Final Well Report
Beardie-1
(W1340)

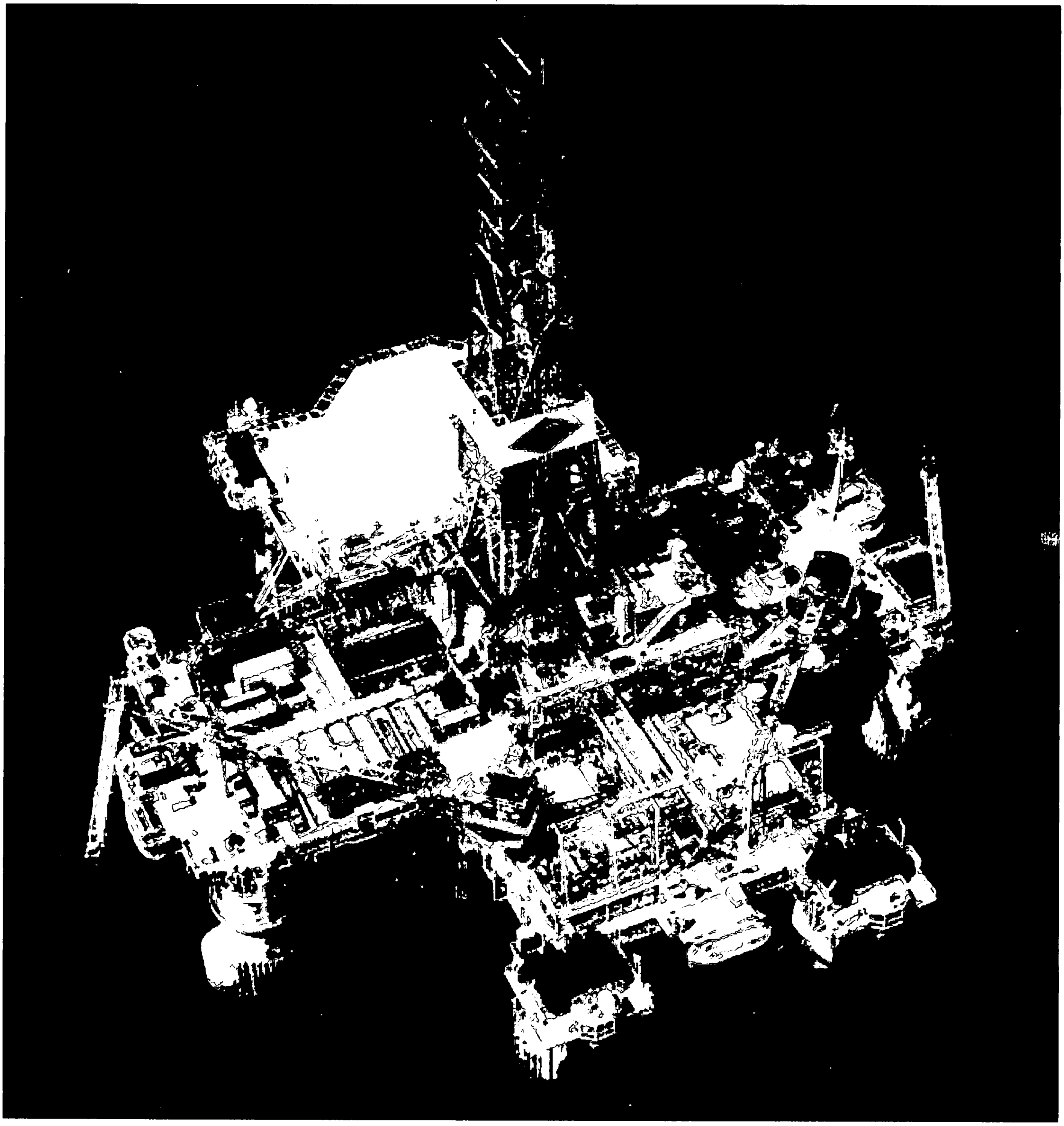
Esso Australia Pty Ltd

FINAL WELL REPORT

BEARDIE-1

August 2002

VolumeOne



Esso Australia Pty Ltd
ABN 49 000 018 566
12 Riverside Quay
Southbank, Victoria 3006
GPO Box 400C
Melbourne, Victoria 3001
61 3 9270 3333 Telephone

913712 002

8th January 2003

Mr. J. W. Kiker
Operations Manager
ExxonMobil Development Company, Drilling
Houston, Texas

BEARDIE-1 FINAL WELL REPORT

Joel,

Attached is the Final Well Report for Beardie-1, a near-field wildcat well drilled with the Ocean Bounty semi-submersible rig in Licence Area VIC/L2. The well was drilled vertically to 1,905m, logged, plugged and abandoned in 16.3 days versus the original AFE time of 20.5 days.

Non-productive time (NPT) was 19 hours (4.9%) and was primarily associated with:

a) problems with Weatherford's MOST tool (6 hours);
b) problems cementing the 30" conductor when the float shoe initially blocked, and then would not hold backpressure; and
c) logging problems, both failure of the CDR, and the need to record a section of the well missed while wireline logging (5.5 hours).

AFE NPT allowance was 2 days (9.8%). The estimated final drilling cost is US$5.5M, 28% below the original AFE which was approved for US$7.6M.

There were two reportable incidents during Beardie-1 drilling. The more serious resulting from the little finger of the Ocean Bounty's 2nd Engineer being caught between the shoulders of a 1-1/4" dry break hydraulic connector. The finger required stiches. The second incident was from the treatment of one of the work boat crews to remove a foreign body from the eye that required additional procedures above the first aid threshold.

Yours faithfully,

Daniel L. Whiteman
Field Drilling Manager

/Attach.

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cc:		
	G.A. Nash	EAPL - Melbourne (2 copies)
	S. Sazenis	EAPL - Melbourne (5 copies for distribution with the Well Completion Report)
	Library	EAPL - Melbourne (2 copies)
	S. Clarke	EMDC Drilling - Houston
	F.W. Kratzer	EMDC Drilling - Melbourne
	C.P. Meakin	EMDC Drilling - Melbourne
	Drilling Files	EMDC Drilling - Melbourne (Original plus 1 copy)

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ESSO AUSTRALIA PTY LTD

BEARDIE-1
NEAR-FIELD WILDCAT WELL

OCEAN BOUNTY

FINAL WELL REPORT

PREPARED BY:
CHRIS MEAKIN
NOVEMBER 2002

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ESSO AUSTRALIA PTY LTD
BEARDIE-1 EXPLORATION WELL

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ESSO AUSTRALIA PTY LTD
BEARDIE-1 EXPLORATION WELL
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GENERAL WELL
SUMMARY

General Well
Summary

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Well Summary Data Sheet

Well Summary Data Sheet

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ESSO AUSTRALIA PTY LTD
BEARDIE-1

WELL SUMMARY DATA SHEET

Well Name:	Beardie-1
Partners:	Esso - 50% BHPP - 50%
Block:	License VIC L2 Bass Strait, Australia
Surface Location:	AGD 1966 Latitude: 38° 15' 16.214" S Longitude: 147° 48' 24.643" E AMG Zone 55 Easting: 570,594.15m E Northing: 5,765,624.16m N
Rig Contractor:	Diamond Offshore/Ocean Bounty Semi-Submersible
Well Profile:	Vertical Well
Depths:	Water Depth: 51.23m DF-SL: 25m MD DF-ML: 76.23m MD DF-TD: 1905m MD (1905m TVD)
Casings:	30" x 20" to 122.0m MD 20" x 13-3/8" to 849.1m MD
Dates:	Commence Tow - 17:00 hrs, 24 July 2002 Arrive Location - 08:00 hrs, 25 July 2002 Spud - 17:00 hrs, 26 July 2002 Reach TD - 21:00 hrs, 3 August 2002 FRW - 00:30 hrs, 10 August 2002
Time Analysis:	Total Days - 16.31 days Total NPT Days - 0.75 days AFE Days - 20.5 days
Cost Analysis:	Original AFE (A$): 14,680,000 Estimated Actual Costs (A$): 10,550,000 FOREX : A$1.00 = US$0 .52
KPIs:	A$5,769/m A$646,842/day US$914/ft US$336,358/day

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Sequence of Operations

Sequence of Operations

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ESSO AUSTRALIA PTY LTD
BEARDIE-1

SEQUENCE OF OPERATIONS

Start Date	Time	Days	Operation
24-Jul-2002	17:00	0.63	Mobilise Ocean Bounty from Sole-2
25-Jul-2002	08:00	1.38	Mooring and RU operations
26-Jul-2002	17:00	1.88	Spud. Drill 36" hole. Run & cement 30" x 20"casing
28-Jul-2002	14:00	1.16	Drill 17-1/2" hole. Run & cement 20" x 13-3/8" casing
29-Jul-2002	17:45	0.78	Run BOP & riser
30-Jul-2002	12:30	4.35	Drill 12-1/4" hole to TD (1,905m)
3-Aug-2002	21:00	0.67	Condition hole. POOH to Log
4-Aug-2002	13:00	2.00	Logging
6-Aug-2002	13:00	2.78	P & A
9-Aug-2002	7:45	0.70	De-moor Rig
10-Aug-2002	00:30		Release Ocean Bounty

TOTAL PROGRAM 16.31 days

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Well Name: Beardie-1

Activity, Days, Depth, Mud Weight and Cost Report

Report Date	Days on AFE	Days from Spud	Measured Depth (m MDRT)	True Vertical Depth (m TVDRT)	Drilling Cumulative Cost (A$)	Completion Cumulative Cost (A$)	Mud Density (ppg)	Pore Pressure (ppg)	Leak-Off Test (ppg MWE)	Management Summary
25-Jul-02	0.5	0	0	0	$6,197,465		0.0	0.0	0.0	Tow rig from the Sole 2 well location towards the Beardie 1 well location.
26-Jul-02	1.5	0	0	0	$6,549,042		0.0	0.0	0.0	Complete tow to Beardie. Start mooring rig. Change selected anchors from 18 tonne Offdrill IIs to 10/12 tonne Stevpris Mark Vs.
27-Jul-02	2.5	0	122.5	122.5	$7,280,385		8.5	0.0	0.0	Complete changing anchors to Stevpris and running anchors. Spud well and drill 26"/36" hole to 122.54 meters. Run 30 inch conductor.
28-Jul-02	3.5	1	533	533	$7,604,979		8.5	0.0	0.0	Cement 30" conductor. RIH w/ 17½" bit and drill to 533 m.
29-Jul-02	4.5	2	863	863	$7,940,247		8.5	0.0	0.0	Drill 17½" hole from 533 m to 863 m. Wiper trip. Drop Gyro. Displace hole w/ mud. POOH. Start to run 13 3/8" casing.
30-Jul-02	5.5	3	863	863	$8,415,108		0.0	0.0	0.0	Finish running 13 3/8" casing swaged to 20" w/ 18 3/4" housing. Land w/ shoe at 849 m. Cement casing w/ 1,335 sx lead slurry, 726 sx tail slurry. Run BOP stack
31-Jul-02	6.5	4	884	884	$8,804,491		8.9	8.4	14.7	Land BOP stack and pressure test connector. RIH w/ 12¼" BHA. Drill out cement in casing. Change out mud to KCl/PHPA mud. Run PIT test. Drill to 884 m.
1-Aug-02	7.5	5	1380	1380	$9,230,363		9.7	8.6	14.7	Drill 12¼" hole from 884 m to 1,380 m.
2-Aug-02	8.5	6	1579	1579	$9,692,938		9.8	8.6	14.7	Drill 12¼" hole from 1,380 m to 1,579 m. POOH to change bit. Change LWD tools. Pick up additional drill collars. TIH.
3-Aug-02	9.5	7	1793	1793	$10,067,517		9.8	8.6	14.7	RIH to 1,537 m. Precautionary ream to 1,579 m. Drill from 1,579 m to 1,793 m
4-Aug-02	10.5	8	1905	1905	$10,401,721		9.8	8.6	14.7	Drill 12¼" hole from 1,793 m to 1,905 m. Circulate. Short trip to casing shoe. RIH to 1,905 m.
5-Aug-02	11.5	9	1905	1905	$10,700,162		9.8	8.6	14.7	Circulate hole clean. POOH laying down LWD/MWD tools. Run Schlumberger wireline logs. Run PEX-HALS-LDT, FMI-HNGS, and MDT.
6-Aug-02	12.5	10	1905	1905	$11,066,927		9.8	8.6	14.7	Run Modular Dynamic Tester. Take 32 formation pressure measurements. Probe plugged while taking first sample. Run velocity survey.
7-Aug-02	13.5	11	1905	1905	$11,868,439		9.8	8.6	14.7	Take sidewall cores. Run DSI log. Set balanced cement plugs from 1,460 m to 920 m.
8-Aug-02	14.5	12	1905	1905	$12,337,092		0.0	0.0	14.7	Complete setting balanced cement plugs and bridge plug in well. Tag and pressure test plugs. Lay down drill string. Pull nominal seat protector. Prepare to pull BOP stack.
9-Aug-02	15.5	13	1905	1905	$11,497,699		0.0	0.0	14.7	Pull BOP stack. Cut 20" and 30" casing with casing cutter. MOST tool could not pull wellheads. Attempt to pull wellheads with CART tool - no go. Continue to cut 20" and 30" casing.
10-Aug-02	16.5	14	1905	1905	$10,825,688		0.0	0.0	14.7	Recovered 30" Housing, and PGB. Conduct Final Seabed survey with ROV. Pulled anchors, deballasted and released rig at 00:30hrs to OMV.

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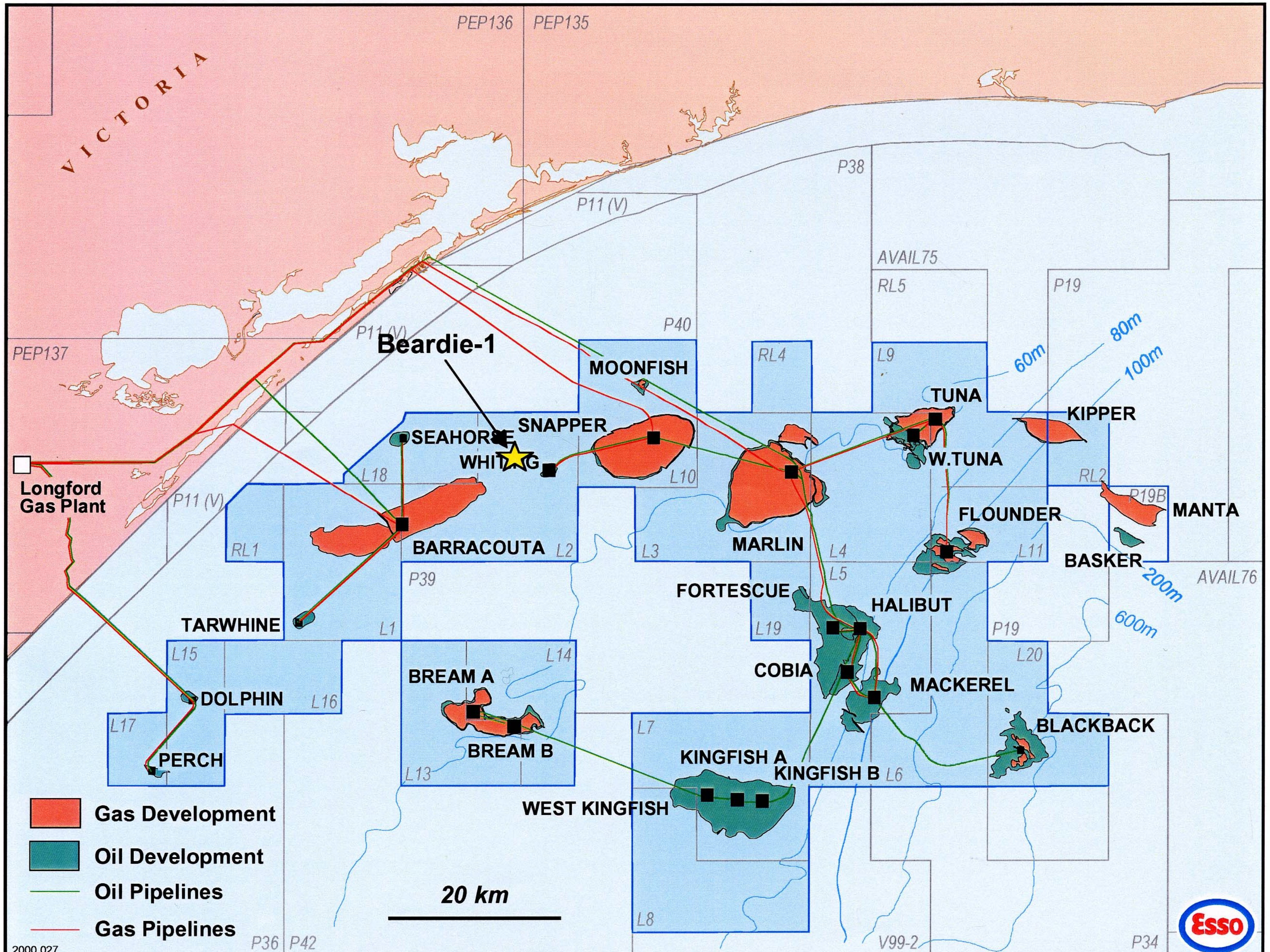
Location Map

Location Map

BEARDIE-1 LOCATION MAP



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Well Progress Curve

Well Progress Curve

BEARDIE-1 WELL PROGRESS CURVE

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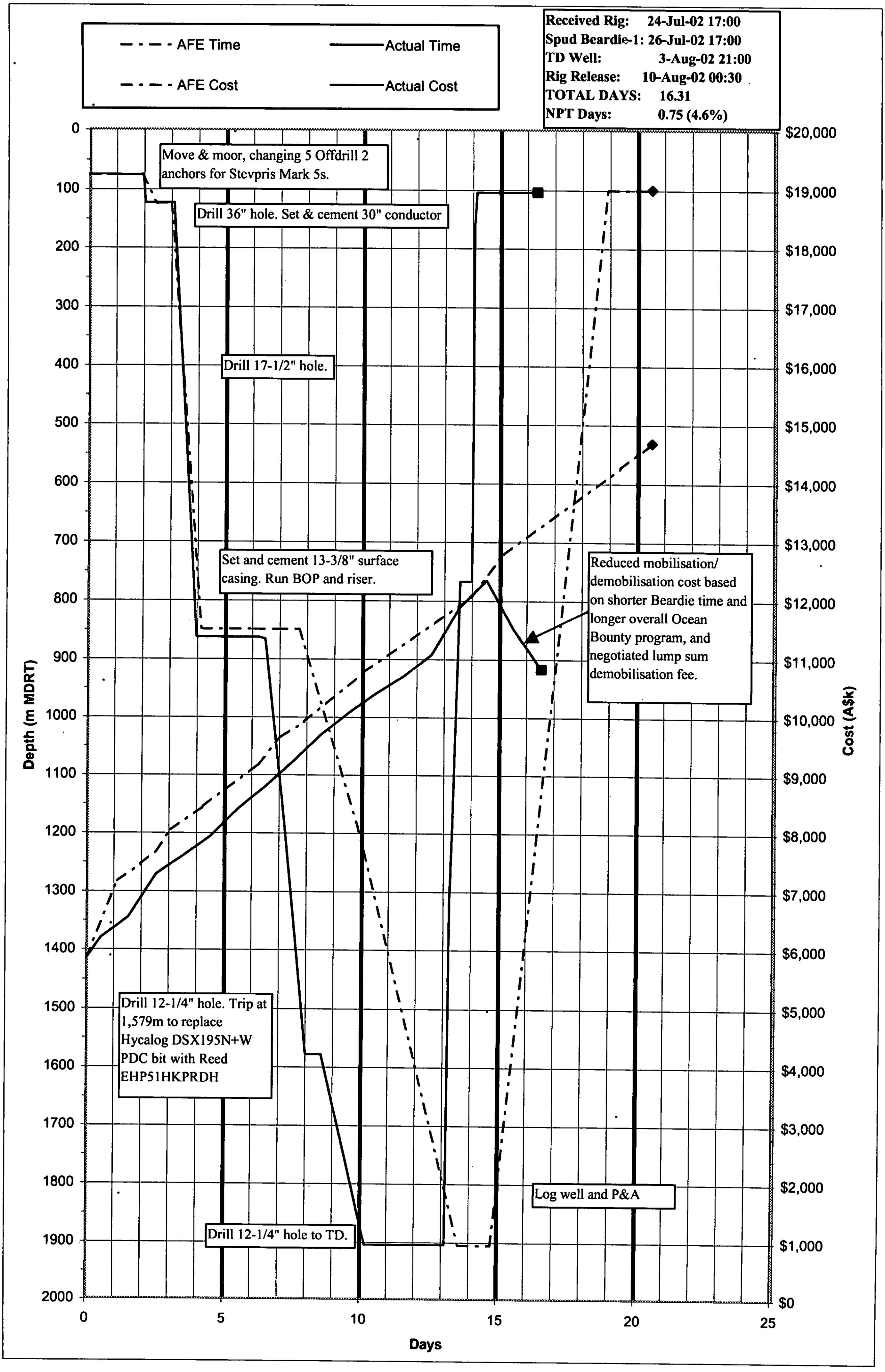

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Wellbore Schematic

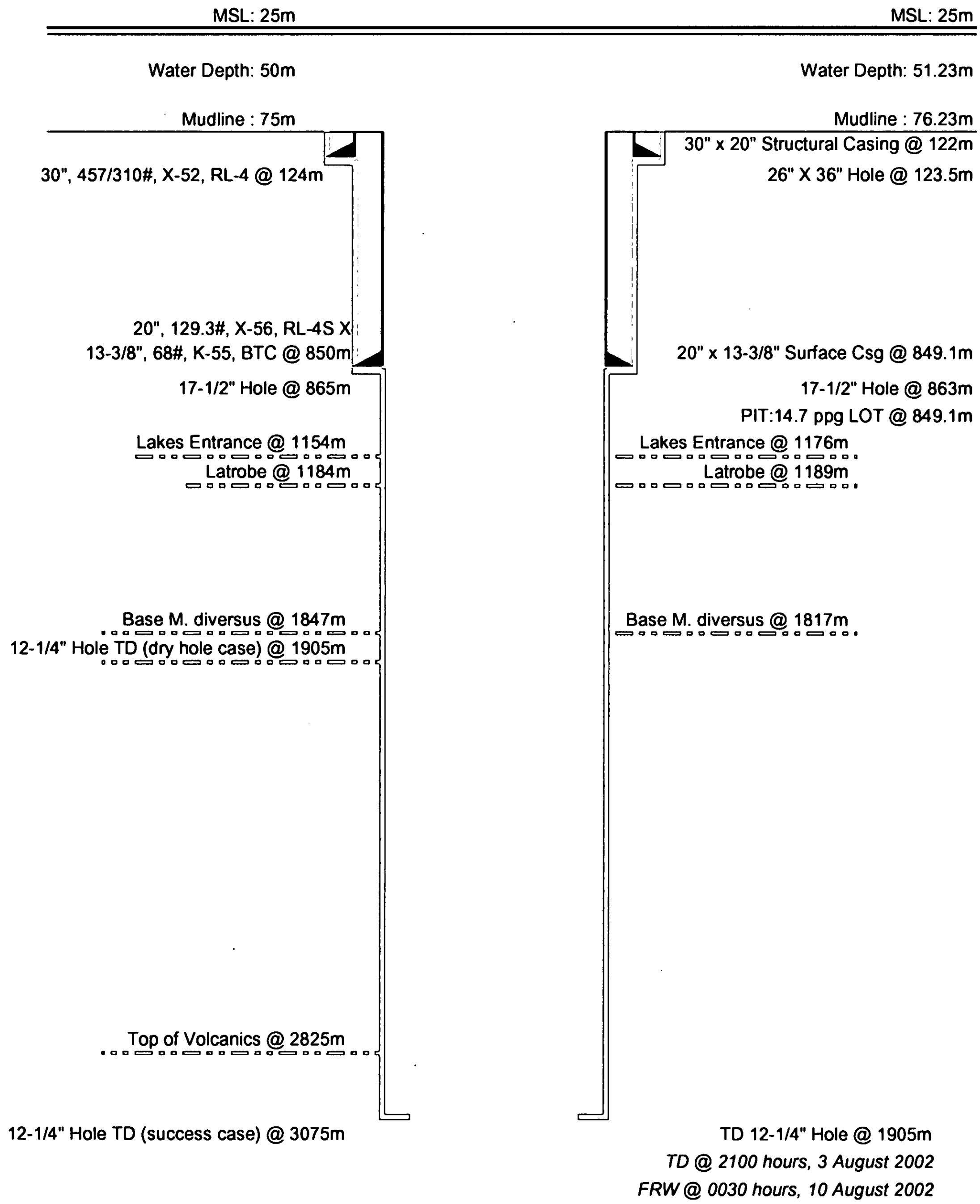
Wellbore Schematic

BEARDIE-1 WELLBORE SKETCH

PLANNED | **ACTUAL** *(All depths LAT)*

Receive rig @ 1700 hours, 24 July 2002

RT Elevation: 0m | *Spud Beardie-1 @ 1700 hours, 26 July 2002*



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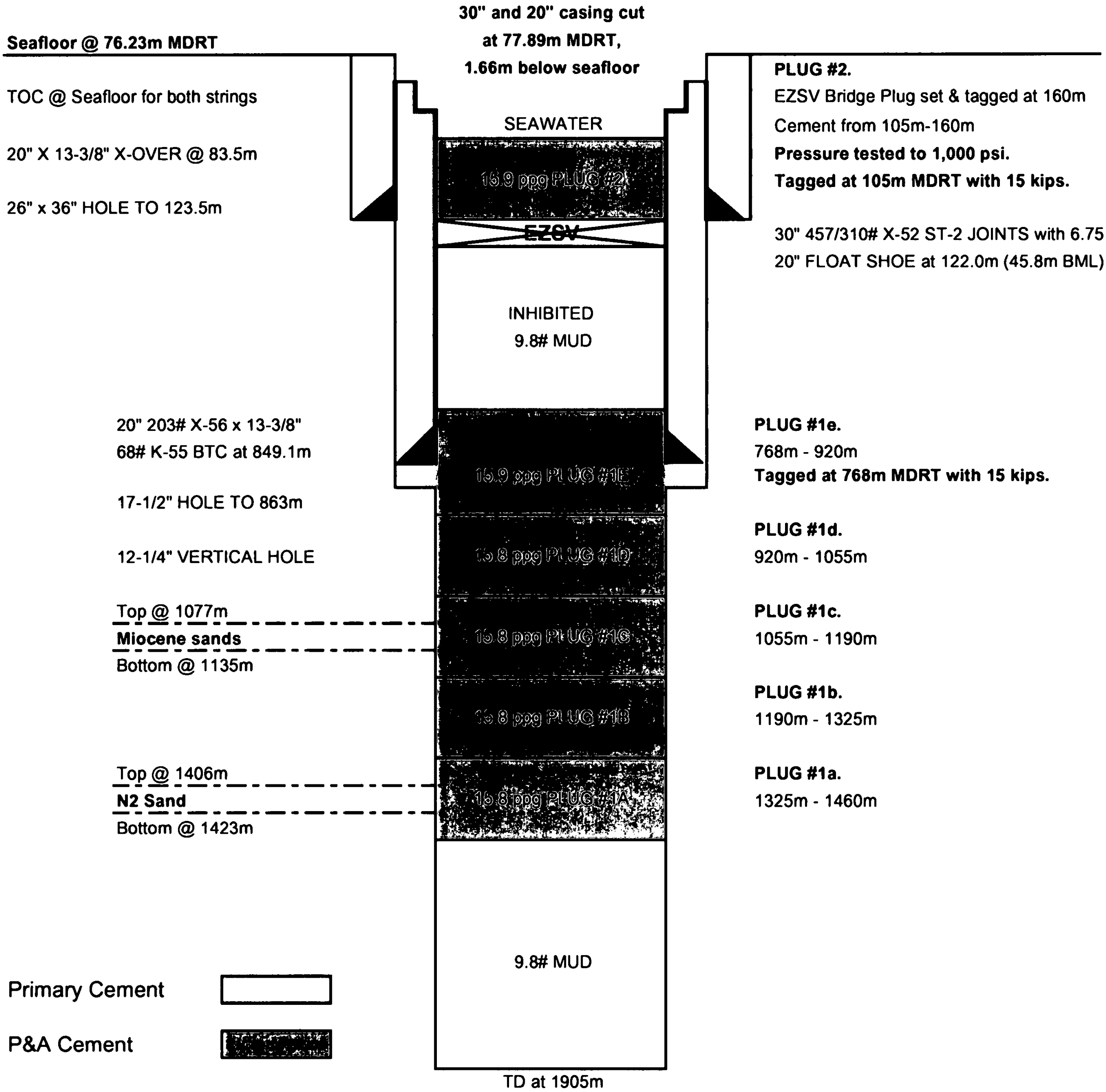
WELLBORE SKETCH AFTER PLUGGING & ABANDONING
DIAMOND OFFSHORE OCEAN BOUNTY
BEARDIE-1

LOCATION: AGD 1966. Latitude 38° 15' 16.214" S. Longitude 147° 48' 24.643" E.
AMG Zone 55 Easting 570,594.15m, Northing 5,765,624.16m
Rig on Location 0800hr 25-Jul-2002. Rig released 0030 hours 10-Aug-2002

ALL DEPTHS ARE LAT IN METERS FROM ROTARY TABLE (MD=TVD)

MSL @ 25m RT

WATER DEPTH = 51.23m



Revision 1.

ROV SEABED SURVEY

tmt AUSTRALIA

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Client: ESSO	Well / Location: Beardie-1	Permit No.:
Vehicle: Nomad #7	Sonar: Imagenex 881A	Date: 9/8/02

All headings are taken using the well position on seabed as a starting datum.

Visual survey is taken in 30° arc segments. Excursions are a minimum of 50 meters.

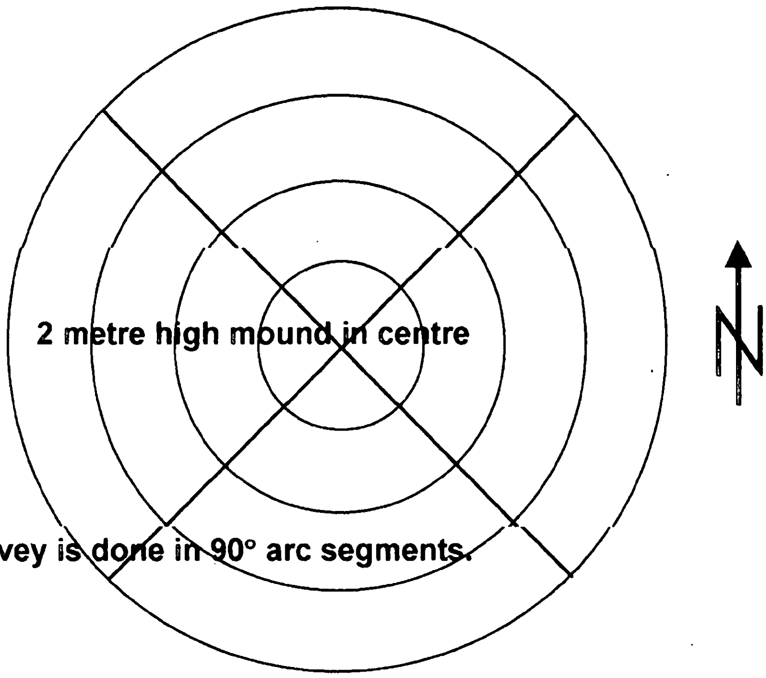
Post Drilling Survey Observations:

Previous to recovering the PGB and casing a full seabed visual and sonar survey was done
On 8/8/02 with no debris found. This was repeated on the 9/8/02 when the PGB and cut
Casing was recovered to surface. Again no debris was found during visual seabed surveys
Out to 50m from well and sonar scans to 100m.
At the wellsite a mound or crater is left approximately up to 2 metres above seabed about 2
To 3 metres in diameter at the centre. This is made of cutting returns and gently slopes down
To natural seabed over 10 meters.

Brief sketch of any features observed during the sonar scan.

Sonar Survey Diagram

Outer ring = 100 meters
Third ring = 75 meters
Second ring = 50 meters
Centre ring = 25 meters



Sonar survey is done in 90° arc segments.

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Riser and BOP Schematic

REVISIONS						
REV.	REV. CODE	DESCRIPTION	DWN BY	REVD BY	APPD BY	RELEASE DATE
A	111	PER CUSTOMER'S REQUEST	JK	MFO	MFO	22APR02

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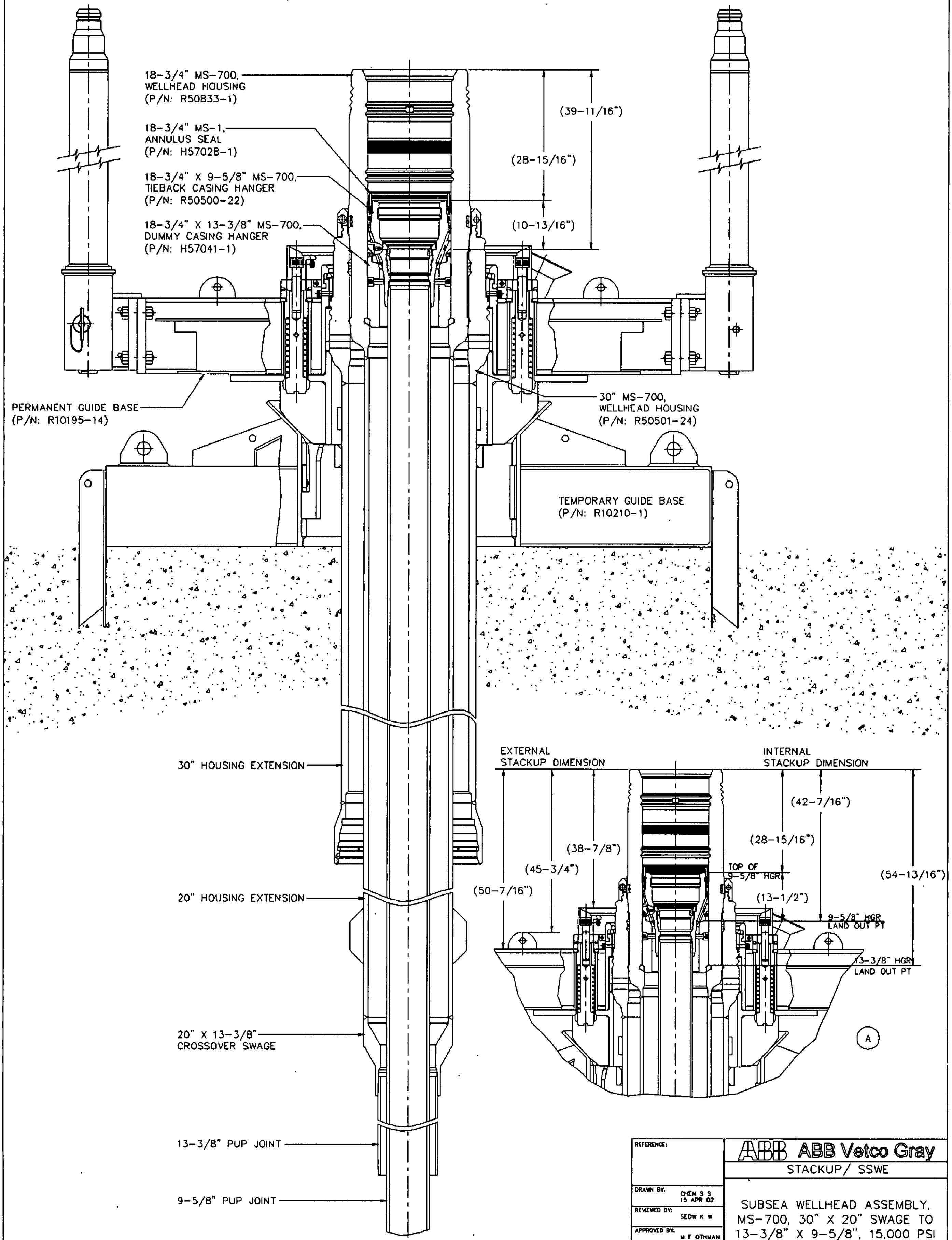

REFERENCE:	ABB Vetco Gray
	STACKUP/ SSWE
DRAWN BY: CHEN S S 15 APR 02	SUBSEA WELLHEAD ASSEMBLY, MS-700, 30" X 20" SWAGE TO 13-3/8" X 9-5/8", 15,000 PSI
REVIEWED BY: SEOW K W	
APPROVED BY: M F OTHMAN	
RELEASE DATE: 17 APR 02	
THIRD ANGLE PROJECTION	SIZE D · DRAWING NUMBER R602031-1 · REV. A
DO NOT SCALE DRAWING	DIST. CODE · WEIGHT (LBS.) · SHEET 1 OF 2

NOTES: ALL DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

FILE NAME-R602031-1S1 JK/22APR02/A1 PROJECT ID NO.- SALES ORDER- CB3036 RIG CUSTOMER ESSO

ACAD

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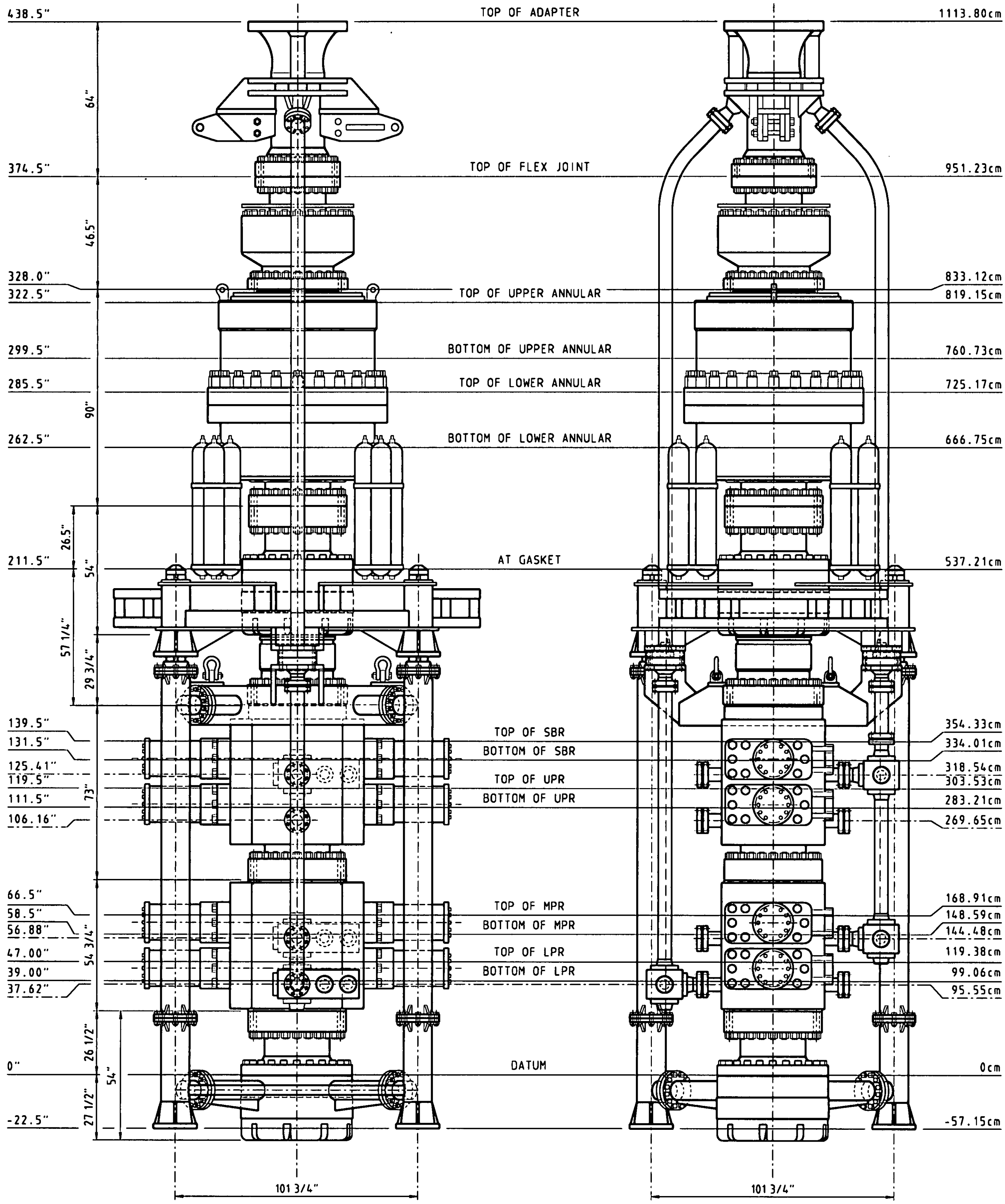

NOTES:

RAM CONFIGURATION
(FROM TOP CAVITY DOWN)

- SHEAR RAMS
- 3.5"-5" VARIABLE RAMS
- 5" PIPE RAMS
- 5" PIPE RAMS

DIAMOND OFFSHORE P O BOX 4558 HOUSTON, TEXAS 77210	OCEAN BOUNTY			
	10,000 PSI SHAFFER 18-3/4" MSP BOP STACK WITH VETCO H4 CONNECTOR			
	ENG: E. JACOBSEN	CHKD:	DATE: 27.02.2002	DRAWING NUMBER 144-GA-008
	DRN: C. HUXTABLE	APRVD:	SCALE: NTS	REV B

Geology

Geology

Beardie 1
Gippsland Basin, Victoria

GEOLOGICAL DISCUSSION

OBJECTIVES & UNCERTANTIES

The Beardie-1 well was drilled as a nearfield wildcat well, 4 km west of Whiting-2. The well was located in 50 metres of water, within the VIC/L2 licence area of the Gippsland Basin, and was drilled to a TD of 1880m TVDSS.

The Beardie-1 well was designed to explore for oil in fluvial reservoirs in the Latrobe Group *(N.asperus – L.balmei* age). A four-way dip closure was mapped on the Barracouta anticlinal trend. This is part of a larger anticlinal feature that extends from Mulloway to Snapper along which have been intersected several intra-Latrobe oil accumulations. Traditionally, intra-Latrobe prospects have carried a greater risk due to fault seal and top seal integrity issues. In this region proven seals are observed across the Whiting and Barrcouta fields, and have been interpreted, with the aid of high resolution 3D seismic data, to extend over the Beardie area.

The primary risk for the Beardie-1 well was closure adequacy due to a high velocity Miocene-age carbonate filled channel extending across the Beardie prospect.

RESULTS

A comparison of prognosed versus actual stratigraphy penetrated in Beardie-1 is summarised in Figure X. The prognosed stratigraphy was based on adjacent well data and regional seismic correlations.

Beardie-1 intersected the Top of Latrobe at 1164m TVDSS versus a prognosis of 1159m TVDSS ie 5m low to prediction. From TOL to a TD of 1905m MD, the well intersected several anomalous gas peaks on the mud log mainly at the N2 (50 units of total gas, up to C5's) and the M50 (230 units of total gas, up to C5's) levels.

Wireline logging indicates several thin hydrocarbon bearing sand stringers are present sitting above the blocky, clean water wet N2 reservoir sand. MDT pressures taken within 3 of these stringers lie on an oil gradient of approximately 1.01 psi/m (Whiting-2 N2 equivalent oil gradient is 0.97 psi/m). Points were also taken in the water sands within the N2 reservoir. The interpreted oil and water points are drawn down approximately 90psi below the original basin gradient. Plotting these oil and water pressure points gives an intersection for an oil-water contact near or just below the top of the blocky N2 reservoir.

In the M50 reservoir there was a slight increase in log resistivity at the same level as the mud gas increase. MDT pressures taken near this point were inconclusive. A pumpout was performed at 1664m TVDSS that flowed 35 litres of water over a pump out duration of 56 minutes. Fluid resistivity increased slightly over the pumping period indicating that we were sampling fresh formation water. There were no indications of hydrocarbons. SWC's shot over this interval did have cut and fluorescence. This, combined with the mud gas peak suggests that we are likely very close to an M50 oil water contact and Beardie-1 is just down dip of a small closure.

FORMATION RESERVOIR TOPS

Formation/ Zone	mTVDSS			mMDRT
	Predicted	Actual	Difference	
Top Lakes Entrance Fm	-1129	-1151	22m low	1176
Top Latrobe Group	-1159	-1164	5m low	1189
Top N1.6	-1243	-1263	20m low	1288
Top N1.7	-1321	-1342	21m low	1367
Top N2	-1378	-1398	20m low	1423
Top N4	-1440	-1465	25m low	1490
Top M1	-1588	-1633	45m low	1658
Top L.balmei	-1822	-1792	30m high	1817
TOTAL DEPTH	**-1880**	**-1880**		**1905**

SAMPLES, CONVENTIONAL CORES, SIDEWALL CORES

Cuttings

Type	Number	Interval	Frequency
Washed & Dried	4	13-3/8" casing to 900mTVDSS	30m
		900mTVDSS to TD	5m
Lightly Washed and Air Dried	1	13-3/8" casing to 900mTVDSS	30m
		900mTVDSS to TD	5m

Conventional Coring

No conventional core was cut in Beardie-1

Sidewall Cores

1070.0-1887.0m MDRT CST, 60 shots, 45 recovered (75%)

WIRELINE LOGS AND SURVEYS

LOGGING SUITE NUMBER 1

DATE LOGGED: 04/08/02 - 5/08/02 **HOLE SIZE: 12 1/4"** **CASING SHOE:** 849.1m	**DRILLERS DEPTH:** 1905m **LOGGERS DEPTH:** 1909.5m **LOGGERS CASING SHOE:** 850.5

TYPE OF LOG	FROM	TO	RPT. SECT. / SUMMARY.
DUAL AXIS DENSITY-PEX-HALS-LEHQT	1909	850	1740m - 1580m
FMI-DSI-HNGS-GR-LEHQT	1909	850	FMI & DSI recorded from TD to 13 3/8" casing shoe, p-wave recorded to surface casing shoe
MDT-GR-LEHQT (for pressures, and OFA)	1755	1081	33 pretests, 32 ok, 1 tight, 1 OFA, GR depth correlation after each ten points
DUAL CSAT-VSP	1900	119	
CST -GR4	1887	1070	GR depth correlation 1875m - 1850m
DSI-GR	850	Sea Floor	GR depth correlation 875m - 850m

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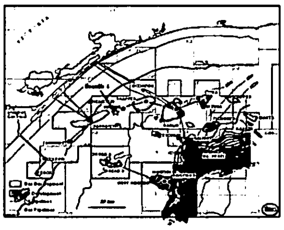
Figure:

ESSO Australia Pty Ltd

Predicted Well Section

WELL : Beardie-1

LOCATION MAP



PERMIT	VIC/L2
BASIN	Gippsland

Date Spudded:	26/07/2002
T.D. Reached:	03/08/2002
Rig Released:	10/08/02

STATUS: P & A Dry Hole

LOCATION : 147 deg 48' 24.643 E, 38 deg 15' 16.214 S, 570,594.15mE, 5,765,624.16mN

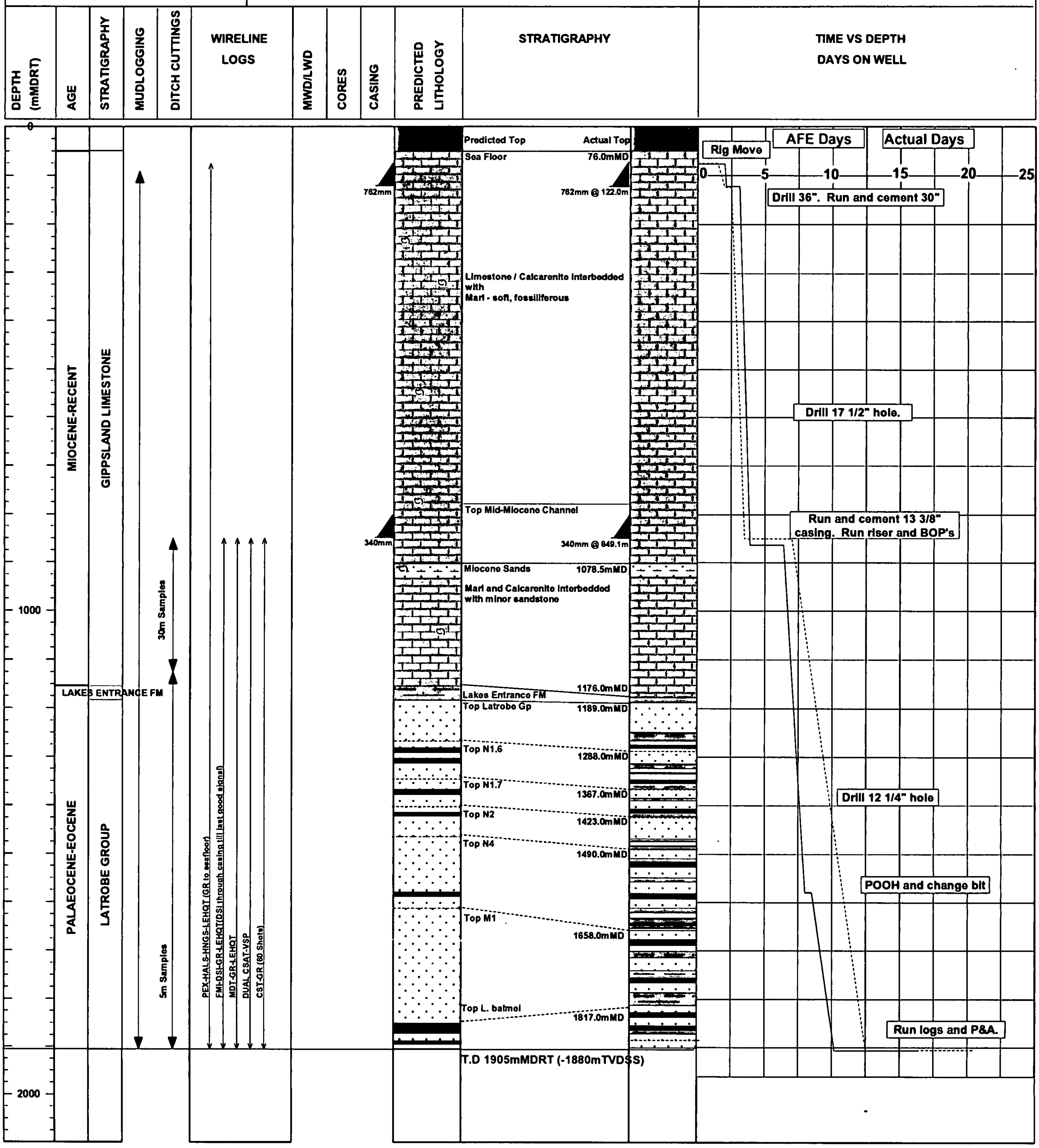
SEISMIC REFERENCE : Barracouta G99 3D, Inline 684, X-line 3235

WELL TYPE: Near Field Wildcat

PRIMARY OBJECTIVE : Latrobe Group

SECONDARY OBJECTIVE: Latrobe Group

RIG :	Ocean Bounty
RIG CONTRACTOR :	Diamond Offshore General Co.
WATER DEPTH:	51.2m
K.B. ELEVATION:	25m
PTD:	1905mMDRT



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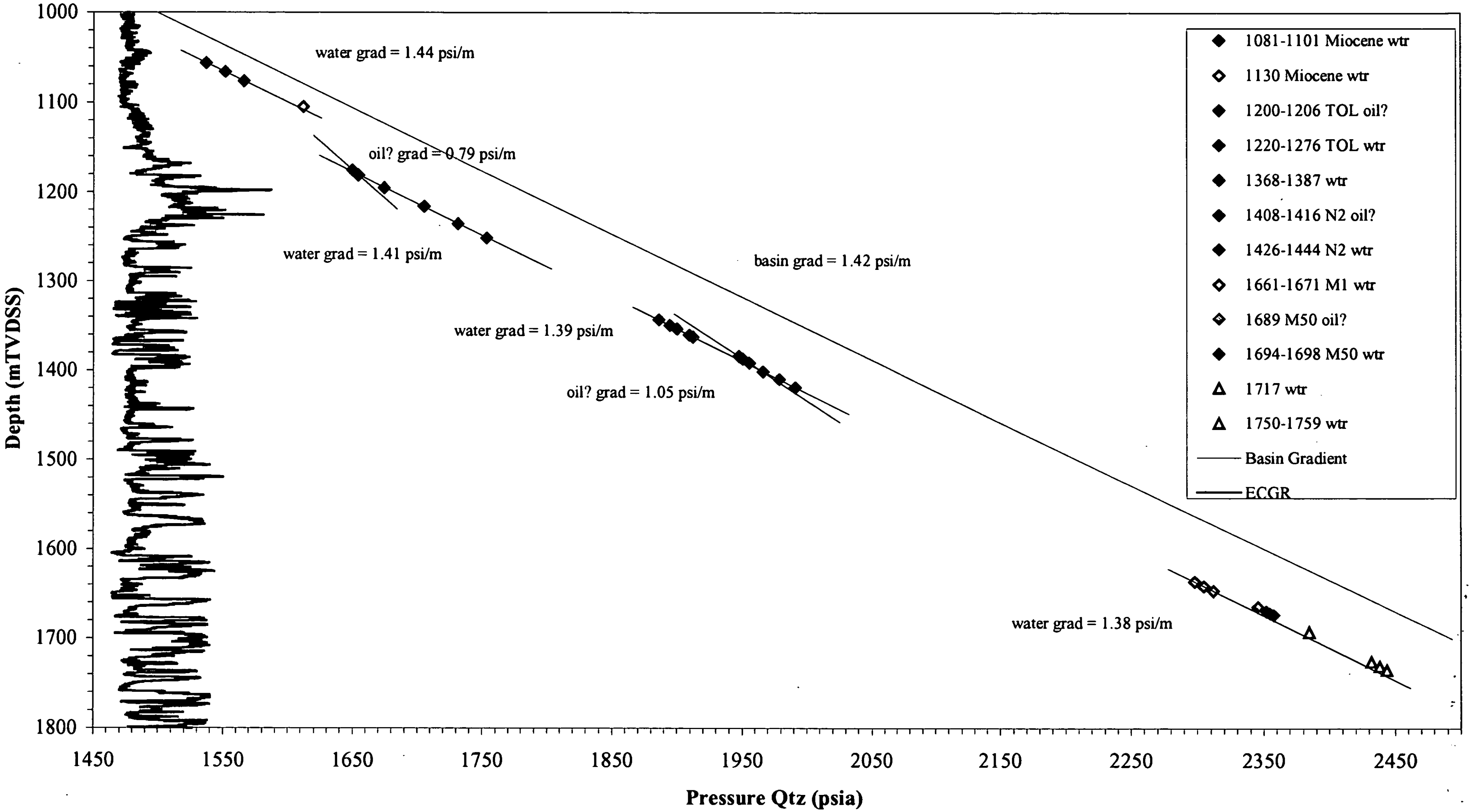
Beardie-1 MDT Pressure Plot



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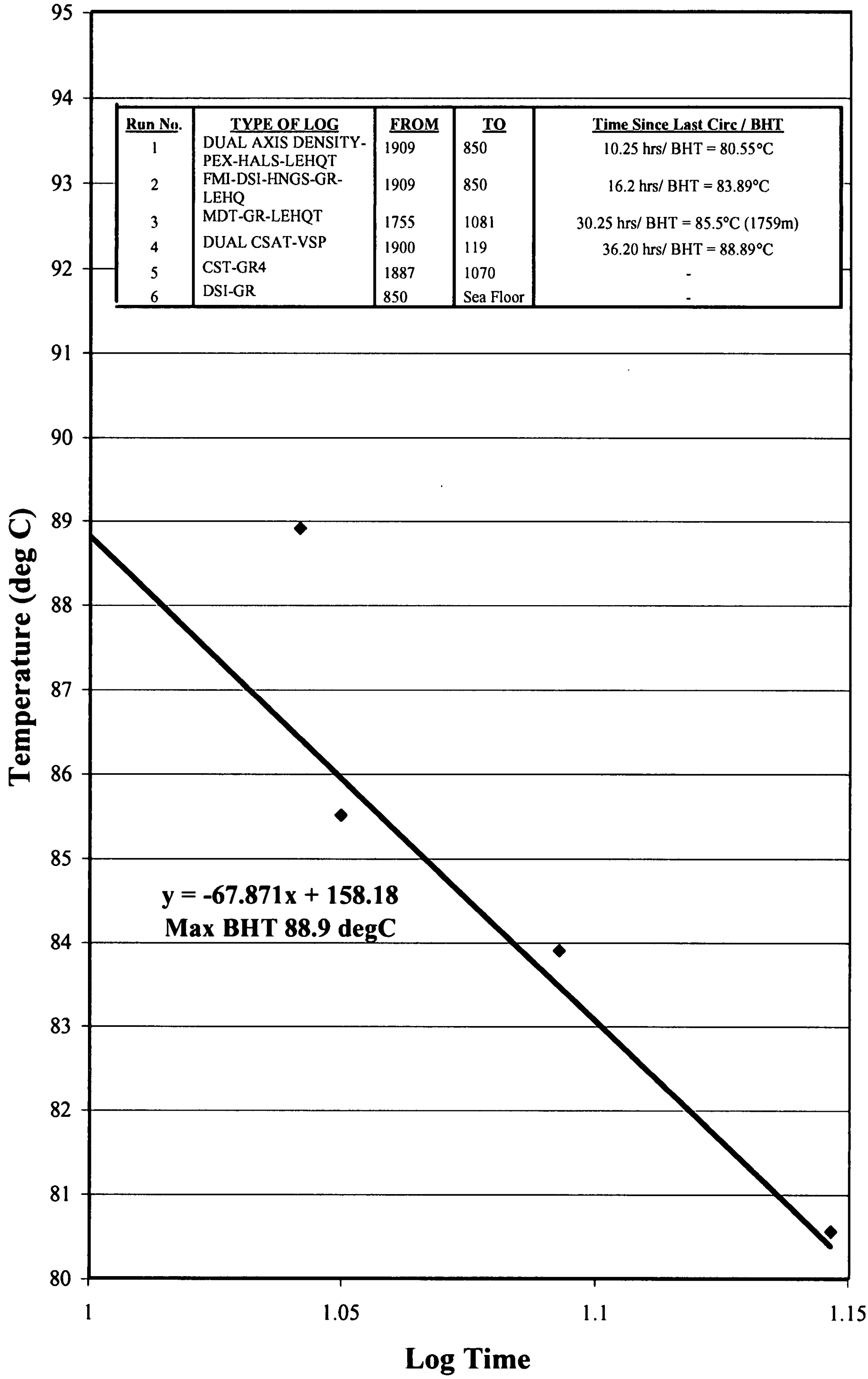
Beardie-1 Horner Plot



Run No.	TYPE OF LOG	FROM	TO	Time Since Last Circ / BHT
1	DUAL AXIS DENSITY-PEX-HALS-LEHQT	1909	850	10.25 hrs/ BHT = 80.55°C
2	FMI-DSI-HNGS-GR-LEHQ	1909	850	16.2 hrs/ BHT = 83.89°C
3	MDT-GR-LEHQT	1755	1081	30.25 hrs/ BHT = 85.5°C (1759m)
4	DUAL CSAT-VSP	1900	119	36.20 hrs/ BHT = 88.89°C
5	CST-GR4	1887	1070	-
6	DSI-GR	850	Sea Floor	-

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Rig Time

Distribution

Rig Time Distribution

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Time Distribution Summary

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DETAILED ACCOUNTABLE RIG TIME REPORT

With Prorated Intangible Costs

Well Name BEARDIE.1
Job Types Drilling Completion Workover
Date Range All Data

Description	Original				Scope Change				Total			
	Hours	Percent Hours	Cost	Percent Cost	Hours	Percent Hours	Cost	Percent Cost	Hours	Percent Hours	Cost	Percent Cost
Detailed DescriptionTime Accountability Summary												
Productive Time Summary												
Drilling Time Summary												
BEARDIE.1 Drilling Time Summary												
Job running 24-Jul-02 17:00 to 10-Aug-02 00:30												
BOP												
Install, remove or change BOP (incl change rams)	6.30	1.60	$84,979	1.00	0.00	0.00	$0	0.00	6.30	1.60	$84,979	1.00
Test BOP, wellhead or tree	5.30	1.30	$73,654	0.90	0.00	0.00	$0	0.00	5.30	1.30	$73,654	0.90
Install, remove or change wellhead	1.00	0.30	$12,275	0.20	0.00	0.00	$0	0.00	1.00	0.30	$12,275	0.20
Run, pull or handle riser	18.00	4.60	$256,647	3.20	0.00	0.00	$0	0.00	18.00	4.60	$256,647	3.20
BOP	30.50	7.80	$427,556	5.30	0.00	0.00	$0	0.00	30.50	7.80	$427,556	5.30
Cementing												
Mix, pump and place cement slurry	9.50	2.40	$220,979	2.70	0.00	0.00	$0	0.00	9.50	2.40	$220,979	2.70
Pressure test squeeze or other cement	0.30	0.10	$4,882	0.10	0.00	0.00	$0	0.00	0.30	0.10	$4,882	0.10
Cementing	9.80	2.50	$225,860	2.80	0.00	0.00	$0	0.00	9.80	2.50	$225,860	2.80
Circulating												
Circulate or pump	13.50	3.40	$290,817	3.60	0.00	0.00	$0	0.00	13.50	3.40	$290,817	3.60
Circulating	13.50	3.40	$290,817	3.60	0.00	0.00	$0	0.00	13.50	3.40	$290,817	3.60
Drilling												
Drill (new hole)	99.30	25.40	$1,519,103	18.70	0.00	0.00	$0	0.00	99.30	25.40	$1,519,103	18.70
Directional survey	0.50	0.10	$7,066	0.10	0.00	0.00	$0	0.00	0.50	0.10	$7,066	0.10
Drill cement, plugs, etc. to clean-out	4.30	1.10	$59,906	0.70	0.00	0.00	$0	0.00	4.30	1.10	$59,906	0.70
Drilling	104.00	26.60	$1,586,074	19.50	0.00	0.00	$0	0.00	104.00	26.60	$1,586,074	19.50
Inspecting												
Inspect or test equipment	0.30	0.10	$3,565	0.00	0.00	0.00	$0	0.00	0.30	0.10	$3,565	0.00
Inspecting	0.30	0.10	$3,565	0.00	0.00	0.00	$0	0.00	0.30	0.10	$3,565	0.00
Logging												
Log	46.50	11.90	$781,125	9.60	0.00	0.00	$0	0.00	46.50	11.90	$781,125	9.60
Logging	46.50	11.90	$781,125	9.60	0.00	0.00	$0	0.00	46.50	11.90	$781,125	9.60
Mobilizing												
Move or tow rig in or out	15.00	3.80	$1,999,529	24.60	0.00	0.00	$0	0.00	15.00	3.80	$1,999,529	24.60
Moor or demoor	49.30	12.60	$767,108	9.50	0.00	0.00	$0	0.00	49.30	12.60	$767,108	9.50
Mobilizing	64.30	16.40	$2,766,637	34.10	0.00	0.00	$0	0.00	64.30	16.40	$2,766,637	34.10
Rig												
Service rig (including slip drilling line)	1.50	0.40	$21,106	0.30	0.00	0.00	$0	0.00	1.50	0.40	$21,106	0.30
Rig	1.50	0.40	$21,106	0.30	0.00	0.00	$0	0.00	1.50	0.40	$21,106	0.30

913712 035

DETAILED ACCOUNTABLE RIG TIME REPORT

With Prorated Intangible Costs

Well Name BEARDIE.1
Job Types Drilling Completion Workover
Date Range All Data

Description	Original				Scope Change				Total			
	Hours	Percent Hours	Cost	Percent Cost	Hours	Percent Hours	Cost	Percent Cost	Hours	Percent Hours	Cost	Percent Cost
Testing												
Test formation (including FIT, DST, RFT, etc.)	1.00	0.30	$14,131	0.20	0.00	0.00	$0	0.00	1.00	0.30	$14,131	0.20
Testing	1.00	0.30	$14,131	0.20	0.00	0.00	$0	0.00	1.00	0.30	$14,131	0.20
Tripping												
Run string in hole	11.00	2.80	$203,138	2.50	0.00	0.00	$0	0.00	11.00	2.80	$203,138	2.50
Pull string out of hole	19.00	4.90	$298,585	3.70	0.00	0.00	$0	0.00	19.00	4.90	$298,585	3.70
Pick up or make up string, BHA, or tools	16.50	4.20	$266,355	3.30	0.00	0.00	$0	0.00	16.50	4.20	$266,355	3.30
Break and lay down string, BHA or tools	14.50	3.70	$299,184	3.70	0.00	0.00	$0	0.00	14.50	3.70	$299,184	3.70
Short trip (not to surface)	9.50	2.40	$135,832	1.70	0.00	0.00	$0	0.00	9.50	2.40	$135,832	1.70
Set or release downhole equipment	2.80	0.70	$53,700	0.70	0.00	0.00	$0	0.00	2.80	0.70	$53,700	0.70
Tripping	73.30	18.70	$1,256,793	15.50	0.00	0.00	$0	0.00	73.30	18.70	$1,256,793	15.50
Tubulars												
Rig up or rig down crews	2.00	0.50	$38,167	0.50	0.00	0.00	$0	0.00	2.00	0.50	$38,167	0.50
Run tubular (casing, liner or production tubing)	18.00	4.60	$287,053	3.50	0.00	0.00	$0	0.00	18.00	4.60	$287,053	3.50
Pull tubular (casing, liner or production tubing)	9.00	2.30	$116,478	1.40	0.00	0.00	$0	0.00	9.00	2.30	$116,478	1.40
Tubulars	29.00	7.40	$441,698	5.40	0.00	0.00	$0	0.00	29.00	7.40	$441,698	5.40
Job running 24-Jul-02 17:00 to 10-Aug-02 00:30	373.50	95.40	$7,815,364	96.30	0.00	0.00	$0	0.00	373.50	95.40	$7,815,364	96.30
BEARDIE.1 Drilling Time Summary	373.50	95.40	$7,815,364	96.30	0.00	0.00	$0	0.00	373.50	95.40	$7,815,364	96.30
Drilling Time Summary	373.50	95.40	$7,815,364	96.30	0.00	0.00	$0	0.00	373.50	95.40	$7,815,364	96.30
Productive Time Summary	**373.50**	**95.40**	**$7,815,364**	**96.30**	**0.00**	**0.00**	**$0**	**0.00**	**373.50**	**95.40**	**$7,815,364**	**96.30**

913712 036

DETAILED ACCOUNTABLE RIG TIME REPORT

With Prorated Intangible Costs

Well Name BEARDIE.1
Job Types Drilling Completion Workover
Date Range All Data

Description	Original				Scope Change				Total			
	Hours	Percent Hours	Cost	Percent Cost	Hours	Percent Hours	Cost	Percent Cost	Hours	Percent Hours	Cost	Percent Cost
Non-Productive Time Summary												
Accountable Trouble Time												
Casing equipment problem												
BEARDIE.1 Non-Productive Time Summary												
Event running 26-Jul-02 22:30 to 27-Jul-02 00:30												
Tubulars												
Run tubular (casing, liner or production tubing)	2.00	0.50	$44,304	0.50	0.00	0.00	$0	0.00	2.00	0.50	$44,304	0.50
Tubulars	2.00	0.50	$44,304	0.50	0.00	0.00	$0	0.00	2.00	0.50	$44,304	0.50
Event running 26-Jul-02 22:30 to 27-Jul-02 00:30	2.00	0.50	$44,304	0.50	0.00	0.00	$0	0.00	2.00	0.50	$44,304	0.50
BEARDIE.1 Non-Productive Time Summary	2.00	0.50	$44,304	0.50	0.00	0.00	$0	0.00	2.00	0.50	$44,304	0.50
Casing equipment problem	2.00	0.50	$44,304	0.50	0.00	0.00	$0	0.00	2.00	0.50	$44,304	0.50
Accountable Trouble Time	2.00	0.50	$44,304	0.50	0.00	0.00	$0	0.00	2.00	0.50	$44,304	0.50
Contractor-Caused Trouble Time												
Top drive system problem												
BEARDIE.1 Non-Productive Time Summary												
Event running 31-Jul-02 06:30 to 31-Jul-02 07:00												
Rig												
Service rig (including slip drilling line)	0.50	0.10	$8,768	0.10	0.00	0.00	$0	0.00	0.50	0.10	$8,768	0.10
Rig	0.50	0.10	$8,768	0.10	0.00	0.00	$0	0.00	0.50	0.10	$8,768	0.10
Event running 31-Jul-02 06:30 to 31-Jul-02 07:00	0.50	0.10	$8,768	0.10	0.00	0.00	$0	0.00	0.50	0.10	$8,768	0.10
BEARDIE.1 Non-Productive Time Summary	0.50	0.10	$8,768	0.10	0.00	0.00	$0	0.00	0.50	0.10	$8,768	0.10
Top drive system problem	0.50	0.10	$8,768	0.10	0.00	0.00	$0	0.00	0.50	0.10	$8,768	0.10
Contractor-Caused Trouble Time	0.50	0.10	$8,768	0.10	0.00	0.00	$0	0.00	0.50	0.10	$8,768	0.10
Third-Party Caused Trouble Time												
Cementing or cementing systems problem												
BEARDIE.1 Non-Productive Time Summary												
Event running 29-Jul-02 11:00 to 29-Jul-02 12:00												
Cementing												
Mix, pump and place cement slurry	1.00	0.30	$13,704	0.20	0.00	0.00	$0	0.00	1.00	0.30	$13,704	0.20
Cementing	1.00	0.30	$13,704	0.20	0.00	0.00	$0	0.00	1.00	0.30	$13,704	0.20
Event running 29-Jul-02 11:00 to 29-Jul-02 12:00	1.00	0.30	$13,704	0.20	0.00	0.00	$0	0.00	1.00	0.30	$13,704	0.20
BEARDIE.1 Non-Productive Time Summary	1.00	0.30	$13,704	0.20	0.00	0.00	$0	0.00	1.00	0.30	$13,704	0.20
Cementing or cementing systems problem	1.00	0.30	$13,704	0.20	0.00	0.00	$0	0.00	1.00	0.30	$13,704	0.20

913712 037

DETAILED ACCOUNTABLE RIG TIME REPORT

With Prorated Intangible Costs

Well Name BEARDIE.1
Job Types Drilling Completion Workover
Date Range All Data

Description	Original				Scope Change				Total			
	Hours	Percent Hours	Cost	Percent Cost	Hours	Percent Hours	Cost	Percent Cost	Hours	Percent Hours	Cost	Percent Cost
Logging problem												
BEARDIE.1 Non-Productive Time Summary												
Event running 06-Aug-02 10:30 to 06-Aug-02 12:00												
Logging												
Log	1.50	0.40	$50,095	0.60	0.00	0.00	$0	0.00	1.50	0.40	$50,095	0.60
Logging	1.50	0.40	$50,095	0.60	0.00	0.00	$0	0.00	1.50	0.40	$50,095	0.60
Event running 06-Aug-02 10:30 to 06-Aug-02 12:00	1.50	0.40	$50,095	0.60	0.00	0.00	$0	0.00	1.50	0.40	$50,095	0.60
BEARDIE.1 Non-Productive Time Summary	1.50	0.40	$50,095	0.60	0.00	0.00	$0	0.00	1.50	0.40	$50,095	0.60
Logging problem	1.50	0.40	$50,095	0.60	0.00	0.00	$0	0.00	1.50	0.40	$50,095	0.60
LWD problem												
BEARDIE.1 Non-Productive Time Summary												
Event running 01-Aug-02 20:30 to 01-Aug-02 21:15												
Tripping												
Break and lay down string, BHA or tools	0.80	0.20	$10,695	0.10	0.00	0.00	$0	0.00	0.80	0.20	$10,695	0.10
Tripping	0.80	0.20	$10,695	0.10	0.00	0.00	$0	0.00	0.80	0.20	$10,695	0.10
Event running 01-Aug-02 20:30 to 01-Aug-02 21:15	0.80	0.20	$10,695	0.10	0.00	0.00	$0	0.00	0.80	0.20	$10,695	0.10
Event running 01-Aug-02 21:45 to 01-Aug-02 23:00												
Tripping												
Pick up or make up string, BHA, or tools	1.30	0.30	$17,826	0.20	0.00	0.00	$0	0.00	1.30	0.30	$17,826	0.20
Tripping	1.30	0.30	$17,826	0.20	0.00	0.00	$0	0.00	1.30	0.30	$17,826	0.20
Event running 01-Aug-02 21:45 to 01-Aug-02 23:00	1.30	0.30	$17,826	0.20	0.00	0.00	$0	0.00	1.30	0.30	$17,826	0.20
BEARDIE.1 Non-Productive Time Summary	2.00	0.50	$28,521	0.40	0.00	0.00	$0	0.00	2.00	0.50	$28,521	0.40
LWD problem	2.00	0.50	$28,521	0.40	0.00	0.00	$0	0.00	2.00	0.50	$28,521	0.40
Rig mobilization or rig up/down problem												
BEARDIE.1 Non-Productive Time Summary												
Event running 26-Jul-02 10:00 to 26-Jul-02 10:30												
Mobilizing												
Moor or demoor	0.50	0.10	$11,076	0.10	0.00	0.00	$0	0.00	0.50	0.10	$11,076	0.10
Mobilizing	0.50	0.10	$11,076	0.10	0.00	0.00	$0	0.00	0.50	0.10	$11,076	0.10
Event running 26-Jul-02 10:00 to 26-Jul-02 10:30	0.50	0.10	$11,076	0.10	0.00	0.00	$0	0.00	0.50	0.10	$11,076	0.10
BEARDIE.1 Non-Productive Time Summary	0.50	0.10	$11,076	0.10	0.00	0.00	$0	0.00	0.50	0.10	$11,076	0.10
Rig mobilization or rig up/down problem	0.50	0.10	$11,076	0.10	0.00	0.00	$0	0.00	0.50	0.10	$11,076	0.10

913712 038

DETAILED ACCOUNTABLE RIG TIME REPORT

With Prorated Intangible Costs

Well Name BEARDIE.1
Job Types Drilling Completion Workover
Date Range All Data

Description	Original				Scope Change				Total			
	Hours	Percent Hours	Cost	Percent Cost	Hours	Percent Hours	Cost	Percent Cost	Hours	Percent Hours	Cost	Percent Cost
String or BHA failure												
BEARDIE.1 Non-Productive Time Summary												
Event running 08-Aug-02 19:45 to 09-Aug-02 00:00												
Tripping												
Pull string out of hole	0.80	0.20	$9,706	0.10	0.00	0.00	$0	0.00	0.80	0.20	$9,706	0.10
Pick up or make up string, BHA, or tools	2.80	0.70	$35,590	0.40	0.00	0.00	$0	0.00	2.80	0.70	$35,590	0.40
Tripping	3.50	0.90	$45,297	0.60	0.00	0.00	$0	0.00	3.50	0.90	$45,297	0.60
Tubulars												
Pull tubular (casing, liner or production tubing)	0.80	0.20	$9,706	0.10	0.00	0.00	$0	0.00	0.80	0.20	$9,706	0.10
Tubulars	0.80	0.20	$9,706	0.10	0.00	0.00	$0	0.00	0.80	0.20	$9,706	0.10
Event running 08-Aug-02 19:45 to 09-Aug-02 00:00	4.30	1.10	$55,003	0.70	0.00	0.00	$0	0.00	4.30	1.10	$55,003	0.70
Event running 09-Aug-02 04:30 to 09-Aug-02 06:15												
Tripping												
Run string in hole	0.80	0.20	$9,206	0.10	0.00	0.00	$0	0.00	0.80	0.20	$9,206	0.10
Pull string out of hole	1.00	0.30	$12,608	0.20	0.00	0.00	$0	0.00	1.00	0.30	$12,608	0.20
Tripping	1.80	0.40	$21,815	0.30	0.00	0.00	$0	0.00	1.80	0.40	$21,815	0.30
Event running 09-Aug-02 04:30 to 09-Aug-02 06:15	1.80	0.40	$21,815	0.30	0.00	0.00	$0	0.00	1.80	0.40	$21,815	0.30
BEARDIE.1 Non-Productive Time Summary	6.00	1.50	$76,818	0.90	0.00	0.00	$0	0.00	6.00	1.50	$76,818	0.90
String or BHA failure	6.00	1.50	$76,818	0.90	0.00	0.00	$0	0.00	6.00	1.50	$76,818	0.90
Casing equipment problem												
BEARDIE.1 Non-Productive Time Summary												
Event running 27-Jul-02 08:30 to 27-Jul-02 12:00												
Cementing												
Mix, pump and place cement slurry	3.50	0.90	$47,337	0.60	0.00	0.00	$0	0.00	3.50	0.90	$47,337	0.60
Cementing	3.50	0.90	$47,337	0.60	0.00	0.00	$0	0.00	3.50	0.90	$47,337	0.60
Event running 27-Jul-02 08:30 to 27-Jul-02 12:00	3.50	0.90	$47,337	0.60	0.00	0.00	$0	0.00	3.50	0.90	$47,337	0.60
BEARDIE.1 Non-Productive Time Summary	3.50	0.90	$47,337	0.60	0.00	0.00	$0	0.00	3.50	0.90	$47,337	0.60
Casing equipment problem	3.50	0.90	$47,337	0.60	0.00	0.00	$0	0.00	3.50	0.90	$47,337	0.60

913712 039

DETAILED ACCOUNTABLE RIG TIME REPORT

With Prorated Intangible Costs

Well Name BEARDIE.1
Job Types Drilling Completion Workover
Date Range All Data

Description	Original				Scope Change				Total			
	Hours	Percent Hours	Cost	Percent Cost	Hours	Percent Hours	Cost	Percent Cost	Hours	Percent Hours	Cost	Percent Cost
Wellhead or tree problem												
BEARDIE.1 Non-Productive Time Summary												
Event running 07-Aug-02 15:00 to 07-Aug-02 16:00												
Tripping												
Set or release downhole equipment	1.00	0.30	$19,527	0.20	0.00	0.00	$0	0.00	1.00	0.30	$19,527	0.20
Tripping	1.00	0.30	$19,527	0.20	0.00	0.00	$0	0.00	1.00	0.30	$19,527	0.20
Event running 07-Aug-02 15:00 to 07-Aug-02 16:00	1.00	0.30	$19,527	0.20	0.00	0.00	$0	0.00	1.00	0.30	$19,527	0.20
BEARDIE.1 Non-Productive Time Summary	1.00	0.30	$19,527	0.20	0.00	0.00	$0	0.00	1.00	0.30	$19,527	0.20
Wellhead or tree problem	1.00	0.30	$19,527	0.20	0.00	0.00	$0	0.00	1.00	0.30	$19,527	0.20
Third-Party Caused Trouble Time	15.50	4.00	$247,077	3.00	0.00	0.00	$0	0.00	15.50	4.00	$247,077	3.00
Non-Productive Time Summary	18.00	4.60	$300,148	3.70	0.00	0.00	$0	0.00	18.00	4.60	$300,148	3.70
Time Accountability Summary	391.50	100.00	$8,115,512	100.00	0.00	0.00	$0	0.00	391.50	100.00	$8,115,512	100.00

NOTE: The sum of the percentages for non-scheduled time and cost may exceed 100% due to overlapping events.
Total Flat Time **292.3 hours**

913712 040

Time Repartition Analysis

Time Repartition Analysis

913712 041

BEARDIE-1 DIVERGENCE ANALYSIS

PLANNED ACTIVITY	P10 Target (hours)	P10 Target Days	Actual Days	NPT Hours	Divergence Days [(Actual - NPT) - Target]	Comment
Rounded Total (days)		18.25				
Total (days)		18.01	16.25	0.75	-2.75	
	AFE Time Estimate					
Start						
Move from previous location in Bass Strait	24.00	1.00	0.63	0.00	-0.39	Calm weather & tow distance of 64nm allowed the tow to be completed in 15 hours at 4.27 knots.
Run primary & secondary anchore. Ballast down. Move to final location	18.00	0.75	1.31	0.50	0.53	Additional time was required during mooring to changout 5 Offdrill II anchors for HHP Stevpris Mark 5 anchors to meet Mooring Design requirements.
MU 17-1/2" bit & 36" Hole Opener, run to seabed.	6.50	0.27	0.06	0.00	-0.21	Calm weather allowed ballasting down prior to running secondary anchors. This, in turn, allowed drillfloor activities such as P/U BHAs to be performed off the critical path.
Drill 17-1/2" hole and open to 36", to 124m. 49m at 30m/hr	1.75	0.07	0.08	0.00	0.01	
Survey, displace to mud, wiper trip and POOH	3.00	0.13	0.08	0.00	-0.04	
Hold JSA. R/U to run conductor. Move guidebase to moon pool	2.00	0.08	0.05	0.00	-0.03	
Run 30" conductor. Land casing and PGB	6.00	0.25	0.28	2.00	-0.06	
R/U and Cement conductor. POOH.	3.50	0.15	0.34	3.50	0.05	
Cleanout conductor with 17-1/2" BHA. Rig down	0.00	0.00	0.00	0.00	0.00	
Gyro conductor	0.00	0.00	0.00	0.00	0.00	
PU 8-1/2" bit & pilot hole BHA (3hr) and RIH.	3.25	0.14	0.00	0.00	-0.14	Pilot hole eliminated at risk assessment after shallow hazard review saving 1.04 days total.
Drill pilot hole to 850m @ 40m/hr	18.25	0.76	0.00	0.00	-0.77	
Wiper trip, circulate, POOH	3.00	0.13	0.00	0.00	-0.13	
PU 17-1/2" bit & BHA and RIH.	5.00	0.21	0.21	0.00	0.00	
Drill from 124m to 850m @ 30m/hr	24.00	1.00	0.88	0.00	-0.14	17-1/2" Surface hole was drilled at 35.2 m/hr vs 30m/hr assumed in the time estimate and 32.8m/hr for East Pilchard-1 using the same bit.
Circulate hole clean (1hr), wiper trip (300m/hr), displace to mud (1hr), POOH spotting wgt mud (300m/hr). L/D 9-1/2" BHA (2 hr).	12.25	0.51	0.40	0.00	-0.12	9-1/2" BHA not laid down on the critical path, and the wellhead did not require washing, saving 2-3/4 hours.
Hold JSA. RU to run 13-3/8" casing on 18-3/4" HP Housing. MU float joints	4.50	0.19	0.03	0.00	-0.16	Calm weather allowed ballasting down prior to running secondary anchors. This, in turn, allowed drillfloor activities such as P/U BHAs to be performed off the critical path.
Run 13-3/8" casing to 850m - 71m @ 200m/hr, top joint is 20"	4.00	0.17	0.40	0.00	0.23	Ran 773m of 13-3/8" casing, HP housing and 76m of landing string (849m total) in 9.5 hrs (89m/hr). This was slower than the 200m/hr assumed in the time estimate. East Pilchard-1 ran 782m casing plus 116m landing string in 8.25hr (including 1.25 hr to M/U shoe).
Run 18-3/4" housing with WB. R/D casing gear. Run landing string. Circulate.	3.50	0.15	0.04	0.00	-0.11	Running 18-3/4" High Pressure housing included in casing running time
R/U and cement. BO and POOH	5.50	0.23	0.24	1.00	-0.03	
R/U and run BOP on riser. Test BOP connections. Test casing	17.50	0.73	0.64	0.00	-0.10	Ran BOP & riser, latch and test, run diverter in 15.25 hr (East Pilchard took 17.5 hr).
P/U 12-1/4" BHA (5hr).RIH @ 600m/hr to 850m	6.50	0.27	0.52	0.00	0.25	Extra time spent installing MWD sensor in standpipe (0.5hr), P/U BHA and testing BOPs on bottom than spent for East Pilchard.
Drill floats & new hole to 853m. PIT.	8.00	0.33	0.25	0.00	-0.09	
Drill 12-1/4" hole from 853m to 1154m @ 22m/hr with PDC bit	13.75	0.57	0.66	0.50	0.05	

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BEARDIE-1 DIVERGENCE ANALYSIS

PLANNED ACTIVITY	AFE Time Estimate P_{10} Target (hours)	P_{10} Target Days	Actual Days	NPT Hours	Divergence Days [(Actual - NPT) - Target]	Comment
Rounded Total (days)		18.25				
Total (days)		18.01	16.25	0.75	-2.75	
Trip for bit at 300m/hr plus 1 hr on surface	5.00	0.21	0.00	0.00	-0.21	Based on WTA-2 offset data a bit trip was included at ~1154m to P/U a tricone bit to drill a 30m hard streak immediately above Latrobe. This comprised 8 stringers from 20 to 30 kpsi UCS with 1 stringer @ 1170m at 40 kpsi. These stringers were not encounte
Drill 12-1/4" hard streak from 1154m to 1184 (TOL) @ 3m/hr with TCI bit	10.00	0.42	0.06	0.00	-0.36	
Trip for bit at 300m/hr plus 1 hr on surface	5.00	0.21	0.00	0.00	-0.21	
Drill 12-1/4" hole from 1184m to 1605m @ 20m/hr	21.00	0.88	0.81	0.00	-0.07	
Trip for bit at 300m/hr plus 1 hr on surface	6.00	0.25	0.57	2.00	0.24	Actual round trip time of 204m/hr was slower than 300m/hr assumed. Actual time changing the BHA, including P/U additional 8" DCs of 5 hr was longer than the 1 hr estimated.
Drill 12-1/4" hole with 627 bit 1605m to 1905m @ 7m/hr with 517 TCI	43.00	1.79	1.63	0.00	-0.19	Actual ROP was 8.33m/hr using a 12-1/4" Reed EHP51H bit. The time estimate assummed a ROP of 7m/hr based on 5.9m/hr seen on WTA-2.
Circulate hole clean (1hr), wiper trip (300m/hr), POOH (600m/hr).	10.50	0.44	0.67	0.00	0.22	Actual was 169m/hr round tripping for the wiper trip to the shoe, with 346m/hr to POOH and 1hr to L/D the BHA.
R/U Schlumberger (1hr) and run PEX/DSI/HGNS	9.00	0.38	0.32	0.00	-0.06	
Run FMI	0.00	0.00	0.29	0.00	0.29	FMI included in final dry-hole logging suite.
Run MDTs	0.00	0.00	0.48	0.00	0.48	Took 32 pretests. Probe seal failed when attemptng to collect 1st sample. Tool was rest but probe was plugged. Sampling was aborted. MDT program took 11.25hr vs 6hr assumed for 25 pretests in the dry-hole logging case.
Run CSAT	10.00	0.42	0.57	0.00	0.15	Assumed 9 hrs in the dry-hole logging case for 95 shots. Actual for Dual CSAT-VSP was 2 x 62 levels in 13.75hr.
Run CST (checkshots)	5.00	0.21	0.23	0.00	0.02	
R/D Schlumbeger	1.00	0.04	0.10	1.50	0.00	

BEARDIE-1 DIVERGENCE ANALYSIS

Rounded Total (days)		18.25				
Total (days)		18.01	16.25	0.75	-2.75	
	AFE Time Estimate					
PLANNED ACTIVITY	P_{10} Target (hours)	P_{10} Target Days	Actual Days	NPT Hours	Divergence Days [(Actual - NPT) - Target]	Comment
P/U 9 stands 3-1/2" tubing stinger (2hr), RIH on 5" DP to TD @ 600m/h to 1905m	5.25	0.22	0.25	0.00	0.03	1.05 days were saved by setting a 692m continuous balanced cement in five stages, avoiding circulating and WOC time. In addition cement P&A plugs between 1905m and 1725m were not required.
Circ & cond (1.5hr). R/U & Set plug # 1 from 1905m to 1815m (1.5hr). POOH 200m circ (1.25hr).	4.25	0.18	0.10	0.00	-0.08	
RIH to 1815m (0.25hr). Circ (0.5hr). Set Plug #2 from 1815m to 1725m (1.5hr). POOH 200m circ (1.25hr).	3.50	0.15	0.00	0.00	-0.15	
WOC, RIH and tag TOC	7.00	0.29	0.00	0.00	-0.30	
POOH to 1250m (600m/h)	0.75	0.03	0.00	0.00	-0.03	
Circ & cond (1hr). R/U & Set plug # 3 at TOL from 1250m to 1160m (1.5hr). POOH 200m circ (1.25hr).	3.75	0.16	0.09	0.00	-0.06	
RIH to 1160m (0.25hr). Circ (0.5hr). Set Plug #4 from 1160m to 1070m (1.5hr). POOH 200m circ 1.25hr.	3.50	0.15	0.08	0.00	-0.06	
WOC, RIH and tag TOC	7.00	0.29	0.00	0.00	-0.30	
POOH to 940m @ 600m/h	0.25	0.01	0.00	0.00	-0.01	
Circ & cond (1hr). R/U & Set plug # 5 at shoe from 940m to 850m (1.5hr). POOH 200m circ (1.25hr).	3.75	0.16	0.08	0.00	-0.07	
RIH to 850m (0.25hr). Circ (0.5hr). Set Plug #6 across 13-3/8" shoe from 850m to 760m (1.5hr). POOH 200m circ 1.25hr.	3.50	0.15	0.08	0.00	-0.06	
WOC, RIH and tag TOC	5.00	0.21	0.20	0.00	-0.01	
POOH @ 600m/hr. Rack back tubing stinger	1.50	0.06	0.17	1.00	0.06	
P/U 13-3/8" Bridge plug (0.25hr). RIH @ 400m/hr and set at 160m. P/U & tag (0.25hr).	1.00	0.04	0.07	0.00	0.03	
Circ & cond (0.25hr). R/U & Set plug from 160m to 100m (0.5hr). POOH to 100m and reverse circ (1.00hr).	1.75	0.07	0.07	0.00	0.00	
Pressure test plug	0.25	0.01	0.01	0.00	0.00	
L/D drill pipe	6.00	0.25	0.29	0.00	0.04	
R/U and pull BOP	18.00	0.75	0.41	0.00	-0.35	9.75 hours to pull riser and BOP compared to AFE target of 18 hours! East Pilchard required 12.25 hours. Beardie-1 was faster than East Pilcahrd-1 because of the shorter riser section (shallower water depth).
P/U Multistring cutter and cut 20" and 30" below PGB. POOH with PGB	12.00	0.50	0.80	6.00	0.05	
Break and laydown tools	1.00	0.04	0.00	0.00	-0.04	
Prepare to move-off.	12.00	0.50	0.00	0.00	-0.51	No preparation required for the move-off.
Recover anchors. Deballast to towing draft after secondary anchors recovered.	12.00	0.50	0.70	0.00	0.19	Calm weather assisted demooring operatiions. The HHP Stevpris Mark 5 anchors were purchased by Diamond Offshore avoiding additional time that would have been required to replace the Offdrill 2 anchors.

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NPT Summary

NPT Summary

BEARDIE-1 NON-PRODUCTIVE TIME REPORT

Well ID	Category	Type	Start Timestamp	End Timestamp	Start MD	End MD	Elapsed Time	NPT?	Acc Party Type	Acc Party Name	Description
BEARDIE.1	MOB	Rig mobilization or rig up/down problem	7/26/02 10:00 am	7/26/02 10:30 am	0	0	0.50	Yes	Third Party	Thales GeoSolutions	Repaired survey equipment on Pacific Conqueror. Replaced interface box between the antenna and computer.
BEARDIE.1	TBLR	Casing equipment problem	7/26/02 10:30 pm	7/27/02 12:30 am	123	123	2.00	Yes	Operator		Blockage in 20 inch float shoe of 30" conductor string.
BEARDIE.1	TBLR	Casing equipment problem	7/27/02 8:30 am	7/27/02 12:00 pm	124	124	3.50	Yes	Third Party	Weatherford	Float in float shoe failed to hold after displacing cement.
BEARDIE.1	CMT	Cementing or cementing systems problem	7/29/02 11:00 am	7/29/02 12:00 pm	863	863	1.00	Yes	Third Party	Weatherford Completion	**Equipment:** Nodeco top drive cement head type TDH w/ dual dart releasers, cementing manifold, swivel, ball release, and indicator sub w/ 4½ IF box x pin rented from Weatherford Completion Systems. **Problem:** Side flange leaked. The allen screws were found to have not been tightened. Removed flange, clean, replace O-ring, and tighten same. Leaked slightly but were able to finish cement job.
BEARDIE.1	RIG	Top drive system problem	7/31/02 6:30 am	7/31/02 7:00 am	913	913	0.50	Yes	Contractor		Renew top-drive saver sub that backed-out on connection.
BEARDIE.1	FE	LWD problem	8/1/02 8:30 pm	8/1/02 9:15 pm	1,579	1,579	0.75	Yes	Third Party	Anadrill	Array Resistivity Compensated tool did not transmit data while drilling. Had to lay down tool.
BEARDIE.1	FE	LWD problem	8/1/02 9:45 pm	8/1/02 11:00 pm	1,579	1,579	1.25	Yes	Third Party	Anadrill	Pick up new MWD and compensated dual resistivity tool to replace old MWD and ARC tool
BEARDIE.1	FE	Logging problem	8/6/02 10:30 am	8/6/02 12:00 pm	1,905	1,905	1.50	Yes	Third Party	Schlumberger	Re run DSI-GR log from Casing shoe to seafloor, due to Schlumberger engineer failing to save correct log. (Saved Picture file not Data File
BEARDIE.1	TBLR	Wellhead or tree problem	8/7/02 3:00 pm	8/7/02 4:00 pm	1,905	1,905	1.00	Yes	Third Party	ABB VETCO	Incorrect slips(size) fitted to Wear bushing retrieval tool.
BEARDIE.1	RIG	String or BHA failure	8/8/02 7:45 pm	8/9/02 12:00 am	1,905	1,905	4.25	Yes	Third Party	Weatherford	Weatherford "MOST Tool" dressed with Cameron Locking dogs instead of Vetco H4 type dogs.
BEARDIE.1	RIG	String or BHA failure	8/9/02 4:30 am	8/9/02 6:15 am	1,905	1,905	1.75	Yes	Third Party	Weatherford	Unable to redress MOST tool with Vetco H4 type dogs, as none available onsite. (Tool not dressed with correct dogs when shipped)

Category	Total Days	Productive Days	Non-Productive Days	PT%	NPT%	PT Fixed Cost	NPT Fixed Cost
	16.31	15.56	0.75	95.4%	4.6%	$7,815,364	$300,148
Mobilizing	2.70	2.68	0.02	99.2%	0.8%	$2,766,637	$11,076
Drilling	4.33	4.33	0.00	100.0%	0.0%	$1,586,075	$0
Circulating	0.56	0.56	0.00	100.0%	0.0%	$290,817	$0
Tripping	3.40	3.05	0.34	89.9%	10.1%	$1,256,793	$115,160
Tubulars	1.32	1.21	0.11	91.3%	8.7%	$441,698	$54,010
Cementing	0.59	0.41	0.19	68.4%	31.6%	$225,860	$61,040
BOP	1.27	1.27	0.00	100.0%	0.0%	$427,556	$0
Rig	0.08	0.06	0.02	75.0%	25.0%	$21,106	$8,768
Testing	0.04	0.04	0.00	100.0%	0.0%	$14,131	$0
Inspecting	0.01	0.01	0.00	100.0%	0.0%	$3,565	$0
Logging	2.00	1.94	0.06	96.9%	3.1%	$781,125	$50,094

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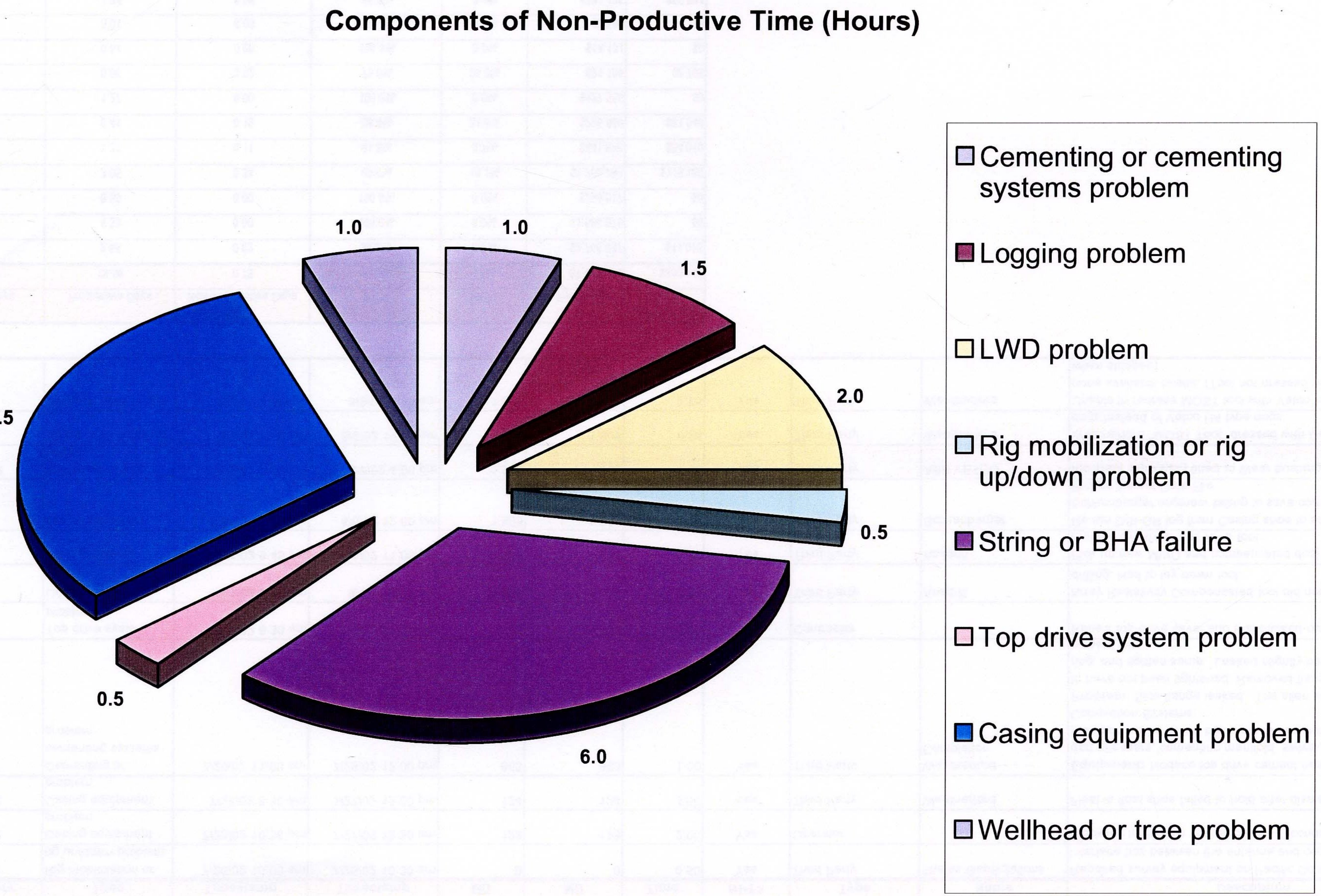

Beardie-1 Activity and NPT Report.xls 03/09/2002 4:40 pm

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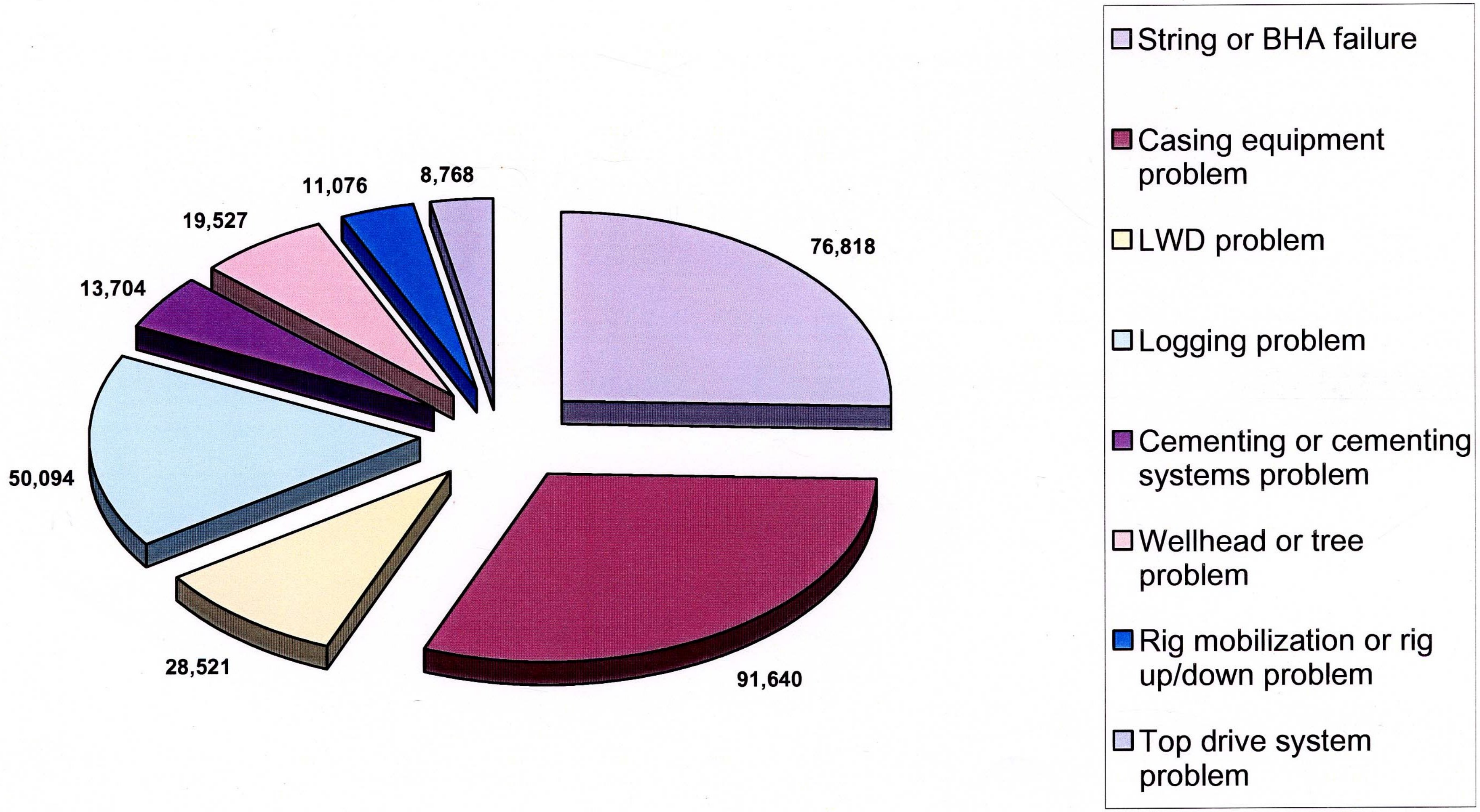
Prorated Non-Productive Cost (by Problem Event)



Beardie-1 Activity and NPT Report.xls 03/09/2002 4:41 pm

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Well Cost Analysis

Well Cost Analysis

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AFE

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AUTHORITY FOR EXPENDITURE

LOCATION:	AFE TITLE:	CO:	AFE NUMBER:
	Beardie-1 Near-Field Wildcat Well	EAL	L.0501B003

FUNDING REQUEST PHASE: (CHECK ONE X)

PROJECT SCOPING STUDY	(PS)	
PROJECT DETAILED DESIGN	(PD)	
PHASE 1 ASSET EXPENDITURE	(AE)	
TOTAL ASSET EXPENDITURE	(AE)	X

CUSTODIAN NAME: Chris Meakin Outlook ID: (CPMEAKI)

WIZARD CUSTODIAN NO.: 13006

WORK GROUP: EMDC Drilling - Australia Offshore

PRIMARY PROJECT EXPENDITURE TYPE: (CHECK ONE X)

RATE ENHANCEMENT	
SAFETY	
ENVIRONMENTAL	
REGULATORY	
OTHER ECONOMIC	X

FORECAST MILESTONE DATES: (MM/YY)

SCOPING STUDY	04/02
DETAILED DESIGN	04/02
OPERATIONAL	07/02

ESTIMATED COST DETAILS (A$):

THIS PHASE	CURRENT	SUPPLEMENT	PREVIOUS*
MAJOR EQUIPMENT	$340,000	$220,000	$120,000
MATERIALS	$1,540,000	$1,010,000	$530,000
CONTRACT LABOUR & SERVICES	$10,760,000	$10,000,000	$760,000
ALLOCATIONS	$1,750,000	$650,000	$1,100,000
CONTINGENCY	$290,000	$290,000	$0
TOTAL	$14,680,000	$12,170,000	$2,510,000
less BHPP PETROLEUM 50% (WHERE APPLICABLE)	$7,340,000	$6,085,000	$1,255,000
ESSO NET	$7,340,000	$6,085,000	$1,255,000

TOTAL PROJECT COST:† US$7,634,000

SCOPE / JUSTIFICATION / ASSET DETAILS / PROJECT EXECUTION PLAN:

The above funds are requested to drill the Beardie-1 near-field wildcat well to a total depth of 1880m TVDSS. The estimated duration of the well, including 10% contingency, is 20.5 days, of which 1 day has been allowed for the move of the rig to the location.

This AFE is based on dry hole costs, viz. drilling the well to 1880m TVDSS, logging and P&A. The costs assume an operating day rate for the rig of US$92,500, and include an allowance of $2,340,000 as Esso/BHP Billiton's share of the cost for mobilising/demobilising the MODU to Bass Strait. This mobilisation/demobilisation cost is based on an estimated total cost of $14,530k, with Esso/BHP's share being 20.5 days in a total program lasting 140.5 days. A rig has yet to be contracted for this work.

The previous revision of this AFE (Rev. 0) was only for planning and early order costs for this well.

In this AFE costs in US dollars have been converted to Australia dollars at a 0.52 exchange rate.

AFE FUNDING REQUEST USE ONLY: **DETAILS:**

DOES THIS AFE REPLACE EXISTING EQUIPMENT OR FACILITIES? NO

IDENTIFY KEY SAFETY, OCCUPATIONAL HEALTH AND ENVIRONMENTAL ISSUES TO BE CONSIDERED:

Drilling a subsea well from a semisubmersible with multiple contractors working simultaneously.

PROJECT TEAM: Leader Andy Zannetos :

DRILLING ENGINEER(S): Chris Meakin DRILLING SUPV(S): Tba

SUPERVISING ENGINEER: OPERATIONS SUPT(S): Frank Kratzer

ENDORSEMENTS — REFER TO PROJECT MANAGEMENT MANUAL (PMM) 4.1 FOR REQUIREMENTS

ROLE	NAME	SIGNATURE	DATE
DRILLING ENGINEER	Chris Meakin		13-December-2001
OPERATIONS SUPERINTENDENT	Frank Kratzer		17 Dec 2001
DRILLING MANAGER	Dan Whiteman		19 Dec 2001
PROJECT COORDINATOR	Andy Zannetos		10 - Jan 2001
~~TECH. SUB-SURFACE~~ RESERVOIR TECH. MANAGER	Bob Griffith		10 - Jan - 01
GIPPSLAND PROJECT MANAGER	Glen Nash		10/1/02
HOUSTON CENTRAL TECHNOLOGY GEOSCIENCE	Willott / Howard -	see attached approval	31/1/02
APPROVAL (LEVEL:) — REFER TO PMM 4.1 AND APPROVALS MANUAL FOR REQUIREMENTS			
DEPUTY PRODUCTION MANAGER	Mark J. Nolan		1/2/02

* Only use if revising request for this phase. Do not use if revising from Phase 1 to Phase 2 AE.

† Defines required approval level at Phase 1 AE Stage.

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AFE COST ESTIMATE

Well name:	BEARDIE-1 Rev. 1 Dry Hole	Well Depth:	1905
Date:	December 13, 2001	Well Days:	20.5
		Rig Rate US$k:	92.5
		Forex:	0.52

COST ELEMENT	DESCRIPTION	CURRENT AFE K$	PREVIOUS AFE K$
	(A) EQUIPMENT		
05010000	Subsurface Production Equip.	0	0
05010100	Surface Casing	210	0
05010300	Intermediate Casing		0
05010500	Production Casing	0	0
05010600	Tubing	10	0
05010700	Wellhead Assembly	120	120
	SUB-TOTAL (A)	340	120
	(B) MATERIALS		
05013800	Fuel Products Diesel	530	0
05015000	Float Equipment, Centralizers	120	120
05015100	Drilling Fluid / Cement	390	50
05015200	Drill Bits	360	300
05013000	Other Materials	70	30
05013100	Other Materials - *Intangible	70	30
	SUB-TOTAL (B)	1,540	530
	(C) CONTRACT & RENTALS		
05020100	Contract Transport - Land & Courier	90	0
05020200	Contract Transport - Air	0	0
05020300	Contract Transport - Marine	1,030	0
05020900	Diving/ROV Services	220	0
05021400	Offshore Construction - Rig Mobilisation	2,340	0
05021700	Electric Logging	340	0
05021800	Mud Logging	80	0
05021900	Directional Drilling	240	0
05022000	Coring	0	0
05022100	Cementing Services	80	0
05022200	Drilling	3,960	0
05022300	Miscellaneous Labour/Services, Drilling	1,320	250
05022500	Production Testing	0	0
05023000	Other	500	240
	SUB-TOTAL (C)	10,200	490
	(D) TECHNICAL PROFESSIONAL SERVICES		
05026000	Engineering Consultants	240	220
05026800	Technical Service Affiliate	320	50
	SUB-TOTAL (D)	560	270
	(E) FEES AND LICENSES		
N/A	Other Fees	0	0
	SUB-TOTAL (E)	0	0

	SUB-TOTAL (C)+(D)+(E)	10,760	760

	(F) ALLOCATIONS		
05041300	EMDC/Other Affiliate Charges	470	330
05050100	Well Insurance	0	0
05064700	Opex to Capex	30	0
05070200	Exploration Gippsland	70	20
05070700	Exploration Geophysical Operations	0	0
05070800	Exploration Formation Evaluation	110	20
05076000	Marine Terminals	150	90
05076200	Supply Vessels	230	230
05076400	Helicopters	70	0
05077000	Drilling Support	550	390
05078200	Reservoir Technology	70	20
	SUB-TOTAL (F)	1,750	1,100
	(G) CONTINGENCY		
05097000	Contingency	290	0
	SUB-TOTAL (G)	290	0
	PROJECT TOTAL:(A)+(B)+(C)+(D)+(E)+(F)+(G)	A$14,680k	A$2,510k
	PROJECT TOTAL: A$1.00 = US$0.52	US$7,634k	US$1,305k

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Final Well Cost Report

Final Well Cost Report.

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WELL COST WORKSHEET

Well: Beardie-1

Class	Description	AFE	Actual	Percent	25-Jul-02	26-Jul-02	27-Jul-02	28-Jul-02	29-Jul-02	30-Jul-02	31-Jul-02	1-Aug-02	2-Aug-02	3-Aug-02	4-Aug-02	5-Aug-02	6-Aug-02	7-Aug-02	8-Aug-02	9-Aug-02	10-Aug-02
101	Surface Casing	$210,000	$217,265	103.5%	$0	$0	$64,874	$0	$0	$138,513	$13,878	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
106	Tubing	$10,000	$0	0.0%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
107	Wellhead Assembly	$120,000	$117,496	97.9%	$0	$0	$117,496	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	EQUIPMENT	**$340,000**	**$334,761**	**98.5%**	**$0**	**$0**	**$182,370**	**$0**	**$0**	**$138,513**	**$13,878**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
130	Other Materials	$70,000	$53,052	75.8%	$38,239	$1,000	$1,000	$0	$0	$0	$3,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$813
131	Other Material-Intangible	$70,000	$11,210	16.0%	$10,750	$0	$0	$0	$0	$0	$400	$60	$0	$0	$0	$0	$0	$0	$0	$0	$0
138	Fuel Products Diesel	$530,000	$158,500	29.9%	$15,000	$9,600	$0	$0	$14,680	$6,360	$7,460	$11,360	$16,120	$7,360	$10,760	$6,000	$5,440	$5,280	$11,480	$14,600	$17,000
150	Float Equip, Centralizers	$120,000	$7,464	6.2%	$0	$0	$0	$0	$0	$7,464	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
151	Drilling Fluid / Cement	$390,000	$409,994	105.1%	$0	$0	$0	$0	$12,263	$44,866	$1	$120,074	$82,693	$38,268	$21,325	$378	$3,836	$2,820	$83,470	$0	$0
152	Drill Bits	$360,000	$153,243	42.6%	$0	$0	$11,538	$0	$0	$0	$29,000	$0	$112,009	$0	$0	$696	$0	$0	$0	$0	$0
	MATERIALS	**$1,540,000**	**$793,463**	**51.5%**	**$63,989**	**$10,600**	**$12,538**	**$0**	**$26,943**	**$58,690**	**$39,861**	**$132,494**	**$211,822**	**$46,628**	**$33,085**	**$8,074**	**$10,276**	**$9,100**	**$95,950**	**$15,600**	**$17,813**
201	Contract Transport-Land	$90,000	$58,625	65.1%	$27,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$1,625
203	Contract Transport-Marine	$1,030,000	$900,091	87.4%	$59,698	$59,698	$55,698	$55,698	$52,238	$52,238	$52,238	$52,238	$52,238	$52,238	$52,238	$52,238	$52,238	$52,238	$52,238	$52,238	$42,443
209	Contract/Rent-Diving, ROV	$220,000	$106,641	48.5%	$7,490	$7,490	$7,490	$7,490	$7,490	$7,490	$7,490	$4,735	$4,735	$4,735	$4,735	$4,735	$4,735	$4,735	$4,735	$10,245	$6,086
214	Offshore Mob & Demob	$2,340,000	$2,067,506	88.4%	$4,002,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	-$1,150,000	-$784,494
217	Electric Logging	$340,000	$498,596	146.6%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$498,596	$0	$0	$0
218	Mud Logging	$80,000	$61,006	76.3%	$8,850	$3,250	$3,250	$3,250	$3,250	$6,650	$3,250	$3,850	$3,250	$3,250	$3,250	$3,250	$3,250	$7,450	$3,250	$3,250	-$4,794
219	Directional Drilling	$240,000	$108,533	45.2%	$63,074	$6,383	$6,383	$6,383	$12,452	$12,883	$6,383	$3,233	$3,135	$3,819	$3,819	$3,819	-$32,027	$444	$10,081	-$1,731	$0
221	Cementing Services	$80,000	$63,113	78.9%	$3,955	$2,515	$2,515	$2,515	$2,515	$8,315	$3,955	$3,955	$8,315	$2,515	$2,515	$2,515	$2,515	$3,030	$6,910	$2,515	$2,043
222	Drilling	$3,960,000	$3,214,721	81.2%	$367,294	$184,679	$181,647	$181,647	$181,647	$181,647	$190,180	$181,647	$154,459	$217,824	$181,147	$181,147	$274,115	$179,022	$179,022	$179,022	$18,575
223	Misc Drill Services	$1,320,000	$736,142	55.8%	$265,317	$16,854	$222,205	$15,154	$15,154	$1	$32,400	$15,275	$15,930	$15,890	$28,205	$17,717	$17,717	$17,717	$23,817	$16,477	$312
230	Other	$500,000	$206,325	41.3%	$177,583	$4,125	$990	$0	$3,325	$835	$835	$835	$4,805	$835	$835	$835	$835	$835	$835	$835	$7,147
	CONTRACTS & RENTALS	**$10,200,000**	**$8,021,299**	**78.6%**	**$4,982,261**	**$286,994**	**$482,178**	**$274,137**	**$280,071**	**$272,059**	**$298,731**	**$267,768**	**$248,867**	**$303,106**	**$278,744**	**$268,256**	**$325,378**	**$766,067**	**$282,888**	**-$885,149**	**-$711,057**
260	Engineering Consultants	$240,000	$228,705	95.3%	$196,004	$0	$3,800	$0	$3,300	$1	$2,200	$3,100	$4,300	$1,100	$1,100	$1,100	$10,100	$2,600	$0	$0	$0
268	Tech Service Affiliate	$320,000	$228,077	71.3%	$160,769	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$67,308	$0	$0
	ECH./PROFESSIONAL SERVICES	**$560,000**	**$456,782**	**81.6%**	**$356,773**	**$0**	**$3,800**	**$0**	**$3,300**	**$1**	**$2,200**	**$3,100**	**$4,300**	**$1,100**	**$1,100**	**$1,100**	**$10,100**	**$2,600**	**$67,308**	**$0**	**$0**
413	Other Affiliate Charges	$470,000	$552,346	117.5%	$449,992	$6,473	$6,473	$6,473	$6,473	$6,473	$6,473	$6,473	$6,473	$6,473	$6,473	$6,473	$6,473	$6,473	$6,473	$6,473	$5,259
647	Allocation Opex to Capex	$30,000	$30,000	100.0%	$30,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
702	Exploration Gippsland	$70,000	$0	0.0%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
708	Exploration Formation Evaluat	$110,000	$0	0.0%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
760	Prod Support Service-BBMT	$150,000	$89,063	59.4%	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$10,000	$4,063
762	Alloc Prod Trans-Boats	$230,000	$85,002	37.0%	$25,000	$25,000	$25,000	$25,000	$1	$1	$10,000	$0	-$25,000	$0	$0	$0	$0	$0	$0	$0	$0
764	Alloc Prod Trans-Air	$70,000	$29,094	41.6%	$0	$8,060	$4,534	$4,534	$4,030	-$15,326	$3,790	$1,587	$1,663	$2,822	$352	$88	$88	$2,822	$1,584	$4,233	$4,233
770	Drilling Support	$550,000	$433,878	78.9%	$284,450	$9,450	$9,450	$9,450	$9,450	$9,450	$9,450	$9,450	$9,450	$9,450	$9,450	$9,450	$9,450	$9,450	$9,450	$9,450	$7,678
782	Reservoir Technology	$70,000	$0	0.0%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	ALLOCATIONS	**$1,750,000**	**$1,219,383**	**69.7%**	**$794,442**	**$53,983**	**$50,457**	**$50,457**	**$24,954**	**$5,598**	**$34,713**	**$22,510**	**-$2,414**	**$23,745**	**$21,275**	**$21,011**	**$21,011**	**$23,745**	**$22,507**	**$30,156**	**$21,233**
970	Contingency	$290,000	$0	0.0%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	TOTAL	**$14,680,000**	**$10,825,688**	**73.7%**	**$6,197,465**	**$351,577**	**$731,343**	**$324,594**	**$335,268**	**$474,861**	**$389,383**	**$425,872**	**$462,575**	**$374,579**	**$334,204**	**$298,441**	**$366,765**	**$801,512**	**$468,653**	**-$839,393**	**-$672,011**
	Days on AFE				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Days from Spud				0	0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Hole Cut				0.0	0.0	122.5	410.5	330.0	0.0	21.0	496.0	199.0	214.0	112.0	0.0	0.0	0.0	0.0	0.0	0.0
	Measured Depth				0.0	0.0	122.5	533.0	863.0	863.0	884.0	1380.0	1579.0	1793.0	1905.0	1905.0	1905.0	1905.0	1905.0	1905.0	1905.0
	Plugback Depth				0.0	0.0	122.5	533.0	863.0	863.0	884.0	1380.0	1579.0	1793.0	1905.0	1905.0	1905.0	768.0	105.0	105.0	105.0
	Job Number				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Job Type				Drilling	Drilling	Drilling	Drilling	Drilling	Drilling	Drilling	Drilling	Drilling	Drilling	Drilling	Drilling	Drilling	Drilling	Drilling	Drilling	Drilling

913712 054

Cost Deviation Summary.

Cost Deviation Summary

ESSO AUSTRALIA PTY. LTD.

Subject: Cost Deviation Summary for Beardie-1 File: 6.0

Date: 7 November 2002

Below is the Cost Deviation Summary for Beardie-1, a Production Company funded Near-Field Wildcat well drilled with the Ocean Bounty semi-submersible rig to a total depth of 1,905m. Beardie-1 was drilled, logged, plugged and abandoned in 16.3 days versus the original AFE time of 20.5 days. Total estimated final cost was $A10.83M versus an original AFE of $A14.68M.

Total non-productive time (NPT) on the well amounted to 18 hours or 0.75 days (4.6% of the total days) and was primarily associated with the incorrect set-up of Weatherford's MOST tools (6 hours), blockage of the 20" float shoe followed by the float failing requiring back-pressure to be held while WOC (5.5 hours) and logging and LWD problems (3.5 hours). Estimated total cost for NPT was A$300k. AFE NPT target was 2.25 days (11.0%) and A$1,710k.

Scope changes comprising an expanded FE program added 0.5 days and A$310k to the program.

Drilling enhancements were time neutral (didn't save or cost any days), but resulted in a saving of A$850k. These included:

- using a chartered vessel for the site survey (A$340k saving);
- sharing the cost of the rig inspection and levering off previous inspection work (saving A$430k);
- optimising the well design (saving $290k);
- eliminating the pilot hole after the risk assessment and shallow hazard review (saving 1.0 day and $410k); and
- Changing five Offdrill II anchors to HHP Stevpris Mark V anchors to achieve a compliant mooring design (costing 1.0 day and A$620k).

Other deviation saved 3.3 days and A$1,910k. These were:

- A trip to pickup a tricone bit to drill a 30m hard interval prognosed at 1154m MDRT form the Whiting-2 offset well stratigraphy, and the resulting slower ROP and trip to replace the PDC bit at the top of Latrobe, was not required. This saved 0.8 days and A$250k;
- Both the requirements for less extensive P&A cement plugs than was used in the cost estimate, and optimisation of the P&A design, resulted in a saving of 1.3 days and A$390k. The optimisation involved placing the open-hole P&A cement as consecutive plugs on-top of each other, requiring only the upper plug be tagged to verify integrity and position saving substantial WOC time;
- Negotiations between Esso, Diamond Offshore and the other operators using the Ocean Bounty allowed Diamond Offshore to purchase the HHP Stevpris anchors. This reduced the overall rental period, offset by a lump sum payment, but more importantly saved and estimated 1.1 days that would have been required to replace the Stevpris anchors with the original Offdrill II anchors, resulting in an overall saving of A$380k;

- The AFE allowed for demobilisation of the Ocean Bounty to be shared by the Operators in the Bass Strait Rig Sharing agreement. Demobilisation was negotiated between Diamond Offshore, New Zealand operators who were interested in using the Ocean Bounty, and the Bass Strait Operators, resulting in an estimated saving of A$270k.
- Faster operations and ROPs, lower rig costs and diesel costs and allocations than was assumed for the AFE cost estimate, resulted in a saving of 0.1 days and A$620k.

913712 057

Preliminary Well Cost Reconciliation

To be completed only for wells greater than $10M ***PROPRIETARY***

Date: August 28, 2002
Prepared By: Chris Meakin
Approved: ____________ Drilling Engineering Manager

Well: Beardie-1 (50% EM NWI)
Rig: DOGC Ocean Bounty
FRR Date: August 10, 2002

	Days	US$M	A$M	Comments
AFE				
Original Drilling AFE	20.5	7.63	14.68	A$14.68M gross Exchange rate: A$1.00 = US$0.52
Supplement #1				
Supplement #2				
Final Drilling AFE	20.5	7.63	14.68	A$14.68M gross
TARGET				
Original Target	18.25	6.75	12.97	A$12.97M gross
Final Target	18.75	6.91	13.28	A$13.28M gross
DEVIATIONS FROM TARGET				
A. Scope Changes				
a) Expand FE program	0.5	0.16	0.31	Run additional logs (eg. MDTs) for dry hole TD scenario.
B. Drilling Enhancements				
a) Site Survey implementation	0.0	-0.18	-0.34	Used a chartered vessel & shared mob/demob with another operator
b) Share inspection costs	0.0	-0.22	-0.43	Used only Moduspec, EMRC not involved & costs shared with other operators.
c) Well design optimisation	0.0	-0.15	-0.29	Stage collar eliminated, bits on consignment, and large target eliminated MWD.
d) Mooring design compliance	1.0	0.32	0.62	Changeout 5 Offdrill 2 anchors for HHP Stevpris Mark 5 anchors.
e) Eliminate pilot hole	-1.0	-0.21	-0.41	Pilot hole eliminated at risk assessment after shallow hazard review
C. Non-Productive Time (NPT)	0.75	0.16	0.30	Actual NPT: 4.6% (Should match DRS total)
AFE NPT total	2.25	0.89	1.71	**AFE NPT: 11.0%**
D. Other Deviations				
a) Bit trips avoided.	-0.8	-0.13	-0.25	Two bits trips and slower ROP to drill a prognosed hard interval were not required.
b) Less extensive P&A than planned in AFE.	-1.3	-0.20	-0.39	Fewer plugs set and WOC time minimised by P&A design
c) Anchor changeout at demooring avoided.	-1.1	-0.20	-0.38	The HHP anchors were purchased avoiding replacement of the original anchors.
d) Mobilisation & Demobilisation charges	0.0	-0.14	-0.27	Esso share of mobilization reduced, and demob. negotiated to a lump-sum.
e) Other	-0.1	-0.32	-0.62	Faster operations & ROP. Lower rig cost, diesel cost & allocations
PROJECTED TOTAL				
No Scope Change (exclude A)	15.8	5.5	10.52	Total days and cost excluding scope changes
With Scope Change (include A)	16.31	5.63	10.83	A$10.83M gross Actual days and cost (should match DRS)

E. Breakout of Major NPT	Days	$M		Comments
a) String or BHA failure	0.25	0.04	0.08	Weatherford MOST tool dressed for Cameron wellhead, not Vetco H4.
b) Casing equipment problems	0.23	0.05	0.09	Float on 20" conductor blocked, and then failed requiring holding backpressure.
c) LWD problem.	0.08	0.01	0.03	ARCs tool failed neccessitating changeout to CDR backup tool.
d) Logging problem	0.06	0.03	0.05	Interval from casing shoe to mudline logged but log not recorded. Interval re-logged.
d) Other	0.13	0.03	0.05	4 NPT events, each less than or equal to 1 hour.

EXPLORATION/APPRAISAL OBJECTIVES WERE ACHIEVED (see note 2)

Notes:
1. This form is completed within 10 working days of rig release for **all wells greater than $10M gross**. The estimated actual well cost will be provided in the final well report and may differ from above. Attach a one page summary of key learnings/well plan optimizations/cost savings.
2. Exploration/Appraisal Objectives stewarded include the following where applicable: reached primary target and planned TD, recovered cores and acquired planned logs, testing program completed. Reporting of success or failure to achieve the objectives (original and revised) will be as mutually agreed by Drilling and the client.
3. "NPT %" is defined as a ratio % of NPT days to total days. Breakout major NPT drivers in Section E., but ensure NPT total (section C) is consistent with DRS data.

Distribution:

Drilling:		Well File, Business Planning Mgr
ExxonMobil Exploration Company (If applicable):		Ops Geo Resource Mgr (Van Veenstra), Ops Geo Coord (Donal Mageean), FE Coord (John Nieto)
ExxonMobil Development Company (If applicable):		Determined by FDM
ExxonMobil Production Company (If applicable):		Determined by FDM

913712 058

Preliminary Well Cost Reconciliation Summary Form Instructions

Note: Information on the Preliminary Well Cost Reconciliation Summary Form (PWCR) is located in the OIMS Manual Element 4 - Information / Documentation and on the LAN under I:\EMDC\Drilling\Technical\Tech Library\Manuals\OIMS Forms\Preliminary Well Cost Reconciliation.xls. All costs are to be recorded as gross costs for the well (100%) rather than the ExxonMobil share of the well.

<u>AFE</u>

Original AFE dollars for drilling operations as approved by Drilling and the Business Partner

Supplement #X Days and dollars as approved by Drilling and the Business Partner
List each supplement individually with a brief description of the purpose of the supplement in the comments section.

Final AFE Drilling AFE + Original Completion AFE + Supplement #1 + Supplement #2 + ...

<u>Target</u>

Original Target = Original AFE - Contingency
Final Target= Original Target + scope changes (Deviations to AFE - part A below)

<u>Deviations From AFE</u>

A. Scope Changes Geology / Reservoir Engineering decisions to change objectives of the well (drill deeper/shallower, additional unplanned logging, did not perform planned production test, etc)
List each scope change with a brief description of the purpose in the comments section.

B. Drilling Enhancements Any positive or negative deviations from the planned drilling procedure

C. Non-Productive Time NPT available directly via the "Activity and NPT Report" program located on the DIMC website / for non-DRS users it is unplanned trouble time. Bracket major NPT events in section E.
AFE NPT Total = Original AFE - Original Target
In the comments section,
Actual NPT% = Actual NPT Total Days / Actual Total Days
Change (days)(Projected Total below)*100%
AFE NPT% = AFE NPT Total (days) / Original AFE (days)*100%

D. Other Deviations non-trouble deviations from target days/cost

<u>Projected Total</u>

No Scope Change B (Drilling Enhancements) + C (Non-Productive Time) + D (Other Deviations)

With Scope Change A (Scope Changes) + B (Drilling Enhancements) + C (Non-Productive Time) + D (Other Deviations) = Actual Time and Cost on well (should match DRS)

<u>Breakout of Major NPT</u> Significant problem events that occurred during well (stuck pipe, lost returns, equipment problems, etc...). Total does not need to match DRS due to overlapping events.

<u>Notes</u>

Verify with geology / exploration group that all objectives were met. Make appropriate note with explanation of why any objectives were not met.

<u>Distribution</u>

Copy appropriate Business Partner contact as specified by FDM.
For EMEC wells, copies should be supplied to Operation Geology contacts listed.

<u>Page 2</u>

Attach a one page summary of positive and negative key learnings, well plan optimizations, and cost savings.

Final Well Cost Reconciliation - Costs as at 2-Dec-2002

To be completed only for wells greater than $10M

PROPRIETARY

Date:	December 2, 2002	Well:	Beardie-1 (50% EM NWI)
Prepared By:	Chris Meakin	Rig:	DOGC Ocean Bounty
		FRR Date:	August 10, 2002

	Days	US$M	A$M	Comments
AFE				
Original Drilling AFE	20.5	7.63	14.68	A$14.68M gross Exchange rate: A$1.00 = US$0.52
Supplement #1				
Supplement #2				
Final Drilling AFE	20.5	7.63	14.68	A$14.68M gross
TARGET				
Original Target	18.25	6.75	12.97	A$12.97M gross
Final Target	18.75	6.91	13.28	A$13.28M gross
DEVIATIONS FROM TARGET				
A. Scope Changes				
a) Expand FE program	0.5	0.16	0.31	Run additional logs (eg. MDTs) for dry hole TD scenario.
B. Drilling Enhancements				
a) Site Survey implementation	0.0	-0.18	-0.34	Used a chartered vessel & shared mob/demob with another operator
b) Share inspection costs	0.0	-0.22	-0.43	Used only Moduspec, EMRC not involved & costs shared with other operators.
c) Well design optimisation	0.0	-0.15	-0.29	Stage collar eliminated, bits on consignment, and large target eliminated MWD.
d) Mooring design compliance	1.0	0.32	0.62	Changeout 5 Offdrill 2 anchors for HHP Stevpris Mark 5 anchors.
e) Eliminate pilot hole	-1.0	-0.21	-0.41	Pilot hole eliminated at risk assessment after shallow hazard review
C. Non-Productive Time (NPT)	0.75	0.16	0.30	Actual NPT: 4.6% (Should match DRS total)
AFE NPT total	2.25	0.89	1.71	**AFE NPT:** 11.0%
D. Other Deviations				
a) Bit trips avoided.	-0.8	-0.13	-0.25	Two bits trips and slower ROP to drill a prognosed hard interval were not required.
b) Less extensive P&A than planned in AFE.	-1.3	-0.20	-0.39	Fewer plugs set and WOC time minimised by P&A design
c) Anchor changeout at demooring avoided.	-1.1	-0.20	-0.38	The HHP anchors were purchased avoiding replacement of the original anchors.
d) Mobilisation & Demobilisation charges	0.0	-0.43	-0.83	Esso share of mobilization reduced, and demob. negotiated to a lump-sum.
e) Other	-0.1	-0.17	-0.33	Faster operations & ROP. Lower rig cost, diesel cost & allocations
PROJECTED TOTAL				
No Scope Change (exclude A)	15.8	5.3	10.24	Total days and cost excluding scope changes
With Scope Change (include A)	16.31	5.49	10.55	A$10.55M gross Actual days and cost (should match DRS)

E. Breakout of Major NPT	Days	$M		Comments
a) String or BHA failure	0.25	0.04	0.08	Weatherford MOST tool dressed for Cameron wellhead, not Vetco H4.
b) Casing equipment problems	0.23	0.05	0.09	Float on 20" conductor blocked, and then failed requiring holding backpressure.
c) LWD problem.	0.08	0.01	0.03	ARCs tool failed neccessitating changeout to CDR backup tool.
d) Logging problem	0.06	0.03	0.05	Interval from casing shoe to mudline logged but log not recorded. Interval re-logged.
d) Other	0.13	0.03	0.05	4 NPT events, each less than or equal to 1 hour.

913712 060

Failure Reports Summary

Well: BEARDIE-1 Country: Australia

#	Date	Summary	Responsible Third Party	NPT (hours)
1	30-Jul-2002	Leaking No deco Top Drive cement head	Weatherford	1.00
2	1-Aug-2002	LWD failure	Anadrill	2.00
3	6-Aug-2002	Re-logging of a missed interval (human error)	Schlumberger	1.50
4	6-Aug-2002	25% misfires in a CST run	Schlumberger	Nil
5	7-Aug-2002	Wear bushing retreival spear incorrectly dressed.	ABB Vetco Gray	1.00
6	8-Aug-2002	MOST tool dressed for Cameron hub not Vetco H4	Weatherford	6.00
7				
8				
9				
10				

I:\EMDC Drilling\EMDC Exploration\Beardie-1\Reports\Failure Reports & NCRs\25 - Beardie-1 Failure Reports Summary.doc
13 November, 2002

ExxonMobil 913712 061

Non-Conformance Report

SECTION COMPLETED BY LEAD SURVEILLANCE ENGINEERITECHNICIAN			
Identifier's name:	Anthony Bassett		
Date:	30/07/2002		Description of Non-Conformance (as detailed in Original NCR) and additional comments as necessary:
Site:	NFW		Weatherford NODECO Top Drive Model TDH 4-1/2" IF Double Dart and Ball cement head leaked at the side-entry connection (flanged spiggoted O-ring) when circulating. Inspection of the cement head identified one Umbako bolt corroded into the housing, and no evidence of previous service of this component. The cement head looked to be freshly painted. The failure resulted in 1 hours loss time.
Well No.:	BEARDIE-1		
Responsible Third Party:	Weatherford		
Result of Non-Conformance:	Downtime	☑	
	Potential Downtime	☐	
Categorisation of Non-Conformance:	Equipment Failure	☑	
	Delivery Delays	☐	
	Design Fault	☐	
	Maintenance Fault	☑	
	Human Error	☐	
	Other	☐	
Effects of Non-Conformance:	Safety Concerns	☐	
	Financial / Time loss	☑	
	Environmental	☐	
	Other	☐	

SECTION COMPLETED BY VERIFIERIKEY CONTACT (if different from Verifier)	
Verifier's name:	CPM
Key contact name (if different form Verifier):	CPM
Date:	08/08/2002
Conflict with the current contract/agreement?: Yes:	☐
If Yes, give details:	

Recommended Remedial Action/Folllow-up Plans:
In future ensure a suitable QA program is implemented when O-rings are replaced, and unit pressure tested in the shop prior to shipment. Perform both a low pressure test as well as a high pressure test. Ship a redress kit with unit. As discussed with Weatherford, immediately ship a redress kit for the exisitng cement head, and a replacement cement head for load-out from BBMT on Thursday 1-Aug-02.

SECTION COMPLETED WHEN NC CLOSED OUT		
Date:	10/09/2002	Action Taken:
Non-Conformance action closed out: Yes:	☑	Assembly and Testing. Tool History. The head last received a major service in September 2001 and subsequently after use a minor service on the 4 th July 2002. There are no indications of leakage during either of these services and tests as per the charts attached to the Weatherford Report - QSIR Closeout Report, No. CSQSIR00017, QSD 073, Prepared by Scott Beattie. Recommendations This is the first documented leak from this component of a TDH. However, Weatherford were unable to recreate the leak in the test bay. As there is no apparent damage or leak Weatherford have taken a course of preventative measures which have been written into the assembly and testing instructions. Current testing calls for 4 x 1000psi tests with the swivel in 4 positions and 1 x 5000psi test. In future a pressure test of 250psi will be performed as the initial low pressure test. All the bolts which secure the side entry subs to the swivel will be checked for
(leave unchecked if No)		

secure fitting with a torque wrench during each service.

913712 063

WELL No.: Beardie 1

CLIENT: ESSO

QSIR No.: CSQSIR00017

913712 064

Table of Contents

1. OVERVIEW

Weatherford Australia dispatched a Nodeco Top Drive Cement Head (Serial Number 230397) to Sale, Victoria for ESSO's Beardie-1 sub sea well on the 12th July 2002. Subsequently the equipment was shipped offshore and used to launch darts for a 13 3/8" Sub-sea Wiper Plug System.

On the 30th of July a non-conformance report was received from the rig explaining that the head had leaked from one of the swivels side entry ports. Immediate action was taken by the rig crew, removing the side entry sub and replacing the o-ring seals. This problem resulted in approximately 1 hour down time.

In order to avoid a similar occurrence during the 9 5/8" cement job a replacement TDH was dispatched by air on the 30th July 2002.

The ESSO NCR recommendations are to perform both low and high pressure tests prior to load out. Weatherford currently test each head to 1,000psi with the swivel in 4 positions and a static test of 5,000psi.

913712 066

2. Assembly and Testing

Attached to this report are assembly and test instructions adhered to as well as the documented tool history. The head last received a major service in September 2001 and subsequently after use a minor service on the 4th July 2002. There are no indications of leakage during either of these services and tests as per the attached charts.

4. Recommendations

913712 067

This is the first documented leak from this component of a TDH however we have been unable to recreate the leak in the test bay. As there is no apparent damage or leak we have taken a course of preventative measures which have been written into the assembly and testing instructions.

Current testing calls for 4 x 1000psi tests with the swivel in 4 positions and 1 x 5000psi test. In future a pressure test of 250psi will be performed as the initial low pressure test. All the bolts which secure the side entry subs to the swivel will be checked for secure fitting with a torque wrench during each service.

4. WCS QSIR

913712 069

Weatherford	**QUALITY & SAFETY IMPROVEMENT REPORT** **QSIR**	**ISSUE: A** **REVISION: 2** **NO:**

GENERAL INFORMATION			
REPORTER NAME:	Scott Beattie	DATE:	30/07/02
CONTACT TELEPHONE NO:	+61 8 9212 4600	CLIENT:	ESSO
E-MAIL ADDRESS:	scott.beattie@weatherford.com	RIG / INSTILLATION:	Ocean Bounty
RESPONSIBLE MANAGER:	Iain Farley	WELL NO:	Beardie-1
LOCATION:	Perth	PRODUCT LINE:	Liners
COUNTRY:	Australia	TIME:	

INCIDENT / EVENT							
QUALITY		**HEALTH**		**SAFETY**		**ENVIRONMENTAL**	
SUB STD CONDITION	X	INCIDENT		ACCIDENT		SPILL LEAK	
OTHER QUALITY ISSUE		IDENTIFIED RISK		FIRST AID CASE		AIR EMISSION	
MATERIAL DEFECT		SAFETY IDEA		LOST TIME INCIDENT		DISPOSAL	
COMPLAINT	X	PROCEDURAL		MEDICAL EVACUATION		SECURITY	
CLIENT / EXTERNAL		PROBLEM JOB		IMPROVEMENT		ORDER DELIVERY	
HANDLING / STEPPING		LIFTING		MOTOR VEHICLE		EQUIPMENT	
WORKSHOP	X	INDUSTRIAL ILLNESS		PERSONNEL		MISC/OTHER	
PRODUCT FAILURE		OCCUPATIONAL INJURY		INCORRECT PRODUCT			
LOST TIME RECORDED	X	LT IN HOURS					

STAGE IN TOUR / SHIFT							
BEGINNING		MIDDLE		END		OFF DUTY	
TRAVEL		STAND BY		ON LOCATION		OFF LOCATION	

DESCRIPTION OF INCIDENT

Weatherford Dual Top drive Model TDH 4 1/2" IF cement head. Leaked at the side entry connection o-ring on the flange connection with the swivel when circulating. Failure caused loss of 1 hr rigtime.

Esso reported 1 x bolt corroded into housing, with no evidence of previous service of this component. Cement head looked freshly painted. Ensure QA program is implemented where O rings are replaced, and unit pressure tested in the shop prior to shipment. Ship redress kit with unit.

The wellsite company representative also mentioned that the bolts securing the WECO fitting to the swivel were loose however subsequent attempts to tighten had little effect on the rate of leak.

DESCRIPTION OF IMMEDIATE CORRECTIVE ACTION TAKEN

Action: Replaced cement head with one from Perth; shipped via air freight. Discussed maintenance procedures with wellsite company representative and explained the WCS servicing procedures and policies.
Person: Scott Beattie
Deadline: 30/07/02
Status: Done

Background: The TDH head in question underwent a major service in March and has since had one minor service performed between jobs. After each service the heads are tested to 1,000psi 4 times while rotating the swivel 90 degrees between tests a subsequent main body test of 5,000psi is performed and the head is marked acceptable for service.

Preventative Action: With immediate effect, prior to load out all TDH heads will be visually inspected and the bolts which attach the WECO fitting to the swivel will be checked with a torque wrench.

Follow Up: When the head is returned to Perth WCS will access the failure mode and put in place additional corrective action if required. A fulkl report will be submitted to Esso upon completion of the investigation.

Person: Scott Beattie
Status: Open

ATTACHMENTS TO THIS REPORT				
SCHEMATIC OF INCIDENT		ATTACHED WITH REPORT		OTHERS PLEASE LIST
CLIENT REPORT	X	INCLUDED IN REPORT		
POLICE REPORT		COPY SENT TO CLIENT		
PHOTOGRAPHS		SENT TO DISTRICT OFFICE		
OTHERS		SENT TO REGION OFFICE		

CLASSIFICATION							
CORRECT ACTION TAKEN		PREVENTATIVE ACTION TAKEN		OPEN FOR INVESTIGATION AND ACTION	X	CLOSED	
CORRECTIVE / PREVENTATIVE ACTION TAKEN BY		NAME:					

5. ESSO NCR

ExxonMobil 913712 071

Non-Conformance Report

SECTION COMPLETED BY LEAD SURVEILLANCE ENGINEERITECHNICIAN			
Identifier's name:	Anthony Bassett		
Date:	30/07/2002		Description of Non-Conformance (as detailed in Original NCR) and additional comments as necessary:
Site:	NFW		Weatherford NODECO Top Drive Model TDH 4-1/2" IF Double Dart and Ball cement head leaked at the side-entry connection (flanged spiggoted O-ring) when circulating. Inspection of the cement head identified one Umbako bolt corroded into the housing, and no evidence of previous service of this component. The cement head looked to be freshly painted. The failure resulted in 1 hours loss time.
Well No.:	BEARDIE-1		
Responsible Third Party:	Weatherford		
Result of Non-Conformance:	Downtime	☑	
	Potential Downtime	☐	
Categorisation of Non-Conformance:	Equipment Failure	☑	
	Delivery Delays	☐	
	Design Fault	☐	
	Maintenance Fault	☑	
	Human Error	☐	
	Other	☐	
Effects of Non-Conformance:	Safety Concerns	☐	
	Financial / Time loss	☑	
	Environmental	☐	
	Other	☐	

SECTION COMPLETED BY VERIFIERIKEY CONTACT (if different from Verifier)	
Verifier's name:	CPM
Key contact name (if different form Verifier):	CPM
Date:	08/08/2002
Conflict with the current contract/agreement?: Yes:	☐
If Yes, give details:	

Recommended Remedial Action/Folllow-up Plans:
In future ensure a suitable QA program is implemented when O-rings are replaced, and unit pressure tested in the shop prior to shipment. Perform both a low pressure test as well as a high pressure test. Ship a redress kit with unit. As discussed with Weatherford, immediately ship a redress kit for the exisitng cement head, and a replacement cement head for load-out from BBMT on Thursday 1-Aug-02.

SECTION COMPLETED WHEN NC CLOSED OUT		
Date:		Action Taken:
Non-Conformance action closed out: Yes:	☐	
(leave unchecked if No)		

6. Amended TDH Work Instruction

913712 073

SERVICING AND TEST INSTRUCTIONS FOR TYPE 'TDH' TOP DRIVE CEMENTING HEAD FOR DUAL DRILL PIPE DARTS

ISSUE HISTORY

Rev No.	Date	Description	Reviewed By	Approved By
0	2/12/97		Bill Bavidge	A. Sharpe
1	09/09/02	Update testing requirements	Scott Beattie	D. Spadaccini

DISASSEMBLY

NOTE: A Top Drive Head receives either a MAJOR or MINOR service defined and applicable as follows:-

MAJOR SERVICE: Complete disassembly of the Top Drive Head into component parts including a full stripdown of swivel assembly and indicator. This service is due every third job assuming there are no problems found with the swivel and indicator when they are checked after each job.

MINOR SERVICE: Swivel assembly and indicator are checked for ease of operation but not stripped down. All other components are removed and serviced. Part of the MINOR service is a rotational test on the Top Drive Head with the swivel at four different positions on the body. (This is outlined in the servicing instructions). Should any problems arise whilst carrying out the pressure testing the Top Drive Head will be given a MAJOR service.

The services will be recorded on the Rental Tool Maintenance Sheet and the Rental Tool Maintenance Record. They are to be recorded as follows:-

No.1 Service MAJOR

No.2 Service MINOR

No.3 Service MINOR

In the event of a Top Drive Head being given a MINOR service and a problem arises with pressure testing or the easy operation of the swivel, or any other problem which may compromise the satisfactory performance of the Top Drive Head, it must be given a MAJOR service (No.1).
The servicing rota then starts again from that point

1.0 DISASSEMBLY OF DART DROPPING VALVES

1.1 UNSCREW AND REMOVE NUT AND SPRING WASHER FROM DART DROPPING VALVE No. 1.

1.2 REMOVE GREASE NIPPLE.

1.3 REMOVE THE WHEEL.

1.4 REMOVE THE STOP HOUSING.
Note: REMOVE KEYS FROM THE DART DROPPING VALVE, IF LOOSE, BEFORE PROCEEDING.

1.5 INSPECT LOCK KNOB ON HOUSING IF FITTED. REPLACE/REPAIR IF REQUIRED.

1.6 REMOVE LOCK RINGS.

1.7 REMOVE DART DROPPING VALVE FROM BODY.
Note: THE REAR SLIDE BEARING MAY REMAIN IN POSITION. INSPECT AND REPLACE SEALS AS REQUIRED, BUT DO NOT REMOVE UNLESS OBVIOUSLY DAMAGED OR HEAD IS DUE FOR A MAJOR SERVICE.

1.8 REPEAT PROCESS FOR DART DROPPING VALVE No.2.

2.0 DISASSEMBLY OF THE BALL RELEASER

2.1 LEAVING LOCK CLIP IN POSITION, UNSCREW NUT FROM THE TOP OF THE HOUSING USING A 'C' SPANNER UNTIL BALL RELEASER IS FREE.

2.2 REMOVE BALL RELEASER.

3.0 DISASSEMBLY OF THE SWIVEL (MAJOR SERVICE)

3.1 REMOVE THE LOCK KEYS SECURING THE TOP CAP IN PLACE. **CLOSELY INSPECT THE CONDITON OF THESE LOCK KEYS, IF IN DOUBT - REPLACE.**

3.2 REMOVE SET SCREWS AND REMOVE THE TOP CAP.

3.3 UNSCREW THE UPPER BEARING LOCK RING.

3.4 SLACKEN BUT DO NOT REMOVE COMPLETELY THE LOWER BEARING LOCK RING (LEFT HAND THREAD)

3.0 DISASSEMBLY OF THE SWIVEL (MAJOR SERVICE) (Cont'd.)

3.5 REMOVE THE SNAP RING OR SPLIT RING HOLDING THE UPPER BEARING IN PLACE.

3.6 REMOVE THE SWIVEL BY STANDING THE HEAD ON IT's END AND PULLING THE HEAD UP/PUSHING THE SWIVEL DOWN.

3.7 REMOVE THE LOWER BEARING LOCK RING. (LEFT HAND THREAD).

3.8 REMOVE BOTH BEARINGS AND ALL INTERNAL 'V' RINGS AND 'O' RINGS.

3.9 CHECK AND RECORD THE DIMENSIONS OF THE I.D. OF THE SWIVEL AND THE O.D. OF THE BODY WHERE THE SEALS ARE POSITIONED. DIMENSIONS ARE TO BE RECORDED IN THE T.D.H. REGISTER.

3.10 WHEN THE SWIVEL AND HEAD BODY TOLERANCE EXCEEDS 0.030" BELOW SPECIFIED DIMENSIONS THE HEAD AND/OR BODY REQUIRE REWORK TO RELEVANT ENGINEERING SPECIFICATIONS (AS PER ENGINEERING DRAWING).

