

SANTOS – BEACH

COMPILED FOR
SANTOS LIMITED
ABN 800 075 50923

NARINGAL 1
WELL COMPLETION REPORT

Prepared by:
A. HUDDLESTON
July 2002

NARINGAL 1 WCR

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LOCATION MAP

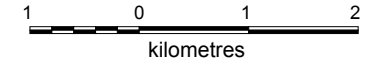


Santos

Exploration & Development
VICTORIA
OTWAY BASIN, PEP 154A

NARINGAL 1

Location Map

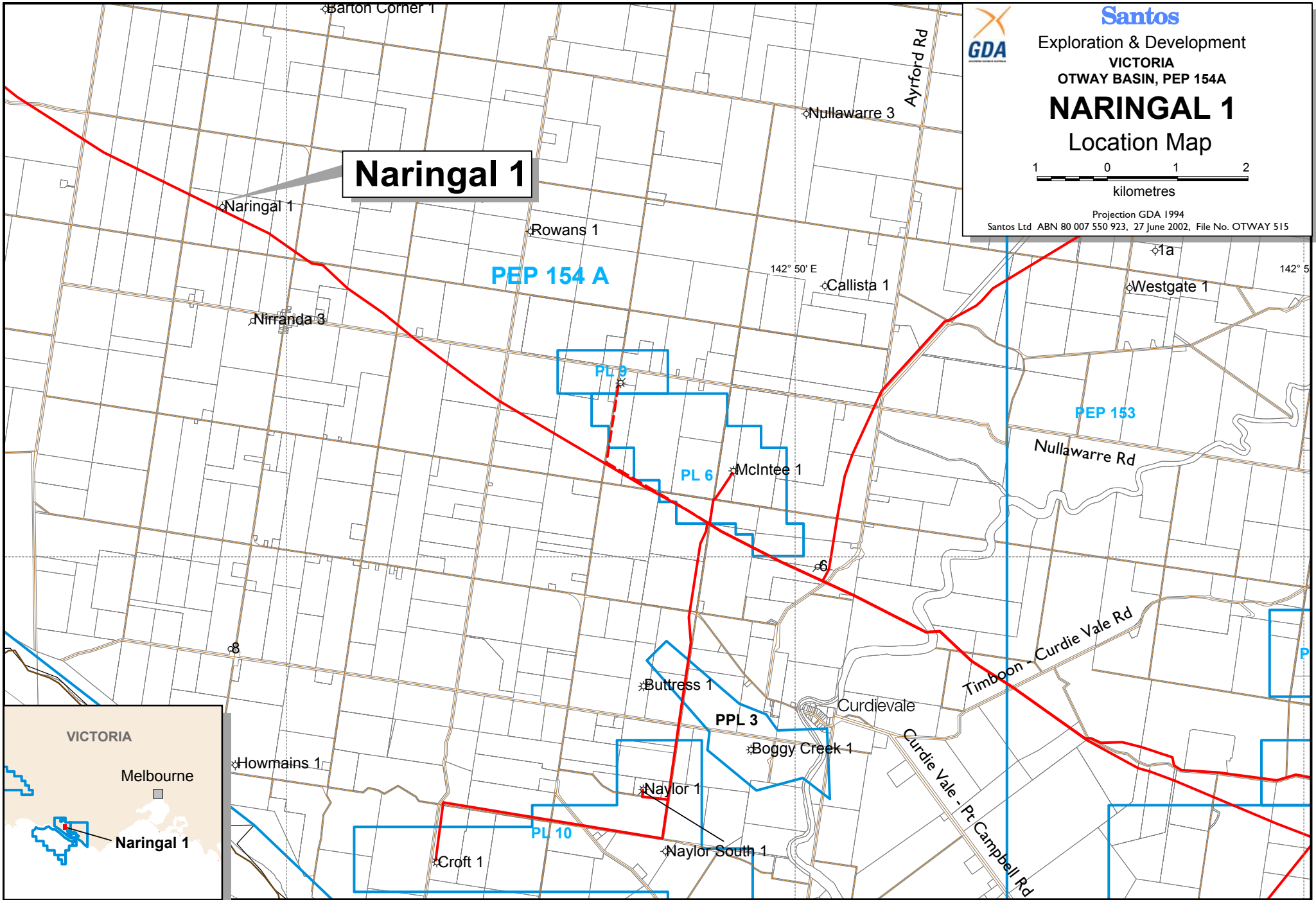
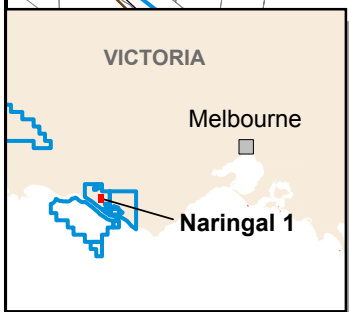


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Naringal 1

PEP 154 A

PEP 153



WELL DATA CARD

WELL HISTORY

1. GENERAL DATA

Well Name:	Naringal 1
Well Classification:	Gas Exploration
Interest Holders:	Santos Ltd (90%) Beach Petroleum (10%)
Participating Interests:	Santos Ltd (90%) Beach Petroleum (10%)
Operator	Santos
Block/Licence	PEP 154, Onshore Otway Basin, Victoria
Surface Location	Latitude: 38° 27' 18.32" South Longitude: 142° 44' 22.34" East
Surveyed Elevation	Ground Level: 50.17m Rotary Table: 54.87m
Seismic Survey	CURDIEVALE 3D
Seismic Location	CDP 10532, LINE 2202
Total Depth	Driller: 1710.0m Logger Ext: 1710.0m
Completion	Four plugs were set. Plug 1 set from 1618m to 1528m; Plug 2 set from 1135m to 1035m; Plug 3 set from 404m to 320m; Plug 4 set from 30m to surface.
Status	Plugged & Abandoned

2. DRILLING DATA

Date Drilling Commenced	1600 hours, 23 rd January 2002
Date Drilling Completed	0430 hours, 30 th January 2002
Date Rig Released	0700 hours, 2 nd February 2002
Contractor	Oil Drilling & Exploration Pty Ltd (OD&E)
Rig	OD&E 30
Rig Specifications	Refer to Appendix XIV

3. DRILLING SUMMARY

(a) Drilling Summary:

Naringal 1 was spudded at 1600 hours on the 23rd January 2002. A 250.825mm (9 7/8") surface hole was drilled to 382m (Drlr). A 193.675mm (7 5/8") surface casing was run and cemented from surface to 378m (Drlr). A Leak-Off Test was conducted to 1.95 S.G. EMW (16.3 ppg EMW) at 385m (Drlr). A 171.45mm (6 3/4") main hole was then drilled to a Total Depth of 1710m (Drlr) which was reached at 0430 hours, on the 30th January 2002. Naringal 1 was plugged and abandoned post logging with 4 plugs set. Plug#1 was set from 1618m to 1528m, Plug#2 set from 1135m to 1035m, Plug#3 set from 404m to 320m and Plug#4 set from 30m to surface. The rig was released at 0700 hours on 2nd February 2002. A more comprehensive drilling summary can be found in Appendix XIII, in the Drilling - Final Well Report.

Tables I and II summarise the casing, cementing and mud systems used in this well. A more comprehensive summary is appended to this report Appendix XIII: (Drilling - Final Well Report).

TABLE I: CASING, HOLE, AND CEMENT DETAILS

BIT SIZE	DEPTH	CSG SIZE	CSG DEPTH	JNTS	CSG TYPE	CEMENT
250.825mm (9.875")	382m	193.675mm (7 5/8")	378m (D&L)	32	26.4 lb/ft L-80	Lead: 60 bbls of Slurry (119 sacks Class G cement) @ 11.0 ppg + 4% bwoc of D020 + 1.5% bwoc of S001 + 0.01 gal/sax of D047. Tail: 22 bbls of slurry (104 sacks Class G) @ 15.6 ppg + 0.5 gal/sx of D145A + 0.01 gal/sx of D144 + 0.5 gal/sx of S001.
171.45mm (6.75")	1710 (D) 1710 (L)					

TABLE II: SUMMARY OF MUD SYSTEMS

MUD TYPE	INTERVAL (m)
Spud Mud (Gel/Water)	Surface – 382m
KCL/PHPA	382m – 1660m
KCL/Polymer	1660m – 1710m

(b) Lost Time:

Lost time at Naringal 1 – Please refer to Appendix XIII (Drilling - Final Well Report: Time Breakdown Data).

(c) Water Supply:

Local sources of water were used for Naringal 1. The make up water had the following properties:

Cl: 800 mg/l
 Hardness(Ca⁺⁺): -100 mg/l
 PH: 7.3
 Pf/Mf: 0.0/0.4

(d) Mudlogging:

Mudlogging services were provided by Geoservices Ltd. Samples were collected, washed, and described at 10m intervals from the surface to 1000m, 3m intervals from 1000m to 1710m (TD). All samples were checked for oil shows using ultraviolet fluorescence. Gas levels were monitored from the surface casing shoe to TD using a total gas detector and other parameters monitored include rate of penetration, weight on hook and mud pit levels.

(e) Testing:

No DST's were conducted on Naringal 1.

(f) Coring:

No cores were cut on Naringal 1.

(g) Electric Logging:

Reeves completed one suite with three wireline logging runs. A sonic and resistivity run (GR-STD-MSFL-DLL-CAL-LDL-CNL), side wall core run (GR-SWC) and a velocity survey run.

One suite of wireline logs was run in Naringal 1, as detailed below:

TABLE III: ELECTRIC LOG SUMMARY

LOG	SUITE/ RUN	INTERVAL (m)	BHT/TIME/ REMARKS	LOG	SUITE/ RUN	INTERVAL (m)	BHT/TIME/ REMARKS
GR	1/1	1675-surface	71°C/35:00hrs	GR - SWC	1/2		
SDT	1/1	1685 - 360	71°C/35:00hrs (waveform processing to 1485m)				24 Samples, 4 misfires, 1 lost, 19 bought. BHT not recorded
MSFL	1/1	1695 - 360	71°C/35:00hrs	VELOCITY	1/3		
DLL	1/1	1694 - 360	71°C/35:00hrs				20 point check point survey. BHT not recorded
CAL	1/1	1695 - 360	71°C/35:00hrs (noisy data over sands)				
LDL	1/1	1680 - 1480	71°C/35:00hrs				
CNL	1/1	1677 - 1480	71°C/35:00hrs				

*Logger Contractor - REEVES

(h) Geothermal Gradient:

An estimated static bottom hole temperature of 71.0°C at 1710m, and a geothermal gradient of 2.94°C/100m was calculated from down hole temperatures recorded during logging run 1.

