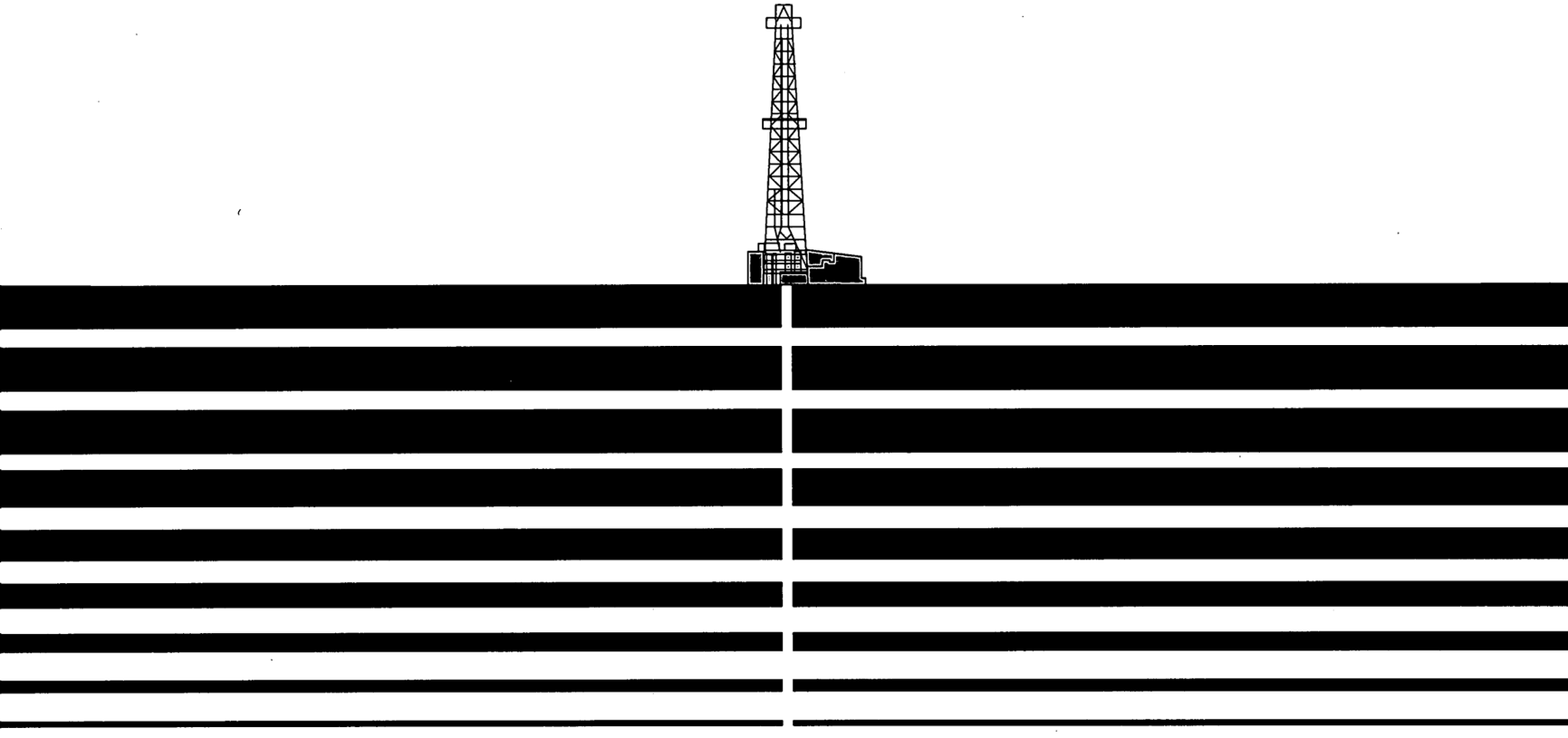
(page 1 of 78) 908927 001

908927 001

PENRYN 2

Well Completion Report



Santos

P.E.P. 153, OTWAY BASIN
VICTORIA

Santos Ltd A.B.N. 80 007 550 923

SANTOS

COMPILED FOR

SANTOS LIMITED

ABN 80 007 550 923

Petroleum Development

PENRYN 2

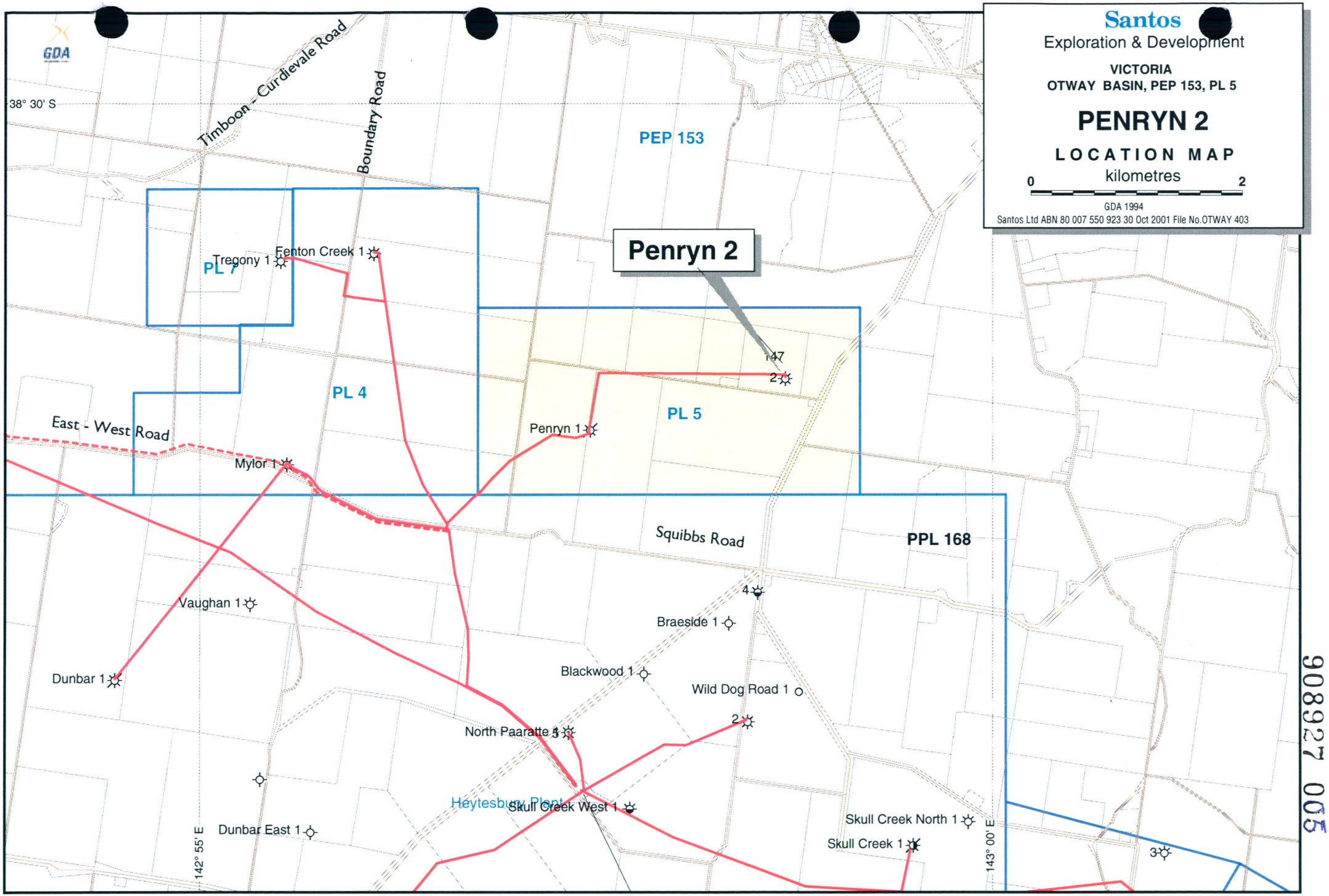
WELL COMPLETION REPORT

Prepared By:
M. D'Cruz
Operations Geology
November, 2001

PENRYN 2 WCR

TABLE OF CONTENTS

LOCATION MAP


Santos
Exploration & Development
VICTORIA
OTWAY BASIN, PEP 153, PL 5
PENRYN 2
LOCATION MAP
kilometres
0
2
GDA 1994
Santos Ltd ABN 80 007 550 923 30 Oct 2001 File No.OTWAY 403
GDA
38° 30' S
Timboon - Curdievale Road
Boundary Road
PEP 153
Penryn 2
PL 7
Tregony 1
Fenton Creek 1
PL 4
PL 5
147
2
East - West Road
Penryn 1
Mylor 1
Squibbs Road
PPL 168
4
Vaughan 1
Braeside 1
Dunbar 1
Blackwood 1
Wild Dog Road 1
2
North Paaratte 1
Heytesbury Plant
Skull Creek West 1
Dunbar East 1
Skull Creek North 1
Skull Creek 1
3
142° 55' E
143° 00' E

9008927 005

908927 006

WELL DATA CARD

REVISION 1 (11/11/96)

WELL: PENRYN 2	**WELL CATEGORY:** DEVELOPMENT **WELL INTENT:** GAS	**SPUD:** 06:30 Hrs 07/08/01 **TD REACHED:** 21:45 Hrs 14/08/01
		RIG RELEASED: 17:00 Hrs 17/08/01 **CMPLT:** 02/09/01
		RIG: OD&E 30
LAT: 38° 31' 20.15" S **LONG:** 142° 58' 43.05" E (GDA94)		**STATUS:** SCG (Single Completion Gas Well)
SEISMIC STATION: LINE 3285 HEYTSBURY 3D CDP 10323		**REMARKS:** Structure is a tilted-fault block closure, defined by 3D seismic. Trace oil show in the Eumeralla Formation.
ELEVATION GND: 128.7m **RT:** 133.4m		
BLOCK/LICENCE: PEP 153, VICTORIA		
TD 1694m MDRT(Logr) 1703m MDRT(Drlr)		
PBTD m (Logr) m (Drlr)		
TYPE STRUCTURE: FAULT TRAP		
TYPE COMPLETION: SINGLE ZONE MONOBORE		
ZONE(S): WAARRE 'UNIT C' SANDSTONE		

CASING SIZE	SHOE DEPTH	TYPE
7 5/8"	356m (L)	26.4 lb/ft, L-80, BT&C
3 1/2"	1696m (D)	9.2 lb/ft, Fox J-55

AGE	FORMATION OR ZONE TOPS	DEPTH (m)			INTERVAL THICKNESS (m)	HIGH (H) LOW (L)
		PROGNOSED DEPTH	LOGGER (MD)	LOGGERS DEPTH (TVD SS)		
TERTIARY	PORT CAMPBELL LIMESTONE		4.7	+128.69	64.30	Not Prognosed
TERTIARY	GELLIBRAND MARL		69.00	+64.4	216.50	Not Prognosed
TERTIARY	CLIFTON FORMATION	-164.00	285.50	-151.97	40.00	12 H
TERTIARY	NARRAWATURK MARL		325.50	-191.93	61.00	Not Prognosed
TERTIARY	MEPUNGA FORMATION	-252.00	386.50	-252.82	119.00	1 L
TERTIARY	DILWYN FORMATION		505.50	-371.66	124.00	Not Prognosed
TERTIARY	PEMBER MUDSTONE		629.50	-495.52	83.00	Not Prognosed
TERTIARY	PEBBLE POINT FORMATION	-590.00	712.50	-578.43	64.50	11 H
LATE CRETACEOUS	PAARATTE FORMATION	-655.00	777.00	-642.83	396.50	11.5 H
LATE CRETACEOUS	SKULL CREEK MUDSTONE	-1039.00	1173.50	-1038.71	153.00	1 L
LATE CRETACEOUS	NULLAWARRE GREENDSAND	-1215.00	1326.50	-1191.36	181.00	22 H
LATE CRETACEOUS	BELFAST MUDSTONE	-1338.00	1507.50	-1371.87	67.50	36 L
LATE CRETACEOUS	FLAXMANS FORMATION	-1454.00	1575.00	-1439.08	22.50	12.5 H
LATE CRETACEOUS	WAARRE FORMATION, UNIT C	-1474.00	1597.50	-1461.46	19.50	10 H
LATE CRETACEOUS	WAARRE FORMATION, UNIT B		1617.00	-1480.85	5.00	Not Prognosed
LATE CRETACEOUS	WAARRE FORMATION, UNIT A		1622.00	-1485.82	17.50	Not Prognosed
EARLY CRETACEOUS	EUMERALLA FORMATION	-1538.00	1639.50	-1503.21	54.50+	32 H
	TD	-1600.00	1694.00	-1557.14		40 H

FINAL LOG INTERPRETATION (Interval Averages)

FORMATION	INTERVAL (m)	SAND	NP	Ø %	Sw %
WARREE	1597.5-1617.00	UNIT C	19.5 m	20.2	16
WARREE	1618.50-1620.00	UNIT B	0.4 m	13.6	52
WARREE	1622.00-1633.5	UNIT A	11.5 m	25.5	11

PERFORATIONS (6 shots/foot)

FORMATION	INTERVAL
WAAREE 'UNIT C' SST	1598m to 1601m RT

CORES

FORM	NO.	INTERVAL	CUT	REC
NO CORES CUT				

LOG	SUITE/ RUN	INTERVAL (m)	BHT/TIME/ REMARKS
GR	1/1	1675-0	BHT: 140°F @ 1652.7m @ 8:25 hrs since last circulation
DLL		1664-356	
MLL		1690-356	
DAC		1671-356	Full Wave Semblance processing to 1535m
CAL		1692-356	
SP		1653-356	
ZDL		1668-625	
CN		1659-625	

LOG	SUITE/ RUN	INTERVAL (m)	BHT/TIME/ REMARKS
GR-FMT	1/2	1598-1674.5	BHT: 146°F @ 1674.5m @ 15:10 hrs since last circulation
			24 Pretests, 21 Good, 2 Curtailed, 1 No Seal. 2 Samples taken at 1605m. First chamber filled in 70 sec to 1220 psi and the second in 30 sec. to 1280 psi

FORMATION TESTS

NO.	INTERVAL (m)	FORMATION	FLOW (mins)	SHUT IN (mins)	BOTTOM GAUGE IP/FP (psia)	SIP	MAX SURF PRESS (psia)	FLUID TO SURF (mins)	TC/ BC	REMARKS
		No tests conducted.								

HOLE, CASING & CEMENT DETAILS							
BIT SIZE	DEPTH (m)	CASING SIZE	CASING SHOE DEPTH	JOINTS	CASING WEIGHT	CASING TYPE	CEMENT
9 7/8"	357.3 (D)	7 5/8"	355m (D) 356m (L)	30	26.4 lb/ft	L-80, BTC	**Lead:** 50.4 bbls @ 11.5 ppg 100 sacks class G Cement, + 376 lbs D 020 Bentonite, + 141 lbs S 001 Accelerator **Tail:** 18.3 bbls @ 15.6 ppg 85 sacks class A cement, + 5 gals D145A Dispersant
6 ¾"	1703 (D) 1694 (L)	3 ½"	1696m (D)	137	9.2 lb/ft	J-55, Fox	**Lead:** 172 bbls @ 11.5 ppg 343 sacks class G Cement, + 1290 lbs D 020 Bentonite, + 14 gals D 081 Retarder, + 4 gals D047 Antifoam **Tail:** 21 bbls @ 15.6 ppg 100 sacks class G cement, + 5 gals D 145A Dispersant, + 5 gals D 080 Dispersant, + 2 gals D 047 Antifoam

MUD SYSTEM	
MUD TYPE	INTERVAL (m)
Spud	Spud-357
KCl/PHPA/Polymer	357-1283
KCl/Polymer	1283-1703

MUD PARAMETERS	
DENSITY	9.1 ppg
Rm	0.201 Ω @ 56.73° F
Rmf	0.162 Ω @ 55.27° F
Rmc	0.2777 @ 57.26° F

SUMMARY:

Location:

Penryn 2, an Otway Basin, Victoria Gas Development well is located in the PEP 153 licence, approximately 4 km south of the town of Timboon. The well is1.9 km east-northeast of Penryn 1 on a separate culmination and was prognosed 40-50m updip at Waaree Sandstone level.

Pre-Drilling Summary/ Drilling Rationale:

The Penryn 2 structure is a tilted-fault block closure defined by 3D seismic with the primary reservoir the Waaree Sandstone; both vertical and cross-fault seal is provided by a thick Belfast Mudstone. The Penryn 2 structure is charged from mature source beds located within the underlying Eumeralla and/ or Crayfish Group with migration conduit directly into the reservoir or via fault conduits. The play has been proven successfully in the nearby Penryn, Mylor, Fenton Creek, North Paaratte, Wallaby Creek and Iona Fields.

The greater Penryn structure occurs on the upside of a tilted-fault block and is reliant on fault closure to the north and south and dip closure to the west. The greater closure contains two dip closures against the southern bounding fault separated by a small saddle. Penryn 1 is on the western closure and Penryn 2 is on the eastern closure.

The Waaree Sandstone reservoir was deposited as the initial post-rift sequence at the commencement of the Turonian time under non-marine to marginal marine conditions. The section is sub-divided into three sub-units: Waaree A, B and C. The sands within the A and B units are generally shalier and more cemented and consequentially have lower porosity than the overlying Unit C (average 20% porosity).

Thickness changes in the lower units imply that syn-depositional subsidence increased basinward to the southwest.

All Otway Basin successes in the Port Campbell Embayment area have been in high side, tilted fault and horst blocks. The ultimate top seal to Waaree reservoirs is the marine Belfast Mudstone. While a potential waste zone exists between the Waaree sands and the Belfast seal; the Flaxmans Formation, which was deposited under transitional marginal marine conditions, is most likely to act as a seal.