3.11 REMOVE SIDE ENTRY SUBS FROM SVIVEL BODY. **(ALL SERVICES)**

4.0 DISASSEMBLY OF THE INDICATOR (MAJOR SERVICE)

4.1 REMOVE INSEX SCREW AND WASHER.

4.2 REMOVE OUTER INDICATOR.

4.3 UNSCREW THE NUT AND REMOVE THE SPINDLE FROM THE BODY.

4.4 REMOVE INTERNAL INDICATOR FROM BORE OF BODY.

Notes:

1) CLEAN ALL PARTS THOROUGHLY AND CHECK FOR DAMAGE.
2) RENEW ALL SEALS AS REQUIRED.
3) DRIFT THE MAIN BORE WITH 74 mm DRIFT.
4) DRIFT THE BYPASS LINE WITH 1 3/4" OD BAKELITE BALL.
5) CHECK THAT INLET PORTS IN SWIVEL AND INLET HOLES IN MAIN BODY ARE CLEAR. IF SWIVEL HAS NOT BEEN REMOVED, THIS SHOULD BE ACHIEVED BY ROTATING SWIVEL THROUGH 360^{o} WHILST THOROUGHLY WASHING THROUGH **BOTH** INLET PORTS AND THEN VISUALLY CHECKING THAT THE HOLES IN THE BODY ARE CLEAR.

ASSEMBLY AND TEST

5.0 ASSEMBLY OF THE SWIVEL (MAJOR SERVICE)

5.1 **PRIOR TO ASSEMBLY, CHECK THAT UPPER AND LOWER BEARINGS ARE IN WORKING ORDER.**

5.2 REFURBISH SWIVEL WITH NEW 'V' RINGS AND 'O' RINGS.

5.3 REPLACE LOWER BEARING IN SWIVEL HOUSING (GREASE THOROUGHLY W/ PRESCRIBED BEARING GREASE).

5.4 MAKE UP LOWER BEARING LOCK RING (LH THREAD)AND REPLACE SET SCREWS.

5.5 GREASE INTERNAL SWIVEL SEALS WITH PRESCRIBED GREASE.

5.6 INSTALL SWIVEL ON TO THE BODY BY LOWERING BODY INTO THE SWIVEL.

5.7 INSTALL UPPER BEARING (GREASE THOROUGHLY W/PRESCRIBED BEARING GREASE).

5.8 INSTALL SNAP RING OR SPLIT RING TO HOLD BEARING IN POSITION.

5.9 MAKE UP UPPER BEARING LOCK RING TO SWIVEL HOUSING AND REPLACE SET SCREWS.

5.10 **CHECK AT THIS STAGE THAT THE SWIVEL CAN BE ROTATED FREELY WITH A 36" CHAIN TONG.**

5.11 MAKE UP TOP CAP UNTIL KEYWAYS LINE UP WITH SLOTS IN BODY.

5.12 REPLACE LOCK KEYS AND INSEX SCREWS.

5.13 REPLACE SIDE ENTRY SUBS AND LUBRICATE SEAL AREA AND SECURING STUDS.

6.0 ASSEMBLY OF THE DART DROPPING VALVES

6.1 ENSURE GREASE CHANNELS ARE CLEAR OF CEMENT DEBRIS.

6.2 GREASE ALL SEALS PRIOR TO INSTALLING THE DART DROPPING VALVES.

6.3 INSTALL THE REAR SLIDE BEARING (IF REQUIRED) AND DART DROPPING VALVE No 1 INTO BODY.

6.0 ASSEMBLY OF THE DART DROPPING VALVES (Cont'd.)

6.4 MAKE UP THE LOCK RING UNTIL IT IS FLUSH WITH THE BODY.

6.5 INSTALL GREASE NIPPLE.

6.6 FILL GREASE CHANNEL WITH PLUG VALVE GREASE.

6.7 INSTALL THE STOP HOUSING.
Note: MAKE SURE THE KEYS ARE STILL IN PLACE IN THE DART DROPPING VALVE PRIOR TO INSTALLING THE STOP HOUSING.

6.8 INSTALL THE OPERATING WHEEL. (ENSURE BRASS SIGN PLATE IS CORRECT FOR THE DART DROPPING VALVE ON WHICH THE WHEEL IS INSTALLED).

6.9 REPLACE THE SPRING WASHERS AND MAKE UP THE NUT.

6.10 REPEAT THE ASSEMBLY PROCESS FOR DART DROPPING VALVE No. 2.

Note: THE LOWER DART DROPPING VALVE IS MARKED "1" AND THE UPPER DART DROPPING VALVE IS MARKED "2". THE LOWER AND UPPER POCKETS ON THE BODY OF THE CEMENT HEAD ARE ALSO MARKED "1" AND "2" RESPECTIVELY. ENSURE THAT THE DART DROPPING VALVES ARE INSTALLED IN THE CORRECT POSITIONS.

7.0 ASSEMBLY OF THE BALL RELEASER

PRIOR TO ASSEMBLY, CHECK BOTTOM GUIDE PIN (IF FITTED), INTERNAL GUIDE PIN AND CLAWS FOR DAMAGE AND REPAIR/REPLACE AS NECESSARY. ENSURE ALSO THAT BALL RELEASER IS COMPLETELY CLEAN AND FREE FROM CEMENT OR MUD AND THAT RELEASE MECHANISM OPERATES FREELY.

Note: CHECK BALL RELEASER CLAWS ARE IN GOOD WORKING ORDER AND HAVE NOT BEEN DAMAGED. ENSURE THAT THEY ARE ABLE TO RETAIN A 1.1/4" SETTING BALL.

7.1 GREASE THOROUGHLY.

7.0 ASSEMBLY OF THE BALL RELEASER (Cont'd.)

7.2 LINE UP BOTTOM GUIDE PIN (IF FITTED) WITH HOLE IN BODY OF CEMENT HEAD.(ENSURE LOCK CLIP IS INSTALLED THROUGH SPINDLE AND WHEEL NUT TO FACILITATE ASSEMBLY).

Note: A NOTCH ON THE TOP OF THE SPINDLE INDICATES THE POSITION OF THE BOTTOM GUIDE PIN.

7.3 INSERT BALL RELEASER INTO HOUSING AND MAKE UP THE NUT WITH A 'C' SPANNER UNTIL IT BOTTOMS OUT ON THE HOUSING.

Note: THE NEW STYLE BALL RELEASER HOUSING(WITHOUT BOTTOM GUIDE PIN) MUST BE MADE UP ONTO THE END CAP BEFORE THE COMPLETE UNIT IS MADE UP INTO THE HEAD.

8.0 ASSEMBLY OF THE INDICATOR (MAJOR SERVICE)

8.1 REPLACE ALL SEALS ON SPINDLE.

8.2 REPLACE THE INTERNAL INDICATOR BY TEMPORARILY ATTACHING IT TO A ROD AND PLACING IT INTO ITS INTERNAL SLOT WHILST HOLDING THE INTERNAL INDICATOR IN PLACE. GUIDE THE SPINDLE IN FROM THE OUTSIDE AND LOCATE THE HOLE IN THE INTERNAL INDICATOR. ONCE LOCATED, REMOVE THE ROD, LEAVING THE INDICATOR IN PLACE.

8.3 MAKE UP THE NUT, REPLACE OUTER INDICATOR AND MAKE UP THE INSEX SCREW WITH THE WASHER.

8.4 ENSURE INDICATOR IS FREE MOVING.

9.0 PRESSURE TESTING - MAJOR SERVICE

Safety Note: ALL PRESSURE TESTING MUST BE CARRIED OUT IN THE PRESSURE TEST BAY. NO PERSONNEL ARE ALLOWED INSIDE THE PRESSURE TEST BAY WHILE A TEST IS IN PROGRESS.

9.1 MAKE UP TEST BLANKS TO EACH END OF THE TOP DRIVE HEAD.

9.2 FILL THE HEAD WITH WATER. MAKE SURE THE WHEELS ARE POINTING DOWN AND THE OPEN INLET IS POINTING UPWARDS TO FACILITATE THE REMOVAL OF AIR. ONCE FULL, OPERATE BOTH DART DROPPING VALVES 2-3 TIMES EACH TO REMOVE ALL THE AIR FROM THE HEAD.

9.0 PRESSURE TESTING - MAJOR SERVICE (Cont'd.)

9.3 MAKE UP TEST BLANK TO THE OPEN INLET.

9.4 PRESSURE TEST HEAD TO 250 PSI FOR 5 MINUTES AND 5000 PSI FOR 15 MINUTES UNLESS OTHERWISE INSTRUCTED (NO LEAKS ALLOWED) AND RECORD TEST ON CHART.

9.5 BLEED OFF PRESSURE AND REMOVE TEST BLANKS.

9.6 COMPLETE PRESSURE TEST INFORMATION ON CHART AND FILE CHART IN APPROPRIATE MAINTENANCE FILE.

10.0 PRESSURE TESTING - MINOR SERVICE ONLY

Safety Note: ALL PRESSURE TESTING MUST BE CARRIED OUT IN A SAFE AREA.

10.1 MAKE UP TEST BLANKS TO EACH END OF THE TOP DRIVE HEAD.

10.2 FILL THE HEAD WITH WATER. MAKE SURE THE WHEELS ARE POINTING DOWN AND THE OPEN INLET IS POINTING UPWARDS TO FACILITATE THE REMOVAL OF AIR. ONCE FULL, OPERATE THE DART DROPPING VALVES 2-3 TIMES EACH TO REMOVE ALL THE AIR FROM THE HEAD.

10.3 MAKE UP TEST BLANK TO THE OPEN INLET.

10.4 PRESSURE TESTING WILL COMPRISE OF TESTING THE HEAD WITH THE SWIVEL AT FOUR DIFFERENT POSITIONS ON THE BODY.

10.5 PERFORM THE FIRST TEST TO 250 PSI FOR 5 MINUTES WITH THE SWIVEL INLET AT THE 12 O'CLOCK POSITION, AND THEN A FURTHER 4 TESTS, WITH THE INLET AT 90 DEGREES TO THE PREVIOUS TESTING POSITION. HOLD EACH TEST FOR A DURATION OF TWO MINUTES AT 1000psi. BLEED THE PRESSURE OFF BETWEEN EACH TEST. NO LEAKS ARE ALLOWED AND THE TEST MUST BE RECORDED ON A PRESSURE TEST CHART.

10.6 ON COMPLETION OF THE ROTATIONAL TESTS, RETURN THE SWIVEL INLET TO THE 12 O'CLOCK POSITION, AND TEST THE TOP DRIVE HEAD 5000psi FOR 10 MINUTES. NO LEAKS ARE ALLOWED AND THE TEST SHOULD BE RECORDED ON THE SAME PRESSURE TEST CHART AS THE ROTATIONAL TESTS.

10.7 BLEED OFF PRESSURE AND REMOVE TEST BLANKS.

10.8 COMPLETE PRESSURE TEST INFORMATION ON CHART AND FILE CHART IN APPROPRIATE REGISTER.

11.0 PRESSURE TESTING - ANNUAL HIGH PRESSURE TEST 11250PSI

Safety Notes:

1) ALL PRESSURE TESTING MUST BE CARRIED OUT IN A SAFE AREA.

2) DUE TO THE HIGHER PRESSURE INVOLVED WHEN CARRYING OUT THIS TEST THE TEST BLANKS MUST BE TORQUED ON TO 20,000 FT/LBS. THE TEST BLANKS DO NOT HAVE 'O' RINGS THEY ARE A "FACE TO FACE" SEAL.

11.1 MAKE UP TEST BLANKS TO EACH END OF THE TOP DRIVE HEAD TO 20,000FT/LBS.

11.2 FILL THE HEAD WITH WATER. ENSURE THAT THE WHEELS ARE POINTING DOWN TOWARDS THE GROUND, AND THE OPEN CHIKSAN INLET IS POINTING UPWARDS TO FACILITATE THE REMOVAL OF AIR FROM THE HEAD. ONCE FULL OF WATER OPERATE THE DART DROPPING VALVES 2 - 3 TIMES TO REMOVE ALL THE AIR FROM THE HEAD.

11.3 MAKE UP TEST BLANK TO OPEN CHISKAN INLET.

11.4 PRESSURE TEST HEAD TO 11250PSI FOR 15 MINUTES (NO LEAKS ALLOWED), AND RECORD TEST ON PRESSURE TEST CHART.

11.5 BLEED OFF PRESSURE AND REMOVE TEST BLANKS.

11.6 COMPLETE PRESSURE TEST INFORMATION ON CHART, AND FILE CHART IN APPROPRIATE MAINTENANCE FILE.

FINAL SAFETY NOTE:-

IF ANY MEMBER OF STAFF IS UNSURE ABOUT THE METHOD OF PERFORMING THE HIGH PRESSURE TEST REFER TO THE LINER OPERATIONS PERSONNEL FOR INSTRUCTIONS.

12.0 FINAL CHECKS AND PREPARATION

12.1 DRIFT MAIN BORE W/ DART DROPPING VALVES IN "OPEN" POSITION WITH 74 mm DRIFT.

12.2 INSPECT LOCK CLIP AND CHAIN ON BALL RELEASER AND RE-NEW IF NECESSARY.

12.3 PROTECT THREADS.

12.4 CHECK THAT DART DROPPING VALVES HAVE BEEN FITTED IN CORRECT POSITION.

12.5 CHECK THAT SWIVEL IS FREE TO ROTATE (W/36" CHAIN TONG) AND THAT INDICATOR IS FREE.

12.6 PAINT HEAD.

12.7 MARK SERIAL NUMBER OF HEAD ON SWIVEL AND ALSO ON LOWER PART OF BODY.

12.8 CHECK THAT THE BOLTS SECURING THE SIDE ENTRY PORTS ARE SECURE USING TORQUE WRENCH.

Note: TOP DRIVE HEADS MUST NOT BE LAID DOWN WITH THE WEIGHT RESTING ON THE SWIVEL OR INLET PORTS, AS THIS COULD, OVER A PERIOD OF TIME, DEFORM THE SWIVEL SEALS AND CAUSE A LEAK. ALWAYS SUPPORT THE HEAD PROPERLY TO AVOID THIS.

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7. Tool History

913712 084

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A Weatherford Company

RENTAL TOOL MAINTENANCE RECORD

Tool Size and Type	Serial Number
Cement Head TD for Dual DP Darts w/Indicator Sub P110	230397
Other Relevant Details:-	

DATE	DETAILS OF WORK PERFORMED & PARTS USED	P.O. REF	WORK CARRIED OUT / VERIFIED BY: (SIGNATURE)
4/7/02	Minor Service	-	J Jachiewicz
	Minor Service		
	Major Service		
	Minor Service.		

913712 085

Nodeco
A Weatherford Company

RENTAL TOOL MAINTENANCE RECORD

Tool Size and Type	Serial Number
CMT HEAD TD FOR DUAL DP DARTS W/INDICATOR SUB P-110	08/1991
Other Relevant Details:- ASAS N° 230397	

DATE	DETAILS OF WORK PERFORMED & PARTS USED	P.O. REF	WORK CARRIED OUT / VERIFIED BY: (SIGNATURE)
27/1/98	ACME CONS ON SWIVEL END AND TOP CAP INSPECTED		[signature]
5.4.98	DRIFTED TO 74mm TESTED TO 5,000PSI BALL RELEASER CHECKED for 1¼" BALL		[signature]
[illegible] 7.98	[illegible]		[signature]
[illegible]	[illegible]		[signature]
14/10/98	SWIVEL REMOVED AND DIMENSIONS CHECKED, SERVICE CARRIED OUT, BALL RELEASER ASSEMBLY REPLACED. REPLACE SEALS IN SWIVEL ASSEMBLY		DKM
[illegible] 99	MINOR SERVICE, ALL SEALS IN DIVERTERS OK. BALL RELEASE CHECKED. DRIFTED. REPLACED GREASE NIPPLES ON DIVERTORS. SEALS ON BOTH SIDE OF SWIVEL		[signature]
24/05/99	TDH STRIPPED AND SOAKED IN CAUSTIC. BODY SENT TO [illegible] TO HAVE [illegible] SPRAYING CARRIED OUT ON SWIVEL SEAL AREA		DKM
23/06/99	CARRY OUT MAJOR SERVICE AND ANNUAL PRESSURE TEST		DKM
20/09/99	CARRY OUT MINOR SERVICE, REPLACE 1¼ LOCKWOOD		DKM
22/11/99	CARRY OUT MINOR SERVICE		DKM
30/11/99	CARRY OUT MAJOR SERVICE		DKM
31/1/01	carry out major service		[signature]
12/7/01	carry out major service		[signature]

913712 086

Nodeco
A Weatherford Company

RENTAL TOOL MAINTENANCE SHEET
FOR TYPE 'TDH' TOP DRIVE CEMENT HEADS

SERIAL NUMBER OF CEMENT HEAD :	230397 MK1 DUEL HEAD

NOTE : A TOP DRIVE HEAD RECEIVES EITHER A MAJOR OR MINOR SERVICE DEFINED AND APPLICABLE AS SHOWN IN WORKSHOP PROCEDURES FOR DOUBLE TDH (INSTRUCTIONS LH 042)

ASSEMBLY, INSPECTION AND TEST OF CEMENT HEAD

ACTION	ACTION POINTS CARRIED OUT (SIGNATURE)
IDENTIFY AND RECORD UPPER X-OVER SERIAL NO 230790	[signature]
IDENTIFY AND RECORD LOWER X-OVER SERIAL NO 230791	[signature]
IDENTIFY AND RECORD SERVICE DUE 1 / 2 / 3 (CIRCLE APPROPRIATE NUMBER)	[signature]
TOP AND BOTTOM ROTARY SHOULDERED CONNECTIONS INSPECTED AND PASSED, OR REPAIRED AS NECESSARY	[signature]
IF HEAD RETURNED UNUSED PERFORM VISUAL INSPECTION REMOVE AND INSPECT DOGS IN TOP CAP	N/A
IF HEAD IS RETURNED UNUSED RE-DRIFT SIZE CAL MAIN	N/A
SWIVEL AND ALL 'O' RINGS AND OTHER SEALS INSPECTED FOR DAMAGE AND REPLACED AS NECESSARY **(MAJOR SERVICE ONLY)**	[signature]
INDICATOR REMOVED AND ALL SEALS REPLACED **(MAJOR SERVICE ONLY)**	
COMPONENT PARTS INCLUDING 'O' RINGS AND TORQUE LOCK DOGS etc. INSPECTED FOR DAMAGE AND REPAIRED OR REPLACED AS NECESSARY	[signature]
MAIN AND BY-PASS CHANNELS OF HEAD BOTH DRIFTED WITH CORRECT SIZE DRIFTS AS PER WRITTEN INSTRUCTIONS SIZE CAL MAIN 74·085MM. BY-PASS 1 3/4" BALL DRIFT	[signature]
HEAD ASSEMBLED AND PRESSURE TESTED AS PER WRITTEN INSTRUCTIONS	[signature]
DART DROPPING VALVE(S) INSTALLED IN CORRECT POSITIONS - #1 IN LOWER POSITION AND #2 IN UPPER POSITION (DOUBLE HEAD ONLY)	[signature]
BALL RELEASER CHECKED FOR ABILITY TO RETAIN A 1 1/4" BALL	[signature]
SWIVEL FREE TO ROTATE AND INDICATOR FREE TO OPERATE	[signature]

913712 087

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RENTAL TOOL MAINTENANCE SHEET FOR TYPE 'TDH' TOP DRIVE CEMENT HEADS

ACTION	ACTION POINTS CARRIED OUT (SIGNATURE)
THREADS (INCLUDING CHIKSAN CONNECTION) PROTECTED. WIRE ROPE SLING ON CHICKSAN INSPECTED.	N/A
IF TOP DRIVE HEAD HAD ANNUAL PRESSURE TEST TO 11250psi RECORD DETAILS IN MAINTENANCE RECORD	N/A
RECORD SERIAL NUMBER OF 3rd PARTY X-OVERS ATTATCHED TO HEAD IF APPLICABLE UPPER: ____________ LOWER: ____________	CONNECTION BOX X PIN N/A

	PASS	FAIL	SIGNATURE
BODY MEASURED AND SIZES RECORDED ON WORKSHOP MEASUREMENT SHEET			N/A
SWIVEL MEASURED AND SIZES RECORDED ON WORKSHOP MEASUREMENT SHEET			N/A

- * All repairs to threads and components plus replacement spare parts to be recorded on the RENTAL TOOL MAINTENANCE RECORD
- ** New damage to head or problem encountered during servicing and testing must be recorded BELOW and in RENTAL TOOL MAINTENANCE RECORD

DAMAGE COMMENTS:- If Inspection Request Issued Form Completed YES/NO (Circle One)

ITEM DESCRIPTION	BRIEF DESCRIPTION OF DAMAGE FOUND	DATE	SIGNATURE

PROBLEM	BRIEF DESCRIPTION OF PROBLEM FOUND	DATE	SIGNATURE
Ball Release	WHEEL STIFF TO TURN.	18-03-02	[signature]

MAINTENANCE COMPLETED BY:- [signature] DATE 22-03-02

REVIEWED AND VERIFIED BY:- [signature] DATE 22-03-02

913712 088

Nodeco
A Weatherford Company

RENTAL TOOL MAINTENANCE SHEET FOR DOWNHOLE TOOLS

TOOL SIZE AND TYPE	S/N
Dual Dart Cement Head Minor Service	230397

ASSEMBLY, INSPECTION and TEST of TOOL

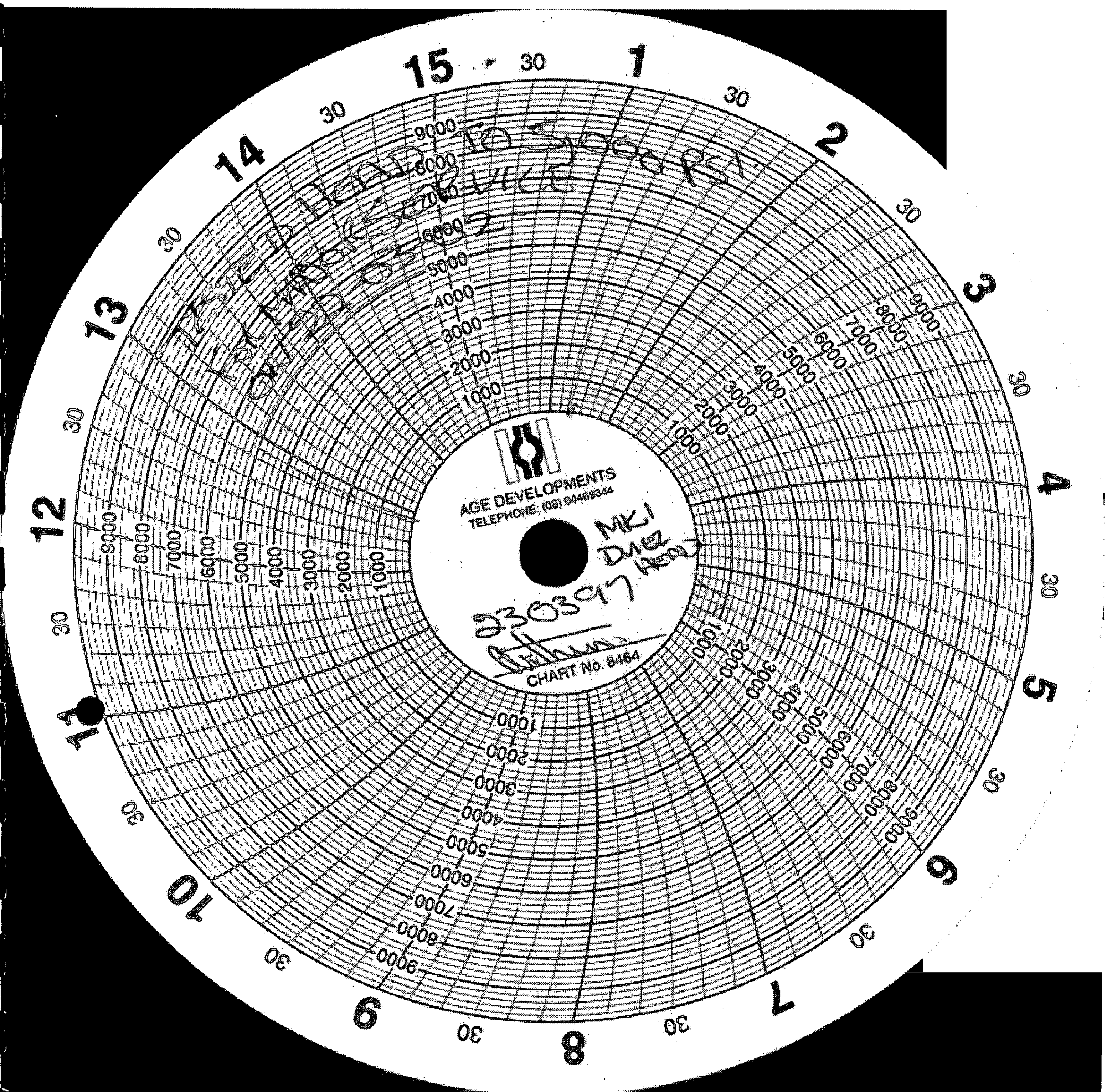
ACTION	ACTION CARRIED OUT/VERIFIED BY: (SIGNATURE)
ALL LOAD BEARING THREADS INSPECTED AND PASSED OR REPAIRED AS NECESSARY *	✓ DJ
ALL 'O' RINGS AND OTHER SEALS INSPECTED FOR DAMAGE AND REPLACED AS NECESSARY	✓ DJ
ALL COMPONENT PARTS INSPECTED FOR DAMAGE AND REPAIRED OR REPLACED AS NECESSARY *	✓ DJ
TOOL ASSEMBLED AS PER RELEVANT WRITTEN INSTRUCTION	✓ DJ
ALL SHARP EDGES AND BURRS ON OUTSIDE OF TOOL REMOVED	✓ DJ
TOOL PRESSURE TESTED AS PER RELEVANT WRITTEN INSTRUCTION	✓ DJ
TOOL DRIFTED W/ DRIFT SIZE 74 mm (Drift S/N : CAL.-)	DJ
THREADS PROTECTED	DJ

*** All repairs to threads and components plus replacement spare parts to be recorded on the RENTAL TOOL MAINTENANCE RECORD***

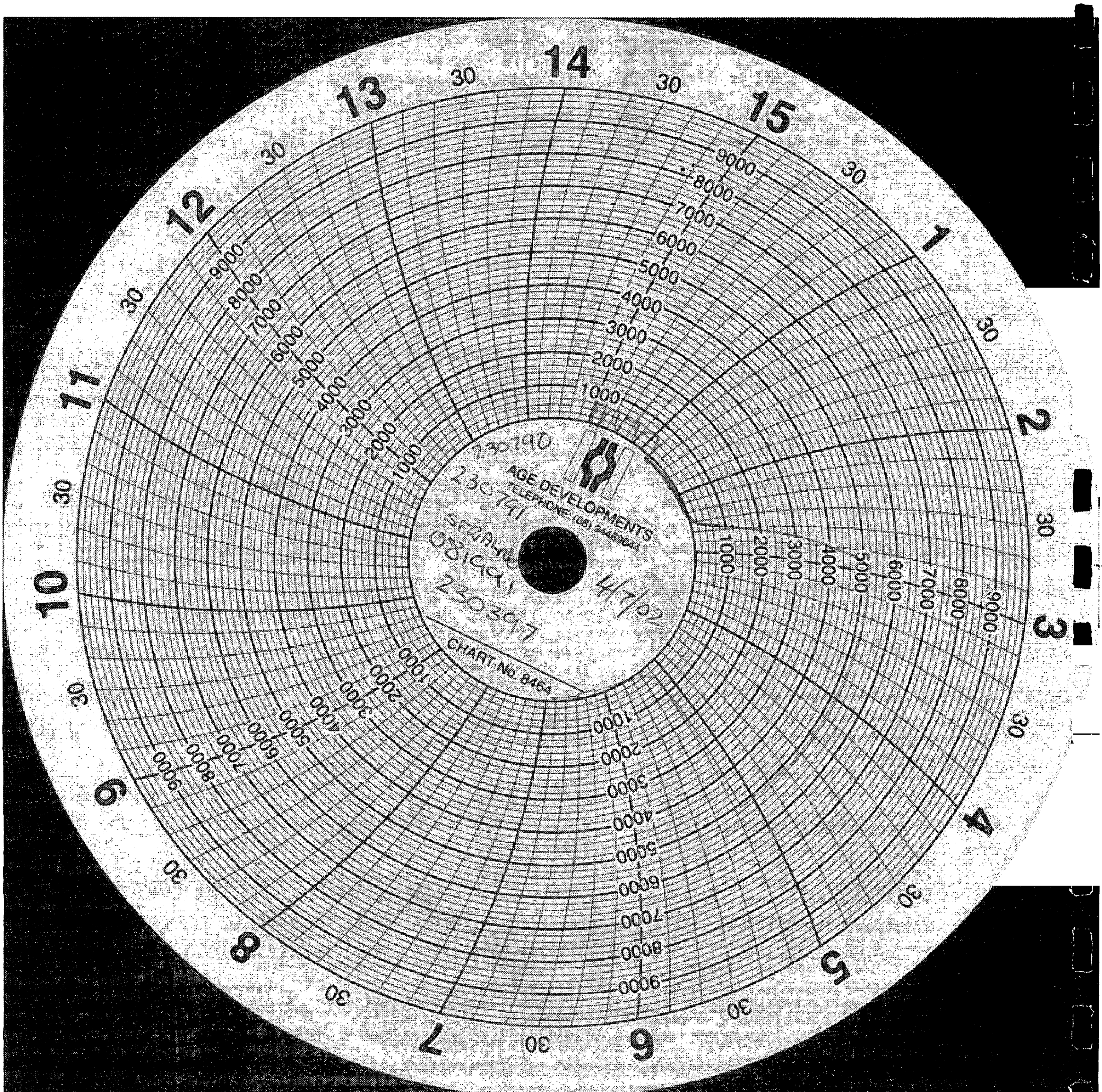
MAINTENANCE COMPLETED BY: D Jackiewicz / RDickson DATE 4/7/02

REVIEWED AND VERIFIED BY: DATE

913712 089



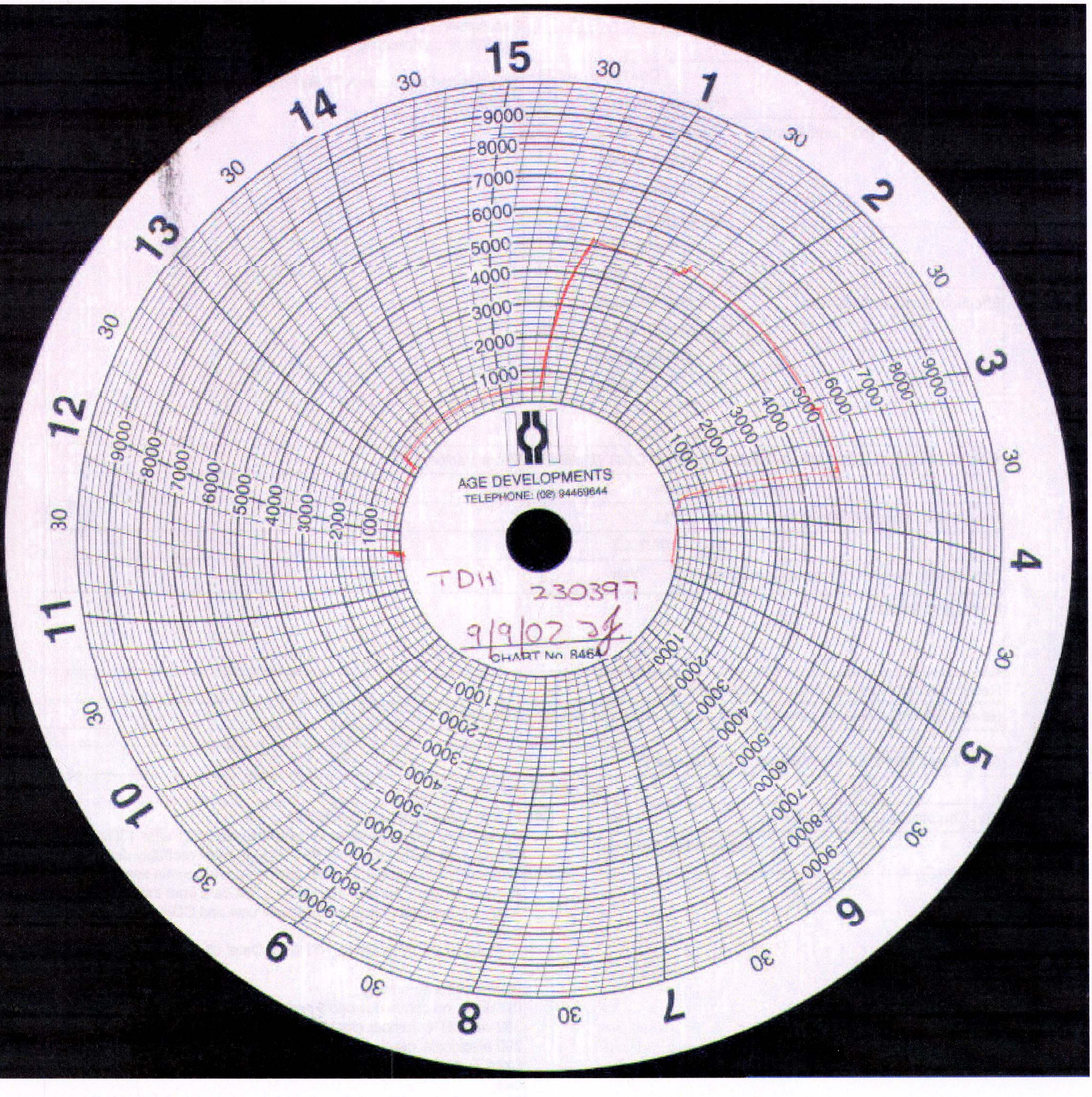
913712 090



AGE DEVELOPMENTS
CHART No. 8464
230790
230791
081991
230397
4/7/02

~~Pe 913712 colour ØØ4~~

913712 091



913712 092

ExxonMobil

Non-Conformance Report

SECTION COMPLETED BY LEAD SURVEILLANCE ENGINEERITECHNICIAN			
Identifier's name:	Cliff Menhennitt (Wellsite Geologist)		
Date:	01/08/2002		Description of Non-Conformance (as detailed in Original NCR) and additional comments as necessary:
Site:	NFW		
Well No.:	Beardie-1		Time lost changing BHA as a result of LWD tool failure necessitating change out of tool. Back up tool different to original tool further complicating problem. This resulted in 2 hours NPT laying down the CDR and picking up the ARCs tool.
Responsible Third Party:	Anadrill		
Result of Non-Conformance:	Downtime	☑	
	Potential Downtime	☐	
Categorisation of Non-Conformance:	Equipment Failure	☑	
	Delivery Delays	☐	
	Design Fault	☐	
	Maintenance Fault	☐	
	Human Error	☐	
	Other	☐	
Effects of Non-Conformance:	Safety Concerns	☐	
	Financial / Time loss	☑	
	Environmental	☐	
	Other	☐	

SECTION COMPLETED BY VERIFIERIKEY CONTACT (if different from Verifier)	
Verifier's name:	CPM
Key contact name (if different form Verifier):	CPM
Date:	15/08/2002
Conflict with the current contract/agreement?: Yes:	☐
If Yes, give details:	
Recommended Remedial Action/Folllow-up Plans:	
Review failure and provide recommendations to avoid similar downtime in the future.	

SECTION COMPLETED WHEN NC CLOSED OUT		
Date:	30/08/2002	Action Taken:
Non-Conformance action closed out: Yes:	☑	Failure Description and Symptoms: PowerPulse and CDR failed to communicate in RT after 150m of drilling. Tool tested ok during SHT. Failure most probably due to extender MEXU on CDR9. Both extenders were within spec at surface. When at surface dumped the RM data from the CDR ok. Also able to communicate with PowerPulse and CDR via LTB at surface. Completed By: WILLEM BERTHEUX Date: 05-Aug-2002 R&M Failure Summary: IST done, no comm downhole end. Disassy tool, cxed MTA S/no. 392 with MTK. Jumper cxed okay, IR & Cont. good. Cxed MTA 392 electricals, good. Cxed Turbine end cap, found, bad IR and no reading for continuity cx's. Disassy, 5 pin buklhead, found pin 1, burnt, moisture found in the end cap. The rest of the Mech. Tool(MMA 412) cxed out okay. Noel. 27/08/02. Corrective Action Plan: Raise awareness of risk associated with condensation in End Cap Channels.
(leave unchecked if No)		

913712 093

ExxonMobil

Non-Conformance Report

Procedure:
1) Insure End cap channel is always sealed.
2) Insure that traces of humidity are checked for and eliminated when fitting bulk head.
Analysis completed by: NOEL E. DE SOUZA. Date:02-Aug-2027

913712 094

Schlumberger

Failure Report

314 Raglan Street.
Sale, Victoria, 3850
Australia
+61 3 5143 2242
(fax) +61 3 5143 2450

ESSO AUSTRALIA LTD / O.BOUNTY

Job No: ASQ-02-07 **Run No** 2 **Failure Date:**02-Aug-2002 **Failure Number**2

FSM: William.A **Dept:**

Failure Description and Symptoms

PowerPulse and CDR failed to communicate in RT after 150m of drilling. Tool tested ok during SHT. Failure most probably due to extender MEXU on CDR9. Both extenders were within spec at surface. When at surface dumped the RM data from the CDR ok. Also able to communicate with PowerPulse and CDR via LTB at surface.

Completed By WILLEM BERTHEUX **Date:**05-Aug-2002

R&M Failure Summary:

IST done, no comm downhole end. Disassy tool, cxed MTA S/no. 392 with MTK.
Jumper cxed okay, IR & Cont. good.
Cxed MTA 392 electricals, good.
Cxed Turbine end cap, found, bad IR and no reading for continuity cx's.
Disassy, 5 pin buklhead, found pin 1, burnt, moisture found in the end cap.
The rest of the Mech. Tool(MMA 412) cxed out okay.

Noel. 27/08/02

Corrective Action Plan:

Raise awareness of risk associated with condensation in End Cap Channels.
Procedure:
Insure End cap channel is always sealed.
Insure that traces of humidity are checked for and eliminated when fitting bulk head.

Analysis completed b:NOEL E. DE SOUZA **Date:**02-Aug-2027 **Severity:** L **Lost time:** 0 hrs

Depth: 1905 met **Inclination:** 0.9799 deg **Hole Size:** 31.12 cm

Mud Wt: 1.17 g/cc **Mud Type:** OTHER **Flow Rate:** 3122.9 lpm **Max Temp:** 66 degC

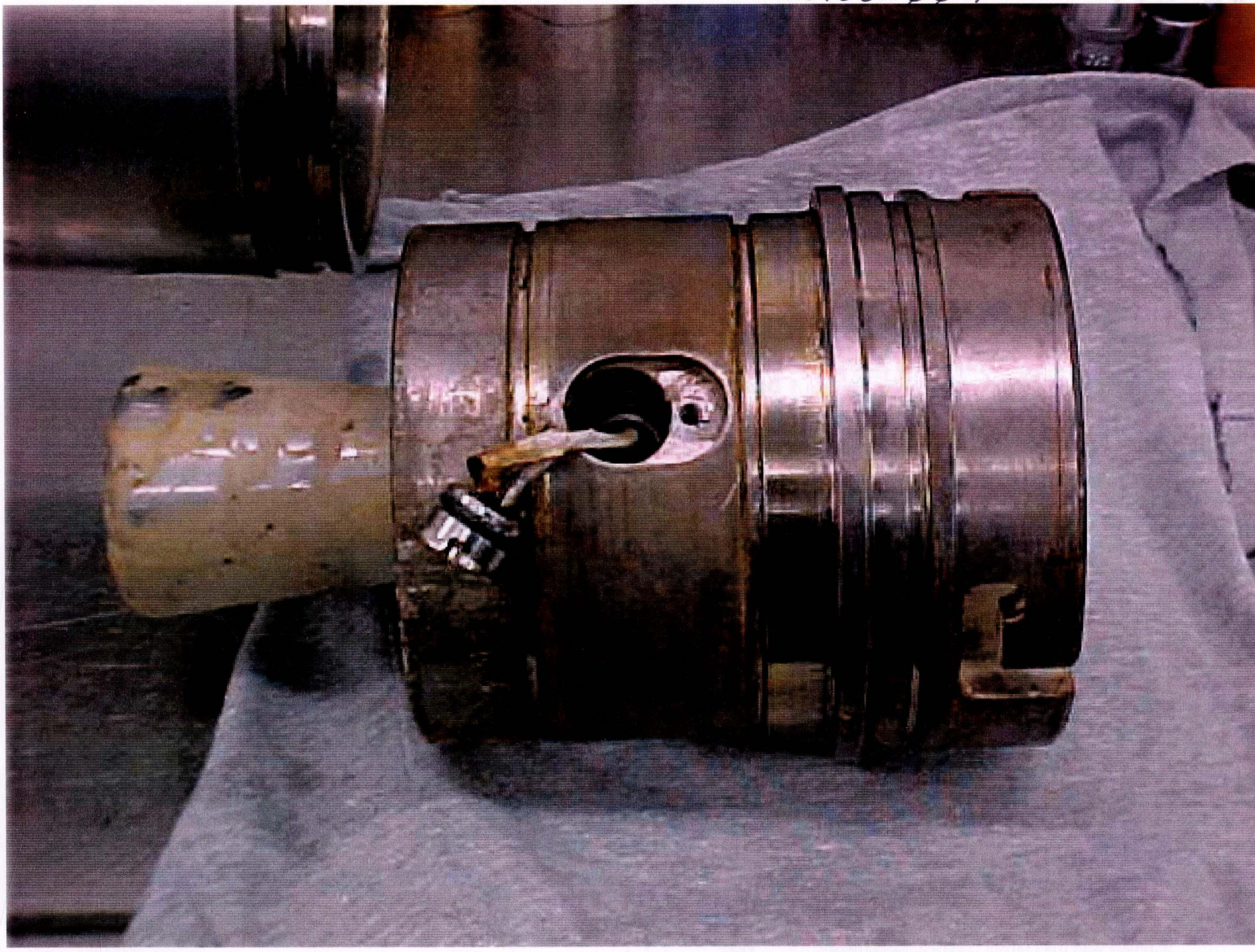
Total Shocks: 0 **Max Shock Level:** 0 **Max Shock Duration:** 0

Asset	Shop Analysis	Failure No.
MDC-DC-833		
MDC-DC-833		
MDI-BC-626		
MDI-BC-626		
MEA-BB-612		
MEA-BB-612		
MEC-BB-612		
MEC-BB-612		
MEH-BA-612		
MEH-BA-612		
MMA-BB-412		
MMA-BB-412		
MTA-BA-392	Moisture found in MTA End cap, 5 pin bulkhead, pin 1 burnt.	2
		2
MTA-BA-392	Moisture found in MTA End cap, 5 pin bulkhead, pin 1 burnt.	2
		2
MVC-AA-098		
MVC-AA-098		
MWA-AA-806		
MWA-AA-806		
MEXD-BA-577		
MEXD-BA-577		

~~Pc913712-colour005~~
913712 095

~~PC913712 - colour 006~~

~~Pe 913712 - colour 007~~ 913712 097



913712 098

ExxonMobil

Non-Conformance Report

SECTION COMPLETED BY LEAD SURVEILLANCE ENGINEER/TECHNICIAN		
Identifier's name:	Cliff Menhennitt (Wellsite Geologist)	
Date:	06/08/2002	Description of Non-Conformance (as detailed in Original NCR) and additional comments as necessary:
Site:	NFW	Wireline engineer failed to enable software to record DSI data necessitating additional run of DSI tool. This was an unfortunate error which marred a good performance. This error resulted in 1.5 hours NPT re-logging the missed interval from the casing shoe to the seafloor.
Well No.:	Beardie-1	
Responsible Third Party:	Schlumberger	

Result of Non-Conformance:	Downtime	☑
	Potential Downtime	☐
Categorisation of Non-Conformance:	Equipment Failure	☐
	Delivery Delays	☐
	Design Fault	☐
	Maintenance Fault	☐
	Human Error	☑
	Other	☐
Effects of Non-Conformance:	Safety Concerns	☐
	Financial / Time loss	☑
	Environmental	☐
	Other	☐

SECTION COMPLETED BY VERIFIER/KEY CONTACT (if different from Verifier)	
Verifier's name:	CPM
Key contact name (if different form Verifier):	CPM
Date:	15/08/2002
Conflict with the current contract/agreement?: Yes:	☐
If Yes, give details:	

Recommended Remedial Action/Folllow-up Plans:
Review non-conformance and provide recommendations to avoid a similar occurrence in the future.

SECTION COMPLETED WHEN NC CLOSED OUT		
Date:	27/06/2002	Action Taken:
Non-Conformance action closed out: Yes:	☑	Root Cause:
(leave unchecked if No)		

Root Cause:
After completing the repeat and main passes for the log, logging GR and Dt through the casing up to the sea bed was required. Instead of "Depth Logging" (acquiring data from tools, writing this data to picture files pds, as well as data files, dlis), "Depth View" command (acquiring data from tools, and writing to picture files, pds only) was initiated. Thus there was not dlis data file for the through casing interval.

Human error is the root cause of this failure. This basic mistake necessitated the re-run of the DSI again once the planned logging was finished. Remedial action items identified were:

1. Emphasize completeness of logging data sheet entry;
2. Raise issue to Software product center to possibly issue "blue box warning" when initiating depth view.

WELL:	Beardie-1
CLIENT:	Esso Australia Pty. Ltd.
SUBJECT:	Failure Reports
DATE:	19-August-02

Software Failure

Toolstring:

FMI-DSI-HNGS-LEHQT

Failure Description:

No dlis data file created for Gamma Ray and Delta-T through casing log.

Failure Anaylsis:

After completing the repeat and main passes for the log, logging GR and Dt through the casing up to the sea bed was required. Instead of "Depth Logging" (acquiring data from tools, writing this data to picture files pds, as well as data files, dlis), "Depth View"command (acquiring data from tools, and writing to picture files, pds only) was initiated. Thus there was not dlis data file for the through casing interval.

Root Cause:

Human error is the root cause of this failure. This basic mistake necessitated the re-run of the DSI again once the planned logging was finished. Find below breakdown of logging runs and the extra time needed to acquire the DT and GR data through casing.

Run	Operating Time	Lost Time
PEX-HALS-LDT	7.17	0
FMI-DSI-HNGS	7.58	***see extra DSI-GR run***
MDT-GR CSAT-GR (VSP survey)	14 13	0 0
CST-GR (sidewall cores)	5.58	0
[redacted]	[redacted]	[redacted]
Lost Time/Total Operating Time = 3.1%	48.83	

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Initiates depth view – pds files only

Initiates depth log – pds files and dlis data files

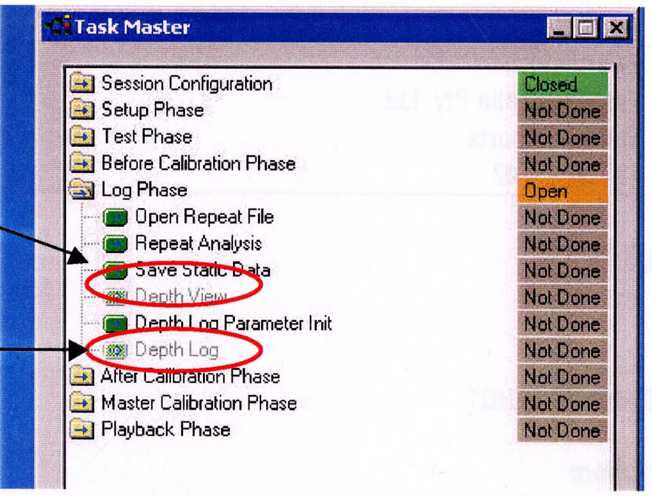

Figure 1: Log acquisition control menu (Task Master)

Remedial Action Items:

	Action Item	Done by	Date/Status
1	Emphasize completeness of logging data sheet entry*	T. Speldrich	19-Aug-2002 - DONE
2	Raise issue to Software product center to possibly issue "blue box warning" when initiating depth view	M. Al-Ayed	Done, and awaiting response.

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Non-Conformance Report

SECTION COMPLETED BY LEAD SURVEILLANCE ENGINEERITECHNICIAN		
Identifier's name:	Cliff Menhennitt (Wellsite Geologist)	
Date:	06/08/2002	Description of Non-Conformance (as detailed in Original NCR) and additional comments as necessary:
Site:	NFW	25% misfires (15 misfires out of 60 shots) is an unacceptably high level of misfires in a CST run, resulting in the loss of potentially useful Geological data.
Well No.:	Beardie-1	
Responsible Third Party:	Schlumberger	

Result of Non-Conformance:		
	Downtime	☐
	Potential Downtime	☐
Categorisation of Non-Conformance:	Equipment Failure	☑
	Delivery Delays	☐
	Design Fault	☐
	Maintenance Fault	☐
	Human Error	☐
	Other	☐
Effects of Non-Conformance:	Safety Concerns	☐
	Financial / Time loss	☐
	Environmental	☐
	Other	☑

SECTION COMPLETED BY VERIFIERIKEY CONTACT (if different from Verifier)	
Verifier's name:	CPM
Key contact name (if different form Verifier):	CPM
Date:	15/08/2002
Conflict with the current contract/agreement?: Yes:	☐
If Yes, give details:	

Recommended Remedial Action/Folllow-up Plans:

Review the results of the CST run and make recommendations to reduce the percentage of misfires in the future.

SECTION COMPLETED WHEN NC CLOSED OUT		
Date:	27/08/2002	Action Taken:
Non-Conformance action closed out: Yes:	☑	
(leave unchecked if No)		

Failure Analysis:
Prior to running in hole with the dual CST guns, the following standard checks were made on the gun:
1. Gun operatically check, by passing current to each of the 60 "jack knife" metal contacts (feeder line contacts), and taking note of the amount of current sent from surface and that measured on the tool using an ammeter.
2. Each individual igniter check for continuity prior to arming and running in hole;
3. Installation of arming wires made as per SOP.
The types of guns used in this run were of the type with 6 feeder line contact. That is, 6 of the 7 cable conductor wires are alternately used for firing the sidewall core bullets. (see CST-AA6, and CST-Z diagram). The two guns use alternate polarity for shooting the bullets, by use of a dual diode cartridge located in the top gun (CST -Z).
Upon retrieving the gun after sampling was finished, it was seen that 15 bullets had misfired (6 from the bottom gun, and 9 from the top). Furthermore, the pattern of misfires shows that all bullets (from both the top and bottom gun) that use Line 3 to fire, were the ones that had misfired - except for bullet number 3 (first bullet to use line 3 on the bottom gun) which had fired successfully.

ExxonMobil

Non-Conformance Report

Root Cause:
Upon inspection of the guns, it was found that the top gun (CST - Z) had connectors that were not giving good contact and was thus intermittent. Those contacts that supply shooting power through line 3 were the worst, as they did not have continuity. Once those were replaced, the gun was functioning normally on all wires again.

Future Recommendations:
Upcoming jobs will be utilizing the new CST-D type guns where each bullet in the gun has its own dedicated shooting wire. This is accomplished by using an electronic cartridge for each gun which in turn switches power to each of the 30 bullets in the gun. Multiple guns can be combined for achieving 60 shots by combining multiple electronic cartridges with each gun as well. These guns were not able to be available for Beardie -1 because they were tied up on jobs in Western Australia.
Critical cores in the program will be highlighted by the geologist to the wireline
engineer such that if a misfire is suspected, then the bullet sampling sequence can be altered somewhat to ensure that the critical cores are retrieved.

WELL:	Beardie -1
CLIENT:	Esso Australia Pty. Ltd.
SUBJECT:	Failure Reports
DATE:	19-August-02

CST Recovery

Toolstring:

CST-AA6-CST-Z-PGGT-LEH

Failure Description:

15 bullets misfired out of 60 while running dual CST guns.

Failure Analysis:

Prior to running in hole with the dual CST guns, the following standard checks were made on the gun:

1. Gun operatically check, by passing current to each of the 60 "jack knife" metal contacts (feeder line contacts), and taking note of the amount of current sent from surface and that measured on the tool using an ammeter.
2. Each individual igniter check for continuity prior to arming and running in hole
3. Installation of arming wires made as per SOP

The types of guns used in this run were of the type with 6 feeder line contact. That is, 6 of the 7 cable conductor wires are alternately used for firing the sidewall core bullets. (see CST-AA6, and CST-Z diagram). The two guns use alternate polarity for shooting the bullets, by use of a dual diode cartridge located in the top gun (CST-Z).
Upon retrieving the gun after sampling was finished, it was seen that 15 bullets had misfired (6 from the bottom gun, and 9 from the top). Furthermore, the pattern of misfires shows that all bullets (from both the top and bottom gun) that use Line 3 to fire, were the ones that had misfired – except for bullet number 3 (first bullet to use line 3 on the bottom gun) which had fired successfully. See CST report and attached gun diagrams for details.

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Root Cause:

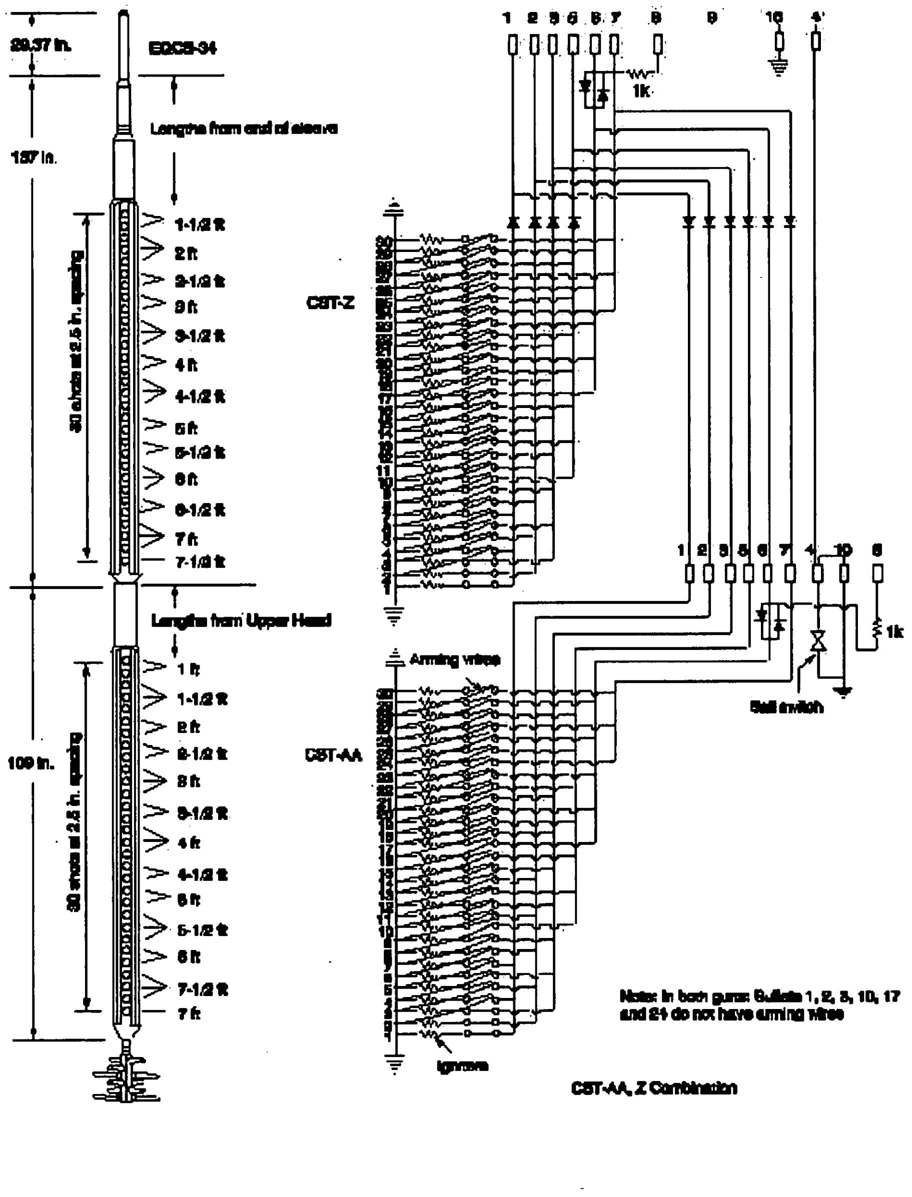
Upon inspection of the guns, it was found that the top gun (CST-Z) had connectors that were not giving good contact and was thus intermittent. Those contacts that supply shooting power through line 3 were the worst, as they did not have continuity. Once those were replaced, the gun was functioning normally on all wires again.

Future Recommendations:

Upcoming jobs will be utilizing the new CST-D type guns where each bullet in the gun has its own dedicated shooting wire. This is accomplished by using an electronic cartridge for each gun which in turn switches power to each of the 30 bullets in the gun. Multiple guns can be combined for achieving 60 shots by combining multiple electronic cartridges with each gun as well.
These guns were not able to be available for Beardie-1 because they were tied up on jobs in Western Australia.

Critical cores in the program will be highlighted by the geologist to the wireline engineer such that if a misfire is suspected, then the bullet sampling sequence can be altered somewhat to ensure that the critical cores are retrieved.

Wiring Diagram for CST-Z and CST-AA6 Combination



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ExxonMobil

Non-Conformance Report

SECTION COMPLETED BY LEAD SURVEILLANCE ENGINEERITECHNICIAN		
Identifier's name:	Chris Meakin	
Date:	07/08/2002	Description of Non-Conformance (as detailed in Original NCR) and additional comments as necessary:
Site:	NFW	The wear bushing retrieval spear ran could not engage the nominal seat protector. Tool had been run with the incorrect slips.
Well No.:	Beardie-1	
Responsible Third Party:	ABB Vetco Gray	This failure resulted in 1 hour of non-productive time. Additionally, the correct slips had been back-loaded onto a supply vessel which had to return to the Ocean Bounty.

Result of Non-Conformance:	Downtime	☑
	Potential Downtime	☐
Categorisation of Non-Conformance:	Equipment Failure	☐
	Delivery Delays	☐
	Design Fault	☐
	Maintenance Fault	☐
	Human Error	☑
	Other	☐
Effects of Non-Conformance:	Safety Concerns	☐
	Financial / Time loss	☑
	Environmental	☐
	Other	☐

SECTION COMPLETED BY VERIFIERIKEY CONTACT (if different from Verifier)	
Verifier's name:	CPM
Key contact name (if different form Verifier):	CPM
Date:	15/08/2002
Conflict with the current contract/agreement?: Yes: ☐	
If Yes, give details:	

Recommended Remedial Action/Folllow-up Plans:
Consider introducing a checklist to ensure all necessary checks are made prior to running a tool.

SECTION COMPLETED WHEN NC CLOSED OUT		
Date:	04/09/2002	Action Taken:
Non-Conformance action closed out:	Yes: ☑	Failure Analysis:
(leave unchecked if No)		

Failure Analysis:
Due to deck space being required for a quantity of containers to being
loaded on the rig, our service rep was asked to prematurely back load one
of the two tool skids prior to P&A. Apparently the skid that was back
loaded had the Nominal seat protector tool that was dressed with the slips
for the Noninal seat protector retreival. It also contained both NSP and WB
back up Slip components in the tool box. The skid that remained on the rig
had a tool dressed with slips for the 9-5/8 SEAT PROTECTOR. These slips
are very similiar however some what SMALLER and could not interface with
the NOMINAL SEAT PROTECTOR when attempting to retrieve.
When it became apparent the NSP could not be retreived, a request was made to return the off loaded skid with the properly dressed tool. When the tool arrived back on the rig, the NSP was sucessfully retrieved.

Roor Cause:
The ROOT of the problem was Human error and not of a quality or technical nature.

Recommendation:
Two issues are raised here. They are:
1) Wellhead Tools should not be back loaded prior to P&A as this could cause need for tools as they were intended. This holds for either primary or back up tools.
2) The service rep should have double checked the slips prior to releasing the back loaded skid. I have reviewed this with our service rep and highlighted the procedure OSP 6072 page 7 of 9 paragraph 1. This procedure is found in Section IV A of the Beardie service manual.

We are now placing backup Slip components in each skid rather than in just
one. As a note of clarification here, The primary skid typically contains
the tool dressed for the NSP. IT WAS THE PRIMARY SKID THAT WAS BACK LOADED
The back up (or second) skid contains a 2nd tool dressed for the wear
bushings. We have found this method of providing tools more efficient as
the service rep does not have to change slips during operations. As
mentioned above we will now have back up wear bushing slips in the primary
skid and NSP slips in the second skid.

don.kunath@sg.abb.com

03/09/2002 04:56 pm

To: chris.p.meakin@exxonmobil.com
cc:
Subject: Non conformance revision

My Appologies Chris. Please replace the previously issued report with the following.

Due to deck space being required for a quantity of containers to being loaded on the rig, our service rep was asked to prematurely back load one of the two tool skids prior to P&A. Apparently the skid that was back loaded had the Nominal seat protector tool that was dressed with the slips for the Noninal seat protector retreival. It also contained both NSP and WB back up Slip components in the tool box. The skid that remained on the rig had a tool dressed with slips for the 9-5/8 SEAT PROTECTOR. These slips are very similiar however some what SMALLER and could not interface with the NOMINAL SEAT PROTECTOR when attempting to retrieve. When it became apparent the NSP could not be retreived, a request was made to return the off loaded skid with the properly dressed tool. When the tool arrived back on the rig, the NSP was sucessfully retrieved. Hence the ROOT of the problem was Human error and not of a quality or technical nature.

Two issues are raised here. They are 1) Wellhead Tools should not be back loaded prior to P&A as this could cause need for tools as they were intended. This holds for either primary or back up tools. 2) The service rep should have double checked the slips prior to releasing the back loaded skid. I have reviewed this with our service rep and highlighted the procedure OSP 6072 page 7 of 9 paragraph 1. This procedure is found in Section IV A of the Beardie service manual.

We are now placing backup Slip components in each skid rather than in just one. As a note of clarification here, The primary skid typically contains the tool dressed for the NSP. IT WAS THE PRIMARY SKID THAT WAS BACK LOADED The back up (or second) skid contains a 2nd tool dressed for the wear bushings. We have found this method of providing tools more effecient as the service rep does not have to change slips during operations. As mentioned above we will now have back up wear bushing slips in the primary skid and NSP slips in the second skid.

I trust this closes the non conformance issue.
Please do not hesitate to contact us if further clarification is required.

Best Regards

Don Kunath

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ExxonMobil

Non-Conformance Report

SECTION COMPLETED BY LEAD SURVEILLANCE ENGINEER/TECHNICIAN		
Identifier's name:	Chris Meakin	
Date:	08/08/2002	Description of Non-Conformance (as detailed in Original NCR) and additional comments as necessary:
Site:	NFW	Weatherford MOST tool was dressed to catch a 18-3/4" Cameron hub connector, not the Vetco H4 profile at Beardie-1.
Well No.:	Beardie-1	This failure resulted in 6 hours of non-productive time. This problem was not identified by the Weatherford service hand who arrived at the rig a week before the MOST tool was deployed.
Responsible Third Party:	Weatherford	

Result of Non-Conformance:	Downtime	☑
	Potential Downtime	☐
Categorisation of Non-Conformance:	Equipment Failure	☐
	Delivery Delays	☐
	Design Fault	☐
	Maintenance Fault	☐
	Human Error	☑
	Other	☐
Effects of Non-Conformance:	Safety Concerns	☐
	Financial / Time loss	☑
	Environmental	☐
	Other	☐

SECTION COMPLETED BY VERIFIER/KEY CONTACT (if different from Verifier)	
Verifier's name:	CPM
Key contact name (if different form Verifier):	CPM
Date:	15/08/2002
Conflict with the current contract/agreement?: Yes:	☐
If Yes, give details:	
Recommended Remedial Action/Folllow-up Plans:	
Review quality systems. Consider introducing a data sheet to capture all essential well information required for preparing the tool.	

SECTION COMPLETED WHEN NC CLOSED OUT		
Date:	25/09/2002	Action Taken:
Non-Conformance action closed out: Yes:	☑	Weatherform have initiated: 1) A Well Abandonment Information Form to identify information for the Downhole Servering (DHS) services including the type of hub on the wellhead; 2) Updated the Work Instructions for the Well Severance Engineer; and 3) Initiated a Well Abandonment Checklist as a verification tool to ensure critical steps in the procedure are completed. Weatherford Non-Conformance No. CA0533. Above actions approved by Weatherford's Australian QA Manager - Danny Spadaccini.
(leave unchecked if No)		

CUSTOMER COMPLAINTS

Non-Conformance Details

Number
CA0533

Printed on03/09/02

Source
CUSTOMER COMPLAINTS

Area of Standard

Audit Title

Procedure

Department / Supplier
DOWNHOLE SERVICES

Cause / Reason
EQUIPMENT/INCORRECT TYPE

Raised By
ESSO AUSTRALIA LTD

Severity	**Date**
A	21/08/02

Non-Conformance Details

MOST Tool sent out with Retrieval Arms for Cameron Hub and not Vetco H-4. The problem was not identified by service hand who arrived at the rig a week prior.
Data Sheet to capture critical information exists but was not used. All previous jobs over a 3 year period had been a Cameron Hub. Complancency meant it was assumed that this project would also be a Cameron Hub.

Product / Service
WELL HEAD SEVERANCE

Filename

Corrective Action

Target CA Date	Actual CA Date	Cost	Supporting Actions	Responsible for CA
16/08/02	16/08/02		0	BRELAND, HERSCHELL

Corrective Action

Issue Well Abandonment Information Form (MODU) on all future wells
Review all Work Instructions and Forms for area.

Preventive Action

PA Required	Target PA Date	Actual PA Date	Responsible for PA
Yes	21/08/02	21/08/02	BRELAND, HERSCHELL

Preventive Action

Issue Well Abandonment Information Form (MODU) for all future wells.
Offshore Service hand to check Hub type prior to commencement of project

Follow Up/Verification

Resolution
REPLACE ITEM

Responsible for Follow-up Action
SPADACCINI, DANNY

Follow-Up / Verification

Data sheet to capture essential well information in place.
Job flow checklist added to Work instruction.

Status	Actual Close Date	Approver
OPEN		SPADACCINI, DANNY

Weatherford	DHS Well Abandonment Information Form	Australia

WELL ABANDONMENT INFORMATION FORM (SEMI SUBMERSIBLES)

COMPANY:			DATE:	TIME:
RIG/PLATFORM:			WELL NO.	
WELLHEAD TYPE:			WELLHEAD PROFILE: VETCO H4 ☐ Cameron Hub ☐	
WATER DEPTH:	DATUM:	RIG DRAUGHT:	CASING SIZES & WEIGHT: " # " # " # " #	

SPECIAL INSTRUCTIONS

HAVE LOCK RINGS BEEN RUN?	IS THERE ANY CEMENT IN THE ANNULUS AT CUT DEPTH?
HAS 30" CEMENT JOB HAD TOP UP?	IS THERE A DRAWING OF WELLHEAD? (With lengths, location of ribs, and connector info)
IS WELLHEAD SWEDGED? And if so what depth (RKB)	IS THERE MIXED CASINGS SIZES?

OTHER INFORMATION – DO YOU REQUIRE –

8" BOWEN FISHING JARS/ACCELERATOR/BUMPER SUB?	YES ☐	NO ☐
30" BACK-UP SPEAR?	YES ☐	NO ☐

CONTACT PERSON:		FORM INITIATED BY:	
TELEPHONE NO.:		CUSTOMER PO/AFE NO.	
EQUIPMENT LOADED FROM:		TRANSPORT PROVIDED BY:	

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Weatherford	**DHS Well Abandonment Checklist**	Australia

Job Description: ______________________

Well Name: ______________ **Rig:** ______________

Date: ______________ **Severance Engineer** ______________

Job No: ______________ **Signed:** ______________

NOTE: ENSURE A SAFE WORKING ENVIRONMENT IS MAINTAINED THROUGHOUT THE JOB. ALL HSE INCIDENTS AND ACCIDENTS MUST BE REPORTED IMMEDIATELY TO THE RIG MEDIC AND THE WELL-SITE MANAGER INFORMED AS SOON AS POSSIBLE.

HEALTH, SAFETY, ENVIRONMENT & QUALITY	✓ when done
1. All HSE incidents and accidents are reported immediately to the rig medic, Well-Site Manager (WSM) and other personnel as required informed as soon as possible. (Enter N/A if no incidents)	
2. Personnel to comply with all rig specific safety initiatives and directives e.g. mandatory attendance at safety meetings.	
PRE-OPERATIONAL CHECKS	
• Confirmation of *job details* are obtained on site.	
• Participation in Pre-Job Toolbox Talk (JSA).	
• Reconfirm Well head type and size	
• Check all Wellhead dimensions & Casing Design	
• Unloading of containers is done safely.	
• Confirmation of *equipment* shipped is obtained.	
• Confirmation of Rig Owned *equipment* available is obtained.	
• All *equipment* is visually inspected for damage in accordance with procedures.	
• If required, a Permit to Work is approved and the terms and conditions understood.	
• All *equipment* shipped (and rig owned as required for the operation) is function tested as per relevant procedures. Ensure all parts are free moving and suitably lubricated.	
• **Ensure that 17"OD Mandrel is able to pass freely down the whole length of the Well Bore.** • **ALL connections on the string must be checked to ensure that they have been torqued appropriately BEFORE running the tool in the hole.**	

OPERATION	✓ when done
1. All equipment to be utilized in accordance with procedure	
2. *Appropriate remedial action* is taken if shortages, omissions, damage, or incompatibilities are identified.	
3. *Difficulties in carrying out instructions* in accordance with company and customer *policies, procedures and legislation* are clarified with the person in charge.	
POST OPERATIONAL CHECKS	
1. If required, Permit to Work closed off.	
2. All *equipment* assembled in a safe area.	
3. All *equipment* cleaned.	
4. Repairs carried out if *equipment* to remain onboard.	
5. Bare metal areas protected from corrosion and all points greased.	
6. Re-pack *equipment* in containers and fit covers (assist deck crew if crane required).	
7. *Equipment* prepared for back-load.	
8. All *relevant paperwork* completed.	
9. Feedback invited from the Client.	

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Weatherford	DHS Work Instruction	Australia

WORK INSTRUCTION FOR WELL SEVERANCE ENGINEER

QAWI/DHS/WA 01 Rev 04

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Weatherford	DHS Work Instruction	Australia

PURPOSE

The job function of a Weatherford Well Severance Engineer is to ensure that Well Severance Services are provided according to Weatherford and Customer requirements.

SCOPE

This Work Instruction is meant as a general guide and does not necessarily list all activities that a Weatherford Engineer may be required to undertake. The Engineer should at all times liaise with Client representatives to ensure that all required work is done in as efficient a manner as possible.

NOTE: *All incidents, accidents and near misses MUST be reported Weatherford Management in as timely a manner as possible.*

1. PRE- JOB

1.1. Upon request to provide Well Abandonment Services ensure that Well Abandonment Information Form (QAF/DHS/WA 01) is completed by client and is accurate.

1.2. Based on Well Abandonment Information access the appropriate DHS Work Instruction (QAWI/DHS/WA 01 – 4) and Well Abandonment Checklist (QAF/DHS/WA 02) for the project. The Checklist is to be utilized from Pre – Job stage onwards.

1.3. Attend pre-job brief with DHS Supervisor, Base Manager or his delegate.

1.4. Establish check-in times. In case of problem in meeting check in, contact the Duty Supervisor immediately by telephone.

1.5. Report to the Client Representative upon arrival at the installation. Establish the job to be performed, and check wellhead type, casing sizes and weights etc and the timing of the job.

1.6. Be aware of all Company and client safety and operational procedures / regulations and ensure that these are rigorously followed at all times.

1.7. Actively participate in Rig pre-job safety / operations meetings.

1.8. Ensure that all pre-job equipment checks are carried out thoroughly and that these are documented.

1.9. Keep a daily diary of activities and document these in the job report.

2. DURING JOB

2.1. Ensure equipment is operated in a safe and efficient manner in accordance with Weatherford and Customer procedures. Utilize checklist (QA/DHS/WI/F 02) throughout operations.

2.2. Organise shifts and meal breaks as required.

2.3. Supervise on-the-job training of trainees as required and conduct ongoing appraisals.

2.4. Liase with the Client Representative on all procedural difficulties, safety incidents, equipment problems, etc. (whether caused by Weatherford or 3rd party) that occur during and that impinge on the job and report these by telephone or fax to the shore base as soon as operationally feasible. Ensure that these are fully documented for the attention of line management.

2.5. Write a *detailed* account of the job noting all stoppages, JSA's, incidents, Weatherford down time etc.

3. POST JOB

3.1. Ensure all equipment is checked on completion of the job and that it is either stowed or made ready for backloading in consultation with the Company Representative. Utilize checklist (QA/DHS/WI/F 02) throughout operations.

3.2. Ensure that all Job Reports, Work Order tickets, etc., are completed and signed by the Company Representative as required.

3.3. On arrival in town report by telephone or in person to the Duty Supervisor.

3.4. Report to the Base Manager / Product Line Manager with all completed

3.5. Complete job reports, etc. for debriefing as soon as possible.

3.6. Assist with post-job follow-up as required.

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Weatherford	DHS Work Instruction	Australia

MECHANICALLY CUTTING 20" AND 30" CASING UTILISING MOST TOOL SYSTEM

QAWI/DHS/WA 02 Rev 02

Weatherford	DHS Work Instruction	Australia

Equipment List for Mechanically Cutting 20" & 30" casing utilizing the MOST tool System.

- Sub. Marine Swivel with 6-5/8"Reg Pin/Box connections.
- 18-1/2" Spacer Ring.
- 20" Guide Ring.
- 30" Guide Assembly.
- 35" Support Plate.
- 4 x Bolts complete with nuts.
- 17-1/4" Non- Rotating Stabiliser.
- 26" Stabiliser Sleeve.
- 7' Long Spacer Sub with 6-5/8"Reg Pin/Box connections.
- 5' Long Spacer Sub with 6-5/8"Reg Pin/Box connections.
- Set of 8", 12" and 18" Long Spacer Subs with 6-5/8"Reg Pin/Box connections.
- 9-5/8" Spear Body.
- Grapple for 20" Casing.
- Stop Sub, Bottom and Top Mandrel with 21" Ring.
- 8"OD Bullnose with 6-5/8" API Reg connection.
- Knives for M24 BIC Cutter 3 x 2430, and 3 x 2436.
- Spare parts for13-3/8" Cutter.
- Safety Clamps.
- Hand slips.
- Thread protectors
- All hand tools required to service all equipment

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Weatherford	**DHS Work Instruction**	Australia

1. CUT & PULL 20" & 30" CASINGS UTILISING MOST TOOL

- **The MOST Tool *cannot* be used if there is a Hanger or Wear Bushing in the Wellhead Bore. The MOST Tool requires that its 17"OD Mandrel is able to pass freely down the whole length of the Well Bore.**

WARNING

If anyone is in any doubt, stop and confirm.

- ALL connections on the string must be checked to ensure that they have been torqued appropriately BEFORE running the tool in the hole.
- Pick up MOST tool housing and check that housing is dressed with correct arm to match wellhead BOP profile.
- Function test the MOST tool to ensure that the grapple arms are working properly. This should be preformed at the field store as well as on site prior to running in hole.

1.1 Run in the hole with the following assembly:
- Bullnose
- 13 3/8 "Casing Cutter with knives set to 42" sweep
- 17-1/4" Stabiliser
- Spacer Subs (Pony)(as required)
- MOST Tool built to the required well profile (18-3/4" Wellhead Housing)
- Series 1400 Marine Swivel
- Drill Collars and Drill Pipe to the surface

1.2 Land MOST Tool and 1400 Marine Swivel with 10,000 – 15,000# down weight.

1.3 Fill up drill string.

1.4 Start rotation 100 – 150 RPM (Depending on water depth).

1.5 Break circulation by pumping 700 – 800 PSI circulating pressure.

1.6 Cut finished indicated by 50 – 70% pressure drop when knives reach the preset sweep or the drill string stalls out due to the casing dropping.

1.7 Monitor the torque fall back to free rotation – ***Stop rotation and pumps***.

1.8 After the casing is cut lift the string until neutral weight.

1.9 Set the Limiter low and then turn the string to the left picking up the string as it turns. Seen on the video monitor the MOST Tool Housing will turn to the left. Keep pulling watching the weight indicator until weight is taken. Stop the rotation to the left.

1.10 Pull and retrieve 20" & 30" casings, wellhead, PGB and TGB, ensuring the weight is held on the drill string and not the guide wires. A Toolbox meeting **must** be held to ensure that all the deck/drill floor crew, are aware that the guide wires must not be pulled faster than the drill string.

- If unable to pull, the Marine Swivel can be landed and the cut continued.
- If still not able to pull, the MOST Tool can be released and retrieved.
- If unable to retrieve 20" & 30" casings after mechanical cutting, a standard explosives charge should be fired at the same depth as the cut made. The charge will then ventilate through the cut, and shock the formation or cement holding the casing.
- After explosive severing a 20" spear and grapple is used to retrieve the casing, or re-run the MOST Tool.

WARNING

If anyone is in any doubt, stop and confirm.

- Should the explosive charge be run on the Drill String with the MOST Tool in the string. The MOST Tool **must not be engaged, and must, at a minimum**, be clear the top of the wellhead by 3-5 metres.

1.11 When pulling the wellhead free, ensure that the casing stub is free of the seabed before breaking a connection at the rig floor. Similarly, ensure that the guidebase is not held in the splash zone while breaking connections.

1.12 Release the MOST Tool, when the 20", 30", PGB and TGB is secure in the moonpool, lower the string 18 inches, then turn to the right just under a quarter of a turn. Pick up free of the wellhead, and retrieve to the drill floor. Break down the Cutting Assembly and return tools to their respective baskets.

1.13 To retrieve the 20" and 30" through the rotary, the safest way is using the Wellhead Running Tool attached to a pup.

In all Plug & Abandonment Operations it is important that the rig is kept in the correct position over the wellhead. If not the landing string may break due to the pendular movement.

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Conclusions & Recomm-endations

Conclusions & Recommendations

BEARDIE-1 NEAR FIELD WILDCAT WELL

COMMENCE TOW FROM SOLE-2 TO BEARDIE-1:	17:00 hrs 24-JUL2002
DROP 1ST ANCHOR:	08:00 hrs 25-JUL-2002
SPUD:	17:00 hrs 26-JUL2002
TD WELL AT 1905m:	21:00 hrs 03-AUG-2002
START LOGGING:	13:00 hrs 04-AUG-2002
COMPLETE LOGGING:	13:00 hrs 06-AUG-2002
COMPLETE P&A:	07:45 hrs 09-AUG-2002
RELEASE RIG:	00:30 hrs 10-AUG-2002

LESSONS LEARNT

ITEM	DATE	CONCLUSIONS & RECOMMENDATIONS
1.	16-Jul-02	<u>Conclusion:</u> ***High holding power Stevpris Mark 5 anchors were employed successfully and at A$608,000 were a cost effective alternative to meet the mooring design criteria.*** The initial recommendation from the Mooring Design was to deploy 4,800' of anchor chain. With two AHVs, each with 8000 HP and 100T bollard pull, the predicted pullout was only 2,500' to 3,000' of chain in the 50m water depth. Deploying 4,800' would have been a time-consuming operation involving removing the anchors, transferring chain into the AHV's chain locker, using the second AHV to pickup additional chain at the rig, use both AHVs to pull out as much chain as possible, before re-deploying the anchor chain from the AHV chain locker and re-attaching the anchor. To optimise anchor deployment and meet the Mooring Analysis recommendations, five of the Offdrill 2 anchors on the weather-side of the rig, viz., anchors 1, 2, 3, 7 & 8 at 180°, 210°, 270°, 90° & 120°, were changed to high-holding power Stevpris Mark 5 anchors. In developing the final mooring plan, discussion were held with one AHV's Master, CSO Aker Unirig was contracted to develop a detailed anchor changeout plan, identifying all spares (e.g. Kenter links, Pear links, lead) required. A risk assessment was run in Perth to review the procedure, and identify any additional hazards and required mitigations. Pre-slinging the Stevpris anchors at BBMT, and the Offdrill 2 anchors for offloading, was one of the action items identified. Anchors were changed out without incident with an estimated saving of A$340,000, and with less risk compared with the base case of deploying 4800' of chain to meet the mooring criteria. Diamond Offshore later elected to purchase these anchors from CSO Aker Unirig, the supplier, which saved substantial time replacing the Offdrill 2 anchors during demooring and resulted in an additional saving of A$250,000.
2.	7-Aug-02	<u>Conclusion</u>*:* ***Lawson and Treloars supplied a current meter and a technician to successfully collect 2 hourly current, wind, wave and anchor tension data. This data was required to verify mooring design Metocean assumptions and the resultant anchor line tensions. Analysis of the data is continuing.*** A previous attempt to collect this data at East Pilchard-1 was unsuccessful when the cable to the current meter failed. Good co-operation from DOGC was important as the electrician let us put the current meter computer in the electrical room which allowed the current meter to be run off the stern away from the supply boats.
3.	5-Dec-01	<u>Recommendation:</u> ***Maximise the well target size as this allows use of lower cost survey tools, and eliminates the need to hold directional motors for correction runs required by smaller targets.*** On Beardie-1 in the initial plan the large 100m radius target allowed use of the lower cost Andergauge Anderdrift tool as opposed to requiring MWD services for an expected saving of ~$250k (Directional drillers, MWD hands, MWD equipment and motors). However, as MWD was later included in a packaged LWD logging suite at no additional cost, MWD was run below surface hole. The well was spudded 1.79m NNE of the intended location. The final bottom hole location at TD was 15.2m SW of the intended location.

ITEM	DATE	OBSERVATIONS, CONCLUSIONS & RECOMMENDATIONS
4.	13-May-02	**Recommendation:** ***Continue using Drill-on-Paper review sessions with attendees from both in-house and partner stakeholders, 3rd party contractors and the regulator to communicate the program intent, identify additional efficiencies and generally achieve alignment from all parties.*** For Beardie-1 the Drill-on-Paper session was run over one day to review the program in detail. Attendees included drilling management, operations and engineering staff, exploration staff, rig contractor and major third party contractors. This allows a thorough review of the program, identifies opportunities for optimisation, and allows face-to-face contact between the key players. The Drill-on-Paper was followed by the Risk Assessment on the following day. 44 action items were identified and closed-out prior to spud.
5.	20-May-02	**Recommendation:** ***Use at least a 26' long 20" extension joint below the 18-3/4" High Pressure Wellhead Housing to allow the wellhead to be severed at least 5m below the seafloor as required by P(SL)A Clause 514(10). Consider adding a set of centralising fins 3m below the top of the wellhead housing in addition to fins immediately above the crossover to the 13-3/8" casing to further aid centralisation during cutting.*** However on Beardie-1, after some concern that a wellhead cut 5+ metres below the seafloor may not be able to be recovered, approval was sought and received from DNRE to cut the casing at a minimum depth of 1.5m below the mudline. The actual casing cut was 1.66m below the seafloor.
6.	19-Jun-02	**Recommendation:** ***Consider more effective ways of communicating any Information Booklet and the Operations Safety Plan and any other Operator requirements to the rig crew, boat crews and 3rd party personnel.*** The Beardie-1 Information Booklet and Operations Safety Plan was distributed to the management of all contractors with the request "Please ensure your personnel review, fully understand and agree to this plan prior to the commencement of the Beardie #1 drilling campaign." This was not done.
7.	19-Jun-02	**Recommendation:** ***Continue to utilise dedicated contract materials personnel to manage movement of 3rd party equipment into BBMT, dispatch of this equipment to the Ocean Bounty, return of this equipment from the Ocean Bounty, and then to the vendor.*** On Beardie-1 use of dedicated contract materials personnel was very successful, providing a single point of contact for materials 12 hour a day, seven days a week.
8.	16-Jul-02	**Recommendation:** ***If anchor changeout is required and the MODU is supported by only two AHVs, use a Production supply vessel (or contracted additional support vessel), to move supply the anchors for changeout, and return the changed-out anchors to the marine depot. With one AHV on the main tow bridle until the four primary anchors have been run, this allows the second AHV to run anchors without making a run to the marine depot to collect the anchors required for the changeout.*** On Beardie-1 the production supply vessel Lady Elizabeth was used during the mooring to transfer the Stevpris anchors to the Ocean Bounty, return the Offdrill 2 anchors to BBMT, as well as continue the load-out of material for the well.
9.	16-Jul-02	**Recommendation:** ***Pre-sling all anchors for change-out at the marine depot to minimise handling of slings offshore.*** This was identified as an action item at the Beardie-1 anchor changeout risk assessment and implement with the purchase of the required slings.
10.	25-Jul-02	**Recommendation:** ***Consider an agreement between the platform support vessel contractor and the other parties in the rig sharing agreement in future operations to allow use of the platform support vessel to load-out materials to the MODU prior to its release from the previous operator.*** When OMV decided to abort their production test, backloading test equipment to free space for Esso equipment became an issue. Even though the Lady Elizabeth was on anchor a short distance away, this vessel could not participate due to a lack of a contractual agreement covering this vessel while the rig was operated by OMV.

ITEM	DATE	OBSERVATIONS, CONCLUSIONS & RECOMMENDATIONS
11.	25-Jul-02	**Recommendation:** ***Continue issuing bound copies of the drilling program and Operational Safety Plan in sufficient quantities that all relevant personnel can have their own copy of these documents.*** About 50 copies of the Drilling program and the Operational Safety Plan, single side copied and spirally bound, were taken to the rig. This was very effective as it allowed key personnel to have their own copy of the program, in which they could add additional notes for reference as required.
12.	25-Jul-02	**Recommendation:** ***Use laptops for at least the DRS computer and the geologist's computer.*** This would allow the former to be hand-carried out to the rig and hand-carried back into the office, ensuring DRS reports are captured throughout the operation. A desktop PC was used on Beardie-1 for DRS, and this did not arrive in its shipping container until two days into the well. The PCs were shipped back to BBMT a couple of days before rig release except for the DRS computer, which was hand-carried back to Melbourne office, not a good practice from a HSE perspective! (The box with the computer and rig files weighted 40 kilograms). A laptop computer for the Geologist would allow this unit to be used to capture both mudlogging and electric line logging data, for data transmission to Melbourne office.
13.	25-Jul-02	**Recommendation:** ***Consider performing a Systems Analysis for the computer support on future MODUs.*** On Beardie-1 there were four Desktop PCs, one Docking Station, and a LAN printer. However, limited transmission rate to the server at Longford led to deteriorated performance if all PCs were in use, for example, 30 minutes to log onto the LAN, 60 minutes to print a single page document. The one Docking Station was insufficient, two or three should be considered for future programs.
14.	25-Jul-02	**Recommendation:** ***Consider utilising additional available space as additional office space.*** With three supervisors, one logistics person, one engineer, and one or more Company visitors, the space in a single office is insufficient. On the Ocean Bounty the Company Man's bedroom could have be used as an office during the day, with phone and docking station installed.
15.	25-Jul-02	**Recommendation:** ***Continue using a logistics co-ordinator offshore. However, ensure that this position is rotated at two week of longer intervals.*** A logistics assistant (contract personnel from Skilled Engineering) was used to manage both personnel and material movements between the Ocean Bounty, Longford Heliport and BBMT. This was very successful allowing the Drilling Supervisors more time to supervise the drilling operations. Having one person for the duration of the 16 day well, or rotating every two weeks, would be an improvement on the one week schedule that was worked on Beardie-1.
16.	25-Jul-02	**Recommendation:** ***In future programs requiring anchor changeout during mooring, plan for anchor changeout to commence after the second anchor has been run.*** On Beardie-1 the plan was to changeout anchor #2 (210°), the second anchor to be run, from an Offdrill II to a Stevpris Mark 5. The first anchor (#6 at 30°) was dropped at 4,800' on the run in. However, for rig safety (risk minimisation), #2 anchor was run immediately to get two anchors in place. In the mooring operation #2 was changed out to a Stevpris Mark 5 as the last anchoring operation.

ITEM	DATE	OBSERVATIONS, CONCLUSIONS & RECOMMENDATIONS
17.	26-Jul-02	**<u>Recommendation</u>*: Consider testing assemble float shoat and collar joints at BBMT using a crane, to ensure that the floats are not plugged.*** The 20" Weatherford stab-in float shoe on the 20" x 30" crossover joint failed to flow seawater after running two joints. Drill pipe was run with a star stinger to flush out the float shoe. Leathery polymer (guar gum) was recovered. Failure may have been from the guar gum, or the ball may have been seized (supplied as a purchase item from ABB Vetco Gray), or a combination. 2 hours NPT resulted from this failure. Additionally, the 20" float shoe then failed to hold backpressure after displacing cement. This may have resulted from the drillpipe run to clear the blocked shoe, or from the original condition of the float. A further 3.5 hours NPT resulted from this failure.
18.	27-Jul-02	**<u>Recommendation</u>*: Write future programs referencing depth relative to LAT (Lowest Astronomical Tide).*** For Beardie-1 the program was written referencing TVD to MSL. Calculations relative to MSL are confusing as corrections are both positive and negative depending on tide height relative to MSL. Using LAT as the reference is less error-prone for rig hands who can correct depth by subtracting tide heights (relative to LAT) from tag depths. On Beardie-1 depths references during drilling were made to LAT.
19.	29-Jul-02	**<u>Recommendation</u>*: Consider using a Flush Mounted Spider or PS21 slips to run casing.*** On Beardie-1 the operator had to run power tongs above head level, and frequently use a stepladder to shift power tongs.
20.	29-Jul-02	**<u>Recommendation</u>*: Test Weatherford's NODECO top drive cement head, and similar 3rd Party contract equipment, off the critical path.*** On Beardie-1 the Weatherford NODECO top drive cement head side flange connection leaked under a low-pressure test. 1 hours NPT resulted from this failure. Specific recommendations are captured in the Non-Conformance Report for this incident.
21.	30-Jul-02	**<u>Recommendation</u>*: Consider drilling out the float using mud.*** On Beardie-1 the floats were drilled out with seawater to avoid treating the mud for green cement. However, high vibration was observed, and this may have contributed to the Hycalog bit loosing one or more teeth. Mud would provide more lubricity and better hole cleaning.
22.	9-Aug-02	**<u>Recommendation</u>*: Ship the Weatherford MOST tool with a hand-tight top connection to allow the blade setting to be checked, and with a bullnose stabiliser to stabilised the lower portion of the tool.*** On Beardie-1 the Weatherford MOST tool had been dressed with Cameron locking dogs instead of Vetco H4 dogs, which were not available on-site. This resulted in 6 hours NPT. Specific recommendations are captured in the Non-Conformance Report for this incident. Focus shifted from cutting casing to the dogs and the MOST tool was pulled prematurely. It was know that the wrong dogs were installed and the indicator was set at 30". Continuing to cut casing instead of pulling the MOST tool probably would have resulted in pulling the wellhead on the first try.

ITEM	DATE	OBSERVATIONS, CONCLUSIONS & RECOMMENDATIONS

23.	10-Aug-02	**<u>Recommendation</u>*: Consider reducing the offshore emphasis on tracking well costs to allow Field Supervisors more time to manage the operational aspects of the well. A system for consideration is detailed below. Additional office-based staff may be required.*** Managing field costs still requires excessive time both in the field and at the office. If ownership of the DRS Cost data can be shared between rig and office, then review and revision of daily cost could be managed using DRS accessing one set of data. However, with the limitation of the current system, the use of a Field Cost Excel spreadsheet shared between the rig and the office, and the protocols for using it, assists in the cost management process, albeit, with double-handling of data, and the added time need to reconcile the spreadsheet data with those entered into DRS. However, the spreadsheet does allow costs to be monitored and updated. It does capture corrections required to DRS at one location, and it provides a traceable document on the costs. Work is still required to optimise the spreadsheet and its use. As always, the primary fault lies in the way DRS is set up. The cost function should be broken into a separate module that will blend with the operations report at the DIMC. The present DRS set-up is convoluted and inefficient. There is a large disparity in how field costs are entered in the world-wide affiliates. Some drilling supervisors spend ten minutes a day entering costs. Bakari spent four hours a day and Beardie spent three hours a day on costs. Every hour spent by drilling supervisors reporting while making hole is time not spent on the operation. Two major oversights on Beardie could have been avoided IF the focus was on operations instead of reporting and cost estimates. It is costly to turn the operations over to contractors. The drilling supervisors can and should have major involvement in the drilling operation as emphasised by Juan Garcia and Dave Anglin in the recent Operations Safety Seminar. Here is a solution, which is practical for future Beardie type wells. 1. The engineers develop a reasonably good 95% accurate expected average daily cost. These daily fixed costs are entered in the DRS report on Day 1 and carry-over daily while the well is being drilled. The drilling supervisor concentrates on safely and efficiently drilling the well. Fixed costs are entered in DRS as follows: Cost Code — Category — Daily Cost 201 — Contract Transport – Land & Courier — $1,500 202 — Contract Transport – Air — $2,300 2. The drilling supervisor enters periodic major costs (periodic costs in excess of A$25,000) into DRS as these are incurred, for example, daily mud costs, tubular costs, wellhead costs; and faxes into the Office 3rd Party timesheets, invoices, job tickets, etc daily. 3. The engineer/accountant spends as much time as desired on cost work using an Excel spreadsheet. At the end of the well, they get with Longford, Barry Beach, and accounting to ascertain how much was spent on land transport, air transport, and all other costs to come up with their final costs for each cost code. 4. The DIMC usually leaves the well's DRS open for a month. This can be extended upon request. The rig's DRS computer (preferably a laptop) is delivered to the office at the end of the well. After the engineer is satisfied with his final cost numbers, he makes corrective entries in each cost code category. These corrections may be either to the final days to correct the final well cost, to the final day of each drilling or completion phase to correct phases costs, or to each day if required. 5. This process results in saving many hours of operations time and has the same accuracy desired by the office. There may be some driving force which has increased this attention to costs and has move the field cost "estimate" to a full fledged actual well cost report. We will have to learn to work around it if we are going to work on the efficiency desired by the field drilling manager.

ITEM	DATE	OBSERVATIONS, CONCLUSIONS & RECOMMENDATIONS
24.	10-Aug-02	**Recommendation**: ***Continue use of the KCl, glycol, PHPA, polymer mud system on future wells.*** The mud system used on Beardie-1 performed well.
25.	10-Aug-02	**Recommendation**: ***Consider modifying future Operations Safety Plans so that the Drilling Supervisor does not have to be present every time a riding belt is used.*** In the Beardie Operations Safety Plan, Rev. 0: June 2002 Page 19 of 22, Section 14.0 Man Riding Hoist Policy required that man riding operations will be carried out as per section 33.21 of DOGC Offshore Safe Working Practices Manual. A work permit for each individual job task is required prior to utilising the man riding hoist, and that a Drilling Supervisor is to be present at all times when a riding belt is in use. Consider modifying the requirement for a Drilling Supervisor be present (possibly to requiring that the Toolpusher or Driller be present) as: 1. This might make Esso liable for any incidents instead of the contractor. 2. There are long periods while running and pulling the BOP stack and riser and other equipment and conductor when the Esso supervisor has to spend long hours in the moonpool. During this period, the Esso supervisor cannot conduct any other business during a very busy time of the operation.

BEARDIE-1 NEAR FIELD WILDCAT WELL

COMMENCE TOW FROM SOLE-2 TO BEARDIE-1:	17:00 hrs 24-JUL2002
DROP 1ST ANCHOR:	08:00 hrs 25-JUL-2002
SPUD:	17:00 hrs 26-JUL2002
TD WELL AT 1905m:	21:00 hrs 03-AUG-2002
START LOGGING:	13:00 hrs 04-AUG-2002
COMPLETE LOGGING:	13:00 hrs 06-AUG-2002
COMPLETE P&A:	07:45 hrs 09-AUG-2002
RELEASE RIG:	00:30 hrs 10-AUG-2002

LESSONS LEARNT

ITEM	DATE	LESSONS LEARNT
1.	5-Dec-01	The large 100m radius target allowed use of the lower cost Andergauge Anderdrift tool as opposed to requiring MWD services. In Beardie-1 MWD was run as this was included in a packaged LWD logging suite.
2.	13-May-02	Drill-on-Paper session run over one day to review program in detail. Attendees included drilling management, operations and engineering staff, exploration staff, rig contractor and major third party contractors. This allows a thorough review of the program, identifies opportunities for optimisation, and allows face-to-face contact between the key players. The Drill-on-Paper was followed by the Risk Assessment on the following day. 44 action items were identified and closed-out prior to spud.
3.	20-May-02	18-3/4" HP Housing. The 20" extension joint needs to be 26' as per East Pilchard-1. A shorter joint, viz. 17' proposed for Beardie-1, would result in cutting all casing string at a depth of less than the 5 metre below the seabed as required by P(SL)A Clause 514(10). The 20" extension joint had centralising fins immediately above the crossover to 13-3/8". Consider adding an additional set of centralising fins 3m below the top of the wellhead housing to further aid centralisation during cutting. However, after some concern that a wellhead cut 5+ metres below the seafloor may not be able to be recovered, approval was sought from DNRE to cut the casing at least 1.5m below the mudline. This was approved. The casing was cut 1.66m below the seafloor.
4.	19-Jun-02	The Beardie-1 Information Booklet and Operations Safety Plan was distributed to the management of all contractors with the request "Please ensure your personnel review, fully understand and agree to this plan prior to the commencement of the Beardie #1 drilling campaign." This was not done. Consider more effective ways of communicating this information and Esso requirements to the rig crew, boat crews and 3rd party personnel.
5.	19-Jun-02	Dedicated contract materials personnel were used to manage movement of 3rd party equipment into BBMT, dispatch of this equipment to the Ocean Bounty, return of this equipment from the Ocean Bounty, and then to the vendor. This was very successful, providing a single point of contact for materials 12 hour a day, seven days a week.
6.	16-Jul-02	The initial recommendation from the Mooring Design was to deploy 4,800' of anchor chain. With two AHVs, each with 8000 HP and 100T bollard pull, the predicted pull-out was only 2,500' to 3,000' of chain in the 50m water depth. Deploying 4,800' would have been a time-consuming operation involving removing the anchors, transferring chain into the AHV's chain locker, using the second AHV to pickup additional chain at the rig, use both AHVs to pull out as much chain as possible, before re-deploying the anchor chain from the AHV chain locker and re-attaching the anchor. To optimise anchor deployment and meet the Mooring Analysis recommendations, five of the Offdrill 2 anchors on the weather-side of the rig, viz., anchors 1, 2, 3, 7 & 8 at 180°, 210°, 270°, 90° & 120°, were changed to high-holding power Stevpris Mark 5 anchors. Diamond Offshore later elected to purchase these anchors from CSO Aker Unirig, the supplier, which saved substantial time replacing the Offdrill 2 anchors during demooring.

6. (cont)	16-Jul-02	In developing the final mooring plan, discussion were held with one AHV's Master, CSO Aker Unirig was contracted to develop a detailed anchor changeout plan, identifying all spares (e.g. Kenter links, Pear links, lead) required. A risk assessment was run in Perth to review the procedure, and identify any additional hazards and required mitigations. Pre-slinging the Stevpris anchors at BBMT, and the Offdrill 2 anchors for offloading, was one of the action items identified. Anchors were changed out without incident. A Production supply vessel (Lady Elizabeth) was required during the mooring to transfer the Stevpris anchors to the Ocean Bounty, return the Offdrill 2 anchors to BBMT, as well as continue the load-out of material for Beardie-1.
7.	25-Jul-02	When OMV decided to abort their production test, backloading test equipment to free space for Esso equipment became an issue. Even though the Lady Elizabeth was on anchor a short distance away, this vessel could not participate due to a lack of a contractual agreement covering this vessel while the rig was operated by OMV.
8.	25-Jul-02	About 50 copies of the Drilling program and the Operational Safety Plan, single side copied and spirally bound, were taken to the rig. This was very effective as it allowed key personnel to have their own copy of the program, in which they could add additional notes for reference as required.
9.	25-Jul-02	Consider using laptops for at least the DRS computer and the geologist's computer. This would allow the former to be hand-carried out to the rig and hand-carried back into the office, ensuring DRS reports are captured throughout the operation. A desktop PC was used on Beardie-1 for DRS, and this did not arrive in its shipping container until two days into the well. The PCs were shipped back to BBMT a couple of days before rig release except for the DRS computer, which was hand-carried back to Melbourne office, not a good practice from a HSE perspective! (The box with the computer and rig files weighted 40 kilograms). A laptop computer for the Geologist would allow this unit to be used to capture both mudlogging and electric line logging data, for data transmission to Melbourne office.
10.	25-Jul-02	Consider performing a Systems Analysis for the computer support on future MODUs. On Beardie-1 there were four Desktop PCs, one Docking Station, and a LAN printer. However, limited transmission rate to the server at Longford led to deteriorated performance if all PCs were in use, for example, 30 minutes to log onto the LAN, 60 minutes to print a single page document. The one Docking Station was insufficient, two or three should be considered for future programs.
11.	25-Jul-02	With three supervisors, one logistics person, one engineer, and one or more Company visitors, the space in a single office is insufficient. Consider utilising additional available space. For example, on the Ocean Bounty the Company Man's bedroom could be used as an office during the day, with phone and docking station installed.
12.	25-Jul-02	A logistics assistant (contract personnel from Skilled Engineering) was used to manage both personnel and material movements between the Ocean Bounty, Longford Heliport and BBMT. This was very successful allowing the Drilling Supervisors more time to supervise the drilling operations. Having one person for the duration of the 16 day well, or rotating every two weeks, would be an improvement on the one week schedule that was worked on Beardie-1.
13.	25-Jul-02	The plan was to changeout anchor #2 (210°), the second anchor to be run, from an Offdrill II to a Stevpris Mark 5. The first anchor (#6 at 30°) was dropped at 4,800' on the run in. However, for rig safety (risk minimisation), #2 anchor was run immediately to get two anchors in place. In the mooring operation #2 was changed out to a Stevpris Mark 5 as the last anchoring operation.
14.	26-Jul-02	The 20" Weatherford stab-in float shoe on the 20" x 30" crossover joint failed to flow seawater after running two joints. Drill pipe was run with a star stinger to flush out the float shoe. Leathery polymer (guar gum) was recovered. Failure may have been from the guar gum, or the ball may have been seized (supplied as a purchase item from ABB Vetco Gray), or a combination. Consider testing assemble float shoat and collar joints at BBMT using a crane, to ensure that the floats are not plugged. 2 hours NPT resulted from this failure.

15.	27-Jul-02	The 20" float shoe on the 20" x 30" crossover joint failed to hold backpressure after displacing cement. This may have resulted from the drillpipe run (described above) to clear the blocked shoe, or from the condition of the float. 3.5 hours NPT resulted from this failure.
16.	27-Jul-02	The program was written referencing TVD to MSL. Future programs should reference depth relative to LAT (Lowest Astronomical Tide). This provides a less error-prone calculation for rig hands who can correct depth by subtracting tide heights (relative to LAT) from tag depths. Calculations relative to MSL are confusing as a further correction of height of MSL above LAT needs to be added. On Beardie-1 depths references during drilling were made to LAT.
17.	29-Jul-02	Consider using a Flush Mounted Spider or PS21 slips to run casing. On Beardie-1 the operator had to run power tongs above head level, and frequently use a stepladder to shift power tongs.
18.	29-Jul-02	The Weatherford NODECO top drive cement head side flange connection leaked under a low pressure test. 1 hours NPT resulted from this failure. Recommendations are captured in the Non-Conformance Report for this incident.
19.	30-Jul-02	Consider drilling out the float using mud. On Beardie-1 the floats were drilled out with seawater to avoid treating the mud for green cement. However, high vibration was observed, and this may have contributed to the Hycalog bit loosing one or more teeth. Mud would provide more lubricity and better hole cleaning.
20.	1-Aug-02	Array Resistivity Compensated (ARC) LWD tool failed to transmit data and was changed out for the backup Compensated Dual Resistivity (CDR) tool on the next trip out of the hole. This resulted in 2 hours NPT. Recommendations are captured in the Non-Conformance Report for this incident.
21.	6-Aug-02	The DSI-GR log had to be re-run from the casing shoe to the seafloor when the operator failed to record the log on the original run, resulting in 1.5 hours NPT. Recommendations are captured in the Non-Conformance Report for this incident.
22.	7-Aug-02	Incorrect slips had been fitted to the ABB Vetco Gray wear bushing retrieval, resulting in 1 hour of NPT. Recommendations are captured in the Non-Conformance Report for this incident. Consider fitting and testing the 18-3/4" pulling tool when installing the wear bushing in the 18-3/4" housing. This was totally due to the service man not checking his equipment. The focus for the company men should be spending more time on the basics, which means chasing the service personnel to do their job and spending time on deck looking at equipment.
23.	7-Aug-02	Lawson and Treloars supplied a current meter and a technician to collect 2 hourly current, wind, wave and anchor tension data. This was successfully implemented. A previous attempt to collect this data at East Pilchard-1 was unsuccessful when the cable to the current meter failed. Good co-operation from DOGC was important as the electrician let us put the current meter computer in the electrical room which allowed the current meter to be run off the stern away from the supply boats.
24.	9-Aug-02	The Weatherford MOST tool had been dressed with Cameron locking dogs instead of Vetco H4 dogs, which were not available on-site. This resulted in 6 hours NPT. Recommendations are captured in the Non-Conformance Report for this incident. Focus shifted from cutting casing to the dogs and the MOST tool was pulled prematurely. It was know that the wrong dogs were installed and the indicator was set at 30". Continuing to cut casing instead of pulling the MOST tool probably would have resulted in pulling the wellhead on the first try. The MOST tool should be shipped with a hand-tight top connection to allow the blade setting to be checked. The MOST tool should be set-up with a Bullnose stabiliser to stabilised the lower portion of the tool.

25.	10-Aug-02	Managing field costs still requires excessive time both in the field and at the office. If ownership of the DRS Cost data can be shared between rig and office, then review and revision of daily cost could be managed using DRS accessing one set of data. However, with the limitation of the current system, the use of a Field Cost Excel spreadsheet shared between the rig and the office, and the protocols for using it, assists in the cost management process, albeit, with double-handling of data, and the added time need to reconcile the spreadsheet data with those entered into DRS. However, the spreadsheet does allow costs to be monitored and updated. It does capture corrections required to DRS at one location, and it provides a traceable document on the costs. Work is still required to optimise the spreadsheet and its use. As always, the primary fault lies in the way DRS is set up. The cost function should be broken into a separate module that will blend with the operations report at the DIMC. The present DRS set-up is convoluted and inefficient. There is a large disparity in how field costs are entered in the world-wide affiliates. Some drilling supervisors spend ten minutes a day entering costs. Bakari spent four hours a day and Beardie spent three hours a day on costs. Every hour spent by drilling supervisors reporting while making hole is time not spent on the operation. Two major oversights on Beardie could have been avoided IF the focus was on operations instead of reporting and cost estimates. It is costly to turn the operations over to contractors. The drilling supervisors can and should have major involvement in the drilling operation as emphasised by Juan Garcia and Dave Anglin in the recent Operations Safety Seminar. Here is a solution, which is practical for future Beardie type wells. 1. The engineers develop a reasonably good 95% accurate expected average daily cost. These daily fixed costs are entered in the DRS report on Day 1 and carry-over daily while the well is being drilled. The drilling supervisor concentrates on safely and efficiently drilling the well. Fixed costs are entered in DRS as follows: Cost Code / Category / Daily Cost 201 / Contract Transport – Land & Courier / $1,500 202 / Contract Transport – Air / $2,300 2. The drilling supervisor enters periodic major costs (periodic costs in excess of A$25,000) into DRS as these are incurred, for example, daily mud costs, tubular costs, wellhead costs; and faxes into the Office 3rd Party timesheets, invoices, job tickets, etc daily. 3. The engineer/accountant spends as much time as desired on cost work using an Excel spreadsheet. At the end of the well, they get with Longford, Barry Beach, and accounting to ascertain how much was spent on land transport, air transport, and all other costs to come up with their final costs for each cost code. 4. The DIMC usually leaves the well's DRS open for a month. This can be extended upon request. The rig's DRS computer (preferably a laptop) is delivered to the office at the end of the well. After the engineer is satisfied with his final cost numbers, he makes corrective entries in each cost code category. These corrections may be either to the final days to correct the final well cost, to the final day of each drilling or completion phase to correct phases costs, or to each day if required. 5. This process results in saving many hours of operations time and has the same accuracy desired by the office. There may be some driving force which has increased this attention to costs and has move the field cost "estimate" to a full fledged actual well cost report. We will have to learn to work around it if we are going to work on the efficiency desired by the field drilling manager.
26.	10-Aug-02	The mud system used on Beardie-1 performed well.

27.	10-Aug-02	In the Beardie Operations Safety Plan, Rev. 0: June 2002 Page 19 of 22, Section 14.0 Man Riding Hoist Policy required that man riding operations will be carried out as per section 33.21 of DOGC Offshore Safe Working Practices Manual. A work permit for each individual job task is required prior to utilising the man riding hoist, and that a Drilling Supervisor is to be present at all times when a riding belt is in use. Consider modifying the requirement for a Drilling Supervisor be present (possibly to requiring that the Toolpusher or Driller be present) as: 1. This might make Esso liable for any incidents instead of the contractor. 2. There are long periods while running and pulling the BOP stack and riser and other equipment and conductor when the Esso supervisor has to spend long hours in the moonpool. During this period, the Esso supervisor cannot conduct any other business during a very busy time of the operation.

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Operations & Well
Data Analysis

OPERATIONS & WELL
DATA ANALYSIS

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Safety and Incident Reports

Safety & Incident Reports

Esso Australia Pty Ltd
BEARDIE-1 - SUMMARY OF INCIDENTS

#	Date	Classification	Incident
1	26 July 2002	Spill	Incomplete combustion of fuel in engines running at low loads between anchor winch operations resulted in occasional diesel droplets falling overboard. The estimated amount was 2.5 millilitres producing a sheen 30' long by 4' wide. Engine intakes were adjusted to cause the engines to run hotter.
2	31 July 2002	MTI	IP welding and grinding on deck of vessel in area which required IP to lay down and reach into confined area to perform the task. Face shield did not allow IP to see area being repaired because unable to position head to see area when wearing a face shield. IP was wearing safety glasses only while grinding. IP did not notice foreign object in eye until the next morning (01//08/02) when IP woke and eye was red and irritated. Foreign object was removed from left eye & minor burn observed on left cornea. **Assume foreign object in eye from grinding activity performed 31/07/02.**
3	3 August 2002	RWI	IP performing daily task of filling main engines with oil. IP was connecting the lube filling hose to the engine oil intake. IP applied pressure to the hose 1-1/4" dry break hydraulic female connector when the female connector slid down over the male connector on the engine his little finger was pinched between the shoulder on the male connector and the female connector slide lock ring. IP sent to Gippsland Hospital August 3, 2002. The attending practitioner applied four sutures and the finger was splinted. IP given antibiotics, and analgesic. An X-ray showed a small fracture at end of finger.

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Oil/Chemical Spill Report

Form D-020

1. General Information:

Rig Name: Ocean Bounty Date: 26-07-02 Time: 11:30 hrs

Well Name: Beardie #1 Report By: B.E.Bigby

Reported To: Frank Kratzer Date/Time: 11:30 am

Activity: Running Anchors

2. Spill Information:

Material : Diesel Color: Low visibility white

Est. Volume: 2.5 millilitres Sheen Length: 30 feet Width: 4 feet

Spill Source: Rig engine exhaust

3. Spill Status:

Action Taken: Nil

Ignition Sources Eliminated: N/A Sensitive Areas Threatened: ☐ Y X N

Areas Threatened: Nil Miles: Nil

Wind Speed: 10 knots Direction: S/W Sea State: Calm

4. Surveillance Data:

Date	Time	Latitude	Longitude	Description	Reported By
				No Surveillance required	

5. Comments:

Occasional Diesel droplets from engine exhaust created from engines running at low loads between anchor winch operations. Engine air intakes adjusted to cause engine to run at higher temperature to reduce incomplete combustion.

Fax To: Operations Superintendent
Distribute To: Field Drilling Manager, Operations Manager, Drilling Manager, Safety Coordinator, Drilling Technical Manager

ExxonMobil Development

EMDC Drilling Incident Report Form D-010

D-010 Incident Report Form

1. General Information

Date of Incident: 31-07-02 **Time: 1130**

Current Classification:

☐ LTI ☐ RWI ☒ MTI ☐ First Aid ☐ Minor ☐ Serious Near Miss ☐ Near Miss

☐ Other ☐ Fire ☐ Equipment Damage ☐ Vehicle ☐ SIE

Location/Country: Australia **Rig/Site: Pacific Sentinel - BBMT** **Rig Phone: 03-5142-2876**

Description of Incident: *One sentence.*	Foreign object in left eye from grinding activity & minor burn to left cornea.
Detailed Description:	IP welding and grinding on deck of vessel in area which required IP to lay down and reach into confined area to perform the task. Face shield did not allow IP to see area being repaired because unable to position head to see area when wearing a face shield. IP was wearing safety glasses only while grinding. IP did not notice foreign object in eye until the next morning (01//08/02) when IP woke and eye was red and irritated. **Assume foreign object in eye from grinding activity performed 31/07/02.**
Associated Activity:	Grinding and Welding — **Area of Rig:** Work Vessel

2. If Injury or Illness

☐ Employee ☒ Contractor ☐ Other

Name: David Butler **Company: Swire** **Job Position: Boilermaker**

Nature of Injury or Illness: Foreign object in left eye

Medical Response Taken: IP taken to Foster Medical Centre on 01/08/02. Dr. Castello applied local anaesthetic, remove minute foreign object from left eye, and gave antibiotics for prevention of possible infection. IP released 08/01/02 for normal work duties.

Years Experience with Company:	**4**	**Years Experience in Job:**	**27**
Number of Days into Shift:	**14**	**Hours Slept in Last 48 Hours:**	**18**

3. Incident Severity

Actual Severity: Level 0
Drop-down box

Potential Severity: Level 1
Drop-down box

Level 0 Near Miss, Minor, First Aid only, no Restricted Work
Level 1* OSHA recordable, Restricted Work < 2 days, prescription medication, single stitch cuts
Level 2* Restricted Work < 10 days, serious bruises or abrasions, cuts that require stitches
Level 3* Restricted Work < 30 days, fractures, hospitalization, lost time
Level 4* Restricted Work > 30 days, amputations, disability
Level 5* Complete disability or fatality

* Incident/Near Miss Investigation Summary must be completed for Actual Severity Level 1 and greater and is recommended for Potential Severity Level 3 and greater (see Section 4).

	Name	Title		Name	Title
Prepared By:	Brigham Bigby	Esso Oper. Supv.	**Reviewed By:**	Frank Kratzer	Esso Oper. Supt.
Signature:			**Signature:**		

Distribution: Field Drilling Manager, Operations Manager
Drilling SH&E Manager
File

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EMDC Drilling Incident Report Form D-010

4. Incident / Near Miss Investigation Summary			
Root Cause Analysis Tool *Attach RCA Forms.*	☐ **Ask Why 5 Times**	☐ **TapRooT®** *Required for Actual Severity Level 3 and greater.*	☐ **Other** **Describe:**

Key Findings / Causal Factors

1. Working into a confined space area.
2. Not wearing correct PPE.
3. Habit of performing job task as required to complete task.

Root Causes

1. Not wearing correct PPE

Corrective Actions (Do they address root causes identified above?)	Party Responsible	Target Date
1. Wear impact safety goggles and face shield when grinding.	ALL	01/08/02
2. Stop work activity if unable to wear correct PPE for task.	ALL	01/08/02
3. Conduct risk assessment with crew of the Pacific Sentinel and determine preventive actions required to perform this task.	Mike Dawes (Swire Area Manager)	02/08/02
4. Review PPE requirements and risk assessment with crews of the Pacific Sentinel and the Pacific Conqueror.	Mike Dawes (Swire Area Manager)	02/08/02
5. Conduct safety meeting with the crews of the Pacific Sentinel and Pacific Conqueror and review the "Operation Safety Plan" again and ensure all crews fully understand the Operations Safety Plan.	Mike Dawes (Swire Area Manager)	02/08/02
6. Review incident with the crews of the Ocean Bounty.	Steve Andrews (OB OIM)	02/08/02
7.		
8.		
9.		
10.		

	Name	Signature	Date
Accepted By:	Mike Dawes		02/08/02

	Follow Up Team Lead Name	Signature	Date
Closed Out By:	Brigham Bigby		02/08/02

ExxonMobil Development

EMDC Drilling Incident Report Form D-010

D-010 Incident Report Form

1. General Information

Date of Incident: August 3rd, 2002 **Time:** 1058

Current Classification:

☐ LTI ☒ RWI ☐ MTI ☐ First Aid ☐ Minor ☐ Serious Near Miss ☐ Near Miss

☐ Other ☐ Fire ☐ Equipment Damage ☐ Vehicle ☐ SIE

Location/Country: Beardie #1 / Aust.	**Rig/Site:** Ocean Bounty	**Rig Phone:** 03-5142-2876

Description of Incident: *One sentence.*	Left hand little finger pinched between shoulders of 1 ¼" dry break hydraulic connector.		
Detailed Description:	IP performing daily task filling main engines with oil. IP was connecting the lube oil filling hose to engine oil intake. IP applied pressure to the hose 1 1/4" dry break hydraulic female connector. When the female connector slid down over the male connector on the engine his little finger was pinched between the shoulder on the male connector and the female connector slide lock ring.		
Associated Activity:	Filling engines with oil	**Area of Rig:**	Engine room

2. If Injury or Illness

☐ Employee ☒ Contractor ☐ Other

Name: Terry Coldwell **Company:** Total Marine Services **Job Position:** Second Engineer

Nature of Injury or Illness: Laceration and contusion to the left hand little finger near end of finger.

Medical Response Taken: IP sent to Gippsland Hospital August 3rr, 2002. Dr. Winters attending practitioner. Four sutures required and finger splinted. IP given antibiotics, and analgesic. X-ray of finger showed small fracture at end of finger. Dr. Winters did not release IP for normal or restricted work duties. IP chose to return to work on August 4th, 2002.

Years Experience with Company:	2	**Years Experience in Job:**	20
Number of Days into Shift:	20	**Hours Slept in Last 48 Hours:**	16

3. Incident Severity

Actual Severity: Level 1
Drop-down box

Potential Severity: Level 2
Drop-down box

Level 0 Near Miss, Minor, First Aid only, no Restricted Work
Level 1* OSHA recordable, Restricted Work < 2 days, prescription medication, single stitch cuts
Level 2* Restricted Work < 10 days, serious bruises or abrasions, cuts that require stitches
Level 3* Restricted Work < 30 days, fractures, hospitalization, lost time
Level 4* Restricted Work > 30 days, amputations, disability
Level 5* Complete disability or fatality

* Incident/Near Miss Investigation Summary must be completed for Actual Severity Level 1 and greater and is recommended for Potential Severity Level 3 and greater (see Section 4).

	Name	Title		Name	Title
Prepared By:	Brigham Bigby	Esso Oper. Supv.	**Reviewed By:**	Frank Kratzer	Esso Oper. Supt.
Signature:			**Signature:**		

Distribution:	Field Drilling Manager, Operations Manager Drilling SH&E Manager File

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EMDC Drilling Incident Report Form D-010

4. Incident / Near Miss Investigation Summary

Root Cause Analysis Tool *Attach RCA Forms.*	☐ **Ask Why 5 Times**	☐ **TapRooT®** *Required for Actual Severity Level 3 and greater.*	☐ **Other** **Describe:**

Key Findings / Causal Factors

1. Incorrect placement and position of finger.
2. Lack of concentration performing a daily task.
3. Not wearing work gloves.

Root Causes

1. Incorrect placement and position of finger.

Corrective Actions (Do they address root causes identified above?)	Party Responsible	Target Date
1. Stress the importance of hand and finger placement.	OIM – Steve Andrews	04/08/02
2. Reinforce the importance of wearing gloves for added protection.	OIM – Steve Andrew	04/08/02
3. Stress the importance of staying alert / aware when doing daily job task.	OIM – Steve Andrews	04/08/02
4. Discuss incident and highlight above items 1 thru 3 at pre-tour and weekly safety meetings.	OIM – Steve Andrews	04/08/02
5.		
6.		
7.		
8.		
9.		
10.		

	Name	Signature	Date
Accepted By:	Steve Andrews		03/08/02

	Follow Up Team Lead Name	Signature	Date
Closed Out By:	Frank Kratzer		

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Risk Assessment

ESSO AUSTRALIA PTY. LTD. 913712 141
BEARDIE-1

RISK ASSESSMENT FOLLOW-UP

A Risk Assessment Follow-up on Beardie-1 has identified no significant incidents occurred which should be considered as a future Risk Assessment Hazard Scenario.

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Hazard Identification and Risk Assessment

of

Beardie-1

HIR Apac

Issue Date : 12/06/2002

Project : Beardie-l

EXECUTIVE SUMMARY

A project risk assessment for the planned exploration well Beardie-l was completed on May 14, 2002. It was completed in accordance with standard ExxonMobil requirements. A total of 30 events were reviewed and their risk levels estimated. Certain EMDC Drilling events for a "standard floating drilling operation" were assessed as not applicable or credible. These are detailed later in the report.

Subsequent to the May 14 risk assessment, the risk assessment was revisited on June 7, to consider any changes to risk arising from a possible. deepening of the well from 1905 metres to 3075 metres MDRT. This second session concluded that the risks assessed in the May 14 workshop did not require change and that there were no additional action items.

There were no events with higher risk health/safety/environment consequences identified. Three events have been identified with all medium risk consequences. Four events have all consequences assessed as low risk. The remaining 23 events all have risks in both medium and low risk categories.

Of the consequences evaluated, consequence types were:

- H & S	53
- Public disruption	3
- Environment	10
- Financial	41

A total of 22 action items were identified and action parties assigned.

Report Endorsed: EAPL Drilling Engineering Manager EAPL Drilling Operations Superintendent

Colin Johnston

Report Endorsed: EAPL Geoscience Project Manager Gippsland

Report Approved: EAPL Drilling Manager

25/6/2002

SCOPE AND OBJECTIVES

This risk assessment focused on the Beardie-l location. Beardie-1 is located in licence area VIC/L2, which is operated by Esso on behalf of Esso (50%) and BHPB (50 %). The well is scheduled to be drilled in July 2002.

Scope covers the exploration well project and includes:

- Rig move to location
- Mooring operations
- Drilling operations (excluding production testing and coring)

WORKSHOP DETAILS

MAY 14 SESSION
Team Leader: Andy Camp
Assistant Team Leader and record keeper: Mary-Anne Camp
Esso Coordinator: Chris Meakin

Members:

Esso: Frank Kratzer (Drilling Operations Superintendent), Steve Felstead (Senior Operations Supervisor); George Sharkey (Drilling Supervisor); Brigham Bigby (Operations Supervisor); Colin Johancsik (Drilling Engineering Manager); Chris Meakin (Drilling Engineer); Andy McGregor (Senior Engineer); Andy Zannetos (Geophysicist)

BHPBilliton: Simon Horan (Geoscientist); David Banks (Drilling Engineering Supervisor)

Diamond Offshore: Eric Jacobsen (Rig Engineer); David Johnson (HSE Manager); Kevin Beamish (Driller); Andrew Stumer (Driller)

Swire: Ian Del Rosso (Ops/Safety Manager)

TMT: Peter Hunstock (ROV Supervisor)

Worley: Kerri Reeks (Principal consultant)

DNRE: Ka-lok Siu (Petroleum Engineer)

JUNE 7 SESSION
Team Leader and record keeper: Andy Camp
Esso Coordinator: Chris Meakin

Members:

Esso: Frank Kratzer (Drilling Operations Superintendent), Steve Felstead (Senior Operations Supervisor); Paul Owen (Geologist)

Diamond Offshore: Eric Jacobsen (Rig Engineer)

WORKSHOP METHODOLOGY

The ExxonMobil risk scenario method was used, with risk levels assessed on the ExxonMobil risk matrix. In assessing consequence and probability, the "most likely" outcomes were assessed. Where "injury" was considered an outcome, the most likely injury outcome is noted in each event.

The following standard events were assessed as having no risk contribution for the reasons given:
Diving Incident: No diving activities are currently planned.
Hydrogen sulphide release: H2S not expected based on offset well and production information. (H2S levels at

Project : Beardie-1

Barracouta range from 0-18 ppm recorded from gas production (N.asperus section) in 1992, yet no detection of H2S has occured on any of the initial exploration or production wells. Similarly, gas production from Whiting (L.balmei section) produced concentration of 0 ppm (1989 - 1993) until water coning introduced H2S levels up to 70 ppm in the east of the field, although the west part of the field had low concentration of 10 ppm. At present, the Whiting A6 flowline is reporting H2S levels of <8 ppm. At Beardie-1 H2S levels are expected to be in the range of 0- 20 ppm for the entire well.)
Unauthorised entry to drilling rig: No history of similar events but an action item to check this with Security is included in Event 25.

WELL COMPARISON: GENERIC OFFSHORE WELL vs. EAST PILCHARD 1

Characteristic	Generic Well	Beardie 1
ENVIRONMENT		
Climate	Moderate	Moderate
Min water temperature	12.8° C	11.1° C
LOCATION		
Distance offshore	80 km	28 km
Distance to Supply Base	129 km	134 km
Distance to heliport	129 km	56 km
WELL DEPTH		
MD-RT	3048 m	1905 m
NORMAL PRESSURE		
Maximum Mud Weight	11 ppg	10.5 ppg
Mud Type	FW Polymer	FW KCl/Glycol/PHPA/Polymer
H2S EXPECTED	No	No
SHALLOW GAS EXPECTED	No, But Possible	No
PRODUCTION TEST	No	No
UNUSUAL SECURITY THREAT?	No	No
REGULATORY REQUIREMENTS	Moderate	Moderate

Key differences are not significant.

Deliverables
· Hazard list for each event
· Each event with risks evaluated in the four standard ExxonMobil consequence types (health and safety, public disruption, environmental impact and financial impact {reputation or loss of business opportunity included here})
· Risk scenario registers (one for each event) that include: identified hazards, consequences, event prevention and consequence mitigation measures, risk matrix results
· List of action items ranked by risk level, and event.

ACTION ITEM SUMMARY

A total of 22 action items were identified. The key item(s) are
- ensure that Diamond and Swire have up to date charts showing pipeline locations and that the rig move procedure includes pipeline coordinates;
- develop anchor handling procedure with Diamond / Swire; and
- ensure drilling or logging procedures take into account possibility of gas in riser and Schlumberger record and report gas releases into the wellbore. Ensure that appropriate personnel are aware, by including in both the drilling program and geological program.

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HIR Apac	Project Comments	Date: 11/07/2002 Page No.: 4

Project : Beardie-1

AMENDMENT TO RISK ASSESSMENT ANCHOR CHANGEOUT
On Tuesday July 9, 2002 and additional risk assessment was made of Beardie-l Event No. 4 "Failure during mooring / anchor handling operations".

The risk assessment was held in Diamond Offshore Group Companies Perth office (225 St George's Terrace) after reviewing in detail the procedures to changeout five (5) of the Offdrill II anchors on the Ocean Bounty, for Stevpris Mark 5 anchors, to meet the Beardie-1 mooring analysis requirements.

Attendees were:
Diamond Offshore: Jimmy R. Moore, Eric Jacobsen, Nick Romolo
Swire Pacific: Sam Pullan, Ian Vrendenbregt.
CSO Aker Unirig: John Riggs, Harry Wilson.
Esso: George Sharkey, Chris Meakin (chair).

Changes have been incorporated into the Event 4 scenario sheet. Six new action items have been added to this Event and incorporated into the total number of action items earlier in this Executive Summary

Amendment Endorsed: EAPL Drilling Engineering Manager EAPL Drilling Operations Superintendent

Colin Johnston ____________________ Ru Kratzer ____________________

Amendment Endorsed: EAPL Geoscience Project Manager - Gippsland

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Amendment Approved: EAPL Drilling Manager

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HIR Apac	**Hazard Identification & Risk Assessment Register**	Date : 12/06/2002 Page No. : 5

Project : Beardie-1	**Event No. :** 1

System/Operation : Aviation transport

Event : Helicopter flight incident

Causes :

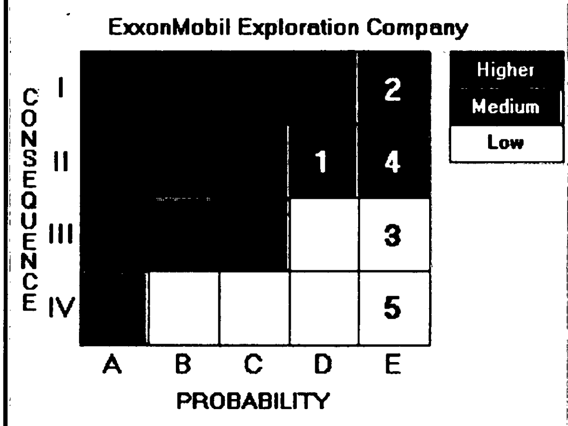
Adverse or rapidly changing weather
Pilot incapacitation (fatigue, A&D abuse, medical)
Lack of pilot/engineer skill/experience
Aircraft mechanical, hydraulic or electrical failure
Inadequate helipad condition/lighting
Contaminated fuel, Fuel starvation
Poor air traffic control / collision with other aircraft
Communication failure
Overload
Hazardous cargo (flammable or explosive)
Passenger or other person comes too close to rotating propellers
Inappropriate passenger behaviour
Debris on helipad
Movement of rig

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (LTI)	Health/Safety	II	D
2	Fatality	Health/Safety	I	E
3	Project delay	Financial	III	E
4	Damage to assets	Financial	II	E
5	Public reaction	Public disrupt	IV	E

Risk Controls :

PREVENTION:
ExxonMobil aviation standards
Inspection and maintenance program
Civil aviation standards
Normal helicopter operations in daylight only
Aviation audits/assessments
Quality checks of fuel supply
Adherence to procedures
EAPL aviation policy
Flight following with live tracking
Co-pilot in each helicopter
Project-specific training
Helicopter induction briefing
Controls on arrival and departure by helideck crew
Markings on helideck
Inspection of helideck by aviation
Training for rig crew and all passengers on S76 helicopter

MITIGATION:
Emergency communication capability/ELT
EAPL ERP incl Public Affairs procedures
Search and Rescue
Flight following
Survival kits
Aircraft first aid kits
HUET training



Drilling	
Exploration	
ALARP?	
Action Item/s?	Five
Project File :	BeardieDeepened1.mdb

HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 6

Project : Beardie-1	**Event No. :** 1

System/Operation : Aviation transport

Event : Helicopter flight incident

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

Minimal population under flight path
Long incident-free history of helicopter operations in Bass Strait
Short project duration - low number of flights
Medium sized helicopter fleet
No refuelling on rig

HIR Apac	Hazard Identification & Risk Assessment Register	Date : 12/06/2002 Page No. : 7

Project : Beardie-1 **Event No. :** 2

System/Operation : Rig move

Event : Personnel safety incident during rig move

Causes :

Unsecured hand tools
Pinching/crushing/caught between
Fatigue, Human error incl crane operator
Inadequately secured equipment
Overload of lifting equipment, Lifting slings/straps worn/damaged
Winch failure
Unclear instructions
Adverse weather conditions
Restricted space on site, Restricted visibility
Excess noise
Multiple activities simultaneously
Unfamiliar/untrained personnel, Inadequate/insufficient supervision
Electrical incident
Insufficient lighting

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (MTI)	Health/Safety	III	C
2	Fatality	Health/Safety	I	E
3	Disruption to project	Financial	IV	E

Risk Controls :

PREVENTION:
Rig move procedures / pre-move checklist
Pre-move planning meeting to ensure clear accountabilities
Contractor JSA, SMS, contractor STOP program
Toolbox and safety meetings
Appropriate supervision
Appropriate lighting for night time operations
Straps/ties for hand tools
Inspection of rig and other lifting equipment
Equipment maintenance
Appropriate training
Work permit system
ADU policy
Good housekeeping
Communications equipment
PPE
Securing of loose items
Contractor interface management

MITIGATION:
ERP
First aid capability
Medic
Helicopter medical evacuation if required
Backup equipment to replace damaged items
Fire fighting equipment

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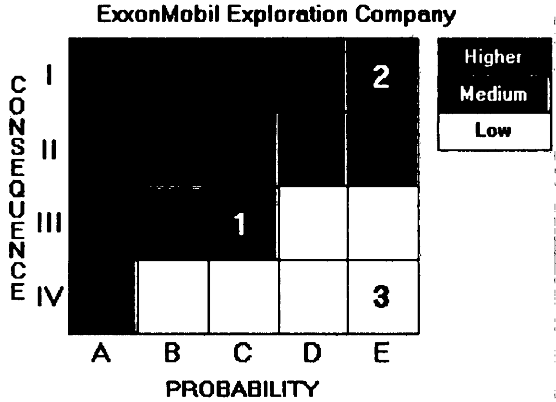

Drilling	
Exploration	
ALARP?	
Action Item/s?	
Project File :	BeardieDeepened1.mdb

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HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 8

Project : Beardie-1	**Event No. :** 2

System/Operation : Rig move

Event : Personnel safety incident during rig move

Consequence Assessment Comments :

There is an ongoing supply vessel audit process both EM and SWIRES.

Rig and vessels have worked together for some time. Both crews and management have worked together long term.

Probability Assessment Comments :

No comments were recorded.

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HIR Apac

Hazard Identification & Risk Assessment Register

Date : 12/06/2002

Page No. : 9

Project : Beardie-1

Event No. : 3

System/Operation : Rig move

Event : Failure of tow vessel/line (tow and positioning)

Causes :

Overload of line
Line wear/corrosion/damage
Inadequate tow line inspection
Incorrect tow line specification
Intrusion of other vessel into tow path (busy shipping lanes)
Adverse weather
Mechanical failure on tow vessels
Ineffective maintenance of tow vessels
Operator error, Communications failure, Unskilled workers
Navigation error
Inadequate tow vessel specification
Vessel breakdown leads to loss of separation of tow vessels
Failure of shackles or padeyes

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (First aid)	Health/Safety	IV	C
2	Fatality	Health/Safety	I	E
3	Collision with ship / platform / pipeline	Financial	II	D
4	Damage to rig/boat, delay to project	Financial	II	E

Risk Controls :

PREVENTION
Tow vessel specification/selection
Inspection of tow vessels
Two tow vessels being used
24 hour watch on tow vessel and rig
Positioning equipment/staff on board
Line specification, inspection program
Notification to AMSA of move plan
Navigation lighting
Design/inspection of tow bridle etc (3rd party verification)
Weather monitoring and forecasting
Tow line monitoring (metering and visual)
Marine certification of crew qualification
Additional crew during rig move
Rig move plans checked by rig insurer
Rig has marine crew permanently on board
Radar monitoring during rig move (Diamond & EAPL)
Tow vessel has primary responsibility for navigation with back-up position monitoring by rig
Selection of trained crew
Documented rig move procedure
Back-up communications
No crew on tow boat decks while tow in progress

MITIGATION
Rig has anchors and own propulsion at ready during tow

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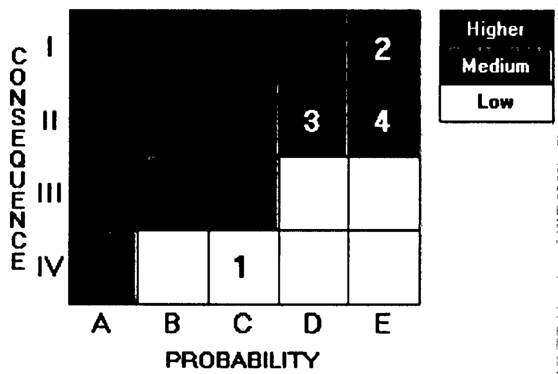

Drilling	
Exploration	
ALARP?	
Action Item/s?	Six
Project File :	BeardieDeepened1.mdb

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HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 10

Project : Beardie-1	**Event No. :** 3

System/Operation : Rig move

Event : Failure of tow vessel/line (tow and positioning)

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

Rig can change course to avoid collision
12km from BTA and 6km from WTA

HIR Apac	**Hazard Identification & Risk Assessment Register**	Date : 11/07/2002 Page No. : 1

Project : Beardie-1 **Event No. :** 4

System/Operation : Mooring/marine

Event : Failure during mooring/anchor handling and anchor changeout operations

Causes :

Anchor chain failure
Shackle, work wire failure
Boat failure
Pennant line failure
Equipment wear & corrosion
Inadequate specification of equipment
Anchor drags
Adverse weather
Mechanical failure
Failure of emergency release mechanism
Operator error
Inadequate boat capacity
Failure of communications between anchor-handling vessel and rig
Simultaneous operations during completion of mooring (handling anchors while preparing drilling equipment)
Surveying equipment failure
Inadequate rig capacity (crowding)
Survey failure
Anchor transfers rig to boat and boat to rig
Failure of cargo lashings

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (LTI)	Health/Safety	II	D
2	Fatality	Health/Safety	I	E
3	Anchor left behind (disruption to fishing)	Public disrupt	III	D
4	Anchor left behind requiring retrieval	Financial	IV	D
5	Move off location (delay to project)	Financial	IV	E

Risk Controls :

PREVENTION
Chains selected appropriate to service requirements
Mooring system designed for location
Independently verified mooring analysis allows for loss of one anchor
Chain tension monitoring, Storm-tension testing of chains
No work done on bolster; Permit to work/JSA/Risk assessment
Inspection/testing of anchors/chains; Selection/training of personnel
Mooring procedure; Pre-tour meetings, Pre mooring planning meeting
Weather forecasting/monitoring
Mooring System for Offshore Units Standards
Mooring equipment inspection and service life standards
Wire/chain/connecting links acceptance testing
Computer mooring analysis
Selection of anchors with adequate holding power for sea floor conditions
Procedure for anchor pull tests
Mooring line management program if required
Two AHTSs operating simultaneously use different radio channels
Stability calculations on Ocean Bounty
Current forecasting for towing and mooring operations
Cargo lashing manual used on AHTSs
AHTSs have ability to return to port in severe Metocean conditions
MOC procedure in place on Ocean Bounty
Redundant survey/positioning systems

MITIGATION
ERP; Medic on rig
Change tension on other anchors if one lost
Back up anchor available if piggyback anchors not used

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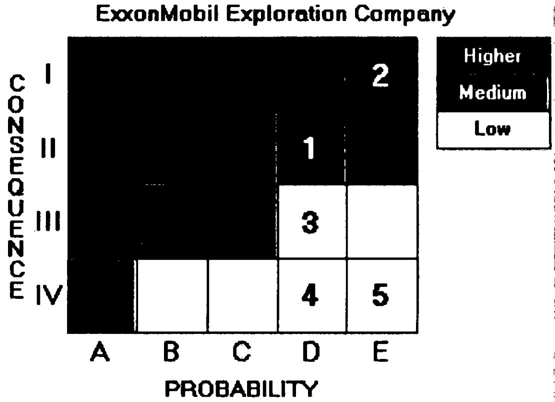

Drilling	
Exploration	
ALARP?	
Action Item/s?	Seven
Project File :	BeardieDeepenedAnchor1.mdb

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HIRApac	Consequence & Probability Assessment Comments	Date : 11/07/2002 Page No. : 2

Project : Beardie-1	**Event No. :** 4

System/Operation : Mooring/marine

Event : Failure during mooring/anchor handling and anchor changeout operations

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

Injuries more likely to boat crew than to rig crew
Injuries higher risk if running piggybacks (more equipt, more manual handling)

The meeting of July 9 2002 (see Executive Summary) was of the opinion that the probability of a fatality was "E" (rather than the "D" probability assigned during the original risk assessment) and that there was no change in the Probability Category rating for the other consequences. However injury probability is higher for anchor changeout operations than for routine mooring operations.

HIR Apac

Hazard Identification & Risk Assessment Register

Date : 12/06/2002

Page No. : 13

Project : Beardie-1

Event No. : 5

System/Operation : Mooring/marine

Event : Failure of lifeboat supports or launch during maintenance or drills

Causes :

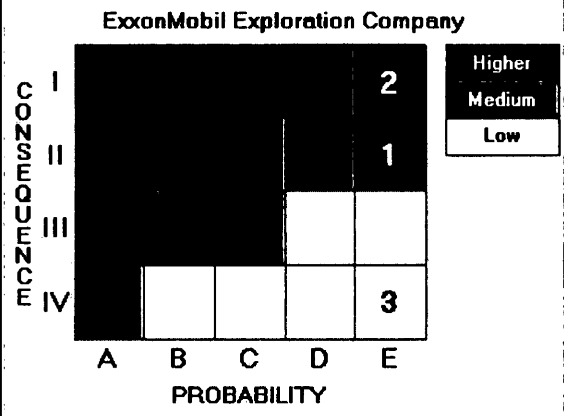
Inadequate maintenance/inspection
Failure of wires
Failure to install safety lines
Mechanical failure
Structural failure of lifeboat or davits

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (LTI)	Health/Safety	II	E
2	Fatality	Health/Safety	I	E
3	Delay to project	Financial	IV	E

Risk Controls :

PREVENTION
Inspection/maintenance program
Release mechanism failsafe (lifeboat cannot be released until it's in the water)
Designated personnel responsible for launching lifeboats (with training)
Limited access to lifeboats
Permit to work
JSAs
Trained personnel

MITIGATION
ERP
Medic
Fast rescue craft is on standby vessel
Provision of more lifeboats than personnel (200%)



Drilling	
Exploration	
ALARP?	
Action Item/s?	

Project File : BeardieDeepened1.mdb

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HIR Apac	**Consequence & Probability Assessment Comments**	Date : 12/06/2002 Page No. : 14

Project : Beardie-1 | **Event No. :** 5

System/Operation : Mooring/marine

Event : Failure of lifeboat supports or launch during maintenance or drills

Consequence Assessment Comments :

No life boats on supply vessels (have FRCs)

Probability Assessment Comments :

No comments were recorded.

HIR Apac	Hazard Identification & Risk Assessment Register	Date : 12/06/2002 Page No. : 15

Project : Beardie-1 **Event No. :** 6

System/Operation : Mooring/marine

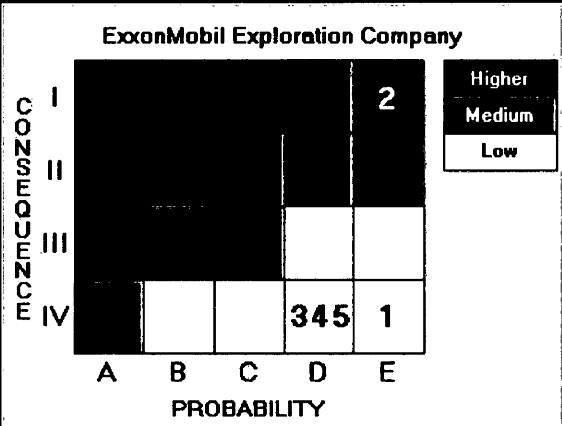
Event : Supply vessel collision with rig

Causes :
Loss of supply vessel power, control
Adverse weather
Operator error
Inadequate communication
Deviation from standard procedure
Incident during personnel transfer between rig and supply vessel
Inadequate length on transfer hoses

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (First Aid)	Health/Safety	IV	E
2	Fatality	Health/Safety	I	E
3	Damage to equipment	Financial	IV	D
4	Release to environment	Environmental	IV	D
5	Delay to project	Financial	IV	D

Risk Controls :
PREVENTION
Procedures for selection of experienced marine contractors with trained crews.
ADU stated in Marine Contract.
Marine Service Vessel specifications in Marine Contract.
Supply boats selected with adequate power and bow thrusters.
Weather/sea state operating limits
Radio communications between workboat and rig
Visual control over close manouevres
Rig heading selection for weather
Workboat and rig ballast control procedures
Supply vessel master ultimate control over approach to rig
Transfer hoses long enough for transit draft
Dry break coupling
Bulkhead protection
Heavy lift procedures

MITIGATION
ERP
Design of rig permits loss of column without capsize
Fast rescue craft on both supply vessels
Medic on rig



Drilling	
Exploration	
ALARP?	
Action Item/s?	
Project File :	BeardieDeepened1.mdb

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HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 16

Project : Beardie-1	**Event No. :** 6

System/Operation : Mooring/marine

Event : Supply vessel collision with rig

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

No comments were recorded.

Hazard Identification & Risk Assessment Register	Date : 12/06/2002 Page No. : 17

Project : Beardie-1 — **Event No. :** 7

System/Operation : Mooring/marine

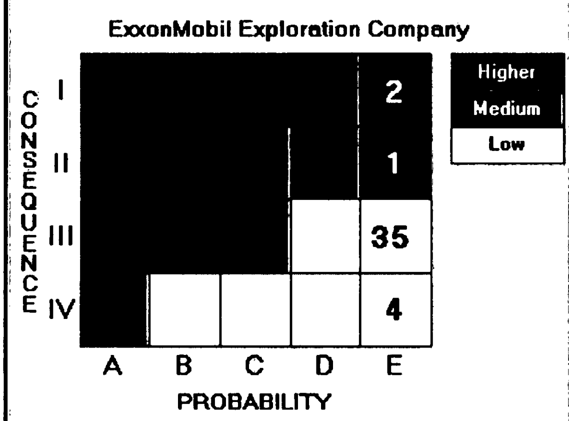
Event : Rig ballast system failure

Causes :
Loss of rig air causing inability to operate valves
Hull rupture
Operator error
Valve failure
Inadequate maintenance/testing
Damaged ballast piping by corrosion, or collision (while at transit draft)
Fire in Pumproom
Fire in ballast control room

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (LTI)	Health/Safety	II	E
2	Fatality	Health/Safety	I	E
3	Loss of assets	Financial	III	E
4	Release to environment	Environmental	IV	E
5	Delay to project	Financial	III	E

Risk Controls :
PREVENTION
Defined qualifications of ballast control operators
24-hour/day manning of ballast control room.
Daily stability calculations with accurate weights of equipment/materials and liquids (tank soundings), calculations checked by Diamond Houston.
Monthly verification of ballast/stability by manual calculations
Marine safety inspection/surveys
Damage stability analysis.
Documented ballast control procedures
Ballast control drills.
Redundancy in critical equipment (ballast pumps, bilge pumps, etc.)
Preventive maintenance program.
Back up rig air supply (four different)
Back up power supply
Include work on ballast control system in "Work Permit System".
Planned maintenance
Daily testing program
Valves fail safe (closed)
Fire/heat detection system
CO2 deluge system
Counter flood procedure to compensate for hull rupture

MITIGATION
ERP
Back up on rig air



Drilling	
Exploration	
ALARP?	
Action Item/s?	

Project File : BeardieDeepened1.mdb

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HIR Apac	**Consequence & Probability Assessment Comments**	Date : 12/06/2002 Page No. : 18

Project : Beardie-1	**Event No. :** 7

System/Operation : Mooring/marine

Event : Rig ballast system failure

Consequence Assessment Comments :

Loss of assets and delay to project consequences are based on time to repair ballast system

Probability Assessment Comments :

No comments were recorded.

HIR Apac	Hazard Identification & Risk Assessment Register	Date : 12/06/2002 Page No. : 19

Project : Beardie-1 | **Event No. :** 8

System/Operation : Well Program Execution

Event : Excess gas in riser

Causes :
Circulating up after MDT pump outs
Inappropriate stack gas clearing procedures

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (MTI)	Health/Safety	III	E
2	Fatality	Health/Safety	I	E
3	Equipment damage	Financial	IV	D
4	Project delay	Financial	IV	D

Risk Controls :

PREVENTION
Procedure for circulating out sample gas
Crew aware of possibility
Schlumberger records amount of fluid pumped into well

MITIGATION
Diverter in place if gas escapes stack
Stack in place
ERP as per other scenarios

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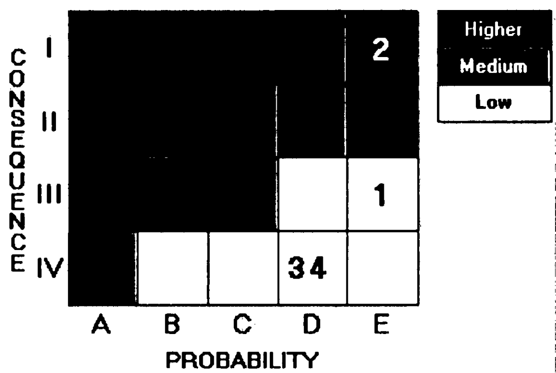

Drilling	
Exploration	
ALARP?	
Action Item/s?	One

Project File : BeardieDeepened1.mdb

HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 20

Project : Beardie-1	**Event No. :** 8

System/Operation : Well Program Execution

Event : Excess gas in riser

Consequence Assessment Comments :

could lead to escalating consequences

Probability Assessment Comments :

Participants in the addendum considered that the possible deepening of the well does not give an order of magnitude in risk.