(i) Hole Deviation

Directional surveys indicate a maximum deviation from vertical of 1.75° inclination 50.46°T at 1694m.

(j) Velocity Survey:

Velocity survey was run on Naringal 1.

(k) Completion Summary:

Naringal 1 was plugged and abandoned on the 2/2/02.

GEOLOGY

Four plugs were set at Naringal 1. Plug 1 was set from 1618m to 1528m; Plug 2 set from 1135m to 1035m; Plug 3 set from 404m to 320m and Plug 4 set from 30m to surface.

5. REFERENCES

Abele, C., Pettifer, G., Tabassi, A. 1995 The Stratigraphy, Structure, Geophysics, and Hydrocarbon Potential of the Eastern Otway Basin. Department of Agriculture, Energy and Minerals of Victoria. Geological Survey of Victoria, Geological Survey Report 103.

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APPENDIX I: LITHOLOGICAL DESCRIPTIONS

APPENDIX I (a): CUTTINGS

APPENDIX I (b): SIDE WALL CORES



Core Gun Shot Report

Tool Assembly
CGR- 13
CBA- 15

Client: Santos
Well: Naringal 1

Date: 31-Jan-02
Unit: V1030

Engineer: J. Kokonas
Witness: A. Hill

Core No.	Core Depth	Depth Offset	Shot Depth	Sonic Transit Time	Bullet Type	Cutter Ring	Powder Load	Pull	Sold	Remarks
1	1660.7	3.1	1657.6	79	Bobcat	Yes	550		Yes	Good Recovery
2	1647.7	3.0	1644.7	83	Bobcat	Yes	550	100	Yes	Good Recovery
3	1625.7	3.0	1622.7	84	Bobcat	No	550		Yes	Good Recovery
4	1615.7	2.9	1612.8	86	Bobcat	No	550		Yes	Good Recovery
5	1611.7	2.8	1608.9	80	Bobcat	Yes	550		Yes	Good Recovery
6	1609.7	2.8	1606.9	77	Bobcat	Yes	550	200	Yes	Good Recovery
7	1607.7	2.7	1605.0	83	Bobcat	No	550		Yes	Good Recovery
8	1605.7	2.6	1603.1	83	Bobcat	Yes	550		Yes	Good Recovery
9	1602.7	2.6	1600.1	84	Bobcat	Yes	550		No	Misfire
10	1600.7	2.5	1598.2	81	Bobcat	Yes	550	100	Yes	Good Recovery
11	1598.7	2.4	1596.3	81	Bobcat	No	550		Yes	Good Recovery
12	1595.7	2.4	1593.3	84	Bobcat	Yes	550		No	Lost
13	1594.2	2.3	1591.9	91	Bobcat	Yes	450	100	Yes	Good Recovery
14	1592.7	2.3	1590.4	83	Bobcat	No	550		Yes	Good Recovery
15	1590.7	2.2	1588.5	88	Bobcat	Yes	450		Yes	Good Recovery
16	1585.7	2.1	1583.6	89	Bobcat	Yes	450		Yes	Good Recovery
17	1582.7	2.1	1580.6	84	Bobcat	No	550		Yes	Good Recovery
18	1581.2	2.0	1579.2	90	Bobcat	Yes	450	100	Yes	Good Recovery
19	1576.7	1.9	1574.8	80	Bobcat	No	550	50	Yes	Good Recovery
20	1574.7	1.9	1572.8	86	Bobcat	No	550	50	Yes	Good Recovery
21	1571.2	1.8	1569.4	82	Bobcat	No	550		No	Misfire
22	1559.7	1.7	1558.0	89	Bobcat	Yes	550		Yes	Good Recovery
23	1554.7	1.7	1553.0	97	Bobcat	Yes	550		No	Misfire
24	1545.7	1.6	1544.1	92	Bobcat	Yes	550		No	Misfire

APPENDIX II: HYDROCARBON SHOW REPORTS

There were no hydrocarbon shows on Naringal 1

APPENDIX III: WIRELINE LOGGING REPORTS

APPENDIX III (a): LOGGING ORDER FORM

LOGGING ORDER FORM

COMPANY: Santos	
WELL: NARINGAL 1	FIELD: OTWAY
RIG: OD&E 30	STATE: VICTORIA
LOCATION: OTWAY, VICTORIA	BLOCK: PEP 154
LATITUDE: 38 27' 18.32" S (GDA 94)	LONGITUDE: 142 44' 22.34" E (GDA 94)
ELEVATION: _____ GL: 50.17	RT: 54.87 DF: 4.70
9 7/8" HOLE: 382m	7 5/8" CSG: 378 (D) WT: 26.4 lb/ft, L-80, BTC
6 3/4" HOLE: 1710	CSG: _____ WT: _____
TD (Drilr.): 1710	TD (Logr.): 1696.00
MUD SYSTEM: 4.2% KCl / Polymer	CIRC. STOPPED: 07:15 AM 30/January/2002
WT: 9.4 VISC: 39 PV/YP: 11/14 PH: 9.5 FLUID LOSS: 6.2 CHL: 26,000	K+: 22,700
GEOLOGIST: _____ A. HILL	

INFORMATION GIVEN ABOVE IS TO BE USED ON LOG HEADING SHEETS.

HOLE CONDITIONS: (TIGHT SPOTS, DEVIATION, COALS, BARITE IN MUD, ETC..)

Maximum Hole Deviation: 1.75deg @ 1694m
Maximum Dog Leg Severity: 1.99deg @ 1694m
KCl: 4.2 %, BARITE 0.50%

No expected over-pressure or depletion in Waarre Sandstone, possible over pressure in Eumeralla Fmn.
Expected fm press: 2250 psi
TIGHT HOLE:
Expected BHT: 200 Deg F Static (93.3 DegC)

DRILL STEM TESTS/CORED INTERVALS:

NO FORMATION TESTS

COMMENTS

LOGS:

PROGRAM CONFIRMED WITH OPERATIONS GEOLOGIST AT 07:30HRS HOURS ON 30/01/2002

PROGRAM VARIES FROM PRE-SPUD NOTES: YES: NO:

LOG	INTERVAL (m)	REMARKS/REPEAT SECTION
RUN # 1		
GR	TD to Surface	
SDT	TD to Surface	Full Waveform to 1500m
MSFL-DLL-CAL	TD to surface casing	MFSL to 100m above Pember Member, approx 850m
LDL-CNL	TD to 1490m	
RUN # 2		
SWC		
20 Samples	Points to be chosen from Run 1	Contingent on town
RUN # 3		
GR		
20 MDT Points	Points to be chosen from Run 1	Contingent on town
RUN # 4		
VELOCITY SURVEY		
<i>Transmitted Ascii data to include: dt24, dth, dtr, dtt, so11, so12, so13, so14 sonic curves.</i>		

REMARKS:

(ALL OPERATIONS ARE TO CONFORM TO CURRENT SANTOS OPERATING PROCEDURES)

- 1 TENSION CURVE - TO BE DISPLAYED ON LOG FROM T.D. TO CASING SHOE.
- 2 ALL CALIBRATIONS IN CASING MUST BE VERSUS DEPTH. (IF HOLE CONDITIONS PERMIT).
- 3 SONIC WAVEFORMS TO BE RECORDED FROM TD TO 30m ABOVE CONIACIAN (WAARRE FORMATION).
- 4 ALL ZONES OF SONIC CYCLE SKIPPING OR POOR QUALITY DATA TO BE REPEATED AND NOTED IN REMARKS SECTION. (EXCEPT ABOVE NARRAWATURK MARL. IF HOLE CONDITION IS POOR).
- 5 REPEAT SECTION NOT TO BE RUN IN 6" HOLES, COMPARE DOWN LOG FOR REPEAT ANALYSIS.
- 6 REPEAT SECTION TO BE LOGGED PRIOR TO MAIN LOG OVER INTERVAL OF INTEREST. (IF HOLE CONDITIONS ALLOW). CONFIRM REPEAT SECTION INTERVAL WITH OPERATIONS GEOLOGIST.
- 7 ALL THERMOMETER READINGS TO BE RECORDED ON LOG
- 8 ALL SCALES AND PRESENTATIONS TO CONFIRM TO STANDARDS UNLESS OTHERWISE ADVISED.
- 9 THE FIELD/EDIT TAPE MUST BE A MERGED COPY OF ALL LOGS RUN. SEPARATE TAPES ARE ONLY ACCEPTABLE AS AN INTERIM MEASURE.
- 10 ANY CHANGE FROM STANDARD PROCEDURES/SCALES TO BE NOTED IN REMARKS SECTION.
- 11 RM, RMF, RMC AND BHT MUST BE ANNOTATED ON FAXED LOGS. FAXED LOGS SHOULD ALSO INDICATE IF ON DEPTH OR NOT.
- 12 LOG DATA IS TO BE TRANSMITTED AS SOON AS POSSIBLE AFTER ACQUISITION. IF ANY DELAYS ARE LIKELY OR IF DATA TRANSMISSION WILL ADVERSELY EFFECT THE OPERATION THEN THE OPERATIONS GEOLOGIST MUST BE IMMEDIATELY INFORMED.
- 13 THE OPERATIONS GEOLOGIST MUST BE INFORMED IMMEDIATELY OF ANY TOOL OR HOLE PROBLEMS, LOST TIME OR ANY OTHER EVENT WHICH MAY AFFECT THE LOGGING OPERATIONS.

