Element #28904 @ MPP = 25362 kPa
 Shut in bottomhole temperature = 137°C

SUB-SURFACE PRESSURE SURVEY

00009

CO.		RUN 01 FIELD VARANUS	WELL 01
EFF DEPTH		WELL STAT	TOOL HUNG 9527'
CASING	-	CASING PRESS	ON BOTTOM 1757 21/12
LINER	-	TUBING PRESS	OFF BOTTOM 1440 23/12
DATE	901223	ELEMENT RANGE 0 - 5109	ZERO POINT
ELEVATION		ZONE	SHUT-IN
MAX TEMP	266	PICK-UP	ON-PROD
PERF	-	CAL SER NO. 15451	MPP
TUBING	-		
UNITS	ENGLISH	PURPOSE	FLOW

SURVEY DATA

CO.	TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
	17:57	1406.6	1406.6	.0	2:29	1800.5	1800.5	8.5
	18:18	1408.1	1408.1	.4	2:40	1789.9	1789.9	8.7
	18:54	1415.6	1415.6	.9	2:57	1803.7	1803.7	9.0
	20:02	1430.4	1430.4	2.1	3:15	1815.2	1815.2	9.3
	21:04	1440.1	1440.1	3.1	3:46	1827.4	1827.4	9.8
	21:17	1440.0	1440.0	3.3	4:17	1832.9	1832.9	10.3
	21:25	1480.7	1480.7	3.5	4:35	1832.7	1832.7	10.6
	21:34	1520.5	1520.5	3.6	4:45	1829.3	1829.3	10.8
	21:50	1572.3	1572.3	3.9	4:51	1845.2	1845.2	10.9
	22:04	1598.4	1598.4	4.1	5:19	1864.0	1864.0	11.4
	22:18	1623.4	1623.4	4.3	6:00	1880.4	1880.4	12.0
	22:25	1629.0	1629.0	4.5	6:26	1890.3	1890.3	12.5
	22:28	1597.9	1597.9	4.5	6:54	1900.7	1900.7	13.0
	22:32	1575.9	1575.9	4.6	7:08	1902.3	1902.3	13.2
	22:36	1555.8	1555.8	4.6	7:13	1847.2	1847.2	13.3
	22:43	1555.7	1555.7	4.8	7:20	1773.0	1773.0	13.4
	22:48	1565.8	1565.8	4.9	7:26	1742.1	1742.1	13.5
	22:54	1591.5	1591.5	5.0	7:35	1701.5	1701.5	13.6
	23:01	1623.0	1623.0	5.1	7:43	1675.2	1675.2	13.8
	23:09	1645.6	1645.6	5.2	7:54	1656.8	1656.8	13.9
	23:15	1665.6	1665.6	5.3	8:08	1623.8	1623.8	14.2
	23:25	1692.0	1692.0	5.5	8:28	1597.8	1597.8	14.5
	23:41	1713.9	1713.9	5.7	8:47	1577.5	1577.5	14.8
	0:00	1741.8	1741.8	6.1	9:16	1562.1	1562.1	15.3
	0:18	1759.4	1759.4	6.4	9:39	1554.5	1554.5	15.7
	0:47	1785.6	1785.6	6.8	10:01	1538.2	1538.2	16.1
	1:27	1803.7	1803.7	7.5	10:18	1561.7	1561.7	16.4
	1:48	1812.1	1812.1	7.9	10:36	1549.8	1549.8	16.6
	2:09	1814.7	1814.7	8.2	10:44	1545.9	1545.9	16.8
	2:20	1814.6	1814.6	8.4	11:08	1562.9	1562.9	17.2

SURVEY DATA

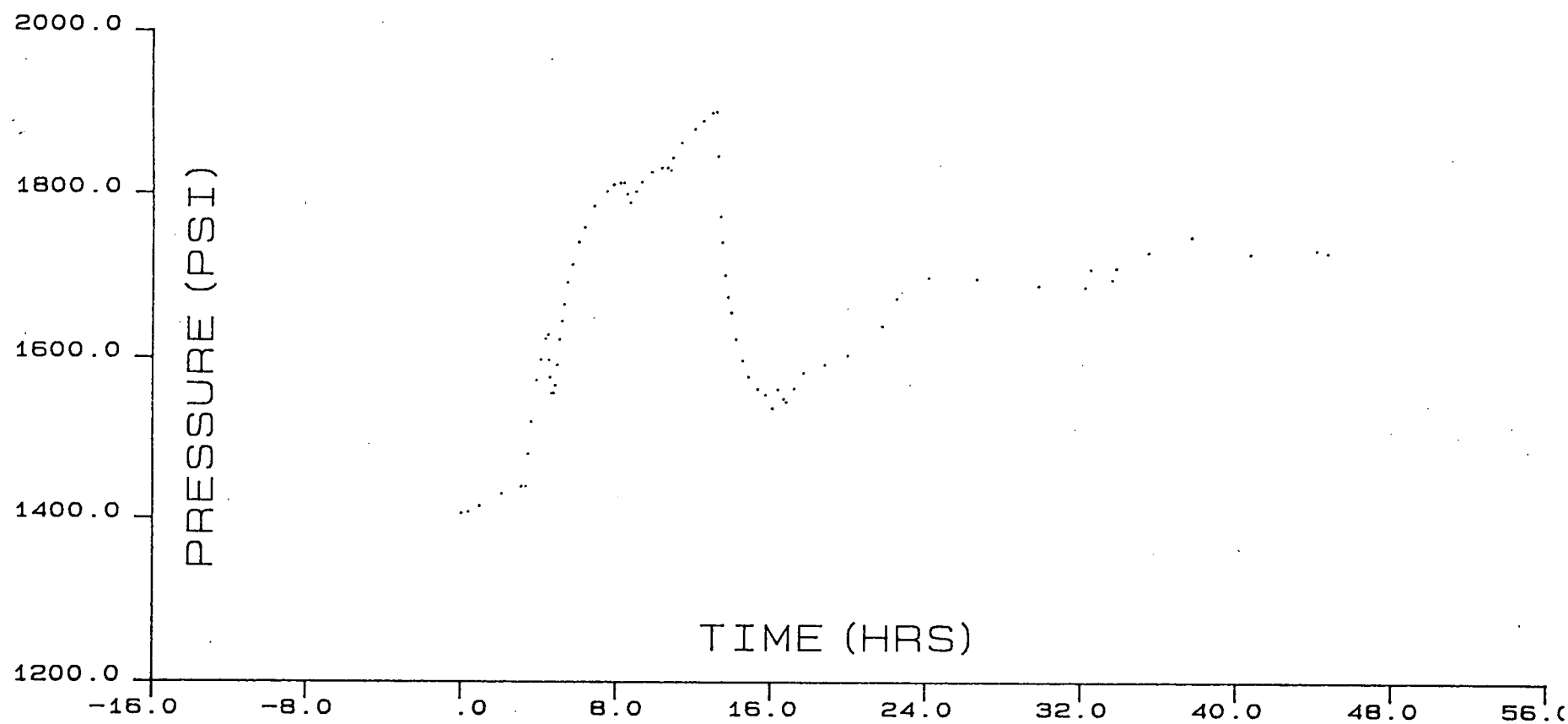
00010

CO.	RUN 01 FIELD VARANUS				WELL 01			
	TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
	11:37	1582.2	1582.2	17.7	2:27	1709.6	1709.6	32.5
	12:44	1593.4	1593.4	18.8	3:34	1696.8	1696.8	33.6
	13:55	1605.1	1605.1	20.0	3:46	1711.5	1711.5	33.8
	15:42	1640.6	1640.6	21.7	5:27	1731.2	1731.2	35.5
	16:27	1674.0	1674.0	22.5	7:40	1749.6	1749.6	37.7
	18:06	1699.3	1699.3	24.2	10:42	1728.5	1728.5	40.7
	20:35	1697.7	1697.7	26.6	14:07	1734.3	1734.3	44.2
	23:46	1689.2	1689.2	29.8	14:40	1730.2	1730.2	44.7
	2:10	1687.6	1687.6	32.2	0:00	.0	.0	.0

LUB IN DWT = 171 PSI / OUT = 314 PSI

LUB IN AMERADA = 171 PSI / OUT = 301 PSI

VARANUS #1 FLOW DEC 1990
ELEMENT #15451 (TOP)



00011

SUB-SURFACE PRESSURE SURVEY

00012

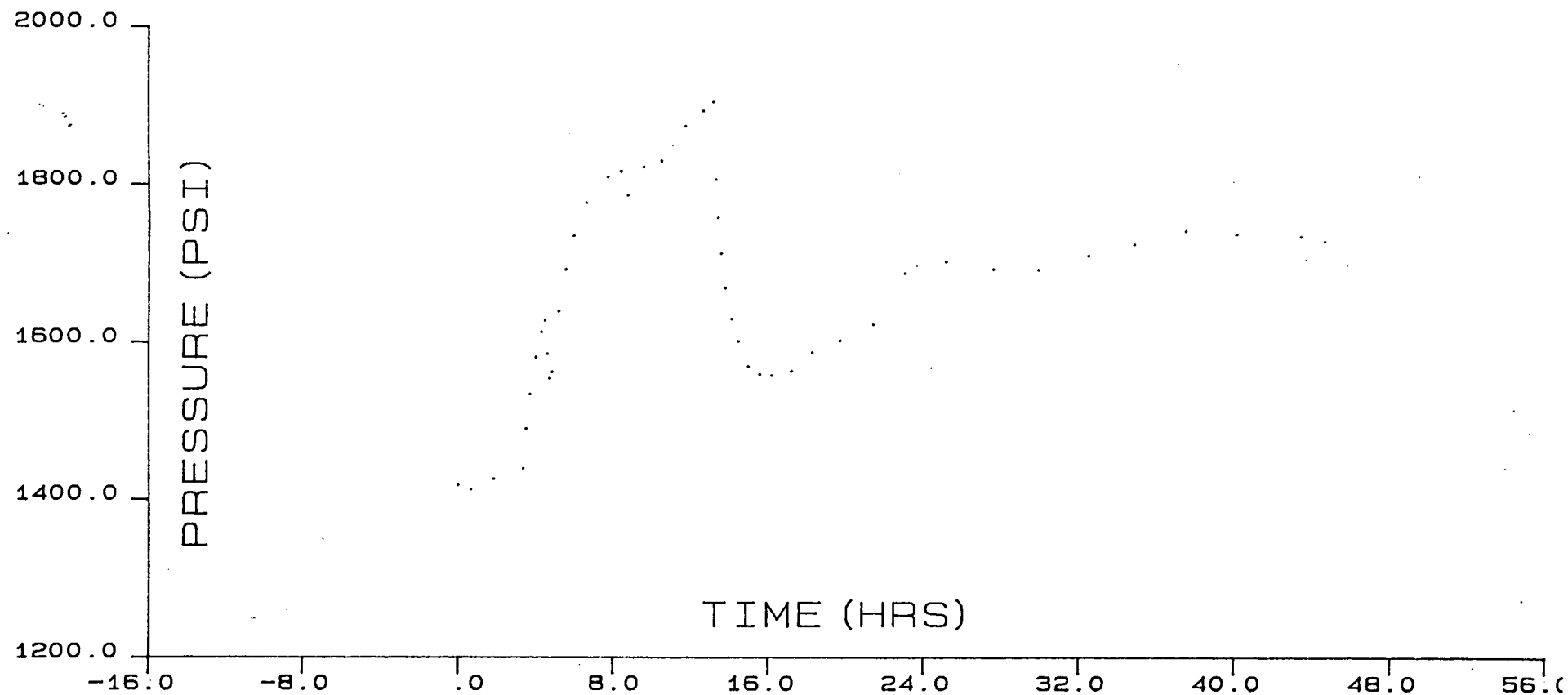
CO.		RUN 02 FIELD VARANUS	WELL 01
EFF DEPTH		WELL STAT	TOOL HUNG 9533'
CASING	-	CASING PRESS	ON BOTTOM 1757 21/12
LINER	-	TUBING PRESS	OFF BOTTOM 1440 23/12
DATE	901223	ELEMENT RANGE 0 - 5159	ZERO POINT
ELEVATION		ZONE	SHUT-IN
MAX TEMP	266	PICK-UP	ON-PROD
PERF	-	CAL SER NO. 28904	MPP
TUBING	-		
UNITS	ENGLISH	PURPOSE	FLOW

SURVEY DATA

CO.	TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
	17:57	1418.6	1418.6	.0	7:16	1807.9	1807.9	13.3
	18:37	1412.3	1412.3	.7	7:24	1758.8	1758.8	13.4
	19:47	1426.3	1426.3	1.8	7:33	1712.7	1712.7	13.6
	21:19	1439.7	1439.7	3.4	7:45	1670.0	1670.0	13.8
	21:28	1490.9	1490.9	3.5	8:05	1630.6	1630.6	14.1
	21:40	1534.7	1534.7	3.7	8:27	1602.4	1602.4	14.5
	21:58	1581.6	1581.6	4.0	8:57	1570.0	1570.0	15.0
	22:15	1614.0	1614.0	4.3	9:32	1559.5	1559.5	15.6
	22:27	1628.0	1628.0	4.5	10:10	1558.1	1558.1	16.2
	22:34	1585.9	1585.9	4.6	11:10	1564.3	1564.3	17.2
	22:40	1554.5	1554.5	4.7	12:14	1587.9	1587.9	18.3
	22:49	1562.1	1562.1	4.9	13:41	1603.3	1603.3	19.7
	23:10	1639.7	1639.7	5.2	15:24	1623.5	1623.5	21.4
	23:32	1692.9	1692.9	5.6	17:02	1688.6	1688.6	23.1
	23:57	1735.4	1735.4	6.0	19:10	1703.5	1703.5	25.2
	0:36	1777.4	1777.4	6.6	21:36	1693.5	1693.5	27.7
	1:42	1810.5	1810.5	7.7	23:55	1692.8	1692.8	30.0
	2:23	1817.9	1817.9	8.4	2:30	1711.0	1711.0	32.5
	2:44	1787.4	1787.4	8.8	4:52	1725.7	1725.7	34.9
	3:32	1823.7	1823.7	9.6	7:32	1743.1	1743.1	37.6
	4:28	1831.5	1831.5	10.5	10:07	1738.2	1738.2	40.2
	5:42	1874.8	1874.8	11.7	13:26	1735.2	1735.2	43.5
	6:37	1894.4	1894.4	12.7	14:40	1729.2	1729.2	44.7
	7:08	1905.7	1905.7	13.2	0:00	.0	.0	.0

LUB IN DWT = 171 PSI / OUT = 314 PSI
 LUB IN AMERADA = 178 PSI / OUT = 315 PSI

VARANUS #1 FLOW DEC 1990
ELEMENT #28904 (BOT)



00013

BHP/BHT GAUGE RUN DATA



PERFORATIONS: 9494'-9567'

PAGE: 1 OF

FORMATION : PATCHAWARRA

DATE: 21-12-90

OPR : N. MAY

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.		15451	28904	N/A	DATE	21.12.90			
ELEMENT RANGE		5650	5200		PRESSURE LUBRICATOR		17:08	1179	0
RECORDING SECTION SERIAL NO.		12961	12974		RUN IN HOLE		17:38	1179	0
DATE OF CALIBRATION:					ON DEPTH AT	9533 FT/M	17:57	1165	0
								169	
CLOCK SERIAL NO.		29713	26824		DATE	23.12.90			
CLOCK RANGE		48 HR	48 HR		PULL OUT OF HOLE		1440		0
LEAD SCREW TYPE		15 T45	15 T45		AT SURFACE		1457		0
					DEPRESSURE LUBRICATOR		1530	2165	0
ENGAGE STYLUS	DATE 21.12.90	TIME 17:04	17:04		MAXIMUM BHT AT 9533 FT/M = 266 °F/16 314				
DISENGAGE STYLUS	DATE 23.12.90	TIME 15:36	15:36		N.B. ALL DEPTHS ARE MEASURED FROM K.B.				

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00014

SUB-SURFACE PRESSURE SURVEY

00015

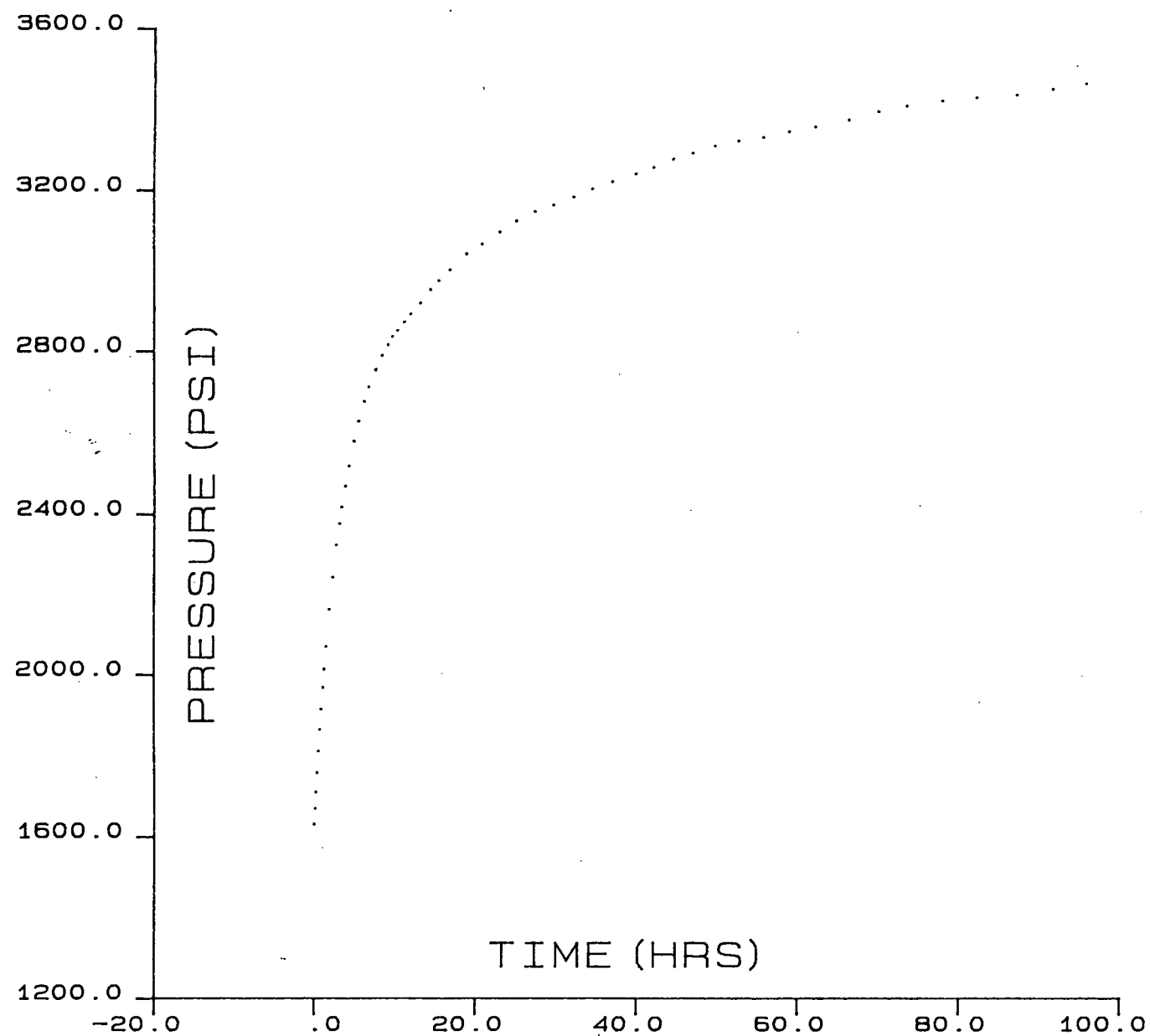
CO.		RUN 03 FIELD VARANUS	WELL 01
EFF DEPTH		WELL STAT	TOOL HUNG 9474'
CASING	-	CASING PRESS	ON BOTTOM 1810 23/12
LINER	-	TUBING PRESS	OFF BOTTOM 0600 28/12
DATE	901228	ELEMENT RANGE 0 - 5109	ZERO POINT
ELEVATION		ZONE	SHUT-IN 0600 24/12
MAX TEMP	274	PICK-UP	ON-PROD
PERF	-	CAL SER NO. 15451	MPP
TUBING	-		
UNITS	ENGLISH	PURPOSE	BUILD-UP

SURVEY DATA

CO.				RUN 03 FIELD VARANUS				WELL 01			
TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
6:00	1631.0	1631.0	.0	20:31	2954.0	2954.0	14.5				
6:07	1669.5	1669.5	.1	21:34	2976.8	2976.8	15.6				
6:13	1709.5	1709.5	.2	22:58	3005.4	3005.4	17.0				
6:22	1757.9	1757.9	.4	1:02	3044.4	3044.4	19.0				
6:31	1810.1	1810.1	.5	2:58	3068.9	3068.9	21.0				
6:42	1863.8	1863.8	.7	5:11	3098.7	3098.7	23.2				
6:53	1912.0	1912.0	.9	7:13	3125.9	3125.9	25.2				
7:07	1968.3	1968.3	1.1	9:31	3149.4	3149.4	27.5				
7:17	2014.7	2014.7	1.3	11:50	3166.4	3166.4	29.8				
7:32	2071.3	2071.3	1.5	14:20	3186.2	3186.2	32.3				
7:57	2164.2	2164.2	1.9	16:41	3206.3	3206.3	34.7				
8:23	2244.6	2244.6	2.4	19:10	3224.1	3224.1	37.2				
8:49	2324.2	2324.2	2.8	22:04	3243.4	3243.4	40.1				
9:12	2378.6	2378.6	3.2	0:15	3259.6	3259.6	42.3				
9:30	2418.8	2418.8	3.5	2:42	3280.8	3280.8	44.7				
9:55	2469.4	2469.4	3.9	5:07	3296.8	3296.8	47.1				
10:21	2518.7	2518.7	4.4	7:52	3315.1	3315.1	49.9				
10:56	2579.1	2579.1	4.9	10:49	3327.5	3327.5	52.8				
11:33	2628.5	2628.5	5.5	13:53	3337.1	3337.1	55.9				
12:14	2676.2	2676.2	6.2	17:07	3350.2	3350.2	59.1				
12:46	2711.8	2711.8	6.8	20:21	3362.4	3362.4	62.4				
13:39	2755.1	2755.1	7.7	0:29	3379.2	3379.2	66.5				
14:28	2790.8	2790.8	8.5	4:13	3399.8	3399.8	70.2				
15:12	2815.6	2815.6	9.2	7:44	3413.5	3413.5	73.7				
15:44	2835.4	2835.4	9.7	12:10	3426.0	3426.0	78.2				
16:23	2850.8	2850.8	10.4	16:25	3434.3	3434.3	82.4				
17:15	2872.9	2872.9	11.3	21:23	3440.6	3440.6	87.4				
18:02	2893.4	2893.4	12.0	1:51	3454.9	3454.9	91.9				
19:14	2921.4	2921.4	13.2	6:00	3467.8	3467.8	96.0				

LUB IN DWT = 322 PSI / OUT = 1614 PSI
 LUB IN AMERADA = 318 PSI / OUT = 1615 PSI

VARANUS #1 BUILDUP DEC 1990
ELEMENT #15451 (TOP)



SUB-SURFACE PRESSURE SURVEY

00017

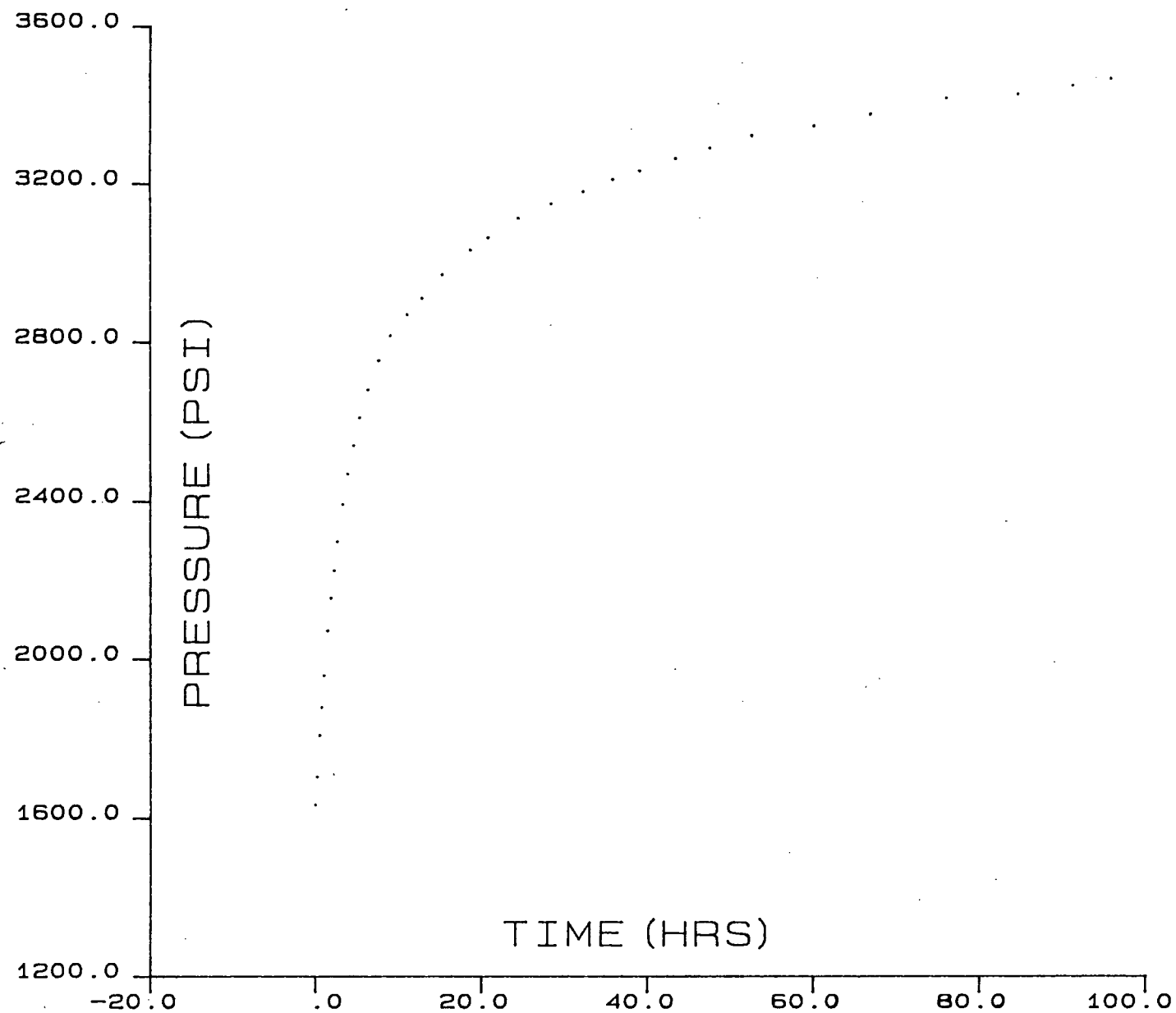
CO.		RUN 04 FIELD VARANUS	WELL 01
EFF DEPTH		WELL STAT	TOOL HUNG 9480'
CASING	-	CASING PRESS	ON BOTTOM 1810 23/12
LINER	-	TUBING PRESS	OFF BOTTOM 0600 28/12
DATE	901228	ELEMENT RANGE 0 - 5159	ZERO POINT
ELEVATION		ZONE	SHUT-IN 0600 24/12
MAX TEMP	274	PICK-UP	ON-PROD
PERF	-	CAL SER NO. 28904	MPP
TUBING	-		
UNITS	ENGLISH	PURPOSE	BUILDUP

SURVEY DATA

CO.	TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
	6:00	1633.8	1633.8	.0	21:22	2971.0	2971.0	15.4
	6:12	1704.4	1704.4	.2	0:47	3033.9	3033.9	18.8
	6:31	1808.2	1808.2	.5	2:54	3065.2	3065.2	20.9
	6:46	1877.1	1877.1	.8	6:31	3112.9	3112.9	24.5
	7:04	1958.9	1958.9	1.1	10:30	3151.6	3151.6	28.5
	7:30	2072.1	2072.1	1.5	14:22	3182.5	3182.5	32.4
	7:55	2155.3	2155.3	1.9	17:57	3213.4	3213.4	36.0
	8:18	2224.9	2224.9	2.3	21:13	3234.6	3234.6	39.2
	8:40	2298.9	2298.9	2.7	1:31	3266.6	3266.6	43.5
	9:19	2393.3	2393.3	3.3	5:40	3294.2	3294.2	47.7
	9:57	2469.2	2469.2	3.9	10:45	3327.8	3327.8	52.7
	10:39	2542.1	2542.1	4.6	18:15	3353.1	3353.1	60.2
	11:23	2612.1	2612.1	5.4	1:02	3382.3	3382.3	67.0
	12:23	2681.9	2681.9	6.4	10:09	3422.5	3422.5	76.2
	13:39	2755.4	2755.4	7.6	18:46	3432.4	3432.4	84.8
	15:05	2816.1	2816.1	9.1	1:23	3453.8	3453.8	91.4
	17:07	2869.8	2869.8	11.1	6:00	3471.0	3471.0	96.0
	18:53	2911.3	2911.3	12.9	0:00	.0	.0	.0

LUB IN DWT = 322 PSI / OUT = 1614 PSI
 LUB IN AMERADA = 310 PSI / OUT = 1631 PSI

VARANUS #1 BUILDUP DEC 1990
ELEMENT #28904 (BOT)



00018

The logo of the National Association of Manufacturers (NAM) is located in the top right corner. It features a stylized circular emblem with a gear-like or cogwheel design inside, set against a background of horizontal stripes.

The logo of the National Association of Manufacturers (NAM) is located in the top right corner. It features a stylized circular emblem with a gear-like or cogwheel design inside, set against a background of horizontal stripes.

PAGE: / OF

DATE: 23.12.80

OPR : N. HAY

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.		15451	28904	N/A	DATE : 23-12-90			
ELEMENT RANGE		5650	5200		PRESSURE LUBRICATOR :	1546		0
RECORDING SECTION SERIAL NO.		12961	12979		RUN IN HOLE :	1745	3220	0
DATE OF CALIBRATION:					ON DEPTH AT : 9480' FT/M	1810	1875	0
CLOCK SERIAL NO.		2	1-15683		DATE : 28-12-90		PSI	
CLOCK RANGE		120HR	120 HR		PULL OUT OF HOLE :	0600	1612	0
LEAD SCREW TYPE		15 T45	15 T45		AT SURFACE :	0623		
					DEPRESSURE LUBRICATOR :	0823	1614	0
ENGAGE STYLUS DATE 23-12-90 TIME		1542	1542		MAXIMUM BHT AT 9480' FT/M = 274 °F/C			
DISENGAGE STYLUS DATE TIME					N.B. ALL DEPTHS ARE MEASURED FROM K.B.			