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HIR Apac	Hazard Identification & Risk Assessment Register	Date : 12/06/2002 Page No. : 21

Project : Beardie-1	**Event No. :** 9

System/Operation : Well program execution

Event : Mooring failure during drilling operations

Causes :

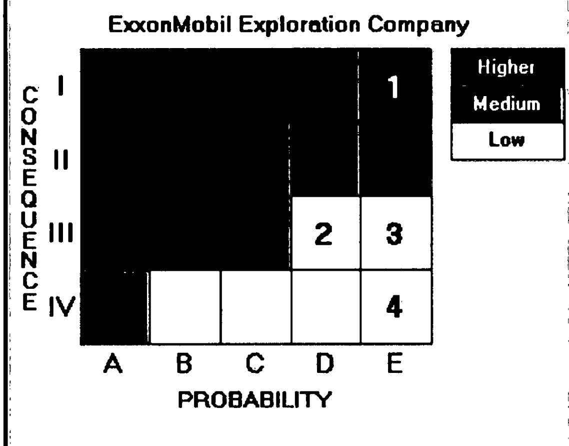
Anchor chain failure
Shackle failure
Equipment wear & corrosion
Inadequate specification of equipment
Anchor drags
Adverse weather
Mechanical failure
Failure of emergency release mechanism
Operator error
Incorrect or inadequate procedures

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Fatality	Health/Safety	I	E
2	Injury (MTI)	Health/Safety	III	D
3	Damage to equipment	Financial	III	E
4	Delay to project (drifted off location)	Financial	IV	E

Risk Controls :

PREVENTION
Chains selected appropriate to service requirements
Mooring system designed for location
Independently verified mooring analysis allows for loss of one anchor
Chain tension monitoring
Storm-tension testing of chains
Permit to work/JSA
Visual inspection/testing of anchors/chains
Selection/training of personnel
Pre-tour meetings
Weather forecasting/monitoring

MITIGATION
ERP
Medic on rig
Change tension on other anchors if one lost
Back up anchor available if piggyback anchors not used
Procedures to cover maximum position offset and suspension of operations
Riser balljoint design as weak point
Riser tension monitoring procedure



Drilling	
Exploration	
ALARP?	
Action Item/s?	
Project File : BeardieDeepened1.mdb	

913712 164

HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 22

Project : Beardie-1	**Event No. :** 9

System/Operation : Well program execution

Event : Mooring failure during drilling operations

Consequence Assessment Comments :

significant anomaly found on seabed survey (1.4km from location)

Probability Assessment Comments :

No comments were recorded.

913712 165

HIR Apac	**Hazard Identification & Risk Assessment Register**	Date : 12/06/2002 Page No. : 23

Project : Beardie-1	**Event No. :** 10

System/Operation : Well program execution

Event : Shallow gas release

Causes :

Geological shallow gas, not predicted
Swabbing
Unfamiliar crews
Ineffective maintenance

with ignition sources as compounding factor

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (First Aid)	Health/Safety	IV	E
2	Fatality	Health/Safety	I	E
3	Loss of assets	Financial	IV	E
4	Delay to project	Financial	IV	E

Risk Controls :

PREVENTION:
Shallow gas geological evaluation and well location selection
Selection of trained personnel
Pre-spud meeting
Toolbox meetings
ROV at seabed to monitor gas in returns
Rig contractor riserless drilling procedures

MITIGATION:
Well control training and drills
Escape routes
ERP (incl safe havens, and abandonment plan)
Rig medic
Stand by boat upwind while drilling riserless
Fire fighting equipment
Mud on standby

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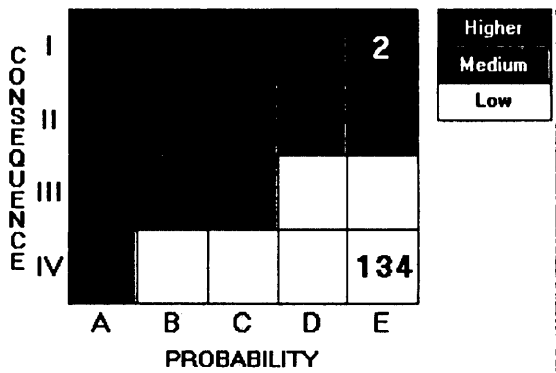


Drilling	
Exploration	
ALARP?	
Action Item/s?	One
Project File :	BeardieDeepened1.mdb

913712 166

HIR Apac	**Consequence & Probability Assessment Comments**	Date : 12/06/2002 Page No. : 24

Project : Beardie-1	**Event No. :** 10

System/Operation : Well program execution

Event : Shallow gas release

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

Shallow gas release not previously encountered in Bass Strait (<850m)

913712 167

HIR Apac | **Hazard Identification & Risk Assessment Register** | Date : 12/06/2002 Page No. : 25

Project : Beardie-1 **Event No. :** 11

System/Operation : Well program execution

Event : Blowout with BOP installed

Causes :

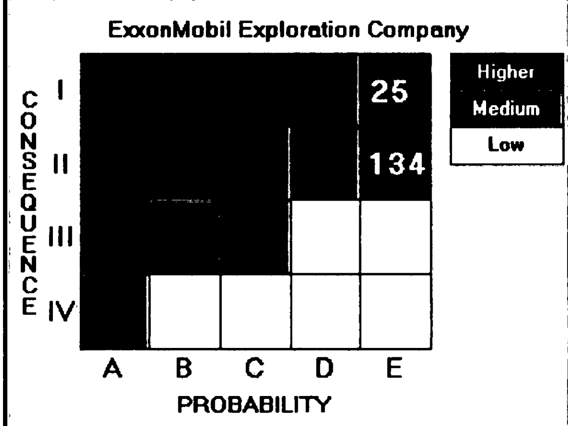
Driller pulling too fast for conditions/swabbing
Supervisor fails to rectify pulling speed
Insufficient trip margin
Trip book procedures fail
Incorrect mud density specification
Formation pressure higher than expected
Changed/unexpected formation conditions
Mud density adjustment error
Mud density measurement error
Gas cutting of mud
Improper use of trip tank
Failure to comply with standard drilling practices
Rig personnel failure to detect low density during routine checks
Mud engineer fails to detect low mud density

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (LTI)	Health/Safety	II	E
2	Fatality	Health/Safety	I	E
3	Loss of assets or delay to project	Financial	II	E
4	Release to environment	Environmental	II	E
5	Public reaction	Public disrupt	I	E

Risk Controls :

PREVENTION:
BOP specifications (ExxonMobil, API)
Wellhead specifications
Casing design and specs/inspection
Pre-acceptance inspection of BOP equipment
Regulatory compliance
BOP maintenance, inspection, and testing program
BOP drills
Well control training
Trained crew
Trained supervision
Contractor's well-control procedures
ExxonMobil/rig operator standard procedures
Pit level monitoring and kick detection equipment
Pore pressure prediction
ExxonMobil supervision
Calibrated mud density measuring equipment
Lost circulation materials

MITIGATION:
ERP
Well control procedures
Oil spill response plan
Rig medic
Rig fire fighting capability



Drilling	
Exploration	
ALARP?	
Action Item/s?	

Project File : BeardieDeepened1.mdb

913712 168

HIR Apac	**Consequence & Probability Assessment Comments**	Date : 12/06/2002 Page No. : 26

Project : Beardie-1	**Event No. :** 11

System/Operation : Well program execution

Event : Blowout with BOP installed

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

No comments were recorded.

913712 169

HIRApac	Hazard Identification & Risk Assessment Register	Date : 12/06/2002 Page No. : 27

Project : Beardie-1 **Event No. :** 12

System/Operation : Well program execution

Event : Annular flow around surface casing including broaching

Causes :

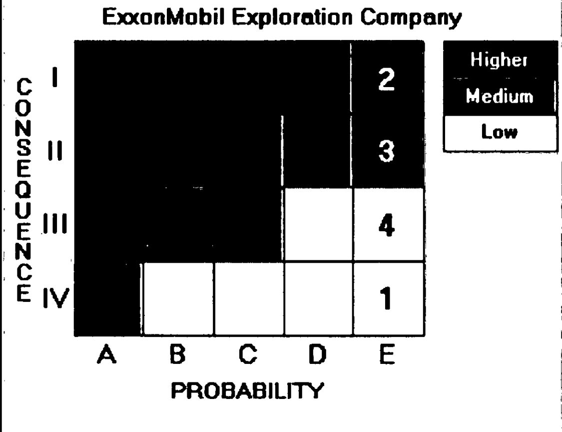
Poor primary cementation
Gas cut cement
Underbalance of formation pressure during cement gellation
Casing centralisation not effective
Casing or wellhead failure
Mechanical failure of cementing unit
Poor quality cement/additives
Poor cement analysis/testing program
Operator error
Improper supervision
Improper slurry design
Poor detection of cement integrity problem
Undetected hydrocarbon
Surface casing set too shallow

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (First Aid)	Health/Safety	IV	E
2	Fatality	Health/Safety	I	E
3	Loss of assets or delay to project	Financial	II	E
4	Release to environment	Environmental	III	E

Risk Controls :

PREVENTION:
Professionally engineered cement jobs
Pressure Integrity Test
Independently verified casing design
Pre-job cement testing
Competent cementing contractor
QC on cement and additives
Close supervision of cement jobs
Surface casing to exceed minimum depth
Minimum formation strength
Vertical well control
Casing centralisation
Large excess of cement is pumped
ROV monitors for cement returns

MITIGATION:
ERP
Oil spill response plan
Rig medic
Remedial cementing capability
Gas detection



Drilling	
Exploration	
ALARP?	See event 10 action item
Action Item/s?	
Project File :	BeardieDeepened1.mdb

913712 170

HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 28

Project : Beardie-1	**Event No. :** 12

System/Operation : Well program execution

Event : Annular flow around surface casing including broaching

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

No comments were recorded.

913712 171

HIR Apac	**Hazard Identification & Risk Assessment Register**	Date : 12/06/2002 Page No. : 29

Project : Beardie-1 **Event No. :** 13

System/Operation : Well program execution

Event : Underground flow

Causes :

Driller pulling too fast for conditions/swabbing
Insufficient formation integrity
Lost circulation
Supervisor fails to rectify pulling speed
Insufficient trip margin
Trip book procedures fail
Incorrect mud density specification
Formation pressure higher than expected
Changed/unexpected formation conditions
Mud density adjustment error
Mud density measurement error
Gas cutting of mud
Improper use of trip tank
Failure to comply with standard drilling practices

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Loss of asset (incl reservoir damage, reserves)	Financial	II	E
2	Delay to project	Financial	III	E

Risk Controls :

PREVENTION:
BOP specifications (ExxonMobil, API)
Casing design and specs/inspection
Pre-acceptance inspection of BOP equipment
Regulatory requirements
BOP maintenance, inspection, and testing program
BOP drills
Well control training
Trained crew
Trained supervision
Contractor's well-control procedures
ExxonMobil/rig contractor standard procedures
Pit level monitoring and kick detection equipment
Pore pressure prediction
ExxonMobil supervision
Calibrated mud density measuring equipment
Lost circulation materials
Run 9 5/8" casing if required
Increase mud weight

MITIGATION:
Increase mud weight
ERP
Well control procedures
Relief well procedures
Capability to pump barite weighted mud through cement unit

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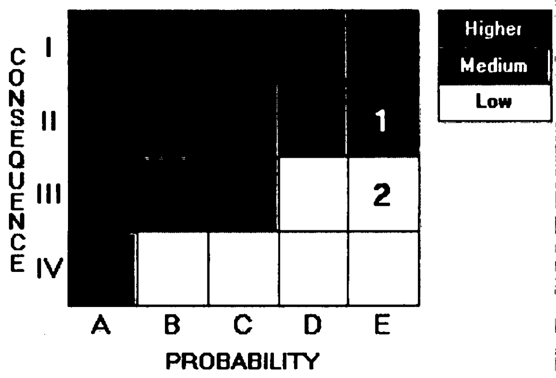

Drilling	
Exploration	
ALARP?	
Action Item/s?	

Project File : BeardieDeepened1.mdb

HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 30

Project : Beardie-1	**Event No. :** 13

System/Operation : Well program execution

Event : Underground flow

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

No comments were recorded.

HIR Apac

Hazard Identification & Risk Assessment Register

Date : 12/06/2002

Page No. : 31

Project : Beardie-1

Event No. : 14

System/Operation : Well program execution

Event : Dropped BOP/riser

Causes :

Fatigue of equipment
Inadequate maintenance or inspection
Operator error
Overload/under-rated equipment
Inappropriate modification of equipment
Failure to follow procedure
Absence of running procedures
Failure of communications
Adverse weather

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (LTI)	Health/Safety	II	D
2	Fatality	Health/Safety	I	E
3	Delay to project	Financial	II	D

Risk Controls :

PREVENTION
Inspection program for all riser components/connections, handling tools and lifting/hoisting equipment during rig acceptance testing and before running.
Weather and vessel motion limits for running BOP.
Pre-job safety meeting.
Rig JSAs held prior to running BOP
Crew change handover
Documented riser running/pulling procedures.
Verification of LMRP connector is fully locked before running BOP and lock-out LMRP connector open function on control panel while running BOP.
Monitoring and testing of riser connector make up.
Trained personnel
Equipment specification on lifting equipment and connectors etc
Connector design to minimise likelihood of inadvertent disconnection

MITIGATION
ERP
Spare riser joints

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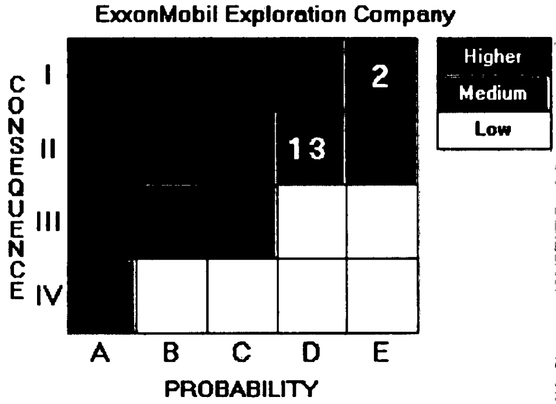

Drilling	
Exploration	
ALARP?	
Action Item/s?	
Project File :	BeardieDeepened1.mdb

HIR Apac

Consequence & Probability Assessment Comments

Date : 12/06/2002

Project : Beardie-1	**Event No. :** 14

System/Operation : Well program execution

Event : Dropped BOP/riser

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

No comments were recorded.

HIR Apac

Hazard Identification & Risk Assessment Register

Date : 12/06/2002
Page No. : 33

Project : Beardie-1 — **Event No. :** 15

System/Operation : Well program execution

Event : Mud-gas separator fails while under pressure & fire results

Causes :

Incorrect equipment specification
Error in determining service pressure and flowrate
Corrosion, erosion
Circulate out kick
Incorrect well control procedure
Incorrect supervision
Line blockage

AND
Ignition source

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (MTI)	Health/Safety	III	E
2	Fatality	Health/Safety	I	E
3	Release to environment	Environmental	IV	E
4	Loss of asset or delay to project	Financial	IV	E

Risk Controls :

PREVENTION:
Mud gas separator meets specifications (ExxonMobil, API)
Dimensional verification and throughput calculation
Maintenance, inspection, and testing program
Well control training
Trained crew
Trained supervision
Contractor's well-control procedures
ExxonMobil/rig contractor standard procedures
ExxonMobil supervision
Correct rig up
Pre acceptance inspection
Equipment inspection and maintenance

MITIGATION:
ERP
Well control procedures incl bull heading
Oil Spill Response plan
On site medic/hospital
Rig fire fighting capability

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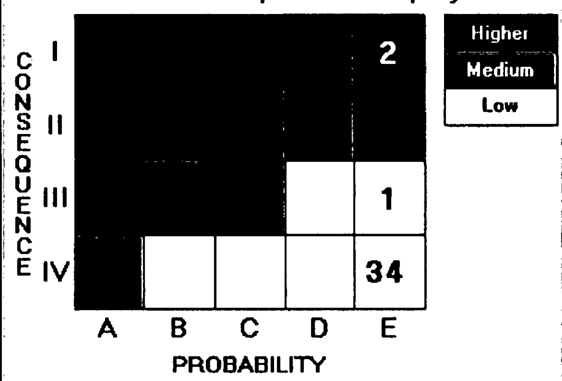

Drilling	
Exploration	
ALARP?	
Action Item/s?	
Project File :	BeardieDeepened1.mdb

HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 34

Project : Beardie-1	**Event No. :** 15

System/Operation : Well program execution

Event : Mud-gas separator fails while under pressure & fire results

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

No comments were recorded.

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HIR Apac	Hazard Identification & Risk Assessment Register	Date : 12/06/2002 Page No. : 35

Project : Beardie-1 **Event No. :** 16

System/Operation : Well program execution

Event : High pressure hose/chicksan/fitting failure

Causes :

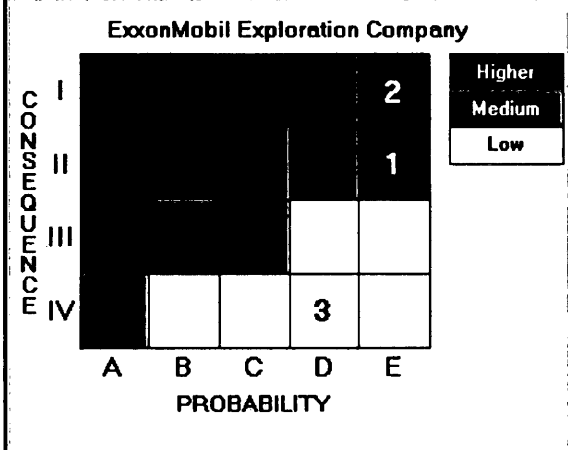
Pressure rating exceeded
Equipment damaged or worn or corroded
Connection failure
Wrong fitting/ mismatched union
Operator error
Piping not restrained
Improper makeup
Ineffective maintenance
Manufacturing defect
Inadequate supervision
Procedural error

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (LTI)	Health/Safety	II	E
2	Fatality	Health/Safety	I	E
3	Damage to assets/Delay to project	Financial	IV	D

Risk Controls :

PREVENTION:
Equipment specification
Manufacturing QA/QC
Contractor interface management re compatibility of equipment
Permit to work procedures
Maintenance, inspection, testing procedures
Use of appropriate equipment (in test)
JSAs
Selection of trained personnel
Job-specific pressure testing procedures
Use of calibrated pressure gauges
Clear communications

MITIGATION:
Minimise personnel in area
Barriers, warning signage
PPE
ERP
On site medic/hospital
Bunding spill catching
OSR plan
Non-hazardous fluids used for pressure testing
Use of appropriate pipe and hose restraints



Drilling	
Exploration	
ALARP?	
Action Item/s?	

Project File : BeardieDeepened1.mdb

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HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 36

Project : Beardie-1 — **Event No. :** 16

System/Operation : Well program execution

Event : High pressure hose/chicksan/fitting failure

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

No comments were recorded.

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Hazard Identification & Risk Assessment Register

HIR Apac

Date : 12/06/2002
Page No. : 37

Project : Beardie-1 | **Event No. :** 17

System/Operation : Well program execution

Event : Dropped objects during drilling operations

Causes :

(Item/load falls off forklift or crane, item falls out of derrick)
Top drive equipment failure
Unsecured hand tools
Materials fatigue, Vibration
Structural failure
Human error
Inadequately secured equipment
Overload of lifting equipment
Lifting slings/straps worn/damaged
Items falling off load
Winch failure, Draw works failure, Drill-line failure
Drill-string failure
Wireline failure, Sheave failure (including logging contractor)
Loss of control of travelling blocks

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (MTI)	Health/Safety	III	C
2	Serious injury (LTI)	Health/Safety	II	D
3	Fatality	Health/Safety	I	E
4	Loss of assets (incl damage to pontoon, well)	Financial	IV	C
5	Delay to project	Financial	IV	C

Risk Controls :

PREVENTION:
Straps/ties for hand tools
Rig and other lifting equipment inspection incl top drive
Lifting equipment testing and inspection
Work permit system
Equipment maintenance
Critical function testing
JSA
Training and supervision
Contractor and company SMS
Appropriate lifting procedures
Housekeeping procedures
Shutdown switch on travelling block
Taglines and use of signal man
Limitation on overhead work
dropped objects survey for derrick

MITIGATION:
PPE
ERP
First aid capability
Medic
Backup equipment to replace damaged items
Cover hole

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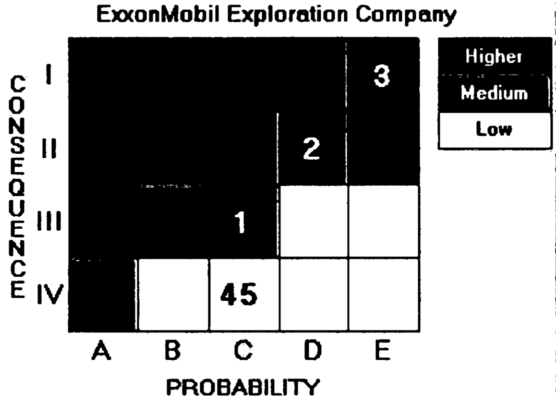

Drilling	
Exploration	
ALARP?	
Action Item/s?	One

Project File : BeardieDeepened1.mdb

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HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 38

Project : Beardie-1 — **Event No. :** 17

System/Operation : Well program execution

Event : Dropped objects during drilling operations

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

No comments were recorded.

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HIR Apac	Hazard Identification & Risk Assessment Register	Date : 12/06/2002 Page No. : 39

Project : Beardie-1 **Event No. :** 18

System/Operation : Well program execution

Event : Premature detonation of explosives

Causes :

Stray electric current including:
- Welding machines
- earth faults
- lightning
- static electricity

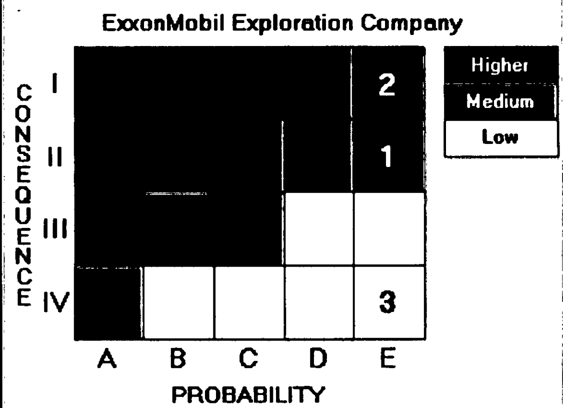
Non-compliance with storage and handling procedures
Human error
Incorrect packaging on explosives
Sources of EMR including:
- radar (from aircraft and naval vessels)
- radio communications
- antennae-bearing devices.
- mobile phones

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (LTI)	Health/Safety	II	E
2	Fatality	Health/Safety	I	E
3	Delay to project, Loss of assets	Financial	IV	E

Risk Controls :

PREVENTION:
Stray current and EMR monitoring before explosive is armed.
Special explosives work permit (to control hazards from EMR and stray currents)
Drilling and contractor procedures cover radio silence requirements and hot-work during explosives activities.
JSAs
Pre job safety meeting
Visual indications for helicopter landing
Training of specialist contractor personnel and rig crew/radio operator
Minimise use of explosives
Licensed explosives handler
Adequate supervision
No arming of explosives during lightning
Designated smoking areas
Mobile phones controlled on rig during drilling operations (procedure, induction)
Contractor management
Notification of naval movements
EM Explosives checklist completed by Schlumberger

MITIGATION:
ERP
On-site medic/hospital
Minimal personnel during explosives activities



Drilling	
Exploration	
ALARP?	
Action Item/s?	

Project File : BeardieDeepened1.mdb

HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 40

Project : Beardie-1	**Event No. :** 18

System/Operation : Well program execution

Event : Premature detonation of explosives

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

No comments were recorded.

HIR Apac	Hazard Identification & Risk Assessment Register	Date : 12/06/2002 Page No. : 41

Project : Beardie-1	**Event No. :** 19

System/Operation : Well program execution

Event : Fall from heights

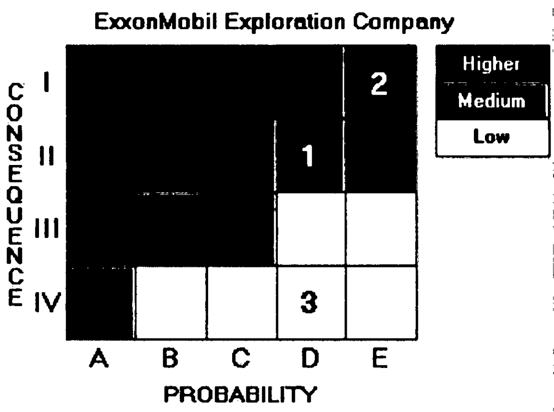
Causes :
Incorrect or inadequate procedures
Inadequate training
Failure of height safety equipment
Inadequate job design
Adverse weather
Human error

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (LTI)	Health/Safety	II	D
2	Fatality	Health/Safety	I	E
3	Delay to project	Financial	IV	D

Risk Controls :

PREVENTION
Hand rails/kick plates located in normal walking and access areas.
All hand rails conform to required specifications.
Personnel are required to conform to the ExxonMobil height safety standards for work outside hand rail areas.
Adequate supervision
Compliance with height safety standards.
Personnel are trained in the knowledge and use of height safety standards.
Appropriate specification and selection of equipment
Pre-job safety meeting
Selection of trained personnel
Pre-job inspection of all hoist equipment
Adequate communications during manhoist
Minimise work at heights
6 point harness is required
Secondary fall protection program
Personnel transfer procedures to-from boats (Billy Pugh)

MITIGATION
Fall arrest devices where applicable
First aid capability at site
ERP incl medical evacuation if required



Drilling	
Exploration	
ALARP?	
Action Item/s?	One
Project File :	BeardieDeepened1.mdb

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HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 42

Project : Beardie-1	**Event No. :** 19

System/Operation : Well program execution

Event : Fall from heights

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

No comments were recorded.

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HIR Apac	Hazard Identification & Risk Assessment Register	Date : 12/06/2002 Page No. : 43

Project : Beardie-1	**Event No. :** 20

System/Operation : Well program execution

Event : Personnel safety incident

Causes :

Slips/trips/falls/crush/pinch
Slip/walk inadvertently on rotary table
Stabbing board/scaffolding interference with top drive
Failure of tong tie-back line
Substance abuse
Prior/existing injury
Struck by object
Work with sharp objects
Foreign objects in eyes/skin (eg dust, grinding waste, caustic)
Excessive noise
Heat (burns/scalds), UV light (welding/sun)
Electrocution
Derrickman struck by travelling equipment
Man riding winch

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (First aid)	Health/Safety	IV	B
2	Injury (LTI)	Health/Safety	II	D
3	Fatality	Health/Safety	I	E
4	Delay to project	Financial	IV	C

Risk Controls :

PREVENTION:
PPE
ADU policy
Equipment maintenance and inspection
JSA
Company and contractor Safety Management Systems
Toolbox and safety meetings
Permit to work (with list of activities for Diamond Offshore)
On-site supervision
Good housekeeping
Selection of appropriate tools (JSA)
Competent personnel (skills, experience, training)
Inspection during installation and use of top drive
Dedicated manriding winches or permit when using other winches
Fall arrest device
Individual training
Fencing around and rescue ropes into pits
Induction briefing re site hazards, equipment
STOP program
Limitations on hours of work
regular safety meetings
Toolbox meetings
Incident investigation

MITIGATION:
On site medic

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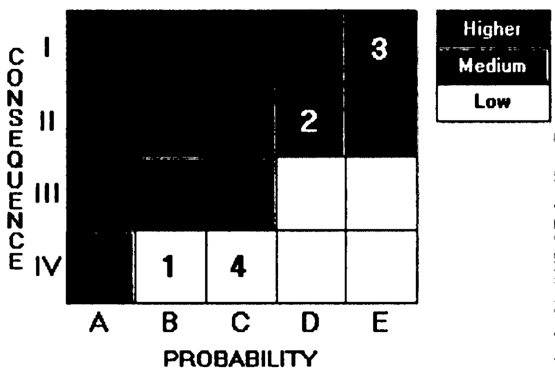

Drilling	
Exploration	
ALARP?	
Action Item/s?	
Project File : BeardieDeepened1.mdb	

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HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 44

Project : Beardie-1	**Event No. :** 20

System/Operation : Well program execution

Event : Personnel safety incident

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

No comments were recorded.

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HIR Apac	**Hazard Identification & Risk Assessment Register**	Date : 12/06/2002 Page No. : 45

Project : Beardie-1 — **Event No. :** 21

System/Operation : Well program execution

Event : Hazardous materials release

Causes :

Inappropriate packaging, storage, handling, disposal of:
- Radioactive substances
- Corrosive substances (acidic/basic)
- Toxic substances
- Carcinogenic material
- Samples in pressurised containers

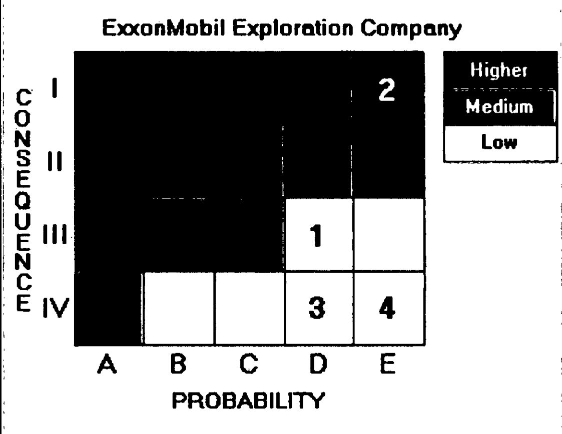
Drop of material from forklift, crane
Inappropriate labelling, Improper use/mixing, Improper storage
Transportation incident (eg forklift puncturing)
Inadequate training / communication / supervision
Failure to use PPE
Inadequate/inappropriate/ failure of PPE
Improper sampling procedures
Equipment failure

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (MTI)	Health/Safety	III	D
2	Fatality	Health/Safety	I	E
3	Release to environment	Environmental	IV	D
4	Delay to project	Financial	IV	E

Risk Controls :

PREVENTION:
Safe handling procedures
JSA
Appropriate storage procedures covering isolation and security
Appropriate containers, labelling
Hazard register
MSDSs
Site safety program
Haz Mat training / DG training
Permit to work (eg radioactive materials)
PPE
Restricted areas
Procedures by contractors for handling, disposal
Procedures that minimise use of hazardous materials and exposure times
Waste management plan incl briefing in induction
Personal and area monitoring (for radioactive materials)
Work permit system

MITIGATION:
First aid (incl on-site neutralising agents)
Emergency eye wash and shower
MSDSs
Recovery and disposal of radioactive material
ERP



Drilling	
Exploration	
ALARP?	
Action Item/s?	One
Project File :	BeardieDeepened1.mdb

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HIR Apac	**Consequence & Probability Assessment Comments**	Date : 12/06/2002 Page No. : 46

Project : Beardie-1 | **Event No. :** 21

System/Operation : Well program execution

Event : Hazardous materials release

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

No comments were recorded.

HIR Apac	Hazard Identification & Risk Assessment Register	Date : 12/06/2002 Page No. : 47

Project : Beardie-1 **Event No. :** 22

System/Operation : Well program execution

Event : Fuel or oil spill

Causes :

Rupture or failure of line (fill up or transfer)
Rupture or failure of storage container
Pump leak
Overfill
Operator error
Failure of seals, Failure of level indicators
Failure of fuel transfer procedures, Failure of bunding
Disassembly of equipment
Failure of communication
Adverse weather

AND
Ignition source

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (FA)	Health/Safety	IV	E
2	Fatality (caused by fire)	Health/Safety	I	E
3	Release to environment	Environmental	III	D
4	Loss of assets (caused by fire), delay to project	Financial	IV	E

Risk Controls :

PREVENTION:
Procedures incl continuous manning during transfer
Continual monitoring of ullage
Equipment maintenance
Fuel transfer monitored throughout operation
Supply of spare seals
Work permit system incl JSA
Trained personnel
Anti-slip matting at refuelling areas
Adequate lighting
Fuel transfers from supply boats during daylight only
Dry break couplings
Fuel transfer line replaced annually
Communication during fuel transfer
Drip pans and oil absorbent materials
Weather limit on transfers
EM & Diamond hydrocarbon transfer checklists

MITIGATION:
On site medic/hospital
ERP (incl evacuation)
Drip pans
Bunding
Oil spill response plan incl kits on rig and boats
Fire fighting equipment
Drills

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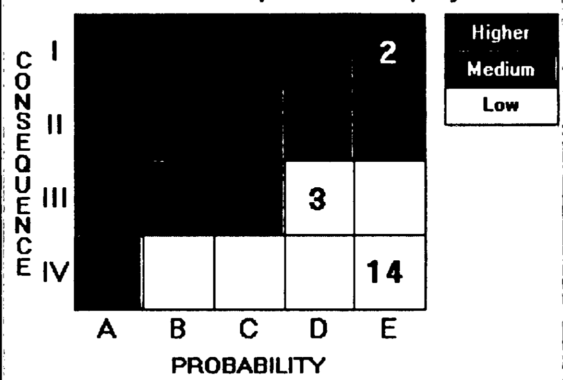

Drilling	
Exploration	
ALARP?	
Action Item/s?	One
Project File :	BeardieDeepened1.mdb

HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 48

Project : Beardie-1 **Event No. :** 22

System/Operation : Well program execution

Event : Fuel or oil spill

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

No comments were recorded.

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HIR Apac	Hazard Identification & Risk Assessment Register	Date : 12/06/2002 Page No. : 49

Project : Beardie-1 **Event No. :** 23

System/Operation : Well program execution

Event : Release of untreated sewage or waste

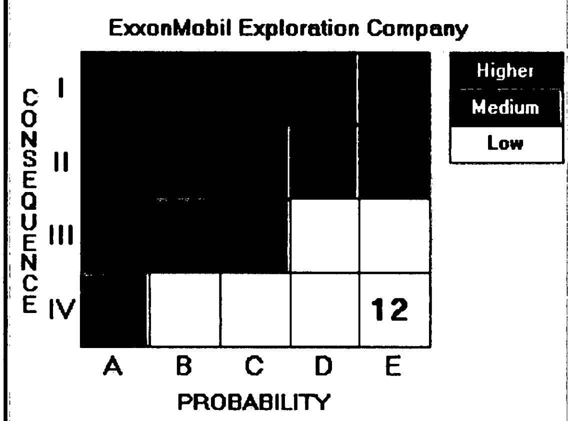
Causes :
(Paper waste, solid waste, fluid waste)

Unclear waste management procedures and policies
Lack of training
Line or container failure
Ineffective waste treatment
Operator error
Ineffective equipment maintenance and inspection
Improper storage and handling procedures

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Release to environment	Environmental	IV	E
2	Public reaction	Financial	IV	E

Risk Controls :
PREVENTION:
EM water guidelines (in medical plan)
Waste management procedures
Training
Supervision
PPE
Personal hygiene management
Environment Management Plan

MITIGATION:
First aid
Medic
ERP



Drilling	
Exploration	
ALARP?	
Action Item/s?	One
Project File :	BeardieDeepened1.mdb

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HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 50

Project : Beardie-1	**Event No. :** 23

System/Operation : Well program execution

Event : Release of untreated sewage or waste

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

No comments were recorded.

913712 193

HIR Apac	**Hazard Identification & Risk Assessment Register**	Date : 12/06/2002 Page No. : 51

Project : Beardie-1 **Event No. :** 24

System/Operation : Well program execution

Event : Accidental release of mud (incl mud cuttings discharge)

Causes :

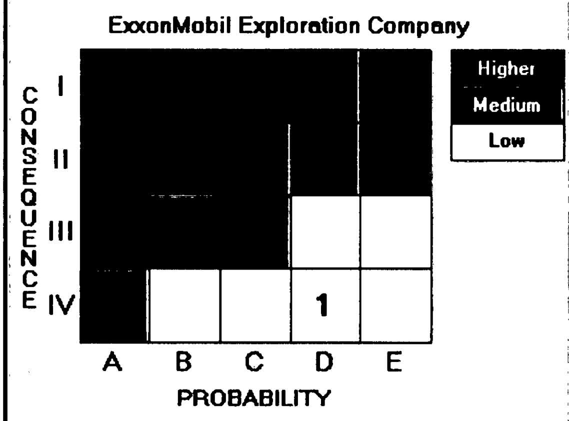
Line or container failure
Operator error
Ineffective equipment maintenance and inspection
Slip joint leak

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Release to environment	Environmental	IV	D

Risk Controls :

PREVENTION:
Design mud system
Trained personnel
Equipment tested
Use of water-based muds (not oil-based)
Inspection of slip joints

MITIGATION:



Drilling	
Exploration	
ALARP?	
Action Item/s?	

Project File : BeardieDeepened1.mdb

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HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 52

Project : Beardie-1 | **Event No. :** 24

System/Operation : Well program execution

Event : Accidental release of mud (incl mud cuttings discharge)

Consequence Assessment Comments :

Plan is to use water-based mud (KCl/PHPA/polymer) with diluted mud and cuttings discharge under these conditions permissible under regulation.

Probability Assessment Comments :

No comments were recorded.

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HIR Apac	Hazard Identification & Risk Assessment Register	Date : 12/06/2002 Page No. : 53

Project : Beardie-1 **Event No. :** 25

System/Operation : Project execution - general

Event : Civil unrest, terrorism, sabotage, criminal act, IR

Causes :

Based on experience, the only credible threat was Industrial Relations

Failure to manage public interfaces
Terrorist event (bomb threat, death threat etc) - considered non credible
Industrial espionage - considered non credible
Industrial unrest - possible
Local concerns about emissions from drilling activity - considered non credible

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Disruption to project	Financial	IV	D
2	Damage to equipment	Financial	IV	E

Risk Controls :

PREVENTION:
Global security group provide security services/controls documented in security procedures manuals
Security information/intelligence
Communications
Kidnap/ransom/extortion procedure

MITIGATION:
First aid training
ERP
Counselling services post-trauma
Passive resistance
Copies of critical documents

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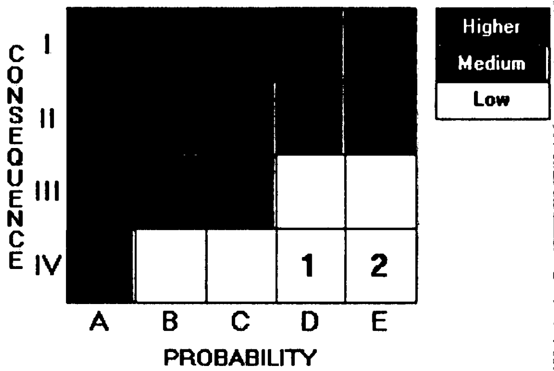

Drilling	
Exploration	
ALARP?	
Action Item/s?	
Project File :	BeardieDeepened1.mdb

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HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 54

Project : Beardie-1 **Event No. :** 25

System/Operation : Project execution - general

Event : Civil unrest, terrorism, sabotage, criminal act, IR

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

No comments were recorded.

HIR Apac	**Hazard Identification & Risk Assessment Register**	Date : 12/06/2002 Page No. : 55

Project : Beardie-1 **Event No. :** 26

System/Operation : Project execution - general

Event : Personnel contract disease/illness

Causes :

Water-borne infection
- Inadequate water standard
- Contaminated water supply
- Inadequate water purification
- Inadequate water storage
- Ineffective water testing

Blood-borne infection & STDs

Food-borne infection (eg Hepatitis A)
- Inadequate food storage/preparation/transportation
- Inadequate kitchen hygiene
- Inadequate personal hygiene/pre-existing medical condition
- Poor food quality

Air-borne infection

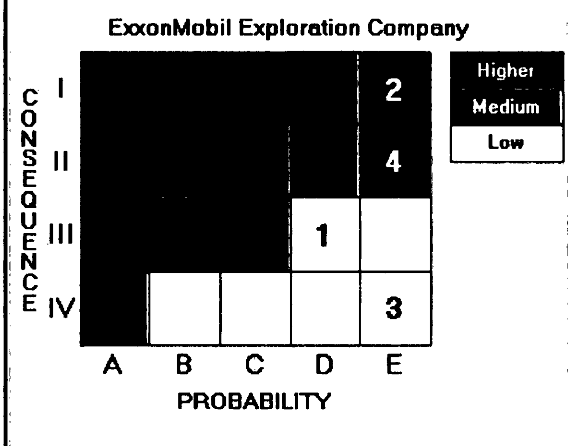
Allergies

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Illness (MTI)	Health/Safety	III	D
2	Fatality	Health/Safety	I	E
3	Delay to project	Financial	IV	E
4	Long-term personnel disability	Health/Safety	II	E

Risk Controls :

PREVENTION:
Pre-employment medical assessment for all personnel
Assessment of fitness for work
Water control protocol
Catering services program
Universal hygiene procedures (communicated during pre-startup assessment)
Medic on rig (incl specification of experience, training)
Medical equipment on site (minimum specification incl secure storage of prescription drugs)
Pre-startup assessment of facilities by OHD
Contractual fitness for work requirements
Supervision of catering, etc
Sampling of water on 3 monthly basis

MITIGATION:
ERP
On rig hospital
On rig medic
Medical evacuation



Drilling	
Exploration	
ALARP?	
Action Item/s?	One
Project File :	BeardieDeepened1.mdb

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HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 56

Project : Beardie-1	**Event No. :** 26

System/Operation : Project execution - general

Event : Personnel contract disease/illness

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

No comments were recorded.

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HIR Apac	Hazard Identification & Risk Assessment Register	Date : 12/06/2002 Page No. : 57

Project : Beardie-1 **Event No. :** 27

System/Operation : Project execution - general

Event : Person overboard (including during rig move)

Causes :

Human error
Failure to follow procedures incl PPE
Failure of PPE
Barrier/handrail failure
Incident during personnel transfer
Hypnotic effect of sea motion
Impact from suspended load
Wave action from supply vessel
Adverse weather (supply vessel)
Fall from heights
Blown off helideck
Slips trips falls
Slippery deck, poor housekeeping
Capsize of fast rescue boat

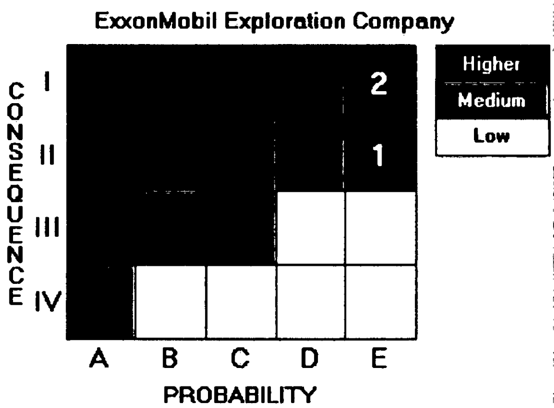
	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (LTI)	Health/Safety	II	E
2	Fatality	Health/Safety	I	E

Risk Controls :

PREVENTION

Design specifications for hand rails, integrity of decking and grating, kick plate (or toe-plate).
"Work Permit" system for work outside hand rails and in other exposed areas.
Procedures requiring use of work vest, safe scaffolding and restraining harness when working over water.
Restricted entry to exposed areas and limit work in exposed areas during heavy weather/pronounced vessel motion and daylight hours when possible.
Safe work practices developed for any work over water (i.e. Safety Meeting).
Inspection of personnel lifting devices such as personnel baskets.
Training and procedures for personnel to wear life jackets, transfers occur only in good weather, and only trained personnel operate crane lifting basket.

MITIGATION
ERP
Fast rescue vessel
Stand-by boat
Lifejackets
Immersion suits for fast rescue craft personnel



Drilling	
Exploration	
ALARP?	
Action Item/s?	Two

Project File : BeardieDeepened1.mdb

HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 58

Project : Beardie-1	**Event No. :** 27

System/Operation : Project execution - general

Event : Person overboard (including during rig move)

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

No comments were recorded.

913712 201

HIR Apac	**Hazard Identification & Risk Assessment Register**	Date : 12/06/2002 Page No. : 59

Project : Beardie-1	**Event No. :** 28

System/Operation : Project execution - general

Event : Rig structural failure

Causes :

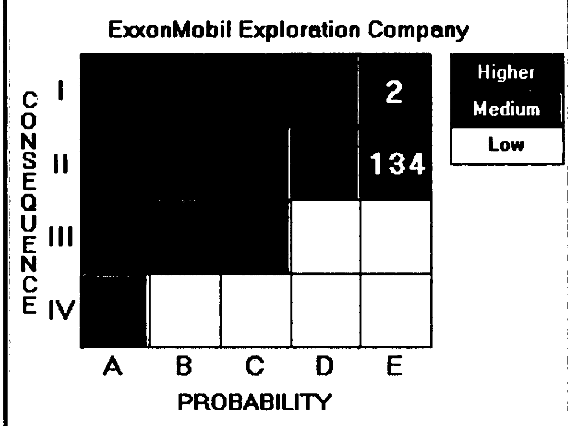
Fatigue
Corrosion
Adverse weather
Ineffective/inappropriate inspection/maintenance
Overload
Inappropriate modifications to rig
Inadequate design
Fire - explosion (incl detonation of wellhead severing tool)

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (LTI)	Health/Safety	II	E
2	Fatality	Health/Safety	I	E
3	Release to environment	Environmental	II	E
4	Delay to project / damage to assets	Financial	II	E

Risk Controls :

PREVENTION
Review operational history of rig for evidence of extensive rough weather operations in the past.
Certification Society documentation and damage stability analysis.
Marine safety inspections/surveys.
Verification of rig design by 3rd party (ABS)
Any modifications need to be approved by 3rd party (ABS)
Modification control procedures. Records of previous structural repairs and confirmation that repairs were made properly.
Daily stability checks/reports.
Work permit / JSA
Fire detection
No production testing
Metocean analysis

MITIGATION
Abandon ship drills and other safety drills.
ERP
Oil spill contingency plan.
Adequate (200%) lifeboat capacity and frequent inspection/maintenance/testing of same.
Adequate survival suits, life preservers, and other safety items.
Search and rescue plans
Emergency well control procedures.
Stand by vessels



Drilling	
Exploration	
ALARP?	
Action Item/s?	

Project File : BeardieDeepened1.mdb

913712 202

HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 60

Project : Beardie-1 **Event No. :** 28

System/Operation : Project execution - general

Event : Rig structural failure

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

No comments were recorded.

913712 203

HIR Apac	**Hazard Identification & Risk Assessment Register**	Date : 12/06/2002 Page No. : 61

Project : Beardie-1	**Event No. :** 29

System/Operation : Project execution - general

Event : Regulatory non-compliance

Causes :

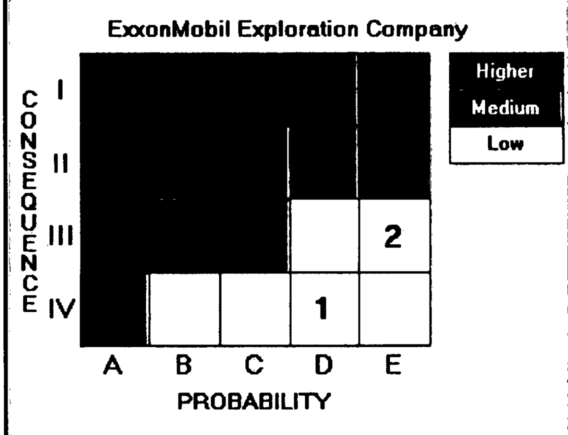
Laws/regulations not known or understood
Complexity of local regulatory requirements
Unable to obtain necessary internal/co-venturer approvals
Insufficient EAPL resource allocation
Inadequate, lost or erroneous data/information
Change of regulations
Delays to obtaining licences/permits
Human error
Immigration/customs problems
Deliberate flouting of law
Approval not within authority level
Approval process not completed
Contractor, partner regulatory problem
Poor communication

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Delay to project	Financial	IV	D
2	Fines	Financial	III	E

Risk Controls :

PREVENTION:
Regulatory database and deadline monitoring system (OIMS 4-2)
Regulatory compliance plan
Early/ongoing dialogue with regulators
Awareness of internal government processes
Influence of regulatory process
Formal approval of non-compliance
Subscription to regulatory advisory/monitoring services (by drilling contractor)
Training
Involvement by regulator in planning process
Awareness of vessel safety case, bridging document

MITIGATION:
Legal defence
Close liaison with regulator



Drilling	
Exploration	
ALARP?	
Action Item/s?	

Project File : BeardieDeepened1.mdb

913712 204

HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 62

Project : Beardie-1	**Event No. :** 29

System/Operation : Project execution - general

Event : Regulatory non-compliance

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

No comments were recorded.

HIR Apac

Hazard Identification & Risk Assessment Register

Date : 12/06/2002
Page No. : 63

Project : Beardie-1 | **Event No. :** 30

System/Operation : Project execution - general

Event : Natural disaster

Causes :
Lightning
High winds
High seas

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (MTI)	Health/Safety	III	E
2	Fatality	Health/Safety	I	E
3	Loss of assets	Financial	III	E
4	Delay to project	Financial	IV	E

Risk Controls :
PREVENTION:
Lightning conductors
Weather forecast
Vessel design criteria
Mooring analysis
Metocean analysis

MITIGATION:
ERP
Rig design incl lightning protection devices
Fire fighting equipment
Aviation policy limit on wind speed
Wind speed limit on crane operations
Medic

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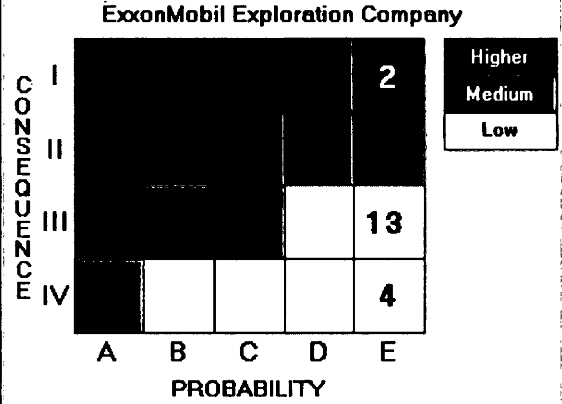

Drilling	
Exploration	
ALARP?	
Action Item/s?	

Project File : BeardieDeepened1.mdb

HIR Apac	Consequence & Probability Assessment Comments	Date : 12/06/2002 Page No. : 64

Project : Beardie-1	**Event No. :** 30

System/Operation : Project execution - general

Event : Natural disaster

Consequence Assessment Comments :

No comments were recorded.

Probability Assessment Comments :

No comments were recorded.

HIR Apac

Risk Rank

Project: Beardie-1 | **Consequence Type:** All | **Rank Mode:** Risk (All risks for each event)

Rank No.	Event No.	System/Operation	Event	Consequence	Consequence Type	C Cat.	P Cat.	Risk	Risk Level
1	4	Mooring/marine	Failure during mooring/anchor handlin..	Fatality	Health/Safety	I	D	6	Medium
2	1	Aviation transport	Helicopter flight incident	Injury (LTI)	Health/Safety	II	D	5	Medium
3	1	Aviation transport	Helicopter flight incident	Fatality	Health/Safety	I	E	5	Medium
4	1	Aviation transport	Helicopter flight incident	Damage to assets	Financial	II	E	5	Medium
5	2	Rig move	Personnel safety incident during rig ..	Injury (MTI)	Health/Safety	III	C	5	Medium
6	2	Rig move	Personnel safety incident during rig ..	Fatality	Health/Safety	I	E	5	Medium
7	3	Rig move	Failure of tow vessel/line (tow and p..	Fatality	Health/Safety	I	E	5	Medium
8	3	Rig move	Failure of tow vessel/line (tow and p..	Collision with ship / platform /..	Financial	II	D	5	Medium
9	3	Rig move	Failure of tow vessel/line (tow and p..	Damage to rig/boat, delay to pro..	Financial	II	E	5	Medium
10	4	Mooring/marine	Failure during mooring/anchor handlin..	Injury (LTI)	Health/Safety	II	D	5	Medium
11	5	Mooring/marine	Failure of lifeboat supports or launc..	Injury (LTI)	Health/Safety	II	E	5	Medium
12	5	Mooring/marine	Failure of lifeboat supports or launc..	Fatality	Health/Safety	I	E	5	Medium
13	6	Mooring/marine	Supply vessel collision with rig	Fatality	Health/Safety	I	E	5	Medium
14	7	Mooring/marine	Rig ballast system failure	Injury (LTI)	Health/Safety	II	E	5	Medium
15	7	Mooring/marine	Rig ballast system failure	Fatality	Health/Safety	I	E	5	Medium
16	8	Well Program Executio..	Excess gas in riser	Fatality	Health/Safety	I	E	5	Medium
17	9	Well program executio..	Mooring failure during drilling opera..	Fatality	Health/Safety	I	E	5	Medium
18	10	Well program executio..	Shallow gas release	Fatality	Health/Safety	I	E	5	Medium
19	11	Well program executio..	Blowout with BOP installed	Injury (LTI)	Health/Safety	II	E	5	Medium
20	11	Well program executio..	Blowout with BOP installed	Fatality	Health/Safety	I	E	5	Medium
21	11	Well program executio..	Blowout with BOP installed	Loss of assets or delay to proje..	Financial	II	E	5	Medium
22	11	Well program executio..	Blowout with BOP installed	Release to environment	Environmental	II	E	5	Medium
23	11	Well program executio..	Blowout with BOP installed	Public reaction	Public disrupt	I	E	5	Medium
24	12	Well program executio..	Annular flow around surface casing in..	Fatality	Health/Safety	I	E	5	Medium
25	12	Well program executio..	Annular flow around surface casing in..	Loss of assets or delay to proje..	Financial	II	E	5	Medium
26	13	Well program executio..	Underground flow	Loss of asset (incl reservoir da..	Financial	II	E	5	Medium
27	14	Well program executio..	Dropped BOP/riser	Injury (LTI)	Health/Safety	II	D	5	Medium
28	14	Well program executio..	Dropped BOP/riser	Fatality	Health/Safety	I	E	5	Medium
29	14	Well program executio..	Dropped BOP/riser	Delay to project	Financial	II	D	5	Medium
30	15	Well program executio..	Mud-gas separator fails while under p..	Fatality	Health/Safety	I	E	5	Medium
31	16	Well program executio..	High pressure hose/chicksan/fitting f..	Injury (LTI)	Health/Safety	II	E	5	Medium
32	16	Well program executio..	High pressure hose/chicksan/fitting f..	Fatality	Health/Safety	I	E	5	Medium
33	17	Well program executio..	Dropped objects during drilling opera..	Injury (MTI)	Health/Safety	III	C	5	Medium
34	17	Well program executio..	Dropped objects during drilling opera..	Serious injury (LTI)	Health/Safety	II	D	5	Medium

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HIR Apac

Risk Rank

Date :12/06/2002
Page No. : 66

Project: Beardie-1 | **Consequence Type:** All | **Rank Mode:** Risk (All risks for each event)

Rank No.	Event No.	System/Operation	Event	Consequence	Consequence Type	C Cat.	P Cat.	Risk	Risk Level
35	17	Well program executio..	Dropped objects during drilling opera..	Fatality	Health/Safety	I	E	5	Medium
36	18	Well program executio..	Premature detonation of explosives	Injury (LTI)	Health/Safety	II	E	5	Medium
37	18	Well program executio..	Premature detonation of explosives	Fatality	Health/Safety	I	E	5	Medium
38	19	Well program executio..	Fall from heights	Injury (LTI)	Health/Safety	II	D	5	Medium
39	19	Well program executio..	Fall from heights	Fatality	Health/Safety	I	E	5	Medium
40	20	Well program executio..	Personnel safety incident	Injury (LTI)	Health/Safety	II	D	5	Medium
41	20	Well program executio..	Personnel safety incident	Fatality	Health/Safety	I	E	5	Medium
42	21	Well program executio..	Hazardous materials release	Fatality	Health/Safety	I	E	5	Medium
43	22	Well program executio..	Fuel or oil spill	Fatality (caused by fire)	Health/Safety	I	E	5	Medium
44	26	Project execution - g..	Personnel contract disease/illness	Fatality	Health/Safety	I	E	5	Medium
45	26	Project execution - g..	Personnel contract disease/illness	Long-term personnel disability	Health/Safety	II	E	5	Medium
46	27	Project execution - g..	Person overboard (including during ri..	Injury (LTI)	Health/Safety	II	E	5	Medium
47	27	Project execution - g..	Person overboard (including during ri..	Fatality	Health/Safety	I	E	5	Medium
48	28	Project execution - g..	Rig structural failure	Injury (LTI)	Health/Safety	II	E	5	Medium
49	28	Project execution - g..	Rig structural failure	Fatality	Health/Safety	I	E	5	Medium
50	28	Project execution - g..	Rig structural failure	Release to environment	Environmental	II	E	5	Medium
51	28	Project execution - g..	Rig structural failure	Delay to project / damage to ass..	Financial	II	E	5	Medium
52	30	Project execution - g..	Natural disaster	Fatality	Health/Safety	I	E	5	Medium
53	3	Rig move	Failure of tow vessel/line (tow and p..	Injury (First aid)	Health/Safety	IV	C	4	Low
54	4	Mooring/marine	Failure during mooring/anchor handlin..	Anchor left behind (disruption t..	Public disrupt	III	D	4	Low
55	9	Well program executio..	Mooring failure during drilling opera..	Injury (MTI)	Health/Safety	III	D	4	Low
56	17	Well program executio..	Dropped objects during drilling opera..	Loss of assets (incl damage to p..	Financial	IV	C	4	Low
57	17	Well program executio..	Dropped objects during drilling opera..	Delay to project	Financial	IV	C	4	Low
58	20	Well program executio..	Personnel safety incident	Injury (First aid)	Health/Safety	IV	B	4	Low
59	20	Well program executio..	Personnel safety incident	Delay to project	Financial	IV	C	4	Low
60	21	Well program executio..	Hazardous materials release	Injury (MTI)	Health/Safety	III	D	4	Low
61	22	Well program executio..	Fuel or oil spill	Release to environment	Environmental	III	D	4	Low
62	26	Project execution - g..	Personnel contract disease/illness	Illness (MTI)	Health/Safety	III	D	4	Low
63	1	Aviation transport	Helicopter flight incident	Project delay	Financial	III	E	3	Low
64	4	Mooring/marine	Failure during mooring/anchor handlin..	Anchor left behind requiring ret..	Financial	IV	D	3	Low
65	6	Mooring/marine	Supply vessel collision with rig	Damage to equipment	Financial	IV	D	3	Low
66	6	Mooring/marine	Supply vessel collision with rig	Release to environment	Environmental	IV	D	3	Low
67	6	Mooring/marine	Supply vessel collision with rig	Delay to project	Financial	IV	D	3	Low
68	7	Mooring/marine	Rig ballast system failure	Loss of assets	Financial	III	E	3	Low

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Risk Rank

Date :12/06/2002

Project: Beardie-1 | **Consequence Type:** All | **Rank Mode:** Risk (All risks for each event)

Rank No.	Event No.	System/Operation	Event	Consequence	Consequence Type	C Cat.	P Cat.	Risk	Risk Level
69	7	Mooring/marine	Rig ballast system failure	Delay to project	Financial	III	E	3	Low
70	8	Well Program Executio..	Excess gas in riser	Injury (MTI)	Health/Safety	III	E	3	Low
71	8	Well Program Executio..	Excess gas in riser	Equipment damage	Financial	IV	D	3	Low
72	8	Well Program Executio..	Excess gas in riser	Project delay	Financial	IV	D	3	Low
73	9	Well program executio..	Mooring failure during drilling opera..	Damage to equipment	Financial	III	E	3	Low
74	12	Well program executio..	Annular flow around surface casing in..	Release to environment	Environmental	III	E	3	Low
75	13	Well program executio..	Underground flow	Delay to project	Financial	III	E	3	Low
76	15	Well program executio..	Mud-gas separator fails while under p..	Injury (MTI)	Health/Safety	III	E	3	Low
77	16	Well program executio..	High pressure hose/chicksan/fitting f..	Damage to assets/Delay to projec..	Financial	IV	D	3	Low
78	19	Well program executio..	Fall from heights	Delay to project	Financial	IV	D	3	Low
79	21	Well program executio..	Hazardous materials release	Release to environment	Environmental	IV	D	3	Low
80	24	Well program executio..	Accidental release of mud (incl mud c..	Release to environment	Environmental	IV	D	3	Low
81	25	Project execution - g..	Civil unrest, terrorism, sabotage, cr..	Disruption to project	Financial	IV	D	3	Low
82	29	Project execution - g..	Regulatory non-compliance	Delay to project	Financial	IV	D	3	Low
83	29	Project execution - g..	Regulatory non-compliance	Fines	Financial	III	E	3	Low
84	30	Project execution - g..	Natural disaster	Injury (MTI)	Health/Safety	III	E	3	Low
85	30	Project execution - g..	Natural disaster	Loss of assets	Financial	III	E	3	Low
86	1	Aviation transport	Helicopter flight incident	Public reaction	Public disrupt	IV	E	2	Low
87	2	Rig move	Personnel safety incident during rig ..	Disruption to project	Financial	IV	E	2	Low
88	4	Mooring/marine	Failure during mooring/anchor handlin..	Move off location (delay to proj..	Financial	IV	E	2	Low
89	5	Mooring/marine	Failure of lifeboat supports or launc..	Delay to project	Financial	IV	E	2	Low
90	6	Mooring/marine	Supply vessel collision with rig	Injury (First Aid)	Health/Safety	IV	E	2	Low
91	7	Mooring/marine	Rig ballast system failure	Release to environment	Environmental	IV	E	2	Low
92	9	Well program executio..	Mooring failure during drilling opera..	Delay to project (drifted off lo..	Financial	IV	E	2	Low
93	10	Well program executio..	Shallow gas release	Injury (First Aid)	Health/Safety	IV	E	2	Low
94	10	Well program executio..	Shallow gas release	Loss of assets	Financial	IV	E	2	Low
95	10	Well program executio..	Shallow gas release	Delay to project	Financial	IV	E	2	Low
96	12	Well program executio..	Annular flow around surface casing in..	Injury (First Aid)	Health/Safety	IV	E	2	Low
97	15	Well program executio..	Mud-gas separator fails while under p..	Release to environment	Environmental	IV	E	2	Low
98	15	Well program executio..	Mud-gas separator fails while under p..	Loss of asset or delay to projec..	Financial	IV	E	2	Low
99	18	Well program executio..	Premature detonation of explosives	Delay to project, Loss of assets..	Financial	IV	E	2	Low
100	21	Well program executio..	Hazardous materials release	Delay to project	Financial	IV	E	2	Low
101	22	Well program executio..	Fuel or oil spill	Injury (FA)	Health/Safety	IV	E	2	Low
102	22	Well program executio..	Fuel or oil spill	Loss of assets (caused by fire),..	Financial	IV	E	2	Low

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Risk Rank

Date :12/06/2002

Page No. : 68

Project: Beardie-1 **Consequence Type:** All **Rank Mode:** Risk (All risks for each event)

Rank No.	Event No.	System/Operation	Event	Consequence	Consequence Type	C Cat.	P Cat.	Risk	Risk Level
103	23	Well program executio..	Release of untreated sewage or waste	Release to environment	Environmental	IV	E	2	Low
104	23	Well program executio..	Release of untreated sewage or waste	Public reaction	Financial	IV	E	2	Low
105	25	Project execution - g..	Civil unrest, terrorism, sabotage, cr..	Damage to equipment	Financial	IV	E	2	Low
106	26	Project execution - g..	Personnel contract disease/illness	Delay to project	Financial	IV	E	2	Low
107	30	Project execution - g..	Natural disaster	Delay to project	Financial	IV	E	2	Low

Beardie-1 Action Items Status Report

Action Item #	Risk Number	System	Risk	Action	Who	Initiation Date	Status	Compltn Date
1	1	Aviation transport	Helicopter flight incident	Ensure rig personnel who remain on board during tow are briefed on specific helicopter requirements during on-board induction (obtain video for offshore personnel).	FWK	15-May-02	Persons on-board during the tow will receive Beardie Information package and will attend Beardie Induction program, All persons departing the rig will be show the Esso Helicopter Briefing video.	7-Jun-02
2	1	Aviation transport	Helicopter flight incident	Alert Longford helicopter operations of possibility of helicopter movements during tow and possible medivacs. (Implications for project ERP).	FWK	15-May-02	Helicopter Operations have been and are being advised of the forthcoming Beardie-1 program, and will be advised of the tow date when this becomes available.	ongoing
3	1	Aviation transport	Helicopter flight incident	Confirm whether EM Aviation need to audit the Ocean Bounty helipad.	FWK	15-May-02	Helicopter Operations will visit the Ocean Bounty on the first flight after Esso accepts the rig, to brief helicopter handling personnel on Esso's requirements	after rig acceptance
4	1	Aviation transport	Helicopter flight incident	Ensure all contractors receive Operational Safety Plan with requirements for HUET included. Ensure HUET requirement covered in induction booklet.	GS / BB	15-May-02	HUET requirement covered in Induction Booklet. All contractors sent copy of Operations Safety Plan and Induction Booklet	19-Jun-02
5	1	Aviation transport	Helicopter flight incident	Contractors to submit details of HUET training courses undertaken by their personnel which are not currently recognised by EAPL.	Contractors	15-May-02	Major HUET training courses are recognised by Esso. The Operations Superintendent will be the final arbiter of course suitability. The need for HUET training is contained in the Induction Plan and the Beardie Operations Safety Plan. DOGC have provided list of HUET training providers 15-May-02.	15-May-02
6	3	Rig move	Failure of tow vessel/line (tow and positioning)	Consider adverse weather in rig tow planning, including the proximity of pipelines and platforms.	FWK	15-May-02	Consideration of both weather, seastate and current conditions has been included in the move program. The Ocean Bounty tow course to the Beardie-1 location is to leeward of all platforms for the predominant Bass Strait weather conditions. The tow route drawing identifies pipeline locations and crossing points. The program requires at least 2 nm clearnace from existing platforms.	15-Jul-02
7	3	Rig move	Failure of tow vessel/line (tow and positioning)	Advise Diamond to provide radar qualified person in the pilot house during rig move.	FWK	15-May-02	Requirement has been included in the Move & Mooring program	15-Jul-02
8	3	Rig move	Failure of tow vessel/line (tow and positioning)	Provide details on latest certification of primary tow bridle.	EJ	15-May-02	Certificates provided by DOGC	16-Jul-02
9	3	Rig move	Failure of tow vessel/line (tow and positioning)	Ensure that Diamond and Swire have up to date charts showing pipeline locations.	CPM	15-May-02	Drawings showing pipeline locations have been sent to Diamond, Swires and Thales Geosolutions. The tow route plan shows the pipelines and the crossing location.	15-Jul-02
10	3	Rig move	Failure of tow vessel/line (tow and positioning)	Ensure the rig move procedure includes pipeline coordinates.	CPM	15-May-02	Rig move procedure includes the locations where the planned tow route crosses existing pipelines	15-Jul-02
11	3	Rig move	Failure of tow vessel/line (tow and positioning)	Monitor seismic boat activity (due to leave area end of May).	FWK	15-May-02	The Geco Beta is expected to leave the area on ~20-Jul-2002. The rig move procedure requires contacting the Master of the Geco Beta if the seismic vessel is still operation in the Bass Strait shipping exclusion area,	15-Jul-02
12	4	Mooring/ marine	Failure during mooring/anchor handling operations	Develop anchor handling procedure with Diamond / Swire.	CPM	15-May-02	Anchor handling procedures were developed by CSO Aker Unirig and Esso, and reviewed in detail with Diamond, and Swires on 9-Jul-2002 before reviewing the mooring risks include anchor changeout.	9-Jul-02
13	8	Well Program Execution	Excess gas in riser	Ensure drilling or logging procedures take into account possibility of gas in riser; and Schlumberger record and report gas releases into the well.	CPM/ FWK/ AZ	15-May-02	This requirement has been included in Paragraph 5.3.1 of the Drilling Program	13-Jun-02

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Beardie-1 Action Items Status Report

Action Item #	Risk Number	System	Risk	Action	Who	Initiation Date	Status	Compltn Date
14	10	Well program execution	Shallow gas release	Confirm that the strategy is documented for the rig to move off location if shallow gas is encountered.	DJ	15-May-02	DOGC provided references to move off location requirements if shallow gas encountered 15-May-02	15-May-02
15	17	Well program execution	Dropped objects during drilling operations	Ensure rig side entry subs are integral 1502s not welded.	BB	15-May-02	Side entry subs reviewed and accepted.	14-Jun-02
16	19	Well program execution	Fall from heights	Ensure that the Operations Safety Plan highlights the procedure for ensuring mobile phones are controlled while on the rig.	BB	15-May-02	Section 13.0 of the Beardie Operations Safety Plan details the Mobile Phone policy.	7-Jun-02
17	21	Well program execution	Hazardous materials release	Confirm how hours of work are being managed for third party contractors (work cycle, prior jobs).	SSF	15-May-02	This will be managed at the rig using the Beardie Operations Safety Plan	11-Jun-02
18	22	Well program execution	Fuel or oil spill	Get Schlumberger to communicate with Swire to ensure that the transport documentation required by government Dangerous Goods regulations is understood.	SSF	15-May-02	Communication have been established. Movement of Dangerous Goods is covered by Marine Order 41	16-May-02
19	23	Well program execution	Release of untreated sewage or waste	Verify age and condition of Ocean Bounty fuel transfer hoses and replace if necessary.	BB	15-May-02	This verification will be made when the rig is accepted.	16-Jul-02
20	26	Project execution - general	Personnel contract disease/illness	Check with Peter Signorotto re any security advice for drilling Beardie (e.g. activists).	FWK	15-May-02	Security advice received 20-May-2002. Intelligence information does not indicate any direct or known threat to Esso activities in this region.	20-May-02
21	27	Project execution - general	Person overboard (including during rig move)	Seek OHD advice re flu shots for rig personnel.	FWK	15-May-02	OHD support flu shots for staff and crews on a volunteer basis, but cannot provide this service due to liability issues.	16-May-02
22	27	Project execution - general	Person overboard (including during rig move)	Ensure work vests used by Swire and Diamond are continuous strap type.	BB	15-May-02	This verification will be made when the rig is accepted.	16-Jul-02
23	4	Mooring/ marine	Failure during mooring/anchor handling operations	Supply three-legged slings and pre-sling the five (5) Stevpris anchors	Esso	9-Jul-02	Slings procured to pre-sling Stevpris anchors	19-Jul-02
24	4	Mooring/ marine	Failure during mooring/anchor handling operations	Supply slings and pre-sling the five (5) Offdrill II anchors	Esso	9-Jul-02	Slings used for Stevpris anchor will be reused to return Offdrill II anchors	19-Jul-02
25	4	Mooring/ marine	Failure during mooring/anchor handling operations	Consider the need for mooring jewellery for piggyback anchors.	Esso	9-Jul-02	The need for piggyback mooring as a contingency was reviewed 15-Jul-2002. It was decided that the costs & potential benefits of piggyback as a backup options were not justified. Piggyback anchors were removed as an potentail risk prevention measure in Event No. 4.	15-Jul-02
26	4	Mooring/ marine	Failure during mooring/anchor handling operations	Consider the need for additional crane operator(s) and dogmen for anchor handling transfers.	FWK	9-Jul-02	Diamond requested to provide additional crane operaors and dogmen.	15-Jul-02
27	4	Mooring/ marine	Failure during mooring/anchor handling operations	Check the chain pigtails on the Stevpris anchors and remove if they are weaker than the Ocean Bounty chain.	CSO Aker Unirig	9-Jul-02	Pigtails removed during anchor assembly as BBMT.	17-Jul-02
28	4	Mooring/ marine	Failure during mooring/anchor handling operations	Investigate staging the five (5) Stevpris anchors on West Tuna to alleviate rig crowding.	Esso	9-Jul-02	The need for additional crane drivers and dogmen, and recent history of WTN crane reliability, makes staging the anchors on WTN unattractive, as the Ocean Bounty now believe they have space to store five anchors.	15-Jul-02

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Mooring Summary

Mooring Summary

Ocean Bounty Mooring Plan for Beardie-1

Esso

THALES

Thales GeoSolutions (Australasia) Limited

DATE: 6 AUGUST 2002. BY: CHRIS MEAKIN

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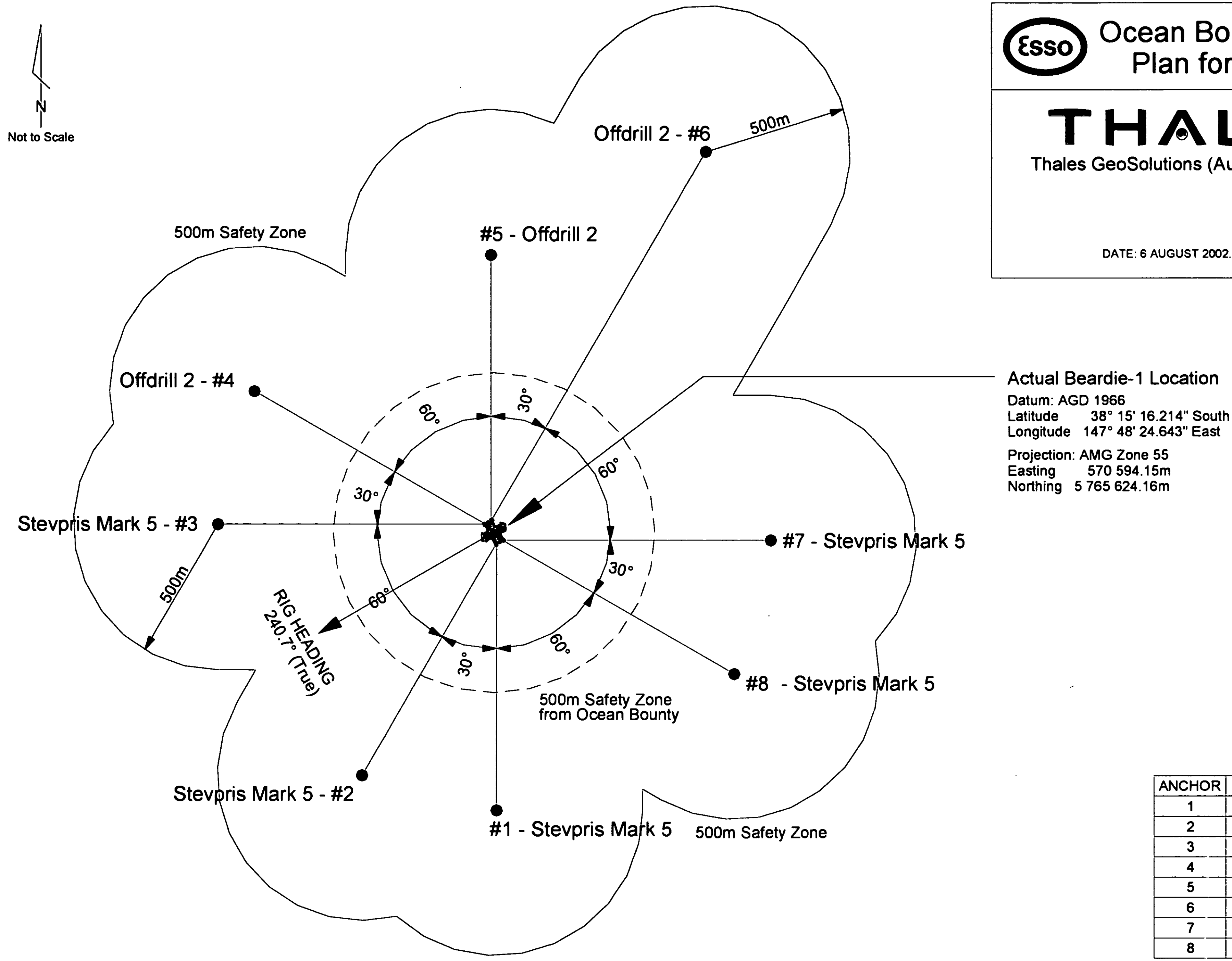


ANCHOR	HEADING	DISTANCE (ft)
1	178.8°	2 594
2	211.2°	2 888
3	270.8°	2 594
4	305.6°	2 742
5	356.0°	2 675
6	031.6°	4 981
7	090.6°	2 808
8	120.3°	2 564

GLOBAL OFFSHORE PTY.LTD

HYDROGRAPHIC SURVEYORS REPORT ON

QUALITY ASSURANCE/QUALITY CONTROL
BEARDIE -1 WELL SITE
DRILLING RIG POSITIONING

BY

ARROWSMITH MUIR & ASSOCIATES PTY.LTD.
CONSULTANT HYDROGRAPHIC SURVEYORS
11 CLONMULT AV HIGHETT VIC.3190
TEL 03 95550197 FAX 03 95559883
EMAIL:hydro@office.net .au

TABLE OF CONTENTS

INTRODUCTION

On July 07 2002 Arrowsmith Muir & Associates Pty.Ltd, Consultant Land Engineering & Hydrographic Surveyors were requested by Global Offshore Pty Ltd to provide Quality Assurances & Quality Control services for the positioning of the Drilling Rig "Ocean Bounty" at the site of Beardie- 1 drilling site Bass Strait.

This report outlines the procedures adopted and the findings of the supervising Surveyor who carried out the work.

1.0 ARRIVAL AT RIG

The Ocean Bounty was at the site of Sole-1 and on charter to OMV when the QC/QA surveyor went aboard by helicopter from Essendon Victoria Australia on the afternoon of July 23 2002. The surveyor attended the rig induction and safety course immediately after boarding and then inspected the positioning equipment installed in the Pilot House.
The rig was in the process of recovering anchors at the time, this continuing until 1700 hours on July 24th at which time ExxonMobil assumed responsibility for the charter.

2.0 POSITIONING CONTRACTOR

The positioning Contractor was "Thales Geo Solutions Group". Thales personnel had been embarked and had mobilised their equipment prior to the arrival of the QC/QA surveyor.
All positioning equipment had been installed in the Pilot House with the necessary equipment for vessel control installed on the anchor handling vessels "Pacific Conquerer" and "Pacific Sentinal"

.

2.1 POSITIONING EQUIPMENT

Positioning was being carried with Trimble 4000 series single frequency GPS receiver utilising Racal Star fix differential corrections.
Standard Racal rig positioning software was installed to provide rig position and the position of each anchor handling vessel.
A Gyro Compass was also installed and interfaced to provide heading.
A printout of the basic parameters for transformation (WGS84 to AGD66) along with the corrections from antenna to Kelly Bushing was requested and provided.
The GPS antenna was installed on the mast above the pilot house 33.9 m ahead and 0. 28 m starboard of the Kelly bushing. The location of the antenna was as good could be expected under the circumstances with only the drilling derrick obscuring the horizon .

913712-219

3.0 DRILLING LOCATION.

The Co ordinates of drilling location were provided by ExxonMobi
Drilling Department Facsimile dated 23/07/02 as:

AGD	147 deg 48' 24.63"	E Long.
	38 deg 15' 16.27"	S Lat .

AMG Zone55	E.570593.8 m .
	N.5765622.4 m.

Datum : Australian Geodetic 1966 (AGD66)
Reference Spheroid : Australian National Spheroid (ANS)

Equatorial Semi Major Axis	6378160 metres
Semi Minor Axis	6356774.719
Eccentricity Squared	0.006694542
Flattening	298.25

Projection : Universal Transverse Mercator (UTM)

AMG Zone 55	
Central Meridan (CM)	147deg E
Scale Factor at CM	0.99996
False Easting	500,000m
False Northing	10,000,000m

The above co-ordinate values provided were checked for Geographic to Grid conversion prior to the surveyor going to site and the following results derived.

	AGD 147deg48'24.63"E
	38deg15'16.27"S
converted to	E. 570593.819 m
	N. 5765622.423 m

As the geographicals were quoted to 0.01 seconds of arc this conversion was considered satisfactory. (one second of arc at Latitude 38 south is 30.82 metres)

3.1 CONTRACTORS VALUES

The Positioning Contractor provided a copy of his values (Document TGA-3216-PGP Page12 &16) and these were verified as being the same as those provided to the surveyor prior to him going to the site.
A copy of the GPS (WGS84 spheroid to ANS 66) transformation parameters as quoted in Thales Project Quality Plan Document TGA-3410-PQP Rev.0
were requested as a printout from the system configuration file

DX	123.314
DY	47.223
DZ	-136.594
ROT.X	0.2640"
ROT.Y	0.3220"
ROT.Z	0.2700"
SCALE	1.3840.

It was noted at the time that the above 7 parameter shift was different from that as provided by the State Mapping Authority however the above values are considered as applicable to the Gippsland Oilfield area and had been in use since the mid 1990's

3.2 TOW TO BEARDIE-1 SITE.

The tow to the Beardie Site commenced at 1700 hours July 24 th and followed the course as shown in appendex 1 Fixes were taken along the route at 15 minute intervals (approx 1800 metres at towing speed)
The rig arrived at the first proposed anchor location at 0815 hours on 25/7/02
with No6 anchor then being dropped at the location.
The rig then continued on to the Beardie location arriving at 0835 hours.

4.0 ANCHOR PLACEMENT;

Anchor running occupied the remainder of the first day's activities with the final anchor being in position at 1215 hours on 26/7/02..
Ballasting of the rig down to drilling depth was also carried out during the anchor running period.
All anchor chain payouts as set out in table 2.0-1 document
F-100-01-04 were achieved or exceeded.
The offdrill anchors were changed out and replaced with strevpris in accordance with paragraph 10 of the mooring and movement program
AFE No L0501B003.
A Final anchor location plan is contained in Appendix 4

4.1 PRETENSIONING.

Pretensioning of anchors was commenced at 1538 hours July 26th with the rig being maintained within 5 metres of the final position while all anchors were similtaneously tensioned to 1.5 times the working tension and held for a continuous period of 10 minutes.
On completion of pretensioning all anchor chains were then relaxed to working tension and the head trimmed to 240 degrees with the rig within 5 metres of location.

5.0 DRILLING

After the inspection of the seabed by ROV drilling was commenced.
Continuous logging of Final Location was commenced at 1725 hours at 5 second intervals and terminated on the direction ExxonMobil Party Chief at 1825 hours. July 26th
The final location was derived from a statical analysis of 720 fixes.
(see appendix 4)
The survey positioning contractor was then requested to dismantle his equipment with the view to departing the rig the next morning.

6.0 FINAL LOCATION

The final Location in terms of AGD 66 is:

38deg 15' 16.214" S
147deg 48' 24.643" E

AMG Zone 55
E.570594.15
N.5765624.16
Heading 240.7 deg true

6.1 INDEPENDENT VERIFICATION OF FINAL CO-ORDINATES.

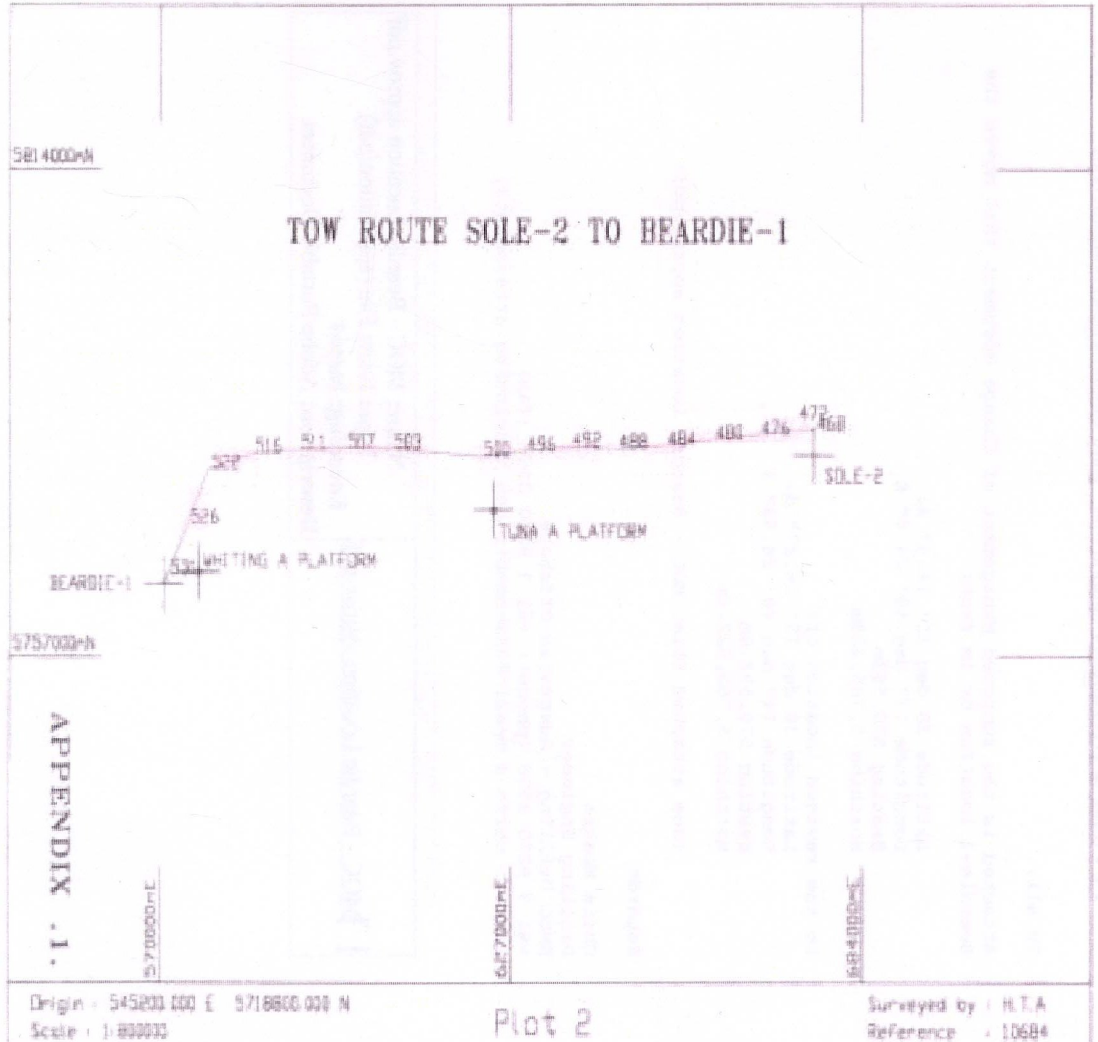
On the morning of July 27th GPS co-ordinates were observed on the centre line of the rig forward and aft in order to verify the heading.
The equipment used was a handheld TRIMBLE SCOUT 8 channel GPS unit reading directly in AMG zone 55 Grid Co-ordinates. Differential corrections were received from the AMSA (Australian Maritime Safety Authority originating from Cape Schank Victoria) using a mobile beacon .
The calculated grid bearing from observed co-ordinates when corrected for convergence was calculated to be 240 deg.(True)
A point on the Starboard side of the rig west of the drill string at 35.5 metres distant and normal to centre line of the rig was also
co ordinated to confirm the drill string location.

The Co ordinates when reduced to the centre were

E. 570591.1
N. 5765622.4

This confirmed the Location of Beardie -1 well to be within the tolerance of 5 metres of the target location.
It was noted that a small movement in location of the rig had taken place in order to vertically re-enter the casing as placed. This movement took place during the period when the independant check was being carried out.
The Positioning Contractors Records were then signed off and the surveyor left the Ocean Bounty at 1100 hours July 27th.

H.T.ARROWSMITH LS
SUPERVISING SURVEYOR
ARROWSMITH MUIR & ASSOCIATES PTY.LTD.



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Subject: 1m Change to Beardie-1 Location
Date: Tue, 23 Jul 2002 14:41:16 +1100
From: chris.p.meakin@exxonmobil.com
To: bounty_oim@dodi.com, ejacobsen@dodi.com, george.k.sharkey@exxonmobil.com, brigham.e.bigby@exxonmobil.com, norman.mackay@thales-geosolutions.com, hydro@office.net.au, brad.obrien@thales-geosolutions.com
CC: frank.w.kratzer@exxonmobil.com, andy.zannetos@exxonmobil.com

To all,

Attached is the approved Management of Change document that moves the Beardie-1 location by 1m from:

Latitude 38 deg 15' 16.3" S;
Longitude 147 deg 48' 24.6" E
Easting 570,593m
Northing 5,765,623m

to the revised location of:
Latitude 38 deg 15' 16.27" S;
Longitude 147 deg 48' 24.63" E
Easting 570,593.8m
Northing 5,765,622.4m

(See attached file: MOC - Beardie Location approv.pdf)

Regards

Chris Meakin
Drilling Engineer
EMDC Drilling - Australia Offshore
+61 3 9270 3536 (phone); +61 3 9270 3593 (fax)
E-mail: chris.p.meakin@exxonmobil.com (including attachments)

MOC - Beardie Location approv.pdf	**Name:** MOC - Beardie Location approv.pdf **Type:** Jview File (application/pdf) **Encoding:** base64 **Description:** Adobe Portable Document

APPENDIX 2

THALES

OCEAN BOUNTY ANCHOR POSITIONS

26 Jul 2002 19:39

Main Anchors

Name	Intended E	Intended N	Dropped E	Dropped N
Anchor 1	570594.21	5764667.35	570611.84	5764793.36
Anchor 2	570134.47	5764791.91	570136.73	5764832.58
Anchor 3	569645.36	5765656.39	569770.56	5765668.85
Anchor 4	569775.36	5766114.62	569889.01	5766144.84
Anchor 5	570593.39	5766577.45	570537.06	5766478.33
Anchor 6	571331.67	5766925.77	571395.24	5766952.92
Anchor 7	571542.25	5765588.40	571483.12	5765581.99
Anchor 8	571412.23	5765130.17	571295.06	5765195.82

APPENDIX . 3.

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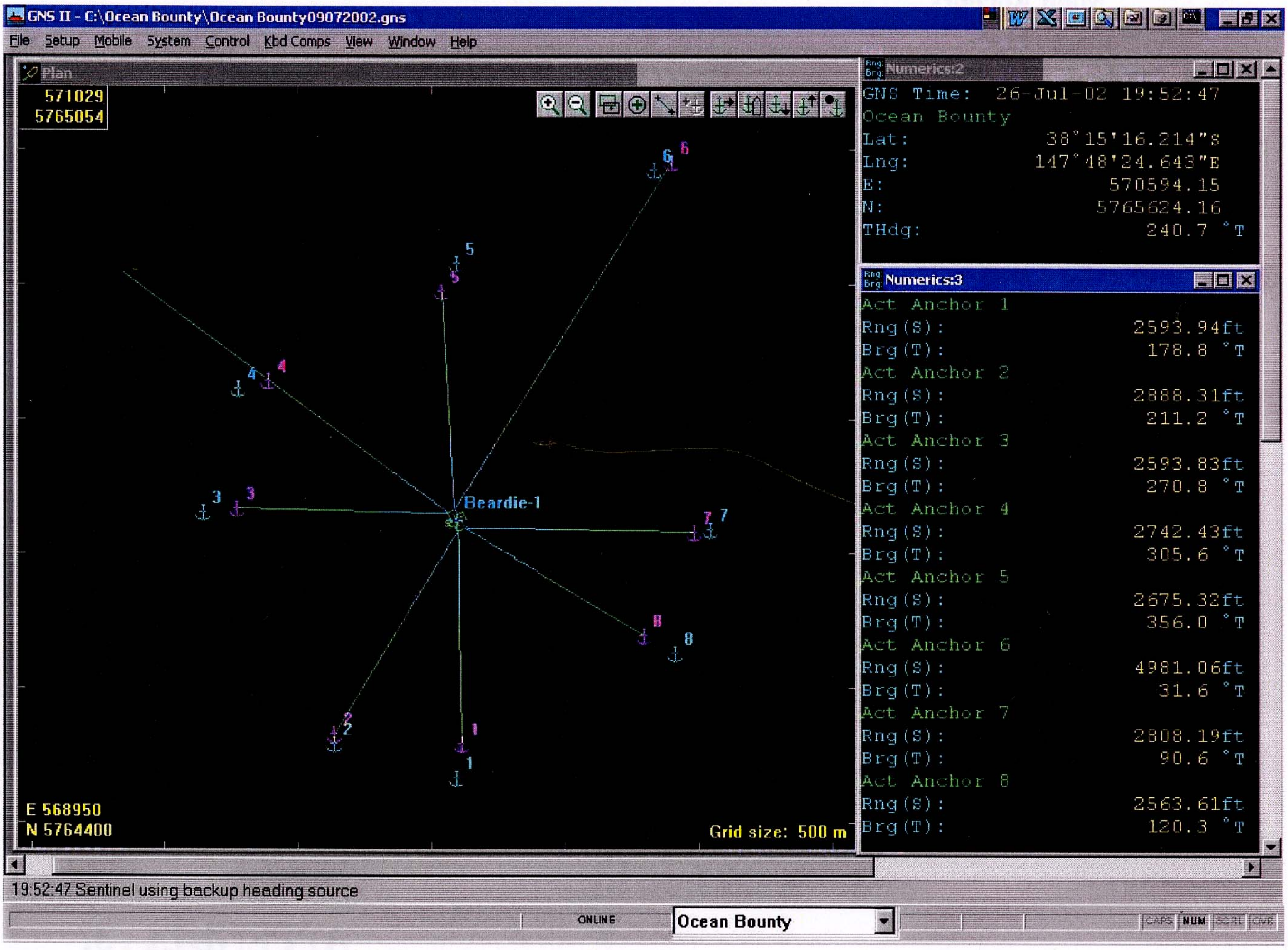

APPENDIX .3

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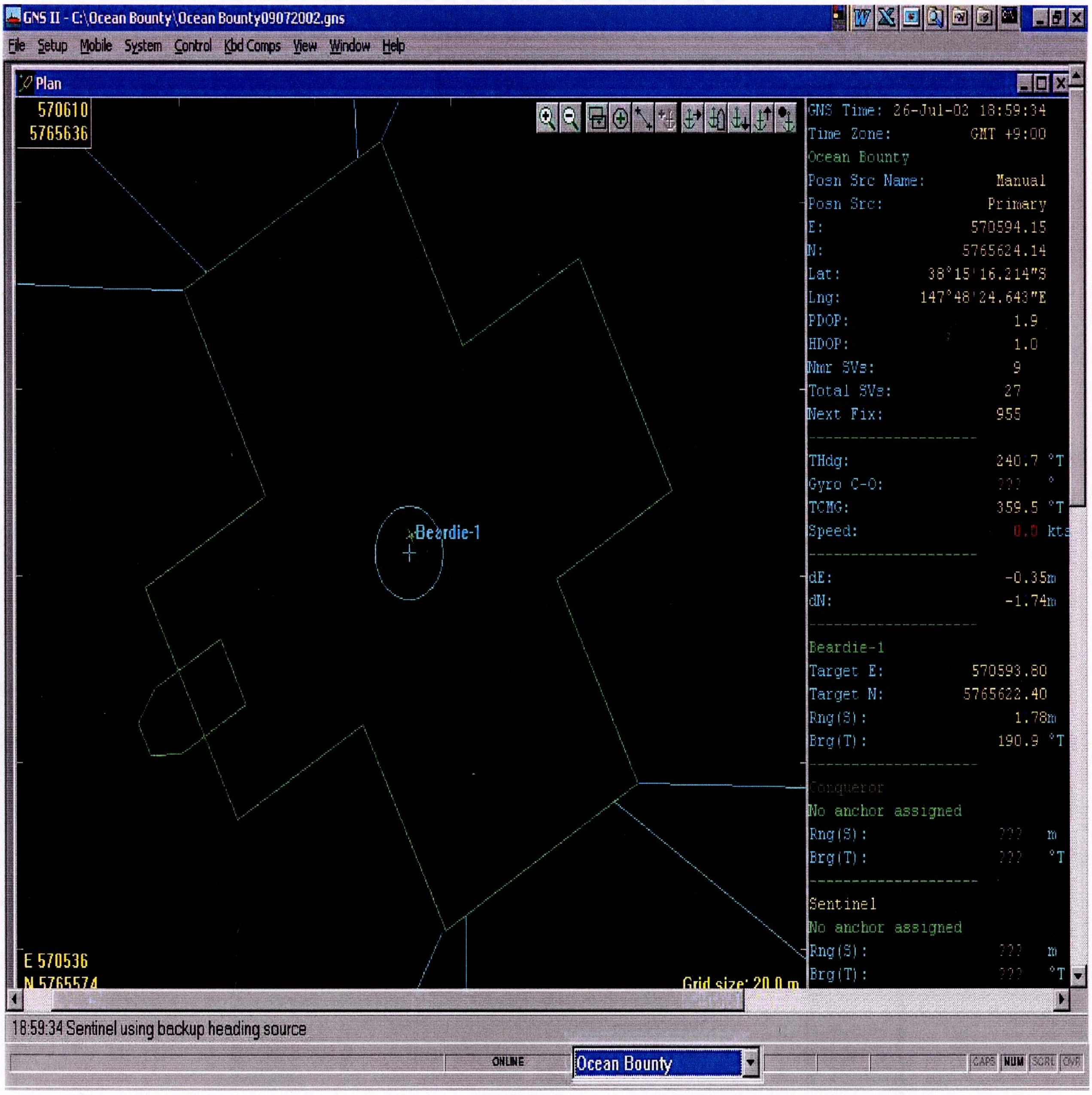

APPENDIX .4

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THALES Thales GeoSolutions Aust Ltd

FINAL POSITION FIX – DIFFERENTIAL GPS
OCEAN BOUNTY – BEARDIE-1

Job Description: Ocean Bounty to Beardie-1
Job Number: 3410A3
Thales Surveyor: N. Cowley
Client: Esso Australia Pty Ltd
Client Representative: H. Arrowsmith
Sampling started: 26 Jul 2002 17:25:33
Sampling end: 26 Jul 2002 18:25:30
Ocean Bounty

Intended datum location

Datum: AGD 1966

Latitude:	38°15'16.271"S	Longitude:	147°48'24.629"E
Projection:	AMG Zone 55		
Easting:	570593.80 m	Northing:	5765622.40 m

Final Antenna Position (T1 Thales UKOOA):

Sample size: 720 fixes used out of a total of 720.

Antenna offset

X:	0.28m	Y:	33.90m	Z:	0.00m
Range:	33.90m	Rel Brg from datum to antenna:			0.5°

Datum:	WGS 84				
Latitude:	38°15'11.244"S	Longitude:	147°48'27.997"E	Spheroidal Ht:	40.92m
Datum:	AGD 1966				
Latitude:	38°15'16.745"S	Longitude:	147°48'23.421"E	Spheroidal Ht:	49.39m
Projection:	AMG Zone 55				
Easting:	570564.32	Northing:	5765608.05	Spheroidal Ht:	49.39m

Standard deviations

Long or E:	0.29m
Lat or N:	0.31m
Height:	0.55m
Position:	0.42m

Final Datum Position

Datum: **AGD 1966**

Latitude: 38°15'16.214"S Longitude: 147°48'24.643"E

Projection: **AMG Zone 55**

Easting: 570594.15 m Northing: 5765624.16 m

Mean corrected heading:	240.7°T
SD heading:	0.1°T
Intended heading:	240.0°T
Difference from intended:	0.7°
Gyro C-O:	1.4°
Convergence:	-0.50°

Final Datum Position is 1.79m on a bearing of 10.8°T (11.3°G) from the intended location.

APPENDIX .4.

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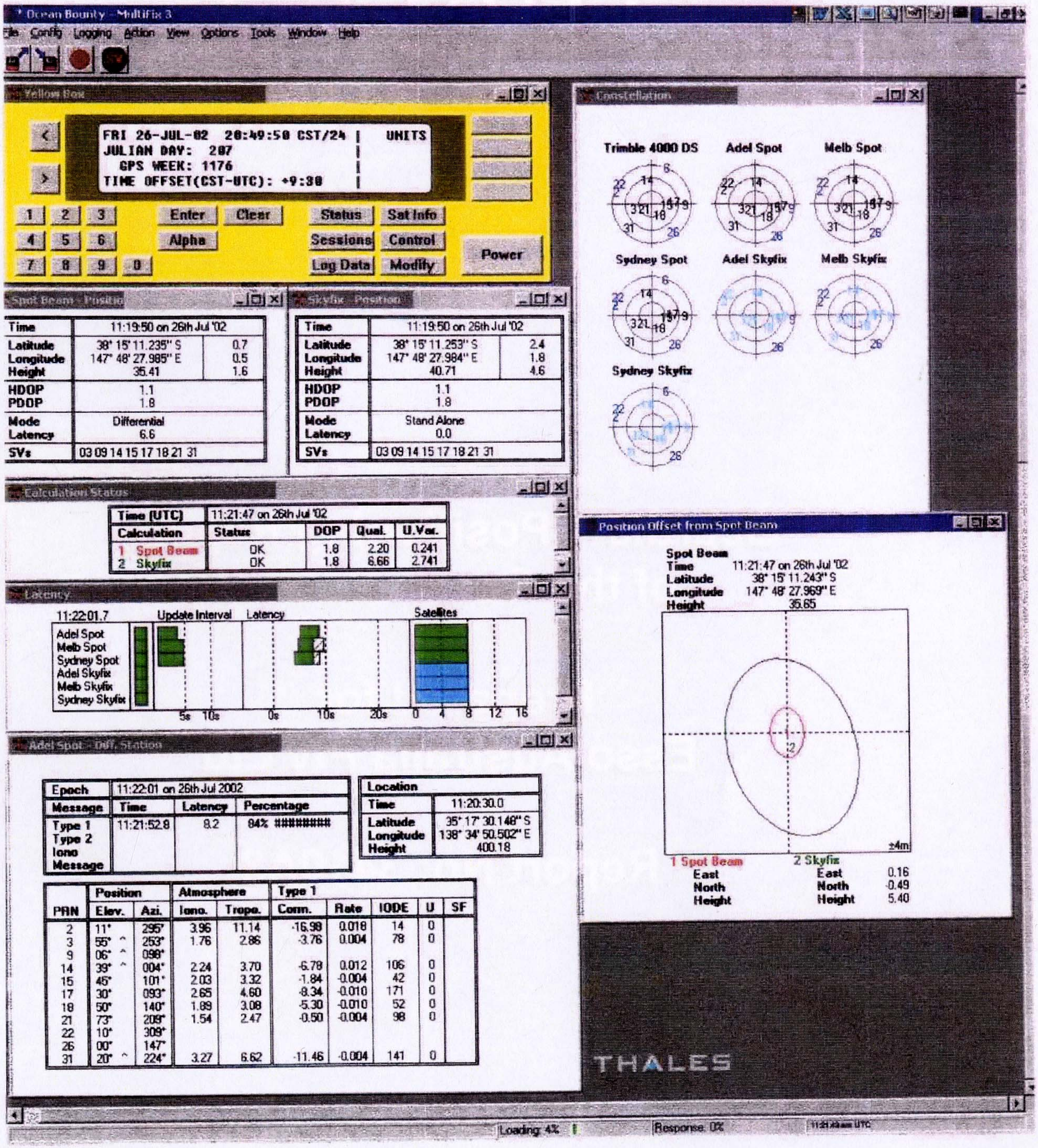

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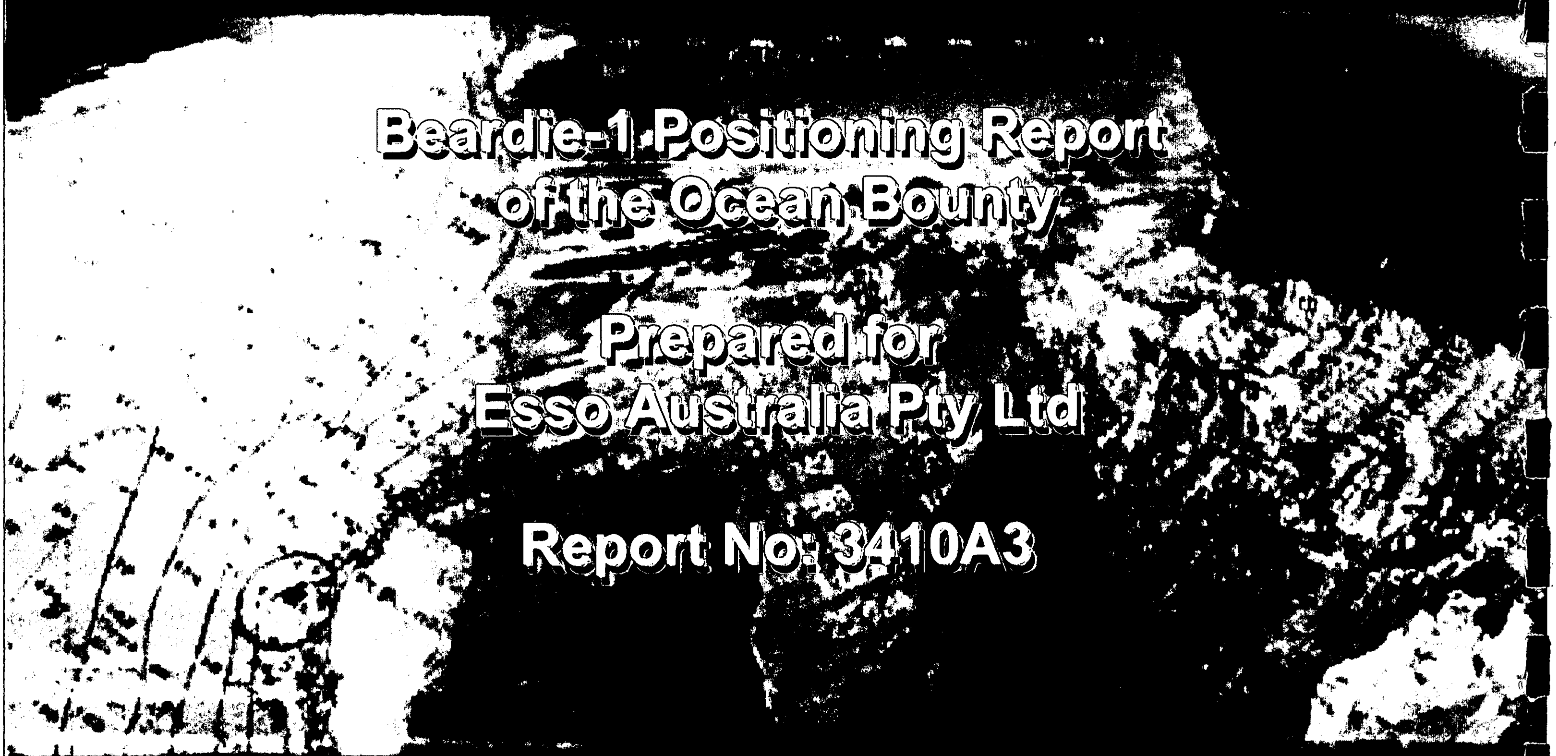

Beardie-1 Positioning Report of the Ocean Bounty

Prepared for Esso Australia Pty Ltd

Report No: 3410A3

Thales GeoSolutions (Australasia) Limited
ABN 82 000 601 909
Hydrographic House
4 Ledgar Road
BALCATTA WA 6021
Tel: +61 (0) 8 9344 7166
Fax: +61 (0) 8 9344 8783

THALES

Thales GeoSolutions (Australasia) Limited
ABN 82 000 601 909

Hydrographic House
4 Ledgar Road
Balcatta WA 6021
Tel: + 61 (0) 8 9344 7166
Fax: + 61 (0) 8 9344 8783

Prepared for

ESSO AUSTRALIA PTY LTD

DOCUMENT TITLE	:	BEARDIE-1 POSITIONING REPORT OF THE OCEAN BOUNTY
CLIENT	:	ESSO AUSTRALIA PTY LTD
LOCATION	:	GIPPSLAND BASIN, BASS STRAIT
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APPENDICES

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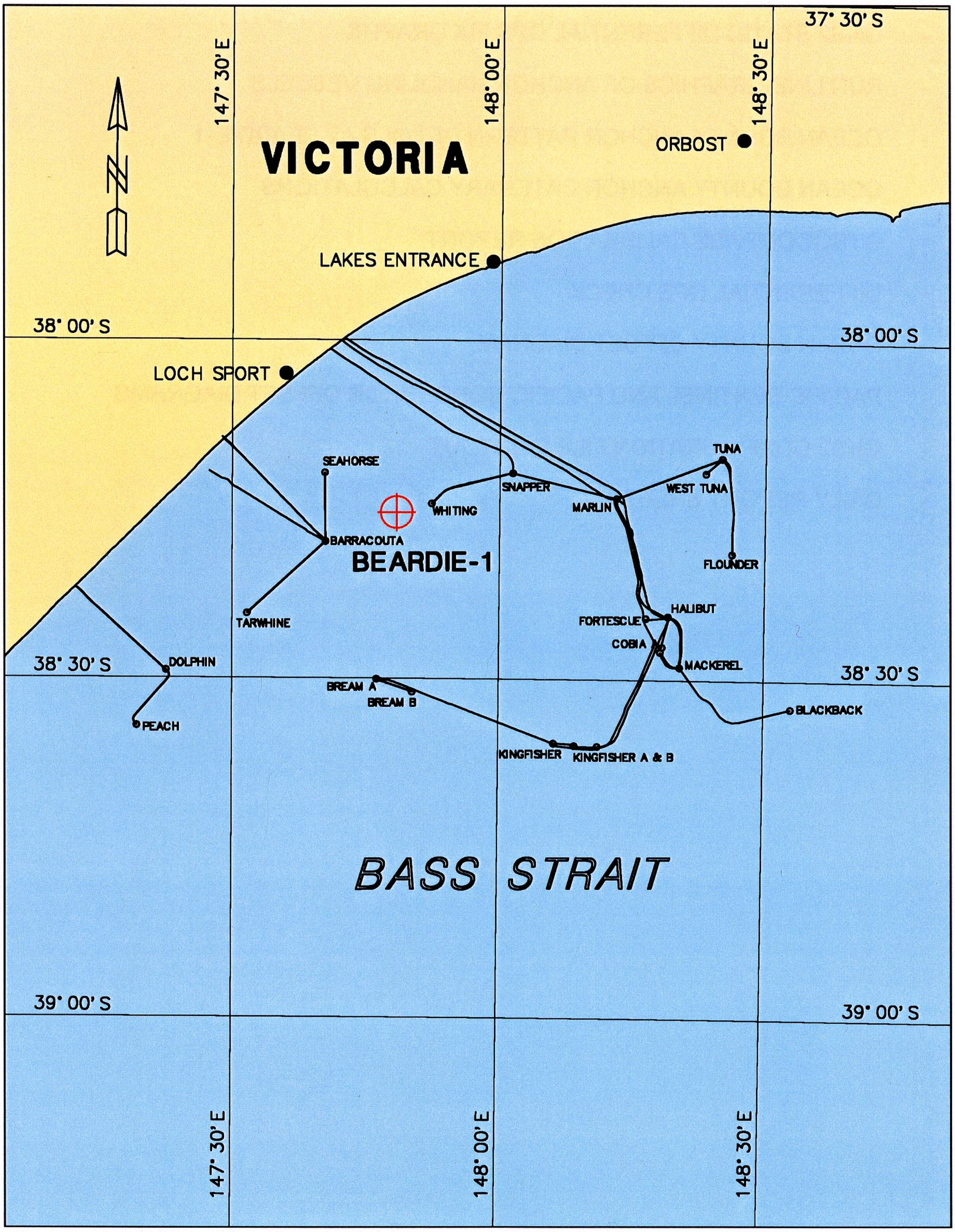
LOCATION DIAGRAM



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ABSTRACT

This report details the positioning services provided by Thales GeoSolutions (Australasia) Limited (Thales), prior to and during the positioning of the semi-submersible drilling rig Ocean Bounty at the Beardie-1 location for Esso Australia Pty Ltd (Esso).

Positioning of the Ocean Bounty during the approach to and at the Beardie-1 location was provided by Thales' SkyFix/SkyFix Spot Differential GPS (DGPS) interfaced to Thales' Multifix 3 multiple reference station positioning software and Thales' GNS2 rig move software. The two anchor handling vessels (AHVs), Pacific Sentinel and Pacific Conqueror were positioned using Thales' Tracs/Tug Display Vessel Tracking System (VTS). The Ocean Bounty was positioned at the Beardie-1 location at 1547 on 26 July 2002.

Intended Beardie-1 Location

The co-ordinates of the intended Beardie-1 location were provided by Esso as follows:

Datum: AGD66

Latitude	:	38° 15' 16.271" South
Longitude	:	147° 48' 24.629" East

Projection: AMG Zone 55, CM 147° East

Easting	:	570 593.80m
Northing	:	5 765 622.40m

Rig Positioning Tolerance : ± 5m

Intended Rig Heading : 240.0° (T)

Final Differential GPS Drillstem Position at the Beardie-1 Location

The final Differential GPS Position of the Ocean Bounty drillstem at the Beardie-1 location was computed from data observed between 1725 and 1825 on 26 July 2002. The final position is as follows:

Datum: AGD66

Latitude	:	38° 15' 16.214" South
Longitude	:	147° 48' 24.643" East

Projection: AMG Zone 55, CM 147° East

Easting	:	570 594.15m
Northing	:	5 765 624.16m

The final Differential GPS drillstem position is 1.79m on a bearing of 10.8° (T) from the intended Beardie-1 location.

Final Rig Heading : 240.7° (T)

All times quoted in this report are Eastern Standard Time (UTC + 10.0 hours).

1. RESULTS

1.1 FINAL DIFFERENTIAL GPS POSITION OF THE OCEAN BOUNTY DRILLSTEM AT THE BEARDIE-1 LOCATION

The Ocean Bounty was positioned at the Beardie-1 location at 1547 on 26 July 2002.

The final Differential GPS position of the Ocean Bounty drillstem at the Beardie-1 location, was determined using Thales' MultiFix 3 positioning software interfaced to a Trimble 4000 DS GPS receiver, with differential corrections being provided by Thales' SkyFix Spot Differential GPS services.

The final fix routine, within Thales' GNS2 rig move software version 2.35, was used to compute the final Differential GPS position of the drillstem at the Beardie-1 location. A total of 720 position fixes were recorded at 5 second intervals between 1725 and 1825 on 26 July 2002.

Refer to Appendix A for the GNS2 final Differential GPS position printouts at the Beardie-1 location. Associated graphs are located in Appendix B.

Differential corrections from the SkyFix reference stations in Melbourne, Sydney and Adelaide were used in the MultiFix 3 software computations to derive the Differential GPS position.

The final surface co-ordinates for the drillstem of the Ocean Bounty at the Beardie-1 location, determined from Differential GPS observations are as follows:

Total number of samples used = 720.

The computed antenna position is as follows:

GPS Antenna Position

Datum: WGS84

Latitude	:	38° 15' 11.244" South	(S.D. 0.29m)
Longitude	:	147° 48' 27.997" East	(S.D. 0.31m)
Ellipsoidal Height	:	40.92m	(S.D. 0.55m)

Transforming the above WGS84 co-ordinates to AGD66 co-ordinates using the parameters in section 6, gives the following antenna co-ordinates:

GPS Antenna Position

Datum: AGD66

Latitude	:	38° 15' 16.745" South
Longitude	:	147° 48' 23.421" East
Ellipsoidal Height	:	49.39m

By applying a distance of 33.90m on a bearing of 61.2° (T) from the antenna position, the following drillstem co-ordinates are calculated:

Final Differential GPS Position of the Drillstem at the Beardie-1 Location

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Datum: AGD66

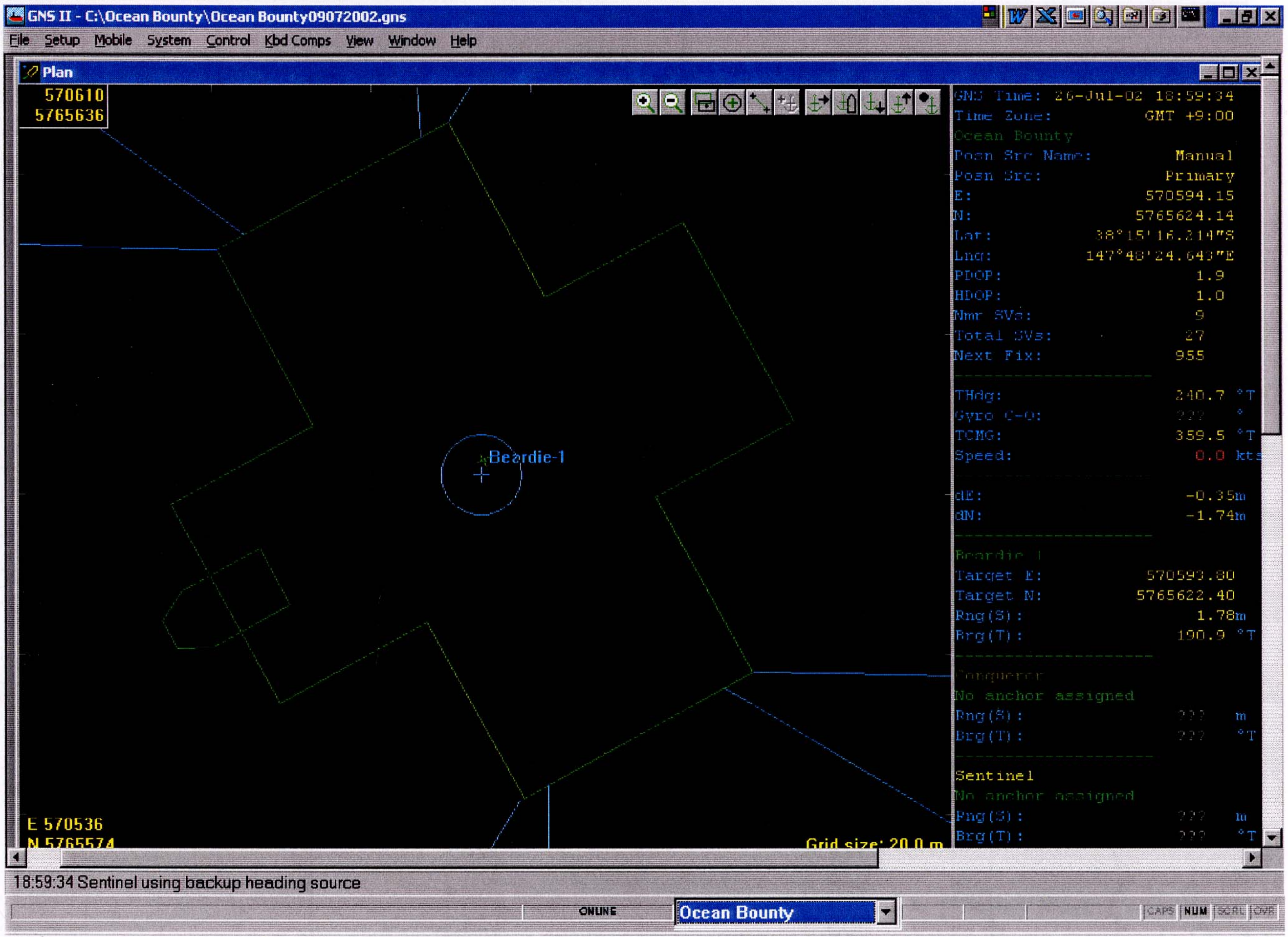
Latitude : 38° 15' 16.214" South
Longitude : 147° 48' 24.643" East

Projection: AMG Zone 55, CM 147° East

Easting : 570 594.15m
Northing : 5 765 624.16m

This final Differential GPS position of the drillstem is 1.79m on a bearing of 10.8° (T) from the intended Beardie-1 location.

Final Rig Heading : 240.7° (T)



Skyfix Spot Differential GPS Position and Intended Position at the Beardie-1 Location

1.2 OCEAN BOUNTY ANCHOR POSITIONS

Deployed anchor positions were derived from the computed anchor function within the GNS2 software. The function takes into account the length of anchor chain out, water depth, anchor tension and the wet weight of anchor chain to compute the deployed anchor positions. The final anchor positions are tabulated below:

Datum: AGD66 Projection: AMG Zone 55, CM 147° East

Anchor	Intended Anchor Position		Final Anchor Position	
	Easting (m)	Northing (m)	Easting (m)	Northing (m)
Anchor 1	570 594	5 764 667	570 612	5 764 793
Anchor 2	570 134	5 764 792	570 137	5 764 833
Anchor 3	569 645	5 765 656	569 771	5 765 669
Anchor 4	569 775	5 766 115	569 889	5 766 145
Anchor 5	570 593	5 766 577	570 537	5 766 478
Anchor 6	571 332	5 766 926	571 395	5 766 953
Anchor 7	571 542	5 765 588	571 483	5 765 582
Anchor 8	571 412	5 765 130	571 295	5 765 196

Difference of final anchor positions from the intended anchor positions.

Anchor	Dropped by	Eastings (m)	Northings (m)
Anchor 1	P.Conqueror	-18	-126
Anchor 2	P.Conqueror	-3	-41
Anchor 3	P.Conqueror	-126	-13
Anchor 4	P.Conqueror	-114	-30
Anchor 5	P.Conqueror	+56	+99
Anchor 6	Ocean Bounty	-63	-27
Anchor 7	P.Conqueror	+59	+6
Anchor 8	P.Conqueror	+117	-66

Horizontal distance and bearing from the Ocean Bounty fairleads to the final anchor positions.

Anchor	Bearing (T)	Horizontal Distance (ft)
1	178.8°	2594
2	211.2°	2888
3	270.8°	2594
4	305.6°	2742
5	356.0°	2675
6	31.6°	4981
7	90.6°	2808
8	120.3°	2564

Ocean Bounty anchor details are located in Appendices C, D and E of this report.

2. SAFETY

A pre-rig move meeting was held at Thales' Perth offices on 22 July 2002. Thales personnel B. O'Brien, and N. Cowley were present. During the meeting safety procedures were discussed including correct operation and handling of equipment. It was also confirmed that personnel had been issued with the appropriate safety equipment.

P. Wells, N. Cowley and J. Antao attended the Ocean Bounty safety induction at 1000 on 23 July 2002.

All Thales personnel attended DOGC's daily pre-tour meetings and the weekly safety meeting on 23 July 2002.

Should an incident occur, Thales' procedures require the incident to be recorded on the appropriate forms and Thales' QA & Safety Manager to be notified immediately. The QA & Safety Manager will initiate a full and thorough investigation with corrective action being introduced to prevent further incidents.

There were no incidents involving Thales personnel during this project. Thales personnel carried out their duties at all times in accordance with Company and Statutory Regulations and Guidelines.

When demobilising the Ocean Bounty, all equipment was packed securely in the designated area where it would not cause obstructions. All heavy or fragile boxes were clearly labelled to avoid accidents during handling.

A project debrief was also held at Thales' Perth offices on 30 July 2002. During the meeting the safety procedures that had been undertaken were discussed and reviewed. It was noted that all personnel had taken due care and as a result there had been no incidents.

3. SUMMARY

3.1 REQUIREMENTS

Thales GeoSolutions (Australasia) Limited were contracted by OMV Australia Pty Ltd to provide personnel and positioning equipment consisting of Thales' SkyFix/SkyFix Spot Differential GPS for the rig move of the Ocean Bounty to the Beardie-1 location.

The project requirements were as follows:

(a) Provide real-time positioning of the semi-submersible drilling rig Ocean Bounty and the anchor handling vessels Pacific Sentinel and Pacific Conqueror during the anchor recovery at the Sole-2 location.

(b) Provide real-time positioning of the semi-submersible drilling rig Ocean Bounty and the anchor handling vessels Pacific Sentinel and Pacific Conqueror, during transit to the Beardie-1 location.

(c) Differential GPS Positioning of the Ocean Bounty at the Beardie-1 location.

(d) Real-time positioning (including GNS2 fixing/logging/streaming) of the Ocean Bounty and the Pacific Sentinel and Pacific Conqueror during anchor deployment operations at the Beardie-1 location.

(e) Determine the final Differential GPS position of the Ocean Bounty drillstem at the Beardie-1 location using a Multiple Reference Station Differential GPS solution.

(f) The provision of a comprehensive positioning report containing the final Differential GPS position of the Ocean Bounty drillstem and anchors at the Beardie-1 location.

The positioning requirements were as follows:

(a) Intended Beardie-1 location was supplied by Esso as follows:

Datum: AGD66

Latitude	:	38° 15' 16.271" South
Longitude	:	147° 48' 24.629" East

Projection: AMG Zone 55, CM 147° East

Easting	:	570 593.80m
Northing	:	5 765 622.40m

(b) Positioning tolerance : ± 5m

(c) Intended rig heading : 240.0° (T)

3.2 SUMMARY OF EVENTS

All times quoted are in Eastern Standard Time (UTC + 10.0 hours).

22 July 2002

1120 Thales personnel N. Cowley and J. Antao depart from Perth Airport for Melbourne.
1745 Check in at Holiday Inn Melbourne.

23 July 2002

0545 Thales personnel P. Wells, J. Antao and N. Cowley depart Holiday Inn.
0730 Thales personnel depart Essendon Airport by helicopter for Ocean Bounty at Sole-2 location.
0850 Thales personnel, arrive on board Ocean Bounty. Make contact with Company Rep.
0900 Start safety Induction course and tour of rig.
1045 Commence mobilisation of navigation equipment.
1345 Mobilisation of navigation equipment complete.
1535 Static DGPS Check conducted. Check Position 5.05m on a bearing of 280.3° from published Sole-2 position. Difference due to anchor 7 being recovered.
1643 Commence recovery of remaining secondary anchors 1, 4 & 5.
2359 Continue recovery of remaining secondary anchors.

24 July 2002

0100 Pacific Conqueror on location, navigation equipment operational.
0125 Recovery of secondary anchors complete. Primary anchors 2, 3, 6 & 8 remaining. Anchor recovery suspended for supplies transfer from Pacific Conqueror to Ocean Bounty.
0350 Commence recovery of primary anchors.
1645 Recovery of primary anchors complete.
1655 Commence transit to Beardie-1.
1700 Ocean Bounty operations transferred from OMV to ESSO.

25 July 2002

0512 Ocean Bounty crossing pipeline Halibut export line.
0525 Ocean Bounty crossing pipeline Marlin-A export line.
0608 Ocean Bounty crossing pipeline Snapper-A platform.
0815 Anchor No. 6 on the bottom.
0835 Ocean Bounty on location.
1120 Commenced running primary anchors.
2020 Completed running primary anchors.
2115 Ocean Bounty commence balasting down operations.
2335 Ocean Bounty @ 75ft drilling draught.

26 July 2002

0355 Commenced running secondary anchors.
1420 Completed running out secondary anchors.
1547 All anchored accepted as pre-tensioned to 400kips and paying out to reduce to approx 300kips.
1620 All anchors at correct tension. Preparing to spud in.
1655 Drillstem spud in. Fix No 933. 1.91m on bearing of 5.6° (T) from intended Beardie-1 location.
1725 Commence Final fix.
1825 Complete Final fix. Drillstem at AGD66 AMG Zone 55 CM 147° East 570 594.15mE, 5 765 624.16mN. Drillstem is 1.79m on a bearing of 10.8°(T) from the intended beardie-1 location.
2000 Commence de-mobilisation.
2200 De-Mobilisation complete.

27 July 2002

1045 Depart Ocean Bounty for Melbourne Airport.
1835 Depart Melbourne for Perth.
2025 Arrive Perth.

4. EQUIPMENT ANALYSIS

4.1 EQUIPMENT PERFORMANCE

During the positioning of the semi-submersible rig Ocean Bounty from the Sole-2 location to the Beardie-1 location, no significant problems were encountered with Thales' equipment or software.

An intermittent fault was experienced with the Geopod interface box onboard the Pacific Conqueror. Thales personnel were transferred to the Pacific Conqueror and replaced the faulty unit with a spare. No downtime was attributed to this fault.

5. EQUIPMENT CHECKS AND CALIBRATIONS

5.1 DIFFERENTIAL GPS CHECK FIX

A Differential GPS check fix of the drillstem position of the Ocean Bounty at the Sole-2 location was computed using SkyFix Spot Differential GPS. 100 fixes were taken. Appendix G contains the results of the check fix of the Ocean Bounty drillstem position at the Sole-2 location.

The published Differential GPS co-ordinates of the Ocean Bounty drillstem position at the Sole-2 location are as follows:

Datum : AGD66

Latitude	:	38° 06' 18.665" South
Longitude	:	149° 00' 28.997" East

Projection : AMG Zone 55, CM 147° East

Easting	:	676 059.05m
Northing	:	5 780 595.42m

The computed Differential GPS check fix co-ordinates of the Ocean Bounty drillstem position is as follows:

Datum : AGD66

Latitude	:	38° 06' 18.636" South
Longitude	:	149° 00' 28.793" East

Projection : AMG Zone 55, CM 147° East

Easting	:	676 054.10m
Northing	:	5 780 596.43m

The Differential GPS check fix of the Ocean Bounty drillstem position is 5.05m on a bearing of 280.3°(T) from the published Ocean Bounty drillstem position at the Sole-2 location.

Note: The check fix data was compiled after recovery of anchor #7. It was found that the 5.05m difference on a bearing of 280.3° (T) from published position corresponded to the anchor #7 recovery.

The client representative reviewed all geodetic parameters and antenna offsets at which time Thales' equipment was accepted as operating correctly.

5.2 GYROCOMPASS CALIBRATION

The S.G. Brown 1000S gyrocompass installed onboard the Ocean Bounty was calibrated on 25 July 2002 using a marine sextant. A series of measurements of the horizontal angle between the centreline of the rig and the Barracouta platform were observed while accurately recording local time at the instant of each observation. The gyrocompass heading was simultaneously recorded within GNS2 data files.

A check observation was also taken to Bream A platform with similar results.

The C-O value in GNS2 was set to zero prior to conducting the gyrocompass calibration.

Observation Date : 25 July 2002

Barracouta Platform

Time	Observed Angle	Observed Easting (m)	Observed Northing (m)	Calculated Heading	Observed Heading	C-O
13:46:30	14.2°	570 533	5 765 574	261.6°	260.0°	1.6°
13:47:15	14.5°	570 533	5 765 574	261.9°	260.5°	1.4°
13:47:45	14.4°	570 534	5 765 573	261.8°	261.0°	0.8°
13:48:15	14.2°	570 536	5 765 572	261.7°	260.2°	1.5°
13:49:30	14.2°	570 540	5 765 571	261.7°	260.2°	1.5°
13:50:00	14.1°	570 541	5 765 571	261.5°	260.0°	1.5°
13:50:30	13.5°	570 542	5 765 570	260.9°	259.2°	1.7°
13:51:15	13.9°	570 543	5 765 569	261.3°	260.0°	1.3°
13:51:45	13.9°	570 545	5 765 569	261.3°	259.8°	1.5°
13:52:15	13.9°	570 545	5 765 569	261.3°	260.0°	1.3°
					Mean	**1.4°**

Bream A Platform

Time	Observed Angle	Observed Easting (m)	Observed Northing (m)	Calculated Heading	Observed Heading	C-0
13:54:00	73.2°	570 546	5 765 568	259.8°	258.5°	1.30°
13:54:30	72.8°	570 546	5 765 569	259.4°	258.2°	1.20°
					Mean	**1.25°**

Mean C-O = +1.4°

The mean C-O of +1.4° was input into the GNS2 navigation software. See Appendix F for the gyrocompass calibration results.

6. GEODETIC PARAMETERS

Co-ordinates listed in this report are referenced to the Australian Geodetic Datum 1966 (AGD66). The Global Positioning System (GPS) is referenced to the World Geodetic System 1984 (WGS84).

6.1 DATUMS

Datum	:	**AGD66**
Spheroid	:	Australian National Spheroid
Semi-major Axis (a)	:	6 378 160.000m
Semi-minor Axis (b)	:	6 356 774.719m
Eccentricity Squared (e^2)	:	0.006 694 542
Flattening ($^1/_f$)	:	298.25

Datum	:	**ITRF 92 (Epoch 1994.0) WGS84 G730**
Spheroid	:	WGS84
Semi-major Axis (a)	:	6 378 137.000m
Semi-minor Axis (b)	:	6 356 752.314m
Eccentricity Squared (e^2)	:	0.006 694 380
Flattening ($^1/_f$)	:	298.257 223 563

6.2 PROJECTION

Projection Name	:	**Australian Map Grid 1966 (AMG66)**
Projection Type	:	Universal Transverse Mercator
AMG Zone	:	55
Central Meridian (CM)	:	147° East
Scale factor on the CM	:	0.9996
False Easting	:	500 000m
False Northing	:	10 000 000m
Latitude of Origin	:	0° (Equator)
Unit of Measure	:	International Metre

6.3 DATUM TRANSFORMATION

The following 7-parameter datum transformation was used by the GNS2 software to convert WGS84 co-ordinates to AGD66 co-ordinates:

Dx	=	+123.314m
Dy	=	+47.223m
Dz	=	– 136.594m
Rx	=	+0.264"
Ry	=	+0.322"
Rz	=	+0.270"
Scale	=	+1.384 p.p.m.

The sign convention in Thales' GNS survey software used is that used by the US Department of Defense and by Higgins, where a positive rotation about the Z axis is an anti-clockwise movement of the X and Y axes (when viewed from the North Pole looking towards the center of the Earth).

7. EQUIPMENT DESCRIPTIONS

7.1 GNS2

GNS2 (General Navigation System) is Thales' third generation of On-line Navigation Survey Control software. It has been written by Thales' Software Support Group in C++ for operation under Windows® 95 or Windows® 98 or Windows® NT. GNS2 adheres to the operation and dialogue conventions of the Microsoft Windows® environment. Attention has been paid to preserving a consistent operator interface, while at the same time modifying individual dialogue boxes to reflect specific logical circumstances. It has been designed for operation with a pointing device such as a mouse or a tracker ball but control can still be effected in case of the absence or failure of such a device.

The program has the ability to accommodate a large number and variety of mobiles, including surface vessels/ships, anchor handling vessels, tugs, barges, ROVs, towfish, aircraft, vehicles and submersibles etc. The only limiting factors on the number of mobiles that can be tracked in GNS2 are the number of input/output serial communication ports available on the computer and the computer's memory.

For the input/output (I/O) of navigation and sensor data, GNS2 employs intelligent multi-channel serial communications boards to expand a computer's serial input/output facility. Currently GNS2 can support up to 26 communication (Comm) ports, which would consist of the computer's two internal Comm ports and three 8 channel serial communications boards fitted in the computer's internal expansion slots.

If Least Squares Computations (LSCs) are employed for positional calculations, whether two-dimensional (2D), three-dimensional (3D) or altitude aided, GNS2 uses standard iteration routines for the minimisation of residuals using 'variation of co-ordinate' algorithms. The number of positioning systems/computations that GNS2 can handle, is only limited by the number of I/O serial communication ports available on the computer and the computer's memory.

All input observables are accepted on interrupt. Screen updates and other internal triggers are paced to once per second but time critical activities occur at discrete moments as required.

The GNS2 application workspace can extend beyond the display area, which is normally restricted to a single monitor connected to the computer. By using one or more multiple VGA cards, an enlarged display area can spread across multiple monitors.

Currently GNS2 can display 14 different types of view windows. Several copies of the same type of view window can be invoked at any one time. This may be required when several mobiles are being tracked and a Plan, Helmsman's or Bullseye display are required for each one or when the data on several Comm ports are to be viewed simultaneously. Each window can be individually sized to optimise use of the available display area.

GNS2 can be operated in 2 modes; GNS2 Master or GNS2 Remote. GNS2 Master has the full functionality of GNS2. GNS2 Remote is run on a separate computer and allows independent configuration of the graphics display and its associated numeric information. GNS2 Remote is operated on Anchor Handling Vessels or anywhere where positional information is required. (eg. Vessel Masters, ROV Pilots, Winch Control Stations). The link between GNS2 Master and GNS2 Remote can be via a telemetry link or hard wired cable.

7.2 GLOBAL POSITIONING SYSTEM (GPS)

System Description

The NAVSTAR GPS (Navigational Satellite Timing and Ranging Global Positioning System) is a USA Military all-weather, space-based positioning system that transmits signals from a constellation of satellites orbiting the Earth. It is capable of providing suitably equipped users worldwide with accurate three-dimensional positions on, or near, the Earth's surface. The accuracy of these determined positions can vary from a few millimetres to several 10's of metres depending on the GPS receiver and on the method of data acquisition and processing. System design consists of three integrated parts: the Ground Control Segment, the Space Segment and the User Segment.

The operational space segment consists of 24 production satellites and 3 active spares; the term Space Vehicle (SV) is used as a synonym for satellite. The satellites are in high orbits, at approximately 20,200km, having an orbit period of 12 hours. They are arranged in 6 orbital planes, inclined at 55 degrees with near circular orbits. The configuration provides complete 4-satellite (3D) coverage worldwide.

GPS Observations

There are two important types of GPS observations (observables): Pseudo-range and Carrier Phase. Carrier phase is sometimes also referred to as carrier beat phase. Pseudo-range techniques are generally used for navigation. In high-precision baseline surveying the carrier phase is used. Although the (undifferenced) phase can be used directly, it has become common practice, at least in surveying applications, to process certain linear combinations of the original carrier phase observations (double differences and triple differences).

Pseudo-ranges

The pseudo-range is a measure of the distance between the satellite and the receiver at the epochs of transmission and reception of the signals. The transit time of the signals is measured by comparing (correlating) identical pseudo-random noise (PRN) codes generated by the satellite and by the receiver. A code-tracking loop within the receiver shifts the internal replica of the PRN code in time until maximum correlation occurs. The codes generated at the receiver are derived from the receiver's own clock, and the codes of the satellite transmissions are generated by the satellite system of clocks. It follows that unavoidable timing errors in both the satellite and the receiver clock will cause the measured quantity (pseudo-range) to differ from the geometric distance.

Where instantaneous positions are required, pseudo-range is the preferred observable. Given the satellite ephemeris (i.e. the position of the satellite at the epoch of transmission), there are seven unknowns: two clock errors, three receiver co-ordinates and the ionospheric and tropospheric delays. The effect of the satellite clock error is negligible for the typical navigation solution, particularly considering that the time errors are indistinguishable from the ionospheric and tropospheric delays. The satellite clocks are constantly monitored and synchronised with GPS time as maintained by the control centre. Actual offsets of the satellite clocks are approximated by polynomials in time and transmitted as part of the navigation message to the user for the correction of the measured pseudo-ranges. The ionospheric and tropospheric delays can be computed on the basis of ionospheric and tropospheric models, thus there are four unknowns left X, Y, Z and receiver clock error. These can be determined from four pseudo-ranges measured simultaneously to four GPS satellites.

Carrier Phase

The phase observable is the difference between the phase of the carrier signal of the satellite, measured at the receiver, and the phase of the local oscillator within the receiver at the epoch of measurement. This can be regarded as a biased range measurement of the satellite-receiver distance with the integer number of carrier waves being unknown. The wavelength of the L1 carrier is about 19cm. Because of the fraction of the carrier phase is measured, the term "interferometry" is often used to describe carrier phase techniques.

7.3 SKYFIX/SKYFIX SPOT DIFFERENTIAL GPS (DGPS)

Differential GPS (DGPS)

GPS is primarily a USA Defence space-based positioning system capable of operating worldwide and in all weather conditions. The USA Military can degrade the accuracy of GPS with the use of Selective Availability (SA) to control the accuracy of Pseudo-range measurements. Essentially, the user is given a false Pseudo-range for each satellite so that the resulting measurement is in error by a controlled amount. On the 1 May 2000 SA was discontinued conditionally and coincided with the successful demonstration of the ability to selectively deny GPS signals on a regional basis. SA has been set to zero and can be reinstated during periods of heightened global tension.

GPS signals are affected by several sources of positional bias, the largest of which was SA. The remaining biases of the ionosphere, the troposphere, time, satellite ephemeris and inherent reciever noise also give rise to substantial bias of position.

Differential GPS is a means by which the civil user can improve the accuracy and quality of GPS to the 1-3 metre level. It requires a receiver be located at a precisely known point from which pseudo-range corrections for each satellite can be determined and monitored. These pseudo-range corrections are then communicated by means of a telecommunications link to users at unknown locations. In the relative mode, most of the important systematic errors common to the known station and at the unknown location cancel out to improve the accuracy of the computed position.

SkyFix/SkyFix Spot Differential

<u>SkyFix</u>

Thales GeoSolutions (Australasia) Limited introduced its SkyFix Differential GPS System in Australia in February 1991, using the Inmarsat Pacific and Indian Ocean marine communications satellites as the differential data broadcast link. Extensive performance trials and projects undertaken to date have shown SkyFix to meet the best industry expectations in terms of quality of service and accuracy.

Satellite communications systems, particularly at the Inmarsat L-band frequencies of 1.5 GHz are reliable and free of the interference associated with the crowded MF/HF bands. This high data integrity gives users confidence that the corrections will be continuously received without interference.

The SkyFix Australian network comprises of reference stations at Dampier, Broome, Perth, Adelaide, Melbourne, Sydney, Cairns and Darwin.

<u>SkyFix Spot</u>

The SkyFix Spot Differential GPS System was launched in Australia in December 1994, using the OPTUS high powered focused communications satellite as the differential data broadcast link. Projects undertaken to date have shown SkyFix Spot to meet the industry expectations in terms of quality of service and accuracy.

The SkyFix Spot system has a link capacity of 1200 bits per second, similar to the SkyFix system but because it is only transmitting corrections from the Australian network an update rate of better than five seconds is achieved.

The OPTUS satellite uses the L-band frequencies of 1.5586 GHz and are very reliable and free of interference avoiding data loss associated with the crowded MF/HF bands.

The SkyFix Spot network comprises of reference stations at Dampier, Broome, Perth, Adelaide, Melbourne, Sydney, Cairns, Darwin, Alice Springs and also Ujung Pandang and Jakarta in Indonesia and Wellington, New Zealand.

The differential corrections generated at each reference station are brought via landline links to the data hub and control centre in Singapore, where the system is monitored for performance and quality. From there, a composite message containing full RTCM 104 version 2 formatted data from all reference stations are sent via dual redundant links to Satellite Earth Stations at Sentosa Island, Singapore, O.T.C. Perth, Western Australia and OPTUS, Perth, Western Australia, for uplink and broadcast over the Inmarsat Pacific and Indian Ocean Region satellites and the OPTUS Satellite.

The SkyFix/SkyFix Spot system includes a 24 hour monitoring facility to ensure the validity of data received at the control centre from the Differential GPS reference stations, and that the same data are received over the SkyFix/SkyFix Spot satellite data link.

7.4 TRIMBLE SERIES 4000 GPS RECEIVER

The Trimble Series 4000 GPS receiver is designed for moderate precision static and dynamic positioning applications. The GPS receiver provides time and three-dimensional station co-ordinates at a once-per-second update rate.

The receiver receives the civilian coded signal (C/A) from the GPS NAVSTAR satellites. The receiver automatically acquires and simultaneously tracks GPS satellites and precisely measures code phase and computes position and velocity.

Latitude, longitude and height values are output on the World Geodetic System (WGS84) Earth-centred, Earth-fixed co-ordinate system.

The receiver is designed to measure the following observables:

- Coarse/Acquisition (C/A) code Pseudo-ranges
- Rate of change of Pseudo-range
- Integrated Carrier

C/A code correlation techniques measure the propagation time of the signal from the satellite to the antenna. Latitude, longitude, height and time can be determined from measurements made from at least 4 satellites, by a process similar to triangulation.

To determine speed and heading, the receiver calculates the rate of change of Range (the range-rate) by measuring the Doppler shift of the carrier.

It is capable of receiving and processing differential corrections from other reference sources using the standard format of the Radio Technical Commission for Maritime Services, Special Committee 104 (RTCM SC-104), Version 1.0 or 2.0 protocols.

The Trimble Series 4000 GPS receiver has several options available, including internal data logging memory, event marker logging etc. and therefore may be used alone or as part of a more extensive navigation system.

7.5 MULTIFIX 3

7.5.1 System Overview

MultiFix 3 is Thales GeoSolutions third generation *multiple reference station* differential GPS (DGPS) real time position computation and quality control program. It is an integral part of the Thales SkyFix Premier service but can also be used with the standard SkyFix service. MultiFix 3 has more advanced features than its predecessor, MultiFix 2, including being able to use dual frequency receivers and form real time 'Iono-Free DGPS position solutions'.

MultiFix 3 is one of a series of programs available under the group name Zero, which includes other tools and utilities with a similar user interface and layout structure, like static and dynamic position comparison programs, a correction monitor program, a terminal program and a replay utility.

MultiFix 3 takes in Almanac, Ephemeris and Raw Code and Carrier measurements from a single or dual frequency GPS receiver (or, for replay, from logged files). It takes in RTCM SC104 Version 2 differential correction messages from one or more RTCM correction delivery systems. It also takes in RTCM Type 15 or Thales Proprietary RTCM Type 55 Ionospheric range corrections generated at selected SkyFix Premier reference stations and broadcast via the Thales global network of high (SkyFix Spot-Optus) and low (SkyFix-Inmarsat) power satellite based L-Band beams.

Key features of the program are:
- No limit on the number of RTCM correction delivery systems (data links)
- No limit on the number of RTCM differential reference stations
- No limit on the number of computations (solutions)
- Each computation can employ corrections from any combination of reference stations available
- Computations are weighted least squares with statistical evaluation based upon the UKOOA recommendations
- No limit on the number of outputs
- No limit on the number of view windows
- View windows can be customised
- Extra NMEA outputs can be defined
- TCP/IP communication via sockets for GPS, RTCM and position data transfer between networked computers

MultiFix 3 has been designed in a modular fashion such that data is passed between modules as if over a computer network. The core module MultiFix 3 performs the computation of position. Additional modules are available and more will be made available in the future. While a single computer can be used, the various modules will equally be able to be run on different computers, provided there is a network interconnection.

MultiFix 3 uses the EGM96 geoid/spheroid separation model.

The RTCM corrections that are generated at reference stations are contaminated by a variety of error components, one of which is Ionospheric delay. The Ionospheric delay is currently more variable because of greater sun spot activity. MultiFix 2 and MultiFix 3's standard computation uses the Klobuchar Ionospheric delay model. This model is updated periodically but is not responsive to the current short-term variability. MultiFix 3 has an additional calculation option when working with dual frequency receivers and in receipt of Type 15 or 55 RTCM messages. With dual frequency receivers, estimates can be made of the Ionospheric delay by examining the differences between the measurements from the two frequencies. If the same procedure for estimation of Ionospheric delay is performed at the reference stations and on the mobile, both the RTCM corrections and the pseudo-ranges can have the Ionospheric delay removed, effectively providing an Iono-Free DGPS position solution.

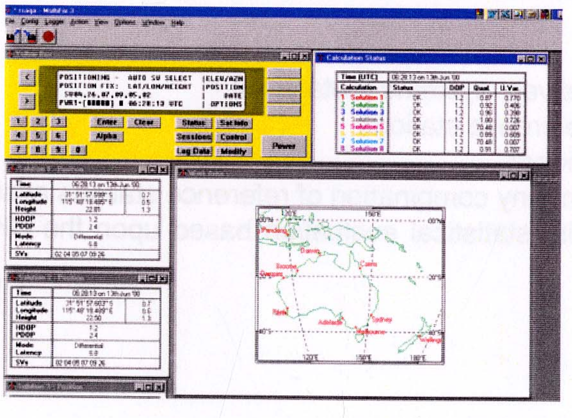
7.5.2 Hardware Requirements

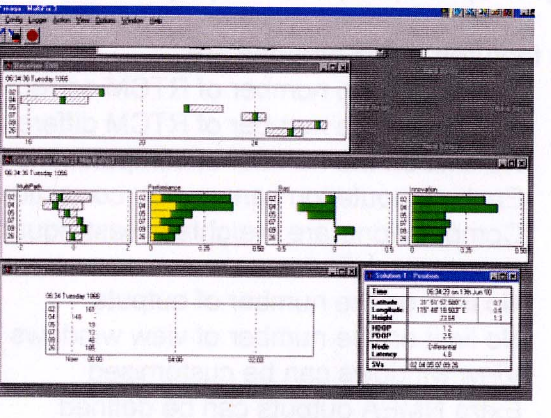
Optimum requirements for MultiFix 3 are:

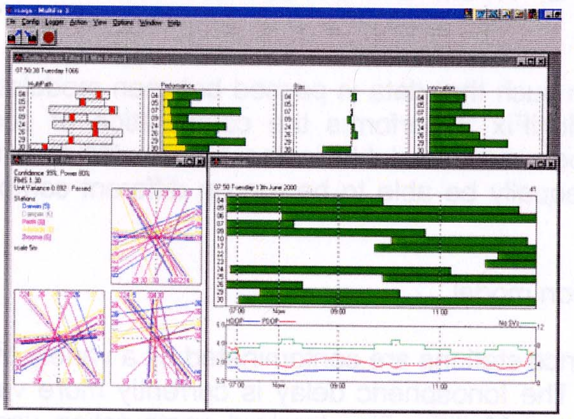
- 350 MHz Pentium II computer
- 32 Mb RAM
- Windows 95, 98 or NT operating system
- Graphics resolution of at least 800 x 600 pixels
- Intelligent multi-port serial I/O board

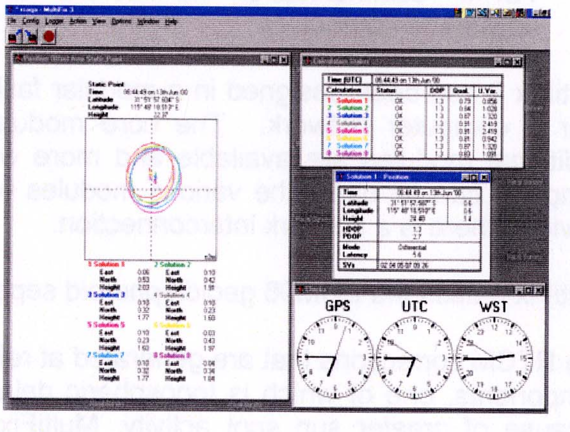
7.5.3 Positioning and Quality Control Displays

MultiFix 3 has a large number of features to accomodate the user requirements of highly accurate positions with quality control (QC) information and outputs in different formats. MultiFix 3 runs in a Windows environment, which allows the user to design a preferred screen layout by opening, sizing and placing the numerous displays that are available. Examples of the various displays can be found below.