APPENDIX III (B): ELECTRIC LOG TIME SUMMARY

30-Jan	RIG UP / DOWN	TOOL CHECK	RIH / POOH	LOGGING	DATA TX	LOST TIME LOGGER	I. O.	WIPER TRIP	LOST TIME OTHERS	OTHERS	COMMENTS / REMARKS
0:00											
:30											
1:00											
:30											
2:00											
:30											
3:00											
:30											
4:00											
:30											04:30, WELL TD, CIRCULATE BOTTOMS UP
5:00											
								0:15			WIPER TRIP
:30								0:15			
								0:15			
6:00								0:15			
								0:15			
:30								0:15			
								0:15			
7:00								0:15			
			0:15								07:15, STOP CIRCULATION, POOH FOR LOGGING
:30			0:15								
			0:15								
8:00			0:15								
			0:15								
:30			0:15								
			0:15								
9:00			0:15								
			0:15								
:30			0:15								
			0:15								
10:00			0:15								
			0:15								
:30			0:15								
			0:15								
11:00			0:15								
			0:15								
:30	0:15										11:30, START RIGGING UP SHEAVES.
	0:15										

TOTALS	<u>WSG (SIGN)</u>	<u>ENGINEER (SIGN)</u>
--------	-------------------	------------------------

0:30	0:30	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
------	------	------	------	------	------	------	------	------	------	------

TOOLS RUN: GR-SDT-MFSL-DLL-CAL-LDL-CNL

0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
------	------	------	------	------	------	------	------	------	------	------

TOOLS RUN: GR-SWC

0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
------	------	------	------	------	------	------	------	------	------	------

TOOLS RUN: GR-VELOCITY

LOGGING UNIT: 1030

WELL NAME: NARINGAL 1

PAGE: 2

30-Jan	RIG UP / DOWN	TOOL CHECK	RIH / POOH	LOGGING	DATA TX	LOST TIME LOGGER	I. O.	WIPER TRIP	LOST TIME OTHERS	OTHERS	COMMENTS / REMARKS
12:00	0:15										
	0:15										12:25, RIH WITH RUN 1 (GR-MSFL-DLL-CAL-LDL-CNL)
:30			0:15								12:35, CALIBRATE @ SHOE, 2m OUT, REZERO @ SURFACE
		0:15									12:50, 2m OFF DEPTH, POOH, REZERO @ SURFACE
13:00						0:15					13:05, BACK TO SHOE, CALIBRATE CORRECT.
			0:15								
:30			0:15								
			0:15								
14:00			0:15								
				0:15							14:20, AT BOTTOM, LOGGERS TD - 1695m
:30				0:15							START SEMBLANCE PROCESSING
				0:15							
15:00				0:15							BACK TO BOTTOM FOR MAIN UPLOG
				0:15							
:30				0:15							
				0:15							
16:00				0:15							16:00, STOP UPLOG FOR PDF FILE MAKING
				0:15							
:30				0:15							
				0:15							
17:00				0:15							17:10, TOOLS AT SURFACE, START RIG DOWN RUN 1.
	0:15										
:30	0:15										
	0:15										
18:00	0:15										18:00, TOOLS ON CATWALK
	0:15										18:30, RUN 1 RIGGED DOWN, RIG UP RUN 2 (GR-SWC)
:30	0:15										RIG UP SWC GUN, 24 SAMPLES PLANNED
	0:15										
19:00	0:15										
	0:15										
:30	0:15										
	0:15										
20:00	0:15										
	0:15										
:30	0:15										
	0:15										
21:00			0:15								21:00, CONDUCT SAFETY MEETING, START RIH RUN 2
			0:15								
:30			0:15								
			0:15								21:45, GR CORRELATION, AND AGAIN, AND AGAIN.....
22:00			0:15								
			0:15								
:30				0:15							22:30, SHOOT FIRST POINT,
				0:15							
23:00						0:15					21:55, GR SUB FAILED, LOST TOOL COMMUNICATION, POOH
						0:15					5 GOOD SHOTS.
:30						0:15					
						0:15					

WSG (SIGN) ENGINEER (SIGN)

TOTALS

6:30	1:45	0:15	1:15	3:00	0:00	0:15	0:00	0:00	0:00	0:00
5:30	2:30	0:00	1:30	0:30	0:00	1:00	0:00	0:00	0:00	0:00
0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00

TOOLS RUN: GR-SDT-MFSL-DLL-CAL-LDL-CNL
 TOOLS RUN: GR-SWC
 TOOLS RUN: GR-VELOCITY

31-Jan	RIG UP / DOWN	TOOL CHECK	RIH / POOH	LOGGING	DATA TX	LOST TIME LOGGER	I. O.	WIPER TRIP	LOST TIME OTHERS	OTHERS	COMMENTS / REMARKS
0:00						0:15					
				0:15							BACK IN TO SHOOT SWC
:30				0:15							
				0:15							
1:00				0:15							
				0:15							
:30				0:15							
				0:15							
2:00				0:15							
			0:15								02:30, TOOL TO SURFACE, START RIG DOWN...
:30	0:15										
	0:15										02:50, RIG DOWN SHEAVES, START WIPER TRIP..
3:00								0:15			WIPER TRIP PRIOR TO VELOCITY SURVEY
								0:15			
:30								0:15			
								0:15			
4:00								0:15			
								0:15			
:30								0:15			
								0:15			
5:00								0:15			
								0:15			
:30								0:15			
								0:15			
6:00								0:15			
								0:15			
:30								0:15			
								0:15			
7:00								0:15			
								0:15			
:30								0:15			
								0:15			
8:00								0:15			
								0:15			
:30								0:15			
								0:15			
9:00								0:15			
								0:15			
:30								0:15			
								0:15			
10:00								0:15			
								0:15			
:30	0:15										10:30, START RIG UP FOR VELOCITY SURVEY... WAIT ON
	0:15										EXPERTEST TO RIG CHARGES..
11:00	0:15										
	0:15										
:30	0:15										
	0:15										

TOTALS	<u>WSG (SIGN)</u>	<u>ENGINEER (SIGN)</u>
---------------	-------------------	------------------------

0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
------	------	------	------	------	------	------	------	------	------	------

TOOLS RUN: GR-SDT-MFSL-DLL-CAL-LDL-CNL

3:00	0:30	0:00	0:15	2:00	0:00	0:15	0:00	0:00	0:00	0:00
------	------	------	------	------	------	------	------	------	------	------

TOOLS RUN: GR-SWC

1:30	1:30	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
------	------	------	------	------	------	------	------	------	------	------

TOOLS RUN: GR-VELOCITY

31-Jan	RIG UP / DOWN	TOOL CHECK	RIH / POOH	LOGGING	DATA TX	LOST TIME LOGGER	I. O.	WIPER TRIP	LOST TIME OTHERS	OTHERS	COMMENTS / REMARKS
12:00	0:15										
	0:15										
:30			0:15								12:30, RIH WITH VELOCITY GEAR... NO GR ????
				0:15							12:45, POWER DOWN TO RIG, START RIG UP CHARGES
13:00				0:15							FIRST TESTS @ 56m, BACKGROUND NOISE CHECK..
				0:15							
:30				0:15							13:35, TESTS AT CASING SHOE.....
				0:15							
14:00				0:15							14:00, RIH TO TESTS ON DOWN RUN.
				0:15							
:30				0:15							
				0:15							
15:00				0:15							15:00, AT BOTTOM, START UP - TESTING POINTS
				0:15							
:30				0:15							
				0:15							
16:00				0:15							
				0:15							
:30				0:15							
				0:15							
17:00				0:15							
				0:15							
:30				0:15							
				0:15							
18:00				0:15							18:00, LAST SHOT DONE, POOH, START RIG DOWN
	0:15										18:20, INITIAL TEST REPORT FINISHED
:30	0:15										
	0:15										
19:00											WELL TO SANTOS
:30											
20:00											
:30											
21:00											
:30											
22:00											
:30											
23:00											
:30											

TOTALS	WSG (SIGN)	ENGINEER (SIGN)
--------	------------	-----------------

0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
------	------	------	------	------	------	------	------	------	------	------

TOOLS RUN: GR-SDT-MFSL-DLL-CAL-LDL-CNL

0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
------	------	------	------	------	------	------	------	------	------	------

TOOLS RUN: GR-SWC

7:00	1:15	0:00	0:15	5:30	0:00	0:00	0:00	0:00	0:00	0:00
------	------	------	------	------	------	------	------	------	------	------

TOOLS RUN: GR-VELOCITY

GRAND TOTALS

7:00	2:15	0:15	1:15	3:00	0:00	0:15	0:00	0:00	0:00	0:00
8:30	3:00	0:00	1:45	2:30	0:00	1:15	0:00	0:00	0:00	0:00
8:30	2:45	0:00	0:15	5:30	0:00	0:00	0:00	0:00	0:00	0:00

TOOLS RUN: GR-SDT-MFSL-DLL-CAL-LDL-CNL

TOOLS RUN: GR-SWC

TOOLS RUN: GR-VELOCITY

OVERALL JOB TOTAL

24:00	8:00	0:15	3:15	11:00	0:00	1:30	0:00	0:00	0:00	0:00
-------	------	------	------	-------	------	------	------	------	------	------

SERVICE QUALITY SUMMARY

CLIENT WSG					ENGINEER					
1	2	3	4	5	1	2	3	4	5	
						✓				SAFETY
					✓					PROMPTNESS
							✓			TOOL & SURFACE SYSTEM PERFORMANCE
					✓					ATTITUDE & CO-OPERATION
					✓					WELLSITE PRODUCTS / LOG QUALITY
						✓				COMMUNICATIONS / TX PERFORMANCE
										OTHER (PLEASE SPECIFY)

1 Excellent, 2 - 3 Normal, 4 - 5 Very Poor

APPENDIX III (C): FIELD ELECTRIC LOG REPORT

FIELD ELECTRIC LOG REPORT

WELL:	NARINGAL 1
LOGGING ENGINEER:	J. KOKONAS, G McMANUS
RUN No.:	1, 2
DRILLERS DEPTH:	1710.00
ARRIVED ON SITE:	PM (29 JAN)
ACTUAL LOGGING TIME:	24:00
TOTAL TIME:	24:00

GEOLOGIST:	A. HILL
	SUITE 1, RUN 1 & 2
DATE LOGGED:	30-Jan-02
LOGGERS DEPTH:	1696.00
CIRCULATION STOPPED:	07:15 30/Jan/02
LOST TIME LOGGERS:	1:30
LOST TIME OTHERS:	0:00