[illegible]

SUB-SURFACE PRESSURE SURVEY

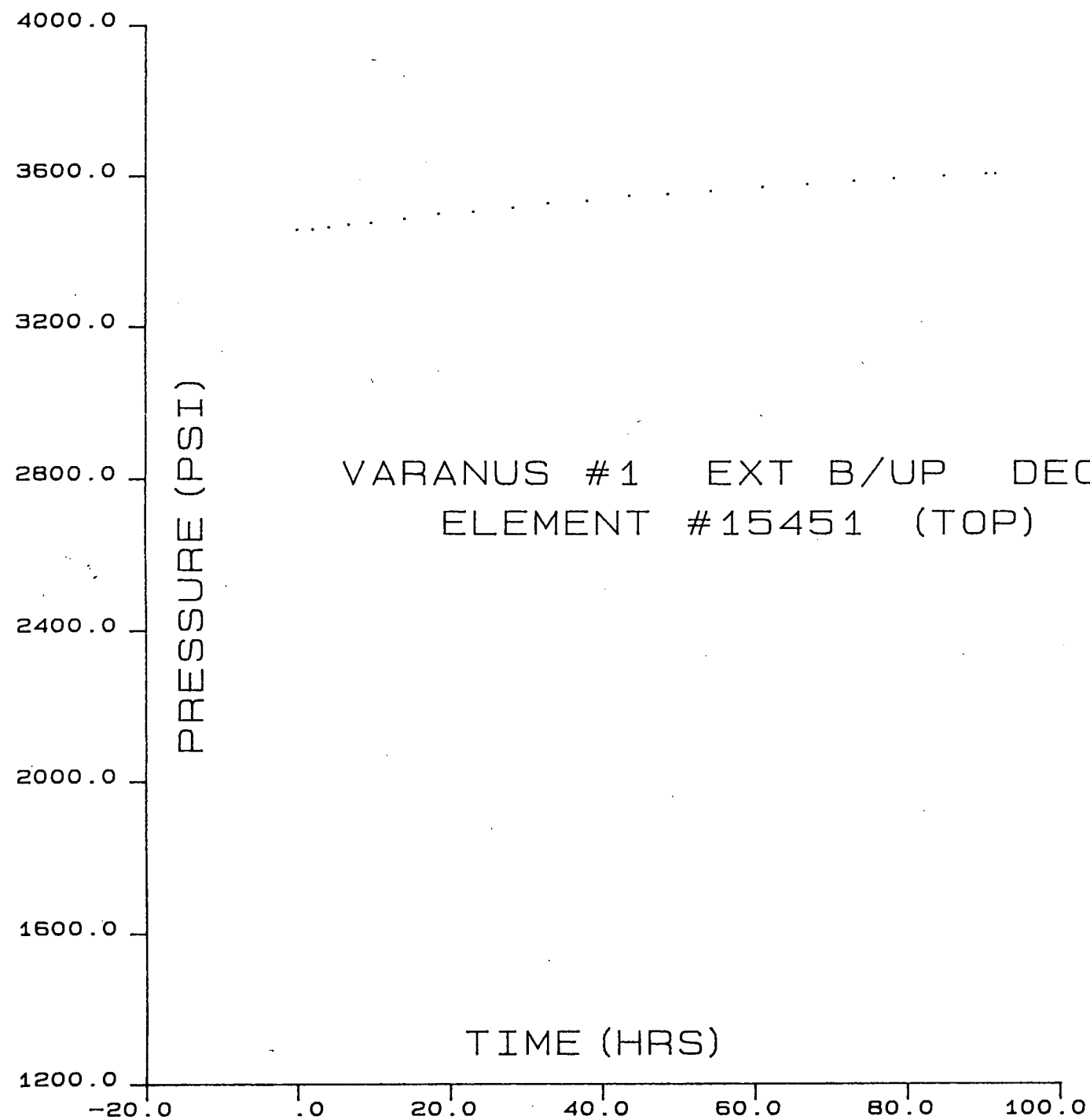
00020

CO.		RUN 05 FIELD VARANUS	WELL 01
EFF DEPTH		WELL STAT	TOOL HUNG 9474'
CASING	-	CASING PRESS	ON BOTTOM 1441 28/12
LINER	-	TUBING PRESS	OFF BOTTOM 1030 1/1
DATE	910101	ELEMENT RANGE 0 - 5109	ZERO POINT
ELEVATION		ZONE	SHUT-IN
MAX TEMP	274	PICK-UP	ON-PROD
PERF	-	CAL SER NO. 15451	MPP
TUBING	-		
UNITS	ENGLISH	PURPOSE	EXT B/UP

SURVEY DATA

CO.	TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
	14:41	3458.3	3458.3	.0	10:21	3547.0	3547.0	43.7
	16:45	3458.4	3458.4	2.1	15:26	3552.0	3552.0	48.7
	18:53	3464.5	3464.5	4.2	21:08	3559.9	3559.9	54.4
	21:28	3471.4	3471.4	6.8	3:55	3570.4	3570.4	61.2
	0:26	3476.5	3476.5	9.7	9:47	3578.1	3578.1	67.1
	4:52	3486.6	3486.6	14.2	15:58	3586.2	3586.2	73.3
	9:21	3499.7	3499.7	18.7	21:12	3592.3	3592.3	78.5
	13:53	3505.7	3505.7	23.2	3:45	3599.7	3599.7	85.1
	19:05	3516.4	3516.4	28.4	9:15	3604.7	3604.7	90.6
	23:43	3527.5	3527.5	33.0	10:30	3605.1	3605.1	91.8
	4:51	3534.1	3534.1	38.2	0:00	.0	.0	.0

LUB IN DWT = 1632 PSI / OUT = 1792 PSI
LUB IN AMERADA = 1601 PSI / OUT = 1777 PSI



00021

SUB-SURFACE PRESSURE SURVEY

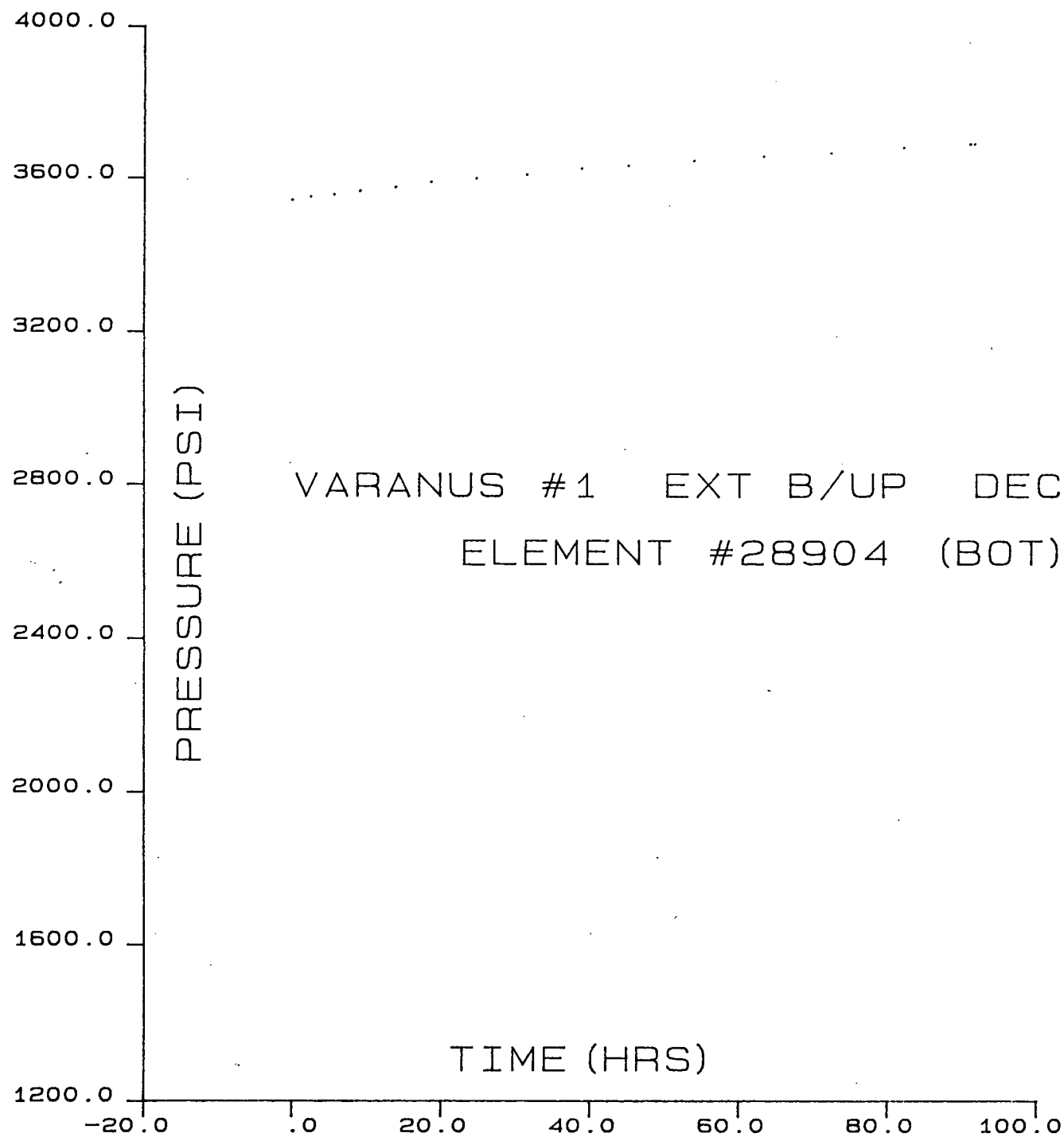
CO.		RUN 06 FIELD VARANUS	WELL 01
EFF DEPTH		WELL STAT	TOOL HUNG 9480'
CASING	-	CASING PRESS	ON BOTTOM 1441 28/12
LINER	-	TUBING PRESS	OFF BOTTOM 1030 1/1
DATE	910101	ELEMENT RANGE 0 - 5159	ZERO POINT
ELEVATION		ZONE	SHUT-IN
MAX TEMP	274	PICK-UP	ON-PROD
PERF	-	CAL SER NO. 28904	MPP
TUBING	-		
UNITS	ENGLISH	PURPOSE	EXT B/UP

SURVEY DATA

CO.	TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
	14:41	3542.4	3542.4	.0	5:36	3626.1	3626.1	38.9
	17:10	3551.7	3551.7	2.5	11:52	3633.9	3633.9	45.2
	20:20	3557.1	3557.1	5.6	20:46	3646.6	3646.6	54.1
	23:50	3566.4	3566.4	9.1	6:06	3658.5	3658.5	63.4
	4:34	3576.6	3576.6	13.9	15:14	3667.7	3667.7	72.6
	9:22	3590.4	3590.4	18.7	1:00	3681.7	3681.7	82.3
	15:27	3600.1	3600.1	24.8	9:55	3691.3	3691.3	91.2
	22:17	3610.0	3610.0	31.6	10:30	3690.9	3690.9	91.8

LUB IN DWT = 1632 PSI / OUT = 1792 PSI

LUB IN MAERADA = 1645 PSI / OUT = 1817 PSI



00023

BHP/BHT GAUGE RUN DATA

CUSTOMER : SANTOS PET.

PERFORATIONS: 9494' - 9567'

PAGE: 2 OF 3

WELL NAME: VARANUS B 1

FORMATION : PATCHAWARRA

DATE: 28.12.90

TEST TYPE : Flow-Build up

OPR : R. LARKIN

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.		15451	28904	}	DATE : 28.12.90			
ELEMENT RANGE PSJ		5650	5200		PRESSURE LUBRICATOR : 1225			
RECORDING SECTION SERIAL NO.		12961	12979		RUN IN HOLE : 1425	1632	0	
DATE OF CALIBRATION:		28.8.90	28.8.90		ON DEPTH AT : 9480' FT/M	1441	1635	0
CLOCK SERIAL NO.		E.P. ²	F-15683		DATE : 1.1.91			
CLOCK RANGE		120 hr	120 hr		PULL OUT OF HOLE : 1030	1792	0	
LEAD SCREW TYPE		15 T L S	15 T L S		AT SURFACE : 1052	1792	0	
					DEPRESSURE LUBRICATOR : 1252	1792.	0	
ENGAGE STYLUS DATE 28.12.90 TIME		1218	1218		MAXIMUM BHT AT 9480 FT/M = 274 °F/10			
DISENGAGE STYLUS DATE 1.1.90 TIME		1300	1300		N.B. ALL DEPTHS ARE MEASURED FROM K.B.			

[illegible]

EXPERTEST

WIRELINE & WELL TESTING SERVICE

PO BOX 354 COWANVILLE 5033

PH. (08) 354 0488 TELEX AA87183

FAX (08) 43 7408

138 RICHMOND ROAD MARLESTON

SOUTH AUSTRALIA 5033

Tested Friday, 21st December 1990.

CLIENT	LOCATION	FORMATION
Santos Ltd.	VARANUS #1	N/A

FLOWING PRESSURE GRADIENT REPORT

P R E S S U R E E L E M E N T D A T A			
POSITION	SERIAL NO.	RANGE	CALIBRATED
Top	15451	5650	28/ 8/90
Bottom	28904	5200	28/ 8/90

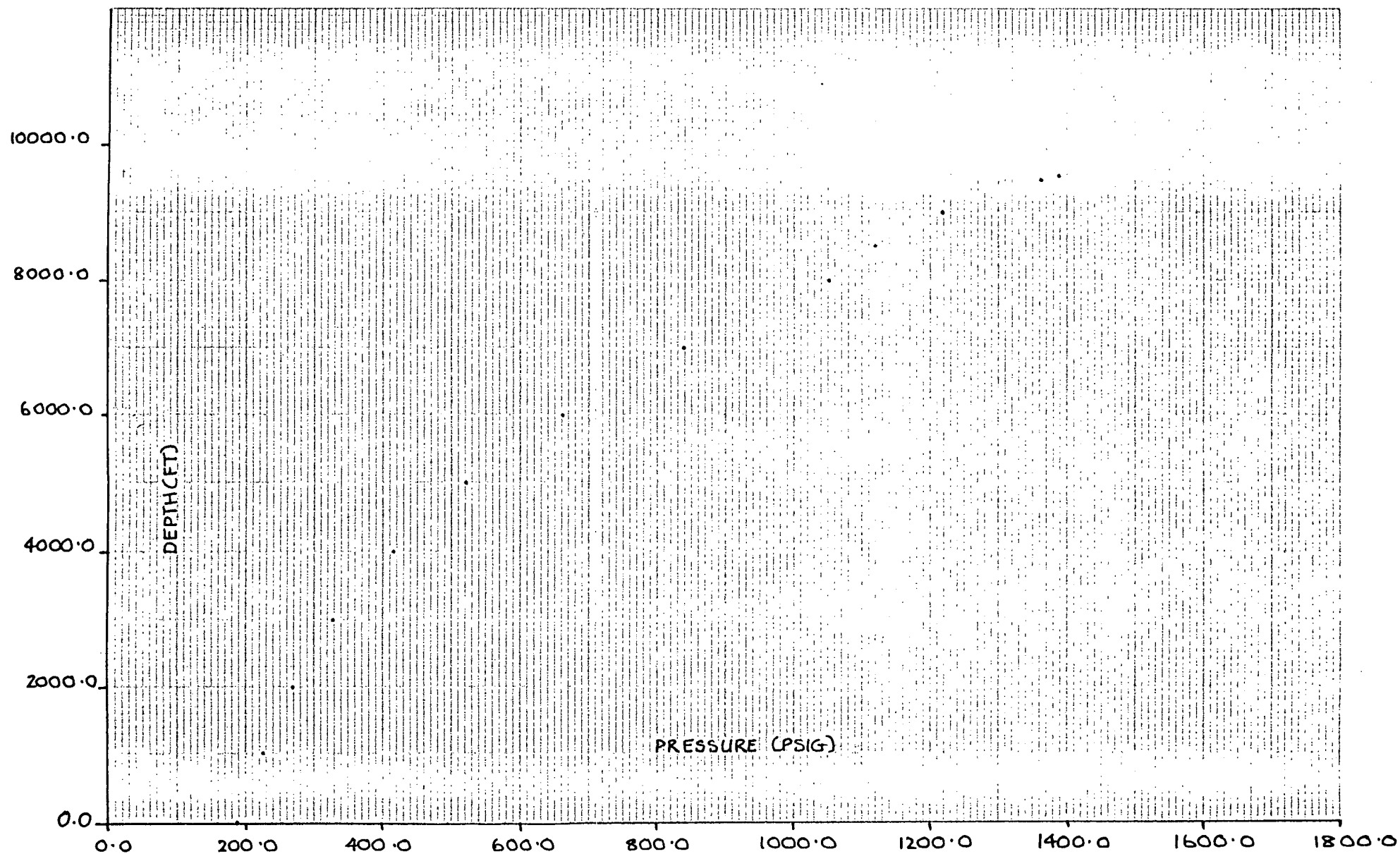
W E L L D A T A	
PARAMETER	VALUE
DWT In	185 PSIG
DWT Out	171 PSIG
Max BHT	N/A

T O P E L E M E N T				B O T T O M E L E M E N T		
DEPTH FT. KB	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT
LUB.	0.0700	166.3	-----	0.0730	187.5	-----
1000	0.0860	207.0	0.041	0.0880	226.1	0.039
2000	0.1020	247.7	0.041	0.1040	267.3	0.041
3000	0.1240	303.7	0.056	0.1270	326.5	0.059
4000	0.1600	395.3	0.092	0.1620	416.5	0.090
5000	0.2030	504.6	0.109	0.2030	521.9	0.105
6000	0.2570	641.9	0.137	0.2580	663.2	0.141
7000	0.3270	819.9	0.178	0.3270	840.4	0.177
8000	0.4020	1010.6	0.191	0.4090	1050.9	0.211
8500	0.4390	1104.7	0.188	0.4360	1120.2	0.139
9000	0.4800	1208.9	0.209	0.4740	1217.8	0.195
9480	0.5360	1351.4	0.297	0.5310	1364.1	0.305
9533	0.5460	1376.9	0.480	0.5400	1387.2	0.436
LUB.	0.0670	158.7	-----	0.0700	179.7	-----

GENERAL REMARKS

VARANUS # 1 — FLOWING PRESSURE GRADIENT — 21/12/90

ELEMENT # 28904 / 5200 (BOT)



BHP/BHT GAUGE RUN DATA



PERFORATIONS: 9494'-9567'

PAGE: 1 OF

FORMATION : PATCHAWARR

DATE: 21-12-90

TEST TYPE : FLOWING GRADIENT

OPR : N. HAY

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.		15451	28904	N/A	DATE : 21-12-90			
ELEMENT RANGE		5650	5200		PRESSURE LUBRICATOR :	1442	1275	0
RECORDING SECTION SERIAL NO.		12961	12979		RUN IN HOLE :	1452	1275	0
DATE OF CALIBRATION:					ON DEPTH AT : 9533 FT/M	1620	1261	0
CLOCK SERIAL NO.		2509	2431		DATE : 21-12-90			
CLOCK RANGE		3HR	3HR		PULL OUT OF HOLE :	1630		
LEAD SCREW TYPE		15 T45	15 T45		AT SURFACE :	1645	1206	0
					DEPRESSURE LUBRICATOR :	1655	1206	0
ENGAGE STYLUS	DATE 21-12-90	TIME 1433	1433		MAXIMUM BHT AT 9533 FT/M = 266 °F/128 °C			
DISENGAGE STYLUS	DATE 21-12-90	TIME 1658	1658		N.B. ALL DEPTHS ARE MEASURED FROM K.B.			

[illegible]

06027

WIRELINE & WELL TESTING SERVICE

PO BOX 354 COWANULLA 5033

PH. (08) 354 0488 TELEX AAB7193

FAX (08) 43 7408

138 RICHMOND ROAD MARLESTON
SOUTH AUSTRALIA 5033

Tested Friday, 28th December 1990.

CLIENT	LOCATION	FORMATION
Santos Ltd.	VARANUS 1	PATCHAWARRA

STATIC PRESSURE GRADIENT REPORT

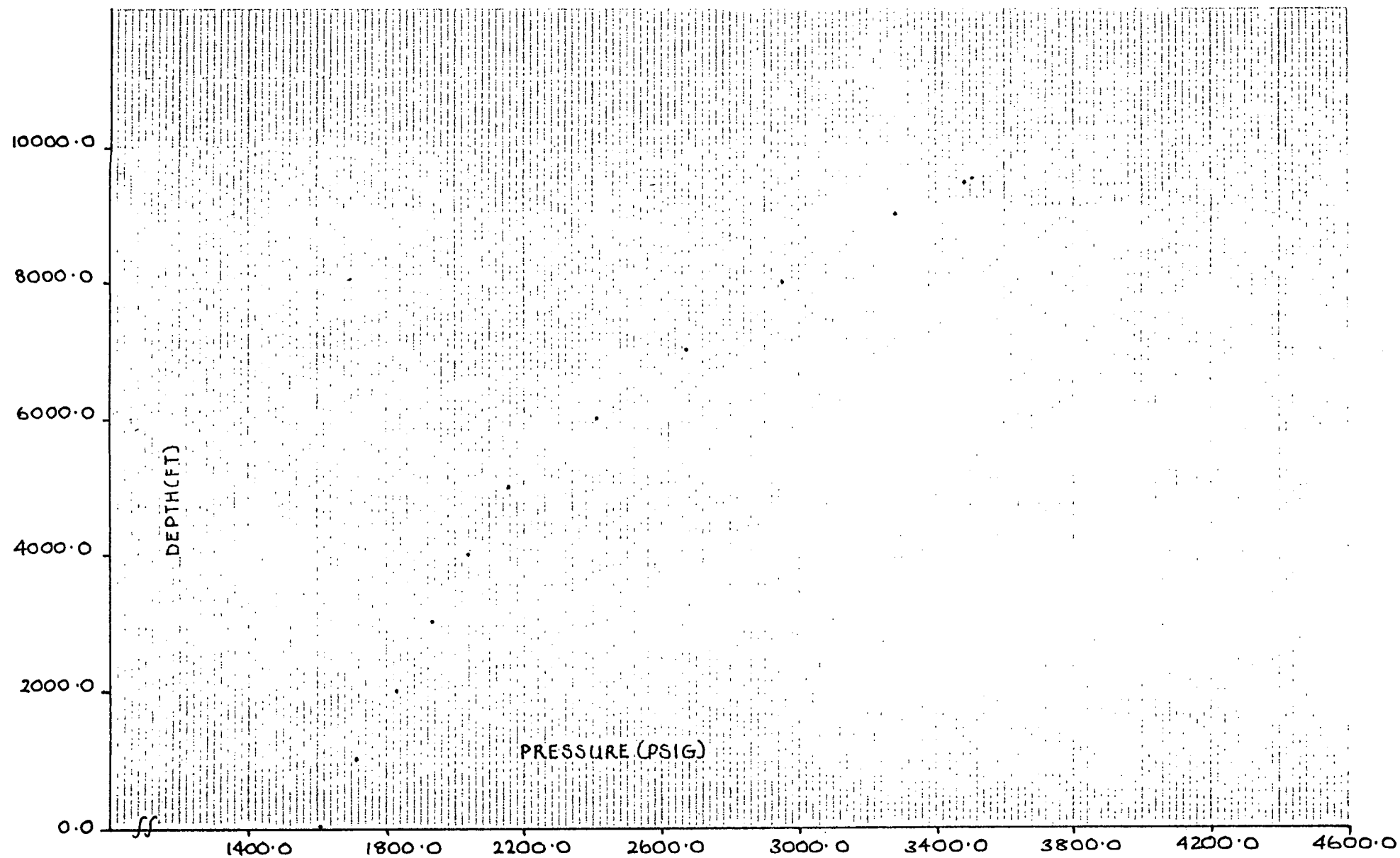
PRESSURE ELEMENT DATA			
POSITION	SERIAL NO.	RANGE	CALIBRATED
Top	15451	5650	28/ 8/90
Bottom	28904	5200	28/ 8/90

WELL DATA	
PARAMETER	VALUE
DWT In	1618 PSIG
DWT Out	1627 PSIG
Max BHT	284 F

TOP ELEMENT				BOTTOM ELEMENT		
DEPTH FT KB	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT
LUB.	0.6370	1608.5	----	0.6330	1626.1	----
1000	0.6800	1718.1	0.110	0.6780	1736.5	0.111
2000	0.7240	1830.2	0.112	0.7190	1847.1	0.111
3000	0.7650	1934.7	0.105	0.7600	1952.5	0.105
4000	0.8060	2039.3	0.105	0.7990	2052.8	0.100
5000	0.8520	2156.7	0.117	0.8450	2171.2	0.118
6000	0.9520	2412.1	0.255	0.9440	2426.2	0.255
7000	1.0550	2675.5	0.263	1.0450	2686.8	0.261
8000	1.1640	2954.7	0.279	1.1530	2965.8	0.279
9000	1.2930	3285.5	0.331	1.2790	3292.0	0.328
9480	1.3700	3483.1	0.412	1.3560	3491.7	0.418
9533	1.3750	3506.2	0.436	1.3650	3515.0	0.441
LUB.	0.6440	1626.4	----	0.6400	1644.0	----

GENERAL REMARKS

VARANUS # 1 — STATIC PRESSURE GRADIENT — 28/12/90
ELEMENT # 15451/5650 (TOP)



PERFORATIONS:	
FORMATION :	

WELL NAME: VARANUS⁹ 1

TEST TYPE : S.G.S.

FORMATION : PATCHAWARRA

DATE: 28.12.90

OPR : R. LARKIN

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.		15451	28904	1	DATE : 28.12.90			
ELEMENT RANGE PSI		5650	5200		PRESSURE LUBRICATOR :	0921		
RECORDING SECTION SERIAL NO.		12961	12979		RUN IN HOLE :	0936	1618	0
DATE OF CALIBRATION:		28.8.90	28.8.90		290°F	ON DEPTH AT : 9533 FT/M	1107	1622
CLOCK SERIAL NO.		2502	2431		DATE : 28.12.90			
CLOCK RANGE		3 HR	3 HR		PULL OUT OF HOLE :	1122	1622	0
LEAD SCREW TYPE		15 TLS	15 TLS		AT SURFACE :	1145		
					DEPRESSURE LUBRICATOR :	1200	1627	0
ENGAGE STYLUS	DATE 28.12.90	TIME 0915	0915		MAXIMUM BHT AT 9533 FT/M = 284 °F/°C			
DISENGAGE STYLUS	DATE 28.12.90	TIME 1205	1205		N.B. ALL DEPTHS ARE MEASURED FROM K.B.			

DATE	TIME	REMARKS

00030

0030

EXPERTEST

WIRELINE & WELL TESTING SERVICE

PO BOX 354 COWANDILLA 5033

PH. (08) 354 0468 TELEX AA87183

FAX (08) 43 7408

138 RICHMOND ROAD MARLESTON
SOUTH AUSTRALIA 5033

Tested Tuesday, 1st January 1991.

CLIENT	LOCATION	FORMATION
Santos Ltd.	VARANUS #1	PATCHAWARRA

STATIC PRESSURE GRADIENT REPORT

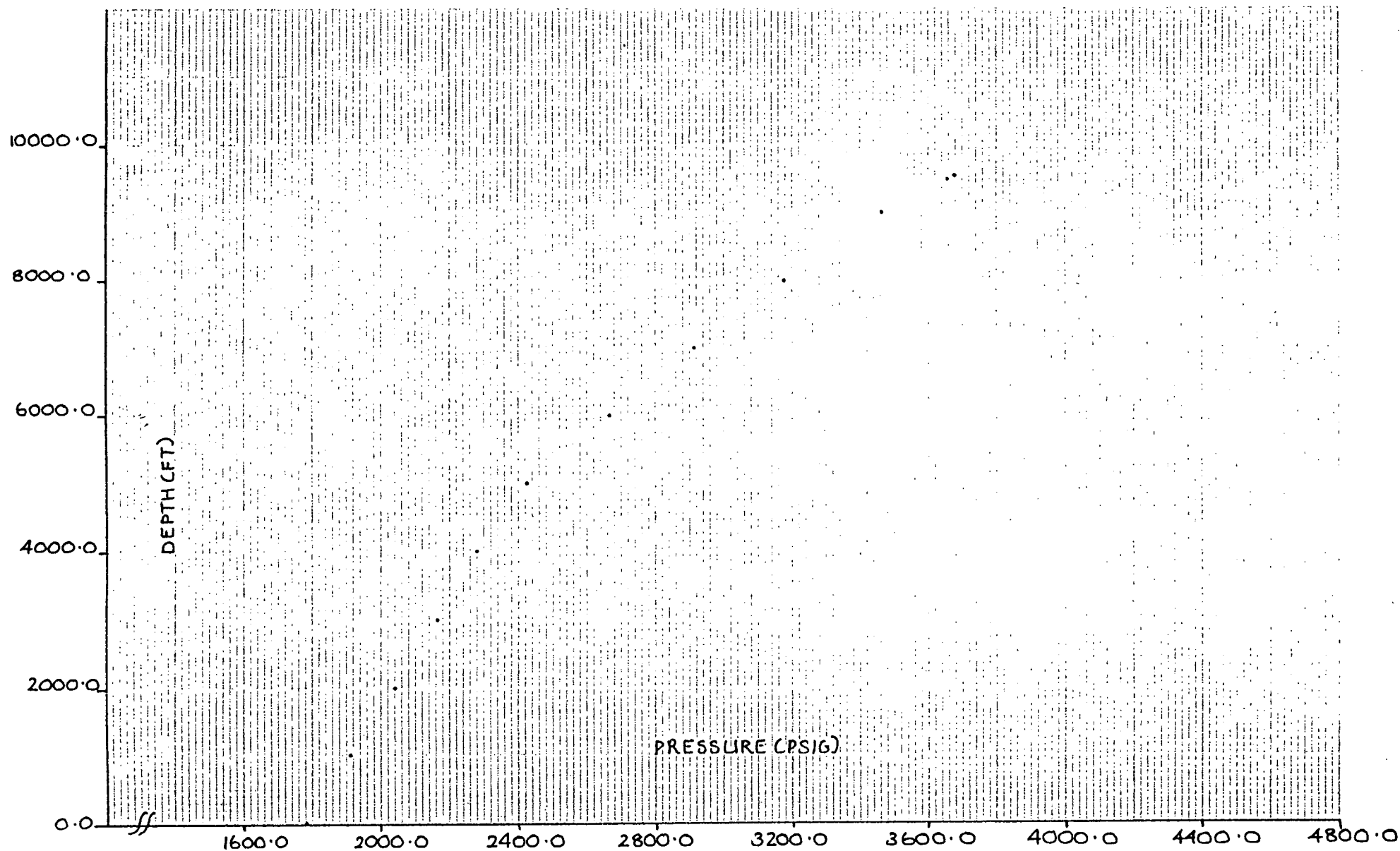
PRESSURE ELEMENT DATA			
POSITION	SERIAL NO.	RANGE	CALIBRATED
Top	15451	5650	28/ 8/90
Bottom	28904	5200	28/ 8/90

WELL DATA	
PARAMETER	VALUE
DWT In	1792 PSIG
DWT Out	1794 PSIG
Max BHT	278 F

TOP ELEMENT				BOTTOM ELEMENT		
DEPTH FT KB	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT
LUB.	0.7040	1779.2	----	0.6958	1787.4	----
1000	0.7550	1909.2	0.130	0.7460	1916.5	0.129
2000	0.8034	2032.7	0.123	0.7944	2041.0	0.125
3000	0.8512	2154.7	0.122	0.8419	2163.2	0.122
4000	0.8977	2273.4	0.119	0.8870	2279.3	0.116
5000	0.9532	2415.2	0.142	0.9428	2423.1	0.144
6000	1.0481	2657.9	0.243	1.0375	2667.4	0.244
7000	1.1456	2907.5	0.250	1.1335	2915.4	0.248
8000	1.2490	3172.6	0.265	1.2345	3176.7	0.261
9000	1.3632	3465.6	0.293	1.3456	3464.7	0.288
9480	1.4402	3663.4	0.412	1.4194	3656.2	0.399
9533	1.4488	3685.5	0.417	1.4279	3678.3	0.417
LUB.	0.7103	1795.3	----	0.7040	1808.5	----

GENERAL REMARKS

VARANUS # 1 - STATIC PRESSURE GRADIENT - 1/1/91
ELEMENT # 28904 / 5200 (BOT)



EXPERTEST PTY. LTD.



BHP/BHT GAUGE RUN DATA

CUSTOMER : SANTOS LTD

PERFORATIONS: 9494' - 9567' KB

PAGE: 3 OF 3

WELL NAME: VARANUS #1

FORMATION : PATCHAWARRA

DATE: 1.1.91

TEST TYPE : PRE-FRAC S.R.T

→ STATIC GRADIENT

OPR : K. KEANE

GAUGE DATA

UPPER
PRESSURE
GAUGELOWER
PRESSURE
GAUGETEMPERATURE
GAUGE

RUN DATA

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

ELEMENT SERIAL NO.

15451

28904

DATE

1.1.91

ELEMENT RANGE

PSI

5650

5200

PRESSURE LUBRICATOR

1332

RECORDING SECTION SERIAL NO.

12961

12979

RUN IN HOLE

1342

1792

0

DATE OF CALIBRATION:

28.8.90

28.8.90

ON DEPTH AT

9533'

FT/M

1505

CLOCK SERIAL NO.

2431

2502

DATE

1.1.91

CLOCK RANGE

3HR

3HR

PULL OUT OF HOLE

1520

1792

LEAD SCREW TYPE

15 T.L.S

15 T.L.S

AT SURFACE

1540

DEPRESSURE LUBRICATOR

1550

1794

0

ENGAGE STYLUS DATE

1.1.91 TIME

1325

1325

MAXIMUM BHT AT 9533 FT/M = 278 °F/°C

DISENGAGE STYLUS DATE

1.1.91 TIME

1600

1600

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

DATE

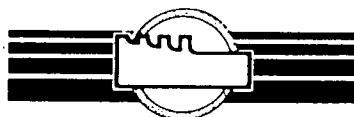
TIME

REMARKS

00033

EXPERTEST PTY. LTD.