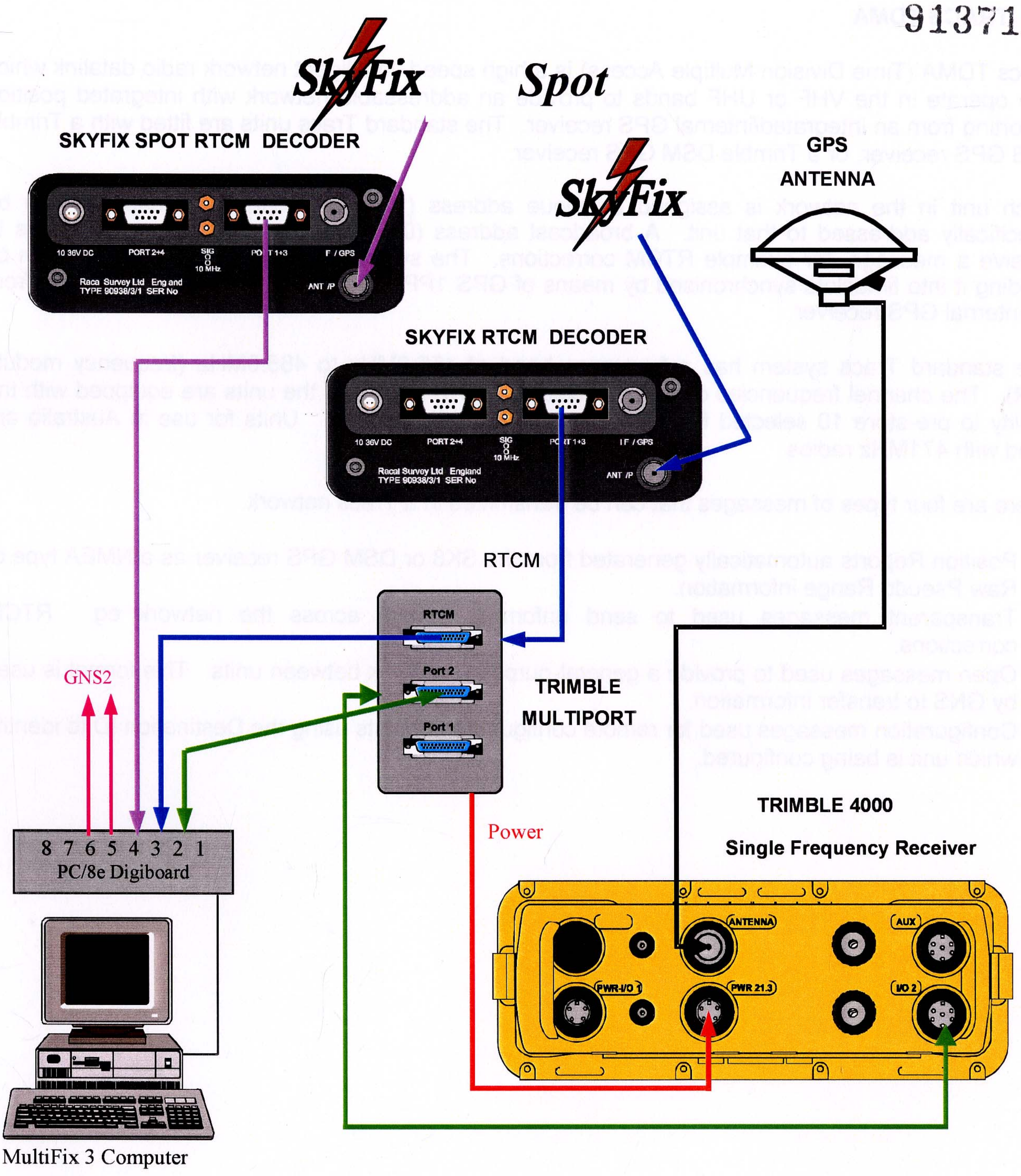








913712 254



Typical MultiFix 3 Interconnection With Trimble 4000 GPS Receiver

7.6 TRACS TDMA

Tracs TDMA (Time Division Multiple Access) is a high speed, intelligent network radio datalink which can operate in the VHF or UHF bands to provide an addressable network with integrated position reporting from an integrated/internal GPS receiver. The standard Tracs units are fitted with a Trimble SK8 GPS receiver, or a Trimble DSM GPS receiver.

Each unit in the network is assigned a unique address (1 to 255) enabling messages can be specifically addressed to that unit. A broadcast address (0) is provided to allow multiple units to receive a message, for example RTCM corrections. The system manages the data bandwidth by dividing it into timeslots synchronised by means of GPS 1PPS (pulse per second) timing pulse from an internal GPS receiver.

The standard Tracs system has a frequency band of 455.0MHz to 465.0MHz (frequency module 53R). The channel frequencies can be selected in 25kHz steps and the units are equipped with the facility to pre-store 10 selected frequencies within the 10MHz band. Units for use in Australia are fitted with 471MHz radios.

There are four types of messages that can be transmitted in a Tracs network.

- Position Reports automatically generated from the SK8 or DSM GPS receiver as a NMEA type or Raw Pseudo Range information.
- Transparent messages used to send unformatted data across the network eg. RTCM corrections.
- Open messages used to provide a general-purpose data link between units. This format is used by GNS to transfer information.
- Configuration messages used for remote configuration of units using the Destination ID to identify which unit is being configured.

7.7 S.G. BROWN 1000S GYROCOMPASS

The S.G. Brown 1000S Gyrocompass is a compact, simple-to-operate master heading reference instrument employing the effect of gravity and the earth's rotation to produce a True North reference. This reference may be read off the compass card or from a digital display and can be interfaced to the GNS2 navigation system.

The normal starting cycle of the instrument is fully automatic and is initiated when the system power supply is switched on. A fail safe control circuit is incorporated which ensures that the compass is not damaged after a power failure when power is restored; the compass will restart automatically and carry out its normal settling program.

8. PERSONNEL AND EQUIPMENT

8.1 PERSONNEL

The following personnel were employed on this project:

For : Thales GeoSolutions (Australasia) Limited

P. Wells	:	Surveyor/Team Leader
J. Antao	:	Senior Engineer
N. Cowley	:	Trainee Surveyor

For : Esso Australia Pty Ltd

H. Arrowsmith	:	Client Representative

8.2 EQUIPMENT

The following equipment was provided for this project:

Ocean Bounty

2 x Compaq Computer, inc monitor, keyboard (for GNS2 / MultiFix 3)

1 x Thales SkyFix Mini Rig Portable

3 x SkyFix/SkyFix Spot MK II Receivers

1 x Compaq Computer, inc. monitor, keyboard (for GNS2 Remote)

1 x S.G. Brown 1000S gyrocompass

1 x Uninteruptable Power Supply (UPS)

2 x Epson LX300 Printers

2 x SkyFix Spot Whip Antennae

1 x SkyFix Spot Antenna 90962/3/1

2 x Trimble 4000DS GPS Receivers

2 x SkyFix Spot Antennae

2 x Tracs Bricks

2 x Tracs Multiplexer

2 x UHF Antennae

1 x Marine Sextant

Pacific Sentinel and Pacific Conqueror (Each)

1 x Tracs Geopod

1 x Fluxgate compasses

1 x Tracs Box and Interface Box

1 x Compaq computer, inc. monitor, keyboard (GNS2 Tug Display)

1 x Uninteruptable Power Supply (UPS)

plus all associated software (GNS 2 version 2.35, MultiFix 3 version 1.24) c/w cables, consumables, software dongles etc.

9. DISTRIBUTION

Copies of this report have been distributed as follows:

Esso Australia Pty Ltd	: 4 copies
Attn: Mr Chris Meakin	: 1 electronic copy
Thales GeoSolutions (Australasia) Limited	: 1 copy

pp

Phil Wells
Surveyor

pp

Anthony Kerr
Survey Manager

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APPENDIX A

FINAL DIFFERENTIAL GPS DRILLSTEM POSITION AT BEARDIE-1

913712 261

THALES Thales GeoSolutions (Australasia) Limited

Project: Beardie-1 Positioning Report of the Ocean Bounty
Client: ESSO Australia Pty Ltd

FINAL POSITION FIX – DIFFERENTIAL GPS
OCEAN BOUNTY – BEARDIE-1

Job Description:	Ocean Bounty to Beardie-1
Job Number:	3410A3
Thales Surveyor:	N. Cowley
Client:	Esso Australia Pty Ltd
Client Representative:	H. Arrowsmith
Sampling started:	26 Jul 2002 17:25:33
Sampling end:	26 Jul 2002 18:25:30

Ocean Bounty
Intended datum location

Datum: AGD 1966

Latitude:	38°15'16.271"S	Longitude:	147°48'24.629"E

Projection: AMG Zone 55

Easting:	570593.80 m	Northing:	5765622.40 m

Final Antenna Position (T1 Thales UKOOA):

Sample size: 720 fixes used out of a total of 720.

Antenna offset

X:	0.28m	Y:	33.90m	Z:	0.00m
Range:	33.90m	Rel Brg from datum to antenna:			0.5°

Datum:	WGS 84				
Latitude:	38°15'11.244"S	Longitude:	147°48'27.997"E	Spheroidal Ht:	40.92m
Datum:	AGD 1966				
Latitude:	38°15'16.745"S	Longitude:	147°48'23.421"E	Spheroidal Ht:	49.39m
Projection:	AMG Zone 55				
Easting:	570564.32	Northing:	5765608.05	Spheroidal Ht:	49.39m

Standard deviations

Long or E:	0.29m
Lat or N:	0.31m
Height:	0.55m
Position:	0.42m

Final Datum Position

Datum: **AGD 1966**

Latitude:	38°15'16.214"S	Longitude:	147°48'24.643"E

Projection: **AMG Zone 55**

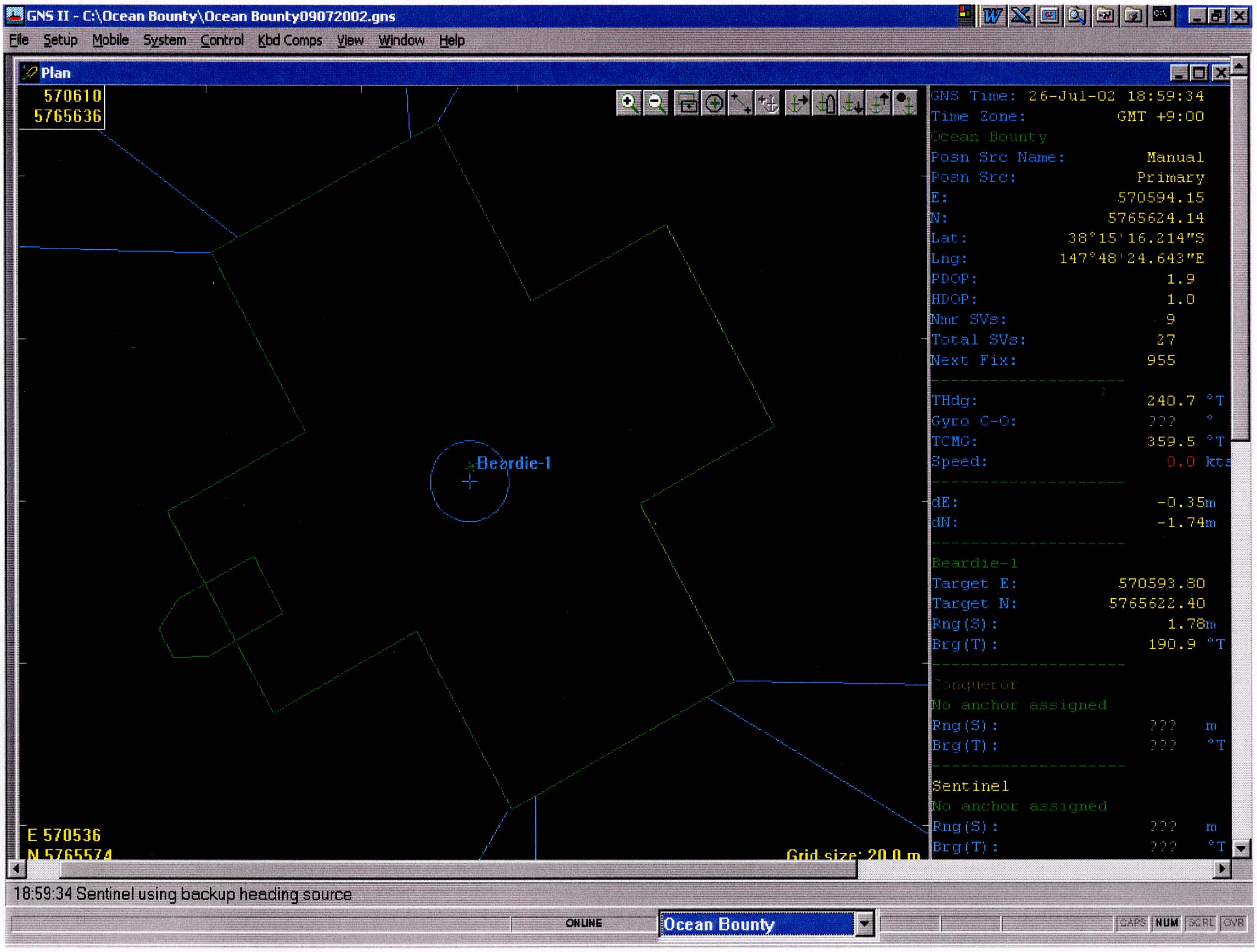
Easting:	570594.15 m	Northing:	5765624.16 m

Mean corrected heading:	240.7°T
SD heading:	0.1°T
Intended heading:	240.0°T
Difference from intended:	0.7°
Gyro C-O:	1.4°
Convergence:	-0.50°

Final Datum Position is 1.79m on a bearing of 10.8°T (11.3°G) from the intended location.

~~PE913712 colour Ø16.~~

913712 262

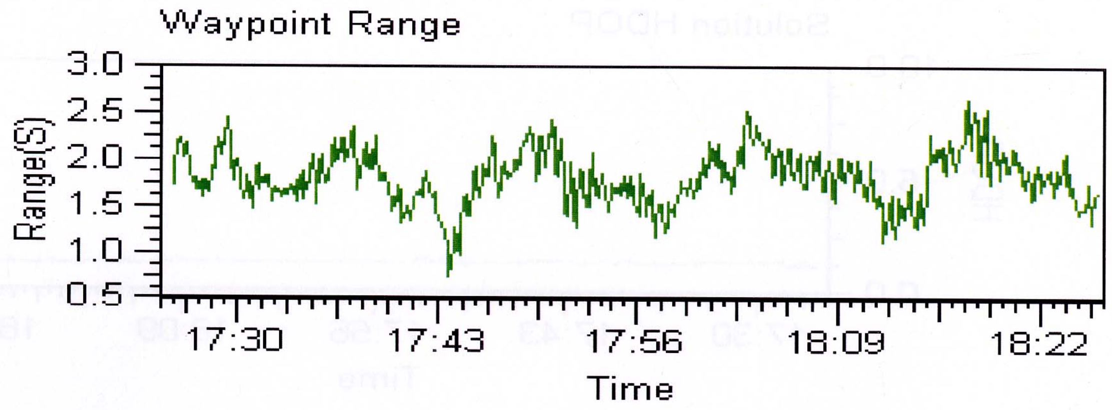


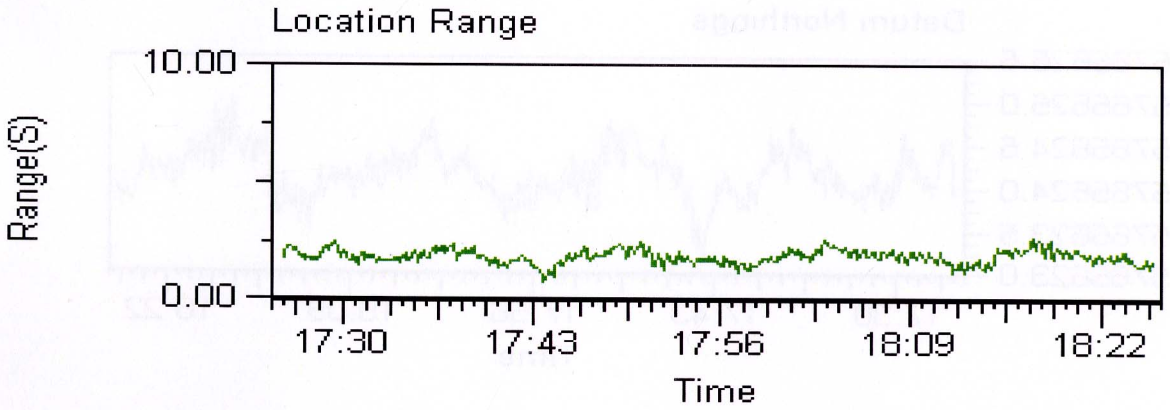
913712 263

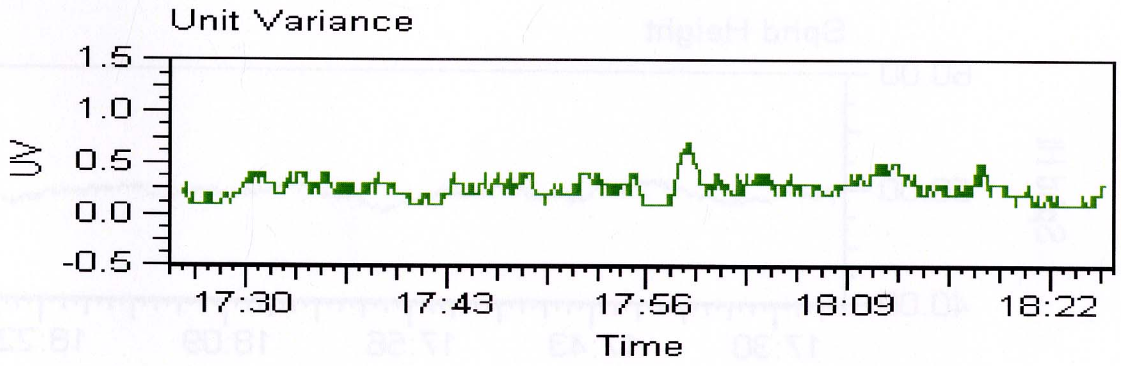
APPENDIX B

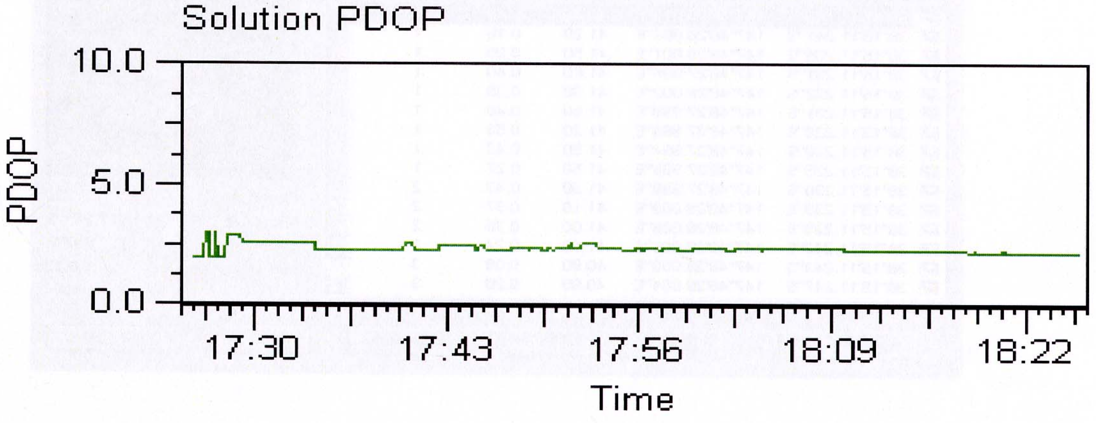
GNS2 STATIC DIFFERENTIAL GPS FIX GRAPHS

913712 264


Waypoint Range
Range(S)
3.0
2.5
2.0
1.5
1.0
0.5
17:30
17:43
17:56
18:09
18:22
Time


Location Range
Range(S)
10.00
0.00
17:30
17:43
17:56
18:09
18:22
Time


Unit Variance
UV
1.5
1.0
0.5
0.0
-0.5
17:30
17:43
17:56
18:09
18:22
Time

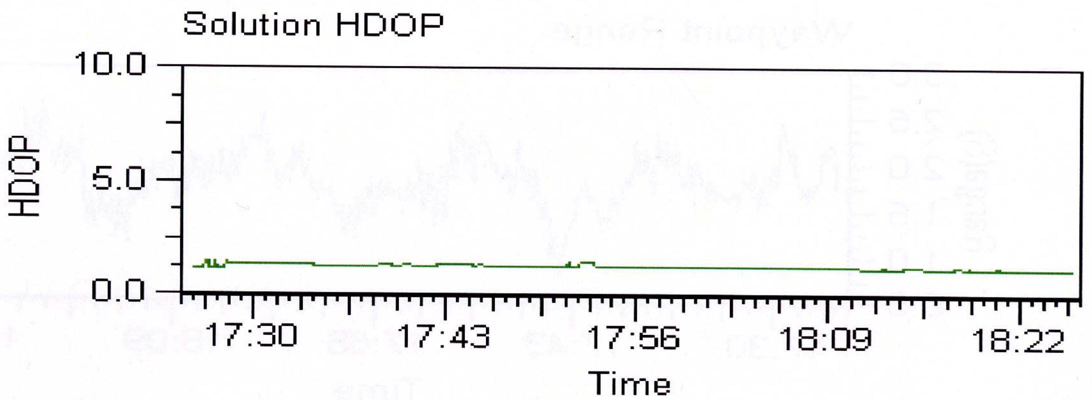

Solution PDOP
PDOP
10.0
5.0
0.0
17:30
17:43
17:56
18:09
18:22
Time

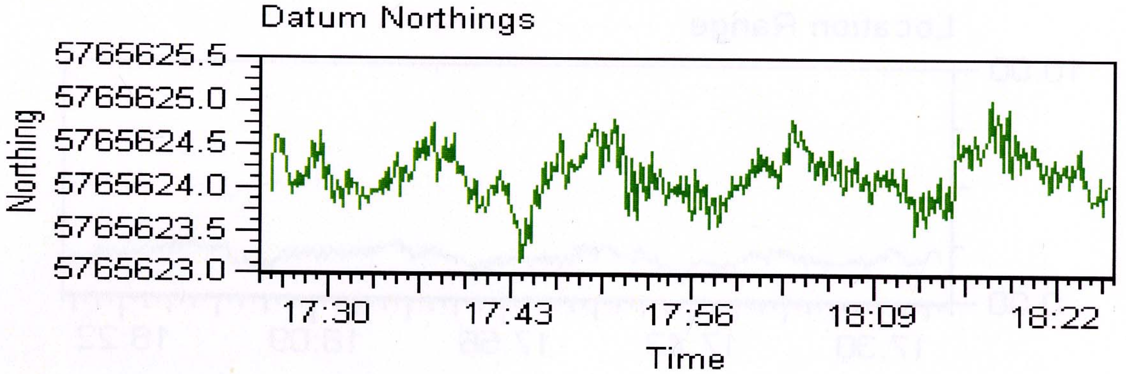
913712 265

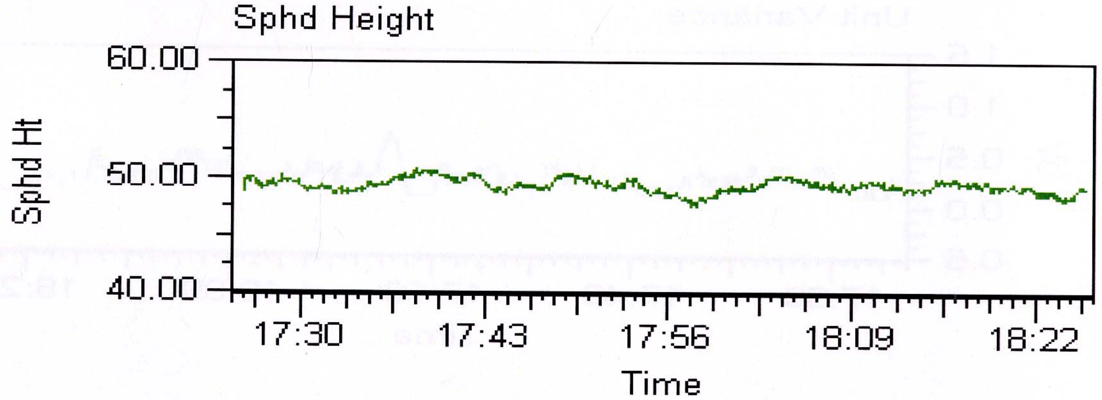
THALES Thales GeoSolutions (Australasia) Limited

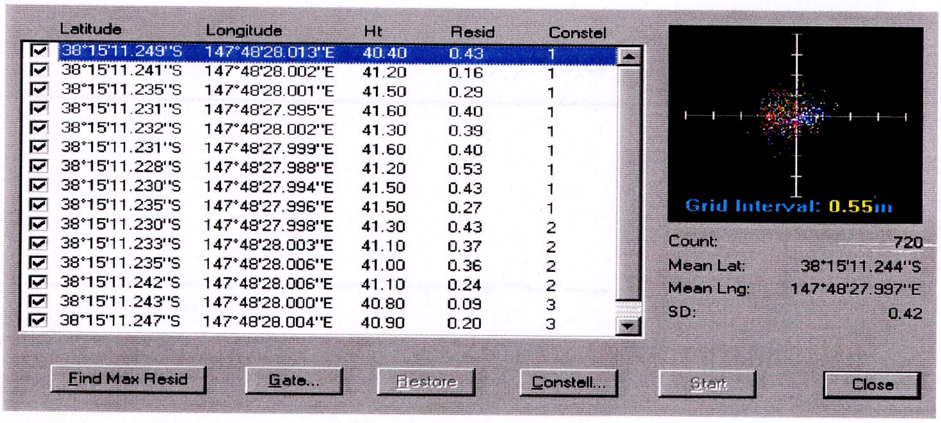
Project: Beardie-1 Positioning Report of the Ocean Bounty

Client: ESSO Australia Pty Ltd









Latitude	Longitude	Ht	Resid	Constel
38°15'11.249"S	147°48'28.013"E	40.40	0.43	1
38°15'11.241"S	147°48'28.002"E	41.20	0.16	1
38°15'11.235"S	147°48'28.001"E	41.50	0.29	1
38°15'11.231"S	147°48'27.995"E	41.60	0.40	1
38°15'11.232"S	147°48'28.002"E	41.30	0.39	1
38°15'11.231"S	147°48'27.999"E	41.60	0.40	1
38°15'11.228"S	147°48'27.988"E	41.20	0.53	1
38°15'11.230"S	147°48'27.994"E	41.50	0.43	1
38°15'11.235"S	147°48'27.996"E	41.50	0.27	1
38°15'11.230"S	147°48'27.998"E	41.30	0.43	2
38°15'11.233"S	147°48'28.003"E	41.10	0.37	2
38°15'11.235"S	147°48'28.006"E	41.00	0.36	2
38°15'11.242"S	147°48'28.006"E	41.10	0.24	2
38°15'11.243"S	147°48'28.000"E	40.80	0.09	3
38°15'11.247"S	147°48'28.004"E	40.90	0.20	3

Static Fix Graphs - Beardie-1

913712 266

APPENDIX C

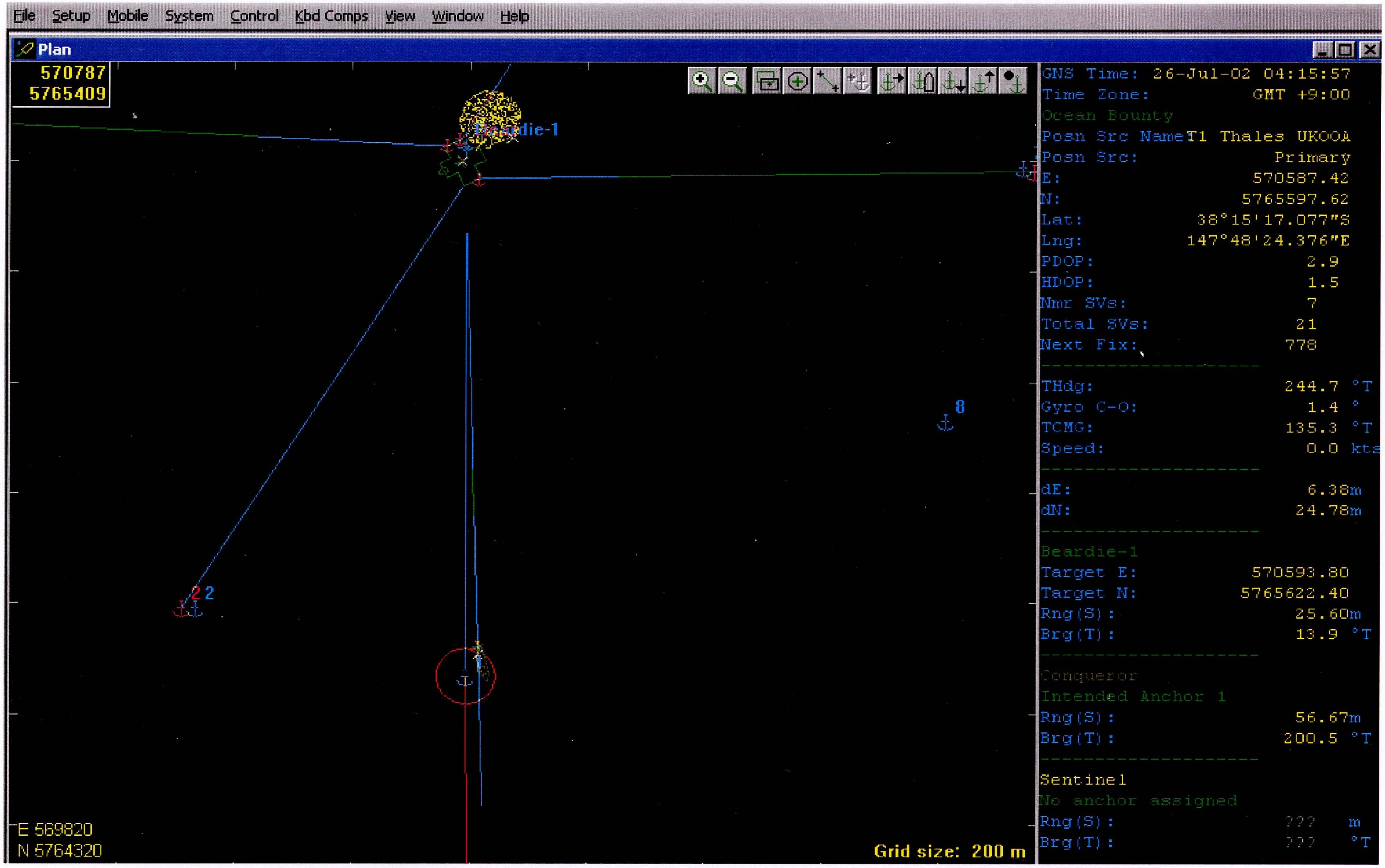
RUN LINE GRAPHICS OF ANCHOR HANDLING VESSELS

PE913712 = colour Ø17

913712 267

THALES Thales GeoSolutions (Australasia) Limited

Project: Beardie-1 Positioning Report of the Ocean Bounty
Client: ESSO Australia Pty Ltd



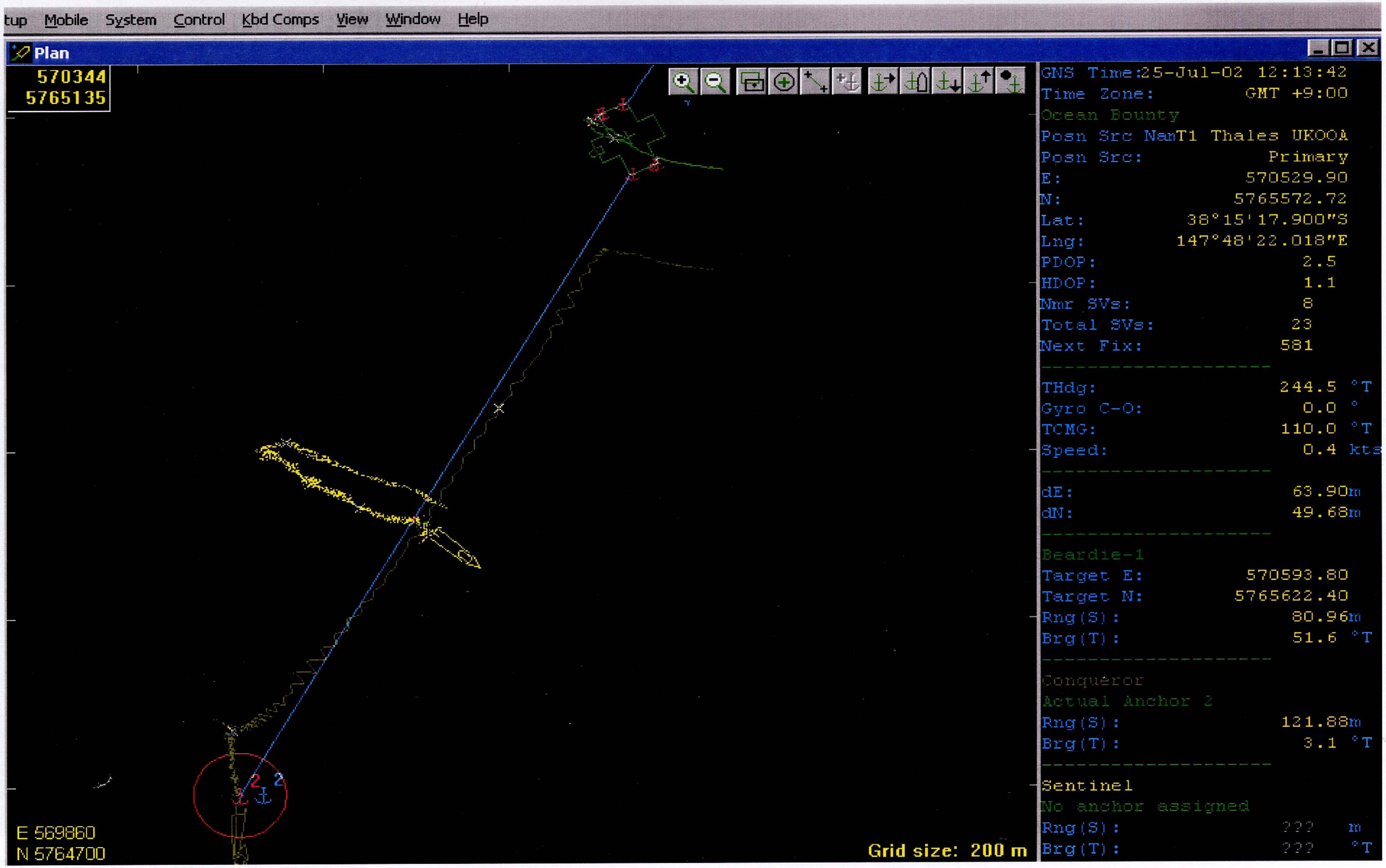
Anchor 1 – Pacific Conqueror

~~PE913712 colour 018~~

913712 268

THALES **Thales GeoSolutions (Australasia) Limited**

Project: Beardie-1 Positioning Report of the Ocean Bounty
Client: ESSO Australia Pty Ltd



Anchor 2 – Pacific Conqueror

THALES **Thales GeoSolutions (Australasia) Limited**

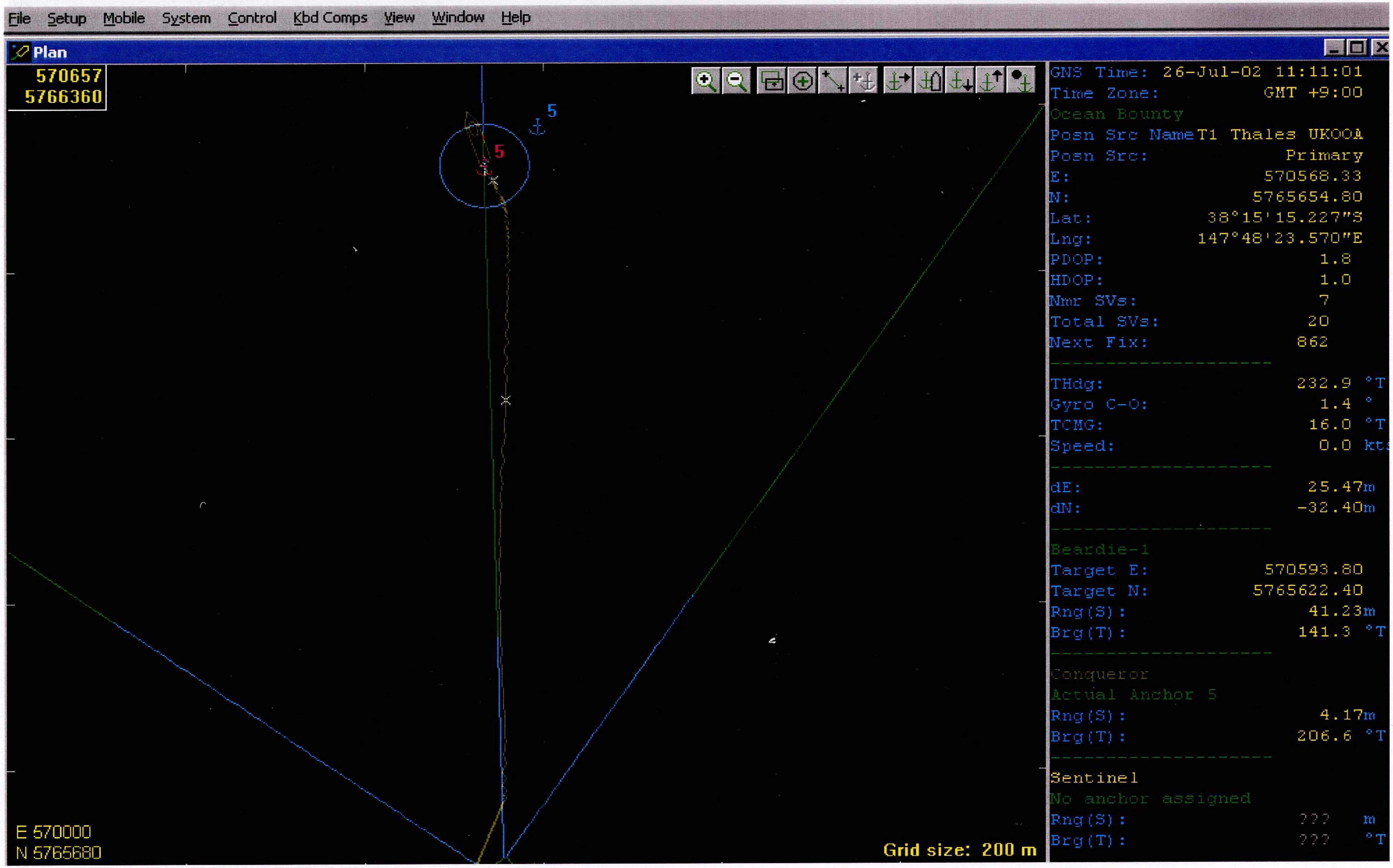
Project: Beardie-1 Positioning Report of the Ocean Bounty
Client: ESSO Australia Pty Ltd

Anchor 3 – Pacific Conqueror

~~PE913712 - colour Ø20~~

THALES **Thales GeoSolutions (Australasia) Limited**

Project: Beardie-1 Positioning Report of the Ocean Bounty
Client: ESSO Australia Pty Ltd



Anchor 5 – Pacific Conqueror

913712 270

PE913712 - colour Ø 21

THALES Thales GeoSolutions (Australasia) Limited

Project: Beardie-1 Positioning Report of the Ocean Bounty

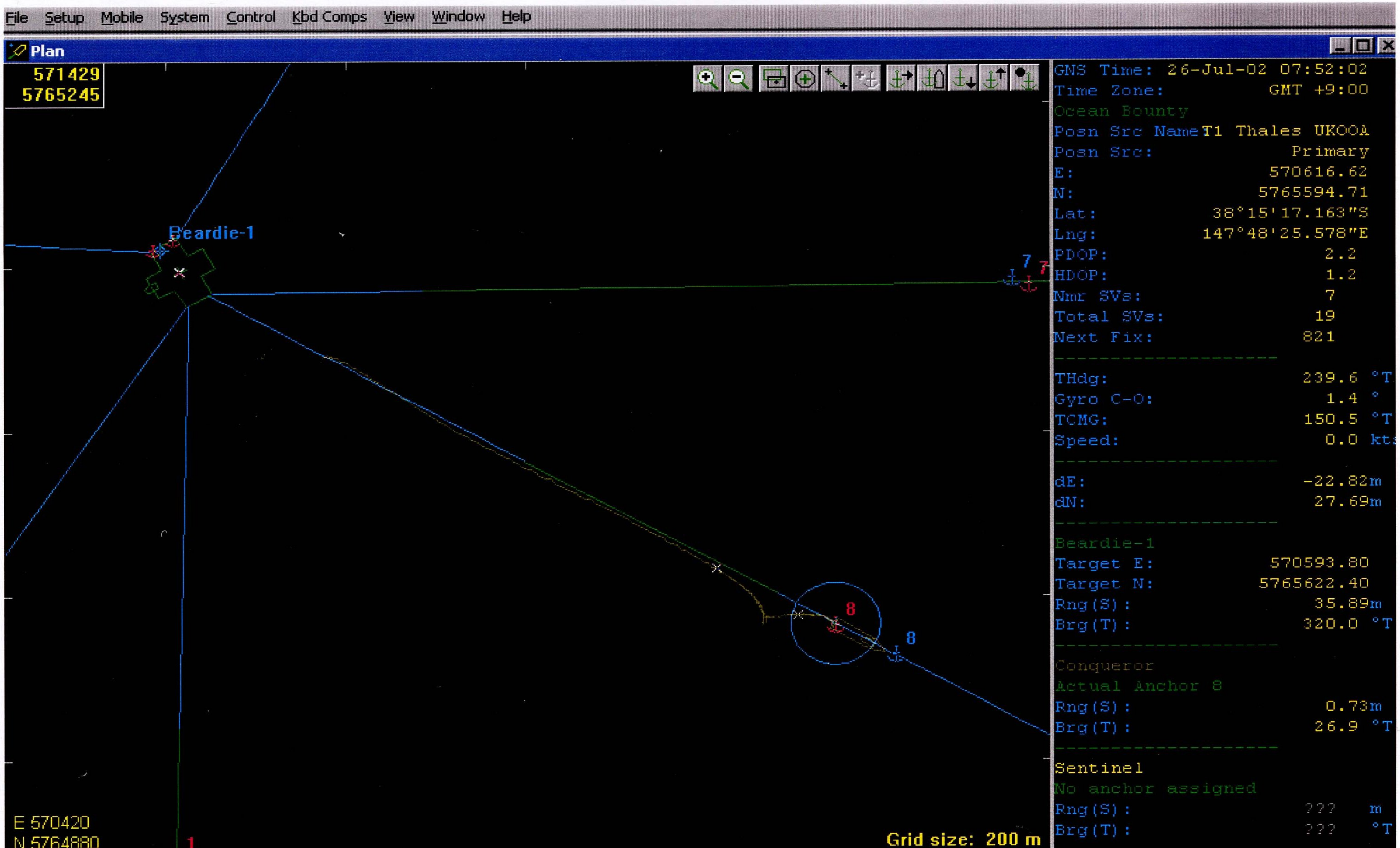
Client: ESSO Australia Pty Ltd

Anchor 7 – Pacific Conqueror

~~PE913712 – colour 022~~

THALES Thales GeoSolutions (Australasia) Limited

Project: Beardie-1 Positioning Report of the Ocean Bounty
Client: ESSO Australia Pty Ltd



Anchor 8 – Pacific Conqueror

913712 272

APPENDIX D

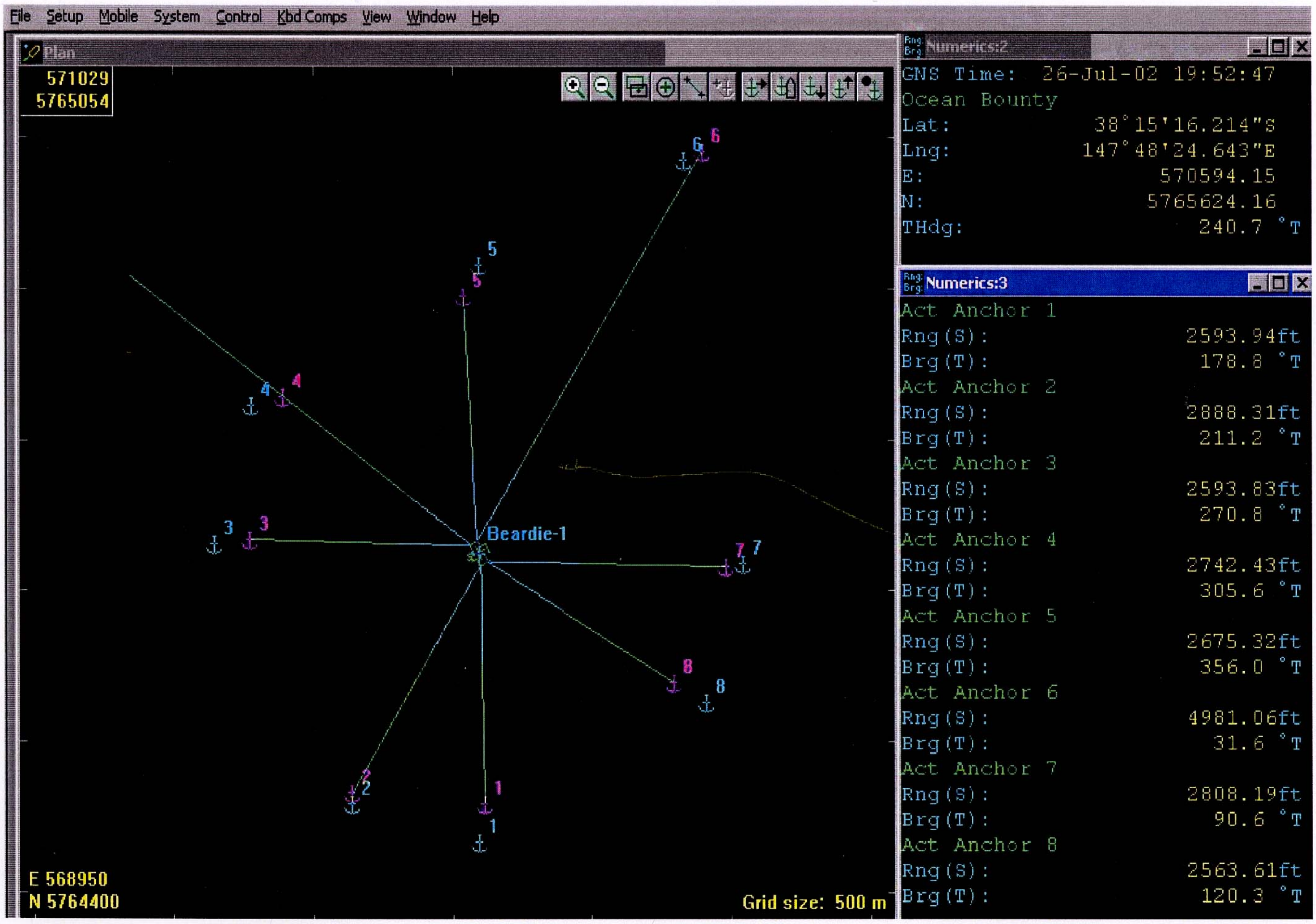
OCEAN BOUNTY ANCHOR PATTERN DETAILS AT BEARDIE-1

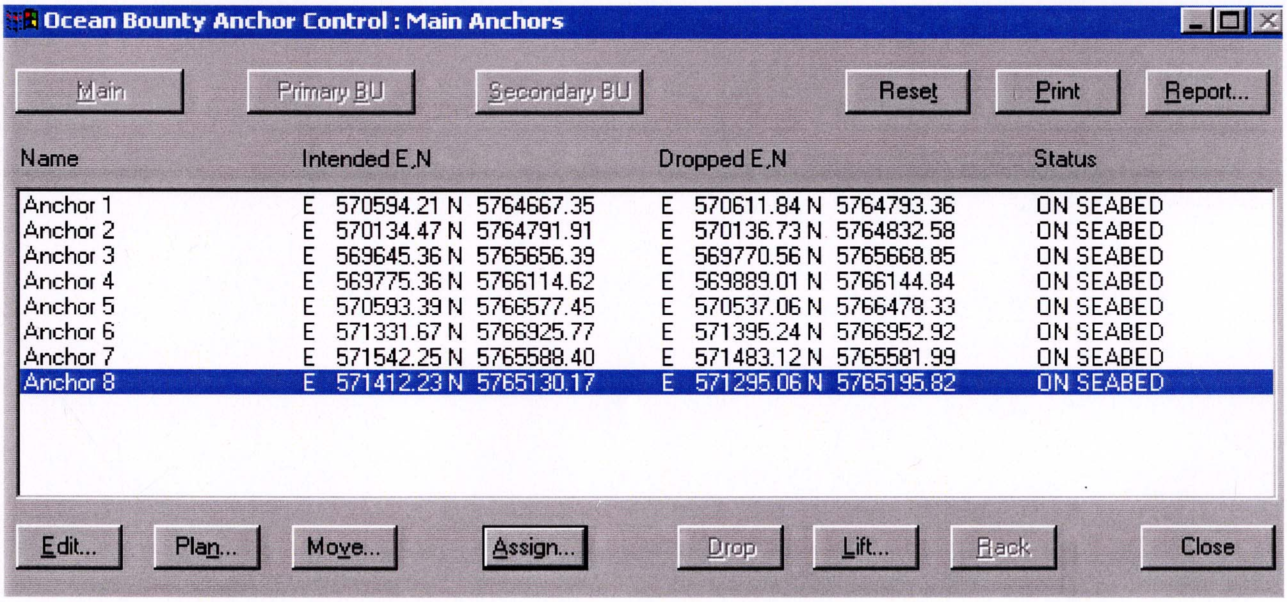
Pe913712 colour Ø23

913712 274

THALES Thales GeoSolutions (Australasia) Limited

Project: Beardie-1 Positioning Report of the Ocean Bounty
Client: ESSO Australia Pty Ltd





Name	Intended E,N		Dropped E,N		Status
Anchor 1	E 570594.21	N 5764667.35	E 570611.84	N 5764793.36	ON SEABED
Anchor 2	E 570134.47	N 5764791.91	E 570136.73	N 5764832.58	ON SEABED
Anchor 3	E 569645.36	N 5765656.39	E 569770.56	N 5765668.85	ON SEABED
Anchor 4	E 569775.36	N 5766114.62	E 569889.01	N 5766144.84	ON SEABED
Anchor 5	E 570593.39	N 5766577.45	E 570537.06	N 5766478.33	ON SEABED
Anchor 6	E 571331.67	N 5766925.77	E 571395.24	N 5766952.92	ON SEABED
Anchor 7	E 571542.25	N 5765588.40	E 571483.12	N 5765581.99	ON SEABED
Anchor 8	E 571412.23	N 5765130.17	E 571295.06	N 5765195.82	ON SEABED

Anchor Pattern At Beardie-1

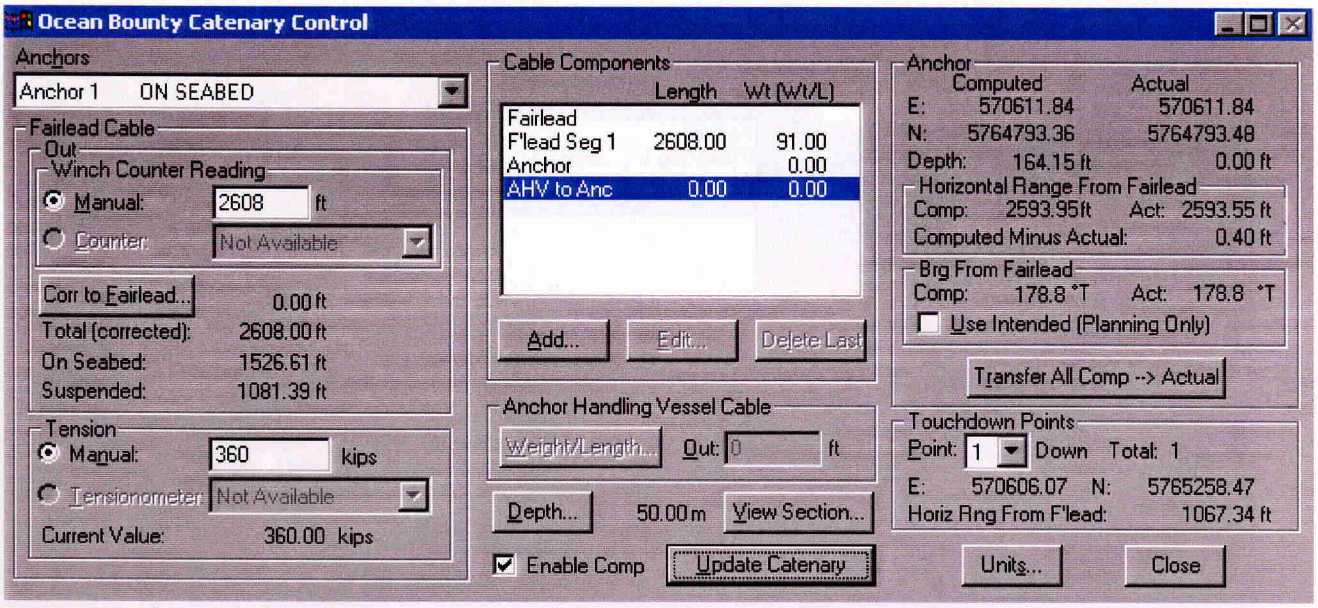
APPENDIX E

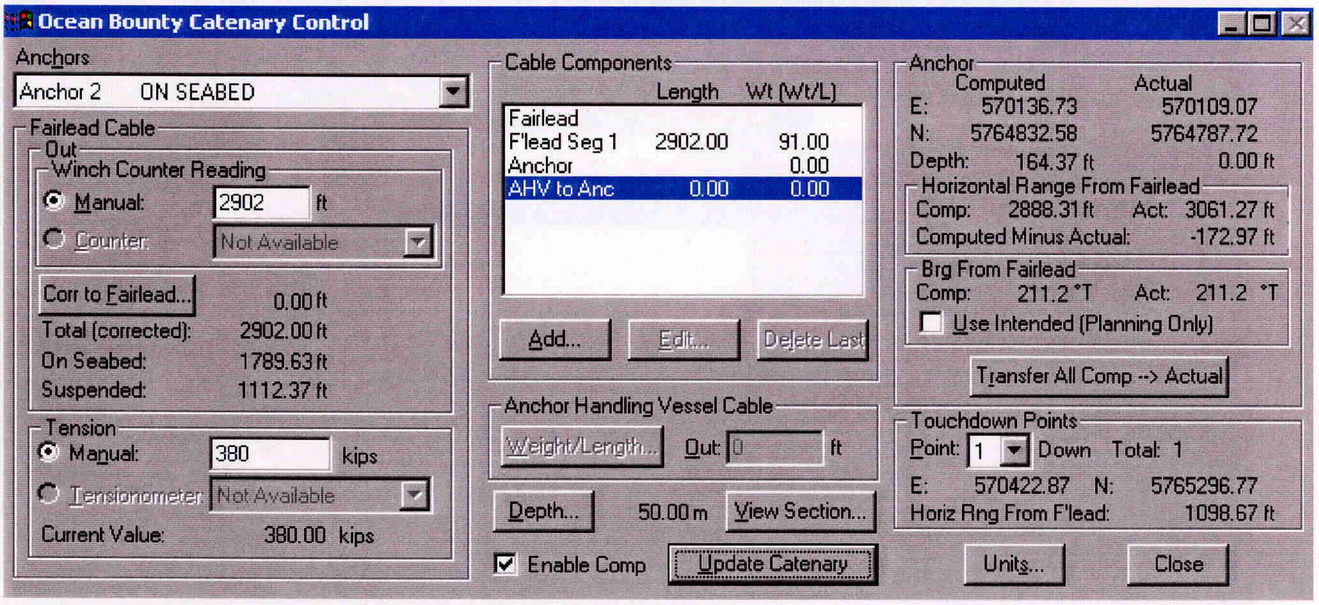
OCEAN BOUNTY ANCHOR CATENARY CALCULATIONS

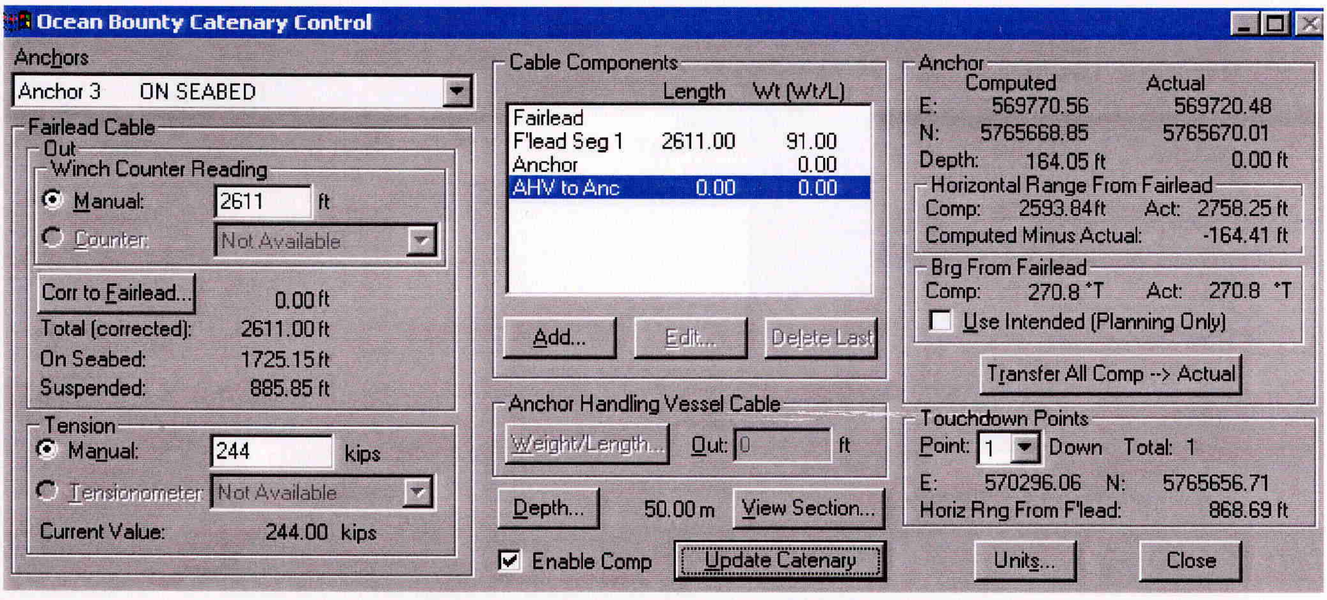
913712 276

THALES Thales GeoSolutions (Australasia) Limited

Project: Beardie-1 Positioning Report of the Ocean Bounty
Client: ESSO Australia Pty Ltd



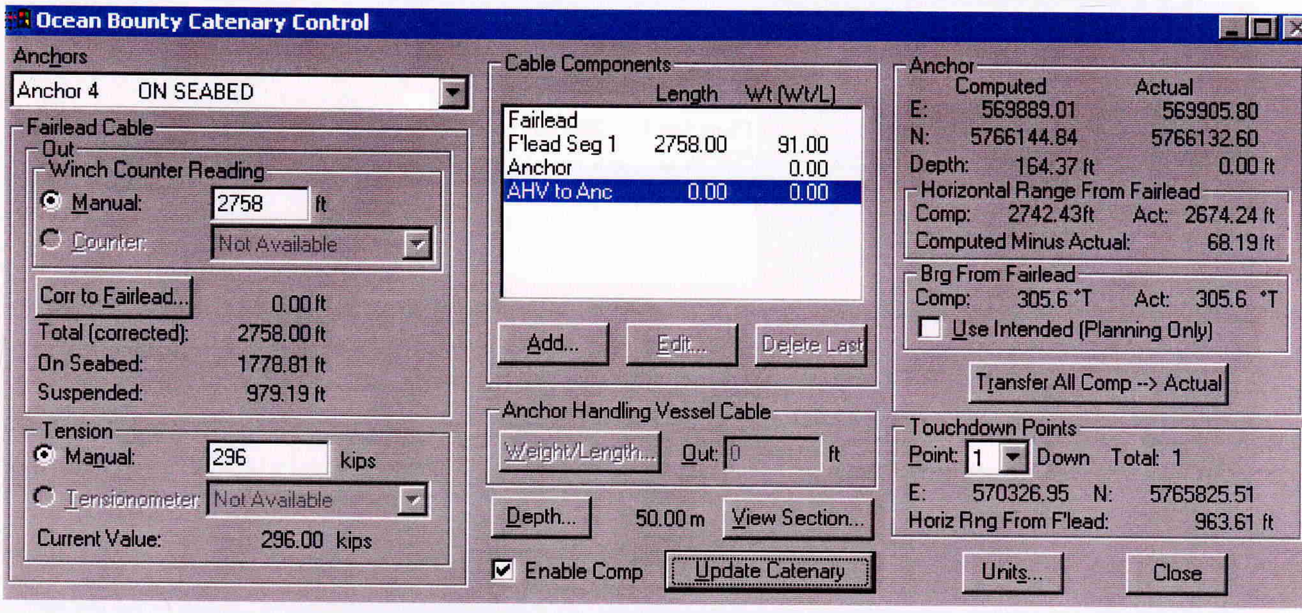


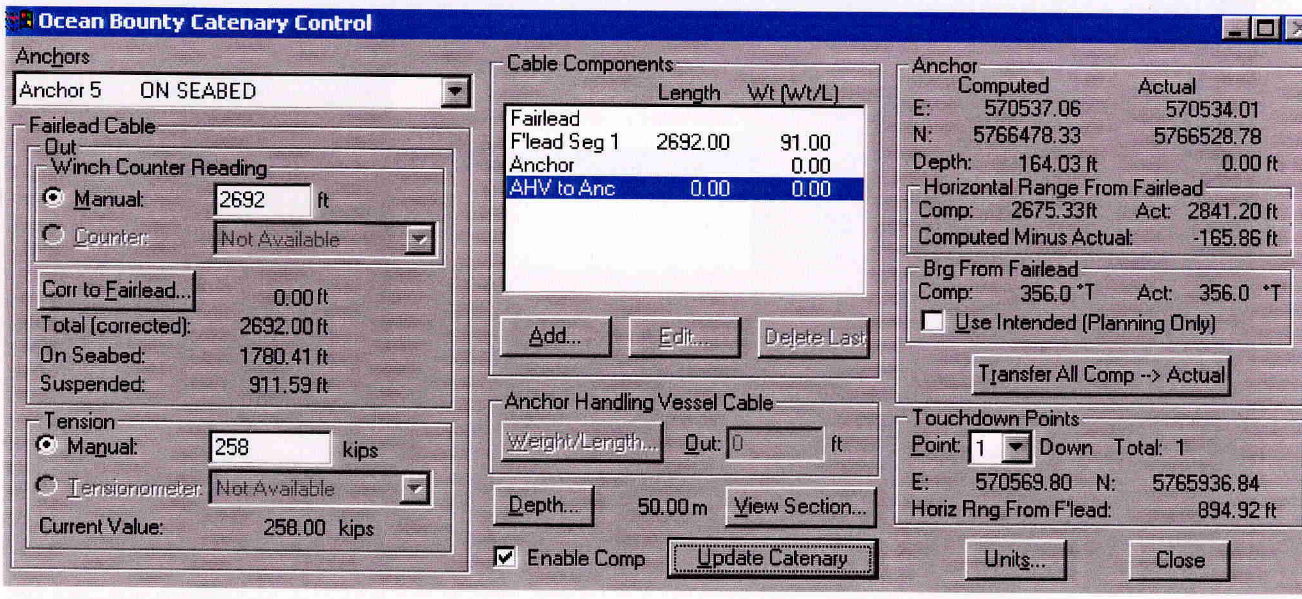


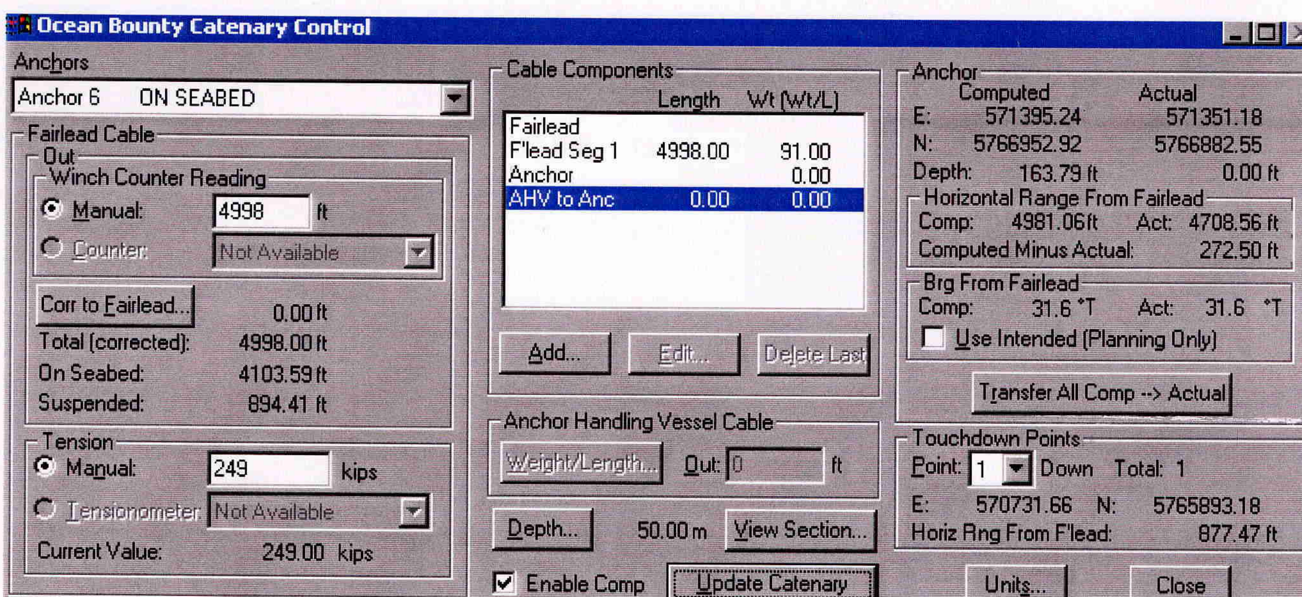
913712 277

THALES Thales GeoSolutions (Australasia) Limited

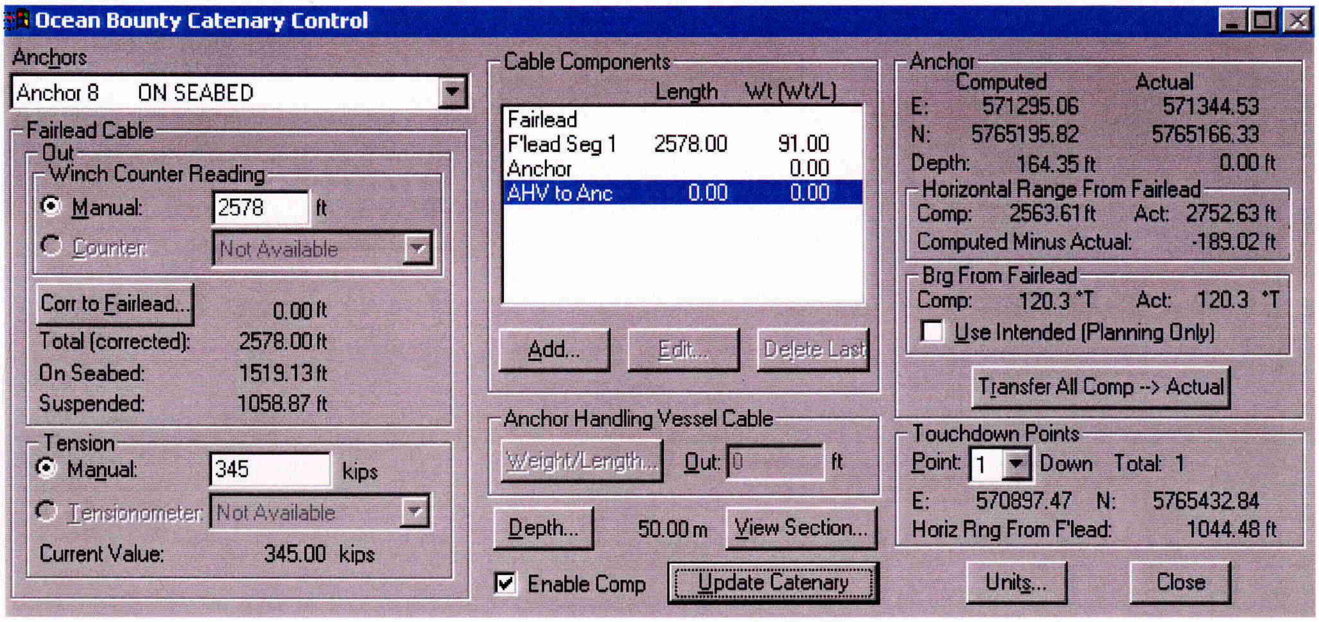
Project: Beardie-1 Positioning Report of the Ocean Bounty
Client: ESSO Australia Pty Ltd







Catenary Calculations – Beardie-1


Ocean Bounty Catenary Control
Anchors
Anchor 8 ON SEABED
Fairlead Cable
Out
Winch Counter Reading
Manual: 2578 ft
Counter: Not Available
Corr to Fairlead... 0.00 ft
Total (corrected): 2578.00 ft
On Seabed: 1519.13 ft
Suspended: 1058.87 ft
Tension
Manual: 345 kips
Tensionometer Not Available
Current Value: 345.00 kips
Cable Components
Length Wt (Wt/L)
Fairlead
F'lead Seg 1 2578.00 91.00
Anchor 0.00
AHV to Anc 0.00 0.00
Add... Edit... Delete Last
Anchor Handling Vessel Cable
Weight/Length... Out: 0 ft
Depth... 50.00 m View Section...
Enable Comp Update Catenary
Anchor
Computed Actual
E: 571295.06 571344.53
N: 5765195.82 5765166.33
Depth: 164.35 ft 0.00 ft
Horizontal Range From Fairlead
Comp: 2563.61 ft Act: 2752.63 ft
Computed Minus Actual: -189.02 ft
Brg From Fairlead
Comp: 120.3 °T Act: 120.3 °T
Use Intended (Planning Only)
Transfer All Comp --> Actual
Touchdown Points
Point: 1 Down Total: 1
E: 570897.47 N: 5765432.84
Horiz Rng From F'lead: 1044.48 ft
Units... Close

APPENDIX F

GYROCOMPASS CALIBRATION REPORT

Gyrocompass Calibration Ocean Bounty

Thales Job No. 3410A3
Job Description: Ocean Bounty Rig Move to Beardie-1
Client: ESSO
Party Chief: Phil Wells
Surveyor / Observer: Noel Cowley
Rig Name: Ocean Bounty
Date: 25 July 2002
Observation Station: Ocean Bounty Heli-deck

Reference Object: Barracouta Platform
R.O. Position (m)
Easting: 558 998
Northing: 5 760 887

Check Reference Object: Bream A Platform
R.O. Postion (m)
Easting: 567 231
Northing: 5 738 271

Barracouta Platform

Time	Observed Angle	Observed Easting(m)	Observed Northing (m)	Calculated Heading	Observed Heading	C-O
13:46:30	14.2°	570 533	5 765 574	261.6°	260.0°	1.6°
13:47:15	14.5°	570 533	5 765 574	261.9°	260.5°	1.4°
13:47:45	14.4°	570 534	5 765 573	261.8°	261.0°	0.8°
13:48:15	14.2°	570 536	5 765 572	261.7°	260.2°	1.5°
13:49:30	14.2°	570 540	5 765 571	261.7°	260.2°	1.5°
13:50:00	14.1°	570 541	5 765 571	261.5°	260.0°	1.5°
13:50:30	13.5°	570 542	5 765 570	260.9°	259.2°	1.7°
13:51:15	13.9°	570 543	5 765 569	261.3°	260.0°	1.3°
13:51:45	13.9°	570 545	5 765 569	261.3°	259.8°	1.5°
13:52:15	13.9°	570 545	5 765 569	261.3°	260.0°	1.3°
					Mean:	**1.4°**

Bream A Platform

Time	Observed Angle	Observed Easting(m)	Observed Northing (m)	Calculated Heading	Observed Heading	C-0
13:54:00	73.2°	570 546	5 765 568	259.8°	258.5°	1.3°
13:54:30	72.8°	570 546	5 765 569	259.4°	258.2°	1.2°
					Mean:	**1.25°**

Sign:______________________________

Surveyor/Party Chief

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APPENDIX G

DIFFERENTIAL GPS CHECK

CHECK POSITION FIX – DIFFERENTIAL GPS
CHECK FIX – SOLE-2

Job Description:	Ocean Bounty to Beardie-1
Job Number:	3410A3
Thales Surveyor:	N. Cowley
Client:	Esso Australia Pty Ltd
Client Representative:	G. Sharky
Sampling started:	23 Jul 2002 15:35:06
Sampling end:	23 Jul 2002 15:43:20

Ocean Bounty

Intended datum location

Datum: AGD 1966
Latitude: 38°06'18.665"S Longitude: 149°00'28.997"E
Projection: AMG Zone 55
Easting: 676059.05 m Northing: 5780595.42 m

Final Antenna Position (T1 Thales UKOOA):
Sample size: 100 fixes used out of a total of 100.

Antenna offset

X:	0.28m	Y:	33.90m	Z:	0.00m
Range:	33.90m	Rel Brg from datum to antenna:			0.5°

Datum:	WGS 84				
Latitude:	38°06'13.281"S	Longitude:	149°00'31.913"E	Spheroidal Ht:	54.76m
Datum:	AGD 1966				
Latitude:	38°06'18.826"S	Longitude:	149°00'27.423"E	Spheroidal Ht:	61.08m
Projection:	AMG Zone 55				
Easting:	676020.59	Northing:	5780591.28	Spheroidal Ht:	61.08m

Standard deviations

Long or E:	0.29m
Lat or N:	0.47m
Height:	0.51m
Position:	0.55m

Final Datum Position

Datum: **AGD 1966**
Latitude: 38°06'18.636"S Longitude: 149°00'28.793"E

Projection: **AMG Zone 55**
Easting: 676054.10 m Northing: 5780596.43 m

Mean corrected heading:	259.6°T
SD heading:	0.3°T
Intended heading:	257.3°T
Difference from intended:	2.3°
Gyro C-O:	0.0°
Convergence:	-1.24°

Final Datum Position is 5.05m on a bearing of 280.3°T (281.5°G) from the intended location.

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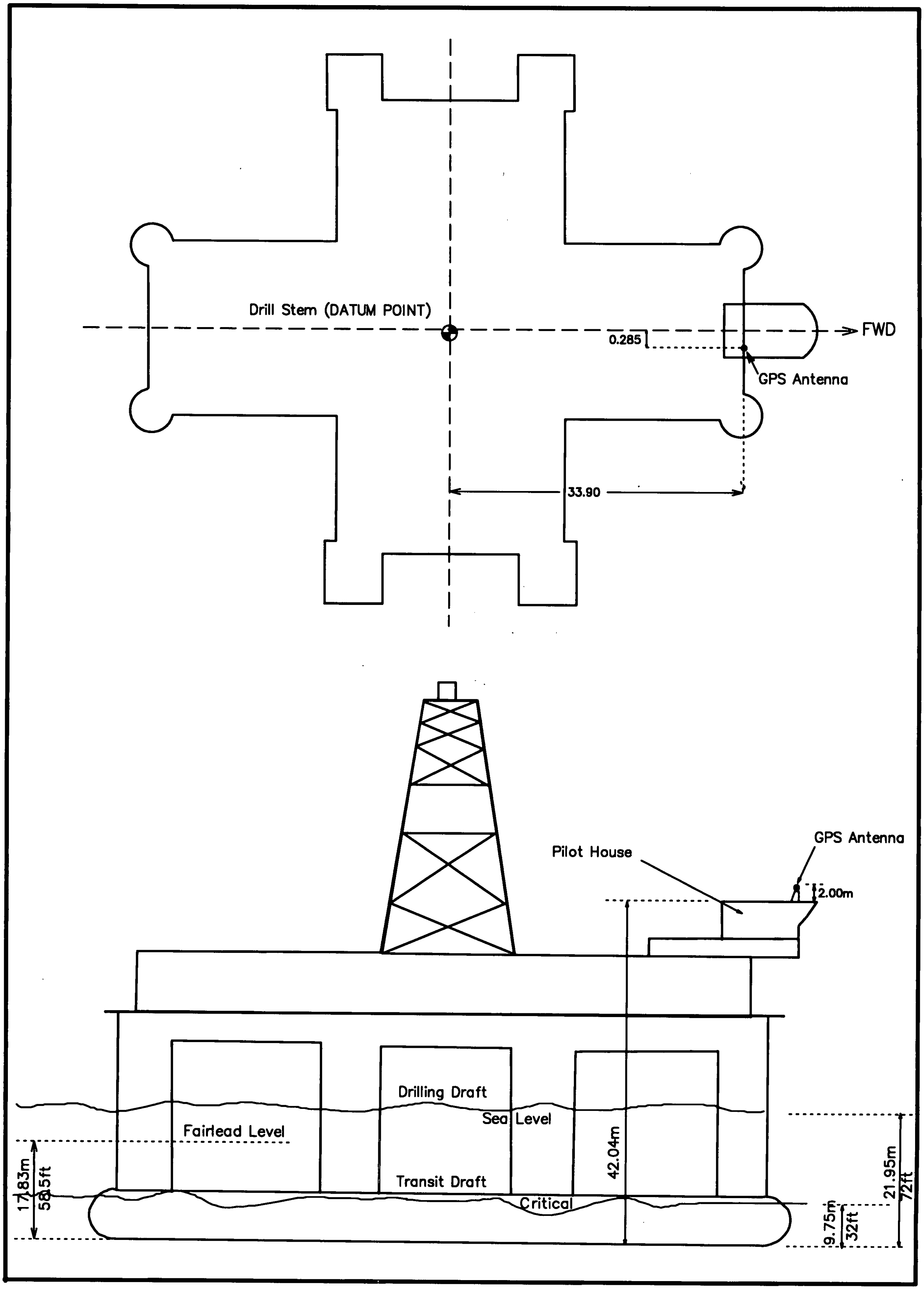
APPENDIX H

OCEAN BOUNTY OFFSET DIAGRAM

OCEAN BOUNTY OFFSET DIAGRAM



NOT TO SCALE

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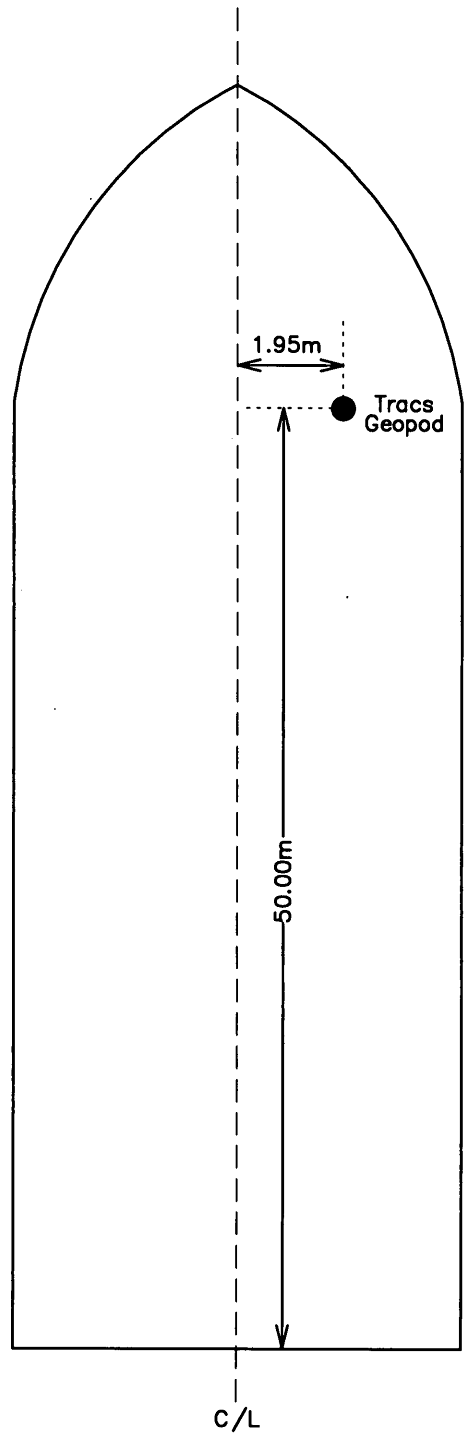
APPENDIX I

PACIFIC SENTINEL AND PACIFIC CONQUEROR OFFSET DIAGRAMS

PACIFIC SENTINEL



(NOT TO SCALE)

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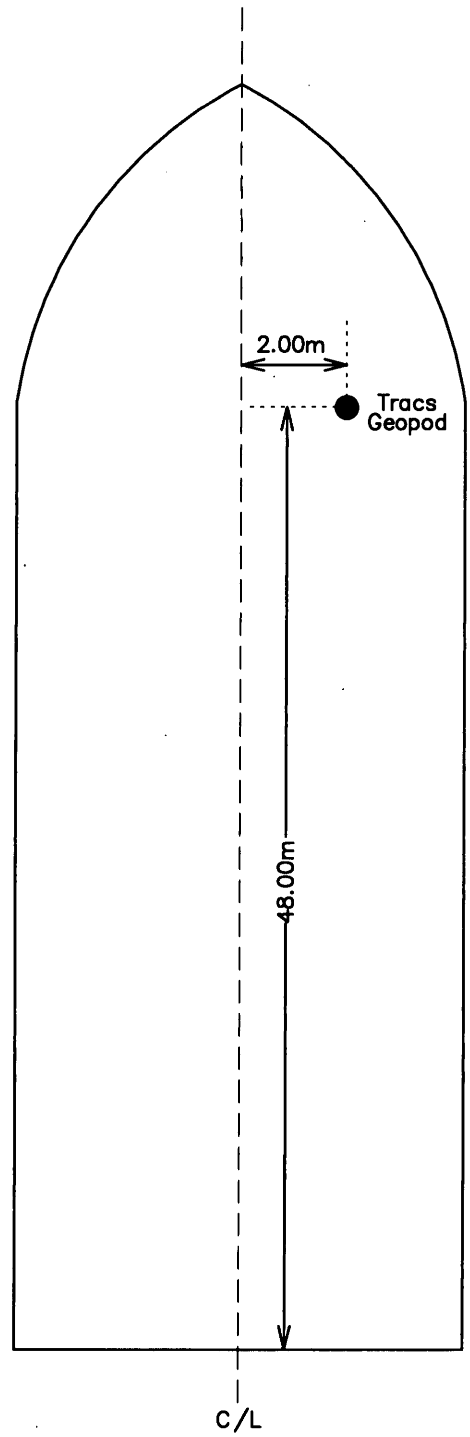
PACIFIC CONQUEROR



(NOT TO SCALE)

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APPENDIX J

GNS2 CONFIGURATION FILE PRINTOUT

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GNS II CONFIGURATION FILE C:\Ocean Bounty\Ocean Bounty09072002.gns

JOB DETAILS
Job Number : 3410A3
Job Description : Ocean Bounty to Beardie-1
Company : Thales GeoSolutions Aust Ltd
Client : Esso Australia Pty Ltd
Time Zone : GMT +9:00

WORKING SPHEROID
AGD 1966
Semi-major : 6378160.000 m
e Squared : 0.006694541855

WORKING PROJECTION
AMG Zone 55
Lat of Origin : 00°00'00.000"N
Long of Origin : 147°00'00.000"E
False Easting : 500000.00
False Northing : 10000000.00
Scale Factor : 0.999600
Units : Metres

GPS TRANSFORMATION
From : WGS 84
Semi-major : 6378137.000 m
e Squared : 0.006694380067
To : AGD 1966
Dx : 123.314 m
Dy : 47.223 m
Dz : -136.594 m
Rot x : 0.2640 secs
Rot y : 0.3220 secs
Rot z : 0.2700 secs
Scale : 1.3840 ppm

WAYPOINTS

Beardie-1	E:	570593.80	N:	5765622.40	Ht:	0.00	m	Toll:	5.00	m	Tol:
Patricia-1	E:	626945.00	N:	5789700.30	Ht:	0.00	m	Toll:	5.00	m	Tol:
Patricia-2	E:	627207.69	N:	5790098.71	Ht:	0.00	m	Toll:	5.00	m	Tol:
West Tuna	E:	621503.10	N:	5771736.08	Ht:	0.00	m				
Act Baleen-3	E:	626675.86	N:	5792541.30	Ht:	0.00	m	Toll:	15.00	m	Tol:
Sole-2	E:	676059.05	N:	5780595.42	Ht:	0.00	m				
A	E:	586070.00	N:	5780596.00	Ht:	0.00	m				
B	E:	584083.00	N:	5780596.00	Ht:	0.00	m				
C	E:	578637.00	N:	5779610.00	Ht:	0.00	m				

TRACK GUIDANCE
None defined

MOBILES
Ocean Bounty (semi-sub rig)
Shape Definition: Ocean Bounty
Line:-

Verified by: (sign)________________________ (print)________________________

20:14 26-Jul-2002

GNS II CONFIGURATION FILE C:\Ocean Bounty\Ocean Bounty09072002.gns

```
   X:  14.20 m  Y:  37.00 m
   X:  14.20 m  Y:  16.60 m
   X:  39.30 m  Y:  16.60 m
   X:  39.30 m  Y: -16.60 m
   X:  14.20 m  Y: -16.60 m
   X:  14.20 m  Y: -36.20 m
   X: -14.20 m  Y: -36.20 m
   X: -14.20 m  Y: -16.60 m
   X: -39.30 m  Y: -16.60 m
   X: -39.30 m  Y:  16.00 m
   X: -14.20 m  Y:  16.00 m
   X: -14.20 m  Y:  37.00 m
   X:  14.20 m  Y:  37.00 m
  Line:-
   X:  -4.00 m  Y:  30.00 m
   X:   4.00 m  Y:  30.00 m
   X:   4.00 m  Y:  41.00 m
   X:   2.00 m  Y:  45.00 m
   X:  -2.00 m  Y:  45.00 m
   X:  -4.00 m  Y:  41.00 m
   X:  -4.00 m  Y:  30.00 m

 Tracking Point       : Datum
 Pitch and Roll Centre: Datum

 Selected Sources:-
  Primary Position  : T1 Thales UKOOA (Using Antenna Offset : GPS Ae)
  Backup Position   : T2 Thales UKOOA (Using Antenna Offset : GPS Ae)
  Primary Heading   : S1 SGB 1000S
  Primary Height    : Datum Displacement
  Pitch and Roll    : Manual
  Soundings         : Manual
  Speed             : Position Filter
  Course Made Good  : Posn Filter CMG

 Equipment:-
  T1 Thales UKOOA
   Status:  ON   Interface: Sock1
   Antenna Offset Selected: GPS Ae
    X:     0.28 m Y:   33.90 m Z:     0.00 m Rng:    33.90 m Brg:  0.5°
   Apply Pitch Roll: Off  Stale Time: 5.0 s  Posn SD: 3.0 m  Ht SD: 1.0 m
   Update posn only when diff corrected
   Filter: Off  Time Constant:60.0 s  Sample Dwell: 0.5 s
   Gate: Off  Gate Width: 9.0 xSD  Minimum Gate: 0.0 m

  T2 Thales UKOOA
   Status:  ON   Interface: Sock2
   Antenna Offset Selected: GPS Ae
    X:     0.28 m Y:   33.90 m Z:     0.00 m Rng:    33.90 m Brg:  0.5°
   Apply Pitch Roll: Off  Stale Time: 5.0 s  Posn SD: 3.0 m  Ht SD: 1.0 m
   Update posn regardless of whether diff corrected
   Filter: Off  Time Constant:60.0 s  Sample Dwell: 0.5 s
   Gate: Off  Gate Width: 9.0 xSD  Minimum Gate: 0.0 m
```

Verified by: (sign)________________________ (print)________________________

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GNS II CONFIGURATION FILE C:\Ocean Bounty\Ocean Bounty09072002.gns

S1 SGB 1000S
Status: ON Interface: COM6
C-O: 1.4 degs Stale Time: 5.0 s SD: 0.1 degs
Filter: Off Gate: Off Time Constant: 5.0 s Sample Dwell: 0.5 s

T3 Tracs TDMA Master
Status: ON Interface: COM10
Antenna Offset Selected: GPS Ae
X: 0.28 m Y: 33.90 m Z: 0.00 m Rng: 33.90 m Brg: 0.5°

Defined Offsets:-
Datum
X: 0.00 m Y: 0.00 m Z: 0.00 m Rng: 0.00 m Brg: 0.0°
GPS Ae
X: 0.28 m Y: 33.90 m Z: 0.00 m Rng: 33.90 m Brg: 0.5°
Fairlead 1
X: -39.30 m Y: 12.60 m Z: -4.11 m Rng: 41.27 m Brg:287.8°
Fairlead 2
X: -39.30 m Y: 16.60 m Z: -4.11 m Rng: 42.66 m Brg:292.9°
Fairlead 3
X: 39.30 m Y: 16.60 m Z: -4.11 m Rng: 42.66 m Brg: 67.1°
Fairlead 4
X: 39.30 m Y: 12.60 m Z: -4.11 m Rng: 41.27 m Brg: 72.2°
Fairlead 5
X: 39.30 m Y: -12.60 m Z: -4.11 m Rng: 41.27 m Brg:107.8°
Fairlead 6
X: 39.30 m Y: -16.60 m Z: -4.11 m Rng: 42.66 m Brg:112.9°
Fairlead 7
X: -39.30 m Y: -16.60 m Z: -4.11 m Rng: 42.66 m Brg:247.1°
Fairlead 8
X: -39.30 m Y: -12.60 m Z: -4.11 m Rng: 41.27 m Brg:252.2°

Conqueror (ship)
Shape Definition: Pac Conquerer
Line:-
X: -6.80 m Y: 0.00 m
X: -6.80 m Y: 49.40 m
X: 0.00 m Y: 65.00 m
X: 6.80 m Y: 49.40 m
X: 6.80 m Y: 0.00 m
X: -6.80 m Y: 0.00 m
Line:-
X: -1.50 m Y: 35.00 m
X: -3.50 m Y: 37.00 m
X: -3.50 m Y: 45.00 m
X: -6.00 m Y: 45.00 m
X: -6.00 m Y: 47.00 m
X: -3.50 m Y: 47.00 m
X: -3.50 m Y: 49.00 m
X: -2.00 m Y: 51.00 m
X: 2.00 m Y: 51.00 m
X: 3.50 m Y: 49.00 m
X: 3.50 m Y: 47.00 m
X: 6.00 m Y: 47.00 m

Verified by: (sign)________________________ (print)________________________

GNS II CONFIGURATION FILE C:\Ocean Bounty\Ocean Bounty09072002.gns

```
    X:   6.00 m  Y:  45.00 m
    X:   3.50 m  Y:  45.00 m
    X:   3.50 m  Y:  37.00 m
    X:   1.50 m  Y:  35.00 m
    X:  -1.50 m  Y:  35.00 m

  Tracking Point       : Datum
  Pitch and Roll Centre: Datum

  Selected Sources:-
   Primary Position : T4 Tracs TDMA Remote (Using Antenna Offset : Pod)
   Primary Heading  : T4 Tracs TDMA Remote
   Primary Height   : Datum Displacement
   Pitch and Roll   : Manual
   Soundings        : Manual
   Speed            : T4 Tracs TDMA Remote
   Course Made Good : Posn Filter CMG

  Equipment:-
   T4 Tracs TDMA Remote
    Status:  ON   Interface: Not defined
    Antenna Offset Selected: Pod
     X:    2.00 m Y:   48.00 m Z:    0.00 m Rng:   48.04 m Brg:  2.4°

  Defined Offsets:-
   Datum
    X:   0.00 m Y:    0.00 m Z:    0.00 m Rng:    0.00 m Brg:  0.0°
   Pod
    X:   2.00 m Y:   48.00 m Z:    0.00 m Rng:   48.04 m Brg:  2.4°

Sentinel (ship)
  Shape Definition: Pac Sentinel
   Line:-
    X:  -6.80 m  Y:   0.00 m
    X:  -6.80 m  Y:  49.40 m
    X:   0.00 m  Y:  65.00 m
    X:   6.80 m  Y:  49.40 m
    X:   6.80 m  Y:   0.00 m
    X:  -6.80 m  Y:   0.00 m
   Line:-
    X:  -1.50 m  Y:  35.00 m
    X:  -3.50 m  Y:  37.00 m
    X:  -3.50 m  Y:  45.00 m
    X:  -6.00 m  Y:  45.00 m
    X:  -6.00 m  Y:  47.00 m
    X:  -3.50 m  Y:  47.00 m
    X:  -3.50 m  Y:  49.00 m
    X:  -2.00 m  Y:  51.00 m
    X:   2.00 m  Y:  51.00 m
    X:   3.50 m  Y:  49.00 m
    X:   3.50 m  Y:  47.00 m
    X:   6.00 m  Y:  47.00 m
    X:   6.00 m  Y:  45.00 m
    X:   3.50 m  Y:  45.00 m
```

Verified by: (sign)________________________ (print)________________________

X: 3.50 m Y: 37.00 m
X: 1.50 m Y: 35.00 m
X: -1.50 m Y: 35.00 m

Tracking Point : Datum
Pitch and Roll Centre: Datum

Selected Sources:-
Primary Position : T5 Tracs TDMA Remote (Using Antenna Offset : Pod)
Primary Heading : T5 Tracs TDMA Remote
Primary Height : Datum Displacement
Pitch and Roll : Manual
Soundings : Manual
Speed : Position Filter
Course Made Good : Posn Filter CMG

Equipment:-
T5 Tracs TDMA Remote
Status: ON Interface: Not defined
Antenna Offset Selected: Pod
X: 1.95 m Y: 50.00 m Z: 0.00 m Rng: 50.04 m Brg: 2.2°

Defined Offsets:-
Datum
X: 0.00 m Y: 0.00 m Z: 0.00 m Rng: 0.00 m Brg: 0.0°
Pod
X: 1.95 m Y: 50.00 m Z: 0.00 m Rng: 50.04 m Brg: 2.2°

ANCHORS
Ocean Bounty
Fairleads:-

Name	X	Y	Z	Rng	Brg
Fairlead 1	-39.30 m	12.60 m	-4.11 m	41.27 m	287.8°
Fairlead 2	-39.30 m	16.60 m	-4.11 m	42.66 m	292.9°
Fairlead 3	39.30 m	16.60 m	-4.11 m	42.66 m	67.1°
Fairlead 4	39.30 m	12.60 m	-4.11 m	41.27 m	72.2°
Fairlead 5	39.30 m	-12.60 m	-4.11 m	41.27 m	107.8°
Fairlead 6	39.30 m	-16.60 m	-4.11 m	42.66 m	112.9°
Fairlead 7	-39.30 m	-16.60 m	-4.11 m	42.66 m	247.1°
Fairlead 8	-39.30 m	-12.60 m	-4.11 m	41.27 m	252.2°

Main Intended Positions:-

Name	Easting	Northing	Depth	Tolerance
Anchor 1	570594.21	5764667.35	0.00 m	50.00 m
Anchor 2	570134.47	5764791.91	0.00 m	50.00 m
Anchor 3	569645.36	5765656.39	0.00 m	50.00 m
Anchor 4	569775.36	5766114.62	0.00 m	50.00 m
Anchor 5	570593.39	5766577.45	0.00 m	50.00 m
Anchor 6	571331.67	5766925.77	0.00 m	50.00 m
Anchor 7	571542.25	5765588.40	0.00 m	50.00 m
Anchor 8	571412.23	5765130.17	0.00 m	50.00 m

Verified by: (sign)____________________ (print)____________________

GNS II CONFIGURATION FILE C:\Ocean Bounty\Ocean Bounty09072002.gns

Main Actual Positions:-

Name	Easting	Northing	Depth	Tolerance
Anchor 1	570611.84	5764793.36	0.00 m	50.00 m
Anchor 2	570136.73	5764832.58	0.00 m	50.00 m
Anchor 3	569770.56	5765668.85	0.00 m	50.00 m
Anchor 4	569889.01	5766144.84	0.00 m	50.00 m
Anchor 5	570537.06	5766478.33	0.00 m	50.00 m
Anchor 6	571395.24	5766952.92	0.00 m	50.00 m
Anchor 7	571483.12	5765581.99	0.00 m	50.00 m
Anchor 8	571295.06	5765195.82	0.00 m	50.00 m

Verified by: (sign)____________________ (print)____________________

APPENDIX K

DAILY REPORT SHEETS

THALES

THALES GEOSOLUTIONS (AUSTRALASIA) LIMITED
DAILY RECORD SHEET

913712 294

Date:24 July 2002 Client: Esso Job No.: 3410A3 Vessel: Ocean Bounty Location: Sole-2

Equipment	Op	B/up
Ocean Bounty		
SkyFix	1	
SkyFix Spot	1	1
Gyro	1	
GNS 2	1	1
MultiFix 3	1	1
Remote Disp	1	1
Tracs	1	1

Equipment	Op	B/up
Pacific Sentinal	1	
GNS 2	1	
Fluxgate Gyro	1	
Tracs	1	
Pacific Conqueror		
GNS 2	1	
Fluxgate Gyro	1	
Tracs	1	

Thales Personnel
P. Wells (PW)
J. Antao (JA)
N. Cowley (NC)
Client Personnel
H. Arrowsmith

WX	Sea State	Swell	Wind Dir.
0000			
0600			
1200			
1800			

DIARY OF OPERATIONS

TIME	Time Zone=UTC + 10 hrs (EST)
1700	Ocean Bounty operations transferred from OMV to Esso. Ocean Bounty 3km north of Sole-2. (Fix No 470 675 852mE 5 783 638mN). Commence tow to Beardie-1. Pacific Sentinal & Pacific Conqueror on tow bridles. Tow route per approved Project Quality Plan (TGA-3410-PGP).
1730	Thales personnel PW & NC participate in daily pre-tour meeting.
2330	Thales personnel JA participated in daily pre-tour meeting.
2350	Lost GPS due to GPS Masking
2359	Continuing tow to Beardie-1.

Forms are to be completed daily in duplicate on all vessels. Each form should be countersigned by the Clients Representative, the original being retained on board until the next crew change or at the end of job, whichever is the earlier, when they should be returned to the PERTH office.

Signature ____________________
SURVEYOR/ENGINEER

WHITE	: Accounts Department
BLUE	:Operations Department
YELLOW	: Clients Representative

Signature ____________________
CLIENT REPRESENTATIVE

THALES GEOSOLUTIONS (AUSTRALASIA) LIMITED
DAILY RECORD SHEET

THALES

Date:25 July 2002 Client: Esso Job No.: 3410A3 Vessel: Ocean Bounty Location: Beardie-1

913712 295

Equipment	Op	B/up
Ocean Bounty		
SkyFix	1	
SkyFix Spot	1	1
Gyro	1	
GNS 2	1	1
MultiFix 3	1	1
Remote Disp	1	1
Tracs	1	1

Equipment	Op	B/up
Pacific Sentinal	1	
GNS 2	1	
Fluxgate Gyro	1	
Tracs	1	
Pacific Conqueror		
GNS 2	1	
Fluxgate Gyro	1	
Tracs	1	

Thales Personnel
P. Wells (PW)
J. Antao (JA)
N. Cowley (NC)
Client Personnel
H. Arrowsmith

WX	Sea State	Swell	Wind Dir.
0000			
0600			
1200			
1800			

DIARY OF OPERATIONS

TIME	Time Zone=UTC + 10 hrs (EST)
0001	Continuing tow to Beardie-1
0200	Satellite masking
0512	Manual fix No. 515 Ocean Bounty crossing pipeline Halibut export line.
0525	Manual fix No. 517 Ocean Bounty crossing pipeline Marlin-A export line.
0608	Manual fix No. 521 Ocean Bounty crossing pipeline Snapper-A platform.
0815	Anchor No. 6 on the bottom.
0835	Ocean Bounty on location.
1014	Paying out on anchor 6 to allow Ocean Bounty to overshoot Beardie-1 ensuring maximum chain out on anchor No 2.
1020	Stopped paying out anchor 6.
1130	Anchor No 2 PCC passed to Pacific Conqueror and Ocean Bounty paying out to get Pacific Conqueror into position for anchor run.
1205	Pacific Conqueror commence runout anchor No 2.
1214	Anchor No 2 OTB. Ocean Bounty heaving in on No 6 winch to bring rig back to Beardie-1.
1223	Pacific Conqueror chasing back on anchor chain No 2.
1248	Helo on deck.
1255	Helo departed Bounty.
1300	Standing by for offloading of supplies and new anchor for No 7 chain from Lady Elizabeth.
1545	New anchor connected to anchor chain No 7 on Pacific Conqueror.
1558	Pacific Conqueror lowering anchor off stern and ready to run out.
1605	Ocean Bounty paying out anchor chain No 2
1613	Pacific Conqueror commenced runout anchor chain No 7
1620	Pacific Conqueror commenced lowering No 7

Forms are to be completed daily in duplicate on all vessels. Each form should be countersigned by the Clients Representative, the original being retained on board until the next crew change or at the end of job, whichever is the earlier, when they should be returned to the PERTH office.

Signature ____________________ SURVEYOR/ENGINEER

WHITE	: Accounts Department
BLUE	:Operations Department
YELLOW	: Clients Representative

Signature ____________________ CLIENT REPRESENTATIVE

THALES GEOSOLUTIONS (AUSTRALASIA) LIMITED
DAILY RECORD SHEET

913712 296

Date:25 July 2002	Client: Esso	Job No.: 3410A3	Vessel: Ocean Bounty	Location: Beardie-1

Equipment	Op	B/up
Ocean Bounty		
SkyFix	1	
SkyFix Spot	1	1
Gyro	1	
GNS 2	1	1
MultiFix 3	1	1
Remote Disp	1	1
Tracs	1	1

Equipment	Op	B/up
Pacific Sentinal	1	
GNS 2	1	
Fluxgate Gyro	1	
Tracs	1	
Pacific Conqueror		
GNS 2	1	
Fluxgate Gyro	1	
Tracs	1	

Thales Personnel
P. Wells (PW)
J. Antao (JA)
N. Cowley (NC)
Client Personnel
H. Arrowsmith

WX	Sea State	Swell	Wind Dir.
0000			
0600			
1200			
1800			

DIARY OF OPERATIONS

TIME	Time Zone=UTC + 10 hrs (EST)
1746	Anchor No. 3 Assigned to the Pacific Conqueror.
1949	Commenced running anchor No. 3
1956	Anchor No. 3 on the Bottom
1958	Pacific Conqueror chasing back.
2020	Anchor No. 3 Deassigned
2045	Pacific Sentinal released from tow bridle.
2115	Ocean Bounty commence balasting down operations.
2335	Ocean Bounty @ 75ft drilling draught.

Forms are to be completed daily in duplicate on all vessels. Each form should be countersigned by the Clients Representative, the original being retained on board until the next crew change or at the end of job, whichever is the earlier, when they should be returned to the PERTH office.

Signature ____________________
SURVEYOR/ENGINEER

WHITE	: Accounts Department
BLUE	:Operations Department
YELLOW	: Clients Representative

Signature ____________________
CLIENT REPRESENTATIVE

THALES

THALES GEOSOLUTIONS (AUSTRALASIA) LIMITED
DAILY RECORD SHEET

Date:26 July 2002 Client: Esso Job No.: 3410A3 Vessel: Ocean Bounty Location: Beardie-1

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Equipment	Op	B/up
Ocean Bounty		
SkyFix	1	
SkyFix Spot	1	1
Gyro	1	
GNS 2	1	1
MultiFix 3	1	1
Remote Disp	1	1
Tracs	1	1

Equipment	Op	B/up
Pacific Sentinal	1	
GNS 2	1	
Fluxgate Gyro	1	
Tracs	1	
Pacific Conqueror		
GNS 2	1	
Fluxgate Gyro	1	
Tracs	1	

Thales Personnel
P. Wells (PW)
J. Antao (JA)
N. Cowley (NC)
Client Personnel
H. Arrowsmith

WX	Sea State	Swell	Wind Dir.
0000			
0600			
1200			
1800			

DIARY OF OPERATIONS

TIME	Time Zone=UTC + 10 hrs (EST)
0355	Conqueror running out anchor No.1
0405	Conqueror lowering No.1
0412	Anchor No.1 on bottom
0421	Pacific Conqueror Chasing back
0435	PCC passed back to Ocean Bounty
0439	Anchor No. 1 De-assigned.
0514	Anchor No. 8 Assigned to the Pacific Conqueror.
0551	Paying out on No. 8 to 500ft
0740	Commenced running anchor No. 8
0749	Conqueror lowering anchor No. 8
0751	Anchor No.8 on the bottom
0754	Pacific Conqueror chasing back
0807	PCC passed back to Ocean Bounty
0809	Anchor No. 8 De-assigned
0841	Moving rig 40m
0905	Pacific Conqueror position no longer being displayed. Investigating Possible Tracs failure
0925	Pacific Conqueror running anchor No. 4 on bearing of 300° from Ocean Bounty fairlead.
0934	Anchor No. 4 on the bottom. Anchor No 4 dropped on angle of 75.6° relative to Ocean Bounty heading of 230.6° and approximate distance out from Ocean Bounty of 780m.
0950	Anchor No 4 pennant passed back to Ocean Bounty.
0955	Pacific Conqueror requested to switch off & power up Tracs interface box. Tracs still not operating.
1000	Thales engineer JA preparing to transfer to Pacific Conqueror with back-up Tracs equipment.

Forms are to be completed daily in duplicate on all vessels. Each form should be countersigned by the Clients Representative, the original being retained on board until the next crew change or at the end of job, whichever is the earlier, when they should be returned to the PERTH office.

Signature ____________________ SURVEYOR/ENGINEER

WHITE	: Accounts Department
BLUE	:Operations Department
YELLOW	: Clients Representative

Signature ____________________ CLIENT REPRESENTATIVE

THALES

THALES GEOSOLUTIONS (AUSTRALASIA) LIMITED
DAILY RECORD SHEET

913712 298

Date:26 July 2002 Client: Esso Job No.: 3410A3 Vessel: Ocean Bounty Location: Beardie-1

Equipment	Op	B/up
Ocean Bounty		
SkyFix	1	
SkyFix Spot	1	1
Gyro	1	
GNS 2	1	1
MultiFix 3	1	1
Remote Disp	1	1
Tracs	1	1

Equipment	Op	B/up
Pacific Sentinal	1	
GNS 2	1	
Fluxgate Gyro	1	
Tracs	1	
Pacific Conqueror		
GNS 2	1	
Fluxgate Gyro	1	
Tracs	1	

Thales Personnel
P. Wells (PW)
J. Antao (JA)
N. Cowley (NC)
Client Personnel
H. Arrowsmith

WX	Sea State	Swell	Wind Dir.
0000			
0600			
1200			
1800			

DIARY OF OPERATIONS

TIME	Time Zone=UTC + 10 hrs (EST)
1035	Tracs system operational on Ocean Bounty & Pacific Conqueror. Tracs interface box on Pacific Conqueror changed out.
1042	Anchor No 5 assigned to Pacific Conqueror and preparing to run anchor.
1104	Pacific Conqueror running No 5 anchor.
1112	Anchor No 5 on the bottom & Pacific Conqueror chasing in anchor chain.
1130	Thales personnel JA attend dailt pre-tour meeting.
1215	Anchor No 2 re-assigned to Pacific Conqueror and preparing to change anchor.
1225	Pacific Conqueror chasing out anchor No 2 chain.
1233	Pacific Conqueror at anchor & raising to change.
1246	Anchor No 2 on deck and changing out.
1246	Anchor chain operations to pre-tension anchor chains & move Ocean Bounty drillstem over intended Beardie-1 location.
1408	Anchor No 2 lowered over stern of Pacific Conqueror.
1417	Anchor No 2 on the bottom.
1547	All anchored accepted as pre-tensioned to 400kips and paying out to reduce to approx 300kips.
1620	All anchors at correct tension. Preparing to spud in.
1655	Drillstem spud in. Fix No 933. 1.91m on bearing of 5.6°(T) from intended Beardie-1 location.
1725	Commence Final fix.
1730	Thales personnel PW & NC attend daily pre-tour meeting.
1825	Complete Final fix. Drillstem at AGD66 AMG Zone 55 CM 147° East 570 594.15mE, 5 765 624.16mN. Drillstem is 1.79m on a bearing of 10.8°(T) from the intended beardie-1 location.
2000	Print-out & save all data to disc. Commence de-mobilisation.
2200	De-Mobilisation complete.

Forms are to be completed daily in duplicate on all vessels. Each form should be countersigned by the Clients Representative, the original being retained on board until the next crew change or at the end of job, whichever is the earlier, when they should be returned to the PERTH office.

Signature ____________________ SURVEYOR/ENGINEER

WHITE	: Accounts Department
BLUE	:Operations Department
YELLOW	: Clients Representative

Signature ____________________ CLIENT REPRESENTATIVE

THALES

THALES GEOSOLUTIONS (AUSTRALASIA) LIMITED
DAILY RECORD SHEET

Date:27 July 2002 Client: Esso Job No.: 3410A3 Vessel: Ocean Bounty Location: Beardie-1

913712 299

Equipment	Op	B/up
Ocean Bounty		
SkyFix		
SkyFix Spot		
Gyro		
GNS 2		
MultiFix 3		
Remote Disp		
Tracs		

Equipment	Op	B/up
Pacific Sentinal		
GNS 2		
Fluxgate Gyro		
Tracs		
Pacific Conqueror		
GNS 2		
Fluxgate Gyro		
Tracs		

Thales Personnel
P. Wells (PW)
J. Antao (JA)
N. Cowley (NC)
Client Personnel
H. Arrowsmith

WX	Sea State	Swell	Wind Dir.
0000			
0600			
1200			
1800			

DIARY OF OPERATIONS

TIME	Time Zone=UTC + 10 hrs (EST).
1000	Thales Personnel attended Helo departure brief.
1044	Departed Ocean Bounty (Beardie-1) for Longford.
1125	Departed Sale for Melbourne.
1830	Departed Melbourne Airport for Perth
2030	Thales Personnel arrive Perth.

Forms are to be completed daily in duplicate on all vessels. Each form should be countersigned by the Clients Representative, the original being retained on board until the next crew change or at the end of job, whichever is the earlier, when they should be returned to the PERTH office.

Signature ____________________
SURVEYOR/ENGINEER

WHITE	: Accounts Department
BLUE	:Operations Department
YELLOW	: Clients Representative

Signature ____________________
CLIENT REPRESENTATIVE

ExxonMobil
Development

913712 300

EMDC Drilling: Request for URC Research Application

Provided by EMDC Administrator	EMDC Job Number	Date Assigned

Work to be Performed

Job Title: Mooring Analysis - Beardie-I Well

Job Description:
Perform mooring and riser tensioning analysis for the semi-submersible rig Ocean Bounty for operation in Bass Strait, offshore Australia on a one well program, Beardie-1, to start mid June 2002, to a maximum cost not exceeding US$40,000.
Perform analysis for use in operational planning. Project to meet ECI Upstream Design Standard for Mooring System per EMDC OIMS Manual. Expected water depth is 50m. Bass Strait Metocean Data and Location Map are attached.

Deliverables Expected: Report

Start Date: 01-Mar-02 **Completion Date:** 01-Apr-02

URC Contact: Stan Christman

Resources

R&E Work Hours	Technician Work Hours	Burden ? YIN	Total Authorized Expenditure

Chargeout Information

Drill/Project Team	URC Division	Affiliate to be Charged	Charge Code
AUSTRALIA	OFFSHOREDIVISION	EMPC - Esso Aust.	AFE L.0501 B003

Approvals

Requested By: CHRIS MEAKIN **Date:** 01-Mar-02

Approved By: [signature] **Date:** 4 March 2002

Daniel L. Whiteman - Drilling Manager

Distribution:
EMDC Administrator - Donna Nice, GP-4, Rm-735
URC - Project Contacts
URC - Sandra Hopko, N-328
URC - Dan Taft, ST-858 (URC Offshore Division Jobs Only)

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ExxonMobil Upstream Research Co.

April 16, 2002

R. E. Sandström

Mooring Analysis of Ocean Bounty for Drilling Operations in Australia

At the request of ExxonMobil Development Company, we have performed a quasi-static mooring analysis for the semisubmersible Ocean Bounty for drilling operations at Beardie-1, Australia, at a nominal water depth of 164 feet (50 meters) [1, 2]. The purpose of the analysis is to determine the adequacy of the Ocean Bounty's chain mooring system for drilling operations at this site.

Based on the results of the mooring analysis, we conclude that the Ocean Bounty's mooring system meets API RP 2SK [3] and Exxon Upstream Design Guidance Manual [4] requirements regarding line strength and anchor holding for operations at Beardie-1, *provided the pretension of the lines is reduced from the operating value of 300 kips to 165 kips in the survival condition (riser-disconnected).* If the operating pretension of 300 kips is maintained in the survival condition, *the anchor loads exceed the holding capacity of the anchors, and thus the requirements of API RP 2SK and the Exxon Upstream Design Guidance Manual are not satisfied. In such a case, application of piggy-back anchors and/or mooring line management should be considered. If mooring line management is adopted, further mooring analysis is required.* Further, our analysis found that *the anchor loads exceed the anchor holding capacity in the 1-year and 10-year return period environments with one line damaged.* API RP 2SK and the Exxon Upstream Design Guidance Manual have no requirements regarding anchor holding with one line damaged. *The use of piggy-back anchors and/or line management could be considered in order to mitigate the risk of anchor dragging in the one-line damaged condition.*

While the mooring system meets applicable criteria (with reduced survival pretension, as noted above), *the capacity of the chain wildcats (420 kips at stall) is lower than the mooring test load required to satisfy the requirements of the Exxon Upstream Design Guidance Manual (553 kips). Alternate means of applying the required test load should be considered.*

We have analyzed the following mooring arrangement:

- 8-line 30°/60° symmetric mooring pattern [2].
- Anchors: eight 40-kip Moorfast Offdrill II [5].
- Mooring Lines: 3¼-inch chain, B.S. 1,573 kips [5], length outboard of fairlead 4,800 ft (at pretension of 300 kips) or 4,810 ft (at pretension of 165 kips).
- Nominal initial tension of 300 kips in operating environments.
- Nominal initial tensions of 165 kips[1] and 300 kips in survival environments.

Vessel Characteristics and Mooring Hardware

The vessel characteristics [6, 7, 8] and mooring hardware [3, 5, 6, 8] are presented in Tables 1 and 2.

Table 1. Ocean Bounty - vessel characteristics

Basic Design:	Modified Ocean Victory (Group 11).
Rig Dimensions:	352 ft. Length x 266 ft. Width x 128 ft. Height (to main deck).
Operating Draft:	70 ft.
Survival Draft:	70 ft.
Displacement:	Approx. 60,800 kips at Operating and Survival Drafts.

Table 2. Ocean Bounty - mooring hardware

Anchors:	8 x 40-kip Moorfast Offdrill II, anchor holding capacity 300 kips in sand.
Chain:	8 x 3.25-inch, BS 1,573 kips, weight in water 87.22 lbs/ft, available length 5,500 ft.
Wildcat:	Capacity of 420 kips at stall.
Thrusters:	None.

Site Specifics

The site is located in the eastern Bass Strait [9] at latitude of 38° 15.3' S and longitude 147° 49' E in a water depth of 50 meters [1, 2, 9]. This location is approximately 4 km from the Whiting mini-platform and 12 km from the Barracouta platform [10, 11]. The distance from the proposed drilling center to the nearest pipeline is of the order of 4 km [12]. A preliminary survey of the area [8] found the site to be very flat with the seabed shoaling gently, with a minimum water depth of 49 meters and a maximum depth of 52 meters. The seabed sediment consists of fine to medium grain sands with some shell fragments. The sub-seabed, which varies with depth along the area sampled, consists of firm to stiff medium to coarse grain sands with shell fragments.

Environmental Criteria and Vessel Loads

Environmental criteria for the 95% non-exceedence (nx), 1-year and 10-year return periods for extreme wave, wind and currents are presented in [9]. The extreme storms in the area are placed into three categories based on the direction the wind is coming from. These directions are SE, S and SW. The storms coming from the northern sector are not considered to be extreme [9]. The currents and waves associated with the extreme winds are not specified. The waves for the wind extremes were conservatively taken as the highest waves in the extreme wave events for each of the three sectors. The associated collinear current speed was taken from [13], which is a more appropriate value to combine with the extreme wind [14].

The proposed rig heading is 240° [2]. The metocean criteria [9] do not specify the approximate sector ranges to which each of the extreme storms apply. For this reason, the mooring analysis was performed for a generic heading assuming the most severe environmental conditions, which come from the southeast. As a conservative approach, we have assumed that current, wind and waves are collinear. The extreme SE current events result in larger mean static loads and mean static fairlead tensions, while the extreme SE wave events result in larger maximum offsets, mooring line tensions and anchor loads. Hence, the mooring analysis was performed for the extreme wave environments coming from the SE. Table 3 shows the environmental criteria used in the mooring analyses. Table 4 summarizes the wind and current force coefficients for the Ocean Bounty [15]. The associated mean loads on the vessel due to the SE wave extremes for head, quartering, and beam directions are summarized in Table 5. The mean wave drift forces and low frequency responses were obtained from API RP 2SK [3], and the wave frequency responses were obtained for a Group 11 semisubmersible by integrating the vessel RAOs [16] with the appropriate wave spectra.

Mooring Analysis Results

The quasi-static mooring analysis was performed with the URC-licensed software Catsim [17]. The results are shown in Tables 6 (intact condition) and 7 (one-line damaged condition) for the 95% nx and 1-year return period environments for a pretension of 300 kips, and for the 10-year return period environment for pretensions of 165 and 300 kips. The conclusions from the mooring analysis are as follows:

- The maximum vessel offsets in the riser connected environments are:
  - 95% non-exceedence -- intact - 3.9% of water depth; damaged - 8.6% of water depth.
  - 1-year return period -- intact - 8.9% of water depth; damaged - 14.4% of water depth.

These offsets are initially assessed to be sufficiently small for the drilling riser. This should be confirmed by a drilling riser analysis.

- The maximum offsets in the survival condition (10-year return period - riser disconnected) are:
  - 165 kips pretension -- intact - 15.9% of water depth; damaged - 23.9% of water depth.
  - 300 kips pretension -- intact - 12.7% of water depth; damaged - 19.2% of water depth.

- The maximum line tension in the intact condition during a 10-year return period storm is 43.9% of breaking strength (BS). This value is below API RP 2SK's quasi-static intact tension limit of 50% BS [3].

- The maximum line tension in the one-line damaged condition during a 10-year return period storm is 57.5% BS, which is below API RP 2SK's quasi-static damaged tension limit of 70% BS [3].

- There is no uplift at the anchors. The minimum grounded-lengths in the 10-year return period are 3,277 ft. in the intact condition and 3,056 ft. in the one-line damaged condition. Assuming additional pay-out of 10 ft in the 10-year return environment, these are 3,437 and 3,180 ft, respectively.

- The holding capacity of the 40-kip Offdrill anchor (AHC) is estimated to be 300 kips in sand [3]. Previous experience from anchor test load operations in nearby sites [6] indicates that a reduction of 15 to 20% from this value is appropriate. This is because the sub-seabed consists of shell fragments embedded in medium to coarse grain sands. Thus, for the assessment of anchor holding capacity we have taken AHC to be 240 kips (i.e. a 20% reduction in AHC). The maximum anchor loads are as follows:
  - 1-year return period -- intact - 241 kips; damaged - 432 kips (pretension 300 kips).
  - 10-year return period -- intact - 240 kips; damaged - 501 kips (pretension 165 kips).
  - 10-year return period -- intact - 391 kips; damaged - 625 kips (pretension 300 kips).

  API RP 2SK requires that, with the system intact, the anchor loads be lower than the anchor holding capacity [3]. This requirement is satisfied in the 1-year return period environment with a pretension of 300 kips and the 10-year return period environment with a pretension of 165 kips (to within the accuracy of the analysis). *However, if a pretension of 300 kips is maintained in the 10-year return period environment, this requirement is not satisfied. If such a pretension is used in the survival environment, piggy-back anchors and/or line management should be considered. In any case, proper embeddment of the anchors should be tested and contingency plans developed to deploy the available piggy-back anchors* [8].

- According to the Exxon Upstream Design Guidance Manual (ECI) [4] the mooring test load should equal to the maximum line tension under the 10-year design environment. If this cannot be achieved due to operational constraints, the mooring test load should not be less than the mean line tension under the maximum design condition or the maximum line tension under the maximum operating condition, whichever is higher. According to ECI practice, the anchors should be test-loaded with a fairlead tension of 553 kips. *This value exceeds the wildcat capacity of 420 kips.* These test loads apply assuming the line pay-out to be 4,800 ft.

References

1. "Beardie-1 - Mooring and Riser Tensioning Analysis," electronic communication from S. Bhattacharjee to X. Wu and T. Kokkinis on March 4, 2002.
2. "Rig Move Procedures Proposal - Ocean Bounty - Patricia 2 or Baleen 3 to Beardie 1 - April 1, 2002," Rev.0, ExxonMobil Development Company - Drilling Rig Positioning and Mooring Procedure. Document contained in an electronic communication from C.P. Meakin of ExxonMobil Development Company to S. Bhattacharjee on April 11, 2002.
3. "Recommended Practice for Design and Analysis of Station Keeping System for Floating Structures", API recommended practice 2SK, Second Edition, December 1996.
4. "Exxon Upstream Design Guidance Manual, Section III.2 – Mobile Offshore Unit Mooring System," Exxon Co. International, December 1999.
5. "Ocean Bounty Mooring Report - Esso's Beardie#1 Well - 164' Water Depth," prepared by Diamond Offshore, Report Number 144-JW-164-1, October 12, 2001.
6. "Mooring Analysis for Ocean Bounty Drilling Operations at E-Pilchard," ExxonMobil Upstream Research Company, Offshore Division, File RA - J030006598, June 5, 2002.
7. Mobile Drilling Units of the World, Oilfield Publications Limited, Ledbury, England, June 1992.
8. "Re - Beardie-1 - Mooring and Riser Tensioning Analysis," electronic communication from C.P. Meakin of ExxonMobil Development Company to S. Bhattacharjee on April 10, 2002. This communication contains a Preliminary Survey Report for the Beardie-1 site.
9. "Metocean Criteria for Beardie 1," facsimile transmission from Lawson and Treloar PTY LTD to C.P. Meakin of ExxonMobil Development Company, October 12, 2001.
10. "Re: Beardie-1. Mooring ans (sic.) Riser Tensioning," electronic communication from S.A. Christman of ExxonMobil Development Company to K.H.H. Seow, S. Bhattacharjee and D.J. Wilson on May 10, 2001.
11. Beardie - 1 - Location Map, ExxonMobil Exploration Company, 2000-027, Gippsland 2001.
12. Pipelines Integrity Critical Drawing - Permitted Anchoring - Anchorage Exclusion Zone, Esso Australia LTD, Production Department, Drawing No. 300-15499, Rev. 3, dated March 1994.
13. 1989 Metocean Design Criteria for Bass Strait Fixed Platforms - Volume 1: Summary Report, ESSO Australia LTD, 1989.
14. "Currents in Bass Strait," electronic communication from J.C. Heideman to L.O. Garza-Rios on April 5, 2002.
15. Wind and Current Force Coefficients for Semisubmersible and Drillship Mobile Offshore Drilling Units, report prepared by Noble Denton and Associates for Exxon Production Research Company, January 1992.
16. WAMIT™ Version 5.3 - A Radiation-Diffraction Panel Program for Wave-Body Interactions, Department of Ocean Engineering, Massachusetts Institute of Technology, Cambridge, MA, 1995.
17. Catsim - Static Catenary-Elastic Analysis Software v. 1.75, SeaSoft® Systems, URC capped mooring analysis software.

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ExxonMobil Upstream Research Co.

Prepared by ______________________________
L.O. Garza-Rios

Reviews

R1 - Technical ________ T. Kokkinis

R2 - Sponsor's Needs ________ T. Kokkinis

R3 - Management ________ R. E. Sandström

R4 - Form ________ T. Kokkinis

File # RA - J030010482

Table 3. Metocean criteria - Extreme waves coming from SE

Environment'	Waves		Wind	Current
	H_s ft	T_p sec	V_w* kts	V_c§ kts
95% - nx	9.51	8	32.44	1.07
1-year	15.42	12	50.70	1.55
10-year	20.67	14	52.84	1.94

' The 1 and 10-year design environments corresponds to wave extremes.
* Corresponds to the one-minute average wind speed at 10 m. above water surface.
§ Surface current speed.

Table 4. Ocean Bounty - wind and current force coefficients* - operating and survival drafts

	Head kips/knt^2	Quartering kips/knt^2	Beam kips/knt^2
Wind	0.077	0.0737	0.077
Current	39.0	52.1	64.0

* The only available current and wind coefficients for this rig correspond to a draft of 74 ft.

Table 5a. Mean Loads -- Collinear head seas - Extreme waves

Environment	Wave kips	Wind* kips	Current kips	Total kips
95% - nx	17.9	81.0	44.5	143.4
1-year	35.0	197.9	94.2	327.1
10-year	46.0	226.2	147.2	419.4

*Mean wind forces are based on the one-minute wind speed.

Table 5b. Mean Loads -- Collinear quartering seas - Extreme waves

Environment	Wave kips	Wind* kips	Current kips	Total kips
95% - nx	17.5	77.6	59.5	154.6
1-year	29.2	189.4	125.8	344.4
10-year	37.0	216.5	196.6	450.1

* Mean wind forces are based on the one-minute wind speed.

Table 5c. Mean Loads -- Collinear beam seas - Extreme waves

Environment	Wave kips	Wind* kips	Current kips	Total kips
95% - nx	19.0	81.0	73.1	173.1
1-year	34.0	197.9	154.6	386.5
10-year	46.5	226.2	241.5	514.2

* Mean wind forces are based on the one-minute wind speed.

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Table 6a. Offsets, Line Tensions and Anchor Loads - INTACT, Head Seas

Description	Offsets						Line Tensions				Anchor Loads		Uplift Angle	Bottom Length
	Mean		Mean + LF		Mean + LF + WF		Mean		Maximum					
	ft	% WD	ft	% WD	ft	% WD	kips	% BS	kips	%BS	kips	% AHC	deg	ft
95% - nx	2.1	1.3	5.6	3.4	6.3	3.9	332	21.1	401	25.5	71	29.6	0.0	3,642
1-year	4.9	3.0	9.2	5.6	14.5	8.9	376	23.9	553	35.2	241	100.4	0.0	3,437
10-year (165)	10.2	6.2	15.9	9.7	25.3	15.4	279	17.7	538	34.2	223	92.9	0.0	3,467
10-year (300)	6.2	3.8	11.0	6.7	20.7	12.7	399	25.4	681	43.3	**381**	**158.8**	0.0	3,288

Table 6b. Offsets, Line Tensions and Anchor Loads - INTACT, Quartering Seas

Description	Offsets						Line Tensions				Anchor Loads		Uplift Angle	Bottom Length
	Mean		Mean + LF		Mean + LF + WF		Mean		Maximum					
	ft	% WD	ft	% WD	ft	% WD	kips	% BS	kips	%BS	kips	% AHC	deg	ft
95% - nx	2.3	1.4	3.9	2.4	4.6	2.8	339	21.6	380	24.2	47	19.6	0.0	3,673
1-year	5.1	3.1	7.2	4.4	12.8	7.8	391	24.9	550	35.0	237	98.8	0.0	3,442
10-year (165)	10.8	6.6	13.6	8.3	23.4	14.3	307	19.5	553	35.2	240	100.0	0.0	3,447
10-year (300)	6.7	4.1	9.1	5.5	19.0	11.6	421	26.8	690	43.9	**391**	**162.9**	0.0	3,277

Table 6c. Offsets, Line Tensions and Anchor Loads - INTACT, Beam Seas

Description	Offsets						Line Tensions				Anchor Loads		Uplift Angle	Bottom Length
	Mean		Mean + LF		Mean + LF + WF		Mean		Maximum					
	ft	% WD	ft	% WD	ft	% WD	kips	% BS	kips	%BS	kips	% AHC	deg	ft
95% - nx	2.6	1.6	4.7	2.9	5.3	3.2	339	21.6	383	24.4	50	20.8	0.0	3,669
1-year	5.7	3.5	9.7	5.9	14.0	8.6	391	24.9	543	34.6	230	95.8	0.0	3,450
10-year (165)	12.4	7.5	18.1	11.0	26.0	15.9	312	19.8	552	35.1	238	99.2	0.0	3,449
10-year (300)	7.7	4.7	12.5	7.6	20.7	12.6	424	27.0	680	43.2	**381**	**158.8**	0.0	3,288

Notes:

API method 1 (Mean + LF_{max} + WF_{sig}) yields larger offsets, tensions, and anchor loads in the 95% non-exceedence environment.

API method 2 (Mean + LF_{sig} + WF_{max}) yields larger offsets, tensions, and anchor loads in the 1-year and 10-year environments.

10-year (165) and 10-year (300) refer to 10-year return environments with pretensions of 165 kips and 300 kips, respectively.

Table 7a. Offsets, Line Tensions and Anchor Loads - ONE-LINE DAMAGED, Head Seas

Description	Offsets						Line Tensions				Anchor Loads		Uplift Angle	Bottom Length
	Mean		Mean + LF		Mean + LF + WF		Mean		Maximum					
	ft	% WD	ft	% WD	ft	% WD	kips	% BS	kips	%BS	kips	% AHC	deg	ft
95% - nx	9.3	5.7	13.4	8.1	14.1	8.6	429	27.3	510	32.4	193	80.4	0.0	3,492
1-year	13.4	8.2	18.6	11.3	23.6	14.4	493	31.3	690	43.9	**391**	**162.9**	0.0	3,277
10-year (165)	21.6	13.2	28.4	17.3	37.4	22.8	388	24.7	682	43.4	**382**	**159.2**	0.0	3,296
10-year (300)	15.6	9.5	21.3	13.0	30.7	18.8	527	33.5	834	53.0	**549**	**228.8**	0.0	3,125

Table 7b. Offsets, Line Tensions and Anchor Loads - ONE-LINE DAMAGED, Quartering Seas

Description	Offsets						Line Tensions				Anchor Loads		Uplift Angle	Bottom Length
	Mean		Mean + LF		Mean + LF + WF		Mean		Maximum					
	ft	% WD	ft	% WD	ft	% WD	kips	% BS	kips	%BS	kips	% AHC	deg	ft
95% - nx	9.9	6.0	11.9	7.3	12.5	7.7	449	28.5	505	32.1	186	77.5	0.0	3,499
1-year	14.6	8.9	17.3	10.6	22.8	13.9	541	34.4	727	46.3	**432**	**180.0**	0.0	3,236
10-year (165)	23.6	14.4	27.1	16.5	36.7	22.4	492	31.3	791	50.3	**501**	**208.8**	0.0	3,180
10-year (300)	17.4	10.6	20.4	12.4	30.1	18.4	599	38.1	905	57.5	**625**	**260.4**	0.0	3,056

Table 7c. Offsets, Line Tensions and Anchor Loads - ONE-LINE DAMAGED, Beam Seas

Description	Offsets						Line Tensions				Anchor Loads		Uplift Angle	Bottom Length
	Mean		Mean + LF		Mean + LF + WF		Mean		Maximum					
	ft	% WD	ft	% WD	ft	% WD	kips	% BS	kips	%BS	kips	% AHC	deg	ft
95% - nx	9.8	6.0	12.4	7.6	12.9	7.9	441	28.0	493	31.3	173	72.1	0.0	3,515
1-year	14.7	8.9	19.4	11.8	23.5	14.3	517	32.9	688	43.7	**389**	**162.1**	0.0	3,280
10-year (165)	24.9	15.2	31.6	19.3	39.3	23.9	438	27.8	711	45.2	**414**	**172.5**	0.0	3,264
10-year (300)	17.8	10.8	23.6	14.4	31.5	19.2	567	36.0	847	53.8	**563**	**234.6**	0.0	3,112

Notes:

API method 1 (Mean + LF_{max} + WF_{sig}) yields larger offsets, tensions, and anchor loads in the 95% non-exceedence environment.

API method 2 (Mean + LF_{sig} + WF_{max}) yields larger offsets, tensions, and anchor loads in the 1-year and 10-year environments.

10-year (165) and 10-year (300) refer to 10-year return environments with pretensions of 165 kips and 300 kips, respectively.

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ExxonMobil
Upstream Research Company
P.O. Box 2189
Houston, Texas 77252-2189

S. L. Davis
Manager
Offshore Division

ExxonMobil
Upstream Research

June 6.2002

C. P. Meakin
ESSO Australia Pty LTD
12 Riverside Quay
Southbank, VIC.3006
Australia

Mooring Analysis of Ocean Bounty for Drilling Operations at Beardie-l Utilizing Line Management

As requested, we performed a quasi-static mooring analysis for the semisubmersible Ocean Bounty for drilling operations at Beardie-1, Australia, at a nominal water depth of 164 ft (50 m), utilizing line management. This analysis follows a previous analysis without line management, which determined that relatively high pretensions are required in order to satisfy offset requirements, resulting in high anchor loads and associated required anchor test loads.

The objective of the present analysis was to assess whether slackening the leeward lines allows the system to satisfy offset requirements with lower anchor loads in the design environments. The analysis determined feasible leeward line payouts, with which the system satisfies all applicable API RP 2SK and Upstream Design Guidance Manual line strength and anchor holding requirements in the design environments. The maximum offsets are within normal operating practice for risers, but their acceptability should be confirmed by a riser analysis. We note, however, that the maximum offsets are underestimated in a quasi-static analysis with line management, because dynamic offsets due to wind and current are not included. This may result in reduced operability for drilling.

The analysis was not intended to prescribe the leeward line payouts for actual operations. This should be done by the rig operator on a case by case basis for the various environments that will be encountered in operations. Detailed operating procedures should be developed for such line management according to the requirements of the Upstream Design Guidance Manual. Also the risk to operations resulting from rapid change of environment direction in the course of a storm should be separately assessed.

To address possible constraints on line length that can be deployed with available anchor handling vessels, the analysis also considered the variation of the anchor loads as a function of the line length outboard of the fairlead (in the range of 2,500 ft to 4,500 ft). The maximum anchor loads in the lo-year return period environment with the system intact exceed the estimated anchor holding capacity of the existing Offdrill II anchors if the line length is reduced to 3,500 ft or less. The anchor loads are in all cases within the anchor holding capacity of the Stevpris Mk 5 anchors being considered for replacing the Offdrill II anchors.

The anchor loads exceed the anchor holding capacity of the Offdrill II anchors (with a deployed line length of 4,000 ft) in the l-year and lo-year return period environments with one line broken. Neither API RP 2SK nor the Upstream Design Guidance Manual have requirements regarding anchor holding with one line broken. The risk of dragging anchors when a line is broken should be separately assessed.

Details are given in the attached ExxonMobil Upstream Research Company memorandum. This memorandum was prepared on a research application basis for ExxonMobil Development Company. It has been approved by ExxonMobil Upstream Research Company for release to ExxonMobil Development Company contractors, coventurers, or host governments. ExxonMobil Development Company should clarify to the third parties that the information is being released under confidentiality terms within the agreements between the parties.

The memorandum was screened under the Operations Integrity Management System for Technical Products (OIMS-TP) and was found to be a Type 2 product, having lower risk of misuse. The assumptions about its use made in reaching that conclusion are given in the OIMS-TP transmittal form attached to the (report, letter, memorandum). If you have any questions please contact L. Garza-Rios at 713-431-7347 or T. Kokkinis at 713-431-7764.

Very truly yours,

S. L. Davis

By ______________

R. E. Sandstrom

LGR/

Copies ExxonMobil Upstream Research Company
X. M. Zhu (URC ST-748)
J. J. Zimmerman (URC ST-750)

ExxonMobil Development Company
S. A. Christman (GP4-736)
J. W. Barnhill (GP4-732)

File: RA - JO30010482

Attachment

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ExxonMobil Upstream Research Company
OIMS-TP Transmittal Form

TP: Memorandum titled " Mooring Analysis of Ocean Bounty for Drilling Operations at Beardie-1 Utilizing Line Management," June 6, 2002, File JO30010482	**Developer: L.O. Garza-Rios**

This form reflects a risk screening carried out under the ExxonMobil Upstream Research Company Operations Integrity Management System for Technical Products, OIMS-TP. The purpose of this form is to assure the user of the TP that the principles of ExxonMobil's Operations Integrity Management Framework (OIMF) were adhered to in its development, and to inform the user of any important assumptions that were made about how the TP will be used.

The attached Technical Product was screened under the ExxonMobil Upstream Research Company OIMS-TP and found to be lower risk in its anticipated use. In this assessment, the following key assumptions about how the TP will be used (e.g., mitigators/preventers in place, training of personnel, limits on TP's range of use) were made:

The TP represents a mooring analysis for a floating drilling operation. The TP was prepared by engineers experienced in mooring analysis, employing ExxonMobil Upstream Research Company quality assurance procedures. The analysis criteria and methodology are based on API RP 2SK, Section III.2 of the Upstream Design Guidance Manual on Mobile Offshore Unit Mooring System and the EMDC OIMS Drilling Manual.
It is assumed that the TP will be used to assess the adequacy of the Ocean Bounty chain mooring system for drilling operations at the specified Beardie-1 location. The mooring system analyzed in the TP addresses operations with line management. The user of the TP should note that the maximum offsets shown in the TP are underestimated because dynamic offsets due to wind and current are not included in quasi-static analysis. It is further assumed that:

- *The actual mooring hardware of the vessel conforms to the analysis inputs and meets the requirements of the Upstream Design Guidance Manual.*
- *Appropriate operatingprocedures will be developed as required by the Upstream Design Guidance Manual, and will be subjected to risk assessment.*
- *Appropriate operating procedures will be developed to address line management fully defining how the mooring system is to be controlled as a function of the environment.*
- *The operator will evaluate the operating risk resulting from rapid changes in environment direction during storms.*
- *The risk of dragging anchors with one line broken will be assessed.*

		DATE
Individual responsible for TP development:	L.O. Garza-Rios	06/06/2002
Others who participated in risk screening:	T Kokkinis	6/6/02
Supervisor*:	R. E. Sandstrom	6-10-02

* If Supervisor does not have OIMS-TP Extended Training, someone who does should sign before Supervisor.

This form accompanies lower risk TPs when transmitted to users/sponsors.

Project File: JO30010482 Section Administrative File: A-117

ExxonMobil Upstream Research Co.

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June 6, 2002

R. E. Sandström

Mooring Analysis of Ocean Bounty for Drilling Operations at Beardie-1 Utilizing Line Management

At the request of ExxonMobil Development Company, we have performed a quasi-static mooring analysis for the semisubmersible Ocean Bounty for drilling operations at Beardie-1, Australia, at a nominal water depth of 164 ft (50 m), utilizing line management. This analysis follows a previous analysis without line management [1], in which it was shown that relatively high pretensions are required in order to satisfy offset requirements, resulting in high anchor loads and associated required anchor test loads.

The present analysis addresses the following base mooring arrangement (prior to any line management actions):

- 8-line 30°/60° symmetric mooring pattern.
- Anchors: eight 40-kip Moorfast Offdrill II [2]. Consideration has been given to replacing some or all of these anchors with high-efficiency 10-ton Stevpris Mk 5 anchors with 2-ton ballast [3].
- Mooring Lines: 3¼-inch chain, B.S. 1,573 kips [2], nominal length outboard of fairlead 4,000 ft.
- Nominal pretension of 200 kips.

Details about the vessel characteristics, mooring hardware, and Beardie-1 site specifics are given in [1].

The line management considered in this analysis consisted of slackening the leeward lines to reduce offsets, line tensions and anchor loads. The objective of the analysis was to assess whether this type of line management allows the system to satisfy offset requirements with lower anchor loads in the design environments. The analysis was not intended to prescribe the leeward line payouts for actual operations. The rig operator has the responsibility to determine the appropriate amounts of line payout for the leeward lines for the various environments that will be encountered in operations, on a case by case basis. Detailed operating procedures should be developed for such line management according to the requirements of the Upstream Design Guidance Manual (UDGM, Section III.2.4.4.3) [4]. Also the risk to operations resulting from rapid change of environment direction in the course of a storm should be separately assessed.

The analysis has found feasible leeward line payouts, with which the system above satisfies all applicable UDGM [4] and API RP 2SK [5] line strength and anchor holding requirements in the design environments. The maximum offsets are within normal operating practice for risers, but their acceptability should be confirmed by a riser analysis. We note, however, that the maximum offsets are underestimated in a quasi-static analysis with line management, because dynamic offsets due to the wind and current are not included. This may result in reduced operability for drilling.

The analysis also considered the variation of the anchor loads as a function of the line length outboard of the fairlead (in the range of 2,500 ft to 4,500 ft). The maximum anchor loads in the 10-year return period environment with the system intact exceed the estimated anchor holding capacity of the Offdrill II anchors if the line length is reduced to 3,500 ft or less. The anchor loads are in all cases within the anchor holding capacity of the Stevpris Mk 5 anchors.

The anchor loads exceed the anchor holding capacity of the Offdrill II anchors (with a deployed line length of 4,000 ft) in the 1-year and 10-year return period environments with one line broken. Neither

API RP 2SK nor UDGM have requirements regarding anchor holding with one line broken. The risk of dragging anchors when a line is broken should be separately assessed, and means to mitigate it (such as deploying piggyback anchors) should be considered.

Environmental Criteria and Vessel Loads

The environmental criteria for this location are dependent upon the direction the environment is coming from [6]. The mooring analysis was carried out for the most severe direction, which is from the SE, assuming collinear environment. Head, quartering and beam directions relative to the rig were considered.

Table 1 shows the environmental criteria used in the mooring analysis. These consist of extreme waves and extreme currents. At the 95% non-exceedence level, there is no distinction between current and wave extremes. Table 2 summarizes the associated mean loads on the vessel due to the SE wave and current extremes for head, quartering, and beam directions.

The metocean criteria [6] also specifies that wind extreme events exist in addition to the current and wave extremes. The waves and current associated with the wind extremes, however, are not provided in [6] and therefore it is not possible to consider this type of extreme without further metocean analyses. We recommend that such analysis be pursued separately.

Table 1. Metocean criteria - Extreme waves and extreme currents coming from SE

Environment	Waves		Wind	Current
	H_s ft	T_p sec	V_w* kts	V_c§ kts
95% - non exceedence	9.51	8	32.44	1.07
1-year - extreme current	11.48	10	50.70	2.14
1-year - extreme wave	15.42	12	50.70	1.55
10-year - extreme current	15.42	10	52.84	2.53
10-year - extreme wave	20.67	14	52.84	1.94

* Corresponds to the one-minute average wind speed at 10 m. above water surface.
§ Surface current speed.

Table 2a. Mean static loads -- Collinear head seas coming from SE

Environment	Wave kips	Wind* kips	Current kips	Total kips
95% - nx	17.9	81.0	44.5	143.4
1-year - extreme current	24.0	197.9	178.1	400.0
1-year - extreme wave	35.0	197.9	94.2	327.1
10-year - extreme current	35.0	226.2	248.7	509.9
10-year - extreme wave	46.0	226.2	147.2	419.4

* Mean wind forces are based on the one-minute wind speed.

Table 2b. Mean static loads -- Collinear quartering seas coming from SE

Environment	Wave kips	Wind* kips	Current kips	Total kips
95% - nx	17.5	77.6	59.5	154.6
1-year - extreme current	21.5	189.4	237.9	448.8
1-year - extreme wave	29.2	189.4	125.8	344.4
10-year - extreme current	29.2	216.5	332.2	577.9
10-year - extreme wave	37.0	216.5	196.6	450.1

* Mean wind forces are based on the one-minute wind speed.

Table 2c. Mean static loads -- Collinear beam seas coming from SE

Environment	Wave kips	Wind* kips	Current kips	Total kips
95% - nx	19.0	81.0	73.1	173.1
1-year - extreme current	23.5	197.9	292.2	513.6
1-year - extreme wave	34.0	197.9	154.6	386.5
10-year - extreme current	34.0	226.2	408.1	668.3
10-year - extreme wave	46.5	226.2	241.5	514.2

* Mean wind forces are based on the one-minute wind speed.

Line Management Techniques

The nominal chain payout for this system is 4,000 ft with a nominal pretension of 200 kips. This corresponds to a fairlead to anchor distance of 3,987 ft. Figure 1 shows the conventions used in this analysis for the mooring line numbering and directions of external excitation. Table 3 shows the amount of additional chain payouts of the leeward mooring lines.

To facilitate the mooring analysis the line payouts shown in Table 3 were taken to be the same for both the extreme wave and extreme current environments for the same return period. Note that the chain payout for up-weather lines is kept at 4,000 ft. The line payouts were in all cases selected to reduce the mean offsets to close to zero in the extreme wave environment.

Table 3. Total chain out (feet) - extreme current and extreme wave environments

Heading	Head				Quartering				Beam			
Line #	3	4	5	6	4	5	6	7	5	6	7	8
95%-nx	4,006	4,004	4,006	4,004	4,007	4,005	4,005	4,007	4,007	4,005	4,005	4,007
1-year	4,016	4,013	4,013	4,016	4,022	4,019	4,019	4,022	4,021	4,018	4,018	4,021
10-year	4,042	4,038	4,038	4,042	4,050	4,046	4,046	4,050	4,049	4,045	4,045	4,049

Note: The total fairlead-anchor chain pay-out for lines not appearing above is 4,000 ft.

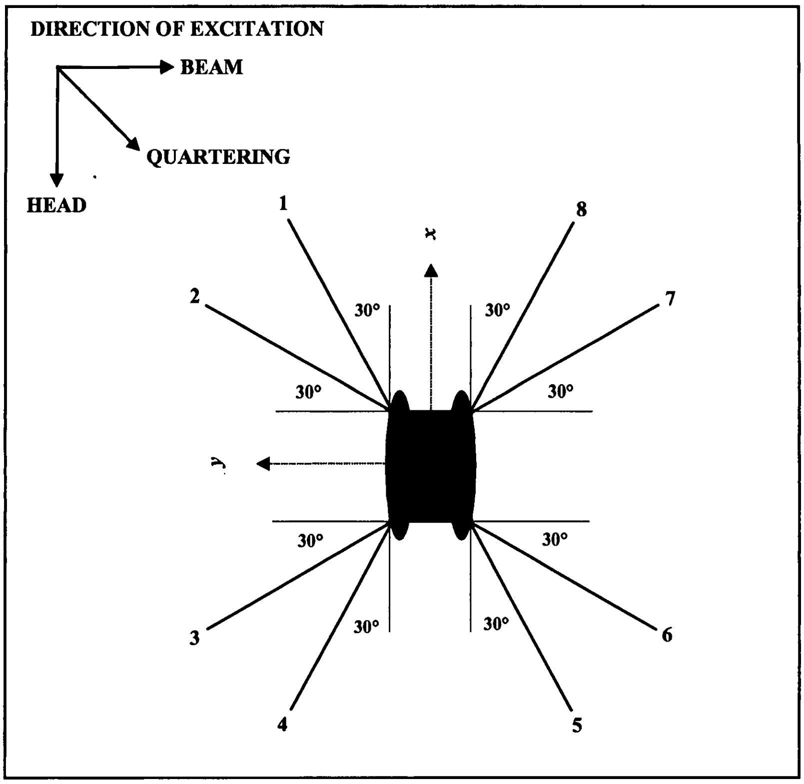

Figure 1. Ocean Bounty - Line numbering convention and direction of excitation

Mooring Analysis Results

The quasi-static mooring analysis with the line management depicted in Table 3 was performed with the URC-licensed software Catsim [7]. The results are shown in Tables 4 (intact condition) and 5 (one-line damaged condition).