TYPE OF LOG	GR-SDT-MFSL-DLL-CAL-LDL-CNL	GR-SWC
TIME CIRC. STOPPED:	07:15 30/Jan/02	07:15 30/Jan/02
TIME TOOL RIG UP:	11:30 30/Jan/02	18:30 30/Jan/02
TIME TOOL RIH:	12:25 30/Jan/02	21:00 30/Jan/02
TIME TOOL RIG DOWN:	18:30 30/Jan/02	03:00 31/Jan/02
TOTAL TIME:	7:00	8:30

TYPE OF LOG	GR-VELOCITY
TIME CIRC. STOPPED:	07:15 30/Jan/02
TIME TOOL RIG UP:	10:30 31/Jan/02
TIME TOOL RIH:	12:30 31/Jan/02
TIME TOOL RIG DOWN:	19:00 31/Jan/02
TOTAL TIME:	8:30

TYPE OF LOG	FROM (m)	TO (m)	REPEAT SECTION	TIME SINCE LAST CIRCULATION	BHT
RUN # 1					
GR	1675	SURFACE		7:10	71°C
STD	1685	360			
STD (WAVEFORM)	1685	1485			
MSFL	1695	360			
DLL	1694	360			
CAL	1695 (MSFL), 1679 (LDL)	360			
LDL	1680	1480			
CNL	1677	1480			
RUN # 2					
GR-SWC	24 PRESET POINTS	4 MISFIRES, 1 LOST, 19 BOUGHT		BHT not recorded	
RUN # 3					
VELOCITY SURVEY	20 CHECK SHOTS			BHT not recorded	

SUITE/RUN	BHT	DEPTH	TIME	SUITE/RUN	BHT	DEPTH	TIME	SUITE/RUN	BHT	DEPTH	TIME	SUITE/RUN	BHT	DEPTH	TIME
1 / 1	71	1690	7.2	1 / 2				1 / 3				1 / 4			

MUD SYSTEM:	TYPE	WT.	VISC.	WL	PH	Cl	PV/YP	RMF	RM	RMC
	4.2% KCl / Polymer	9.4	39	6.2	9.5	26,000	11/14	0.216 ohmm @ 16.5 C	0.233 ohmm @ 18.8 C	0.388 ohmm @ 20.9 C

HOLE CONDITIONS:

Maximum Hole Deviation: 1.75deg @ 1694m

Maximum Dog Leg Severity: 1.99deg @ 1694m

KCl: 4.2 %, BARITE 0.50%

LOG ORDER FORM	✓	MUD SAMPLE RESISTIVITY	✓	TOOL No. / CODE CHECK	
OFFSET WELL DATA		CABLE DATA CARD	✓	LOG SEQUENCE CONFIRM	✓

LOG TYPE	SDT	GR	CAL	DLL	MSFL	SP	ZDL	CNL		GR	SWC	REMARKS
CASING CHECK			✓									
SCALE CHECK	✓	✓	✓	✓	✓	✓	✓	✓				
DEPTH Casing Total		✓	✓		✓							
CALIBRATIONS OK	✓	✓	✓	✓	✓	✓	✓	✓				
REPEATABILITY												
LOGGING SPEED	✓	✓	✓	✓	✓	✓	✓	✓				
OFFSET WELL REPEATABILITY												
NOISY MISSING DATA	📁		📁									
CURVES / LOGS DEPTH MATCHED												
Rm MEASUREMENTS				✓	✓							
RS / RD CHECK				✓								
?PERF / ZCOR CHECK												
LOG HEADER / TAIL	✓	✓	✓	✓	✓	✓	✓	✓				
PRINT FILM QUALITY	✓	✓	✓	✓	✓	✓	✓	✓				

Notes:

- 1 - SDT DATA A LITTLE NOISY DUE TO ROAD NOISE?
- 2 - CAL DATA STRANGE.... HAS VERY RUGOSE WALL?

APPENDIX IV: LOG ANALYSIS

APPENDIX V: PRESSURE SURVEY

No pressure surveys were taken for Naringal 1

APPENDIX VI: DRILL STEM TEST DATA

No drill stem tests were conducted for Naringal 1

APPENDIX VII: HYDROCARBON ANALYSIS

No Hydrocarbon Analysis was done for Naringal 1

APPENDIX VIII: WATER ANALYSIS

No Water Analysis was conducted on Naringal 1

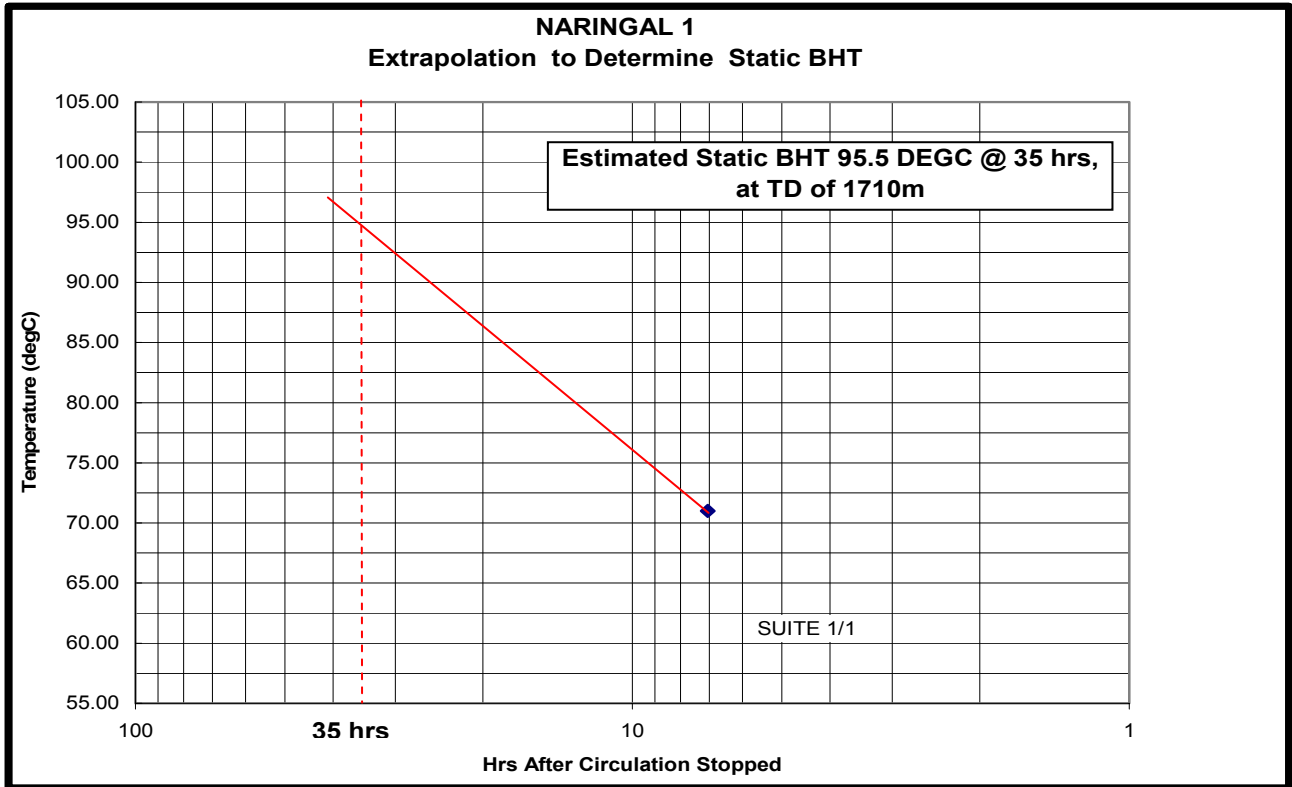
APPENDIX IX: PALYNOLOGICAL ANALYSIS

This analysis will be forwarded as soon as it is available.

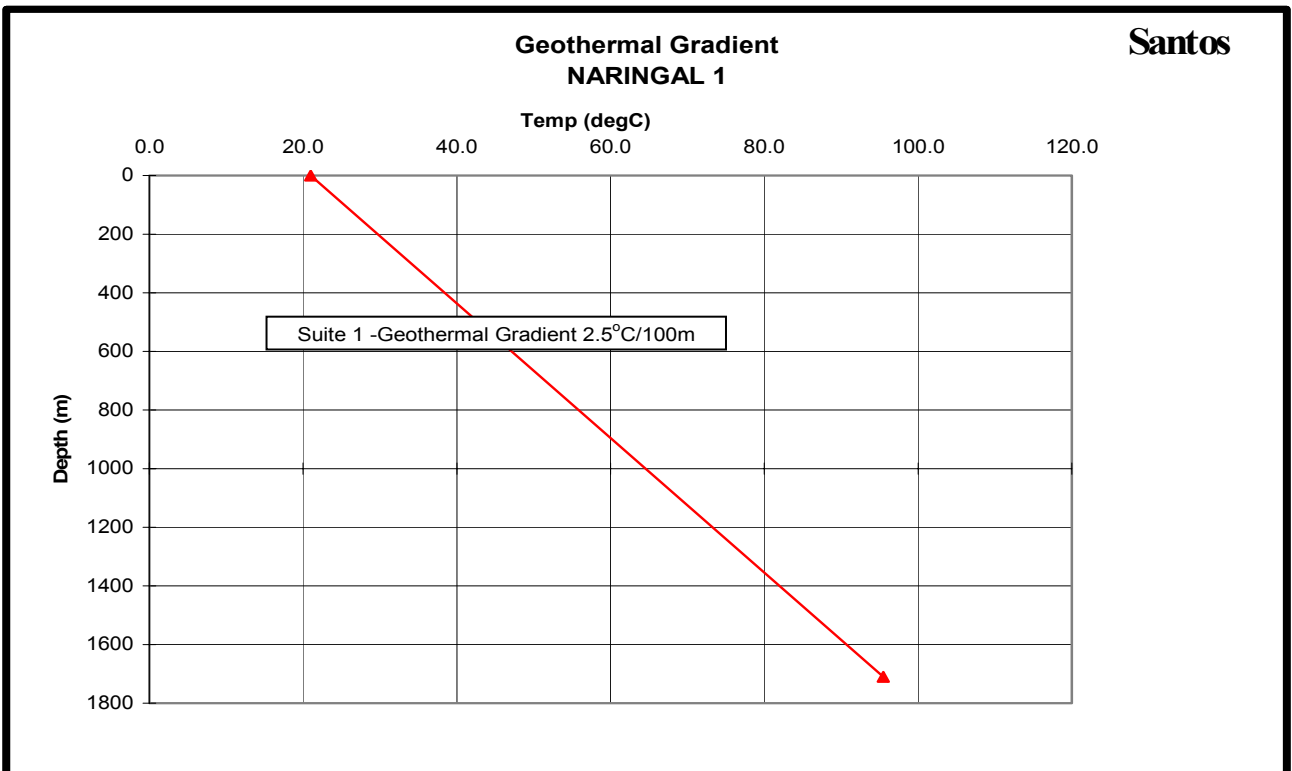
APPENDIX X: GEOTHERMAL GRADIENT

Calculated using Rule of Thumb method as only one logging temperature recorded.