FIELD READINGS



CUSTOMER : SANTOS LTD

PERFORATIONS: 9494' - 9567'

PAGE: 1 OF

WELL NAME: VARANUS #1

FORMATION : PATCHAWARRA

DATE: 14-12-90

TEST TYPE: FLOW AND BUILD-UP

OPR: N. HAY

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)
14-12-90														
13:00		ARRIVE ON LOCATION WELL FLOWING ON 24/64 CHOKER TO FLARE												
		COMMENCE RIGGING IN FLOWLINES SEPARATOR AND STOCK TANK #129												
14:50		744	0											
		SHUT WELL IN TO RIG UP SWAB VALVE AND CHICKSAND TO FLOWLINE TO SEPARATOR												
15:20		1965	0											
		S.I.W.H.P. REOPEN WELL ON 24/64 CHOKER THROUGH SEPARATOR												
16:00	0	765	0								2.5	2		.5
18:00	2	951	0	40	16/64		.75	68	18	104	2.5	2		.5
20:00	4	1137	0	37	"		"	69	15	98	2.5	2		.5
22:00	6	903	0	30	"		"	85	13	73	2.5	2		.5
20-12-90														
02:00	10	1062	0	27	16/64		.75	93	12	80	2.5	2		.5
06:00	14	1296	0	27	"		"	92	12	80	2.5	2		.5
10:00	18	1709	0	34	"		"	69	12	97	2.5	2		.5
14:00	22	1841	0	34	"		"	77	16	123	2.5	2		.5
18:00	26	1227	0	35	"		"	97	13	111	2.5	2		.5
22:00	30	1324	0	30	"		"	103	11	97	2.5	2		.5
21-12-90														
02:00	34	1351	0	28	16/64		.75	105	8	87	2.5	2		.5
06:00	38	1405	0	25	"		"	117	10	79	3.5	2		1.5
10:00	42	1399	0	33	"		"	84	13	89	4.75	2		2.75
14:00	46	1344	0	33	"		"	77	16	125	6.5	2		4.5

EXPERTEST PTY. LTD.

FIELD READINGS



CUSTOMER : SANTOS LTD

PERFORATIONS: 9494' - 9567'

PAGE: 2 OF

WELL NAME: VARANUS #1

FORMATION : PATCHAWARRA

DATE: 21-12-90

TEST TYPE: FLOW AND BUILD-UP

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)
21-12-90														
13:00		RIG UP WIRELINE UNIT												
14:52		R.I.H. WITH GAUGES FOR FLOWING GRADIENT SURVEY												
16:45		ARRIVE BACK AT SURFACE												
17:38		R.I.H. WITH GAUGES COUPLED TO 48 HR CLOCKS												
17:57		HANG GAUGES AT 9533' MB												
18:00	50	1165	0	41	16/64		.75	99	8	113	7	2		5
22:00	54	2103	0	39	11		11	97	10	93	7	2		5
22-12-90														
02:00	58	2854	0	28	16/64		.75	100	12	86	7	2		5
06:00	62	3109	0	29	11		11	91	7	86	7.5	2		5.5
06:00		ROCK CHOKE												
10:00	66	1268	0	30	11		11	89	11	93	9.5	2		7.5
14:00	70	1441	0	39	11		11	79	12	118	9.75	1.75		8
18:00	74	1875	0	36	11		11	95	16	111	10.5	1.75		8.75
22:00	78	1875	0	29	11		11	75	9	93	12	1.75		10.25
23-12-90														
02:00	82	2096	0	28	16/64		.75	93	10	87	13.25	1.75		11.5
06:00	86	2123	0	25	11		11	104	8	77	14.5	1.75		12.75
10:00	90	2040	0	30	11		11	97	13	84	16.25	1.75		14.5
14:00	94	2006	0	32	11		11	92	12	105	16.5	1.75		14.75
14:40		P.O.O.H WITH GAUGES												

EXPERTEST PTY. LTD.

FIELD READINGS



CUSTOMER : SANTOS LTD

PERFORATIONS: 9494'-9567'

PAGE: 3 OF

WELL NAME: VARANUS #1

FORMATION : PATCHAWARRA

DATE: 23-12-90

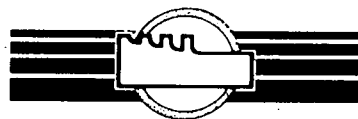
TEST TYPE : FLOW AND BUILD-UP

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)
23-12-90														
14:57		ARRIVE AT SURFACE												
15:46		PRESS LUB WITH GANGE ... COUPLED TO 120 HR CLOCKS												
17:45		2220 R.L.H.												
18:00	98	1875	0	31	16/64		.75	111	8	95	17	1.75		15.25
18:10		HANGES AT 9480' MB												
21:00	101	1379	0	29	16/64			111	10	80				
21:00		START TO OBTAIN 1X500 CC GAS 1X500 CC WATER												
22:00	102	1372	0	27	11		11	110	9	82	18.25	1.75		16.5
		START TO OBTAIN 1X500 CC GAS 1X500 CC WATER												
24-12-90														
02:00	106	1358	0	29	16/64		.75	115	8	73	19.75	1.75		18
06:00	110	1454	0	24	11		11	123	8	69	21.25	1.75		19.5
06:00	0	SHUT WELL IN FOR BUILD-UP												
06:15		2102		23										
06:30	.5	2523		23										
06:45		2826		22										
07:00	1	3261		22										
07:15		3626		23										
07:30	1.5	3937		23										
07:45		4219		24										
08:00	2	4516		24										

EXPERTEST PTY. LTD.

FIELD READINGS



CUSTOMER : SANTOS LTD

PERFORATIONS: 9494' - 9567

PAGE: 4 OF

WELL NAME: VARANUS #1

FORMATION : PATCHAWARRA

DATE: 24.12.90

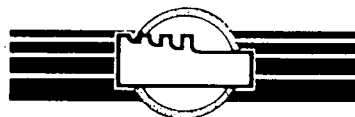
TEST TYPE: BUILD-UP

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 (°C)	CHOKE SIZE	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF PRESS. (IN WC)	GAS TEMP (°F)	TOTAL LIQUID (IN/CM)	OIL (IN/CM)	OIL API GRAVITY @ 60°F	WATER (IN/CM)
24.12.90														
08:15		4785	0	25										
08:30	2.5	5005		26										
08:45		5247		27										
09:00	3	5433		28										
09:15		5619		28										
09:30	3.5	5784		29										
09:45		5950		29										
10:00	4	6095		29										
14:00	8	7212		35										
18:00	12	8211		34										
22:00	16	8791		29										
25.12.90														
02:00	20	9108	0	23										
06:00	24	9356		18										
10:00	28	9529		29										
14:00	32	9677		38										
18:00	36	9826		37										
22:00	40	9979		29										
26.12.90														
02:00	44	10132	0	19										
06:00	48	10287		20										

EXPERTEST PTY. LTD.

FIELD READINGS



CUSTOMER : SANTOS LTD

PERFORATIONS: 9494'-9567'

PAGE: 5 OF

WELL NAME: VARANUS #1

FORMATION : PATCHAWARRA

DATE: 26-12-90

TEST TYPE: BUILD-UP

OPR: R. LARKIN

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)
26-12-90														
10:00	52	10376	0	35										
14:00	56	10446	0	42										
18:00	60	10515	0											
22:00	64	10584	0											
Dec 27/90														
0200	68	10680	0											
0600	72	10798	0											
1000	76	10860	0											
1530		10936	0											
1800	84	10943	0											
2200	88	10956	0											
Dec 28/90														
0200	92	11025	0											
0600	96	11115	0											
0623														
0823		11129	0											
0936		11156	0											
1107		11184	0											
1122														
1200		11218	0											

POOH Pres. gauges

IN Lub.

Dep. Lub.

FOR. S.G.S.

R.I.H

ON DEPTH

POOH

Dep. Lub.

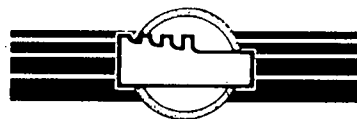
CHARTS good. PREPARE gauges

9533' KB

CHARTS good.

EXPERTEST PTY. LTD.

FIELD READINGS



CUSTOMER : SANTOS PET.

PERFORATIONS: 9494' - 9567'

PAGE: 6 OF

WELL NAME: UARANUS #1

FORMATION : PATCHAWARA

DATE: 28.12.90

TEST TYPE : BUILD UP

OPR : R. LARKIN

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)
Dec 28/90														
1205														
1225														
1425		11253	0											
1441														
1500	105	11273	0											
1800	108	11330	0											
2200	112	11404	0											
Dec 29/90														
0200	116	11466	0											
0600	120	11528	0											
1430	128.5	11646	0											
1800	132	11702	0											
2200	136	11749	0											
Dec 30/90														
0200	140	11777	0											
0600	144	11818	0											
2230	160.5	11818	0											
31/12/90														
1030	172.5	11893	0											
1930	179.5	11900	0											

00089

FIELD READINGS

CUSTOMER : SANTOS

PERFORATIONS:

9494' - 9567'

PAGE: 7 OF

WELL NAME: VARANUS #1

FORMATION

PATCHAWAKRA

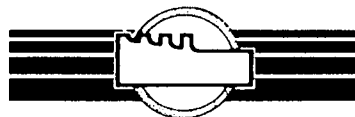
DATE: 11/91

TEST TYPE : SRT + PBU

OPR : R. LARKIN

[illegible][illegible]

EXPERTEST PTY. LTD.



TEST RESULTS

CUSTOMER : SANTOS LTD

PERFORATIONS: 9494' - 9567'

PAGE: 1 OF

WELL NAME: VARANUS M1

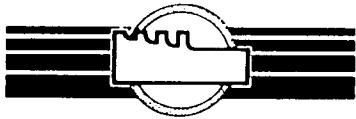
FORMATION : PATCHAWARRA.

DATE: 19-12-90

TEST TYPE : FLOW AND BUILD-UP

OPR : N. HAY

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		
19-12-90															
18:00	2	951	0	40	16/64	469	40	3.296	0	0	2.275				
20:00	4	1137	0	37	"	475	37	3.013	0	0	5.443				
22:00	6	903	0	30	"	586	32	3.094	0	0	8.01				
20-12-90															
02:00	10	1062	0	27	16/64	641	27	3.155	0	0	1.327				
06:00	14	1286	0	27	"	634	27	3.127	0	0	1.848				
10:00	18	1709	0	34	"	475	36	3.705	0	0	2.466				
14:00	22	1841	0	34	"	531	51	3.212	0	0	3.001				
18:00	26	1227	0	35	"	669	44	3.212	0	0	3.536				
22:00	30	1324	0	30	"	710	36	3.099	0	0	4.053				
21-12-90															
02:00	34	1351	0	28	16/64	723	31	2.677	0	0	4.499				
06:00	38	1405	0	25	"	806	26	3.184	0	0.613	5.03		1.02	192.5	
10:00	42	1399	0	33	"	579	32	3.099	0	0.766	5.547		2.29	247.2	
14:00	46	1344	0	33	"	531	52	3.184	0	1.07	6.077		4.07	336.0	
18:00	50	1165	0	41	"	682	45	2.536	0	0.307	6.50		4.59	121.0	
22:00	54	2103	0	39	"	668	34	2.874	0	0	6.979		4.59		
22-12-90															
02:00	58	2854	0	28	16/64	689	30	3.212	0	0	7.514		4.59		
06:00	62	3109	0	29	"	627	30	2.366	0	0.306	7.908		5.10	129.3	
10:00	66	1268	0	30	"	613	34	2.902	0	1.22	8.392		7.14	420.4	



CUSTOMER : SANTOS LTD

PERFORATIONS: 9494'-9567'

PAGE: 2 OF

WELL NAME: VARANUS #1

FORMATION : PATCHAWARRA

DATE: 22-12-90

TEST TYPE : FLOW AND BUILD-UP

OPR : N. HAY

TIME		WELLHEAD DATA				SEPARATOR		FLOW RATES			CUMULATIVE PRODUCTION				
DATE TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD m ³ /10 ³ /D	OIL BPD m ³ /D	WATER BPD m ³ /D	GAS MMSCF m ³ /10 ³	OIL BBLs m ³	WATER BBLs m ³	L.G.R. m ³ /10 ⁶ m ³	
22-12-90															
14:00	70	1441	0	39	16/64	545	48	2.817	0	.307	8.862		.765	108.9	
18:00	74	1875	0	36	"	655	44	2.789	0	.459	9.327		.841	164.57	
22:00	78	1875	0	29	"	517	34	2.451	0	.919	9.736		.994	375.1	
23-12-90															
02:00	82	2096	0	28	16/64	641	31	2.846	0	.766	10.21		1.122	269.15	
06:00	86	2123	0	25	"	717	25	2.705	0	.766	10.661		1.250	283.17	
10:00	90	2040	0	30	"	668	29	3.296	0	1.073	11.21		1.428	325.5	
14:00	94	2006	0	32	"	634	41	3.043	0	.853	11.71		1.453	50.28	
18:00	98	1875	0	31	"	765	31	2.733	0	.306	12.166		1.504	111.96	
21:00	101	1379	0	29	"	765	31	3.099	0		12.55				
22:00	102	1372	0	27	"	758	28	2.930	0	.766	12.714		1.631	261.4	
24-12-90															
02:00	106	1358	0	25	16/64	793	23	2.846	0	.919	13.188		1.784	322.9	
06:00	110	1454	0	24	"	848	21	2.930	0	.919	13.676		1.937	313.6	
06:00	0	SHUT WELL IN FOR BUILD-UP													
06:15		2102		23											
06:30	.5	2523		23											
06:45		2820		22											
07:00	1	3261		22											
07:15		3626		23											
07:30	1.5	3937		23											

00042



CUSTOMER : SANTOS LTD
 WELL NAME : VARANUS #1
 TEST TYPE : BUILD-UP

PERFORATIONS: 9494' - 9567'
 FORMATION : PATCHAWARRA

PAGE: 3 OF
 DATE: 24-12-90
 OPR: N. HAY

TIME		WELLHEAD DATA						FLOW RATES			CUMULATIVE PRODUCTION				
DATE TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (B87/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		
24-12-90															
07:45		4219	0	24											
08:00	2	4516		24											
08:15		4785		25											
08:30	2.5	5005		26											
08:45		5247		27											
09:00	3	5433		28											
09:15		5619		28											
09:30	3.5	5784		29											
09:45		5950		29											
10:00	4	6095		29											
14:00	8	7212		35											
18:00	12	8211		34											
22:00	16	8791		29											
25-12-90															
02:00	20	9108	0	23											
06:00	24	9356		18											
10:00	28	9529		29											
14:00	32	9673		38											
18:00	36	9826		37											
22:00	40	9979		29											

00043

EXPERTEST PTY. LTD.

TEST RESULTS



CUSTOMER : SANTOS LTD

PERFORATIONS: 9494' - 9567'

PAGE: 4 OF

WELL NAME: VARANUS #1

FORMATION : PATCHAWARRA

DATE: 26.12.90

TEST TYPE: BUILD-UP

OPR: R. LARKIN

TIME		WELLHEAD DATA						FLOW RATES			CUMULATIVE PRODUCTION				
DATE	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		
26.12.90															
02:00	44	10132	0	19											
06:00	48	10287	0	20											
10:00	52	10376	0	35											
14:00	56	10446	0	42											
18:00	60	10515	0												
22:00	64	10584	0												
Dec 27/90															
0200	68	10680	0												
0600	72	10798	0												
1000	76	10860	0												
1530		10936	0												
1800	84	10943	0												
2200	88	10956	0												
Dec 28/90															
0200	92	11025	0												
0600	96	11115	0												
0623															
0823		11129	0												
0936		11156	0												
1107		11184	0												

POOH Pressure gauges.

IN Lub

Dep. Lub. charts good PREPARE gauges FOR S.G.S.

R.I.H.

ON Depth. 9533' KB.

33000

EXPERTEST PTY. LTD.



TEST RESULTS

CUSTOMER : SANTOS PET.

PERFORATIONS: 9494'- 9567'

PAGE: 5 OF

WELL NAME: VARANUS #1

FORMATION : PATCHAWARRA

DATE: 28.12.96

TEST TYPE : BUILD UP

OPR : R. LARKIN

TIME		WELLHEAD DATA						FLOW RATES			CUMULATIVE PRODUCTION				
DATE	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		
Dec 28/90															
1122		11184													
1200		11218	0												
1225															
1425		11253	0												
1441															
1500	105	11273	0												
1800	108	11330	0												
2200	112	11404	0												
Dec 29/90															
0200	116	11466	0												
0600	120	11528	0												
1430	128.5	11646	0												
1800	132	11702	0												
2200	136	11749	0												
Dec 30/90															
0200	140	11777	0												
0600	144	11818	0												

00045

TEST RESULTS

CUSTOMER : SANTOS PET.

PERFORATIONS: 9494'- 9567

PAGE: 6 OF 6

WELL NAME: VARANUS.

FORMATION : PATCHAWARRA

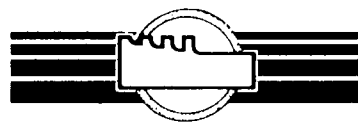
DATE: 30.12.90

TEST TYPE : SRT / PBU

OPR : R. LARKIN

[illegible]

EXPERTEST PTY. LTD.



GAS FLOW CALCULATIONS

CUSTOMER : *SANTOS LTD*

PERFORATIONS: *9494' - 9567'*

PAGE: *1* OF *2*

WELL NAME: *VARANUS #1*

FORMATION : *PATCHAWARRA*

DATE: *19-12-90*

TEST TYPE : *FLOW AND BUILD-UP*

OPR : *N. HAY*

ORIFICE METER TYPE: *DANIELS*

STATIC PRESSURE RANGE : *0-1500* PSIG

GAS SPECIFIC GRAVITY (SG) = *.77*

METER RUN SIZE : *2.90*

DIFFERENTIAL PRESS. RANGE: *0-100* IN WC

FG $\sqrt{(I/SG)}$ = *1.1396*

SEPARATOR NO : *238*

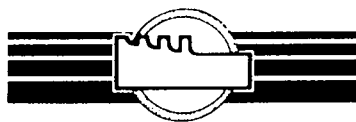
STANDARD CONDITIONS : *14.73 PSI @ 60°F*

C₂ (FU x FG) = *27.350*

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)
<i>19-12-90</i>															
<i>18:00</i>	<i>2</i>	<i>16/64</i>	<i>82</i>	<i>18</i>	<i>104</i>	<i>.75</i>	<i>38.821</i>	<i>113.69</i>	<i>.9602</i>	<i>1.0084</i>	<i>1.0014</i>	<i>110.429</i>	<i>3015.36</i>	<i>0.117</i>	<i>3.296</i>
<i>20:00</i>	<i>4</i>	<i>"</i>	<i>83</i>	<i>15</i>	<i>98</i>	<i>"</i>	<i>35.284</i>	<i>"</i>	<i>0.9653</i>	<i>1.0087</i>	<i>1.0012</i>	<i>110.835</i>	<i>3031.36</i>	<i>0.107</i>	<i>3.013</i>
<i>22:00</i>	<i>6</i>	<i>"</i>	<i>99</i>	<i>13</i>	<i>89</i>	<i>"</i>	<i>36.006</i>	<i>"</i>	<i>.9732</i>	<i>1.0110</i>	<i>1.0009</i>	<i>111.966</i>	<i>3062.3</i>	<i>0.110</i>	<i>3.099</i>
<i>20-12-90</i>															
<i>02:00</i>	<i>10</i>	<i>16/64</i>	<i>107</i>	<i>12</i>	<i>77</i>	<i>.75</i>	<i>35.955</i>	<i>113.69</i>	<i>.9840</i>	<i>1.0128</i>	<i>1.0007</i>	<i>113.398</i>	<i>3101.49</i>	<i>0.112</i>	<i>3.155</i>
<i>06:00</i>	<i>14</i>	<i>"</i>	<i>106</i>	<i>12</i>	<i>77</i>	<i>"</i>	<i>35.787</i>	<i>"</i>	<i>.9840</i>	<i>1.0127</i>	<i>1.0007</i>	<i>113.385</i>	<i>3101.14</i>	<i>0.111</i>	<i>3.127</i>
<i>10:00</i>	<i>18</i>	<i>"</i>	<i>83</i>	<i>12</i>	<i>97</i>	<i>"</i>	<i>31.697</i>	<i>"</i>	<i>.9662</i>	<i>1.0088</i>	<i>1.0009</i>	<i>110.925</i>	<i>3033.86</i>	<i>0.096</i>	<i>2.705</i>
<i>14:00</i>	<i>22</i>	<i>"</i>	<i>91</i>	<i>16</i>	<i>123</i>	<i>"</i>	<i>38.310</i>	<i>"</i>	<i>.9444</i>	<i>1.0083</i>	<i>1.0012</i>	<i>108.395</i>	<i>2964.66</i>	<i>0.114</i>	<i>3.212</i>
<i>18:00</i>	<i>26</i>	<i>"</i>	<i>111</i>	<i>13</i>	<i>111</i>	<i>"</i>	<i>38.111</i>	<i>"</i>	<i>.9543</i>	<i>1.0109</i>	<i>1.0008</i>	<i>109.764</i>	<i>3002.11</i>	<i>0.114</i>	<i>3.212</i>
<i>22:00</i>	<i>30</i>	<i>"</i>	<i>117</i>	<i>11</i>	<i>97</i>	<i>"</i>	<i>35.986</i>	<i>"</i>	<i>.9662</i>	<i>1.0125</i>	<i>1.0006</i>	<i>111.290</i>	<i>3043.86</i>	<i>0.110</i>	<i>3.099</i>
<i>21-12-90</i>															
<i>02:00</i>	<i>34</i>	<i>16/64</i>	<i>119</i>	<i>8</i>	<i>87</i>	<i>.75</i>	<i>30.949</i>	<i>113.69</i>	<i>.9750</i>	<i>1.0134</i>	<i>1.0004</i>	<i>112.393</i>	<i>3074.03</i>	<i>0.095</i>	<i>2.677</i>
<i>06:00</i>	<i>38</i>	<i>"</i>	<i>131</i>	<i>10</i>	<i>79</i>	<i>"</i>	<i>36.294</i>	<i>"</i>	<i>.9822</i>	<i>1.0156</i>	<i>1.0005</i>	<i>113.469</i>	<i>3103.45</i>	<i>0.113</i>	<i>3.184</i>
<i>10:00</i>	<i>42</i>	<i>"</i>	<i>98</i>	<i>13</i>	<i>89</i>	<i>"</i>	<i>35.825</i>	<i>"</i>	<i>.9732</i>	<i>1.0109</i>	<i>1.0009</i>	<i>111.955</i>	<i>3062.04</i>	<i>0.110</i>	<i>3.099</i>
<i>14:00</i>	<i>46</i>	<i>"</i>	<i>91</i>	<i>16</i>	<i>125</i>	<i>"</i>	<i>38.310</i>	<i>"</i>	<i>.9428</i>	<i>1.0082</i>	<i>1.0002</i>	<i>108.199</i>	<i>2959.32</i>	<i>0.113</i>	<i>3.184</i>
<i>18:00</i>	<i>50</i>	<i>"</i>	<i>113</i>	<i>8</i>	<i>113</i>	<i>"</i>	<i>30.163</i>	<i>"</i>	<i>.9526</i>	<i>1.0110</i>	<i>1.0005</i>	<i>109.54</i>	<i>2996.17</i>	<i>0.090</i>	<i>2.536</i>
<i>22:00</i>	<i>54</i>	<i>"</i>	<i>97</i>	<i>10</i>	<i>93</i>	<i>"</i>	<i>33.426</i>	<i>"</i>	<i>.9697</i>	<i>1.0121</i>	<i>1.0006</i>	<i>111.649</i>	<i>3053.66</i>	<i>0.102</i>	<i>2.874</i>
<i>22-12-90</i>															
<i>02:00</i>	<i>58</i>	<i>16/64</i>	<i>114</i>	<i>12</i>	<i>86</i>	<i>.75</i>	<i>37.104</i>	<i>113.69</i>	<i>.9759</i>	<i>1.0129</i>	<i>1.0007</i>	<i>112.46</i>	<i>3076.09</i>	<i>0.114</i>	<i>3.212</i>

EXPERTEST PTY. LTD.

GAS FLOW CALCULATIONS



CUSTOMER : SANTOS LTD

PERFORATIONS: 94.94' - 956.7'

PAGE: 2 OF 2

WELL NAME: VARANUS #1

FORMATION : PATCHAWARRA

DATE: 22-12-90

TEST TYPE: FLOW AND BUILD-UP

OPR: N. HAY

ORIFICE METER TYPE: DANIELS

STATIC PRESSURE RANGE : 0-1500 PSIG

GAS SPECIFIC GRAVITY (SG) = .77

METER RUN SIZE : 2.90

DIFFERENTIAL PRESS. RANGE: 0-100 IN WC.

FG $\sqrt{(1/SG)}$ = 1.1396

SEPARATOR NO : 238

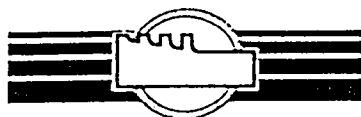
STANDARD CONDITIONS : 14.73 PSI @ 60°F

C₂ (FU x FG) = 27.350

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 × F _{TF} × F _{PV} × Y ₂				C ₁	C (C = C ₁ × 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)
22-12-90															
06:00	62	16/64	105	7	86	.75	27.205	113.69	.9759	1.0119	1.0004	112.325	3072.15	0.084	2.366
10:00	66	"	103	11	93	"	33.779	"	.9697	1.0112	1.0007	111.563	3051.32	0.103	2.902
14:00	70	"	93	12	118	"	33.537	"	.9485	1.0087	1.0008	108.875	2977.80	0.100	2.817
18:00	74	"	109	10	111	"	33.125	"	.9543	1.0107	1.0006	109.724	3001.02	0.099	2.789
22:00	78	"	89	9	93	"	28.417	"	.9697	1.0097	1.0007	111.389	3046.5	0.087	2.451
23-12-90															
02:00	82	16/64	107	10	87	.75	32.822	113.69	.9750	1.0121	1.0006	112.259	3070.36	0.101	2.846
06:00	86	"	118	8	77	"	30.819	"	.9840	1.0142	1.0004	113.516	3104.72	0.096	2.705
10:00	90	"	111	13	84	"	38.111	"	.9777	1.0128	1.0008	112.662	3081.39	0.117	3.296
14:00	94	"	106	12	105	"	35.787	"	.9594	1.0108	1.0007	110.328	3017.53	0.108	3.043
18:00	98	"	125	8	95	"	31.715	"	.9680	1.0135	1.0004	111.582	3051.83	0.097	2.733
21:00	101	"	125	10	80	"	35.458	"	.9813	1.0148	1.0005	113.275	3098.13	0.110	3.099
22:00	102	"	124	9	82	"	33.504	"	.9795	1.0145	1.0005	113.027	3091.35	0.104	2.930
24-12-90															
02:00	106	16/64	129	8	73	.75	32.215	113.69	.9877	1.0159	1.0004	114.132	3121.59	0.101	2.846
06:00	110	"	137	8	69	"	33.194	"	.9915	1.0174	1.0004	114.723	3137.75	0.104	2.930
													average:	0.105	2.948

EXPERTEST PTY. LTD.

LIQUID PRODUCTION



CUSTOMER : SANTOS LTD

PERFORATIONS: 9494' - 9567'

PAGE: 1 OF 2

WELL NAME: VARANUS #1

FORMATION : PATCHAWARRA

DATE: 19-12-90

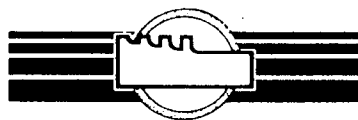
TEST TYPE : FLOW AND BUILD-UP

OPR : N. HAY

TANK NUMBER	#1 = 129 #1	TANK CAPACITY	#1 = 8.2 bbls/m ³	TANK SCALE	#1 = 1" = 0.1022 bbls/in - m ³ /cm	OIL API GRAVITY = @ 60°F					
	#2 = 129 #2		#2 = 8.2 bbls/m ³		#2 = 1" = 0.1022 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)
16:00	0	1	2.5	2	OPENING DIP			.5			
18:00	2	"	2.5	2	0			.5	0		
20:00	4	"	2.5	2	0			.5	0		
22:00	6	"	2.5	2	0			.5	0		
20-12-90											
02:00	10	1	2.5	2	0			.5	0		
06:00	14	"	2.5	2	0			.5	0		
10:00	18	"	2.5	2	0			.5	0		
14:00	22	"	2.5	2	0			.5	0		
18:00	26	"	2.5	2	0			.5	0		
22:00	30	"	2.5	2	0			.5	0		
21-12-90											
02:00	34	1	2.5	2	0			.5	0		
06:00	38	"	3.5	2	0			1.5	.102	.613	.1022
10:00	42	"	4.75	2	0			2.75	.1277	.766	.2299
14:00	46	"	6.5	2	0			4.5	.178	1.073	.4079
18:00	50	"	7	2	0			5	.051	.307	.459
22:00	54	"	7	2	0			5	0	0	.459
22-12-90											
02:00	58	1	7	2	0			5	0	0	.459
06:00	62	"	7.5	2	0			5.5	.0511	.3066	.510

EXPERTEST PTY. LTD.