Hydrocarbons are produced in the Port Campbell Embayment with the Eumeralla formation and/ or the Crayfish Group being the source beds. Analysis of the condensates and oils from the area suggest a non-marine origin with both algal and higher land plant components. Mature source units underlie the gas fields and most likely charge directly into the overlying structures through source-reservoir juxtaposition or via fault conduits.

Objectives:

Penryn 2 was drilled as a gas development well with the top Waaree Sandstone as the primary target reservoir.

Drilling Summary:

Penryn 2 was spudded on 07/08/01 and a 9 7/8" surface hole was drilled to 357.3m (Drlr). 7 5/8" surface casing was run and cemented from surface to 355m (Drlr). A Leak-Off Test was conducted to 17.2 ppg EMW at 360m (Drlr). A 6 ¾" main hole was then drilled to a Total Depth of 1703m (Drlr) which was reached on 14/08/01. Deviational constraints meant that the well had to be steered on to target from 1087m to 1283m using directional assembly. Penryn 2 was Cased and Suspended post logging with 3 ½" monobore production casing run to 1696m (Drlr) and the rig released on 17/08/01. The well was later perforated and completed on 02/09/01.

Results of Drilling:

Penryn 2 was drilled as a gas development well in the PEP 153 licence area of the Otway basin, Victoria.

Penryn 2 was planned to be drilled with a small directional component to intersect the optimal target of 50m from surface location to 180° True North. An attempt was made to jet the hole as required from spud to surface casing point to obtain 1.9° deviation to 180°. Failure to hold angle resulted in having to steer the well back on to target using directional assembly and Down-Hole Motor.

Penryn 2 was drilled to a Total Depth of 1703m (Drlr) which was 40m higher than the proposed total depth.

Most of the formations including the primary objective came in 10m to 40m high to prognosis. The Waaree formation came in 10m high and the Eumeralla 32m high to prognosis. The Mepunga Formation and Skull Creek Mudstone came in 1m low to prognosis with the Belfast Mudstone coming in 36m low to prognosis.

No significant oil shows were penetrated although a trace oil show was encountered in the Eumeralla formation. Significant gas shows were penetrated in the Waaree Formation Units; Unit C (1675 units, 88/6/4/2%), Unit B (900 units, 87/7/4/2%) and Unit A (C (1200 units, 88/6/4/2%).

At total depth, two wireline log runs were conducted, a gamma-resistivity-sonic-density-neutron combo log and FMT pressure surveys. Two samples were taken for analysis on the FMT run. Final analysis showed the samples comprised of mainly hydrocarbon gases with minor amounts of condensate and muddy water.

Preliminary log analysis indicated 32m of conventional gas pay in the Waaree Formation with 21.7% average porosity and 14% average water saturation.

Following the logs, 3 ½" monobore production casing was run to 1696m and Penryn 2 was Cased and Suspended. The well was later completed and brought on line with the Waaree Unit C sand perforated.

Lost Time:

The Total Lost time for Penryn 2 was 5.0 hours

OPERATION	HOURS LOST	% OF LOST TIME
Nipple Up and Test BOP	3.0	60
Trip-In for Bit	1.5	30
Circulate & Condition Mud	0.5	10

Water Supply:

Drilling make-up water was sourced locally. The bore-water was chemically analysed at the wellsite with the following results:

pH	6.8
Bicarbonates	98 mg / L
Hardness	60 mg / L
Chlorides	150 mg / L

Resistivity conducted at the wellsite recorded infinite resistivity at 55° F.

Mudlogging:

Geoservices Overseas S.A. provided the Mudlogging services. Samples were collected, washed and described at 10m intervals from spud to 1000m and at 3m intervals from 1003m to total depth at 1703m (Drlr). All samples were checked for oil fluorescence under ultraviolet light. Spot samples were taken over significant gas peaks and fluorescence shows. During drilling operations, gas levels were monitored and recorded from surface to total depth using a FID Total Gas Analyser and composition analysis was done using a Baseline FID Gas Chromatograph.

Total gas was monitored in gas units. 1 unit equals to 200 parts per million methane equivalent in air. The chromatograph was calibrated to measure parts per million concentrations of the alkane gases methane, ethane, propane, normal and iso-butane.

Other parameters monitored and recorded included rate of penetration, mud pit levels, pump strokes, standpipe pressure, rotary speed, rotary torque, hookload and weight on bit while drilling. Trip tank levels were monitored on all trips into and out of the hole. A real-time screen display was provided in the Drilling Supervisor's office.

Electric Logging

Baker-Atlas provided the electric logging services for this well. The electric logging consisted a single suite of logs at Total Depth comprising of two runs.

The first run was a GR-MLL-DLL-DAC-CAL-SP-ZDL-CN combo log with Full wave- form semblance processing from Total Depth to 1535m. The maximum recorded temperature on this run was 140° F at 1652.7m, 08:25 hours having elapsed since last circulation. The logs recorded a Total depth of 1694m compared to a Driller's Total Depth of 1703m.

The final run was a GR-FMT run. Slim-Hole kit was run. Out of 24 Pre-tests, 22 were Good, 2 Curtailed and 1 No Seal. The last programmed point could not be tested, as the measure point of the tool could not get down below 1684m. Two samples were taken at test point 1605m, both with ten litre tanks. The upper tank was filled first, with a fill time of 70 seconds. The lower tank was filled second, with a fill time of 25 seconds. Sample chambers were checked on surface with a pressure gauge to confirm sampling. The upper chamber registered 1220 psi and the lower registered 1280 psi pressures indicating that sampling was successful. The sample chambers were not extracted and the tanks sent for laboratory analysis.

Hole Deviation

Penryn 2 was drilled essentially as a vertical well with a small directional component to intersect the optimal target of 50m from surface location to 180° True North. The expected angle at Total Depth was meant to be 1.95°. Target tolerance was set as a rectangle with centre as the target allowing 50m relief in the east-west direction and 30m in the north-south direction. This was dictated by the bounding fault located to the southeast of the well site. An attempt was made to jet the hole when required from surface to casing point to obtain a deviation of 1.90° to 180° True North by 350m.

The hole deviation was monitored at regular intervals. However the well failed to hold angle and direction, despite controlled drilling, with the deviation going out to 3.5° bearing 102° True North by 1083m. A Down-Hole motor and directional assembly was then run in hole and the well steered back on to target from 1087m to 1283m. The hole deviation was monitored at regular intervals with a maximum deviation of 7.25° bearing 221° True North recorded at 1685m. However, the well stayed within the target tolerance. The TVD at Total Depth was 1557.14m with a maximum calculated offset of 62.66m bearing 181.74° from the surface location.

Geothermal Gradient:

An estimated static bottom hole temperature of 67.5° C at 1694m, and a geothermal gradient of 2.72° C/km was calculated from down hole temperatures recorded during logging runs 1 and 2.

Status:

Penryn 2 was completed and brought on-line as a Single Zone Gas Completion Well on 02/09/01.

AUTHOR: Melroy D'Cruz **DATE**: December 2001

APPENDIX I: GEOPHYSICAL DATA

PENRYN 2 GEOPHYSICAL DATA

	PENRYN 1					PENRYN 2				
	TWT (m-ss)	Depth (m-ss)	Isopach (m)	VAV (m/s)	VINT* (m/s)	TWT (m-ss)	Depth (m-ss)	Isopach (m)	VAV (m/s)	VINT* (m/s)
CLIFTON	206	168.5		1636		200	152		1636	
			108		2000			88		2000
MEPUNGA	314	276.5		1761		288	253		1747	
			352		2419			339		2419
PEBBLE POINT	605	628.5		2078		568	578.5		2078	
			426		2663			449		2663
SKULL CREEK	925	1054.5		2280		905	1039		2296	
			170		3009			176		3009
NULLAWARRE	1038	1224.5		2359		1022	1191.5		2378	
			142		3087			123		3087
BELFAST	1130	1366.5		2419		1102	1372		2429	
			191		3081			136		3081
WAARRE	1254	1557.5		2484		1190	1461.5		2477	
			81		3682			64		3682
EUMERALLA	1298	1638.5		2525		1225	1503		2512	
			68.5					62		
TD		1707								

APPENDIX II: SAMPLE DESCRIPTIONS

APPENDIX II: (i) CUTTINGS DESCRIPTION

GEOLOGICAL SUMMARY		
INTERVAL (m) **ROP (mn/m)**	**LITHOLOGY**	**GAS (Units)**
17-40 ROP: 1.2-2.5 Ave: 1.8	**PORT CAMPBELL LIMESTONE** MASSIVE LIMESTONE LIMESTONE: Off white, yellow to orange in part, trace clear to translucent, occasional medium crystalline, common fossiliferous, shell fragments in part, trace coral.	No Gas
40-69 ROP: 1.8-3.5 Ave: 2.2	INTERBEDDED LIMESTONE AND MARL MARL: Pale grey, trace pale brown, calcareous, trace fossil fragments, trace lithics, firm to soft, amorphous to subblocky. LIMESTONE: Light brown, yellow to orange, crystalline to fossiliferous, occasional shell fragments, hard to soft.	No Gas
69-100 ROP: 0.4-1.2 Ave: 0.7	**GELLIBRAND MARL** MASSIVE MARL MARL: Grey to light grey, grey to medium grey in part, common arenaceous, occasional lithics, trace glauconite, occasional pyrite, firm to hard, subblocky. MARL: Grey to light grey, common fossil, abundant shell fragments, very soft to dispersive, amorphous.	No Gas
100-285.5 ROP: 1.1-2.1 Ave: 1.3	MASSIVE MARL MARL: Light grey, common strongly calcareous, abundant fossil and shell fragments, nodular pyrite in part, very soft, amorphous. MARL: Grey, occasional light brown to medium brown, abundant of fossil, predominantly shell fragments, coral and forams in part, very soft to dispersive, amorphous.	No Gas
285.5-325.5 ROP: 1.1-2.3 Ave: 1.4	**CLIFTON FORMATION** MASSIVE MARL MARL: Pale to medium grey, pale brown, trace light orange, calcareous, abundant fossil fragments, occasional echinoid spines, common foraminifera, corals in part, trace nodular pyrite, very soft to dispersive, commonly washing out, occasional sticky, amorphous.	No Gas
325.5-386.5 ROP: 0.5-2.2 Ave: 0.4	**NARRAWATURK MARL** MASSIVE MARL MARL: Pale to medium grey, light green/grey, light brown, light olive grey, calcareous, abundant fossil and shell fragments, common foraminifera, inoceramus, corals, abundant pyrite, soft to very dispersive, sticky, amorphous.	No Gas
386.5-505.5 ROP: 0.2-0.7 Ave: 0.2	**MEPUNGA FORMATION** SANDSTONE WITH MINOR CLAYSTONE SANDSTONE: Medium brown, occasionally yellow/brown, fine, trace coarse, moderate to poor sorting, sub angular, trace iron staining, trace fossil fragments, trace to common disseminated pyrite, commonly loose, poor inferred porosity, no fluorescence. CLAYSTONE: Medium brown, argillaceous, trace pyrite, trace lithics, trace calcareous fragments, soft to dispersive, amorphous in part.	No Gas
505.5-629.5 ROP: 0.1-17.1 Ave: 2.1	**DILWYN FORMATION** INTERBEDDED SANDSTONE AND CLAYSTONE SANDSTONE: Translucent, opaque, pale grey/blue, fine to very coarse pebbles, poor sorting, sub rounded to rounded, trace disseminated and nodular pyrite, rare mica, loose, friable to good inferred porosity, no fluorescence. CLAYSTONE: Dark brown, argillaceous grading to SILTSTONE in part, common micromicaceous and lithics, very soft to dispersive, amorphous.	No Gas

GEOLOGICAL SUMMARY		
INTERVAL (m) **ROP (mn/m)**	**LITHOLOGY**	**GAS (Units)**
629.5-712.5 ROP: 0.9-3.1 Ave: 1.7	**PEMBER MUDSTONE** INTERBEDDED SANDSTONE, SILTSTONE AND CLAYSTONE SANDSTONE: Translucent, opaque, pale grey, pale blue grey, coarse to very coarse, pebbles, poor sorting, rounded to sub rounded, loose, fair inferred porosity, no fluorescence. SILTSTONE: Light to medium brown, medium grey/green, dark green, argillaceous grading to CLAYSTONE, common glauconite and lithics, trace carbonaceous fragments, very soft, dispersive, occasionally firm, amorphous to subblocky. CLAYSTONE: Medium brown, common micromicaceous, dispersive, amorphous.	0-2 100% C1
712.5-777 ROP: 0.8-4.1 Ave: 2.0	**PEBBLE POINT FORMATION** SANDSTONE WITH MINOR CLAYSTONE AND SILTSTONE. SANDSTONE: Translucent, pale yellow to pale brown, fine to coarse, poor sorting, sub rounded, common pyrite fragments, trace iron staining, loose, fair inferred porosity, no fluorescence. SILTSTONE: Dark brown, argillaceous grading to CLAYSTONE, trace lithics, trace micromicaceous and glauconite fragments, very soft, amorphous to subblocky. CLAYSTONE: Dark green, red/brown, glauconite, trace micromicaceous, trace lithics, firm to subblocky.	No Gas
777-833 ROP: 1.5-6.5 Ave: 3.6	**PAARATTE FORMATION** SANDSTONE WITH MINOR CLAYSTONE. SANDSTONE: Colourless to translucent, opaque, pale grey, pale yellow, fine to very coarse, pebbles, poor sorting, sub rounded, loose, fair inferred porosity, no fluorescence. CLAYSTONE: Light to medium grey, argillaceous grading to SILTSTONE, common carbonaceous specks, micromicaceous, trace disseminated pyrite, very soft, amorphous to subblocky.	No Gas
833-890 ROP: 0.6-5.0 Ave: 2.8	SANDSTONE WITH MINOR SILTSTONE SANDSTONE: Colourless to translucent, pale brown, light grey, coarse to very coarse, poor sorting, sub rounded, trace to common pyrite nodules, trace pyrite coated sand grains, loose, fair inferred porosity, no fluorescence. SILTSTONE: Off white to light grey, medium brown, argillaceous grading to CLAYSTONE, common arenaceous inclusions, abundant lithics, very soft, dispersive, amorphous to rarely subblocky.	No Gas
890-930 ROP: 0.7-1.8 Ave: 1.2	SANDSTONE WITH MINOR CLAYSTONE SANDSTONE: Colourless to translucent, pale brown, light grey, common smoky quartz fragments, coarse to very coarse, poor sorting, sub rounded, trace to common pyrite nodules, loose, fair inferred porosity, no fluorescence. CLAYSTONE: Light to medium grey, medium grey brown, common micromicaceous and lithics, very soft, dispersive, amorphous.	No Gas
930-990 ROP: 0.6-3.2 Ave: 1.7	SANDSTONE WITH MINOR SILTSTONE SANDSTONE: Colourless to translucent, pale brown, light grey, coarse to very coarse, poor sorting, sub rounded to rounded, trace pyrite nodules, loose, fair inferred porosity, trace dim, green, pinpoint fluorescence, no cut. SILTSTONE: Light grey brown, medium brown, argillaceous grading to CLAYSTONE, abundant lithics, trace carbonaceous fragments, very soft, dispersive, amorphous to rarely subblocky.	No Gas

GEOLOGICAL SUMMARY		
INTERVAL (m) ROP (mn/m)	**LITHOLOGY**	**GAS (Units)**
990-1055 ROP: 0.7-4.1 Ave: 1.9	INTERBEDDED SANDSTONE AND CLAYSTONE SANDSTONE: Translucent, light grey, light blue grey, common smoky quartz fragments, fine to very coarse, poor sorting, trace pyrite nodules, loose, clean, fair inferred porosity, no fluorescence. CLAYSTONE: Light to medium grey, medium brown, argillaceous grading to SILTSTONE in part, common carbonaceous specks, micromicaceous and lithics, very soft to occasionally firm, dispersive, amorphous to rarely subblocky.	0-3 100% C1
1055-1087 ROP: 1.0-28.4 Ave: 2.8	SANDSTONE WITH MINOR CLAYSTONE SANDSTONE: (1) Translucent, light grey, light blue grey, common smoky quartz fragments, fine to very coarse, poor sorting, loose, clean, fair inferred porosity, no fluorescence. SANDSTONE: (2) Off white to light grey, very fine grading to arenaceous SILTSTONE, well sorted, sub rounded, abundant off white to light grey argillaceous matrix, trace carbonaceous specks, feldspar, glauconite and lithics, friable, poor visual porosity, no fluorescence. CLAYSTONE: Light to medium grey, medium brown, argillaceous grading to SILTSTONE in part, common carbonaceous specks, micromicaceous and lithics, very soft to occasionally firm, dispersive, amorphous to rarely subblocky.	No Gas
1087-1110 ROP: 1.8-6 Ave: 2.9	SANDSTONE WITH MINOR SILTSTONE AND CLAYSTONE SANDSTONE: (1) Off white to light grey, very fine grading to arenaceous SILTSTONE, well sorted, sub rounded, abundant off white to light grey argillaceous matrix, trace carbonaceous specks, feldspar, glauconite and lithics, friable, poor visual porosity, no fluorescence. SANDSTONE: (2) Translucent, light grey, common smoky quartz fragments, fine to very coarse, poor sorting, trace pyrite nodules, loose, clean, fair inferred porosity, no fluorescence. CLAYSTONE: Light to medium grey, medium brown, argillaceous grading to SILTSTONE in part, common carbonaceous specks, micromicaceous and lithics, very soft to occasionally firm, dispersive, amorphous to rarely subblocky. SILTSTONE: Medium to dark grey, argillaceous grading to CLAYSTONE, trace carbonaceous specks and glauconite, trace micromicaceous, firm to moderately hard, subblocky to blocky.	No Gas
1110-1173.5 ROP: 1.6-5.2 Ave: 2.6	SANDSTONE WITH MINOR SILTSTONE SANDSTONE: Colourless to translucent, fine to medium, minor coarse, moderately sorting, sub rounded to rounded, trace siliceous cement, trace carbonaceous and glauconitic fragments, trace pyrite nodules, friable to generally loose, fair inferred porosity, no fluorescence. SILTSTONE: Light grey, grey brown, medium dark brown, dark grey in part, argillaceous grading to CLAYSTONE, arenaceous grading to very fine SANDSTONE, trace carbonaceous fragments and micromicaceous, very soft to firm, dispersive in part, amorphous to subblocky.	No Gas

