BAKER HUGHES

INTEQ

Drilling Fluids End of Well Report

Operator	:	**Santos**
Well Name	:	**Casino-3**
Block No.	:	**VIC/P 44**

Country:	Australia	**Mud Engineers:**	W. McKay, R. Tena, R. Berkovic
Well Description:	Appraisal		
Contractor:	Diamond Offshore		
Rig:	Ocean Epoch		
Well Start Date:	13 October 2003	**Mud Co-ordinator:**	C. Hargreaves & B. Guthrie
Well Final Date:	13 November 2003	**RKB to Seabed:**	89.05 m
Well Spud Date:	14 October 2003	**Well TD:**	2,135 m
Well TD Date:	30 October 2003	**Total Meters Drilled:**	2,046 m
Well Days:	31		

Hole Size	Total Depth (m)	Casing Size (in)	Casing Depth (m)	Mud Type	Mud Weight (sg)	Interval Problems	Meters Drilled	Days
36 inch	121.3	30	121.3	SW / PHB sweeps	1.04	None	32.25	2
17.5 inch	645	13.375	635	SW / PHB sweeps	1.04	None	523.7	2
12.25 inch	2,135	9.625	2,113	KCl / PHPA /Glycol	1.05 - 1.16	Screens Blinding	1,490	18
Testing	N/a	N/a	N/a	KCl brine	1.114	None	N/a	6
P & A	N/a	N/a	N/a	Inhibited KCl brine	1.114	None	N/A	3

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1 SUMMARIES

1.1 Well Summary

Operator :	Santos SBU	Well Name :	Casino - 3
Contractor :	DOGC	Rig :	Ocean Epoch
Well Type :	Appraisal	RKB – Sea Level :	25.0 m
Ending Inc :	2.92 deg	RT – Wellhead :	87.05 m
Arrival Date :	12 October 2003	Well TD :	2,135 m
Spud Date :	15 October 2003	TD Date :	30 October 2003
Days on Well :	31	Date Left :	13 November 2003

Interval	Hole Depth (m)	Casing Size (inch)	Depth (m)	Mud Wt (sg)	Mud Type
36 inch	121	30	121	1.04	Seawater / PHB Sweeps
17.5 inch	645	13.375	635	1.04	Seawater / PHB Sweeps
12.25 inch	2,135	9.625	2,113	1.05 - 1.16	Low Gel / KCl / PHPA / Glycol
Testing	N/a	N/a	N/a	1.114	KCl Brine
P & A	N/a	N/a	N/a	1.114	Inhibited KCl brine

Interval	Days	Metres Drilled	Fluid Vol. Required (bbls)	Fluid Vol. Used (bbls)	bbl / metre
36 inch	2	31.95	667	1,153	36.1
17.5 inch	2	524	3,347	3,628	6.9
12.25 inch	18	1,490	4,762	2,688	1.8
Test & P&A	10	N/a	1,128	1,128	N/a
Totals	**32**	**2,046**	**9,904**	**8,597**	**4.2**

Engineers:	Will McKay, Romeo Tena, Rob Berkovic (23 + 19 + 14 days)