	Max Recorded Temp (degC)	Depth Recorded (m)	Time Since Circulation. (hrs)	Total Depth (m)	Estimated BHT (degC)
Run 1	71	1710	7.05	1710	71.00
Run 2					
Run 3					

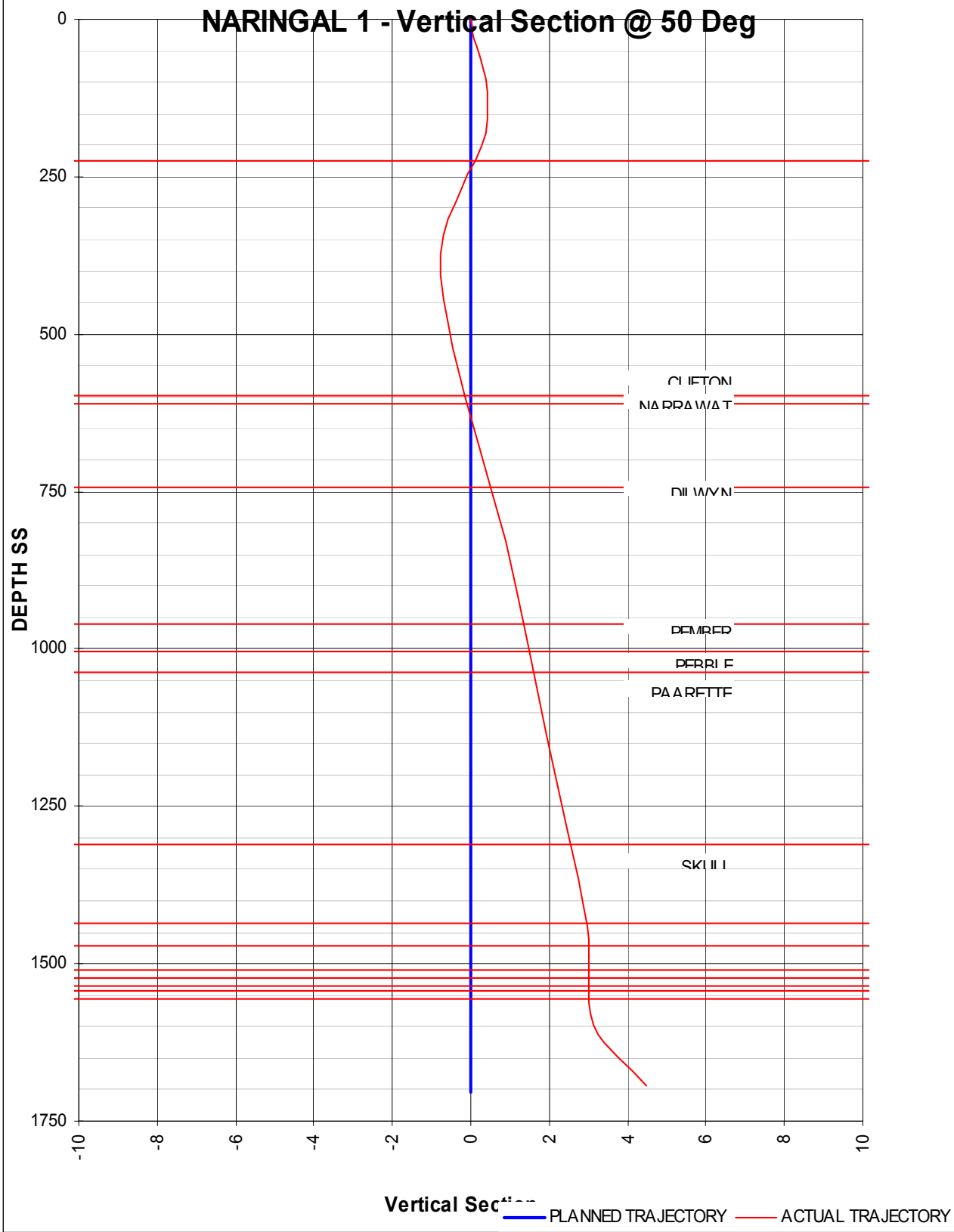


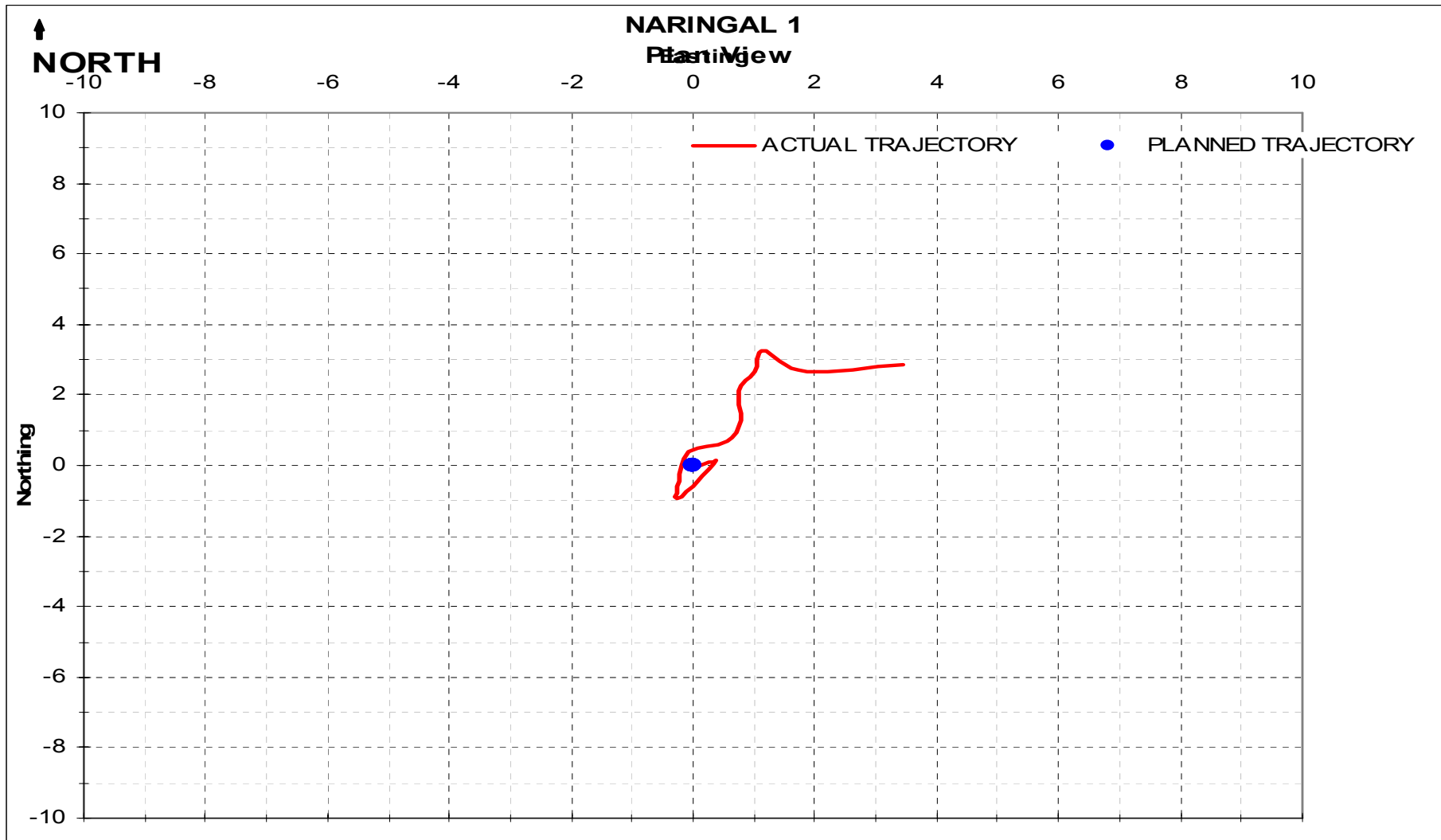
STATIC BHT @ 35 hrs	95.5	°C	@	1710	m
SURFACE TEMP.	21	°C	@	0	m
Geothermal Gradient for Suite 1			2.50	°C/100 m	