GEOLOGICAL SUMMARY		
INTERVAL (m) ROP (mn/m)	**LITHOLOGY**	**GAS (Units)**
1173.5-1180 ROP: 1.1-30.0 Ave: 4.9	**SKULL CREEK MUDSTONE** INTERBEDDED SANDSTONE AND SILTSTONE SANDSTONE: (1) Light grey, light grey green, very fine grading to arenaceous SILTSTONE, well sorted, sub angular to sub rounded, abundant light grey green argillaceous matrix, common carbonaceous specks, lithics and glauconite, friable, poor visual porosity, no fluorescence. SANDSTONE: (2) Colourless to translucent, very fine to fine, trace medium, well sorted, sub rounded to rounded, trace pyrite coated grains, loose, clean, fair inferred porosity, no fluorescence. SILTSTONE: Light to dominantly dark grey/ dark grey brown, argillaceous grading to CLAYSTONE in part, trace arenaceous, common carbonaceous fragments, micromicaceous and lithics, very soft to firm, amorphous to subblocky.	No Gas
1180-1230 ROP: 1.5-9.0 Ave: 3.9	SILTSTONE WITH MINOR SANDSTONE SILTSTONE: Medium to dark brown, medium grey brown, argillaceous grading to CLAYSTONE in part, trace carbonaceous fragments, micromicaceous, disseminated pyrite and lithics, very soft, dispersive, amorphous. SANDSTONE: Colourless to translucent, fine to very coarse, predominantly medium, moderately well sorted, sub rounded to rounded, trace weak siliceous cement, rare glauconite grains, loose, fair inferred porosity, no fluorescence.	No Gas
1230-1283 ROP: 1.7-10.0 Ave: 4.9	SILTSTONE WITH MINOR SANDSTONE SANDSTONE: Light grey, light grey green, very fine grading to arenaceous SILTSTONE, well sorted, sub angular to sub rounded, abundant light grey green argillaceous matrix, common carbonaceous specks, lithics and glauconite, friable, poor visual porosity, no fluorescence. SILTSTONE: Medium to dark brown, medium grey brown, argillaceous grading to CLAYSTONE in part, trace carbonaceous fragments, micromicaceous, disseminated pyrite and lithics, very soft to firm, amorphous to subblocky.	No Gas
1283-1326.5 ROP: 0.5-1.6 Ave: 0.7	SILTSTONE WITH MINOR SANDSTONE SANDSTONE: Light grey, light grey green, very fine grading to arenaceous SILTSTONE, well sorted, sub angular to sub rounded, abundant light grey green argillaceous matrix, common carbonaceous specks, lithics and glauconite, friable, poor visual porosity, no fluorescence. SILTSTONE: Medium to dark brown, medium grey brown, argillaceous grading to CLAYSTONE in part, trace carbonaceous fragments, micromicaceous, disseminated pyrite and lithics, very soft to firm, amorphous to subblocky.	No Gas
1326.5-1507.5 ROP: 0.5-9.0 Ave: 1.1	**NULLAWARRE GREENSAND** SANDSTONE WITH MINOR CLAYSTONE SANDSTONE: Yellow, orange, red brown to brown, fine to coarse, dominantly medium, moderately well sorted, sub rounded to rounded, locally common yellow to orange clay matrix, common iron oxide staining, trace rounded glauconite fragments with occasional pyrite coating, trace pyrite fragments, trace rounded black lithics, friable to generally loose, fair inferred porosity, no fluorescence. CLAYSTONE: Yellow to orange, ochre, trace carbonaceous specks and lithics, very soft, dispersive, amorphous.	No Gas

GEOLOGICAL SUMMARY		
INTERVAL (m) **ROP (mn/m)**	**LITHOLOGY**	**GAS (Units)**
1507.5-1575 ROP: 0.7-1.8 Ave: 0.8	**BELFAST FORMATION** CLAYSTONE WITH MINOR SANDSTONE AND SILTSTONE CLAYSTONE: Medium to dark grey, medium grey brown, grey green in part, grading to arenaceous SILTSTONE in part, glauconitic in part, common disseminated pyrite, trace worm burrows, moderately hard, subblocky. SANDSTONE: Colourless to translucent, pale yellow, pale brown, fine to very coarse, poor sorting, sub angular to rounded, loose, fair inferred porosity, no fluorescence. SILTSTONE: Medium grey brown, dark grey, argillaceous, common very fine arenaceous, common carbonaceous specks, trace micromicaceous, firm to moderately hard, subblocky.	10-80 94/5/1%
1575-1597.5 ROP: 0.5-2.1 Ave: 0.8	**FLAXMANS FORMATION** SILTSTONE WITH MINOR SANDSTONE SILTSTONE: Medium grey, grey green, argillaceous grading to CLAYSTONE in part, trace very fine arenaceous, common micromicaceous and glauconite fragments, moderately hard, subblocky to blocky. SANDSTONE: Colourless to translucent, pale brown, fine to medium, moderately well sorted, sub rounded to rounded, loose, fair inferred porosity, no fluorescence.	40-90 96/4/1%
1597.5-1639.5 ROP: 0.6-2.1 Ave: 0.8	**WAARRE FORMATION** MASSIVE SANDSTONE WITH TRACE SILTSTONE SANDSTONE: (1) Translucent, white, medium to very coarse, poor sorting, angular to sub rounded, trace siliceous cement, trace pyrite cement, friable to generally loose, fair inferred porosity, no fluorescence. SANDSTONE: (2) White to off white, very fine to fine, well sorted, sub angular to sub rounded, moderately strong siliceous cement, common white kaolinitic matrix, trace carbonaceous fragments and lithics, moderately hard to friable aggregates, poor visual porosity, no fluorescence. SILTSTONE: Medium grey, grey brown, arenaceous, trace micromicaceous, moderately hard, subblocky.	800-1200 88/6/4/2%
1639.5-1680 ROP: 0.7-5.0 Ave: 0.6	**EUMERALLA FORMATION** INTERBEDDED SANDSTONE AND SILTSTONE SANDSTONE: White to light green, very fine grading to arenaceous SILTSTONE in part, well sorted, moderately strong siliceous cement, trace calcareous cement, abundant white kaolinitic matrix, abundant glauconite fragments, trace carbonaceous fragments and micromicaceous, moderately hard to dominantly friable aggregates, poor visual porosity, trace dim to moderately bright yellow / white pinpoint fluorescence, no visible cut, thin ring residue. SILTSTONE: Dark grey to black, argillaceous, trace micromicaceous, hard, subblocky.	70-300 89/7/3/1%
1680-1694 ROP: 0.5-2.0 Ave: 0.7	INTERBEDDED SILTSTONE AND SANDSTONE SILTSTONE: (1) Light grey brown to medium brown, argillaceous, trace carbonaceous specks, firm to moderately hard, sub blocky to blocky. SILTSTONE: (2) Light grey green to medium grey, arenaceous, glauconitic in part, firm, subblocky. SANDSTONE: Light to medium green, colourless to translucent, medium grey, very fine to fine, well sorted, sub rounded to rounded, moderately strong siliceous cement, abundant grey green argillaceous matrix, abundant glauconite fragments, moderately hard, poor visual porosity, no fluorescence.	40-150 92/5/2/1%

APPENDIX II: (ii) HYDROCARBON SHOWS

SANTOS LIMITED

OIL SHOW EVALUATION REPORT

WELL: PENRYN 2
INTERVAL: 1653m – 1665m
FORMATION: EUMERALLA

GEOLOGIST: M. D'CRUZ
DATE: 14/08/01

C1 ppm	5k	10k	20k	30k	40k	50k	100k	150k	200k	>250k
C2+ ppm	500	750	1k	2k	3k	4k	5k	7.5k	10k	>15k
Porosity Ø	tight			poor		fair		good		
% with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted	pinpoint		streaked		patchy		solid
Brightness of fluorescence	v. dull		dull		dim			bright	v. bright	glowing
Type of cut	trace	v. slow crush cut	crush cut	instant crush cut	v. slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Residue on spot plate	trace	heavy trace	v. thin ring	thin ring	thick ring	v. thick ring	thin film	mod. film	thick film	solid
Show rating	trace		poor		fair		good			
Comments:	SANDSTONE: White to light green, very fine grading to arenaceous SILTSTONE in part, well sorted, moderately strong siliceous cement, trace calcareous cement, abundant white kaolinitic matrix, abundant glauconite fragments, trace carbonaceous fragments and micromicaceous, moderately hard to dominantly friable aggregates, poor visual porosity, trace fluorescence as above.									

APPENDIX III: LOG ANALYSIS

APPENDIX IV: FMT PRESSURE SURVEY

APPENDIX IV: (i) PRESSURE DEPTHS AND PLOT

SANTOS LIMITED

PRESSURE SURVEY

WELL: PENRYN 2 K.B.: 133.56 TOOL AND GAUGE TYPE: FMT / HP Quartz 5 1/8" PAGE: 2

WITNESS: M. D'CRUZ / T. PRATER TIME SINCE LAST CIRC.: 3:30 15 Aug. 01 PROBE / PACKER TYPE: 5 1/8" DATE: 15/08/01

TEST	FORMATION	DEPTH	DEPTH	EXPECT.	EXPECT.	TEST RESULTS						INTERPRETATION			COMMENTS
	UNIT SANDS	K.B.	S.S.	FORM PRESS	TEMP.	FILL TIME	HYDR. BEFORE	FORM. PRESS.	HYDR. AFTER	TEMP.	DRAW D. MOBILITY	TYPE D/D	TYPE BUILDUP	DEPLET -S/C	(FLUID TYPE)
		M	M	PSIG	°F		PSI	PSI	PSI	°F	MD/CP				
1	WAARRE	1598	1464.50				2532.4	1715.5	2532.4	143.78	152.6	N	Rapid		GOOD TEST
2	WAARRE	1599	1465.50				2534.2	1751.2	2535	144.14	303.2	N	Rapid		GOOD TEST
3	WAARRE	1601.2	1467.70				2537.9	1751.7	2538.5	144.14	318.2	N	Rapid		GOOD TEST
4	WAARRE	1605	1471.50				2543.9	1752.4	2544.8	144.5	136.5	N	Rapid		GOOD TEST
5	WAARRE	1607.5	1474.00				2548	1752.7	2548.6	144.68	140.3	N	Rapid		GOOD TEST
6	WAARRE	1610.8	1477.30				2553.3	1775.2	2553.6	144.68	161.8	N	Mod Fast		GOOD TEST
7	WAARRE	1614	1480.50				2558.7	1753.7	2558.7	145.04	393.1	N	Rapid		GOOD TEST
8	WAARRE	1616	1482.50				2561.7	1759.2	2561.9	145.22	447.1	N	Rapid		GOOD TEST
9	WAARRE	1623	1489.50				2572.8	1754.9	2573	145.4	423.3	N	Rapid		GOOD TEST
10	WAARRE	1626	1492.50				2577.5	1779.7	2578	145.76	254.7	N	Rapid	S/C ?	GOOD TEST
11	WAARRE	1627	1493.5				2579.3	1755.9	2579.5	145.94	317.8	N	Rapid		GOOD TEST
12	WAARRE	1631	1497.50				2585.6	1779.2	2585.7	146.12	43	N	Rapid	S/C ?	GOOD TEST
13	WAARRE	1630.5	1497				2584.9	1840.8	2584.6	146.3	49.1	N	Rapid	S/C ?	GOOD TEST
14	WAARRE	1632.4	1498.90				2587.9	1758.4	2588	146.48	203.6	N	Mod Fast		GOOD TEST
15	WAARRE	1639.4	1505.9				2599.4	1795.5	2599.3	148.28	11	N	Fast		CURTAILED
16	WAARRE	1645.5	1512.00				2608.8	1836.4	2608.8	147.74	59.3	N	Rapid		GOOD TEST
17	WAARRE	1647.5	1514.00				2611.8	1839.4	2612.1	147.92	90.9	N	Rapid		GOOD TEST
18	WAARRE	1651.5	1518.00				2618.4	1846.2	2618.6	148.28	136.4	N	Rapid		GOOD TEST
19	WAARRE	1653.5	1520.00				2621.6	1473.9	2619.3	148.28	37.6	N	Slow		CURTAILED
20	WAARRE	1661	1527.50				2634	1866.9	2634.3	148.82	114.3	N	Rapid		GOOD TEST
21	WAARRE	1664	1530.50				2639.3	1871.1	2639.6	149.36	126.8	N	Rapid		GOOD TEST
22	EUMERALLA	1674.5	1541.00							32					NO SEAL
23	WAARRE	1651.5	1518.00				2618.6	1846.9	2618.7	149.72	80.5	N	Rapid		GOOD TEST
24	WAARRE	1605	1471.44			70 sec/ 30 sec	2544.6	1753.2	2543.9	146.84	78.5	N	Very Rapid		SAMPLE: GOOD TEST
25	EUMERALLA	1685.5	1552							32					COULD NOT GET DOWN

SANTOS LIMITED
PRESSURE SURVEY

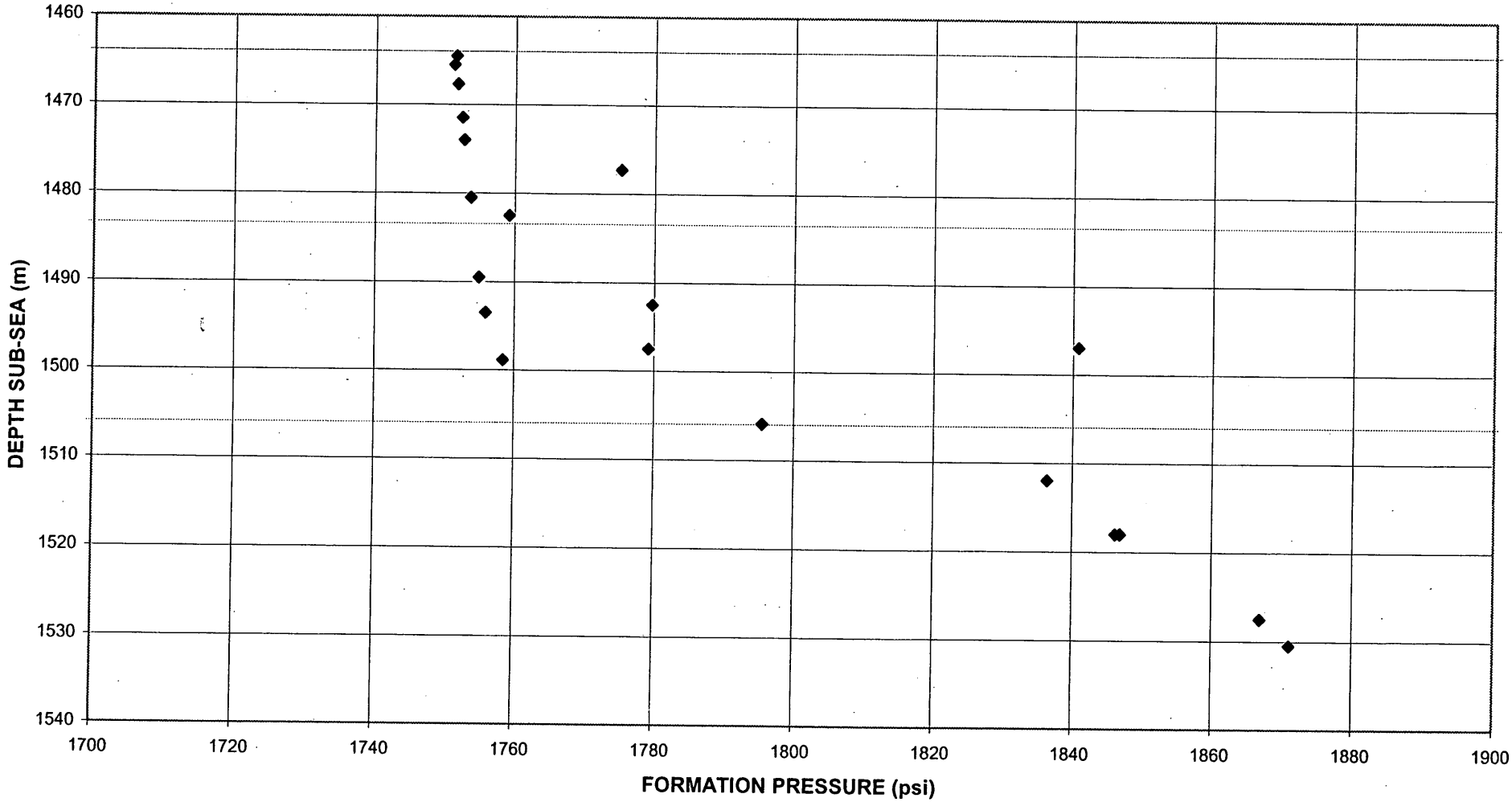
WELL:	PENRYN 2	K.B.:	133.56	TOOL AND GAUGE TYPE:	FMT / HP Quartz 5 1/8"	PAGE:	2
WITNESS:	M. D'CRUZ / T. PRATER	TIME SINCE LAST CIRC.:	3:30 15 Aug. 01	PROBE / PACKER TYPE:	5 1/8"	DATE:	15/08/01

COMMENTS: Supercharging suspected at test point no. 10. Test was re-tried a metre lower. Test no. 12 was also suspected as being supercharged and retried half a metre higher with the same result. Test point 1685.5m could not be tested as the measure point of the tool could not get below 1684m.
2 samples were taken at test point 1605m. The first chamber filled in 70 seconds and the second chamber filled in 30 seconds. Sample chambers were checked on surface with a pressure gauge to confirm sampling. The first chamber registered 1220 psi and the second indicated 1280 psi indicating that sampling was successful.