1.2 Fluid Summary

FORMATION	LITHOLOGY		HOLE DEPTH (RT)	HOLE SIZE & CASING SIZE & DEPTH (RT)	DRILLING FLUID SYSTEM	PRODUCT	CONC	AVERAGE PROPERTIES		COMMENTS & TREATMENTS
	Depth MDRT Water Depth 67 metres		Air Gap 22m Sea Bed 89m	19 in Riser 89m						
HEYTESBURY		Fractured Carbonates Marls	121 m	**36 in HOLE** 30 x 20 in COND 121 m	SEAWATER & BENTONITE SWEEPS	FRESH WATER BENTONITE CAUSTIC SODA SODA ASH	35 PPB 0.2 PPB 0.1 PPB	DENSITY VISCOSITY YP 6 RPM API	1.04 SG 120 75 42 N/C	Drilled first 10 m with PHB mud. Pumped 50 bbl PHB sweeps / joint. Pumped 100 bbl PHB sweep at TD. Carried out wiper trip to mud line. 3 m of fill noted when running back to bottom.
					TD Disp: **Prehyd. Bentonite @ 1.5 X Hole**					
NIRRANDA	675	Water Sensitive Marl	645 m	**17.5 in HOLE** 13.375 in CASING 635 m	SEAWATER & FLOC. BENTONITE SWEEPS	**FLOC. BENTONITE SWEEPS** FRESH WATER BENTONITE CAUSTIC SODA SODA ASH LIME	25 PPB 0.2 PPB 0.1 PPB 0.2 PPB	DENSITY VISCOSITY YP 6 RPM API	1.04 SG 130 75 42 N/C	Pumped 50 bbl flocculated PHB sweeps on first two singles of each stand and 80 bbl PHB (not flocculated) to cover the BHA on connections. At TD, swept hole with 50 bbls PHB, pulled back one stand, ran back to bottom and pumped another 50 bbl PHB sweep. **No** KCl inhibited mud was spotted on bottom prior to POOH to run casing.
					TD Disp: **Prehyd. Bentonite @ 1.5 X Hole**					
MEPUNGA	782	Marls & Claystones								The shoe track was drilled and the rat hole cleaned with seawater and PHB sweeps.
DILWYN	976			Sands blinding shaker screens						The well was then displaced to 0.75 ppb PHPA/ polymer mud, pre-treated with 0.6 ppb sod. bicarb. A LCM pill was not prepared prior to drilling out. When drilling ahead, mud losses occurred over the shakers, due to blinding sands and the roll of the rig. The 84 mesh screens were changed to 52 mesh and the pump rate reduced from 900 to 700 gpm and ROP controlled at 35 m/hr. 7% KCl was added to the mud. The PHPA concentration was reduced to 0.4 ppb by adding water to the drilling fluid and then further reduced by adding premix containing no PHPA. The shakers were jacked up by 2" at the front to increase the mud retention time. By 1,000 m the flow rate had been increased to 800 gpm without mud losses over the shakers. At 1,226 m, KCl conc. was increased to 8 %, PHPA was increased to 1.0 ppb and Aquacol started to be added, reaching 3% by 1,600 m. Mud weight was allowed to increase to 1.10 by this depth. Progressively screened up shakers to 180 mesh by 2,000 m with 900 gpm. Circ. b/u @ 2,004 m, with max. 40% gas recorded. Increased mud weight to 1.16 sg before cutting core from 2,004 to 2,031 m. Drilled to TD of 2,135 m. Carried out wiper trip after 3 logging runs. Blocky cavings, 10-15mm, seen with traces of splintery cav. Pumped hi-vis sweep and circulated out. No hole problems after this. Tested well with 1.114 KCl brine made with seawater.
PEMBER MUDSTONE	1180					BARITE KCL KOH MIL-GEL PAC R PAC SL NEW DRILL L NEW DRILL P FLOWZAN GLYCOL (Aquacol only)	AS REQUIRED 30 PPB 0.2 PPB 3.0 PPB new mud 1.40 PPB 1.75 PPB 0.25 PPB new mud 0.4 - 1.6 PPB 1.2 PPB 3.0 %	DENSITY VISCOSITY PV YP 6 RDG API PHPA KCL MAX LGS MBT	1.03 - 1.16 54 - 75 19 - 26 22 - 40 8 - 12 4.0 - 7.0 0.25 - 2.0 ppb 6.5 - 8.0 % < 5% 2.5 - 12.5 ppb eq	
MASSACRE SHALE	1234	Claystones	1,226 m 1.0 deg							
TIMBOON SST	1249									
SKULL CREEK	1328	Claystones		**12.25 in HOLE** 9.625 in CASING	AQUADRILL					
PARATTE	1530									
BELFAST MUDSTONE	1606	Shales								
BELFAST GREENSAND	1941									
FLAXMAN	1999	Sandstone				**BRINE**				
WAARRE SANDSTONE Unit B Unit A	2032 2072	Sandstone	Cut core 2004 m - 2031 m	Blocky cavings		SEAWATER KCl	58 PPB	DENSITY	1.114 SG	
			2,135 m	2,113 m						
EUMERALLA FM		Sandstone	2.92 deg							

2 INTERVAL DISCUSSION

2.1 36 in Interval 89.0 to 121.3 m

2.1.1 Drilling Summary

The Ocean Epoch arrived on location on October 13, 2003. The anchors were run and the rig was ballasted down to 55 foot drilling draft. The 26 inch BHA was made up with a 36 inch hole opener and the seabed was tagged at 89.57 m. The well was then spudded and drilled to 101 m. The recorded Anderdrift survey showed an inclination of 3 degrees, so it was decided to move the rig 6 metres forward and re-spud the well.