APPENDIX XI: DEVIATION DATA

NARINGAL 1					Actual Trajectory Data				Angle for section plot:			50
DEPTH	INCLIN	Azimuth	TVD	TVD	Northing	Easting	Dog Leg	Vert	Vert	TVD for	Displ	Direction
MD (FT)	DEG	DEG (T)	FT	S/S ft	north	east	°/100'	Sect	Plane	Plan Traj		True
0.00	0.00	000	0.00	-54.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31.00	0.38	085	31.00	-23.87	0.01	0.10	1.22	0.08	-0.08	31.00	0.10	85.00
95.00	0.25	018	95.00	40.13	0.16	0.36	0.57	0.38	-0.38	95.00	0.39	65.82
181.00	0.25	196	181.00	126.13	0.16	0.36	0.58	0.38	-0.38	181.00	0.40	66.45
268.00	0.63	212	268.00	213.13	-0.43	0.06	0.45	-0.23	0.23	268.00	0.43	172.38
374.00	0.00	011	373.99	319.12	-0.92	-0.25	0.59	-0.79	0.79	373.99	0.96	195.22
520.00	0.38	004	519.99	465.12	-0.44	-0.22	0.26	-0.45	0.45	519.99	0.49	206.26
674.00	0.25	020	673.99	619.12	0.38	-0.07	0.10	0.20	-0.20	673.99	0.39	350.10
828.00	0.38	091	827.99	773.12	0.69	0.56	0.25	0.87	-0.87	827.99	0.89	38.95
983.00	0.50	335	982.99	928.12	1.29	0.79	0.48	1.43	1.43	982.99	1.52	31.27
1136.00	0.25	050	1135.98	1081.11	2.11	0.76	0.33	1.94	-1.94	1135.98	2.25	19.77
1290.00	0.25	356	1289.98	1235.11	2.67	0.99	0.15	2.47	2.47	1289.98	2.84	20.45
1440.00	0.25	036	1439.98	1385.11	3.26	1.16	0.11	2.98	-2.98	1439.98	3.46	19.66
1598.00	0.75	150	1597.98	1543.11	2.64	1.88	0.56	3.14	-3.14	1597.98	3.24	35.50
1694.00	1.75	059	1693.96	1639.09	2.85	3.45	1.99	4.48	-4.48	1693.96	4.48	50.46



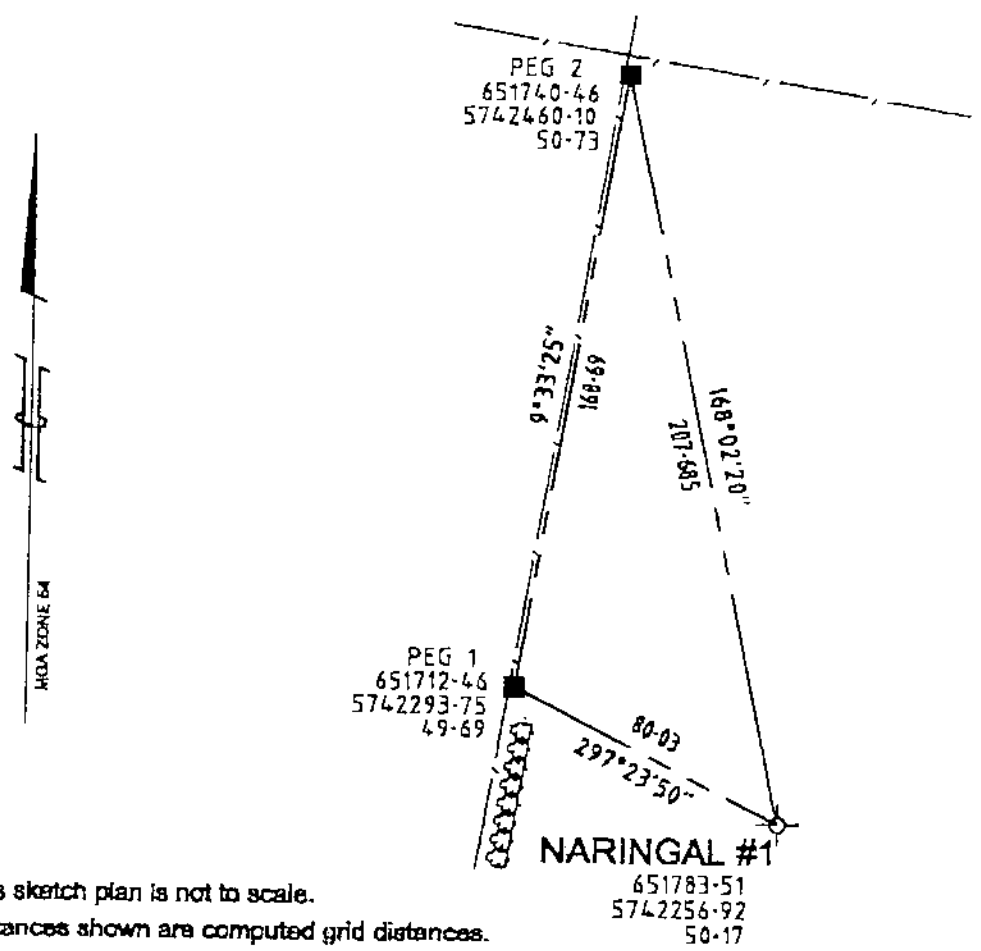


APPENDIX XII: WELL LOCATION SURVEY

61355612935

VICTORIA
GAS WELL LOCATION
 REFERENCE MARKS SKETCH PLAN
 EXPLORATION LICENCE PEP 154

Well Name	NARINGAL #1		
Map			
Spheroid	GDA94	MGA 94	ZONE 54
Latitude	S 38°27'18.32"	Measurement units (metres)	
Longitude	E 142°44'22.34"	Easting	651 783.51
Convergence	1°04'55"	Northing	S 742 256.92
Scale Factor	0.99987584	Elevation	50.17 AHD



NOTES : This sketch plan is not to scale.
 Distances shown are computed grid distances.
 Bearings shown are computed grid bearings.
 DATUM : GDA94 vide Peg 1 and Peg 2.
 Datum coordinates determined by Fyfe
 Surveyors 22 / 10 / 2001.
 Height datum is to AHD vide pegs as above.

Estimated Horizontal error is less than +/- 0.05 metre.
 Estimated Vertical error is less than +/- 0.05 metre.
 Date of Survey : 21 / 01 / 2002

Paul Crowe Surveyor ABN 59521601183 "Ambleside" 192 Kororoit Street Warrnambool 3280 Ph. (03) 5561 1500	REF 1063
---	-----------------

Date 21 / 01 / 2002

Trevor McDowell
 TREVOR McDOWELL
 LICENSED SURVEYOR

APPENDIX XIII: DRILLING - FINAL WELL REPORT

The logo for Santos, featuring the word "SANTOS" in a bold, blue, serif font, enclosed within a white rectangular box with a thin black border. The background of the entire page is a high-contrast, black and white photograph of an oil drilling rig, showing the derrick and various mechanical components.

SANTOS

FINAL WELL REPORT

NARINGAL #1

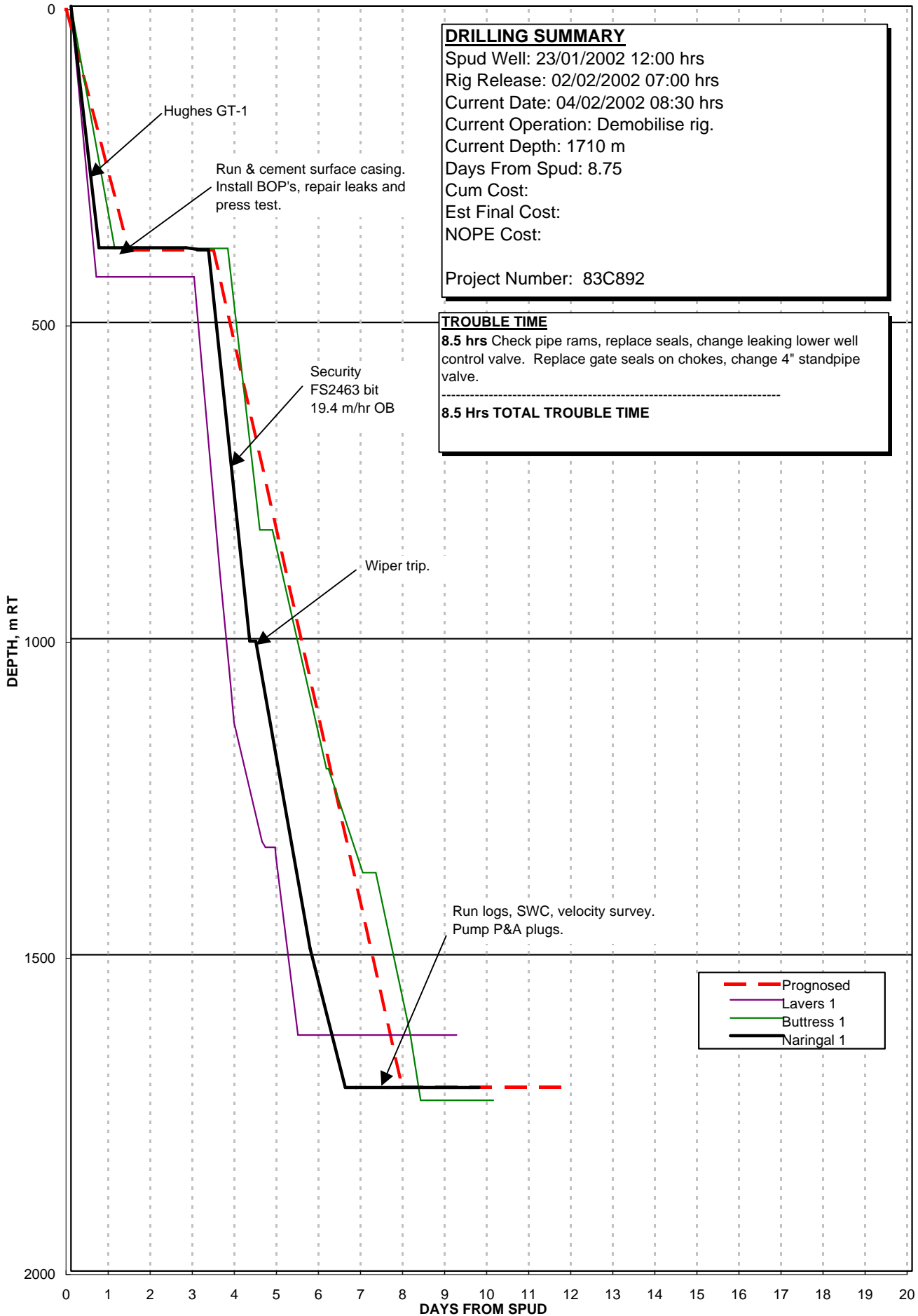
Drilling Supervisor(s)	: Duncan New
Drilling Engineer(s)	: Justine Bevern
Report Author	: T. Robertson
Report Supervisor	: M. Bill
Date of Issue	: 19th April 2002

Table of Contents

Section 1 – Well Summary	
Time vs Depth Curve	
Section 2 – Well History	
Well History Report	
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Bit Record	
FIT/LOT Report.....	
Section 4 – Casing and Cementing.....	
Casing and Cementing Report/s.....	
Wellhead Installation Report/Plug and Abandonment Report.....	