LIQUID PRODUCTION



CUSTOMER : SANTOS LTD

PERFORATIONS: 9494'-9567'

PAGE: 2 OF 2

WELL NAME: VARANUS #1

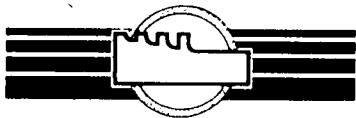
FORMATION : PATCHAWARRA

DATE: 22-12-90

TEST TYPE: FLOW AND BUILD-UP

OPR: N. HAY

TANK NUMBER	#1 = 129 ^{#1}	TANK CAPACITY	#1 = 8.2	TANK	#1 = 1" = 0.1022	SCALE	#2 = 1" = 0.1022	OIL API GRAVITY = @ 60°F			
	#2 = 129 ^{#2}		#2 = 8.2		#2 = 1" = 0.1022						
DATE TIME	FLOW TIME (HOURS)	TANK USED (NUMBER)	TOTAL TANK DIP (IN/CM)	OIL/CONDENSATE PRODUCTION				WATER PRODUCTION			
				TANK DIP (IN/CM)	TANK PRODUCTION (BBL/S/m³)	FLOW RATE (BPD/m³D)	CUMULATIVE PRODUCTION (BBL/S/m³)	TANK DIP (IN/CM)	TANK PRODUCTION (BBL/S/m³)	FLOW RATE (BPD/m³D)	CUMULATIVE PRODUCTION (BBL/S/m³)
22-12-90											
10:00	66	1	9.5	2	0			7.5	.2044	1.226	.7144
14:00	70	"	9.75	1.75	0			8	.051	.307	.765
18:00	74	"	10.5	1.75	0			8.75	.0766	.459	.8416
22:00	78	"	12	1.75	0			10.25	.1533	.9198	.9949
23-12-90											
02:00	82	1	13.25	1.75	0			11.5	.1277	.7665	1.122
06:00	86	"	14.5	1.75	0			12.75	.1277	.7665	1.250
10:00	90	"	16.25	1.75	0			14.5	.1788	1.073	1.428
14:00	94	"	16.5	1.75	0			14.75	.0255	.1533	1.453
18:00	98	"	17	1.75	0			15.25	.0511	.3066	1.504
22:00	102	"	18.25	1.75	0			16.50	.1277	.7665	1.631
24-12-90											
02:00	106	1	19.75	1.75	0			18	.1533	.9198	1.784
06:00	110		21.25	1.75	0			19.5	.1533	.9198	1.937
06:00		SHUT WELL IN									



CUSTOMER : *SANTOS LTD*
 WELL NAME : *VARANUS #1*
 TEST TYPE : *FLOW AND BUILD-UP*

PERFORATIONS: *9494' - 9567'*
 FORMATION : *PATCHAWARRA*

PAGE: *1* OF *2*
 DATE: *23-12-90*
 OPR: *N. HAY*

SAMPLE

TIME SAMPLE COLLECTED	CYLINDER SERIAL NO.	CYLINDER VOLUME (CC)	SAMPLE TYPE	SAMPLING DURATION (MINS)	CYLINDER INITIALLY FILLED WITH		OUTAGE (CC)	VOLUME OF FILL REMAINING WITH SAMPLE (CC)		SAMPLE POINT		SAMPLE PRESS (287 KPa)	SAMPLE TEMP (27 °C)	AMBIENT PRESS (287 KPa)	AMBIENT TEMP (°F/°C)
21:00	224	500	GAS	3	EVALUATED		0	0		GAS METER RUN		765	31	102	
WELLHEAD DATA				SEPARATOR DATA			GRAVITIES		FLOW RATES			RATIOS		BOTTOM HOLE	
TUBING PRESS (287 KPa)	WELLHEAD TEMP (27 °C)	CHOKE SIZE	BS&W (%)	SEPARATOR PRESS (287 KPa)	SEPARATOR TEMP (27 °C)	FPV	GAS SPECIFIC GRAVITY	OIL API GRAV @60°F	GAS MMSCFD m³10³/D	OIL BPD m³/D	WATER BPD m³/D	L.G. R m³/10⁶m³	PRESSURE	TEMPERATURE	
													(PSI/KPa)	(°F/°C)	
1379	29	16/64		765	31	1.0148	.77		3.09	0	0	0			

REMARKS:

SAMPLE

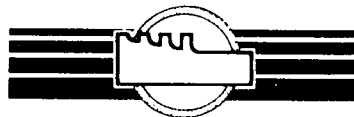
TIME SAMPLE COLLECTED	CYLINDER SERIAL NO.	CYLINDER VOLUME (CC)	SAMPLE TYPE	SAMPLING DURATION (MINS)	CYLINDER INITIALLY FILLED WITH	OUTAGE (CC)	VOLUME OF FILL REMAINING WITH SAMPLE (CC)		SAMPLE POINT		SAMPLE PRESS (PSI/KPa)	SAMPLE TEMP (°F/°C)	AMBIENT PRESS (PSI/KPa)	AMBIENT TEMP (°F/°C)	
21:00		500	WATER	1	AMBIENT	0	0		SIGHT GLASS		AMBIENT		102		
WELLHEAD DATA				SEPARATOR DATA			GRAVITIES		FLOW RATES			RATIOS		BOTTOM HOLE	
TUBING PRESS (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	BS&W (%)	SEPARATOR PRESS (PSI/KPa)	SEPARATOR TEMP (°F/°C)	FPV	GAS SPECIFIC GRAVITY	OIL API GRAV @ 60°F	GAS MMSCFD m ³ /10 ³ /D	OIL BPD m ³ /D	WATER BPD m ³ /D	L. G. R m ³ /10 ⁶ m ³	PRESSURE	TEMPERATURE	
													(PSI/KPa)	(°F/°C)	
1379	29	16/64		765	31	1.0148	.77		3.09	0	0				

REMARKS:

SAMPLE

TIME SAMPLE COLLECTED	CYLINDER SERIAL NO.	CYLINDER VOLUME (CC)	SAMPLE TYPE	SAMPLING DURATION (MINS)	CYLINDER INITIALLY FILLED WITH		OUTAGE (CC)	VOLUME OF FILL REMAINING WITH SAMPLE (CC)		SAMPLE POINT		SAMPLE PRESS (PSI/KPa)	SAMPLE TEMP (°F/°C)	AMBIENT PRESS (PSI/KPa)	AMBIENT TEMP (°F/°C)
WELLHEAD DATA				SEPARATOR DATA			GRAVITIES		FLOW RATES			RATIOS		BOTTOM HOLE	
TUBING PRESS (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	BS&W (%)	SEPARATOR PRESS (PSI/KPa)	SEPARATOR TEMP (°F/°C)	FPV	GAS SPECIFIC GRAVITY	OIL API GRAV @60°F	GAS MMSCFD m³10³/D	OIL BPD m³/D	WATER BPD m³/D			PRESSURE	TEMPERATURE
														(PSI/KPa)	(°F/°C)

REMARKS:



CUSTOMER : SANTOS LTD

PERFORATIONS: 9494'-9567'

PAGE: 2 OF 2

WELL NAME: VARANUS #1

FORMATION : PATCHAWARRA

DATE: 23-12-90

TEST TYPE : FLOW AND BUILD-UP

OPR : N. HAY

SAMPLE

TIME SAMPLE COLLECTED	CYLINDER SERIAL NO.	CYLINDER VOLUME (CC)	SAMPLE TYPE	SAMPLING DURATION (MINS)	CYLINDER INITIALLY FILLED WITH		OUTAGE (CC)	VOLUME OF FILL REMAINING WITH SAMPLE (CC)		SAMPLE POINT		SAMPLE PRESS (PSI/KPa)	SAMPLE TEMP (°F/°C)	AMBIENT PRESS (PSI/KPa)	AMBIENT TEMP (°F/°C)
22:00	117	500	GAS	3	EVACUATED		0	0		GAS METER RUN		758	28	102	
WELLHEAD DATA				SEPARATOR DATA			GRAVITIES		FLOW RATES			RATIOS		BOTTOM HOLE	
TUBING PRESS (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	BS&W (%)	SEPARATOR PRESS (PSI/KPa)	SEPARATOR TEMP (°F/°C)	FPV	GAS SPECIFIC GRAVITY	OIL API GRAV @60°F	GAS MMSCFD m³10³/D	OIL BPD m³/D	WATER BPD m³/D	L.G.R m³/10⁶m³	PRESSURE	TEMPERATURE	
													(PSI/KPa)	(°F/°C)	
1372	27	16/64		758	28	1.0145	.77		2.93	0	.766	261.4			

REMARKS:

SAMPLE

TIME SAMPLE COLLECTED	CYLINDER SERIAL NO.	CYLINDER VOLUME (CC)	SAMPLE TYPE	SAMPLING DURATION (MINS)	CYLINDER INITIALLY FILLED WITH	OUTAGE (CC)	VOLUME OF FILL REMAINING WITH SAMPLE (CC)	SAMPLE POINT	SAMPLE PRESS (PSI/KPa)	SAMPLE TEMP (°F/°C)	AMBIENT PRESS (PSI/KPa)	AMBIENT TEMP (°F/°C)			
22:00		500	WATER	1	AMBIENT	0	0	SIGHT GLASS	AMBIENT		102				
WELLHEAD DATA				SEPARATOR DATA			GRAVITIES		FLOW RATES			RATIOS		BOTTOM HOLE	
TUBING PRESS (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	BS&W (%)	SEPARATOR PRESS (PSI/KPa)	SEPARATOR TEMP (°F/°C)	FPV	GAS SPECIFIC GRAVITY	OIL API GRAV @60°F	GAS MMSCFD m³10³/D	OIL BPD m³/D	WATER BPD m³/D	L. G. R m³/10⁶m³	PRESSURE	TEMPERATURE	
													(PSI/KPa)	(°F/°C)	
1372	27	16/64		758	28	1.0145	.77		2.93	0	.766	261.4			

REMARKS:

SAMPLE

TIME SAMPLE COLLECTED	CYLINDER SERIAL NO.	CYLINDER VOLUME (CC)	SAMPLE TYPE	SAMPLING DURATION (MINS)	CYLINDER INITIALLY FILLED WITH	OUTAGE (CC)	VOLUME OF FILL REMAINING WITH SAMPLE (CC)		SAMPLE POINT		SAMPLE PRESS (PSI/KPa)	SAMPLE TEMP (°F/°C)	AMBIENT PRESS (PSI/KPa)	AMBIENT TEMP (°F/°C)	
WELLHEAD DATA				SEPARATOR DATA			GRAVITIES		FLOW RATES			RATIOS		BOTTOM HOLE	
TUBING PRESS (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	BS&W (%)	SEPARATOR PRESS (PSI/KPa)	SEPARATOR TEMP (°F/°C)	FPV	GAS SPECIFIC GRAVITY	OIL API GRAV @60°F	GAS MMSCFD m³10³/D	OIL BPD m³/D	WATER BPD m³/D		PRESSURE	TEMPERATURE	
													(PSI/KPa)	(°F/°C)	

REMARKS:



CUSTOMER : SANTOS LTD

PERFORATIONS: 9494'-9567'

PAGE: 1 OF

WELL NAME: VARANUS #1

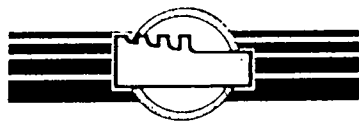
FORMATION : PATCHAWARRA

DATE: 19.12.90

TEST TYPE : FLOW AND BUILD-UP

OPR : N. HAY

DATE/TIME	DESCRIPTION OF EVENTS
19.12.90	
13:00	ARRIVE ON LOCATION WELL FLOWING ON $24/64$ TO FLARE
	COMMENCE RIGGING IN FLOWLINES SEPARATOR AND STOCK TANK #129
14:50	SHUT WELL IN TO RIG UP SWAB VALVE AND CHICKSAND TO FLOWLINE
	TO SEPARATOR
15:20	OPEN WELL ON $24/64$ THRU H SEPARATOR
16:00	CHANGE CHOKER TO $16/64$ AND MONITOR FLOW RATES
20-12-90	
	CONTINUE MONITORING FLOW RATES
21-12-90	
13:00	RIG UP WIRELINE UNIT
14:52	R.L.H FOR FLOWING GRADIENT SURVEY
16:45	ARRIVE BACK AT SURFACE
17:38	R.L.H WITH GAUGES COUPLED TO 48 HR CLOCKS
17:57	HANG GAUGES AT 9533' MB
22-12-90	
	CONTINUE MONITORING FLOW RATES
23-12-90	
	CONTINUE MONITORING FLOW RATES
21:00	OBTAIN 1X500 CC HP GAS SAMPLE 1X500 CC WATER SAMPLE
22:00	OBTAIN 1X500 CC HP GAS SAMPLE 1X500 CC WATER SAMPLE
24-12-90	
06:00	SHUT WELL IN FOR BUILD-UP
08:00	RIG OUT FLOWLINES SEPARATOR AND TANK



CUSTOMER : SANTOS PET.

PERFORATIONS: 9494' - 9567'

PAGE: 2 OF 2.

WELL NAME: VARANUS #1

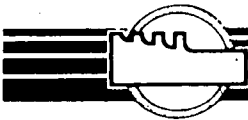
FORMATION : PATCHAWARRA

DATE: 24.12.90

TEST TYPE : Flow Build up

OPR: R. LARKIN

DATE/TIME	DESCRIPTION OF EVENTS
Dec 24/90	MONITOR Build up.
Dec 28/90	
0600	POOH PRES. gauges.
0823	Dep. Lub. CHARTS good.
	PREPARE gauges FOR S.G.S.
0936	R.I.H.
1107	ON Depth. 9533' KB as per PROGRAM.
1122	POOH
1200	Dep. Lub. CHARTS good. PREPARE to
	ReRUN with 120 hr clocks FOR FURTHER Build up.
1225	PRES Lub
1425	R.I.H.
1441	ON Depth 9480' KB. as per PROGRAM.
	MONITOR Build up.
1st JAN. 1991.	
1030	P.O.D.H. WITH PRESSURE ELEMENTS.
1342	R.I.H. WITH PRESSURE ELEMENTS FOR STATIC GRADIENT.
1520	P.O.D.H.
16:30	Rig wireline unit down. Secure well. End Test.



CUSTOMER : SANTOS PET.

PERFORATIONS: N/A

PAGE: 1 OF

WELL NAME: UARAINUS #1

FORMATION : N/A

DATE: 6.12.90

TEST TYPE : CLEAN up to pit

OPR : R. LARKIN

DATE/TIME	DESCRIPTION OF EVENTS	
Dec 6/90	tubing	choke
	KPA	
		well shut IN.
17 30	12894	12/64
		open well to FLARE pit light FLARE
17 35	12411	"
17 40	11728	"
17 45	11411	"
		well Flowing & BURNING OK.
1920	12452	"
		FREZZING OFF at choke. open ON 20/64.
1925	11362	20/64
1930	10136	"
		APPEARS to be Flowing AND BURNING OK.
2200	5950	"
		Rock choke.
Dec 7/90		
0530	3716	"
		NO SIGN OF ANY FLUID. FLARE staying Lit.
		Note: ABLE to see FLARE FROM NARIC #1, during the
		Night when TAKING Readings FOR L.E.T.
0945	8391	20/64
		choke HYDRATED OFF. Rock choke
1000		open ON 30/64
1020	1462	30/64
		shut IN to Light FLARE.
1025	1813	
		open ON 24/64 choke
1030	1724	24/64
		SLUGGING FLUID. TRACE OF OIL.
1035	1944	24/64
1330	1379	24/64
		SLUGGING FLUID. Mostly WATER TRACE OF OIL.
1630	1572	24/64
		FLARING GAS. NO FLUID.
2130	1965	24/64
		FLARING GAS. NO FLUID
Dec 8/90 0530	1662	24/64
		FLARING GAS NO FLUID.



CUSTOMER : SANTOS PET.

PERFORATIONS: N/A

PAGE: 2 OF

WELL NAME: VARAENUS

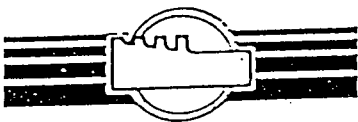
FORMATION : N/A

DATE: 8. 12. 90

TEST TYPE : CLEAN UP TO PIT

OPR : R. LARKIN

DATE/TIME	DESCRIPTION OF EVENTS		
Dec 8/90	Tubing - KPA	choke	
0930	1889	24/64	SLUGGING FLUID. TRACE OF OIL.
1330	1200	"	FLARING GAS. NO FLUID.
1730	1531	"	Relight FLARE.
2130	1055	"	FLARING GAS. NO FLUID
Dec 9/90			
0530	945	"	FLARING GAS. NO FLUID
1020	945	"	FLARING GAS NO FLUID.
1330	945	"	" " "
1730	1000	"	" " "
2130	1386	"	" " "
Dec 10/90			
0630	1503	24/64	FLARING GAS NO FLUID.
1030	1558	"	" " "
2000	1365	24/64	FLARING GAS. WATER DRIPPING FROM FLARE-LINE.
DEC 11/90			
0530	1379	"	FLARING GAS. WATER AND SOME CONDENSATE DRIPPING FROM FLARE LINE.
1200	1427	"	FLARING GAS. WATER DRIPPING FROM FLARE-LINE.
2000	1317	"	FLARING GAS. WATER DRIPPING FROM FLARE-LINE.
DEC 12/90			
0530	1214	"	FLARING GAS. WATER DRIPPING FROM FLARE-LINE.
2000	1123	"	FLARING GAS. WATER DRIPPING FROM FLARE-LINE
	See next page.		



CUSTOMER : SANTOS PET.

PERFORATIONS: N/A

PAGE: 3 OF

WELL NAME: VARAINUS

FORMATION : N/A

DATE: 12.12.90

TEST TYPE : Clean up flow.

OPR : J. Kumsick

DATE/TIME	TUB - KPA	CHOKE	DESCRIPTION OF EVENTS
Dec. 13/90			
0600	1138	24/64	Flaring Gas Water dripping from flare-line.
1400	1020	"	Flaring Gas Water dripping from flare-line
2000	1144	"	" " " " " "
Dec 14/90			
0600	938	"	Flaring Gas Water dripping from flare-line.
1400	1076	"	" " " " " "
2200	972	"	" " " " " "
Dec 15/90			
0600	993	"	" " " " " "
0900	958	24/64	Shut well in and rig in swab valve
0910			Open well on 24/64 choke size.
0935			Run in hole with 1.75" b. box.
1005			Tag PBDT @ 10230' KB and POOH
1125	896	24/64	Run in hole with 2 pressure elements for Flowing Gradient Survey.
1235	662	24/64	POOH
1301	696	24/64	Depressure lub. Rig down w/c unit and move out.
	696		
2200		24/64	Flaring Gas Water dripping from flareline
Dec 15/90			
0630	772	24/64	" " " " " "
1400	751	24/64	Flaring Gas Water dripping from flare
2200	723	24/64	" " " " " "
Dec 17/90			
0600	710	24/64	" " " " " "

SEQUENCE OF EVENTS

CUSTOMER : SANTOS LTD.

PERFORATIONS: N/A

PAGE: 4 OF

WELL NAME: VARAINUS #1

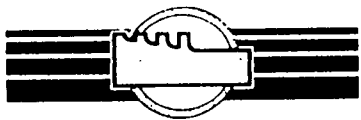
FORMATION : N/A

DATE: 17.12.90

TEST TYPE : Clean up flow

OPR: I. KURASIAK

[illegible]



SEQUENCE OF EVENTS

CUSTOMER : Santos

PERFORATIONS:

PAGE: 1 OF 1

WELL NAME: Varanus #1

FORMATION :

DATE: 5/3/91

TEST TYPE : Static Gradient

OPR : P. Bowyer.

DATE/TIME

DESCRIPTION OF EVENTS

5/3/91

1250

Arrive on location & rig up wire line unit.

1330

R.I.H with 1.75" B/Box.

1400

Tag P.B.T.D @ 10242' KB & P.O.O.H.

1427

In lub, depressure, remove toolstring & prepare to run ameradas.

1437

Pressure lub. for gradient ; 2 x pressure elements & 1 temp element.

1447

Depressure lub.

1452

Pressure lub & R.I.H to stops as per program.

1551

At 9533' KB. bottom stop.

1605

P.O.O.H

1630

In lub, depressure.

1635

Pressure lub

1645

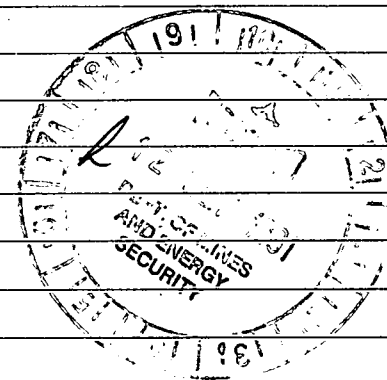
Depressure lub. remove amerada's & check charts, all ok.

1658

Rig down

1730

Move off base.



00059

7160/2

**EXPERTEST**

WIRELINE & WELL TESTING SERVICE

PO BOX 354 COWANILLA 5033

PH. (08) 354 0488 TELEX AA87183

FAX (08) 43 7408

138 RICHMOND ROAD MARLESTON

SOUTH AUSTRALIA 5033

Tested Tuesday, 5th March 1991.

CLIENT	LOCATION	FORMATION
Santos Ltd.	VARANUS #1	o Patchawarra

STATIC PRESSURE GRADIENT REPORT

PRESSURE ELEMENT DATA			
POSITION	SERIAL NO.	RANGE	CALIBRATED
Top	60322	5000	19/ 5/90
Bottom	59451	5000	19/ 5/90

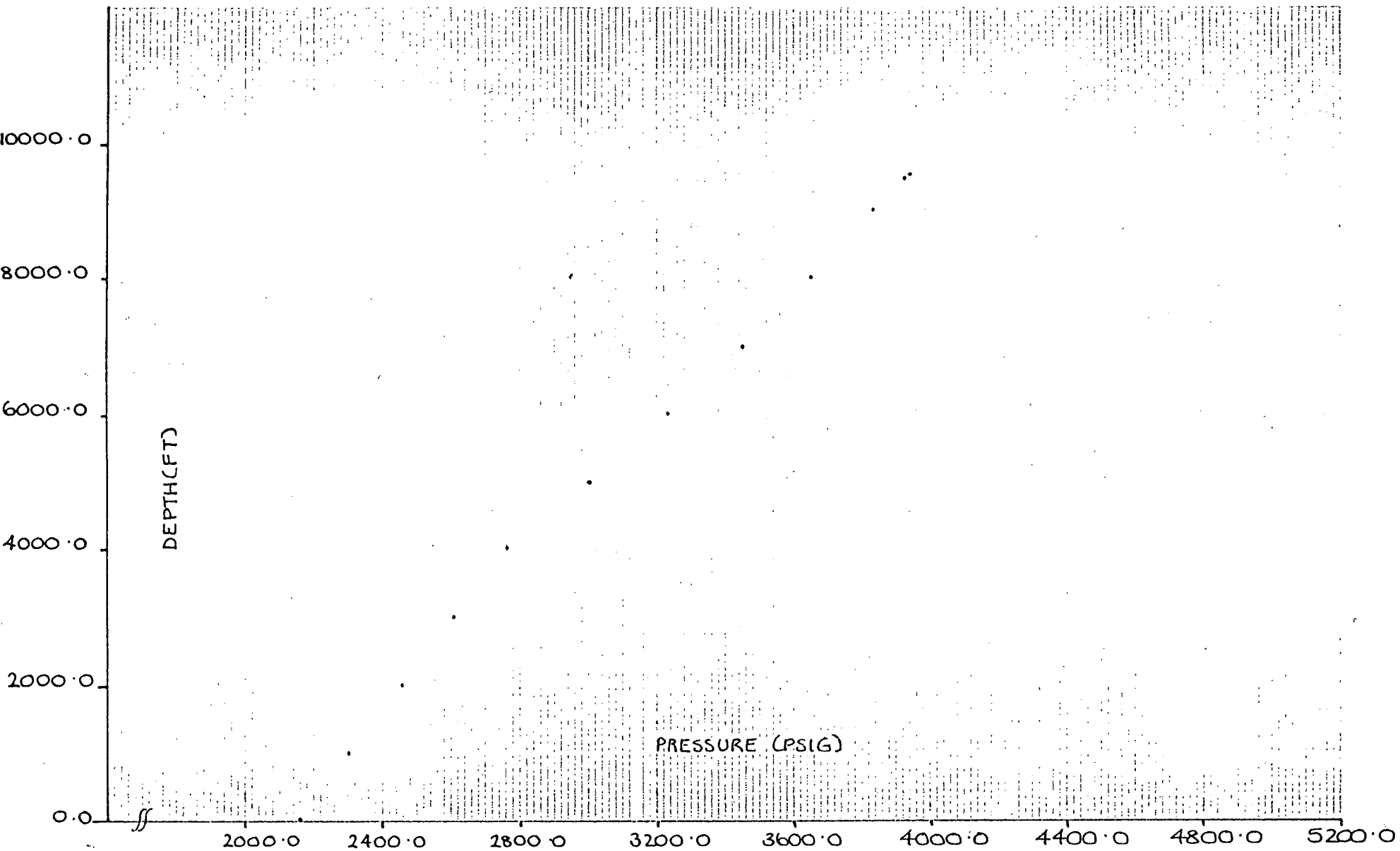
WELL DATA	
PARAMETER	VALUE
DWT In	2160 PSIG
DWT Out	2145 PSIG
Max BHT	

TOP ELEMENT				BOTTOM ELEMENT		
DEPTH FT. KB	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT
LUB.	0.8468	2159.7	----	0.8317	2155.8	----
1000	0.9026	2302.5	0.143	0.8869	2299.7	0.144
2000	0.9629	2456.9	0.154	0.9452	2451.7	0.152
3000	1.0209	2605.6	0.149	1.0031	2602.7	0.151
4000	1.0816	2761.3	0.156	1.0629	2758.7	0.156
5000	1.1758	3003.3	0.242	1.1559	3001.3	0.243
6000	1.2650	3232.7	0.229	1.2435	3230.1	0.229
7000	1.3492	3449.5	0.217	1.3272	3448.9	0.219
8000	1.4272	3650.6	0.201	1.4040	3649.9	0.201
9000	1.4973	3831.5	0.181	1.4732	3831.2	0.181
9480	1.5340	3926.2	0.197	1.5103	3928.5	0.203
9533	1.5410	3944.3	0.341	1.5176	3947.6	0.361
LUB.	0.8375	2135.9	----	0.8226	2132.1	----

GENERAL REMARKS

TEMP ELE 29217 / 136-396 oF USED ON SURVEY

VARANUS # 1 — STATIC PRESSURE GRADIENT — 5/3/91
ELEMENT # 60322/5000 (TOP)





BHP/BHT GAUGE RUN DATA

CUSTOMER : Santos

PERFORATIONS:

PAGE: 1 OF 1

WELL NAME: Varanus #1

FORMATION :

DATE: 5/3/91

TEST TYPE : Static Gradient

OPR : P. Bowyer

GAUGE DATA

UPPER
PRESSURE
GAUGELOWER
PRESSURE
GAUGETEMPERATURE
GAUGE

RUN DATA

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

ELEMENT SERIAL NO.

60322

59451

29217

DATE

5/3/91

ELEMENT RANGE

5000PSI

5000PSI

136°-396°F

PRESSURE LUBRICATOR

1437

14941

0

RECORDING SECTION SERIAL NO.

12952

13028

14633

RUN IN HOLE

1452

14865

0

DATE OF CALIBRATION:

@ 290°F

19/5/90

19/5/90

ON DEPTH AT

9533

FT/M

1551

14893

0

CLOCK SERIAL NO.

2431

2489

2279

DATE

5/3/91

CLOCK RANGE

3HR

3HR

3HR

PULL OUT OF HOLE

1605

14872

0

LEAD SCREW TYPE

15TUS

15TUS

15TUS

AT SURFACE

1630

14789

0

DEPRESSURE LUBRICATOR

1645

14789

0

ENGAGE STYLUS DATE

5/3/91

TIME

1430

1430

1430

MAXIMUM BHT AT

FT/M =

°F/C

DISENGAGE STYLUS DATE

5/3/91

TIME

1649

1649

1649

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

DATE

TIME

REMARKS

Uranus #1

B.H.P. Survey

16-20 December 1991.

B.H.P. Survey

16-12-91 Ran in the hole with ameradas and reached hang depth 9530 ft. KB @ 0850 hours. Flowed well on 100% choke until well shut in @ 1300 hours. Monitored pressures until 1315 hours on 20-12-91 for a buildup time of 96 hours 15 min.

Element # 850208 @ 9524 ft. KB

F.B.H.P. @ shut-in = 1810 psig = 12480 kPag

S.I.B.H.P. final = 2196 psig = 15141 kPag

Element # 29216 @ 9530 ft. KB

Max. B.H.T. = 286.0°F = 141.1°C

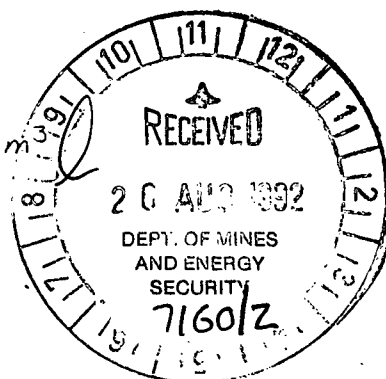
Static Gradient

20-12-91 A static gradient was run to 9635 ft. KB

Element # 850208

S.I.B.H.P. @ 9635 ft. KB = 2245 psig = 15479 kPag

S.I.B.H.P. @ 9530 ft. KB (MPP) = 2202 psig = 15183 kPag

Production SummaryCumulative production to end November 1991 = 67.3 E6 m³Production rate for November 1991 = 247.0 E3 m³/d.

O/F

Varanus #1
B.H.P. Survey
16-20 December 1991.

Production Summary

assume Production for December 1991 to test shut-in

$$= 15.5 \text{ days} \times 247.0 \text{ E3 m}^3/\text{d}$$

$$= 3839 \text{ E3 m}^3$$

$$\text{New cumulative} = 673.00 \text{ E3 m}^3 + 3839 \text{ E3 m}^3$$

$$= 71139 \text{ E3 m}^3$$

$$t = \frac{71139 \text{ E3 m}^3}{247.0 \text{ E3 m}^3/\text{d}} \times 24$$

$$t = 6912 \text{ hrs}$$

$$247.0 \text{ E3 m}^3/\text{d}$$

SUB-SURFACE PRESSURE SURVEY

CO. SANTOS		RUN 01 FIELD VARANUS	WELL 01
EFF DEPTH		WELL STAT	TOOL HUNG 9524 FT KB
CASING	-	CASING PRESS	ON BOTTOM 0850 911216
LINER	-	TUBING PRESS	OFF BOTTOM 1315 911220
DATE	911216	ELEMENT RANGE 0 - 4098	ZERO POINT
ELEVATION		ZONE	SHUT-IN 1300 911216
MAX TEMP		PICK-UP	ON-PROD
PERF	-	CAL SER NO. 850208	MPP
TUBING	-		
UNITS	ENGLISH	PURPOSE	BOTTOMHOLE PRESSURE BUILDUP

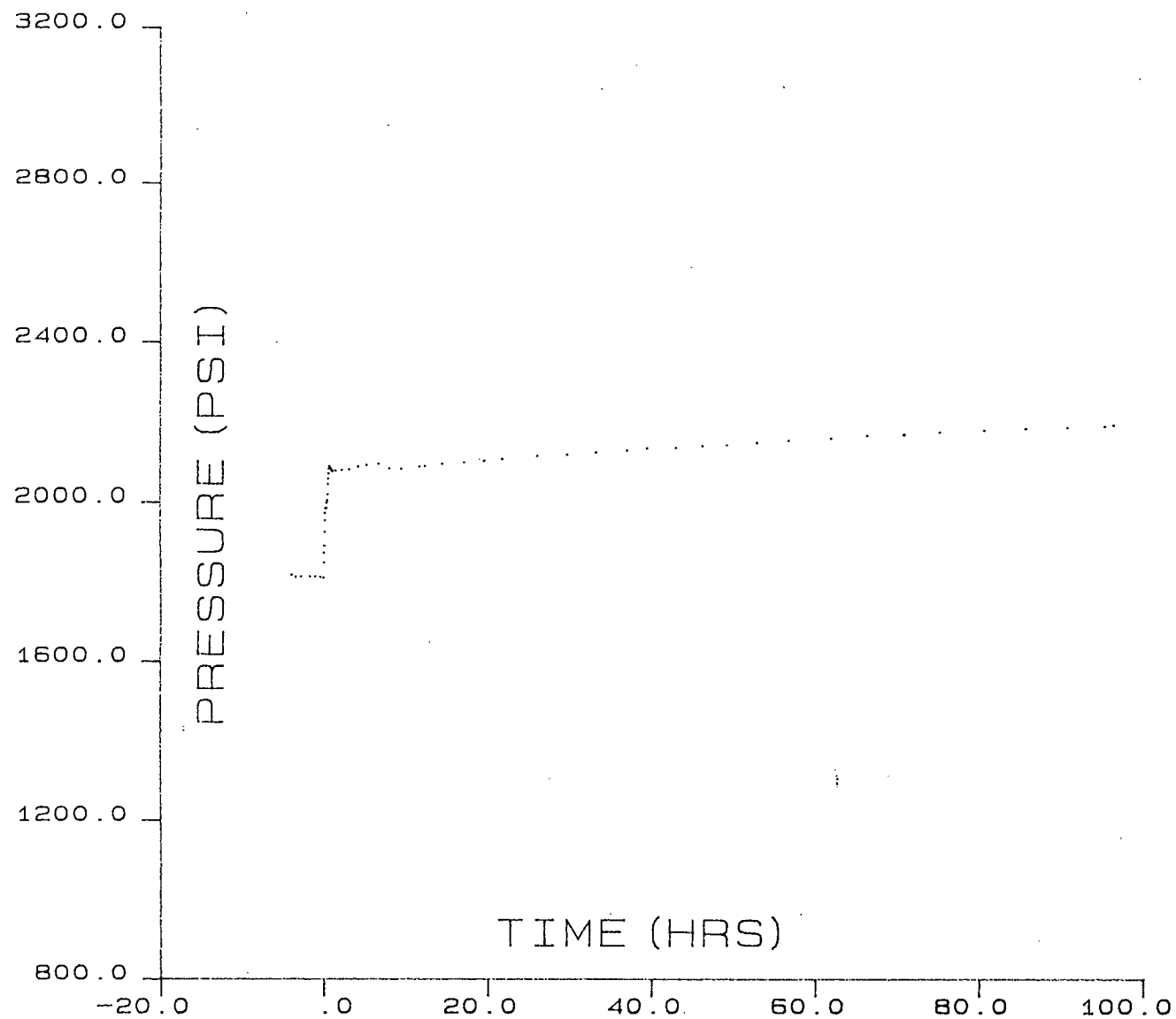
SURVEY DATA

CO. SANTOS				RUN 01 FIELD VARANUS				WELL 01			
TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
13:00	1810.0	1810.0	.0	1:20	2090.6	2090.6	12.3				
13:03	1846.9	1846.9	.0	3:26	2095.7	2095.7	14.4				
13:02	1872.8	1872.8	.0	6:08	2100.0	2100.0	17.1				
13:05	1889.8	1889.8	.1	8:33	2104.1	2104.1	19.6				
13:08	1924.9	1924.9	.1	10:47	2108.8	2108.8	21.8				
13:12	1955.4	1955.4	.2	15:02	2116.1	2116.1	26.0				
13:12	1973.3	1973.3	.2	18:42	2121.0	2121.0	29.7				
13:12	1985.4	1985.4	.2	22:12	2125.8	2125.8	33.2				
13:21	1985.3	1985.3	.4	1:59	2131.4	2131.4	37.0				
13:22	1998.7	1998.7	.4	4:25	2135.5	2135.5	39.4				
13:27	2005.4	2005.4	.5	7:56	2137.2	2137.2	42.9				
13:32	2019.8	2019.8	.5	11:10	2142.2	2142.2	46.2				
13:32	2044.4	2044.4	.5	14:09	2145.1	2145.1	49.1				
13:34	2057.8	2057.8	.6	17:47	2150.2	2150.2	52.8				
13:37	2070.7	2070.7	.6	21:41	2155.5	2155.5	56.7				
13:38	2083.4	2083.4	.6	2:53	2160.4	2160.4	61.9				
13:42	2090.0	2090.0	.7	7:16	2167.6	2167.6	66.3				
13:46	2085.6	2085.6	.8	11:47	2170.1	2170.1	70.8				
13:52	2083.9	2083.9	.9	16:08	2176.1	2176.1	75.1				
13:56	2079.3	2079.3	.9	21:34	2180.6	2180.6	80.6				
14:06	2075.5	2075.5	1.1	2:34	2185.4	2185.4	85.6				
14:28	2077.9	2077.9	1.5	7:37	2188.5	2188.5	90.6				
15:13	2080.5	2080.5	2.2	12:11	2191.7	2191.7	95.2				
16:05	2082.2	2082.2	3.1	13:15	2195.5	2195.5	96.3				
17:12	2089.0	2089.0	4.2	8:59	1817.5	1817.5	-4.0				
18:15	2092.8	2092.8	5.2	9:32	1811.8	1811.8	-3.5				
19:45	2096.5	2096.5	6.8	10:14	1813.5	1813.5	-2.8				
21:01	2082.5	2082.5	8.0	11:19	1812.8	1812.8	-1.7				
22:29	2081.4	2081.4	9.5	11:56	1812.3	1812.3	-1.1				
0:40	2089.0	2089.0	11.7	12:35	1811.9	1811.9	-.4				