Santos

PENRYN 2

Formation Pressure



APPENDIX IV: (ii) FMT SAMPLE ANALYSIS

amdel
www.amdel.com

19 October 2001

Santos Limited
GPO Box 2319
ADELAIDE SA 5001

Attention: Andy Pietsch

REPORT LQ10789

CLIENT REFERENCE: 539489-126

WELL NAME/RE: Penryn-2

MATERIAL: Gas & liquid

WORK REQUIRED: Liquid & gas composition analysis

AUTHOR'S NAME: Michelle Fordham

Please direct technical enquiries regarding this work, to the signatory below, under whose supervision the work was carried out. This report relates specifically to the sample or samples submitted for testing.

Diane Cass
Operations Manager
Petroleum Services

dc.cm

G:\Secretary\petroleum\Docs-01\10789.doc

1. INTRODUCTION

Amdel Limited was requested by Santos Limited to sample and analyse the contents of an RFT from Penryn-2. This report is a formal presentation of results forwarded by facsimile on 19 September 2001.

2. RESULTS

Gas and liquid compositions for Penryn-2 are presented on the following pages.

	UPPER CHAMBER	LOWER CHAMBER
Total Gas (cubic meters)	3067.6	3677.2
Liquid: condensate (ml)	60	40
mud/water (ml)	50	10
Opening Pressure (kPag)	8268	8268
Density (g/cm3 @ 15°C)	0.7305	0.7069

PETROLEUM SERVICES GAS ANALYSIS

Method GL-01-01 ASTM D 1945-96 (modified)

Client: SANTOS Ltd Report # LQ10789

Sample: PENRYN-2
Upper Chamber
8260 kPag @ 14°C
17/08/01, 1305 h, Cyl# 430

GAS	MOL %
Nitrogen	2.66
Carbon Dioxide	0.12
Methane	85.48
Ethane	6.42
Propane	3.14
I-Butane	0.75
N-Butane	0.80
I-Pentane	0.23
N-Pentane	0.15
Hexanes	0.16
Heptanes	0.07
Octanes and higher h'cs	0.02
Total	100.00

(0.00 = less than 0.01%)

The above results are calculated on an air and water free basis assuming only the measured constituents are present
The following parameters are calculated from the above composition at 15°C and 101.325 kPa (abs)

Average Molecular Weight	19.24
Lower Flammability limit	4.47
Upper Flammability limit	14.75
Ratio of upper to lower	3.30
Wobbe Index	51.98
Compressibility Factor	0.9972
Ideal Gas Density (Rel to air = 1)	0.664
Real gas Density (Rel to air = 1)	0.666
Ideal Nett Calorific Value MJ/m^3	38.33
Ideal Gross Calorific Value MJ/m^3	42.36
Real Nett Calorific Value MJ/m^3	38.43
Real Gross Calorific Value MJ/m^3	42.48
Gross calorific value of water-saturated gas MJ/m^3	41.62

This report relates specifically to the sample submitted for analysis.

Approved Signatory Carmelina Valenti

Accreditation No. 2013
Date : 14-09-01

amdel

908927 033

PETROLEUM SERVICES LIQUID ANALYSIS Method GL-02-01

Client: SANTOS Ltd Report # LQ10789

Sample: PENRYN-2
Upper Chamber
17/08/01, 1305 h

Boiling Point Range (Deg.C)	Component	Weight%	Mol%
-88.6	ETHANE	0.01	0.04
-42.1	PROPANE	0.41	0.87
-11.7	I-BUTANE	1.40	2.29
-0.5	N-BUTANE	3.67	5.98
27.9	I-PENTANE	5.53	7.25
36.1	N-PENTANE	6.18	8.10
36.1-68.9	HEXANE, C-6	16.42	18.02
80.0	BENZENE	0.06	0.07
80.7	CYCLOHEXANE	4.59	5.16
68.9-98.3	HEPTANE,C-7	20.26	19.14
100.9	METHYLCYCLOHEXANE	10.33	9.95
110.6	TOLUENE	0.25	0.26
98.3-125.6	OCTANE, C-8	13.66	11.31
136.1-144.4	ETHYLBZ+XYLENES	0.86	0.76
125.6-150.6	C-9	7.28	5.37
150.6-173.9	C-10	4.42	2.94
173.9-196.1	C-11	1.52	0.92
196.1-215.0	C-12	0.86	0.47
215.0-235.0	C-13	0.99	0.51
235.0-252.2	C-14	0.61	0.29
252.2-270.6	C-15	0.51	0.23
270.6-287.8	C-16	0.14	0.06
287.8-302.8	C-17	0.04	0.01
302.8-317.2	C-18	0.00	0.00
317.2-330.0	C-19	0.00	0.00
330.0-344.4	C-20	0.00	0.00
344.4-357.2	C-21	0.00	0.00
357.2-369.4	C-22	0.00	0.00
369.4-380.0	C-23	0.00	0.00
380.0-391.1	C-24	0.00	0.00
391.1-401.7	C-25	0.00	0.00
401.7-412.2	C-26	0.00	0.00
412.2-422.2	C-27	0.00	0.00
>422.2	C-28+	0.00	0.00
	Total	100.00	100.00

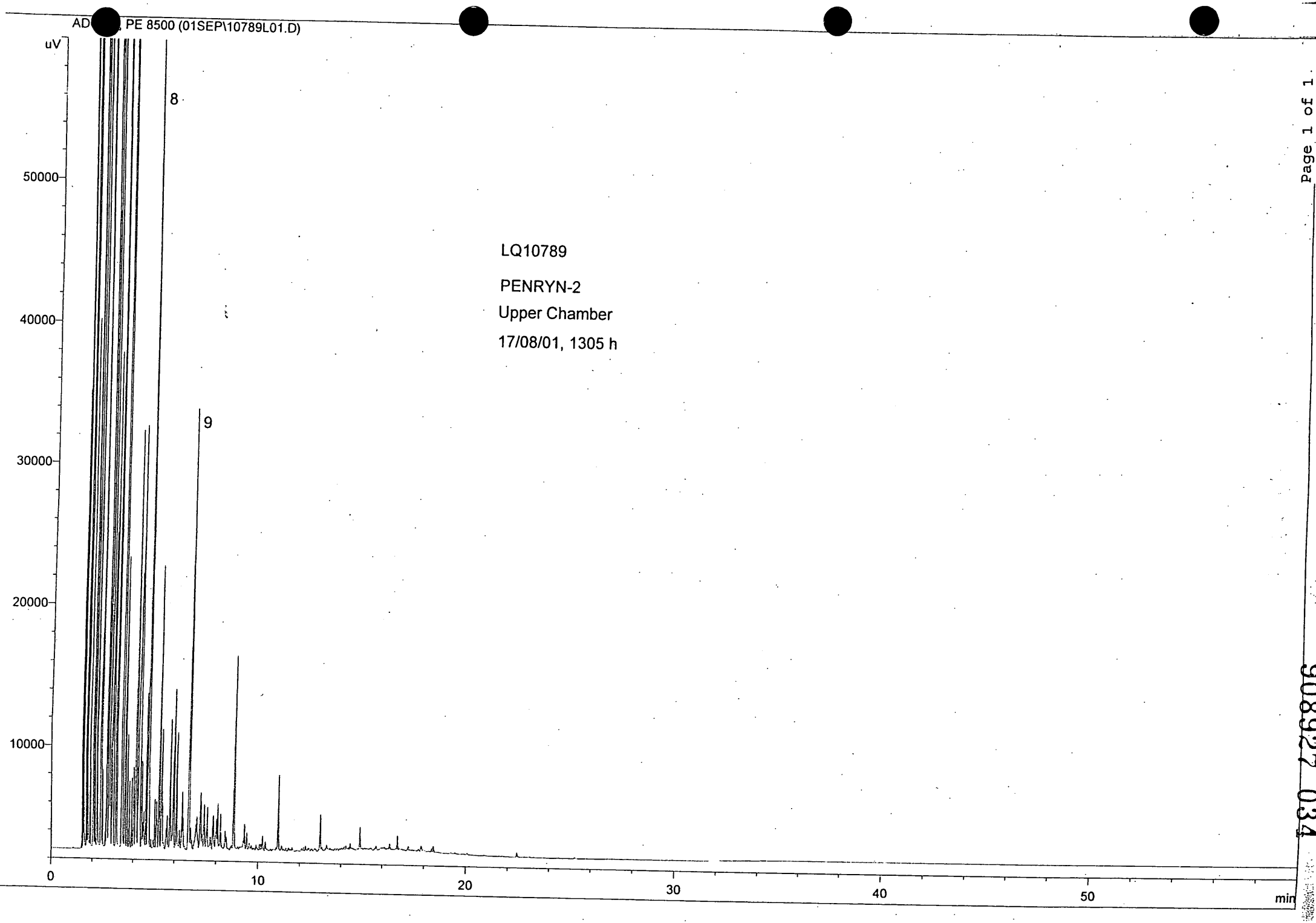
(0.00 = LESS THAN 0.01%)

The above boiling point ranges refer to the normal paraffin hydrocarbon boiling in that range. Aromatics, branched hydrocarbons, naphthenes and olefins may have higher or lower carbon numbers but are grouped and reported according to their boiling points.

Average molecular weight of C-8 plus fraction (calc) = 119 g/mol

This report relates specifically to the sample submitted for analysis.

Approved Signatory Carmelina Valenti
Accreditation No: 2013
Date 13-Sep-01


AD PE 8500 (01SEP\10789L01.D)
uV
50000
40000
30000
20000
10000
8
9
LQ10789
PENRYN-2
Upper Chamber
17/08/01, 1305 h
0
10
20
30
40
50
min

amdel 908927 035

PETROLEUM SERVICES GAS ANALYSIS

Method GL-01-01 ASTM D 1945-96 (modified)

Client: SANTOS Ltd Report # LQ10789

Sample: PENRYN-2
Lower Chamber
8260 kPag @ 14°C
17/08/01, 1140 h, Cyl# 451

GAS	MOL %
Nitrogen	2.61
Carbon Dioxide	0.12
Methane	85.40
Ethane	6.39
Propane	3.24
I-Butane	0.78
N-Butane	0.82
I-Pentane	0.23
N-Pentane	0.16
Hexanes	0.17
Heptanes	0.06
Octanes and higher h'cs	0.02
Total	100.00

(0.00 = less than 0.01%)

The above results are calculated on an air and water free basis assuming only the measured constituents are present
The following parameters are calculated from the above composition at 15°C and 101.325 kPa (abs)

Average Molecular Weight	19.28
Lower Flammability limit	4.46
Upper Flammability limit	14.73
Ratio of upper to lower	3.30
Wobbe Index	52.06
Compressibility Factor	0.9972
Ideal Gas Density (Rel to air = 1)	0.666
Real gas Density (Rel to air = 1)	0.667
Ideal Nett Calorific Value MJ/m^3	38.43
Ideal Gross Calorific Value MJ/m^3	42.47
Real Nett Calorific Value MJ/m^3	38.53
Real Gross Calorific Value MJ/m^3	42.59
Gross calorific value of water-saturated gas MJ/m^3	41.73

This report relates specifically to the sample submitted for analysis.

Approved Signatory Carmelina Valenti

Accreditation No. 2013
Date : 14-09-01

amdel

908927 036

PETROLEUM SERVICES LIQUID ANALYSIS Method GL-02-01

Client: SANTOS Ltd Report # LQ10789

Sample: PENRYN-2
Lower Chamber
17/08/01, 1310 h

Boiling Point Range (Deg.C)	Component	Weight%	Mol%
-88.6	ETHANE	0.03	0.08
-42.1	PROPANE	0.86	1.77
-11.7	I-BUTANE	2.22	3.48
-0.5	N-BUTANE	5.04	7.90
27.9	I-PENTANE	6.19	7.81
36.1	N-PENTANE	6.77	8.54
36.1-68.9	HEXANE, C-6	16.60	17.55
80.0	BENZENE	0.04	0.04
80.7	CYCLOHEXANE	4.75	5.14
68.9-98.3	HEPTANE,C-7	20.06	18.26
100.9	METHYLCYCLOHEXANE	10.46	9.71
110.6	TOLUENE	0.21	0.20
98.3-125.6	OCTANE, C-8	13.10	10.45
136.1-144.4	ETHYLBZ+XYLENES	0.74	0.63
125.6-150.6	C-9	6.59	4.68
150.6-173.9	C-10	3.71	2.37
173.9-196.1	C-11	1.13	0.66
196.1-215.0	C-12	0.47	0.25
215.0-235.0	C-13	0.44	0.22
235.0-252.2	C-14	0.34	0.16
252.2-270.6	C-15	0.12	0.05
270.6-287.8	C-16	0.07	0.03
287.8-302.8	C-17	0.02	0.01
302.8-317.2	C-18	0.04	0.01
317.2-330.0	C-19	0.00	0.00
330.0-344.4	C-20	0.00	0.00
344.4-357.2	C-21	0.00	0.00
357.2-369.4	C-22	0.00	0.00
369.4-380.0	C-23	0.00	0.00
380.0-391.1	C-24	0.00	0.00
391.1-401.7	C-25	0.00	0.00
401.7-412.2	C-26	0.00	0.00
412.2-422.2	C-27	0.00	0.00
>422.2	C-28+	0.00	0.00
	Total	100.00	100.00

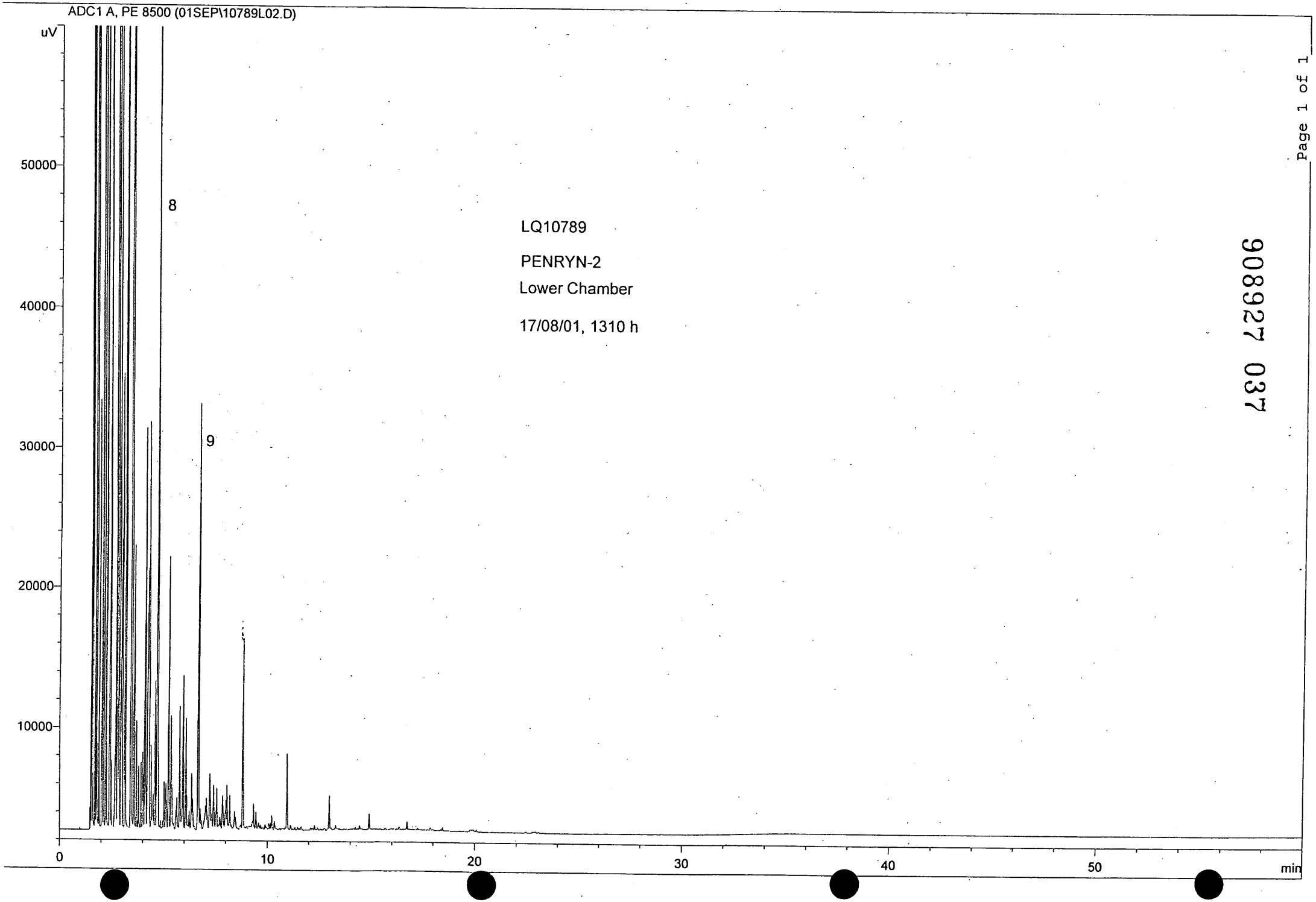
(0.00 = LESS THAN 0.01%)

The above boiling point ranges refer to the normal paraffin hydrocarbon boiling in that range. Aromatics, branched hydrocarbons, naphthenes and olefins may have higher or lower carbon numbers but are grouped and reported according to their boiling points.