Casino - 3 was re-spudded, drilling slowly from the seabed at 89.05 m to 121.3 m, using seawater and Pre-Hydrated Bentonite (PHB) sweeps. A 50 bbl PHB sweep was pumped every single joint of drill pipe. At TD, a 100 bbl PHB sweep was pumped and the hole was then displaced with 1.5 times the hole volume of PHB. A wiper trip to the mud line was carried out and 3 m of fill was noted when running back to bottom. The drill string was then pulled out of the hole.

The 30 inch casing was subsequently run and cemented as per programme, with the shoe at 121.3 m.

2.1.2 Fluid Selection

This interval was drilled using seawater and 50 bbl PHB sweeps pumped every joint, with returns discharging to the seabed. At the section TD, the hole was swept with 100 bbls PHB, and after a wiper trip was displaced with 145 bbls of PHB mud to keep the well bore stable.

2.1.3 Fluid Parameters

Property	Programmed	Actual
Density (sg)	Unweighted	1.04
Funnel Viscosity (seconds)	> 100	110 - 135
6 rpm (dial units)	> 40	40 - 44
Yield Point (lbs / 100ft^2)	> 50	71 - 77

2.1.4 Rheology

Rheology was controlled via the 6 rpm reading, which was in excess of 40.

2.1.5 Solids Control

No solids control equipment was used as returns were to the seabed.

2.1.6 Lost Circulation

No losses were observed during this interval.

2.1.7 Fluid Cost

2.1.8 Recommendations

- This fluid regime was successful and is recommended for other wells in the location.

2.2 17.5 in Interval 121.3 to 645 m

2.2.1 Drilling Summary

This interval was drilled, using one roller cone bit run, in 7.9 hours. A 17.5 inch drilling assembly was made up and run in hole, tagging the top of cement at 117 m. Once the cement, shoe track had been drilled out normal drilling commenced. While drilling ahead, 50 bbl flocculated PHB sweeps were pumped on the first two singles per stand. Prior to making a connection, 80 bbl unflocculated PHB mud was spotted on bottom. This practice continued until TD was reached at 645 m.

At TD, a 50 bbl PHB sweep was pumped and the last stand was pulled back. The stand was run back to bottom and another 50 bbl sweep was pumped. Once the sweep had been displaced out of the hole, the seawater in the well bore was displaced with 1.5 times the hole volume of PHB mud. The drilling assembly was then pulled out and a tight spot was encountered at 589 m. No further problems were encountered for the remainder of the trip out.

The 13.375 inch casing was run and one joint had to be washed down at 495 m. There were no further problems from that point onwards. The casing was then cemented with the shoe set at 635 m.

2.2.2 Fluid Selection

This interval was drilled with seawater and 50 bbl flocculated PHB sweeps. The intermediate sweeps consisted of 25 ppb bentonite and 2 ppb lime. This formula was adopted in order to preserve the bentonite volume on board. The pills spotted on bottom, prior to a connection, were still made up with 35 ppb bentonite only, as per the previous interval.

2.2.3 Fluid Selection

Property	Programmed	Actual
Density (sg)	Unweighted	1.03
Funnel Viscosity (seconds)	> 100	121 - 135
6 rpm (dial units)	> 40	40 - 43
Yield Point (lbs / 100ft^2)	> 50	74 - 76

2.2.4 Rheology

Rheology was controlled via the 6 rpm reading, which was in excess of 40.

2.2.5 Solids Control

No solids control equipment was used as returns were to the seabed.

2.2.6 Lost Circulation

No losses were observed on this section.

2.2.7 Fluid Cost

2.2.8 Recommendations

- This fluid regime was successful and is recommended for other wells in this location.
- The use of lime flocculated PHB provided adequate hole cleaning, when pumped as sweeps, and conserved bentonite stocks until additional supplies were received by the rig. However, to maintain wellbore stability, 35 ppb PHB must always be used for spotting around the BHA on connections and for the final hole displacement.
- Guar gum was available on the rig and also could have been used to conserve bentonite stocks. Bentonite is the preferred viscosifier for this section but guar gum can be used if there is insufficient bentonite stocks or if the bentonite mixing system breaks down.

2.3 12.25 in Interval 645 to 2,135 m

2.3.1 Drilling Summary

This interval was drilled using three bit runs and one coring run (2,004 - 2,031 m). It was drilled in 55.6 hours, with an additional 2.8 hours of coring. Problems encountered while drilling the interval were; drilling fluid losses caused by blinding of the shaker screens drilling through the Mepunga formation, and cavings when the pumps were shut down after carrying out a wiper trip (with washing and reaming to bottom) between logging runs.