The conclusions from the mooring analysis are as follows:

- The maximum vessel offsets are:

  - 95% non-exceedence -- intact - 3.0% of water depth; damaged - 7.6% of water depth.
  - 1-year return period -- intact - 6.6% of water depth; damaged - 13.5% of water depth.
  - 10-year return period -- intact - 10.6% of water depth; damaged - 18.1% of water depth.

  These offsets are significantly lower than those obtained from the previous mooring analysis without line management [1]. It should be noted that the maximum offsets are underestimated in a quasi-static analysis with line management, because dynamic offsets due to wind and current are not included. In mooring analysis without line management, this is compensated for by increasing the current and wind speed-averaging period to 1 minute, which produces higher mean offsets. The line management actions, however, remove most or all of the mean offsets.

- The maximum line tension in the intact condition is 29.1% of breaking strength (BS). This value is well below API RP 2SK's quasi-static intact tension limit of 50% BS [5].

- The maximum line tension in the one-line damaged condition is 43.7% BS, which is well below API RP 2SK's quasi-static damaged tension limit of 70% BS [5].

- The minimum fairlead declination angles with respect to the vertical are 23.2° in the intact and 16.3° in the one-line damaged conditions. These occur in the 10-year extreme waves. If larger angles are required to prevent repeated contact with the bolsters, the leeward line payout should be decreased accordingly.

- There is no uplift at the anchors. The minimum grounded-lengths are 2,762 ft. in the intact condition and 2,479 ft. in the one-line damaged condition.

- The holding capacity of the 40-kip Offdrill anchor (AHC) is estimated to be 300 kips in sand [5]. The EMDC-rated holding capacity of the Stevpris Mk 5 anchor is 930 kips in sand [8]. Due to the sub-seabed conditions (refer to [1] for details) we take the Offdrill II AHC to be 240 kips and the Stevpris AHC to be 744 kips (i.e. a 20% reduction in AHC). The maximum anchor loads are as follows:

  - 95% non-exceedence -- intact - 0 kips; damaged - 89 kips.
  - 1-year return period -- intact - 95 kips; damaged - 281 kips.
  - 10-year return period -- intact - 204 kips; damaged - 459 kips.

  The anchor load criteria are satisfied according to API RP 2SK and UDGM, which require the maximum loads to be lower than the holding capacity in the intact condition. The maximum anchor loads in the 1- and 10-year return environments with one line damaged exceed their holding capacity if Offdrill II anchors are deployed. While neither API nor UDGM have requirements for anchor loads in the damaged condition, proper embeddment of the Offdrill II anchors should be tested and the available piggy-back anchors deployed to reduce the risk of dragging anchors in the one-line damaged condition.

- According to UGDM [4] the mooring test load should be equal to the maximum line tension under the 10-year design environment (457 kips). If this cannot be achieved due to operational constraints (e.g. wildcat stall capacity), the mooring test load should not be less than the mean line tension under the maximum design condition (283 kips) or the maximum line tension under the maximum operating condition (361 kips), whichever is higher. Thus, according to UDGM requirements, the anchors should be test-loaded with a fairlead tension of 361 kips. This value is lower than the chain wildcat stall capacity of 420 kips [1].

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Table 4a. Offsets, Line Tensions and Anchor Loads - INTACT, Head Seas

Description	Offsets						Line Tensions				Anchor Loads		Uplift Angle	Bottom Length
	Mean		Mean + LF		Mean + LF + WF		Mean		Maximum					
	ft	% WD	ft	% WD	ft	% WD	kips	% BS	kips	%BS	kips	% AHC	deg	ft
95% - nx	0.0	0.0	4.1	2.5	4.9	3.0	200	12.7	263	16.7	0	0.0	0.0	3,067
1-year EC	2.3	1.4	7.1	4.4	9.1	5.5	228	14.5	330	21.0	60	25.0	0.0	2,951
1-year EW	0.3	0.2	5.9	3.6	10.8	6.6	204	13.0	361	22.9	95	39.6	0.0	2,902
10-year EC	1.7	1.1	7.6	4.7	10.3	6.3	221	14.0	352	22.4	85	35.4	0.0	2,916
10-year EW	1.5	0.9	8.4	5.1	17.4	10.6	191	12.1	431	27.4	174	72.5	0.0	2,798

Table 4b. Offsets, Line Tensions and Anchor Loads - INTACT, Quartering Seas

Description	Offsets						Line Tensions				Anchor Loads		Uplift Angle	Bottom Length
	Mean		Mean + LF		Mean + LF + WF		Mean		Maximum					
	ft	% WD	ft	% WD	ft	% WD	kips	% BS	kips	%BS	kips	% AHC	deg	ft
95% - nx	0.2	0.1	2.2	1.3	2.8	1.7	203	12.9	239	15.2	0	0.0	0.0	3,111
1-year EC	3.4	2.1	5.7	3.5	8.0	4.9	248	15.8	328	20.9	58	24.2	0.0	2,954
1-year EW	0.4	0.2	3.1	1.9	8.5	5.2	205	13.0	338	21.5	69	28.8	0.0	2,939
10-year EC	4.9	3.0	7.6	4.6	10.9	6.6	273	17.4	387	24.6	124	51.7	0.0	2,863
10-year EW	0.9	0.6	4.1	2.5	13.8	8.4	212	13.5	451	28.7	196	81.7	0.0	2,772

Table 4c. Offsets, Line Tensions and Anchor Loads - INTACT, Beam Seas

Description	Offsets						Line Tensions				Anchor Loads		Uplift Angle	Bottom Length
	Mean		Mean + LF		Mean + LF + WF		Mean		Maximum					
	ft	% WD	ft	% WD	ft	% WD	kips	% BS	kips	%BS	kips	% AHC	deg	ft
95% - nx	0.1	0.1	2.7	1.6	3.2	2.0	201	12.8	240	15.3	0	0.0	0.0	3,108
1-year EC	4.2	2.6	7.7	4.7	9.2	5.6	254	16.1	333	21.2	63	26.3	0.0	2,947
1-year EW	0.6	0.4	5.8	3.5	9.8	6.0	207	13.2	342	21.7	73	30.4	0.0	2,932
10-year EC	6.2	3.8	11.2	6.8	13.2	8.1	283	18.0	407	25.9	147	61.3	0.0	2,834
10-year EW	1.5	0.9	8.1	4.9	15.7	9.6	217	13.8	457	29.1	204	85.0	0.0	2,762

Notes:
EC = extreme current; EW = extreme wave

Table 5a. Offsets, Line Tensions and Anchor Loads - ONE-LINE DAMAGED, Head Seas

Description	Offsets						Line Tensions				Anchor Loads		Uplift Angle	Bottom Length
	Mean		Mean + LF		Mean + LF + WF		Mean		Maximum					
	ft	% WD	ft	% WD	ft	% WD	kips	% BS	kips	%BS	kips	% AHC	deg	ft
95% - nx	7.0	4.3	11.7	7.1	12.5	7.6	273	17.4	355	22.6	89	37.1	0.0	2,911
1-year EC	13.2	8.0	18.7	11.4	20.7	12.6	351	22.3	486	30.9	236	98.3	0.0	2,723
1-year EW	10.3	6.3	16.7	10.2	21.4	13.0	312	19.8	517	32.9	***270***	***112.5***	0.0	2,683
10-year EC	15.1	9.2	21.7	13.2	24.3	14.8	375	23.8	554	35.2	***311***	***129.6***	0.0	2,637
10-year EW	12.4	7.6	19.2	11.7	28.3	17.2	319	20.3	650	41.3	***417***	***173.8***	0.0	2,523

Table 5b. Offsets, Line Tensions and Anchor Loads - ONE-LINE DAMAGED, Quartering Seas

Description	Offsets						Line Tensions				Anchor Loads		Uplift Angle	Bottom Length
	Mean		Mean + LF		Mean + LF + WF		Mean		Maximum					
	ft	% WD	ft	% WD	ft	% WD	kips	% BS	kips	%BS	kips	% AHC	deg	ft
95% - nx	7.5	4.6	9.9	6.0	10.5	6.4	280	17.8	335	21.3	65	27.1	0.0	2,944
1-year EC	16.2	9.9	18.9	11.5	21.1	12.9	411	26.1	527	33.5	***281***	***117.1***	0.0	2,670
1-year EW	11.7	7.1	14.9	9.1	20.2	12.3	327	20.8	515	32.7	***267***	***111.3***	0.0	2,686
10-year EC	20.2	12.3	23.3	14.2	26.5	16.2	479	30.5	639	40.6	***405***	***168.8***	0.0	2,536
10-year EW	14.8	9.0	18.4	11.2	28.0	17.1	366	23.3	688	43.7	***459***	***191.3***	0.0	2,479

Table 5c. Offsets, Line Tensions and Anchor Loads - ONE-LINE DAMAGED, Beam Seas

Description	Offsets						Line Tensions				Anchor Loads		Uplift Angle	Bottom Length
	Mean		Mean + LF		Mean + LF + WF		Mean		Maximum					
	ft	% WD	ft	% WD	ft	% WD	kips	% BS	kips	%BS	kips	% AHC	deg	ft
95% - nx	7.3	4.5	10.4	6.3	10.9	6.6	280	17.8	332	21.1	62	25.8	0.0	2,947
1-year EC	16.7	10.2	20.7	12.6	22.2	13.5	404	25.7	509	32.4	***261***	***108.8***	0.0	2,694
1-year EW	11.6	7.1	17.6	10.7	21.3	13.0	331	21.0	512	32.5	***264***	***110.0***	0.0	2,690
10-year EC	21.0	12.8	26.7	16.3	28.7	17.5	471	29.9	631	40.1	***397***	***165.4***	0.0	2,544
10-year EW	14.9	9.1	22.3	13.6	29.8	18.1	374	23.8	686	43.6	***457***	***190.4***	0.0	2,482

Notes:
EC = extreme current; EW = extreme wave

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Sensitivity of Anchor Loads to Deployed Line Length

The mooring configuration considered in this analysis involves a deployed line length of 4,000 ft. Depending on the anchor handling vessels available, it may not be possible to deploy all 4,000 ft of chain. To address this, we have calculated the maximum anchor loads for deployed line lengths from 2,500 to 4,500 ft, as shown in Table 6. With a deployed line length of 2,500 ft, the maximum anchor loads are 335 kips in the intact condition and 590 kips with one line broken. These exceed the estimated anchor holding capacity of the Offdrill II anchors (240 kips), but they are within the estimated anchor holding capacity of the Stevpris Mk 5 anchors (744 kips).

Table 6. Maximum anchor loads for different mooring line payouts

Return Environment	Condition	Anchor Loads (kips)				
		2,500 ft chain	3,000 ft chain	3,500 ft chain	4,000 ft chain	4,500 ft chain
95% - nx	Intact	32	0	0	*0*	0
	Damaged	220	176	133	*89*	45
1-year EC	Intact	194	150	107	*63*	19
	Damaged	412	368	325	*281*	237
1-year EW	Intact	226	182	139	*95*	51
	Damaged	398	354	311	*267*	223
10-year EC	Intact	278	234	191	*147*	103
	Damaged	536	492	449	*405*	361
10-year EW	Intact	335	291	248	*204*	160
	Damaged	590	546	503	*459*	415

EC = extreme current; EW = extreme wave

Note that for the mooring lines involving the high-efficiency Stevpris Mk 5 anchors, the mooring test load can be taken as the fairlead load corresponding to one-third of the rated anchor holding capacity (i.e. 744/3 = 248 kips) [9]. In such case, the test load of the anchors would be 496 kips if 4,000 ft of chain are deployed and 380 kips if 2,500 ft of chain are deployed. These numbers are higher than the mooring test load of 361 kips according to [4], and therefore the mooring test load should be taken as 361 kips regardless of anchor type.

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Prepared by L.O. Garza-Rios

Reviews

R1 - Technical T. Kokkinis

R2 - Sponsor's Needs T. Kokkinis

R3 Management R. E. Sandstrom

R4 - Form T. Kokkinis

File # RA JO30010482

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July 11, 2002

C. P. Meakin
ESSO Australia Pty LTD
12 Riverside Quay
Southbank, VIC.3006
Australia

Mooring Analysis of Revised Mooring Configuration of Ocean Bounty for Drilling Operations at Beardie-1

As requested, we performed a quasistatic analysis of a revised mooring configuration of the semisubmersible Ocean Bounty, proposed for drilling operations at Beardie-1 in the Bass Strait, Australia, in a water depth of 164 ft (50 m). The configuration is asymmetric, employing high holding capacity Stevpris anchors for 5 of the lines and a longer line deployed towards the NE, while 3 lines (including the longer one) still have the lower holding capacity Offdrill anchors. This analysis supplements earlier analyses which addressed a symmetric mooring configuration with and without line management, and is primarily focused on assessing anchor holding for the lines with the lower holding capacity Offdrill anchors. Offsets and line strength, as well as anchor holding for the lines with the high holding capacity Stevpris anchors are also addressed as needed. Our findings are as follows:

- The system satisfies line strength criteria for all lines, as well as anchor holding criteria for all lines equipped with high holding capacity Stevpris anchors, in both the intact condition and with one line broken.

- Anchor holding criteria are not satisfied in the intact condition with 300-kip nominal pretension for the two shorter lines deployed towards the N and NW equipped with the lower holding capacity Offdrill anchors. If a nominal 200-kip pretension is used, intact anchor holding criteria are satisfied for all lines and environment directions, except for one environment direction and one line when the maximum riser connected drilling environment (95% nonexceedence) is exceeded.

  It may be possible to develop procedures to reduce anchor loads by appropriate slackening of downweather lines for environments from northerly directions. If this option is not practical, the risk of dragging anchors could be mitigated by deploying more line and/or anchor upgrades for the lines towards the N and NW.

  If anchor loads cannot be reduced to acceptable levels, it may be necessary to implement measures to secure the drilling operation when the environment from northerly directions exceeds the 95% nonexceedence level.

  These conclusions are based on analysis of specific cases in accordance with the provided metocean criteria.

- Anchor loads with one line broken may exceed the anchor holding capacity of the Offdrill anchors depending on environment direction and line broken. We note, however, that there are no requirements for anchor holding with one line broken.

- Maximum intact offsets with a 300-kip pretension are somewhat lower than those found in earlier analysis without line management, namely 3.3% of the water depth (WD) in the maximum riser connected drilling environment (95% nonexceedence) and 7.4% WD in the maximum riser connected nondrilling environment (1-year return period). This is because the system is somewhat stiffer due to the reduction in deployed line length. Maximum intact offsets with a 200-kip pretension increase about 25% compared to offsets with a 300-kip pretension, reaching 4.1% WD in the maximum riser connected drilling environment and 8.7% WD in the maximum riser connected nondrilling environment. The acceptability of such offsets for the drilling riser should be assessed by a riser analysis.

Details are given in the attached ExxonMobil Upstream Research Company memorandum. This memorandum was prepared on a research application basis for ExxonMobil Development Company. It has been approved by ExxonMobil Upstream Research Company for release to ExxonMobil Development Company contractors, coventurers, or host governments. ExxonMobil Development Company should clarify to the third parties that the information is being released under confidentiality terms within the agreements between the parties. All rights are reserved under copyright laws.

The memorandum was screened under the Operations Integrity Management System for Technical Products (OIMS-TP) and was found to be a Type 2 product, having lower risk of misuse. The assumptions about its use made in reaching that conclusion are given in the OIMS-TP transmittal form attached to the memorandum. If you have any questions please contact T. Kokkinis at 713-431-7764.

Very truly yours,

S. L. Davis

By ____________________
R. E. Sandström

TK/

Copies ExxonMobil Upstream Research Company
X. M. Zhu (URC ST-748)
J. J. Zimmerman (URC ST-750)
ExxonMobil Development Company
S. A. Christman (GP4-736)
J. W. Barnhill (GP4-732)

File: RA J030010482

Atttachment

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ExxonMobil Upstream Research Company
OIMS-TP Transmittal Form

TP: **Memorandum titled "Mooring Analysis of Revised Mooring Configuration of Ocean Bounty for Drilling Operations at Beardie-1," July 10, 2002, File RA J030010482**	**Developers: L. O. Garza-Rios & T. Kokkinis**

This form reflects a risk screening carried out under the ExxonMobil Upstream Research Company Operations Integrity Management System for Technical Products, OIMS-TP. The purpose of this form is to assure the user of the TP that the principles of ExxonMobil's Operations Integrity Management Framework (OIMF) were adhered to in its development, and to inform the user of any important assumptions that were made about how the TP will be used.

The attached Technical Product was screened under the ExxonMobil Upstream Research Company OIMS-TP and found to be lower risk in its anticipated use. In this assessment, the following key assumptions about how the TP will be used, (e.g., mitigators/preventers in place, training of personnel, limits on TP's range of use) were made:

The TP represents a mooring analysis for a floating drilling operation. The TP was prepared by engineers with experience in mooring analysis, employing ExxonMobil Upstream Research Company quality assurance procedures. The analysis criteria and methodology are based on API RP 2SK, Section III.2 of the Upstream Design Guidance Manual on Mobile Offshore Unit Mooring Systems and the EMDC OIMS Drilling Manual. It is assumed that the TP will be used to assess the adequacy of the Ocean Bounty chain mooring system, as configured in this analysis, for drilling operations at the specified Beardie-1 location. It is further assumed that:

- ***The actual mooring hardware of the vessel conforms to the analysis inputs and meets the requirements of the Upstream Design Guidance Manual.***
- ***Appropriate operating procedures will be developed as required by the Upstream Design Guidance Manual, and will be subjected to risk assessment.***
- ***Consideration will be given to measures for mitigating the risk of dragging anchors for environments from northerly directions (such as appropriate slackening of downweather lines, deploying more line for the two lines towards the N and NW and/or anchor upgrades) and measures for mitigating the consequences of dragging anchors (such as securing the drilling operation as warranted by the environment).***

		DATE
Individuals responsible for TP development:	______________________ L. O. Garza-Rios	July 10, 2002
	______________________ T. Kokkinis	July 10, 2002
Supervisor*:	______________________ R. E. Sandström	____________

* If Supervisor does not have OIMS-TP Extended Training, someone who does should sign before Supervisor.

This form accompanies lower risk TPs when transmitted to users/sponsors.

Project File:	RA J030010482	Section Administrative File:	A-117

July 11, 2002

R. E. Sandström

Mooring Analysis of Revised Mooring Configuration of Ocean Bounty for Drilling Operations at Beardie-1

As requested by ExxonMobil Development Company (EMDC) and Esso Australia Pty Ltd (EAL), we carried out analysis of a revised asymmetric mooring configuration of the semisubmersible Ocean Bounty, proposed for drilling operations at Beardie-1 in the Bass Strait, Australia, in a water depth of 164 ft (50 m). This analysis supplements earlier analyses which addressed a symmetric mooring configuration with and without line management ([1], [2]). The following table summarizes the mooring configuration revisions, compared to the system addressed in earlier analyses:

	Earlier Analyses	**Present Analysis**
line lengths	*all lines had a deployed length of 4,800 ft*	**the deployed length for 7 of the 8 lines has been reduced to 2,500 ft (one line still has a length of 4,800 ft)**
anchors	*all lines had Offdrill anchors (lower capacity)*	**5 of the 8 lines have high holding capacity Stevpris anchors (3 lines, including the longer one, still have lower capacity Offdrill anchors)**

The present analysis focused primarily on assessing anchor holding for the lines with the lower holding capacity Offdrill anchors, considering two levels of nominal pretension: 300 kips and 200 kips. Offsets and line strength, as well as anchor holding for the lines with the high holding capacity Stevpris anchors are also addressed as needed.

Our analysis determined that the intact system with a nominal 300-kip operating pretension (reduced to 165 kips in the survival condition):

- ✓ Satisfies line strength criteria for all lines.
- ✓ Satisfies anchor holding criteria for all lines equipped with high holding capacity Stevpris anchors and the longer line with the lower capacity Offdrill anchor.
- Does not satisfy anchor holding criteria for the two shorter lines deployed towards the N and NW equipped with the lower holding capacity Offdrill anchors.

If a nominal 200-kip operating pretension is used, anchor holding criteria are satisfied for all lines and environment directions, except for the maximum riser connected nondrilling environment (1-year return period) from the NE and only for the line deployed towards the N.

It may be possible to develop procedures to reduce anchor loads by appropriate slackening of downweather lines for environments from northerly directions. If this option is not practical, the risk of dragging anchors could be mitigated by deploying more line and/or anchor upgrades for the lines towards the N and NW.

The maximum intact offsets are:

- With a 300-kip pretension:
  - 3.3% WD in the maximum riser connected drilling environment (95% nonexceedence).
  - 7.4% WD in the maximum riser connected nondrilling environment (1 year return period).
- With a 200-kip pretension (about 25% higher compared to the 300-kip case):
  - 4.1% WD in the maximum riser connected drilling environment.
  - 8.7% WD in the maximum riser connected nondrilling environment.

The acceptability of such offsets for the drilling riser should be assessed by a riser analysis.

When one line is broken, for both 300-kip and 200-kip pretensions:

- ✓ Line strength criteria are satisfied in all cases.
- ✓ Anchor loads are estimated to be within the holding capacity of the more capable Stevpris anchors.
- Anchor loads exceed the holding capacity of the less capable Offdrill anchors, with some exceptions, depending on environment direction and line broken.

We note that there are no requirements for anchor holding with one line broken.

Details of the analysis are given in the following.

<u>Mooring System Configuration</u>

The mooring system considered in the present analysis differs from that addressed in earlier analyses for the same operation ([1], [2]), in that the deployed length of 7 out of the 8 mooring lines is reduced from 4,800 ft to 2,500 ft. Further, the anchors for 5 of the lines are now assumed to be high holding capacity Vryhof Stevpris Mk5 anchors ([2], [3]). The remaining 3 lines are still assumed to have Moorfast Offdrill II anchors [1]. Details are given in Table 1 and Figure 1. Further details about the vessel and the Beardie-1 site are given in [1] and [2].

Line #	Towards[1]	Nominal Pretension	Line Composition Outboard of Fairlead	Anchor
1	180 deg (S)	300 kips[6] in operational conditions[5] 165 kips in survival condition[5]	2,500 ft of 3.25 in chain[2]	12-ton Vryhof Stevpris Mk5[3]
2	210 deg		2,500 ft of 3.25 in chain	12-ton Vryhof Stevpris Mk5
3	270 deg (W)		2,500 ft of 3.25 in chain	12-ton Vryhof Stevpris Mk5
4	300 deg		2,500 ft of 3.25 in chain	40-kip Moorfast Offdrill II[4]
5	0 deg (N)		2,500 ft of 3.25 in chain	40-kip Moorfast Offdrill II
6	30 deg		4,800 ft of 3.25 in chain	40-kip Moorfast Offdrill II
7	90 deg (E)		2,500 ft of 3.25 in chain	12-ton Vryhof Stevpris Mk5
8	120 deg		2,500 ft of 3.25 in chain	12-ton Vryhof Stevpris Mk5

1 The vessel heading is 240 deg [3].
2 The breaking strength (BS) of the chain is 1,573 kips [1].
3 The estimated anchor holding capacity (AHC) of the Stevpris Mk5 anchors in sand is 744 kips [2].
Four of the 5 Stevpris anchors are 10-ton anchors with 2 tons of ballast, while the fifth is a 12-ton anchor [3].
4 The estimated holding capacity of the Moorfast Offdrill II anchors in sand is 240 kips ([1], [2]).
5 Operational conditions are the maximum riser connected drilling and nondrilling environments (see metocean criteria below). Survival condition is the maximum design environment (with the riser disconnected). The vessel draft in all conditions is assumed to be 70 ft [1].
6 Sensitivity cases with 200-kip pretension in operational conditions were also analyzed.

Table 1: Mooring Configuration for Analysis

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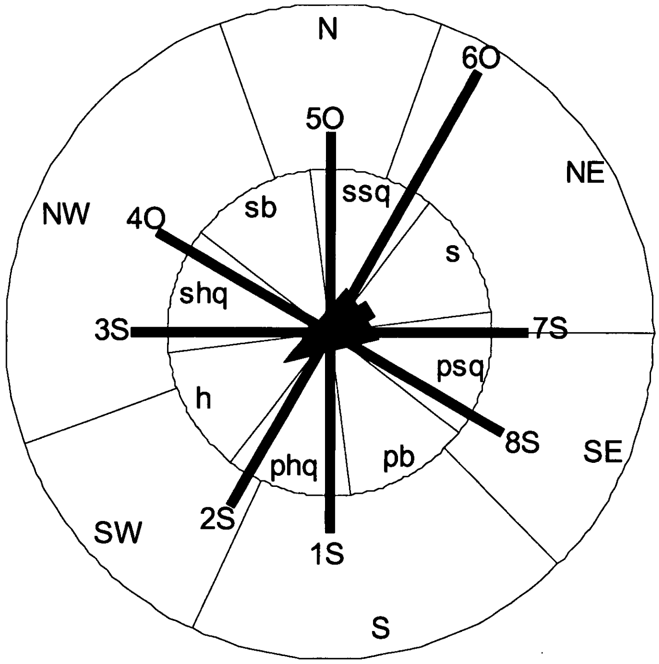

Figure 1: Mooring Configuration and Environment Directions for Vessel Heading of 240°
(h=head, shq=starboard head quarter, sb=starboard beam, ssq=starboard stern quarter, s=stern, psq=port stern quarter, pb=port beam, phq=port head quarter)

Environment

Because of the asymmetry of the mooring system (in anchor placement and line lengths), it was necessary to carry out analysis for environments from several directions. The environmental criteria [4] used for [1] and [2] addressed only environments from the southeast, the south and the southwest, since these were assessed to be more severe than environments from the remaining directions. For the present analysis we also considered environments from the northwest, the north and the northeast, using criteria specified in [5]. Table 2 shows the complete set of criteria. The 95% nonexceedence (nx) environment is the maximum riser connected drilling environment. The 1-year return period environment is the maximum riser connected nondrilling environment. Finally the 10-year return period environment is the maximum design environment. The riser is assumed to be disconnected in this environment. For the 1-year and 10-year return period environments both wave (wave x) and current (curr x) extremes are specified. Environments from the SE are, in general, the most severe. Extreme environments from northerly sectors [4], however, are almost as severe as extreme environments from southerly sectors [5]. Shaded cells in Table 1 indicate the highest wave heights, wind speeds and currents speeds within each set of criteria.

Exceedence or Return Period	Extreme Type	Direction from	Sector		Hs		Wind Speed (1 min avg)		Current Speed (top)	
			From	To	m	ft	m/sec	knots	m/sec	knots
95%nx	na	N	340	20	2.7	8.9	13.0	25.3	0.6	1.17
		NE	20	90			15.2	29.5		
		SE	90	135	2.9	9.5	16.7	32.5	0.55	1.07
		S	135	205						
		SW	205	250						
		NW	250	340	2.7	8.9	18.5	36.0	0.4	0.78
1-year	wave x	N	340	20	2.8	9.2	26.1	50.7	0.7	1.36
		NE	20	90	4.5	14.8			0.8	1.56
		SE	90	135	4.7	15.4				
		S	135	205	3.9	12.8	21.2	41.2		
		SW	205	250	5.0	16.4	20.2	39.3		
		NW	250	340	3.1	10.2	26.1	50.7	0.4	0.78
	curr x	N	340	20	2.1	6.9	26.1	50.7	1	1.94
		NE	20	90	3.4	11.2			1.1	2.14
		SE	90	135	3.5	11.5				
		S	135	205	2.9	9.5	21.2	41.2		
		SW	205	250	3.8	12.5	20.2	39.3		
		NW	250	340	2.3	7.6	26.1	50.7	0.6	1.17
10-year	wave x	N	340	20	3.1	10.2	27.9	54.2	0.9	1.75
		NE	20	90	4.7	15.4			1	1.94
		SE	90	135	6.3	20.7				
		S	135	205	4.8	15.8	22.7	44.1		
		SW	205	250	5.5	18.0	25	48.6		
		NW	250	340	3.4	11.2	27.9	54.2	0.5	0.97
	curr x	N	340	20	2.3	7.6	27.9	54.2	1.2	2.33
		NE	20	90	3.5	11.5			1.3	2.53
		SE	90	135	4.7	15.4				
		S	135	205	3.6	11.8	22.7	44.1		
		SW	205	250	4.1	13.5	25	48.6		
		NW	250	340	2.6	8.5	27.9	54.2	0.7	1.36

Table 2: Metocean Criteria for Analysis

Table 3 shows all possible combinations of environmental directions and directions relative to the vessel, along with the upweather lines for each. The focus of the present analysis was on cases for which lines 4, 5 and 6 (the ones with the lower capacity Offdrill anchors) were either most loaded or next most loaded. This encompassed a total of 9 cases (out of 14). Two of these cases, however, were found to be similar to and less critical than some of the other 7 cases, and were not addressed separately. Some cases for which all upweather lines had Stevpris anchors (and one case for which line 6 was in the next most loaded set) can be sufficiently addressed for line strength and anchor holding using results from previous analysis. Some of these cases, however, were analyzed in the present work primarily for the purpose of assessing offsets. Cases which were the focus of the present analysis are shaded.

Case	direction environment is coming from	direction relative to vessel	upweather lines* most loaded	upweather lines* next most loaded	analysis comments
1	N 340° to 20°	starboard beam	4O, 5O	3S, 6O	focus of present analysis
2	N 340° to 20°	starboard stern quarter	5O, 6O	4O, 7S	
3	NE 20° to 90°	starboard stern quarter	5O, 6O	4O, 7S	
4	NE 20° to 90°	stern	6O, 7S	5O, 8S	
5	NE 20° to 90°	port stern quarter	7S, 8S	6O, 1S	similar to and less critical than case 3 - no need to address
6	SE 90° to 135°	port stern quarter	7S, 8S	6O, 1S	can be addressed on the basis of results from previous analysis for line strength and anchor holding; SE addressed in present analysis for offsets
7	SE 90° to 135°	port beam	8S, 1S	7S, 2S	
8	S 135° to 205°	port beam	8S, 1S	7S, 2S	
9	S 135° to 205°	port head quarter	1S, 2S	8S, 3S	
10	SW 205° to 250°	port head quarter	1S, 2S	8S, 3S	
11	SW 205° to 250°	head	2S, 3S	1S, 4O	focus of present analysis
12	NW 250° to 340°	head	2S, 3S	1S, 4O	similar to and less critical than case 11 - no need to address
13	NW 250° to 340°	starboard head quarter	3S, 4O	2S, 5O	focus of present analysis
14	NW 250° to 340°	starboard beam	4O, 5O	3S, 6O	

* O next to the line number indicates the line has a Moorfast Offdrill II anchor. S next to the line number indicates the line has a Vryhof Stevpris Mk 5 anchor.

Table 3: Analysis Cases

Analysis Results, Intact System

Detailed analysis results for the intact condition with 300-kip (operational) and 165-kip (survival) pretensions are shown in Appendix I.

The mooring system satisfies line strength criteria (the maximum line tension is below 50% BS) for all cases analyzed (1, 2, 3, 4, 11, 13 and 14), as well as anchor holding criteria (the maximum anchor load is below AHC) for all lines with Stevpris anchors and line 6. However, as shown in Table 4, anchor holding criteria are not satisfied (shaded cells) for line 4 or/and line 5 for any case for the 1-year return period environment. Criteria are not satisfied either for the 95% nonexceedence environment (marginally) or the 10-year return period environment in some cases. The maximum anchor load on an Offdrill anchor is:

- 106% AHC in the 95% environment (Case 3, environment from NE onto starboard stern quarter, line 5).
- 191% AHC in the 1-year environment (Case 3, wave extreme from NE onto starboard stern quarter, line 5).
- 151% AHC in the 10-year environment (Case 3, wave extreme from NE onto starboard stern quarter, line 5).

For cases 6 through 10 we can use the results in [1] to draw conclusions regarding line strength and anchor holding. The present system is somewhat stiffer than the one modeled in [1], but the margins found in [1] for line tensions (relative to breaking strength) and anchor loads (relative to the holding capacity of the Stevpris anchors) are sufficiently large to allow us to conclude that all line strength and anchor holding criteria are satisfied for the revised system for cases 6 through 10. Note that lines 4 and 5 are downweather for these cases.

Following the findings above, the sensitivity of the anchor loads to reducing the nominal operating pretension from 300 kips to 200 kips was investigated. Once again analysis was carried out for cases 1, 2, 3, 4, 11, 13 and 14. The detailed analysis results are shown in Appendix II.

The mooring system satisfies line strength criteria (the maximum line tension is below 50% BS) for all cases analyzed (1, 2, 3, 4, 11, 13 and 14, and with a greater margin than with a 300-kip pretension), as well as anchor holding criteria for all lines with Stevpris anchors and line 6. Anchor holding criteria are also satisfied for line 4 and line 5 for all cases for the 1-year return period environment, as shown in Table 5. The only exception is case 3 (environment from the NE onto starboard stern quarter), in which the maximum anchor load for line 5 is 139% AHC in the 1-year extreme wave environment (shaded cells in Table 5). Anchor holding criteria are satisfied for the 95% nonexceedence environment.

Case	direction environment is coming from	direction relative to vessel	reccurrence	extreme type	line 4 anchor load (% AHC)	line 5 anchor load (% AHC)
1	N	starboard beam	95%	na	104	104
			1-year	wave x	131	132
				curr x	133	135
			10-year	wave x	92	94
				curr x	111	114
2		starboard stern quarter	95%	na	75	104
			1-year	wave x	82	134
				curr x	83	141
			10-year	wave x	17	95
				curr x	20	114
3	NE	starboard stern quarter	95%	na	75	106
			1-year	wave x	94	191
				curr x	88	165
			10-year	wave x	26	151
				curr x	24	141
4		stern	95%	na	41	94
			1-year	wave x	17	136
				curr x	29	116
			10-year	wave x	0	71
				curr x	0	61
11	SW	head	95%	na	97	38
			1-year	wave x	131	17
				curr x	114	26
			10-year	wave x	67	0
				curr x	58	0
13	NW	starboard head quarter	95%	na	104	75
			1-year	wave x	124	79
				curr x	119	78
			10-year	wave x	76	15
				curr x	70	13
14		starboard beam	95%	na	104	105
			1-year	wave x	125	126
				curr x	120	122
			10-year	wave x	78	79
				curr x	71	73

Table 4: Anchor Holding Results, Intact Condition, 300-kip Pretension

We can also reach the conclusion that all line strength and anchor holding criteria are satisfied with a 200-kip pretension in all remaining cases, given that they are already satisfied with a 300-kip pretension.

Case	direction environment is coming from	direction relative to vessel	reccurrence	extreme type	line 4 anchor load (% AHC)	line 5 anchor load (% AHC)
1	N	starboard beam	95%	na	54	54
			1-year	wave x	85	86
				curr x	90	92
2		starboard stern quarter	95%	na	25	53
			1-year	wave x	32	88
				curr x	34	98
3	NE	starboard stern quarter	95%	na	26	56
			1-year	wave x	41	139
				curr x	38	123
4		stern	95%	na	0	43
			1-year	wave x	0	81
				curr x	0	67
11	SW	head	95%	na	45	0
			1-year	wave x	73	0
				curr x	63	0
13	NW	starboard head quarter	95%	na	53	25
			1-year	wave x	74	29
				curr x	72	29
14		starboard beam	95%	na	54	54
			1-year	wave x	76	77
				curr x	74	75

Table 5: Anchor Holding Results, Intact Condition, 200-kip Pretension

Since a 200-kip pretension gives much improved performance with respect to anchor holding, the next issue to be addressed is offsets with this pretension, to provide a basis for assessing whether such offsets are acceptable for the drilling riser. Table 6 contrasts maximum offsets for pretensions of 300 and 200 kips for all the cases of Table 5, plus cases 6 and 7 (while line strength and anchor holding are not a concern for these cases, maximum offsets may exceed those for the other cases analyzed, given that the most severe environment is from the southeast). We have the following results:

- The maximum offset in the 95% environment with 300-kip pretension (maximum riser connected drilling environment) is 3.27% WD (case 11, environment from the SW onto head).
- The maximum offset in the 95% environment with 200-kip pretension (maximum riser connected drilling environment) is 4.09% WD (case 11, environment from the SW onto head), an increase of 25%.
- The maximum offset in the 1-year environment with 300-kip pretension (maximum riser connected nondrilling environment) is 6.84% WD (case 6, environment from the SE onto port stern quarter).
- The maximum offset in the 1-year environment with 200-kip pretension (maximum riser connected nondrilling environment) is 8.66% WD (case 7, environment from the SE onto port beam), an increase of 27%.

A riser analysis should be performed to assess whether the increased offsets under the 200-kip pretension are acceptable for the drilling riser.

Case	direction environment is coming from	direction relative to vessel	reccurrence	extreme type	offset with 300-kip pretension (% WD)	offset with 200-kip pretension (% WD)
1	N	starboard beam	95%	na	2.24	2.62
			1-year	wave x	3.62	4.57
				curr x	3.72	5.12
2		starboard stern quarter	95%	na	2.00	2.95
			1-year	wave x	3.39	4.90
				curr x	3.69	5.23
3	NE	starboard stern quarter	95%	na	2.12	2.80
			1-year	wave x	5.65	6.93
				curr x	4.68	6.29
4		stern	95%	na	2.95	3.75
			1-year	wave x	6.53	7.90
				curr x	3.46	6.44
6	SE	port stern quarter	95%	na	2.29	2.94
			1-year	wave x	6.84	8.06
				curr x	5.52	na
7		port beam	95%	na	2.63	3.41
			1-year	wave x	7.37[2]	8.66[4]
				curr x	6.00	na
11	SW	head	95%	na	3.27[1]	4.09[3]
			1-year	wave x	6.27	7.35
				curr x	4.88	6.25
13	NW	starboard head quarter	95%	na	1.97	2.58
			1-year	wave x	2.90	3.82
				curr x	2.69	3.73
14		starboard beam	95%	na	2.25	2.97
			1-year	wave x	3.31	4.40
				curr x	3.11	4.26

1 Maximum, 95% nx environment, 300-kip pretension.
2 Maximum, 1-year environment, 300-kip pretension.
3 Maximum, 95% nx environment, 200-kip pretension.
4 Maximum, 1-year environment, 200-kip pretension.

Table 6: Maximum Offsets, Intact Condition

Analysis Results, One Line Damaged Condition

Previous analysis [1] showed that the symmetric system with 4,800 ft line length for all lines satisfied line strength criteria with one line broken. The maximum line tension with one line broken was found to be well below the limit of 70% BS which applies to this condition. As the system considered in the present analysis is somewhat stiffer, the maximum line tension is expected to be higher, but still below 70% BS.

There is no requirement for anchor holding in the one line damaged condition for operations away from other structures. The nearest installations are the Whiting mini platform 4 km away and the Barracouta platform 12 km away. Based on the results of the analysis of the intact system, we expect that the maximum anchor loads with one line broken will be higher than the AHC of the Offdrill anchors (for those environments for which the lines with the Offdrill anchors are upweather) in both the 95% nx and 1-year return period environments, if a 300-kip pretension is used. The same would be true with a 200-kip pretension for certain combinations of environment direction and broken line number. In contrast, we expect the maximum anchor loads to be within the AHC of the Stevpris anchors in all cases.

We carried out analysis of certain cases, in order to assess the magnitude of the offsets with one line broken, with both a 300-kip (Table 7) and a 200-kip pretension (Table 8). The results confirm that maximum line tensions are well below the 70% BS limit, and that maximum anchor loads on the Stevris anchors are within AHC. On the other had, the maximum anchor loads exceed in most cases analyzed (shaded cells in Table 7 and Table 8) the AHC of the Offdrill anchors. The maximum offsets (heavy border cells in Tables 7 and 8) are:

- 6.7% WD with a 300-kip pretension in the maximum riser connected drilling environment. This increases to 7.8% WD with a 200-kip pretension.
- 11.0% WD with a 300-kip pretension in the maximum riser connected nondrilling environment. This increases to 13.3% WD with a 200-kip pretension.

Case	Environment Direction	Vessel Relative Direction	Environment Recurrence	Extreme Type	Line Broken	Mean Offset (%WD)	Max Offset (%WD)	Max Tension (% BS)	Max Anchor Load for Offdrill (kips)	Max Anchor Load for Stevpris (kips)
1	N	starboard beam	95% nx	na	4[1]	4.3	5.7	29	328	338
					5[2]	4.7	6.1	29	330	236
			1-year	curr x	4[1]	7.4	8.2	35	435	432
					5[2]	8.2	9.1	35	440	277
2		starboard stern quarter	95% nx	na	5[1]	4.7	6.1	29	247	222
					6[2]	4.3	5.5	32	392	233
			1-year	curr x	5[1]	8.4	9.6	36	305	268
					6[2]	7.1	8.1	41	545	276
3	NE		95% nx	na	5[1]	5.0	6.3	30	250	225
					6[2]	4.5	5.7	33	402	235
			1-year	wave x	6[2]	6.5	9.9	49	674	300
4		stern	95% nx	na	5[3]	4.1	6.2	30	144	328
					6[2]	4.3	$\boxed{6.7}$	31	277	371
					7[1]	4.2	6.4	31	364	352
			1-year	wave x	5[3]	5.7	10.1	41	292	534
					6[2]	6.1	10.5	42	568	513
					7[1]	6.4	$\boxed{11.0}$	40	398	527

Table 7: One Line Damaged Condition, 300-kip Pretension

Case	Environment Direction	Vessel Relative Direction	Environment Recurrence	Extreme Type	Line Broken	Mean Offset (%WD)	Max Offset (%WD)	Max Tension (% BS)	Max Anchor Load for Offdrill (kips)	Max Anchor Load for Stevpris (kips)
3	NE	starboard stern quarter	95% nx	na	5[1]	5.8	7.3	23	118	97
					6[2]	5.3	6.6	25	263	106
			1-year	wave x	5[1]	9.7	$\boxed{13.3}$	35	230	158
					6[2]	8.2	11.7	42	552	169
4	NE	stern	95% nx	na	6[2]	4.9	7.5	23	219	219
					7[1]	5.0	$\boxed{7.8}$	23	146	225
			1-year	wave x	6[2]	7.7	12.4	35	378	439
					7[1]	8.1	13.0	32	264	393

Table 8: One Line Damaged Condition, 200-kip Pretension

References

[1] "Mooring Analysis of Ocean Bounty for Drilling Operations in Australia," URC communication to C. P. Meakin (EAL), April 16, 2002, File J030010482.

[2] "Mooring Analysis of Ocean Bounty for Drilling Operations at Beardie-1 Utilizing Line Management," URC communication to C. P. Meakin (EAL), June 6, 2002, File J030010482.

[3] E-mail communication from C. P. Meakin (EAL) to URC, June 18, 2002.

[4] "Metocean Criteria for Beardie 1," communication from Lawson and Treloar Pty Ltd. to EAL, October 12, 2001.

[5] "Further Metocean Criteria for Beardie-1," communication from Lawson and Treloar Pty Ltd. to EAL, June 17, 2002.

Prepared by ____________________ and ____________________

L. O. Garza-Rios *T. Kokkinis*

Reviews

R1 _____ T. Kokkinis

R2 _____ T. Kokkinis

R3 _____ R. E. Sandström

R4 _____ T. Kokkinis

File: RA J030010482

Appendix I - Analysis Results for Nominal Pretension of 300 kips (Operational) and 165 kips (Survival) - Intact

OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME WAVES FROM N ONTO STARBOARD BEAM - CASE 1

	EXC	Pre-Tension	Offsets: Mean		Offsets: Mean+LF(max.)		Offsets: Mean+ LF+WF		Max Line Tension: Mean	Max Line Tension: Mean+ LF+WF	Anchor Load Line 4: Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	300	1.7	1.02	3.4	2.06	3.7	2.24	336	382	249	0	249
Oper.	1-yr	300	3.7	2.23	5.4	3.31	5.9	3.62	383	442	314	0	314
Sur.	10-yrs	165	8.8	5.35	11.2	6.83	11.8	7.17	297	362	221	0	221

	EXC	Pre-Tension	Anchor Load Line 5: Horiz	Ver.	Total	Anchor Load Line 6: Horiz	Ver.	Total	Line on Ground	Mooring Characteristics: Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	300	250	0	250	0	0	0	1371	24	104	104	0	0.0
Oper.	1-yr	300	317	0	317	19	0	19	1283	28	131	132	8	0.0
Sur.	10-yrs	165	226	0	226	0	0	0	1408	23	92	94	0	0.0

OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME CURRENT FROM N ONTO STARBOARD BEAM - CASE 1

	Desc.	Pre-Tension	Offsets: Mean		Offsets: Mean+LF(max.)		Offsets: Mean+ LF+WF		Max Line Tension: Mean	Max Line Tension: Mean+ LF+WF	Anchor Load Line 4: Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	300	1.7	1.02	3.4	2.06	3.7	2.24	336	382	249	0	249
Oper.	1-yr	300	4.9	3.00	5.9	3.58	6.1	3.72	416	447	319	0	319
Sur.	10-yrs	165	11.4	6.92	13.2	8.04	13.4	8.18	353	404	266	0	266

	Desc.	Pre-Tension	Anchor Load Line 5: Horiz	Ver.	Total	Anchor Load Line 6: Horiz	Ver.	Total	Line on Ground	Mooring Characteristics: Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	300	250	0	250	0	0	0	1371	24	104	104	0	0.0
Oper.	1-yr	300	323	0	323	22	0	22	1276	28	133	135	9	0.0
Sur.	10-yrs	165	274	0	274	0	0	0	1346	26	111	114	0	0.0

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OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME WAVES FROM N ONTO STARBOARD STERN QUARTER - CASE 2

	Desc.	Pre-Tension	Offsets: Mean		Offsets: Mean+LF(max.)		Offsets: Mean+ LF+WF		Max Line Tension: Mean	Max Line Tension: Mean+ LF+WF	Anchor Load Line 4: Horiz	Anchor Load Line 4: Ver.	Anchor Load Line 4: Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	300	1.5	0.94	2.9	1.78	3.3	2.00	336	381	179	0	179
Oper.	1-yr	300	3.5	2.15	4.9	3.02	5.6	3.39	387	446	196	0	196
Sur.	10-yrs	165	8.3	5.06	10.1	6.17	10.8	6.59	301	363	42	0	42

	Desc.	Pre-Tension	Anchor Load Line 5: Horiz	Anchor Load Line 5: Ver.	Anchor Load Line 5: Total	Anchor Load Line 6: Horiz	Anchor Load Line 6: Ver.	Anchor Load Line 6: Total	Line on Ground	Mooring Characteristics: Moor. line FOS	Mooring Characteristics: Anchor FOS 4	Mooring Characteristics: Anchor FOS 5	Mooring Characteristics: Anchor FOS 6	Mooring Characteristics: Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	300	249	0	249	21	0	21	1372	24	75	104	9	0.0
Oper.	1-yr	300	322	0	322	70	0	70	1278	28	82	134	29	0.0
Sur.	10-yrs	165	227	0	227	0	0	0	1407	23	17	95	0	0.0

OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME CURRENT FROM N ONTO STARBOARD STERN QUARTER - CASE 2

	Desc.	Pre-Tension	Offsets: Mean		Offsets: Mean+LF(max.)		Offsets: Mean+ LF+WF		Max Line Tension: Mean	Max Line Tension: Mean+ LF+WF	Anchor Load Line 4: Horiz	Anchor Load Line 4: Ver.	Anchor Load Line 4: Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	300	1.5	0.94	2.9	1.78	3.3	2.00	336	381	179	0	179
Oper.	1-yr	300	4.7	2.83	5.8	3.53	6.1	3.69	418	461	199	0	199
Sur.	10-yrs	165	10.6	6.45	12.1	7.38	12.4	7.56	355	405	49	0	49

	Desc.	Pre-Tension	Anchor Load Line 5: Horiz	Anchor Load Line 5: Ver.	Anchor Load Line 5: Total	Anchor Load Line 6: Horiz	Anchor Load Line 6: Ver.	Anchor Load Line 6: Total	Line on Ground	Mooring Characteristics: Moor. line FOS	Mooring Characteristics: Anchor FOS 4	Mooring Characteristics: Anchor FOS 5	Mooring Characteristics: Anchor FOS 6	Mooring Characteristics: Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	300	249	0	249	21	0	21	1372	24	75	104	9	0.0
Oper.	1-yr	300	338	0	338	81	0	81	1258	29	83	141	34	0.0
Sur.	10-yrs	165	275	0	275	0	0	0	1344	26	20	114	0	0.0

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OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME WAVES FROM NE ONTO STARBOARD STERN QUARTER - CASE 3

	Desc.	Pre-Tension	Offsets						Max Line Tension		Anchor Load Line 4		
			Mean		Mean+LF(max.)		Mean+ LF+WF		Mean	Mean+ LF+WF	Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	300	1.7	1.06	3.1	1.91	3.5	2.12	341	387	181	0	181
Oper.	1-yr	300	4.0	2.44	5.9	3.58	9.3	5.65	400	569	225	0	225
Sur.	10-yrs	165	9.2	5.63	11.5	7.01	15.0	9.12	322	483	62	0	62

	Desc.	Pre-Tension	Anchor Load Line 5			Anchor Load Line 6			Line on Ground	Mooring Characteristics				
			Horiz	Ver.	Total	Horiz	Ver.	Total		Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	300	255	0	255	25	0	25	1363	25	75	106	10	0.0
Oper.	1-yr	300	458	0	458	153	0	153	1067	36	94	191	64	0.0
Sur.	10-yrs	165	363	0	363	50	0	50	1235	31	26	151	21	0.0

OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME CURRENT FROM NE ONTO STARBOARD STERN QUARTER - CASE 3

	Desc.	Pre-Tension	Offsets						Max Line Tension		Anchor Load Line 4		
			Mean		Mean+LF(max.)		Mean+ LF+WF		Mean	Mean+ LF+WF	Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	300	1.7	1.06	3.1	1.91	3.5	2.12	341	387	181	0	181
Oper.	1-yr	300	5.3	3.22	6.9	4.22	7.7	4.68	436	512	211	0	211
Sur.	10-yrs	165	11.6	7.10	13.6	8.28	14.4	8.75	382	462	58	0	58

	Desc.	Pre-Tension	Anchor Load Line 5			Anchor Load Line 6			Line on Ground	Mooring Characteristics				
			Horiz	Ver.	Total	Horiz	Ver.	Total		Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	300	255	0	255	25	0	25	1363	25	75	106	10	0.0
Oper.	1-yr	300	396	0	396	118	0	118	1189	33	88	165	49	0.0
Sur.	10-yrs	165	339	0	339	39	0	39	1263	29	24	141	16	0.0

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OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME WAVES FROM NE ONTO STERN - CASE 4

	Desc.	Pre-Tension	Offsets						Max Line Tension		Anchor Load Line 4		
			Mean		Mean+LF(max.)		Mean+ LF+WF		Mean	Mean+ LF+WF	Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	300	1.6	0.94	4.4	2.70	4.8	2.95	331	410	98	0	98
Oper.	1-yr	300	3.7	2.28	7.5	4.60	10.7	6.53	380	579	41	0	41
Sur.	10-yrs	165	8.6	5.21	13.3	8.14	16.4	9.99	284	472	0	0	0

	Desc.	Pre-Tension	Anchor Load Line 5			Anchor Load Line 6			Min Line on Ground	Mooring Characteristics				
			Horiz	Ver.	Total	Horiz	Ver.	Total		Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	300	227	0	227	43	0	43	1329	26	41	94	18	0.0
Oper.	1-yr	300	327	0	327	162	0	162	1106	37	17	136	68	0.0
Sur.	10-yrs	165	171	0	171	47	0	47	1251	30	0	71	19	0.0

OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME WAVES FROM NE ONTO STERN - CASE 4

	Desc.	Pre-Tension	Offsets						Max Line Tension		Anchor Load Line 4		
			Mean		Mean+LF(max.)		Mean+ LF+WF		Mean	Mean+ LF+WF	Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	300	1.6	0.94	4.4	2.70	4.8	2.95	331	410	98	0	98
Oper.	1-yr	300	2.3	1.41	4.8	2.91	5.7	3.46	401	493	69	0	69
Sur.	10-yrs	165	10.3	6.30	13.5	8.23	14.4	8.79	318	415	0	0	0

	Desc.	Pre-Tension	Anchor Load Line 5			Anchor Load Line 6			Min Line on Ground	Mooring Characteristics				
			Horiz	Ver.	Total	Horiz	Ver.	Total		Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	300	227	0	227	43	0	43	1329	26	41	94	18	0.0
Oper.	1-yr	300	280	0	280	107	0	107	1215	31	29	116	44	0.0
Sur.	10-yrs	165	147	0	147	12	0	12	1329	26	0	61	5	0.0

OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME WAVES FROM SW ONTO HEAD - CASE 11

	Desc.	Pre-Tension	Offsets: Mean		Mean+LF(max.)		Mean+ LF+WF		Max Line Tension: Mean	Mean+ LF+WF	Anchor Load Line 4: Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	300	1.6	0.98	4.6	2.80	5.4	3.27	334	427	233	0	233
Oper.	1-yr	300	2.8	1.71	6.6	4.02	10.3	6.27	361	571	314	0	314
Sur.	10-yrs	165	7.4	4.51	12.2	7.42	16.0	9.78	269	470	160	0	160

	Desc.	Pre-Tension	Anchor Load Line 5: Horiz	Ver.	Total	Anchor Load Line 6: Horiz	Ver.	Total	Min Line on Ground	Mooring Characteristics: Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	300	90	0	90	0	0	0	1305	27	97	38	0	0.0
Oper.	1-yr	300	41	0	41	0	0	0	1116	36	131	17	0	0.0
Sur.	10-yrs	165	0	0	0	0	0	0	1253	30	67	0	0	0.0

OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME CURRENT FROM SW ONTO HEAD - CASE 11

	Desc.	Pre-Tension	Offsets: Mean		Mean+LF(max.)		Mean+ LF+WF		Max Line Tension: Mean	Mean+ LF+WF	Anchor Load Line 4: Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	300	1.6	0.98	4.6	2.80	5.4	3.27	334	427	233	0	233
Oper.	1-yr	300	3.6	2.19	7.0	4.26	8.0	4.88	381	500	274	0	274
Sur.	10-yrs	165	9.0	5.49	13.3	8.08	14.3	8.74	300	424	138	0	138

	Desc.	Pre-Tension	Anchor Load Line 5: Horiz	Ver.	Total	Anchor Load Line 6: Horiz	Ver.	Total	Min Line on Ground	Mooring Characteristics: Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	300	90	0	90	0	0	0	1305	27	97	38	0	0.0
Oper.	1-yr	300	63	0	63	0	0	0	1205	32	114	26	0	0.0
Sur.	10-yrs	165	0	0	0	0	0	0	1317	27	58	0	0	0.0

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OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME WAVES FROM NW ONTO STARBOARD HEAD QUARTER - CASE 13

	Desc.	Pre-Tension	Offsets						Max Line Tension		Anchor Load Line 4		
			Mean		Mean+LF(max.)		Mean+ LF+WF		Mean	Mean+ LF+WF	Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	300	1.6	0.95	2.9	1.75	3.2	1.97	337	382	249	0	249
Oper.	1-yr	300	2.6	1.58	4.1	2.48	4.8	2.90	364	425	297	0	297
Sur.	10-yrs	165	5.7	3.47	7.6	4.64	9.1	5.56	251	324	183	0	183

	Desc.	Pre-Tension	Anchor Load Line 5			Anchor Load Line 6			Line on Ground	Mooring Characteristics				
			Horiz	Ver.	Total	Horiz	Ver.	Total		Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	300	179	0	179	0	0	0	1370	24	104	75	0	0.0
Oper.	1-yr	300	190	0	190	0	0	0	1307	27	124	79	0	0.0
Sur.	10-yrs	165	35	0	35	0	0	0	1469	21	76	15	0	0.0

OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME CURRENT FROM NW ONTO STARBOARD HEAD QUARTER - CASE 13

	Desc.	Pre-Tension	Offsets						Max Line Tension		Anchor Load Line 4		
			Mean		Mean+LF(max.)		Mean+ LF+WF		Mean	Mean+ LF+WF	Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	300	1.6	0.95	2.9	1.75	3.2	1.97	337	382	249	0	249
Oper.	1-yr	300	2.9	1.77	4.1	2.51	4.4	2.69	373	415	286	0	286
Sur.	10-yrs	165	6.4	3.90	8.0	4.86	8.5	5.20	266	311	168	0	168

	Desc.	Pre-Tension	Anchor Load Line 5			Anchor Load Line 6			Line on Ground	Mooring Characteristics				
			Horiz	Ver.	Total	Horiz	Ver.	Total		Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	300	179	0	179	0	0	0	1370	24	104	75	0	0.0
Oper.	1-yr	300	187	0	187	0	0	0	1322	26	119	78	0	0.0
Sur.	10-yrs	165	32	0	32	0	0	0	1490	20	70	13	0	0.0

OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME WAVES FROM NW ONTO STARBOARD BEAM - CASE 14

	Desc.	Pre-Tension	Offsets						Max Line Tension		Anchor Load Line 4		
			Mean		Mean+LF(max.)		Mean+ LF+WF		Mean	Mean+ LF+WF	Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	300	1.7	1.04	3.4	2.07	3.7	2.25	336	383	250	0	250
Oper.	1-yr	300	2.8	1.71	4.9	2.97	5.4	3.31	363	429	300	0	300
Sur.	10-yrs	165	6.3	3.84	9.4	5.71	10.4	6.33	251	330	187	0	187

	Desc.	Pre-Tension	Anchor Load Line 5			Anchor Load Line 6			Line on Ground	Mooring Characteristics				
			Horiz	Ver.	Total	Horiz	Ver.	Total		Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	300	251	0	251	0	0	0	1369	24	104	105	0	0.0
Oper.	1-yr	300	302	0	302	13	0	13	1302	27	125	126	5	0.0
Sur.	10-yrs	165	190	0	190	0	0	0	1458	21	78	79	0	0.0

OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME CURRENT FROM NW ONTO STARBOARD BEAM - CASE 14

	Desc.	Pre-Tension	Offsets						Max Line Tension		Anchor Load Line 4		
			Mean		Mean+LF(max.)		Mean+ LF+WF		Mean	Mean+ LF+WF	Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	300	1.7	1.04	3.4	2.07	3.7	2.25	336	383	250	0	250
Oper.	1-yr	300	3.3	2.01	4.9	2.96	5.1	3.11	374	420	289	0	289
Sur.	10-yrs	165	7.3	4.45	9.3	5.68	9.8	5.97	268	317	171	0	171

	Desc.	Pre-Tension	Anchor Load Line 5			Anchor Load Line 6			Line on Ground	Mooring Characteristics				
			Horiz	Ver.	Total	Horiz	Ver.	Total		Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	300	251	0	251	0	0	0	1369	24	104	105	0	0.0
Oper.	1-yr	300	292	0	292	10	0	10	1315	27	120	122	4	0.0
Sur.	10-yrs	165	175	0	175	0	0	0	1481	20	71	73	0	0.0

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Appendix II - Analysis Results for Nominal Pretension of 200 kips (Operational) - Intact

OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME WAVES FROM N ONTO STARBOARD BEAM - CASE 1

	Desc.	Pre-Tension	Offsets						Max Line Tension		Anchor Load Line 4		
			Mean		Mean+LF(max.)		Mean+ LF+WF		Mean	Mean+ LF+WF	Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	200	2.5	1.54	4.6	2.77	4.8	2.95	237	277	129	0	129
Oper.	1-yr	200	5.5	3.33	7.5	4.59	8.0	4.90	290	344	203	0	203

	Desc.	Pre-Tension	Anchor Load Line 5			Anchor Load Line 6			Line on Ground	Mooring Characteristics				
			Horiz	Ver.	Total	Horiz	Ver.	Total		Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	200	130	0	130	0	0	0	1541	17.6	54	54	0	0.0
Oper.	1-yr	200	206	0	206	0	0	0	1429	21.8	85	86	0	0.0

OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME CURRENT FROM N ONTO STARBOARD BEAM - CASE 1

	Desc.	Pre-Tension	Offsets						Max Line Tension		Anchor Load Line 4		
			Mean		Mean+LF(max.)		Mean+ LF+WF		Mean	Mean+ LF+WF	Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	200	2.5	1.54	4.6	2.77	4.8	2.95	237	277	129	0	129
Oper.	1-yr	200	7.3	4.43	8.4	5.09	8.6	5.23	327	357	216	0	216

	Desc.	Pre-Tension	Anchor Load Line 5			Anchor Load Line 6			Line on Ground	Mooring Characteristics				
			Horiz	Ver.	Total	Horiz	Ver.	Total		Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	200	130	0	130	0	0	0	1541	18	54	54	0	0.0
Oper.	1-yr	200	221	0	221	0	0	0	1415	23	90	92	0	0.0

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OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME WAVES FROM N ONTO STARBOARD STERN QUARTER - CASE 2

	Desc.	Pre-Tension	Offsets						Max Line Tension		Anchor Load Line 4		
			Mean		Mean+LF(max.)		Mean+ LF+WF		Mean	Mean+ LF+WF	Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	200	2.3	1.40	3.9	2.40	4.3	2.62	237	275	60	0	60
Oper.	1-yr	200	5.2	3.18	6.9	4.19	7.5	4.57	293	347	77	0	77

	Desc.	Pre-Tension	Anchor Load Line 5			Anchor Load Line 6			Line on Ground	Mooring Characteristics				
			Horiz	Ver.	Total	Horiz	Ver.	Total		Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	200	127	0	127	0	0	0	1544	17	25	53	0	0.0
Oper.	1-yr	200	210	0	210	0	0	0	1424	22	32	88	0	0.0

OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME CURRENT FROM N ONTO STARBOARD STERN QUARTER - CASE 2

	Desc.	Pre-Tension	Offsets						Max Line Tension		Anchor Load Line 4		
			Mean		Mean+LF(max.)		Mean+ LF+WF		Mean	Mean+ LF+WF	Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	200	2.3	1.40	3.9	2.40	4.3	2.62	237	275	60	0	60
Oper.	1-yr	200	6.8	4.16	8.1	4.95	8.4	5.12	330	370	81	0	81

	Desc.	Pre-Tension	Anchor Load Line 5			Anchor Load Line 6			Line on Ground	Mooring Characteristics				
			Horiz	Ver.	Total	Horiz	Ver.	Total		Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	200	127	0	127	0	0	0	1544	17	25	53	0	0.0
Oper.	1-yr	200	236	0	236	0	0	0	1388	24	34	98	0	0.0

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OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME WAVES FROM NE ONTO STARBOARD STERN QUARTER - CASE 3

	Desc.	Pre-Tension	Offsets						Max Line Tension		Anchor Load Line 4		
			Mean		Mean+LF(max.)		Mean+ LF+WF		Mean	Mean+ LF+WF	Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	200	2.6	1.58	4.2	2.58	4.6	2.80	242	281	62	0	62
Oper.	1-yr	200	5.9	3.60	8.1	4.91	11.4	6.93	309	457	99	0	99

	Desc.	Pre-Tension	Anchor Load Line 5			Anchor Load Line 6			Line on Ground	Mooring Characteristics				
			Horiz	Ver.	Total	Horiz	Ver.	Total		Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	200	134	0	134	0	0	0	1534	18	26	56	0	0.0
Oper.	1-yr	200	333	0	333	43	0	43	1264	29	41	139	18	0.0

OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME CURRENT FROM NE ONTO STARBOARD STERN QUARTER - CASE 3

	Desc.	Pre-Tension	Offsets						Max Line Tension		Anchor Load Line 4		
			Mean		Mean+LF(max.)		Mean+ LF+WF		Mean	Mean+ LF+WF	Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	200	2.6	1.58	4.2	2.58	4.6	2.80	242	281	62	0	62
Oper.	1-yr	200	7.7	4.70	9.6	5.83	10.3	6.29	351	423	92	0	92

	Desc.	Pre-Tension	Anchor Load Line 5			Anchor Load Line 6			Line on Ground	Mooring Characteristics				
			Horiz	Ver.	Total	Horiz	Ver.	Total		Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
			(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	200	134	0	134	0	0	0	1534	18	26	56	0	0.0
Oper.	1-yr	200	296	0	296	22	0	22	1310	27	38	123	9	0.0

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OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME WAVES FROM NE ONTO STERN - CASE 4

	Desc.	Pre-Tension	Offsets Mean		Mean+LF(max.)		Mean+ LF+WF		Max Line Tension Mean	Mean+ LF+WF	Anchor Load Line 4 Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	200	2.3	1.41	5.7	3.50	6.1	3.75	232	301	0	0	0
Oper.	1-yr	200	5.6	3.39	10.0	6.10	13.0	7.90	286	462	0	0	0

	Desc.	Pre-Tension	Anchor Load Line 5 Horiz	Ver.	Total	Anchor Load Line 6 Horiz	Ver.	Total	Min Line on Ground	Mooring Characteristics Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	200	103	0	103	0	0	0	1582	19	0	43	0	0.0
Oper.	1-yr	200	194	0	194	49	0	49	1256	29	0	81	21	0.0

OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME CURRENT FROM NE ONTO STERN - CASE 4

	Desc.	Pre-Tension	Offsets Mean		Mean+LF(max.)		Mean+ LF+WF		Max Line Tension Mean	Mean+ LF+WF	Anchor Load Line 4 Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	200	2.3	1.41	5.7	3.50	6.1	3.75	232	301	0	0	0
Oper.	1-yr	200	6.8	4.16	9.7	5.89	10.6	6.44	310	396	0	0	0

	Desc.	Pre-Tension	Anchor Load Line 5 Horiz	Ver.	Total	Anchor Load Line 6 Horiz	Ver.	Total	Min Line on Ground	Mooring Characteristics Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	200	103	0	103	0	0	0	1582	19	0	43	0	0.0
Oper.	1-yr	200	161	0	161	6	0	6	1349	25	0	67	3	0.0

OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME WAVES FROM SW ONTO HEAD - CASE 11

	Desc.	Pre-Tension	Offsets						Max Line Tension		Anchor Load Line 4		
			Mean		Mean+LF(max.)		Mean+ LF+WF		Mean	Mean+ LF+WF	Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	200	2.4	1.46	5.9	3.63	6.7	4.09	235	314	108	0	108
Oper.	1-yr	200	4.2	2.53	8.6	5.23	12.1	7.35	264	443	176	0	176

	Desc.	Pre-Tension	Anchor Load Line 5			Anchor Load Line 6			Min Line on Ground	Mooring Characteristics				
			Horiz	Ver.	Total	Horiz	Ver.	Total		Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	200	0	0	0	0	0	0	1478	20	45	0	0	0.0
Oper.	1-yr	200	0	0	0	0	0	0	1283	28	73	0	0	0.0

OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME CURRENT FROM SW ONTO HEAD - CASE 11

	Desc.	Pre-Tension	Offsets						Max Line Tension		Anchor Load Line 4		
			Mean		Mean+LF(max.)		Mean+ LF+WF		Mean	Mean+ LF+WF	Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	200	2.4	1.46	5.9	3.63	6.7	4.09	235	314	108	0	108
Oper.	1-yr	200	5.3	3.24	9.2	5.64	10.3	6.25	286	396	152	0	152

	Desc.	Pre-Tension	Anchor Load Line 5			Anchor Load Line 6			Min Line on Ground	Mooring Characteristics				
			Horiz	Ver.	Total	Horiz	Ver.	Total		Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	200	0	0	0	0	0	0	1478	20	45	0	0	0.0
Oper.	1-yr	200	0	0	0	0	0	0	1350	25	63	0	0	0.0

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OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME WAVES FROM NW ONTO STARBOARD HEAD QUARTER - CASE 13

	Desc.	Pre-Tension	Offsets						Max Line Tension		Anchor Load Line 4		
			Mean		Mean+LF(max.)		Mean+ LF+WF		Mean	Mean+ LF+WF	Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	200	2.3	1.41	3.9	2.37	4.2	2.58	238	275	126	0	126
Oper.	1-yr	200	3.9	2.37	5.6	3.41	6.3	3.82	267	320	178	0	178

	Desc.	Pre-Tension	Anchor Load Line 5			Anchor Load Line 6			Line on Ground	Mooring Characteristics				
			Horiz	Ver.	Total	Horiz	Ver.	Total		Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	200	60	0	60	0	0	0	1545	17	53	25	0	0.0
Oper.	1-yr	200	70	0	70	0	0	0	1468	20	74	29	0	0.0

OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME CURRENT FROM NW ONTO STARBOARD HEAD QUARTER - CASE 13

	Desc.	Pre-Tension	Offsets						Max Line Tension		Anchor Load Line 4		
			Mean		Mean+LF(max.)		Mean+ LF+WF		Mean	Mean+ LF+WF	Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	200	2.3	1.41	3.9	2.37	4.2	2.58	238	275	126	0	126
Oper.	1-yr	200	4.4	2.69	5.8	3.55	6.1	3.73	278	316	174	0	174

	Desc.	Pre-Tension	Anchor Load Line 5			Anchor Load Line 6			Line on Ground	Mooring Characteristics				
			Horiz	Ver.	Total	Horiz	Ver.	Total		Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	200	60	0	60	0	0	0	1545	17	53	25	0	0.0
Oper.	1-yr	200	69	0	69	0	0	0	1474	20	72	29	0	0.0

OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME WAVES FROM NW ONTO STARBOARD BEAM - CASE 14

	Desc.	Pre-Tension	Offsets						Max Line Tension		Anchor Load Line 4		
			Mean		Mean+LF(max.)		Mean+ LF+WF		Mean	Mean+ LF+WF	Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	200	2.6	1.56	4.6	2.79	4.9	2.97	238	278	129	0	129
Oper.	1-yr	200	4.2	2.58	6.7	4.06	7.2	4.40	266	325	183	0	183

	Desc.	Pre-Tension	Anchor Load Line 5			Anchor Load Line 6			Line on Ground	Mooring Characteristics				
			Horiz	Ver.	Total	Horiz	Ver.	Total		Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	200	130	0	130	0	0	0	1540	18	54	54	0	0.0
Oper.	1-yr	200	185	0	185	13	0	13	1459	21	76	77	5	0.0

OFFSETS, TENSIONS, ANCHOR LOADS - INTACT, EXTREME CURRENT FROM NW ONTO STARBOARD BEAM - CASE 14

	Desc.	Pre-Tension	Offsets						Max Line Tension		Anchor Load Line 4		
			Mean		Mean+LF(max.)		Mean+ LF+WF		Mean	Mean+ LF+WF	Horiz	Ver.	Total
		(kips)	(ft)	%WD	(ft)	%WD	(ft)	%WD	(kips)	(kips)	(kips)	(kips)	(kips)
Oper.	95%	200	2.6	1.56	4.6	2.79	4.9	2.97	238	278	129	0	129
Oper.	1-yr	200	4.9	3.01	6.7	4.11	7.0	4.26	279	320	177	0	177

	Desc.	Pre-Tension	Anchor Load Line 5			Anchor Load Line 6			Line on Ground	Mooring Characteristics				
			Horiz	Ver.	Total	Horiz	Ver.	Total		Moor. line FOS	Anchor FOS 4	Anchor FOS 5	Anchor FOS 6	Anchor Uplift Angle
		(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(ft)	%BS	% AHC	% AHC	% AHC	deg.
Oper.	95%	200	130	0	130	0	0	0	1540	18	54	54	0	0.0
Oper.	1-yr	200	180	0	180	0	0	0	1467	20	74	75	0	0.0

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DIAMOND
OFFSHORE

Ocean Bounty Mooring Report
Esso's Beardie #1 Well – 164' Water Depth
October 12, 2001

Report Prepared By:

John Williams
Diamond Offshore Drilling, Inc.
15415 Katy Freeway
Houston, TX 77094
(281) 647-4082

Initial Distribution:
John Vecchio/File Code #29-614
Dave Webb (Work Request 144-03)
Eric Jacobsen
Tom O'Neill

Report Number: 144-JW-164-1

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Introduction

This report summarizes the results of the quasi-static mooring analysis of the *Ocean Bounty*. We have analyzed the vessel for a water depth at the well center and all anchors at 164'. The Global Maritime program, GMOOR32, was used to perform the analysis. For the analysis, the 10 year supplied storm data from Lawson and Treloar was used.

Results

The results obtained for the analysis are:

Condition	Environmental Heading (Deg off Bow)	Intact Condition				Damaged Condition			
		Line Tension FOS	Anchor Tension (% HC)	Maximum Offset (% WD)	Min Line On Bottom (ft)	Line Tension FOS	Anchor Tension (%HC)	Maximum Offset (%WD)	Min Line on Bottom (ft)
API Requirements		≥2.00	≤100%	8%-12%	N/A	≥1.43	N/A	N/A	N/A
10 Year Extreme Wave Case	45	4.68	47%	0.4%	1,468	2.84	108%	6.0%	1,173
10 Year Extreme Current Case	45	3.62	75%	2.2%	1,324	2.31	143%	9.3%	1,028

The damaged condition must be considered if and only if the vessel is moored up adjacent to other structures or near pipelines.

Discussion

The environmental data considered in the analysis were:

10 Year Extreme Wave Case

One-Minute Wind:	27.9 m/s (54.3 knots)
Surface Current:	1.0 m/s (1.94 knots)
Sig Wave Height:	6.3 m (20.7 feet)
Wave Period:	14.0 sec

10 Year Extreme Current Case

One-Minute Wind:	27.9 m/s (54.3 knots)
Surface Current:	1.3 m/s (2.53 knots)
Sig Wave Height:	4.7 m (15.4 feet)
Wave Period:	10.0 sec

The guidelines from API RP 2SK were used to perform the analysis. API requires a minimum line FOS of 2.00 for intact conditions and 1.43 for damaged conditions. The minimum anchor FOS is required to be 1.00 for intact conditions and there is no anchor tension requirement for the damaged case. For temporary moorings, API requires a 10-year environmental storm condition.

Equipment

The *Ocean Bounty* will be equipped with the following minimum useable mooring equipment listed in the order from the anchor to the rig:

- 40 Kip Offdrill Anchors — Holding Cap: 400 kips in soft clay
- 5,500' of 3.25" K4 Chain — Breaking Strength: 1,573 kips

Mooring Details

An initial payout of 2,500' was used for all lines (although, the more line out the better as it increases friction with the sea floor and decreases anchor tension). A 200 kip operating tension was utilized for the mooring lines. For the storm case, the rig was to be manned with the riser connected (but not drilling – waiting on weather) and all leeward lines were slackened 50'.

Wind and current forces were then determined by the following equation:

$$\boxed{F = C * V^2}$$

Where F is the force in kips, C is the wind or current coefficient in kips/knot^2, and V is the velocity of the wind or current in knots.

The worst case direction was determined to the quartering sea. The calculated force values for the environmental conditions at this angle are:

Environmental Data	Load Coefficient	Supplied Storm Data			
		Extreme Wave	Force (kips)	Extreme Current	Force (kips)
One Minute Wind Speed (knots)	0.071 (k/kt^2)	54.3	209.3	54.3	209.3
Surface Current (knots)	44.77 (k/kt^2)	1.94	168.5	2.53	286.6
Significant Wave Height (ft)	16.6 $(H_s/T_p)^2$	20.7	36.3	15.4	39.4
Peak Period (s)		14		10	
Total Force (kips)			**414**		**535**

Conclusions

The *Ocean Bounty* mooring system meets API RP 2SK requirements in both intact and damaged conditions for the supplied 10 year return storms from Lawson and Treloar. It should be noted, however, that anchor slip could occur in the one line damaged condition.

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ExxonMobil Development

EMDC Drilling: Request for URC Research Application

Provided by EMDC Administrator	EMDC Job Number	Date Assigned

Work to be Performed

Job Title: Riser Analysis -Offshore Bass Strait (Beardie-1 Well)

Job Description:
Review and perform riser analysis for floating rig Ocean Bounty for operation in Bass Strait. One well program, Beardie-l to start about mid June 2002. The well will be in about 50m of water. Work is to develop riser tensioning recommendations. Analysis also for use in operational planning. To support operations for Beardie-l to meet API RP16Q per EMDC OIMS Manual. (Bass Strait Metocean Data and Location Map attached).

Deliverables Expected: Report

Start Date: 01-Mar-02 **Completion Date:** 01-Apr-02

URC Contact: Stan Christman

Resources

R&E Work Hours	Technician Work Hours	Burden ? Y/N	Total Authorired Expenditure

Chargeout Information

Drill/Project Team	URC Division	Affiliate to be Charged	Charge Code
AUSTRALIA	OFFSHORE DIVISION	EMPC - Esso Aust.	AFE L0501 B003

Approvals

Requested By: CHRIS MEAKIN **Date:** 01-Mar-02

Approved By: Daniel L. Whiteman **Date:** 4 March 2002

Daniel L. Whiteman - Drilling Manager

Distribution:
EMDC Administrator. Donna Nice, GP-4, Rm-735
URC - Project Contacts
URC - Sandra Hopko, N-328
URC - Dan Taft, ST-858 (URC Offshore Division Jobs Only)

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Xuemei M Zhu

20/07/2002 06:11 am

To: Chris P Meakin/U-SouthPacific/ExxonMobil@xom
cc: Stan A Christman/U-Houston/ExxonMobil@xom, Luis O Garza-Rios/U-Houston/ExxonMobil@xom, Jim J Zimmerman/U-Houston/ExxonMobil@xom, Brad Campbell/U-Houston/ExxonMobil@xom
Subject: revised MRT analysis for Ocean Bounty drilling at the

Chris:

Attached is our revised MRT analysis report. As we informed you yesterday, we decided to revise one of the parameters in our analysis.
We determined the minimum required tension (MRT) in the drilling and connected, non-drilling modes per API RP 16Q. In conducting the riser analyses, we have used the 95% non-exceedence environment in analyzing the drilling mode; and 5-year return period wind/wave extreme and current extreme environments in analyzing the connected, non-drilling mode. Attached please find the main analysis results and Ocean Bounty riser data information.

Please note that the attached analysis results are preliminary in nature, although we are not anticipating any changes from what is included here. The final report is being prepared and screened under the URC Operation Integrity Management System for Technical Products (OIMS-TP), and is under further technical review and management approval.

The MRT analysis was performed by URC using URC's proprietary software, RISER-2D. Key findings from this analysis are:

- The Ocean Bounty's tensioner capacity of 640 kips is sufficient for operations with mud weights of up to and including 16 ppg and mean vessel offsets up to 1.3% of water depth for the 95% non-exceedence environment in the drilling mode.
- The Ocean Bounty's tensioner capacity of 640 kips is sufficient for operations with mud weights of up to and including 16 ppg and mean vessel offsets up to 3.4% of water depth for the 5-year return period wind/wave extreme and current extreme environments in the connected, non-drilling mode.

The MRT analysis for the drilling mode pertains only to environments less severe than the 95% non-exceedence metocean criteria. The MRT analysis for the connected, non-drilling mode pertains only to environments less severe than the 5-year return period wind/wave or current extreme metocean criteria. These environments are briefly described as follows:

- 95% non-exceedence criteria: Hs = 9.5 ft, Tp = 8 s; Current: Surface layer extreme, maximum speed: 1.8 fps.
- 5-year return period wind/wave extreme criteria: Hs = 18.4 ft, Tp = 12 s; Current: Surface layer extreme, maximum speed: 2.95 fps.
- 5-year return period current extreme criteria: Hs = 13.8 ft, Tp = 10 s; Current: Surface layer extreme, maximum speed: 3.94 fps.

Please contact Xuemei Zhu (phone: 713-431-7363; fax: 713-431-6194; email: xuemei.m.zhu@exxonmobil.com) or Luis Garza-Rios (phone: 713-431-7347), if you have any questions or would like to discuss the analysis results in more details.

URCRiserData_OB_Beardie-1_v5

MRT_Ocean Bounty_Beardie-1_v2.

Xuemei Zhu
Structural Engineering, Offshore Division
ExxonMobil Upstream Research Company
Tel: 713-431-7363, Fax: 713-431-6194
Email: xuemei.m.zhu@exxonmobil.com

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ExxonMobil Upstream Research Co
Offshore Division, Structural Engineering Section

Memorandum

To: J. J. Zimmerman

From: X. M. Zhu

CC: X. Wu, S. Bhattacharjee, R. B. Campbell, L. O. Garza-Rios

Date: 7/15/2002

File: J030010415

Re: Drilling Riser Analysis for the Ocean Bounty Drilling at the Beardie-1 Well (164 feet WD)

Summary

At EMDC-DO's request, URC conducted an analysis to determine the minimum required riser top tension (MRT) for *Ocean Bounty* drilling offshore Australia at the Beardie-1 well in 164 feet of water depth. The analysis was performed using URC's proprietary software, RISER-2D, and the MRTs are determined for the drilling and connected, non-drilling modes, per API RP 16Q [1].

The results of this analysis suggest that the Ocean Bounty's tensioner capacity of 640 kips should be sufficient for mud weights up to and including 16 ppg for all environments and offsets analyzed. The analysis was performed for a typical drilling riser stack up shown in Table 8.

The results of the MRT analysis are summarized in Table 1, for the drilling mode (95% non-exceedence probability environment) and connected, non-drilling mode (five-year extreme wave and five-year extreme current environments). The table lists the required riser tensioner settings as well as the maximum vessel mean offsets for mud weights ranging from 8.55 ppg to 16 ppg. The minimum required tensioner settings for the drilling and connected, non-drilling cases are plotted as a function of mud weight in Figure 1.

The drilling mode tensioner settings presented in Table 1 are calculated for the riser subjected to the 95% non-exceedence probability criteria at the offsets shown in the table. During drilling, operators should monitor upper and lower flex joint angles and apply tension sufficient to maintain them within allowable limits.

The hanging weight of the riser used in this analysis is approximately 70.1 kips. This includes a slip joint inner barrel weight of 3.8 kips. The 69.5 kips riser wet weight includes a submerged weight tolerance factor of 1.05 and a buoyancy loss and tolerance factor of 0.96 as required by API RP 16Q. Appendix A gives guidance on the procedure to follow if the future measured hanging weight is different from 70.1 kips as computed.

The JONSWAP wave spectrum with an enhancement factor of 2 is used for all environments considered [2]. Mean vessel offsets up to 1.3% and 3.4% of water depth were analyzed for the 95% non-exceedence probability and five-year extreme wave and extreme current environments, respectively. These mean vessel offsets correspond to peak vessel offsets of 3.4% and 6.2% of water depth, respectively [3].

As a sensitivity case, we performed the analysis for the larger vessel mean offset (200 kips mooring pretension). The Ocean Bounty's tensioner capacity should also be sufficient for mud weights up to and including 12 ppg for all environments and offsets analyzed.

Minimum Required Tension Criteria

Following API RP 16 Q (Section 3.3), the following criteria are used to determine the minimum required riser tension settings (MRT):

Stability Criterion:

The tension setting to meet the stability requirement (T_{min}) is computed as follows.

$$T_{min} = T_{smin} \times N/[R_f(N-n)]$$

where T_{smin} is the in-water weight of the riser including contents; N is the total number of tensioners; n is the number of tensioners subject to sudden failure; and R_f is the fleet angle and mechanical efficiency factor.

Following the EMDC-DO OIMS manual, the number of tensioners subject to sudden failure, n = 2, and R_f = 0.95 are used in the analysis. The Ocean Bounty has 8 tensioners (N = 8) and therefore:

$$T_{min} = T_{smin} \times 8/[0.95 \times (8-2)] = 1.40 \times T_{smin}$$

Upper and Lower Flex Joint Angle Criterion:

In the drilling mode, the mean angle in the upper and lower flex joints should not exceed 2 degrees. The maximum angle should not exceed 4 degrees.

In the connected, non-drilling mode, the maximum angle in the upper and lower flex joints should not exceed 90% of the maximum allowable flex joint angle.

Stress Criterion:

Method "A" as described in API RP 16Q was used as the stress criteria for this analysis. Method A requires that in the drilling mode, the maximum stress should not exceed 40% of the yield stress of the riser material. For the connected, non-drilling mode, the maximum stress in the riser should not exceed 67% of the yield stress of the riser material.

Tensioner Capacity Criterion:

The minimum required tension should not exceed 90% of the total tensioner capacity available on the vessel, which is 576 kips for the Ocean Bounty.

The stability, upper and lower flex joint criteria provide lower bounds to the minimum required tensioner setting. The tensioner capacity criterion provides an upper bound. The stress criterion is both an upper and lower bound on the minimum required tension.

Analysis Method

The riser is modeled using RISER-2D, URC's proprietary riser analysis program. The riser response to environmental loads is calculated using FREDOM, the frequency domain module of RISER-2D. The effects of riser contents (drilling mud) on riser dynamics are automatically included in the RISER-2D analysis. The riser mud weight is increased slightly to account for the weight of the mud contained in the choke, kill, and booster lines.

Mean vessel offsets are provided by the URC stationkeeping group, along with the low frequency contribution to vessel motion which is included as an input parameter. Vessel motions in the wave frequency range are computed automatically by FREDOM using the vessel RAOs.

Table 6 contains the 95% non-exceedence probability and five-year wave extreme and current extreme environmental criteria. The 95% non-exceedence probability environment is used to evaluate the API RP 16Q connected drilling mode criteria. The connected, non-drilling mode criteria are evaluated using the five-year extreme wave and extreme current environments. Details of the 95% non-exceedence and five-year extreme wave and extreme current environments are given in Appendix B.

The vessel RAOs are taken from the URC RAO database for a Group 11 semi-submersible. Analysis of the drilling and non-drilling modes was performed for the vessel in head seas (wave direction = 0 degrees). RAOs based on a wave height of 8.2 feet and a period of 8.3 seconds were used for the 95% non-exceedence and five-year extreme current environments. RAOs based on a wave height of 21.8 ft with a period of 11 s were used for the 5-year extreme wave environment.

Table 7 lists the upper and lower flex joint and tensioner system specifications used in this analysis. Table 8 shows the configuration of the riser stack-up used in this analysis and the associated riser component information including weights. The riser component data was provided by EMDC-DO (see Appendix B). It should be noted that the weight and buoyancy values presented in Table 8 include tolerance factors of 1.05 on steel weight and 0.96 on buoyancy performance. The total wet weight of the riser excluding the steel weight and buoyancy factors is also shown in Table 8 (approximately 63.2 kips, excluding inner barrel weight).

The drag coefficients used in the analysis are calculated using the following rules:

$$C_d = 1.2 \text{ for } Re < 3\text{x}10^5 \qquad C_d = 0.8 \text{ for } Re \geq 3\text{x}10^5$$

where Re is the Reynolds Number.

The Reynolds number is defined as UD/ν, where U is the local current speed, D is the drag diameter (for slick joints this is the joint OD plus the choke and kill line ODs), and ν is the kinematic viscosity of seawater (taken as 1.68x10-5 ft^2/sec).

Based on the above rules, a C_d value of 1.2 is appropriate for most sections in 95% non-exceedence environment and lower half sections in 5-year extreme wave environment. A C_d value of 0.8 is appropriate for upper half sections in 5-year extreme wave environment and all sections in 5-year extreme current environment.

Analysis Results for Drilling Mode

MRTs for the drilling mode (95% non-exceedence environment) are summarized in Table 2. Drilling mode requirements are satisfied for mean peak vessel offsets and mud weights up to and including 16 ppg.

Stress (STRS) governs mud weights up to and including 16 ppg for mean vessel offsets up to 1.3% of water depth. The criteria governing the MRT for the drilling mode are listed in Table 3 for each mud weight and mean vessel offset.

Analysis Results for Connected, Non-Drilling Mode

MRTs for the connected, non-drilling mode (five-year extreme wave and extreme current environments) are summarized in Table 4. The connected, non-drilling conditions are satisfied for all mud weights up to and including 16 ppg for all mean vessel offsets analyzed.

Buckling stability (STAB) governs all mud weights and mean vessel offset combinations analyzed, which is shown in Table 5.

References

1. American Petroleum Institute. "Recommended Practice for Design, Selection, Operation and

Maintenance of Marine Drilling Riser Systems," API RP16Q, 1st Ed. 1993.

2. Lawson and Treloar Pty Ltd, "Metocean Criteria for Beardie 1," Fax from L&T to EAL, October, 2001.

3. Garza-Rios, L. O. "Mooring Analysis of Ocean Bounty for Drilling Operations in Australia," URC Memorandum to R. E. Sandstrom. February, 2002.

Review

R1 - Technical	______________	XW
R2 - Sponsor's Needs	______________	LGR
R3 - Management	______________	JJZ
R4 - Form	______________	LGR

Attachment

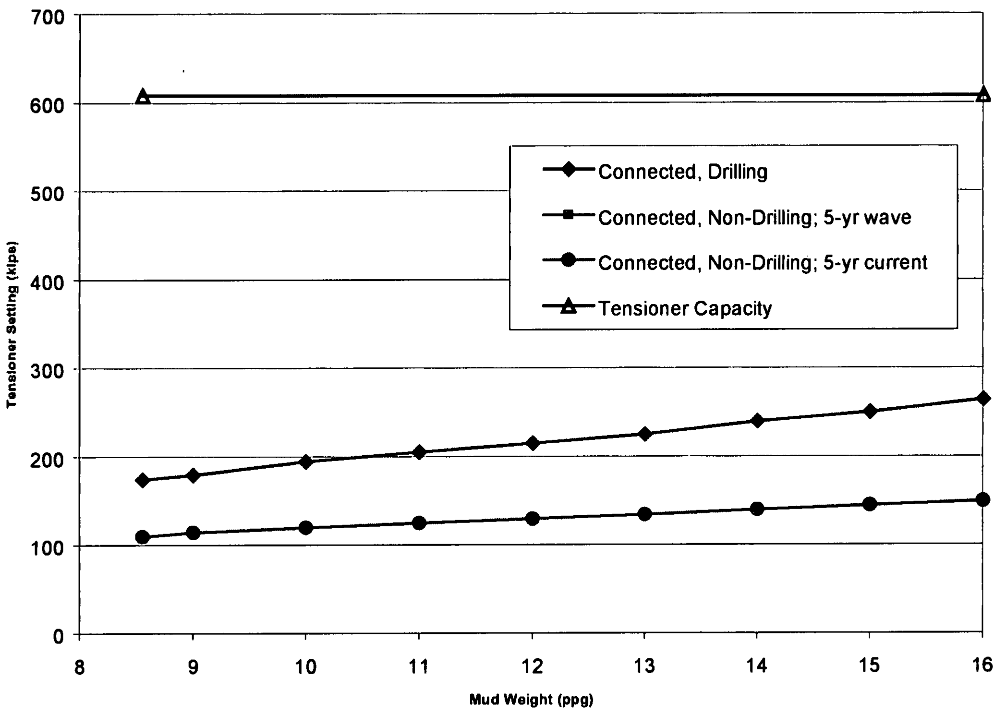

Figure 1. Minimum required tensioner setting versus mud weight for drilling and connected, non-drilling modes.

	Mud Wt. (ppg)	8.55	9	10	11	12	13	14	15	16
	Stability Limit (kips)	110	115	120	125	130	135	140	145	150
Drilling Mode (95% non-exceedence environment)*	Tension Settings (kips)	175	180	195	205	215	225	240	250	265
	Limiting Offset (%WD)	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Connect, Non-Drilling Mode (5-yr extreme wave environment)*	Tension Settings (kips)	110	115	120	125	130	135	140	145	150
	Limiting Offset (%WD)	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Connect, Non-Drilling Mode (5-yr extreme current environment)*	Tension Settings (kips)	110	115	120	125	130	135	140	145	150
	Limiting Offset (%WD)	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4

* Maximum mean vessel offsets analyzed are 1.3% of water depth for the drilling mode and 3.4% of water depth for the connected, non-drilling mode. These correspond to peak vessel offsets of 3.4% and 6.2%.

Table 1. Minimum required tensioner settings for the drilling and connected, non-drilling modes.

Mean Vessel Offset (% water depth)	Minimum Required Tension (kips)								
	Mud Weight (ppg)								
	8.55	9	10	11	12	13	14	15	16
0.0 - 1.3	175	180	195	205	215	225	240	250	265

Table 2. Minimum required tensions for the drilling mode (95% non-exceedence probability environment).

Mean Vessel Offset (% water depth)	Governing Criteria								
	Mud Weight (ppg)								
	8.55	9	10	11	12	13	14	15	16
0.0-1.3	STRS	STRS	STRS	STRS	STRS	STRS	STRS	STRS	STRS

Table 3. Governing criteria for the drilling mode (95% non-exceedence probability environment).
STRS = stress

Mean Vessel Offset (% water depth)	Minimum Required Tension (kips)								
	Mud Weight (ppg)								
	8.55	9	10	11	12	13	14	15	16
0.0 - 3.4	110	115	120	125	130	135	140	145	150

Table 4. Minimum Required tensions for the connected, non-drilling mode (five-year extreme wave and extreme current environments)

Mean Vessel Offset (% water depth)	Governing Criteria								
	Mud Weight (ppg)								
	8.55	9	10	11	12	13	14	15	16
0.0 - 3.4	STAB	STAB	STAB	STAB	STAB	STAB	STAB	STAB	STAB

Table 5. Governing criteria for the connected, non-drilling mode (five-year extreme wave and extreme current environments).
STAB = stability

Criteria	Drilling Mode (95% non-exceedence)		Non-Drilling Mode (Five-year current)		Non-Drilling Mode (Five-year wave)	
Hs (ft)	9.5		13.8		18.4	
Tp (sec)	8		10		12	
Wave Specturm	JONSWAP		JONSWAP		JONSWAP	
Enhancement factor γ	2		2		2	
Current	Depth (ft)	Velocity (ft/s)	Depth (ft)	Velocity (ft/s)	Depth (ft)	Velocity (ft/s)
	0	1.8	0	3.94	0	2.95
	82	1.64	82	3.94	82	2.95
	164	1.31	164	2.62	164	1.97

Table 6. Description of 95% non-exceedence probability and five-year extreme current and extreme wave environments.

Criteria	**Threshold Value**
Upper flex joint - max rotation	10 degrees
Lower flex joint - max rotation	10 degrees
Upper flex joint - stiffness	28,000 lb_f ft/deg
Lower flex joint - stiffness	28,000 lb_f ft/deg
Number of tensioners	8
Tensioner capacity	640 kips
Fleet angle and mechanical efficiency factor	0.95

Table 7. Tensioner and flex joint parameters.

Elevation from Mudline			Component Information								Weight in air				Weight in water				Weight in Running String	Yield Strength
From	To	Depth	Section Length	Qty	Unit Length	Riser Length	Description	Hydro OD	Strength OD	ID	Steel	Steel*1.05	Buoy	Total	steel*1.05	Net Lift	Buoy*0.96	Total		
[ft]	[ft]	[ft]	[ft]		[ft]	[ft]		[ft]	[ft]	[ft]	lb/f	lb/f	lb/f	lbs	lbs	lbs	lb/f	lbs	lbs	psf
0.0	42.4	121.6	42.4	1.0	42.4	0.0	Wellhead/LMRP/BOP													
42.4	142.4	21.6	100.0	2.0	50.0	100.0	slick joint	2.42	1.75	1.646	255.0	267.8	0.0	13388	11634	0	0.0	11634	23268	9.36E+06
142.4	147.4	16.6	5.0	1.0	5.0	105.0	pup joint	2.42	1.75	1.646	807.0	847.4	0.0	4237	3681	0	0.0	3681	3681	9.36E+06
147.4	207.4	-43.4	60.0	1.0	60.0	165.0	Outer barrel (+wt. tens ring)	2.833	2.167	2.063	625.0	656.3	0.0	39375	39375	0	0.0	39375	39375	9.36E+06
207.4	236.0	-72.0	28.6	1.0	28.6	193.6	Inner barrel	1.75	1.75	1.646										
											Total weight in Running String w/ safety factor (lbs)								66324	
											Total weight in Running String w/o safety factor (lbs)								63166	
											difference w/ and w/o safety factor (lbs)								3158	

Table 8. Riser configuration for analysis of the Ocean Bounty drilling at Beardie-1 in 164 ft of water depth.

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Appendix A - Adjustment to Tension Settings

The operator should weigh the riser while running in order to determine the measured hanging weight of the riser, W_{rm}, which is defined as

$$W_{rm} = 1.04\,(W_t - W_b) + \Delta p$$

where W_t is the weight of riser plus BOP stack as determined during running, W_b the weight of BOP stack as determined during running (wet weight), and Δp the resolution of measuring system (i.e., if the measuring system accurate to 10 kips, then Δp = 10 kips).

In the analysis, the computed hanging weight of the riser, W_{rc}, which is the wet weight of riser joints plus dry weight of telescopic joint (inner and outer barrel), was calculated as

$$W_{rc} = 70.1\ kips$$

If the measured hanging weight of the riser (W_{rm}) is different from the computed hanging weight used in the sensitivity analysis (W_{rc}), the following rules should be used to determine the adjustments to the minimum tension settings given in this report.

Condition	**Action**
W_{rm} < 67.0 kips	Contact URC
67.0 kips < W_{rm} < 70.1 kips	Use top tension settings given in report
70.1 kips < W_{rm} < 73.2 kips	Use top tension settings in report + CF x (W_{rm}-W_{rc})
W_{rm} > 73.2 kips	Contact URC
W_{rc} = 70.1 kips and CF = 1.39	

The reasoning behind the above adjustments to tensioner settings is explained below, considering two scenarios.

- ***Measured Weight > Computed Weight***. Analyses indicate that if the measured hanging weight of the riser is greater than the computed hanging weight, then it is acceptable to increase the tension settings according to the rules given in the above table, provided that the difference in weight is less than 3.1 kips. In the calculations for the correction, we have assumed that the measuring system is accurate to within 4% of the true weight. The correction factor, CF, is computed from

  $$CF = N \,/\, [\, R_f\, (N - n)\,]$$

  where N = 8, the number of tensioners; n = 2, the number of tensioners subject to failure; and R_f = 0.95, the fleet angle and mechanical efficiency factor. Hence, CF = 8/[0.95(8-2)] = 1.40, for this case.

  The 3.1 kips delta is the difference between the riser wet weight with and without tolerance factors of 1.05 on steel weight and 0.96 on buoyancy performance. For differences in weight greater than about 3.1 kips, URC should be contacted to determine if revised top tensions are necessary.

- ***Measured Weight < computed Weight***. If the measured weight is less than the computed weight, the tension settings given should still be appropriate, although slightly conservative, as long as the difference in weight is less than 3.1 kips. For weight differences greater than 3.1 kips, URC should be contacted to determine if revised top tensions are necessary.

Appendix B

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Instructions Ocean Bounty - Beardie

riser joints: one line per joint-type, including pup joints													
		structural dimensions				buoyancy	yield	weight in air of		weight in water of		net lift of	depth rating
	number	OD	wall thickness	ID	length	OD	strength	bare joint	buoyant joint (2)	bare joint	buoyant joint (2)	buoyancy	of buoyancy
designation	availlable	(in)	(in)	(in)	(ft)	(in)	(ksi)	(lbf)	(lbf)	(lbf)	(lbf)	(lbf)	(ft)
50' slick	24	21.00	0.6250	19.750	50		65	12,750		11,080			
40' pup	1	21.00	0.6250	19.750	40		65	10,770		9,359			
25' pup	2	21.00	0.6250	19.750	25		65	7,800		6,778			
10' pup	1	21.00	0.6250	19.750	10		65	4,980		4,328			
5' pup	1	21.00	0.6250	19.750	5		65	4,035		3,506			
50' buoyed	8	21.00	0.6250	19.750	50	46.5	65	12,750	20,406	11,080	725	10,355	1,500
Are the riser weights measured during running of the riser? (yes/no):								Yes					
Do the weights and buoyancy values contain any safety factors? If they do, indicate value here:								+/- 4% (when new)					

Notes: 1. The weight data (columns I-L and N) are **all** necessary for joints **fitted with syntactic-foam buoyancy modules**. "Buoyant joint" (columns J and L) refers to the properties c whole joint, including the buoyancy modules. "Bare joint" (columns I and K) refers to the properties of the **same joint** w/o the buoyancy module.

2. The weight data in columns J and L are **not** needed for joints **not fitted with syntactic foam buoyancy modules** (bare joints). Please leave blanc for bare joints.

3. We define "net lift of buoyancy" as the lift of the syntactic foam (the upwards force exerted on the syntactic foam by the water) minus the weight of the syntactic foam in air. URC will calculate this column (M).

slip joint, LMRP, BOP									
	structural dimensions				yield	weight		overpull to	
designation	OD	ID	length	stroke	strength	in air	in water	unlatch	
	(in)	(in)	(ft)	(ft)	(ksi)	(lbf)	(lbf)	(lbf)	
inner barrel	21	19.75		55	65	3,750			API 5L grade X8(<- ?
outer barrel	26	24.75	~60		65	37,500	32,625		includes tensioner ring
tensioner ring						Integral to Slip Joint			
LMRP			18.30			125,000	108,750	~30kips	Estimate for Vetco H4
BOP			23.00			175,000	152,255		

peripheral lines (choke, kill, boost, etc)				
		OD	ID	internal pressure
designation	number	(in)	(in)	(psi)
Kill	1	4	3	10,000
Choke	1	4	3	10,000

upper/lower joints (ball or flex)				
	type		maximum angle	rotational stiffness
designation	(ball/flex)	location	(deg)	(lbf ft/deg)
upper	balll		10	28,000
lower	flex		10	28,000

tensioners			
number of tensioners	rated capacity of each tensioner (lbs)	fleet angle and mechanical efficiency	number to fail (1 or 2?)
8	80000	0.95	2

Notes: Number to fail refers to the number of tensioners that can fail simultaneously.
In most rigs, tensioners are connected in pairs and failure of one automatically results in both being out-of-line. This is the default assumption per EMDC-DO O
In some rigs, tensioners are connected independantly. On these rigs, failure of a tensioner does not result in the opposing tensioner getting off-line.
Please use cell D66 to show whether 1 or 2 tensioner failure should be considered in the analysis.

Instructions

vessel/well information information		
vessel name:	Ocean Bounty	
well name:	Beardie-1	
well location:	Australia	
water depth (ft):	164	
elevation above mud line of **TOP of** LMRP (ft):	42.4	
elevation of riser top (diverter) from sea-surface (ft):	~72	
elevation of riser top (diverter) from vessel CG (ft):	~93	(+) above CG; (-) below CG
longitudinal distance of riser top from vessel CG (ft):	-1.29	(+) forward of CG; (-) aft of CG
lateral distance of riser top from vessel CG (ft):	0	(+) port of CG; (-) starboard of CG

mud weights to be analyzed (ppg):	8.555 to 16

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Instructions All data on this sheet will be specified by URC. If this is a **DP MODU**, please proceed to the next sheet. If this is a **moored MODU**, you are done.

metocean criteria (imperial units)								
mode:	drilling mode				connected non-drilling mode			
environment:	95%	95%	95%	95%	5-yr Current	5-yr Wave	1-yr	1-yr
H_s (ft):	9.5				13.8	18.4		
T_p (s):	8				10	12		
spectrum	J-S				J-S	J-S		
enhancement factor γ	2				2	2		
wind speed (ft/s)	54.8				89.2	89.2		
depth (ft)	current velocity (ft/s)							
0	1.80				3.94	2.95		
82.0	1.64				3.94	2.95		
164.0	1.31				2.62	1.97		

For connected, non-drilling mode, use most conservative results from 5-year current or 5-year wave criteria.

metocean criteria (imperial units)								
mode:	drilling mode				connected non-drilling mode			
environment:	95%	95%	95%	95%	5-yr	5-yr	1-yr	1-yr
H_s (m):	2.9				4.2	5.6		
T_p (s):	8				10	12		
spectrum	J-S				J-S	J-S		
enhancement factor γ	2				2	2		
wind speed (m/s)	16.7				27.2	27.2		
depth (m)	current velocity (m/s)							
0	0.55				1.2	0.9		
25.0	0.5				1.2	0.9		
50.0	0.4				0.8	0.6		

Notes: Metocean criteria need to be specified in one of the two tables above.
Four columns are provided for each mode, in case there are alternative criteria (e.g., swell, sea, current, etc.)

results from mooring analysis			
RAO group:	11		
wave direction (deg):	0 for drilling 0 for nondrilling		use group 11 RAOs
offsets for drilling mode	nominal	extreme	first column to be used for mean-angle criteria and reporting
(% of water depth):	0.00%	2.10%	second column to be used for max-angle criteria
	0.50%	2.60%	
	1.00%	3.10%	
	1.30%	3.40%	
offsets for connected, non-drilling mode	nominal	extreme	use second column for analysis (all criteria)
(% of water depth):	0.0%	2.81%	first column to be used for reporting
	1.00%	3.81%	
	2.00%	4.81%	
	3.00%	5.81%	
	3.40%	6.21%	

It is not necessary to go all the way up to a mean offset of 3.5% WD for the **connected, drilling** case if the mooring is capable of better stationkeeping. However, if the mooring cannot maintain station within a mean offset of 3.5% WD, there is no reason to analyze at higher mean offsets since it is physically impossible to satisfy the API RP 16Q drilling requirements on the mean lower flex joint angle at these offsets.

The increment on the mean offset for the **connected, non-drilling mode** can be changed as desired by URC. However, the last mean offset should be the maximum mean from the mooring analysis.

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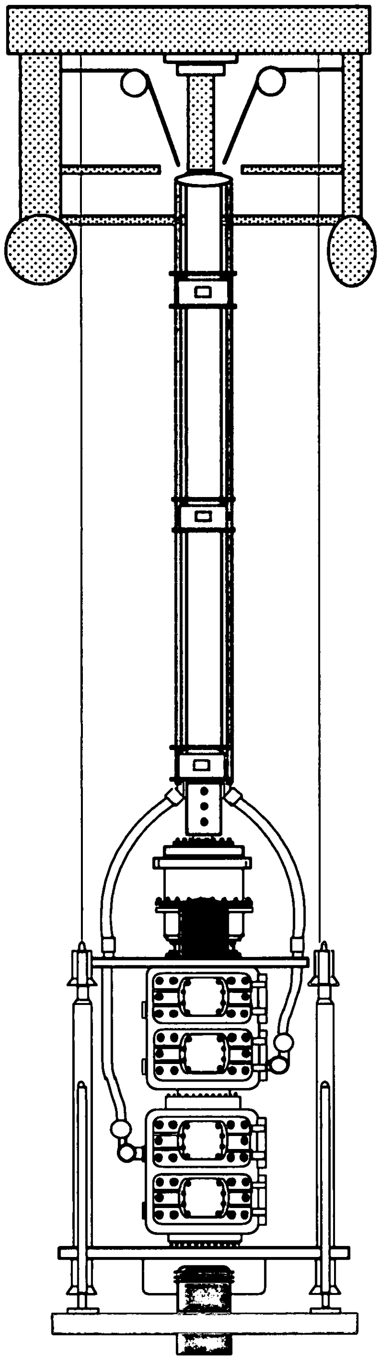
Diamond Offshore General Company
Ocean Bounty
Riser Program

Operator:	Esso	Wellhead Above M.L.:	12.00 Ft.
Well Name:	Beardie 1	Water Depth:	167 Ft.
Well No.:	Vic / L2	Tide:	5.00 Ft.
Area:	Bass Strait	No. Of Tensioners Used:	6 Ea.
Country:	Australia	Fluid Density:	12.0 ppg.



TENSION REQUIRED ON EACH TENSIONER 36437 KIPS

A) Drilling Draft:	70.00 Ft.
B) RKB To Water@ Drg Draft:	82.00 Ft.
C) RKB To Bottom Diverter:	12.30 Ft.
D) Slip Jt. @ Mid Stroke:	89.00 Ft.
E) L. M. R. P. Height:	19.00 Ft.
F) B. O. P. Stack Height:	18.67 Ft.
G) Total Fixed Lengths:	138.97 Ft.
H) RKB To Mudline:	249.00 Ft.
I) RKB To Wellhead:	237.00 Ft.
J) RKB To Bottom LMRP:	218.33 Ft.
K) Total Riser Needed:	100.53 Ft.
Round Up To Nearest 5 (Five) Foot:	105.00 Ft.

RiserUsed *(Riser: 21" O.D. x 19 3/4" I. D.)*

0	50 Ft.	BOUYANCY	0.00 Ft.
2	50 Ft.	SLICK	100.00 Ft.
0	40 Ft.	SLICK	0.00 Ft.
0	25 Ft.	SLICK	0.00 Ft.
0	10 Ft.	SLICK	0.00 Ft.
1	5 Ft.	SLICK	5.00 Ft.

Total Riser Used: 105 Ft.

Safety Factor: 25 %

Riser Tension Req'd w/ Seawater: 34119 k.

Riser Tension Required w/ 12.0 p.p.g. Mud: 36437 k.

Actual Wt. Indicator Reading Prior To Landing: ________ k.

Theoretical Wt. Indicator Reading Prior To Landing: ________ k.

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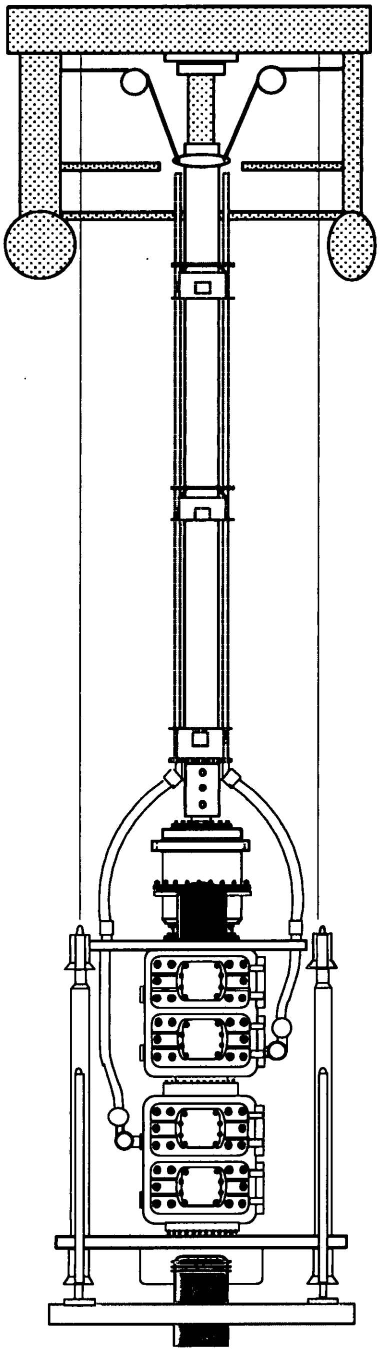
Diamond Offshore General Company

Ocean Bounty

Riser Program

Wellhead Above M.L.:	3.66 mt.
Water Depth:	50.90 mt.
Tide:	1.52 mt.
No. Of Tensioners Used:	6 Ea.
Fluid Density:	1.44 s.g.

Operator:	Esso
Well Name:	Beardie 1
Well No.:	Vic / L2
Area:	Bass Strait
Country:	Australia



A)	Drilling Draft:	21.33 mt.
B)	RKB To Water@ Drg Draft:	24.99 mt.
C)	RKB To Bottom Diverter:	3.75 mt.
D)	Slip Jt. @ Mid Stroke:	27.13 mt.
E)	L. M. R. P. Height:	5.79 mt.
F)	B. O. P. Stack Height:	5.69 mt.
G)	Total Fixed Lengths:	42.36 mt.
H)	RKB To Mudline:	75.89 mt.
I)	RKB To Wellhead:	72.23 mt.
J)	RKB To Bottom LMRP:	66.54 mt.
K)	Total Riser Needed:	30.64 mt.
	Round Up To Nearest 5 (Five) Foot:	32.00 mt.

Riser Required

(Riser: 21" O.D. x 19 3/4" I. D.)

0	50 Ft.	WITH BOUANCY	0.00 mt.
2	50 Ft.	SLICK	30.48 mt.
0	40 Ft.	SLICK	0.00 mt.
0	25 Ft.	SLICK	0.00 mt.
0	10 Ft.	SLICK	0.00 mt.
1	5 Ft.	SLICK	1.52 mt.
			0.00 mt.
		Total Riser Used:	32.00 mt.

Safety Factor	25 %
Riser Tension Req'd w/ Seawater:	34119 k.
Riser Tension Required w/ 12.0 p.p.g. Mud:	36437 k.
Actual Wt. Indicator Reading Prior To Landing:	k.
Theoretical Wt. Indicator Reading Prior To Landing:	k.

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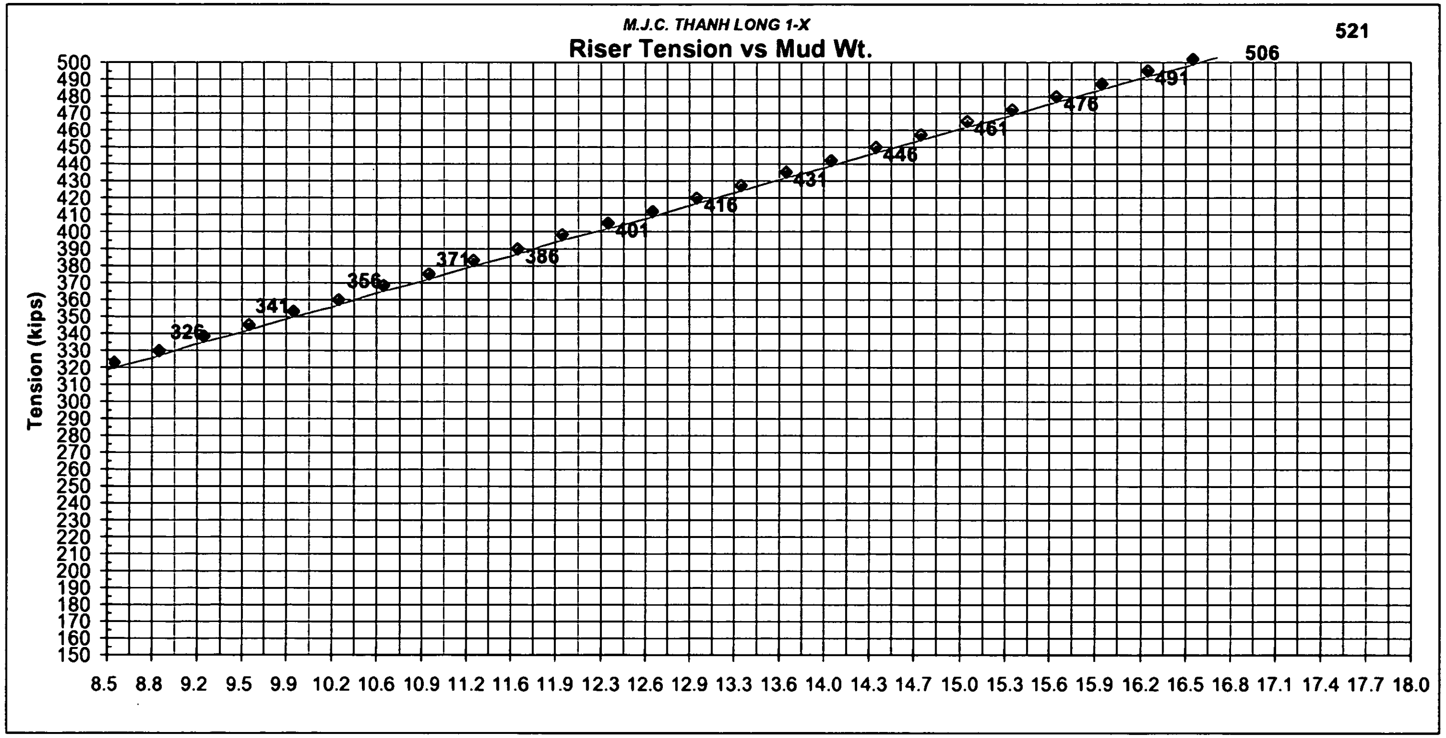
		0	JTS.	50	FT			
RKB TO WELLHEAD:	237.00	2	JTS.	50	FT	50 ft.	2000	Buoy
WEIGHT OF B.O.P.'s:		0	JTS.	50	FT	50 Ft.	8640	No buoy.
WEIGHT OF LMRP:	125000	0	JTS.	25	FT	40 ft.	7420	No buoy.
WEIGHT OF SLIP JOINT:	30000	0	JTS.	10	FT	20 Ft.	4730	No buoy.
TOTAL BOP/LMRP WT:	155000	1	JTS.	0	FT	15 Ft.	4080	No buoy.
		0	JTS.	0	FT	10 Ft.	3475	No buoy.

MUD WT.: 8.60 PPG

SAFETY FACT.: 25.00 PERCENT

				NO. OF TENSIONERS			
WITH WATER				WATER		MUD	
STARTING TENSION IN S/WTR:		148287	LBS.	10	18536	10	18584
TENSION W/ 25	% SAFETY FACT:	185359	LBS.				
TENSION W/ 8.6	PPG MUD WT:	185842.5	LBS.	8	23170	8	23230
WITH MUD							
TENSION W/ 10.5	PPG MUD WT:	185842.5	LBS.	6	30893	6	30974

8.5	319
8.8	326
9.2	334
9.5	341
9.9	349
10.2	356
10.6	364
10.9	371
11.2	379
11.6	386
11.9	394
12.3	401
12.6	408
12.9	416
13.3	423
13.6	431
14.0	438
14.3	446
14.7	453
15.0	461
15.3	468
15.6	476
15.9	483
16.2	491
16.5	498
16.8	506
17.1	514
17.4	521
17.7	528
18.0	536



Mud Wt. P.P.G

Seawater (ppg):	8.8	0.87 bouy. fact. f/ s/water	(65.5 minus fluid density divided by 65.5)
Riser I.D.:	19.75 inches		
RKB To Bottom Of LMRP:	218.33 feet		
Total Riser Capacity:	83 barrels or	3476 gallons	

No. Jts.	Length		Air Wt.	Water Wt.	Total Weight In Seawater
0	50	Bouy	22300	735	0 lbs.
2	50	Slick	12750	11037	22074 lbs.
0	40	Slick	10770	9323	0 lbs.
0	25	Slick	7800	6752	0 lbs.
0	10	Slick	4980	4311	0 lbs.
1	5	Slick	4035	3493	3493 lbs.
	Air Wt. Slipjoint		30000	NA	30000 lbs.
	Air Wt. LMRP		125000	108206	108206 lbs.

Bouyed wt.:		163773 lbs. starting wt. (seawater)
Safety factor:		25%
Tension on riser:		204716 lbs. (with seawater)
No. Of Tensioners:	6	34119 lbs. on each tensioner

New Fluid Density:		12.0 ppg
Seawater:		8.8 ppg
Difference:		3.2 ppg
Times Riser Capacity:		3476 gallons
=		11123 lbs. increase in wt.
Plus Bouyed Wt.:		163773 lbs.
=		174896 lbs.
Safety Factor:		25%
Tension On Riser w/ New Fluid Density:		218620 lbs
No. Of Tensioners:	6	36437 lbs. on each tensioner

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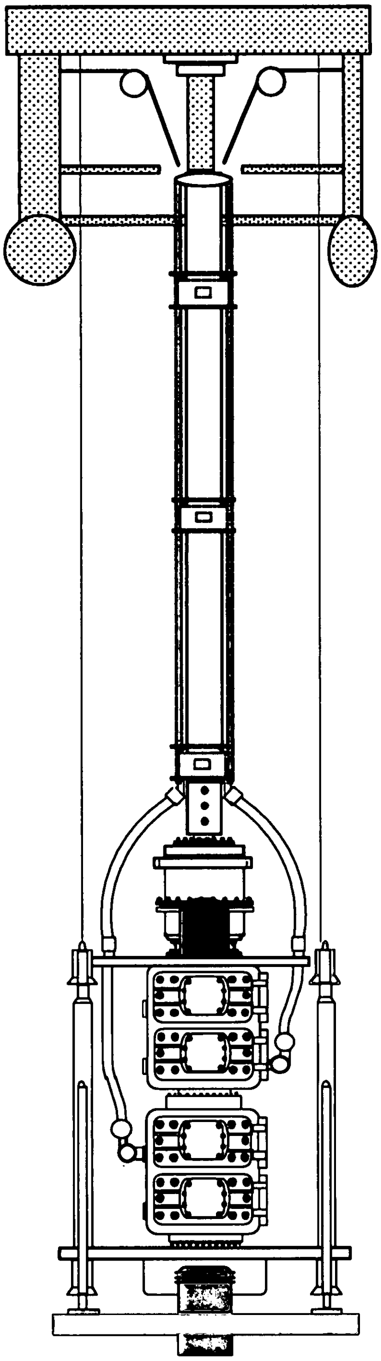
Diamond Offshore General Company

Ocean Bounty

Riser Program

Operator:	Esso
Well Name:	Beardie 1
Well No.:	Vic / L2
Area:	Bass Strait
Country:	Australia

Wellhead Above M.L.:	12.00	Ft.
Water Depth:	167	Ft.
Tide:	5.00	Ft.
No. Of Tensioners Used:	8	Ea.
Fluid Density:	12.0	ppg.



TENSION REQUIRED ON EACH TENSIONER 27328 **KIPS**

A) Drilling Draft:	70.00	Ft.
B) RKB To Water@ Drg Draft:	82.00	Ft.
C) RKB To Bottom Diverter:	12.30	Ft.
D) Slip Jt. @ Mid Stroke:	89.00	Ft.
E) L. M. R. P. Height:	19.00	Ft.
F) B. O. P. Stack Height:	18.67	Ft.
G) Total Fixed Lengths:	138.97	Ft.
H) RKB To Mudline:	249.00	Ft.
I) RKB To Wellhead:	237.00	Ft.
J) RKB To Bottom LMRP:	218.33	Ft.
K) Total Riser Needed:	100.53	Ft.
Round Up To Nearest 5 (Five) Foot:	105.00	Ft.

RiserUsed *(Riser: 21" O.D. x 19 3/4" I. D.)*

0	50 Ft.	BOUYANCY	0.00	Ft.
2	50 Ft.	SLICK	100.00	Ft.
0	40 Ft.	SLICK	0.00	Ft.
0	25 Ft.	SLICK	0.00	Ft.
0	10 Ft.	SLICK	0.00	Ft.
1	5 Ft.	SLICK	5.00	Ft.

Total Riser Used:	105	Ft.
Safety Factor:	25	%
Riser Tension Req'd w/ Seawater:	25590	k.
Riser Tension Required w/ 12.0 p.p.g. Mud:	27328	k.
Actual Wt. Indicator Reading Prior To Landing:		k.
Theoretical Wt. Indicator Reading Prior To Landing:		k.

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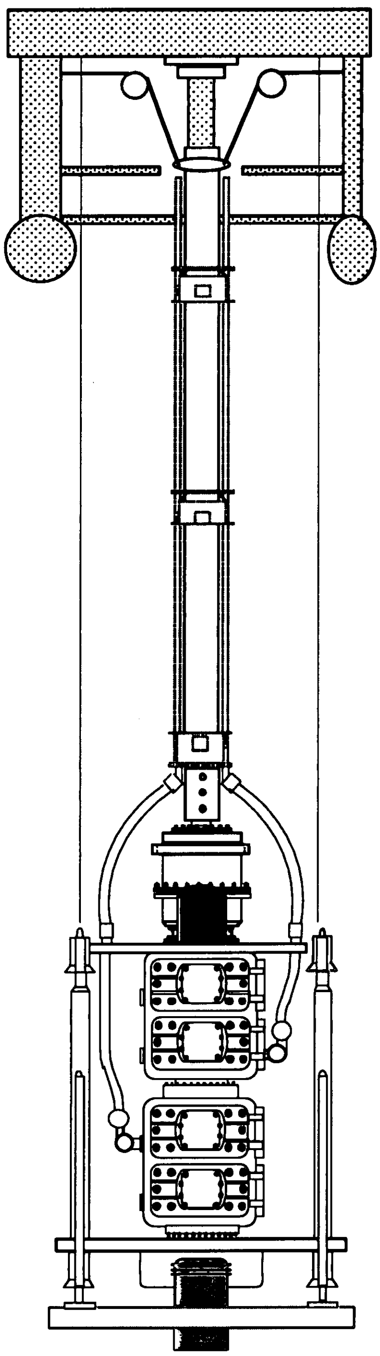
Diamond Offshore General Company

Ocean Bounty

Riser Program

Operator:	Esso
Well Name:	Beardie 1
Well No.:	Vic / L2
Area:	Bass Strait
Country:	Australia

Wellhead Above M.L.:	3.66	mt.
Water Depth:	50.90	mt.
Tide:	1.52	mt.
No. Of Tensioners Used:	8	Ea.
Fluid Density:	1.44	s.g.



A) Drilling Draft:	21.33	mt.
B) RKB To Water@ Drg Draft:	24.99	mt.
C) RKB To Bottom Diverter:	3.75	mt.
D) Slip Jt. @ Mid Stroke:	27.13	mt.
E) L. M. R. P. Height:	5.79	mt.
F) B. O. P. Stack Height:	5.69	mt.
G) Total Fixed Lengths:	42.36	mt.
H) RKB To Mudline:	75.89	mt.
I) RKB To Wellhead:	72.23	mt.
J) RKB To Bottom LMRP:	66.54	mt.
K) Total Riser Needed:	30.64	mt.
Round Up To Nearest 5 (Five) Foot:	32.00	mt.

Riser Required

(Riser: 21" O.D. x 19 3/4" I. D.)

0	50 Ft.	WITH BOUANCY	0.00	mt.
2	50 Ft.	SLICK	30.48	mt.
0	40 Ft.	SLICK	0.00	mt.
0	25 Ft.	SLICK	0.00	mt.
0	10 Ft.	SLICK	0.00	mt.
1	5 Ft.	SLICK	1.52	mt.
			0.00	mt.
		Total Riser Used:	32.00	mt.

Safety Factor	25	%
Riser Tension Req'd w/ Seawater:	25590	k.
Riser Tension Required w/ 12.0 p.p.g. Mud:	27328	k.
Actual Wt. Indicator Reading Prior To Landing:		k.
Theoretical Wt. Indicator Reading Prior To Landing:		k.

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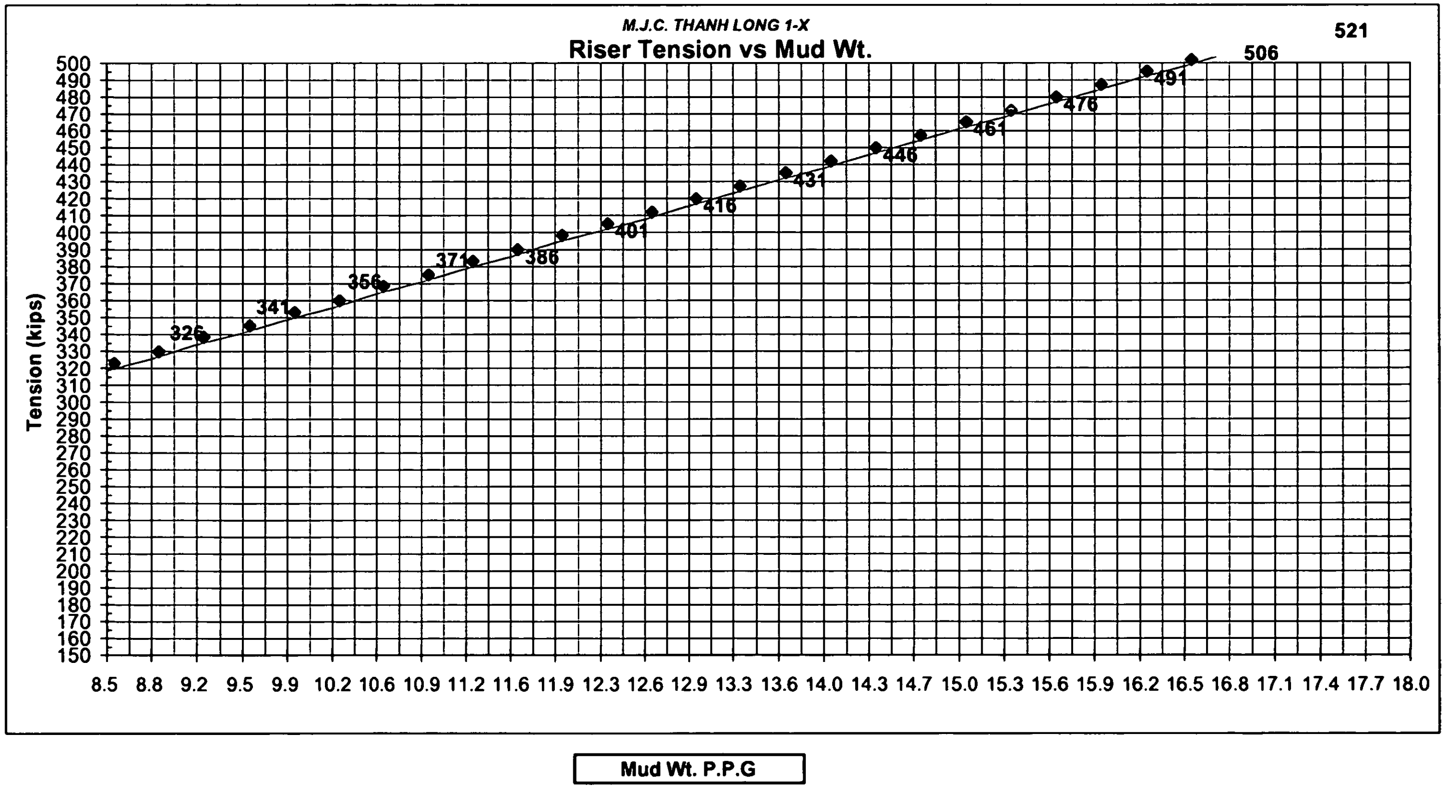
		0	JTS.	50	FT			
RKB TO WELLHEAD:	237.00	2	JTS.	50	FT	50 ft.	2000	Buoy
WEIGHT OF B.O.P.'s:		0	JTS.	50	FT	50 Ft.	8640	No buoy.
WEIGHT OF LMRP:	125000	0	JTS.	25	FT	40 ft.	7420	No buoy.
WEIGHT OF SLIP JOINT:	30000	0	JTS.	10	FT	20 Ft.	4730	No buoy.
TOTAL BOP/LMRP WT:	155000	1	JTS.	0	FT	15 Ft.	4080	No buoy.
		0	JTS.	0	FT	10 Ft.	3475	No buoy.

MUD WT.: 8.60 PPG
SAFETY FACT.: 25.00 PERCENT

					NO. OF TENSIONERS			
WITH WATER					WATER		MUD	
STARTING TENSION IN S/WTR:			148287	LBS.	10	18536	10	18584
TENSION W/	25	% SAFETY FACT:	185359	LBS.				
TENSION W/	8.6	PPG MUD WT:	185842.5	LBS.	8	23170	8	23230
WITH MUD								
TENSION W/	10.5	PPG MUD WT:	185842.5	LBS.	6	30893	6	30974

8.5	319
8.8	326
9.2	334
9.5	341
9.9	349
10.2	356
10.6	364
10.9	371
11.2	379
11.6	386
11.9	394
12.3	401
12.6	408
12.9	416
13.3	423
13.6	431
14.0	438
14.3	446
14.7	453
15.0	461
15.3	468
15.6	476
15.9	483
16.2	491
16.5	498
16.8	506
17.1	514
17.4	521
17.7	528
18.0	536



Riser Tension

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Seawater (ppg):	8.8	0.87 bouy. fact. f/ s/water	(65.5 minus fluid density divided by 65.5)
Riser I.D.:	19.75 inches		
RKB To Bottom Of LMRP:	218.33 feet		
Total Riser Capacity:	83 barrels or	3476 gallons	

No. Jts.	Length		Air Wt.	Water Wt.	Total Weight In Seawater
0	50	Bouy	22300	735	0 lbs.
2	50	Slick	12750	11037	22074 lbs.
0	40	Slick	10770	9323	0 lbs.
0	25	Slick	7800	6752	0 lbs.
0	10	Slick	4980	4311	0 lbs.
1	5	Slick	4035	3493	3493 lbs.
	Air Wt. Slipjoint		30000	NA	30000 lbs.
	Air Wt. LMRP		125000	108206	108206 lbs.

Bouyed wt.:		163773	lbs. starting wt. (seawater)
Safety factor:		25%	
Tension on riser:		204716	lbs. (with seawater)
No. Of Tensioners:	8	25590	lbs. on each tensioner
New Fluid Density:		12.0	ppg
Seawater:		8.8	ppg
Difference:		3.2	ppg
Times Riser Capacity:		3476	gallons
=		11123	lbs. increase in wt.
Plus Bouyed Wt.:		163773	lbs.
=		174896	lbs.
Safety Factor:		25%	
Tension On Riser w/ New Fluid Density:		218620	lbs
No. Of Tensioners:	8	27328	lbs. on each tensioner

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Mud Summary Report

Mud Summary Report

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ESSO AUSTRALIA PTY LTD
BAROID DRILLING FLUID RECAP
BEARDIE - 1
BASS STRAIT, VICTORIA.

Prepared by : Dan Cotter, Tony Kowalski

Date : July/August, 2002.

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Table Of Contents

1. WELL SUMMARY

1.1 Well Data

Well Name	:	Beardie - 1
Operator	:	Esso Australia Pty Ltd.
Well Type	:	Vertical Near Field Wildcat
Bottom Hole Temperature	:	88 °C
Location	:	Bass Strait, Victoria.
Contractor/Rig	:	DGOC Ocean Bounty
Start Date (Baroid)	:	25/07/02
Spud Date	:	26/07/02
RKB to Seabed	:	77 m
Total Depth	:	1905 m
Date TD Reached	:	03/08/02 (15:15 hrs)
Total Days Actual Drilling	:	9
Date Released	:	08/08/02
Total Days on Well	:	15

1.2 Formation Tops

Formation	TVDSS (m)	TVDRT (m)	Estm P.P. (ppg)
Base mid-Miocene Channel	-754	779	8.6
Lakes Entrance	-1129	1154	8.6
Top of Latrobe Group	-1159	1184	8.6
Top N1.6	-1243	1268	8.6
Top N1.7	-1321	1346	8.6
Top N2	-1378	1403	8.6
Top N4	-1440	1465	8.6
Top M1	-1588	1613	8.6
Top *L. balmei*	-1822	1847	8.6
T.D.	-1880	1905	8.6

1.3 Casing Program

30"	Conductor	@	122 m TVDRT
13 3/8"	Surface casing	@	849 m TVDRT
12 ¼"	Plug and Abandon		

1.4 Personnel

Drilling Supervisors	:	Brigham Bigby George Sharkey	Tony Bassett
Baroid Field Service Reps.	:	Dan Cotter Tony Kowalski	

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2. COST SUMMARY

2.1 Drilling Fluid Costs

	Drilling Fluid	Hole Size	MD From	MD To	Cost USD $
1.	Seawater/Hi-Vis Sweeps	36"	77 m	123.5 m	12,070
2.	Seawater/Hi-Vis Sweeps	17 ½"	123.5 m	863 m	51,168.23
3.	KCl/PHPA/Polymer/Glycol-CP	12 ¼"	863 m	1905 m	104,087.17

Mud Materials Used For Drilling	**Total USD $**	**167,325.40**
Materials Used for Cementing:	**USD $**	262.00
P & A:	**USD $**	3348.41
Total Materials:	**USD $**	**170,935.81**

2.2 Engineering Costs

Service Representatives	From (date)	To (date)	Days
Dan Cotter	24/07/02	08/08/02	16
Tony Kowalski	25/07/02	08/08/02	15

Total Days:		31
Service Cost @ AUD $ 865	@ USD $ 475	**14,725.00**

Total Cost of Drilling Material & Engineering:	USD $	**185,660.81**

3. PERFORMANCE SUMMARY

3.1 Comments

- The Beardie-1 well was successfully drilled to TD with seawater/hi-vis bentonite sweeps and an inhibitive KCl/Polymer/PHPA/Glycol mud system. An extensive logging program along with sidewall coring was accomplished trouble-free. The well was plugged and abandoned.

3.2 Performance Indicators

	Program	Actual	Achieved (± 10 %)
Interval 1. Seawater + Hi-Vis Sweeps			
36" Hole, 77 m - 123.5 m			
• Drilled, m	49	46.5	Yes
• Volume Used, bbl	1100	1826	No
• Consumption Rate, bbl/m	22.4	39.27	No
• Mud Cost/bbl	4.14	6.61	No
• Mud Cost/m, US$	93.02	259.57	No
• Interval Mud Cost, $US	4,558.02	12,070	No
Interval 2. Seawater + Hi-Vis Sweeps			
17 ½ " Hole, 123.5 m – 863 m			
• Drilled, m	726	739.5	Yes
• Volume Used, bbl	5000	7863.4	No
• Consumption Rate, bbl/m	6.9	10.63	No
• Mud Cost/bbl, US$	9.35	6.51	Yes
• Mud Cost/m, US$	64.36	69.19	Yes
• Interval Mud Cost, US$	46,726.00	51,168.23	Yes
Interval 3. KCl/Polymer/PHPA/Glycol			
12 ¼" Hole, 863 m – 1905 m			
• Drilled, m	1055	1042	Yes
• Volume Used, bbl	2603	3095	Yes
• Dilution Rate, bbl/m	1.30	1.35	Yes
• Consumption Rate, bbl/m	2.47	2.97	Yes
• Mud Cost/bbl, $US	39.73	33.63	Yes
• Mud Cost/m, $US	98.03	99.89	Yes
• Interval Mud Cost, $US	103,418.00	104,087.17	Yes
Cementing 13-3/8" Casing		262.00	
Plug & Abandon		3,327.45	N/a
Entire Well			
• Total Drilling Fluid Cost, USD$	154,702.02	170,935.81	

3.3 Explanation of Non-Conformance

- **Interval 1.** All indicators were higher than programmed due to Esso's requirement for kill mud, and spotting a higher than programmed volume of hi-vis both prior to, and following, the wiper trip. Also contributing to the higher cost was the use of Guar Gum for hi-vis sweeps.
- **Interval 2.** Performance indicators conformed to programmed specifications except for mud volume and consumption rate. Hi-vis sweeps were generally bigger and pumped more often than programmed to ensure proper hole cleaning. The increased volume of mud built did not have an effect on total mud cost because the weighted kill mud was built with less than programmed amounts of bentonite.
- **Interval 3.** All performance indicators conformed to programmed specifications.

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4. INTERVAL - 1

4.1 SUMMARY

36" Hole From 77 m To 123.5 m In 1 Day

Drilling Fluid Seawater / Hi-Vis Sweeps

Formations Gippsland

Properties Programmed Actual (Typical)

	Min	Max	Min	Max	Conformance
Mud Weight, ppg	-	-	8.5	8.6	
Viscosity, sec/qt	100		105		
Yield Point, lb/100 ft^2	40				No Test Kit

Explanation of Non-Conformance

- The mud testing kit was still on the boat at the commencement of drilling.

Maintenance

- Prior to drilling, bentonite was pre-hydrated in drill water and allowed to yield for as long as possible before use.
- A 385 bbl pit of 12.0 ppg kill mud was prepared as a precaution in the event of shallow gas.
- Hi-Vis Gel sweeps (50 bbl) were pumped on every connection and 50 bbl guar gum sweeps were pumped mid-stand.
- At casing point a 100-bbl guar gum sweep was pumped and the hole circulated clean with seawater. The hole was displaced with 400 bbls of hi-vis bentonite, a wiper trip performed, and a second 400 bbl hi-vis spot displaced to the hole.

4.2 EVALUATION

Comments

- Alternating between bentonite and guar gum proved to be the most time effective method of sweeping the hole. As bentonite requires pre-hydration, it would have been difficult to keep up with sweep volume if guar gum was not available.

Problems, Causes, Remedial Action Taken or Recommended
Hole Conditions

1) Problem None.
   Cause
   Action

Drilling Fluid

1) Problem None
   Cause
   Action

4.3 RECOMMENDATIONS FOR IMPROVEMENT

Hole Conditions
- None.

Drilling Fluid
- None

Solids Control and Mud Mixing Equipment.
- None

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5. INTERVAL - 2

5.1 SUMMARY

17 1/2" Hole From 123.5 m To 863 m In 2 Days

Drilling Fluid Seawater / Hi-Vis Sweeps
Formations Gippsland

Properties	Programmed		Actual (Typical)		
	Min	Max	Min	Max	Conformance
Mud Weight, ppg	-	-	8.5	12.0	
Viscosity, sec/qt	100		110	124	
Yield Point, lb/100 ft^2	40				No Test Kit

Explanation of Non-Conformance
- The mud testing kit was still on the boat at the commencement of drilling.

Maintenance
- Prior to drilling, bentonite was pre-hydrated in drill water and allowed to yield for as long as possible before use.
- A total of 1403 bbls of 12.0 ppg kill mud was prepared as a precaution in the event of shallow gas. This mud was used to displace the hole prior to POOH to running casing.
- 50 bbl Hi-Vis gel sweeps were pumped on every connection and 50 bbl guar gum sweeps were pumped mid stand.
- At casing point a 100-bbl guar gum sweep was pumped and the hole circulated clean with seawater. The hole was displaced with 800 bbls of hi-vis bentonite, a wiper trip performed, and 1200 bbls of 12.0 ppg hi-vis bentonite kill mud displaced before running casing. When pulling out of the hole another 110 bbls of 12.0 ppg hi-vis was pumped at 121 m.

5.2 EVALUATION

Comments
- This interval was drilled and cased off with no hole or mud related problems.

Problems, Causes, Remedial Action Taken or Recommended
Hole Conditions
1) Problem None.
Cause
Action

Drilling Fluid
1) Problem None
Cause
Action

Solids Control and Mud Mixing Equipment
1) Problem None
Cause
Action

5.3 RECOMMENDATIONS FOR IMPROVEMENT

Hole Conditions
- None.

Drilling Fluid
- None.

Solids Control and Mud Mixing Equipment.
- None

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6. INTERVAL - 3

6.1 SUMMARY

12 ¼ " Hole From 863 m To 1905 m In 4 Days

Drilling Fluid 6-8% KCl / PHPA / Polymer / Glycol
Formations Gippsland, Lakes Entrance, Latrobe, N1group, N2, N4, M1, L.balmei.

Properties	Programmed		Actual (Typical)		
	Min	Max	Min	Max	Conformance
Mud Weight, ppg	9.0	10.5	9.0	9.8	Yes
Yield Point, lb/100ft2	25	45	16	33	No
API Filtrate, ml/30 min		6.0	3.2	5.6	Yes
HPHT Filtrate @ 250° F, ml	12	15	10.2	13.8	Yes
pH	8.5	9.2	9.0	10.0	No
Low Gravity Solids, % vol		10	1.3	4.0	Yes
KCl Content, % wt	6	8	7.2	8	Yes
PHPA Content, ppb	1	1.5	1	1.5	Yes
Glycol Content, % vol	3	4	3.0	3.5	Yes

Explanation of Non-Conformance

- The yield point was lower than programmed on the first day of drilling but soon increased with the incorporation of drilled solids.
- The pH was higher than programmed immediately after drill-out due to slight cement contamination.
- All other mud properties conformed to programmed specifications.

Maintenance

- An 8% KCl/PHPA/Polymer/Glycol-CP was used to drill the 12 ¼" interval to provide good hole stability in the reactive claystones, prevent differential sticking in the sands, and provide maximum penetration rates.
- The initial 1,680 bbls of mud volume built was fully specified except for PHPA concentrations. The PHPA was initially mixed at 0.60 ppb in order to avoid the problem of mud losses over the shakers on displacement. After displacement, PHPA concentrations were increased to program levels.
- The initial displacement volume was pre-treated with 0.7 ppb of citric acid and 0.7 ppb of sodium bicarbonate in order to avoid cement contamination while drilling the shoe. The shoe track was drilled to within 9 m of the shoe with seawater and then displaced to mud after concerns about hole cleaning. Cement contamination from the remaining 9m of shoe track was minimal.
- The initial displacement volume of mud was weighted to 8.9 ppg with barite as required by the Esso drilling program.
- Three meters of new hole was drilled and a PIT performed to 14.7 ppg EMW.
- Glycol-CP polyglycol was added to the active mud system and concentrations maintained in the 3-4% range.
- At drill-out, BARACOR 129 oxygen scavenger was added to the active system at an initial concentration of 0.8 ppb and residual sulphite levels subsequently maintained at 100 mg/l through regular product additions.
- The active mud weight followed the parameters as set by the Esso Mud Weight Curve. Prior to drilling the Lakes Entrance Formation at 1129 m, the entire circulation system was weighted to 9.5 ppg with barite. The mud weight increased to 9.8 ppg with the addition of sized calcium carbonate through the Latrobe Formation.

Maintenance (continued)

- Immediately prior to drilling the top of the Latrobe Formation, the entire circulating system was pre-treated with 5 ppb each of calcium carbonate 25 and 100 micron. These products act as pore throat bridging agents to reduce the likelihood of differential sticking and seepage losses in the high permeability sands. Regular additions of calcium carbonate for every 10 m of new hole drilled were made to replace losses to the solids control equipment and to wall cake.
- As the primary indicator of hole cleaning, the yield point was monitored and maintained in the 25-45 lb/100ft2 range.
- The H_2S and CO_2 content were monitored with the Garrett Gas Train and HACH tests. No H_2S and CO_2 was detected.
- Prior to pulling out of the hole to log, the entire circulating system was treated with additional BARACIDE, BARACOR 129 and caustic potash to preserve the mud during extended logging operations.

Solids Control Equipment

- On displacement, the Thule VSM-100 shakers were dressed with 10 mesh scalping screens and 52 mesh primary screens. Coarser screens were utilized in order to avoid losses of un-sheared mud over the shakers.
- As the fluid sheared and mud properties allowed, finer screens were fitted to the shakers. Generally, combinations of 84 and 120 mesh screens were used to TD.
- Where practical, previously used screens were utilized and torn screens patched for later use.
- The Pioneer 3 x 12" desander was operated as required for a total of 12.5 hours with an average underflow weight of 10.8 ppg @ 4.8 bbl/hr.
- The Sweco 20 x 4" desilter was only operated once for 1 hour. The underflow weight was a respectable 12.1 ppg but the 37 bbl/hr underflow rate was excessive and the desilter was not utilized again.

6.2 EVALUATION

Comments

- This interval of 1042 m was drilled without problem in 4 days and within budget. Other than 2 cases of possible fill (most likely dislodged coal), there were no hole or mud related problems. Wireline logs reached bottom and the caliper log indicated a good gauge hole. The programmed 6-8% KCl/PHPA/Polymer/Glycol drilling fluid was easy to formulate and maintain and all specified properties remained within their acceptable ranges.

Problems, Causes, Remedial Action Taken or Recommended
Hole Conditions

1) Problem Fill on bottom after the first bit trip and the wiper trip at interval TD.
Cause Indications were that the fill was dislodged coal, most likely caused by the stabilizers when pulling out for the wiper trip.
Action Increased the yield point while circulating twice bottoms up after the wiper trip.

Drilling Fluid

1) Problem None.
Cause
Action

Solids Control and Mud Mixing Equipment

1) Problem Desander operating pressure only 11 psi when using the centrifugal pump dedicated to the desander.
Cause Specific cause not known.
Action Lined the desander up on the desilter pump, which produced 25 psi.

6.3 RECOMMENDATIONS FOR IMPROVEMENT

Hole Conditions

- None.

Drilling Fluid

- When the new KCl/PHPA/Polymer containing 0.6 ppb PHPA was displaced with returns going over the shakers dressed with 52 mesh screens there we no over screen mud losses at all.
- When displacing on future wells on the Ocean Bounty, consideration might be given to either adding an initial higher concentration of PHPA or dressing the shakers with finer screens.

Solids Control and Mud Mixing Equipment.

- When operating the desander with the centrifugal pump designated for the desander, the operating pressure was only 11 psi. However, when the desilter pump was lined up on the desander, the operating pressure was 25 psi.
- The desander designated pump should be checked, particularly the impeller.