Average molecular weight of C-8 plus fraction (calc) = 116 g/mol

This report relates specifically to the sample submitted for analysis.

Approved Signatory Carmelina Valenti
Accreditation No: 2013
Date 13-Sep-01


ADC1 A, PE 8500 (01SEP\10789L02.D)
uV
50000
40000
30000
20000
10000
8
9
LQ10789
PENRYN-2
Lower Chamber
17/08/01, 1310 h
0
10
20
30
40
50
min

APPENDIX V: DEVIATION DATA

PENRYN 2

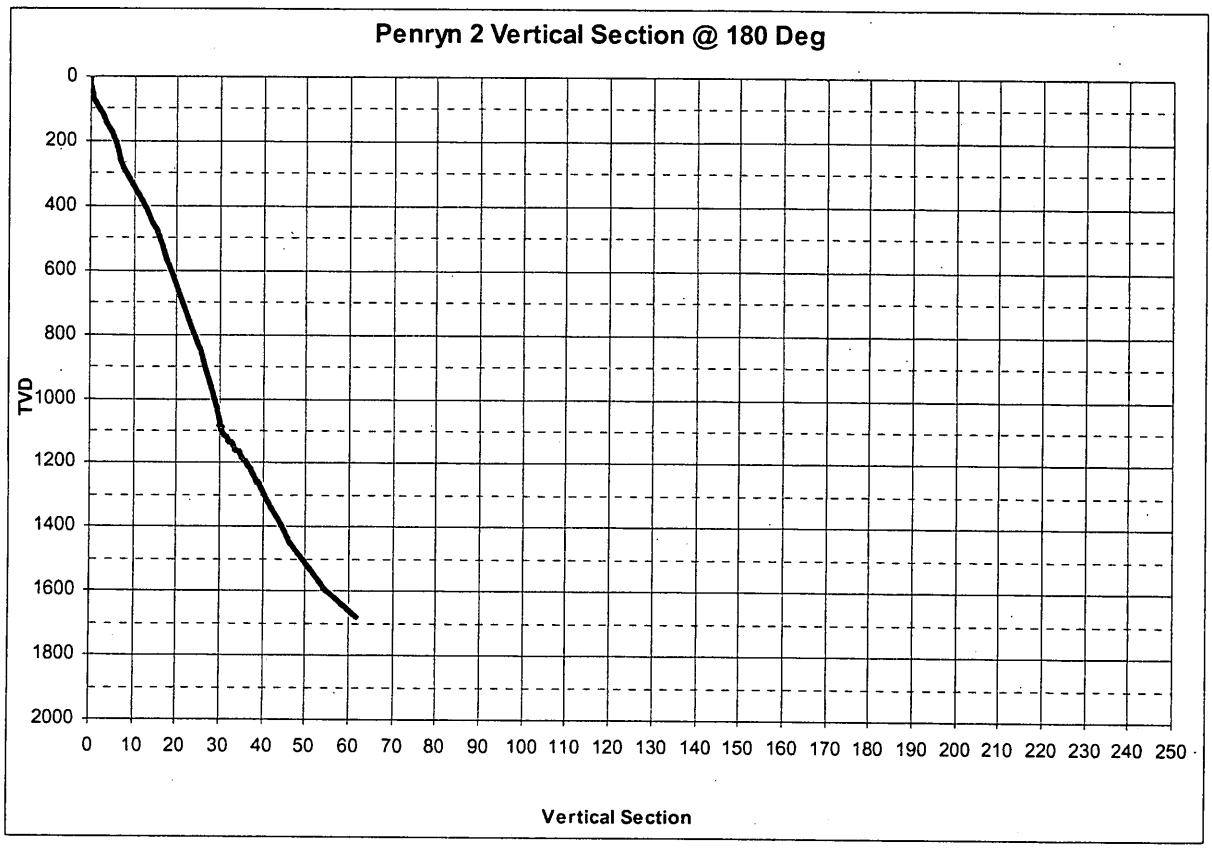
RT= 133.56 **Minimum Curvature Method**

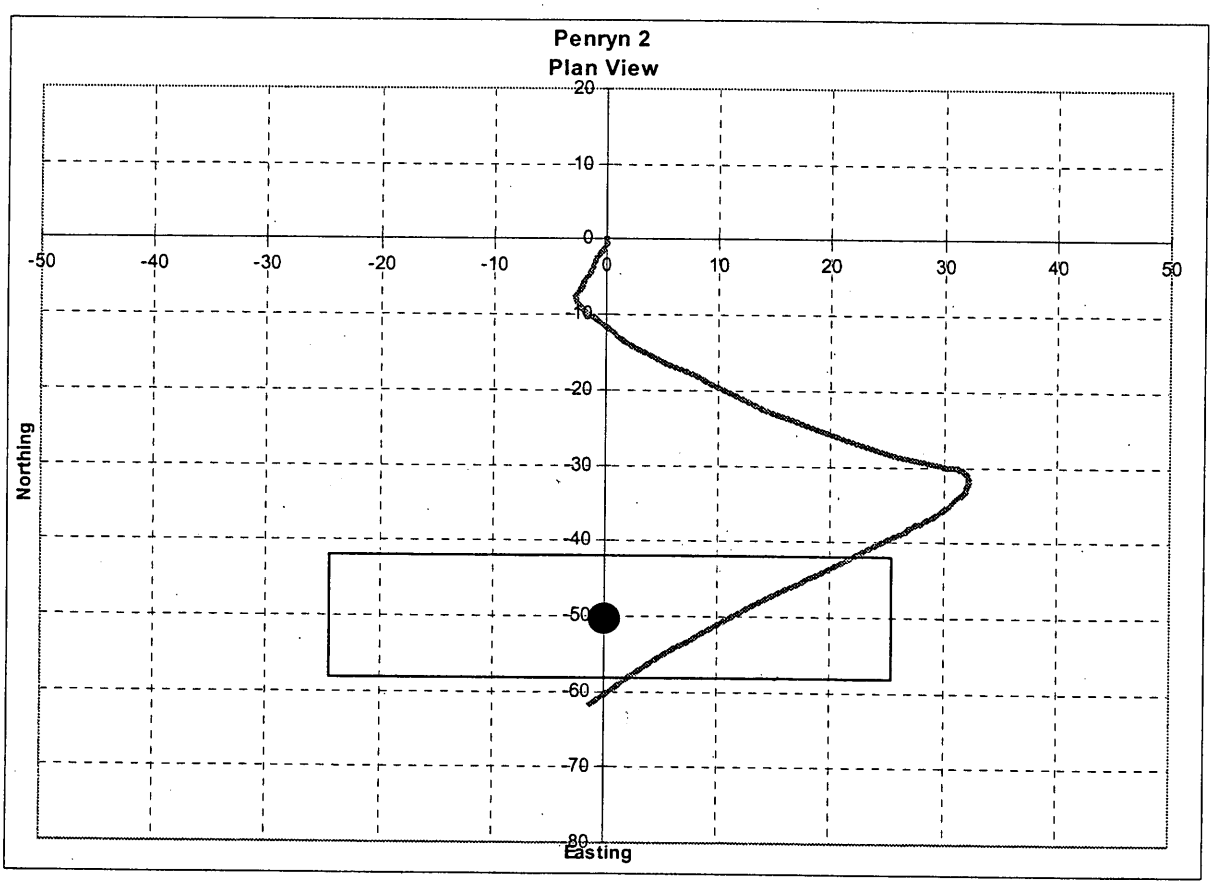
Enter Azimuth 180.0

DEPTH	Inclination	Azimuth	TVD	TVD	Northing	Easting	Q	Vert	Vert	Displ (offset)	Direction
m	DEG	DEG	m	S/S m	north	east	DEG	Sect	Plane		True
0	0.00	0.00	0.00	-133.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.25	62.10	26.00	-107.56	0.03	0.05	0.00	-0.03	0.03	0.06	0.00
52	1.20	191.10	52.00	-81.56	-0.21	0.05	0.02	0.21	-0.21	0.22	167.40
63	2.50	199.10	62.99	-70.57	-0.55	-0.05	0.02	0.55	-0.55	0.56	185.45
90	2.50	201.10	89.97	-43.59	-1.66	-0.46	0.00	1.66	-1.66	1.72	195.41
118	2.25	200.10	117.94	-15.62	-2.75	-0.87	0.00	2.75	-2.75	2.88	197.51
145	2.25	198.10	144.92	11.36	-3.75	-1.21	0.00	3.75	-3.75	3.94	197.94
175	1.80	204.00	174.90	41.34	-4.74	-1.59	0.01	4.74	-4.74	5.00	198.53
203	1.70	202.00	202.89	69.33	-5.52	-1.92	0.00	5.52	-5.52	5.85	199.19
232	1.50	199.00	231.88	98.32	-6.28	-2.21	0.00	6.28	-6.28	6.66	199.36
260	1.60	202.00	259.87	126.31	-6.99	-2.47	0.00	6.99	-6.99	7.42	199.48
290	1.60	197.00	289.86	156.30	-7.78	-2.75	0.00	7.78	-7.78	8.25	199.48
327	3.70	140.00	326.82	193.26	-9.19	-2.14	0.05	9.19	-9.19	9.43	193.08
351	3.70	138.00	350.77	217.21	-10.36	-1.12	0.00	10.36	-10.36	10.42	186.17
382	3.20	142.00	381.71	248.15	-11.78	0.08	0.01	11.78	-11.78	11.78	179.60
411	3.10	138.00	410.67	277.11	-13.00	1.11	0.00	13.00	-13.00	13.05	175.14
449	2.80	129.00	448.62	315.06	-14.35	2.51	0.01	14.35	-14.35	14.57	170.06
478	2.90	125.00	477.58	344.02	-15.22	3.67	0.00	15.22	-15.22	15.65	166.46
526	2.70	124.00	525.53	391.97	-16.55	5.60	0.00	16.55	-16.55	17.47	161.31
564	2.75	127.00	563.48	429.92	-17.59	7.07	0.00	17.59	-17.59	18.96	158.11
621	2.60	125.00	620.42	486.86	-19.16	9.22	0.00	19.16	-19.16	21.26	154.30
680	2.75	127.00	679.36	545.80	-20.78	11.45	0.00	20.78	-20.78	23.72	151.15
737	3.25	122.00	736.28	602.72	-22.46	13.91	0.01	22.46	-22.46	26.42	148.23
795	2.80	118.00	794.20	660.64	-23.99	16.55	0.01	23.99	-23.99	29.15	145.40
853	2.80	120.00	852.13	718.57	-25.37	19.03	0.00	25.37	-25.37	31.71	143.12
910	3.00	116.00	909.06	775.50	-26.72	21.58	0.00	26.72	-26.72	34.34	141.08
968	3.10	113.00	966.97	833.41	-28.00	24.38	0.00	28.00	-28.00	37.13	138.94
1026	3.50	110.00	1024.88	891.32	-29.21	27.49	0.01	29.21	-29.21	40.12	136.74
1073.52	3.44	103.00	1072.31	938.75	-30.03	30.24	0.01	30.03	-30.03	42.62	134.80
1083.29	3.52	102.00	1082.06	948.50	-30.16	30.82	0.00	30.16	-30.16	43.12	134.38
1093.07	3.27	109.00	1091.83	958.27	-30.31	31.38	0.01	30.31	-30.31	43.63	134.01
1102.34	2.95	132.12	1101.08	967.52	-30.56	31.81	0.02	30.56	-30.56	44.11	133.85
1112.12	3.09	159.92	1110.85	977.29	-30.97	32.08	0.03	30.97	-30.97	44.60	133.99
1121.82	3.39	171.76	1120.53	986.97	-31.50	32.22	0.01	31.50	-31.50	45.06	134.36
1131.53	3.52	184.64	1130.23	996.67	-32.09	32.23	0.01	32.09	-32.09	45.48	134.87
1141.26	3.63	199.16	1139.94	1006.38	-32.67	32.11	0.02	32.67	-32.67	45.81	135.50
1150.98	3.90	208.13	1149.64	1016.08	-33.26	31.85	0.01	33.26	-33.26	46.05	136.24
1159.94	3.93	216.41	1158.58	1025.02	-33.77	31.52	0.01	33.77	-33.77	46.20	136.97
1169.1	3.94	218.19	1167.71	1034.15	-34.27	31.14	0.00	34.27	-34.27	46.31	137.74
1178	3.98	217.55	1176.59	1043.03	-34.76	30.77	0.00	34.76	-34.76	46.42	138.49
1188.57	4.06	215.90	1187.14	1053.58	-35.35	30.32	0.00	35.35	-35.35	46.57	139.38

1198.29	4.00	221.42	1196.83	1063.27	-35.88	29.90	0.01	35.88	-35.88	46.71	140.20
1207.81	3.89	229.52	1206.33	1072.77	-36.34	29.43	0.01	36.34	-36.34	46.77	141.00
1217.46	3.92	231.80	1215.96	1082.40	-36.76	28.92	0.00	36.76	-36.76	46.77	141.80
1227.2	3.88	232.92	1225.68	1092.12	-37.16	28.40	0.00	37.16	-37.16	46.77	142.61
1236.99	3.86	233.51	1235.44	1101.88	-37.56	27.87	0.00	37.56	-37.56	46.77	143.42
1246.71	3.86	230.80	1245.14	1111.58	-37.96	27.35	0.00	37.96	-37.96	46.79	144.22
1256.46	3.92	231.85	1254.87	1121.31	-38.37	26.84	0.00	38.37	-38.37	46.83	145.03
1265.65	3.85	231.36	1264.04	1130.48	-38.76	26.35	0.00	38.76	-38.76	46.87	145.79
1338	3.70	234.00	1336.23	1202.67	-41.65	22.56	0.00	41.65	-41.65	47.37	151.55
1397	4.20	234.00	1395.09	1261.53	-44.04	19.28	0.01	44.04	-44.04	48.07	156.36
1450	4.30	234.00	1447.94	1314.38	-46.35	16.10	0.00	46.35	-46.35	49.06	160.85
1594	5.90	229.00	1591.37	1457.81	-54.38	6.14	0.03	54.38	-54.38	54.72	173.55
1685	7.25	221.00	1681.77	1548.21	-61.78	-1.15	0.03	61.78	-61.78	61.79	181.07