The BOP stack was landed and the riser latched on. However, the wave height was too great to disconnect the landing joint and almost two days were lost while waiting on weather. A 12.25 inch drilling assembly, with a rock bit was made up and run in hole, tagging the top of cement at 619 m. The cement, float and shoe were drilled and the rat hole cleaned with seawater and PHB sweeps. The well was then displaced to 1.03 sg (8.6 ppg) 0.75 ppb PHPA / polymer drilling fluid, pre-treated with 0.6 ppb sodium bicarbonate, while drilling three metres of new formation. A LOT was carried out to an EMW of 1.8 sg (15.0 ppg).

Drilling resumed and mud losses over the shakers occurred due to sands blinding the shaker screens and the amplified roll of the rig. The 84 mesh shaker screens were changed to 52 mesh and the pump rate was reduced from 900 to 700 gpm in an effort to reduce the losses. Potassium chloride salt was added to the active drilling fluid system to give a concentration of 7%. ROP was controlled at approximately 35 m/hr, from 715 to 875 m, to prevent massive mud losses at the shakers. These factors assisted to reduce the mud losses, but did not eliminate them.

It was then decided to dilute the PHPA concentration of the mud, from 0.75 to 0.3 ppb by adding drill water as instructed. Reserve mud volume was also built without PHPA. The shaker holding bolts were backed out and the shakers were lifted up by two inches at the front to increase the drilling fluid retention time. The pump rate was gradually increased to 770 gpm as these tasks were completed. By 1,000 m the pump rate was increased to 800 gpm without further whole mud losses over the shakers. At 1,005 m the top drive motor brake locked up and overheated. The drill string was then pulled inside the 13.375 inch casing while repairs were carried out. During this time, the drilling fluid was treated to increase the PHPA content to 0.25 ppb by adding NewDrill Plus (powdered PHPA).

Drilling recommenced with a pump rate of 800 gpm and continued without incident to 1,226 m (TD for this BHA). NewDrill Plus continued to be added while drilling, to a concentration of 0.4 ppb. A 50 bbl high viscosity sweep was pumped with no appreciable increase in cuttings returning to surface. The drill string was pulled and the hole was found to be in good condition. No overpull was recorded. A new BHA, with PDC bit and MWD tools, was made up and run in to drill to the core point. A tight spot (ledge) was encountered at 1,197 to 1,200 m, which was washed and reamed. Washing and light reaming continued to bottom, where no fill was noted. When drilling resumed, the KCl concentration was increased to 8%, PHPA increased to 1.0 ppb and Aquacol was added until a 3% concentration was attained by 1,600 m. At this depth the mud weight was allowed to increase to 1.10 sg. The shakers were also dressed with finer screens, two shakers were now operating with 120 mesh screens and two with 84 mesh screens. These were the finest screens that could handle the flow of 860 gpm. As drilling continued to 2,004 m (core point), all four shakers were again screened up to 180 mesh screens. These adequately handled the 900 gpm flow rate. While circulating bottoms up, maximum gas of 40% was measured. While pulling out, tight hole (max. overpull 70K) was observed at 1,613 m and the hole was backreamed to 1,100 m. The drill string continued to be pulled to surface while pumping out of hole to the 13.375 inch casing shoe.

A coring assembly was made up and run in, with washing and reaming required at 675 m, 775 m and 1,627 m (ledge). The mud weight was increased from 1.12 sg to 1.15 sg and washing and reaming was required to bottom. The PHPA concentration was also increased to 2 ppb. The core was cut from 2,004 m to 2,031 m and laid out on surface. The previous 12.25 inch BHA was re-run and stood up at 1,907 m and 1,975 m. The BHA was worked through and then logged from 2,000 m to 2,030 m. The interval was drilled to TD of 2,135 m (TVD of 2,134.8 m) with a mud weight of 1.16 sg without problem. Bottoms up was circulated twice and the drill string then pulled out of hole. The final hole angle was 2.92 degrees and the maximum BHCT was 68^{o}C.