Daily Costs vs Depth

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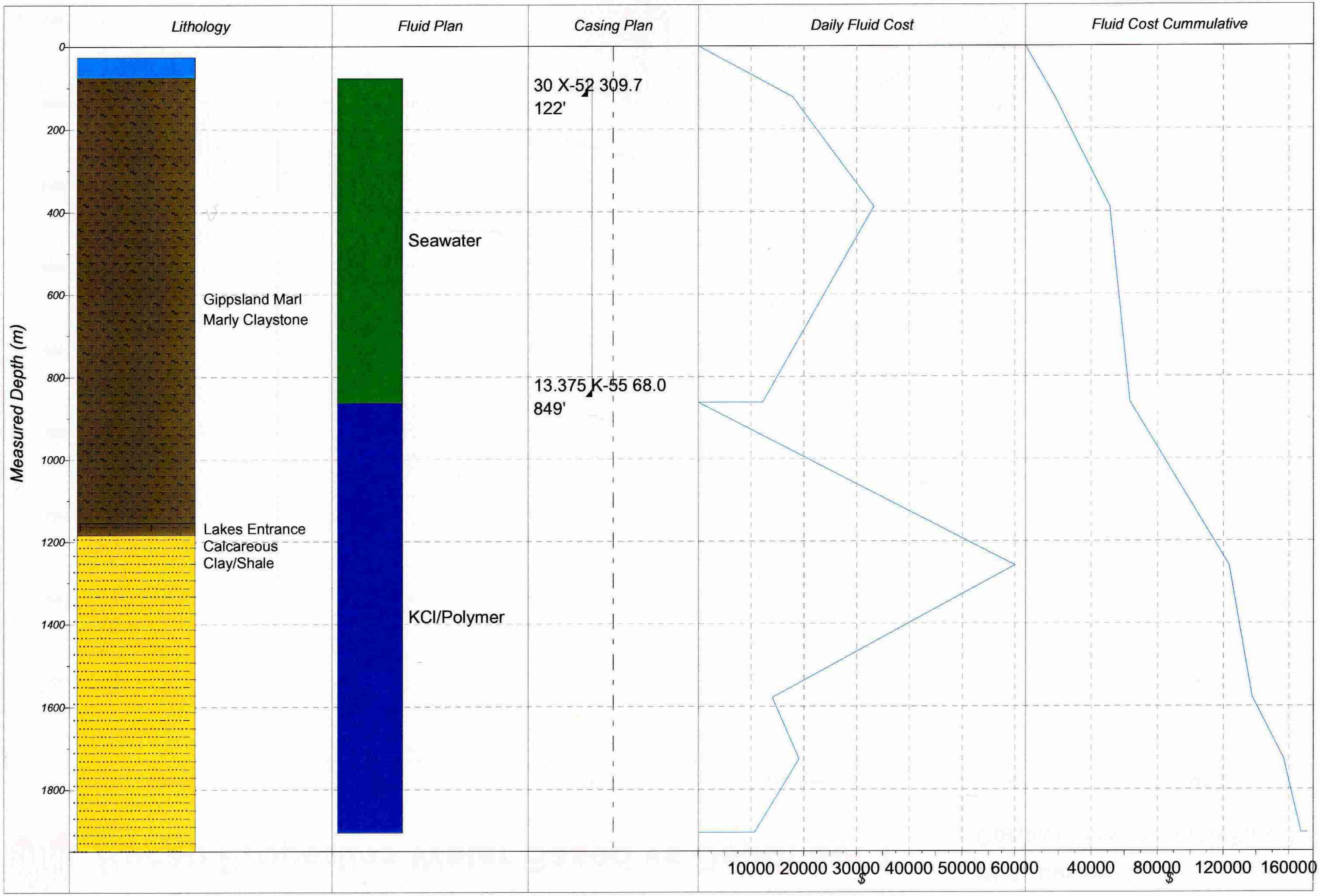
Well : Beardie-1

Operator : Esso Australia Pty Ltd.



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PE913712 - colour Ø 25

Recap Properties Water Based vs Depth Set 1

Well : Beardie-1

Operator : Esso Australia Pty Ltd.

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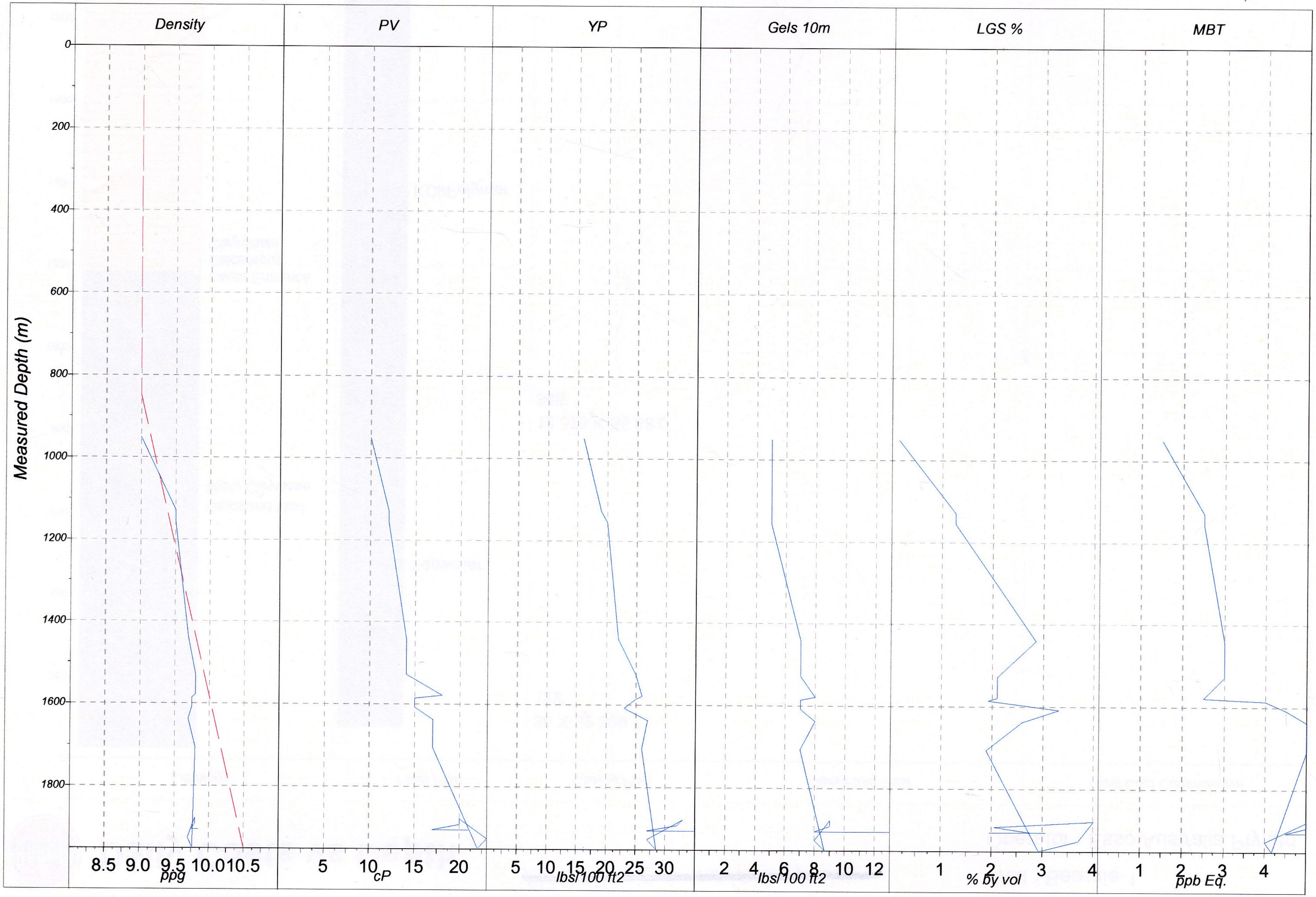
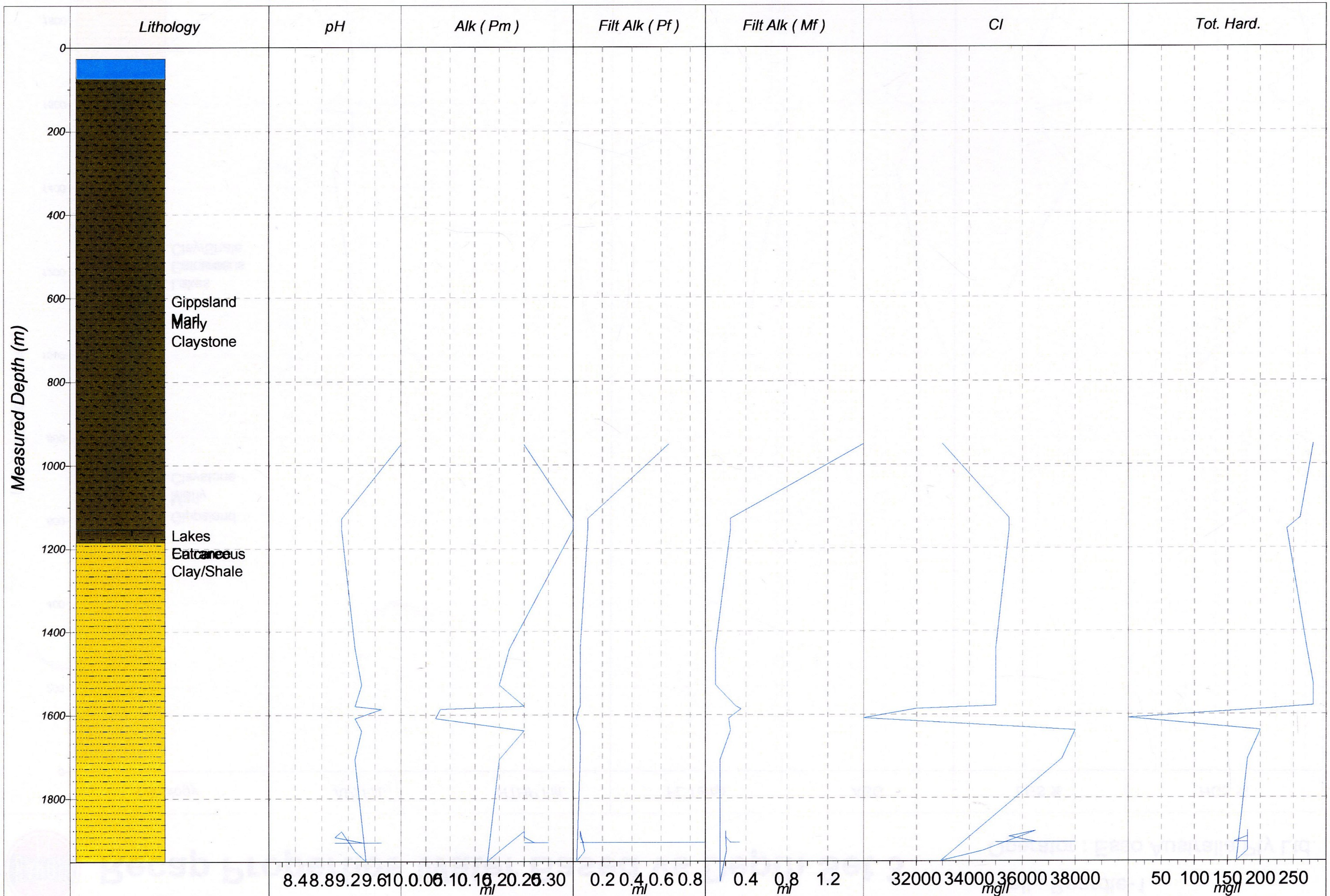


Recap Properties Water Based vs Depth Set 2

Pe913712 - colour Ø26

Well : Beardie-1

Operator : Esso Australia Pty Ltd.



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~~PE913712_colour027~~

Recap Properties Water Based vs Depth Set 3

Well : Beardie-1

Operator : Esso Australia Pty Ltd.

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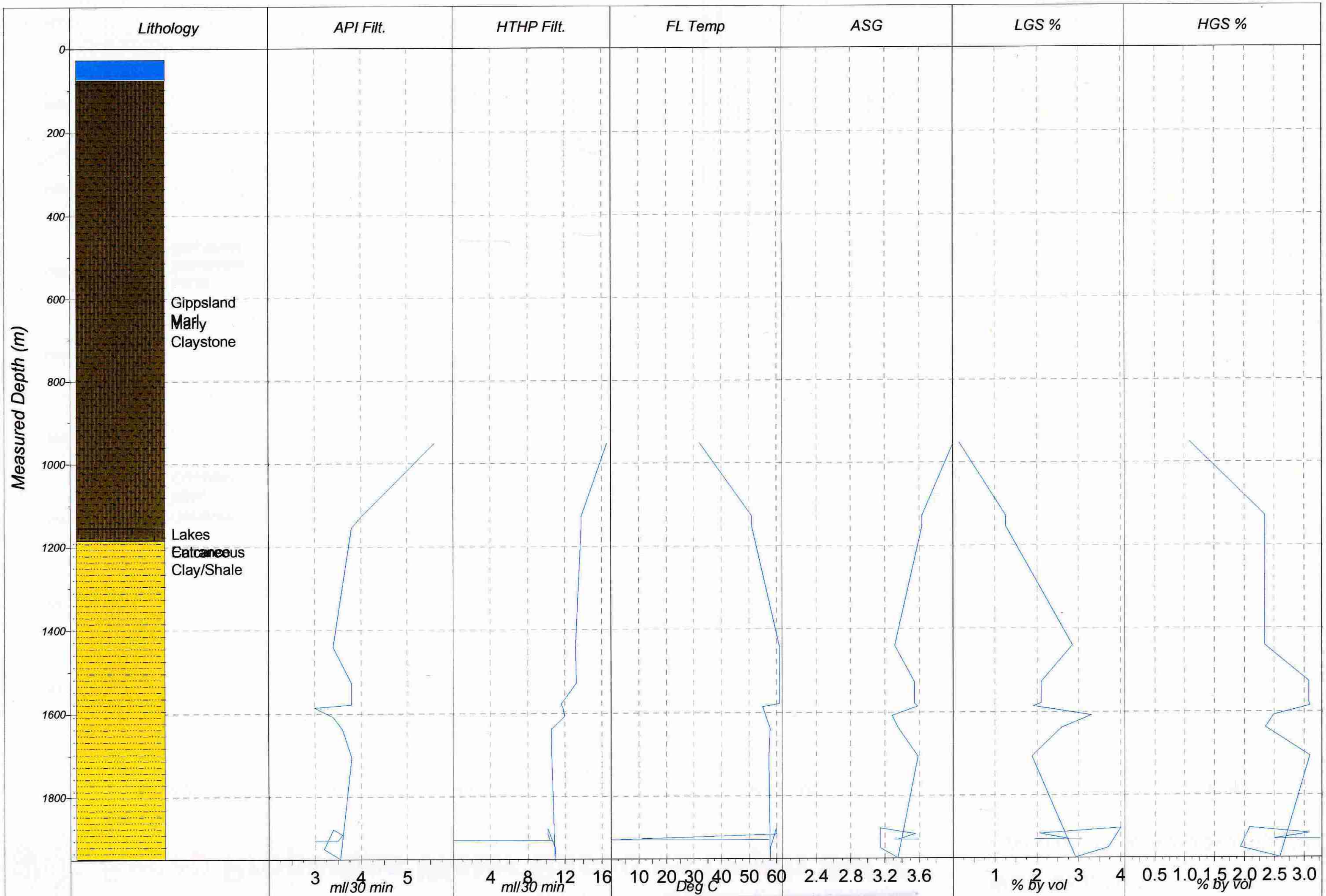

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Well Summary

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Well Data

Spud Date		Jul/26/02	Products/Fluids Drilling Cost	$167,325.40
TD Date		Aug/04/02	Products/Fluids Completion Cost	$0.00
Project			Solids Control/ Waste Management Cost	$0.00
Days on Well		13	Products/Fluids Cementing Cost	$262.00
From Date		Jul/25/02	Products Lost/Damaged Cost	$0.00
To Date		Aug/7/02	Engineering Services Cost	$14,725.00
Drilling Days		9	Equipment Cost	$0.00
Rotating Hours		106.50	Transport / Packaging	$0.00
Average ROP	m/hr	18.0	Other Cost	$3,348.41
Maximum Density	ppg	12.00	Total Well Cost	$185,660.81
Total Measured Depth	m	1,905.0	Planned Cost	$0.00
True Vertical Depth	m	1,905.0	Cost per Fluid Volume $ / bbl	14.52
Distance Drilled	m	1,828.0	Cost per m Drilled $ / m	101.56
Maximum Deviation	degrees	1.00	Cost / Volume of Hole Drilled $ / bbl	152.06
Maximum Horiz. Displacement	m	16.1	Fluid Volume / Hole Volume bbl / bbl	10.470
Bottom Hole Temperature	Deg C	85.00	Fluid Volume / Length Drilled bbl/m	6.990

Casing Design

Casing Description	Set Date and Time	Top MD m	Top TVD m	End MD m	End TVD m	Csg OD in	Csg ID in	Hole Size in	Hole MD m	Hole TVD m
30 X-52 309.7	07/26/2002 22:00	77.0	77.0	122.0	122.0	30.000	28.000		122.0	122.0
13.375 K-55 68.0	07/29/2002 13:00	77.0	77.0	849.0	849.0	13.375	12.415		849.0	849.0

Mud Program

Interval #	Mud Type	Interval Days	BHT Deg C	Max. Dens ppg	Planned Fluid Cost	Actual Fluids and Products Cost	Variance
01	LCM Pill	2		12.00	$ 0.00	$ 12,070.00	$ 12,070.00
01	Seawater	2		12.00	$ 0.00	$ 0.00	$ 0.00
02	Seawater	3		12.00	$ 0.00	$ 51,168.23	$ 51,168.23
03	LCM Pill	9	85	9.85	$ 0.00	$ 562.76	$ 562.76
03	KCl/Polymer/Glycol-CP	9	85	9.85	$ 0.00	$ 103,524.41	$ 103,524.41
03	Seawater	9	85	9.85	$ 0.00	$ 0.00	$ 0.00

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Total Cost Breakdown

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Material	Unit Size	Quantity	Total Cost
Engineering/Services			
Drilling Fluids Engineer	Day(s)	31	$ 14,725.00
		Subtotal	**$ 14,725.00**
Other			
Baracide	25 Kg can	2	$ 635.94
BARACOR 129	25 Kg can	3	$ 136.20
barite	25 Kg bag	220	$ 1,073.60
calcium chloride flake 74%	25 Kg bag	5	$ 52.40
DRILLZAN-D	25 Kg bag	3	$ 844.14
phpa	25 Kg bag	5	$ 475.25
potassium hydroxide	20 Kg pail	4	$ 130.88
		Subtotal	**$ 3,348.41**
Prod/Fluids : Cementing			
calcium chloride flake 74%	25 Kg bag	25	$ 262.00
		Subtotal	**$ 262.00**
Prod/Fluids : Drilling			
BARACARB 100	1200 Kg bulk	3	$ 1,500.15
BARACARB 100	25 Kg bag	96	$ 1,000.32
BARACARB 25	1200 Kg bulk	3	$ 1,190.07
BARACARB 25	25 Kg bag	96	$ 792.96
Baracide	25 Kg can	5	$ 1,589.85
BARACOR 129	25 Kg can	39	$ 1,770.60
BARA-DEFOAM W300	25 l can	1	$ 57.53
barite	100 lb bulk	3,567	$ 31,639.29
bentonite	100 lb bulk	1,812	$ 27,469.92
bicarbonate of soda	25 Kg bag	9	$ 105.75
caustic soda	25 Kg pail	34	$ 1,088.00
citric acid	25 Kg bag	9	$ 495.63
DEXTRID LT	25 Kg bag	144	$ 5,675.04
DRILLZAN-D	25 Kg bag	67	$ 18,852.46
Glycol CP	1500 l bulk	10	$ 43,868.30
guar gum	25 Kg bag	120	$ 6,811.20
KCl Ag grade	1000 Kg bulk	34	$ 10,786.84
lime	20 Kg bag	3	$ 17.88
Mil-pac	25 Kg bag	49	$ 5,431.16
phpa	25 Kg bag	71	$ 6,748.55
potassium hydroxide	20 Kg pail	10	$ 327.20
soda ash	25 Kg bag	10	$ 106.70
		Subtotal	**$ 167,325.40**
		Total Well Cost	**$ 185,660.81**

Net Well Cost Breakdown

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Cost Breakdown I $	Interval 01	Interval 02	Interval 03	Total
Fluids/Products : Drilling	12,070.00	51,168.23	104,087.17	167,325.40
Fluids Products : Comp/Filtration				
Solids Control/Waste Managment				
Fluids/Products : Cementing		262.00		262.00
Engineering Services	2,375.00	2,850.00	9,500.00	14,725.00
Fluids/Products : Lost Damaged				
Other Cost			3,348.41	3,348.41
Equipment cost				
Transport / Packaging Cost				
Total Cost	14,445.00	54,280.23	116,935.58	185,660.81

Cost Breakdown II $	Interval 01	Interval 02	Interval 03	Total
Total Products Cost	12,070.00	51,430.23	107,435.58	170,935.81
Total Fluids Cost				
Total Charges Cost	2,375.00	2,850.00	9,500.00	14,725.00
Total Cost	14,445.00	54,280.23	116,935.58	185,660.81
Planned Cost				
Variance	14,445.00	54,280.23	116,935.58	**185,660.81**

Volumes Breakdown bbl	Interval 01	Interval 02	Interval 03	Total
Total Base Fluids Additions				
Total Chemical Additions	83.0	137.9	275.9	496.8
Total Barite Additions		211.6	30.7	242.3
Total Water Additions	1,743.0	7,513.8	2,788.0	12,044.8
Total Fluid Built	**1,826.0**	**7,863.4**	**3,094.6**	12,784.0
Total Fluids Received				
Total Mixing Additions				
Total Influx Additions				
Total Other Additions				
Total Fluid Volume	**1,826.0**	**7,863.4**	**3,094.6**	12,784.0

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Interval Summary

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Interval # 01	Bit Size 0.000 in	Hole Size Average / Maximum 0.000 / 0.00 in

Interval Start Date		Jul/25/2002	Planned Cost	$	0.00
Interval End Date		Jul/26/2002	Total Interval Cost	$	14,445.00
Interval TD Date		Jul/26/2002	Programmed Variance	$	14,445.00
Drilling Days		1.00	Total Products Cost	$	12,070.00
Rotating Hours		2.00	Total Fluids Cost	$	0.00
Top of Int. MD/TVD	m	77.0/ 77.0	Total Charges Cost	$	2,375.00
End of Int. MD/TVD	m	124.0/ 124.0	Total Cementing Cost	$	0.00
Footage	m	46.5	Fluid Cost per Vol unit	$/bbl	7.91
Average ROP	m/hr	76.28	Fluid Cost / Hole Drilled	$/m	310.65
Max. Hole Angle	degrees	0.00	Fluid Cost / Vol Drilled	$/bbl	0.00
Casing Size/Type	in	30.000	Total Fluid Volume	bbl	1,826.00
Casing Shoe MD	m	122.0	Vol Fluid / Vol Drilled	bbl/bbl	0.00
Casing Length	m	45.0	Vol Fluid / Hole Drilled	bbl/m	39.27
Bottom Hole Temp.	Deg C	85	Fluid Loss / Vol Drilled	bbl/bbl	0.00
Max. Fluid Density	ppg	12.00	Fluid Loss / Hole Drilled	bbl/m	36.85

Interval Products and Base Fluids Usage and Cost

Product Function / Name	Drilling Fluid	Quantity Used	Product Cost
Alkalinity Control			
caustic soda	Water	5.00	$ 160.00
soda ash	Water	4.00	$ 42.68
lime	Water	3.00	$ 17.88
	Total of Alkalinity Control		**$ 220.56**
Viscosifier/Suspension Agent			
guar gum	Water	21.00	$ 1,191.96
bentonite	Water	703.00	$ 10,657.48
	Total of Viscosifier/Suspension Agent		**$ 11,849.44**
	Total Products and Base Fluids Cost		**$ 12,070.00**

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Interval Summary

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Interval # 02	Bit Size 17.500 in	Hole Size Average / Maximum 17.500 / 17.50 in

Interval Start Date		Jul/27/2002	Planned Cost	$	0.00
Interval End Date		Jul/29/2002	Total Interval Cost	$	54,280.23
Interval TD Date		Jul/28/2002	Programmed Variance	$	54,280.23
Drilling Days		2.00	Total Products Cost	$	51,430.23
Rotating Hours		21.25	Total Fluids Cost	$	0.00
Top of Int. MD/TVD	m	123.5/ 123.5	Total Charges Cost	$	2,850.00
End of Int. MD/TVD	m	863.0/ 862.0	Total Cementing Cost	$	262.00
Footage	m	739.5	Fluid Cost per Vol unit	$/bbl	6.90
Average ROP	m/hr	114.17	Fluid Cost / Hole Drilled	$/m	73.40
Max. Hole Angle	degrees	1.00	Fluid Cost / Vol Drilled	$/bbl	75.20
Casing Size/Type	in	13.380	Total Fluid Volume	bbl	7,863.40
Casing Shoe MD	m	849.0	Vol Fluid / Vol Drilled	bbl/bbl	10.89
Casing Length	m	772.0	Vol Fluid / Hole Drilled	bbl/m	10.63
Bottom Hole Temp.	Deg C	85	Fluid Loss / Vol Drilled	bbl/bbl	10.37
Max. Fluid Density	ppg	12.00	Fluid Loss / Hole Drilled	bbl/m	10.12

Interval Products and Base Fluids Usage and Cost

Product Function / Name	Drilling Fluid	Quantity Used	Product Cost	
Alkalinity Control				
soda ash	Seawater	3.00	$	32.01
caustic soda	Seawater	20.00	$	640.00
	Total of Alkalinity Control		**$**	**672.01**
Filtration Control				
Mil-pac	Seawater	4.00	$	443.36
	Total of Filtration Control		**$**	**443.36**
Viscosifier/Suspension Agent				
guar gum	Seawater	99.00	$	5,619.24
bentonite	Seawater	1,109.00	$	16,812.44
	Total of Viscosifier/Suspension Agent		**$**	**22,431.68**
Weighting Material				
barite	Seawater	3,114.00	$	27,621.18
calcium chloride flake 74%	No Fluid	25.00	$	262.00
	Total of Weighting Material		**$**	**27,883.18**
	Total Products and Base Fluids Cost		**$**	**51,430.23**

913712 401

Interval Summary

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Interval # 03	Bit Size 12.250 in	Hole Size Average / Maximum 12.260 / 12.26 in

Interval Start Date		Jul/30/2002	Planned Cost	$	0.00
Interval End Date		Aug/07/2002	Total Interval Cost	$	116,935.58
Interval TD Date		Aug/04/2002	Programmed Variance	$	116,935.58
Drilling Days		6.00	Total Products Cost	$	107,435.58
Rotating Hours		83.25	Total Fluids Cost	$	0.00
Top of Int. MD/TVD	m	863.0/ 862.0	Total Charges Cost	$	9,500.00
End of Int. MD/TVD	m	1,905.0/ 1,904.0	Total Cementing Cost	$	0.00
Footage	m	1,042.0	Fluid Cost per Vol unit	$/bbl	37.79
Average ROP	m/hr	43.69	Fluid Cost / Hole Drilled	$/m	112.22
Max. Hole Angle	degrees	0.98	Fluid Cost / Vol Drilled	$/bbl	234.26
Casing Size/Type	in	13.380	Total Fluid Volume	bbl	3,094.60
Casing Shoe MD	m	849.0	Vol Fluid / Vol Drilled	bbl/bbl	6.20
Casing Length	m	772.0	Vol Fluid / Hole Drilled	bbl/m	2.97
Bottom Hole Temp.	Deg C	85	Fluid Loss / Vol Drilled	bbl/bbl	5.19
Max. Fluid Density	ppg	9.85	Fluid Loss / Hole Drilled	bbl/m	2.48

Interval Products and Base Fluids Usage and Cost

Product Function / Name	Drilling Fluid	Quantity Used	Product Cost	
Alkalinity Control				
bicarbonate of soda	KCl/Polymer	9.00	$	105.75
soda ash	Seawater	0.00	$	0.00
potassium hydroxide	No Fluid	4.00	$	130.88
caustic soda	KCl/Polymer	9.00	$	288.00
caustic soda	Seawater	0.00	$	0.00
soda ash	KCl/Polymer	3.00	$	32.01
citric acid	KCl/Polymer	9.00	$	495.63
caustic soda	Water	0.00	$	0.00
lime	Water	0.00	$	0.00
soda ash	Water	0.00	$	0.00
potassium hydroxide	KCl/Polymer	10.00	$	327.20
	Total of Alkalinity Control		**$**	**1,379.47**
Bactericides				
Baracide	KCl/Polymer	5.00	$	1,589.85
Baracide	No Fluid	2.00	$	635.94
	Total of Bactericides		**$**	**2,225.79**
Filtration Control				
Mil-pac	Seawater	0.00	$	0.00
DEXTRID LT	KCl/Polymer	144.00	$	5,675.04
Mil-pac	KCl/Polymer	45.00	$	4,987.80
	Total of Filtration Control		**$**	**10,662.84**
Lost Circulation/Bridging Agent				
BARACARB 25	KCl/Polymer	99.00	$	1,983.03
BARACARB 100	KCl/Polymer	99.00	$	2,500.47
	Total of Lost Circulation/Bridging Agent		**$**	**4,483.50**
Shale Control				
Glycol CP	KCl/Polymer	10.00	$	43,868.30
KCl Ag grade	KCl/Polymer	34.00	$	10,786.84
phpa	KCl/Polymer	71.00	$	6,748.55
phpa	No Fluid	5.00	$	475.25
	Total of Shale Control		**$**	**61,878.94**
Viscosifier/Suspension Agent				

913712 402

Interval Summary

Well : Beardie-1

Operator: Esso Australia Pty Ltd.

Interval #	03	Bit Size	12.250 in	Hole Size Average / Maximum	12.260 / 12.26 in

guar gum	Seawater	0.00	$	0.00
bentonite	Seawater	0.00	$	0.00
bentonite	Water	0.00	$	0.00
DRILLZAN-D	Water	2.00	$	562.76
guar gum	Water	0.00	$	0.00
DRILLZAN-D	No Fluid	3.00	$	844.14
DRILLZAN-D	KCl/Polymer	65.00	$	18,289.70
	Total of Viscosifier/Suspension Agent		**$**	**19,696.60**
Weighting Material				
barite	Seawater	0.00	$	0.00
barite	KCl/Polymer	453.00	$	4,018.11
barite	No Fluid	220.00	$	1,073.60
calcium chloride flake 74%	No Fluid	5.00	$	52.40
	Total of Weighting Material		**$**	**5,144.11**
Corrosion Inhibitor				
BARACOR 129	No Fluid	3.00	$	136.20
BARACOR 129	KCl/Polymer	39.00	$	1,770.60
	Total of Corrosion Inhibitor		**$**	**1,906.80**
Defoamer				
BARA-DEFOAM W300	KCl/Polymer	1.00	$	57.53
	Total of Defoamer		**$**	**57.53**
	Total Products and Base Fluids Cost		**$**	**107,435.58**

913712 403

Interval Cost Breakdown

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Interval #	01	**From Report Date**	25/07/2002	**Top of Interval**	77.0	m	
Hole Size	0.000 in	**To Report Date**	26/07/2002	**Bottom of Interval**	124.0	m	

Material	Unit Size	Quantity	Total Cost
Engineering/Services			
Drilling Fluids Engineer	Day(s)	5.00	$ 2,375.00
		Subtotal	**$ 2,375.00**
Prod/Fluids : Drilling			
barite	100 lb bulk	495.00	$ 4,390.65
bentonite	100 lb bulk	780.00	$ 11,824.80
caustic soda	25 Kg pail	6.00	$ 192.00
guar gum	25 Kg bag	21.00	$ 1,191.96
lime	20 Kg bag	3.00	$ 17.88
Mil-pac	25 Kg bag	2.00	$ 221.68
soda ash	25 Kg bag	5.00	$ 53.35
		Subtotal	**$ 17,892.32**
		Interval Cost	**$ 20,267.32**
		Programmed Cost	**$ 0.00**
		Programmed Variance	**$ 20,267.32**

913712 404

Interval Cost Breakdown

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Interval #	02	**From Report Date**	27/07/2002	**Top of Interval**	124.0 m
Hole Size	17.500 in	**To Report Date**	29/07/2002	**Bottom of Interval**	863.0 m

Material	Unit Size	Quantity	Total Cost
Engineering/Services			
Drilling Fluids Engineer	Day(s)	6.00	$ 2,850.00
		Subtotal	**$ 2,850.00**
Prod/Fluids : Cementing			
calcium chloride flake 74%	25 Kg bag	25.00	$ 262.00
		Subtotal	**$ 262.00**
Prod/Fluids : Drilling			
barite	100 lb bulk	2,619.00	$ 23,230.53
bentonite	100 lb bulk	1,032.00	$ 15,645.12
caustic soda	25 Kg pail	19.00	$ 608.00
guar gum	25 Kg bag	99.00	$ 5,619.24
Mil-pac	25 Kg bag	2.00	$ 221.68
soda ash	25 Kg bag	2.00	$ 21.34
		Subtotal	**$ 45,345.91**
		Interval Cost	**$ 48,457.91**
		Programmed Cost	**$ 0.00**
		Programmed Variance	**$ 48,457.91**

913712 405

Interval Cost Breakdown

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Interval # 03	**From Report Date**	30/07/2002	**Top of Interval**	863.0	m
Hole Size 12.250 in	**To Report Date**	7/08/2002	**Bottom of Interval**	1,905.0	m

Material	Unit Size	Quantity	Total Cost
Engineering/Services			
Drilling Fluids Engineer	Day(s)	20.00	$ 9,500.00
		Subtotal	**$ 9,500.00**
Other			
Baracide	25 Kg can	2.00	$ 635.94
BARACOR 129	25 Kg can	3.00	$ 136.20
barite	25 Kg bag	220.00	$ 1,073.60
calcium chloride flake 74%	25 Kg bag	5.00	$ 52.40
DRILLZAN-D	25 Kg bag	3.00	$ 844.14
phpa	25 Kg bag	5.00	$ 475.25
potassium hydroxide	20 Kg pail	4.00	$ 130.88
		Subtotal	**$ 3,348.41**
Prod/Fluids : Drilling			
BARACARB 100	1200 Kg bulk	3.00	$ 1,500.15
BARACARB 100	25 Kg bag	96.00	$ 1,000.32
BARACARB 25	1200 Kg bulk	3.00	$ 1,190.07
BARACARB 25	25 Kg bag	96.00	$ 792.96
Baracide	25 Kg can	5.00	$ 1,589.85
BARACOR 129	25 Kg can	39.00	$ 1,770.60
BARA-DEFOAM W300	25 l can	1.00	$ 57.53
barite	100 lb bulk	453.00	$ 4,018.11
bicarbonate of soda	25 Kg bag	9.00	$ 105.75
caustic soda	25 Kg pail	9.00	$ 288.00
citric acid	25 Kg bag	9.00	$ 495.63
DEXTRID LT	25 Kg bag	144.00	$ 5,675.04
DRILLZAN-D	25 Kg bag	67.00	$ 18,852.46
Glycol CP	1500 l bulk	10.00	$ 43,868.30
KCl Ag grade	1000 Kg bulk	34.00	$ 10,786.84
Mil-pac	25 Kg bag	45.00	$ 4,987.80
phpa	25 Kg bag	71.00	$ 6,748.55
potassium hydroxide	20 Kg pail	10.00	$ 327.20
soda ash	25 Kg bag	3.00	$ 32.01
		Subtotal	**$ 104,087.17**
		Interval Cost	**$ 116,935.58**
		Programmed Cost	**$ 0.00**
		Programmed Variance	**$ 116,935.58**

913712 406

Interval Inventory Report

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Interval #	01	From Report Date	25/07/2002	Top of Interval	77.0 m
Hole Size	0.000 in	To Report Date	26/07/2002	Bottom of Interval	123.5 m

Product Name	Unit	Starting	Received	Used	Returned	Ending	Weight lb
BARABLOK	50 lb bag						
BARACARB 100	1200 Kg bulk						
BARACARB 100	25 Kg bag						
BARACARB 25	1200 Kg bulk						
BARACARB 25	25 Kg bag						
Baracide	25 Kg can						
BARACOR 129	25 Kg can						
BARA-DEFOAM W300	25 l can						
BARAFILM	55 gal drum						
barite	100 lb bulk		1,182.00	495.00		687.00	68,700.0
barite	25 Kg bag		240.00			240.00	13,227.6
BAROFIBRE	25 lb bag						
bentonite	100 lb bulk		2,084.00	780.00		1,304.00	130,400.0
bicarbonate of soda	25 Kg bag		20.00			20.00	1,102.3
calcium chloride flake 74%	25 Kg bag		42.00			42.00	2,314.8
caustic soda	25 Kg pail		96.00	6.00		90.00	4,960.4
citric acid	25 Kg bag						
DEXTRID LT	25 Kg bag						
DRILLZAN-D	25 Kg bag						
Glycol CP	1500 l bulk						
guar gum	25 Kg bag		120.00	21.00		99.00	5,456.4
Hme Energizer	5 gal can						
KCl Ag grade	1000 Kg bulk						
Kwikseal Coarse	40 lb bag		44.00			44.00	1,760.0
Kwikseal Fine	40 lb bag		44.00			44.00	1,760.0
Kwikseal Medium	40 lb bag		36.00			36.00	1,440.0
lime	20 Kg bag		84.00	3.00		81.00	3,571.5
Mil-pac	25 Kg bag		80.00	2.00		78.00	4,299.0
NO-SULF	17 Kg pail						
NO-SULF	25 Kg bag						
phpa	25 Kg bag						
potassium hydroxide	20 Kg pail						
soda ash	25 Kg bag		48.00	5.00		43.00	2,369.9

Total Weight of Products in Stock, lb	241,361.9
Total Weight of Products in Stock, Metric Tons	109.48

913712 407

Interval Inventory Report

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Interval #	02	From Report Date	27/07/2002	Top of Interval	123.5	m
Hole Size	17.500 in	To Report Date	29/07/2002	Bottom of Interval	863.0	m

Product Name	Unit	Starting	Received	Used	Returned	Ending	Weight lb
BARABLOK	50 lb bag						
BARACARB 100	1200 Kg bulk						
BARACARB 100	25 Kg bag						
BARACARB 25	1200 Kg bulk						
BARACARB 25	25 Kg bag						
Baracide	25 Kg can		16.00			16.00	881.8
BARACOR 129	25 Kg can		32.00			32.00	1,763.7
BARA-DEFOAM W300	25 l can		2.00			2.00	96.7
BARAFILM	55 gal drum		1.00			1.00	422.0
barite	100 lb bulk	687.00	4,500.00	2,619.00		2,568.00	256,800.0
barite	25 Kg bag	240.00				240.00	13,227.6
BAROFIBRE	25 lb bag						
bentonite	100 lb bulk	1,304.00	500.00	1,032.00		772.00	77,200.0
bicarbonate of soda	25 Kg bag	20.00				20.00	1,102.3
calcium chloride flake 74%	25 Kg bag	42.00		25.00		17.00	937.0
caustic soda	25 Kg pail	90.00		19.00		71.00	3,913.2
citric acid	25 Kg bag		22.00			22.00	1,212.5
DEXTRID LT	25 Kg bag		240.00			240.00	13,227.6
DRILLZAN-D	25 Kg bag		80.00			80.00	4,409.2
Glycol CP	1500 l bulk		12.00			12.00	40,454.9
guar gum	25 Kg bag	99.00		99.00			
Hme Energizer	5 gal can		2.00			2.00	76.7
KCl Ag grade	1000 Kg bulk		24.00			24.00	52,910.4
Kwikseal Coarse	40 lb bag	44.00				44.00	1,760.0
Kwikseal Fine	40 lb bag	44.00				44.00	1,760.0
Kwikseal Medium	40 lb bag	36.00				36.00	1,440.0
lime	20 Kg bag	81.00				81.00	3,571.5
Mil-pac	25 Kg bag	78.00		2.00		76.00	4,188.7
NO-SULF	17 Kg pail		32.00			32.00	1,199.3
NO-SULF	25 Kg bag		41.00			41.00	2,259.7
phpa	25 Kg bag		120.00			120.00	6,613.8
potassium hydroxide	20 Kg pail		32.00			32.00	1,410.9
soda ash	25 Kg bag	43.00		2.00		41.00	2,259.7

Total Weight of Products in Stock, lb 495,099.2
Total Weight of Products in Stock, Metric Tons 224.57

913712 408

Interval Inventory Report

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Interval #	03	From Report Date	30/07/2002	Top of Interval	863.0 m
Hole Size	12.250 in	To Report Date	7/08/2002	Bottom of Interval	1,905.0 m

Product Name	Unit	Starting	Received	Used	Returned	Ending	Weight lb
BARABLOK	50 lb bag		80.00		80.00		
BARACARB 100	1200 Kg bulk		5.00	3.00	2.00		
BARACARB 100	25 Kg bag		96.00	96.00			
BARACARB 25	1200 Kg bulk		5.00	3.00	2.00		
BARACARB 25	25 Kg bag		96.00	96.00			
Baracide	25 Kg can	16.00		7.00	9.00		
BARACOR 129	25 Kg can	32.00	32.00	42.00	22.00		
BARA-DEFOAM W300	25 l can	2.00		1.00	1.00		
BARAFILM	55 gal drum	1.00			1.00		
barite	100 lb bulk	2,568.00		453.00		2,115.00	211,500.0
barite	25 Kg bag	240.00		220.00	20.00		
BAROFIBRE	25 lb bag		60.00		60.00		
bentonite	100 lb bulk	772.00				772.00	77,200.0
bicarbonate of soda	25 Kg bag	20.00		9.00	11.00		
calcium chloride flake 74%	25 Kg bag	17.00		5.00	12.00		
caustic soda	25 Kg pail	71.00		9.00	62.00		
citric acid	25 Kg bag	22.00		9.00	13.00		
DEXTRID LT	25 Kg bag	240.00		144.00	96.00		
DRILLZAN-D	25 Kg bag	80.00		70.00	10.00		
Glycol CP	1500 l bulk	12.00		10.00	2.00		
guar gum	25 Kg bag						
Hme Energizer	5 gal can	2.00			2.00		
KCl Ag grade	1000 Kg bulk	24.00	20.00	34.00	10.00		
Kwikseal Coarse	40 lb bag	44.00			44.00		
Kwikseal Fine	40 lb bag	44.00			44.00		
Kwikseal Medium	40 lb bag	36.00			36.00		
lime	20 Kg bag	81.00			81.00		
Mil-pac	25 Kg bag	76.00		45.00	31.00		
NO-SULF	17 Kg pail	32.00			32.00		
NO-SULF	25 Kg bag	41.00			41.00		
phpa	25 Kg bag	120.00		76.00	44.00		
potassium hydroxide	20 Kg pail	32.00		14.00	18.00		
soda ash	25 Kg bag	41.00		3.00	38.00		

Total Weight of Products in Stock, lb 288,700.0
Total Weight of Products in Stock, Metric Tons 130.95

913712 409

Fluid Volume Record

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Interval # 01

		bbl	ADDITIONS					bbl		LOSSES			bbl		VOLUMES		bbl	
Rpt #	Rpt Date	Initial Volume	Received & Mixed	Base	Water	Barite	Chem	Influx	Daily Total	SCE	Down Hole	Misc	Returned & Mixed	Daily Total	Hole Volume	Active Pits Volume	Reserve Pits Volume	Final Volume

Fluid Name: Hi-Vis Bentonite Sweep

Rpt #	Rpt Date	Initial Volume	Received & Mixed	Base	Water	Barite	Chem	Influx	Daily Total	SCE	Down Hole	Misc	Returned & Mixed	Daily Total	Hole Volume	Active Pits Volume	Reserve Pits Volume	Final Volume
002	5/07/2002				1,098.1		81.1		1,179.2				1,179.2	1,179.2				
Cummulative Volumes:					1,098.1		81.1		1,179.2				1,179.2	1,179.2				

Fluid Name: Guar Gum Sweep

Rpt #	Rpt Date	Initial Volume	Received & Mixed	Base	Water	Barite	Chem	Influx	Daily Total	SCE	Down Hole	Misc	Returned & Mixed	Daily Total	Hole Volume	Active Pits Volume	Reserve Pits Volume	Final Volume
002	5/07/2002				420.0		1.9		421.9				421.9	421.9				
Cummulative Volumes:					420.0		1.9		421.9				421.9	421.9				

Fluid Name: Weighted Hi-Vis Bentonite

Rpt #	Rpt Date	Initial Volume	Received & Mixed	Base	Water	Barite	Chem	Influx	Daily Total	SCE	Down Hole	Misc	Returned & Mixed	Daily Total	Hole Volume	Active Pits Volume	Reserve Pits Volume	Final Volume
002	5/07/2002				337.2	33.6	9.2		380.0								380.0	380.0
Cummulative Volumes:					337.2	33.6	9.2		380.0									

Fluid Name: LCM Pill

Rpt #	Rpt Date	Initial Volume	Received & Mixed	Base	Water	Barite	Chem	Influx	Daily Total	SCE	Down Hole	Misc	Returned & Mixed	Daily Total	Hole Volume	Active Pits Volume	Reserve Pits Volume	Final Volume
002	5/07/2002		1,601.1		112.4				1,713.5			1,713.5		1,713.5				
Cummulative Volumes:			1,601.1		112.4				1,713.5			1,713.5		1,713.5				

Fluid Name: Seawater

Rpt #	Rpt Date	Initial Volume	Received & Mixed	Base	Water	Barite	Chem	Influx	Daily Total	SCE	Down Hole	Misc	Returned & Mixed	Daily Total	Hole Volume	Active Pits Volume	Reserve Pits Volume	Final Volume
002	5/07/2002				112.4				112.4						112.4			112.4
Cummulative Volumes:					112.4				112.4									

Fluid Volume Record

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Interval # 02

		bbl	ADDITIONS						bbl	LOSSES			bbl		VOLUMES		bbl	
Rpt #	Rpt Date	Initial Volume	Received & Mixed	Base	Water	Barite	Chem	Influx	Daily Total	SCE	Down Hole	Misc	Returned & Mixed	Daily Total	Hole Volume	Active Pits Volume	Reserve Pits Volume	Final Volume
Fluid Name: Hi-Vis Bentonite Sweep																		
003	7/07/2002				2,050.5		21.3		2,071.8				1,123.8	1,123.8			948.0	948.0
004	8/07/2002	948.0			1,400.0		64.9		1,464.9				2,412.9	2,412.9				
Cummulative Volumes:					3,450.5		86.2		3,536.7				3,536.7	3,536.7				
Fluid Name: Guar Gum Sweep																		
003	7/07/2002				715.0		3.6		718.6				482.6	482.6			236.0	236.0
004	8/07/2002	236.0			1,100.0		5.6		1,105.6				1,341.6	1,341.6				
Cummulative Volumes:					1,815.0		9.2		1,824.2				1,824.2	1,824.2				
Fluid Name: Weighted Hi-Vis Bentonite																		
003	7/07/2002	380.0			811.7	178.0	33.3		1,023.0								1,403.0	1,403.0
004	8/07/2002	1,403.0											1,403.0	1,403.0				
Cummulative Volumes:					811.7	178.0	33.3		1,023.0				1,403.0	1,403.0				
Fluid Name: Seawater																		
003	7/07/2002	112.4	1,606.4		259.6				1,866.0			1,628.1		1,628.1	350.3			350.3
004	8/07/2002	350.3	5,157.5		463.6				5,621.1			5,135.7		5,135.7	835.7			835.7
005	9/07/2002	835.7			376.2				376.2			723.2		723.2	488.6			488.6
Cummulative Volumes:			6,763.9		1,099.4				7,863.3			7,487.0		7,487.0				

Australia
Bass Strait

Beardie
Victoria

Halliburton Australia Pty Ltd

Printed:27/08/2002

913712 410

Fluid Volume Record

913712 411

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Interval # 03

Fluid Name: KCl/Polymer/Glycol-CP

		bbl	ADDITIONS					bbl		LOSSES			bbl		VOLUMES			bbl
Rpt #	Rpt Date	Initial Volume	Received & Mixed	Base	Water	Barite	Chem	Influx	Daily Total	SCE	Down Hole	Misc	Returned & Mixed	Daily Total	Hole Volume	Active Pits Volume	Reserve Pits Volume	Final Volume
007	/07/2002				1,761.9	15.4	161.2		1,938.5	139.4		24.0		163.4	624.2	616.0	535.0	1,775.2
008	/08/2002	1,775.2				4.6	40.5		45.1	88.2				88.2	824.1	584.0	324.0	1,732.1
009	/08/2002	1,732.1			234.6		45.1		279.6	209.0				209.0	836.7	558.0	408.0	1,802.7
010	/08/2002	1,802.7			210.8	10.7	28.4		249.9	239.3				239.3	903.4	676.0	220.0	1,799.4
011	/08/2002	1,799.4					0.5		0.5	36.1		78.0		114.1	980.8	587.0	118.0	1,685.8
013	/08/2002	1,685.8										76.0		76.0	980.8		629.0	1,609.8
014	/08/2002	1,609.8										629.0		629.0	980.8			980.8
Cummulative Volumes:					2,207.3	30.7	275.7		2,513.6	712.0		807.0		1,519.0				

Fluid Name: LCM Pill

Rpt #	Rpt Date	Initial Volume	Received & Mixed	Base	Water	Barite	Chem	Influx	Daily Total	SCE	Down Hole	Misc	Returned & Mixed	Daily Total	Hole Volume	Active Pits Volume	Reserve Pits Volume	Final Volume
007	/07/2002				130.8		0.2		131.0								131.0	131.0
009	/08/2002	131.0										131.0		131.0				
Cummulative Volumes:					130.8		0.2		131.0			131.0		131.0				

Fluid Name: Seawater

Rpt #	Rpt Date	Initial Volume	Received & Mixed	Base	Water	Barite	Chem	Influx	Daily Total	SCE	Down Hole	Misc	Returned & Mixed	Daily Total	Hole Volume	Active Pits Volume	Reserve Pits Volume	Final Volume
006	/07/2002	488.6			449.9				449.9			496.0		496.0	442.6			442.6
007	/07/2002	442.6										442.5		442.5				
Cummulative Volumes:					449.9				449.9			938.5		938.5				

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Interval Chemical Concentrations

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Interval #	01	From Report Date	25/07/2002	Top of Interval	77.0	m
Hole Size	0.000 in	To Report Date	26/07/2002	Bottom of Interval	124.0	m

Fluid Name: Guar Gum Sweep

Material	Average ppb	Minimum ppb	Maximum ppb
guar gum	2.74	2.74	2.74

Fluid Name: Hi-Vis Bentonite Sweep

Material	Average ppb	Minimum ppb	Maximum ppb
bentonite	59.62	59.62	59.62
caustic soda	0.23	0.23	0.23
lime	0.11	0.11	0.11
soda ash	0.19	0.19	0.19

Fluid Name: LCM Pill

Material	Average ppb	Minimum ppb	Maximum ppb
bentonite	41.03	41.03	41.03
caustic soda	0.16	0.16	0.16
guar gum	0.68	0.68	0.68
lime	0.08	0.08	0.08
soda ash	0.13	0.13	0.13

Fluid Name: Weighted Hi-Vis Bentonite

Material	Average ppb	Minimum ppb	Maximum ppb
barite	130.26	130.26	130.26
bentonite	20.26	20.26	20.26
caustic soda	0.15	0.15	0.15
Mil-pac	0.29	0.29	0.29
soda ash	0.15	0.15	0.15

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Interval Chemical Concentrations

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Interval #	02	**From Report Date**	27/07/2002	**Top of Interval**	124.0 m
Hole Size	17.500 in	**To Report Date**	29/07/2002	**Bottom of Interval**	863.0 m

Fluid Name: Guar Gum Sweep

Material	Average ppb	Minimum ppb	Maximum ppb
guar gum	2.99	2.99	2.99

Fluid Name: Hi-Vis Bentonite Sweep

Material	Average ppb	Minimum ppb	Maximum ppb
bentonite	17.74	8.78	26.70
caustic soda	0.24	0.16	0.31
lime	0.08	0.04	0.11
soda ash	0.04	0.02	0.05

Fluid Name: Seawater

Material	Average ppb	Minimum ppb	Maximum ppb
barite	32.93	13.89	51.96
bentonite	8.89	4.51	17.17
caustic soda	0.10	0.04	0.16
guar gum	0.54	0.18	0.73
lime	0.03	0.00	0.06
Mil-pac	0.03	0.01	0.04
soda ash	0.02	0.00	0.03

Fluid Name: Weighted Hi-Vis Bentonite

Material	Average ppb	Minimum ppb	Maximum ppb
barite	221.95	221.95	221.95
bentonite	26.09	26.09	26.09
caustic soda	0.12	0.12	0.12
Mil-pac	0.16	0.16	0.16
soda ash	0.04	0.04	0.04

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Interval Chemical Concentrations

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Interval #	03	From Report Date	30/07/2002	Top of Interval	863.0 m
Hole Size	12.250 in	To Report Date	7/08/2002	Bottom of Interval	1,905.0 m

Fluid Name: KCl/Polymer/Glycol-CP

Material	Average ppb	Minimum ppb	Maximum ppb
BARACARB 100	2.87	1.00	5.00
BARACARB 25	2.82	1.15	5.00
Baracide	0.12	0.10	0.17
BARACOR 129	0.87	0.45	1.45
BARA-DEFOAM W300	0.02	0.02	0.04
barite	18.09	11.71	31.26
bicarbonate of soda	0.22	0.17	0.30
caustic soda	0.21	0.06	0.32
citric acid	0.22	0.17	0.30
DEXTRID LT	3.37	2.84	5.04
DRILLZAN-D	1.51	1.22	2.29
Glycol CP	13.70	8.70	22.71
KCl Ag grade	31.78	27.88	47.93
Mil-pac	1.07	0.91	1.56
phpa	1.62	1.25	2.59
potassium hydroxide	0.16	0.02	0.34
soda ash	0.06	0.02	0.13

Fluid Name: LCM Pill

Material	Average ppb	Minimum ppb	Maximum ppb
bentonite	41.03	41.03	41.03
caustic soda	0.16	0.16	0.16
DRILLZAN-D	0.84	0.84	0.84
guar gum	0.68	0.68	0.68
lime	0.08	0.08	0.08
soda ash	0.13	0.13	0.13

Fluid Name: Seawater

Material	Average ppb	Minimum ppb	Maximum ppb
barite	7.23	7.23	7.23
bentonite	2.35	2.35	2.35
caustic soda	0.02	0.02	0.02
guar gum	0.09	0.09	0.09
lime	0.00	0.00	0.00
Mil-pac	0.01	0.01	0.01
soda ash	0.00	0.00	0.00

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Interval Chemical Concentrations

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Interval #	03	**From Report Date**	30/07/2002	**Top of Interval**	863.0	m
Hole Size	12.250 in	**To Report Date**	7/08/2002	**Bottom of Interval**	1,905.0	m

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Fluid Property Recap:Water-Based Fluid

BAROID

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Date	Depth	FL Temp	Density	Fun Visc	Rheology @ 120F					Filtration					Filtrate Analysis						Sand	Retort Analysis				MBT	Rheometer Dial Reading					
					PV	YP	Gels lbs/100 ft2			API ml/30 min	HTHP ml/30 min	Cake 32nd in		Temp	pH	Pm ml	Pf ml	Mf ml	Cl mg/l	Total Hard mg/l	% by Vol	Corr Sol % by Vol	LGS % by Vol	Oil % by Vol	Water% by Vol							
	m	Deg C	ppg	sec/qt	cP		10s	10m	30m			API	HTHP	Deg C												ppb Eq.	600	300	200	100	6	3
07/26/02	80.0		8.60	105															0	0		0.0	0.0		0.1	0.0						
07/26/02	124.0		12.00	105															0	0		0.0	0.0	0.1	0.0	0.0						
07/27/02	322.0		8.50	110															0	0		0.0	0.0		1.0	0.0						
07/28/02	498.0		8.60	124															0	0		0.0	0.0		1.0	0.0						
07/28/02	862.0		12.00	120															0	0		0.0	0.0		1.0	0.0						
07/29/02	863.0		8.50	0															0	0		0.0	0.0		1.0	0.0						
07/31/02	951.0	32	9.00	59	10	16	4	5		5.6	16.6	1	2	67	10.00	0.25	0.65	1.55	33,000	280	0.35	1.2	0.1		96.0	1.5	36	26	21	15	5	3
07/31/02	1,129.0	51	9.50	48	12	19	3	5		4.0	13.8	1	2	67	9.10	0.35	0.10	0.25	35,500	260	0.60	3.6	1.3		93.5	2.5	43	31	23	16	5	3
07/31/02	1,155.0	51	9.50	49	12	20	3	5		3.8	13.8	1	2	67	9.10	0.35	0.10	0.25	35,500	240	0.75	3.6	1.3		93.5	2.5	44	32	23	17	5	3
08/01/02	1,441.0	61	9.70	53	14	22	5	7		3.4	13.2	1	2	67	9.30	0.22	0.05	0.10	35,000	270	0.40	5.2	2.9		92.0	3.0	50	36	25	20	7	4
08/01/02	1,528.0	61	9.80	48	14	25	5	7		3.8	13.3	1	2	67	9.40	0.20	0.05	0.10	35,000	280	0.40	5.2	2.1		92.0	3.0	53	39	31	27	6	4
08/01/02	1,579.0	61	9.80	48	18	26	6	8		3.8	11.6	1	2	67	9.30	0.25	0.05	0.30	35,000	280	0.75	5.2	2.1		92.0	2.5	62	44	36	25	7	5
08/02/02	1,586.0	55	9.80	50	15	25	6	7		3.0	11.8	1	2	67	9.70	0.08	0.04	0.35	32,000	220	0.20	5.0	1.9		92.4	4.0	55	40	32	22	7	6
08/02/02	1,609.0	56	9.80	52	15	23	6	7		3.4	12.0	1	2	67	9.30	0.07	0.02	0.23	30,000	0	0.25	5.8	3.3		91.8	4.5	53	38	31	23	8	5
08/02/02	1,638.0	58	9.70	54	17	27	5	8		3.6	10.6	1	2	67	9.40	0.25	0.05	0.25	38,000	200	0.75	4.9	2.6		92.0	5.0	61	44	35	26	7	5
08/02/02	1,707.0	57	9.80	56	17	26	5	7		3.8	10.6	1	2	67	9.30	0.20	0.05	0.15	37,500	180	0.70	5.0	1.9		92.0	5.0	60	43	34	24	7	5
08/03/02	1,999.0	58	9.80	66	23	29	7	9		3.5	11.0	1	2	67	9.50	0.17	0.02	0.15	32,000	160	0.10	5.6	3.1		91.8	4.0	75	52	42	29	9	7
08/03/02	1,926.0	58	9.70	58	23	27	6	8		3.2	11.0	1	2	67	9.30	0.20	0.08	0.21	34,500	180	0.15	5.6	3.7		91.6	4.0	73	50	42	30	8	6
08/03/02	1,879.0	60	9.80	61	20	33	7	9		3.4	10.2	1	2	67	9.10	0.25	0.05	0.20	36,500	180	0.50	6.1	4.0		91.0	5.0	73	53	44	33	9	7
08/03/02	1,892.0	60	9.80	60	20	32	7	9		3.6	10.2	1	2	67	9.00	0.25	0.05	0.20	35,500	180	0.70	5.1	2.1		92.0	5.0	72	52	43	34	9	7
08/04/02	1,905.0		9.80	57	17	27	6	8		3.5	10.4	1	2	67	9.40	0.27	0.07	0.25	36,500	160	0.10	5.3	2.8		91.8	4.5	61	44	36	28	8	6
08/04/02	1,905.0	57	9.80	57	21	33	9	12		3.0	10.0	1	2	67	9.60	0.29	0.08	0.30	38,000	180	0.15	5.6	3.1		91.4	4.5	75	54	45	33	10	8
08/05/02	1,905.0		9.90	68	20	35	10	13		3.3	10.6	1	2	67	9.70	0.30	0.90	0.34	37,000	180	0.10	5.2	2.0		91.8	4.5	75	55	48	36	12	9
08/06/02	1,905.0		9.90	68	20	35	10	13		3.5		1		67	9.00	0.25	0.05	0.25	35,000	180	0.50	5.4	2.1		91.8	5.0	75	55	48	35	9	7

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Fluid Program Exceptions Report

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Report No	Date	Time	Depth m	Property Name	Units	Actual Value	Exception	Program Min	Program Max
002	07/26/02	16:00	80	Funnel Viscosity	sec/qt	105	High	100	
002	07/26/02	19:30	124	Funnel Viscosity	sec/qt	105	High	100	
002	07/26/02	19:30	124	Density	ppg	12.00	High	8.50	9.00
003	07/27/02	20:00	322	Funnel Viscosity	sec/qt	110	High	100	
004	07/28/02	03:30	498	Funnel Viscosity	sec/qt	124	High	100	
004	07/28/02	20:00	862	Density	ppg	12.00	High	8.90	10.50
005	07/29/02	20:00	863	Density	ppg	8.50	Low	8.90	10.50
007	07/31/02	09:45	951	pH	-	10.00	High	8.50	9.20
007	07/31/02	09:45	951	Yield Point	lbs/100 ft2	16	Low	25	45
007	07/31/02	19:00	1,129	Yield Point	lbs/100 ft2	19	Low	25	45
007	07/31/02	21:00	1,155	Yield Point	lbs/100 ft2	20	Low	25	45
008	08/01/02	07:30	1,441	Yield Point	lbs/100 ft2	22	Low	25	45
008	08/01/02	07:30	1,441	pH	-	9.30	High	8.50	9.20
008	08/01/02	10:00	1,528	pH	-	9.40	High	8.50	9.20
008	08/01/02	16:00	1,579	pH	-	9.30	High	8.50	9.20
009	08/02/02	07:30	1,586	pH	-	9.70	High	8.50	9.20
009	08/02/02	10:00	1,609	pH	-	9.30	High	8.50	9.20
009	08/02/02	10:00	1,609	Yield Point	lbs/100 ft2	23	Low	25	45
009	08/02/02	16:00	1,638	pH	-	9.40	High	8.50	9.20
009	08/02/02	22:00	1,707	pH	-	9.30	High	8.50	9.20
010	08/03/02	09:30	1,926	pH	-	9.30	High	8.50	9.20
011	08/04/02	03:30	1,905	pH	-	9.40	High	8.50	9.20
011	08/04/02	06:45	1,905	pH	-	9.60	High	8.50	9.20
011	08/04/02	06:45	1,905	KCl % wt	-	8.20	High	6.00	8.00
012	08/05/02	01:30	1,905	KCl % wt	-	8.10	High	6.00	8.00
012	08/05/02	01:30	1,905	pH	-	9.70	High	8.50	9.20

Well: Beardie-1
Operator: Esso Australia Pty Ltd.

Operations Log Recap

For report #001A on 25/07/2002	Operation at depth(m) 0
Activity	Set anchors.
Rig Activity	Tow rig to Beardie-1 location. Set anchors.
For report #002A on 26/07/2002	Operation at depth(m) 123
Activity	Run 30" casing
Rig Activity	Continued ballasting rig. Completed running anchors and tensioning same. Ran in to seabed (77 m) with 26" bit and 36" hole opener. Drilled with seawater and hi-vis sweeps to 123.5 m. Pumped 100 bbl hi-vis guar gum sweep and spotted 400 bbls of hi-vis bentonite. Made a wiper trip to 84 m (no fill) and spotted another 400 bbls of hi-vis bentonite. Pulled out and rigged to run 30" casing. Unable to pump through 30". Filled with seawater. Rigged down casing slings and made up mechanical setting tool on drill pipe.
Fluid Treatments	Mixed a total of 1981bbls of fluid for the 36" hole interval consisting of: 1179 bbls of hi-vis bentonite, 422 bbls of hi-vis guar gum and 380 bbls of 12.0 ppg hi-vis kill mud. The kill mud was not required and was salvaged and transferred to storage tank D for use on the next interval. Sweeps while drilling consisted of guar gum and seawater diluted / lime flocculated bentonite. Straight hi-vis bentonite was used for spotting.
For report #003A on 27/07/2002	Operation at depth(m) 388
Activity	Drilling 17 1/2" surface hole
Rig Activity	Made up wash assembly and cleared 30" casing float. Continued running 30" casing, made up cement stinger and installed PGB. Landed out casing and circulated 1.5 times casing volume. Repositioned rig to straighten casing. Cemented casing at 122 m and WOC. Released running tool and pulled and laid out. Laid out cement stand. Made up 17 1/2" BHA and ran in hole. Repositioned rig and continued running in. Drilled out shoe track from 117 m. Drilling at 388 m with seawater and hi-vis sweeps at midnight.
Fluid Treatments	Mixed a total of 1023 bbls of 12.0 ppg kill mud and transferred to storage tanks and pit #1. Mixed a total of 2072 bbls of hi-vis mud-both bentonite and guar gum. Pumped 50 bbl gel sweeps on connections and guar sweeps every half stand.
For report #004A on 28/07/2002	Operation at depth(m) 863
Activity	Rig to run 13 3/8" casing.
Rig Activity	Continued drilling 17 1/2 hole with seawater and hi-vis sweeps. Drilled to 863 m. Circulated 100 bbls of hi-vis guar followed by 300 bbls of seawater, and then spotted 800 bbls of hi-vis bentonite. Made wiper trip to 323 m. Ran back to bottom-no fill. Circulated 300 bbls of seawater. Dropped survey and then spotted 1200 bbls of 12.0 ppg hi-vis bentonite. Pulled out to 121 m and spotted 110 bbls of 12.0 ppg hi-vis bentonite. Continued out of hole, recovered survey and broke out bit.
Fluid Treatments	Continued pumping 50 bbl hi-vis guar gum sweeps every 1/2 stand and 50 bbls hi-vis bentonite on connections. Maintained adequate sweep volume in pits. Mixed additional unweighted hi-vis bentonite to give sufficient volume for initial displacement at TD.
For report #005A on 29/07/2002	Operation at depth(m) 863
Activity	Running BOP and riser
Rig Activity	Laid out 17 1/2" BHA. Rigged up and ran 13 3/8" casing. Made up 18 3/4" wellhead assembly and ran in on drill pipe. Made up cement head and landed wellhead. Circulated 500 bbls of sewater, pressure tested lines and cemented casing at 848.7 m. Displaced cement. Plug did not bump. Released running tool and pulled same. Ran riser and nippled up and pressured tested BOP's on skid beams. Running riser and BOP's at report time.
Fluid Treatments	Cleaned all mud pits in preparation for mixing new mud. Commenced mixing KCl/PHPA/Polymer fluid for displacement. Will charge of chemical usage on tomorrow's report.
For report #006A on 30/07/2002	Operation at depth(m) 863
Activity	Drill shoe track
Rig Activity	Continued running riser and BOP's. Pressure test BOP's, surface equipment and casing. Stroked out slip joint. Made up 12 1/4" BHA and tested MWD. Ran in hole and broke circulation at 741 m. Ran in and tagged TOC at 820 m. Pressure tested LMRP connector against 13 3/8" casing and function tested BOP's. Drilling cement and shoe track with seawater at 820 m at report time.
Fluid Treatments	Mixed and initial total of 1633 bbls of 8.9 ppg KCl/PHPA/Polymer mud containing 0.60 ppb PHPA. 560 bbls of this fluid was pretreated with 0.5 ppb each of citric acid and sodium bicarbonate as a precaution against possible cement contamination. 160 bbls of the new mud was transferred up to the shaker tanks and another 230 bbls of mud prepared containing 1.5 ppb PHPA. Also mixed 110 bbls of 1.0 ppb DRILLZAN D in drill water as a basis for an LCM pill when products arrive on boat. Will charge off chemical usage on tomorrow's report after commencing to drill new hole.
For report #007A on 31/07/2002	Operation at depth(m) 1260
Activity	Drilling 12 1/4" hole
Rig Activity	Continued drilling shoe track with seawater and displaced to KCl/PHPA/Polymer mud. Finished drilling shoe track and shoe and cleaned out rat hole. Drilled 3 m new hole to 866 m, circulated and carried out a PIT to an EMW of 14.7 ppg. Resumed drilling 12 1/4" hole to 913 m. Renewed saver sub which had backed off. Drilling at 1260 m at report time.

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Well: Beardie-1
Operator: Esso Australia Pty Ltd.

Operations Log Recap

For report #007A on 31/07/2002	**Operation at depth(m) 1260**
Fluid Treatments	Displaced hole to KCl/PHPA/Polymer mud while still drilling shoe track at 840 m. No losses over 52 mesh screens. Treated active system with additional citric acid and sodium bicarbonate. Added BARACOR 129 oxygen scavenger and 3% Glycol to active. Increased PHPA concentration Lost 50 bbls over shakersdue to fresh PHPA. Mixed volume premixes as required. Increased mud weight to 9.5 ppg prior to Lakes Entrance. Downsized shaker screens as practical and dumped header box as necessary. Adding BARACARB. Sulfides = 0
For report #008A on 1/08/2002	**Operation at depth(m) 1579**
Activity	Trip for bit
Rig Activity	Continued drilling 12 1/4" hole. Flow checked drilling break at 1287 m. Hole static. Drilled to 1579 m. Flow checked-static. Pumped slug and pulled out of hole for a new bit and BHA. 20k overpull at 1282 and 1098 m. Flow checked at shoe-hole static. Laid out MWD and bit. Made up new bit. Picked up MWD and CDR and tested same. Picking up 8" drill collars at report time.
Fluid Treatments	Added 5 ppb each of BARACARB 25 AND 100 and maintained while drilling the Latrobe. Maintained volume with premixes treated as per results of mud checks. Downsized shaker screens as practical. Header box jetted regularly. Mixed barite slug for bit trip. No Sulfides apparent on either GGT or Hach tests.
For report #009A on 2/08/2002	**Operation at depth(m) 1727**
Activity	Drilling 12 1/4" hole
Rig Activity	Continued picking up 8" drill collars. Ran in hole to 830 m, filled pipe and serviced top drive. Ran in to 1572 m. Tagged up. Wash/reamed to bottom at 1579 m. Drilled 12 1/4" hole to 1727 m at report time.
Fluid Treatments	Maintained volume and required properties with premix additions. Used previously prepared LCM base fluid for the latest premix. Maintained required Glycol concentration. Continued adding 5 ppb each of BARACARB 25 and 100 to minimize seepage losses. No Sulfides apparent on either GGT or Hach tests. Increased active system yield point. Desander: 10.8 ppg @ 5.0 bph. Desilter: 12.1 ppg @ 37 bph - ran minimally.
For report #010A on 3/08/2002	**Operation at depth(m) 1905**
Activity	Wiper trip prior to logging
Rig Activity	Continued drilling 12 1/4" hole to 1905 m. Pumped around a 100 bbl hi-vis sweep. Flow checked and pulled 3 stands. 60K overpull. Circulated for 1/2 hour. Made up TDS and pumping/rotating out of hole at report time.
Fluid Treatments	Maintained volume and properties based on active system mud checks. Increased PHPA concentration based on cuttings quality. Treated active system to increase yield point and gel strengths prior to logging. Utilized previously used shaker screens where possible. Prepared 100 bbl hi-vis sweep. Very little noticeable increase in cuttings return when hi-vis sweep returned to surface. Desander: 10.2 ppg @ 5.1 bph.
For report #011A on 4/08/2002	**Operation at depth(m) 1905**
Activity	Wireline logging
Rig Activity	Continued pumping/rotating out of hole for wiper trip to 1579 m. Pulled out to 13 3/8" casing shoe. Flow checked-static. Serviced TDS. Ran back in hole, breaking circulation at 1579 m. Precautionary washed/reamed from 1879-1905 m. Tagged up 6 m off bottom. Possibly fill. Circulated 2 times bottoms up while working pipe. Pulled out of hole and layed out MWD and CDR. Rigged up wireline. Running wireline logs at report time.
Fluid Treatments	Bled fresh premix into the active system to increase yield point and gel strengths prior to logging. Also increased the pH plus oxygen scavenger and biocide concentrations. Ran desander: 10.1 ppg @ 4.2 bph. Sulfides=0.
For report #012A on 5/08/2002	**Operation at depth(m) 1905**
Activity	Wireline logging
Rig Activity	Continued wireline logging.
Fluid Treatments	Replaced damaged shaker screens with previously used screens. Commenced preparing 10.5 ppg hi-vis pill for spotting in open hole during P & A operations.
For report #013A on 6/08/2002	**Operation at depth(m) 1905**
Activity	Plug & Abandon

Operations Log Recap

For report #013A on 6/08/2002	Operation at depth(m) 1905
Rig Activity	Continued wireline logging. Rigged down wireline. Laid out 12 1/4" assembly. Made up Side Entry and TIW valve. Picked up 20 joints of 3 1/2" drill pipe stinger. Ran in to 1560 m and circulated bottoms up. Pumped 54 bbls of 10.5 ppg hi-vis.Pulled up to 1460 m and pressure tested cement lines. Set P & A plug 1a at 1460. Pulled up to 1325 m and circulated bottoms up. Dumpedr contaminated returns. Setting plug 1b at 1325 m at report time.
Fluid Treatments	Finished preparing 165 bbls (120 bbls pumpable) of 10.5 ppg hi-vis pill with a funnel viscosity of 115 seconds. BARACOR 129, Baracide and caustic potash used to inhibit mud to be left in the 13 3/8" casing when plugging and abandoning. Backloaded mud chemicals as per inventory: Glycol 1500 litres = 2 (onboard "Sentinel") Balance of returned products as per inventory (onboard "Conquerer")
For report #014A on 7/08/2002	**Operation at depth(m) 1905**
Activity	Plug & Abandon
Rig Activity	Continued P & A operations. Pulled to 1190 m and circulated bottoms up. No indication of cement or water. Set plug 1c at 1190 m. Pulled to 1055 m and circulated bottoms up. Dumped water diluted mud. Set cement plug 1d at 1055 m. Pulled to 920 m and circulated bottoms up. Dumped water diluted mud. Set plug 1e at 920 m. Pulled up to 650 m and circulated bottoms up. Dumped water diluted mud. Pulled out of hole laying out 5" drill pipe and 3 1/2" drill pipe stinger. Ran back in hole with 5" drill pipe and tagged plug 1e at 785 m. Displaced hole with 330 bbls of inhibited mud. Pulled out of hole laying down 5" drill pipe.
Fluid Treatments	Completing treating inhibited mud to be left in the 13 3/8" casing with BARACOR 129, Baracide and caustic potash. Calcium chloride used in top cement plug (#2).

913712 421

BAROID

Deviation Actual

Well : Beardie-1
Operator: Esso Australia Pty Ltd.

Survey Date	MD m	TVD m	Angle	Direction	Horiz Displacement m
27/07/2002	353.0	352.9	0.50	0.0	
28/07/2002	729.0	728.0	1.00	0.0	
31/07/2002	1,257.4	1,257.3	0.51	245.4	4.7
1/08/2002	1,517.2	1,517.1	0.79	222.5	2.4
2/08/2002	1,639.1	1,639.0	0.83	214.9	0.8
3/08/2002	1,869.0	1,868.0	0.98	215.8	16.1

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Bit Record

Well : Beardie-1

Operator: Esso Australia Pty Ltd.

Run No	Bit No	Bit Size in	Bit Manufacturer	Bit Type	Bit Style	IADC Code	Serial No	Jet or TFA	Depth Out m	Run Length m	ROP m / hr	WOB lb	Bit RPM	Pump Pres psi	Pump Output gpm	Fluid Type	Fluid Density ppg	Dev Angle	Bit Grading	Reason Pulled
1	1	26.000	DBS	S3SJ	MT	111		4x20	124.0	47.0	23.3	5,000.0	75	900.0	937	Seawater	8.60	0.00	1 - 4 - IN	TD - Total/Casing Depth
2	2	17.500	HYC	DS34H	FC	S223	244002	8x14	863.0	740.0	35.2	10,000.0	130	2,900.0	1,134	Seawater	8.40	1.00	1 - 1 - IN	TD - Total/Casing Depth
3	3	12.250	HYC	DSX195	FC		103092	5x14	1,579.0	716.0	23.2	25.0	170	3,315.0	970	KCl/Polymer	9.80	0.67	5-8-LT-N-X-1-R O	PR - Penetration Rate
4	4	12.250	RTC	EHP51H	IN	517	NL503	3x18	1,905.0	326.0	8.1	52.0	98	3,138.0	812	KCl/Polymer	9.80	0.98	3-4-WT-AE-20-NO-TD	LOG - Run Logs

913712 423

Daily Drilling Fluid Report

Baroid, a Halliburton Company

Report No 001

Date 26/07/2002	Depth 164.9 m
Spud Date 27/07/2002	Rig Activity Rig Up On A-29

Operator	Report For	Well Name
Esso Australia Ltd	Bruce Woodward / Bim Steel	A-29
Contractor	**Report For**	**Rig Name**
ISDL	Dave Milne / Justin Dessent	#453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information

Bit Size		in
Make/Type	/	
Jets		
TFA		sq-in
Jets Velocity		ft/sec
Jet Impact Force		lbf
HHSI		hhp/in2
Pres Drop @ Bit		psi
Bit Depth		m
ECD @ Shoe		ppg
ECD @ Bit		ppg

Drill String

ITEM	OD in	ID in	Length m

Casing

OD in		Set MD m
20.000	@	164.9

Circulation/Hydraulics Data

Model	GD PZ-9	GD PZ-9
Bore in	7.000	7.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.104	.104
SPM		
gpm		

Total gpm	AV, Riser	Circ Pressure psi
Total Circ Time	AV, DP	Tot Prs Loss psi
BU Time, min	AV, DC	Pres Drop DP psi
Total Strokes	BU Stroke	Pres Drop An psi

Properties	1 Hyd	2	3	4	Target 1	Target 2	Target 3	Target 4	Program
Source	Suction								
Time	19:00								
Depth m	164.9								
FL Temp Deg C									
Density ppg @ Deg C	8.60 @								8.50 | 9.50
FV @ Deg C	50 @								35 | 50
PV @ Deg C	0 @								
YP lbs/100 ft2	0								
Gels lbs/100 ft2	0/0/0								
600/300	0/0								
200/100	0/0								
6/3	0/0								
API Filt ml/30 min	0.0								
HTHP ml/30 min @Deg C									
Cake 32nd in	0.0/0.0								
Corr Solids % by vol	0.0								
NAP/Water % by vol	0.0/1.0								
Sand % by vol	0.00								
MBT ppb Eq.	0.0								
pH	0.00								
Alk Mud (Pm)	0.00								
Alk Filt (Pf/Mf)	0.00/0.00								
Chlorides mg/l	0								
Hard Ca mg/l	0								
LGS/HGS %	0.0/0.0								
LGS/HGS ppb	0.00/0.00								
ASG	0.000								

Fluid Treatments

Fluid Type: **Spud Mud**

Mixed up 580 bbls of Prehydrated Bentonite (36 ppb).

(Daily Service Charged to A-31).

Rig Activity

Skid Rig from A-31 to A-29 (at 11:15 hrs).
Rig up over A-29 (from 13:45 hrs).

Product Name	Units	Start	Rec	Used	End	Cost
bentonite	1200 Kg bag		15	8	7	$ 3,248.00
BARABLOK	50 lb bag		40		40	
BARACARB 100	1200 Kg bulk		1		1	
BARACARB 25	1200 Kg bulk		3		3	
BARACARB 25	25 KG.BAG		48		48	
Baracide	25 Kg can		1		1	
BARACOR 129	25 Kg can		15		15	
BARA-DEFOAM W300	25 l can		4		4	
BARAFILM	55 Gal drum		1		1	
barite	100 lb bulk		1,010		1,010	
BAROFIBRE	25 lb bag		40		40	
caustic soda	25 Kg pail		36		36	
citric acid	25 Kg bag		20		20	
Coat-2748	208 l drum		1		1	
CON DET	5 gal can		20		20	
DEXTRID LT	25 Kg bag		143		143	
DRILLZAN-D	25 Kg bag		92		92	
EZ MUD-AZ	25 Kg pail		8		8	
Finagreen EBL	55 Gal drum		9		9	
Glycol CP	1500 l bulk		6		6	
KCl - Tech.	25 Kg bag		20		20	
KCl Ag grade	1000 Kg bulk		2		2	
lime	20 Kg bag		28		28	
PAC-L	25 Kg bag		19		19	
phpa	25 Kg bag		72		72	
Potassium Chloride Bulk	80 lb bulk		498	498		

Daily Products Cost	$ 3,248.00	Total Daily Cost	$ 3,248.00
Cummulative Products Cost	$ 3,248.00	Total Cummulative Cost	$ 3,248.00

Solid Control Equipment

Shaker	Screens			Hrs
Derrick	80	80	80	0.0
Derrick	50	50	50	0.0

Time (Hrs)

Drilling	
Circulating	
Trips	
Rig	
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	24.00
Total	24.00
Rotating	
ROP	
Dil Rate	

Fluid Volume Breakdown Spud Mud

Active	bbl	Additions	bbl	Losses	bbl
Annulus		Oil		Dumped	
Pipe Cap		Drill Water		Transferred	
Active Pits		Dewatering		SC Equip	
Total Hole		Sea Water		Evaporation	
Total Circ	580.0	Whole Mud		Trips	
Reserve		Barite		Other	
Prev Vol		Chemicals		Total Surface	
Net Chg		Other Adds.		Downhole	
Total Vol	498.0	Total Added		Total Losses	

Other Fluid Types	Vol bbl
Potassium Chloride brine	498.0

Deviation Information

Survey MD	156 m
Survey TVD	156 m
Angle	6.35
Direction	308
Horiz Displ.	2 m

Baroid Representatives: Emad Elzahaby Tun Aung

Office 90 Talinga Rd Melbourne Tel 61-03-9581-7555

Warehouse c/o of Esso Australia Ltd via Toora Victoria Tel 61-3-56-881-445

913712 424

Daily Drilling Fluid Report

Baroid, a Halliburton Company

Report No 002

Date	27/07/2002	Depth	235.0 m
Spud Date	27/07/2002	Rig Activity	Drill 12 1/4" Hole

Operator	Report For	Well Name
Esso Australia Ltd	Bruce Woodward / Bim Steel	A-29
Contractor	**Report For**	**Rig Name**
ISDL	Dave Milne / Justin Dessent	#453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information

Bit Size	12.250 in
Make/Type	HYC / DS195
Jets	5x18
TFA	1.114 sq-in
Jets Velocity	168 ft/sec
Jet Impact Force	513.7 lbf
HHSI	0.74 hhp/in2
Pres Drop @ Bit	228.1 psi
Bit Depth	235.0 m
ECD @ Shoe	9.00 ppg
ECD @ Bit	9.00 ppg

Drill String

ITEM	OD in	ID in	Length m
Drill Pipe	5.000	4.276	99.1
Drill Pipe	5.000	3.000	91.6
Drill Collar	8.000	3.000	36.0
Drill Motor	8.250	0.000	8.3
Open Hole	12.250		70.1

Casing

OD in	Casing Set	MD m
20.000	@	164.9

Circulation/Hydraulics Data

Model	GD PZ-9	GD PZ-9
Bore in	7.000	7.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.104	.104
SPM	75	75
gpm	327	327

Total gpm	654	AV, Riser		Circ Pressure psi	850.0
Total Circ Time	32.7	AV, DP	49.1	Tot Prs Loss psi	378.1
BU Time, min	12.4	AV, DC	186.4	Pres Drop DP psi	
Total Strokes	4,903	BU Stroke	1,867	Pres Drop An psi	

Properties	1 Hyd	2	3	4	Targets 1	2	3	4	Program
Source	Flow Line								
Time	22:45								
Depth m	158.0								
FL Temp Deg C	20								
Density ppg @ Deg C	9.00 @								8.50 | 9.50
FV @ Deg C	36 @								35 | 50
PV @ Deg C	0 @								
YP lbs/100 ft2	0								
Gels lbs/100 ft2	0/0/0								
600/300	0/0								
200/100	0/0								
6/3	0/0								
API Filt ml/30 min	0.0								
HTHP ml/30 min @Deg C									
Cake 32nd in	0.0/0.0								
Corr Solids % by vol	0.0								
NAP/Water % by vol	1.0/0.0								
Sand % by vol	0.00								
MBT ppb Eq.	0.0								
pH	0.00								
Alk Mud (Pm)	0.00								
Alk Filt (Pf/Mf)	0.00/0.00								
Chlorides mg/l	0								
Hard Ca mg/l	0								
LGS/HGS %	0.0/0.0								
LGS/HGS ppb	0.00/0.00								
ASG	0.000								

Fluid Treatments

Fluid Type: Spud Mud

Daily Volume Made : 309 bbl.
Total for 12 1/4" : 889 bbl.

Dilute mud back with Seawater (to 15 ppb). Added Caustic Soda and Lime for flocculation (0.3 ppb each).

Rig Activity

Continued rigging up. Run in with 12 1/4" drilling assembly to 156+ m. Displace hole to Spud Mud. Drill out shoe track. Kick off and drill to 235 m.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
caustic soda	25 Kg pail	36		3	33	$ 96.00
lime	20 Kg bag	28		3	25	$ 17.88
BARABLOK	50 lb bag	40			40	
BARACARB 100	1200 Kg bulk	1			1	
BARACARB 25	1200 Kg bulk	3			3	
BARACARB 25	25 KG.BAG	48			48	
Baracide	25 Kg can	1			1	
BARACOR 129	25 Kg can	15			15	
BARA-DEFOAM W300	25 l can	4			4	
BARAFILM	55 Gal drum	1			1	
barite	100 lb bulk	1,010			1,010	
BAROFIBRE	25 lb bag	40			40	
bentonite	1200 Kg bag	7			7	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	1			1	
CON DET	5 gal can	20			20	
DEXTRID LT	25 Kg bag	143			143	
DRILLZAN-D	25 Kg bag	92			92	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	9			9	
Glycol CP	1500 l bulk	6			6	
KCl - Tech.	25 Kg bag	20			20	
KCl Ag grade	1000 Kg bulk	2			2	
PAC-L	25 Kg bag	19			19	
phpa	25 Kg bag	72			72	

Solid Control Equipment

Shaker	Screens			Hrs
Derrick	80	80	80	3.0
Derrick	50	50	50	3.0

Time (Hrs)

Drilling	1.50
Circulating	0.25
Trips	7.25
Rig	
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	15.00
Total	24.00
Rotating	1.50
ROP	153.32
Dil Rate	

Fluid Volume Breakdown Spud Mud

Active	bbl	Additions	bbl	Losses	bbl
Annulus	194.0	Oil		Dumped	
Pipe Cap	9.4	Drill Water		Transferred	
Active Pits	306.0	Dewatering		SC Equip	
Total Hole	203.3	Sea Water	308.9	Evaporation	
Total Circ	509.3	Whole Mud		Trips	
Reserve	380.0	Barite		Other	
Prev Vol	580.0	Chemicals	0.4	Total Surface	
Net Chg	309.3	Other Adds.		Downhole	
Total Vol	889.3	Total Added	309.3	Total Losses	

Daily Products Cost	$ 113.88	Total Daily Cost	$ 1,053.88
Cummulative Products Cost	$ 3,361.88	Total Cummulative Cost	$ 4,301.88

Other Fluid Types	Vol bbl
Potassium Chloride brine	498.0

Deviation Information

Survey MD	199 m
Survey TVD	199 m
Angle	7.95
Direction	302
Horiz Displ.	6 m

Baroid Representatives: Emad Elzahaby Tun Aung

Office 90 Talinga Rd Melbourne Tel 61-03-9581-7555

Warehouse c/o of Esso Australia Ltd via Toora Victoria Tel 61-3-56-881-445

913712 425

Daily Drilling Fluid Report

Baroid, a Halliburton Company

Report No 003

Date 28/07/2002	Depth 635.0 m
Spud Date 27/07/2002	Rig Activity Drill 12 1/4" Hole

Operator	Report For	Well Name
Esso Australia Ltd	Bruce Woodward / Bim Steel	A-29
Contractor	**Report For**	**Rig Name**
ISDL	Dave Milne / Justin Dessent	#453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information	
Bit Size	12.250 in
Make/Type	HYC / DS195
Jets	5x18
TFA	1.114 sq-in
Jets Velocity	218 ft/sec
Jet Impact Force	805.6 lbf
HHSI	1.50 hhp/in2
Pres Drop @ Bit	399.2 psi
Bit Depth	635.0 m
ECD @ Shoe	9.40 ppg
ECD @ Bit	9.40 ppg

Drill String ITEM	OD in	ID in	Length m
Drill Pipe	5.000	4.276	499.1
Drill Pipe	5.000	3.000	91.6
Drill Collar	8.000	3.000	36.0
Drill Motor	8.250	0.000	8.3
Open Hole	12.250		470.1

OD in	Casing Set	MD m
20.000	@	164.9

Circulation/Hydraulics Data

Model	GD PZ-9	GD PZ-9
Bore in	7.000	7.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.104	.104
SPM	87	87
gpm	380	380

Total gpm	759	AV, Riser		Circ Pressure psi	1,400.0
Total Circ Time	36.6	AV, DP	57.0	Tot Prs Loss psi	549.2
BU Time, min	19.5	AV, DC	216.2	Pres Drop DP psi	
Total Strokes	6,369	BU Stroke	3,402	Pres Drop An psi	

Properties	1	2 Hyd	3	4	Targets 1	2	3	4	Program
Source	Flow Line	Flow Line							
Time	11:00	23:30							
Depth m	480.0	627.0							
FL Temp Deg C	33	35							
Density ppg @ Deg C	9.45 @ 28	9.40 @							8.50 | 9.50
FV @ Deg C	45 @ 28	41 @							35 | 50
PV @ Deg C	0 @	0 @							
YP lbs/100 ft2	0	0							
Gels lbs/100 ft2	0/0/0	0/0/0							
600/300	0/0	0/0							
200/100	0/0	0/0							
6/3	0/0	0/0							
API Filt ml/30 min	0.0	0.0							
HTHP ml/30 min @Deg C									
Cake 32nd in	0.0/0.0	0.0/0.0							
Corr Solids % by vol	0.0	0.0							
NAP/Water % by vol	0.0/1.0	1.0/0.0							
Sand % by vol	0.00	0.00							
MBT ppb Eq.	0.0	0.0							
pH	0.00	0.00							
Alk Mud (Pm)	0.00	0.00							
Alk Filt (Pf/Mf)	0.00/0.00	0.00/0.00							
Chlorides mg/l	0	0							
Hard Ca mg/l	0	0							
LGS/HGS %	0.0/0.0	0.0/0.0							
LGS/HGS ppb	0.00/0.00	0.00/0.00							
ASG	0.000	0.000							

Fluid Treatments

Fluid Type: Spud Mud

Daily Volume Made : 504 bbl.
Total for 12 1/4" : 1393 bbl.

Adding Seawater to maintain weight, and Prehydrated Gel for viscosity in conjunction with Caustic Soda/Lime. Pumped 35 bbl of prehydrated bentonite to sweep the hole. Mixed 120 bbl of prehydrated bentonite.

Rig Activity

Drill/Steer and Survey from 235 m to 635 m (Gippsland Fm).

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
bentonite	1200 Kg bag	7		1	6	$ 406.00
caustic soda	25 Kg pail	33		6	27	$ 192.00
lime	20 Kg bag	25		4	21	$ 23.84
BARABLOK	50 lb bag	40			40	
BARACARB 100	1200 Kg bulk	1			1	
BARACARB 25	1200 Kg bulk	3			3	
BARACARB 25	25 KG.BAG	48			48	
Baracide	25 Kg can	1			1	
BARACOR 129	25 Kg can	15			15	
BARA-DEFOAM W300	25 l can	4			4	
BARAFILM	55 Gal drum	1			1	
barite	100 lb bulk	1,010			1,010	
BAROFIBRE	25 lb bag	40			40	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	1			1	
CON DET	5 gal can	20			20	
DEXTRID LT	25 Kg bag	143			143	
DRILLZAN-D	25 Kg bag	92			92	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	9			9	
Glycol CP	1500 l bulk	6			6	
KCl - Tech.	25 Kg bag	20			20	
KCl Ag grade	1000 Kg bulk	2			2	
PAC-L	25 Kg bag	19			19	
phpa	25 Kg bag	72			72	

Daily Products Cost	$ 621.84	Total Daily Cost	$ 1,561.84
Cummulative Products Cost	$ 3,983.72	Total Cummulative Cost	$ 5,863.72

Solid Control Equipment

Shaker	Screens			Hrs
Derrick	80	80	80	24.0
Derrick	50	50	50	24.0

Time (Hrs)

Drilling	21.00
Circulating	2.00
Trips	
Rig	
Surveys	1.00
Fishing	
Run Casing	
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	
Total	24.00
Rotating	21.00
ROP	62.49
Dil Rate	

Fluid Volume Breakdown Spud Mud

Active	bbl	Additions	bbl	Losses	bbl
Annulus	353.4	Oil		Dumped	-291.6
Pipe Cap	32.3	Drill Water	120.4	Transferred	
Active Pits	276.0	Dewatering		SC Equip	-50.0
Total Hole	385.7	Sea Water	380.0	Evaporation	
Total Circ	661.7	Whole Mud		Trips	
Reserve	390.0	Barite		Other	
Prev Vol	889.3	Chemicals	3.6	Total Surface	-341.6
Net Chg	162.4	Other Adds.		Downhole	
Total Vol	1,051.7	Total Added	504.0	Total Losses	-341.6

Other Fluid Types	Vol bbl
Potassium Chloride brine	498.0

Deviation Information

Survey MD	634 m
Survey TVD	521 m
Angle	69.39
Direction	278
Horiz Displ.	263 m

Baroid Representatives: Emad Elzahaby Tun Aung
Office 90 Talinga Rd Melbourne Tel 61-03-9581-7555
Warehouse c/o of Esso Australia Ltd via Toora Victoria Tel 61-3-56-881-445

913712 426

Daily Drilling Fluid Report

Baroid, a Halliburton Company

Report No 004

Date 29/07/2002	Depth 934.0 m
Spud Date 27/07/2002	Rig Activity Casing Point. Wiper Trip. Circ.

Operator	Report For	Well Name
Esso Australia Ltd	Bruce Woodward / Bim Steel	A-29
Contractor	**Report For**	**Rig Name**
ISDL	Dave Milne / Justin Dessent	#453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information	
Bit Size	12.250 in
Make/Type	HYC / DS195
Jets	5x18
TFA	1.114 sq-in
Jets Velocity	204 ft/sec
Jet Impact Force	810.9 lbf
HHSI	1.42 hhp/in2
Pres Drop @ Bit	360.1 psi
Bit Depth	934.0 m
ECD @ Shoe	9.65 ppg
ECD @ Bit	9.65 ppg

Drill String ITEM	OD in	ID in	Length m
Drill Pipe	5.000	4.276	798.1
Drill Pipe	5.000	3.000	91.6
Drill Collar	8.000	3.000	36.0
Drill Motor	8.250	0.000	8.3
Open Hole	12.250		769.1

Casing OD in	Set	MD m
20.000	@	164.9

Circulation/Hydraulics Data

Model	GD PZ-9	GD PZ-9
Bore in	7.000	7.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.104	.104
SPM	91	91
gpm	397	397

Total gpm	794	AV, Riser		Circ Pressure psi	1,800.0
Total Circ Time	44.2	AV, DP	59.6	Tot Prs Loss psi	960.1
BU Time, min	25.0	AV, DC	226.2	Pres Drop DP psi	
Total Strokes	8,038	BU Stroke	4,549	Pres Drop An psi	

Properties	1	2 Hyd	3	4	Targets 1	2	3	4	Program
Source	Flow Line	Flow Line							
Time	08:30	14:00							
Depth m	824.0	934.0							
FL Temp Deg C	36	36							
Density ppg @ Deg C	9.70 @ 36	9.65 @ 36			*	*			8.50 | 9.50
FV @ Deg C	46 @ 36	43 @ 36							35 | 50
PV @ Deg C	0 @	0 @							
YP lbs/100 ft2	0	0							
Gels lbs/100 ft2	0/0/0	0/0/0							
600/300	0/0	0/0							
200/100	0/0	0/0							
6/3	0/0	0/0							
API Filt ml/30 min	0.0	0.0							
HTHP ml/30 min @Deg C									
Cake 32nd in	0.0/0.0	0.0/0.0							
Corr Solids % by vol	0.0	0.0							
NAP/Water % by vol	0.0/1.0	0.0/1.0							
Sand % by vol	0.00	0.00							
MBT ppb Eq.	0.0	0.0							
pH	0.00	0.00							
Alk Mud (Pm)	0.00	0.00							
Alk Filt (Pf/Mf)	0.00/0.00	0.00/0.00							
Chlorides mg/l	0	0							
Hard Ca mg/l	0	0							
LGS/HGS %	0.0/0.0	0.0/0.0							
LGS/HGS ppb	0.00/0.00	0.00/0.00							
ASG	0.000	0.000							

Fluid Treatments

Fluid Type: **Spud Mud**

Daily Volume Made : 614 bbl.
Total for 12 1/4" Hole : 2007 bbl.

Run dilution with Sea Water and Prehydrated Bentonite to control mud weight and solids build up.
Mixed 240 bbls of Prehydrated Bentonite.

Changed Shaker #2 screens to #125 mesh.
Cleaning Reserve and Premix tanks for cement mixwater.

Rig Activity

Drill, steer and survey 12 1/4" hole from 635 m to 934 m.
Circulate hole clean and rack back to 825 m.
Wiper trip to shoe.
Circulate clean at shoe. Ran back to bottom of 934 m.
Pump 30 bbl of Hi-Vis sweep, circulate clean.

(Will spot 225 bbl of Prehydrated Bentonite on bottom before pulling out).

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
barite	100 lb bulk	1,010		106	904	$ 940.22
bentonite	1200 Kg bag	6		2	4	$ 812.00
caustic soda	25 Kg pail	27		5	22	$ 160.00
lime	20 Kg bag	21		5	16	$ 29.80
BARABLOK	50 lb bag	40			40	
BARACARB 100	1200 Kg bulk	1			1	
BARACARB 25	1200 Kg bulk	3			3	
BARACARB 25	25 KG.BAG	48			48	
Baracide	25 Kg can	1			1	
BARACOR 129	25 Kg can	15			15	
BARA-DEFOAM W300	25 l can	4			4	
BARAFILM	55 Gal drum	1			1	
BAROFIBRE	25 lb bag	40			40	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	1			1	
CON DET	5 gal can	20			20	
DEXTRID LT	25 Kg bag	143			143	
DRILLZAN-D	25 Kg bag	92			92	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	9			9	
Glycol CP	1500 l bulk	6			6	
KCl - Tech.	25 Kg bag	20			20	
KCl Ag grade	1000 Kg bulk	2			2	
PAC-L	25 Kg bag	19			19	
phpa	25 Kg bag	72			72	

Daily Products Cost	$ 1,942.02	Total Daily Cost	$ 2,882.02
Cummulative Products Cost	$ 5,925.74	Total Cummulative Cost	$ 8,745.74

Solid Control Equipment

Shaker	Screens	Hrs
Derrick	80 80 80	24.0
Derrick	125 125 125	24.0

Time (Hrs)

Drilling	14.00
Circulating	1.50
Trips	7.75
Rig	0.75
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	
Total	24.00
Rotating	14.00
ROP	70.07
Dil Rate	

Fluid Volume Breakdown Spud Mud

Active	bbl	Additions	bbl	Losses	bbl
Annulus	472.6	Oil		Dumped	-774.0
Pipe Cap	49.5	Drill Water	240.0	Transferred	
Active Pits	313.0	Dewatering		SC Equip	-25.6
Total Hole	522.0	Sea Water	360.0	Evaporation	
Total Circ	835.0	Whole Mud		Trips	
Reserve	31.0	Barite	7.2	Other	
Prev Vol	1,051.7	Chemicals	6.7	Total Surface	-799.6
Net Chg	-185.7	Other Adds.		Downhole	
Total Vol	866.0	Total Added	613.9	Total Losses	-799.6

Other Fluid Types	Vol bbl
Potassium Chloride brine	498.0

Deviation Information

Survey MD	912 m
Survey TVD	618 m
Angle	68.72
Direction	277
Horiz Displ.	523 m

Baroid Representatives: Emad Elzahaby Tun Aung Clive Da Silva
Office 90 Talinga Rd Melbourne Tel 61-03-9581-7555
Warehouse c/o of Esso Australia Ltd via Toora Victoria Tel 61-3-56-881-445

913712 427

Daily Drilling Fluid Report

Baroid, a Halliburton Company

Report No 005

Date 30/07/2002	Depth 934.0 m
Spud Date 27/07/2002	Rig Activity Run in Casing. Circulate.

Operator	Report For	Well Name
Esso Australia Ltd	Bruce Woodward / Bim Steel	A-29
Contractor	**Report For**	**Rig Name**
ISDL	Dave Milne / Justin Dessent	#453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information

Bit Size	9.625 in
Make/Type	DUMMY / Open-Ended
Jets	0.001
TFA	0.001 sq-in
Jets Velocity	ft/sec
Jet Impact Force	lbf
HHSI	hhp/in2
Pres Drop @ Bit	psi
Bit Depth	928.0 m
ECD @ Shoe	9.70 ppg
ECD @ Bit	9.70 ppg

Drill String

ITEM	OD in	ID in	Length m
Drill Collar	9.625	8.681	928.0
Open Hole	12.250		769.1

Casing

OD in	Casing Set	MD m
20.000	@	164.9

Circulation/Hydraulics Data

Model	GD PZ-9	GD PZ-9
Bore in	7.000	7.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.104	.104
SPM		
gpm		

Total gpm	AV, Riser	Circ Pressure psi
Total Circ Time	AV, DP	Tot Prs Loss psi
BU Time, min	AV, DC	Pres Drop DP psi
Total Strokes	BU Stroke	Pres Drop An psi

Properties	1 Hyd	2	3	4	Targets 1	2	3	4	Program
Source	Chemical								
Time	11:00								
Depth m	934.0								
FL Temp Deg C									
Density ppg @ Deg C	9.70 @ 25				*				8.50 | 9.50
FV @ Deg C	46 @ 25								35 | 50
PV @ Deg C	0 @								
YP lbs/100 ft2	0								
Gels lbs/100 ft2	0/0/0								
600/300	0/0								
200/100	0/0								
6/3	0/0								
API Filt ml/30 min	0.0								
HTHP ml/30 min @Deg C									
Cake 32nd in	0.0/0.0								
Corr Solids % by vol	0.0								
NAP/Water % by vol	0.0/1.0								
Sand % by vol	0.00								
MBT ppb Eq.	0.0								
pH	0.00								
Alk Mud (Pm)	0.00								
Alk Filt (Pf/Mf)	0.00/0.00								
Chlorides mg/l	0								
Hard Ca mg/l	0								
LGS/HGS %	0.0/0.0								
LGS/HGS ppb	0.00/0.00								
ASG	0.000								

Fluid Treatments

Fluid Type: **Spud Mud**

Total Volume for 12 1/4" Hole : 2007 bbl.

No treatment today. Clean pits for cement job.

Rig Activity

Circulate clean. Spot 225 bbl of Prehydrated Bentonite prior to POOH. Pump slug and POOH to the shoe at 165m, circulate hole clean. Pull out and lay down BHA, pull master bushing and install 350 ton elevator.
Rig up and run in 9 5/8" casing to 928 m. Rig up cementing head. Circulate clean. Prepare to cement.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
BARABLOK	50 lb bag	40			40	
BARACARB 100	1200 Kg bulk	1			1	
BARACARB 25	1200 Kg bulk	3			3	
BARACARB 25	25 KG.BAG	48			48	
Baracide	25 Kg can	1			1	
BARACOR 129	25 Kg can	15			15	
BARA-DEFOAM W300	25 l can	4			4	
BARAFILM	55 Gal drum	1			1	
barite	100 lb bulk	904			904	
BAROFIBRE	25 lb bag	40			40	
bentonite	1200 Kg bag	4			4	
caustic soda	25 Kg pail	22			22	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	1			1	
CON DET	5 gal can	20			20	
DEXTRID LT	25 Kg bag	143			143	
DRILLZAN-D	25 Kg bag	92			92	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	9			9	
Glycol CP	1500 l bulk	6			6	
KCl - Tech.	25 Kg bag	20			20	
KCl Ag grade	1000 Kg bulk	2			2	
lime	20 Kg bag	16			16	
PAC-L	25 Kg bag	19			19	
phpa	25 Kg bag	72			72	

Solid Control Equipment

Shaker	Screens	Hrs
Derrick	80 80 80	17.0
Derrick	125 125 125	17.0

Time (Hrs)

Drilling	
Circulating	2.50
Trips	6.50
Rig	
Surveys	
Fishing	
Run Casing	12.00
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	3.00
Total	24.00
Rotating	
ROP	
Dil Rate	

Fluid Volume Breakdown Spud Mud

Active	bbl	Additions	bbl	Losses	bbl
Annulus	278.6	Oil		Dumped	-60.5
Pipe Cap	222.9	Drill Water		Transferred	
Active Pits	269.0	Dewatering		SC Equip	-10.0
Total Hole	501.5	Sea Water		Evaporation	
Total Circ	767.6	Whole Mud		Trips	
Reserve	25.0	Barite		Other	
Prev Vol	866.0	Chemicals		Total Surface	-70.5
Net Chg	-70.5	Other Adds.		Downhole	
Total Vol	795.5	Total Added		Total Losses	-70.5

Daily Products Cost	$ 0.00	Total Daily Cost	$ 940.00
Cummulative Products Cost	$ 5,925.74	Total Cummulative Cost	$ 9,685.74

Other Fluid Types	Vol bbl
Potassium Chloride brine	498.0

Deviation Information

Survey MD	912 m
Survey TVD	618 m
Angle	68.72
Direction	277
Horiz Displ.	523 m

Baroid Representatives: Tun Aung Clive Da Silva

Office 90 Talinga Rd Melbourne Tel 61-03-9581-7555

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913712 428

Report No 006

Daily Drilling Fluid Report

Baroid, a Halliburton Company

Date 31/07/2002	Depth 934.0 m
Spud Date 27/07/2002	Rig Activity Cement Casing. WOC. Nipple Up BO

Operator	Report For	Well Name
Esso Australia Ltd	Brian Davis / Bim Steel	A-29
Contractor	**Report For**	**Rig Name**
ISDL	Dave Milne / Justin Dessent	#453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information	
Bit Size	in
Make/Type /	
Jets	
TFA	sq-in
Jets Velocity	ft/sec
Jet Impact Force	lbf
HHSI	hhp/in2
Pres Drop @ Bit	psi
Bit Depth	m
ECD @ Shoe	ppg
ECD @ Bit	ppg

Drill String ITEM	OD in	ID in	Length m

Casing OD in	Set	MD m
20.000	@	164.9
9.625	@	928.0

Circulation/Hydraulics Data

Model	GD PZ-9	GD PZ-9
Bore in	6.000	6.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.076	.076
SPM		
gpm		

Total gpm	AV, Riser	Circ Pressure psi
Total Circ Time	AV, DP	Tot Prs Loss psi
BU Time, min	AV, DC	Pres Drop DP psi
Total Strokes	BU Stroke	Pres Drop An psi

Properties	1 Hyd	2	3	4	Targets 1	2	3	4	Program
Source	Pill								
Time	20:00								
Depth m	934.0								
FL Temp Deg C									
Density ppg @ Deg C	8.50 @								8.50 | 9.50
FV @ Deg C	27 @				*				35 | 50
PV @ Deg C	0 @								
YP lbs/100 ft2	0								
Gels lbs/100 ft2	0/0/0								
600/300	0/0								
200/100	0/0								
6/3	0/0								
API Filt ml/30 min	0.0								
HTHP ml/30 min @Deg C									
Cake 32nd in	0.0/0.0								
Corr Solids % by vol	0.0								
NAP/Water % by vol	1.0/0.0								
Sand % by vol	0.00								
MBT ppb Eq.	0.0								
pH	0.00								
Alk Mud (Pm)	0.00								
Alk Filt (Pf/Mf)	0.00/0.00								
Chlorides mg/l	0								
Hard Ca mg/l	0								
LGS/HGS %	0.0/0.0								
LGS/HGS ppb	0.00/0.00								
ASG	0.000								

Fluid Treatments

Fluid Type: Seawater

Dump and clean tanks. Mix up new KCl/Polymer Mud.

Change out shaker screens to #24 mesh. Change out pump liners to 6 x 9 inch.

Rig Activity

Continued circulating clean. Carry out cementing operation.
Displaced cement with 20 bbl drillwater and 199 bbl seawater.
WOC. Dump and clean tanks.
Rig down diverter/ riser. Nipple up BOP.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
BARABLOK	50 lb bag	40			40	
BARACARB 100	1200 Kg bulk	1			1	
BARACARB 25	1200 Kg bulk	3			3	
BARACARB 25	25 KG.BAG	48			48	
Baracide	25 Kg can	1	12		13	
BARACOR 129	25 Kg can	15	30		45	
BARA-DEFOAM W300	25 l can	4			4	
BARAFILM	55 Gal drum	1	1		2	
barite	100 lb bulk	904			904	
BAROFIBRE	25 lb bag	40			40	
bentonite	1200 Kg bag	4			4	
caustic soda	25 Kg pail	22			22	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	1			1	
CON DET	5 gal can	20			20	
DEXTRID LT	25 Kg bag	143			143	
DRILLZAN-D	25 Kg bag	92			92	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	9			9	
Glycol CP	1500 l bulk	6			6	
KCl - Tech.	25 Kg bag	20			20	
KCl Ag grade	1000 Kg bulk	2			2	
lime	20 Kg bag	16			16	
PAC-L	25 Kg bag	19	32		51	
phpa	25 Kg bag	72			72	

Daily Products Cost	$ 0.00	Total Daily Cost	$ 940.00
Cummulative Products Cost	$ 5,925.74	Total Cummulative Cost	$ 10,625.74

Solid Control Equipment

Shaker	Screens	Hrs
Derrick	80 80 80	4.0
Derrick	125 125 125	4.0

Time (Hrs)

Drilling	
Circulating	1.25
Trips	
Rig	
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	22.75
Total	24.00
Rotating	
ROP	
Dil Rate	

Fluid Volume Breakdown Seawater

Active	bbl	Additions	bbl	Losses	bbl
Annulus	224.3	Oil		Dumped	
Pipe Cap		Drill Water		Transferred	
Active Pits		Dewatering		SC Equip	
Total Hole	224.3	Sea Water		Evaporation	
Total Circ		Whole Mud		Trips	
Reserve		Barite		Other	
Prev Vol	795.5	Chemicals		Total Surface	
Net Chg	224.3	Other Adds.	224.3	Downhole	
Total Vol		Total Added	224.3	Total Losses	

Other Fluid Types	Vol bbl
Potassium Chloride brine	498.0

Deviation Information

Survey MD	912 m
Survey TVD	618 m
Angle	68.72
Direction	277
Horiz Displ.	523 m

Baroid Representatives: Tun Aung Clive Da Silva

Office 90 Talinga Rd Melbourne Tel 61-03-9581-7555

Warehouse c/o of Esso Australia Ltd via Toora Victoria Tel 61-3-56-881-445

913712 429

Daily Drilling Fluid Report

Baroid, a Halliburton Company

Report No 007

Date	1/08/2002	Depth	934.0 m
Spud Date	27/07/2002	Rig Activity	Testing B.O.P.

Operator	Report For	Well Name
Esso Australia Ltd	Brian Davis / Bim Steel	A-29
Contractor	**Report For**	**Rig Name**
ISDL	John Obrien / Peter Bennett	#453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information		
Bit Size		in
Make/Type	/	
Jets		
TFA		sq-in
Jets Velocity		ft/sec
Jet Impact Force		lbf
HHSI		hhp/in2
Pres Drop @ Bit		psi
Bit Depth	934.0	m
ECD @ Shoe		ppg
ECD @ Bit		ppg

Drill String ITEM	OD in	ID in	Length m

Casing OD in	Set	MD m
20.000	@	164.9
9.625	@	928.0

Circulation/Hydraulics Data		
Model	GD PZ-9	GD PZ-9
Bore in	6.000	6.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.076	.076
SPM		
gpm		

Total gpm		AV, Riser		Circ Pressure	psi
Total Circ Time		AV, DP		Tot Prs Loss	psi
BU Time, min		AV, DC		Pres Drop DP	psi
Total Strokes		BU Stroke		Pres Drop An	psi

Properties	1 Hyd	2	3	4	Targets 1	2	3	4	Program
Source	Pill								
Time	10:30								
Depth m	934.0								
FL Temp Deg C									
Density ppg @ Deg C	8.50 @ 20								8.50 | 9.50
FV @ Deg C	27 @								35 | 50
PV @ Deg C	0 @								
YP lbs/100 ft2	0								
Gels lbs/100 ft2	0/0/0								
600/300	0/0								
200/100	0/0								
6/3	0/0								
API Filt ml/30 min	0.0								
HTHP ml/30 min @Deg C									
Cake 32nd in	0.0/0.0								
Corr Solids % by vol	0.0								
NAP/Water % by vol	0.0/1.0								
Sand % by vol	0.00								
MBT ppb Eq.	0.0								
pH	0.00								
Alk Mud (Pm)	0.00								
Alk Filt (Pf/Mf)	0.00/0.00								
Chlorides mg/l	0								
Hard Ca mg/l	0								
LGS/HGS %	0.0/0.0								
LGS/HGS ppb	0.00/0.00								
ASG	0.000								

Fluid Treatments

Fluid Type: Seawater

KCl/Polymer Mud Made : 654 bbl.

Using old stock of Baracide.
Made up 35 bbl of Hi-Vis sweep.

Rig Activity

Nipple up BOP and riser. Conduct BOP pressure test.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
Potassium Chloride brine	42 gal bbl		318	318		$ 4,944.90
DRILLZAN-D	25 Kg bag	92		19	73	$ 5,346.22
DEXTRID LT	25 Kg bag	143		46	97	$ 1,812.86
PAC-L	25 Kg bag	51		12	39	$ 1,330.08
caustic soda	25 Kg pail	22		5	17	$ 160.00
soda ash	25 Kg bag	14		6	8	$ 64.02
BARA-DEFOAM W300	25 l can	4		1	3	$ 57.93
BARABLOK	50 lb bag	40			40	
BARACARB 100	1200 Kg bulk	1			1	
BARACARB 25	1200 Kg bulk	3			3	
BARACARB 25	25 KG.BAG	48			48	
Baracide	25 Kg can	13			13	
BARACOR 129	25 Kg can	45			45	
BARAFILM	55 Gal drum	2			2	
barite	100 lb bulk	904			904	
BAROFIBRE	25 lb bag	40			40	
bentonite	1200 Kg bag	4			4	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	1			1	
CON DET	5 gal can	20			20	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	9			9	
Glycol CP	1500 l bulk	6			6	
KCl - Tech.	25 Kg bag	20			20	
KCl Ag grade	1000 Kg bulk	2			2	

Daily Products Cost	$ 13,716.01	Total Daily Cost	$ 14,656.01
Cummulative Products Cost	$ 19,641.75	Total Cummulative Cost	$ 25,281.75

Solid Control Equipment Shaker	Screens			Hrs
Derrick	24	24	24	0.0
Derrick	24	24	24	0.0

Time (Hrs)	
Drilling	
Circulating	
Trips	
Rig	
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	24.00
Total	24.00
Rotating	
ROP	
Dil Rate	

Fluid Volume Breakdown Seawater

Active	bbl	Additions	bbl	Losses	bbl
Annulus	224.3	Oil		Dumped	
Pipe Cap		Drill Water		Transferred	
Active Pits		Dewatering		SC Equip	
Total Hole	224.3	Sea Water		Evaporation	
Total Circ		Whole Mud		Trips	
Reserve		Barite		Other	
Prev Vol		Chemicals		Total Surface	
Net Chg		Other Adds.		Downhole	
Total Vol	654.0	Total Added		Total Losses	

Other Fluid Types	Vol bbl
Hi-Vis Pill / Sweep	35.0
KCl/PHPA/GLYCOL	654.0
Potassium Chloride brine	180.0

Deviation Information	
Survey MD	912 m
Survey TVD	618 m
Angle	68.72
Direction	277
Horiz Displ.	523 m

Baroid Representatives: Tun Aung Clive Da Silva

Office 90 Talinga Rd Melbourne Tel 61-03-9581-7555

Warehouse c/o of Esso Australia Ltd via Toora Victoria Tel 61-3-56-881-445

913712 430

Daily Drilling Fluid Report

Baroid, a Halliburton Company

Report No 008

Date	2/08/2002	Depth	934.0 m
Spud Date	27/07/2002	Rig Activity	Run In Hole

Operator	Report For	Well Name
Esso Australia Ltd	Brian Davis / Bim Steel	A-29
Contractor	**Report For**	**Rig Name**
ISDL	John Obrien / Peter Bennett	#453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information

Bit Size	8.500 in
Make/Type	HTC / MX-20D
Jets	3x22
TFA	1.114 sq-in
Jets Velocity	ft/sec
Jet Impact Force	lbf
HHSI	hhp/in2
Pres Drop @ Bit	psi
Bit Depth	100.0 m
ECD @ Shoe	8.50 ppg
ECD @ Bit	8.50 ppg

Drill String

ITEM	OD in	ID in	Length m
Drill Pipe	5.000	3.000	62.0
Drill Collar	6.500	2.812	30.3
Drill Motor	6.750	0.000	7.7

Casing

OD in	Casing Set	MD m
20.000	@	164.9
9.625	@	928.0

Circulation/Hydraulics Data

Model	GD PZ-9	GD PZ-9
Bore in	6.000	6.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.076	.076
SPM		
gpm		

Total gpm	AV, Riser	Circ Pressure psi
Total Circ Time	AV, DP	Tot Prs Loss psi
BU Time, min	AV, DC	Pres Drop DP psi
Total Strokes	BU Stroke	Pres Drop An psi

Properties

Properties	1 Hyd	2	3	4	Targets 1	2	3	4	Program	
Source	Pill									
Time	19:00									
Depth m	934.0									
FL Temp Deg C										
Density ppg @ Deg C	8.50 @								8.50	9.50
FV @ Deg C	27 @				*				35	50
PV @ Deg C	0 @									
YP lbs/100 ft2	0									
Gels lbs/100 ft2	0/0/0									
600/300	0/0									
200/100	0/0									
6/3	0/0									
API Filt ml/30 min	0.0									
HTHP ml/30 min @Deg C										
Cake 32nd in	0.0/0.0									
Corr Solids % by vol	0.0									
NAP/Water % by vol	0.0/1.0									
Sand % by vol	0.00									
MBT ppb Eq.	0.0									
pH	0.00									
Alk Mud (Pm)	0.00									
Alk Filt (Pf/Mf)	0.00/0.00									
Chlorides mg/l	0									
Hard Ca mg/l	0									
LGS/HGS %	0.0/0.0									
LGS/HGS ppb	0.00/0.00									
ASG	0.000									

Fluid Treatments

Fluid Type: Seawater

KCl/Polymer Mud Made : Nil.
Total for 8 1/2" Hole : 654 bbl.

Rig Activity

Pick up 175 joints of 5" drill pipe. Make up 8 1/2" BHA, rig service and RIH.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
BARABLOK	50 lb bag	40			40	
BARACARB 100	1200 Kg bulk	1			1	
BARACARB 25	1200 Kg bulk	3			3	
BARACARB 25	25 KG.BAG	48			48	
Baracide	25 Kg can	13			13	
BARACOR 129	25 Kg can	45			45	
BARA-DEFOAM W300	25 l can	3			3	
BARAFILM	55 Gal drum	2			2	
barite	100 lb bulk	904			904	
BAROFIBRE	25 lb bag	40			40	
bentonite	1200 Kg bag	4			4	
caustic soda	25 Kg pail	17			17	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	1			1	
CON DET	5 gal can	20			20	
DEXTRID LT	25 Kg bag	97			97	
DRILLZAN-D	25 Kg bag	73			73	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	9			9	
Glycol CP	1500 l bulk	6			6	
KCl - Tech.	25 Kg bag	20			20	
KCl Ag grade	1000 Kg bulk	2			2	
lime	20 Kg bag	16			16	
PAC-L	25 Kg bag	39			39	
phpa	25 Kg bag	72			72	

Daily Products Cost	$ 0.00	Total Daily Cost	$ 940.00
Cummulative Products Cost	$ 19,641.75	Total Cummulative Cost	$ 26,221.75

Solid Control Equipment

Shaker	Screens			Hrs
Derrick	24	24	24	0.0
Derrick	24	24	24	0.0

Time (Hrs)

Drilling	
Circulating	
Trips	
Rig	
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	24.00
Total	24.00
Rotating	
ROP	
Dil Rate	

Fluid Volume Breakdown Seawater

Active	bbl	Additions	bbl	Losses	bbl
Annulus	214.1	Oil		Dumped	
Pipe Cap	2.6	Drill Water		Transferred	
Active Pits	7.6	Dewatering		SC Equip	
Total Hole	216.7	Sea Water		Evaporation	
Total Circ	24.0	Whole Mud		Trips	
Reserve		Barite		Other	
Prev Vol		Chemicals		Total Surface	
Net Chg		Other Adds.		Downhole	
Total Vol		Total Added		Total Losses	

Other Fluid Types	Vol bbl
Hi-Vis Pill / Sweep	35.0
KCl/PHPA/GLYCOL	654.0
Potassium Chloride brine	180.0

Deviation Information

Survey MD	912 m
Survey TVD	618 m
Angle	68.72
Direction	277
Horiz Displ.	523 m

Baroid Representatives: Tun Aung Clive Da Silva
Office 90 Talinga Rd Melbourne Tel 61-03-9581-7555
Warehouse c/o of Esso Australia Ltd via Toora Victoria Tel 61-3-56-881-445

913712 431

Daily Drilling Fluid Report

Baroid, a Halliburton Company

Report No 009

Date 3/08/2002	Depth 984.0 m
Spud Date 27/07/2002	Rig Activity Drilling

Operator: Esso Australia Ltd	Report For: Brian Davis / Bim Steel	Well Name: A-29
Contractor: ISDL	Report For: John Obrien / Peter Bennett	Rig Name: #453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information

Bit Size	8.500 in
Make/Type	DBS / H89F
Jets	6x16
TFA	1.178 sq-in
Jets Velocity	148 ft/sec
Jet Impact Force	375.8 lbf
HHSI	0.99 hhp/in2
Pres Drop @ Bit	176.1 psi
Bit Depth	984.0 m
ECD @ Shoe	9.56 ppg
ECD @ Bit	9.65 ppg

Drill String

ITEM	OD in	ID in	Length m
Drill Pipe	5.000	4.276	800.0
Drill Pipe	5.000	3.000	127.0
Drill Collar	6.500	2.812	49.3
Drill Motor	6.750	0.000	7.7
Open Hole		8.500	56.0

Casing

OD in	Set	MD m
20.000	@	164.9
9.625	@	928.0

Leak Off 16.10 ppg

Circulation/Hydraulics Data

Model	GD PZ-9	GD PZ-9
Bore in	6.000	6.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.076	.076
SPM	85	85
gpm	272	272

Total gpm	545	AV, Riser		Circ Pressure psi	1,100.0
Total Circ Time	38.5	AV, DP	265.2	Tot Prs Loss psi	1,373.9
BU Time, min	11.9	AV, DC	445.2	Pres Drop DP psi	330.5
Total Strokes	6,537	BU Stroke	2,020	Pres Drop An psi	71.2

Properties

Properties	1	2 Hyd	3	4	Targets 1	2	3	4	Program
Source	Flow Line	Flow Line							
Time	10:30	23:45							
Depth m	937.0	982.0							
FL Temp Deg C	28	31							
Density ppg @ Deg C	8.80 @ 28	9.00 @ 31							8.80 | 11.00
FV @ Deg C	50 @ 28	43 @ 31							
PV @ Deg C	13 @ 49	11 @ 49							
YP lbs/100 ft2	24	16							
Gels lbs/100 ft2	7/9/0	4/6/0							
600/300	50/37	38/27							
200/100	31/24	22/17							
6/3	7/5	6/4							
API Filt ml/30 min	4.8	5.0							| 6.0
HTHP ml/30 min @Deg C	13.5 @ 120	13.6 @ 120							| 15.0
Cake 32nd in	1.0/2.0	1.0/2.0							
Corr Solids % by vol	0.2	1.2							
NAP/Water % by vol	0.0/96.0	0.0/95.0							
Sand % by vol	0.10	0.25							
MBT ppb Eq.	1.0	2.0							
pH	9.50	9.50							8.80 | 9.50
Alk Mud (Pm)	0.25	0.35							
Alk Filt (Pf/Mf)	0.10/0.20	0.15/0.25							
Chlorides mg/l	44,500	45,000							
Hard Ca mg/l	120	240							
LGS/HGS %	0.6/-0.3	1.1/0.2							
LGS/HGS ppb	5.33/-5.01	9.85/2.33							
ASG	0.368	2.804							
Glycol Content % by vol		3.5							
Potassium % by vol	8.0	8.0							6.0 | 8.0
Sulfite residual mg/l		100							

Fluid Treatments

Fluid Type: KCl/PHPA/GLYCOL

Drill cement with Seawater and Hi-Vis sweeps.
Displace hole to new KCl/Polymer mud at 934 m.
Mixed up slug for tripping.

Received 410 bbl of KCl Brine and mud chemicals ex Lady Kari-Ann. Backloaded 4 Bulk Bags of Bentonite and 1 Bulk Bag of Salt.

KCl/Polymer Mud Made: 122 bbl.
Total for 8 1/2" Hole : 776 bbl.

Rig Activity

Run in hole to 877m, pressure test casing. Tag cement at 901m, Drill out cement and shoe track with seawater and hi-vis pills, Displace to KCl/Polymer Mud and drill 3 m new hole, perform FIT (EMW 16.1 ppg). Slug pipe and POOH.
Change bit and BHA and RIH to 928 m. Precautionary wash and ream to 937 m. Drill/Steer and Survey from 937 m to 984 m.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
Potassium Chloride brine	42 gal bbl		60	60		$ 933.00
Glycol CP	1500 l bulk	6		2	4	$ 8,773.66
DRILLZAN-D	25 Kg bag	73		7	66	$ 1,969.66
phpa	25 Kg bag	72		8	64	$ 760.40
barite	100 lb bulk	904	160	56	1,008	$ 496.72
DEXTRID LT	25 Kg bag	97		9	88	$ 354.69
Baracide	25 Kg can	13		1	12	$ 317.97
BARACOR 129	25 Kg can	45		6	39	$ 272.40
PAC-L	25 Kg bag	39		2	37	$ 221.68
caustic soda	25 Kg pail	17		1	16	$ 32.00
soda ash	25 Kg bag	8		1	7	$ 10.67
BARABLOK	50 lb bag	40			40	
BARACARB 100	1200 Kg bulk	1			1	
BARACARB 25	1200 Kg bulk	3			3	
BARACARB 25	25 KG.BAG	48			48	
BARA-DEFOAM W300	25 l can	3			3	
BARAFILM	55 Gal drum	2			2	
BAROFIBRE	25 lb bag	40			40	
bentonite	1200 Kg bag	4				
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	1			1	
CON DET	5 gal can	20			20	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	9			9	
KCl - Tech.	25 Kg bag	20			20	

Solid Control Equipment

Shaker	Screens			Hrs
Derrick	24	24	24	15.0
Derrick	24	24	24	15.0

Time (Hrs)

Drilling	3.00
Circulating	1.00
Trips	13.25
Rig	0.50
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	0.25
Testing	
Logging	
Dir Work	
Repair	
Other	6.00
Total	24.00
Rotating	3.25
ROP	54.68
Oil Rate	

Fluid Volume Breakdown KCl/PHPA/GLYCOL

Active	bbl	Additions	bbl	Losses	bbl
Annulus	154.2	Oil		Dumped	-32.0
Pipe Cap	50.8	Drill Water		Transferred	
Active Pits	294.0	Dewatering		SC Equip	-10.0
Total Hole	205.0	Sea Water		Evaporation	
Total Circ	499.0	Whole Mud		Trips	
Reserve	122.0	Barite	3.8	Other	-15.7
Prev Vol	224.3	Chemicals	20.9	Total Surface	-57.7
Net Chg	-33.0	Other Adds.		Downhole	
Total Vol		Total Added	24.7	Total Losses	-57.7

Daily Products Cost	$ 14,142.85	Total Daily Cost	$ 15,082.85
Cummulative Products Cost	$ 33,784.60	Total Cummulative Cost	$ 41,304.60

Other Fluid Types

Other Fluid Types	Vol bbl
Potassium Chloride brine	530.0
Premix	122.0

Deviation Information

Survey MD	963 m
Survey TVD	637 m
Angle	68.84
Direction	277
Horiz Displ.	573 m

Baroid Representatives: Tun Aung, Clive Da Silva

Office	90 Talinga Rd	Melbourne	Tel 61-03-9581-7555
Warehouse	c/o of Esso Australia Ltd	via Toora Victoria	Tel 61-3-56-881-445

913712 432

Report No. 010

Daily Drilling Fluid Report

Baroid, a Halliburton Company

Date 4/08/2002	Depth 1,211.0 m
Spud Date 27/07/2002	Rig Activity Bit Trip. Drill.

Operator Esso Australia Ltd	**Report For** Brian Davis / Bim Steel	**Well Name** A-29
Contractor ISDL	**Report For** John Obrien / Peter Bennett	**Rig Name** #453

Country	**State/Province/Region**	**County/Geographic Area**	**Field or Block**
Australia	Victoria	Bass Strait	Tuna

Bit Information	
Bit Size	8.500 in
Make/Type	GEO / S73HPX
Jets	8x15
TFA	1.381 sq-in
Jets Velocity	138 ft/sec
Jet Impact Force	400.8 lbf
HHSI	0.98 hhp/in2
Pres Drop @ Bit	160.2 psi
Bit Depth	1,211.0 m
ECD @ Shoe	10.61 ppg
ECD @ Bit	10.91 ppg

Drill String ITEM	OD in	ID in	Length m
Drill Pipe	5.000	4.276	1,027.0
Drill Pipe	5.000	3.000	127.0
Drill Collar	6.500	2.812	49.3
Drill Motor	6.750	0.000	7.7
Open Hole	8.500		283.0

OD in	Casing Set	MD m
20.000	@	164.9
9.625	@	928.0
Leak Off		16.10 ppg

Circulation/Hydraulics Data

Model	GD PZ-9	GD PZ-9
Bore in	6.000	6.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.076	.076
SPM	93	93
gpm	298	298

Total gpm	596	AV, Riser		Circ Pressure psi	1,550.0
Total Circ Time	37.1	AV, DP	290.2	Tot Prs Loss psi	1,461.6
BU Time, min	13.3	AV, DC	487.1	Pres Drop DP psi	517.8
Total Strokes	6,907	BU Stroke	2,468	Pres Drop An psi	186.7

Properties	1	2 Hyd	3	4	Targets 1	2	3	4	Program
Source	Flow Line	Flow Line							
Time	08:30	23:30							
Depth m	1,133.0	1,209.0							
FL Temp Deg C	46	40							
Density ppg @ Deg C	9.40 @ 46	9.40 @ 40							8.80 | 11.00
FV @ Deg C	75 @ 46	70 @ 40							
PV @ Deg C	23 @ 49	20 @ 49							
YP lbs/100 ft2	32	36							
Gels lbs/100 ft2	9/12/0	7/12/0							
600/300	78/55	76/56							
200/100	46/35	46/34							
6/3	10/8	10/8							
API Filt ml/30 min	3.8	3.5							| 6.0
HTHP ml/30 min @Deg C	11.0 @ 120	11.0 @ 120							| 15.0
Cake 32nd in	1.0/2.0	1.0/2.0							
Corr Solids % by vol	4.3	4.3							
NAP/Water % by vol	0.0/92.0	0.0/92.0							
Sand % by vol	0.50	1.00							
MBT ppb Eq.	5.0	5.0							
pH	9.50	9.50							8.80 | 9.50
Alk Mud (Pm)	0.35	0.40							
Alk Filt (Pf/Mf)	0.10/0.25	0.10/0.45							
Chlorides mg/l	45,500	46,000							
Hard Ca mg/l	240	80							
LGS/HGS %	4.2/0.1	4.1/0.2							
LGS/HGS ppb	37.97/2.20	37.55/2.26							
ASG	2.656	2.657							
6 rpm -	10	10							10 | 15
Glycol Content % by vol	3.5	3.5							3.0 | 4.0
PHPA Concentr ppb	1.30	1.30							

Fluid Treatments

Fluid Type: KCl/PHPA/GLYCOL

Adding Premix to active to maintain volume and properties. Added directly to active 1.3 ppb PHPA, 3.5 % Glycol, BARACOR-129 for sulfite residual of 100+ mg/l and DRILLZAN-D to increase the rheology and 6 rpm reading.

Changed screens on both shakers to 50 mesh.

Received 111 bbls KCL Brine ex Lady Liz.

KCl/Polymer Mud Made : 122 bbls.
Total for 8 1/2" Hol : 898 bbls.

Rig Activity

Drill slide 8.5" hole from 984m to 1192m. Slow ROP. Circulate hole clean pump slug and POOH for bit change.
Run in hole, precautionary wash last 2 stands to bottom.
Drill/Steer and Survey from 1192 m to 1211 m.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
Potassium Chloride brine	42 gal bbl		63	63		$ 979.65
Glycol CP	1500 l bulk	4	7	1	10	$ 4,386.83
DRILLZAN-D	25 Kg bag	66	80	9	137	$ 2,532.42
phpa	25 Kg bag	64	120	14	170	$ 1,330.70
BARAFILM	55 Gal drum	2		1	1	$ 496.32
DEXTRID LT	25 Kg bag	88	160	9	239	$ 354.69
barite	100 lb bulk	1,008		38	970	$ 337.06
BARACOR 129	25 Kg can	39		5	34	$ 227.00
PAC-L	25 Kg bag	37	40	2	75	$ 221.68
potassium hydroxide	20 Kg pail		32	1	31	$ 32.72
soda ash	25 Kg bag	7	40	1	46	$ 10.67
BARABLOK	50 lb bag	40	80		120	
BARACARB 100	1200 Kg bulk	1	3		4	
BARACARB 25	1200 Kg bulk	3	1		4	
BARACARB 25	25 KG.BAG	48			48	
Baracide	25 Kg can	12			12	
BARA-DEFOAM W300	25 l can	3			3	
BAROFIBRE	25 lb bag	40			40	
caustic soda	25 Kg pail	16			16	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	1			1	
CON DET	5 gal can	20			20	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	9	16		25	
Hme Energizer	5 gal can		3		3	

Solid Control Equipment

Shaker	Screens			Hrs
Derrick	50	50	50	19.0
Derrick	50	50	50	19.0

Time (Hrs)	
Drilling	10.25
Circulating	1.25
Trips	9.25
Rig	1.00
Surveys	2.00
Fishing	
Run Casing	
Coring	
Reaming	0.25
Testing	
Logging	
Dir Work	
Repair	
Other	
Total	24.00
Rotating	10.50
ROP	72.66
Dil Rate	

Fluid Volume Breakdown KCl/PHPA/GLYCOL

Active	bbl	Additions	bbl	Losses	bbl
Annulus	188.3	Oil		Dumped	-41.0
Pipe Cap	63.8	Drill Water		Transferred	
Active Pits	275.0	Dewatering		SC Equip	-20.0
Total Hole	252.2	Sea Water		Evaporation	
Total Circ	527.2	Whole Mud		Trips	-0.2
Reserve	49.0	Barite	2.6	Other	
Prev Vol	122.0	Chemicals	13.8	Total Surface	-61.2
Net Chg	-44.8	Other Adds.		Downhole	
Total Vol	244.0	Total Added	16.4	Total Losses	-61.2

Daily Products Cost	$ 10,909.74	Total Daily Cost	$ 11,849.74
Cummulative Products Cost	$ 44,694.34	Total Cummulative Cost	$ 53,154.34

Other Fluid Types	Vol bbl
Potassium Chloride brine	578.0
Premix	244.0

Deviation Information	
Survey MD	1,192 m
Survey TVD	717 m
Angle	68.78
Direction	277
Horiz Displ.	785 m

Baroid Representatives: Tun Aung Clive Da Silva
Office 90 Talinga Rd Melbourne Tel 61-03-9581-7555
Warehouse c/o of Esso Australia Ltd via Toora Victoria Tel 61-3-56-881-445

913712 433

Daily Drilling Fluid Report

Baroid, a Halliburton Company

Report No 011

Date 5/08/2002	Depth 1,717.0 m
Spud Date 27/07/2002	Rig Activity Drilling

Operator Esso Australia Ltd	**Report For** Brian Davis / Bim Steel	**Well Name** A-29
Contractor ISDL	**Report For** John Obrien / Peter Bennett	**Rig Name** #453
Country Australia	**State/Province/Region** Victoria / **County/Geographic Area** Bass Strait	**Field or Block** Tuna

Bit Information

Bit Size	8.500 in
Make/Type	GEO / S73HPX
Jets	8x15
TFA	1.381 sq-in
Jets Velocity	141 ft/sec
Jet Impact Force	436.0 lbf
HHSI	1.09 hhp/in2
Pres Drop @ Bit	174.3 psi
Bit Depth	1,717.0 m
ECD @ Shoe	11.27 ppg
ECD @ Bit	11.89 ppg

Drill String

ITEM	OD in	ID in	Length m
Drill Pipe	5.000	4.276	1,533.0
Drill Pipe	5.000	3.000	127.0
Drill Collar	6.500	2.812	49.3
Drill Motor	6.750	0.000	7.7
Open Hole	8.500		789.0

Casing

OD in	Casing Set	MD m
20.000	@	164.9
9.625	@	928.0

Leak Off 16.10 ppg

Circulation/Hydraulics Data

Model	GD PZ-9	GD PZ-9
Bore in	6.000	6.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.076	.076
SPM	95	95
gpm	305	305

Total gpm	609	AV, Riser		Circ Pressure psi	1,860.0
Total Circ Time	44.9	AV, DP	296.4	Tot Prs Loss psi	2,088.6
BU Time, min	18.2	AV, DC	497.6	Pres Drop DP psi	726.9
Total Strokes	8,522	BU Stroke	3,466	Pres Drop An psi	321.4

Properties

Properties	1	2	3	4	Targets 1	2	3	4	Program
Source	Flow Line	Flow Line	Flow Line						
Time	08:00	13:30	23:30						
Depth m	1,354.0	1,469.0	1,620.0						
FL Temp Deg C	46	46	47						
Density ppg @ Deg C	9.60 @ 46	9.80 @ 46	9.90 @ 40						8.80 | 11.00
FV @ Deg C	75 @ 46	77 @ 40	71 @ 40						
PV @ Deg C	24 @ 49	24 @ 49	24 @ 49						
YP lbs/100 ft2	40	42	46						
Gels lbs/100 ft2	11/15/0	12/17/0	10/16/0						
600/300	88/64	90/66	94/70						
200/100	54/40	55/42	58/43						
6/3	11/9	12/10	12/9						
API Filt ml/30 min	3.2	3.0	3.0						| 6.0
HTHP ml/30 min @Deg C	10.2 @ 120	10.0 @ 120	9.8 @ 120						| 15.0
Cake 32nd in	1.0/2.0	1.0/2.0	1.0/2.0						
Corr Solids % by vol	6.3	6.4	7.4						
NAP/Water % by vol	0.0/90.0	0.0/90.0	0.0/89.0						
Sand % by vol	1.25	1.25	1.25						
MBT ppb Eq.	10.0	10.0	12.5						
pH	9.20	9.00	8.80						8.80 | 9.50
Alk Mud (Pm)	0.50	0.40	0.50						
Alk Filt (Pf/Mf)	0.10/0.35	0.12/0.25	0.02/0.35						
Chlorides mg/l	46,500	45,500	46,000						
Hard Ca mg/l	100	120	160						
LGS/HGS %	6.7/-0.4	5.3/1.1	6.5/0.9						
LGS/HGS ppb	60.73/-5.16	47.90/16.78	59.28/13.10						
ASG	2.511	2.885	2.793						
6 rpm	11	12	12						10 | 15
Glycol Content % by vol	3.5	3.5	3.5						3.0 | 4.0
PHPA Concentr ppb	1.30	1.30	1.30						

Fluid Treatments

Fluid Type: KCl/PHPA/GLYCOL

Adding Premix as needed to maintain volume and mud properties. Weighed up mud from 9.6 ppg to 9.8 ppg with Barite as per company request, starting at 1415m.
Dump sand trap as required.
One shaker changed to 80 mesh.

KCL/PHPA/POLYMER Mud Made:362 bbls
Total for 8 1/2" Hole:1260 bbls

Rig Activity

Drill ahead from 1211m to 1717 m.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
Potassium Chloride brine	42 gal bbl		180	180		$ 2,799.00
Glycol CP	1500 l bulk	10		2	8	$ 8,773.66
DRILLZAN-D	25 Kg bag	137		11	126	$ 3,095.18
DEXTRID LT	25 Kg bag	239		34	205	$ 1,339.94
barite	100 lb bulk	970		90	880	$ 798.30
PAC-L	25 Kg bag	75		6	69	$ 665.04
phpa	25 Kg bag	170		6	164	$ 570.30
BARACOR 129	25 Kg can	34		6	28	$ 272.40
potassium hydroxide	20 Kg pail	31		3	28	$ 98.16
soda ash	25 Kg bag	46		3	43	$ 32.01
BARABLOK	50 lb bag	120			120	
BARACARB 100	1200 Kg bulk	4			4	
BARACARB 25	1200 Kg bulk	4			4	
BARACARB 25	25 KG.BAG	48			48	
Baracide	25 Kg can	12			12	
BARA-DEFOAM W300	25 l can	3			3	
BARAFILM	55 Gal drum	1			1	
BAROFIBRE	25 lb bag	40			40	
caustic soda	25 Kg pail	16			16	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	1			1	
CON DET	5 gal can	20			20	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	25			25	
Hme Energizer	5 gal can	3			3	

Daily Products Cost	$ 18,443.99	Total Daily Cost	$ 19,383.99
Cummulative Products Cost	$ 63,138.33	Total Cummulative Cost	$ 72,538.33

Solid Control Equipment

Shaker	Screens			Hrs
Derrick	80	80	80	24.0
Derrick	50	50	50	24.0

Time (Hrs)

Drilling	22.00
Circulating	
Trips	
Rig	
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	2.00
Total	24.00
Rotating	22.00
ROP	38.48
Dil Rate	

Fluid Volume Breakdown KCl/PHPA/GLYCOL

Active	bbl	Additions	bbl	Losses	bbl
Annulus	264.5	Oil		Dumped	-231.2
Pipe Cap	92.9	Drill Water		Transferred	
Active Pits	293.0	Dewatering		SC Equip	-200.0
Total Hole	357.4	Sea Water		Evaporation	
Total Circ	650.4	Whole Mud	518.9	Trips	
Reserve	40.0	Barite	6.1	Other	
Prev Vol	578.0	Chemicals	20.5	Total Surface	-431.2
Net Chg	114.3	Other Adds.		Downhole	
Total Vol	398.0	Total Added	545.5	Total Losses	-431.2

Other Fluid Types	Vol bbl
Potassium Chloride brine	398.0
Premix	87.0

Deviation Information

Survey MD	1,676 m
Survey TVD	887 m
Angle	69.60
Direction	278
Horiz Displ.	1,237 m

Baroid Representatives:	Clive Da Silva	Justin Lewis	
Office	90 Talinga Rd	Melbourne	Tel 61-03-9581-7555
Warehouse	c/o of Esso Australia Ltd	via Toora Victoria	Tel 61-3-56-881-445

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Daily Drilling Fluid Report

Baroid, a Halliburton Company

Report No 012

Date 6/08/2002	Depth 2,136.0 m
Spud Date 27/07/2002	Rig Activity Drilling

Operator: Esso Australia Ltd	Report For: Brian Davis / Bim Steel	Well Name: A-29
Contractor: ISDL	Report For: John Obrien / Peter Bennett	Rig Name: #453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information

Bit Size	8.500 in
Make/Type	GEO / S73HPX
Jets	8x15
TFA	1.381 sq-in
Jets Velocity	141 ft/sec
Jet Impact Force	451.6 lbf
HHSI	1.13 hhp/in2
Pres Drop @ Bit	180.5 psi
Bit Depth	2,136.0 m
ECD @ Shoe	11.75 ppg
ECD @ Bit	12.59 ppg

Drill String

ITEM	OD in	ID in	Length m
Drill Pipe	5.000	4.276	1,952.0
Drill Pipe	5.000	3.000	127.0
Drill Collar	6.500	2.812	49.3
Drill Motor	6.750	0.000	7.7
Open Hole	8.500		1,208.0

Casing

OD in	Casing Set	MD m
20.000	@	164.9
9.625	@	928.0

Leak Off 16.10 ppg

Circulation/Hydraulics Data

Model	GD PZ-9	GD PZ-9
Bore in	6.000	6.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.076	.076
SPM	95	95
gpm	305	305

Total gpm	609	AV, Riser		Circ Pressure psi	2,040.0
Total Circ Time	51.0	AV, DP	296.4	Tot Prs Loss psi	2,408.9
BU Time, min	22.6	AV, DC	497.6	Pres Drop DP psi	912.5
Total Strokes	9,689	BU Stroke	4,293	Pres Drop An psi	435.6

Properties

Properties	1	2	3	4 Hyd	Targets 1	2	3	4	Program	
Source	Flow Line	Flow Line	Flow Line	Flow Line						
Time	07:45	13:45	19:00	23:30						
Depth m	1,813.0	1,911.0	1,999.0	2,055.0						
FL Temp Deg C	52	52	52	52						
Density ppg @ Deg C	9.90 @ 45	10.00 @ 45	10.10 @ 45	10.15 @ 45					8.80	11.00
FV @ Deg C	73 @ 45	75 @ 45	74 @ 45	79 @ 45						
PV @ Deg C	25 @ 49	26 @ 49	26 @ 49	26 @ 49						
YP lbs/100 ft2	45	44	46	47						
Gels lbs/100 ft2	12/20/0	13/22/0	10/25/0	11/26/0						
600/300	95/70	96/70	98/72	99/73						
200/100	59/44	60/45	61/44	61/44						
6/3	12/10	12/10	13/10	13/10						
API Filt ml/30 min	3.0	2.8	2.6	2.8						6.0
HTHP ml/30 min @Deg C	9.8 @ 120	9.8 @ 120	10.0 @ 120	10.0 @ 120						15.0
Cake 32nd in	1.0/2.0	1.0/2.0	1.0/2.0	1.0/2.0						
Corr Solids % by vol	7.4	7.3	8.4	8.8						
NAP/Water % by vol	0.0/89.0	0.0/89.0	0.0/88.0	0.0/87.5						
Sand % by vol	1.25	1.25	1.50	1.50						
MBT ppb Eq.	10.0	12.5	15.0	15.0						
pH	9.00	9.20	9.00	9.20					8.80	9.50
Alk Mud (Pm)	0.50	0.60	0.80	0.85						
Alk Filt (Pf/Mf)	0.08/0.30	0.07/0.30	0.04/0.40	0.06/0.40						
Chlorides mg/l	46,300	46,800	47,000	47,500						
Hard Ca mg/l	200	200	200	220						
LGS/HGS %	6.5/0.9	5.7/1.6	7.0/1.4	7.6/1.3						
LGS/HGS ppb	59.04/13.13	51.81/24.21	63.45/20.49	68.95/18.67						
ASG	2.794	2.959	2.867	2.830						
6 rpm -	12	12	13	13					10	15
Glycol Content % by vol	3.5	4.0	4.0	4.0					3.0	4.0
PHPA Concentr ppb	1.25	1.25	1.25	1.25						

Fluid Treatments

Fluid Type: KCl/PHPA/GLYCOL

Continue adding fully specked Premix to active to maintain volume and mud properties. Allow weight to gradually raise naturally from 9.9 ppg to 10.15 ppg as per company request. Dump sand trap as required.