LUB IN DWT = 529 PSI / OUT = 1435 PSI

LUB IN AMERADA = 522 PSI / OUT = 1433 PSI

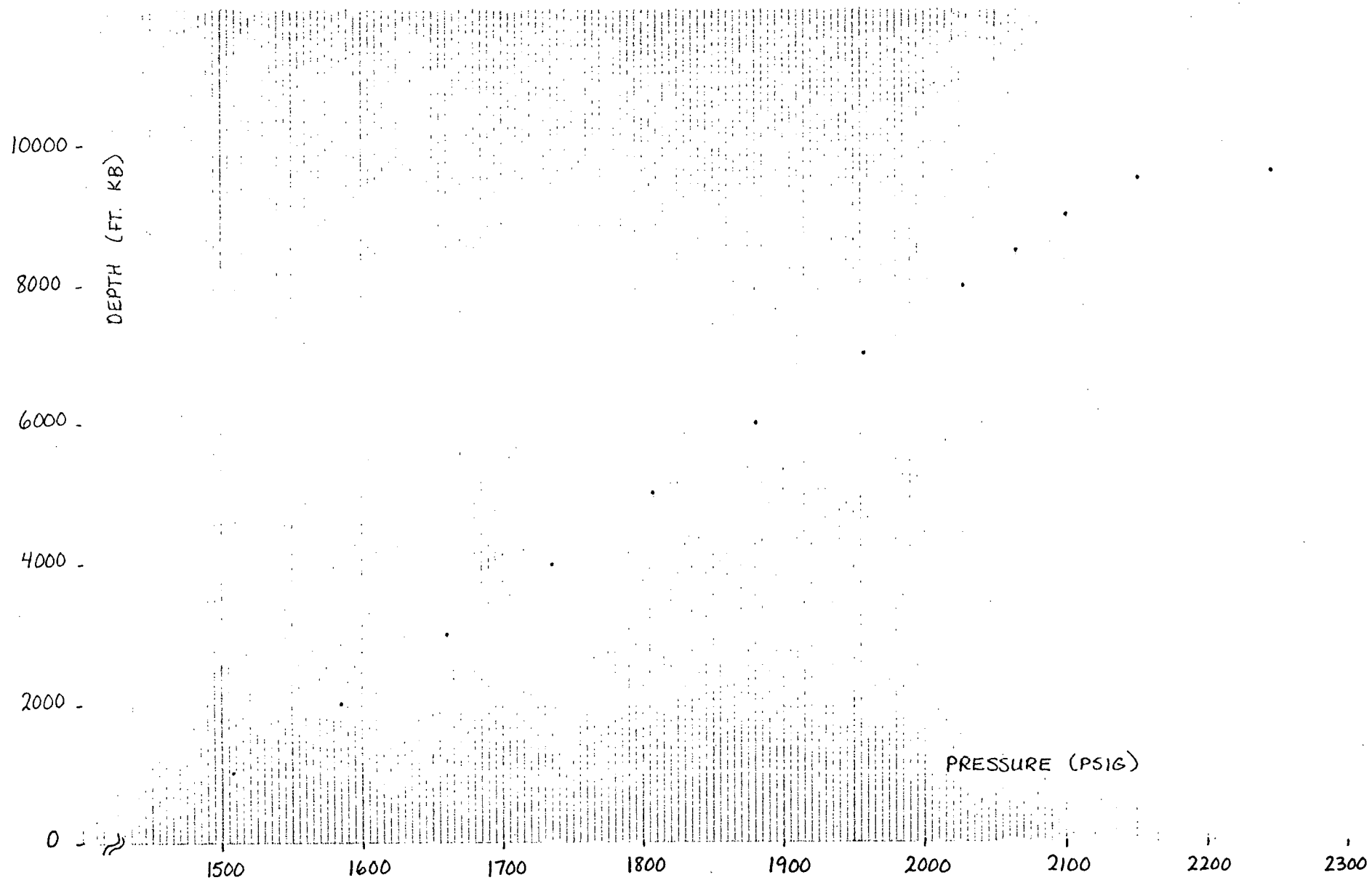
VARANUS 1 BOTTOMHOLE PRESSURE BUILDUP
16 - 20 DECEMBER 1991
ELEMENT #850208 @ 9524 FT KB



99000

VARANUS # 1 - STATIC PRESSURE GRADIENT - 20/12/91.

ELEMENT # 850208 (BOTTOM)



00067

EXPERTEST

WIRELINE & WELL TESTING SERVICE

PO BOX 354 COVARDILLA 5033

PH. (08) 354 0488 TELEX AAB7183

FAX (08) 43 7408

138 RICHMOND ROAD MARLESTON
SOUTH AUSTRALIA 5033

Tested Friday, 20th December 1991.

CLIENT	LOCATION	FORMATION
Santos Ltd.	VARANUS #1	PATCHAWARRA

STATIC PRESSURE GRADIENT REPORT

PRESSURE ELEMENT DATA			
POSITION	SERIAL NO.	RANGE	CALIBRATED
Top	850207	4075	4/12/91
Bottom	850208	4100	4/12/91

WELL DATA	
PARAMETER	VALUE
DWT In	1435 PSIG
DWT Out	1436 PSIG
Max BHT	

DEPTH FT KB	TOP ELEMENT			BOTTOM ELEMENT		
	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT
LUB.	0.7050	1433.8	----	0.7010	1429.1	----
1000	0.7430	1511.3	0.077	0.7390	1507.1	0.078
2000	0.7810	1588.7	0.078	0.7770	1585.1	0.078
3000	0.8180	1664.2	0.076	0.8130	1659.0	0.074
4000	0.8540	1737.7	0.074	0.8500	1735.0	0.076
5000	0.8910	1813.3	0.076	0.8850	1806.9	0.072
6000	0.9270	1886.9	0.074	0.9210	1881.0	0.074
7000	0.9620	1958.5	0.072	0.9580	1957.1	0.076
8000	0.9980	2032.2	0.074	0.9920	2027.0	0.070
8500	1.0160	2069.0	0.074	1.0100	2064.1	0.074
9000	1.0340	2105.9	0.074	1.0280	2101.2	0.074
9530	1.0820	2204.3	0.186	1.0770	2202.1	0.190
9635	1.1040	2249.4	0.430	1.0980	2245.4	0.412
LUB.	0.7060	1435.9	----	0.7030	1433.2	----

GENERAL REMARKS

EXPERTEST PTY. LTD.

SEQUENCE OF EVENTS

CUSTOMER : SANTOS LTD

PERFORATIONS: 9499 - 9567'

PAGE: 1 OF 2

WELL NAME: VARANUS #1

FORMATION : PATCHAWARRA

DATE: 15-12-91

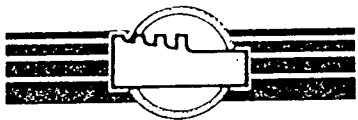
TEST TYPE : B.H.P. SURVEY

OPR : P. BLACK.

DATE/TIME	DESCRIPTION OF EVENTS
15-12-91	
1415	ON LOCATION
1430	RIG UP WIRELINE UNIT
1500	WAITING ON SANTOS OPERATOR
1550	SHUT WELL IN TO FIT SWAB VALVE.
1655	R.I.H. WITH 1.75" TOOL STRING
1726	TAG P.B.T.D. OF 10207' KB. NO OBSTRUCTIONS.
1727	P.O.O.H.
1750	AT SURFACE WITH TOOL STRING SECURE LEASE OVERNIGHT.
16-12-91	
0600	PREPARE B.H.P./B.H.T. GAUGES.
0824	R.I.H. WITH GAUGES.
0850	AT HANG DEPTH OF 9530' KB. WELL FLOWING ON 100% CHOKE.
1300	SHUT WELL IN COMMENCE 96 HOUR BUILD UP.
20-12-91	
1315	PULL OUT OF HOLE WITH GAUGES.
1336	AT SURFACE AND DEPRESSURE LUBRICATOR.
1436	PRESSURE LUBRICATOR
1536	DEPRESSURE LUBRICATOR. ALL CHARTS GOOD
1540	PREPARE B.H.P./B.H.T. GAUGES FOR STATIC GRADIENT.
1622	R.I.H. WITH GAUGES.
1730	AT BOTTOM GRADIENT STOP OF 9635' KB.
1745	P.O.O.H
1805	AT SURFACE WITH GAUGES AND DEPRESSURE

00069

EXPERTEST PTY. LTD.



SEQUENCE OF EVENTS

CUSTOMER : SANTOS LTD.

PERFORATIONS: 9499-9567' K13

PAGE: 2 OF 2

WELL NAME: VARANUS #1

FORMATION : PATCHAWARRA

DATE: 20-12-91

TEST TYPE : B.H.P. SURVEY

OPR : P. BLACK

DATE/TIME

DESCRIPTION OF EVENTS

20-12-91

1810 PRESSURE LUBRICATOR.

1825 DEPRESSURE LUBRICATOR. ALL CHARTS GOOD

1830 SECURE LEASE OVER NIGHT

21-12-91

0730 RIG DOWN WIRELINE EQUIPMENT.

0830 HAND WELL BACK TO PRODUCTION.

00070

EXPERTEST PTY. LTD.



TEST RESULTS

CUSTOMER : SANTOS LTD.

PERFORATIONS: 9499 → 9567' k13.

PAGE: 1 OF 3

WELL NAME: VARANUS. #1

FORMATION : PATCHAWARRA.

DATE: 16.12.91

TEST TYPE : B.H.P. SURVEY.

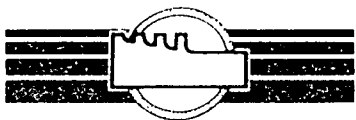
OPR : P. BLACK

TIME		WELLHEAD DATA						FLOW RATES			CUMULATIVE PRODUCTION						
DATE TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE /KPa	ANNULUS PRESSURE /KPa	WELLHEAD TEMP °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				
16-12-91																	
0624		3647	6377	59	100	PRESSURE LUBRICATOR											
0724		3661	6426	59	"	DEPRESSURE LUBRICATOR											
0824		3681	6481	59	"	PRESSURE LUBRICATOR AND R.I.H.											
0850	0	3716	6660	59	"	AT HANK DEPTH OF 9530' k13.											
0920		3668	6557	59	"												
0950	1	3675	6536	59	"												
1020		3675	6529	59	"												
1050	2	3668	6474	60	"												
1120		3675	6433	60	"												
1150	3	3675	6281	60	"												
1220		3681	6674	60	"												
1250	4	3688	6674	60	"												
1300	0	3688	6681	60		SHUT WELL IN FOR 96 HRS BUILD UP.											
1315		8901	8915														
1330		8839	8908														
1345		7908	7929														
1400	1	7936	7943														
1415		8018	8012														
1430		8087	8101														
1445		8187	8184														
1500	2	8281	8287														

00071

00071

EXPERTEST PTY. LTD.



TEST RESULTS

CUSTOMER : SANTOS LTD.

PERFORATIONS: 9499 → 9567' K13

PAGE: 2 OF 3

WELL NAME: VARANUS #1

FORMATION : PATCHAWARRA

DATE: 16.12.91

TEST TYPE : B.H.P. SURVEY

OPR : P. BLACK

TIME		WELLHEAD DATA						FLOW RATES			CUMULATIVE PRODUCTION				
DATE	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (KPa)	ANNULUS PRESSURE (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		
16.12.91															
1515		8349	8356												
1530		8446	8446												
1545		8446	8515												
1600	3	8508	8591												
1615		8589	8632												
1630		8756	8763												
1645		8818	8839												
1700	4	8901	8908												
2100	8	9253	9232												
2200	9	9563	9570												
17.12.91															
0200	13	9584	9597												
0600	17	9611	9625												
2200	33	9687	9701												
18.12.91															
0200	37	9694	9701												
0600	41	9708	9728												
2200	57	9770	9790												
19.12.91															
0200	61	9784	9804												
0600	65	9804	9839												

00072

TEST RESULTS

WELL NAME: VARANUS #1

TEST TYPE : B.H.P. SURVEY

FORMATION : PATCHAWARKA

DATE: 19.12.91

OPR : P. BLACK

[illegible]

EXPERTEST PTY. LTD.

BHP/BHT GAUGE RUN DATA

CUSTOMER : SANTOS LTD.

PERFORATIONS: 9499-9567' K13.

PAGE: 1 OF

WELL NAME: VARANUS #1

FORMATION : PATCHAWARRA

DATE: 16-12-91

TEST TYPE : B.H.P. SURVEY

OPR : P. BLACK

GAUGE DATA

UPPER
PRESSURE
GAUGELOWER
PRESSURE
GAUGETEMPERATURE
GAUGE

RUN DATA

TIME
(HOURS)TUBING
PRESSURE
/KPaANNULUS
PRESSURE
/KPa

ELEMENT SERIAL NO.

850207

850208

29216

DATE

16-12-91

ELEMENT RANGE

4075 PSI

4100 PSI

156"→366" F

PRESSURE LUBRICATOR

0624

3647

6377

RECORDING SECTION SERIAL NO.

K 3433

K 3434

30929

RUN IN HOLE

0824

3681

6481

DATE OF CALIBRATION:

① 290°F

4-12-91

4-12-91

ON DEPTH AT

9530' FT.

0850

3716

6660

CLOCK SERIAL NO.

1103

24724

24711

DATE

20-12-91

CLOCK RANGE

120 HRS

120 HRS.

120 HRS.

PULL OUT OF HOLE

1315

9880

9908

LEAD SCREW TYPE

15 TLS.

15 TLS.

15 TLS.

AT SURFACE

1336

9887

9908

DEPRESSURE LUBRICATOR

1536

9894

9921

ENGAGE STYLUS DATE

16-12-91

TIME

0616

0616

0616

MAXIMUM BHT AT

FT/M =

°F/C

N/A.

1435 psi

DISENGAGE STYLUS DATE

20-12-91

TIME

1546

1546

1546

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

DATE

TIME

REMARKS

00074

BHP/BHT GAUGE RUN DATA		
CUSTOMER : SANTOS LTD.	PERFORATIONS: 9499 → 9567' K13.	PAGE: 1 OF 1
WELL NAME: VARANUS #1	FORMATION : PATCHAWARRA	DATE: 20-12-91
TEST TYPE : S.G.S.		OPR : P. BLACK

GAUGE DATA		UPPER PRESSURE GAUGE	LOWER PRESSURE GAUGE	TEMPERATURE GAUGE	RUN DATA	TIME (HOURS)	TUBING PRESSURE (KPa)	ANNULUS PRESSURE (KPa)
ELEMENT SERIAL NO.		850207	850208	29216	DATE : 20-12-91			
ELEMENT RANGE		4075 PSI	4100 PSI	156 → 366 °F	PRESSURE LUBRICATOR :	1602	9901	9921
RECORDING SECTION SERIAL NO.		K3433	K3434	30929	RUN IN HOLE :	1622	9901	9921
DATE OF CALIBRATION:	@ 290 °F.	4-12-91	4-12-91		ON DEPTH AT : 9635 FT.	1730	9901	9921
CLOCK SERIAL NO.					DATE : 20-12-91			
CLOCK RANGE		3 HRS	3 HRS.	3 HRS.	PULL OUT OF HOLE :	1745	9901	9928
LEAD SCREW TYPE		15 TCS	15 TCS	15 TCS	AT SURFACE :	1805	9908	9928
					DEPRESSURE LUBRICATOR :	1825	9908	9928
ENGAGE STYLUS	DATE 20-12-91 TIME 1550	1550	1550	1550	MAXIMUM BHT AT FT/M = °F/°C	N/A.		
DISENGAGE STYLUS	DATE 20-12-91 TIME 1830	1830	1830	1830	N.B. ALL DEPTHS ARE MEASURED FROM K.B.			

[illegible]

ATTACHMENT #1



DOWNHOLE INSTALLATION

VARANUS 1

00076

[illegible]

PERFORATED INTERVALS:		GUN:			CHARGES:		
FORMATION	INTERVAL	SIZE	TYPE	S.P.F.	TYPE	WT(g)	
PATCHAWARRA 90-9	9499' - 9510'	2 1/8"	E/jet 90° phasing	6	RDX	22	
91-2	9521' - 9567'	2 1/8"	E/jet 90° phasing	6	RDX	22	
Reperforated 90-9 and 91-2 (10/3/91)		2 1/8"	E/jet	4	RDX	13.5	
See Attached Sheet for additional perforations		"	"	"	0°	"	

REMARKS:

ANNULUS FLUID :	2% KCl brine with inhibitor
INDICATED STRING WEIGHT :	54,000# with 6,000# blocks
CALCULATED STRING WEIGHT :	51,000#
SLACK-OFF WEIGHT :	8,000# compression
TENSION :	

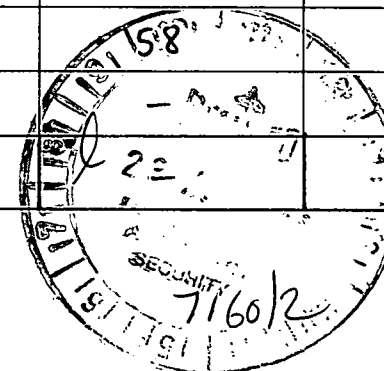
NOT TO SCALE	WELLSITE SUPERVISOR	P. Allwood
PROPOSED	DATE OF INSTALLATION	
RE-COMPLETION	DRAFTED	E. Coppins
DATE OF COMPLETION	DATE	13/12/2020



SANTOS LIMITED PETROLEUM ENGINEERING

MODIFIED ISOCHRONAL WELL TEST SUMMARYTESTED BY OILSERV FORMATION PATCHAWARRAWELL VARANUS #1DATE 8/8/91 to 22/8/91LATITUDE 27° 43' 54.5" SLONGITUDE 140° 01' 59.3" ECASING SIZE 7 in.TUBING SIZE 2 7/8 in.

	DATE	TIME (HOURS)	DURATION (HOURS)	FINAL WELLHEAD READINGS			CHOKE SIZE (in.)
				TUBING (kPa)	CASING (kPa)	TEMP (°C)	
INITIAL FLOW	8/8 11/8	0600 1815	84.25	11784	8274	21	18%
INITIAL SHUT IN	—	—	—	—	—	—	
FLOW 1	19/8 19/8	1800 2400	6	12197	8964	49	19/64
SHUT IN	19/8 20/8	2400 0600	6	12900	9653	—	
FLOW 2	20/8 20/8	0600 1200	6	10460	7929	59	31/64
SHUT IN	20/8 20/8	1200 1800	6	12976	—	—	
FLOW 3	20/8 20/8	1800 2400	6	9301	7585	62	37/64
SHUT IN	20/8 21/8	2400 0600	6	12990	—	—	
FLOW 4	21/8 21/8	0600 1200	6	8481	7240	63	42/64
EXTENDED FLOW	11/8 12/8	1815 1000	15.75	7970	6550		55%
FINAL BUILDUP	12/8 18/8	1000 1000	144	12755	9308		
SHUT IN	21/8 22/8	1200 0625	17.42	12956	9653		





SANTOS LIMITED PETROLEUM ENGINEERING

WELL TEST SUMMARY - GAS FLOW RATES

WELL VARANUS #1

DATE 8/8/91 to 22/8/91

METER RUN SIZE 3.826 "

**SEPARATOR GAS PROPERTIES CALCULATED
FROM HP GAS SAMPLES TAKEN DURING TEST**

GAS SPECIFIC GRAVITY (SG) = 1.104

FG = $\sqrt{1/SG}$ = 0.9517

Pc = 854.07 psia

Tc = 469.28 °R

CO₂ mol. fr. = 46.84 %

	ORIFICE SIZE (in.)	CHOKE SIZE (in.)	SEPARATOR READING						CALCULATED SEPARATOR GAS FLOW RATE Qg	
			Pf		Hw		Temp		MMscf/D	E3 m ³ / d
			psig	kPa	" w.c.	kPa	°F	°C		
Last INITIAL rate FLOW	1.75	18%	400	2758	64	15.9	68.0	20	2.490	70.154
Last FLOW 1 rate	2.0	19/64	330	2275	72	17.9	66.2	19	3.177	89.520
Last FLOW 2 rate	2.75	31/64	295	2034	76	18.9	77.0	25	6.424	180.985
Last FLOW 3 rate	3.0	37/64	280	1931	72	17.9	89.6	32	7.730	217.773
Last FLOW 4 rate	3.0	42/64	330	2275	76	18.9	96.8	36	8.574	241.570
EXTENDED Ave. FLOW	3.0	55%	590	4068	40.5	10.1	124.0	51.1	8.284	233.397

00078



SANTOS LIMITED PETROLEUM ENGINEERING

GAS WELL DELIVERABILITY TEST CALCULATIONS

BASE CONDITIONS = 14.65 psia and 60°F

WELL VARANUS #1DATE 8/8/91 to 22/8/91ELEMENT No. 56652
S.R.O.DEPTH TESTED 9160' KB

DWT IN

OUT

LUB IN

OUT

SIMPLIFIED ANALYSIS

	DURATION (HOURS)	SANDFACE PRESSURE (psia)	BOTTOM HOLE TEMPERATURE (°F)	Δp^2 (x 10 ⁶ psia ²)	SEPARATOR GAS FLOW RATE E3 m ³ / d	AVERAGE H/CARBON FLOW RATE m ³ / d	AVERAGE WATER FLOW RATE m ³ / d	REMARKS
INITIAL FLOW	84.25	—	—					$q = C(\bar{p}_R^2 - p_{wf}^2)^n$ SLOPE n = _____ $\bar{p}_R = \text{_____ psia}$ $C = \frac{q}{(\bar{p}_R^2 - p_{wf}^2)^n}$ = _____ AOF (MMscf/D) = _____
INITIAL SHUT IN	—	—	—					
FLOW 1	6	2720	257.1		89.520	10.840	1.160	
SHUT IN	6	2829	258.0					
FLOW 2	6	2572	256.4		180.985	20.200	4.240	
SHUT IN	6	2828	257.2					
FLOW 3	6	2511	255.1		217.773	22.400	5.120	
SHUT IN	6	2821	256.4					
FLOW 4	6	2487	254.2		241.570	23.440	5.760	
EXTENDED FLOW	15.75	2405	261.8		233.397	17.616	4.464	
FINAL SHUT IN	144	2790	260.1					
POST FLOW 4 SHUT IN	17.42	2827	257.4					

00079



Santos Ltd
A.C.N. 007 550 923

SANTOS LIMITED PETROLEUM ENGINEERING

GAS WELL DELIVERABILITY TEST CALCULATIONS

BASE CONDITIONS = 14.65 psia and 60°F

WELL VARANUS #1

DATE 8/8/91 to 22/8/91

LIT (Ψ) ANALYSIS

	DURATION (HOURS)	SANDFACE PRESSURE (psia)	Ψ ($\times 10^6$ psia ² /cp)	$\Delta \Psi$ ($\times 10^6$ psia ² /cp)	SEPARATOR GAS FLOW RATE (q) (MMscf/D)	$\Delta \Psi / q$	q^2	$\Delta \Psi - bq^2$
INITIAL FLOW	84.25	—						
INITIAL SHUT IN	—	—						
FLOW 1	6	2720			3.177			
SHUT IN	6	2829						
FLOW 2	6	2572			6.424			
SHUT IN	6	2828						
FLOW 3	6	2511			7.730			
SHUT IN	6	2821						
FLOW 4	6	2487			8.574			
TOTAL								
EXTENDED FLOW	15.75	2405			8.284			
FINAL SHUT IN	144	2790						
POST FLOW 4 SHUT IN	17.42	2827						

PRE MOD
ISO RATES

00800



SANTOS LIMITED PETROLEUM ENGINEERING

GAS WELL DELIVERABILITY TEST CALCULATIONS**LIT (Ψ) ANALYSIS**WELL VARANUS #1DATE 8/8/91 to 22/8/91

DISCARDED POINT _____

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

$$a, a_t = \frac{\sum \frac{\Delta \Psi}{q} \sum q^2 - \sum q \sum \Delta \Psi}{N \sum q^2 - \sum q \sum q} = \text{_____}$$

$$b = \frac{N \sum \Delta \Psi - \sum q \sum \frac{\Delta \Psi}{q}}{N \sum q^2 - \sum q \sum q} = \text{_____}$$

(EXTENDED FLOW)

 $\Delta \Psi$ = _____ q = _____ b = _____

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

AOF = _____ MMscf/D n = _____

TOTAL VOLUME OF GAS
PRODUCED DURING TEST = _____ MMscf

CONDENSATE = _____ Bbls

WATER = _____ Bbls

RESULTSTRANSIENT FLOW : $\bar{\Psi}_R - \Psi_{wf} = a_t q + bq^2$ I.E. _____ - Ψ_{wf} = _____ q + _____ q²STABILISED FLOW : $\bar{\Psi}_R - \Psi_{wf} = aq + bq^2$ I.E. _____ - Ψ_{wf} = _____ q + _____ q²DELIVERABILITY : $q = \frac{1}{2b} [-a + \sqrt{a^2 + 4b(\bar{\Psi}_R - \Psi_{wf})}]$ FOR $\Psi_{wf} = 0$, q = AOF = _____ MMscf/DREMARKS _____

INTERPRETED BY : _____ DATE : ____ / ____ / ____

00081



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV

PERFORATIONS: 9195' - 10075' K.B

PAGE: 1 OF 15

WELL NAME: VARANUS *1

FORMATION: PATCHAWARRA

DATE: 6/8/91

TEST TYPE: MODIFIED ISOCHRONAL

OPR: KUNAC, KAPPLER

TIME		WELLHEAD DATA				SEPARATOR DATA		FLOW RATES			CUMULATIVE PRODUCTION				OPR: KUNAC, KAPPLER		
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	L.G.R. BBLs/MMSCF m³/10³m³		
							MODIFIED ISOCHRONAL										
6/8/91	1010						LEAVE LOCATION, EPSILON #1										
	1655						ARRIVE ON LOCATION VARANUS #1										
	1730						TRUCK ARRIVES ON LOCATION, SPOT TEST EQUIPMENT RIG UP FOLLOWING DAY										
7/8/91	1005						SHUT WELL IN TO RIG IN SWAB VALVE										
	1031						WELL BACK ON LINE 100%										
	1100						RIG UP W/LINE UNIT										
1302	7700	9515					CLOSE WELL TO 10% FOR BLIND BOX RUN										
1310							R.I.H WITH WEIGHT BAR, SPANG-JARS 21.750" BLIND 7160/2										
							BOX TO 10214' I.C.B. NO OBSTRUCTIONS										
1435							P.O.O.H										
1539							IN LUB										
1541							DEPRESSURE LUB, RIG DOWN W/LINE UNIT										
1619							SHUT WELL IN TO RIG ONTO TEST FLANGES BY-PASSING SEPARATOR										
	7700	12273					SHUT IN PRESSURE										
1731							OPEN WELL BACK ON LINE 100% (THROUGH SANTOS METER RUN)										
							FLOW THROUGH SEPARATOR FOLLOWING DAY										
8/8/91	0600	00.00	6061	9308	67	100%	TRIM FLOW THROUGH SEPARATOR										

AND EXERCISE
SECURITY

3/1/91

00082



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 9195'-10075' K.B	PAGE: 2 OF 15
WELL NAME: VARANUS *1	FORMATION: PATCHAWARRA	DATE: 8/8/91
TEST TYPE: MODIFIED ISOCHRONAL		OPR: KUNAC, KAPPEK

TIME		WELLHEAD DATA				SEPARATOR 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	L.G.R. BBLs/MMSCF m³/10³m³	
8/8/91															
0615						ENGAGE 3.00" O/P									
1000	04.00	6061	9377	68	100%	4689	58	322.0364	17.850	4.950	53.6727	2.975	0.825	0.071	
1245					70%	CLOSE WELL TO 70% CHOKER									
1253					60%	CLOSE WELL TO 60% CHOKER									
		S.G.= 1.082, CO2= 30%, H2S= 48.7, A.P.I.= 48.7													
1323					55%	CLOSE WELL TO 55% CHOKER									
1400	08.00	7991	9998	59	55%	4344	53	277.9478	16.410	5.430	99.9973	5.710	1.730	0.079	
1800	12.00	7957	9998	59	55%	4275	53	271.4998	18.060	4.500	145.2473	8.720	2.480	0.083	
2200	16.00	7957	9998	59	55%	4172	54	265.9653	16.920	4.800	189.5088	11.540	3.280	0.082	
9/8/91															
0200	20.00	7964	9998	59	55%	4172	53.5	266.1107	18.360	5.160	233.8606	14.600	4.140	0.088	
0600	24.00	7964	9998	59	55%	4172	53	266.6589	17.100	5.580	278.3037	17.450	5.070	0.085	
1000	28.00	7943	9998	59	55%	4240	53	272.9994	15.420	4.440	323.8036	20.020	5.810	0.073	
1400	32.00	7957	9998	60	55%	4275	53	274.6399	17.040	5.160	369.5769	22.860	6.670	0.081	
1800	36.00	7957	9998	59.5	55%	4275	53	277.7466	16.500	5.160	415.8677	25.610	7.530	0.078	
2200	40.00	8011	9998	60.5	55%	4378	53.5	269.3068	18.060	4.800	460.7522	28.620	8.330	0.085	
10/8/91															
0200	44.00	8025	9998	60.5	55%	4412	54.5	269.7048	17.340	4.860	505.7030	31.510	9.140	0.082	
0600	48.00	8025	9998	60	55%	4551	54	262.9274	16.560	5.160	549.5242	34.270	10.000	0.083	
0800	50.00	7929	9998	60.5	55%	4275	55	266.0664	17.040	6.720	571.6964	35.690	10.560	0.089	
0800						SCHLUMBERGER ARRIVE ON SITE									
1000	52.00	7950	5861	60	55%	4275	55	274.0511	17.040	5.520	594.5340	37.110	11.020	0.082	

00083



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 9195'-10075' KB	PAGE: 3 OF 15
WELL NAME: VARANUS #1	FORMATION: PATCHAWARRA	DATE: 10.8.91.
TEST TYPE: MODIFIED ISOCHRONAL		OPR: DOWLING

TIME		WELLHEAD DATA				SEPARATOR DATA		FLOW RATES			CUMULATIVE PRODUCTION				
DATE	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	OIL	WATER	GAS	OIL	WATER	L.G.R.	
								MMSCFD m³10³/D	BPD m³/D	BPD m³/D	MMSCF m³10³	BBLS m³	BBLS m³	BBLS/MMSCF m³/10³m³	
10.8.91.															
1010						BEGIN CLOSING CHOKE									
1024						ENGAGE 2.500" O.P.									
1032						CLOSE CHOKE TO 20%									
1044						CLOSE CHOKE TO 15%									
1106						ENGAGE 0.750" O.P.									
1110						SCHLUMBERGER R.I.H.									
1115						OPEN CHOKE TO 18%									
1124						ENGAGE 1.250" O.P.									
1141						ENGAGE 1.750" O.P.									
1200	54.00	11722	7585	21	18%	2689	54	69.6781	7.44	1.32	600.34	37.73	11.13	0.126	
1230						OPEN CHOKE TO 55%									
1249						ENGAGE 3.00" O.P.									
1400	56.00	7943	6550	57	55%	4137	52	264.1525	15.60	15.56	622.35	39.03	12.51	0.122	
1500	57.00	7791	6550	58	55%	4137	52	256.7001	16.08	2.40	633.05	39.70	12.61	0.072	
1600	58.00	7757	6550	58	55%	4137	52	259.8903	19.92	2.40	643.88	40.53	12.71	0.086	
1700	59.00	7771	6550	58	55%	4068	52	259.8625	14.64	5.76	654.71	41.14	12.95	0.079	
1800	60.00	7840	6550	58	55%	4068	52	259.8625	19.20	4.32	665.53	41.94	13.13	0.091	
1900	61.00	7847	6550	58	55%	4068	53	255.7207	17.76	3.36	676.19	42.68	13.27	0.083	
2000	62.00	7909	6550	58.5	55%	4068	53	255.7207	14.40	4.32	686.84	43.28	13.48	0.073	
2000						SHUT CHOKE TO 18%									
2015						SCHLUMBERGER		ENGAGE 1.750" O.P.							
2100	63.00	11715	7585	25.5	18%	2792	25	78.9689	9.60	1.44	690.13	43.68	13.51	0.140	