Three wireline logging runs (GR-HALS, MDT, GMR-HGNS) were carried out successfully, before run #4 (MCST) was unable to pass 1,950 m. The wireline tool string was pulled to 1,625 m and run in again, where it would not pass 1,870 m. Wireline operations rigged down and a BHA was made up for a wiper trip. Washing and reaming was required from 1,893 m to TD, with tight spots noted at 1,893 m, 1,953 m, 2,105 m and 2,109 m. One and a half times bottoms up was circulated. A steady flow of blocky cavings, 10 - 15 mm in size were seen, along with traces of splintery cavings, before the shakers cleaned up. An attempt to pull out of hole was made, however, 30k overpull was experienced. A high viscosity, weighted (1.32 sg) sweep was mixed and pumped and circulated out until the shakers came clean. The drill string was then pulled to surface. Wireline logging runs #4 (re-run) and # 5 (CST) were run without further hole problems. The BHST measured during these logging runs was 83.3°C.

The 9.625 inch casing was run and landed at 2,113 m, with washing required at 1,946 m and 2,079 m. One and half times casing volume was circulated. A large amount of cavings were observed over the shakers for the first three quarters of the circulation and then quickly cleared up. The casing was then cemented as per programme. A full pressure test of the BOP's was then carried out.

2.3.2 Fluid Section

The AQUADRILL mud system was specifically selected to address hole stability problems in the Lower Paaratte and particularly the Belfast dispersive claystone formations. The potassium concentrations programmed provided good inhibition in conjunction with the Aquacol (glycol) clouding temperatures. The inclusion of glycol should have assisted with keeping a lower mud weight and increased ROP. However, no Aquacol B was added to the system at the operator's request, due to minimal drilling after the coring run. The PHPA also provided good shale encapsulation.

2.3.3 Fluid Parameters

Programmed and actual fluid properties while drilling are shown below.

Property	Units	Programmed	Actual
Density	sg	1.10 - 1.22	1.03 - 1.16
Funnel Viscosity	sec / qt	> 50	54 - 75
Plastic Viscosity	cP	15 - 25	19 - 26
Yield Point	lb / 100 ft^2	20 - 30	22 - 40
6 rpm Reading	dial units	8 - 12	8 - 12
Low Gravity Solids	%	< 5.0	0.8 - 5.4
API Fluid Loss	mL / 30 min	5.0 - 8.0	4.0 - 7.0
PHPA Conc.	lb / bbl	1.0	0.25 - 2.0
KCl Conc.	%	7.0 - 8.0	6.5 - 8.0
Glycol	%	3.0	3.0
MBT	lb / bbl	< 10	2.5 - 12.5
pH		9.0 - 9.5	9.0 - 9.5

Fluid Density

The fluid density at the beginning of the interval was 1.03 sg (8.6 ppg), as there was no potassium chloride or barite in the drilling fluid. By 1,000m, 7% potassium chloride was added to the drilling fluid and the weight had increased to 1.06 sg (8.8 ppg). To this point, maintaining the fluid density weight was simply achieved through the addition of new premix to replace the drilling fluid which was lost over the shakers. Before entering the Belfast Mudstone at 1,530 m, the weight was 1.10 sg (9.2 ppg).

The fluid density was allowed to increase to 1.12 sg (9.3 ppg) while drilling through the Belfast Greensand. The fluid density was increased to 1.15 sg before the coring run. This was a precautionary measure against possible hole problems due to a potential top drive failure. By TD, the

fluid density was allowed to increase to 1.16 sg (9.7 ppg) through the incorporation of slugs into the fluid system.

Fluid Loss

The API fluid loss was easily controlled within the programmed range of 5 - 8 ml/30 min (actual 4 - 7 ml/30 min) through the addition of pre-hydrated bentonite initially and Milpac LV and Drispac SL. A tight fluid loss of 4.0 ml/30 min was reached and maintained for the core run and to TD.

Rheology

The rheology was maintained with the use of Flowzan. Once drilling was underway the rheology was fairly constant with the Plastic Viscosity ranging from 19 - 26 cP and Yield Point 22 - 40 lb/100 ft^2. These properties were achieved even though the mud weight was increased from 1.03 to 1.16 sg through the interval.

2.3.4 Solids Control

	Shaker #1	Shaker #2	Shaker #3	Shaker #4
At start of section	84	84	84	84
At end of section	180	180	180	180
Typically	120	120	120	120

The shakers were initially dressed with 84 mesh screens, however these were changed to 52 mesh when sands blinded the screens and whole mud losses occurred. Diluting the PHPA concentration, raising the front of the shakers and reducing the pump rate allowed finer screens to be fitted by 1,200 m. The shakers were then progressively screened up to 180 mesh by 2,000 m and were able to handle a flow rate of 900 gpm. By this stage the PHPA concentration had been increased to 2.0 ppb.