KCL/PHPA/Polymer Mud Made: 488 bbls
Total for 8 1/2" Hole: 1748 bbls

Rig Activity

Continue drilling/sliding survey from 1717m to 2136m at report time.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
Potassium Chloride brine	42 gal bbl		240	240		$ 3,732.00
Glycol CP	1500 l bulk	8		1	7	$ 4,386.83
DRILLZAN-D	25 Kg bag	126		12	114	$ 3,376.56
DEXTRID LT	25 Kg bag	205		36	169	$ 1,418.76
phpa	25 Kg bag	164		11	153	$ 1,045.55
PAC-L	25 Kg bag	69		8	61	$ 886.72
Baracide	25 Kg can	12		1	11	$ 317.97
potassium hydroxide	20 Kg pail	28		9	19	$ 294.48
BARACOR 129	25 Kg can	28		6	22	$ 272.40
soda ash	25 Kg bag	43		4	39	$ 42.68
BARABLOK	50 lb bag	120			120	
BARACARB 100	1200 Kg bulk	4			4	
BARACARB 25	1200 Kg bulk	4			4	
BARACARB 25	25 KG.BAG	48			48	
BARA-DEFOAM W300	25 l can	3			3	
BARAFILM	55 Gal drum	1			1	
barite	100 lb bulk	880			880	
BAROFIBRE	25 lb bag	40			40	
caustic soda	25 Kg pail	16			16	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	1			1	
CON DET	5 gal can	20			20	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	25			25	
Hme Energizer	5 gal can	3			3	

Daily Products Cost	$ 15,773.95	Total Daily Cost	$ 16,713.95
Cummulative Products Cost	$ 78,912.28	Total Cummulative Cost	$ 89,252.28

Solid Control Equipment

Shaker	Screens			Hrs
Derrick	80	80	80	24.0
Derrick	50	50	50	24.0

Time (Hrs)

Drilling	22.00
Circulating	
Trips	
Rig	
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	2.00
Total	24.00
Rotating	22.00
ROP	14.32
Dil Rate	

Fluid Volume Breakdown KCl/PHPA/GLYCOL

Active	bbl	Additions	bbl	Losses	bbl
Annulus	327.6	Oil		Dumped	-120.0
Pipe Cap	116.9	Drill Water		Transferred	
Active Pits	295.0	Dewatering		SC Equip	-141.6
Total Hole	444.6	Sea Water		Evaporation	
Total Circ	739.6	Whole Mud	355.2	Trips	
Reserve	55.0	Barite		Other	
Prev Vol	690.4	Chemicals	10.5	Total Surface	-261.6
Net Chg	104.1	Other Adds.		Downhole	
Total Vol	794.6	Total Added	365.7	Total Losses	-261.6

Other Fluid Types	Vol bbl
Potassium Chloride brine	158.0
Premix	220.0

Deviation Information

Survey MD	2,111 m
Survey TVD	1,038 m
Angle	69.90
Direction	277
Horiz Displ.	1,644 m

Baroid Representatives: Clive Da Silva Justin Lewis

Office 90 Talinga Rd Melbourne Tel 61-03-9581-7555

Warehouse c/o of Esso Australia Ltd via Toora Victoria Tel 61-3-56-881-445

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Daily Drilling Fluid Report

Baroid, a Halliburton Company

Report No 013

Date 7/08/2002	Depth 2,606.0 m
Spud Date 27/07/2002	Rig Activity Drilling

Operator	Report For	Well Name
Esso Australia Ltd	Brian Davis / Glenn Campbell	A-29
Contractor	**Report For**	**Rig Name**
ISDL	John Obrien / Peter Bennett	#453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information	
Bit Size	8.500 in
Make/Type	GEO / S73HPX
Jets	8x15
TFA	1.381 sq-in
Jets Velocity	141 ft/sec
Jet Impact Force	467.2 lbf
HHSI	1.17 hhp/in2
Pres Drop @ Bit	186.7 psi
Bit Depth	2,606.0 m
ECD @ Shoe	12.19 ppg
ECD @ Bit	13.18 ppg

Drill String ITEM	OD in	ID in	Length m
Drill Pipe	5.000	4.276	2,422.0
Drill Pipe	5.000	3.000	127.0
Drill Collar	6.500	2.812	49.3
Drill Motor	6.750	0.000	7.7

Casing OD in	Set	MD m
20.000	@	164.9
9.625	@	928.0

Leak Off 16.10 ppg

Circulation/Hydraulics Data		
Model	GD PZ-9	GD PZ-9
Bore in	6.000	6.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.076	.076
SPM	95	95
gpm	305	305

Total gpm	609	AV, Riser		Circ Pressure	psi	2,620.0
Total Circ Time	57.6	AV, DP	296.4	Tot Prs Loss	psi	2,725.3
BU Time, min	27.5	AV, DC	497.6	Pres Drop DP	psi	1,093.1
Total Strokes	10,944	BU Stroke	5,220	Pres Drop An	psi	560.3

Properties	1	2	3	4	Targets 1	2	3	4	Program
Source	Chemical	Flow Line	Flow Line	Flow Line					
Time	08:15	14:00	19:00	23:30					
Depth m	2,262.0	2,362.0	2,490.0	2,590.0					
FL Temp Deg C	55	55	56	56					
Density ppg @ Deg C	10.20 @ 40	10.50 @ 45	10.50 @ 45	10.55 @ 45					8.80 | 11.00
FV @ Deg C	84 @ 40	90 @ 45	93 @ 45	99 @ 45					
PV @ Deg C	26 @ 49	28 @ 49	29 @ 49	33 @ 49					
YP lbs/100 ft2	46	47	52	58					
Gels lbs/100 ft2	12/24/0	13/26/0	15/30/0	15/35/0					
600/300	98/72	103/75	110/81	124/91					
200/100	62/46	64/48	70/49	75/55					
6/3	13/10	14/11	15/11	15/12					
API Filt ml/30 min	3.0	2.8	3.0	3.2					| 6.0
HTHP ml/30 min @Deg C	9.4 @ 120	9.4 @ 120	9.8 @ 120	9.8 @ 120					| 15.0
Cake 32nd in	1.0/2.0	1.0/2.0	1.0/2.0	1.0/2.0					
Corr Solids % by vol	8.3	9.9	9.9	10.4					
NAP/Water % by vol	0.0/88.0	0.0/86.5	0.0/86.5	0.0/86.0					
Sand % by vol	1.50	1.50	1.75	1.75					
MBT ppb Eq.	12.5	15.0	15.0	17.5					
pH	9.30	9.00	9.00	9.00					8.80 | 9.50
Alk Mud (Pm)	0.70	0.80	1.00	1.05					
Alk Filt (Pf/Mf)	0.08/0.40	0.09/0.45	0.04/0.70	0.04/0.50					
Chlorides mg/l	47,200	47,500	47,500	48,000					
Hard Ca mg/l	240	240	220	200					
LGS/HGS %	6.2/2.1	7.0/2.9	7.0/2.9	7.6/2.8					
LGS/HGS ppb	56.46/31.54	63.70/42.50	63.70/42.50	69.21/40.68					
ASG	3.011	3.068	3.068	3.027					
6 rpm -	13	14	15	15					10 | 15
Glycol Content % by vol	4.0	4.0	4.0	4.0					3.0 | 4.0
PHPA Concentr ppb	1.25	1.25	1.25	1.25					

Fluid Treatments

Fluid Type: KCl/PHPA/GLYCOL

Weigh up mud from 10.2 ppg to 10.5 ppg with Barite prior to entering Lakes Entrance formation as per company request. Adding Premix to active to maintain volume and mud properties. Adding Caustic Potash, Glycol and BARACOR-129 direct to active to maintain specs.

Received 500 bbls KCL Brine ex Lady Liz.

KCL/PHPA/Polymer Mud Made: 244 bbls
Total for 8 1/2" Hole: 1992 bbls

Rig Activity

Drill slide and survey from 2136m to 2620m at report time.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
Potassium Chloride brine	42 gal bbl		138	138		$ 2,145.90
Glycol CP	1500 l bulk	7		2	5	$ 8,773.66
DRILLZAN-D	25 Kg bag	114		6	108	$ 1,688.28
barite	100 lb bulk	880		150	730	$ 1,330.50
DEXTRID LT	25 Kg bag	169		18	151	$ 709.38
phpa	25 Kg bag	153		6	147	$ 570.30
PAC-L	25 Kg bag	61		4	57	$ 443.36
BARACOR 129	25 Kg can	22		6	16	$ 272.40
potassium hydroxide	20 Kg pail	19		8	11	$ 261.76
soda ash	25 Kg bag	39		2	37	$ 21.34
BARABLOK	50 lb bag	120			120	
BARACARB 100	1200 Kg bulk	4			4	
BARACARB 25	1200 Kg bulk	4			4	
BARACARB 25	25 KG.BAG	48			48	
Baracide	25 Kg can	11			11	
BARA-DEFOAM W300	25 l can	3			3	
BARAFILM	55 Gal drum	1			1	
BAROFIBRE	25 lb bag	40			40	
caustic soda	25 Kg pail	16			16	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	1			1	
CON DET	5 gal can	20			20	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	25			25	
Hme Energizer	5 gal can	3			3	

Daily Products Cost	$ 16,216.88	Total Daily Cost	$ 17,156.88
Cummulative Products Cost	$ 95,129.16	Total Cummulative Cost	$ 106,409.16

Solid Control Equipment Shaker	Screens			Hrs
Derrick	80	80	80	24.0
Derrick	50	50	50	24.0

Time (Hrs)	
Drilling	24.00
Circulating	
Trips	
Rig	
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	
Total	24.00
Rotating	24.00
ROP	64.25
Dil Rate	

Fluid Volume Breakdown KCl/PHPA/GLYCOL

Active	bbl	Additions	bbl	Losses	bbl
Annulus	398.4	Oil		Dumped	-100.0
Pipe Cap	143.9	Drill Water		Transferred	
Active Pits	293.0	Dewatering		SC Equip	-148.6
Total Hole	542.3	Sea Water		Evaporation	
Total Circ	835.3	Whole Mud	319.1	Trips	
Reserve	60.0	Barite	10.2	Other	
Prev Vol	794.6	Chemicals	20.1	Total Surface	-248.6
Net Chg	100.8	Other Adds.		Downhole	
Total Vol	895.3	Total Added	349.4	Total Losses	-248.6

Other Fluid Types	Vol bbl
Potassium Chloride brine	520.0
Premix	145.0

Deviation Information	
Survey MD	2,603 m
Survey TVD	1,223 m
Angle	58.60
Direction	286
Horiz Displ.	2,099 m

Baroid Representatives:	Clive Da Silva	Justin Lewis	
Office	90 Talinga Rd	Melbourne	Tel 61-03-9581-7555
Warehouse	c/o of Esso Australia Ltd	via Toora Victoria	Tel 61-3-56-881-445

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Daily Drilling Fluid Report

Baroid, a Halliburton Company

Report No 014

Date	8/08/2002	Depth	2,796.0 m
Spud Date	27/07/2002	Rig Activity	Drilling

Operator: Esso Australia Ltd	Report For: Brian Davis / Glenn Campbell	Well Name: A-29
Contractor: ISDL	Report For: John Obrien / Rob Balfour	Rig Name: #453
Country: Australia	State/Province/Region: Victoria	County/Geographic Area: Bass Strait
Field or Block: Tuna		

Bit Information		
Bit Size	8.500	in
Make/Type	GEO / S73HPX	
Jets	8x15	
TFA	1.381	sq-in
Jets Velocity		ft/sec
Jet Impact Force		lbf
HHSI		hhp/in2
Pres Drop @ Bit		psi
Bit Depth	1,220.0	m
ECD @ Shoe	10.50	ppg
ECD @ Bit	10.50	ppg

Drill String ITEM	OD in	ID in	Length m
Drill Pipe	5.000	4.276	1,036.0
Drill Pipe	5.000	3.000	127.0
Drill Collar	6.500	2.812	49.3
Drill Motor	6.750	0.000	7.7
Open Hole	8.500		1,868.0

Casing OD in	Set	MD m
20.000	@	164.9
9.625	@	928.0
Leak Off		16.10 ppg

Circulation/Hydraulics Data		
Model	GD PZ-9	GD PZ-9
Bore in	6.000	6.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.076	.076
SPM		
gpm		

Total gpm		AV, Riser		Circ Pressure psi	
Total Circ Time		AV, DP		Tot Prs Loss psi	650.0
BU Time, min		AV, DC		Pres Drop DP psi	
Total Strokes		BU Stroke		Pres Drop An psi	

Properties	1	2	3	4	Targets 1	2	3	4	Program
Source	Chemical	Flow Line	Flow Line						
Time	08:30	13:30	23:30						
Depth m	2,735.0	2,796.0	2,796.0						
FL Temp Deg C	57	57	55						
Density ppg @ Deg C	10.50 @ 45	10.50 @ 45	10.55 @ 45						8.80 | 11.00
FV @ Deg C	95 @ 45	90 @ 45	88 @ 45						
PV @ Deg C	28 @ 49	28 @ 49	29 @ 49						
YP lbs/100 ft2	47	44	44						
Gels lbs/100 ft2	14/29/0	13/28/0	13/29/0						
600/300	103/75	100/72	102/73						
200/100	65/49	61/46	62/46						
6/3	14/11	14/11	14/11						
API Filt ml/30 min	3.0	2.8	3.0						| 6.0
HTHP ml/30 min @Deg C	9.6 @ 120	9.4 @ 120	10.0 @ 120						| 15.0
Cake 32nd in	1.0/2.0	1.0/2.0	1.0/2.0						
Corr Solids % by vol	10.4	10.3	10.4						
NAP/Water % by vol	0.0/86.0	0.0/86.0	0.0/86.0						
Sand % by vol	1.70	1.75	1.75						
MBT ppb Eq.	15.0	15.0	17.5						
pH	9.00	9.20	9.00						8.80 | 9.50
Alk Mud (Pm)	0.90	0.95	0.90						
Alk Filt (Pf/Mf)	0.07/0.50	0.08/0.60	0.07/0.55						
Chlorides mg/l	47,800	48,200	48,000						
Hard Ca mg/l	240	240	220						
LGS/HGS %	8.0/2.4	8.0/2.4	7.6/2.8						
LGS/HGS ppb	72.78/35.15	72.46/35.19	69.21/40.68						
ASG	2.968	2.970	3.027						
6 rpm	14	14	14						10 | 15
Glycol Content % by vol	4.0	4.0	4.0						3.0 | 4.0
PHPA Concentr ppb	1.25	1.30	1.25						

Fluid Treatments

Fluid Type: KCl/PHPA/GLYCOL

Add Glycol, Caustic Potash and BARACOR-129 direct to the active system to maintain these properties. Continue adding Premix to active to maintain volume and mud properties. Change three broken 80 mesh screens on # 1 shaker. Mix slug.
Prepare to add BARACARB prior to entering the Latrobe.

PREMIX Mud Made : 244 bbls
Total for 8 1/2" Hole : 2236 bbls

Rig Activity

Drill, slide and survey to 2796 m. Circulate hole clean and perform wiper trip, POOH to 2080m tight hole. Run back to 2150m, circulate hole clean and work pipe, continue to backream out of hole, pulling intermittently at intervals 2044 m to 1784 m, 1784 m to 1634 m, 1583 m to 1518 m. Overpulls of typically 30 K observed. Backream to 1395 m. Large volumes of cuttings returned to surface on bottoms up of all circulations. POOH to 1220 m.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
Potassium Chloride brine	42 gal bbl		120	120		$ 1,866.00
Glycol CP	1500 l bulk	5		1	4	$ 4,386.83
DRILLZAN-D	25 Kg bag	108		4	104	$ 1,125.52
DEXTRID LT	25 Kg bag	151		18	133	$ 709.38
phpa	25 Kg bag	147		6	141	$ 570.30
barite	100 lb bulk	730		60	670	$ 532.20
PAC-L	25 Kg bag	57		4	53	$ 443.36
Baracide	25 Kg can	11		1	10	$ 317.97
BARACOR 129	25 Kg can	16		3	13	$ 136.20
potassium hydroxide	20 Kg pail	11		4	7	$ 130.88
soda ash	25 Kg bag	37		2	35	$ 21.34
BARABLOK	50 lb bag	120			120	
BARACARB 100	1200 Kg bulk	4			4	
BARACARB 25	1200 Kg bulk	4			4	
BARACARB 25	25 KG.BAG	48			48	
BARA-DEFOAM W300	25 l can	3			3	
BARAFILM	55 Gal drum	1			1	
BAROFIBRE	25 lb bag	40			40	
caustic soda	25 Kg pail	16			16	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	1			1	
CON DET	5 gal can	20			20	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	25			25	
Hme Energizer	5 gal can	3			3	

Daily Products Cost	$ 10,239.98	Total Daily Cost	$ 11,179.98
Cummulative Products Cost	$ 105,369.14	Total Cummulative Cost	$ 117,589.14

Baroid Representatives: Clive Da Silva Justin Lewis

Office 90 Talinga Rd Melbourne Tel 61-03-9581-7555

Warehouse c/o of Esso Australia Ltd via Toora Victoria Tel 61-3-56-881-445

Solid Control Equipment

Shaker	Screens			Hrs
Derrick	80	80	80	22.0
Derrick	50	50	50	22.0

Time (Hrs)	
Drilling	13.00
Circulating	7.00
Trips	2.00
Rig	
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	2.00
Total	24.00
Rotating	13.00
ROP	47.95
Dil Rate	

Fluid Volume Breakdown . KCl/PHPA/GLYCOL

Active	bbl	Additions	bbl	Losses	bbl
Annulus	552.6	Oil		Dumped	-25.0
Pipe Cap	64.4	Drill Water		Transferred	
Active Pits	303.0	Dewatering		SC Equip	-74.0
Total Hole	617.0	Sea Water	0.5	Evaporation	
Total Circ	557.1	Whole Mud	160.1	Trips	
Reserve	51.0	Barite	4.1	Other	
Prev Vol	895.3	Chemicals	9.9	Total Surface	-99.0
Net Chg	75.6	Other Adds.		Downhole	
Total Vol	971.0	Total Added	174.6	Total Losses	-99.0

Other Fluid Types	Vol bbl
Potassium Chloride brine	400.0
Premix	182.0

Deviation Information	
Survey MD	2,777 m
Survey TVD	1,328 m
Angle	47.80
Direction	292
Horiz Displ.	2,236 m

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Daily Drilling Fluid Report

Baroid, a Halliburton Company

Report No 015

Date	9/08/2002	Depth	2,796.0 m
Spud Date	27/07/2002	Rig Activity	Tripping

Operator	Report For	Well Name
Esso Australia Ltd	Brian Davis / Glenn Campbell	A-29
Contractor	**Report For**	**Rig Name**
ISDL	John Obrien / Rob Balfour	#453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information

Bit Size	in
Make/Type	/
Jets	
TFA	sq-in
Jets Velocity	143 ft/sec
Jet Impact Force	479.3 lbf
HHSI	1.21 hhp/in2
Pres Drop @ Bit	191.6 psi
Bit Depth	m
ECD @ Shoe	12.16 ppg
ECD @ Bit	13.07 ppg

Drill String

ITEM	OD in	ID in	Length m
Open Hole	8.500		1,868.0

Casing

OD in	Set	MD m
20.000	@	164.9
9.625	@	928.0

Leak Off 16.10 ppg

Circulation/Hydraulics Data

Model	GD PZ-9	GD PZ-9
Bore in	6.000	6.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.076	.076
SPM	96	96
gpm	308	308

Total gpm	615	AV, Riser		Circ Pressure psi	2,650.0
Total Circ Time	59.9	AV, DP	299.6	Tot Prs Loss psi	2,841.9
BU Time, min	29.1	AV, DC	502.8	Pres Drop DP psi	1,182.9
Total Strokes	11,501	BU Stroke	5,595	Pres Drop An psi	574.3

Properties

Properties	1	2 Hyd	3	4	Targets 1	2	3	4	Program
Source	Chemical	Flow Line							
Time	10:30	14:30							
Depth m	2,796.0	2,796.0							
FL Temp Deg C	57	57							
Density ppg @ Deg C	10.55 @ 45	10.55 @ 42							8.80 | 11.00
FV @ Deg C	95 @ 45	93 @ 42							
PV @ Deg C	29 @ 49	27 @ 49							
YP lbs/100 ft2	47	45							
Gels lbs/100 ft2	13/28/0	12/28/0							
600/300	105/76	99/72							
200/100	64/48	61/45							
6/3	14/12	14/11							
API Filt ml/30 min	2.8	3.0							| 6.0
HTHP ml/30 min @Deg C	9.4 @ 120	9.4 @ 120							| 15.0
Cake 32nd in	1.0/2.0	1.0/2.0							
Corr Solids % by vol	10.4	10.4							
NAP/Water % by vol	0.0/86.0	0.0/86.0							
Sand % by vol	1.75	1.75							
MBT ppb Eq.	15.0	15.0							
pH	9.00	9.00							8.80 | 9.50
Alk Mud (Pm)	0.95	0.90							
Alk Filt (Pf/Mf)	0.08/0.60	0.06/0.45							
Chlorides mg/l	47,900	47,800							
Hard Ca mg/l	240	240							
LGS/HGS %	7.6/2.8	7.6/2.8							
LGS/HGS ppb	69.28/40.67	69.36/40.66							
ASG	3.026	3.026							
6 rpm -	14	14							10 | 15
Glycol Content % by vol	4.0	4.0							3.0 | 4.0
PHPA Concentr ppb	1.30	1.25							

Fluid Treatments

Fluid Type: KCl/PHPA/GLYCOL

Added small volume of Premix to active while washing reaming and circulating.
Mix slug for tripping.

Premix Mud Made :- 0 bbls
Total for 8 1/2" Hole :- 2236 bbls

Rig Activity

Continue to POOH from 1220 m to 1126 m. 20 K overpull observed. Backream to 926 m. Slip and cut drill line and service rig at the shoe. RIH to 2487m wash and ream to 2565m. Run to bottom, wash down last stand as precautionary measure. MWD tool not working circulate bottoms up, and pull out of the hole.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
barite	100 lb bulk	670		95	575	$ 842.65
BARABLOK	50 lb bag	120			120	
BARACARB 100	1200 Kg bulk	4			4	
BARACARB 25	1200 Kg bulk	4			4	
BARACARB 25	25 KG.BAG	48			48	
Baracide	25 Kg can	10			10	
BARACOR 129	25 Kg can	13			13	
BARA-DEFOAM W300	25 l can	3			3	
BARAFILM	55 Gal drum	1			1	
BAROFIBRE	25 lb bag	40			40	
caustic soda	25 Kg pail	16			16	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	1			1	
CON DET	5 gal can	20			20	
DEXTRID LT	25 Kg bag	133			133	
DRILLZAN-D	25 Kg bag	104			104	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	25			25	
Glycol CP	1500 l bulk	4			4	
Hme Energizer	5 gal can	3			3	
KCl - Tech.	25 Kg bag	34			34	
KCl Ag grade	1000 Kg bulk	2			2	
lime	20 Kg bag	16			16	
PAC-L	25 Kg bag	53			53	
phpa	25 Kg bag	141			141	

Daily Products Cost	$ 842.65	Total Daily Cost	$ 1,782.65
Cummulative Products Cost	$ 106,211.79	Total Cummulative Cost	$ 119,371.79

Solid Control Equipment

Shaker	Screens			Hrs
Derrick	80	80	80	8.0
Derrick	50	50	50	8.0

Time (Hrs)

Drilling	
Circulating	3.00
Trips	8.00
Rig	1.00
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	4.00
Testing	
Logging	
Dir Work	
Repair	
Other	8.00
Total	24.00
Rotating	4.00
ROP	
Dil Rate	

Fluid Volume Breakdown KCl/PHPA/GLYCOL

Active	bbl	Additions	bbl	Losses	bbl
Annulus	653.0	Oil		Dumped	-30.0
Pipe Cap		Drill Water		Transferred	
Active Pits	229.0	Dewatering		SC Equip	-47.4
Total Hole	653.0	Sea Water		Evaporation	
Total Circ	229.0	Whole Mud	33.0	Trips	
Reserve	51.0	Barite	6.5	Other	
Prev Vol	971.0	Chemicals		Total Surface	-77.4
Net Chg	-37.9	Other Adds.		Downhole	
Total Vol	933.0	Total Added	39.5	Total Losses	-77.4

Other Fluid Types	Vol bbl
Potassium Chloride brine	400.0
Premix	149.0

Deviation Information

Survey MD	2,777 m
Survey TVD	1,328 m
Angle	47.80
Direction	292
Horiz Displ.	2,236 m

Baroid Representatives: Clive Da Silva Justin Lewis

Office 90 Talinga Rd Melbourne Tel 61-03-9581-7555

Warehouse c/o of Esso Australia Ltd via Toora Victoria Tel 61-3-56-881-445

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Daily Drilling Fluid Report

Barold, a Halliburton Company

Report No 016

Date 10/08/2002	Depth 2,971.0 m
Spud Date 27/07/2002	Rig Activity Drilling

Operator	Report For	Well Name
Esso Australia Ltd	Brian Davis / Glenn Campbell	A-29
Contractor	**Report For**	**Rig Name**
ISDL	John Obrien / Rob Balfour	#453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information	
Bit Size	8.500 in
Make/Type	GEO / S73HPX
Jets	8x15
TFA	1.381 sq-in
Jets Velocity	143 ft/sec
Jet Impact Force	486.2 lbf
HHSI	1.23 hhp/in2
Pres Drop @ Bit	194.3 psi
Bit Depth	2,971.0 m
ECD @ Shoe	12.35 ppg
ECD @ Bit	13.18 ppg

Drill String ITEM	OD in	ID in	Length m
Drill Pipe	5.000	4.276	2,787.2
Drill Pipe	5.000	3.000	100.1
Drill Collar	6.500	2.750	9.8
Drill Pipe	5.000	3.000	26.9
Drill Collar	6.500	2.250	39.4
Drill Motor	6.750	0.000	7.6
Open Hole	8.500		2,043.0

Casing OD in	Set	MD m
20.000	@	164.9
9.625	@	928.0
Leak Off		16.10 ppg

Circulation/Hydraulics Data

Model	GD PZ-9	GD PZ-9
Bore in	6.000	6.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.076	.076
SPM	96	96
gpm	308	308

Total gpm	615	AV, Riser		Circ Pressure	psi	2,270.0
Total Circ Time	42.2	AV, DP	299.6	Tot Prs Loss	psi	3,114.1
BU Time, min	30.9	AV, DC	502.8	Pres Drop DP	psi	1,401.2
Total Strokes	8,095	BU Stroke	5,940	Pres Drop An	psi	623.0

Properties	1	2	3	4	Targets 1	2	3	4	Program
Source	Flow Line	Flow Line	Flow Line						
Time	11:00	14:05	23:00						
Depth m	2,800.0	2,830.0	2,245.0						
FL Temp Deg C	58	57	62						
Density ppg @ Deg C	10.50 @ 45	10.70 @ 45	10.40 @ 45						8.80 | 11.00
FV @ Deg C	99 @ 45	97 @ 45	68 @ 45						
PV @ Deg C	29 @ 49	28 @ 49	24 @ 49						
YP lbs/100 ft2	47	45	37						
Gels lbs/100 ft2	14/30/0	13/29/0	9/18/0						
600/300	105/76	101/73	85/61						
200/100	64/48	63/46	50/36						
6/3	14/12	14/11	11/8						
API Filt ml/30 min	3.0	2.6	2.8						| 6.0
HTHP ml/30 min @Deg C	9.2 @ 120	9.2 @ 120	10.0 @ 120						| 15.0
Cake 32nd in	1.0/2.0	1.0/2.0	1.0/2.0						
Corr Solids % by vol	10.3	11.4	9.9						
NAP/Water % by vol	0.0/86.0	0.0/85.0	2.0/84.5						
Sand % by vol	1.75	1.75	2.00						
MBT ppb Eq.	17.5	17.5	15.0						
pH	9.00	9.00	8.80						8.80 | 9.50
Alk Mud (Pm)	0.95	0.95	0.60						
Alk Filt (Pf/Mf)	0.08/0.60	0.06/0.50	0.03/0.30						
Chlorides mg/l	48,500	48,500	48,000						
Hard Ca mg/l	240	200	220						
LGS/HGS %	7.9/2.4	8.5/2.9	7.6/2.3						
LGS/HGS ppb	72.22/35.22	77.21/42.51	69.13/34.39						
ASG	2.971	3.007	2.977						
6 rpm -	14	14	11						10 | 15
Glycol Content % by vol	4.0	4.0	4.0						3.0 | 4.0
PHPA Concentr ppb	1.25	1.25	1.25						

Fluid Treatments

Fluid Type: KCl/PHPA/GLYCOL

Added 6 ppb BARACARB-100 and BARACARB-25 to active system starting at 2796m prior to entering the Latrobe formation, maintain BARACARB additions while drilling ahead. Transfer Premix to active mud to maintain volume and mud properties. Add BARACOR-129, Caustic Potash and Glycol to maintain these Properties in the mud.

Premix Mud Made :- 241 bbls
Total for 8 1/2" Hole :- 2477 bbls

Rig Activity

RIH to bottom with no problems. Drill steer and survey 8 1/2 " hole from 2796m to 2971m.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
Potassium Chloride brine	42 gal bbl		180	180		$ 2,799.00
Finagreen EBL	55 Gal drum	25		16	9	$ 19,619.68
Glycol CP	1500 l bulk	4		1	3	$ 4,386.83
DRILLZAN-D	25 Kg bag	104		8	96	$ 2,251.04
DEXTRID LT	25 Kg bag	133		27	106	$ 1,064.07
BARACARB 100	1200 Kg bulk	4		2	2	$ 1,000.10
phpa	25 Kg bag	141		9	132	$ 855.45
BARACARB 25	1200 Kg bulk	4		2	2	$ 793.38
BARACARB 25	25 KG.BAG	48		27	21	$ 223.02
PAC-L	25 Kg bag	53		6	47	$ 665.04
Baracide	25 Kg can	10		1	9	$ 317.97
BARACOR 129	25 Kg can	13		6	7	$ 272.40
potassium hydroxide	20 Kg pail	7		7		$ 229.04
barite	100 lb bulk	575		25	550	$ 221.75
caustic soda	25 Kg pail	16		4	12	$ 128.00
soda ash	25 Kg bag	35		3	32	$ 32.01
BARABLOK	50 lb bag	120			120	
BARA-DEFOAM W300	25 l can	3			3	
BARAFILM	55 Gal drum	1			1	
BAROFIBRE	25 lb bag	40			40	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	1			1	
CON DET	5 gal can	20			20	
EZ MUD-AZ	25 Kg pail	8			8	
Hme Energizer	5 gal can	3			3	

Solid Control Equipment

Shaker	Screens			Hrs
Derrick	80	80	80	16.0
Derrick	50	50	50	16.0

Time (Hrs)	
Drilling	16.00
Circulating	
Trips	4.00
Rig	
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	4.00
Total	24.00
Rotating	16.00
ROP	35.88
Dil Rate	

Fluid Volume Breakdown KCl/PHPA/GLYCOL

Active	bbl	Additions	bbl	Losses	bbl
Annulus	453.4	Oil		Dumped	-160.0
Pipe Cap	164.5	Drill Water		Transferred	
Active Pits		Dewatering		SC Equip	-114.1
Total Hole	617.9	Sea Water		Evaporation	
Total Circ	617.9	Whole Mud	263.1	Trips	
Reserve	349.0	Barite	1.7	Other	
Prev Vol	400.0	Chemicals	43.1	Total Surface	-274.1
Net Chg	33.8	Other Adds.		Downhole	
Total Vol	520.0	Total Added	307.9	Total Losses	-274.1

Other Fluid Types	Vol bbl
Potassium Chloride brine	520.0
Premix	127.0

Deviation Information	
Survey MD	2,949 m
Survey TVD	1,455 m
Angle	36.50
Direction	309
Horiz Displ.	2,345 m

Daily Products Cost	$ 34,858.78	Total Daily Cost	$ 35,798.78
Cummulative Products Cost	$ 141,070.57	Total Cummulative Cost	$ 155,170.57

Baroid Representatives: Clive Da Silva Justin Lewis
Office 90 Talinga Rd Melbourne Tel 61-03-9581-7555
Warehouse c/o of Esso Australia Ltd via Toora Victoria Tel 61-3-56-881-445

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Daily Drilling Fluid Report

Baroid, a Halliburton Company

Report No 017

Date 11/08/2002	Depth 3,075.0 m
Spud Date 27/07/2002	Rig Activity Wiper Trip

Operator: Esso Australia Ltd	Report For: Brian Davis / Glenn Campbell	Well Name: A-29
Contractor: ISDL	Report For: John Obrien / Rob Balfour	Rig Name: #453
Country: Australia / State/Province/Region: Victoria	County/Geographic Area: Bass Strait	Field or Block: Tuna

Bit Information

Bit Size	8.500	in
Make/Type	GEO / S73HPX	
Jets	8x15	
TFA	1.381	sq-in
Jets Velocity		ft/sec
Jet Impact Force		lbf
HHSI		hhp/in2
Pres Drop @ Bit		psi
Bit Depth	1,656.0	m
ECD @ Shoe	10.30	ppg
ECD @ Bit	10.30	ppg

Drill String

ITEM	OD in	ID in	Length m
Drill Pipe	5.000	4.276	1,472.2
Drill Pipe	5.000	3.000	100.1
Drill Collar	6.500	2.750	9.8
Drill Pipe	5.000	3.000	26.9
Drill Collar	6.500	2.250	39.4
Drill Motor	6.750	0.000	7.6
Open Hole	8.500		2,147.0

Casing

OD in	Set	MD m
20.000	@	164.9
9.625	@	928.0

Leak Off 16.10 ppg

Circulation/Hydraulics Data

Model	GD PZ-9	GD PZ-9
Bore in	6.000	6.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.076	.076
SPM		
gpm		

Total gpm		AV, Riser		Circ Pressure psi	
Total Circ Time		AV, DP		Tot Prs Loss psi	650.0
BU Time, min		AV, DC		Pres Drop DP psi	
Total Strokes		BU Stroke		Pres Drop An psi	

Properties

Properties	1	2	3	4	Targets 1	2	3	4	Program
Source	Flow Line	Flow Line	Suction						
Time	08:00	13:00	23:30						
Depth m	3,039.0	3,075.0	3,075.0						
FL Temp Deg C	57	57							
Density ppg @ Deg C	10.30 @ 45	10.30 @ 45	10.35 @ 30						8.80 | 11.00
FV @ Deg C	73 @ 45	71 @ 45	71 @ 30						
PV @ Deg C	28 @ 49	26 @ 49	27 @ 49						
YP lbs/100 ft2	39	41	40						
Gels lbs/100 ft2	11/22/0	12/21/0	9/19/0						
600/300	95/67	93/67	94/67						
200/100	55/42	54/41	56/40						
6/3	12/10	12/10	12/8						
API Filt ml/30 min	2.7	2.6	2.6						| 6.0
HTHP ml/30 min @Deg C	9.2 @ 120	9.2 @ 120	9.0 @ 120						| 15.0
Cake 32nd in	1.0/2.0	1.0/2.0	1.0/2.0						
Corr Solids % by vol	9.4	9.4	9.4						
NAP/Water % by vol	2.0/85.0	2.0/85.0	2.0/85.0						
Sand % by vol	1.75	1.75	2.00						
MBT ppb Eq.	15.0	15.0	15.0						
pH	9.00	9.00	9.00						8.80 | 9.50
Alk Mud (Pm)	0.50	0.60	0.75						
Alk Filt (Pf/Mf)	0.04/0.35	0.04/0.40	0.04/0.60						
Chlorides mg/l	47,900	48,000	48,000						
Hard Ca mg/l	200	200	220						
LGS/HGS %	7.3/2.1	7.3/2.1	6.9/2.5						
LGS/HGS ppb	66.71/30.73	66.63/30.74	63.22/36.25						
ASG	2.955	2.955	3.019						
6 rpm -	12	12	12						10 | 15
Glycol Content % by vol	4.0	4.0	4.0						3.0 | 4.0
PHPA Concentr ppb	1.25	1.25	1.25						

Fluid Treatments

Fluid Type: KCl/PHPA/GLYCOL

Reduce mud weight to 10.3 ppg while drilling with additions of Premix as per company request. Continue adding BARACARB, Glycol, DRILLZAN-D and BARACOR-129 to active system while drilling to T.D.
Added 2% Finagreen-EBL starting at 2905 m yesterday.
Mixed a slug. Added 6 ppb BARABLOK to active mud to control coal sloughing.

Premix Mud Made :- 244 bbls (incl. 122 bbls yesterday)
Total for 8 1/2" Hole :- 2721 bbls

Rig Activity

Drill slide and survey from 2971m to 3075 m T.D. Reach T.D. at 10:45 hrs 11/08/02. Circulate 2x Latrobe hole volume. Backream to one stand above top of Latrobe, circulate hole clean. RIH back to T.D. Circulate hole clean again, backream to top of Latrobe circulate hole clean. RIH to bottom circulate hole clean and add BARABLOK. Rack back 12 stands and circulate 3x bottoms up. Continue to POOH to shoe.

Products

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
Potassium Chloride brine	42 gal bbl		60	60		$ 933.00
Glycol CP	1500 l bulk	3		1	2	$ 4,386.83
BARABLOK	50 lb bag	120		80	40	$ 2,664.00
DRILLZAN-D	25 Kg bag	96		6	90	$ 1,688.28
barite	100 lb bulk	550		50	500	$ 443.50
DEXTRID LT	25 Kg bag	106		9	97	$ 354.69
Baracide	25 Kg can	9		1	8	$ 317.97
phpa	25 Kg bag	132		3	129	$ 285.15
BARACOR 129	25 Kg can	7		6	1	$ 272.40
PAC-L	25 Kg bag	47		2	45	$ 221.68
BARACARB 25	1200 Kg bulk	2			2	
BARACARB 25	25 KG.BAG	21		21		$ 173.46
Hme Energizer	5 gal can	3		1	2	$ 111.99
caustic soda	25 Kg pail	12		1	11	$ 32.00
soda ash	25 Kg bag	32		1	31	$ 10.67
BARACARB 100	1200 Kg bulk	2			2	
BARA-DEFOAM W300	25 l can	3			3	
BARAFILM	55 Gal drum	1			1	
BAROFIBRE	25 lb bag	40			40	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	1	4		5	
CON DET	5 gal can	20			20	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	9			9	
KCl - Tech.	25 Kg bag	34			34	

Daily Products Cost	$ 11,895.62	Total Daily Cost	$ 12,835.62
Cummulative Products Cost	$ 152,966.19	Total Cummulative Cost	$ 168,006.19

Solid Control Equipment

Shaker	Screens			Hrs
Derrick	80	80	80	18.0
Derrick	50	50	50	18.0

Time (Hrs)

Drilling	11.00
Circulating	3.00
Trips	5.00
Rig	
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	2.00
Testing	
Logging	
Dir Work	
Repair	
Other	3.00
Total	24.00
Rotating	13.00
ROP	31.02
Dil Rate	

Fluid Volume Breakdown KCl/PHPA/GLYCOL

Active	bbl	Additions	bbl	Losses	bbl
Annulus	582.1	Oil		Dumped	-100.0
Pipe Cap	89.0	Drill Water		Transferred	
Active Pits		Dewatering		SC Equip	-108.9
Total Hole	671.1	Sea Water		Evaporation	
Total Circ	344.4	Whole Mud	229.3	Trips	
Reserve	341.0	Barite	3.4	Other	
Prev Vol	127.0	Chemicals	21.5	Total Surface	-208.9
Net Chg	45.3	Other Adds.		Downhole	
Total Vol	20.0	Total Added	254.2	Total Losses	-208.9

Other Fluid Types	Vol bbl
Potassium Chloride brine	460.0
Premix	20.0

Deviation Information

Survey MD	3,075 m
Survey TVD	1,563 m
Angle	26.61
Direction	314
Horiz Displ.	450 m

Baroid Representatives: Clive Da Silva Justin Lewis
Office 90 Talinga Rd Melbourne Tel 61-03-9581-7555
Warehouse c/o of Esso Australia Ltd via Toora Victoria Tel 61-3-56-881-445

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Daily Drilling Fluid Report

Barold, a Halliburton Company

Report No 018

Date 12/08/2002	Depth 3,075.0 m
Spud Date 27/07/2002	Rig Activity Wiper Trip

Operator: Esso Australia Ltd	Report For: Brian Davis / Glenn Campbell	Well Name: A-29
Contractor: ISDL	Report For: John Obrien / Rob Balfour	Rig Name: #453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information

Bit Size	8.500	in
Make/Type	GEO / S73HPX	
Jets	8x15	
TFA	1.381	sq-in
Jets Velocity		ft/sec
Jet Impact Force		lbf
HHSI		hhp/in2
Pres Drop @ Bit		psi
Bit Depth	885.0	m
ECD @ Shoe	10.30	ppg
ECD @ Bit	10.30	ppg

Drill String

ITEM	OD in	ID in	Length m
Drill Pipe	5.000	4.276	701.2
Drill Pipe	5.000	3.000	100.1
Drill Collar	6.500	2.750	9.8
Drill Pipe	5.000	3.000	26.9
Drill Collar	6.500	2.250	39.4
Drill Motor	6.750	0.000	7.6
Open Hole	8.500		2,147.0

Casing

OD in	Set	MD m
20.000	@	164.9
9.625	@	928.0

Leak Off 16.10 ppg

Circulation/Hydraulics Data

Model	GD PZ-9	GD PZ-9
Bore in	6.000	6.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.076	.076
SPM		
gpm		

Total gpm	AV, Riser	Circ Pressure psi
Total Circ Time	AV, DP	Tot Prs Loss psi 650.0
BU Time, min	AV, DC	Pres Drop DP psi
Total Strokes	BU Stroke	Pres Drop An psi

Properties

Properties	1	2	3	4	Targets 1	2	3	4	Program
Source	Chemical	Flow Line	Suction						
Time	10:00	12:30	23:30						
Depth m	3,075.0	3,075.0	3,075.0						
FL Temp Deg C		57							
Density ppg @ Deg C	10.30 @ 40	10.30 @ 40	10.30 @ 30						8.80 | 11.00
FV @ Deg C	71 @ 30	73 @ 40	72 @ 30						
PV @ Deg C	25 @ 49	26 @ 49	26 @ 49						
YP lbs/100 ft2	35	36	36						
Gels lbs/100 ft2	11/21/0	12/22/0	11/22/0						
600/300	85/60	88/62	88/62						
200/100	50/40	52/41	52/41						
6/3	11/9	11/9	11/9						
API Filt ml/30 min	2.4	2.4	2.4						| 6.0
HTHP ml/30 min @Deg C	9.0 @ 120	9.0 @ 120	9.0 @ 120						| 15.0
Cake 32nd in	1.0/2.0	1.0/2.0	1.0/2.0						
Corr Solids % by vol	9.5	9.4	9.4						
NAP/Water % by vol	2.0/85.0	2.0/85.0	2.0/85.0						
Sand % by vol	1.75	1.75	2.00						
MBT ppb Eq.	15.0	15.0	15.0						
pH	9.00	9.00	9.10						8.80 | 9.50
Alk Mud (Pm)	0.80	0.70	0.75						
Alk Filt (Pf/Mf)	0.06/0.40	0.06/0.50	0.06/0.50						
Chlorides mg/l	47,300	47,500	48,000						
Hard Ca mg/l	200	200	220						
LGS/HGS %	7.4/2.1	7.4/2.1	7.3/2.1						
LGS/HGS ppb	67.18/30.67	67.02/30.69	66.63/30.74						
ASG	2.953	2.953	2.955						
6 rpm	12	12	11						10 | 15
Glycol Content % by vol	4.0	4.0	4.0						3.0 | 4.0
PHPA Concentr ppb	1.25	1.25	1.25						

Fluid Treatments

Fluid Type: KCl/PHPA/GLYCOL

Added Premix while circulating and backreaming to clean hole on wiper trip to maintain mud properties and volume.
Mix slug.

Premix Mud Made :- 122 bbls
Total for 8 1/2" Hole :- 2843 bbls

Rig Activity

RIH to bottom, wash down last stand as precautionary measure. Circulate hole clean no coal sloughing, pump slug then pull out to the shoe. Wait on weather due to high winds, breaking circulation every hour.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
Potassium Chloride brine	42 gal bbl		60	60		$ 933.00
DRILLZAN-D	25 Kg bag	90		3	87	$ 844.14
barite	100 lb bulk	500		40	460	$ 354.80
DEXTRID LT	25 Kg bag	97		9	88	$ 354.69
Baracide	25 Kg can	8		1	7	$ 317.97
phpa	25 Kg bag	129		3	126	$ 285.15
PAC-L	25 Kg bag	45		2	43	$ 221.68
caustic soda	25 Kg pail	11		1	10	$ 32.00
soda ash	25 Kg bag	31		1	30	$ 10.67
BARABLOK	50 lb bag	40			40	
BARACARB 100	1200 Kg bulk	2			2	
BARACARB 25	1200 Kg bulk	2			2	
BARACOR 129	25 Kg can	1			1	
BARA-DEFOAM W300	25 l can	3			3	
BARAFILM	55 Gal drum	1			1	
BAROFIBRE	25 lb bag	40			40	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	5			5	
CON DET	5 gal can	20			20	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	9			9	
Glycol CP	1500 l bulk	2			2	
Hme Energizer	5 gal can	2			2	
KCl - Tech.	25 Kg bag	34			34	
KCl Ag grade	1000 Kg bulk	2			2	

Daily Products Cost	$ 3,354.10	Total Daily Cost	$ 4,294.10
Cummulative Products Cost	$ 156,320.29	Total Cummulative Cost	$ 172,300.29

Solid Control Equipment

Shaker	Screens			Hrs
Derrick	80	80	80	8.0
Derrick	50	50	50	8.0

Time (Hrs)

Drilling	
Circulating	4.00
Trips	8.00
Rig	
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	4.00
Testing	
Logging	
Dir Work	
Repair	
Other	8.00
Total	24.00
Rotating	4.00
ROP	
Dil Rate	

Fluid Volume Breakdown KCl/PHPA/GLYCOL

Active	bbl	Additions	bbl	Losses	bbl
Annulus	643.6	Oil		Dumped	
Pipe Cap	44.8	Drill Water		Transferred	
Active Pits	229.0	Dewatering		SC Equip	-54.8
Total Hole	688.3	Sea Water		Evaporation	
Total Circ	412.6	Whole Mud	22.3	Trips	
Reserve	50.0	Barite	2.7	Other	-15.0
Prev Vol	1,012.1	Chemicals		Total Surface	-69.8
Net Chg	-44.8	Other Adds.		Downhole	
Total Vol	967.3	Total Added	25.0	Total Losses	-69.8

Other Fluid Types	Vol bbl
Potassium Chloride brine	400.0
Premix	120.0

Deviation Information

Survey MD	3,075 m
Survey TVD	1,563 m
Angle	26.61
Direction	314
Horiz Displ.	450 m

Baroid Representatives: Clive Da Silva Justin Lewis

Office 90 Talinga Rd Melbourne Tel 61-03-9581-7555

Warehouse c/o of Esso Australia Ltd via Toora Victoria Tel 61-3-56-881-445

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Daily Drilling Fluid Report

Baroid, a Halliburton Company

Report No 019

Date 13/08/2002	Depth 3,075.0 m
Spud Date 27/07/2002	Rig Activity Tripping

Operator	Report For	Well Name
Esso Australia Ltd	Brian Davis / Glenn Campbell	A-29
Contractor	**Report For**	**Rig Name**
ISDL	John Obrien / Rob Balfour	#453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information		
Bit Size	8.500	in
Make/Type	GEO / S73HPX	
Jets	8x15	
TFA	1.381	sq-in
Jets Velocity		ft/sec
Jet Impact Force		lbf
HHSI		hhp/in2
Pres Drop @ Bit		psi
Bit Depth	190.0 m	
ECD @ Shoe	10.30 ppg	
ECD @ Bit	10.30 ppg	

Drill String ITEM	OD in	ID in	Length m
Drill Pipe	5.000	4.276	6.2
Drill Pipe	5.000	3.000	100.1
Drill Collar	6.500	2.750	9.8
Drill Pipe	5.000	3.000	26.9
Drill Collar	6.500	2.250	39.4
Drill Motor	6.750	0.000	7.6
Open Hole		8.500	2,147.0

Casing OD in	Set	MD m
20.000	@	164.9
9.625	@	928.0
Leak Off		16.10 ppg

Circulation/Hydraulics Data

Model	GD PZ-9	GD PZ-9
Bore in	6.000	6.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.076	.076
SPM		
gpm		

Total gpm		AV, Riser		Circ Pressure psi	
Total Circ Time		AV, DP		Tot Prs Loss psi	650.0
BU Time, min		AV, DC		Pres Drop DP psi	
Total Strokes		BU Stroke		Pres Drop An psi	

Properties	1	2	3	4	Targets 1	2	3	4	Program
Source	Suction	Suction							
Time	10:00	23:30							
Depth m	3,075.0	3,075.0							
FL Temp Deg C									
Density ppg @ Deg C	10.30 @ 30	10.30 @ 25							8.80 | 11.00
FV @ Deg C	70 @ 30	74 @ 25							
PV @ Deg C	25 @ 49	28 @ 49							
YP lbs/100 ft2	34	42							
Gels lbs/100 ft2	10/20/0	11/22/0							
600/300	84/59	98/70							
200/100	49/39	58/41							
6/3	10/9	13/10							
API Filt ml/30 min	2.4	2.5							| 6.0
HTHP ml/30 min @Deg C	9.0 @ 120	9.0 @ 120							| 15.0
Cake 32nd in	1.0/2.0	1.0/2.0							
Corr Solids % by vol	9.4	9.4							
NAP/Water % by vol	2.0/85.0	2.0/85.0							
Sand % by vol	1.75	2.00							
MBT ppb Eq.	12.5	15.0							
pH	9.00	9.00							8.80 | 9.50
Alk Mud (Pm)	0.70	0.80							
Alk Filt (Pf/Mf)	0.06/0.45	0.04/0.60							
Chlorides mg/l	48,000	48,000							
Hard Ca mg/l	200	220							
LGS/HGS %	7.3/2.1	7.3/2.1							
LGS/HGS ppb	66.63/30.74	66.63/30.74							
ASG	2.955	2.955							
6 rpm -	10	13							10 | 15
Glycol Content % by vol	4.0	4.0							3.0 | 4.0
PHPA Concentr ppb	1.25	1.25							

Fluid Treatments

Fluid Type: KCl/PHPA/GLYCOL

Added Premix to maintain volume and properties on wiper trip and while circulating. Mix slug.

Add Finagreen to maintain 2% in active system prior to running the casing as per company request.

Premix Mud Made :- Nil

Total for 8 1/2" Hole :- 2843 bbls

Rig Activity

Wait on weather at the shoe. RIH to bottom, circulate hole clean and POOH.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
Finagreen EBL	55 Gal drum	9		5	4	$ 6,131.15
barite	100 lb bulk	460		40	420	$ 354.80
BARABLOK	50 lb bag	40			40	
BARACARB 100	1200 Kg bulk	2			2	
BARACARB 25	1200 Kg bulk	2			2	
Baracide	25 Kg can	7			7	
BARACOR 129	25 Kg can	1			1	
BARA-DEFOAM W300	25 l can	3			3	
BARAFILM	55 Gal drum	1			1	
BAROFIBRE	25 lb bag	40			40	
caustic soda	25 Kg pail	10			10	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	5			5	
CON DET	5 gal can	20			20	
DEXTRID LT	25 Kg bag	88			88	
DRILLZAN-D	25 Kg bag	87			87	
EZ MUD-AZ	25 Kg pail	8			8	
Glycol CP	1500 l bulk	2			2	
Hme Energizer	5 gal can	2			2	
KCl - Tech.	25 Kg bag	34			34	
KCl Ag grade	1000 Kg bulk	2			2	
lime	20 Kg bag	16			16	
PAC-L	25 Kg bag	43			43	
phpa	25 Kg bag	126			126	
salt	1200 Kg bulk	5			5	

Daily Products Cost	$ 6,485.95	Total Daily Cost	$ 7,425.95
Cummulative Products Cost	$ 162,806.24	Total Cummulative Cost	$ 179,726.24

Solid Control Equipment

Shaker	Screens			Hrs
Derrick	80	80	80	3.0
Derrick	50	50	50	3.0

Time (Hrs)	
Drilling	
Circulating	3.00
Trips	8.00
Rig	
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	13.00
Total	24.00
Rotating	
ROP	
Dil Rate	

Fluid Volume Breakdown KCl/PHPA/GLYCOL

Active	bbl	Additions	bbl	Losses	bbl
Annulus	698.9	Oil		Dumped	-10.0
Pipe Cap	4.9	Drill Water		Transferred	
Active Pits	298.0	Dewatering		SC Equip	-9.8
Total Hole	703.8	Sea Water		Evaporation	
Total Circ	330.2	Whole Mud	85.0	Trips	
Reserve	40.0	Barite	2.7	Other	
Prev Vol	967.3	Chemicals	6.5	Total Surface	-19.8
Net Chg	74.4	Other Adds.		Downhole	
Total Vol	1,041.8	Total Added	94.2	Total Losses	-19.8

Other Fluid Types	Vol bbl
Potassium Chloride brine	400.0
Premix	35.0

Deviation Information	
Survey MD	3,075 m
Survey TVD	1,563 m
Angle	26.61
Direction	314
Horiz Displ.	450 m

Baroid Representatives:	Clive Da Silva	Justin Lewis		
Office	90 Talinga Rd	Melbourne		Tel 61-03-9581-7555
Warehouse	c/o of Esso Australia Ltd	via Toora	Victoria	Tel 61-3-56-881-445

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Daily Drilling Fluid Report

Barold, a Halliburton Company

Report No 020

Date 14/08/2002	Depth 3,075.0 m
Spud Date 27/07/2002	Rig Activity Run Casing

Operator	Report For	Well Name
Esso Australia Ltd	Bruce Woodward / B. Sutherland	A-29
Contractor	**Report For**	**Rig Name**
ISDL	John Obrien / Rob Balfour	#453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information	
Bit Size	7.000 in
Make/Type	DUMMY / Open-Ended
Jets	55
TFA	55.000 sq-in
Jets Velocity	ft/sec
Jet Impact Force	lbf
HHSI	hhp/in2
Pres Drop @ Bit	psi
Bit Depth	2,179.0 m
ECD @ Shoe	10.30 ppg
ECD @ Bit	10.30 ppg

Drill String ITEM	OD in	ID in	Length m
Drill Collar	7.000	6.276	2,179.0
Open Hole	8.500		2,147.0

Casing OD in	Set	MD m
20.000	@	164.9
9.625	@	928.0
Leak Off		16.10 ppg

Circulation/Hydraulics Data		
Model	GD PZ-9	GD PZ-9
Bore in	6.000	6.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.076	.076
SPM		
gpm		

Total gpm	AV, Riser	Circ Pressure psi
Total Circ Time	AV, DP	Tot Prs Loss psi
BU Time, min	AV, DC	Pres Drop DP psi
Total Strokes	BU Stroke	Pres Drop An psi

Properties	1	2	3	4	Targets 1	2	3	4	Program
Source	Suction	Flow Line							
Time	07:30	23:30							
Depth m	3,075.0	3,075.0							
FL Temp Deg C									
Density ppg @ Deg C	10.30 @ 35	10.30 @ 30							8.80 | 11.00
FV @ Deg C	70 @ 35	72 @ 30							
PV @ Deg C	27 @ 49	28 @ 49							
YP lbs/100 ft2	39	37							
Gels lbs/100 ft2	10/22/0	11/22/0							
600/300	93/66	93/65							
200/100	55/42	54/42							
6/3	11/9	11/9							
API Filt ml/30 min	2.6	2.5							| 6.0
HTHP ml/30 min @Deg C	9.2 @ 120	9.0 @ 120							| 15.0
Cake 32nd in	1.0/2.0	1.0/2.0							
Corr Solids % by vol	9.5	9.4							
NAP/Water % by vol	2.0/85.0	2.0/85.0							
Sand % by vol	1.50	1.75							
MBT ppb Eq.	12.5	15.0							
pH	8.80	9.00							8.80 | 9.50
Alk Mud (Pm)	0.40	0.50							
Alk Filt (Pf/Mf)	0.05/0.30	0.04/0.40							
Chlorides mg/l	46,500	47,500							
Hard Ca mg/l	240	220							
LGS/HGS %	7.4/2.1	7.4/2.1							
LGS/HGS ppb	67.80/30.59	67.02/30.69							
ASG	2.949	2.953							
6 rpm -	11	11							10 | 15
Glycol Content % by vol	4.0	4.0							3.0 | 4.0
PHPA Concentr ppb	1.25	1.25							

Fluid Treatments

Fluid Type: KCl/PHPA/GLYCOL

Clean out Reserve pits for cement mix water.

Mix 140 bbls of Low Vis Premix.

Premix Mud Made :- 140 bbls
Total for 8 1/2" Hole :- 2983 bbls

Rig Activity

POOH, lay down BHA . Rig up and run 7" casing.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
Potassium Chloride brine	42 gal bbl		70	70		$ 1,088.50
Baracide	25 Kg can	7		3	4	$ 953.91
PAC-L	25 Kg bag	43		6	37	$ 665.04
DEXTRID LT	25 Kg bag	88		10	78	$ 394.10
caustic soda	25 Kg pail	10		2	8	$ 64.00
soda ash	25 Kg bag	30		2	28	$ 21.34
BARABLOK	50 lb bag	40			40	
BARACARB 100	1200 Kg bulk	2			2	
BARACARB 25	1200 Kg bulk	2			2	
BARACOR 129	25 Kg can	1			1	
BARA-DEFOAM W300	25 l can	3			3	
BARAFILM	55 Gal drum	1			1	
barite	100 lb bulk	420			420	
BAROFIBRE	25 lb bag	40			40	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	5			5	
CON DET	5 gal can	20			20	
DRILLZAN-D	25 Kg bag	87			87	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	4			4	
Glycol CP	1500 l bulk	2			2	
Hme Energizer	5 gal can	2			2	
KCl - Tech.	25 Kg bag	34			34	
KCl Ag grade	1000 Kg bulk	2			2	
lime	20 Kg bag	16			16	

Daily Products Cost	$ 3,186.89	Total Daily Cost	$ 4,126.89
Cummulative Products Cost	$ 165,993.13	Total Cummulative Cost	$ 183,853.13

Baroid Representatives: Clive Da Silva Justin Lewis

Office	90 Talinga Rd	Melbourne	Tel 61-03-9581-7555
Warehouse	c/o of Esso Australia Ltd	via Toora Victoria	Tel 61-3-56-881-445

Solid Control Equipment

Shaker	Screens	Hrs
Derrick		
Derrick		

Time (Hrs)	
Drilling	
Circulating	
Trips	10.00
Rig	
Surveys	
Fishing	
Run Casing	12.00
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	2.00
Total	24.00
Rotating	
ROP	
Dil Rate	

Fluid Volume Breakdown KCl/PHPA/GLYCOL

Active	bbl	Additions	bbl	Losses	bbl
Annulus	377.0	Oil		Dumped	-53.6
Pipe Cap	273.5	Drill Water		Transferred	
Active Pits	311.0	Dewatering		SC Equip	
Total Hole	650.5	Sea Water		Evaporation	
Total Circ	755.2	Whole Mud	35.0	Trips	
Reserve	62.0	Barite		Other	
Prev Vol	35.0	Chemicals	0.3	Total Surface	-53.6
Net Chg	-18.3	Other Adds.		Downhole	
Total Vol	140.0	Total Added	35.3	Total Losses	-53.6

Other Fluid Types	Vol bbl
Potassium Chloride brine	330.0
Premix	140.0

Deviation Information	
Survey MD	3,075 m
Survey TVD	1,563 m
Angle	26.61
Direction	314
Horiz Displ.	450 m

913712 443

Daily Drilling Fluid Report

Baroid, a Halliburton Company

Report No 021

Date 15/08/2002	Depth 3,075.0 m
Spud Date 27/07/2002	Rig Activity Wait on cement.

Operator	Report For	Well Name
Esso Australia Ltd	Bruce Woodward / B. Sutherland	A-29
Contractor	**Report For**	**Rig Name**
ISDL	Dave Milne / Rob Balfour	#453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information		
Bit Size	in	
Make/Type	/	
Jets		
TFA	sq-in	
Jets Velocity	ft/sec	
Jet Impact Force	lbf	
HHSI	hhp/in2	
Pres Drop @ Bit	psi	
Bit Depth	m	
ECD @ Shoe	10.00 ppg	
ECD @ Bit	10.00 ppg	

Drill String ITEM	OD in	ID in	Length m
Open Hole	8.500		8.0

Casing OD in	Set	MD m
20.000	@	164.9
9.625	@	928.0
7.000	@	3,067.0
Leak Off		16.10 ppg

Circulation/Hydraulics Data		
Model	GD PZ-9	GD PZ-9
Bore in	6.000	6.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.076	.076
SPM		
gpm		

Total gpm	AV, Riser	Circ Pressure psi
Total Circ Time	AV, DP	Tot Prs Loss psi
BU Time, min	AV, DC	Pres Drop DP psi
Total Strokes	BU Stroke	Pres Drop An psi

Properties	1	2	3	4	Targets 1	2	3	4	Program
Source	Flow Line	Slug							
Time	13:00	23:30							
Depth m	3,075.0	3,075.0							
FL Temp Deg C	57								
Density ppg @ Deg C	10.00 @ 40	10.00 @							8.80 | 11.00
FV @ Deg C	53 @ 40	54 @ 20							
PV @ Deg C	21 @ 49	22 @ 49							
YP lbs/100 ft2	24	24							
Gels lbs/100 ft2	6/12/0	6/12/0							
600/300	66/45	68/46							
200/100	35/26	35/26							
6/3	7/5	7/5							
API Filt ml/30 min	3.0	3.0							| 6.0
HTHP ml/30 min @Deg C	9.8 @ 120	9.8 @ 120							| 15.0
Cake 32nd in	1.0/2.0	1.0/2.0							
Corr Solids % by vol	7.5	7.4							
NAP/Water % by vol	2.0/87.0	2.0/87.0							
Sand % by vol	0.50	0.50							
MBT ppb Eq.	7.5	7.5							
pH	9.00	9.00							8.80 | 9.50
Alk Mud (Pm)	0.40	0.50							
Alk Filt (Pf/Mf)	0.09/0.35	0.07/0.40							
Chlorides mg/l	45,500	47,000							
Hard Ca mg/l	240	220							
LGS/HGS %	5.7/1.8	5.6/1.8							
LGS/HGS ppb	51.82/26.94	50.63/27.09							
ASG	2.990	2.998							
Glycol Content % by vol	4.0	4.0							3.0 | 4.0
PHPA ppb	1.00	1.00							
Potassium Chlori % by vol	8.0	8.0							6.0 | 8.0

Fluid Treatments

Fluid Type: KCl/PHPA/GLYCOL

Added 140 bbls low vis Premix to the active system to condition the mud prior to cementing as per program. Reduce Weight and Rheology as per company program.

Dump and clean out mud pits.

KCL sacks and Barite used for cement mix water.

Premix Mud Made :-Nil
Total for 8 1/2" Hole :- 2983 bbls

Rig Activity

Completed running 7" casing to 3067m. Rig up and circulate the casing while adding premix. Cement casing as per program, displace cement with mud. WOC. Rig down casing running equipment and jet wellhead. RIH seal assembly and pressure test.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
barite	100 lb bulk	420		110	310	$ 975.70
KCl - Tech.	25 Kg bag	34		14	20	$ 124.74
BARABLOK	50 lb bag	40			40	
BARACARB 100	1200 Kg bulk	2			2	
BARACARB 25	1200 Kg bulk	2			2	
Baracide	25 Kg can	4			4	
BARACOR 129	25 Kg can	1			1	
BARA-DEFOAM W300	25 l can	3			3	
BARAFILM	55 Gal drum	1			1	
BAROFIBRE	25 lb bag	40			40	
caustic soda	25 Kg pail	8			8	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	5	2		7	
CON DET	5 gal can	20			20	
DEXTRID LT	25 Kg bag	78			78	
DRILLZAN-D	25 Kg bag	87			87	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	4			4	
Glycol CP	1500 l bulk	2			2	
Hme Energizer	5 gal can	2			2	
KCl Ag grade	1000 Kg bulk	2			2	
lime	20 Kg bag	16			16	
PAC-L	25 Kg bag	37			37	
phpa	25 Kg bag	126			126	
salt	1200 Kg bulk	10	4		14	

Solid Control Equipment Shaker	Screens	Hrs
Derrick		
Derrick		

Time (Hrs)	
Drilling	
Circulating	3.00
Trips	
Rig	
Surveys	
Fishing	
Run Casing	12.00
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	9.00
Total	24.00
Rotating	
ROP	
Dil Rate	

Fluid Volume Breakdown KCl/PHPA/GLYCOL

Active	bbl	Additions	bbl	Losses	bbl
Annulus	386.9	Oil		Dumped	-670.0
Pipe Cap		Drill Water		Transferred	
Active Pits		Dewatering		SC Equip	-6.7
Total Hole	386.9	Sea Water		Evaporation	
Total Circ		Whole Mud	140.0	Trips	
Reserve	100.0	Barite		Other	
Prev Vol	140.0	Chemicals		Total Surface	-676.7
Net Chg	-536.7	Other Adds.		Downhole	
Total Vol		Total Added	140.0	Total Losses	-676.7

Daily Products Cost	$ 1,100.44	Total Daily Cost	$ 2,040.44
Cummulative Products Cost	$ 167,093.57	Total Cummulative Cost	$ 185,893.57

Other Fluid Types	Vol bbl
Potassium Chloride brine	330.0

Deviation Information	
Survey MD	3,075 m
Survey TVD	1,563 m
Angle	26.61
Direction	314
Horiz Displ.	450 m

Baroid Representatives: Clive Da Silva Justin Lewis
Office 90 Talinga Rd Melbourne Tel 61-03-9581-7555
Warehouse c/o of Esso Australia Ltd via Toora Victoria Tel 61-3-56-881-445

913712 444

Report No 022

Daily Drilling Fluid Report

Barold, a Halliburton Company

Date 16/08/2002	Depth 3,075.0 m
Spud Date 27/07/2002	Rig Activity 7" Scraper run.

Operator: Esso Australia Ltd	Report For: Bruce Woodward / B. Sutherland	Well Name: A-29
Contractor: ISDL	Report For: Dave Milne / Rob Balfour	Rig Name: #453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information

Bit Size	7.000 in
Make/Type	DBS / Scraper
Jets	5
TFA	5.000 sq-in
Jets Velocity	ft/sec
Jet Impact Force	lbf
HHSI	hhp/in2
Pres Drop @ Bit	psi
Bit Depth	2,400.0 m
ECD @ Shoe	8.90 ppg
ECD @ Bit	8.90 ppg

Drill String

ITEM	OD in	ID in	Length m
Drill Pipe	3.500	2.764	2,280.0
Drill Pipe	3.500	2.250	110.0
Drill Collar	4.000	2.250	10.0
Open Hole	8.500		8.0

Casing

OD in	Set	MD m
20.000	@	164.9
9.625	@	928.0
7.000	@	3,067.0
Leak Off		16.10 ppg

Circulation/Hydraulics Data

Model	GD PZ-9	GD PZ-9
Bore in	6.000	6.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.076	.076
SPM		
gpm		

Total gpm	AV, Riser	Circ Pressure psi
Total Circ Time	AV, DP	Tot Prs Loss psi
BU Time, min	AV, DC	Pres Drop DP psi
Total Strokes	BU Stroke	Pres Drop An psi

Properties

Properties	1 Hyd	2	3	4	Targets 1	2	3	4	Program
Source	Suction								
Time	12:30								
Depth m	3,075.0								
FL Temp Deg C									
Density ppg @ Deg C	8.90 @ 35								8.80 | 11.00
FV @ Deg C	28 @ 35								
PV @ Deg C	0 @								
YP lbs/100 ft2	0								
Gels lbs/100 ft2	0/0/0								
600/300	0/0								
200/100	0/0								
6/3	0/0								
API Filt ml/30 min	0.0								| 6.0
HTHP ml/30 min @Deg C									| 15.0
Cake 32nd in	0.0/0.0								
Corr Solids % by vol	0.0								
NAP/Water % by vol	0.0/1.0								
Sand % by vol	0.00								
MBT ppb Eq.	0.0								
pH	0.00				*				8.80 | 9.50
Alk Mud (Pm)	0.00								
Alk Filt (Pf/Mf)	0.00/0.00								
Chlorides mg/l	0								
Hard Ca mg/l	0								
LGS/HGS %	0.0/0.0								
LGS/HGS ppb	0.00/0.00								
ASG	0.000								

Fluid Treatments

Fluid Type: KCl/PHPA/GLYCOL

Mixing 590 bbls of 8.9 ppg NaCL Completion Brine.

Brine Made :- 590 bbls
Total Brine :- 590 bbls

Rig Activity

Pressure test BOP stack. Install wear bushing, make up 7" scraper BHA and RIH, picking up 3 1/2" drill pipe.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
salt	1200 Kg bulk	14		8	6	$ 2,564.16
BARABLOK	50 lb bag	40			40	
BARACARB 100	1200 Kg bulk	2			2	
BARACARB 25	1200 Kg bulk	2			2	
Baracide	25 Kg can	4			4	
BARACOR 129	25 Kg can	1			1	
BARA-DEFOAM W300	25 l can	3			3	
BARAFILM	55 Gal drum	1			1	
barite	100 lb bulk	310			310	
BAROFIBRE	25 lb bag	40			40	
caustic soda	25 Kg pail	8			8	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	7			7	
CON DET	5 gal can	20			20	
DEXTRID LT	25 Kg bag	78			78	
DRILLZAN-D	25 Kg bag	87			87	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	4			4	
Glycol CP	1500 l bulk	2			2	
Hme Energizer	5 gal can	2			2	
KCl - Tech.	25 Kg bag	20			20	
KCl Ag grade	1000 Kg bulk	2			2	
lime	20 Kg bag	16			16	
PAC-L	25 Kg bag	37			37	
phpa	25 Kg bag	126			126	

Daily Products Cost	$ 2,564.16	Total Daily Cost	$ 3,504.16
Cummulative Products Cost	$ 169,657.73	Total Cummulative Cost	$ 189,397.73

Solid Control Equipment

Shaker	Screens	Hrs
Derrick		
Derrick		

Time (Hrs)

Drilling	
Circulating	
Trips	18.00
Rig	
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	6.00
Total	24.00
Rotating	
ROP	
Dil Rate	

Fluid Volume Breakdown KCl/PHPA/GLYCOL

Active	bbl	Additions	bbl	Losses	bbl
Annulus	293.0	Oil		Dumped	-96.4
Pipe Cap	57.4	Drill Water		Transferred	
Active Pits		Dewatering		SC Equip	
Total Hole	350.5	Sea Water		Evaporation	
Total Circ	474.9	Whole Mud		Trips	
Reserve	40.0	Barite		Other	
Prev Vol	486.9	Chemicals		Total Surface	-96.4
Net Chg	-96.4	Other Adds.		Downhole	
Total Vol	390.5	Total Added		Total Losses	-96.4

Other Fluid Types	Vol bbl
Potassium Chloride brine	330.0
Sodium Chloride Brine	590.0

Deviation Information

Survey MD	3,075 m
Survey TVD	1,563 m
Angle	26.61
Direction	314
Horiz Displ.	450 m

Baroid Representatives: Clive Da Silva Justin Lewis

Office 90 Talinga Rd Melbourne Tel 61-03-9581-7555

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913712 445

Daily Drilling Fluid Report

Baroid, a Halliburton Company

Report No 023

Date 17/08/2002	Depth 3,075.0 m
Spud Date 27/07/2002	Rig Activity POOH, laying out drill pipe.

Operator Esso Australia Ltd	**Report For** Bruce Woodward / B. Sutherland	**Well Name** A-29
Contractor ISDL	**Report For** Dave Milne / Rob Balfour	**Rig Name** #453
Country Australia	**State/Province/Region** Victoria / **County/Geographic Area** Bass Strait	**Field or Block** Tuna

Bit Information	
Bit Size	7.000 in
Make/Type	DBS / Scraper
Jets	5
TFA	5.000 sq-in
Jets Velocity	25 ft/sec
Jet Impact Force	46.8 lbf
HHSI	0.03 hhp/in2
Pres Drop @ Bit	5.2 psi
Bit Depth	700.0 m
ECD @ Shoe	8.95 ppg
ECD @ Bit	8.95 ppg

Drill String ITEM	OD in	ID in	Length m
Drill Pipe	3.500	2.764	580.0
Drill Pipe	3.500	2.250	110.0
Drill Collar	4.000	2.250	10.0
Open Hole	8.500		8.0

Casing OD in	Set	MD m
20.000	@	164.9
9.625	@	928.0
7.000	@	3,067.0
Leak Off		16.10 ppg

Circulation/Hydraulics Data		
Model	GD PZ-9	GD PZ-9
Bore in	6.000	6.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.076	.076
SPM	62	62
gpm	199	199

Total gpm	398	AV, Riser		Circ Pressure psi	2,500.0
Total Circ Time	18.5	AV, DP	359.0	Tot Prs Loss psi	55.2
BU Time, min	6.4	AV, DC	416.6	Pres Drop DP psi	
Total Strokes	2,299	BU Stroke	792	Pres Drop An psi	

Properties	1 Hyd	2	3	4	Targets 1	2	3	4	Program
Source	Suction								
Time	10:45								
Depth m	3,075.0								
FL Temp Deg C									
Density ppg @ Deg C	8.95 @ 35								8.80 | 11.00
FV @ Deg C	28 @ 35								
PV @ Deg C	0 @								
YP lbs/100 ft2	0								
Gels lbs/100 ft2	0/0/0								
600/300	0/0								
200/100	0/0								
6/3	0/0								
API Filt ml/30 min	0.0								| 6.0
HTHP ml/30 min @Deg C									| 15.0
Cake 32nd in	0.0/0.0								
Corr Solids % by vol	0.0								
NAP/Water % by vol	0.0/1.0								
Sand % by vol	0.00								
MBT ppb Eq.	0.0								
pH	0.00				*				8.80 | 9.50
Alk Mud (Pm)	0.00								
Alk Filt (Pf/Mf)	0.00/0.00								
Chlorides mg/l	0								
Hard Ca mg/l	0								
LGS/HGS %	0.0/0.0								
LGS/HGS ppb	0.00/0.00								
ASG	0.000								

Fluid Treatments

Fluid Type: Sodium Chloride Brine

Wash last 2m of cement with seawater, pump 40 bbls hi-vis sweep and circulate out with seawater until clean. Displaced hole to 8.95 ppg Inhibited NaCL Brine. Added Coat-2748.

Received 190 bbls KCl Brine ex Kari-Ann.

Brine Made :- Nil
Total Brine :- 590 bbls

Rig Activity

RIH wash last 2m to bottom circulating seawater. Pump 40 bbl hi-vis sweep and displace to 8.95 ppg Inhibited Brine. Pressure test casing, wait on crane and POOH.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
Coat-2748	208 l drum	7		2	5	$ 1,404.34
BARABLOK	50 lb bag	40			40	
BARACARB 100	1200 Kg bulk	2			2	
BARACARB 25	1200 Kg bulk	2			2	
Baracide	25 Kg can	4			4	
BARACOR 129	25 Kg can	1			1	
BARA-DEFOAM W300	25 l can	3			3	
BARAFILM	55 Gal drum	1			1	
barite	100 lb bulk	310			310	
BAROFIBRE	25 lb bag	40			40	
caustic soda	25 Kg pail	8			8	
citric acid	25 Kg bag	20			20	
CON DET	5 gal can	20			20	
DEXTRID LT	25 Kg bag	78			78	
DRILLZAN-D	25 Kg bag	87			87	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	4			4	
Glycol CP	1500 l bulk	2			2	
Hme Energizer	5 gal can	2			2	
KCl - Tech.	25 Kg bag	20			20	
KCl Ag grade	1000 Kg bulk	2			2	
lime	20 Kg bag	16			16	
PAC-L	25 Kg bag	37			37	
phpa	25 Kg bag	126			126	
Potassium Chloride Bulk	80 lb bulk		190	190		

Daily Products Cost	$ 1,404.34	Total Daily Cost	$ 2,344.34
Cummulative Products Cost	$ 171,062.07	Total Cummulative Cost	$ 191,742.07

Baroid Representatives: Clive Da Silva Justin Lewis
Office 90 Talinga Rd Melbourne Tel 61-03-9581-7555
Warehouse c/o of Esso Australia Ltd via Toora Victoria Tel 61-3-56-881-445

Solid Control Equipment Shaker	Screens	Hrs
Derrick		
Derrick		

Time (Hrs)	
Drilling	
Circulating	3.00
Trips	12.00
Rig	
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	9.00
Total	24.00
Rotating	
ROP	
Dil Rate	

Fluid Volume Breakdown Sodium Chloride Brine

Active	bbl	Additions	bbl	Losses	bbl
Annulus	359.4	Oil		Dumped	-92.4
Pipe Cap	16.1	Drill Water		Transferred	
Active Pits	99.0	Dewatering		SC Equip	
Total Hole	375.5	Sea Water		Evaporation	
Total Circ	175.5	Whole Mud		Trips	
Reserve	15.0	Barite		Other	-8.1
Prev Vol	330.0	Chemicals		Total Surface	-100.5
Net Chg	-100.5	Other Adds.		Downhole	
Total Vol	520.0	Total Added		Total Losses	-100.5

Other Fluid Types	Vol bbl
Potassium Chloride brine	520.0

Deviation Information	
Survey MD	3,075 m
Survey TVD	1,563 m
Angle	26.61
Direction	314
Horiz Displ.	450 m

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Daily Drilling Fluid Report

Baroid, a Halliburton Company

Report No 024

Date 18/08/2002	Depth 3,075.0 m
Spud Date 27/07/2002	Rig Activity Run Completion Tubing

Operator	Report For	Well Name
Esso Australia Ltd	Bruce Woodward / B. Sutherland	A-29
Contractor	**Report For**	**Rig Name**
ISDL	Dave Milne / Rob Balfour	#453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information

Bit Size	3.500	in
Make/Type	DUMMY / Open-Ended	
Jets	8	
TFA	8.000	sq-in
Jets Velocity		ft/sec
Jet Impact Force		lbf
HHSI		hhp/in2
Pres Drop @ Bit		psi
Bit Depth	3,041.0	m
ECD @ Shoe		ppg
ECD @ Bit		ppg

Drill String

ITEM	OD in	ID in	Length m
Drill Collar	3.500	2.993	3,041.0
Open Hole	8.500		8.0

Casing

OD in	Set	MD m
20.000	@	164.9
9.625	@	928.0
7.000	@	3,067.0

Leak Off 16.10 ppg

Circulation/Hydraulics Data

Model	GD PZ-9	GD PZ-9
Bore in	6.000	6.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.076	.076
SPM		
gpm		

Total gpm	AV, Riser	Circ Pressure psi
Total Circ Time	AV, DP	Tot Prs Loss psi
BU Time, min	AV, DC	Pres Drop DP psi
Total Strokes	BU Stroke	Pres Drop An psi

Properties

Properties	1	2	3	4	Targets 1	2	3	4	Program
Source	Suction								
Time	10:00								
Depth m	3,075.0								
FL Temp Deg C									
Density ppg @ Deg C	8.95 @ 35								8.80 | 11.00
FV @ Deg C	28 @ 35								
PV @ Deg C	0 @								
YP lbs/100 ft2	0								
Gels lbs/100 ft2	0/0/0								
600/300	0/0								
200/100	0/0								
6/3	0/0								
API Filt ml/30 min	0.0								| 6.0
HTHP ml/30 min @Deg C									| 15.0
Cake 32nd in	0.0/0.0								
Corr Solids % by vol	0.0								
NAP/Water % by vol	0.0/1.0								
Sand % by vol	0.00								
MBT ppb Eq.	0.0								
pH	0.00				*				8.80 | 9.50
Alk Mud (Pm)	0.00								
Alk Filt (Pf/Mf)	0.00/0.00								
Chlorides mg/l	0								
Hard Ca mg/l	0								
LGS/HGS %	0.0/0.0								
LGS/HGS ppb	0.00/0.00								
ASG	0.000								

Fluid Treatments

Fluid Type: Sodium Chloride Brine

Received 710 sacks of Barite.

No Treatment.

Rig Activity

POOH laying out drill pipe BHA and casing scraper. Pull wear bushing, jet well head . Rig up and 3 1/2" completion tubing.

Products

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
BARABLOK	50 lb bag	40			40	
BARACARB 100	1200 Kg bulk	2			2	
BARACARB 25	1200 Kg bulk	2			2	
Baracide	25 Kg can	4			4	
BARACOR 129	25 Kg can	1			1	
BARA-DEFOAM W300	25 l can	3			3	
BARAFILM	55 Gal drum	1			1	
barite	100 lb bulk	310	710		1,020	
BAROFIBRE	25 lb bag	40			40	
caustic soda	25 Kg pail	8			8	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	5			5	
CON DET	5 gal can	20			20	
DEXTRID LT	25 Kg bag	78			78	
DRILLZAN-D	25 Kg bag	87			87	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	4			4	
Glycol CP	1500 l bulk	2			2	
Hme Energizer	5 gal can	2			2	
KCl - Tech.	25 Kg bag	20			20	
KCl Ag grade	1000 Kg bulk	2			2	
lime	20 Kg bag	16			16	
PAC-L	25 Kg bag	37			37	
phpa	25 Kg bag	126			126	
salt	1200 Kg bulk	6			6	

Daily Products Cost	$ 0.00	Total Daily Cost	$ 940.00
Cummulative Products Cost	$ 171,062.07	Total Cummulative Cost	$ 192,682.07

Solid Control Equipment

Shaker	Screens	Hrs
Derrick		
Derrick		

Time (Hrs)

Drilling	
Circulating	
Trips	12.00
Rig	
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	12.00
Total	24.00
Rotating	
ROP	
Dil Rate	

Fluid Volume Breakdown Sodium Chloride Brine

Active	bbl	Additions	bbl	Losses	bbl
Annulus	268.1	Oil		Dumped	
Pipe Cap	86.8	Drill Water		Transferred	
Active Pits	107.4	Dewatering		SC Equip	
Total Hole	355.0	Sea Water		Evaporation	
Total Circ	457.2	Whole Mud		Trips	-27.1
Reserve		Barite		Other	
Prev Vol	489.5	Chemicals		Total Surface	-27.1
Net Chg	-27.1	Other Adds.		Downhole	
Total Vol	462.4	Total Added		Total Losses	-27.1

Other Fluid Types	Vol bbl
Potassium Chloride brine	520.0

Deviation Information

Survey MD	3,075 m
Survey TVD	1,563 m
Angle	26.61
Direction	314
Horiz Displ.	450 m

Baroid Representatives: Clive Da Silva Justin Lewis

Office 90 Talinga Rd Melbourne Tel 61-03-9581-7555

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Daily Drilling Fluid Report

Baroid, a Halliburton Company

Report No 025

Date 19/08/2002	Depth 3,075.0 m
Spud Date 27/07/2002	Rig Activity Completion

Operator	Report For	Well Name
Esso Australia Ltd	Bruce Woodward / B. Sutherland	A-29
Contractor	**Report For**	**Rig Name**
ISDL	Dave Milne / Rob Balfour	#453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information

Bit Size	3.500	in
Make/Type	DUMMY / Open-Ended	
Jets	8	
TFA	8.000	sq-in
Jets Velocity		ft/sec
Jet Impact Force		lbf
HHSI		hhp/in2
Pres Drop @ Bit		psi
Bit Depth	3,041.0	m
ECD @ Shoe		ppg
ECD @ Bit		ppg

Drill String

ITEM	OD in	ID in	Length m
Drill Collar	3.500	2.993	3,041.0
Open Hole	8.500		8.0

Casing

OD in	Set	MD m
20.000	@	164.9
9.625	@	928.0
7.000	@	3,067.0

Leak Off 16.10 ppg

Circulation/Hydraulics Data

Model	GD PZ-9	GD PZ-9
Bore in	7.000	7.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.104	.104
SPM		
gpm		

Total gpm	AV, Riser	Circ Pressure psi
Total Circ Time	AV, DP	Tot Prs Loss psi
BU Time, min	AV, DC	Pres Drop DP psi
Total Strokes	BU Stroke	Pres Drop An psi

Properties	1	2	3	4	Targets 1	2	3	4	Program
Source	Suction								
Time	04:30								
Depth m	3,041.0								
FL Temp Deg C									
Density ppg @ Deg C	8.95 @ 35								8.80 | 11.00
FV @ Deg C	28 @ 35								
PV @ Deg C	0 @								
YP lbs/100 ft2	0								
Gels lbs/100 ft2	0/0/0								
600/300	0/0								
200/100	0/0								
6/3	0/0								
API Filt ml/30 min	0.0								| 6.0
HTHP ml/30 min @Deg C									| 15.0
Cake 32nd in	0.0/0.0								
Corr Solids % by vol	0.0								
NAP/Water % by vol	0.0/1.0								
Sand % by vol	0.00								
MBT ppb Eq.	0.0								
pH	0.00				*				8.80 | 9.50
Alk Mud (Pm)	0.00								
Alk Filt (Pf/Mf)	0.00/0.00								
Chlorides mg/l	0								
Hard Ca mg/l	0								
LGS/HGS %	0.0/0.0								
LGS/HGS ppb	0.00/0.00								
ASG	0.000								

Fluid Treatments

Fluid Type: Sodium Chloride Brine

Change out pump liners to 7".

Rig Activity

Completed running 3 1/2" tubing, sting into packer. Space out and land tubing. Run test plug, set packer and POOH wireline.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
BARABLOK	50 lb bag	40			40	
BARACARB 100	1200 Kg bulk	2			2	
BARACARB 25	1200 Kg bulk	2			2	
Baracide	25 Kg can	4			4	
BARACOR 129	25 Kg can	1			1	
BARA-DEFOAM W300	25 l can	3			3	
BARAFILM	55 Gal drum	1			1	
barite	100 lb bulk	1,020			1,020	
BAROFIBRE	25 lb bag	40			40	
caustic soda	25 Kg pail	8			8	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	5			5	
CON DET	5 gal can	20			20	
DEXTRID LT	25 Kg bag	78			78	
DRILLZAN-D	25 Kg bag	87			87	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	4			4	
Glycol CP	1500 l bulk	2			2	
Hme Energizer	5 gal can	2			2	
KCl - Tech.	25 Kg bag	20			20	
KCl Ag grade	1000 Kg bulk	2			2	
lime	20 Kg bag	16			16	
PAC-L	25 Kg bag	37			37	
phpa	25 Kg bag	126			126	
salt	1200 Kg bulk	6			6	

Solid Control Equipment

Shaker	Screens	Hrs
Derrick		
Derrick		

Time (Hrs)

Drilling	
Circulating	
Trips	
Rig	
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	24.00
Total	24.00
Rotating	
ROP	
Dil Rate	

Fluid Volume Breakdown Sodium Chloride Brine

Active	bbl	Additions	bbl	Losses	bbl
Annulus	268.1	Oil		Dumped	
Pipe Cap	86.8	Drill Water		Transferred	
Active Pits	81.0	Dewatering		SC Equip	
Total Hole	355.0	Sea Water		Evaporation	
Total Circ	430.8	Whole Mud		Trips	-21.4
Reserve	5.0	Barite		Other	
Prev Vol	462.4	Chemicals		Total Surface	-21.4
Net Chg	-21.4	Other Adds.		Downhole	
Total Vol	441.0	Total Added		Total Losses	-21.4

Daily Products Cost	$ 0.00	Total Daily Cost	$ 940.00
Cummulative Products Cost	$ 171,062.07	Total Cummulative Cost	$ 193,622.07

Other Fluid Types	Vol bbl
Potassium Chloride brine	520.0

Deviation Information

Survey MD	3,075 m
Survey TVD	1,563 m
Angle	26.61
Direction	314
Horiz Displ.	450 m

Baroid Representatives: Justin Lewis Emad Elzahaby

Office 90 Talinga Rd Melbourne Tel 61-03-9581-7555

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Daily Drilling Fluid Report

Baroid, a Halliburton Company

Report No 026

Date 20/08/2002	Depth 3,075.0 m
Spud Date 27/07/2002	Rig Activity Prepare to Skid

Operator	Report For	Well Name
Esso Australia Ltd	Bruce Woodward / B. Sutherland	A-29
Contractor	**Report For**	**Rig Name**
ISDL	Dave Milne / Rob Balfour	#453

Country	State/Province/Region	County/Geographic Area	Field or Block
Australia	Victoria	Bass Strait	Tuna

Bit Information		
Bit Size	3.500	in
Make/Type	DUMMY / Open-Ended	
Jets	8	
TFA	8.000	sq-in
Jets Velocity		ft/sec
Jet Impact Force		lbf
HHSI		hhp/in2
Pres Drop @ Bit		psi
Bit Depth	3,075.0	m
ECD @ Shoe		ppg
ECD @ Bit		ppg

Drill String ITEM	OD in	ID in	Length m
Drill Collar	3.500	2.993	3,075.0
Open Hole	8.500		8.0

Casing OD in		Set MD m
20.000	@	164.9
9.625	@	928.0
7.000	@	3,067.0
3.500	@	3,066.0
Leak Off		16.10 ppg

Circulation/Hydraulics Data		
Model	GD PZ-9	GD PZ-9
Bore in	7.000	7.000
Stroke in	9.000	9.000
Eff (%)	97	97
bbl/strk	.104	.104
SPM		
gpm		

Total gpm	AV, Riser	Circ Pressure psi
Total Circ Time	AV, DP	Tot Prs Loss psi
BU Time, min	AV, DC	Pres Drop DP psi
Total Strokes	BU Stroke	Pres Drop An psi

Properties						Targets 1	2	3	4	Program
Source										
Time										
Depth m										
FL Temp Deg C										
Density ppg @ Deg C										
FV @ Deg C										
PV @ Deg C										
YP lbs/100 ft2										
Gels lbs/100 ft2										See Rpt Tgts
600/300										
200/100										
6/3										
API Filt ml/30 min										
HTHP ml/30 min @Deg C										
Cake 32nd in										
Corr Solids % by vol										
NAP/Water % by vol										See Rpt Tgts
Sand % by vol										
MBT ppb Eq.										
pH										
Alk Mud (Pm)										
Alk Filt (Pf/Mf)										See Rpt Tgts
Chlorides mg/l										
Hard Ca mg/l										
LGS/HGS %										
LGS/HGS ppb										
ASG										

Fluid Treatments

Fluid Type: **Sodium Chloride Brine**

Received chemicals for A-30 surface hole.

Began mixing prehydrated gel for A-30 surface hole.

Rig Activity

Install Xmas tree and prepare to skid.

Product Name	Units	Start	Rec	Used	End	Cost
Drilling Fluids Engineer	Day(s)			2		$ 940.00
BARABLOK	50 lb bag	40			40	
BARACARB 100	1200 Kg bulk	2			2	
BARACARB 25	1200 Kg bulk	2			2	
Baracide	25 Kg can	4			4	
BARACOR 129	25 Kg can	1			1	
BARA-DEFOAM W300	25 l can	3			3	
BARAFILM	55 Gal drum	1			1	
barite	100 lb bulk	1,020			1,020	
BAROFIBRE	25 lb bag	40			40	
bentonite	1200 Kg bag		16		16	
caustic soda	25 Kg pail	8	24		32	
citric acid	25 Kg bag	20			20	
Coat-2748	208 l drum	5			5	
CON DET	5 gal can	20			20	
DEXTRID LT	25 Kg bag	78			78	
DRILLZAN-D	25 Kg bag	87			87	
EZ MUD-AZ	25 Kg pail	8			8	
Finagreen EBL	55 Gal drum	4			4	
Glycol CP	1500 l bulk	2			2	
Hme Energizer	5 gal can	2			2	
KCl - Tech.	25 Kg bag	20			20	
KCl Ag grade	1000 Kg bulk	2			2	
lime	20 Kg bag	16			16	
PAC-L	25 Kg bag	37			37	
phpa	25 Kg bag	126			126	

Solid Control Equipment Shaker	Screens	Hrs
Derrick		
Derrick		

Time (Hrs)	
Drilling	
Circulating	
Trips	
Rig	
Surveys	
Fishing	
Run Casing	
Coring	
Reaming	
Testing	
Logging	
Dir Work	
Repair	
Other	24.00
Total	24.00
Rotating	
ROP	
Dil Rate	

Fluid Volume Breakdown Sodium Chloride Brine

Active	bbl	Additions	bbl	Losses	bbl
Annulus	266.8	Oil		Dumped	-86.4
Pipe Cap	87.8	Drill Water		Transferred	
Active Pits		Dewatering		SC Equip	
Total Hole	354.6	Sea Water		Evaporation	
Total Circ	354.6	Whole Mud		Trips	
Reserve		Barite		Other	
Prev Vol	441.0	Chemicals		Total Surface	-86.4
Net Chg	-86.4	Other Adds.		Downhole	
Total Vol	354.6	Total Added		Total Losses	-86.4

Daily Products Cost	$ 0.00	Total Daily Cost	$ 940.00
Cummulative Products Cost	$ 171,062.07	Total Cummulative Cost	$ 194,562.07

Other Fluid Types	Vol bbl
Potassium Chloride brine	520.0

Deviation Information	
Survey MD	3,075 m
Survey TVD	1,563 m
Angle	26.61
Direction	314
Horiz Displ.	450 m

Baroid Representatives: Justin Lewis Emad Elzahaby

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BEARDIE-1 DRS MUD PROPERTIES

Date	Time	Depth (m)	Loc	MW	PV	YP	10" Gel	10' Gel	30' Gel	600	300	200	100	6	3	API	HTHP	HTHP Temp	%Sol	%Oil	% Water	% Sand	MBT	pH	Pf	Mf	Pm	Ca++	Cl-	XLIME	Flowline Temp	Elec Stab	CaCl	% LGS	Mud Type	Filter Cake
26-Jul-02	16:00	80.0	Pit	8.55	0	0	0	0		0	0	0	0	0	0	0	0	0	0.0	0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0	0	0	0.0	0	0	0	Water-Based	0
26-Jul-02	18:30	0.0	Pit	12.00	0	0	0	0		0	0	0	0	0	0	0	0	0	0.0	0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0	0	0	0.0	0	0	0	Water-Based	0
27-Jul-02	20:00	322.0	Pit	8.50	0	0	0	0		0	0	0	0	0	0	0	0	0	0.0	0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0	0	0	0.0	0	0	0	Water-Based	0
28-Jul-02	3:30	498.0	Pit	8.55	0	0	0	0		0	0	0	0	0	0	0	0	0	0.0	0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0	0	0	0.0	0	0	0	Water-Based	0
28-Jul-02	20:00	863.0	Pit	12.00	0	0	0	0		0	0	0	0	0	0	0	0	0	0.0	0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0	0	0	0.0	0	0	0	Water-Based	0
29-Jul-02	20:00	0.0	Flow	8.50	0	0	0	0		0	0	0	0	0	0	0	0	0	0.0	0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0	0	0	0.0	0	0	0	Water-Based	0
30-Jul-02	23:59	863.0	Flow	0.00	0	0	0	0		0	0	0	0	0	0	0	0	0	0.0	0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0	0	0	0.0	0	0	0	Water-Based	0
31-Jul-02	9:45	951.0	Pit	9.00	10	16	4	5		36	26	21	15	5	3	5.6	16.6	49	4.0	0	96.0	0.35	1.5	10.0	0.6	1.6	0.3	280	33,000	0	32.0	0	0	0	Water-Based	1
31-Jul-02	19:00	1129.0	Pit	9.50	12	19	5	3		43	31	23	16	5	3	4	13.8	49	6.5	0	93.5	0.60	2.5	9.1	0.1	0.3	0.4	260	35,500	0.07	51.0	0	0	1	Water-Based	1
31-Jul-02	21:00	1155.0	Flow	9.50	12	20	3	5		44	32	23	17	5	3	3.8	13.8	49	6.5	0	93.5	0.75	2.5	9.1	0.1	0.3	0.4	240	35,500	0.07	51.0	0	0	1	Water-Based	1
1-Aug-02	7:30	1441.0	Pit	9.70	14	22	5	7		50	36	25	20	7	4	3.4	13.2	49	8.0	0	92.0	0.40	3.0	9.3	0.1	0.1	0.2	270	35,000	0.05	61.0	0	0	3	Water-Based	1
1-Aug-02	10:00	1528.0	Flow	9.80	14	25	5	7		53	39	31	27	6	4	3.8	13.3	49	8.0	0	92.0	0.40	3.0	9.4	0.1	0.1	0.2	280	35,000	0.04	61.0	0	0	2	Water-Based	1
1-Aug-02	16:00	1579.0	Pit	9.80	18	26	6	8		62	44	36	25	7	5	3.8	11.6	49	8.0	0	92.0	0.75	2.5	9.3	0.1	0.3	0.3	280	35,000	0.05	61.0	0	0	2	Water-Based	1
2-Aug-02	7:30	1586.0	Pit	9.75	15	25	6	7		55	40	32	22	7	6	3	11.8	49	7.6	0	92.4	0.20	4.0	9.7	0.0	0.4	0.1	220	32,000	0.01	55.0	0	0	2	Water-Based	1
2-Aug-02	10:00	1609.0	Flow	9.75	15	23	5	8		53	38	31	23	8	5	3.4	12	49	8.2	0	91.8	0.25	4.5	9.3	0.0	0.2	0.1	240	30,000	0.01	56.0	0	0	3	Water-Based	1
2-Aug-02	16:00	1638.0	Pit	9.70	17	27	5	8		61	44	35	26	7	5	3.6	10.6	49	8.0	0	92.0	0.75	5.0	9.4	0.1	0.3	0.3	200	38,000	0.05	58.0	0	0	3	Water-Based	1
2-Aug-02	22:00	1707.0	Flow	9.80	17	26	5	7		60	43	34	24	7	5	3.8	10.6	49	8.0	0	92.0	0.70	5.0	9.3	0.1	0.1	0.2	180	37,500	0.04	57.0	0	0	2	Water-Based	1
3-Aug-02	5:45	1799.0	Pit	9.75	23	29	7	9		75	52	42	29	9	7	3.5	11	49	8.2	0	91.8	0.10	4.0	9.5	0.0	0.1	0.2	160	32,000	0.04	58.0	0	0	3	Water-Based	1
3-Aug-02	9:30	1826.0	Flow	9.70	23	27	6	8		73	50	43	30	8	6	3.2	11	49	8.4	0	91.6	0.15	4.0	9.3	0.1	0.2	0.2	180	34,500	0.03	58.0	0	0	4	Water-Based	1
3-Aug-02	15:00	1879.0	Pit	9.80	20	33	7	9		73	53	44	33	9	7	3.4	10.2	49	9.0	0	91.0	0.50	5.0	9.1	0.1	0.2	0.3	180	36,500	0.05	60.0	0	0	4	Water-Based	1
3-Aug-02	19:00	1892.0	Flow	9.80	20	32	7	9		72	52	43	34	9	7	3.6	10.2	49	8.0	0	92.0	0.70	5.0	9.0	0.1	0.2	0.3	180	35,500	0.05	60.0	0	0	2	Water-Based	1
4-Aug-02	3:30	1905.0	Pit	9.75	17	27	6	8		61	44	36	28	8	6	3.5	10.4	49	8.2	0	91.8	0.10	4.5	9.4	0.1	0.3	0.3	160	36,500	0.05	0.0	0	0	3	Water-Based	1
4-Aug-02	6:45	1905.0	Flow	9.80	21	33	9	12		75	54	45	33	10	8	3	10	49	8.6	0	91.4	0.15	4.5	9.6	0.1	0.3	0.3	0	0	0.06	57.0	0	0	3	Water-Based	1
5-Aug-02	1:30	1905.0	Pit	9.85	20	35	10	13		75	55	48	36	12	9	3.3	10.6	49	8.2	0	91.8	0.10	4.5	9.7	0.1	0.3	0.3	180	37,000	0.06	0.0	0	0	2	Water-Based	1
6-Aug-02	14:00	1905.0	Pit	9.85	20	35	10	13		75	55	48	35	9	7	3.5	0	0	8.2	0	91.8	0.50	5.0	9.0	0.1	0.3	0.3	180	35,000	0.05	0.0	0	0	2	Water-Based	1

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Pressure Integrity Tests

Pressure Integrity Tests

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Integrity Test Data

Well	Beardie #1
Csg Size (in)	13.375
Rig	Ocean Bounty
RKB (AMSL, m)	25.0
Water Depth (m)	51.2
Field	Bass Strait
Country	Australia

Final Interpretation				
Test	Depth (m)	Integ (ppg)	Type	MS (ppg)
Test 1	849.1	14.7	PIT	14.6
Test 2	0.0			
Test 3	0.0			

Data input = BLUE   Calculated value = RED

Casing Test		Integrity Test 1		Integrity Test 2		Integrity Test 3	
Date	30-Jul-02	**Date**	30-Jul-02	**Date**		**Date**	
Last Csg (in)	13.375	**Last Casing Set (in)**	13.375	**Last Casing Set (in)**		**Last Casing Set (in)**	
TOC in Csg	820.0	**Test Depth (m TVD)**	849.1	**Test Depth (m TVD)**		**Test Depth (m TVD)**	
Mud Density	8.6	**Well Depth (m MD)**	870.0	**Well Depth (m MD)**		**Well Depth (m MD)**	
Mud Type	WBM	**Mud Density (ppg)**	8.9	**Mud Density (ppg)**		**Mud Density (ppg)**	
Pump Rate	0.25	**Mud Type**	WBM	**Mud Type**		**Mud Type**	
		Pump Rate (bbl/min)	0.25	**Pump Rate (bbl/min)**		**Pump Rate (bbl/min)**	
		Req'd EMW (ppg)	17.0	**Req'd EMW (ppg)**		**Req'd EMW (ppg)**	
		Req'd Test Press (psi)	1,172	**Req'd Test Press (psi)**	0	**Req'd Test Press (psi)**	0

Casing Test Pumping		Integrity Test 1 Pumping		Integrity Test 1 Shut in		Integrity Test 2 Pumping		Integrity Test 2 Shut in		Integrity Test 3 Pumping			
V (bbl)	P (psi)	V (bbl)	P (psi)	t (min)	P (psi)	V (bbl)	P (psi)	t (min)	P (psi)	V (bbl)	P (psi)		
0.00	0	0.00	20	0.00	864								
4.70	2,240	0.50	38	1.00	829								
		1.00	45	2.00	821								
		1.50	60	3.00	817								
		2.00	89	4.00	815								
		2.50	115	5.00	813								
		3.00	278	6.00	812								
		3.50	555	7.00	812								
		4.00	845	8.00	810								
		4.10	874	9.00	809								
		4.20	885	10.00									
		4.30	892	11.00									
		4.36	901	12.00									
				13.00									
				14.00									
				15.00									
				16.00									
				17.00									
				18.00									
				19.00									
				20.00									
				21.00									
				22.00									
				23.00									
				24.00									
				25.00									
				26.00									
				27.00									
				28.00									
				29.00									
				30.00									

~~PE913712~~ colour Ø28

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Integrity Test Plot

Well	Beardie #1
Csg Size (in)	13.375
Rig	Ocean Bounty
RKB (AMSL, m)	25.0
Water Depth (m)	51.2
Field	Bass Strait
Country	Australia

Test and interpretation comments...

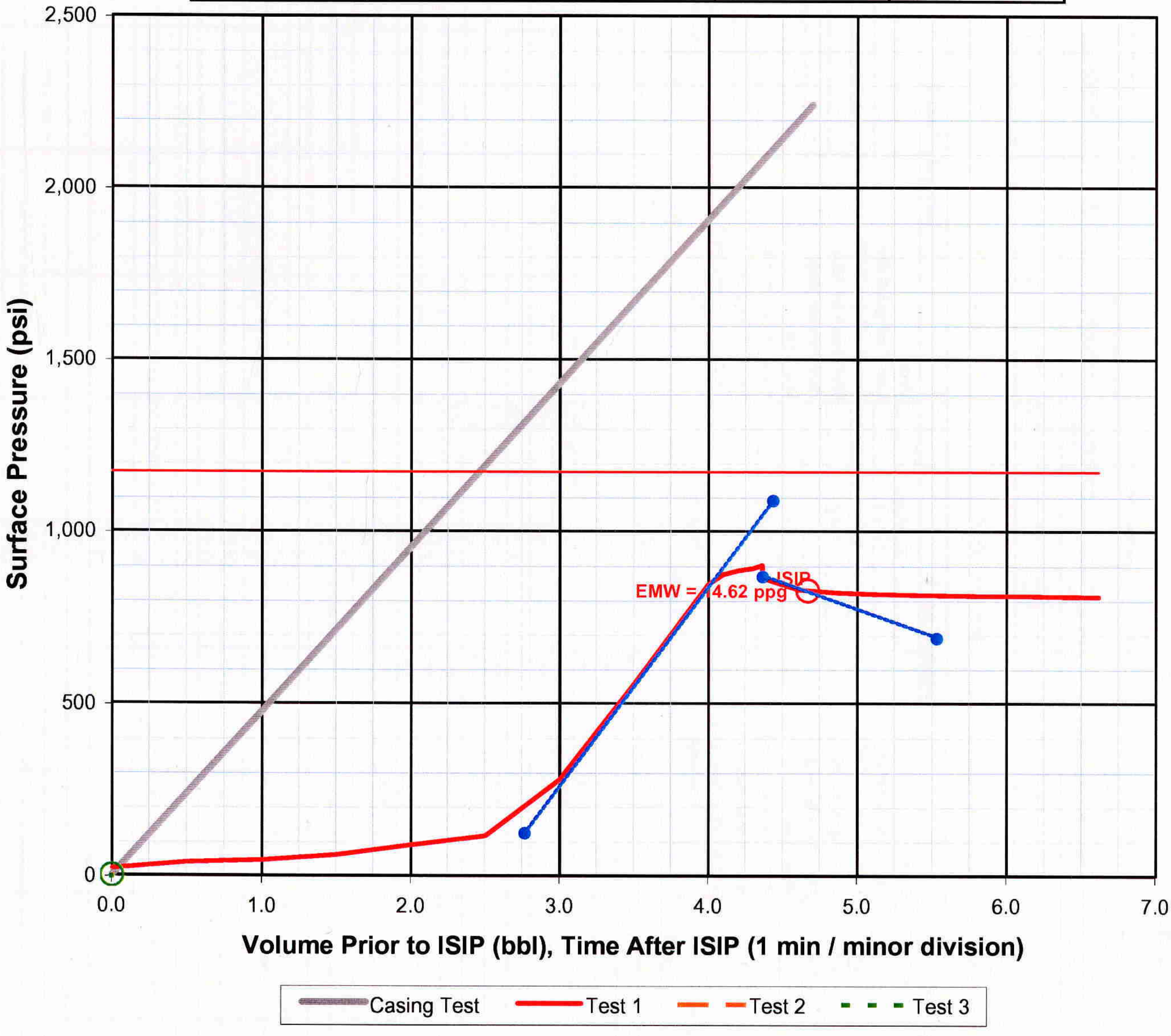
HOWCO Pumped 4.37bbls of 8.9ppg KCL PHPA mud with a PV 1, YP 12 and FV 52.

Pumped 4.375bbls, bled back 3.5bbls.

PIT conducted by G. Sharkey, J. Selway & R. Stares HOWCO operator.

Final Interpretation

Test	Depth (m)	Integ (ppg)	Type	MS (ppg)
Test 1	849.1	14.7	PIT	14.6
Test 2	0.0			
Test 3	0.0			



Integrity Test Beardie 13 38 Inch.xls 03/08/2002

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BIT Summary Report

BIt Summary Report

BEARDIE-1 BIT REPORT

Well ID	Tool Size	Tool Code	Tool No	Run No	Make	Type	Serial	IADC Code	Date Run	Time Run	Date Pulled	Time Pulled	Depth In	Depth Out	Min WOB	Max WOB	Min RPM	Max RPM	Nozzles	TFA
BEARDIE.1	36.000	HO	RR1	1	GOT		46355		26-Jul-02	5:00:00PM	26-Jul-02	9:00:00PM	76	123	2	10	60	80	14.0-14.0-14.0-14.0-14.0-.0-.0-.0	0.75
BEARDIE.1	17.500	BT	1	1	RRB	DS34HF	244002	S223	27-Jul-02	5:00:00PM	28-Jul-02	11:45:00PM	123	863	10	12	105	136	14.0-14.0-14.0-14.0-14.0-14.0-14.0-14.	1.20
BEARDIE.1	12.250	BT	2	1	RRB	DSX195	103092	M232	30-Jul-02	12:00:00PM	01-Aug-02	9:15:00PM	863	1,579	0	31	114	208	14.0-14.0-14.0-14.0-14.0-.0-.0-.0	0.75
BEARDIE.1	12.250	BT	3	1	RRB	EHP51H	NL5038	517W	01-Aug-02	9:30:00PM	04-Aug-02	12:00:00PM	1,579	1,905	40	55	60	110	18.0-18.0-18.0-.0-.0-.0-.0-.0	0.75

Well ID	Tool Size	Min Flow Rate	Max Flow Rate	Min Pump Pressure	Max Pump Pressure	Length Cut	Hours	Length /Hour	Dull Grade	Billing	Cost	Rig Rate	Cost/Length	Max Torque	Min Torque	Approx Starting Survey MD	Approx Starting Survey Incl	Approx Starting Survey Azim	Approx Ending Survey MD	Approx Ending Survey Incl	Approx Ending Survey Azim
BEARDIE.1	36.000	508	1,083	160	952	46	2.00	23.16	2-2-NO-A-3-0.-NO-TD	P	0	0	0	900	5,600						
BEARDIE.1	17.500	1,157	1,157	2,600	3,050	740	21.00	35.24	1-1-NO-A-X-0.-NO-TD	D	0	0	0	5,000	12,000	130.50	0.12	223.02	852.70	0.56	173.86
BEARDIE.1	12.250	846	979	2,626	3,696	716	36.75	19.48	5-8-LT-N-X-1.-RO-PR	D	0	0	0	4,000	15,600	907.95	0.55	184.35	1,517.17	1.19	222.49
BEARDIE.1	12.250	880	934	2,850	3,375	326	39.50	8.25	3-4-WT-A-E-2.-NO-TD	D	0	0	0	3,000	6,000	1,551.21	1.09	226.63	1,869.06	0.98	215.87

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BEARDIE-1 BIT PERFORMANCE SUMMARY

Double Click Cells to Show / Hide Detail

Sum of Cost			
Tool Size	Make	Type	Total
12.25	RRB	DSX195	0
		EHP51H	0
17.5	RRB	DS34HF	0
Grand Total			0

Sum of Length Cut			
Tool Size	Make	Type	Total
12.25	RRB	DSX195	716
		EHP51H	326
17.5	RRB	DS34HF	740
Grand Total			1,782

Average of Cost/Length			
Tool Size	Make	Type	Total
12.25	RRB	DSX195	0.00
		EHP51H	0.00
17.5	RRB	DS34HF	0.00
Grand Total			0.00

Average of Length/Hour			
Tool Size	Make	Type	Total
12.25	RRB	DSX195	19.5
		EHP51H	8.3
17.5	RRB	DS34HF	35.2
Grand Total			21.0

PDC GRADING CHART

BIT RUN DATA

Bit Size:	12 1/4	
Manufacturer:	Reed Hycalog	
Bit Type:	DSX195	
Serial Number:	0103092	
New Bit:	Yes	
IADC Code:	PDC	
Number of Nozzles:	5	
Size of Nozzles:	14	
Number of Blades:	5	
Number of Cutters:	67	7
Size of Cutters:	16	13
T.F.A. (sq ins):	0.7517	
W.O.B. :	5-35 Kips	
Depth Out:	1579.4	
Depth In:	820	TOC
Meters Drilled:	759.4	
Rotating Hours:	30.75	
Steering Hours:	NA	
Metres Rotary:	759.4	
Metres Steered:	NA	
Total Hours:	30.75	
Average R.O.P:	24.70	
Circulation Rate (GPM):	960	
R.P.M. at Bit:	170	
Motor Used:	NO	
Motor Size:	NA	
Good for Rerun:	NO	

WELL DATA

Date:	1-Aug-2002
Drilling Supervisor:	Bigby, Sharkey,Bassett
Platform:	NA
Well Number:	Beardie #1
Rig Contractor:	DOGC
Average Hole Angle:	0.51
Date in:	30-Jul-2002
Date Out:	1-Aug-2002

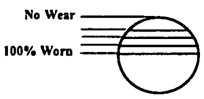
MUD AND LITHOLOGY DATA

Majority Formation:	Sandstone
Other Formation:	Siltstone
% Formation:	
Mud Type:	KCL/ PHPA Glycol
Mud Weight:	9.5
PV:	12
YP:	20
% Solids:	3.6
PH (meter):	9.1

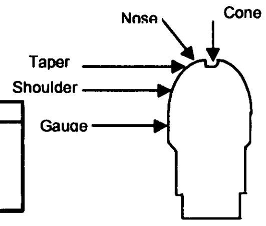
COMMENTS: Wear on nose considered an 8 signified by lost cutters. Signs wear/erosion to bit body in immediate area

PDC GRADING (THIS BIT RUN)

Wear Classification



(A)	(A)	(B)	(C)	(D)	(E)	(B)	(F)
4	5	LT	N	X	1	WT	PR



PDC GRADING CHART AS PER IADC NOMENCLATURE

CUTTING STRUCTURE				B	G	REMARKS	
INNER ROWS	OUTER ROWS	DULL CHAR.	LOC ATION.	BRING SEALS	GAUGE 1/16"	OTHER CHAR.	REASON PULLED
(A)	(A)	(B)	(C)	(D)	(E)	(B)	(F)

(A)		
	0	No Wear
	8	No Cutting structure

(B)		
	BT	Broken Cutters
	BU	Balled Up
	CR	Cored
	CT	Chipped Cutters
	ER	Erosion
	HC	Heat Checking
	JD	Junk Damage
	LN	Lost Nozzle
	LT	Lost Cutters
	OC	Off-Center Wear
	PN	Plugged Nozzle/ Waterway Passage
	RG	Rounded Gauge
	RO	Ring Out
	WO	Washed Out - Bit
	WT	Worn Cutters
	NO	Bit is Green
	IM	Impact
	DEL	Delamination
	SPL	Spalling
	BF	Bond Failure

(C)		
	C	Cone
	N	Nose
	T	Taper
	S	Shoulder
	G	Gauge
	A	All Angles

(D)		
	X	Fixed Cutter Bits

(E)		
	1	In Gauge
	1/16	1/16" Undergauge
	2/16	1/8" Undergauge etc.

(F)		
	BHA	Change BHA
	DMF	Downhole Motor Fail
	DSF	Drill String Fail
	DST	Drill Stem Test
	DTF	Downhole Tool Fail
	LOG	Run Logs
	RIG	Rig Repair
	CM	Condition mud
	CP	Core Point
	DP	Drill Plug
	FM	Formation Change
	HP	Hole Problems
	HR	Hours
	PP	Pump Pressure
	PR	Penetration Rate
	TD	Total Depth
	TC	Casing Depth
	TQ	Torque
	TW	Twist-Off
	WC	Weather Conditions
	WO	Washout/Drill String
	ROP	Rate of Penetration

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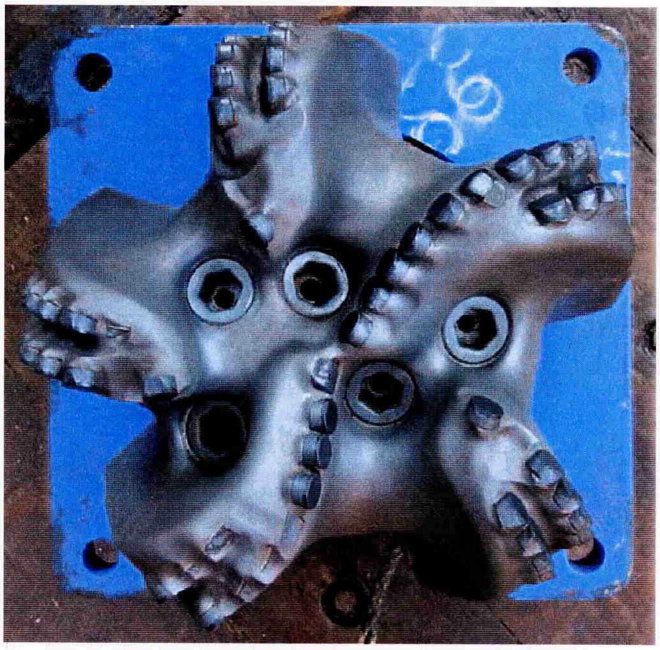
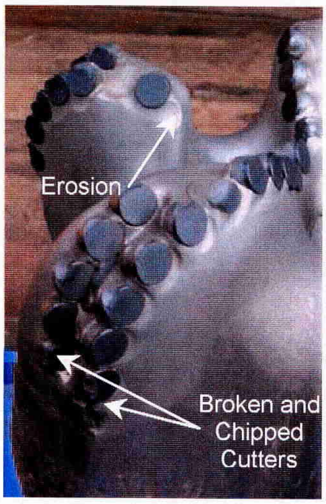
Dull Grade Report

Bit Type :	DSX195DGN+W
Bit Size :	12 1/4"
Serial Number :	103092
Dull Grading :	4-5-LT-N-X-1-WT-PR

Bit History;

Well Name	BEARDIE-1
Run Date	30 July, 2002
Depth Out	1580 meters
Drilled	760 meters
Avg R.O.P.	24.7 m/hr
Avg W.O.B	20,000 lbs
Avg R.P.M	170
Circ'n Rate	960 gpm





On the whole, the cutting structure exhibits an inconsistent and non-uniform wear profile.

The most striking and evident dull characteristic is the loss of cutters to the nose of the bit. Other dull conditions include chipped and/or broken cutters, erosion of the matrix bit body and on the odd cutter, partial delamination of the diamond table.

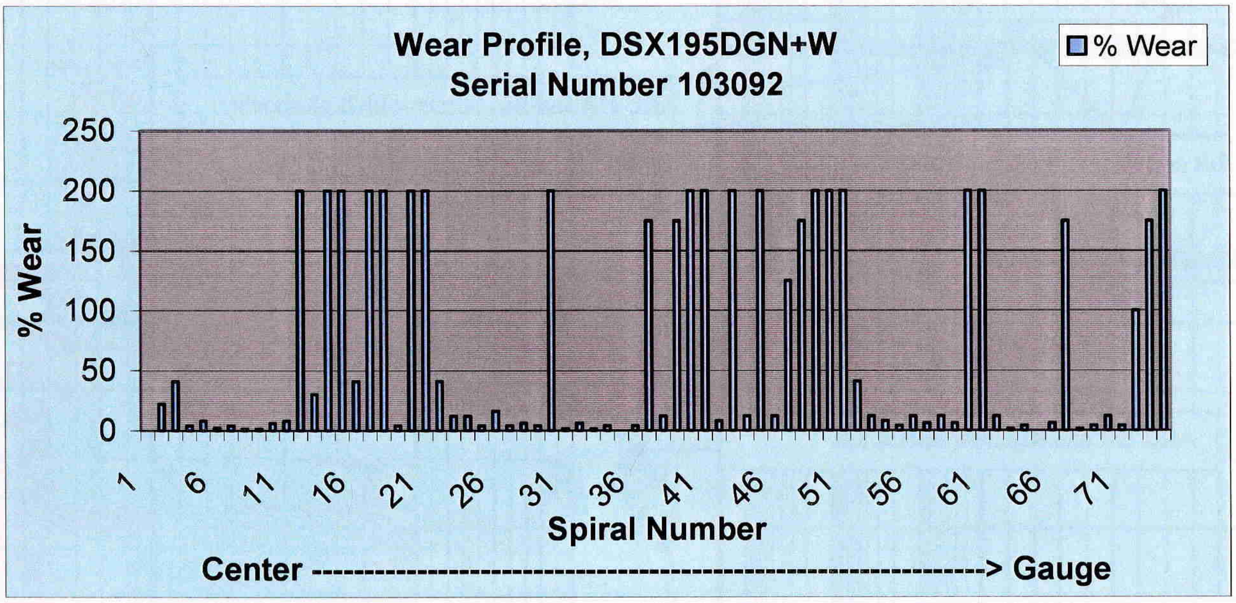
Alternatively, where the cutters are still intact their associated dull characteristic is best described as being normal wear and by rights the degree of wear is relatively minimal.

On gauge, the bit does shows evidence that it was subject to a large degree of vibration. The cutters that are chipped and/or broken support this. Furthermore, individual cutters do display signs that they may have experienced a knock from behind. This could be attributed to bit whirl and would explain the inordinately high number of cutters indicating breakage of the tungsten carbide post.

Dull Grade Report 913712 458

The graph below represents a wear profile of the entire cutting structure of the bit. As described earlier the wear pattern is very inconsistent and non-uniform in nature. The peaks indicating a % wear of 200 percent represent lost cutters. In so doing 100 percent wear equates to a 50 percent loss of the cutting structure for a given cutter.

In view of the above, the graph below confirms the fact that although a few of the cutters that were lost occurred in close proximity to each other: there is no clear pattern to suggest that wear was confined to a particular aspect of the cutting profile.
Most interesting is the fact that the degree of wear can almost be confined to two ends of the spectrum. Where there is a noticeable degree of wear, this translates into a total or partial loss of the cutter. Conversely, where the cutters are still intact the degree of wear is almost negligible.
This uncharacteristic wear pattern confined to two extremes (complete/partial loss vs. no wear) could be attributed to excessive vibration. When in vibration that exceeds normal or acceptable levels, load distribution across the cutter profile is non-uniform. As a direct consequence, individual cutters are then severely over loaded and also become subject to extreme impact loading. This in turn results in a high proportion of cutters being chipped and or broken.



To further support the notion that vibration was a principle contributor to the irregular wear pattern the following is a description of the shock environment as witnessed by the Drilling and Measurements Engineer aboard the Ocean Bounty.

Description of Shock environment by D&M Engineer:

BHA made up successfully, tools Shallow Hole Tested at 650 gpm. Shallow hole test successful (see attached document). Ran in till tag cement. Cement drilled with seawater. ARC and PowerPulse initially did not communicate PowerPulse shocks sitting at 60 – 100 cps with shock peaks at 40-150 g's. When near bit stabilizer (1 meter behind bit) got into cement shocks subsided communication between ARC and PowerPulse regained. Couple meters further shock on PowerPulse ranged between 100 – 250 cps shock peak between 90 – 255 g's and torsional vibration at maximum value of 5000 kftlb. Rotary slowed down from 60 rpm to 30 rpm led to no significant change in drilling shock levels. These high shock levels persisted for 50 minutes.

Shock log with arc resistivity and GR 1:500

Offset resistivity to bit is 21.5 m. Offset gamma ray to bit is 21.47

Tag cement at 820 m, Arc gamma ray and resistivity real time communication fails at 827 m

High shocks lat shocks above 250 cps and shock peaks above 250 g's at 825 m

~~PE913712 colour Ø 30~~

Dull Grade Report

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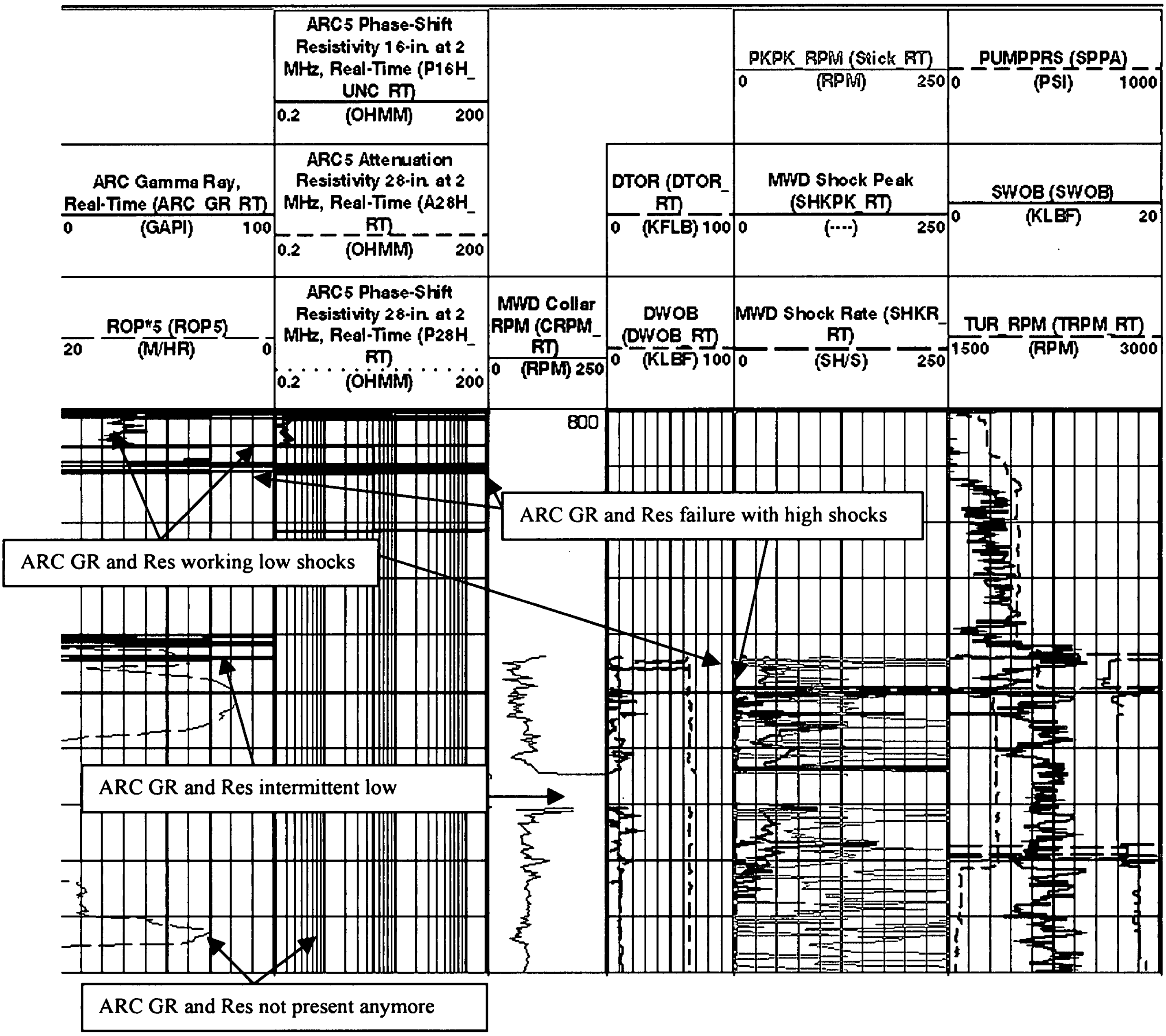

Note:
PKPK_RPM, which indicates Peak to peak variation of the RPM (i.e. Stick and Slip condition.) great environment to destroy PDC Bit cutters.

Taking into account the observations of the Drilling and Measurements Engineer, a strong argument presents itself. The extreme degree of vibration experienced by the bit during drilling out of the shoe may very well have led to catastrophic damage and the potential loss of individual cutters. This is strongly supported by the complete absence of cutter pockets in two locations. The only explanation for this condition is that the cutters were lost very early in the process. Inadvertently, the remaining cutter pocket had been worn perfectly flat giving the impression that a cutter was never present.
In spite of the above, the bit drilled admirably through the shallower, lower compressive strength intervals. However, upon reaching the extremely hard band at 1580 meters the bit did not have sufficient cutting structure in place. Hence, a noticeable drop in ROP was observed and the bit had to be pulled.

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BHA Summary Report

BHA Summary Rpt.

DRILL STRING REPORT

Mixed Oilfield Units

Date Run:	26-Jul-02	Date Pulled:	26-Jul-02	Length of BHA :	57.010
Time Run:	17:00	Time Pulled:	21:00	BHA Weight in Air :	.0
Depth In:	76.230	Depth Out :	122.540	Above Jars:	.0
				Below Jars:	.0
				In Mud :	.0

26" bit, 36" hole opener, float sub, Anderdrift, three 9«" drill collars, crossover, two 8¬" drill collars, crossover

Tp	OD	ID	Grd	Connections Size	Connections Type	Nom Wt/Len	Stab Blade OD In	Stab Blade OD Out	Length To Ctr	Bend	Section Length	Serial Number
XO	8.250	2.687	????	6.625	REG	.0					1.100	
DC	8.250	2.875	????	6.625	REG	.0					9.410	
DC	8.250	2.937	????	6.625	REG	.0					9.410	
XO	9.500	2.937	????	7.625	REG	.0					1.800	
DC	9.500	3.125	????	7.625	REG	.0					18.540	
DC	9.500	3.000	????	7.625	REG	.0					9.320	
SV	9.500	3.000	????	7.625	REG	.0					7.430	
FS	9.500	3.500	????	7.625	REG	.0					4.210	
HO	36.000	3.125	????	7.625	REG	.0					2.650	46355
BT	26.000	.000	????	7.625	REG	.0					.560	S3SJ4 SN 668369

Bit Code :	HO	Bit Manufacturer:	GOT	Billing :	P
Bit Number:	R 1	Bit Model :		Cost :	0
Run Number:	1	Serial Number :	46355	Daily Rig Rate:	0
Bit Size :	36.000	IADC Class :			

Nozzles : 14.0 14.0 14.0 14.0 14.0
Flow Area : .7517

Reason bit pulled or run terminated :	TD	Location of reported wear:	A
Wear to inner 2/3 cutters:	2	Wear to bearings or seals:	3
Wear to inner 1/3 cutters:	2	Wear to gauge :	0.
Major dull characteristic:	NO	Other dull characteristic:	NO

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DRILL STRING REPORT

Mixed Oilfield Units

Date Run:	27-Jul-02	Date Pulled:	28-Jul-02	Length of BHA :	361.020
Time Run:	17:00	Time Pulled:	23:45	BHA Weight in Air :	55.2
Depth In:	122.540	Depth Out :	863.000	Above Jars:	8.0
				Below Jars:	40.0
				In Mud :	48.0

17«" bit, 17«" NBS, 9«" Anderdrift, 17«" stabilizer, 9«" dc, xo, 8¬" dc, xo, HWDP, 6«" jars, HWDP

Tp	OD	ID	Grd	Connections Size	Connections Type	Nom Wt/Len	Stab Blade OD In	Stab Blade OD Out	Length To Ctr	Bend	Section Length	Serial Number
DP	5.000	4.276	????	4.500	IF	.0					501.980	
HW	5.000	3.125	????	4.500	IF	.0					274.910	
JR	6.250	2.750	????	4.500	IF	.0					9.810	
HW	5.000	3.125	????	4.500	IF	.0					17.500	
XO	8.250	2.687	????	4.500	IF	.0					1.100	
DC	8.250	2.875	????	6.625	REG	147.0					18.820	
XO	9.500	2.937	????	6.625	REG	.0					1.800	
DC	9.500	3.125	????	7.625	REG	216.0					9.110	
ST	17.500	3.500	????	7.625	REG	.0	.000	17.500	.000		1.770	207A75
DC	9.500	3.125	????	7.625	REG	216.0					18.790	
ST	17.500	3.500	????	7.625	REG	.0	.000	17.500	.000		2.100	207A143
MS	9.500	3.000	????	7.625	REG	.0	.000	.000	.000		3.220	Anderdrift
ST	17.500	3.500	????	7.625	REG	.0	.000	17.500	.000		1.700	020700010 w/ solid f
BT	17.500	3.000	????	7.625	REG	.0					.430	244002

Bit Code :	BT	Bit Manufacturer:	RRB	Billing :	D
Bit Number:	1	Bit Model :	DS34HF	Cost :	0
Run Number:	1	Serial Number :	244002	Daily Rig Rate:	0
Bit Size :	17.500	IADC Class :	S223		

Nozzles : 14.0 14.0 14.0 14.0 14.0 14.0 14.0 14.0
Flow Area : 1.2026

Reason bit pulled or run terminated :	TD	Location of reported wear:	A
Wear to inner 2/3 cutters:	1	Wear to bearings or seals:	X
Wear to inner 1/3 cutters:	1	Wear to gauge :	0.
Major dull characteristic:	NO	Other dull characteristic:	NO

12-Sep-02 ExxonMobil DRILLING 18:34

Beardie-1

BEARDIE.1

DRILL STRING REPORT

Mixed Oilfield Units

Date Run:	30-Jul-02	Date Pulled:	1-Aug-02	Length of BHA :	364.940
Time Run:	12:00	Time Pulled:	21:15	BHA Weight in Air :	89.6
Depth In:	863.000	Depth Out :	1579.000	Above Jars:	43.1
				Below Jars:	33.3
				In Mud :	76.4

12¬ DS195 bit, NB stab, 8" pony, stab, dc, stab, ARC, MWD, 3 x dc, xo, HWDP, jars, HWDP

Tp	OD	ID	Grd	Connections Size	Connections Type	Nom Wt/Len	Stab Blade OD In	Stab Blade OD Out	Length To Ctr	Bend	Section Length	Serial Number
DP	5.000	4.276	S135	4.500	IF	19.5					1214.060	
HW	5.000	3.125	????	4.500	IF	50.0					274.910	
JR	6.250	2.750	????	4.500	IF	.0					9.810	14161589
HW	5.000	3.125	????	4.500	IF	50.0					17.500	
XO	8.250	2.687	????	4.500	IF	.0					1.100	144-208
DC	8.250	2.875	????	6.625	REG	147.0					28.220	
MW	8.250	4.250	????	6.625	REG	.0	.000	.000	.000		8.520	Anadrill ARC 231
LW	8.375	5.875	????	6.625	REG	.0					5.730	Anadrill ARC 8031
ST	12.250	2.750	????	6.625	REG	.0	8.062	12.250	1.110		2.350	207A307
DC	8.250	2.750	????	6.625	REG	147.0					9.420	
ST	12.250	2.750	????	6.625	REG	.0	8.000	12.250	1.110		2.340	207A305
DC	8.000	2.750	????	6.625	REG	.0					3.250	05020000031
ST	12.250	2.500	????	6.625	REG	.0	7.938	12.250	.470		1.470	207A79
BT	12.250	3.000	????	6.625	REG	.0					.320	DS195 DGNUW SN103092

Bit Code :	BT	Bit Manufacturer:	RRB	Billing :	D
Bit Number:	2	Bit Model :	DSX195	Cost :	0
Run Number:	1	Serial Number :	103092	Daily Rig Rate:	0
Bit Size :	12.250	IADC Class :	M232		

Nozzles : 14.0 14.0 14.0 14.0 14.0

Flow Area : .7517

Reason bit pulled or run terminated :	PR	Location of reported wear:	N
Wear to inner 2/3 cutters:	8	Wear to bearings or seals:	X
Wear to inner 1/3 cutters:	5	Wear to gauge :	1.
Major dull characteristic:	LT	Other dull characteristic:	RO

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Beardie-1
BEARDIE.1

DRILL STRING REPORT

Mixed Oilfield Units

Date Run:	1-Aug-02	Date Pulled:	4-Aug-02	Length of BHA :	460.280
Time Run:	21:30	Time Pulled:	12:00	BHA Weight in Air :	135.2
Depth In:	1579.000	Depth Out :	1905.000	Above Jars:	40.0
				Below Jars:	75.0
				In Mud :	115.0

12¬ EHP51HKPRDH bit, NB stab, 8" pony, stab, dc, stab, CDR, MWD, 13 x dc, xo, HWDP, jars, HWDP

Tp	OD	ID	Grd	Connections Size	Connections Type	Nom Wt/Len	Stab Blade OD In	Stab Blade OD Out	Length To Ctr	Bend	Section Length	Serial Number
DP	5.000	4.276	S135	4.500	IF	19.5					1444.720	
HW	5.000	3.125	????	4.500	IF	50.0					274.910	
JR	6.250	2.750	????	4.500	IF	.0					9.810	14161589
HW	5.000	3.125	????	4.500	IF	50.0					17.500	
XO	8.250	2.687	????	4.500	IF	.0					1.100	144-208
DC	8.250	2.875	????	6.625	REG	147.0					122.330	
MW	8.250	4.250	????	6.625	REG	.0	.000	.000	.000		8.530	
LW	9.000	5.875	????	6.625	REG	.0					8.030	Anadrill CDR
ST	12.250	2.750	????	6.625	REG	.0	8.062	12.250	1.110		2.350	207A307
DC	8.250	2.750	????	6.625	REG	147.0					9.420	
ST	12.250	2.750	????	6.625	REG	.0	8.000	12.250	1.110		2.340	207A305
DC	8.000	2.750	????	6.625	REG	.0					3.250	05020000031
ST	12.250	2.500	????	6.625	REG	.0	7.938	12.250	.470		1.470	207A79
BT	12.250	3.000	????	6.625	REG	.0					.340	EHP51HKPRDH SNNL5038

Bit Code :	BT	Bit Manufacturer:	RRB	Billing :	D
Bit Number:	3	Bit Model :	EHP51H	Cost :	0
Run Number:	1	Serial Number :	NL5038	Daily Rig Rate:	0
Bit Size :	12.250	IADC Class :	517W		

Nozzles : 18.0 18.0 18.0
Flow Area : .7455

Reason bit pulled or run terminated :	TD	Location of reported wear:	A
Wear to inner 2/3 cutters:	4	Wear to bearings or seals:	E
Wear to inner 1/3 cutters:	3	Wear to gauge :	2.
Major dull characteristic:	WT	Other dull characteristic:	NO

913712 464

913712 465

Casing Data

Casing Data

ESSO AUSTRALIA PTY. LTD.
BEARDIE-1

CASING DATA

Size (inches)	Weight (ppf)	Grade	Connection	Interval (meters)
30	457	X-52	ST-2	72.96-86.79
30	310	X-52	ST-2	86.79-115.24
20	129	X-56	Weld	115.24-122.00
20	203	X-56	Welded Xover	72.18-83.38
13.375	68	L-80	BTC	83.38-84.94
13.375	68	K-55	BTC	84.94-849.10

913712 467

6-Aug-02 ExxonMobil DRILLING 16:14

Beardie-1

BEARDIE.1

CASING REPORT

Mixed Oilfield Units

Start Date/Time	: 26-Jul-02 21:00	Water Depth	:	51.23 below MSL
End Date/Time	: 27-Jul-02 05:00	K.B. Elevation:		25.00 above MSL
Hours to Run Casing:	08:00	K.B. to Seabed:		76.23
		Bradenhead	:	3.27 above ML

============================== Setting Depths ==============================

	Measured Depth	True Vertical Depth
String Top Depth :	72.96	72.96
String Shoe Depth:	122.00	122.00

========================= Casing String Limitations =========================

Burst of Top Joint: 3309. Drift of Smallest Section: 18.562

============================== Casing (Top Down) ==============================

OD	ID	Wgt/Lng	Grade	Conn	No of Jts	Length
30.000	26.970	457.000	X52	ST 2	1	13.830
30.000	27.500	310.000	X52	ST 2	2	23.170
30.000	27.500	310.000	X52	ST 2	1	4.180
30.000	18.562	129.000	X56	WELD	1	1.100
20.000	18.562	129.000	X56	WELD	1	6.750
				Total	6	49.030

============================== Casing Equipment ==============================

	Placement	Length	--------------- Description ----------------
Shoe			Weatherford stab in float shoe. Stab in not used.

6-Aug-02 ExxonMobil DRILLING 16:14

Beardie-1

BEARDIE.1

CASING REPORT

Mixed Oilfield Units

Start Date/Time :	29-Jul-02 01:30	Water Depth :	51.23 below MSL
End Date/Time :	29-Jul-02 11:00	K.B. Elevation:	25.00 above MSL
Hours to Run Casing:	09:30	K.B. to Seabed:	76.23
		Bradenhead :	3.27 above ML

Setting Depths

	Measured Depth	True Vertical Depth
String Top Depth :	72.18	72.18
String Shoe Depth:	849.10	849.10

Casing String Limitations

Burst of Top Joint: 3564. Drift of Smallest Section: 12.259

Casing (Top Down)

OD	ID	Wgt/Lng	Grade	Conn	No of Jts	Length
20.000	18.000	203.000	X56	H 4	1	11.200
13.375	12.415	68.000	L80	WELD	1	1.560
13.375	12.415	68.000	K55	BUTT	63	764.210
				Total	65	776.970

Casing Equipment

	Placement	Length	Description
Shoe			Weatherford float shoe
Float Collar	824.040		Weatherford float collar
Centralizers	Number:	11	Bow
Placement Interval:			4 mtrs above float shoe, then on every collar
Other			Vetco 18 3/4" MS 700 housing on joint of 20"

Remarks

Wellhead joint is 18 3/4" housing, 20", swage to 13 3/8". Distance from top of housing to top of centralizer fins is 10.4 meters. Top of 18 3/4" housing is 72.18 m RT.

913712 469

								27/07/2002	
				Beardie #1					
				30" Casing					
JT #	RUN NO.	LENGTH			TOTAL PIPE	Collar	WEIGHT	GRADE	THREAD
			comments	**THREAD LOCK**	RUN	Depth			
					SHOE @	**121.99**			
Shoe Jt	1	6.75	(20")		6.75	115.24	129	X-52	Weld
"		1.10	(swedge)		7.85	114.14	129	X-52	Weld
"		4.18	(30")		12.03	109.96	310	X-52	ST-2
2		11.55			23.58	98.41	310	X-52	ST-2
3		11.62			35.20	86.79	310	X-52	ST-2
WH JT		13.83			49.03	72.96	457	X-52	WH
RF to WH		**72.96**			**121.99**	**0.00**			
					Total CSG	**CSG Set**			
					49.03	**121.99**			
Note:	**Depths are at zero tide latitude**								
-	**Rig floor to MSL = 25.0**								
-	**Rig floor to ML = 76.23**								
-	**Rig floor to top of 30" well head housing = 72.96**								

Casing Tally (as run) : Ocean Bounty Beardie #1, 13 3/8"" Csg. run 28/07/2002

Drilling Supv.:	3 Bigby, G sharkey, A.Basset
AFE Number :	L0501B003

Total Full Joints Run :	58 Joints
Full Jts Left on Deck :	6 Joints

Item No.	Item Length	Cumulative Length	Depth to Top of Item	Depth to Btm of Item	Casing Description Weight	Grade	Conn.	Centraliser / Scratcher	Comments
Casing Shoe Depth			849.10m						
A	12.51	12.51m	836.59m	849.10m	68.0 lb/ft	K55	BTC	X	Floatshoe A
C	12.17	24.68m	824.42m	836.59m	68.0 lb/ft	K55	BTC	X	Int Jt B
D	11.76	36.44m	812.66m	824.42m	68.0 lb/ft	K55	BTC	X	Float collar Jt A
E	12.18	48.62m	800.48m	812.66m	68.0 lb/ft	K55	BTC	X	Int Jt C
64	12.17	60.79m	788.31m	800.48m	68.0 lb/ft	k55	BTC	X	
63	12.17	72.96m	776.14m	788.31m	68.0 lb/ft	k55	BTC	X	
62	12.16	85.12m	763.98m	776.14m	68.0 lb/ft	k55	BTC	X	
61	12.16	97.28m	751.82m	763.98m	68.0 lb/ft	k55	BTC	X	
60	12.17	109.45m	739.65m	751.82m	68.0 lb/ft	k55	BTC	X	
59	12.17	121.62m	727.48m	739.65m	68.0 lb/ft	k55	BTC	X	
58	12.17	133.79m	715.31m	727.48m	68.0 lb/ft	k55	BTC	X	
57	12.16	145.95m	703.15m	715.31m	68.0 lb/ft	k55	BTC		
56	12.17	158.12m	690.98m	703.15m	68.0 lb/ft	k55	BTC		
55	12.16	170.28m	678.82m	690.98m	68.0 lb/ft	k55	BTC		
54	12.17	182.45m	666.65m	678.82m	68.0 lb/ft	k55	BTC		
53	12.10	194.55m	654.55m	666.65m	68.0 lb/ft	k55	BTC		
52	12.16	206.71m	642.39m	654.55m	68.0 lb/ft	k55	BTC		
51	12.16	218.87m	630.23m	642.39m	68.0 lb/ft	k55	BTC		
50	12.16	231.03m	618.07m	630.23m	68.0 lb/ft	k55	BTC		
49	11.99	243.02m	606.08m	618.07m	68.0 lb/ft	k55	BTC		
48	11.99	255.01m	594.09m	606.08m	68.0 lb/ft	k55	BTC		
47	12.03	267.04m	582.06m	594.09m	68.0 lb/ft	k55	BTC		
46	12.17	279.21m	569.89m	582.06m	68.0 lb/ft	k55	BTC		
45	12.05	291.26m	557.84m	569.89m	68.0 lb/ft	k55	BTC		
44	12.11	303.37m	545.73m	557.84m	68.0 lb/ft	k55	BTC		
43	12.16	315.53m	533.57m	545.73m	68.0 lb/ft	k55	BTC		
42	12.16	327.69m	521.41m	533.57m	68.0 lb/ft	k55	BTC		
41	12.03	339.72m	509.38m	521.41m	68.0 lb/ft	k55	BTC		
40	12.17	351.89m	497.21m	509.38m	68.0 lb/ft	k55	BTC		
39	12.17	364.06m	485.04m	497.21m	68.0 lb/ft	k55	BTC		
38	12.17	376.23m	472.87m	485.04m	68.0 lb/ft	k55	BTC		
37	12.16	388.39m	460.71m	472.87m	68.0 lb/ft	k55	BTC		
36	12.17	400.56m	448.54m	460.71m	68.0 lb/ft	k55	BTC		
35	12.16	412.72m	436.38m	448.54m	68.0 lb/ft	k55	BTC		
34	12.16	424.88m	424.22m	436.38m	68.0 lb/ft	k55	BTC		
33	12.17	437.05m	412.05m	424.22m	68.0 lb/ft	k55	BTC		
32	12.17	449.22m	399.88m	412.05m	68.0 lb/ft	k55	BTC		
31	12.17	461.39m	387.71m	399.88m	68.0 lb/ft	k55	BTC		
30	12.12	473.51m	375.59m	387.71m	68.0 lb/ft	k55	BTC		
29	11.96	485.47m	363.63m	375.59m	68.0 lb/ft	k55	BTC		
28	11.99	497.46m	351.64m	363.63m	68.0 lb/ft	k55	BTC		
27	12.17	509.63m	339.47m	351.64m	68.0 lb/ft	k55	BTC		
26	12.17	521.80m	327.30m	339.47m	68.0 lb/ft	k55	BTC		
25	12.17	533.97m	315.13m	327.30m	68.0 lb/ft	k55	BTC		
24	12.17	546.14m	302.96m	315.13m	68.0 lb/ft	k55	BTC		
23	12.17	558.31m	290.79m	302.96m	68.0 lb/ft	k55	BTC		
22	12.16	570.47m	278.63m	290.79m	68.0 lb/ft	k55	BTC		
21	12.11	582.58m	266.52m	278.63m	68.0 lb/ft	k55	BTC		
20	12.05	594.63m	254.47m	266.52m	68.0 lb/ft	k55	BTC		
19	12.03	606.66m	242.44m	254.47m	68.0 lb/ft	k55	BTC		
18	12.11	618.77m	230.33m	242.44m	68.0 lb/ft	k55	BTC		
17	12.17	630.94m	218.16m	230.33m	68.0 lb/ft	k55	BTC		
16	12.16	643.10m	206.00m	218.16m	68.0 lb/ft	k55	BTC		
15	12.17	655.27m	193.83m	206.00m	68.0 lb/ft	k55	BTC		
14	12.16	667.43m	181.67m	193.83m	68.0 lb/ft	k55	BTC		
13	11.97	679.40m	169.70m	181.67m	68.0 lb/ft	k55	BTC		
12	12.00	691.40m	157.70m	169.70m	68.0 lb/ft	k55	BTC		
11	12.17	703.57m	145.53m	157.70m	68.0 lb/ft	k55	BTC		
10	12.03	715.60m	133.50m	145.53m	68.0 lb/ft	k55	BTC		
9	12.10	727.70m	121.40m	133.50m	68.0 lb/ft	k55	BTC		
8	12.17	739.87m	109.23m	121.40m	68.0 lb/ft	k55	BTC		
7	12.16	752.03m	97.07m	109.23m	68.0 lb/ft	k55	BTC		
F	12.18	764.21m	84.89m	97.07m	68.0 lb/ft	K55	BTC		No X Joint A
H	12.71	776.92m	72.18m	84.89m	68.0 lb/ft	K55	BTC		Hanger Joint A
				72.18m	19.5 lb/ft		IF		L/string 5" D/pipe

EMLRFD CASING ANALYSIS REPORT
(For ExxonMobil Use Only)

Version 1.0
File Name: Beardie-1 Casing Design.LRF
Case Name: Subsea
Well Type: Exploration

Designed By: meaki
Endorsed By:
Bridging Doc Exceptions: Yes ___ No ___

Peer reviewed
David White
11/4/2002

PAL/CTP Summary for Current Casing String
Casing Type: Cond

PAL Report

Sect	From (m)	To (m)	OD (in)	Weight (lbs/ft)	Grade	PAL	Load Cond	Temp (°C)	H2S (psia)	PAL Table Values PAL1 (psi)	PAL2 (psi)	PAL3 (psi)
1	75	87	30.000	457.00	K55							
2	87	124	30.000	310.00	K55							

CTP Report

Sect.	Type	Plat. (in)	OS/Std	G/L	CTP	OD	CTP Values CTP1 (psi)	CTP2 (psi)	CTP3 (psi)
1	PRM			L					
2	PRM			L					

** Burst load must be selected to obtain a complete PAL and CTP report **

Wellbore Casing Summary

Subsea well RKB-ML = 75 (m)

Type	From (m)	To (m)	Length (m)	OD (in)	Weight (lbs/ft)	ID (in)	Grade	Conn. Type
Cond	75	87	12	30.000	457.00	27.000	K55	PRM
Cond	87	124	37	30.000	310.00	28.000	K55	PRM
Surface	75	87	12	20.000	202.92	18.000	K55	PRM
Surface	87	850	763	13.375	68.00	12.415	K55	BTC
Prod	75	78	3	9.625	53.50	8.535	L80	PRM
Prod	78	1905	1827	9.625	47.00	8.681	L80	LTC

API Rating

OD (in)	Wt. (lbs/ft)	Grade	P.B. Tension (lbf)	P.B. Burst (psi)	P.B. Collapse (psi)	Conn. Type	Conn. Tension (lbf)
30.000	457.00	K55	7386687	4813	4044	PRM	
30.000	310.00	K55	5010852	3208	1669	PRM	
20.000	202.92	K55	3282972	4813	4044	PRM	
13.375	68.00	K55	1069489	3454	1949	BTC	1300000
9.625	53.50	L80	1243722	7927	6617	PRM	
9.625	47.00	L80	1085791	6865	4754	LTC	893000

** Premium connections must be checked against a specific performance envelope **

Tubular Weights

Type	Length	OD	Weight	Air Wt.	Buoyed Wt.