Section 1 – Well Summary
Time vs Depth Curve

NARINGAL 1 TIME v DEPTH CURVE



Section 2 – Well History
Well History Report

NARINGAL #1

Drilling Co.: OD&E

Rig: OD&E #30

RT above GL: 53 m Lat : 38 deg 27 min 18.32 sec Spud Date: 23/01/2002 Release Date: 02/02/2002
 GL above MSL : 49 m Long : 142 deg 44 min 22.33 sec Spud Time: 16:00:00 Release Time: 07:00:00

Well History

#	DATE	DEPTH	WELL HISTORY (24 Hr Summary)
1	19/01/2002	0	Start rigging down at Butress #1.
2	20/01/2002	0	Rig down and lower mast. prepare to move rig. Move matting and spot and new location.
3	21/01/2002	0	Move rig to Naringal #1 and rig up.
4	22/01/2002	0	Wait on daylight. Rig up.
5	23/01/2002	181	Finish rigging up. Spud in and drill to 195m.
6	24/01/2002	382	Drill to 382m Circulate hole clean. Wiper trip to bit. Circulate hole clean. POOH and lay out DC's. Rig up and run 32 joints of 7 5/8" casing. Cement casing.
7	25/01/2002	382	Finish cementing casing. WOC. Install bradenhead. Nipple up and test BOP's.
8	26/01/2002	436	Pressure test BOP's. Change out pipe ram rubbers. Replace gate and seat on two choke valves. M/U BHA and RIH. Drill shoe track and run LOT. Replace/repair and test upper kelly cock and 4" valve on standpipe. Drill ahead.
9	27/01/2002	1,004	Drill ahead with surveys to 1004m Circulate. Run survey. POOH to 231m for wiper trip.
10	28/01/2002	1,376	Drill ahead with surveys to 1374m.
11	29/01/2002	1,672	Drill to 1619m. CBU. Wiper trip to 828m. Drill to 1629m Shut in and monitor pressures. Drill ahead to 1672m.
12	30/01/2002	1,710	Drill to 1710m. CBU. 5 stand wiper trip. CBU. POOH. Run wireline logs. Run 1 super combo. Run 2 CST's.
13	31/01/2002	1,710	Run wireline logs run 2. Wiper trip to TD. Run log #3: Velocity survey.
14	01/02/2002	1,710	Set cement plug 3 across shoe. Lay down pipe. RIH and tag plug. Lay down BHA. Nipple down BOP's.
15	02/02/2002	1,710	Set surface plug. Clean tanks lay out kelly and release rig.

Section 3 – Drilling Data
Bit Record
FIT/LOT Report

NARINGAL #1

Drilling Co.: OD&E

Rig : OD&E #30

RT above GL : 53 mtrs
GL above MSL : 49 mtrsLat : 38 deg 27 min 18.32 sec
Long : 142 deg 44 min 22.33 secSpud Date: 23/01/2002
Spud Time: 16:00:00Release Date: 02/02/2002
Release Time: 07:00:00**BIT RECORD**

DATE	BIT#	SIZE "	IADC	SER	MFR	TYPE	JETS	D.IN mtrs	D.OUT mtrs	MTRG	HRS o/b	SPP psi	FLW gpm	WOB k-lbs	RPM	MW ppg	TFA sq.in	VEL mps	HHP /sq"	ROP m/hr	I	O1	D	L	B	G	O2	R
24/01/2002	1	9.88	117	A33JB	HUGHES	GT-1	3x20	0	382	382	7.9	953	560	5.0	110	8.9	0.921	59	0.00	48.4	2	2	WT	A	0	I	RR	TD
30/01/2002	2	6.75		5009516	DBS	FS2463	4x12	382	1,710	1,328	52.7	1495	334	5.1	101	9.1	0.442	69	0.00	25.2	8	3	RO	N	X	I	BT	TD
31/01/2002	3RR	6.75	517	MH 4631	SMITH	XR32TDG	3x32	1,710	1,710	0	0.0	1800	311	0.0	0	9.5	2.357	13	0.00	5	5	WT	A	E	I	ER	TD	

Section 4 – Casing and Cementing

Casing and Cementing Report/s

Wellhead Installation Report/Plug and Abandonment Report

APPENDIX XIV: RIG SPECIFICATIONS

Rig Inventory for RIG # 30

DRAWWORKS	:	Ideco Hydrair H-725-D double drum with V-80 Parmac hydromatic brake, Martin Decker satellite automatic drilling control. Max. single line pull - 50,000 lbs. Main drum grooved for 1-1/8" drilling line.
SUBSTRUCTURE	:	One piece substructure 14' high x 13'6" wide x 50' long with 12' BOP clearance. Setback area loading: 250,000 lbs Casing area loading: 275,000 lbs
ENGINES	:	Four (4) Caterpillar Model 3412 PCTA diesel engines.
BRAKE	:	V-80 Parmac hydromatic brake,
MAST	:	Dreco Model #: M12713-510 Floor Mounted Cantilever Mast designed in accordance with API Specification 4E Drilling & Well Servicing Structures. Hook load Gross Nominal Capacity - 510,000 lbs with:- 10 lines strung - 365,000 lbs 8 lines strung - 340,000 lbs Clear working height of 127'. Base width of 13'6". Adjustable racking board with capacity for i) 108 stands of 4.½" drill pipe, ii) 10 stands of 6.½" drill collars, iii) 3 stands of 8" drill collars Designed to withstand an API windload of 84 mph with pipe racked and 100 mph with no pipe racked.
CATHEADS	:	One (1) Foster Model 37 make-up spinning cathead mounted on drillers side. One (1) Foster Model 24 break-out cathead mounted off drillers side.
TRAVELLING BLOCK/HOOK	:	One (1) 667 Crosby McKissick 250 ton combination block hook Web Wilson. 250 ton Hydra hook Unit 5 - 36" sheaves.
WINCHES	:	One (1) Ingersol Rand HU-40 with 5/8" wireline. Capacity 2,000 lb. One (1) ANSI B30.7 with 3/8" wire capacity 4000lbs @ 70 fpm
SWIVEL	:	One (1) Oilwell PC-300 ton swivel
RIG LIGHTING	:	Explosive proof fluorescent. As per approved State Specifications.
KELLY DRIVE	:	One (1) 27 HDP Varco kelly drive bushing.
MUD PUMPS	:	Two (2) Gardner Denver mud pumps Model PZH-8 each driven by 750 HP EMD D-79 motors. 8" stroke with liner size 6" through to 5". 6" liner maximum pressure 2387 psi 5.1/2" liner maximum pressure 2841 psi 5" liner maximum pressure 3437 psi 6" liner maximum volume 412 gpm 5.1/2" liner maximum volume 345 gpm 5" liner maximum volume 280 gpm

MIXING PUMP	:	Two (2) Mission Magnum 5" x 6" x 14" centrifugal pump complete with 50 HP, 600 Volt, 60 Hz, 3 phase explosion proof electric motors.
MUD AGITATORS	:	Five (5) Geograph/Pioneer 40TD - 15" 'Pitbull' mud agitators with 15 HP, 60 Volt, 60 Hz, 3 phase electric motors.
LINEAR MOTION SHALE SHAKERS	:	Two (2) DFE SCR-01 Linear motion shale shakers.
DEGASSER	:	48" Dia Poor Boy Degasser
DESILTER	:	One (1)DFE - Harrisburg style 12 cone desilter 12 x 5" cones. Approximate output of 960 gpm. Driven by Mission Magnum 5" x 6" x 11" centrifugal pump complete with 50 hp 600 volt 60 Hz 3 phase explosion proof motor.
GENERATORS	:	Four (4) Brown Boveri 600 volt, 600 Kw, 750 kva , 3 phase, 60 HZ AC generators. Powered by four (4) Cat 3412 PCTA diesel engines.
BOP's & ACCUMULATOR	:	One (1) Wagner Model 20-160 3 BND 160 gallon accumulator consisting of: Sixteen (16) 11 gallon bladder type bottles One (1) 20 HP electric driven triplex pump 600 volts, 60 HZ, 3 phase motor and controls.
BOP's & ACCUMULATOR (Cont'd)	:	One (1) Wagner Model A 60 auxiliary air pump 4.5 gals/minute. One (1) Wagner Model UM2SCB5S mounted hydraulic control panel with five (5) 1" stainless steel fitted selector valves and two (2) stripping controls and pressure reducing valves. Three (3) 4" hydraulic readout gauges:- one for annular pressure- one for accumulator pressure one for manifold pressure. One (1) Stewart & Stevenson 5 station remote drillers control with air cable umbilical with three pressure gauges, increase and decrease control for annular pressure. One (1) Shaffer 13.5/8" x 3,000 psi spherical annular BOP, One (1) Shaffer 13.5/8" x 5,000 psi LWS studded, double gate autolock B.O.P.
KELLY COCK (UPPER)	:	Two (2) Upper Kelly Cock 7.3/4"OD with 6.5/8" API connections (1 x M&M, 1 x Hydril).
KELLY COCK (LOWER)	:	Three (3) M&M Lower Kelly Cocks 6.½" OD with 4" IF connections
DRILL PIPE SAFETY VALVE	:	One (1) Hydril 6.½" stabbing valve (4" IF). One (1) Gray inside BOP with 4.3/4" OD and 2.1/4" ID with 3.1/2" IF connections c/w releasing tool and thread protectors.
AIR COMPRESSORS AND RECEIVERS	:	Two (2) LeRoi Dresser Model 660A air compressor packages c/w 10 HP motors rated at 600 Volts, 60 HZ, 3 phase. Receivers each 120 gallon capacity and fitted with relief valves.
POWER TONGS	:	One (1) Farr 13.5/8" - 5.½" hydraulic casing tongs c/w hydraulic power pack and hoses and torque gauge assembly. One (1) Foster hydraulic kelly spinner with 6.5/8" LH connection.
TORQUE WRENCH	:	Yutani c/w drive sockets 1 1/8" through to 2 3/8"