The rig had a three cone (12 inch) de-sander and twelve cone (4 inch) de-silter installed. The de-sander was only utilised for a short period as it was not functioning correctly and mainly discharged active mud. The de-silter was run most of the time while drilling to reduce the low gravity solids in the drilling fluid.

There was no centrifuge installed for this well.

2.3.5 Lost Circulation

There was no lost circulation observed and most likely no down hole mud losses. The mud weight was kept at a minimum for the entire interval.

2.3.6 Fluid Cost

2.3.7 Recommendations

- If drilling another well with similar formations it would be advisable to build a drilling fluid with a lower concentration of PHPA present to begin with and gradually increase the concentration once the sands have been drilled. It was probably a direct result of the volume of sand that was encountered rather than the concentration of PHPA in the drilling fluid that caused the shaker screens to blind off. It would be prudent to try a different approach in an attempt to reduce the problems at the beginning of this section.

- Shale shaker screens can be purchased from Thule specifically designed for drilling through sand stone. In the past they have proved to be beneficial in circumstances like the one encountered on Casino-3. It may be a good idea to purchase some before the commencement of drilling the Hill well.

- The de-sander and de-silter on board require attention. They did not work very well at all, but with a little maintenance they should be fine.

- The services of a centrifuge would be of great benefit to drilling the 12 ¼" section. The daily hire cost of a centrifuge far outweighs the cost of having to dump and dilute. Especially when using a drilling fluid like Aquadrill. If only to remove the low gravity solids alone it would be a worthwhile exercise.

2.4 Testing Summary

A scraper assembly was run in hole and tagged the top of cement at 2,077 m. The AQUADRILL drilling fluid was then displaced to brine by pumping a 50 bbl high viscosity guar gum sweep, followed by a 250 bbl caustic cleaning pill and 800 bbls of seawater. The seawater was pumped at 1,200 gpm. The choke, kill and boost lines were then displaced to seawater while carrying out the scraper passes over the packer setting depth of 1,976 m. The assembly was run back to bottom and another 50 bbl high viscosity guar gum sweep was pumped and then followed by 1.114 sg (9.3 ppg) potassium chloride brine. The scraper assembly was pulled out of hole and a casing bond log (CBL) was run on wireline.

The permanent packer was made up and run on wireline and set at 1,973.9 m. The TCP gun assembly and DST tools were made up and landed in the packer. The sub surface test tree was made up and run in the hole on the landing string. The flow control head was made up and the test string landed. The test string was displaced to the under-balance fluid (diesel) and the casing was perforated. The initial flow period was carried out and the well then shut in for the initial build up period. The well was opened for the clean up flow period and then shut in for the pressure build up period. The well was again opened for the main flow test period (18 hours) and then shut in for the final pressure build up period.

The well was killed by bullheading, 10 bbls of brine followed by 10 bbls of brine containing 10 ppb calcium carbonate, into the formation. The test string was withdrawn from the packer and the test string contents reverse circulated out. The well was flow checked and then circulated to remove any gas. Another flow check was carried out before laying down the flow head and pulling the test string out of the hole.

3 INTERVAL MATERIAL CONSUMPTION

3.1 36 in Interval

ITEM	QUANTITY	UNIT SIZE
Calcium Chloride[1]	13	25 kg
Caustic Soda[1]	4	25 kg
Mil-Gel[1]	17	1.0 MT
Soda Ash[1]	3	25 kg

3.2 17.5 in Interval

ITEM	QUANTITY	UNIT SIZE
Caustic Soda[1]	2	25 kg
Lime[1]	42	18.5 kg
Mil-Gel[1]	30	1.0 MT
Potassium Hydroxide[2]	3	25 kg
Soda Ash[1]	5	25 kg

3.3 12.25 in Interval

ITEM	QUANTITY	UNIT SIZE
Aquacol	50	200 L
Citric Acid[2]	4	25 kg
Drispac R[2]	40	50 lb
Drispac SL[2]	24	50 lb
Drispac SL	40	50 lb
Flowzan[1]	40	25 kg
Flowzan[2]	40	25 kg
Flowzan	17	25 kg
LD-8	2	5 US gal
Mil-Bar	47	1.0 MT
Mil-Gel[1]	1	1.0 MT
Mil-Pac R	38	25 kg
Mil-Pac LV[2]	40	25 kg
Mil-Pac LV	74	25 kg
New-Drill Liquid[2]	35	25 kg
New-Drill Plus[2]	48	25 kg
New-Drill Plus	40	25 kg
Potassium Chloride[2]	4	1.0 MT
Potassium Chloride	45	1.0 MT
Potassium Hydroxide[2]	11	25 kg
Sodium Bicarbonate[2]	10	25 kg

[1] Indicates a Loaded Darwin/Dampier Price.
[2] Indicates an Insitu Portland Price.