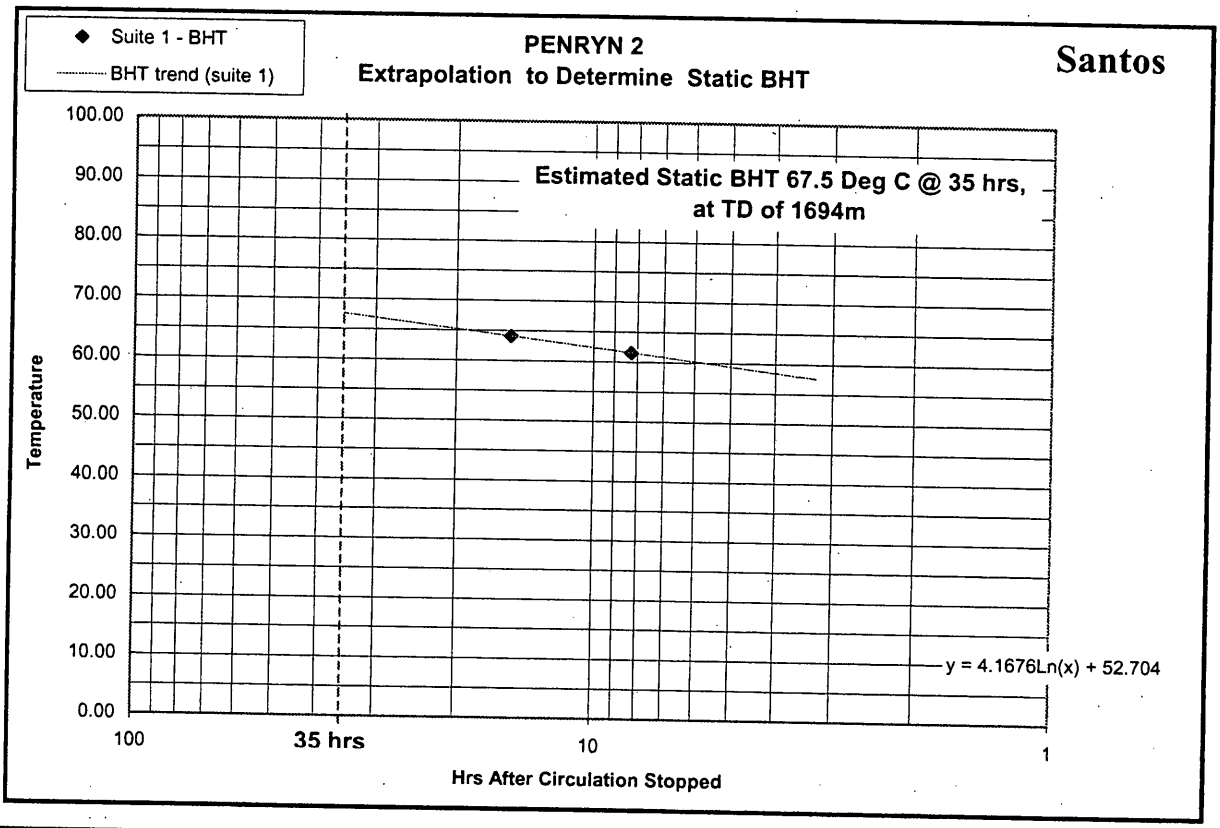
PENRYN 2
DEVIATION PLOTS



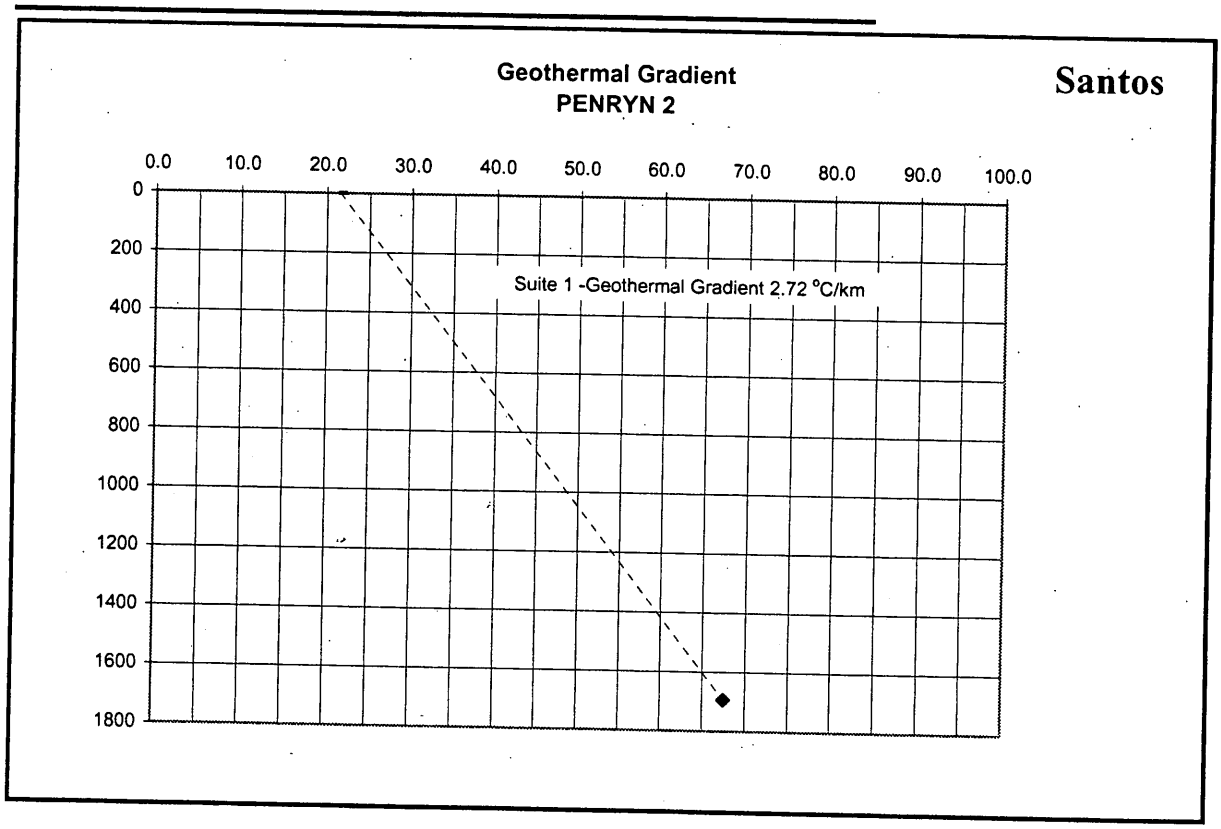


APPENDIX VI: GEOTHERMAL GRADIENT

	Max Recorded Temp	Depth Recorded	Time Since Circulation.	Total Depth	Estimated BHT
Run 1	60	1652.72	8.25	1694	61.50
Run 2	63.3	1674.5	15.17	1694	64.04
Run 3					



STATIC BHT @ 35 hrs	67.5	°C	@	1694	m
SURFACE TEMP.	21.5	°C	@	0	m
Geothermal Gradient for Suite 1		2.72	°C/km		



APPENDIX VII: WELL LOCATION SURVEY

908927 045

VICTORIA

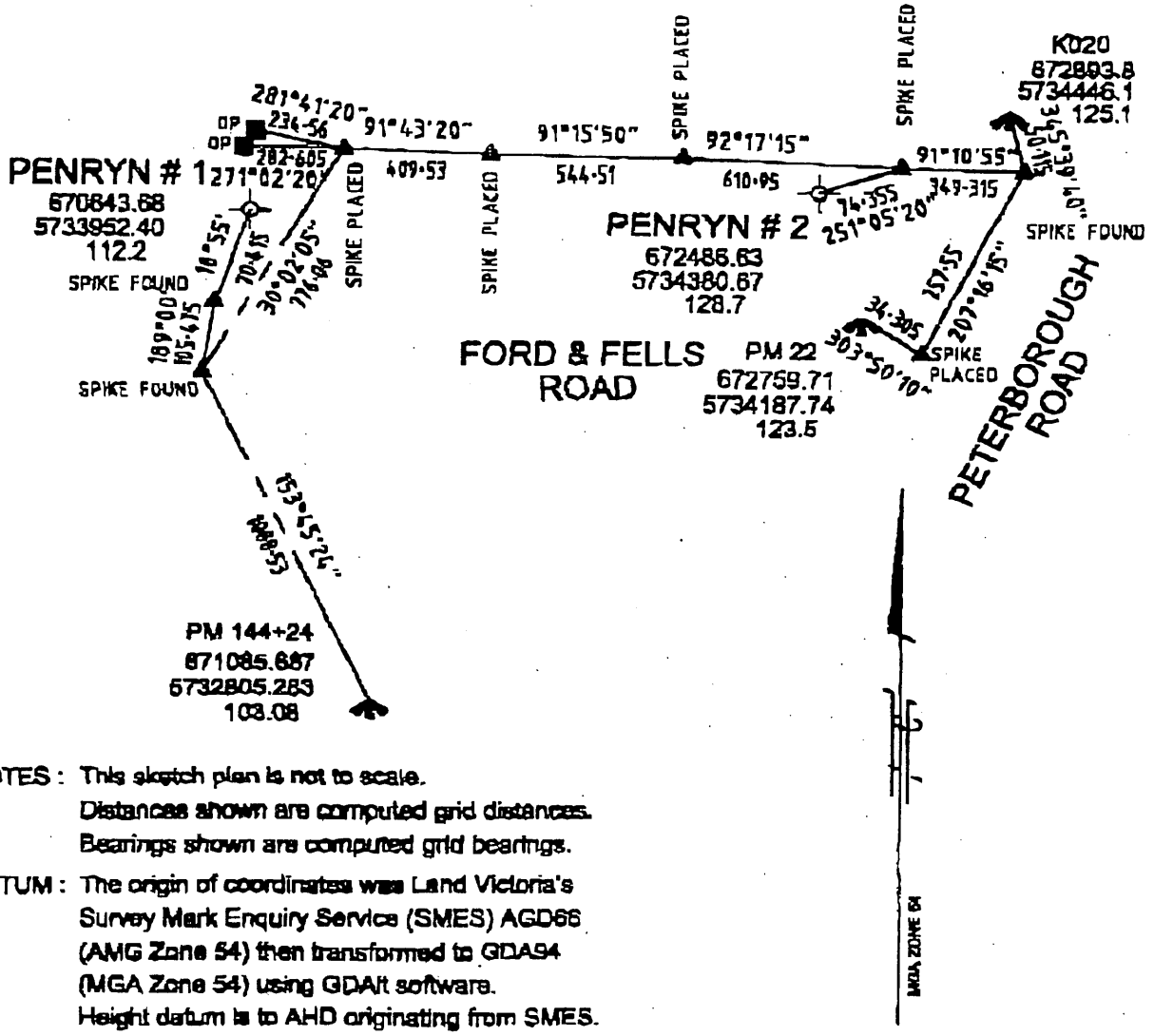
GAS WELL LOCATION

REFERENCE MARKS SKETCH PLAN

EXPLORATION LICENCE PEP 153

Well Name	PENRYN # 2
Map	
Spheroid	GDA94
Latitude	S 38°31'20.15"
Longitude	E 142°58'43.05"
Convergence	1°13'57"
Scale Factor	0.99994614

MGA 94	ZONE 54
Measurement units	(metres)
Easting	672486.63
Northing	5734380.67
Elevation	128.7 (AHD)



NOTES : This sketch plan is not to scale.
Distances shown are computed grid distances.
Bearings shown are computed grid bearings.

DATUM : The origin of coordinates was Land Victoria's Survey Mark Enquiry Service (SMES) AGD66 (AMG Zone 54) then transformed to GDA94 (MGA Zone 54) using GDAit software.
Height datum is to AHD originating from SMES.

Estimated Horizontal error is less than +/- 0.2 metre.
Estimated Vertical error is less than +/- 0.2 metre.
Date of Survey : 14 / 8 / 2001

Paul Crowe Surveyor ABN 59621601185 "Ambleside" 182 Koroit Street Warrnambool 3280 Ph. (03) 5561 1500	REF 1018

Date 14 / 8 / 2001

LICENSED SURVEYOR

APPENDIX VIII: DRILLING - FINAL WELL REPORT

SANTOS LTD

FINAL WELL REPORT

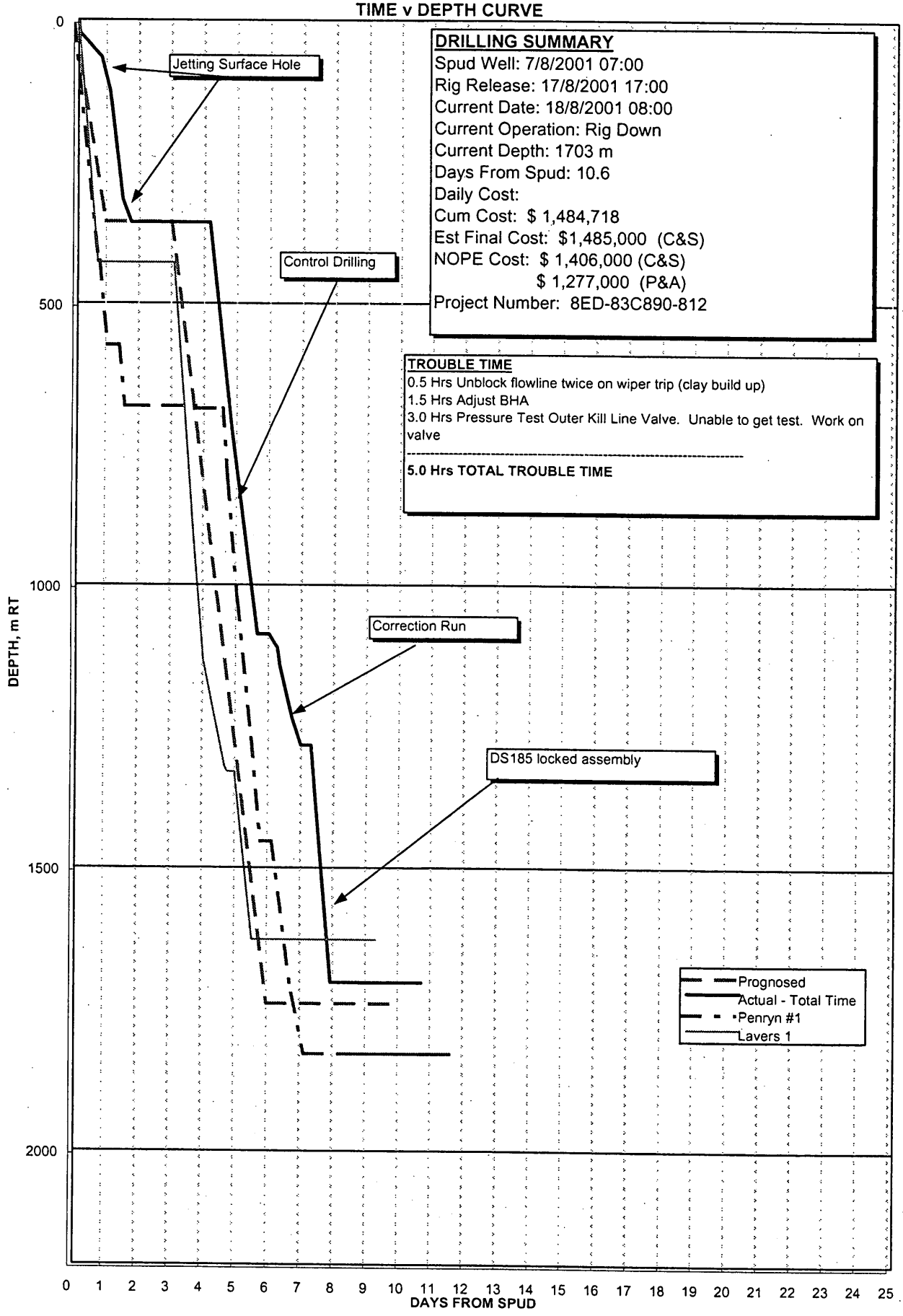
PENRYN #2

Drilling Supervisor(s)	: S. Porter
Drilling Engineer(s)	: G. Coker
Report Author	: G. Coker / T. Robertson
Report Supervisor	: M. Bill
Date of Issue	: 19th October 2001

Table of Contents

Section 1 – Well Summary
Time vs Depth Curve

PENRYN #2
TIME v DEPTH CURVE



Section 2 – Well History
Well History Report

PENRYN #2

Drilling Co.: OD&E **Rig:** OD&E #30

RT above GL: 133 m Lat : 38 deg 31 min 20.17 sec Spud Date: 07/08/2001 Release Date: 17/08/2001
GL above MSL : 128 m Long : 142 deg 58 min 43.06 sec Spud Time: 07:00:00 Release Time: 17:00:00

Well History

#	DATE	DEPTH	WELL HISTORY (24 Hr Summary)
1	31/07/2001		Rig released from OCA at Penola at 1500 hrs. Rig down for move to Penryn 2
2	01/08/2001		Rigging down at Penola
3	02/08/2001		Load out part of rig & move from Penola to Penryn 2. 40% of rig moved
4	03/08/2001		Move rig & rigging up on Penryn 2
5	04/08/2001		Move & set up camp. Rig up on Penryn 2
6	05/08/2001		Rigging up on Penryn 2. Rain most of the day
7	06/08/2001		Prepare & raise mast. Rig up, drill mouse hole
8	07/08/2001	66	Spud in at 0700 hrs & drill 9-7/8" hole to 66 m. Jetting to build angle
9	08/08/2001	357	Jet & drill 9-7/8" surface hole to 357.3 metres.
10	09/08/2001	357	Condition hole. Run & cement 30 joints of 7-5/8" casing at 355.3 metres. Wait on cement & nipple up BOP's
11	10/08/2001	357	Nipple up & test BOP's. Make up BHA & run in hole.
12	11/08/2001	721	RIH, pressure test Pipe Rams & Annular after having trouble getting a test on the Kill Line valve. Drill out cement, run L.O.T to 17.2 ppg EMW. Drill 6-3/4" hole with surveys to 721 m
13	12/08/2001	1,087	Drill from 721 to 1087 m with surveys. Hoist & pick up DHM & MWD for correction run
14	13/08/2001	1,283	Run in hole & drill with DHM & MWD to correct direction. Hoist to go back drilling with rotary locked assembly
15	14/08/2001	1,703	POH & lay out directional tools. RIH with Locked Rotary assembly & drill ahead to TD of 1703 m. Condition hole for logging
16	15/08/2001	1,703	Condition hole & hoist. Run Logs with Baker-Atlas
17	16/08/2001	1,703	RIH, circulate clean. Hoist, laying out pipe. Run 137 joints of 3-1/2" casing & one Marker joint. Circulate ready to start cement job
18	17/08/2001	1,703	Cement 3-1/2" casing at 1696 m. W.O.C. Set Slip & Seal Assy, ND BOP's & NU Xmas Tree & Adaptor Flange. Pressure test to 5000 psi. Rig released at 1700 hrs, 17-8-01

Section 3 – Drilling Data
Bit Record
FIT/LOT Report

PENRYN #2

Drilling Co.: OD&E

Rig : OD&E #30

RT above GL : 133 mtrs
GL above MSL : 128 mtrs

Lat : 38 deg 31 min 20.17 sec
Long : 142 deg 58 min 43.06 sec

Spud Date: 07/08/2001
Spud Time: 07:00:00

Release Date: 17/08/2001
Release Time: 17:00:00

BIT RECORD

DATE	BIT#	SIZE "	IADC	SER	MFR	TYPE	JETS	D.IN mtrs	D.OUT mtrs	MTRG	HRS IADC	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
09/08/2001	1RR	9.88	116	LY9255	SMITH	FGSS+2C	1x22	0	357	357	33.5	2289	550	8.7	76	8.9	0.371	0	0.00	10.7	1	2	WT	A	E	I	NO	TD
12/08/2001	2RR	6.75		5010844	DBS	FM2465	4x11	357	1,087	730	27.5	901	269	5.0	80	8.8	0.371	75	2.29	26.5	2	3	CT	N	X	I	WT	BHA
14/08/2001	3	6.75	437	D86YU	HUGHES	STR-R09D	2x12,1x14	1,087	1,283	196	19.0	1809	252	12.1	126	9.0	0.371	66	1.55	10.3	1	1	WT	A	E	I	NO	BHA
15/08/2001	4	6.75		24429	HYC	DS 185GNVW	4x12	1,283	1,703	420	13.0	1800	300	10.0	115	9.2	0.442	0	0.00	32.3	1	2	WT	N	X	I	NO	TD