00084



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 9195' - 10075' KB	PAGE: 4 OF 15
WELL NAME: VARANUS #2.	FORMATION: PATCHAWARRA.	DATE: 10.8.91
TEST TYPE: MODIFIED ISOCHRONAL.		OPR: DOWLING

TIME		WELLHEAD DATA				SEPARATOR DATA		FLOW RATES			CUMULATIVE PRODUCTION				
DATE	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	OIL	WATER	GAS	OIL	WATER	L.G.R.	
								MMSCFD m³10³/D	BPD m³/D	BPD m³/D	MMSCFD m³10³	BBLS m³	BBLS m³	BBLS/MMSCFD m³/10³m³	
10-8-91.															
2115						SCHLUMBERGER IN LUB									
2120						OPEN CHOKE TO 55%									
2150						ENGAGE 3.00" O.P.									
2200	64.00	8033	6895	57	55%	4171	51.	272.0338	18.72	1.20	701.47	44.46	13.56	0.073	
11-8-91															
0200	68.00	7998	6550	59	55%	4137	52.5	259.3522	18.72	4.62	744.70	47.58	14.33	0.090	
0600	72.00	7998	6550	59	55%	4137	52.5	259.3522	17.10	5.58	787.92	50.43	15.26	0.087	
0730						SCHLUMBERGER ON SITE TO RIG DOWN.									
0900						RIG UP LUB + E-LINE FOR WIRE CONDITIONING									
1000	76.00	8033	6550	59.5	55%	4240	52.5	264.0889	16.92	5.04	833.93	53.25	16.10	0.083	
1100						CHOKE WELL TO 18%.									
1110						R.I.H.									
1245						P.O.O.H.									
1400						IN LUB.									
1400.	80.00	11873	8274.	21	18%.	2689.	22	68.7522	10.32	1.20	845.39	54.95	16.30	0.168.	
1400						PREPARE AMERADA.									
1530						RIG UP ELECTRIC LINE									
1535						PRESSURE UP LUB.									
1600	82.00	11763	8274.	22.5	18%.	2758	22.	68.7522	8.88	1.20	852.05	55.71.	16.40	0.126.	
1635		11749.				R.I.H.									
1700	83.00	11784	8274.	20	18%	2724	20	74.4087	10.08	1.92	855.15	56.13	16.48	0.161	
1800	84.00	11784	8274	21	18%	2758	20	77.5324	7.92	0.96	858.38	56.46	16.52	0.115	

00085

00085



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 9195'-10075' KB	PAGE: 5 OF 15
WELL NAME: VARANUS #1.	FORMATION: PATCHAWARRA.	DATE: 11-8-91
TEST TYPE: MODIFIED ISOCHRONAL		OPR: DOWLING

TIME		WELLHEAD DATA				SEPARATOR DATA		FLOW RATES			CUMULATIVE PRODUCTION				
DATE TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE	ANNULUS PRESSURE	WELLHEAD TEMP	CHOKE SIZE	PRESSURE	TEMP	GAS	OIL	WATER	GAS	OIL	WATER	L.G.R.	
		(PSI/KPa)	(PSI/KPa)	(°F/°C)		(PSI/KPa)	(°F/°C)	MMSCFD m³10³/D	BPD m³/D	BPD m³/D	MMSCF m³10³	BBLS m³	BBLS m³	BBLS/MMSCF m³/10³m³	
11-8-91															
1810						E-LINE AT HANG DEPTH 9160' KB									
1815						BRING CHOKE UP TO 55%									
1900	85.00	8067	7240	56	55%	4137	48	273.9980	18.00	5.28	869.79	57.21	16.74	0.085	
2000	86.00	8005	6550	56	55%	4137	50	265.2927	18.96	4.32	880.85	58.00	16.92	0.088	
2100	87.00	7929	6550	56.5	55%	4102	51	262.5368	19.92	4.56	891.79	58.83	17.11	0.093	
2200	88.00	7929	6550	57	55%	4102	51	259.3913	17.28	4.32	902.59	59.55	17.29	0.083	
2300	89.00	7929	6550	57	55%	4102	51	259.3913	16.80	5.04	913.40	60.25	17.50	0.084	
2400	90.00	7929	6550	57.5	55%	4068	50	255.7059	17.04	5.04	924.05	60.96	17.71	0.086	
12-8-91															
0100	91.00	7929	6550	57.5	55%	4068	51.5	254.1146	17.52	4.56	934.64	61.69	17.90	0.087	
0100					COLLECT	1ST SET OF SAMPLES COND. # 060					GAS #1.				
0200	92.00	7929	6550	57.5	55%	4034	51.5	252.5636	18.24	4.08	945.17	62.45	18.07	0.088	
0200					COLLECT	2ND SET OF SAMPLES COND # L-84					GAS #2.				
0300	93.00	7936	6550	57.5	55%	4034	51.5	252.5636	17.76	4.80	955.69	63.19	18.27	0.089	
0300					COLLECT	3RD SET OF SAMPLES COND # 028					GAS #3.				
0400	94.00	7936	6550	57.5	55%	4034	52.	252.0565	18.00	4.08	966.19	63.94	18.42	0.088	
0500	95.00	7957	6550	57.5	55%	4034	52.	252.0565	19.20	4.80	976.70	64.74	18.62	0.095	
0600	96.00	7957	6550	57.5	55%	3999	52	247.3696	14.16	4.32	987.00	65.33	18.80	0.075	
0700	97.00	7963	6550	57.5	55%	3999	52	247.3696	18.48	3.36	997.31	66.10	18.94	0.088	
0800	98.00	7963	6550	58	55%	4033	51	249.8923	13.92	7.92	1007.72	66.68	19.27	0.087	
0900	99.00	7970	6550	58	55%	4068	51.5	254.1146	16.08	3.60	1018.31	67.35	19.42	0.077	
1000	100.00	7970	6550	58	55%	4102	52	258.3160	16.80	4.80	1029.07	68.05	19.62	0.084	00086



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 9195' - 10075' KB.	PAGE: 6 OF 15
WELL NAME: VARANUS # 1.	FORMATION: PATCHAWARRA	DATE: 12.8.91.
TEST TYPE: MODIFIED ISOCHRONAL		OPR: DOWLING

TIME		WELLHEAD DATA				SEPARATOR 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	L.G.R. BBLS/MMSCF m³/10⁶m³
12.8.91															
1000						SHUT IN WELL FOR BUILD-UP.									
1015.	00.15	12218	6895			5/IN.									
1030	00.30	12232	7585			"									
1045	00.45	12239	7585			"									
1100	01.00	12252	7929			"									
1115	01.15	12266	8274			"									
1130	01.30	12280	8274			"									
1145	01.45	12290	8274			"									
1200	02.00	12287	8274			"									
1215	02.15	12287	8274			"									
1230	02.30	12287	8619			"									
1245	02.45	12287	8619			"									
1300	03.00	12287	8274			"									
1315	03.15	12287	8619			"									
1330	03.30	12287	8619			"									
13.45	03.45	12287	8619			"									
1400	04.00	12301	8619.			"									
1800	08.00	12301	8619			"									
2200	12.00	12314	8619			"									
13.8.91.															
0200	16.00	12338	8619			"									
0600	20.00	12343	8619			"									

00087



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 9195' - 10075' KB.	PAGE: 7 OF 15
WELL NAME: VARANUS #1.	FORMATION: PATCHAWARRA.	DATE: 13.8.91.
TEST TYPE: MODIFIED ISOCHRONAL.		OPR: DOWLING

TIME		WELLHEAD DATA				SEPARATOR 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	L.G.R. BBLS/MMSCF m³/10⁶m³		
13.8.91.																
1000	24.00	12363	8619	"	S/IN.											
1400	28.00	12370	8619		"											
1800	32.00	12377	8619		"											
2200	36.00	12383	8619		"											
14.8.91.																
0200	40.00	12390	8619		"											
0600	44.00	12390	8619		"											
1000	48.00	12432	8619		"											
1335	51.35					P.O.O.H TO RETIE ROPE SOCKET.										
1400	52.00	12432	8619		"											
1430	52.30	12432	8619		"	IN LUB.										
1500	53.00					PREPARE AMERADA										
1615	54.15	12445	8964		"	PRESSURE UP LUB.										
1620	54.20				"	R.I. HOLE										
1735	55.35					AT HANG DEPTH										
1800	56.00	12445	8964		"											
2200	60.00	12452	8964		"											
15/8/91.																
0200	64.00	12487	9308		"											
0600	68.00	12487	9308		"											
1000	72.00	12549	9308													
1400	76.00	12570	9308													

00088



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OLSEV.	PERFORATIONS: 9195' - 10075' KB	PAGE: 8 OF 15
WELL NAME: VARANUS #1.	FORMATION: PATCHAWARRA.	DATE: 15/8/91.
TEST TYPE: MODIFIED ISOCHRONAL		OPR: DOWLING.

TIME		WELLHEAD DATA				SEPARATOR DATA		FLOW RATES			CUMULATIVE PRODUCTION				
DATE	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 m³/10³/D	OIL BPD m³/D	WATER BPD m³/D	GAS MMSCFD m³/10³	OIL BBLs m³	WATER BBLs m³	L.G.R. BBLs/MMSCFD m³/10³m³	
1800	80.00	12576	9308		5/16										
2200	84.00	12576	9308		"										
16-8-91															
0200	88.00	12583	9308		"										
0600	92.00	12597	9308		"										
1000	96.00	12632	9308		"										
1400	100.00	12652	9308		"										
1800	104.00	12666	9308		"										
2200	108.00	12666	9308		"										
17-8-91															
0200	112.00	12687	9308		"										
0600	116.00	12700	9308		"										
1000	120.00	12700	9308		"										
1400	124.00	12721	9308		"										
1800	128.00	12714	9308		"										
2200	132.00	12721	9308		"										
18-8-91															
0200	136.00	12735	9308		"										
0600	140.00	12748	9308		"										
1000	144.00	12755	9308		"										
1000						P.O.O. H.									
1400	148.00	12783	9308		"										
1500						IN LUB.									

68000



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 9195'-10075' KB.	PAGE: 9. OF 15
WELL NAME: VARANUS #1.	FORMATION: PATCHANAREA.	DATE: 18/8/91.
TEST TYPE: MODIFIED ISOCHRONAL.		OPR: DOWLING.

TIME		WELLHEAD DATA				SEPARATOR 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	L.G.R. BBLS/MMSCF m³/10³m³		
18/8/91.																
1700	150.00	12783	9308			DEPRESSURE LOG.										
1730						PRESSURE TEST LINES TO SEPARATOR										
						LEAK IN FLANGE ON METER SKID.										
						CALLED OUT SANTOS O.P.										
1800.	151.00	12783	9308.			OPERATOR ON LEASE, ADVISED MAINTENANCE WILL HAVE TO ATTEND.										
1820						ADVISED BY OPERATOR THAT MAINTENANCE WOULD BE OUT ON LEASE										
						FIRST THING TOMORROW.										
2200	155.00.	12783	9308													
19/8/91.																
0200	159.00	12783	9308													
0600	163.00	12783	9308.													
0745.	164.45					MAINTENANCE ON SITE; DID NOT HAVE CORRECT TOOL.										
0845.	165.45.					MAINTENANCE BACK ON SITE, FIXED PROBLEM.										
0850.		12783	9308.			OPENED WELL AT WING VALVE.										
0920						SEPARATOR ON BY-PASS.										
0930					8/64"	TRIM FLOW THROUGH SEPARATOR.										
0940.						OPEN WELL TO 16/64" CHOKE.										
0950	1.00					OPEN WELL TO 18/64"										
1000						ENGAGED 2.00" O.P.										
1010						OPENED WELL TO 19/64" CHOKE			1ST RATE SET.							
1040.						OPENED WELL TO 31/64"										
1100	2.00.					ENGAGED 2.750" O.P.			2ND RATE SET.							

06000



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV

PERFORATIONS: 9195' - 10075' KB.

PAGE: 10 OF 15

WELL NAME: VARANUS^{##}1

FORMATION: PATCHAWARRA

DATE: 19/8/91.

TEST TYPE: MODIFIED ISOCHRONAL.

OPR: DOWLING

TIME		WELLHEAD DATA				SEPARATOR DATA		FLOW RATES			CUMULATIVE PRODUCTION			L.G.R.	
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	BBLs MMSCF m ³ /10 ⁶ m ³
19/8/91.															
1130							OPEN WELL TO 37/64"								
1140							ENGAGE 3.00" O.P.			3RD RATE SET.					
1210	2.10						OPEN WELL TO 42/64"								
1215							ENGAGE 3.00" O.P.								
1241	2.41.					5/16"	SHUT IN WELL.								
1400	1.19.					5/16"	PREPARE AMERADA.								
1500	2.19.	12804.	9653			5/16"	PRESSURE UP LOG.								
1535.	2.35.					5/16"	R.I. H.								
1652.	3.52.					5/16"	AT HANG DEPTH OF 9160' KB.								
1800	00.00	12790	9653			19/64"	OPEN WELL TO 19/64" CHOKE								
1810	00.10.					19/64"	ENGAGE 2.00" O.P.			START OF 1ST RATE.					
1830	00.30	12170	9308	44.5		19/64"	1724	5	96.40	—	—	1031.08	—	—	—
1900	01.00	12170	9308	46.5		19/64"	1827	10	96.53	11.52	0.00	1033.09	68.53	19.62	0.119.
1930	01.30	12170	9308	47		19/64"	2103	15	96.67	—	—	1035.11	—	—	—
2000	02.00	12197	9308	47.5		19/64"	2689.	19.	98.63	12.96	0.96	1037.16	69.07	19.66	0.141.
2030	02.30	12197	9308	48		19/64"	2896	21.	99.55	—	—	1039.24	—	—	—
2100	03.00	12197	9308	48		19/64"	3447	23.	102.46	11.76	0.96	1041.37	69.56	19.70	0.124
2130	03.30	12197	8964.	48.5		19/64"	2275	20	97.82	—	—	1043.41	—	—	—
2200	04.00	12197	8964	48.5		19/64"	2241	19.	97.23	10.08	1.68	1045.43	69.98	19.77	0.121.
2230	04.30	12197	8964	49		19/64"	2241	19	96.57	—	—	1047.45	—	—	—
2300	05.00	12197	8964	49		19/64"	2241	19	96.57	9.84	1.68	1049.46	70.39	19.84	0.119
2330	0530	12197	8964	49		19/64"	2275	19.	96.82	—	—	1051.47	—	—	—

00091



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 9195' - 10075' KB.	PAGE: 11 OF 15
WELL NAME: VARANUS #1	FORMATION: PATCHAWARRA	DATE: 20.8.91
TEST TYPE: MODIFIED ISOCHRONAL.		OPR: DOWLING

TIME		WELLHEAD DATA				SEPARATOR 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	OIL	WATER	GAS	OIL	WATER	L.G.R.		
									MMSCFD m³10³/D	BPD m³/D	BPD m³/D	MMSCF m³10³	BBLS m³	BBLS m³	BBLS/MMSCF m³/10⁶m³		
2400	06.00	12197	8964	49	1 9/64	2275	19	96.82	8.88	1.68	1053.49	70.76	19.91	0.109.			
20.8.91.						WELL SHUT IN END OF 1ST RATE.											
00.30	00.30	12921	9308		5/16												
01.00	01.00	12928	9653		"												
01.30	01.30	12935	9653		"												
02.00	02.00	12935	9653		"												
0230	02.30	12935	9653		"												
0300	03.00	12928	9653		"												
0330	03.30	12921	9653		"												
0400	04.00	12914	9653		"												
0430	04.30	12907	9653		"												
0500	05.00	12900	9653		"												
0530	05.30	12900	9653		"												
0600	06.00	12900	9653		"												
0600.						OPEN WELL TO 3 1/64" CHOKES START 2ND RATE											
0630	00.30	10515	9308	48	3 1/64"	2068	9	199.77	—	—	1057.65	—	—	—	—		
0700	01.00	10508	8619	50.5	3 1/64"	2000	16	196.25	22.80	3.12	1061.74	71.71.	20.04	0.132			
0730	01.30	10494	8274	52	3 1/64"	2000	20	192.53	—	—	1065.75	—	—	—	—		
0800	02.00	10494	7929	53.5	3 1/64"	2000	22	192.65	19.20	4.08	1069.77	72.51	20.21	0.121			
0830	02.30	10494	7929	54.5	3 1/64"	2000	23	192.08	—	—	1073.77	—	—	—	—		
0900	03.00	10494	7929	55	3 1/64"	2034	25	191.60	21.84	4.32	1077.76	73.42	20.39	0.137			
0930	03.30	10480	7929	56	3 1/64"	2034	25.5	191.32	—	—	1081.75	—	—	—	—		
1000	04.00	10480	7929.	57	3 1/64"	2034	27	191.77	18.48	4.56	1085.74.	74.19	20.58	0.120			

00092



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 9195' - 10075' KB	PAGE: 12 OF 15
WELL NAME: VARANUS #1.	FORMATION: PATCHAWARRA	DATE: 20.8.91.
TEST TYPE: MODIFIED ISOCHRONAL		OPR: DOWLING

TIME		WELLHEAD DATA				SEPARATOR 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 m³/10³D	OIL BPD m³/D	WATER BPD m³/D	GAS MMSCFD m³/10³	OIL BOES m³	WATER BOES m³	L.G.R.	
10.30	04.30	10480.	7929	57.5	31/64	2000	25	190.97	—	—	—	1089.72	—	—	—	
11.00	05.00	10460	7929	58	31/64	2000	24	191.52	20.40	4.08	—	1093.71	75.04	20.75	0.128	
11.30	05.30	10460	7929	58.5	31/64	2034	25	192.87	—	—	—	1097.73	—	—	—	
12.00	06.00	10460.	7929.	59.	31/64.	2034	25.	192.87	18.48	5.28	—	1101.75.	75.81	20.97	0.123.	
1200					SHUT IN WELL,		END OF		2 ND RATE.							
1230	00.30	12969														
1300	01.00	13045														
1330	01.30	13131														
1400	02.00	13066														
1430	02.30	13059														
1500	03.00	13045														
1530	03.33	13038														
1600	04.00	13031														
1630	04.30	13017														
1700	05.00	12997														
1730	05.30	12976														
1800	06.00	12976.														
1800						OPEN WELL ON 37/64" CHOKE		START 3 RD RATE								
1810						ENGAGE 3.00" O.P.										
1830	00.30	9446	9308	52.5	37/64"	1965	18	239.22	—	—	—	1106.73	—	—	—	
1900	01.00	9425	8274	54.5	37/64"	1931	19.5	235.66	25.44	2.88	—	1111.64.	76.87	21.07	0.120	
1930	01.30.	9370	7929	56	37/64"	1931	24	232.59	—	—	—	1116.49	—	—	—	
2000	02.00	9322	7585	57.5.	37/64"	1931.	26.5	229.36	27.84	4.56	—	1121.26.	78.03	21.26	0.141	

00093



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR:	OILSERV	PERFORATIONS:	9195' - 10075' KB	PAGE:	13	OF	15
WELL NAME:	VARANUS #1.	FORMATION:	PATCHAWARRA.	DATE:	20.8.91		
TEST TYPE:	MODIFIED ISOCHRONAL			OPR:	DOWLING		

TIME		WELLHEAD DATA				SEPARATOR DATA		FLOW RATES			CUMULATIVE PRODUCTION				
DATE TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE	ANNULUS PRESSURE	WELLHEAD TEMP	CHOKE SIZE	PRESSURE	TEMP	GAS	OIL	WATER	GAS	OIL	WATER	L.G.R.	
		(PSI/KPa)	(PSI/KPa)	(°F/°C)		(PSI/KPa)	(°F/°C)	MMSCFD m³10³/D	BPD m³/D	BPD m³/D	MMSCF m³10³	BBLS m³	BBLS m³	BBLS/MMSCF m³/10⁶m³	
20/8/91.															
2030	02.30	9239	7585	59	37/64"	1931	28	228.41	—	—	1126.02	—	—	—	
2100	03.00	9232	7585	59.5	37/64"	1931	29.5	227.49	21.84	5.28	1130.76	78.94	21.48	0.119	
2130	03.30	9232	7585	60	37/64"	1931	30	227.18	—	—	1135.44	—	—	—	
2200	04.00	9253	7585	60.5	37/64"	1931	30	228.78	17.04	6.24	1140.21	79.65	21.74	0.102	
2230	04.30	9288	7585	61	37/64"	1931	31	228.17	—	—	1144.96	—	—	—	
2300	05.00	9301	7585	62	37/64"	1931	31.5	227.87	22.80	6.72	1149.71	80.60	22.02	0.130	
2330	05.30	9301	7585	62	37/64"	1931	32	227.57	—	—	1154.45	—	—	—	
2400	06.00	9301	7585	62	37/64"	1931	32.	227.57	19.44	5.04	1159.19	81.41	22.23	0.108	
2400					SHUT IN	WELL	END OF	3 RD	RATE.						
21.8.91.															
0030	00.30	12887													
0100	01.00	12942													
0130	01.30	12976													
0200	02.00	12997													
0230	02.30	12997													
0300	03.00	12997													
0330	03.30	12997													
0400	04.00	12997													
0430	04.30	12990													
0500	05.00	12990													
0530	05.30	12990													
0600	06.00	12990													

000924

00094



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 9195' - 10075' KB.	PAGE: 14 OF 15
WELL NAME: VARANUS #1.	FORMATION: PATCHAWARRA.	DATE: 21.8.91.
TEST TYPE: MODIFIED ISOCHRONAL.		OPR: DOWLING

TIME		WELLHEAD DATA				SEPARATOR DATA		FLOW RATES			CUMULATIVE PRODUCTION			
DATE	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 MMSCFD m³10³	OIL BOES m³	WATER BOES m³	L.G.R. BOES/MMSCFD m³/10³m³
21/8/91														
0600						OPEN WELL TO 4 1/2" CHOKE, START 4 th RATE								
0620						ENGAGE 3.00" O.P.								
0630	0030	8391	8963	53.5	4 1/2"	2069	20	263.19	—	—	1164.67	—	—	—
0700	0100	8529	8619	55	4 1/2"	2034	27.5	256.38	26.64	3.36	1170.01	82.52	22.37	0.117
0730	0130	8481	7585	57	4 1/2"	2034	31	253.90	—	—	1175.30	—	—	—
0800	0200	8439	7240	58	4 1/2"	2034	31	252.38	24.72	6.00	1180.56	83.55	22.62	0.122
0830	0230	8412	7240	59	4 1/2"	2034	31	252.38	—	—	1185.82	—	—	—
0900	0300	8384	7240	60	4 1/2"	2034	32	251.70	24.00	6.96	1191.06	84.55	22.91	0.123
0930	0330	8384	7240	60.5	4 1/2"	2034	33	251.02	—	—	1196.29	—	—	—
1000	0400	8384	7240	61	4 1/2"	2275	34	255.57	22.08	5.52	1201.62	85.47	23.14	0.108
1030	0430	8412	7240	61.5	4 1/2"	2275	35	254.85	—	—	1206.93	—	—	—
1100	0500	8426	7240	62	4 1/2"	2275	35	254.85	22.56	5.04	1212.24	86.41	23.35	0.108
1130	0530	8481	7240	62.5	4 1/2"	2275	35	254.85	—	—	1217.55	—	—	—
1200.	0600	8481	7240	63	4 1/2"	2275	36	254.13	20.64	7.68	1222.84	87.27	23.67	0.111
1200						SHUT IN WELL, END OF 4 th RATE								
1230	0030	12859	8274											
1300	0100	12928	9308											
1330	0130	12990	9653											
1400	0200	12997	9653											
1430	0230	12997	9653											
1500	0300	12990	9653											
1530	0330	12990	9653											

00095

PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 9195' - 10075' KR	PAGE: 15 OF 15.
WELL NAME: VARANUS #1.	FORMATION: PATCHAWARRA	DATE: 21-8-91.
TEST TYPE: MODIFIED ISOCHRONAL		OPR: DOWLING

[illegible]



PETROLEUM ENGINEERING : GAS FLOW CALCULATIONS

CONTRACTOR: OILSERV	PERFORATIONS: 9195' - 10075' K.B	PAGE: 1 OF 8
WELL NAME: VARANUS #1	FORMATION: PATCHAWARRA	DATE: 8/8/91
TEST TYPE: MODIFIED ISOCHRONAL		OPR: DOWLING

TEST TYPE: MODIFIED ISOCHRONAL										PSIG		GAS SPECIFIC GRAVITY (SG) = 1.082			
ORIFICE METER TYPE: BARTON							STATIC PRESSURE RANGE: 0-1500				IN WC		FG = $\sqrt{(1/SG)}$ = 0.9614		
METER RUN SIZE: 3.826"							DIFFERENTIAL PRESS. RANGE: 0-200						C ₂ = (FU X FG) =		
SEPARATOR NO.:							STANDARD CONDITIONS: 14.73 PSI @ 60°F								
DATE TIME	FLOW TIME (HOURS)	CHOKE SIZE	STATIC PRESS P _f (PSIA)	DIFF PRESS H _w (IN WC)	GAS FLOW TEMP. °C	ORIF. PLATE SIZE (IN)	$\sqrt{(P_f \times H_w)}$	$C_1 = F_B \times F_{TF} \times F_{PV} \times Y_2$				CUMULATIVE GAS PRODUCTION M ³ 10 ³	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)
							MODIFIED ISOCHRONAL								
8/8/91							TRIM FLOW THRU SEPARATOR								
0600	00.00	100%					ENGAGE 3.00" O/P								
0617		100%				3.00"									
1000	04.00	100%	695	55	58	3.00"	195.4742	2288.3929	0.9338	1.1858	1.0002	53.6727	2436.4405	11.4303	322.0364
1400	08.00	55%	645	44	53	3.00"	168.4284	2288.3929	0.9409	1.1788	1.0002	99.9973	2440.5527	9.8654	277.9478
1800	12.00	55%	635	43	53	3.00"	165.2071	2288.3929	0.9409	1.1739	1.0002	145.2473	2430.4184	9.6365	271.4998
2200	16.00	55%	620	43	54	3.00"	163.2433	2288.3929	0.9394	1.1639	1.0002	189.5088	2405.9277	9.4260	265.9653
4/8/91.															
0200	20.00	55%	620	43	53.5	3.00"	163.2433	2288.3929	0.9402	1.1654	1.0002	233.8606	2410.8326	9.4453	266.1107
0600	24.00	55%	620	43	53	3.00"	163.2433	2288.3929	0.9409	1.1669	1.0002	278.3037	2415.7990	9.4647	266.6589
1000	28.00	55%	630	44	53	3.00"	166.4576	2288.3929	0.9409	1.1715	1.0002	323.8036	2425.4838	9.6898	272.9994
1400	32.00	55%	635	44	53	3.00"	167.1171	2288.3929	0.9409	1.1739	1.0002	369.5769	2430.4299	9.7480	274.6399
1800	36.00	55%	635	45	53	3.00"	169.0055	2288.3929	0.9409	1.1739	1.0002	415.8677	2430.4414	9.8582	277.7446
2200	40.00	55%	650	41	53.5	3.00"	163.2144	2288.3929	0.9402	1.1796	1.0002	460.7522	2440.2214	9.5587	269.3068
10-8-91															
0200	44.00	55%	655	41	54.5	3.00"	163.8412	2288.3929	0.9387	1.1786	1.0002	505.7030	2434.4784	9.5728	269.7048
0600	48.00	55%	675	37	54	3.00"	158.0032	2288.3929	0.9394	1.1906	1.0002	549.5242	2460.9919	9.3323	262.9274
0800	50.00	55%	635	42	55	3.00"	163.2748	2288.3929	0.9380	1.1676	1.0002	571.6964	2409.9671	9.4437	266.0664
1000	52.00	55%	635	44	53.5	3.00"	167.1171	2288.3929	0.9402	1.1723	1.0002	594.5340	2425.2191	9.7271	274.0511
1010							START CLOSING CHOKE								

00097



PETROLEUM ENGINEERING : GAS FLOW CALCULATIONS

CONTRACTOR: OILSERV	PERFORATIONS: 9195' - 10075' KB	PAGE: 2 OF 8
WELL NAME: VARANUS #1.	FORMATION: PATCHAWARRA	DATE: 10-8-91
TEST TYPE: MODIFIED ISOCHRONAL		OPR: DOWLING

ORIFICE METER TYPE: BARTON							STATIC PRESSURE RANGE: 0 - 1500 PSIG				GAS SPECIFIC GRAVITY (SG) = 1.082				
METER RUN SIZE: 3-826							DIFFERENTIAL PRESS. RANGE: 0 - 200 IN WC				FG = $\sqrt{(1/SG)}$ = 0.9614				
SEPARATOR NO.:							STANDARD CONDITIONS: 14.73 PSI @ 60°F				C ₂ = (FU X FG) =				
DATE TIME	FLOW TIME (HOURS)	CHOKE SIZE	STATIC PRESS P _F (PSIA)	DIFF PRESS H _W (IN WC)	GAS FLOW TEMP. (C°)	ORIF. PLATE SIZE (IN)	$\sqrt{(P_F \times H_W)}$	$C_1 = F_B \times F_{TF} \times F_{PV} \times Y_2$				CUMULATIVE GAS PRODUCTION M ³ /D.	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)
10-8-91															
1024							ENGAGE 2.50" O.P.								
1032							CHOKE BACK TO 20%.								
1044							CHOKE TO 15%								
1106							ENGAGE 0.750" O.P.								
1110							SCHLUMBERGER R.I.H.								
1115							OPEN CHOKE TO 18%.								
1124							ENGAGE 1.250" O.P.								
1141							ENGAGE 1.750" O.P.								
1200	54.00	18%	405	54	21.	1.750"	147.8358	637.8335	0.9907	1.1465	1.0008	600.3405	697.0391.	2.4731	69.6781.
1230							OPEN CHOKE TO 55%.								
1249.							ENGAGE 3.00" O.P.								
1400	56.00	55%	615	42	51	3.00"	160.6819	2288.3929	0.9438	1.1707	1.0002	622.3532	2431.2420	9.3758	264.1525
1500	57.00	55%	615	40	52	3.00"	156.8094	2288.3929	0.9423	1.1676	1.0002	633.0490	2420.9964	9.1112	256.7001
1600	58.00	55%	615	41	52	3.00"	158.7575	2288.3929	0.9423	1.1676	1.0002	643.8778	2421.0083	9.2245	259.8903
1700	59.00	55%	605	42	52	3.00"	159.3696	2288.3929	0.9423	1.1630	1.0002	654.7054.	2411.4515	9.2235	259.8625
1800	60.00	55%	605	42	52	3.00"	159.3696	2288.3929	0.9423	1.1630	1.0002	665.5330	2411.4515	9.2235	259.8625
1900	61.00	55%	605	41	53	3.00"	157.4609	2288.3929	0.9409	1.1601	1.0002	676.1880	2401.7810	9.0765	255.7207
2000	62.00	55%	605	41	53	3.00"	157.4609	2288.3929	0.9409	1.1601	1.0002	686.8430	2401.7810	9.0765	255.7207
2000								CLOSE CHOKE TO 18%.							
2015							SCHLUMBERGER P.O.OH	ENGAGE 1.750" O.P.							