3.4 Testing Interval

ITEM	QUANTITY	UNIT SIZE
Mil-Gel[1]	1	1.0 MT
Caustic Soda[1]	14	25 kg
Calcite 300 C[2]	1	25 kg
Circal 1000[2]	1	25 kg
Noxygen	4	5 US gal
Mil-Guar[1]	7	25 kg
Potassium Chloride	38	1.0 MT
Potassium Hydroxide[2]	3	25 kg

3.5 Total Well Consumption

ITEM	QUANTITY	UNIT SIZE
Aquacol	50	200 L
Calcite 300 C[2]	1	25 kg
Calcium Chloride[1]	13	25 kg
Caustic Soda[1]	20	25 kg
Circal 1000[2]	1	25 kg
Citric Acid[2]	4	25 kg
Drispac R[2]	40	50 lb
Drispac SL	40	50 lb
Drispac SL[2]	24	50 lb
Flowzan	17	25 kg
Flowzan[1]	40	25 kg
Flowzan[2]	40	25 kg
LD-8	2	5 US gal
Lime[1]	42	18.5 kg
Mil-Bar	47	1.0 MT
Mil-Gel[1]	49	1.0 MT
Mil-Guar[1]	7	25 kg
Mil-Pac LV	74	25 kg
Mil-Pac LV[2]	40	25 kg
Mil-Pac R	38	25 kg
New-Drill Liquid[2]	35	25 kg
New-Drill Plus	40	25 kg
New-Drill Plus[2]	48	25 kg
Noxygen	4	5 US gal
Potassium Chloride	83	1.0 MT
Potassium Chloride[2]	4	1.0 MT
Potassium Hydroxide[2]	17	25 kg
Soda Ash[1]	8	25 kg
Sodium Bicarbonate[2]	10	25 kg

[1] Indicates a Loaded Darwin/Dampier Price.
[2] Indicates an Insitu Portland Price.

3.6 Reconciliation

ITEM	QUANTITY	UNIT SIZE
Mil-Bar	8	1.0 MT
Mil-Gel[1]	7.4	1.0 MT
Kwikseal F[2]	1	40 lb
Mil-Pac LV	-40	25 kg
Mil-Pac R	40	25 kg

[1] Indicates a Loaded Darwin/Dampier Price.
[2] Indicates an Insitu Portland Price.

The balance of stock left at the end of this well was carried forward to Santos's next well, Hill-1, at the same price. This means that any stock consumed by the intermediate operator will not affect the prices Santos will have to pay on their second well.

5 INTERVAL VOLUME ACCOUNTING

5.1 36 in Interval

Mud Made (bbls)		Mud Lost (bbls)	
Water added:	110	Mud discharged:	713
Brine added:		Mud lost on surface:	
Oil added:		Mud lost down hole:	
Whole mud added:		Mud lost to solids control:	
Chemicals added:	43	Other losses:	
Barite added:		Left in hole:	
Mud received:		Mud returned:	363
Other gains:		Dead volume in mud pits:	77
Total volume additions:	1,153	Total volume lost:	790

5.2 17.5 in Interval

Mud Made (bbls)		Mud Lost (bbls)	
Water added:	3,550	Mud discharged:	3,328
Brine added:		Mud lost on surface:	
Oil added:		Mud lost down hole:	
Whole mud added:		Mud lost to solids control:	
Chemicals added:	789	Other losses:	
Barite added:		Left in hole:	
Mud received:		Mud returned:	300
Other gains:		Behind casing:	
Total volume additions:	3,629	Total volume lost:	3,328

5.3 12.25 in Interval

Mud Made (bbls)		Mud Lost (bbls)	
Water added:	3,743	Mud dumped:	2,074
Brine added:		Mud lost on surface:	
Oil added:		Mud lost down hole:	8
Whole mud added:	588	Mud lost to solids control:	1,584
Chemicals added:	360	Other losses:	1,034
Barite added:	71	Left in hole:	
Mud received:		Mud returned:	
Other gains:		Behind casing:	62
Total volume additions:	4,762	Total volume lost:	4,762