908927 055

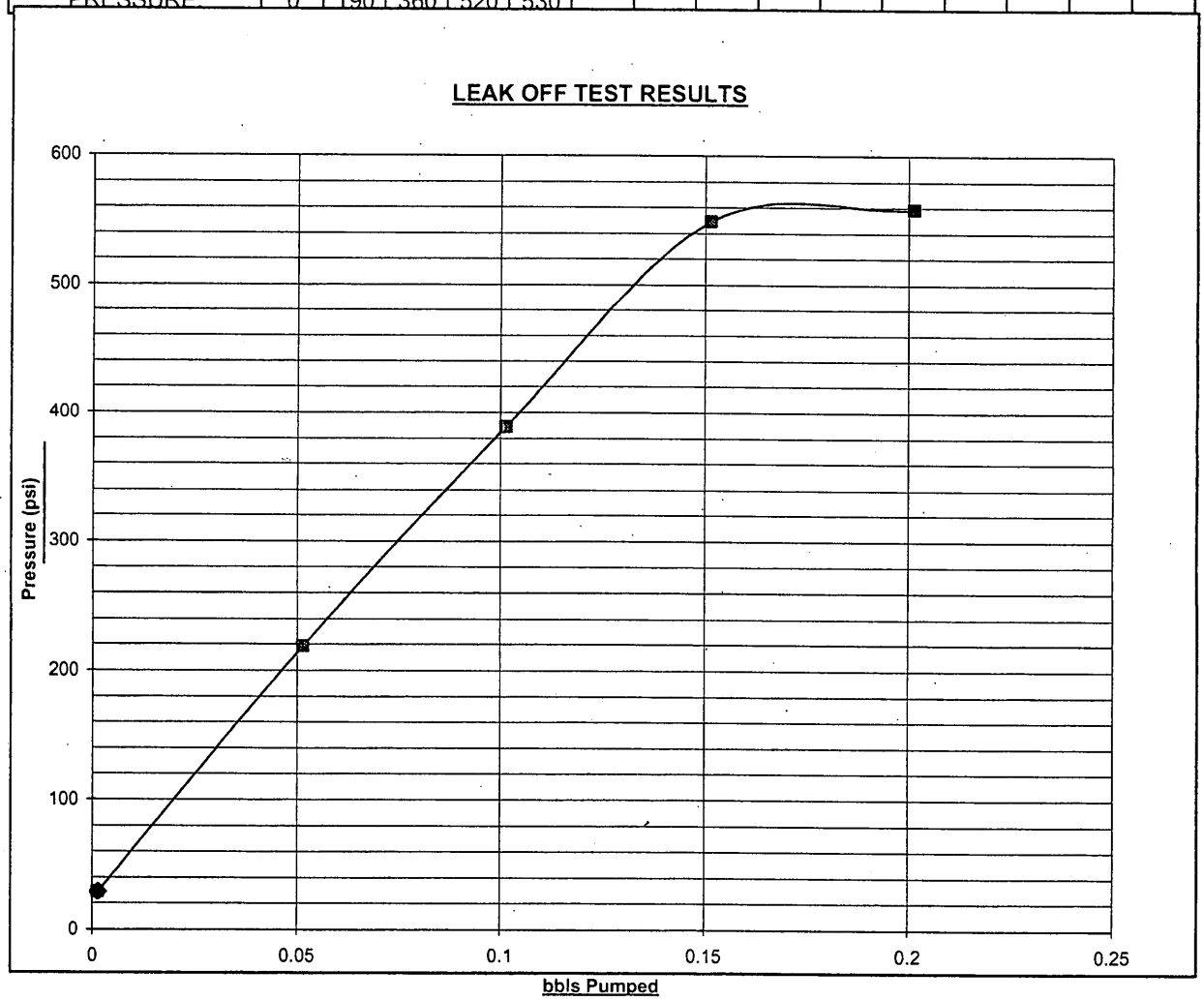
Santos	QNTBU DRILLING DEPARTMENT LEAK OFF TEST RESULTS	FORM DMS F-214

WELL: PENRYN 2 **RIG:** O D & E 30 **DATE:** 29/11/2001

CASING SIZE: 7-5/8 (inch) SANTOS SUPERVISOR: Seton Porter

A. MUD DENSITY IN USE:		8.6 (ppg)
B. HOLE DEPTH:		360 (m)
C. SHOE DEPTH:		355 (m)
D. LEAK-OFF PRESSURE (GRAPH):		520 (psi)
E. EQUIVALENT DENSITY:		
LEAK-OFF PRES. (D) (psi) / SHOE DEPTH (C) (ft) x 0.052	+ MUD DENSITY IN USE (A) (ppg)	**17.2 (ppg) (EMW)**
F. MAXIMUM PRESSURE RECORDED:		530 (psi)
G. VOLUME PUMPED:		8.4 (gals)
H. VOLUME REGAINED:		8.1 (gals)

BBLS:	0	0.05	0.1	0.15	0.2										
PRESSURE:	0	190	360	520	530										



Section 4 – Casing and Cementing

Casing and Cementing Report/s

Wellhead Installation Report/Plug and Abandonment Report

908927 057

Santos

Santos Ltd

A.C.N. 007 550 923

CASING AND CEMENTING REPORT

Well Name: PENRYN 2

FORM DQMS F-220

Casing type: ☒ Surface casing ☐ Intermediate Casing ☐ Production Casing ☐ Completion tubing

Originated by: Seton Porter **Checked by:** Justine Bevern **Date:** 09-Aug-01

Hole Size: 9-7/8" **T.D.:** 357.3 metres **Contractor:** O D & E 30

PRE-FLUSH 40 bbls. @ 8.33 ppg. Water

Additives: Nil

SPACER bbls@ ppg.

Nil

CEMENT		ADDITIVES	Product	%	Amount
LEAD SLURRY:	100 sacks class G		D 020 Bentonite	4	376 lbs
Slurry Yield:	2.84 cu.ft./sack		S 001, Accelerator	1.5	141 lbs
Mixwater Req't:	17.43 gal./sack				
Actual Slurry Pumped:	50.4 bbls @ 11.5 ppg				
TAIL SLURRY:	85 sacks class G		D 145A Dispersant	0.05 gal/sack	5 gals
Slurry Yield:	1.19 cu.ft./sack				
Mixwater Req't:	5.24 gal./sack				
Actual Slurry Pumped:	18.3 bbls @ 15.6 ppg				

DISPLACEMENT Fluid: Mud @ 8.9 ppg

Theoretical Displ.:	51.3 bbl.	Bumped plug with	2000 psi
Actual Displ.	51.2 bbl @ 6 bpm	Pressure Tested to:	2000 psi
Displaced via	(RIG) / TRUCK / PUMP	Bleed back:	0.3 bbls

ACTIVITY	Time
Start Running csg.	07:15
Casing on Bottom	10:00
Start Circulation	10:35
Start Pressure Test	11:05
Pump Preflush	11:15
Start Mixing	11:25
Finish Mixing	11:41
Start Displacing	11:42
Stop Displ./Bump	11:54
Press. test	12:05

Returns to Surface: bbls mud 6 bbls cmt.

Reciprocate / Rotate Casing: While circulating, then casing chained down

Top Up Job run: (Yes) / No 50 sx class G

Plug Set Make / Type:

Centraliser Placement, type/depth: Bow Spring, Weatherford 348, 337, 319, 296, 273, & 17 metres

Remarks: Casing went right to bottom, head up & circulate. Pressure test lines to 2500 psi & pump 40 bbls of water ahead. Mix & pump 100 sacks of Lead & 86 sacks of Tail cement. Displaced with mud, using rig pump. Had 6 bbls of good cement back (minimal mud returns for a short time at start of displacement) Ran Top-Up job & circulated good cement back from a depth of 13 metres, RT., at 1300 hrs.

No. JOINTS	SIZE OD	WT lb/ft	GRADE	THREAD	Metres	FROM	TO
Stick Up (Enter as negative number)					-0.98		
Rotary table to top of Bradenhead					4.64		4.64
Bradenhead							
Jts							
marker							
Jts							
marker							
Jts							
Landing Joint	7-5/8"	26.4	L-80	BTC	6.15	-0.98	5.17
28 Jts	7-5/8"	26.4	L-80	BTC	326.04	5.17	331.21
Float Collar	Weatherford			BTC	0.40	331.21	331.61
Joints	7-5/8"	26.4	L-80	BTC	23.24	331.61	354.85
Float Shoe	Weatherford			BTC	0.45	354.85	355.30

Theoretical Bouyed wt of casing(klb):	26.6	Bradenhead Height above GL	
Actual wt of casing (last joint run-block wt, klb)	24.0	Casing wt just prior to landing csg/	23 klbs
Landing WT (after cementing and pressure bleed off)	23.0	setting slips	

Santos

Santos Ltd

A.C.N. 007 550 923

CASING AND CEMENTING REPORT

Well Name: PENRYN 2

FORM DQMS F-220

Casing type: ☐ Surface casing ☐ Intermediate Casing ☒ Production Casing ☐ Completion tubing

Originated by: Seton Porter **Checked by:** Geoff Coker **Date:** 17-Aug-01

Hole Size: 6-3/4" **T.D.:** 1703 metres **Contractor:** O D & E 30

PRE-FLUSH 40 bbls. @ 8.33 ppg. Water

Additives: S.A.P.P, Biocide

SPACER 5 bbls@ 8.33 ppg. Water

CEMENT

LEAD SLURRY:	343 sacks class	G
Slurry Yield:	2.84 cu.ft./sack	
Mixwater Req't:	17.43 gal./sack	
Actual Slurry Pumped:	172 bbls @	11.5 ppg
TAIL SLURRY:	100 sacks class	G
Slurry Yield:	1.19 cu.ft./sack	
Mixwater Req't:	5.24 gal./sack	
Actual Slurry Pumped:	21 bbls @	15.6 ppg

ADDITIVES

	Product	%	Amount
D 020	Bentonite	4	1290 lbs
D081	Retarder	1.5	14 gals
D047	Antifoam	0.01	4 gals
D 145A	Dispersant	0.01	5 gals
D047	Antifoam	0.01	2 gals
D080	Dispersant	0.05	5 gals

DISPLACEMENT

Fluid: 3% KCL Brine 8.5 ppg

Theoretical Displ.: 48.05 bbl. Bumped plug with 2000 psi

Actual Displ. 45 bbl @ 6 bpm Pressure Tested to: 2000 psi

Displaced via (RIG) / TRUCK PUMP Bleed back: 0.3 bbls

ACTIVITY	Time
Start Running csg.	16/08/2001 15:30
Casing on Bottom	16/08/2001 21:55
Start Circulation	16/08/2001 22:25
Pump Preflush	16/08/2001 23:15
Start Pressure Test	16/08/2001 23:20
Start Mixing	17/08/2001 00:03
Finish Mixing	17/08/2001 00:36
Start Displacing	17/08/2001 00:38
Stop Displ./Bump	17/08/2001 00:50
Press. test	17/08/2009 01:01

Returns to Surface: Full bbls mud **Trace of** bbls cement.

(Reciprocate) / Rotate Casing: Yes

Top Up Job run: Yes / (No) sx class G

Plug Set Make / Type:

Centraliser Placement, type/depth: Bow Spring, Weatherford

1693, 1670, 1658, 1633, 1608, 1584, 1556, 1531, 344, 319 m

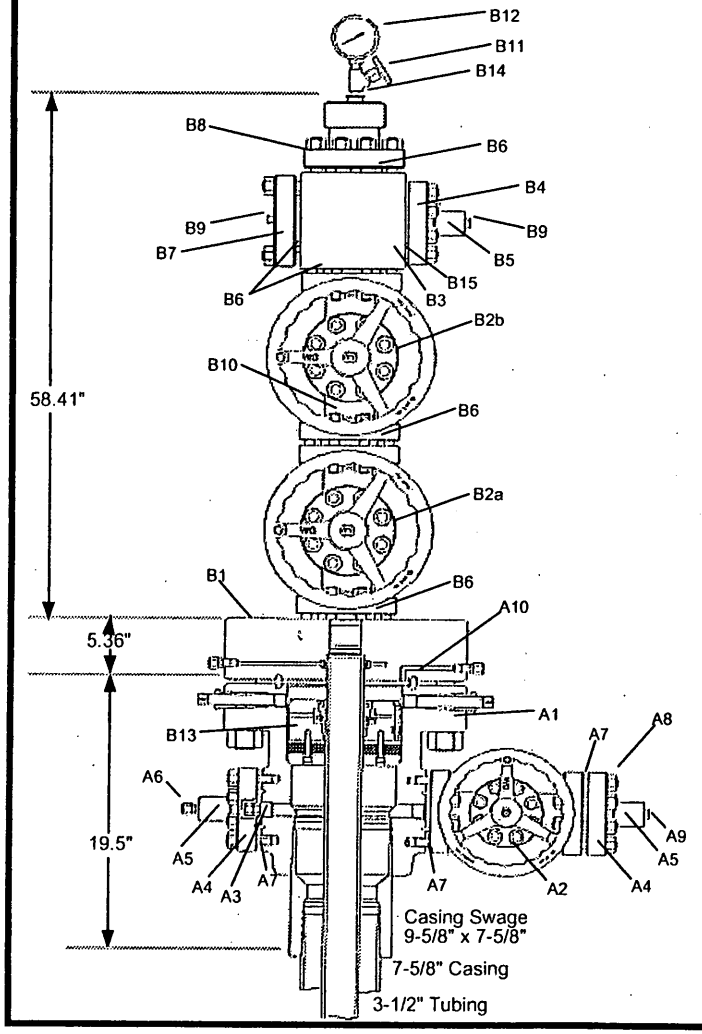
Remarks: Casing went right to bottom at 1703 m. Laid out 1 joint, shoe at 1696 m. Head up & circulate. Pump 40 bbls of Biocide treated mud ahead, then 40 bbls of S.A.P.P Pre-Flush. Trouble with Dowell line plugged with cement then pressure tested to 2500 psi. Mix & pump Lead & Tail cement slurries, on spec. Displaced cement with 2% KCL brine & bumped plug to 2000 psi. Start of Lead returned over shakers. W.O.C then set slips

No. JOINTS	SIZE OD	WT lb/ft	GRADE	THREAD	Metres	FROM	TO
Stick Up (Enter as negative number)					-0.92		
Rotary table to top of Bradenhead					4.64		4.64
Bradenhead							
128 Jts		9.2	J-55	Fox	1581.81	-0.92	1580.89
Marker	3-1/2"	9.2	L-80	Fox	3.06	1580.89	1583.95
8 Jts.	3-1/2"	9.2	J-55	Fox	98.92	1583.95	1682.87
Float Collar	Weatherford			Fox	0.35	1682.87	1683.22
1 Joint	3-1/2"	9.2	J-55	Fox	12.37	1683.22	1695.59
Float Shoe	Weatherford			Fox	0.41	1695.59	1696.00

Theoretical Bouyed wt of casing(klb):	44.1	Bradenhead Height above GL
Actual wt of casing (last joint run-block wt, klb)	40.0	Casing wt just prior to landing csg/ 36 klbs
Landing WT (after cementing and pressure bleed off)	36.0	setting slips. Set slips with 40 klbs over casing weight ie 76 klbs

FORM DQMS F-130	WELLHEAD INSTALLATION REPORT 2 STRING MONOBORE (7-5/8" SURFACE CASING)	Santos

Well : PENRYN 2
Supervisor : Seton Porter
Date : 16-Aug-2001



COMPONENT	DESCRIPTION	No USED
A1. Casing Head	11" 5k x 7-5/8" 5k c/w BTC Box (WG-22-L, BTS, PR-2, CC, U)	1
A2. Gate Valve	2-1/16" 5k Model 2200 (Type 'FE', PSL-1, PR-1, BB, U)	1
A3. Plug	1-1/2" line pipe c/w 1-1/4" hex	1
A4. Companion Flange	2-1/16" 5k x 2" line pipe, (AA, U)	2
A5. Bull Plug	2" line pipe tapped c/w 1/2" NPT, XX-H	2
A6. Test Fitting	1/2" NPT	1
A7. Ring Gasket	RX-24 Stainless Steel	3
A8. Studs	7/8" x 6-1/4" long c/w nuts	8
A9. Pipe Plug	1/2" NPT male	1
A10. Ring Gasket	RX-54 Stainless Steel	1
B13. Slip & Seal Assy	11" x 3-1/2" (WG-22, PSL-1, PR-2, AA, U)	1
B1. Adaptor Flange	11" x 3-1/8" 5k, 3.5" P seal, 3" H BPV (WG-A4-P, PSL-1, CC, U)	1
B2a. Gate Valve	3-1/8" 5k Model 2200 (6A, PSL-1, PR-2, CC, PU)	1
B2b. Gate Valve	2-1/16" 5k Model 2200 (6A, PSL-1, PR-2, CC, U)	1
B3. Flow Cross	3-1/8" x 3-1/8" x 3-1/8" x 2-1/16" 5k (PSL-1, PR-2, CC, U)	1
B4. Companion Flange	2-1/16" 5k x 2" line pipe, (AA, U)	1
B5. Bull Plug	2" line pipe tapped c/w 1/2" NPT, XX-H	1
B6. Ring Gasket	RX-35 Stainless Steel	5
B7. Blind Flange	3-1/8" 5k tapped 1/2" NPT (CC, U)	1
B8. Tree Cap	3-1/8" 5k c/w Bowen union, 3.5" lift thread, tapped 1" NPT	1
B9. Pipe Plug	1/2" NPT male	1
B10. Studs	7-1/4" x 1-1/8" w/ nuts	8
B11. Needle Valve	1/2" NPT 5k Stainless Steel	1
B12. Pressure Gauge	1/2" NPT 0-5000psi	1
B14. Reducer	1" male x 1/2" female NPT Reducer	1
B15. Ring Gasket	RX-24 Stainless Steel	1
Notes:	3-1/2" Tubing stub cut off 85mm above top flange on bradenhead.	
	1/2" NPT male Pipe plug fitted in lieu of Items B11 & B12 at this time.	