00098



PETROLEUM ENGINEERING : GAS FLOW CALCULATIONS

CONTRACTOR: OILSERV	PERFORATIONS: 9195' - 10075' KB	PAGE: 3 OF 8
WELL NAME: VARANUS #1	FORMATION: PATCHAWARRA	DATE: 10.8.91
TEST TYPE: MODIFIED ISOCHRONAL		OPR: DOWLING

TEST TYPE: MODIFIED ISOCHRONAL															
ORIFICE METER TYPE: BARTON.							STATIC PRESSURE RANGE: 0 - 1500 PSIG				GAS SPECIFIC GRAVITY (SG) = 1.082				
METER RUN SIZE: 3.826.							DIFFERENTIAL PRESS. RANGE: 0 - 200 IN WC				FG = $\sqrt{(1/SG)}$ = 0.9614				
SEPARATOR NO.:							STANDARD CONDITIONS: 14.73 PSI @ 60°F				C ₂ = (FU X FG) =				
DATE TIME	FLOW TIME (HOURS)	CHOKE SIZE	STATIC PRESS P _f (PSIA)	DIFF PRESS H _w (IN WC)	GAS FLOW TEMP. (°C)	ORIF. PLATE SIZE (IN)	$\sqrt{(P_f \times H_w)}$	$C_1 = F_B \times F_{TF} \times F_{PV} \times Y_2$				CUMULATIVE GAS PRODUCTION M3/D.	C (C = C ₁ x C ₂)	GAS FLOW RATE $Q = \sqrt{(P_f \times H_w)^3} \times C$	
								F _B	F _{TF}	F _{PV}	Y ₂			(MMSCFD)	(m³10³/D)
10.8.91.															
2100	63.00	18%	420	68	25	1.750"	168.9427	637.8335	0.9840	1.1445	1.0010	690.1334	691.2846	2.8029	78.9689
2115								SCHLUMBERGER IN LUB.							
2120								OPEN CHOKE TO 55%. ENGAGE 3.00' O.P.							
2200	64.00	55%	620	44	51	3.00"	165.1306	2288.3929	0.9438	1.1732	1.0002	701.4681	2436.3265	9.6555	272.0388
11-8-91															
0200	68.00	55%	615	41	52.5	3.00"	158.7575	2288.3929	0.9416	1.1661	1.0002	744.6935	2415.9948	9.2054	259.3522
0600	72.00	55%	615	41	52.5	3.00"	158.7575	2288.3929	0.9416	1.1661	1.0002	789.9189	2415.9948	9.2054	259.3522
0730								SCHLUMBERGER ON SITE TO RIG DOWN.							
0900								RIG UP F-LINE + LUB FOR WIRE CONDITIONING							
1000	76.00	55%	630	41	52.5	3.00"	160.6827	2288.3929	0.9416	1.1731	1.0002	833.9337	2430.6438	9.3735	264.0889
1100.								CHOKE WELL BACK TO 18%							
1110								R.I.H.							
1245								P.O.O.H.							
1400								IN LUB.							
1400	80.00	18%	405	53	22	1.750"	146.4605	637.8335	0.9890	1.1438	1.0008	845.3924	694.2342	2.4403	68.7522
1400								PREPARE AMERADAS.							
1530								RIG UP F-LINE							
1535								PRESSURE UP LUB.							
1600	82.00	18%	415	69	22	1.750"	169.1637	637.8335	0.9890	1.1497	1.0008	852.0454	697.9597	2.8337	79.8357
1635								R.I.H.							

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PETROLEUM ENGINEERING : GAS FLOW CALCULATIONS

CONTRACTOR: OILSERV	PERFORATIONS: 9195' - 10075' KB	PAGE: 4 OF 8
WELL NAME: VARANUS #1.	FORMATION: PATCHAWARRA.	DATE: 11.8.91.
TEST TYPE: MODIFIED ISOCHRONAL.		OPR: DOWLING

ORIFICE METER TYPE: BARTON							STATIC PRESSURE RANGE: 0 - 1500 PSIG				GAS SPECIFIC GRAVITY (SG) = 1.082				
METER RUN SIZE: 3.826							DIFFERENTIAL PRESS. RANGE: 0 - 200 IN WC				FG = $\sqrt{(1/SG)}$ = 0.9614				
SEPARATOR NO.:							STANDARD CONDITIONS: 14.73 PSI @ 60°F				C ₂ = (FU X FG) =				
DATE TIME	FLOW TIME (HOURS)	CHOKE SIZE	STATIC PRESS P _F (PSIA)	DIFF PRESS H _W (IN WC)	GAS FLOW TEMP. (°C)	ORIF. PLATE SIZE (IN)	$\sqrt{(P_F \times H_W)}$	$C_1 = F_B \times F_{TF} \times F_{PV} \times Y_2$				CUMULATIVE GAS PRODUCTIVE M ³ /D	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)
11-8-91.															
1700	83.00	18%	410	60	20	1.750"	156.7922	637.8335	0.9924	1.1523	1.0009	855.1458	701.8425	2.6410	74.4087
1800	84.00	18%	415	64	20	1.750"	162.9194	637.8335	0.9924	1.1555	1.0010	858.3763	703.8026	2.7519	77.5324
1810								E-LINE AT HANK DEPTH 9160' KB.							
1815								BRING CHOKE UP TO 55%							
1900	85.00	55%	615	44	48	3.00"	164.4631	2288.3929	0.9482	1.1813	1.0002	869.7929	2463.8772	9.7252	273.9980
2000	86.00	55%	615	42	50	3.00"	160.6819	2288.3929	0.9452	1.1740	1.0002	880.8468	2441.7364	9.4162	265.2927
2100	87.00	55%	610	42	51	3.00"	160.0271	2288.3929	0.9438	1.1683	1.0002	891.7858	2426.2586	9.3184	262.5368
2200	88.00	55%	610	41	51	3.00"	158.1105	2288.3929	0.9438	1.1683	1.0002	902.5938	2426.2466	9.2068	259.3913
2300	89.00	55%	610	41	51	3.00"	158.1105	2288.3929	0.9438	1.1683	1.0002	913.4018	2426.2466	9.2068	259.3913
2400	90.00	55%	605	40	50	3.00"	155.5288	2288.3929	0.9452	1.1690	1.0002	924.0562	2431.4778	9.0760	255.7059
12-8-91															
0100	91.00	55%	605	40	51.5	3.00"	155.5288	2288.3929	0.9430	1.1645	1.0002	934.6443	2416.3460	9.0195	254.1146
0100							COLLECT	1 ST SET OF SAMPLES COND. # 060				GAS #1.			
0200	92.00	55%	600	40	51.5	3.00"	154.8845	2288.3929	0.9430	1.1622	1.0002	945.1678	2411.5884	8.9644	252.5636
0200							COLLECT	2 ND SET OF SAMPLES COND # L-84				GAS #2.			
0300	93.00	55%	600	40	51.5	3.00"	154.8845	2288.3929	0.9430	1.1622	1.0002	955.6913	2411.5884	8.9644	252.5636
0300							COLLECT	3 RD SET OF SAMPLES COND # 028				GAS #3.			
0400	94.00	55%	600	40	52	3.00"	154.8845	2288.3929	0.9423	1.1607	1.0002	966.1937	2406.7461	8.9464	252.0565
0500	95.00	55%	600	40	52	3.00"	154.8845	2288.3929	0.9423	1.1607	1.0002	976.6961	2406.7461	8.9464	252.0565
0600	96.00	55%	595	39	52	3.00"	152.2973	2288.3929	0.9423	1.1585	1.0002	987.0032	2402.1184	8.7801	247.3696



PETROLEUM ENGINEERING : GAS FLOW CALCULATIONS

CONTRACTOR: OILSERV	PERFORATIONS: 9195' - 10075' KB	PAGE: 5 OF 8
WELL NAME: VARANUS #1.	FORMATION: PATCHAWARRA	DATE: 12.8.91.
TEST TYPE: MODIFIED ISOCHRONAL		OPR: DOWLING

ORIFICE METER TYPE: BARTON							STATIC PRESSURE RANGE: 0 - 1500 PSIG				GAS SPECIFIC GRAVITY (SG) = 1.082					
METER RUN SIZE: 3.826							DIFFERENTIAL PRESS. RANGE: 0 - 200 IN WC				FG = $\sqrt{(1/SG)}$ = 0.9614					
SEPARATOR NO.:							STANDARD CONDITIONS: 14.73 PSI @ 60°F				C ₂ = (FU X FG) =					
DATE TIME	FLOW TIME (HOURS)	CHOKE SIZE	STATIC PRESS P _F (PSIA)	DIFF PRESS H _W (IN WC)	GAS FLOW TEMP. (°C)	ORIF. PLATE SIZE (IN)	$\sqrt{(P_F \times H_W)}$	$C_1 = F_B \times F_{TF} \times F_{PV} \times Y_2$				CUMULATIVE GAS PRODUCTION M ³ /D.	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)	
12.8.91																
0700	97.00	55%	595	39	52	3.00"	152.2973	2288.3929	0.9423	1.1585	1.0002	997.3103	2402.1184	8.7801	247.3696	
0800	98.00	55%	600	39	51	3.00"	152.4362	2288.3429	0.9438	1.1636	1.0002	1007.7225	2416.4780	8.8696	249.8923	
0900	99.00	55%	605	40	51.5	3.00"	155.5288	2288.3929	0.9430	1.1645	1.0002	1018.3106	2416.3460	9.0195	254.1146	
1000	100.00	55%	610	41	52	3.00	158.1105	2288.3929	0.9423	1.1653	1.0002	1029.0738	2416.1889	9.1686	258.3160	
1000								WELL SHUT IN AT WING VALVE FOR BUILD UP.								
19/8/91.																
1800	00.00							OPEN WELL ON 19/64" CHOKE FOR 1ST RATE.								
1830	00.30	19/64"	265	91.	5'	2.00"	155.2109	849.4091	1.0188	1.1018	1.0020	1031.0821	918.4958	3.4215	96.3960	
1900	01.00	19/64"	280	88	10	2.00"	156.8956	849.4091	1.0098	1.1014	1.0019	1033.0931	909.8950	3.4262	96.5299	
1930	01.30	19/64"	320	77	15	2.00"	156.9051	849.4091	1.0010	1.1131.	1.0014	1035.1070	911.1282	3.4311	96.6666	
2000	02.00	19/64"	405	60	19	2.00"	155.8326	849.4091	0.9941	1.1520	1.0009	1037.1617	936.0125	3.5007	98.6279	
2030	02.30	19/64"	435	56	21	2.00"	156.0285	849.4091	0.9907	1.1654	1.0008	1039.2356	943.5645.	3.5333	99.5486	
2100	03.00	19/64"	515	46	23	2.00"	153.8752	849.4091.	0.9874	1.2207	1.0005	1041.3701	984.7310	3.6366	102.4580	
2130	03.30	19/64"	345	74	20	2.00"	159.7186	849.4091.	0.9924	1.1163	1.0013	1043.4081	905.7317	3.4721	97.8225	
2200	04.00	19/64"	340	74	19	2.00"	158.5560	849.4091	0.9941	1.1157	1.0013	1045.4337	906.8724	3.4510	97.2274	
2230	04.30	19/64"	340	73	19.	2.00"	157.4811	849.4091	0.9941	1.1157.	1.0013	1047.4455	906.8565	3.4275	96.5665	
2300	05.00	19/64"	340	73	19	2.00"	157.4811	849.4091	0.9941	1.1157	1.0013	1049.4573	906.8565	3.4275	96.5665	
2330	05.30	19/64"	345	72	19	2.00"	157.5454	849.4091	0.9941	1.1182	1.0012	1051.4744	908.8605	3.4365	96.8195	
2400	06.00	19/64"	345	72	19.	2.00"	157.5454	849.4091	0.9941	1.1182	1.0012	1053.4920	908.8605	3.4365	96.8195	
2400								WELL SHUT IN END OF 1ST RATE								

00101



PETROLEUM ENGINEERING : GAS FLOW CALCULATIONS

CONTRACTOR:	OILSERV	PERFORATIONS:	9195' - 10075' KB	PAGE:	6 OF 8
WELL NAME:	VARANUS #1.	FORMATION:	PATCHAWARRA	DATE:	20.8.91.
TEST TYPE:	Modified Isochronal			OPR:	Dowling

ORIFICE METER TYPE: BARTON							STATIC PRESSURE RANGE: 0 - 1500 PSIG				GAS SPECIFIC GRAVITY (SG) = 1.082				
METER RUN SIZE: 3.826							DIFFERENTIAL PRESS. RANGE: 0 - 200" IN WC				FG = $\sqrt{(1/SG)}$ = 0.9614.				
SEPARATOR NO.:							STANDARD CONDITIONS: 14.73 PSI @ 60°F				C ₂ = (FU X FG) =				
DATE TIME	FLOW TIME (HOURS)	CHOKE SIZE	STATIC PRESS P _F (PSIA)	DIFF PRESS H _w (IN WC)	GAS FLOW TEMP. (C)	ORIF. PLATE SIZE (IN)	$\sqrt{(P_F \times H_w)}$	$C_1 = F_B \times F_{TF} \times F_{PV} \times Y_2$				CUMULATIVE GAS PRODUCTION M ³ /D.	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)
20.8.91.															
0600		3 1/64"						OPEN UP WELL TO 3 1/64" CHOKE BEGIN 2 ND RATE.							
0630	00.30	3 1/64"	315	72	9	2.750"	150.5342	1796.5971	1.0115	1.1223	1.0009	1057.6538	1962.5775	7.0904	199.7661
0700	01.00	3 1/64"	305	76	16	2.750"	152.1824	1796.5971	0.9992	1.1040	1.0010	1061.7424	1907.1971	6.9658	196.2546
0730	01.30	3 1/64"	305	75	20	2.750"	151.1779	1796.5971	0.9924	1.0977	1.0010	1065.7535	1883.4625	6.8337	192.5329
0800	02.00	3 1/64"	305	76	22	2.750"	152.1824	1796.5971	0.9890	1.0949	1.0010	1069.7670	1872.1698	6.8379	192.6502
0830	02.30	3 1/64"	305	76	23	2.750"	152.1824	1796.5971	0.9874	1.0935	1.0010	1073.7687	1866.6348	6.8177	192.0806
0900	03.00	3 1/64"	310	75	25	2.750"	152.4131	1796.5971	0.9840	1.0928	1.0010	1077.7603	1859.1288	6.8005	191.5982
0930	03.30	3 1/64"	310	75	25.5	2.750"	152.4131	1796.5971	0.9832	1.0921	1.0010	1081.7461	1856.4317	6.7907	191.3203
1000	04.00	3 1/64"	310	76	27	2.750"	153.4258	1796.5971	0.9808	1.0901	1.0010	1085.7412	1848.4775	6.8065	191.7663
1030	04.30	3 1/64"	305	76	25	2.750"	152.1824	1796.5971	0.9840	1.0908	1.0010	1089.7197	1855.8005	6.7781	190.9657
1100	05.00	3 1/64"	305	76	24	2.750"	152.1824	1796.5971	0.9857	1.0921	1.0010	1093.7097	1861.1792	6.7977	191.5192
1130	05.30	3 1/64"	310	76	25	2.750"	153.4258	1796.5971	0.9840	1.0928	1.0010	1097.7279	1859.1535	6.8458	192.8739
1200	06.00	3 1/64"	310	76	25	2.750"	153.4258	1796.5971	0.9840	1.0928	1.0010	1101.7461	1859.1535	6.8458	192.8739
1200							SHUT IN WELL, END OF 2 ND RATE								
1800							OPEN WELL ON 3 7/64" START 3 RD RATE.								
1810							ENGAGE 3.00" O.P.								
1830	00.30	3 7/64"	300	72	18	3.00"	146.9032	2288.3929	0.9958	1.0985	1.0007	1106.7298	2408.2474	8.4907	239.2171
1900	01.00	3 7/64"	295	72	19.5	3.00"	145.6728	2288.3929	0.9932	1.0941	1.0007	1111.6395	2392.5246	8.3646	235.6647
1930	01.30	3 7/64"	295	72	24	3.00"	146.6728	2288.3929	0.9857	1.0881	1.0007	1116.4852	2361.3406	8.2556	232.5931
2000	02.00	3 7/64"	295	71	26.5	3.00"	144.6576	2288.3929	0.9816	1.0851	1.0007	1121.2634	2344.8120	8.1407	229.3555



PETROLEUM ENGINEERING : GAS FLOW CALCULATIONS

CONTRACTOR: OILSERV	PERFORATIONS: 9195 - 10075' KB	PAGE: 7 OF 8
WELL NAME: VARANUS #1.	FORMATION: PATCHAWARRA	DATE: 20.8.91.
TEST TYPE: MODIFIED ISOCHRONAL		OPR: DOWLING

ORIFICE METER TYPE: BARTON							STATIC PRESSURE RANGE: 0 - 1500 PSIG				GAS SPECIFIC GRAVITY (SG) = 1.082				
METER RUN SIZE: 3.826							DIFFERENTIAL PRESS. RANGE: 0 - 200 IN WC				FG = $\sqrt{(1/SG)}$ = 0.9614				
SEPARATOR NO.:							STANDARD CONDITIONS: 14.73 PSI @ 60°F				C ₂ = (FU X FG) =				
DATE TIME	FLOW TIME (HOURS)	CHOKE SIZE	STATIC PRESS P _f (PSIA)	DIFF PRESS H _w (IN WC)	GAS FLOW TEMP. (°C)	ORIF. PLATE SIZE (IN)	$\sqrt{(P_f \times H_w)}$	C ₁ = F _B x F _{TF} x F _{PV} x Y ₂				CUMULATIVE GAS PRODUCTION M ³ /D.	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)
2030	02.30	37/64"	295	71	28	3.00"	144.6576	2288.3929	0.9791	1.0833	1.0007	1126.0220	2335.1681	8.1072	228.4122
2100	03.00	37/64"	295	71	29.5	3.00"	144.6576	2288.3929	0.9767	1.0816	1.0007	1130.7613	2325.7084	8.0744	227.4869
2130	03.30	37/64"	295	71	30	3.00"	144.6576	2288.3929	0.9759	1.0810	1.0007	1135.4414	2322.5948	8.0635	227.1823
2200	04.00	37/64"	295	72	30	3.00"	145.6728	2288.3929	0.9759	1.0810	1.0007	1140.2076	2322.6188	8.1202	228.7790
2230	04.30	37/64"	295	72	31	3.00"	145.6728	2288.3929	0.9743	1.0799	1.0007	1144.9612	2316.4494	8.0986	228.1713
2300	05.00	37/64"	295	72	31.5	3.00"	145.6728	2288.3929	0.9735	1.0794	1.0007	1149.7085	2313.3941	8.0880	227.8702
2330	05.30	37/64"	295	72	32	3.00"	145.6728	2288.3929	0.9727	1.0789	1.0007	1154.4496	2310.3555	8.0773	227.5710
2400	06.00	37/64"	295	72	32	3.00"	145.6728	2288.3929	0.9727	1.0789	1.0007	1159.1907	2310.3555	8.0773	227.5710
2400								SHUT IN WELL END OF 3 rd RATE.							
21.8.91															
0600		3						OPEN WELL TO 42/64" CHOKER, START 4 th RATE							
0620								ENGAGE 3.00" O.P.							
0630	00.30	42/64"	315	83	20	3.00"	161.6248	2288.3929	0.9924	1.1022	1.0008	1164.6738	2408.2271	9.3415	263.1875
0700	01.00	42/64"	310	84	27.5	3.00"	161.2989	2288.3929	0.9799	1.0895	1.0008	1170.0151	2350.6989	9.1000	256.3823
0730	01.30	42/64"	310	84	31	3.00"	161.2989	2288.3929	0.9743	1.0852	1.0008	1175.3047	2327.9354	9.0118	253.5996
0800	02.00	42/64"	310	83	31	3.00"	160.3359	2288.3929	0.9743	1.0852	1.0008	1180.5626	2327.9125	8.9579	252.3813
0830	02.30	42/64"	310	83	31	3.00"	160.3359	2288.3929	0.9743	1.0852	1.0008	1185.8205	2327.9125	8.9579	252.3813
0900	03.00	42/64"	310	83	32	3.00"	160.3359	2288.3929	0.9727	1.0840	1.0008	1191.0642	2321.5984	8.9337	251.6967
0930	03.30	42/64"	310	83	33	3.00"	160.3359	2288.3929	0.9711	1.0829	1.0008	1196.2935	2315.3644	8.9097	251.0208
1000	04.00	42/64"	345	76	34	3.00"	161.8625	2288.3929	0.9695	1.0940	1.0007	1201.6181	2335.0716	9.0711	255.5679
1030	04.30	42/64"	345	76	35	3.00"	161.8625	2288.3929	0.9680	1.0927	1.0007	1206.9274	2328.4691	9.0454	254.8453

00103

PETROLEUM ENGINEERING : GAS FLOW CALCULATIONS

CONTRACTOR:	OILSERV	PERFORATIONS:	9195' - 10075' KB.	PAGE:	8	OF	8
WELL NAME:	VARANUS #1.	FORMATION:	PATCHAWARRA.	DATE:	21.8.91.		
TEST TYPE:	MODIFIED ISOCHRONAL.			OPR:	DOWLING		

[illegible]



PETROLEUM ENGINEERING : LIQUID PRODUCTION

CONTRACTOR: OILSERV	PERFORATIONS: 9195' - 10075' KB	PAGE: 2. OF 6
WELL NAME: VARANUS #1.	FORMATION: PATCHAWARLA	DATE: 10.8.91.
TEST TYPE: MODIFIED ISOCHRONAL		OPR: DOWLING

TANK NUMBER	#1 =	TANK CAPACITY	#1 =	bbls/m ³		TANK SCALE	#1 = CALIBRATED LITRES	bbls/in-m ³ /cm		OIL API GRAVITY = @ 60°F	
	#2 =		bbls/m ³		#2 = CALIBRATED LITRES		bbls/in-m ³ /cm				
DATE TIME	FLOW TIME (HOURS)	TANK USED (NUMBER)	TOTAL TANK DIP LITRES	OIL/CONDENSATE PRODUCTION				WATER PRODUCTION			
				TANK DIP LITRES	TANK PRODUCTION (BBLs/m ³)	FLOW RATE (BPD) (m ³ /D)	CUMULATIVE PRODUCTION (BBLs/m ³)	TOTAL TANK DIP LITRES	TANK PRODUCTION (BBLs/m ³)	FLOW RATE (BPD) (m ³ /D)	CUMULATIVE PRODUCTION (BBLs/m ³)
1044				CHOKE TO 15%.							
1106				ENGAGE 0.750" O.P.							
1110				SCHLUMBERGER R.I.H.							
1115				OPEN CHOKE TO 18%							
1124				ENGAGE 1.250" O.P.							
1141				ENGAGE 1.750 O.P.							
1200	54.00	#2.	90/820	90/820	0.620	7.440	37.73	30/140.	0.110	1.320	11.13
1230				OPEN CHOKE TO 55%.							
1249				ENGAGE 3.00" O.P.							
1400	56.00	#2	3500	3500	1.300	15.600	39.03	1520	1.380	15.560	12.51.
1500	57.00	#2.	4270	4270	0.670	16.080	39.70	1620	0.100	2.400	12.61
1600	58.00	#2.	5200	5200	0.830	19.920	40.53	1720	0.100	2.400	12.71
1700	59.00	#1	120/970	120/970	0.610	14.640	41.14.	240	0.240	5.760	12.95.
1800	60.00	#1.	1950	1950	0.800	19.200	41.94	420	0.180	4.320	13.13
1900	61.00	#1.	2830	2830	0.740	17.760	42.68	560	0.140	3.360	13.27
2000	62.00	#1.	3610	3610	0.600	14.400	43.28	740.	0.180	4.320	13.48
2000				SHUT CHOKE TO 18%							
2015				SCHLUMBERGER R.I.H. ENGAGE 1.750" O.P.							
2100	63.00	#1.	4070	4070	0.400	9.600	43.68	800	0.060	1.440	13.51
2115				SCHLUMBERGER IN LUB.							
2120				OPEN CHOKE TO 55%.							

00106



PETROLEUM ENGINEERING : LIQUID PRODUCTION

CONTRACTOR: OILSERV				PERFORATIONS: 9195' - 10075' KB				PAGE: 3 OF 6			
WELL NAME: VARANUS #1.				FORMATION: PATCHAWARRA				DATE: 10.8.91.			
TEST TYPE: MODIFIED ISOCHRONAL								OPR: DOWLING			
TANK	#1 =	bbls/m ³		TANK	#1 = CALIBRATED LITRES	bbls/in-m ³ /cm		OIL API GRAVITY = @ 60°F			
CAPACITY	#2 =	bbls/m ³		SCALE	#2 = CALIBRATED LITRES	bbls/in-m ³ /cm					
TANK USED (NUMBER)	TOTAL TANK DIP LITRES	OIL/CONDENSATE PRODUCTION				WATER PRODUCTION					
		TANK DIP LITRES	TANK PRODUCTION (BBLT/m ³)	FLOW RATE (BPD) (m ³ /D)	CUMULATIVE PRODUCTION (BBLT/m ³)	TOTAL TANK DIP LITRES	TANK PRODUCTION (BBLT/m ³)	FLOW RATE (BPD) (m ³ /D)	CUMULATIVE PRODUCTION (BBLT/m ³)		
#1.	4900	4900	0.780	18.720	44.46	850	0.050	1.200	13.56		
#2	100/3990	100/3990	3.120	18.720	47.58	0/770	0.770	4.620	14.33		
#2	7770	7770	2.850	17.100	50.43	1700	0.930	5.580	15.26		
#1.	80/3740	80/3740	2.820	16.920	53.25	0/840.	0.840	5.040	16.10		
		CHOKE WELL BACK TO 18%.									
		R.I.H.									
		POOH									
#1.	5660	5660	1.720	10.320	54.97	1040	0.200	1.200	16.30		
#1.	6500	6550	0.740	8.880	55.71	1140.	0.100	1.200	16.40		
		E-LINE R.I.H.									
#2.	0/500	0/500	0.420	10.080	56.13	0/80	0.080	1.920.	16.48		
#2.	870	870	0.330	7.920	56.46	120	0.040	0.960	16.52		
		E-LINE AT HANG DEPTH 9160' KB.									
		BRING CHOKE TO 55%									
#2.	1840	1840	0.750	18.000	57.21	340	0.220	5.280	16.74		
#2.	2810	2810	0.790	18.960	58.00	520	0.180	4.320	16.92		
#2.	3830	3830	0.830	19.920	58.83	710	0.190	4.560	17.11.		
#2.	4730	4730	0.720	17.280	59.55	890	0.180	4.320	17.29.		
#2	5640	5640	0.700	16.800	60.250	1100	0.210	5.040	17.50		
#2	6560	6560	0.710	17.040	60.960	1310	0.210	5.040	17.71		



PETROLEUM ENGINEERING : LIQUID PRODUCTION

CONTRACTOR:	OILSERV	PERFORATIONS:	9195' - 10075' KB	PAGE:	4 OF 6
WELL NAME:	VARANUS #1.	FORMATION:	PATCHAWARRA.	DATE:	12.8.91.
TEST TYPE:	MODIFIED ISOCHRONAL			OPR:	DOWLING

TANK NUMBER	#1 =	TANK CAPACITY	#1 =	bbls/m³		TANK SCALE	#1 = CALIBRATED LITRES	bbls/in-m³/cm		OIL API GRAVITY = @ 60°F		
	#2 =		bbls/m³		#2 = CALIBRATED LITRES		bbls/in-m³/cm					
DATE TIME	FLOW TIME (HOURS)	TANK USED (NUMBER)	TOTAL TANK DIP LITRES	OIL/CONDENSATE PRODUCTION				WATER PRODUCTION				
				TANK DIP LITRES	TANK PRODUCTION (BBLT/m³)	FLOW RATE (BPD) (m³/D)	CUMULATIVE PRODUCTION (BBLT/m³)	TOTAL TANK DIP LITRES	TANK PRODUCTION (BBLT/m³)	FLOW RATE (BPD) (m³/D)	CUMULATIVE PRODUCTION (BBLT/m³)	
12.8.91.												
0100	91.00.	#1.	100/1020	100/1020	0.730	17.520	61.69	90/280	0.190	4.560	17.90	
0200	92.00	#1	1950	1950	0.760	18.240	62.45	450	0.170	4.080	18.07	
0300	93.00	#1	2890	2890	0.740	17.760	63.19	650	0.200	4.800	18.27	
0400	94.00	#1	3810	3810	0.750	18.000	63.94	820	0.170	4.080	18.42.	
0500	95.00	#1.	4810	4810	0.800	19.200	64.74	1020	0.200	4.800	18.62.	
0600	96.00	#1.	5580	5580	0.590	14.160	65.33	1200	0.180	4.320	18.80	
0700	97.00	#1	6490	6490	0.770	18.480	66.10	1340	0.140	3.360	18.94	
0800	98.00	#1	7400	7400	0.580	13.920	66.68	1670	0.330	7.920	19.27	
0900	99.00	#2	130/950	130/950	0.670	16.080	67.35	70/220	0.150	3.600	19.42	
1000	100.00	#2.	1850	1850	0.700	16.800	68.05	420	0.200	4.800	19.62.	
1000				WELL SHUT IN AT WING VALVE FOR BUILD UP.								
19/8/91.												
1800.				OPEN WELL ON 19/64" CHOKE FOR 1ST RATE.								
1900	01.00	#2	150/630	150/630.	0.480	11.520	68.53	80/80	0.000	0.000	19.62	
2000.	02.00	#2	1210	1210.	0.540	12.960	69.07	120	0.040	0.960	19.66	
2100	03.00	*2.	1740	1740	0.490	11.760	69.56	160	0.040	0.960	19.70	
2200	04.00	#2	2230	2230	0.420	10.080	69.98	230	0.070	1.680	19.77	
2300	05.00	#2	2710	2710	0.410	9.840	70.39	300	0.070	1.680	19.84	
2400	06.00	#2.	3150	3150	0.370	8.880	70.76	370	0.070	1.680	19.91.	
2400				WELL SHUT IN END OF 1ST RATE								

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PETROLEUM ENGINEERING : LIQUID PRODUCTION

CONTRACTOR:	OILSERV	PERFORATIONS:	9195' - 10075' KB	PAGE:	5 OF 6
WELL NAME:	VARANUS #1.	FORMATION:	PATCHAWARRA	DATE:	20.8.91.
TEST TYPE:	MODIFIED ISOCHRONAL			OPR:	DOWLING
TANK #1 =		TANK #1 =	Calibrated Litres	bbls/in-m ³ /cm	OIL API GRAVITY = @ 60°F
TANK #2 =		TANK #2 =	Calibrated Litres	bbls/in-m ³ /cm	

DATE TIME	FLOW TIME (HOURS)	TANK USED (NUMBER)	TOTAL TANK DIP Litres	OIL/CONDENSATE PRODUCTION				WATER PRODUCTION			
				TANK DIP Litres	TANK PRODUCTION (BBLs/m ³)	FLOW RATE (BPD) (m ³ /D)	CUMULATIVE PRODUCTION (BBLs/m ³)	TOTAL TANK DIP Litres	TANK PRODUCTION (BBLs/m ³)	FLOW RATE (BPD) (m ³ /D)	CUMULATIVE PRODUCTION (BBLs/m ³)
0600				OPEN WELL ON 31/64" CHOKE				START 2 ND RATE.			
0700	01.00	1 [#]	0/1080	0/1080	0.950	22.800	71.71	0/130.	0.130	3.120	20.04
0800	02.00	1 [#]	2050	2050	0.800	19.200	72.51	300	0.170	4.080	20.21.
0900	03.00	1 [#]	3140	3140	0.910	21.840	73.42	480.	0.180	4.320	20.39.
1000	04.00	1 [#]	4100	4100	0.770	18.480	74.19	670.	0.190	4.560	20.58
1100	05.00	1 [#]	5120	5120	0.850	20.400	75.04	840	0.170	4.080	20.75
1200	06.00	1 [#]	6110	6110	0.770	18.480	75.81	1060.	0.220	5.280	20.97.
1200				SHUT IN WELL, END OF 2 ND RATE.							
1800				OPEN WELL ON 37/64" CHOKE				START 3 RD RATE			
1810				ENGAGE 3.00" O.P.							
1900	01.00	#2	170/1350	170/1350	1.060	25.440	76.87	110/230.	0.120	2.880	21.07
2000	02.00	#2.	2700	2700	1.160	27.840	78.03	420	0.190	4.560	21.26.
2100	03.00	#2.	3830	3830	0.910	21.840	78.94	640	0.220	5.280	21.45
2200	04.00	#2.	4800	4800	0.710	17.040	79.65	900	0.260	6.240	21.74.
2300	05.00	#2	6030	6030	0.950	22.800	80.60	1180	0.280	6.720	22.02
2400	06.00	#2.	7050	7050	0.810	19.440	81.41	1390.	0.210	5.040	22.23.
2400				SHUT IN WELL END OF 3 RD RATE.							
21.8.91.											
0600				OPEN WELL ON 42/64" CHOKE, START 4 TH RATE.							
0700	01.00	#1	80/1330	80/1330	1.110	26.640	82.52	0/140	0.140	3.360	22.37
0800	02.00	#1	2610	2610	1.030	24.720	83.55	390	0.250	6.000	22.62
0900	03.00	#1.	3900	3900	1.000	24.000	84.55	680.	0.290	6.960	22.91

OILSERV AUSTRALIA LIMITED

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SUBSURFACE PRESSURE CALIBRATION REPORT

CLIENT: SANTOS LTD

CALIBRATION NO: VARANUS # 1

DATE OF CALIBRATION: 09/08/91

DATE OF LAST CALIBRATION: 20/06/91

OWNER OF GAUGE: OILSERV AUSTRALIA LTD

TYPE OF ELEMENT: RPG-3

PRESS ELEM NO: 55994 RANGE: 0-5000 PSI

RECORDING SECT NO: 12068

DEADWEIGHT TESTER TYPE AND RANGE: CHANDLER 55-1

SERIAL NO: 18731

BASE LINE DRAWN AT ATMOSPHERIC PRESSURE READING $D_0 =$

TEMPERATURE = xF

REFERENCE LINE READING $D_r =$

REF PRESSURE =

TEMPERATURE = xF

MAXIMUM TEMPERATURE EXPECTED = 270 xF

CALIBRATION TEMPERATURE = 270 xF

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

LEVEL DIFFERENCE H = 17.000 in ?