SPOOLS	:	One (1) set double studded adaptor flanges to mate 13.5/8" 5,000 psi. API BOP flange to following wellhead flange 13.5/8" x 3,000 series, 11" x 3,000 series, 11" x 5,000 series 7.1/16" x 3,000 series, 7.1/16" x 5,000 series 4 1/16" 5000 x 3 1/16" 5000 3 1/16" 5000 x 2 1/16" 5000
SPOOLS (Cont'd)	:	1 double studded adaptor flange 4 1/16" 5K x 3 1/16" 5K 1 double studded adaptor flange 3 1/16" 5K x 2 1/16" 5K 1 only 14" - BOP mud cross (drilling spool) 13.5/8" 5,000 x 13.5/8" 5,000 BX160. with 2 x 3 1/16" 5K outlets. 1 only BOP spacer spool 13 5/8" 3,000 x 13 5/8" 3,000 1 only BOP spacer .spool 11" 3,000 x 13.5/8" 5,000 .
ROTARY TABLE	:	One (1) Oilwell A 20.½" rotary table torque tube driven from drawworks complete with Varco MASTER bushings and Insert Bowls.
MUD TANKS	:	SHAKER Active No 1. 277 BBL Desilter 73 BBL Sand Trap 50 BBL Trip Tank 29 BBL Total <u>429 BBL</u> SUCTION Active No 2 174 BBL Pre-Mix 146 BBL Pill Tank 63 BBL Total <u>383 BBL</u>
TRIP TANK	:	Trip Tank <u>29 BBL</u> One (1) Mission Magnum 2" x 3" centrifugal pump complete with 20 HP, 600 Volts, 60 HZ, 3 phase explosion proof motors
KILL LINE VALVE	:	2 x 3 1/8" Cameron FL 5K gate valves
CHOKE LINE VALVES	:	1 x 4 1/16 Cameron FC 5K hydraulic operated gate valve 1 x 4 1/16 5K manual gate valve
CHOKE MANIFOLD	:	One (1) McEvoy choke and kill manifold 3" 5,000 psi with hydraulic Swaco "super" choke.
DRILL PIPE	:	240 joints (2270 m) - 3.½" 13.30lb/ft drill pipe Grade 'G' 105 with 3 1/2" IF conn
PUP JOINTS	:	One (1) - 10(3.65 m)3.½" OD Grade 'G' with 3.½" IF conn
HEVI-WATE DRILL PIPE	:	6 joints of 3.½" H.W.D.P. with 3.½" IF conn
DRILL COLLARS	:	12 x 6.½" OD drill collars (113 m) with 4" IF conn 24 x 4 ¾" O.D. drill collars (227 m) with 3.½"IF conn 1 x 4.3/4" OD Pony Drill Collar
KELLIES	:	Two (2) Square Kelly drive 4.¼" x 40' complete with Scabbard and 55 ft x 3 ½" kelly hose

- FISHING TOOLS : One (1) only 8.1/8" Bowen series 150 FS overshot
One (1) 5.3/4" SH Bowen 150 Overshot c/w grapples and packoffs to fish contractors downhole equipment.
One (1) only Reverse circulating junk basket 4" IF box
One (1) only 6.½" OD Griffith Fishing Jars One (1) only 4 ¾" O.D. Bowen Type "Z" Fishing Jar
One (1) only Bumper Sub 6.½" OD 4" IF pin & box.
One (1) 5" R.C.J.B.
One (1) 5" Junk Sub with 4.3/4" OD x 1.1/2" ID.
- WIRELINE SURVEY UNIT : Gearmatic hydraulic drive Model 5 c/w .092" line
- SUBSTITUTES : Two (2) Bit Sub - 7.5/8" reg x 6.5/8" reg double box.
Two (2) Bit Subs - 6.5/8" reg double box.
Two (2) Bit Sub - 6.5/8" reg box. x 4½" IF box
Two (2) Bit Subs - 4.½" reg x 4" IF double box.
Two (2) 4.3/4" bit subs (36" long) with 3.1/2" IF box x 3.1/2" reg box bored for float.
One (1) Float Sub 6.5/8" reg box (FC) x 6.5/8" reg pin
Two (2) XO Sub - 4" IF box x 4.½" IF pin.
Two (2) XO Sub - 4½" IF box x 4." IF pin.
One (1) XO Sub - 4.½" reg x 4" IF double pin.
Two (2) XO Sub - 6.5/8" reg pin x 4" IF box.
One (1) Junk Sub - 6.5/8" reg pin x 6.5/8" reg box
One (1) Junk Sub - 4.½" reg box x 4.½" reg pin.
One (1) XO Sub - 4.½" IF box x 4" IF box.
Two (2) Kelly Saver Subs c/w rubber 4" IF pin & box.
Two (2) Kelly Saver Subs 4" IF pin & box
One (1) Kelly Saver Subs 4½" IF pin & box.
Two (2) 4 IF box x 3.1/2" IF pin Saver Subs.
One (1) Circulating Subs - 4" IF x 2" 1502 hammer union.
One (1) Circulating Subs - 4" IF x 2" 602 hammer union.
Eleven (11) Lifting Subs - 18" Taper 4.½" pick up neck and 4" IF pin.
Eight (8) Lift Subs with 3.1/2" OD D.P. neck and 3.1/2" IF pin connections.
- HANDLING TOOLS : 2 only 4.½" BJ 250 ton 18 degree taper D/P elevators.
1 only 3.½" BJ 200 ton 18 degree taper D/P elevators.
1 only 3.1/2" BJ type MGG 18° centre latch Elevators.
1 only 4.½" Varco SDXL D/P slips.
1 only 4.½" Varco SDML D/P slips
2 only 8" - 6.½" DCS-R drill collar slips.
1 only 3.1/2" Varco SDML Slips
1 only 4.3/4" Varco DCS-S Drill Collar Slips
- CASING RUNNING TOOLS : 1 only 13.3/8" Webb Wilson 150 ton side door elevator.
1 only 13.3/8" single joint P.U. elevators.
1 only 9.5/8" Webb Wilson 150 ton side door elevators.
1 only 9.5/8 single joint P.U. elevator.
1 only 7" BJ 150 ton side door elevators.
1 only 7" single joint P.U. elevators.
1 only 5.½" BJ 200 ton S11
1 only 2.7/8" BJ 100 ton tubing elevator.
1 only 2.3/8" BJ 100 ton tubing elevator.
(all P.U. elevators c/w slings & swivel)
1 only 13.3/8" Varco CMS-XL casing slips
1 only 9.5/8" Varco CMS-XL casing slips.
1 only 7" Varco CMS-XL casing slips.
1 only 3.1/2" Varco SDML tubing slips.

CASING / TUBING DRIFTS	:	9 5/8, 7", 5 1/2", 3 1/2"
THREAD PROTECTORS	:	9 5/8, 7".
KELLY SPINNER	:	One (1) Foster hydraulic kelly spinner with 6.5/8" LH connection.
PIPE SPINNER	:	One (1) International 850H hydraulic pipe spinner
WELDING EQUIPMENT	:	1 - Miller 400 amp welding machine. 1 - oxy acetylene set.
DOGHOUSE	:	1 Doghouse 5m x 2.4m x 2.3m
GENERATOR HOUSE	:	Ross Hill SCR
UTILITY HOUSE	:	1 Utility and Mechanics House
CATWALKS	:	2 catwalks total 18.6m long x 1.6m wide x 1.08m high
PIPE RACKS	:	8 - 9m tumble racks.
DAY FUEL TANK	:	1 only 19,000 ltrs
WATER/FUEL TANK	:	WATER 1 only 320 bbls. 1 only brake cooling tank 80 bbl FUEL 1 only 27,500 litres
OIL STORAGE	:	drums
DRILLING RATE RECORDER	:	1 only 6 pen Pioneer Geograph drill sentry recorder to record: weight (D) penetration (feet) pump pressure (0-6,000 psi) electric rotary torque rotary speed (rpm) pump spm (with selector switch)
DEVIATION RECORDER	:	1 set Totco 'Double Shot' deviation instrument 0□-8□.
INSTRUMENTS & INDICATORS	:	1 only Martin Decker Sealtite. 1 only Martin Decker Deadline type. 1 only drillers console including the following equipment. Martin Decker Weight Indicator type'D' Electric rotary torque gauge. MD Totco Mud Watch Instrumentation c/w display and alarms. Rotary rpm gauge
MUD TESTING	:	1 set Baroid mud testing laboratory (standard kit
RATHOLE DRILLER	:	One (1) fabricated rotary table chain driven.
MUD SAVER	:	Okeh unit
CELLAR PUMP	:	Cellar jet from No 1 pump
WATER PUMP	:	Three (3) Mission Magnum 2" x 3" centrifugal pumps c/w 20 HP, 600 Volts, 60 HZ, 3 phase explosion proof motors
FIRE EXTINGUISHERS	:	Dry Chemical Rig 22 Camp 20 CO2 Rig 3 Camp 0 Foam Rig 1 Camp 1

PIPE BINS : 5 units
CUP TESTER : Two (2) Grey Cup Tester c/w test cups for 9.5/8" & 13.3/8".
DRILLING LINE : 5,000' 1.1/8" - E.I.P.S

TRANSPORT EQUIPMENT AND MOTOR VEHICLES

One (1) International 530 Forklift
One (1) Tray Top Utility
One (1) Crew Bus

CAMP EQUIPMENT

Four (4) x 8-Man Bunkhouses (12 man emergency)
One (1) x Recreation/Canteen unit
One (1) x Ablution/Laundry/Freezer unit
One (1) x Kitchen/Cooler/Diner unit
One (1) x Toolpushers unit
One (1) x Meeting / Smoko unit
One (1) x Combined Water/Fuel Tank unit
Two (2) x CAT 3304PC generator sets each 106 kVa, 86 KW, 50 HZ.

NOTE: At Contractor's discretion any of the foregoing items may be replaced by equipment of equivalent or greater capacity.

ENCLOSURE I : 1:200M COMPOSITE LOG

ENCLOSURE II : 1:500M MUDLOG

ENCLOSURE III : STRUCTURE MAPS (PRE-DRILLING)

ENCLOSURE IV : WELL EVALUATION SUMMARY PLOT