Section 5 – Survey Data
Survey Report

PENRYN #2

Drilling Co.: OD&E **Rig:** OD&E #30

RT above GL: 133 m Lat : 38 deg 31 min 20.17 sec Spud Date: 07/08/2001 Release Date: 17/08/2001
GL above MSL : 128 m Long : 142 deg 58 min 43.06 sec Spud Time: 07:00:00 Release Time: 17:00:00
Magnetic Declination (degs): 10.90
Projection:

DEVIATION SURVEY

MD (m)	TVD (m)	INCL (deg)	AZIMUTH (deg)	CORRECT. AZ (deg)	DOGLEG (deg/30m)	'V' SECT (m)	N/S (m)	E/W (m)	CLOSURE (m)
26	26	0.25	74	85	0.3	0	0	0	0
52	52	1.20	191	202	1.3	0	0	0	0
63	63	2.50	199	210	10.0	0	0	0	0
90	90	2.50	201	212	5.5	1	1	-0	1
118	118	2.25	200	211	5.0	1	1	-0	1
145	145	2.25	198	209	4.9	1	1	-0	1
175	175	1.80	204	215	4.0	1	1	-1	1
203	203	1.70	202	213	3.7	1	1	-1	1
232	232	1.50	201	212	3.2	1	1	-1	1
260	260	1.60	202	213	3.3	1	1	-1	1
290	290	1.60	199	210	3.1	1	1	-1	1
327	327	3.70	140	151	4.2	1	1	-1	2
351	351	3.70	138	149	8.7	2	2	-1	2
382	382	3.20	142	153	6.2	2	2	-0	2
411	411	3.10	138	149	6.2	2	2	0	2
449	449	2.80	129	140	4.3	2	2	1	2
478	478	2.90	125	136	5.3	2	2	2	3
526	526	2.70	124	135	3.1	2	2	3	3
564	564	2.75	127	138	3.8	2	2	4	4
621	621	2.60	125	136	2.5	3	3	5	5
680	680	2.75	127	138	2.4	3	3	6	7
737	737	3.25	122	133	2.8	4	4	7	8
795	795	2.80	118	129	2.7	4	4	9	9
853	853	2.80	120	131	2.5	4	4	10	11
910	910	3.00	116	127	2.6	5	5	11	12
968	968	3.10	113	124	2.7	6	6	13	14
1,026	1,025	3.50	110	121	2.8	6	6	15	16
1,074	1,073	3.44	103	114	3.6	7	7	16	18
1,083	1,083	3.52	102	113	16.7	7	7	16	18
1,093	1,092	3.27	109	120	16.1	7	7	17	18
1,102	1,102	2.95	132	143	16.4	7	7	17	19
1,112	1,112	3.09	160	171	16.9	8	8	17	19
1,122	1,121	3.39	172	183	19.7	8	8	17	19
1,132	1,131	3.52	185	196	21.3	8	8	17	19
1,141	1,141	3.63	199	210	22.0	8	8	17	19
1,151	1,150	3.90	208	219	22.9	8	8	17	19
1,160	1,159	3.93	216	227	25.4	8	8	17	19
1,169	1,168	3.94	218	229	24.5	8	8	17	19
1,178	1,177	3.98	218	228	25.2	8	8	17	18
1,189	1,188	4.06	216	227	21.6	8	8	17	18
1,198	1,198	4.00	221	232	23.7	8	8	16	18
1,208	1,207	3.89	230	240	23.3	8	8	16	18
1,217	1,217	3.92	232	243	22.0	8	8	16	18
1,227	1,226	3.88	233	244	21.6	9	9	16	18
1,237	1,236	3.86	234	244	21.2	9	9	15	18
1,247	1,246	3.86	231	242	21.3	9	9	15	18
1,256	1,256	3.92	232	243	21.6	9	9	15	18
1,266	1,265	3.85	231	242	22.8	9	9	15	17
1,338	1,337	3.70	234	245	2.8	10	10	13	17
1,397	1,396	4.20	234	245	3.6	12	12	12	17
1,450	1,449	4.30	234	245	4.3	13	13	10	17
1,594	1,593	5.90	229	240	1.9	18	18	7	19
1,685	1,683	7.25	221	232	3.9	21	21	4	22

PENRYN #2

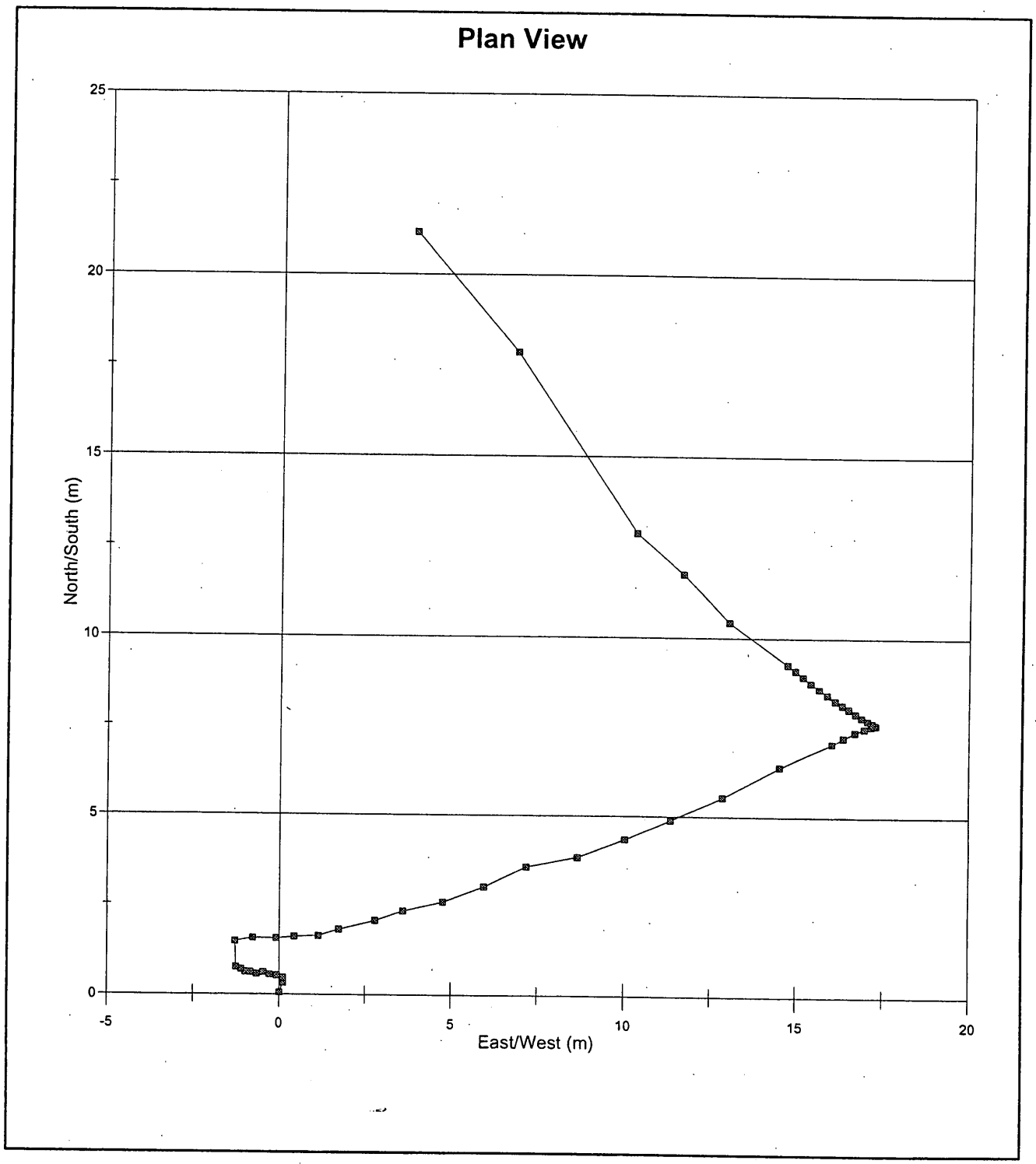
Drilling Co.: OD&E **Rig:** OD&E #30

RT above GL: 133 m Lat : 38 deg 31 min 20.17 sec Spud Date: 07/08/2001 Release Date: 17/08/2001
GL above MSL : 128 m Long : 142 deg 58 min 43.06 sec Spud Time: 07:00:00 Release Time: 17:00:00

Magnetic Declination (degs): 10.90

Projection:

DEVIATION SURVEY



PENRYN #2

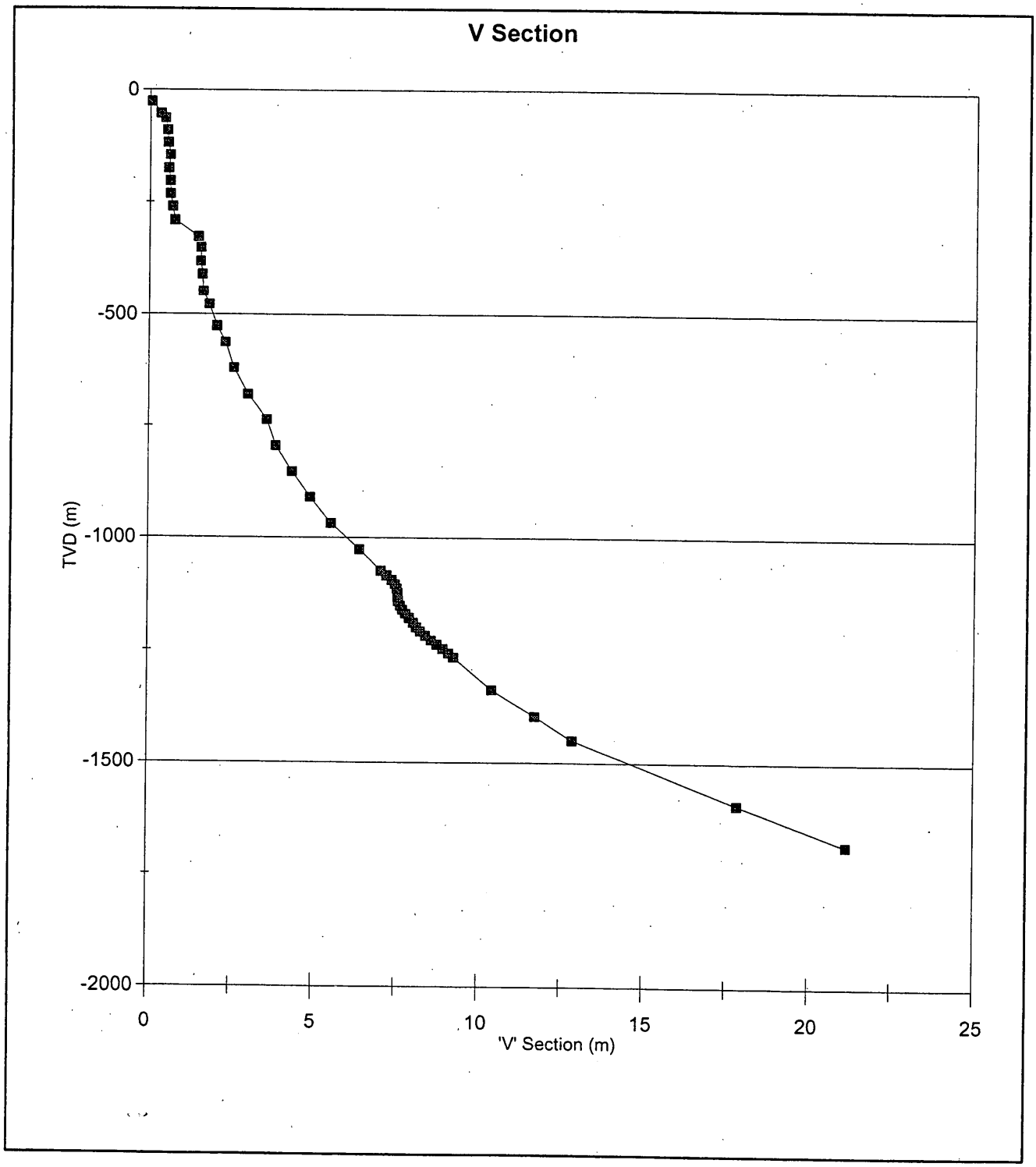
Drilling Co.: OD&E **Rig:** OD&E #30

RT above GL: 133 m Lat : 38 deg 31 min 20.17 sec Spud Date: 07/08/2001 Release Date: 17/08/2001
GL above MSL : 128 m Long : 142 deg 58 min 43.06 sec Spud Time: 07:00:00 Release Time: 17:00:00

Magnetic Declination (degs): 10.90

Projection:

DEVIATION SURVEY



APPENDIX IX: 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) Geolograph/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. One (1) Wagner Model A 60 auxiliary air pump 4.5 gals/minute.
BOP's & ACCUMULATOR (Cont'd)	:	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 429 BBL SUCTION Active No 2 174 BBL Pre-Mix 146 BBL Pill Tank 63 BBL Total 383 BBL
TRIP TANK	:	Trip Tank 29 BBL 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	908927 068	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 ½",3 ½"
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 x1.08m 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 Geolograph 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 1: 5" = 100' (1:240) COMPOSITE LOG

PE607402

This is an enclosure indicator page.
The enclosure PE607402 is enclosed within the container PE908927 at this location in this document.

The enclosure PE607402 has the following characteristics:

ITEM_BARCODE	= PE607402
CONTAINER_BARCODE	= PE908927
NAME	= Penryn-2 Composite Well Log
BASIN	= OTWAY
ONSHORE?	= Y
DATA_TYPE	= WELL
DATA_SUB_TYPE	= COMPOSITE_LOG
DESCRIPTION	= Penryn-2 Composite Well Log Enclosure 1
REMARKS	=
DATE_WRITTEN	=
DATE_PROCESSED	=
DATE_RECEIVED	= 04-FEB-2002
RECEIVED_FROM	= Santos Ltd
WELL_NAME	= Penryn-2
CONTRACTOR	=
AUTHOR	=
ORIGINATOR	= Santos Ltd
TOP_DEPTH	=
BOTTOM_DEPTH	=
ROW_CREATED_BY	= DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

ENCLOSURE 2: 5" = 100' (1:240) MUDLOG

PE607403

This is an enclosure indicator page.
The enclosure PE607403 is enclosed within the container PE908927 at this location in this document.

The enclosure PE607403 has the following characteristics:

ITEM_BARCODE	= PE607403
CONTAINER_BARCODE	= PE908927
NAME	= Penryn-2 Mudlog
BASIN	= OTWAY
ONSHORE?	= Y
DATA_TYPE	= WELL
DATA_SUB_TYPE	= MUD_LOG
DESCRIPTION	= Penryn-2 Mudlog Scale 1:500 Enclosure 2
REMARKS	=
DATE_WRITTEN	=
DATE_PROCESSED	=
DATE_RECEIVED	= 04-FEB-2002
RECEIVED_FROM	= Santos Ltd
WELL_NAME	= Penryn-2
CONTRACTOR	=
AUTHOR	=
ORIGINATOR	= Santos Ltd
TOP_DEPTH	=
BOTTOM_DEPTH	=
ROW_CREATED_BY	= DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

ENCLOSURE 3: WELL EVALUATION SUMMARY PLOT

PE908928

This is an enclosure indicator page.
The enclosure PE908928 is enclosed within the container PE908927 at this location in this document.

The enclosure PE908928 has the following characteristics:

ITEM_BARCODE	= PE908928
CONTAINER_BARCODE	= PE908927
NAME	= Penryn-2 Well Evaluation Summary Log
BASIN	= OTWAY
ONSHORE?	= Y
DATA_TYPE	= WELL
DATA_SUB_TYPE	= MONTAGE_LOG
DESCRIPTION	= Penryn-2 Well Evaluation Summary Log Scale 1:200 Enclosure 3
REMARKS	=
DATE_WRITTEN	= 30-NOV-2001
DATE_PROCESSED	=
DATE_RECEIVED	= 04-FEB-2002
RECEIVED_FROM	= Santos Ltd
WELL_NAME	= Penryn-2
CONTRACTOR	=
AUTHOR	=
ORIGINATOR	= Santos Ltd
TOP_DEPTH	=
BOTTOM_DEPTH	=
ROW_CREATED_BY	= DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

ENCLOSURE 4: WARRE TOP DEPTH STRUCTURE MAP

PE908929

This is an enclosure indicator page.
The enclosure PE908929 is enclosed within the container PE908927 at this location in this document.

The enclosure PE908929 has the following characteristics:

ITEM_BARCODE	PE908929
CONTAINER_BARCODE	PE908927
NAME	Near Top Waarre Sand Depth Map
BASIN	OTWAY
ONSHORE?	Y
DATA_TYPE	SEISMIC
DATA_SUB_TYPE	HRZN_CONTR_MAP
DESCRIPTION	Near Top Waarre Sand Depth Horizon Map Scale 1:10000 Enclosure 4
REMARKS	
DATE_WRITTEN	29-NOV-2001
DATE_PROCESSED	
DATE_RECEIVED	04-FEB-2002
RECEIVED_FROM	Santos Ltd
WELL_NAME	Penryn-2
CONTRACTOR	
AUTHOR	
ORIGINATOR	Santos Ltd
TOP_DEPTH	
BOTTOM_DEPTH	
ROW_CREATED_BY	DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)