SPEC GRAV OF OIL D = 0.330 $\rho = 0.4$ psia (+ when dwt above bellows)

EQUIVALENT PRESSURE P OF LEVEL DIFFERENCE BETWEEN DWT AND BELLWS: psia

CALIBRATION STEPS

: LEAST SQUARES

dwt	Y	KY	YJ	Y * P	Pc = KY+a	Pc = P-Pc	CJ	A = $\frac{dP}{n}$
500	0.1905	0.1905	0.0362	95.25	500.98	-0.98	0.9769	B = $\frac{dY}{n}$
1000	0.3840	0.1935	0.1474	384.00	998.65	1.34	1.7962	C = $\frac{d(Y)}{dY} = 1.3577$
1500	0.5780	0.1940	0.3340	867.00	1497.61	2.38	5.6782	D = $\frac{d(YP)}{dY} = 3503.01$
2000	0.7730	0.1950	0.5975	1546.00	1999.14	0.85	0.7286	K = $\frac{D-A}{C-B} = 2571.94$
2500	0.9680	0.1950	0.9370	2420.00	2500.67	-0.67	0.4565	a = $\frac{A-BK}{C-B} = 11.0328$
3000	1.1628	0.1948	1.3521	3488.40	3001.69	-1.69	2.8579	a = $\frac{D-CK}{C-B} = 11.0328$
3500	1.3574	0.1946	1.8425	4750.90	3502.19	-2.19	4.8006	Q = $\frac{d(C)}{n} = 5.8886$
4000	1.5519	0.1945	2.4083	6207.60	4002.43	-2.43	5.9260	
4500	1.7462	0.1943	3.0492	7857.90	4502.16	-2.16	4.6797	
5000	1.9376	0.1914	3.7542	9688.00	4994.43	5.56	30.9854	
27500	10.6494		14.4589	37305.05		d + = 10.14	58.8864	
						d - = -10.14		

CALIBRATION RESULTS

COMMENTS

K = 2571.945 Dr - D0 = Yr =
a + p = 11.527 Pr =

Em. 7160/2

SR21/4 b160/D

Santos Ltd

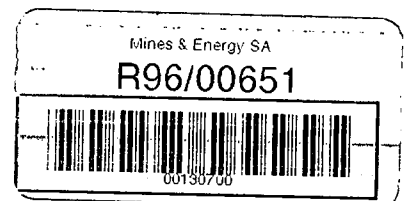
A.C.N. 007 550 923

Varanus 1

Welltest Interpretation

Prepared by: Chris Thompson
Date: April 1996
Report No: PEDSA: 005/96

SCANNED



Varanus 1 BHP Survey September 1993

Well Test Analysis Report

Analyst name	C.J. Thompson
Company	Santos Limited
Field	Varanus
Well	1
Date	4/09/93
Formation	Patchawarra
Test	BHP Survey
Depth Reference - MSL	126 ft.ASL
Gauge Type	Amerada
Gauge Number	850208
Gauge Depth - Measured	9530 ft.KB
Gauge Depth - Vertical	-9404 ft.SS
Perforation Interval Top	9499 ft.KB
Perforation Interval Bottom	10075 ft KB

Remarks: As no rates were recorded during the flowing period, a rate of 2.7 MMscf/d was assumed (from the October 1993 Petroleum Production Report) prior to shut-in.

An initial inspection of the test overview identified humping in the early time region, this feature is characteristic of phase re-distribution in the wellbore, some degree of noise is also evident.

The radial derivative (Log-Log plot) is dominated in the middle time region by the effects of humping which, combined with cross flow between the many perforated intervals have masked radial flow. However, the flow capacity has been estimated to be between 370 and 550 md.ft (3 to 4.5 md). In such a case, the skin factor is likely to be below 6.

A reservoir pressure of 1540 psia, at the datum depth of -9510 ft.SS, was determined by extrapolation of the late time data on the Horner plot.

Varanus 1 BHP Survey September 1993

Well Test Analysis Report

Reservoir Description

Fluid type : Gas

Well orientation : Vertical

Number of wells : 1

Number of layers : 1

Layer Parameters Data

	Layer 1
Formation thickness	123.00 ft
Average formation porosity	0.105
Water saturation	0.33
Gas saturation	0.67
Formation compressibility	4.7648e-6 psi-1
Total system compressibility	5.3666e-4 psi-1
Layer pressure	1534.4286 psia
Temperature	278.0000 deg F

Well Parameters Data

	Well 1
Well radius	0.354 ft
Distance from observation to active well	0.0000 ft
Wellbore storage coefficient	0.1355 bbl/psi
Well offset - x direction	0.00 ft
Well offset - y direction	0.00 ft

Fluid Parameters Data

	Layer 1
Gas gravity	1.1053 sp grav
Water-Gas ratio	0.0000 STB/MMscf
Water salinity	0.0000 ppm
Check Pressure	1500.0000 psia
Check Temperature	278.0000 deg F
Gas density	7.88005 lb/ft3
Initial gas viscosity	0.017091 cp
Gas formation volume factor	0.01071 ft3/scf
Water density	58.1821 lb/ft3
Water viscosity	0.17762 cp
Water formation volume factor	1.07192 RB/STB
Initial Z-factor	0.76726
Initial Gas compressibility	7.9197e-4 psi-1
Water compressibility	3.8606e-6 psi-1

Layer 1 Correlations

Ug Correlation : Carr et al

Layer Boundaries Data

Layer 1 Boundary Type : Infinitely acting

	Layer 1
L1	0.0000 ft
L2	0.0000 ft
L3	0.0000 ft
L4	0.0000 ft
Drainage area	0.0000 acres
Dietz shape factor	0.0000

Layer 1 Model Data

Layer 1 Model Type : Radial homogeneous

Varanus 1 BHP Survey September 1993

Well Test Analysis Report

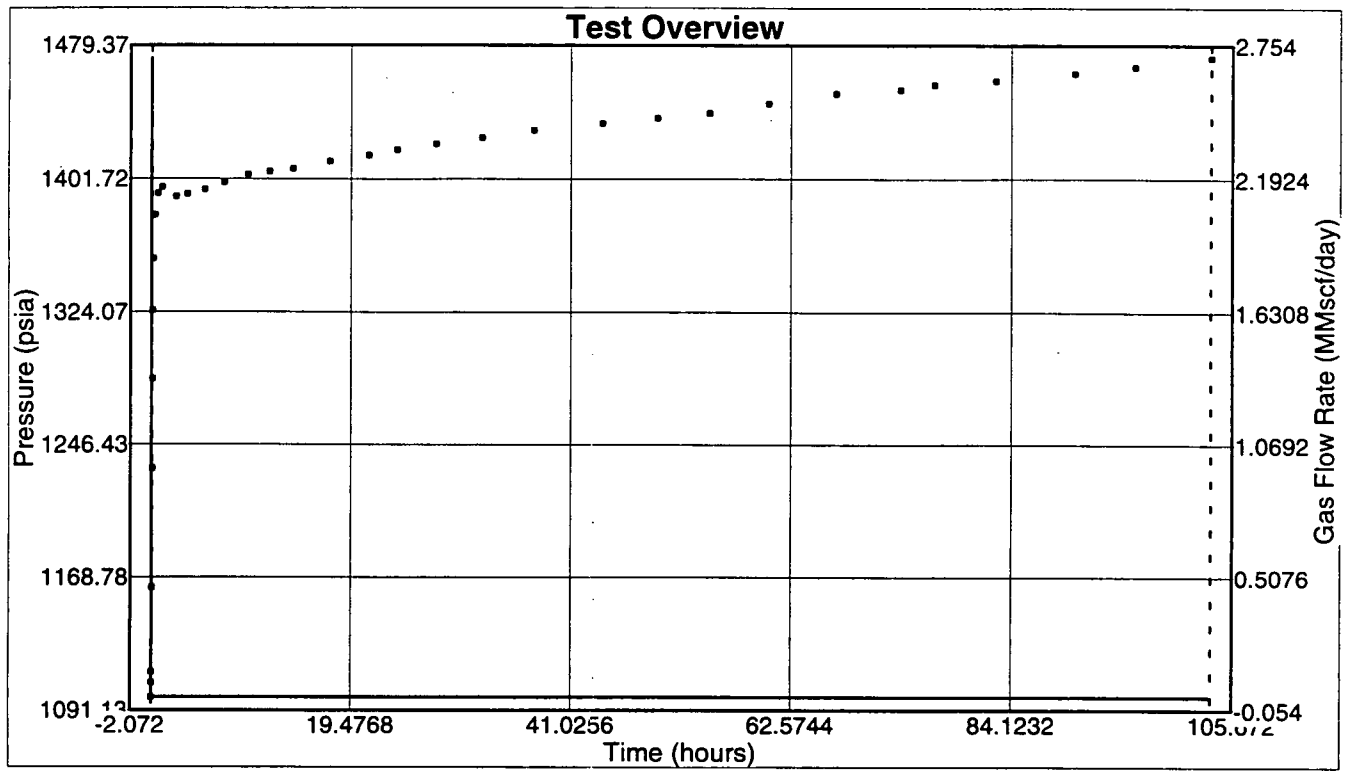
	Layer 1
Permeability	0.00 md
Skin factor (Well 1)	0.00
Rate dependent skin coefficient (D)	0.0000 1/(Mscf/day)

Rate Change Data

Time	Pressure	Rate
Hours	psia	MMscf/day
-100.00000	1107.1000	2.7000
-21.50000	1098.6000	2.7000
-21.25000	1400.0000	0.0000
0.02000	1098.6000	2.7000
103.60000	1471.9000	0.0000

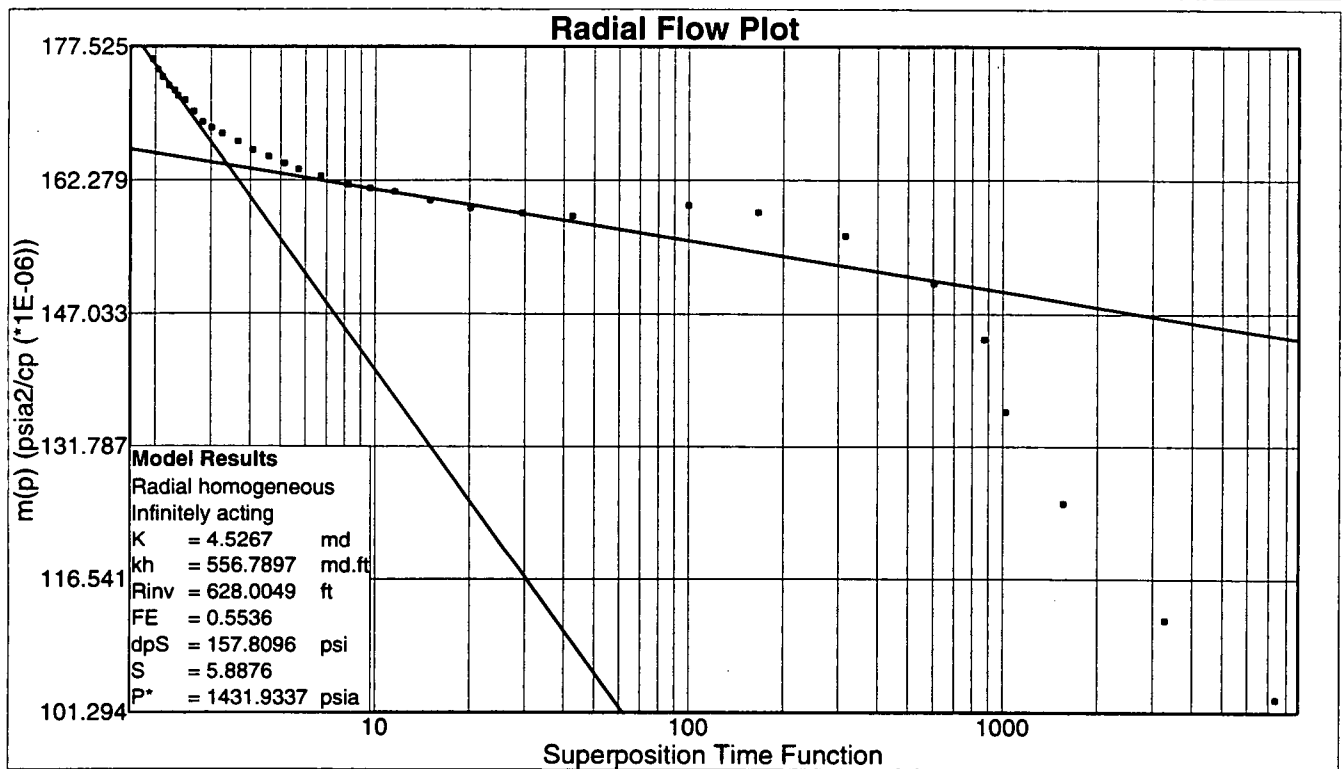
Varanus 1 BHP Survey September 1993

Well Test Analysis Report



Varanus 1 BHP Survey September 1993

Well Test Analysis Report

**Radial Flow Plot Model Results**

Radial homogeneous
 Infinitely acting

	Value
Permeability	4.5267 md
Permeability-thickness	556.7897 md.ft
Radius of investigation	628.0049 ft
Flow efficiency	0.5536
dP skin (constant rate)	157.8096 psi
Skin factor	5.8876
Extrapolated pressure	1431.9337 psia

Radial Flow Plot Line Details

Line type : Free model line

Slope : -49.7524

Intercept : 190.378

Coefficient of Determination : Not Used

	Free model line
Permeability	0.5326 md
Skin factor	-4.141
Total mobility	31.1653 md/cp
Permeability-thickness	65.5155 md.ft
dP skin (constant rate)	-1098.6000 psi
Radius of investigation	215.4217 ft
Extrapolated m(p)	190.3780 psia2/cp (*1E-06)
Extrapolated pressure	1534.4286 psia
m(p) at dt = 1 hr	90.9038 psia2/cp (*1E-06)
Pressure at dt = 1 hour	1046.0118 psia
Flow efficiency	2.9813

Varanus 1 BHP Survey September 1993

Well Test Analysis Report

Line type : Radial flow

Slope : -5.8542

Intercept : 167.12

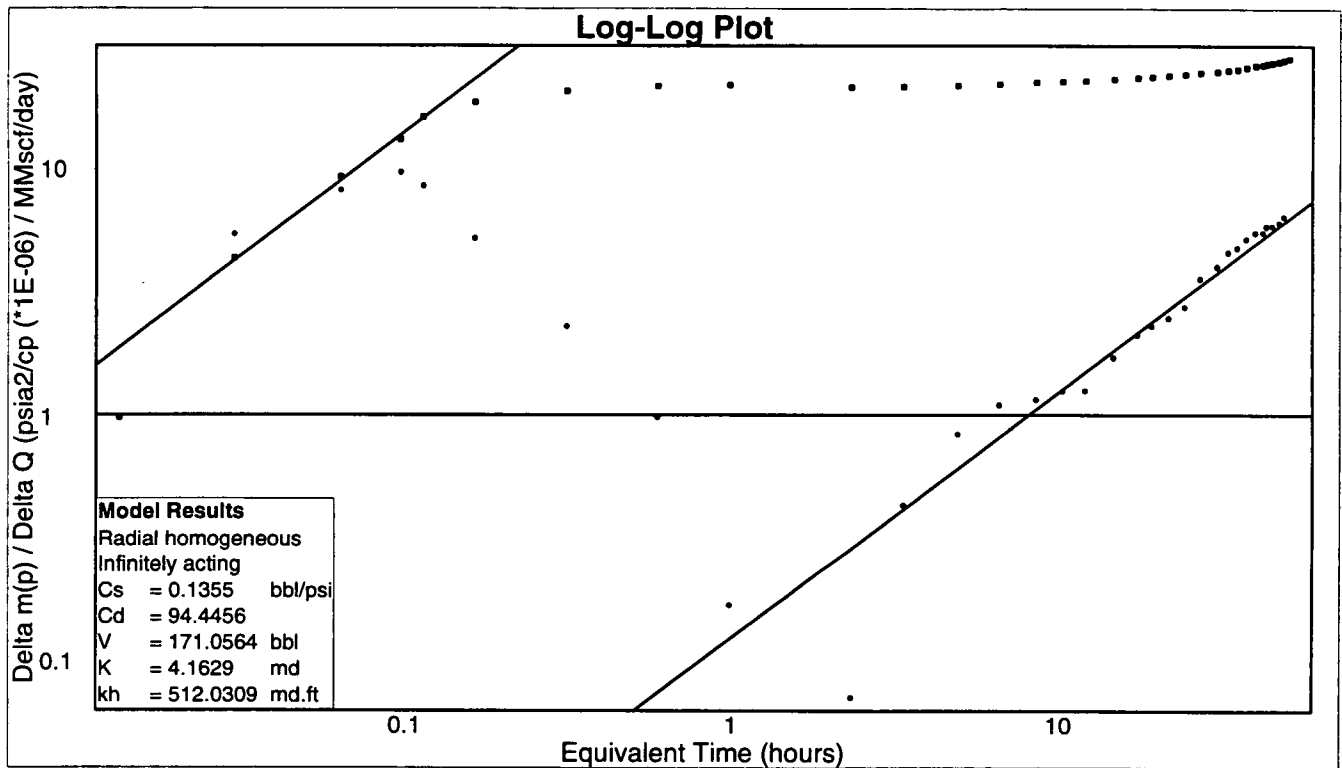
Coefficient of Determination : Not Used

	Radial flow
Extrapolated m(p)	167.1203 psia2/cp (*1E-06)
Extrapolated pressure	1431.9337 psia
m(p) at dt = 1 hr	155.4156 psia2/cp (*1E-06)
Pressure at dt = 1 hour	1378.3463 psia

Number of Intersections = 0

Varanus 1 BHP Survey September 1993

Well Test Analysis Report

**Log-Log Plot Model Results**

Radial homogeneous

Infinitely acting

	Value
Wellbore storage coefficient	0.1355 bbl/psi
Dimensionless wellbore storage	94.4456
Apparent wellbore volume	171.0564 bbl
Permeability	4.1629 md
Permeability-thickness	512.0309 md.ft

Log-Log Plot Line Details

Line type : Wellbore storage

Slope : 1

Intercept : 142.334

Coefficient of Determination : Not Used

Line type : Free model line

Slope : 1

Intercept : 0.125901

Coefficient of Determination : Not Used

Line type : Radial flow

Slope : 0

Intercept : 1.02396

Coefficient of Determination : Not Used

Number of Intersections = 0

Varanus 1 BHP Survey September 1993

Well Test Analysis Report

Reservoir Description

Fluid type : Gas

Well orientation : Vertical

Number of wells : 1

Number of layers : 1

Layer Parameters Data

	Layer 1
Formation thickness	123.00 ft
Average formation porosity	0.105
Water saturation	0.33
Gas saturation	0.67
Formation compressibility	4.7648e-6 psi-1
Total system compressibility	5.3666e-4 psi-1
Layer pressure	1534.4286 psia
Temperature	278.0000 deg F

Well Parameters Data

	Well 1
Well radius	0.354 ft
Distance from observation to active well	0.0000 ft
Wellbore storage coefficient	0.1355 bbl/psi
Well offset - x direction	0.00 ft
Well offset - y direction	0.00 ft

Fluid Parameters Data

	Layer 1
Gas gravity	1.1053 sp grav
Water-Gas ratio	0.0000 STB/MMscf
Water salinity	0.0000 ppm
Check Pressure	1500.0000 psia
Check Temperature	278.0000 deg F
Gas density	7.88005 lb/ft3
Initial gas viscosity	0.017091 cp
Gas formation volume factor	0.01071 ft3/scf
Water density	58.1821 lb/ft3
Water viscosity	0.17762 cp
Water formation volume factor	1.07192 RB/STB
Initial Z-factor	0.76726
Initial Gas compressibility	7.9197e-4 psi-1
Water compressibility	3.8606e-6 psi-1

Layer 1 Correlations

Ug Correlation : Carr et al

Layer Boundaries Data

Layer 1 Boundary Type : Infinitely acting

	Layer 1
L1	0.0000 ft
L2	0.0000 ft
L3	0.0000 ft
L4	0.0000 ft
Drainage area	0.0000 acres
Dietz shape factor	0.0000

Layer 1 Model Data

Layer 1 Model Type : Radial homogeneous

Santos Limited

Report File:

V1_993.PAN

Varanus 1 BHP Survey September 1993

Well Test Analysis Report

	Layer 1
Permeability	0.00 md
Skin factor (Well 1)	0.00
Rate dependent skin coefficient (D)	0.0000 1/(Mscf/day)

Rate Change Data

Time Hours	Pressure psia	Rate MMscf/day
-100.00000	1107.1000	2.7000
-21.50000	1098.6000	2.7000
-21.25000	1400.0000	0.0000
0.02000	1098.6000	2.7000
103.60000	1471.9000	0.0000

SEQUENCE OF EVENTS

CUSTOMER : SANTOS

WELL NAME: VARANUS # 1

TEST TYPE : *Free BHP Gauge's*

PERFORATIONS:

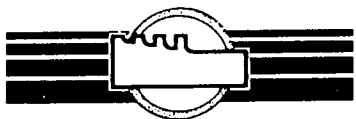
FORMATION: :

PAGE: 2 OF 6

DATE: 11.9.93

OPR :	<i>N. Pearson.</i>
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[illegible]



SEQUENCE OF EVENTS

CUSTOMER : SANTOS LTD

PERFORATIONS: 9494' - 9567'

PAGE: 3 OF 6

WELL NAME: VARANUS. #1

FORMATION : PATCHAWARRA

DATE: 13/8/93

TEST TYPE : PULL STUCK BOMBS

OPR : R. BUCKLAND

DATE/TIME	DESCRIPTION OF EVENTS	
13/8/93		
0800	ARRIVE LOCATION HOLD SAFETY MEETING. SITHP: 977 PSI CASE: 978 PSI.	
0815	COMMENCE TO FLOW WELL AT 10% INCREMENTS WITH 600 lbs ON WIRE.	
0830	WELL FLOWING ON 100% CHOKE - NO PROGRESS MADE WITH STUCK BOMBS.	
0830	SHUT WELL IN. REPORT TO MOOMBA.	
0850	ATTEMPT TO FREE STUCK BOMBS AGAIN BY OPENING CHOKE MORE RAPIDLY WITH 600 lbs STRAIN ON WIRE.	
0855	WELL FLOWING ON 100% CHOKE - NO PROGRESS MADE WITH STUCK BOMBS.	
0930	LEAVE WELL FLOWING ON 100% CHOKE AND 600 lbs STRAIN ON WIRE.	
	SECURE EQUIPMENT, RETURN TO MOOMBA.	
	N.B. PRESSURE OBSERVATIONS WHEN FIRST OPENING WELL:	
	TUBING PRESSURE	CASEING PRESSURE
0820	780 PSI	780 PSI
0822	730	731
0824	644	645
0825	556	556
0826	451	448
0827	449	446
0828	448	446
0830		
0831	438	436.
0833	500	500
0835	700	704

SEQUENCE OF EVENTS

CUSTOMER : SANJO5

PERFORATIONS:

PAGE: 4 OF 6

WELL NAME: VARANUS # 1

FORMATION :

DATE: 16.9.93

TEST TYPE : FREE TOOL-SIZING

OPR : J. KERESZTESI

[illegible]

SEQUENCE OF EVENTS

CUSTOMER : SANTOS

PERFORATIONS:

PAGE: 45 OF 6

WELL NAME: VATZANUS # 1

FORMATION :

DATE: 18.9.93

TEST TYPE : FREE-UP STUCK TOOL-STRING

OPR : J. KERESZTESI

[illegible]

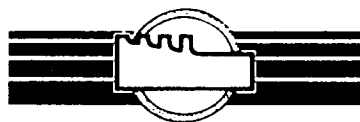
SEQUENCE OF EVENTS		
CUSTOMER : SANTOS	PERFORATIONS:	PAGE: 6 OF 6
WELL NAME: VARANUS #1	FORMATION :	DATE: 19.9.93
TEST TYPE : FREE UP TOOL-STRING		OPR : J. KERESZTESI

PAGE: 6 OF 6

DATE: 19.9.93

OPR : J. KERESZTESI

[illegible]



CUSTOMER : Santos Ltd

PERFORATIONS: 9499' - 10075' KB

PAGE: 1 OF 3

WELL NAME: Varanus # 1

FORMATION : Patchawarra

DATE: 3rd Sept 1993

TEST TYPE : B.H.P.S.

OPR : B. Potter

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		
3rd September 1993															
1030		Arrive location, Shut in well, fit swab valve.													
1045		Well back on line 100% choke													
1120		R.I.H. with 1.75" Blind Box to P.B.T.D.													
1200		Tag P.B.T.D @ 10207' KB. No obstructions. P.O.O.H.													
1230		At surface with toolstring. Prepare gauges for B.H.P.S													
1400		3082	3103	49	100	Pressure Lub.									
1500		3082	3103	50	↓	Depressure Lub.									
1600		3068	3082	51		Pressure Lub & R.I.H. with gauges.									
1630		3061	3082	51		Hang depth @ 9530' KB.									
4th September.															
0600		3075	3075	47	↓										
0800	0	3068	3089	47		Shut in well, Commence 96hr Build up period.									
0815		6157	6157												
0830		6247	6247												
0845		6295	6295												
0900	1	6295	6295												
0915		6288	6288												
0930		6288	6288												
0945		6281	6281												
1000	2	6281	6281												



CUSTOMER : Santos Ltd

PERFORATIONS: 9499' - 10075' KB

PAGE: 2 OF 3

WELL NAME: Varanus # 1

FORMATION : Patchawarra

DATE: 4th Sept 1993

TEST TYPE : B. H. P. S.

OPR : B. Potter

TIME		WELLHEAD DATA						FLOW RATES			CUMULATIVE PRODUCTION				
DATE	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		
4 th September 1993															
1015		6281	6281												
1030		6281	6281												
1045		6281	6281												
1100	3	6281	6281												
1115		6281	6281												
1130		6274	6274												
1145		6274	6274												
1200	4	6267	6267												
1400	6	6323	6323												
1800	10	6336	6336												
5 th September 1993															
0600	22	6336	6336												
1000	26	6350	6350												
1400	30	6364	6364												
1800	34	6371	6371												
6 th September															
0600	46	6398	6398												
1000	50	6419	6419												
1400	54	6433	6433												
1800	58	6447	6447												

PERFORATIONS: 9499' - 10075'

WELL NAME: Varanus #1

FORMATION : Tirrwarra

DATE: 7th Sept 1993

TEST TYPE : B.H.P.S.

OPR : B. Potter

ET 104

EXPERTEST PTY. LTD.



BHP/BHT GAUGE RUN DATA

CUSTOMER : Santos Ltd

PERFORATIONS: 9499' - 10075' KB

PAGE: 1 OF 2

WELL NAME: Varanus # 1

FORMATION : Patchawarra

DATE: 3rd Sept 1993

TEST TYPE : B.H.P.S.

OPR : B. Potter

GAUGE DATA

UPPER
PRESSURE
GAUGELOWER
PRESSURE
GAUGETEMPERATURE
GAUGE

RUN DATA

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

ELEMENT SERIAL NO.

850207 850208

DATE : 3.9.93

ELEMENT RANGE

(PSI)

4075 4100

PRESSURE LUBRICATOR

14:00 3082 3103

RECORDING SECTION SERIAL NO.

K3433 K3434

RUN IN HOLE

16:00 3068 3082

DATE OF CALIBRATION:

@ 290°F

6.3.92 6.3.92

ON DEPTH AT : 9530 FT/M

16:30 3061 3082

CLOCK SERIAL NO.

F-15693 F-15694

DATE

CLOCK RANGE

(hr)

120 120

PULL OUT OF HOLE

18.9.93 1600 6665 6685

LEAD SCREW TYPE

15 TLS 15 TLS

AT SURFACE

19.9.93 11:15

DEPRESSURE LUBRICATOR

11:16 6674 6690

ENGAGE STYLUS DATE 3.9.93 TIME

13:55 13:55

MAXIMUM BHT AT 9530 FT/M = 278 °F/B

DISENGAGE STYLUS DATE 19.9.93 TIME

13:30 13:30

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

DATE

TIME

REMARKS

19.9.93

* SWL UNIT UNABLE TO PULL BONDS,
UNIT WAS ASSISTED W/ 108" WIRE AND HEAVY DTY W/L UNIT.

* TOP CLOCK FAILED @ APPROX 100 HRS

SUB-SURFACE PRESSURE SURVEY

CO. SANTOS		RUN 01 FIELD VARANUS	WELL 1
EFF DEPTH		WELL STAT	TOOL HUNG 9530'KB
CASING	-	CASING PRESS	ON BOTTOM 1630 3/9/93
LINER	-	TUBING PRESS	OFF BOTTOM N/AV
DATE	930904	ELEMENT RANGE 0 - 4110	ZERO POINT
ELEVATION		ZONE	SHUT-IN 0800 4/9/93
MAX TEMP	278	PICK-UP	ON-PROD
PERF	-	CAL SER NO. 850208	MPP
TUBING	-		
UNITS	ENGLISH	PURPOSE	BHP

SURVEY DATA

CO. SANTOS				RUN 01 FIELD VARANUS				WELL 1			
TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME				
8:00	1083.9	1083.9	.0	7:59	1404.1	1404.1	24.0				
8:02	1098.8	1098.8	.0	11:48	1407.5	1407.5	27.8				
8:03	1148.2	1148.2	.1	16:18	1410.9	1410.9	32.3				
8:05	1218.0	1218.0	.1	21:25	1415.2	1415.2	37.4				
8:07	1270.1	1270.1	.1	4:03	1419.4	1419.4	44.1				
8:08	1310.4	1310.4	.1	9:32	1422.4	1422.4	49.5				
8:11	1340.8	1340.8	.2	14:34	1425.3	1425.3	54.6				
8:20	1366.3	1366.3	.3	20:25	1430.8	1430.8	60.4				
8:37	1378.6	1378.6	.6	3:00	1436.6	1436.6	67.0				
9:01	1382.3	1382.3	1.0	9:19	1438.8	1438.8	73.3				
10:26	1376.8	1376.8	2.4	12:38	1441.6	1441.6	76.6				
11:31	1378.3	1378.3	3.5	18:35	1444.0	1444.0	82.6				
13:11	1381.0	1381.0	5.2	2:19	1448.3	1448.3	90.3				
15:05	1385.0	1385.0	7.1	8:13	1452.0	1452.0	96.2				
17:23	1389.6	1389.6	9.4	15:33	1457.2	1457.2	103.6				
19:28	1391.4	1391.4	11.5	- 3:58	1080.3	1080.3	-12.0				
21:47	1393.1	1393.1	13.8	- 1:08	1081.4	1081.4	-9.1				
1:27	1397.4	1397.4	17.4	3:00	1083.5	1083.5	-5.0				
5:09	1401.0	1401.0	21.2	7:04	1082.8	1082.8	-.9				

LUBRICATOR; D.W.T. IN: 447 psi / OUT: 968 psi
 AMERADA IN: 445 psi / OUT: N/A

NOTE: Pressure gauges became stuck in the hole and were unable to be pulled out at the end of the 96hr build-up. The gauges were pulled out after several attempts and days on the 19/9/93 at 0830hrs. Due to this delay a end of test calibration check was not recorded on the amerada chart.

ELEMENT #850207 WAS ALSO RUN BUT THE CLOCK FAILED.

CUMULATIVE PRODUCTION BEFORE SHUT IN = 152.0 E6m3

August cumulative production = 151.7 E6m3
 August mean gas daily = 76.0 E3m3/d = 0.076 E6m3/d
 Well on line for 3.333 days in September before shut in.
 (assumes that the flow rates remained constant.)

VARANUS #1

BHP

SEPTEMBER 1993

ELEMENT #850208 @ 9530'KB