5.4 Testing

Brine Made (bbls)		Brine Lost (bbls)	
Water added:	943	Mud dumped:	688
Brine added:		Mud lost on surface:	
Oil added:		Mud lost down hole:	
Whole mud added:		Mud lost to solids control:	
Chemicals added:	185	Other losses:	
Barite added:		Left in hole:	440
Mud received:		Mud returned:	
Other gains:		Behind casing:	
Total volume additions:	1,128	Total volume lost:	1,128

6 12.25 in INTERVAL MUD PROPERTIES

Report Date	Depth MD m	FL Temp. C	Test Temp. C	Mud Wt. sg	F.Visc sec/qt	PV cp	YP	Gels 10 sec	Gels 10 min	API Filt. cc	Cake API	Solids crtd Pct.	Water Pct.	Sand Pct.	MBT ppb	pH	Alk Pf ml	Alk Mf ml	Chloride Mg/l	Total Hdns mg/l	ASG	LGS ppb	HGS ppb
18/10/03	645	-	49	1.03	67	19	23	-	-	11	1	3.0	97.0	0.0	5.0	9.5	0.0	1.0	0.0	50	1.93	17.6	0.0
19/10/03	645	-	49	1.03	69	23	36	10	18	11	1	3.0	97.0	0.0	5.0	9.5	0.0	1.0	0.0	50	1.93	17.6	0.0
20/10/03	645	-	49	1.03	70	20	35	9	18	10	1	3.0	97.0	0.0	5.0	9.5	0.0	1.0	0.0	50	2.10	20.5	0.0
21/10/03	645	-	49	1.03	70	21	33	10	19	10	1	3.0	97.0	0.0	5.0	9.5	0.0	1.0	0.0	50	2.10	20.5	0.0
22/10/03	715	27	49	1.05	68	20	30	9	18	8	1	1.4	96.5	025	5.0	9.5	0.0	1.0	35,800	50	1.68	7.1	0.0
23/10/03	1,005	32	49	1.06	54	21	29	7	15	7	1	1.4	96.5	0.25	2.5	9.5	0.0	0.6	35,800	175	2.40	13.0	0.0
24/10/03	1,226	-	49	1.06	58	18	22	7	14	6.5	1	0.88	97.0	1.0	5.0	9.5	0.1	0.6	35,700	200	3.18	13.0	0.0
25/10/03	1,658	36	49	1.10	61	19	28	8	16	6.0	1	0.44	95.0	0.5	7.8	9.5	0.15	1.0	35,700	260	13.04	33.4	0.0
26/10/03	2,004	46	49	1.12	69	25	33	8	16	5.0	1	1.21	93.5	0.5	11.8	9.5	0.2	0.9	40,000	240	7.09	45.4	0.0
27/10/03	2,004	-	49	1.12	70	24	35	8	16	5.0	1	1.21	93.5	0.6	12.5	9.5	0.2	1.0	40,000	280	7.09	45.4	0.0
28/10/03	2,031	43	49	1.15	71	24	37	8	12	4.4	1	5.02	90.0	0.5	10.0	9.0	0.05	0.75	36,000	280	3.18	29.3	26.6
29/10/03	2,097	53	49	1.15	70	24	35	7	11	4.0	1	5.10	90.0	0.6	8.8	9.0	0.05	0.60	34,500	400	3.17	30.0	26.7
30/10/03	2,135	57	49	1.16	71	25	39	7	11	4.1	1	5.19	90.0	0.4	8.8	8.8	0.05	0.60	33,000	440	3.36	24.9	36.1
31/10/03	2,135	-	49	1.16	74	24	36	8	11	4.1	1	5.09	90.0	0.5	8.8	8.8	0.05	0.6	33,000	440	3.36	24.9	36.1
01/11/03	2,135	45	49	1.16	70	26	40	9	13	4.0	1	5.73	89.5	0.5	8.8	8.7	0.05	0.6	32,500	480	3.23	31.6	33.3
02/11/03	2,135	-	49	1.17	96	24	36	8	12	4.0	1	5.73	89.5	0.4	8.8	8.7	0.05	0.6	32,500	480	3.39	26.4	41.7
03/11/03	2,135	49	49	1.16	77	24	39	8	11	4.0	1	5.25	90.0	0.5	8.8	8.7	0.05	0.6	32,000	480	3.31	26.5	34.4
04/11/03	2,135	-	49	1.16	87	24	36	8	11	4.0	1	5.25	90.0	0.4	8.8	8.7	0.05	0.55	32,000	480	3.33	26.0	35.3