913712 472

	(m)	(in)	(lbs/ft)	(lbs)	(lbs)
Cond	12	30.000	457.00	17992	15520
Cond	37	30.000	310.00	37631	32461
Surface	12	20.000	202.92	7989	6829
Surface	763	13.375	68.00	170223	146200
Prod	3	9.625	53.50	527	447
Prod	1827	9.625	47.00	281722	239460

Casing Buoyed + Tubing Air Weights: ________ (lbs)
Other Wellhead Load: ________ (lbs)
Total Wellhead Load: ________ (lbs)

Setting Mud Weight

Setting Mud Weight: 9.00 (ppg)
Displacement Fluid Density: 8.50 (ppg)

Cement

Top MD (m)	Bottom MD (m)	Type	Weight (ppg)
75	124	Cement	15.90

Overpull After Cement Sets: 0.0 (K lbf)

LRFD/RFD Analysis Summary Results

DCE	Load Combination	Max Load		@ Depth (m)	Max UF	@ Depth (m)
Collapse	Cement Column Collapse	68	(psi)	124	0.043	124

Safety Factor Analysis Summary

DCE	Load Combination	Max Load		@ Depth (m)	Min SF	@ Depth (m)
Tension	Running with Overpull	42551	(lbf)	75	165.273	87

* Wear is used only in burst for drilling & drilling/prod. casing. See casing wear ta

Detailed Analysis Results

Design Check Equation: Tension
Load Combination: Drilling - Running with Overpull

Overpull While Running : 10.0 (K lbf)

Casing Section No.	Depth (m)	Real Tension (lbf)	P.B. Rating (lbf)	Conn. Rating (lbf)	P.B. S.F.	Conn. S.F.
1	75	42551	7386670	________	173.594	________
1	85	27558	7386670	________	268.041	________
1	87	24559	7386670	________	300.769	________
2	87	30319	5010840	________	165.273	________
2	95	22182	5010840	________	225.896	________
2	105	12011	5010840	________	417.172	________

2	115	1841	5010840		2721.991	
2	124	-7313	5010840		685.229	

For liners & subsea strings, compare the buoyed weight of each section of the stri (from the Tubular Weights table) + overpull to the strengths of the tubulars and connections to ensure that the appropriate design factors are satisfied.

Design Check Equation: Collapse
Load Combination: Drilling - Cement Column Collapse

Casing Section No.	Depth (m)	Lf	Rf	Unf. Load (psi)	Unf. Resistance (psi)	Factored Load (psi)	Factored Resistance (psi)	UF
1	75		0.961	6	4044		3885	0.002
1	85		0.961	19	4044		3885	0.005
1	87		0.961	22	4044		3885	0.006
2	87		0.944	22	1669		1576	0.014
2	95		0.944	32	1669		1576	0.020
2	105		0.944	44	1669		1576	0.028
2	115		0.944	57	1669		1576	0.036
2	124		0.944	68	1669		1576	0.043

RFD Pressure and Tension Summary, Cement Column Collapse

Casing Section No.	Depth (m)	Int. Press (psi)	Ext. Press (psi)	Real Tension (lbf)	Eff. Tension (lbf)
1	75	109	115	-14323	4769
1	85	123	142	-29317	626
1	87	126	147	-32315	-202
2	87	126	147	-26876	-202
2	95	137	169	-35012	-159
2	105	152	196	-45183	-104
2	115	166	223	-55354	-49
2	124	179	248	-64507	0

Well Data

Pore Pressure Curve

MD (m)	Pore Pressure (ppg)	Frac Pressure (ppg)
75	8.50	8.50
835	8.50	13.00
3325	8.50	15.00

Survey

Selected Data Type: MD/TVD Pairs

MD/TVD Pairs

MD (m)	TVD (m)
0	0
3325	3325

Directional

No directional data entered

Temperature Profiles

Profile Name & Type: Geothermal (Manual Entry)

MD (m)	Temp (°C)
0	20
75	23
3325	140

Profile Name & Type: Drilling (Cubic Polynomial)

MD (m)	Temp (°C)
0	68
3325	92

Profile Name & Type: Injection (Manual Entry)

MD (m)	Temp (°C)
0	20
3325	60

Casing Wear

MD (m)	Casing Wear % of Wall Thickness
75	10.000
124	10.000

EMLRFD CASING ANALYSIS REPORT
(For ExxonMobil Use Only)

Version 1.0
File Name: Beardie-1 Casing Design.LRF
Case Name: Subsea
Well Type: Exploration

Designed By: czakai
Endorsed By:
Bridging Doc Exceptions: Yes ___ No ___

Peer reviewed
11/4/2002

PAL/CTP Summary for Current Casing String
Casing Type: Surface

PAL Report

Sect	From (m)	To (m)	OD (in)	Weight (lbs/ft)	Grade	PAL	Load Cond	Temp (°C)	H2S (psia)	PAL Table Values PAL1 (psi)	PAL2 (psi)	PAL3 (psi)
1	75	87	20.000	202.92	K55	?	KICK	23	0.031			
2	87	850	13.375	68.00	K55	2	P_TST	23	0.061	3017	4127	5062

CTP Report

Sect.	Type	Plat. (in)	OS/Std	G/L	CTP	OD	CTP Values CTP1 (psi)	CTP2 (psi)	CTP3 (psi)
1	PRM			L	1	N/A	3513	4813	6691
2	BTC	Phos	Std	L	3	14.375	2520	0	3110

Wellbore Casing Summary

Subsea well RKB-ML = 75 (m)

Type	From (m)	To (m)	Length (m)	OD (in)	Weight (lbs/ft)	ID (in)	Grade	Conn. Type
Cond	75	87	12	30.000	457.00	27.000	K55	PRM
Cond	87	124	37	30.000	310.00	28.000	K55	PRM
Surface	75	87	12	20.000	202.92	18.000	K55	PRM
Surface	87	850	763	13.375	68.00	12.415	K55	BTC
Prod	75	78	3	9.625	53.50	8.535	L80	PRM
Prod	78	1905	1827	9.625	47.00	8.681	L80	LTC

API Rating

OD (in)	Wt. (lbs/ft)	Grade	P.B. Tension (lbf)	P.B. Burst (psi)	P.B. Collapse (psi)	Conn. Type	Conn. Tension (lbf)
30.000	457.00	K55	7386687	4813	4044	PRM	________
30.000	310.00	K55	5010852	3208	1669	PRM	________
20.000	202.92	K55	3282972	4813	4044	PRM	________
13.375	68.00	K55	1069489	3454	1949	BTC	1300000
9.625	53.50	L80	1243722	7927	6617	PRM	________
9.625	47.00	L80	1085791	6865	4754	LTC	893000

** Premium connections must be checked against a specific performance envelope **

Tubular Weights

Type	Length (m)	OD (in)	Weight (lbs/ft)	Air Wt. (lbs)	Buoyed Wt. (lbs)
Cond	12	30.000	457.00	17992	15520

Cond	37	30.000	310.00	37631	32461
Surface	12	20.000	202.92	7989	6829
Surface	763	13.375	68.00	170223	146200
Prod	3	9.625	53.50	527	447
Prod	1827	9.625	47.00	281722	239460

Casing Buoyed + Tubing Air Weights: ________ (lbs)
Other Wellhead Load: ________ (lbs)
Total Wellhead Load: ________ (lbs)

Setting Mud Weight

Setting Mud Weight: 9.50 (ppg)
Displacement Fluid Density: 9.50 (ppg)

Cement

Top MD (m)	Bottom MD (m)	Type	Weight (ppg)
75	700	Cement	12.50
700	850	Cement	15.90

Overpull After Cement Sets: 0.0 (K lbf)

LRFD/RFD Analysis Summary Results

DCE	Load Combination	Max Load		@ Depth (m)	Max UF	@ Depth (m)
Burst	Kick	1552	(psi)	75	0.368	87
	Pressure Test	3069	(psi)	850	0.750	850
Tension	Green Cmt Pressure Test	518248	(lbf)	75	0.256	87
Collapse	Cement Column Collapse	483	(psi)	850	0.260	850

Safety Factor Analysis Summary

DCE	Load Combination	Max Load			@ Depth (m)	Min SF	@ Depth (m)
Burst	Kick	27887	(psi)	VME	87	1.972	87
	Pressure Test	42123	(psi)	VME	850	1.275	850
Tension	Running with Overpull	245811	(lbf)		75	4.392	87
	Green Cmt Pressure Test	21425	(psi)	VME	87	2.567	87

* Wear is used only in burst for drilling & drilling/prod. casing. See casing wear t

Detailed Analysis Results

Design Check Equation: Burst
Load Combination: Drilling - Kick

H2S: 20 (ppm)
Gas Gradient: 0.154 (psi/m)
Pipe Probability of Failure: -6.5

Casing Section	Depth	Lf	Rf	Unf. Load	Unf. * Resistance	Factored Load	Factored Resistance	UF

No.	(m)			(psi)	(psi)	(psi)	(psi)	
1	75	0.880	1.365	1764	4328	1552	5907	0.263
1	87	0.880	1.365	1749	4327	1539	5907	0.261
2	87	0.880	1.347	1749	3108	1539	4186	0.368
2	125	0.880	1.347	1591	3109	1400	4186	0.334
2	175	0.880	1.347	1526	3108	1343	4186	0.321
2	225	0.880	1.347	1462	3108	1286	4185	0.307
2	275	0.880	1.347	1397	3107	1229	4184	0.294
2	325	0.880	1.347	1332	3107	1172	4183	0.280
2	375	0.880	1.347	1267	3106	1115	4182	0.267
2	425	0.880	1.347	1203	3104	1058	4181	0.253
2	475	0.880	1.347	1138	3103	1002	4179	0.240
2	525	0.880	1.347	1073	3102	945	4177	0.226
2	575	0.880	1.347	1009	3100	888	4174	0.213
2	625	0.880	1.347	944	3098	831	4172	0.199
2	675	0.880	1.347	879	3096	774	4169	0.186
2	700	0.880	1.347	847	3095	745	4168	0.179
2	725	0.880	1.347	815	3094	717	4166	0.172
2	775	0.880	1.347	750	3091	660	4163	0.159
2	825	0.880	1.347	685	3089	603	4160	0.145
2	835	0.880	1.347	672	3088	592	4159	0.142
2	850	0.880	1.347	653	3088	575	4158	0.138

* Includes effects of casing wear and tension derating if applicable.

LRFD Pressure and Tension Summary, Kick

Casing Section No.	Depth (m)	Int. Press (psi)	Ext. Press (psi)	Real Tension (lbf)	Eff. Tension (lbf)
1	75	1764	0	327747	-121162
1	87	1766	17	317076	-126845
2	87	1766	17	193708	-17629
2	125	1772	181	181190	-7877
2	175	1779	253	164719	-15111
2	225	1787	326	148248	-22346
2	275	1795	398	131777	-29580
2	325	1803	470	115306	-36814
2	375	1810	543	98835	-44048
2	425	1818	615	82364	-51282
2	475	1826	687	65893	-58516
2	525	1833	760	49422	-65750
2	575	1841	832	32950	-72985
2	625	1849	905	16479	-80219
2	675	1856	977	8	-87453
2	700	1860	1013	-8227	-91070
2	725	1864	1049	-16463	-94687
2	775	1872	1122	-32934	-101921
2	825	1879	1194	-49405	-109155
2	835	1881	1209	-52699	-110602
2	850	1883	1230	-57640	-112773

vonMises Design Check, Kick

Csg. Sect. No.	Depth (m)	Int. * Press (psi)	Ext. Press (psi)	Real Tension (lbf)	VME Stress (psi)	Derated Strength (psi)	Derated Triaxial S.F.	Geo. Temp (°C)	
1	75	1764	0	327747	20670	55000	2.661	23	#
1	87	1766	17	317076	20513	55000	2.681	23	#
2	87	1766	17	193708	27887	55000	1.972	23	#
2	125	1772	181	181190	25312	54769	2.164	24	
2	175	1779	253	164719	24338	54696	2.247	26	
2	225	1787	326	148248	23371	54623	2.337	28	

2	275	1795	398	131777	22411	54550	2.434	30
2	325	1803	470	115306	21459	54477	2.539	32
2	375	1810	543	98835	20518	54404	2.652	34
2	425	1818	615	82364	19587	54331	2.774	35
2	475	1826	687	65893	18669	54258	2.906	37
2	525	1833	760	49422	17765	54184	3.050	39
2	575	1841	832	32950	16878	54111	3.206	41
2	625	1849	905	16479	16012	54038	3.375	43
2	675	1856	977	8	15168	53965	3.558	44
2	700	1860	1013	-8227	14756	53929	3.655	45
2	725	1864	1049	-16463	14352	53892	3.755	46
2	775	1872	1122	-32934	13568	53819	3.967	48
2	825	1879	1194	-49405	12822	53746	4.192	50
2	835	1881	1209	-52699	12678	53731	4.238	50
2	850	1883	1230	-57640	12465	53710	4.309	51

* Frac@shoe: gas to surface for surf & cond csg and water to surface for others.
# For temperature < 75 F, nominal strength is used for S.F. calculation.

Design Check Equation: Burst
Load Combination: Drilling - Pressure Test

H2S: 20 (ppm)
Surface Pressure: 2350.0 (psi) (User Input)
Pipe Probability of Failure: -3.5

Casing Section No.	Depth (m)	Lf	Rf	Unf. Load (psi)	Unf. * Resistance (psi)	Factored Load (psi)	Factored Resistance (psi)	UF
1	75	1.230	1.365	2471	4322	3040	5900	0.515
1	87	1.230	1.365	2473	4321	3042	5899	0.516
2	87	1.230	1.347	2473	3104	3042	4180	0.728
2	125	1.230	1.347	2371	3105	2917	4182	0.697
2	175	1.230	1.347	2380	3103	2927	4179	0.700
2	225	1.230	1.347	2388	3101	2938	4176	0.703
2	275	1.230	1.347	2397	3099	2948	4173	0.707
2	325	1.230	1.347	2405	3096	2959	4169	0.710
2	375	1.230	1.347	2414	3092	2969	4164	0.713
2	425	1.230	1.347	2422	3088	2980	4159	0.716
2	475	1.230	1.347	2431	3084	2990	4153	0.720
2	525	1.230	1.347	2439	3080	3000	4147	0.723
2	575	1.230	1.347	2448	3075	3011	4141	0.727
2	625	1.230	1.347	2456	3069	3021	4133	0.731
2	675	1.230	1.347	2465	3064	3032	4126	0.735
2	700	1.230	1.347	2469	3060	3037	4121	0.737
2	725	1.230	1.347	2473	3057	3042	4117	0.739
2	775	1.230	1.347	2482	3051	3053	4108	0.743
2	825	1.230	1.347	2490	3044	3063	4099	0.747
2	835	1.230	1.347	2492	3042	3065	4097	0.748
2	850	1.230	1.347	2495	3040	3069	4094	0.750

* Includes effects of casing wear and tension derating if applicable.

LRFD Pressure and Tension Summary, Pressure Test

Casing Section No.	Depth (m)	Int. Press (psi)	Ext. Press (psi)	Real Tension (lbf)	Eff. Tension (lbf)
1	75	2471	0	435724	-193146
1	87	2491	17	427735	-200618
2	87	2491	17	246350	-52724
2	125	2552	181	237872	-45666
2	175	2633	253	226718	-56444

2	225	2714	326	215563	-67222
2	275	2795	398	204408	-78001
2	325	2876	470	193253	-88779
2	375	2957	543	182098	-99557
2	425	3037	615	170943	-110335
2	475	3118	687	159789	-121114
2	525	3199	760	148634	-131892
2	575	3280	832	137479	-142670
2	625	3361	905	126324	-153449
2	675	3442	977	115169	-164227
2	700	3482	1013	109592	-169616
2	725	3523	1049	104014	-175005
2	775	3604	1122	92860	-185783
2	825	3685	1194	81705	-196562
2	835	3701	1209	79474	-198717
2	850	3725	1230	76127	-201951

vonMises Design Check, Pressure Test

Csg. Sect. No.	Depth (m)	Int. Press (psi)	Ext. Press (psi)	Real Tension (lbf)	VME Stress (psi)	Derated Strength (psi)	Derated Triaxial S.F.	Geo. Temp (°C)	
1	75	2471	0	435724	29043	55000	1.894	23	#
1	87	2491	17	427735	29094	55000	1.890	23	#
2	87	2491	17	246350	39685	55000	1.386	23	#
2	125	2552	181	237872	38002	54769	1.441	24	
2	175	2633	253	226718	38240	54696	1.430	26	
2	225	2714	326	215563	38485	54623	1.419	28	
2	275	2795	398	204408	38738	54550	1.408	30	
2	325	2876	470	193253	38998	54477	1.397	32	
2	375	2957	543	182098	39265	54404	1.386	34	
2	425	3037	615	170943	39538	54331	1.374	35	
2	475	3118	687	159789	39819	54258	1.363	37	
2	525	3199	760	148634	40106	54184	1.351	39	
2	575	3280	832	137479	40399	54111	1.339	41	
2	625	3361	905	126324	40699	54038	1.328	43	
2	675	3442	977	115169	41005	53965	1.316	44	
2	700	3482	1013	109592	41160	53929	1.310	45	
2	725	3523	1049	104014	41317	53892	1.304	46	
2	775	3604	1122	92860	41635	53819	1.293	48	
2	825	3685	1194	81705	41959	53746	1.281	50	
2	835	3701	1209	79474	42024	53731	1.279	50	
2	850	3725	1230	76127	42123	53710	1.275	51	

For temperature < 75 F, nominal strength is used for S.F. calculation.

Design Check Equation: Tension
Load Combination: Drilling - Running with Overpull

Overpull While Running : 100.0 (K lbf)

Casing Section No.	Depth (m)	Real Tension (lbf)	P.B. Rating (lbf)	Conn. Rating (lbf)	P.B. S.F.	Conn. S.F.
1	75	245811	3282964		13.356	
1	87	237822	3282964		13.804	
2	87	243486	1069486	1300000	4.392	5.339
2	125	235008	1069486	1300000	4.551	5.532
2	175	223854	1069486	1300000	4.778	5.807
2	225	212699	1069486	1300000	5.028	6.112
2	275	201544	1069486	1300000	5.306	6.450
2	325	190389	1069486	1300000	5.617	6.828

2	375	179234	1069486	1300000	5.967	7.253
2	425	168079	1069486	1300000	6.363	7.734
2	475	156925	1069486	1300000	6.815	8.284
2	525	145770	1069486	1300000	7.337	8.918
2	575	134615	1069486	1300000	7.945	9.657
2	625	123460	1069486	1300000	8.663	10.530
2	675	112305	1069486	1300000	9.523	11.576
2	700	106728	1069486	1300000	10.021	12.181
2	725	101150	1069486	1300000	10.573	12.852
2	775	89996	1069486	1300000	11.884	14.445
2	825	78841	1069486	1300000	13.565	16.489
2	835	76610	1069486	1300000	13.960	16.969
2	850	73263	1069486	1300000	14.598	17.744

For liners & subsea strings, compare the buoyed weight of each section of the stri
(from the Tubular Weights table) + overpull to the strengths of the tubulars and
connections to ensure that the appropriate design factors are satisfied.

Design Check Equation: Tension
Load Combination: Drilling - Green Cmt Pressure Test

Surface Pressure: 1500.0 (psi)
Pipe Probability of Failure: -3.5

Casing Section No.	Depth (m)	Lf	Rf	Unf. Load (lbf)	Unf. Resistance (lbf)	Factored Load (lbf)	Factored Resistance (lbf)	UF
1	75	1.130	1.060	458627	3282964	518248	3479942	0.149
1	87	1.130	1.060	450638	3282964	509220	3479942	0.146
2	87	1.130	1.060	257245	1069486	290687	1133655	0.256
2	125	1.130	1.060	248767	1069486	281107	1133655	0.248
2	175	1.130	1.060	237613	1069486	268502	1133655	0.237
2	225	1.130	1.060	226458	1069486	255897	1133655	0.226
2	275	1.130	1.060	215303	1069486	243292	1133655	0.215
2	325	1.130	1.060	204148	1069486	230687	1133655	0.203
2	375	1.130	1.060	192993	1069486	218082	1133655	0.192
2	425	1.130	1.060	181838	1069486	205477	1133655	0.181
2	475	1.130	1.060	170684	1069486	192872	1133655	0.170
2	525	1.130	1.060	159529	1069486	180267	1133655	0.159
2	575	1.130	1.060	148374	1069486	167663	1133655	0.148
2	625	1.130	1.060	137219	1069486	155058	1133655	0.137
2	675	1.130	1.060	126064	1069486	142453	1133655	0.126
2	700	1.130	1.060	120487	1069486	136150	1133655	0.120
2	725	1.130	1.060	114909	1069486	129848	1133655	0.115
2	775	1.130	1.060	103755	1069486	117243	1133655	0.103
2	825	1.130	1.060	92600	1069486	104638	1133655	0.092
2	835	1.130	1.060	90369	1069486	102117	1133655	0.090
2	850	1.130	1.060	87022	1069486	98335	1133655	0.087

LRFD Pressure and Tension Summary, Green Cmt Pressure Test

Casing Section No.	Depth (m)	Int. Press (psi)	Ext. Press (psi)	Real Tension (lbf)	Eff. Tension (lbf)
1	75	1621	121	458627	84165
1	87	1641	147	450638	79260
2	87	1641	147	257245	79260
2	125	1702	228	248767	74705
2	175	1783	334	237613	68712
2	225	1864	441	226458	62718
2	275	1945	547	215303	56724
2	325	2026	653	204148	50731
2	375	2107	760	192993	44737
2	425	2187	866	181838	38744

2	425	2187	866	181838	38744
2	475	2268	973	170684	32750
2	525	2349	1079	159529	26757
2	575	2430	1186	148374	20763
2	625	2511	1292	137219	14770
2	675	2592	1398	126064	8776
2	700	2632	1452	120487	5779
2	725	2673	1519	114909	4816
2	775	2754	1655	103755	2890
2	825	2835	1790	92600	963
2	835	2851	1817	90369	578
2	850	2875	1858	87022	0

vonMises Design Check, Green Cmt Pressure Test

Csg. Sect. No.	Depth (m)	Int. Press (psi)	Ext. Press (psi)	Real Tension (lbf)	VME Stress (psi)	Derated Strength (psi)	Derated Triaxial S.F.	Geo. Temp (°C)	
1	75	1621	121	458627	15529	55000	3.542	23	#
1	87	1641	147	450638	15464	55000	3.557	23	#
2	87	1641	147	257245	21425	55000	2.567	23	#
2	125	1702	228	248767	21125	54769	2.593	24	
2	175	1783	334	237613	20733	54696	2.638	26	
2	225	1864	441	226458	20345	54623	2.685	28	
2	275	1945	547	215303	19959	54550	2.733	30	
2	325	2026	653	204148	19576	54477	2.783	32	
2	375	2107	760	192993	19197	54404	2.834	34	
2	425	2187	866	181838	18822	54331	2.887	35	
2	475	2268	973	170684	18450	54258	2.941	37	
2	525	2349	1079	159529	18082	54184	2.997	39	
2	575	2430	1186	148374	17719	54111	3.054	41	
2	625	2511	1292	137219	17361	54038	3.113	43	
2	675	2592	1398	126064	17007	53965	3.173	44	
2	700	2632	1452	120487	16832	53929	3.204	45	
2	725	2673	1519	114909	16446	53892	3.277	46	
2	775	2754	1655	103755	15674	53819	3.434	48	
2	825	2835	1790	92600	14903	53746	3.606	50	
2	835	2851	1817	90369	14749	53731	3.643	50	
2	850	2875	1858	87022	14518	53710	3.700	51	

For temperature < 75 F, nominal strength is used for S.F. calculation.

Design Check Equation: Collapse
Load Combination: Drilling - Cement Column Collapse

Casing Section No.	Depth (m)	Lf	Rf	Unf. Load (psi)	Unf. Resistance (psi)	Factored Load (psi)	Factored Resistance (psi)	UF
1	75		0.961	0	4014		3856	0.000
1	87		0.961	6	4017		3860	0.002
2	87		0.953	6	1913		1823	0.003
2	125		0.953	26	1917		1827	0.014
2	175		0.953	51	1923		1832	0.028
2	225		0.953	77	1928		1837	0.042
2	275		0.953	102	1933		1842	0.055
2	325		0.953	128	1938		1847	0.069
2	375		0.953	153	1943		1852	0.083
2	425		0.953	179	1948		1856	0.096
2	475		0.953	204	1949		1856	0.110
2	525		0.953	230	1949		1856	0.124
2	575		0.953	255	1949		1856	0.138
2	625		0.953	281	1949		1856	0.151

2	625	0.953	281	1949	1856	0.151
2	675	0.953	306	1949	1856	0.165
2	700	0.953	319	1949	1856	0.172
2	725	0.953	347	1949	1856	0.187
2	775	0.953	401	1949	1856	0.216
2	825	0.953	455	1949	1856	0.245
2	835	0.953	466	1949	1856	0.251
2	850	0.953	483	1949	1856	0.260

RFD Pressure and Tension Summary, Cement Column Collapse

Casing Section No.	Depth (m)	Int. Press (psi)	Ext. Press (psi)	Real Tension (lbf)	Eff. Tension (lbf)
1	75	121	121	76923	84165
1	87	141	147	68934	79260
2	87	141	147	75662	79260
2	125	202	228	67185	74705
2	175	283	334	56030	68712
2	225	364	441	44875	62718
2	275	445	547	33720	56724
2	325	526	653	22565	50731
2	375	607	760	11411	44737
2	425	687	866	256	38744
2	475	768	973	-10899	32750
2	525	849	1079	-22054	26757
2	575	930	1186	-33209	20763
2	625	1011	1292	-44364	14770
2	675	1092	1398	-55518	8776
2	700	1132	1452	-61096	5779
2	725	1173	1519	-66673	4816
2	775	1254	1655	-77828	2890
2	825	1335	1790	-88983	963
2	835	1351	1817	-91214	578
2	850	1375	1858	-94560	-0

Well Data

Pore Pressure Curve

MD (m)	Pore Pressure (ppg)	Frac Pressure (ppg)
75	8.50	8.50
835	8.50	13.00
3325	8.50	15.00

Survey

Selected Data Type: MD/TVD Pairs

MD/TVD Pairs

MD (m)	TVD (m)
0	0
3325	3325

913712 433

Directional

No directional data entered

Temperature Profiles

Profile Name & Type: Geothermal (Manual Entry)

MD (m)	**Temp (°C)**
0	20
75	23
3325	140

Profile Name & Type: Drilling (Cubic Polynomial)

MD (m)	**Temp (°C)**
0	68
3325	92

Profile Name & Type: Injection (Manual Entry)

MD (m)	**Temp (°C)**
0	20
3325	60

Casing Wear

MD (m)	**Casing Wear % of Wall Thickness**
75	10.000
850	10.000

913712 434

EMLRFD CASING ANALYSIS REPORT
(For ExxonMobil Use Only)

Version 1.0
File Name: Beardie-1 Casing Design.LRF
Case Name: Subsea
Well Type: Exploration

Designed By: Gobeaki
Endorsed By:
Bridging Doc Exceptions? Yes ___ No ___

Peer Reviewed
Grill White
11/4/2002

PAL/CTP Summary for Current Casing String
Casing Type: Prod

PAL Report

Sect	From (m)	To (m)	OD (in)	Weight (lbs/ft)	Grade	PAL	Load Cond	Temp (°C)	H2S (psia)	PAL Table Values PAL1 (psi)	PAL2 (psi)	PAL3 (psi)
1	75	78	9.625	53.50	L80	1	TUBLK	23	0.048	7005	9594	11855
2	78	1905	9.625	47.00	L80	1	TUBLK	23	0.048	6232	8436	10337

CTP Report

Sect.	Type	Plat. (in)	OS/Std	G/L	CTP	OD	CTP Values CTP1 (psi)	CTP2 (psi)	CTP3 (psi)
1	PRM			G	2	N/A	0	7927	11103
2	LTC	Phos	Std	G	3	10.625	0	0	5500

Wellbore Casing Summary

Subsea well RKB-ML = 75 (m)

Type	From (m)	To (m)	Length (m)	OD (in)	Weight (lbs/ft)	ID (in)	Grade	Conn. Type
Cond	75	87	12	30.000	457.00	27.000	K55	PRM
Cond	87	125	38	30.000	310.00	28.000	K55	PRM
Surface	75	87	12	20.000	202.92	18.000	K55	PRM
Surface	87	850	763	13.375	68.00	12.415	K55	BTC
Prod	75	78	3	9.625	53.50	8.535	L80	PRM
Prod	78	1905	1827	9.625	47.00	8.681	L80	LTC

API Rating

OD (in)	Wt. (lbs/ft)	Grade	P.B. Tension (lbf)	P.B. Burst (psi)	P.B. Collapse (psi)	Conn. Type	Conn. Tension (lbf)
30.000	457.00	K55	7386687	4813	4044	PRM	______
30.000	310.00	K55	5010852	3208	1669	PRM	______
20.000	202.92	K55	3282972	4813	4044	PRM	______
13.375	68.00	K55	1069489	3454	1949	BTC	1300000
9.625	53.50	L80	1243722	7927	6617	PRM	______
9.625	47.00	L80	1085791	6865	4754	LTC	893000

** Premium connections must be checked against a specific performance envelope **

Tubular Weights

Type	Length (m)	OD (in)	Weight (lbs/ft)	Air Wt. (lbs)	Buoyed Wt. (lbs)
Cond	12	30.000	457.00	17992	15520
Cond	38	30.000	310.00	38648	33338
Surface	12	20.000	202.92	7989	6829
Surface	763	13.375	68.00	170223	146200
Prod	3	9.625	53.50	527	447
Prod	1827	9.625	47.00	281722	239460

Casing Buoyed + Tubing Air Weights: ______ (lbs)
Other Wellhead Load: ______ (lbs)
Total Wellhead Load: ______ (lbs)

Setting Mud Weight

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Setting Mud Weight:	10.00	(ppg)
Displacement Fluid Density:	9.50	(ppg)

Cement

Top MD (m)	Bottom MD (m)	Type	Weight (ppg)
1034	1905	Cement	15.80

Overpull After Cement Sets: 0.0 (K lbf)

Packer Information

Mid Point of Perfs (MD):	1613 (m)
Packer Fluid Density:	8.50 (ppg)
Packer Depth:	1155 (m)

LRFD/RFD Analysis Summary Results

DCE	Load Combination	Max Load		@ Depth (m)	Max UF	@ Depth (m)
Burst	Tubing Leak	2478	(psi)	75	0.286	78
	Thru Tubing Stimulation	2840	(psi)	75	0.327	78
	Casing Frac/Pressure Test	3941	(psi)	75	0.454	78
Tension	Green Cmt Pressure Test	287348	(lbf)	78	0.270	78
Collapse	Evacuation Collapse	3244	(psi)	1905	0.706	1905

Safety Factor Analysis Summary

DCE	Load Combination	Max Load			@ Depth (m)	Min SF	@ Depth (m)
Burst	Tubing Leak	24222	(psi)	VME	1905	3.133	1905
	Thru Tubing Stimulation	31032	(psi)	VME	1905	2.445	1905
	Casing Frac/Pressure Test	36345	(psi)	VME	1905	2.088	1905
Tension	Running With Overpull	337961	(lbf)		75	2.644	78
	Green Cmt Pressure Test	19364	(psi)	VME	78	4.131	78

Detailed Analysis Results

Design Check Equation: Burst
Load Combination: Production - Tubing Leak

H2S:	20	(ppm)	
Shut In Tubing Pressure:	2124	(psi)	
@	75	(m)	Calculated Using Methane
Pipe Probability of Failure:	-6.5		

Casing Section No.	Depth (m)	Lf	Rf	Unf. Load (psi)	Unf. * Resistance (psi)	Factored Load (psi)	Factored Resistance (psi)	UF
1	75	1.120	1.279	2213	7900	2478	10101	0.245
1	78	1.120	1.279	2212	7900	2478	10101	0.245
2	78	1.120	1.269	2212	6831	2478	8671	0.286
2	325	1.120	1.269	2149	6848	2407	8692	0.277
2	575	1.120	1.269	2085	6859	2335	8706	0.268
2	825	1.120	1.269	2021	6865	2264	8713	0.260
2	835	1.120	1.269	2019	6865	2261	8714	0.259
2	1034	1.120	1.269	2015	6865	2257	8714	0.259
2	1075	1.120	1.269	2015	6864	2257	8713	0.259
2	1155	1.120	1.269	2015	6862	2257	8711	0.259
2	1325	1.120	1.269	2015	6856	2257	8703	0.259
2	1575	1.120	1.269	2015	6841	2257	8683	0.260
2	1825	1.120	1.269	2015	6819	2257	8655	0.261
2	1905	1.120	1.269	2015	6810	2257	8644	0.261

* Includes effects of casing wear and tension derating if applicable.

includes effects of casing wear and tension derating if applicable.

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LRFD Pressure and Tension Summary, Tubing Leak

Casing Section No.	Depth (m)	Int. Press (psi)	Ext. Press (psi)	Real Tension (lbf)	Eff. Tension (lbf)
1	75	2124	-89	230567	102569
1	78	2128	-84	230023	102148
2	78	2128	-84	240546	108470
2	325	2485	336	200965	78332
2	575	2847	762	160904	47827
2	825	3209	1188	120842	17323
2	835	3224	1205	119240	16103
2	1034	3512	1497	83399	-15550
2	1075	3571	1556	76829	-21315
2	1155	3687	1672	64010	-32563
2	1325	3933	1918	36768	-56465
2	1575	4295	2280	-3294	-91616
2	1825	4656	2641	-43355	-126767
2	1905	4772	2757	-56175	-138015

vonMises Design Check, Tubing Leak

Csg. Sect. No.	Depth (m)	Int. Press (psi)	Ext. Press (psi)	Real Tension (lbf)	VME Stress (psi)	Derated Strength (psi)	Derated Triaxial S.F.	Geo. Temp (°C)	
1	75	2124	-89	230567	21004	80000	3.809	23	#
1	78	2128	-84	230023	20990	80000	3.811	23	#
2	78	2128	-84	240546	24183	80000	3.308	23	#
2	325	2485	336	200965	23047	79239	3.438	32	
2	575	2847	762	160904	22078	78707	3.565	41	
2	825	3209	1188	120842	21314	78176	3.668	50	
2	835	3224	1205	119240	21288	78155	3.671	50	
2	1034	3512	1497	83399	21405	77732	3.631	57	
2	1075	3571	1556	76829	21461	77645	3.618	59	
2	1155	3687	1672	64010	21594	77475	3.588	62	
2	1325	3933	1918	36768	21977	77113	3.509	68	
2	1575	4295	2280	-3294	22778	76582	3.362	77	
2	1825	4656	2641	-43355	23835	76051	3.191	86	
2	1905	4772	2757	-56175	24222	75881	3.133	89	

For temperature < 75 F, nominal strength is used for S.F. calculation.

Design Check Equation: Burst
Load Combination: Production - Thru Tubing Stimulation

H2S:	20	(ppm)
Temperature Profile:	Geothermal	
Injection Fluid Density:	9.00	(ppg)
Screen Out Pressure:	2500.0	(psi)
Backup Pressure:	0.0	(psi)
Have Pop-off Valve:	Yes	
Pop-off Valve Pressure:	2800.0	(psi)
Pipe Probability of Failure:	-5	

Fluid Use: Injection fluid below packer & packer fluid above.

Casing Section No.	Depth (m)	Lf	Rf	Unf. Load (psi)	Unf. * Resistance (psi)	Factored Load (psi)	Factored Resistance (psi)	UF
1	75	1.050	1.279	2704	7906	2840	10108	0.281
1	78	1.050	1.279	2704	7907	2839	10109	0.281
2	78	1.050	1.269	2704	6838	2839	8679	0.327
2	325	1.050	1.269	2640	6852	2773	8698	0.319
2	575	1.050	1.269	2577	6861	2705	8709	0.311
2	825	1.050	1.269	2513	6865	2638	8714	0.303
2	835	1.050	1.269	2510	6865	2636	8714	0.302
2	1034	1.050	1.269	2506	6863	2632	8712	0.302
2	1075	1.050	1.269	2506	6862	2632	8711	0.302
2	1155	1.050	1.269	2506	6860	2632	8707	0.302
2	1325	1.050	1.269	2613	6851	2743	8696	0.315
2	1575	1.050	1.269	2634	6832	2766	8673	0.319
2	1825	1.050	1.269	2655	6807	2788	8640	0.323
2	1905	1.050	1.269	2662	6797	2795	8627	0.324

* Includes effects of casing wear and tension derating if applicable.

LRFD Pressure and Tension Summary, Thru Tubing Stimulation

Casing Section No.	Depth (m)	Int. Press (psi)	Ext. Press (psi)	Real Tension (lbf)	Eff. Tension (lbf)	Temp (°C)
1	75	2615	-89	246466	90353	23
1	78	2619	-84	245922	89932	23
2	78	2619	-84	258967	97806	23
2	325	2977	336	219387	67668	32
2	575	3339	762	179325	37163	41
2	825	3700	1188	139264	6659	50
2	835	3715	1205	137661	5438	50
2	1034	4003	1497	100850	-27184	N/A
2	1075	4062	1556	94280	-32949	N/A
2	1155	4178	1672	81461	-44197	N/A
2	1325	4531	1918	57998	-70619	N/A
2	1575	4914	2280	18693	-106274	N/A
2	1825	5297	2641	-20613	-141928	N/A
2	1905	5419	2757	-33191	-153337	N/A

Weighted Average Geothermal Temp. Above TOC: 39.96 (°C)
Weighted Average Operational Temp. Above TOC: 39.96 (°C)
Delta Temperature Above TOC: -17.78 (°C)

vonMises Design Check, Thru Tubing Stimulation

Csg. Sect. No.	Depth (m)	Int. Press (psi)	Ext. Press (psi)	Real Tension (lbf)	VME Stress (psi)	Derated Strength (psi)	Derated Triaxial S.F.	Geo. Temp (°C)	
1	75	2615	-89	246466	25205	80000	3.174	23	#
1	78	2619	-84	245922	25193	80000	3.175	23	#
2	78	2619	-84	258967	28984	80000	2.760	23	#
2	325	2977	336	219387	28009	79239	2.829	32	
2	575	3339	762	179325	27181	78707	2.896	41	
2	825	3700	1188	139264	26528	78176	2.947	50	
2	835	3715	1205	137661	26506	78155	2.949	50	
2	1034	4003	1497	100850	26702	77732	2.911	57	
2	1075	4062	1556	94280	26766	77645	2.901	59	
2	1155	4178	1672	81461	26910	77475	2.879	62	
2	1325	4531	1918	57998	28450	77113	2.711	68	
2	1575	4914	2280	18693	29433	76582	2.602	77	
2	1825	5297	2641	-20613	30615	76051	2.484	86	
2	1905	5419	2757	-33191	31032	75881	2.445	89	

For temperature < 75 F, nominal strength is used for S.F. calculation.

Design Check Equation: Burst
Load Combination: Production - Casing Frac/Pressure Test

H2S: 20 (ppm)
Temperature Profile: Geothermal
Injection Fluid Density: 9.00 (ppg)
Maximum Casing Pressure: 3000.0 (psi) (User Input)
Pipe Probability of Failure: -3.5

Casing Section No.	Depth (m)	Lf	Rf	Unf. Load (psi)	Unf. * Resistance (psi)	Factored Load (psi)	Factored Resistance (psi)	UF
1	75	1.230	1.279	3204	7912	3941	10115	0.390
1	78	1.230	1.279	3204	7912	3941	10115	0.390
2	78	1.230	1.269	3204	6843	3941	8687	0.454
2	325	1.230	1.269	3162	6856	3889	8703	0.447
2	575	1.230	1.269	3119	6864	3837	8712	0.440
2	825	1.230	1.269	3077	6865	3784	8714	0.434
2	835	1.230	1.269	3075	6865	3782	8714	0.434
2	1034	1.230	1.269	3088	6861	3798	8708	0.436
2	1075	1.230	1.269	3092	6859	3803	8706	0.437
2	1155	1.230	1.269	3098	6856	3811	8702	0.438
2	1325	1.230	1.269	3113	6846	3829	8689	0.441
2	1575	1.230	1.269	3134	6825	3855	8663	0.445
2	1825	1.230	1.269	3155	6796	3881	8627	0.450

2	1825	1.230	1.269	3155	6796	3881	8627	0.450
2	1905	1.230	1.269	3162	6786	3889	8613	0.452

* Includes effects of casing wear and tension derating if applicable. 913712 488

LRFD Pressure and Tension Summary, Casing Frac/Pressure Test

Casing Section No.	Depth (m)	Int. Press (psi)	Ext. Press (psi)	Real Tension (lbf)	Eff. Tension (lbf)	Temp (°C)
1	75	3115	-89	262642	77922	23
1	78	3120	-84	262107	77496	23
2	78	3120	-84	277720	86951	23
2	325	3498	336	238886	56314	32
2	575	3881	762	199581	25306	41
2	825	4264	1188	160275	-5703	50
2	835	4280	1205	158703	-6943	50
2	1034	4585	1497	121506	-40955	N/A
2	1075	4647	1556	115060	-46802	N/A
2	1155	4770	1672	102482	-58212	N/A
2	1325	5031	1918	75754	-82457	N/A
2	1575	5414	2280	36449	-118111	N/A
2	1825	5797	2641	-2857	-153766	N/A
2	1905	5919	2757	-15435	-165175	N/A

Weighted Average Geothermal Temp. Above TOC: 39.96 (°C)
Weighted Average Operational Temp. Above TOC: 39.96 (°C)
Delta Temperature Above TOC: -17.78 (°C)

vonMises Design Check, Casing Frac/Pressure Test

Csg. Sect. No.	Depth (m)	Int. Press (psi)	Ext. Press (psi)	Real Tension (lbf)	VME Stress (psi)	Derated Strength (psi)	Derated Triaxial S.F.	Geo. Temp (°C)	
1	75	3115	-89	262642	29617	80000	2.701	23	#
1	78	3120	-84	262107	29609	80000	2.702	23	#
2	78	3120	-84	277720	34026	80000	2.351	23	#
2	325	3498	336	238886	33388	79239	2.373	32	
2	575	3881	762	199581	32891	78707	2.393	41	
2	825	4264	1188	160275	32548	78176	2.402	50	
2	835	4280	1205	158703	32537	78155	2.402	50	
2	1034	4585	1497	121506	32982	77732	2.357	57	
2	1075	4647	1556	115060	33090	77645	2.346	59	
2	1155	4770	1672	102482	33317	77475	2.325	62	
2	1325	5031	1918	75754	33863	77113	2.277	68	
2	1575	5414	2280	36449	34822	76582	2.199	77	
2	1825	5797	2641	-2857	35950	76051	2.115	86	
2	1905	5919	2757	-15435	36345	75881	2.088	89	

For temperature < 75 F, nominal strength is used for S.F. calculation.

Design Check Equation: Tension
Load Combination: Production - Running With Overpull

Overpull While Running : 100.0 (K lbf)

Casing Section No.	Depth (m)	Real Tension (lbf)	P.B. Rating (lbf)	Conn. Rating (lbf)	P.B. S.F.	Conn. S.F.
1	75	337961	1243719		3.680	
1	78	337434	1243719		3.686	
2	78	337697	1085789	893000	3.215	2.644
2	325	299609	1085789	893000	3.624	2.981
2	575	261060	1085789	893000	4.159	3.421
2	825	222510	1085789	893000	4.880	4.013
2	835	220968	1085789	893000	4.914	4.041
2	1034	190282	1085789	893000	5.706	4.693
2	1075	183960	1085789	893000	5.902	4.854
2	1155	171624	1085789	893000	6.327	5.203
2	1325	145410	1085789	893000	7.467	6.141
2	1575	106860	1085789	893000	10.161	8.357
2	1825	68311	1085789	893000	15.895	13.073
2	1905	55975	1085789	893000	19.398	15.954

For liners & subsea strings, compare the buoyed weight of each section of the string

For liners & subsea strings, compare the buoyed weight of each section of the string (from the Tubular Weights table) + overpull to the strengths of the tubulars and connections to ensure that the appropriate design factors are satisfied.

Design Check Equation: Tension
Load Combination: Production - Green Cmt Pressure Test

Surface Pressure: 1500.0 (psi)
Pipe Probability of Failure: -3.5

Casing Section No.	Depth (m)	Lf	Rf	Unf. Load (lbf)	Unf. Resistance (lbf)	Factored Load (lbf)	Factored Resistance (lbf)	UF
1	75	1.130	0.980	251607	1243719	284316	1218844	0.233
1	78	1.130	0.980	251080	1243719	283721	1218844	0.233
2	78	1.130	0.980	254291	1085789	287348	1064073	0.270
2	325	1.130	0.980	216203	1085789	244310	1064073	0.230
2	575	1.130	0.980	177654	1085789	200749	1064073	0.189
2	825	1.130	0.980	139104	1085789	157187	1064073	0.148
2	835	1.130	0.980	137562	1085789	155445	1064073	0.146
2	1034	1.130	0.980	106876	1085789	120770	1064073	0.113
2	1075	1.130	0.980	100554	1085789	113626	1064073	0.107
2	1155	1.130	0.980	88218	1085789	99686	1064073	0.094
2	1325	1.130	0.980	62004	1085789	70065	1064073	0.066
2	1575	1.130	0.980	23454	1085789	26504	1064073	0.025
2	1825	1.130	0.980	-15095	1085789	-17058	1064073	0.016
2	1905	1.130	0.980	-27431	1085789	-30997	1064073	0.029

LRFD Pressure and Tension Summary, Green Cmt Pressure Test

Casing Section No.	Depth (m)	Int. Press (psi)	Ext. Press (psi)	Real Tension (lbf)	Eff. Tension (lbf)
1	75	1621	128	251607	168138
1	78	1626	133	251080	167705
2	78	1626	133	254291	167705
2	325	2026	553	216203	136571
2	575	2430	979	177654	105058
2	825	2835	1405	139104	73546
2	835	2851	1422	137562	72285
2	1034	3173	1761	106876	47202
2	1075	3239	1871	100554	44980
2	1155	3368	2086	88218	40644
2	1325	3643	2544	62004	31432
2	1575	4048	3216	23454	17884
2	1825	4452	3889	-15095	4335
2	1905	4582	4104	-27431	-0

vonMises Design Check, Green Cmt Pressure Test

Csg. Sect. No.	Depth (m)	Int. Press (psi)	Ext. Press (psi)	Real Tension (lbf)	VME Stress (psi)	Derated Strength (psi)	Derated Triaxial S.F.	Geo. Temp (°C)	
1	75	1621	128	251607	16916	80000	4.729	23	#
1	78	1626	133	251080	16898	80000	4.734	23	#
2	78	1626	133	254291	19364	80000	4.131	23	#
2	325	2026	553	216203	17941	79239	4.417	32	
2	575	2430	979	177654	16697	78707	4.714	41	
2	825	2835	1405	139104	15699	78176	4.980	50	
2	835	2851	1422	137562	15664	78155	4.989	50	
2	1034	3173	1761	106876	15088	77732	5.152	57	
2	1075	3239	1871	100554	14609	77645	5.315	59	
2	1155	3368	2086	88218	13675	77475	5.665	62	
2	1325	3643	2544	62004	11695	77113	6.594	68	
2	1575	4048	3216	23454	8797	76582	8.705	77	
2	1825	4452	3889	-15095	5941	76051	12.800	86	
2	1905	4582	4104	-27431	5048	75881	15.032	89	

For temperature < 75 F, nominal strength is used for S.F. calculation.

Design Check Equation: Tension
Load Combination: Production - Buckling Check

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Temperature Profile: Geothermal

Result is for as cemented in setting MW with displacement fluid inside

Pressure and Tension Summary, Buckling Check

Casing Section No.	Depth (m)	Int. Press (psi)	Ext. Press (psi)	Real Tension (lbf)	Eff. Tension (lbf)
1	75	121	128	165787	168138
1	78	126	133	165260	167705
2	78	126	133	165509	167705
2	325	526	553	127422	136571
2	575	930	979	88872	105058
2	825	1335	1405	50323	73546
2	835	1351	1422	48781	72285
2	1034	1673	1761	18095	47202
2	1075	1739	1871	11773	44980
2	1155	1868	2086	-563	40644
2	1325	2143	2544	-26777	31432
2	1575	2548	3216	-65327	17884
2	1825	2952	3889	-103876	4335
2	1905	3082	4104	-116212	0

Buckling Check Parameters

Top of Cement (TOC):	1034	(m)
Packer Fluid Density:	8.50	(ppg)
Average Geothermal Temperature Above TOC:	39.96	(°C)
Average Operational Temperature Above TOC:	39.96	(°C)
Delta Temperature Above TOC:	-17.78	(°C)
Real Tension at TOC:	11816	(lbf)
Effective Tension at TOC:	32140	(lbf)

**** If Effective Tension is (-), Pipe May Buckle. *****

Design Check Equation: Collapse
Load Combination: Production - Evacuation Collapse

Fluid Level: 1905.0 (m)

Casing Section No.	Depth (m)	Lf	Rf	Unf. Load (psi)	Unf. Resistance (psi)	Factored Load (psi)	Factored Resistance (psi)	UF
1	75		0.923	128	6309		5825	0.022
1	78		0.923	133	6310		5827	0.023
2	78		0.967	133	4563		4413	0.030
2	325		0.967	553	4632		4480	0.124
2	575		0.967	979	4695		4540	0.216
2	825		0.967	1405	4752		4595	0.306
2	835		0.967	1422	4754		4597	0.309
2	1034		0.967	1761	4754		4597	0.383
2	1075		0.967	1830	4754		4597	0.398
2	1155		0.967	1967	4754		4597	0.428
2	1325		0.967	2256	4754		4597	0.491
2	1575		0.967	2682	4754		4597	0.583
2	1825		0.967	3108	4754		4597	0.676
2	1905		0.967	3244	4754		4597	0.706

RFD Pressure and Tension Summary, Evacuation Collapse

Casing Section No.	Depth (m)	Int. Press (psi)	Ext. Press (psi)	Real Tension (lbf)	Eff. Tension (lbf)
1	75	0	128	161871	171163
1	78	0	133	161178	170842
2	78	0	133	160780	170443
2	325	0	553	108503	148768
2	575	0	979	55592	126830
2	825	0	1405	2681	104892
2	835	0	1422	565	104014
2	1034	0	1761	-41304	86801
2	1075	0	1830	-49981	83203
2	1155	0	1967	-66913	76183
2	1325	0	2256	-102892	61265

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2	1575	0	2682	-155803	39326
2	1825	0	3108	-208714	17388
2	1905	0	3244	-225646	10368

Well Data

Pore Pressure Curve

MD (m)	Pore Pressure (ppg)	Frac Pressure (ppg)
75	8.50	8.50
835	8.50	13.00
3325	8.50	15.00

Survey

Selected Data Type:MD/TVD Pairs

MD/TVD Pairs

MD (m)	TVD (m)
0	0
3325	3325

Directional

No directional data entered

Temperature Profiles

Profile Name & Type: Geothermal (Manual Entry)

MD (m)	Temp (°C)
0	20
75	23
3325	140

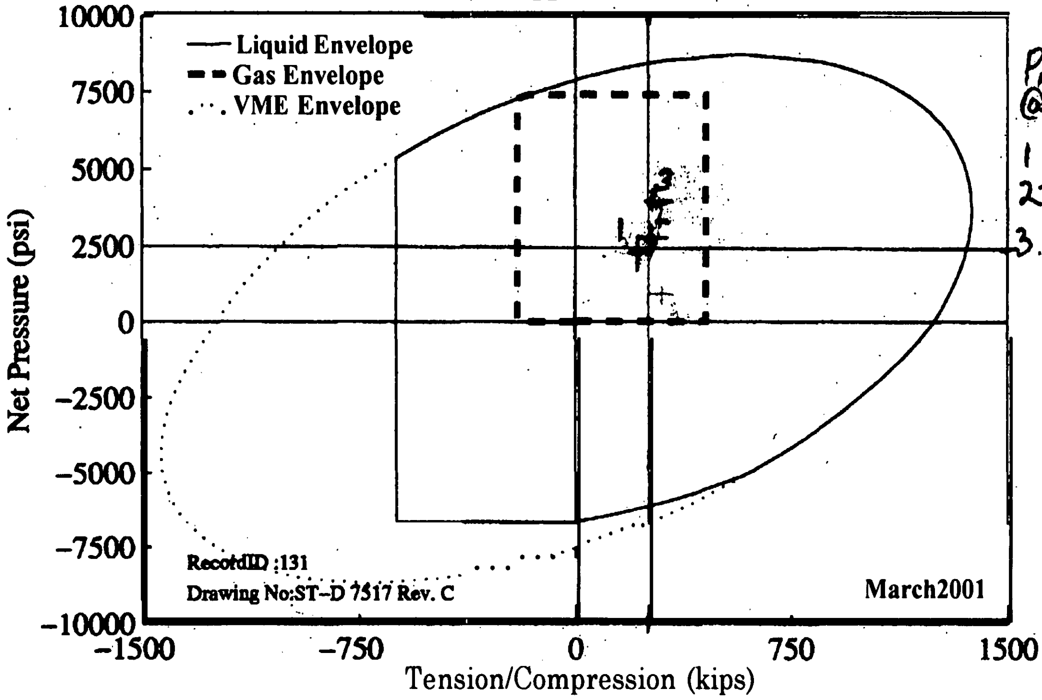
Profile Name & Type: Drilling (Cubic Polynomial)

MD (m)	Temp (°C)
0	68
3325	92

Profile Name & Type: Injection (Manual Entry)

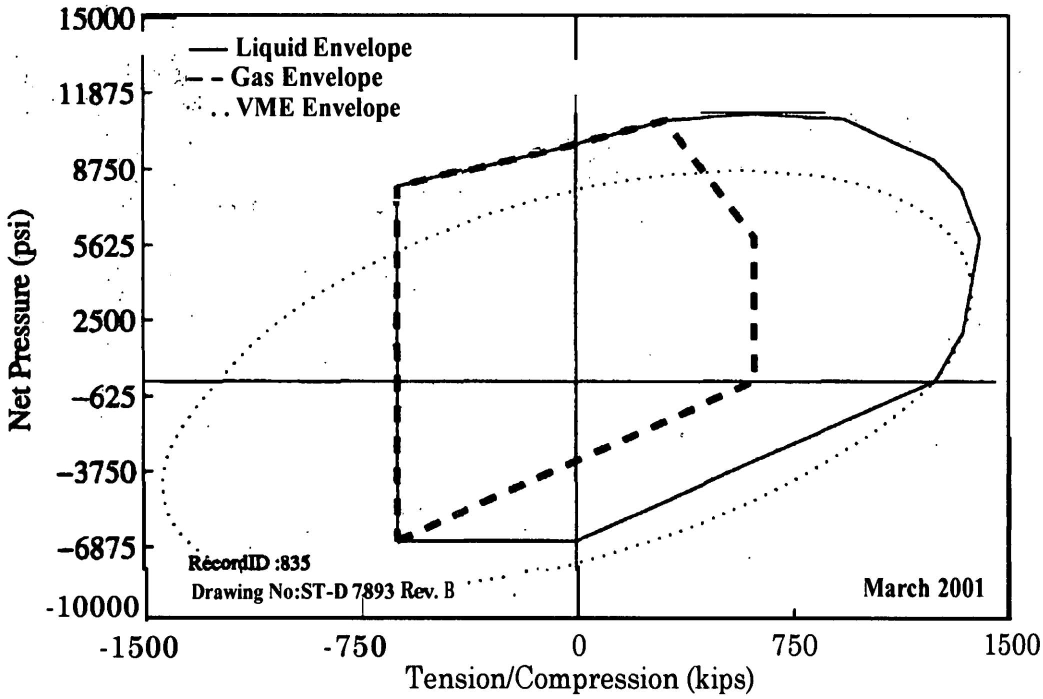
MD (m)	Temp (°C)
0	20
3325	60

9.625-inch, 53.5ppf, L80 N80, Vam Top



Premium Connectin
@ 75 (40 psi)
1 Prod. Tbg Leak
2 Thr Tbg Stimulat.
3. Burst Csg Frac/
Press. Test

9.62%inch, 53.5ppf, L80 N80, Vam Top KB



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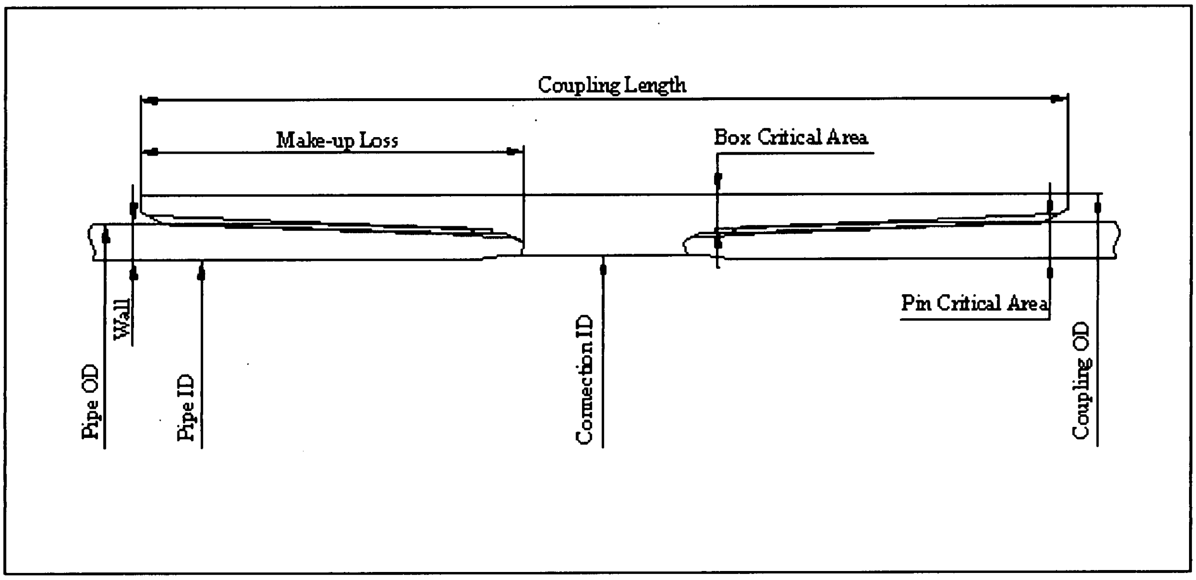
CONNECTION DATA SHEET

Connection : **VAM TOP Reg 9.625" 53.50#**
L-80 Alternate drift 8.500"

Customer :

ISO 9001



OD	WEIGHT	WALL	GRADE	DRIFT
9.625	**53.50**	**0.545**	**L-80**	**8.379**

PIPE BODY PROPERTIES

Outer Diameter	inch	**9.625**
Inner Diameter	inch	**8.535**
Nominal Area	sqin.	**15.546**
Yield Strength	kips	**1244**
Ultimate Strength	kips	**1477**
MIYP	psi	**7930**
Collapse Pressure	psi	**6620**

CONNECTION PROPERTIES

Coupling OD(max)	inch	**10.575**
Connection ID	inch	**8.726**
Coupling Length	inch	**13.189**
Make-up Loss	inch	**5.589**
Box Crit. Area		**102%**
Pin Crit. Area		**100%**
Yield Strength	kips	**1244**
Parting Load	kips	**1403**
MIYP	psi	**7930**
Collapse Pressure	psi	**6620**
Make-up Torque	Min	**20850**
	Opt	**23150**
	Max	**25450**
Max Load on Coupling Face	1000 lbs	**760**

VALLOUREC & MANNESMANN TUBES
OCTG Division

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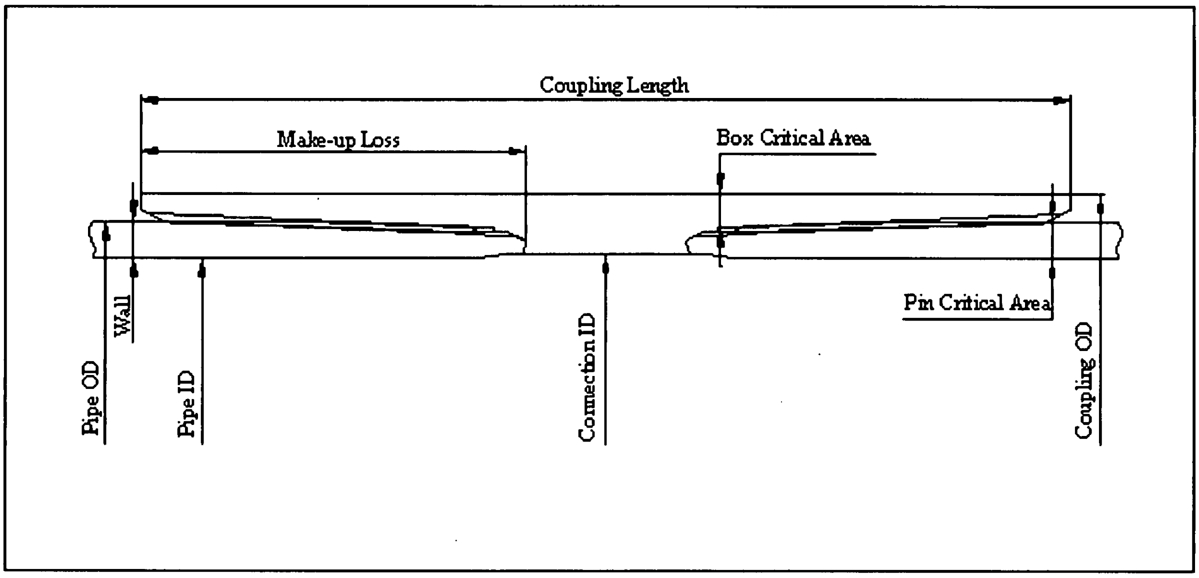
Please refer to the genuine web site www.vamservices.com

CONNECTION DATA SHEET

Connection : **VAM TOP Reg 9.625" 53.50#**
L-80 Alternate drift 8.500"

Customer : **ExxonMobil**
VAM TOP-KB

ISO 9001



OD	WEIGHT	WALL	GRADE	DRIFT
9.625	**53.50**	**0.545**	**L-80**	**8.379**

PIPE BODY PROPERTIES

Outer Diameter	inch	**9.625**
Inner Diameter	inch	**8.535**
Nominal Area	sqin.	**15.546**
Yield Strength	kips	**1244**
Ultimate Strength	kips	**1477**
MIYP	psi	**7930**
Collapse Pressure	psi	**6620**

CONNECTION PROPERTIES

Coupling OD(max)	inch	**10.575**
Connection ID	inch	**8.726**
Coupling Length	inch	**13.189**
Make-up Loss	inch	**5.589**
Box Crit. Area		**102%**
Pin Crit. Area		**100%**
Yield Strength	kips	**1244**
Parting Load	kips	**1403**
MIYP	psi	**7930**
Collapse Pressure	psi	**6620**
Make-up Torque	Min	**20850**
	Opt	**23150**
	Max	**25450**
Max Load on Coupling Face	1000 lbs	**760**

V&M
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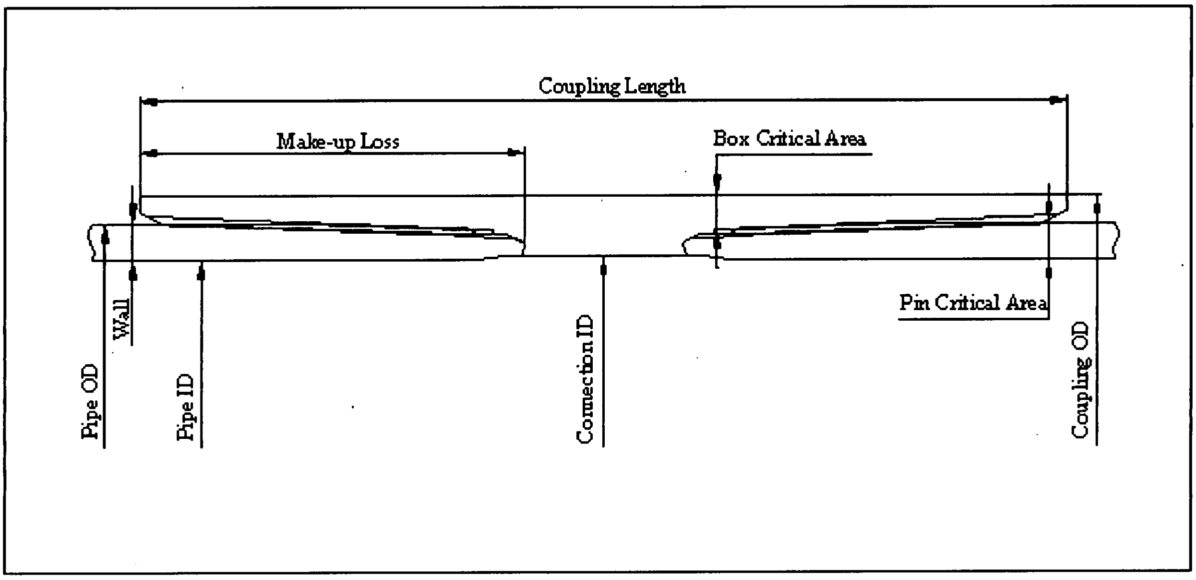
913712 495

CONNECTION DATA SHEET

Connection : **VAM TOP Reg 9.625" 53.50#**
L-80 Alternate drift 8.500"
Customer : **ExxonMobil**
VAM TOP-KC

ISO 9001



OD	WEIGHT	WALL	GRADE	DRIFT
9.625	**53.50**	**0.545**	**L-80**	**8.379**

PIPE BODY PROPERTIES

Outer Diameter	inch	**9.625**
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Yield Strength	kips	**1244**
Ultimate Strength	kips	**1477**
MIYP	psi	**7930**
Collapse Pressure	psi	**6620**

CONNECTION PROPERTIES

Coupling OD(max)	inch	**10.575**
Connection ID	inch	**8.722**
Coupling Length	inch	**13.189**
Make-up Loss	inch	**5.589**
Box Crit. Area		**102%**
Pin Crit. Area		**100%**
Yield Strength	kips	**1244**
Parting Load	kips	**1403**
MIYP	psi	**7930**
Collapse Pressure	psi	**6620**
Make-up Torque	Min	**20850**
	Opt	**23150**
	Max	**25450**
Max Load on Coupling Face	1000 lbs	**760**

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Cementing Data

Cementing Data

ESSO AUSTRALIA PTY. LTD.
BEARDIE-1

CEMENTING SUMMARY

CASING

		30" x 20" Casing	20" x 13-3/8" Casing
Hole Depth	MDRT	122m	863m
Casing Setting Depth	MDRT	122m	849.1m
Hole Size	in	36	17.5
Excess over Hole Size	%	250	100

Lead Slurry Interval	MDRT		76.2m - 510m
Class "G" cement	sacks		1335
Volume pumped	bbls		526
Weight	ppg		12.5
Yield	cfs		2.21
Mix water	gps		12.99 (SW)
Econolite	gal/10 bbl		14.6
SCR – 100L	gal/10 bbl		
Halad 413L	gal/10 bbl		
NF-5 (Anti-Foam)	gal/10 bbl		0.25

Tail Slurry Interval	MDRT	76.2m - 122.0m	510m - 849.1m
Class "G" cement	sacks	1228	726
Volume pumped	bbls	256	150
Weight	ppg	15.9	15.8
Yield	cfs	1.16	1.16
Mix water	gps	5.15 (SW)	5.11 (FW)
CaCl2	% BWOC	1	
SCR – 100L	gal/10 bbl		
WG 17 LXP	gal/10 bbl		
NF-5 (Anti-Foam)	gal/10 bbl	0.25	0.25

P&A PLUGS

		Plug 1a	Plug 1b	Plug 1c	Plug 1d	Plug 1e	Plug 2a	Plug 2b
Base	m MDRT	1,460	1,325	1,190	1,055	920	160	160
Planned Top	m MDRT	1,325	1,190	1,055	920	785	160	100
Tagged Top	m MDRT	N/A	N/A	N/A	N/A	768	160	105
Tag weight	1,000 lbs	N/A	N/A	N/A	N/A	15	5	15
Pressure test	psig	-	-	-	-	-	-	1,000
Class "G" cement	sacks	335	335	335	335	407	EZSV Bridge plug	145
Volume pumped	bbls	69.2	69.2	69.2	69.2	84.0		31
Weight	ppg	15.8	15.8	15.8	15.8	15.9		15.9
Yield	cfs	1.16	1.16	1.16	1.16	1.16	-	1.16
Mix water	gps	4.88	4.88	4.88	4.88	5.15	-	5.15
Mixwater	type	Fresh	Fresh	Fresh	Fresh	Seawater	-	Seawater
$CaCl_2$	%	-	-	-	-	-	-	1.0
SCR-100L	gal/10 bbl	1.0	1.0	-	-	-	-	-
Halad 413L	gal/10 bbl	20.0	20.0	20.0	20.0	-	-	-
NF-5 (Defoam)	gal/10 bbl	0.25	0.25	0.25	0.25	0.25	-	0.25

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Beardie-1

BEARDIE.1

CEMENT REPORT

Mixed Oilfield Units

Start Date/Time: 27-Jul-02 07:28 Job Type: Primary Single Stage
End Date/Time : 27-Jul-02 08:40 Rig Name: Ocean Bounty

Casing Size :	30.000	Setting Depth :	122.00	Float Collar :	.00
Drift :	18.562	String Top MD :	72.96	Landing Collar:	.00
Weight/Length:	457.000	Gauge Hole Size:	36.000	Estimated BHST:	15.0
Excess Cement:	250.0% over Gauge				

Last Casing Run: at (shoe MD)

Mud Data

Mud Weight :	12.00	PV:	.0	Oil Content :	.0
pH :	.0	YP:	.0	Water Content:	.0
Temperature:	.0				

Mud Flush and Spacer

Type	Density	Volume	Avg Rate	Maximum Press	Composition
Preflush	8.500	20.0	6.0	300.	Seawater w/ Fluorozene

Cement Slurries

Cement	Class	Additives
Lead	G	Seawater w/ 1% CaCl2

Cement	Amount Used	Yield	Water Req	Mix Water	Thick Time	Comp Strength 12 Hr	Comp Strength 24 Hr	Free Water	Fluid Loss
Lead	1228.	1.17	5.150	S	03:45	600.0	.0	0	0

Type	Density	Volume	Avg Rate	Maximum Press
Lead	15.900	256.0	5.0	500.

Postflush and Displacement

Type	Density	Volume	Avg Rate	Maximum Press	Composition
Displ'mnt	8.500	18.0	5.0	150.	Seawater

Job Procedure

Date	Start Time	End Time	Activity

```
27-Jul-02 07:30 08:30 Cement 30 inch conductor with 1,228 sacks Class G cement
                      mixed to 15.9 ppg w/ seawater and 1% CaCl2
27-Jul-02 08:30 12:00 Float shoe did not hold. Hold pressure on landing string.

================================== Post Job ==================================

Final Pump Pressure         :     150.          Estimated TOC:     76.23
Number of Plugs Used        :        0             From      :  Other
Did Plug Bump? (Y/N)        :        N          Estimated BOC:    122.54
   Bump Pressure            :       0.             From      :  Other
Held Pressure for           :    03:20
Release Pressure at         :    12:00
Reciprocated Casing? (Y/N):          N
Rotated Casing? (Y/N)       :        N
Float Equipment OK? (Y/N)   :        N
% Returns during Job        :    100.0
Cement to Surface? (Y/N)    :        Y
   Volume                   :      18.

============================ Remarks and Problems ============================

Cement 30 inch conductor
```

913712 500

Beardie-1
BEARDIE.1

CEMENT REPORT

Mixed Oilfield Units

Start Date/Time: 29-Jul-02 12:45 Job Type: Primary Single Stage
End Date/Time : 29-Jul-02 16:00 Rig Name: Ocean Bounty

Casing Size :	13.375	Setting Depth :	849.10	Float Collar :	824.04
Drift :	12.259	String Top MD :	72.18	Landing Collar:	.00
Weight/Length:	203.000	Gauge Hole Size:	17.500	Estimated BHST:	50.0
Excess Cement:	100.0% over Gauge				

Last Casing Run: 20.000 at 122.00 (shoe MD)

Mud Data

Mud Weight :	12.00	PV:	.0	Oil Content :	.0
pH :	.0	YP:	.0	Water Content:	.0
Temperature:	.0				

Mud Flush and Spacer

Type	Density	Volume	Avg Rate	Maximum Press	Composition
Preflush	8.500	50.0	7.0	300.	Seawater

Cement Slurries

Cement	Class	Additives
Lead	G	Seawater, Econolite 14.6 gal/10 bbl
Tail	G	Fresh water,

Cement	Amount Used	Yield	Water Req	Mix Water	Thick Time	Comp Strength 12 Hr	Comp Strength 24 Hr	Free Water	Fluid Loss
Lead	1335.	2.21	12.990	S	04:15	350.0	.0	0	0
Tail	726.	1.16	5.110	F	04:30	1000.0	.0	0	0

Type	Density	Volume	Avg Rate	Maximum Press
Lead	12.500	526.0	8.0	600.
Tail	15.800	150.0	5.0	450.

Postflush and Displacement

Type	Density	Volume	Avg Rate	Maximum Press	Composition
Postflush	8.340	10.0	5.0	250.	Drill water
Displ'mnt	8.500	369.0	14.0	700.	Seawater

Job Procedure

Date	Start Time	End Time	Activity
29-Jul-02	11:00	12:00	Nodeco top drive cement head leaked at the side flange. Service same.
29-Jul-02	13:00	15:15	Cement casing with 1335 sx Class G cement mixed with Econolite in seawater to 12.5 ppg followed by 726 sx Class G cement mixed in freshwater to 15.8 ppg. HOWCO pump 5 bbls freshwater, release dart from Cement head, displace dart and sheared wiper plug w/ 2,450 psi.
29-Jul-02	15:15	16:00	Displaced cement with 374 bbls-700 psi seawater. Pumped full displacement and 1/2 shoe track. Did not bump plug. Bleed off pressure. Floats held. Casing shoe @ 849 meters RT.

Post Job

Final Pump Pressure	700.	Estimated TOC:	76.23
Number of Plugs Used	1	From :	Other
Did Plug Bump? (Y/N)	N	Estimated BOC:	849.10
Bump Pressure	0.	From :	Other
Held Pressure for	00:02		
Release Pressure at	15:56		
Reciprocated Casing? (Y/N)	N		
Rotated Casing? (Y/N)	N		
Float Equipment OK? (Y/N)	Y		
% Returns during Job	100.0		
Cement to Surface? (Y/N)	Y		
Volume	0.		

Remarks and Problems

Used top wiper plug only. Dart sheared plug w/ 4.9 bbls at 2450 psi. Cement 13 3/8" casing.

913712 502

CEMENT REPORT

Mixed Oilfield Units

Start Date/Time: 6-Aug-02 20:30 Job Type: Plug and Abandon
End Date/Time : 6-Aug-02 21:30 Rig Name: Ocean Bounty

Casing Size :	13.375	Setting Depth :	849.10	Float Collar :	824.04
Drift :	12.259	String Top MD :	72.18	Landing Collar:	.00
Weight/Length:	203.000	Gauge Hole Size:	12.680	Estimated BHST:	88.0
Excess Cement:	.0%	over Gauge			

Last Casing Run: 13.375 at 849.10 (shoe MD)

Mud Data

Mud Weight :	9.85	PV:	20.0	Oil Content :	.0
pH :	9.0	YP:	35.0	Water Content:	91.8
Temperature:	.0				

Mud Flush and Spacer

Type	Density	Volume	Avg Rate	Maximum Press	Composition
Preflush	8.300	30.0	9.4	630.	Fresh water

Cement Slurries

Cement	Class	Additives
Lead	G	Class G cement w/ .1 gpb SCR-100L, 2 gpb Halad 413L, .025 gpb NF 5 in fresh water

Cement	Amount Used	Yield	Water Req	Mix Water	Thick Time	Comp Strength 12 Hr	Comp Strength 24 Hr	Free Water	Fluid Loss
Lead	335.	1.16	4.880	F	02:30	.0	.0	0	0

Type	Density	Volume	Avg Rate	Maximum Press
Lead	15.800	69.2	5.4	480.

Postflush and Displacement

Type	Density	Volume	Avg Rate	Maximum Press	Composition
Postflush	8.300	2.0	8.8	820.	Fresh water

Type	Temp	PV	YP
Displ'mnt	49.0	20.	35.

Job Procedure

Date	Start Time	End Time	Activity
6-Aug-02	20:30	21:30	Set a balanced cement plug from 1,460 m to 1,325 m with 335 sacks Class G cement mixed with 0.1 gpb SCR-100L, 2 gpb Halad 413 L, and 0.025 gpb NF-5 in fresh water to 15.8 ppg.
6-Aug-02	23:00	23:45	Set a balanced cement plug from 1,325 m to 1,190 m with 335 sacks Class G cement mixed with 0.1 gpb SCR-100L, 2 gpb Halad 413 L and 0.025 gpb NF-5 in fresh water to 15.8 ppg.
7-Aug-02	00:45	01:45	Set a balanced cement plug from 1,190 m to 1,055 m with 335 sacks Class G cement mixed with 2 gpb Halad 413 L and 0.025 gpb NF-5 in fresh water to 15.8 ppg.
7-Aug-02	02:45	03:45	Set a balanced cement plug from 1,055 m to 920 m with 335 sacks Class G cement mixed with 2 gpb Halad 413 L and 0.025 gpb NF-5 in fresh water to 15.8 ppg.
7-Aug-02	04:30	05:00	Setting a balanced plug from 920 m to 785 m with 407 sacks Class G cement mixed with 0.025 gpb NF-5 in sea water to 15.9 ppg.

Post Job

Wait-on-cement Time:	24:00	Estimated TOC:	1325.00
Tagged Cement at :	.00	From :	Calculation
Weight Applied :	0.	Estimated BOC:	1460.00
Tested Cement to :	0.	From :	Calculation
Drilled Cement to :	.00		

Remarks and Problems

Balanced cement plug set from 1460 m to 1325 m in 12¬" open hole

913712 504

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Beardie-1

BEARDIE.1

CEMENT REPORT

Mixed Oilfield Units

Start Date/Time: 6-Aug-02 23:00 Job Type: Plug and Abandon
End Date/Time : 6-Aug-02 23:45 Rig Name: Ocean Bounty

Casing Size : 13.375 Setting Depth : 849.10 Float Collar : 824.04
Drift : 12.259 String Top MD : 72.18 Landing Collar: .00
Weight/Length: 203.000 Gauge Hole Size: 12.680 Estimated BHST: 88.0
Excess Cement: .0% over Gauge

Last Casing Run: 13.375 at 849.10 (shoe MD)

Mud Data

Mud Weight : 9.85 PV: 20.0 Oil Content : .0
pH : 9.0 YP: 35.0 Water Content: 91.8
Temperature: .0

Mud Flush and Spacer

Type	Density	Volume	Avg Rate	Maximum Press	Composition
Preflush	8.340	30.0	5.8	480.	Drill water

Cement Slurries

Cement	Class	Additives
Lead	G	Class G cement w/ .1 gpb SCR-100L, 2 gpb Halad 413L, .025 gpb NF 5 in fresh water

Cement	Amount Used	Yield	Water Req	Mix Water	Thick Time	Comp Strength 12 Hr	Comp Strength 24 Hr	Free Water	Fluid Loss
Lead	335.	1.16	4.880	F	02:30	.0	.0	0	0

Type	Density	Volume	Avg Rate	Maximum Press
Lead	15.800	69.2	4.7	550.

Postflush and Displacement

Type	Density	Volume	Avg Rate	Maximum Press	Composition
Postflush	8.340	2.0	9.7	450.	Drillwater

Type	Temp	PV	YP
Displ'mnt	49.0	20.	35.

Job Procedure

Date	Start Time	End Time	Activity
6-Aug-02	20:30	21:30	Set a balanced cement plug from 1,460 m to 1,325 m with 335 sacks Class G cement mixed with 0.1 gpb SCR-100L, 2 gpb Halad 413 L, and 0.025 gpb NF-5 in fresh water to 15.8 ppg.
6-Aug-02	23:00	23:45	Set a balanced cement plug from 1,325 m to 1,190 m with 335 sacks Class G cement mixed with 0.1 gpb SCR-100L, 2 gpb Halad 413 L and 0.025 gpb NF-5 in fresh water to 15.8 ppg.
7-Aug-02	00:45	01:45	Set a balanced cement plug from 1,190 m to 1,055 m with 335 sacks Class G cement mixed with 2 gpb Halad 413 L and 0.025 gpb NF-5 in fresh water to 15.8 ppg.
7-Aug-02	02:45	03:45	Set a balanced cement plug from 1,055 m to 920 m with 335 sacks Class G cement mixed with 2 gpb Halad 413 L and 0.025 gpb NF-5 in fresh water to 15.8 ppg.
7-Aug-02	04:30	05:00	Setting a balanced plug from 920 m to 785 m with 407 sacks Class G cement mixed with 0.025 gpb NF-5 in sea water to 15.9 ppg.

Post Job

Wait-on-cement Time:	24:00	Estimated TOC:	1190.00
Tagged Cement at :	.00	From :	Calculation
Weight Applied :	0.	Estimated BOC:	1325.00
Tested Cement to :	0.	From :	Calculation
Drilled Cement to :	.00		

Remarks and Problems

Balanced cement plug set from 1325 m to 1190 m in 12¬" open hole

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Beardie-1

BEARDIE.1

CEMENT REPORT

Mixed Oilfield Units

Start Date/Time:	7-Aug-02 00:45	Job Type:	Plug and Abandon
End Date/Time :	7-Aug-02 01:45	Rig Name:	Ocean Bounty

Casing Size :	13.375	Setting Depth :	849.10	Float Collar :	824.04
Drift :	12.259	String Top MD :	72.18	Landing Collar:	.00
Weight/Length:	203.000	Gauge Hole Size:	12.680	Estimated BHST:	60.0
Excess Cement:	.0% over Gauge				

Last Casing Run: 13.375 at 849.10 (shoe MD)

Mud Data

Mud Weight :	9.85	PV:	20.0	Oil Content :	.0
pH :	9.0	YP:	35.0	Water Content:	91.8
Temperature:	.0				

Mud Flush and Spacer

Type	Density	Volume	Avg Rate	Maximum Press	Composition
Preflush	8.340	30.0	.0	0.	Drill water

Cement Slurries

Cement	Class	Additives
Lead	G	Class G cement w/ 2 gpb Halad 413L, .025 gpb NF 5 in fresh water

Cement	Amount Used	Yield	Water Req	Mix Water	Thick Time	Comp Strength 12 Hr	Comp Strength 24 Hr	Free Water	Fluid Loss
Lead	335.	1.16	4.900	F	02:20	.0	.0	0	0

Type	Density	Volume	Avg Rate	Maximum Press
Lead	15.800	69.2	.0	0.

Postflush and Displacement

Type	Density	Volume	Avg Rate	Maximum Press	Composition
Postflush	8.340	2.0	.0	0.	Drill water

Type	Temp	PV	YP
Displ'mnt	49.0	20.	35.

Job Procedure

Date	Start Time	End Time	Activity
6-Aug-02	20:30	21:30	Set a balanced cement plug from 1,460 m to 1,325 m with 335 sacks Class G cement mixed with 0.1 gpb SCR-100L, 2 gpb Halad 413 L, and 0.025 gpb NF-5 in fresh water to 15.8 ppg.
6-Aug-02	23:00	23:45	Set a balanced cement plug from 1,325 m to 1,190 m with 335 sacks Class G cement mixed with 0.1 gpb SCR-100L, 2 gpb Halad 413 L and 0.025 gpb NF-5 in fresh water to 15.8 ppg.
7-Aug-02	00:45	01:45	Set a balanced cement plug from 1,190 m to 1,055 m with 335 sacks Class G cement mixed with 2 gpb Halad 413 L and 0.025 gpb NF-5 in fresh water to 15.8 ppg.
7-Aug-02	02:45	03:45	Set a balanced cement plug from 1,055 m to 920 m with 335 sacks Class G cement mixed with 2 gpb Halad 413 L and 0.025 gpb NF-5 in fresh water to 15.8 ppg.
7-Aug-02	04:30	05:00	Setting a balanced plug from 920 m to 785 m with 407 sacks Class G cement mixed with 0.025 gpb NF-5 in sea water to 15.9 ppg.

Post Job

Wait-on-cement Time:	24:00	Estimated TOC:	1055.00
Tagged Cement at :	.00	From :	Calculation
Weight Applied :	0.	Estimated BOC:	1190.00
Tested Cement to :	0.	From :	Calculation
Drilled Cement to :	.00		

Remarks and Problems

Balanced cement plug set from 1,190 m to 1,055 m in 12¬" open hole.

913712 508

Beardie-1
BEARDIE.1

CEMENT REPORT

Mixed Oilfield Units

Start Date/Time:	7-Aug-02 02:45	Job Type:	Plug and Abandon
End Date/Time :	7-Aug-02 03:45	Rig Name:	Ocean Bounty

Casing Size :	13.375	Setting Depth :	849.10	Float Collar :	824.04
Drift :	12.259	String Top MD :	72.18	Landing Collar:	.00
Weight/Length:	203.000	Gauge Hole Size:	12.680	Estimated BHST:	.0
Excess Cement:	.0%	over Gauge			

Last Casing Run: 13.375 at 849.10 (shoe MD)

Mud Data

Mud Weight :	9.85	PV:	20.0	Oil Content :	.0
pH :	9.0	YP:	35.0	Water Content:	91.8
Temperature:	.0				

Mud Flush and Spacer

Type	Density	Volume	Avg Rate	Maximum Press	Composition
Preflush	8.340	30.0	8.8	410.	Drill water

Cement Slurries

Cement	Class	Additives
Lead	G	Class G cement w/ 2 gpb Halad 413L, .025 gpb NF 5 in fresh water

Cement	Amount Used	Yield	Water Req	Mix Water	Thick Time	Comp Strength 12 Hr	Comp Strength 24 Hr	Free Water	Fluid Loss
Lead	335.	1.16	4.900	F	02:20	.0	.0	0	0

Type	Density	Volume	Avg Rate	Maximum Press
Lead	15.800	69.2	5.2	490.

Postflush and Displacement

Type	Density	Volume	Avg Rate	Maximum Press	Composition
Postflush	8.340	2.0	6.0	240.	Drill water

Type	Temp	PV	YP
Displ'mnt	49.0	20.	35.

Job Procedure

Date	Start Time	End Time	Activity
6-Aug-02	20:30	21:30	Set a balanced cement plug from 1,460 m to 1,325 m with 335 sacks Class G cement mixed with 0.1 gpb SCR-100L, 2 gpb Halad 413 L, and 0.025 gpb NF-5 in fresh water to 15.8 ppg.
6-Aug-02	23:00	23:45	Set a balanced cement plug from 1,325 m to 1,190 m with 335 sacks Class G cement mixed with 0.1 gpb SCR-100L, 2 gpb Halad 413 L and 0.025 gpb NF-5 in fresh water to 15.8 ppg.
7-Aug-02	00:45	01:45	Set a balanced cement plug from 1,190 m to 1,055 m with 335 sacks Class G cement mixed with 2 gpb Halad 413 L and 0.025 gpb NF-5 in fresh water to 15.8 ppg.
7-Aug-02	02:45	03:45	Set a balanced cement plug from 1,055 m to 920 m with 335 sacks Class G cement mixed with 2 gpb Halad 413 L and 0.025 gpb NF-5 in fresh water to 15.8 ppg.
7-Aug-02	04:30	05:00	Setting a balanced plug from 920 m to 785 m with 407 sacks Class G cement mixed with 0.025 gpb NF-5 in sea water to 15.9 ppg.

Post Job

Wait-on-cement Time:	24:00	Estimated TOC:	920.00
Tagged Cement at :	.00	From :	Calculation
Weight Applied :	0.	Estimated BOC:	1055.00
Tested Cement to :	0.	From :	Calculation
Drilled Cement to :	.00		

Remarks and Problems

Balanced cement plug set from 1,055 m to 920 m in 12¬" open hole.

913712 510

Beardie-1
BEARDIE.1

CEMENT REPORT

Mixed Oilfield Units

Start Date/Time: 7-Aug-02 04:45 Job Type: Plug and Abandon
End Date/Time : 7-Aug-02 05:30 Rig Name: Ocean Bounty

Casing Size :	13.375	Setting Depth :	849.10	Float Collar :	824.04
Drift :	12.259	String Top MD :	72.18	Landing Collar:	.00
Weight/Length:	203.000	Gauge Hole Size:	14.000	Estimated BHST:	50.0

Excess Cement: .0% over Gauge

Last Casing Run: 13.375 at 849.10 (shoe MD)

Mud Data

Mud Weight :	9.85	PV:	20.0	Oil Content :	.0
pH :	9.0	YP:	35.0	Water Content:	91.8
Temperature:	.0				

Mud Flush and Spacer

Type	Density	Volume	Avg Rate	Maximum Press	Composition
Preflush	8.500	35.0	5.0	390.	Sea water

Cement Slurries

Cement	Class	Additives
Lead	G	Class G cement w/ ,025 gpb NF 5 mixed in seawater

Cement	Amount Used	Yield	Water Req	Mix Water	Thick Time	Comp Strength 12 Hr	Comp Strength 24 Hr	Free Water	Fluid Loss
Lead	407.	1.16	5.150	S	01:55	.0	.0	0	0

Type	Density	Volume	Avg Rate	Maximum Press
Lead	15.900	84.0	5.0	570.

Postflush and Displacement

Type	Density	Volume	Avg Rate	Maximum Press	Composition
Postflush	8.500	3.0	7.0	255.	Sea water

Type	Temp	PV	YP
Displ'mnt	49.0	20.	35.

================================ Job Procedure ================================

Date	Start Time	End Time	Activity
6-Aug-02	20:30	21:30	Set a balanced cement plug from 1,460 m to 1,325 m with 335 sacks Class G cement mixed with 0.1 gpb SCR-100L, 2 gpb Halad 413 L, and 0.025 gpb NF-5 in fresh water to 15.8 ppg.
6-Aug-02	23:00	23:45	Set a balanced cement plug from 1,325 m to 1,190 m with 335 sacks Class G cement mixed with 0.1 gpb SCR-100L, 2 gpb Halad 413 L and 0.025 gpb NF-5 in fresh water to 15.8 ppg.
7-Aug-02	00:45	01:45	Set a balanced cement plug from 1,190 m to 1,055 m with 335 sacks Class G cement mixed with 2 gpb Halad 413 L and 0.025 gpb NF-5 in fresh water to 15.8 ppg.
7-Aug-02	02:45	03:45	Set a balanced cement plug from 1,055 m to 920 m with 335 sacks Class G cement mixed with 2 gpb Halad 413 L and 0.025 gpb NF-5 in fresh water to 15.8 ppg.
7-Aug-02	04:30	05:00	Setting a balanced plug from 920 m to 785 m with 407 sacks Class G cement mixed with 0.025 gpb NF-5 in sea water to 15.9 ppg.
7-Aug-02	05:00	05:45	Set balanced plug from 920 m to 785 m with 407 sacks Class G cement mixed with 0.025 gpb NF-5 in sea water to 15.9 ppg.
7-Aug-02	18:00	18:30	Set a balanced cement plug from 160 m to 100 m with 145 sacks Class G cement mixed with 1% CaCl2 and 0.025 gpb NF-5 in sea water to 15.9 ppg.
7-Aug-02	19:30	19:45	Test cement plug and casing to 1,000 psi for five minutes.

==================================== Post Job ====================================

Wait-on-cement Time:	06:00	Estimated TOC:	785.00
Tagged Cement at :	768.00	From :	Calculation
Weight Applied :	0.	Estimated BOC:	920.00
Tested Cement to :	0.	From :	Calculation
Drilled Cement to :	.00		

============================ Remarks and Problems ============================

Balanced cement plug set from 920 m to 785 m in 12¬" open hole, across casing shoe, and into casing

913712 512

12-Sep-02 ExxonMobil DRILLING 18:38

Beardie-1

BEARDIE.1

CEMENT REPORT

Mixed Oilfield Units

Start Date/Time:	7-Aug-02 18:15	Job Type:	Plug and Abandon
End Date/Time :	7-Aug-02 18:30	Rig Name:	Ocean Bounty

Casing Size :	13.375	Setting Depth :	849.10	Float Collar :	824.04
Drift :	12.259	String Top MD :	72.18	Landing Collar:	.00
Weight/Length:	203.000	Gauge Hole Size:	12.400	Estimated BHST:	15.0
Excess Cement:	.0%	over Gauge			

Last Casing Run: 13.375 at 849.10 (shoe MD)

================================== Mud Data ==================================

Mud Weight :	9.85	PV:	20.0	Oil Content :	.0
pH :	9.0	YP:	35.0	Water Content:	91.8
Temperature:	.0				

============================ Mud Flush and Spacer ============================

Type	Density	Volume	Avg Rate	Maximum Press	Composition
Preflush	8.500	20.0	6.2	300.	Seawater

=============================== Cement Slurries ===============================

Cement	Class	Additives
Lead	G	Class G cement w/ 1% CaCl2 and ,025 gpb NF 5 mixed in seawater

Cement	Amount Used	Yield	Water Req	Mix Water	Thick Time	Comp Strength 12 Hr	Comp Strength 24 Hr	Free Water	Fluid Loss
Lead	145.	1.16	5.150	S	02:00	.0	.0	0	0

Type	Density	Volume	Avg Rate	Maximum Press
Lead	15.900	31.0	5.2	450.

========================= Postflush and Displacement =========================

Type	Density	Volume	Avg Rate	Maximum Press	Composition
Postflush	8.500	5.5	7.4	380.	Seawater

=============================== Job Procedure ===============================

Start End

Date	Time	Time	Activity
7-Aug-02	05:00	05:45	Set balanced plug from 920 m to 785 m with 407 sacks Class G cement mixed with 0.025 gpb NF-5 in sea water to 15.9 ppg.
7-Aug-02	18:00	18:30	Set a balanced cement plug from 160 m to 100 m with 145 sacks Class G cement mixed with 1% CaCl2 and 0.025 gpb NF-5 in sea water to 15.9 ppg.
7-Aug-02	19:30	19:45	Test cement plug and casing to 1,000 psi for five minutes.

Post Job

Wait-on-cement Time:	06:00	Estimated TOC:	100.00
Tagged Cement at :	105.00	From :	Calculation
Weight Applied :	20000.	Estimated BOC:	160.00
Tested Cement to :	1000.	From :	Other
Drilled Cement to :	.00		

Remarks and Problems

Balanced cement plug set from 160 m to 100 m in 13 3/8" casing with bridge plug at base (160 m)

913712 514

Esso Australia Pty Ltd
12 Riverside Quay
Southbank, VIC 3006

Beardie #1

Rig: Ocean Bounty
Offshore, Bass Strait

Date: July 2002

END OF WELL REPORT

HALLIBURTON

1.0 CEMENT PROGRAMME

913712 516

Esso Australia Pty Ltd
12 Riverside Quay
Southbank, 3006

Beardie #1
Bass Strait
Victoria

Cementing Recommendation

Prepared For: Chris Meakin
24th April 2001
Version 3

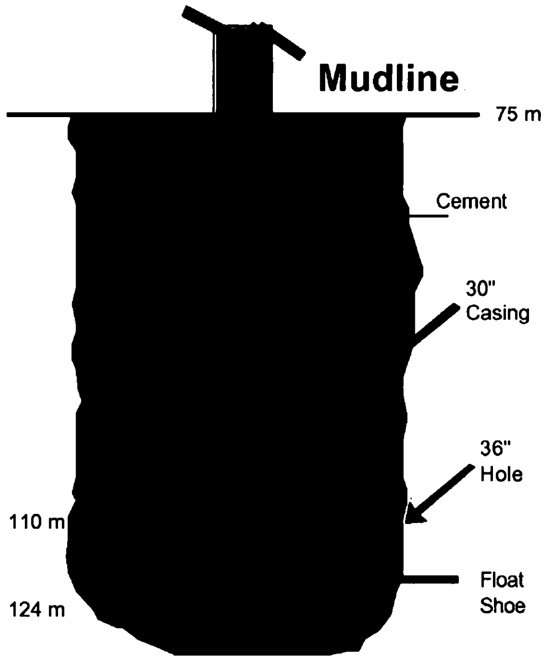
Submitted by:
Richard Taylor
Technical Professional

Halliburton Energy Services
90 Talinga Road
Cheltenham
VIC 3192

HALLIBURTON

Well Information

Water Depth (MD)	50 m
RT to Mean Sea Level (MD)	25 m
Measured depth (MD)	124 m
Casing O.D.	30.0"
Casing I.D.	28.0"
Hole size	36"
Mud type	Sea Water
Mud weight	8.55 ppg
BHST	16 °C
BHCT	27 °C
Excess	250 % on OH



Calculations

SEA WATER: (Spacer)

TOTAL SEA WATER		= 20 bbls

CEMENT SLURRY: (49 m fill)

36" hole by 30" Casing	(124m – 75m) * 1.262 bbls/m	= 61.8 bbls
	250 % excess on openhole	= 154.6 bbls
Shoe Joint, 30" Casing	1 m * 2.4986 bbl/m	= 2.5 bbls
TOTAL TAIL SLURRY PLUS SHOE JOINT		= 218.9 bbls

TOTAL DISPLACEMENT VOLUME:

5" Drill pipe, 19.5ppf, S-135	110m * 0.05827 bbl/m	= 6.4 bbls
30" Casing	13m * 2.4986 bbl/m	= 32.5 bbls
		= 38.9 bbls

OPERATING TIME CALCULATIONS:

Cement Pump Time	= 219 / 5bpm = 44 mins
Displacement Pump Time	= 39 / 8bpm = 5 mins
Contingency Time	= 60 mins
Total Operating Time	= 109 mins or 1 hr 49 mins

THICKENING TIME CALCULATIONS:

Minimum Thickening Time	= 1.2 * 109 mins = 131 mins or 2 hrs 11mins
Maximum Thickening Time	= 1.4 * 109 mins = 153 mins or 2 hrs 33 mins

Job Recommendation

FLUID 1: SEA WATER

	Fluid Volume:	20 bbls

FLUID 2: CEMENT SLURRY

AB Class G Cement	Fluid Weight:	15.90 lb/gal
1%BWOC Calcuim Chloride (Accelerator)	Fluid Yield:	1.17 ft³/sk
	Fluid Ratio:	5.00 gal/sk
Mixed With Sea Water	Total Mixing Fluid:	125 bbls
	Top of Fluid:	Mudline
	Calculated Fill:	50 m
	Fluid Volume:	219 bbls
	Total Volume:	1051 sks

FLUID 3: DISPLACEMENT

	Total Displacement Volume:	38.9 bbls

CEMENT SLURRY CRITERIA:

Cement Slurry	
Thickening time (hrs:mins)	2:45plus
Free water	< 1%
24 hr Compressive Strength	2000 @ 16 °C and 2000 psi

Job Procedure

1. Pressure test cement line to 2000 psi
2. Pump 20 bbls of sea water spacer and monitor returns at sea bed.
3. Mix and pump 219 bbls of cement slurry. Take samples and check density.
4. Pump the theoretical displacement volume of 38.9bbls of displacement fluid
5. Displace cement at maximum pump rate wellbore conditions can tolerate.
6. Reciprocate casing throughout job if well conditions allow.
7. Wait on cement.

Cost Estimate (confidential)

Cement and Additives

Price Ref	Description	Qty	U/M	Unit Price	Total
130-006	ADELAIDE BRIGHTON 'G'	1051	SK	11.01	11,571.51
	CaCl2	988	LB	0.92	908.96
507-967	NF-5	4	GAL	67.50	270.00

TOTAL AMOUNT AUS$	(Cement)	$ 11,571.51
TOTAL AMOUNT US$	(Additives)	$ 1,178.96

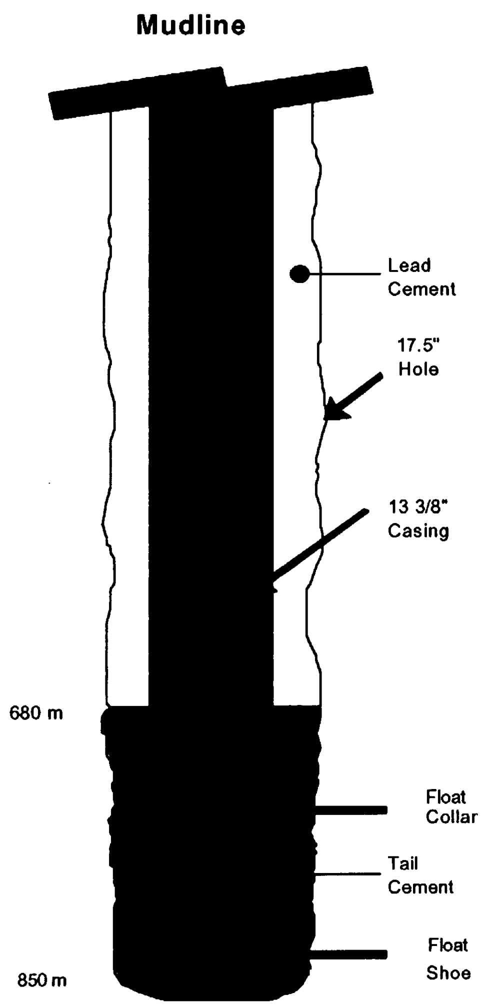
NOTE:
1. Service Location - Barry's Beach
2. Baroid to supply CaCl2
3. Volumes calculated do not include tank bottoms

~~Pe913712 colour 031~~

913712 520

Well Information

Water Depth (MD)	50 m
RT to Mean Sea Level (MD)	25 m
Measured depth (MD)	850 m
Vertical depth (TVD)	850 m
Casing O.D.	13 3/8"
Casing I.D.	12.415"
Casing weight	68 ppf
Hole size	17.5"
Mud type	Sea Water
Mud weight	8.6 ppg
BHST	50 degC
BHCT	35 degC
Excess	100% on OH



Calculations

LEAD SLURRY (605m fill)

30" Casing by 13 3/8" Casing	50 m * 1.753 bbls/m	= 87.7 bbls
17 ½" Hole by 13 3/8" Casing	555 m * 0.4059 bbls/m	= 225.3 bbls
	100 % excess on openhole	= 225.3 bbls
TOTAL ANNULAR LEAD SLURRY VOLUME		= 538.3 bbls

TAIL SLURRY: (170 m fill)

17 ½" Hole by 13 3/8" Casing	170 * 0.4059 bbls/m	= 69.1 bbls
	100 % excess on openhole	= 69.1 bbls
13 3/8" Casing, 68ppf, K55, Shoe Joint	24 m * 0.491 bbl/m	= 11.8 bbls
TOTAL TAIL SLURRY VOLUME PLUS SHOE JOINT		= 150.0 bbls

TOTAL DISPLACEMENT VOLUME:

5" Drill Pipe, 19.5ppf, S-135	75 m * 0.05827 bbls/m	= 4.4 bbls
13 3/8" Casing, 68ppf, K55	775m * 0.491 bbl/m	= 380.5 bbls
	minus shoe joint	= (11.8 bbls)
		= 370.5 bbls

LEAD OPERATING TIME CALCULATIONS:

Cement Pump Time	= 538 bbls / 5 bpm+ 150 bbls / 5 bpm = 138 mins
Drop top plug	= 10 mins
Displacement Pump Time	= 371 bbls / 10 bpm = 37 mins
Contingency Time	= 60 mins
Total Operating Time	= 245 mins or 4 hrs 05 mins

LEAD THICKENING TIME CALCULATIONS:

Minimum Thickening Time	= 1.2 * 245 mins = 294 mins or 4 hrs 54 mins
Maximum Thickening Time	= 1.4 * 245 mins = 343 mins or 5 hrs 43 mins

TAIL OPERATING TIME CALCULATIONS:

Cement Pump Time	= 150 bbls / 5 bpm = 30 mins
Drop top plug	= 10 mins
Displacement Pump Time	= 370 / 10 bpm = 37 mins
Contingency Time	= 60 mins
Total Operating Time	= 137 mins or 2 hr 17 mins

TAIL THICKENING TIME CALCULATIONS:

Minimum Thickening Time	= 1.2 * 137 mins = 164 mins or 2 hrs 44 mins
Maximum Thickening Time	= 1.4 * 137 mins = 192 mins or 3 hrs 12 mins

Job Recommendation

FLUID 1: FLUSH Sea water	Fluid Volume:	50 bbls
FLUID 2: LEAD SLURRY AB Class G Cement 14.6 gal ECONOLITE Liquid (drum) (Extender) /10bblsMix Fluid 0.25 gal NF-5 (Defoamer) /10bblsMix Fluid Mixed With Sea Water	Fluid Weight: Fluid Yield: Fluid Ratio: Water Ratio Total Mix Fluid: Fluid Volume: Total Volume:	12.5 lb/gal 2.21 ft³/sk 12.99 gal/sk 12.54 gal/sk 423 bbls 538 bbls 1367 sks
FLUID 3: TAIL SLURRY AB Class G Cement 0.25 gal NF-5 (Defoamer) /10bblsMix Fluid Mixed Wih Sea Water	Fluid Weight: Fluid Yield: Fluid Ratio: Total Mix Water: Fluid Volume: Total Volume:	15.90 lb/gal 1.16 ft³/sk 5.15 gal/sk 89 bbls 150 bbls 726 sks
FLUID 4: DISPLACEMENT	Total Displacement Volume:	370 bbls

CEMENT SLURRY CRITERIA:

Lead Slurry	
Thickening time (hrs:mins)	5:00+
Free water	< 1.4%
24 hr Compressive Strength	400 psi @ 35 degC and 2000 psi
Tail Slurry	
Thickening time (hrs:mins)	3:15
Free water	< 1.0%
24 hr Compressive Strength	2500 @ 35 degC and 2000 psi

Job Procedure

1. Run casing on D/P (with D/P stinger, swivel equiliser and SSR top plug set below the running tool such that the SSR top plug set is inside the top joint of 13-3/8" casing) and land in subsea wellhead.
2. Pressure test cement line to 3000 psi.
3. Pump 50 bbls sea water and monitor returns at sea bed.
4. Mix and pump 538 bbls of lead cement slurry. Take samples and check density
5. Mix and pump 150 bbls of tail cement slurry. Take samples and check density
6. Release top Drillpipe wiper dart.
7. Displace with seawater the drill pipe (slowing down while releasing top plug), then the casing until the SSR top plug lands.
8. Bump the plug to 500 psi over the final differential pressure.
9. Bleed off pressure and check floats.
10. Unlatch running tool and withdraw swivel equaliser assembly washing excess cement clear of mudline suspension system.
11. Wait on cement.

Cost Estimate (confidential)

Cement and Additives

Price Ref	Description	Qty	U/M	Unit Price	Total
130-006	ADELAIDE BRIGHTON 'G'	2093	SK	11.01	23,043.93
507-291	ECONOLITE LIQUID	618	GAL	7.49	4,628.82
507-967	NF-5	4	GAL	67.50	270.00

TOTAL AMOUNT AUS$ (Cement) $ 23,043.93

TOTAL AMOUNT US$ (Additives) $ 4,898.82

NOTE:
1. Service Location - Barry's Beach
2. Volumes calculated do not include tank bottoms

Float Equipment

SAP No.	Description	Qty	U/M	Unit Price	Total
100004666	13 3/8" SSR Plug Set, NR	1	EA	4,999.00	4,999.00
100004849	13 3/8" Float Collar, 4 ¼" SSII valve, BTC	1	EA	1,401.84	1,401.84
100004974	13 3/8" Float Shoe, 4 ¼" SSII valve, BTC	1	EA	930.35	930.35

TOTAL AMOUNT US$ $ 7,331.19

NOTE:
1. Back up float equipment already owned by Esso

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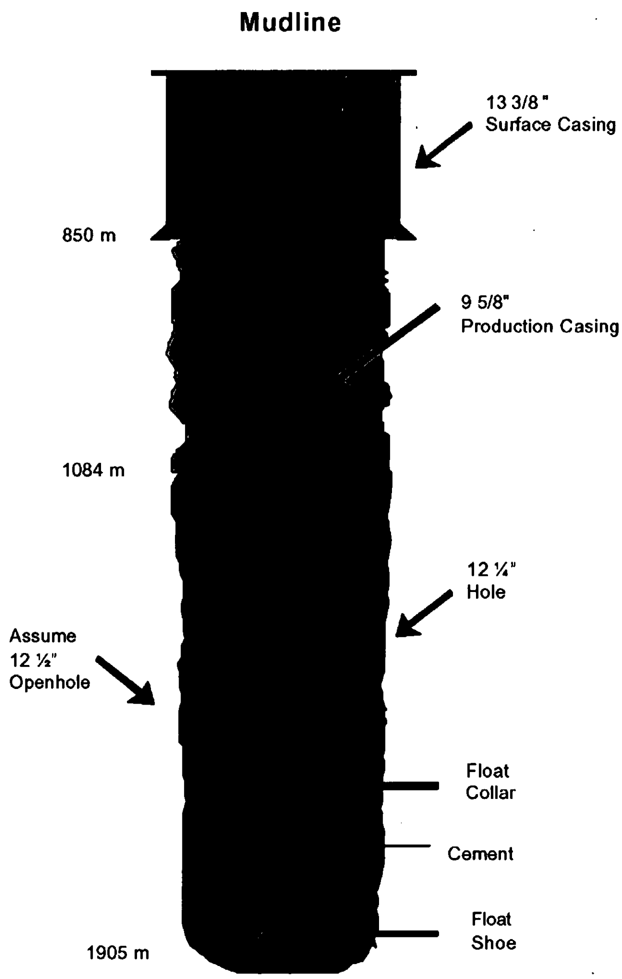
HALLIBURTON

Esso Australia Pty Ltd
Beardie #1
Production Casing

Well Information

Measured depth (MD)	1905 m
Vertical depth (TVD)	1905 m
Casing O.D.	9.625"
Casing I.D.	8.681"
Casing weight	47 ppf
Hole size	12.25"
Mud type	PHPA KCl / Glycol
Mud weight	10.0 ppg
BHST	95 °C
BHCT	74 °C
RT to Mean Sea Level	25 m
Water depth	50 m
Surface temp	27 °C
Excess	20% on 12.5" OH



Calculations

CEMENT SLURRY: (821 m fill)

12 ½" Hole by 9 5/8" Casing	(1905m – 1084m) * 0.2027 bbls/m	= 166.4 bbls
	20% excess on Openhole	= 33.3 bbls
Shoe Joint 9 5/8" Casing	26 m * 0.2402 bbls/m	= 6.2 bbls
TOTAL SLURRY VOLUME		= 205.9 bbls

TOTAL DISPLACEMENT VOLUME:

5" Drill Pipe, 19.5ppf, S-135	75 m * 0.05827 bbls/m	= 4.4 bbls
9 5/8" Casing, 47ppf, L-80	1830m * 0.2402 bbls/m	= 439.6 bbls
	minus Shoe Joint	= (6.2 bbls)
		= 437.8 bbls

OPERATING TIME CALCULATIONS:

Cement Pump Time	= 206 / 5 bpm =42 mins
Drop top plug	= 10 mins
Displacement Pump Time	= 438 / 12 bpm = 36 mins
Contingency Time	= 60 mins
Total Operating Time	= 148 mins or 2 hrs 28 mins

THICKENING TIME CALCULATIONS:

Minimum Thickening Time	= 1.2 * 148 mins = 178 mins or 2 hrs 58 mins
Maximum Thickening Time	= 1.4 * 148 mins = 208 mins or 3 hrs 28 mins

Job Recommendation

FLUID 1: FLUSH
Sea water — Fluid Volume: ~~60 bbls~~

FLUID 2: SPACER
Dual Spacer — Fluid Volume: 60 bbls

FLUID 3: SLURRY
AB Class G Cement
32 gal/10bbls Halad 413L (Fluid Loss/Dispersant)
2 gal/10bbls SCR 100L (Retarder)
0.25 gal/10bbls NF-5 (Defoamer)
Mixed With Drill Water

Fluid Weight:	15.80 lb/gal
Fluid Yield:	1.16 ft³/sk
Fluid Ratio:	5.17 gal/sk
Water Ratio:	4.75 gal/sk
Total Mixing Fluid:	122 bbls
Fluid Volume:	206 bbls
Proposed Volume:	995 sks

FLUID 4: DISPLACEMENT
Drilling Mud — Total Displacement Volume: 439 bbls

CEMENT SLURRY CRITERIA:

Thickening time (hrs:mins)	3:15
Free water	<1.0%
24 hr Compressive Strength	3000 @ 74°C and 2000 psi

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Job Procedure

1. Run casing on D/P (with D/P stinger, swivel equiliser and SSR plug set below the running tool such that the SSR plug set is inside the top joint of 9-5/8" casing) and land in subsea wellhead.
2. Prior to the cementing operation circulate well at maximum practicle rate until drilling fluid properties and circulating pressure are both constant or a minimum of 2 times bottoms up.
3. Pressure test cement line to 3000 psi.
4. Pump 60bbls of sea water spacer.
5. Pump 60bbls of weighted Dual spacer flush.
6. Drop ball to release Bottom wiper plug.
7. Mix and pump 208 bbls of cement slurry. Take samples and check density.
8. Release top Drill pipe wiper dart.
9. Displace Drill Pipe, slowing down while releasing top plug (after approx 6.6 bbls), then the casing until the SSR top plug lands. Pump the theoretical displacement volume of 438 bbls of displacement fluid and if plug has not bumped, over displace by no more than half the shoe track volume
10. Displace cement at as high a rate as well conditions will allow.
11. Bump the plug to 500 psi over the final differential pressure.
12. Bleed off pressure and check floats.
13. Unlatch running tool and withdraw swivel equaliser assembly washing excess cement clear of mudline suspension system.
14. Wait on cement.

Cost Estimate (confidential)

Cement and Additives

Price Ref	Description	Qty	U/M	Unit Price	Total
018-335	DUAL SPACER	3600	LB	$ 3.01	$ 10,836.00
018-340	DUAL SPACER MIXING AID	6	GAL	118.20	709.20
018-302	MUSOL A	20	GAL	38.40	768.00
018-301	SEM-7	20	GAL	44.40	888.00
516-002	ADELAIDE BRIGHTON CLASS G	995	SK	17.48	10,954.95
507-771	HALAD 413L	392	GAL	74.43	29,176.56
508-109	SCR-100 LIQUID	25	GAL	62.97	1,274.25
507-967	NF-5	3	GAL	67.50	202.50

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TOTAL AMOUNT AUS$	(Cement)	$ 10,954.95
TOTAL AMOUNT US$	(Additives)	$ 44,154.51

NOTE:
1. Service Location - Barry's Beach
2. Volumes calculated do not include tank bottoms

Float Equipment

SAP No.	Description	Qty	U/M	Unit Price	Total
100009813	9 5/8" SSR Plug Set, NR	1	EA	4,226.00	4,226.00
120005545	9 5/8" Float Collar, L80, LTC	1	EA	1,299.00	1,299.00
100077323	9 5/8" Float Shoe, L80, LTC	1	EA	1,200.00	1,200.00

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TOTAL AMOUNT US$ $ 6,725.00

NOTE:
1. Back up float equipment already owned by Esso

Esso Australia Pty Ltd
12 Riverside Quay
Southbank, 3006

Beardie #1

Bass Strait
Victoria; Australia

OptiCem
9.625 in Cement Production Casing

Prepared for: Chris Meakin

December 05, 2001

Version 1

Prepared by:
Richard Taylor

HALLIBURTON

The Future Is Working Together.

Design

Parameters		
Fracture Zone Measured Depth	3075.0	m
Fracture Zone Gradient	15.00	lb/gal
Reservoir Measured Depth	3075.0	m
Reservoir Pore Pressure	8.60	lb/gal
Additional Pressure to Seat Plug	500.0	psi
Mud Line to Mean Sea Level Height	50.0	m
Mean Sea Level to Rotary Kelly Bushing Height	25.0	m
Sea Floor Returns	☒	
Sea Water Density	8.54	lb/gal
Simulator Volume Increment	15.0	bbl

Wellbore

Annulus-Casing					Depth		Orientation		
Hole		Casing							
Excess	Diameter	OD	ID	Weight	Measured	True Vertical	Dev.	Az.	Build
%	in	in	in	lb/ft	m	m	°	°	°/(100*ft)
					0.0	0.0	0.0	0.0	
0.0	12.415	5.000	3.000	49.30	75.0	75.0	0.0	0.0	0.000
0.0	12.415	9.625	8.681	47.00	850.0	850.0	0.0	0.0	0.000
0.0	12.250	9.625	8.681	47.00	3075.0	3075.0	0.0	0.0	0.000

Pumping Schedule

Stage		Liquid				
Number	Description	Density	Rate	Volume	Tracer	Shutdown
		lb/gal	bpm	bbl		min
1	PHPA mud	10.00	12.00	0.0	☐	
2	Sea water	8.54	8.00	60.0	☐	
3	Dual Spacer	11.00	8.00	60.0	☐	
4	HTB slurry	15.80	5.00	375.0	☒	
5	HTB slurry	15.80	5.00	6.2	☐	
6	PHPA mud	10.00	2.00	8.0	☐	
7	PHPA mud	10.00	12.00	548.4	☐	
8	PHPA mud	10.00	12.00	80.0	☐	
9	PHPA mud	10.00	8.00	80.0	☐	

Fluid Rheology

Fluid Description	Temp.	Bingham Plastic PV	Bingham Plastic YP	Power Law n'	Power Law K'	Fann Viscometer Speed	Fann Viscometer Dial
	°F	cp	lbf/(100*ft²)		lb*s^n'/ft²	rpm	
PHPA mud	145.0	29.00	43.00				
Sea water	80.0	1.00	0.01				
Dual Spacer	72.0					300 200 100	27.0 20.0 13.0
	120.0					300 200 100	22.0 17.0 12.0
	190.0					300 200 100	18.0 14.0 10.0
HTB slurry	80.0					300 200 100	268.0 192.0 104.0
	180.0					300 200 100	162.0 113.0 61.0

Fracture Gradient/Pore Pressure Profile

True Vertical Depth	Pore Pressure	Fracture Gradient
m	lb/gal	
3075.0	8.60	15.00

Back Pressure

Total Return Volume	Back Pressure
bbl	psia
> 0.0	87.5*

*Calculated for sea floor returns

Volume and Rate Calculations

Time	Surface Stage Number		Liquid Volume	Total Volume	Liquid Rate	Total Rate	Leading Edge of Tracer Fluid
	In	Out	In	Out	In	Out	
min			bbl		bpm		m
0.08	1	1	1.0	1.0	12.00	12.00	0.0
7.58	2	1	61.0	61.0	8.00	8.00	0.0
15.08	3	1	121.0	121.0	8.00	8.00	0.0
27.08	4	1	181.0	181.0	5.00	5.00	-315.9
39.08	4	1	241.0	241.0	5.00	5.00	-565.7
51.08	4	1	301.0	301.0	5.00	5.00	-815.5
63.08	4	1	361.0	366.8	5.00	6.30	-1089.5
75.08	4	1	421.0	458.7	5.00	7.97	-1472.0
87.08	4	1	481.0	555.5	5.00	8.10	-1875.2
96.58	7	1	525.2	617.4	12.00	6.77	-2132.8
101.58	7	1	585.2	666.0	12.00	10.84	-2335.2
106.58	7	1	645.2	724.0	12.00	11.89	-2576.5
111.58	7	1	705.2	804.9	12.00	15.58	-2913.5
116.58	7	1	765.2	860.0	12.00	7.20	2985.8
121.58	7	1	825.2	887.9	12.00	5.24	2833.3
126.58	7	1	885.2	913.6	12.00	5.12	2692.9
131.58	7	1	945.2	945.2	12.00	9.98	2520.1
136.58	7	1	1005.2	1005.2	12.00	12.00	2192.2
142.28	8	1	1073.6	1073.6	12.00	12.00	1818.5
147.70	8	1	1138.6	1138.6	12.00	12.00	1463.3
155.20	9	1	1198.6	1198.6	8.00	8.00	1135.4
157.70	9	1	1218.6	1218.6	8.00	8.00	1026.2

Time of Events

Time	ECD at Zone		Stage	
	Fracture	Reservoir	Starts Pumping	Enters Annulus
min	lb/gal			
1.96	11.34	11.34	Sea water	
9.46	11.34	11.34	Dual Spacer	
18.08	11.24	11.24	HTB slurry	
91.33	11.35	11.35	HTB slurry	
95.33	11.23	11.23	PHPA mud	
96.58	11.30	11.30	PHPA mud	
106.58	11.47	11.47		Sea water
110.33	11.32	11.32		Dual Spacer
115.33	11.13	11.13		HTB slurry
142.28	13.54	13.54	PHPA mud	
149.57	14.13	14.13	PHPA mud	
157.70	14.82	14.82	Prior to plug landing	
157.80	13.72	13.72	Plug landed	

Free Fall Calculations

Time	Liquid Volume	Pump Output	Surface Pressure		Equivalent Circulating Density		Free Fall Height	Leading Edge of Tracer Fluid
	In		In	Out	Total Depth	Fracture Zone		
min	bbl	hhp	psi		lb/gal		m	m
0.08	1.0		1058.6	0.0	11.47	11.47	0.0	0.0
7.58	61.0		966.3	0.0	11.34	11.34	0.0	0.0
15.08	121.0		908.0	0.0	11.34	11.34	0.0	0.0
27.08	181.0		544.3	0.0	11.24	11.24	0.0	-315.9
39.08	241.0		294.3	0.0	11.24	11.24	0.0	-565.7
51.08	301.0		43.8	0.0	11.24	11.24	0.0	-815.5
63.08	361.0		0.0	0.0	11.28	11.28	90.2	-1089.5
75.08	421.0		0.0	0.0	11.34	11.34	222.9	-1472.0
87.08	481.0		0.0	0.0	11.35	11.35	376.3	-1875.2
96.58	525.2		0.0	0.0	11.30	11.30	449.7	-2132.8
101.58	585.2		0.0	0.0	11.44	11.44	402.3	-2335.2
106.58	645.2		0.0	0.0	11.47	11.47	393.8	-2576.5
111.58	705.2		0.0	0.0	11.24	11.24	481.0	-2913.5
116.58	765.2		0.0	0.0	11.15	11.15	460.6	2985.8
121.58	825.2		0.0	0.0	11.35	11.35	327.0	2833.3
126.58	885.2		0.0	0.0	11.59	11.59	184.2	2692.9
131.58	945.2		173.1	0.0	12.10	12.10	0.0	2520.1
136.58	1005.2		833.7	0.0	12.82	12.82	0.0	2192.2
142.28	1073.6		1502.2	0.0	13.54	13.54	0.0	1818.5
147.70	1138.6		2144.6	0.0	14.24	14.24	0.0	1463.3
155.20	1198.6		2538.7	0.0	14.61	14.61	0.0	1135.4
157.70	1218.6		2733.6	0.0	14.82	14.82	0.0	1026.2
157.80	1218.6		3233.6	0.0	13.83	13.72	0.0	1026.2

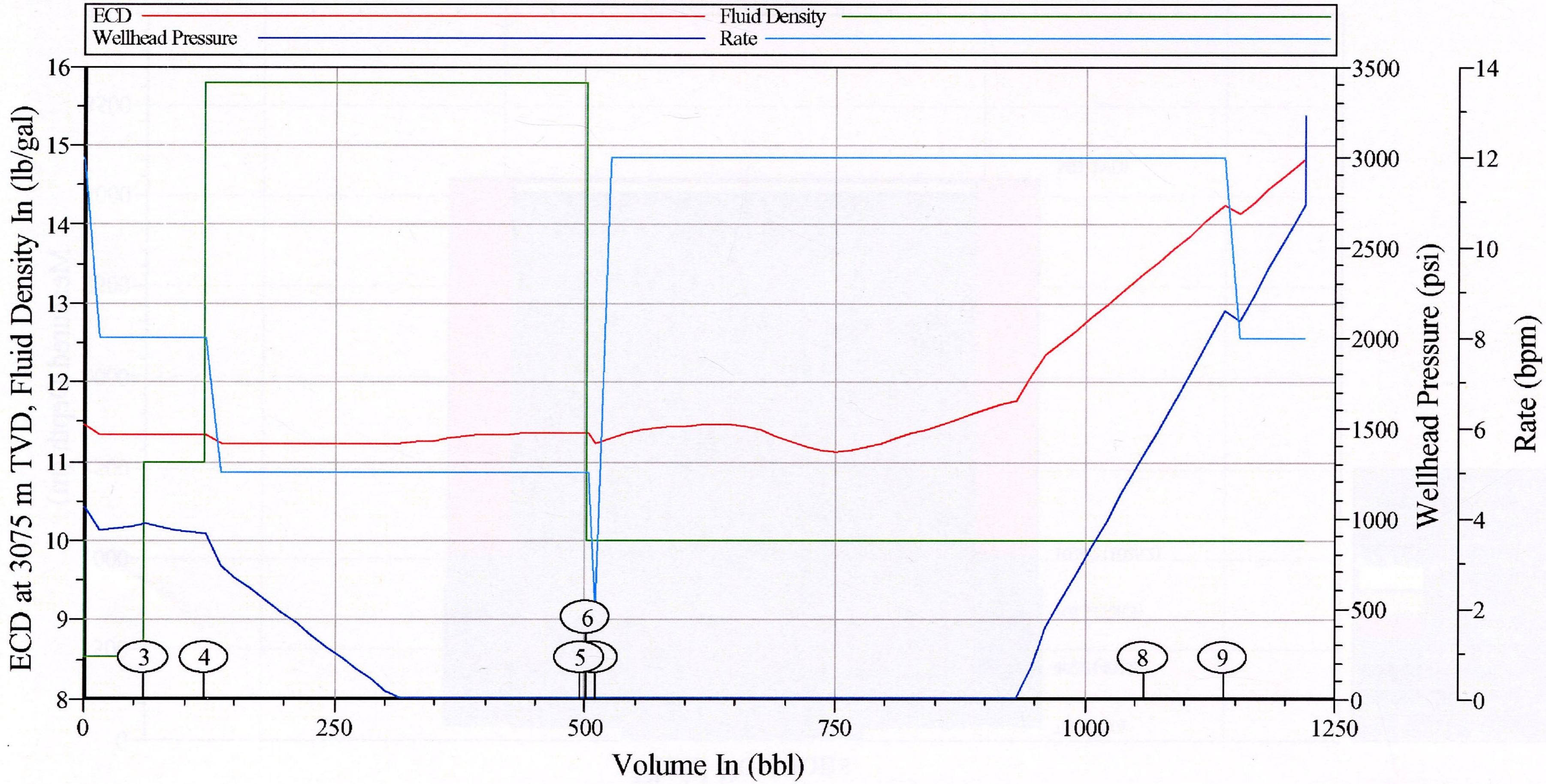
Gas Flow Potential	1.6	
at Reservoir Zone Measured Depth	3075.0	m

Final Position of Stages

Stage Description	Cumulative Liquid Volume	Annular Measured Length	Top of Fluid Measured Depth
	bbl	m	m
PHPA mud	0.0	327.2	75.0
Sea water	60.0	306.2	402.2
Dual Spacer	120.0	317.8	708.3
HTB slurry	495.0	2048.9	1026.2

OptiCem

Summary



Esso Australia Pty Ltd
9.625 in Cement Production Casing

HALLIBURTON
OptiCem v3.1.0
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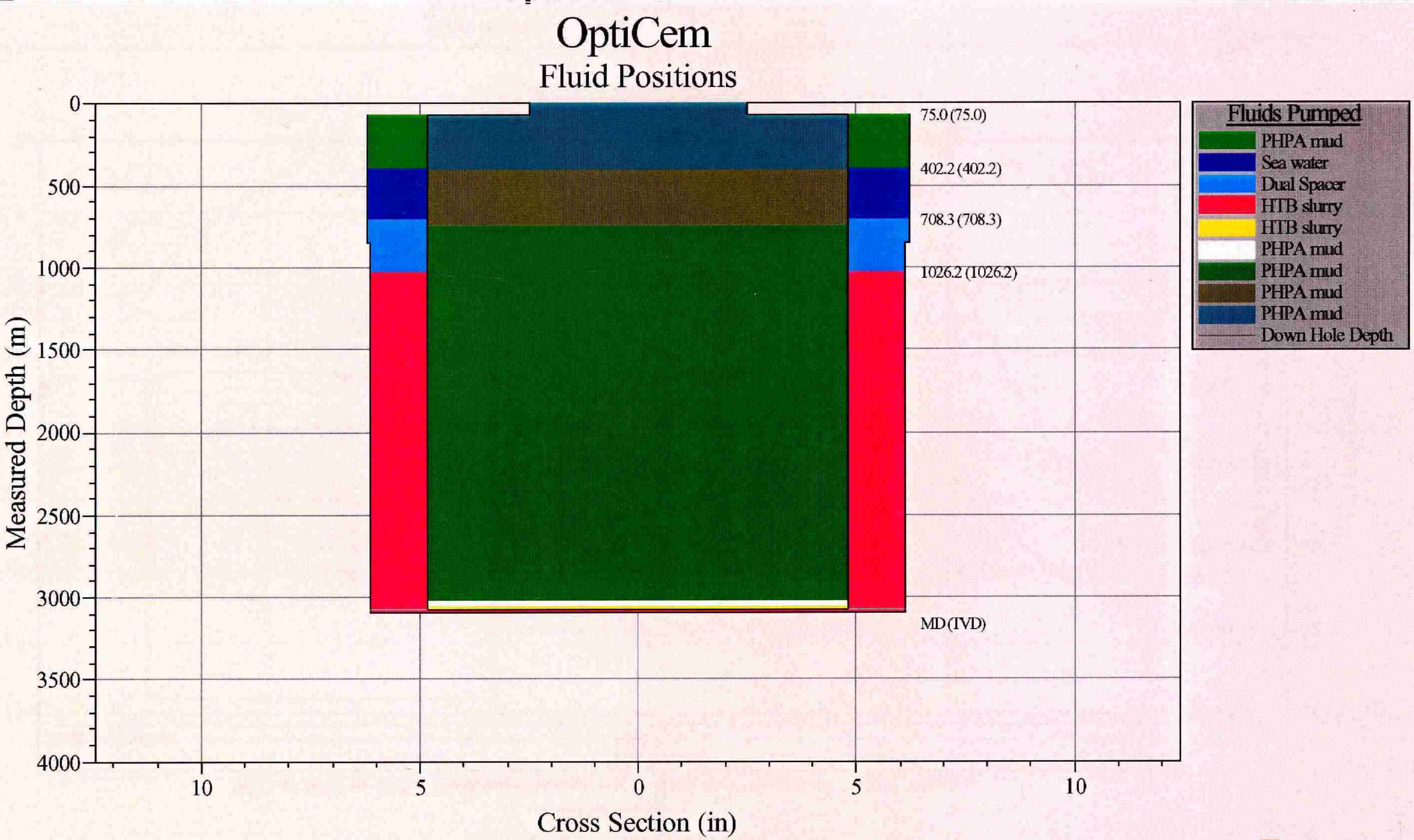

Esso Australia Pty Ltd
9.625 in Cement Production Casing

HALLIBURTON
OptiCem v3.1.0
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2.0 LABORATORY RESULTS

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HALLIBURTON

CEMENT SLURRY REPORT

Customer	: Esso Australia Ltd		Date	:	23-Jul-02	
Well Name	: Beardie 1		Reference	:	R41/OCB/Beardie#1/CC/M02	
Casing Size	: 30	in.				
Job Type	: Cement Conductor Casing					
Slurry Type	: Single					
API Schedule	:					

RKB to Mudline	:	Meters	**Depth(TVD from RKB)**	:	124	Meters
Depth(MD from RKB)	: 124	Meters	**Temperature Gradient**	:		Deg.C./100M
Surface Temperature	: 27	Deg.C.	**BHCT (per API Spec 10)**	:	14	Deg.C.
BHST	: 12	Deg.C.	**Water Source**	:	Seawater	
Mud Weight	: 8.6	PPG	**Cl⁻ Content**	:	-	mg/L

ABC Class 'G'	: 94.0	Lbs.	From Rig
Calcium Chloride	: 1.000	% BWOC	
NF-5	: 0.003	gal/sk	0.25 gal/10bbl Mix Fluid
	:		
	:		

Slurry Weight (Surface)	: 15.90	PPG	**Slurry Yield (Surface)**	:	1.16	CuFt/Sack
Mixing Water	: 5.15	Gals/Sack	**Total Mixing Fluid**	:	5.15	Gals/Sack

Thickening Time (Hrs:Mins)	: **Initial BC**	**30 BC**	**50 BC**	**70 BC**	200	psi
	14	2:55	3:29	3:43	20	Deg.C.

500psi Compressive Strength **@ 1000 psi and 14 DegC** 10:02

Notes : Test was conducted to the specifications provided

Lab Technician : Adam Martin ____________________

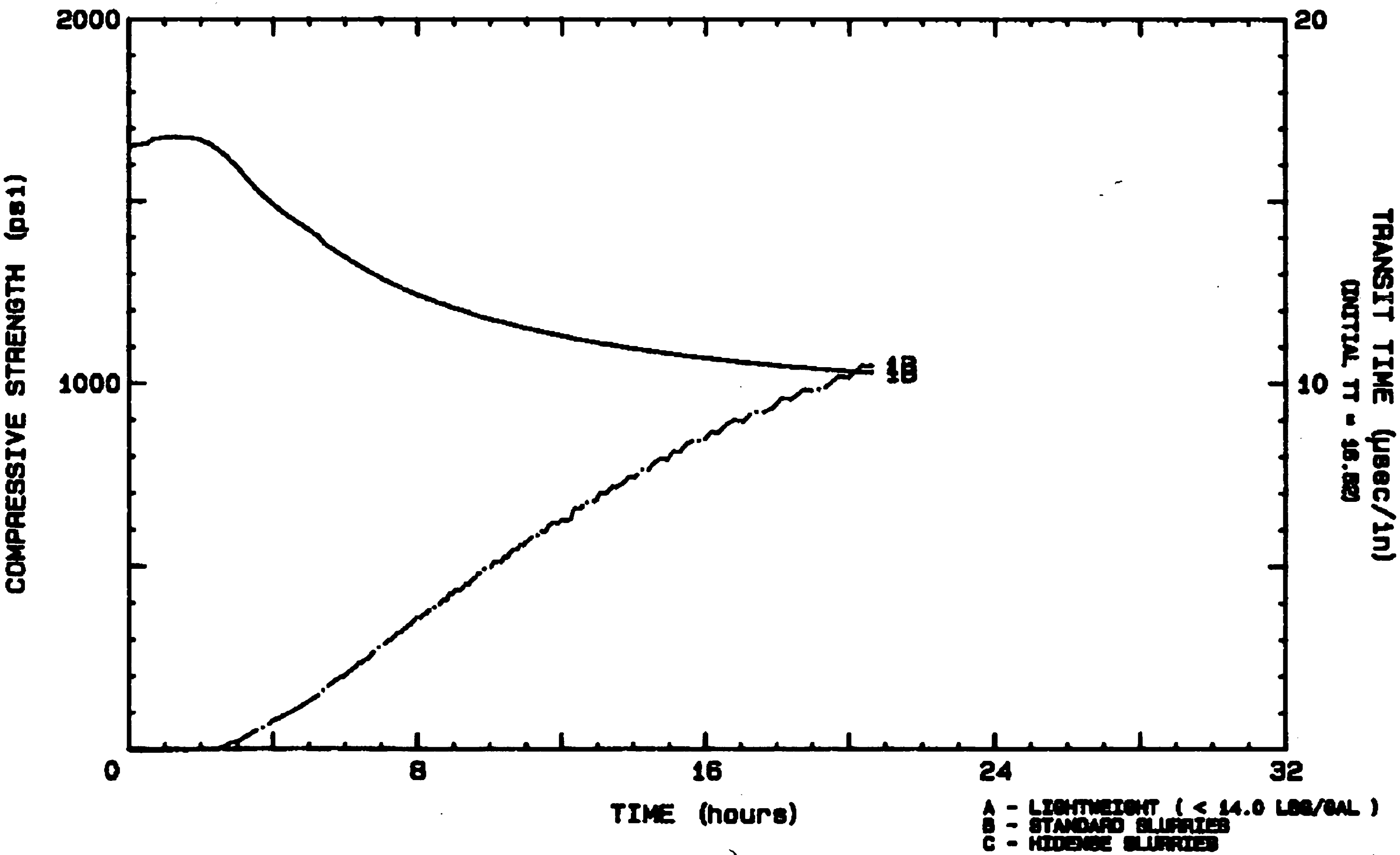
Approved : Richard Taylor ____________________

PROJECT NO.: R41/OCB/Beardie 1/cc/M02
DATE: 23 July 2002
PRESSURE: 1000 PSI
TEMPERATURE: 20°C

ULTRASONIC CEMENT ANALYZER
HALLIBURTON SERVICES

INITIAL SET:	50	@	3:27
STRENGTH 1 :	500	@	10:02
STRENGTH 2 :	19999		
CURR. STR. :	1048	@	20:45

CEMENT: ABC "G", Sea Water, 1% BWOC $CaCl_2$
Density 15.90 ppg, Yield 1.16 ft³/sk, water req'd 5.15 gal/sk, total fluid req'd 5.15 gal/sk



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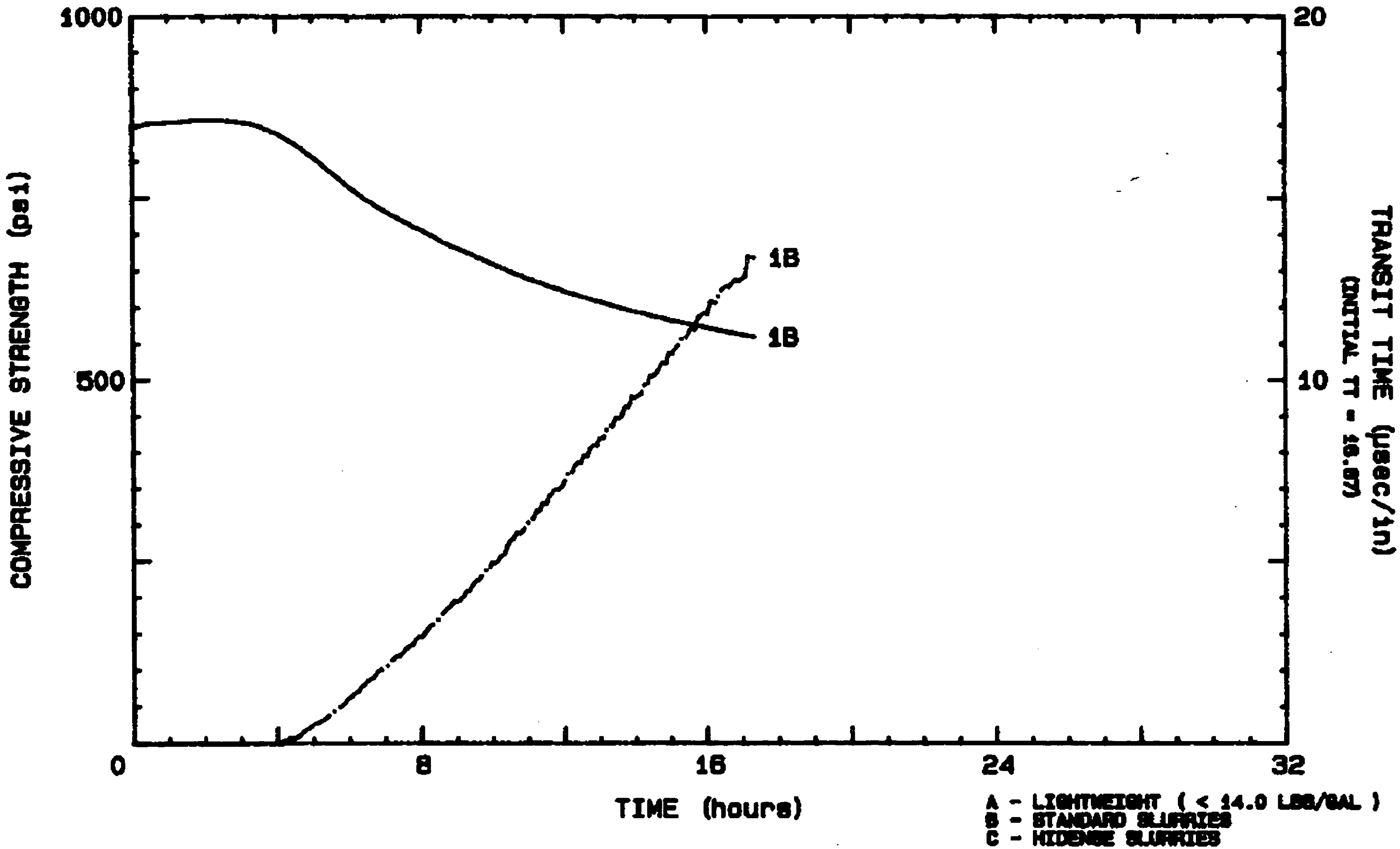
913712 538

PROJECT NO.: R041/OCB/Beardie 1/c/w02
DATE: 26 Jul 2002
PRESSURE: 1000 psi
TEMPERATURE: 15°C

ULTRASONIC CEMENT ANALYZER
HALLIBURTON SERVICES

INITIAL SET:	50	@	5:39
STRENGTH 1 :	500	@	14:21
STRENGTH 2 :	19999		
CURR. STR. :	687	@	17:28

CEMENT: AB class G Cement Seawater 1% BWOC $CaCl_2$
Yield 1.16 ft/sk, Density 15.9 ppg, Mix fluid 5.15 gal/sk.



HALLIBURTON

CEMENT SLURRY REPORT

Customer	: Esso Australia Ltd	Date	:	27-Jul-02
Well Name	: Beardie 1	Reference	:	R42/OCB/Beardie#1/SC/M02
Casing Size	: 13 3/8 in.			
Job Type	: Cement Surface Casing			
Slurry Type	: Lead			
API Schedule	:			

RKB to Mudline	:	Meters	**Depth(TVD from RKB)**	:	850	Meters
Depth(MD from RKB)	: 850	Meters	**Temperature Gradient**	:		Deg.C./100M
Surface Temperature	: 27	Deg.C.	**BHCT (per API Spec 10)**	:	35	Deg.C.
BHST	: 50	Deg.C.	**Water Source**	:	Seawater	
Mud Weight	: 8.6	PPG	**Cl⁻ Content**	:	-	mg/L

ABC Class 'G'	: 94.0	Lbs.	From Rig
Liquid Econolite	: 0.451	gal/sk	14.6 gal/10bbl Mix Fluid
NF-5	: 0.003	gal/sk	0.25 gal/10bbl Mix Fluid
	:		
	:		

Slurry Weight (Surface)	: 12.50	PPG	**Slurry Yield (Surface)**	:	2.21	CuFt/Sack
Mixing Water	: 12.54	Gals/Sack	**Total Mixing Fluid**	:	12.99	Gals/Sack

Thickening Time (Hrs:Mins)	: **Initial BC**	**30 BC**	**50 BC**	**70 BC**	2,000 psi
	12	3:45	4:05	4:13	35 Deg.C.

500psi Compressive Strength **@ 1000 psi and 35 DegC** 17:56

Notes : Test was conducted to the specifications provided

Lab Technician : Adam Martin ______________________

Approved : Richard Taylor ______________________

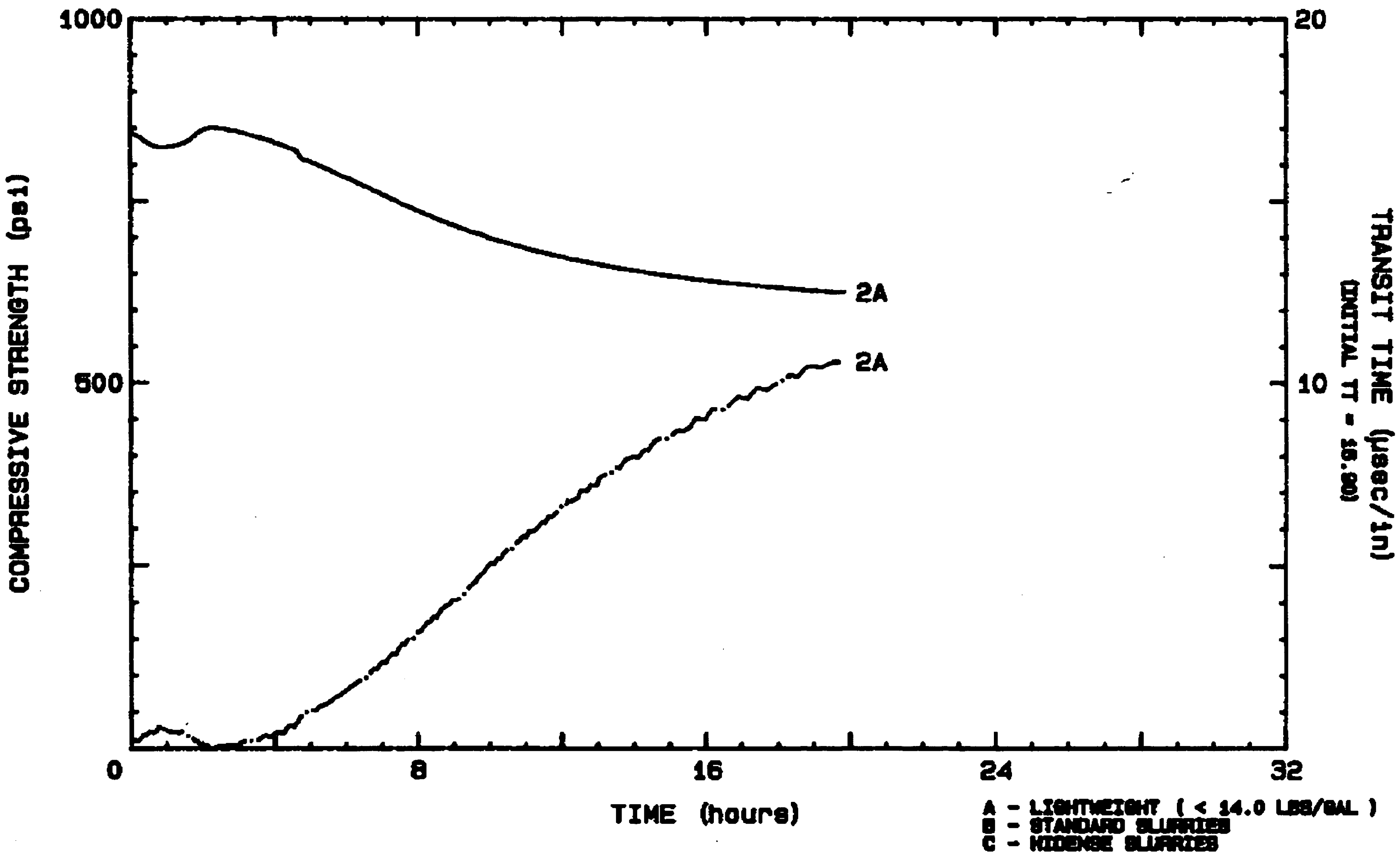
913712 540

PROJECT NO.: A42/OCB/Bonda1/SC/no2
DATE: 27 July 2002
PRESSURE: 1000 psi
TEMPERATURE: 35 psi

ULTRASONIC CEMENT ANALYZER
HALLIBURTON SERVICES

INITIAL SET:	50	@	4:51
STRENGTH 1 :	500	@	17:56
STRENGTH 2 :	19999		
CURR. STR. :	544	@	19:57

CEMENT: AB class G Cement, Sea water 14.6 gal Econolite/10 bbls mix fluid. 12.5 ppg, Yield 2.21 ft³/sk, Mix water 12.54 gal/sk, mix fluid 12.99 gal/sk.



HALLIBURTON

CEMENT SLURRY REPORT

Customer	: Esso Australia Ltd		Date	:	27-Jul-02
Well Name	: Beardie 1		Reference	:	R44/OCB/Beardie#1/SC/M02
Casing Size	: 13 3/8	in.			
Job Type	: Cement Surface Casing				
Slurry Type	: Tail				
API Schedule	:				

RKB to Mudline	:	Meters	**Depth(TVD from RKB)**	:	850	Meters
Depth(MD from RKB)	: 850	Meters	**Temperature Gradient**	:		Deg.C./100M
Surface Temperature	: 27	Deg.C.	**BHCT (per API Spec 10)**	:	35	Deg.C.
BHST	: 50	Deg.C.	**Water Source**	:	Drillwater	
Mud Weight	: 8.6	PPG	**Cl⁻ Content**	:	-	mg/L

ABC Class 'G'	: 94.0	Lbs.	From Rig
NF-5	: 0.003	gal/sk	0.25 gal/10bbl Mix Fluid
	:		
	:		

Slurry Weight (Surface)	: 15.80	PPG	**Slurry Yield (Surface)**	:	1.16	CuFt/Sack
Mixing Water	: 5.11	Gals/Sack	**Total Mixing Fluid**	:	5.11	Gals/Sack

Thickening Time (Hrs:Mins)	: **Initial BC**	**30 BC**	**50 BC**	**70 BC**	2,000	psi
	13	4:15	4:25	4:29	35	Deg.C.

500psi Compressive Strength **@ 1000 psi and 35 DegC** 8:10

Notes : Test was conducted to the specifications provided

Lab Technician : Adam Martin ____________________

Approved : Richard Taylor ____________________

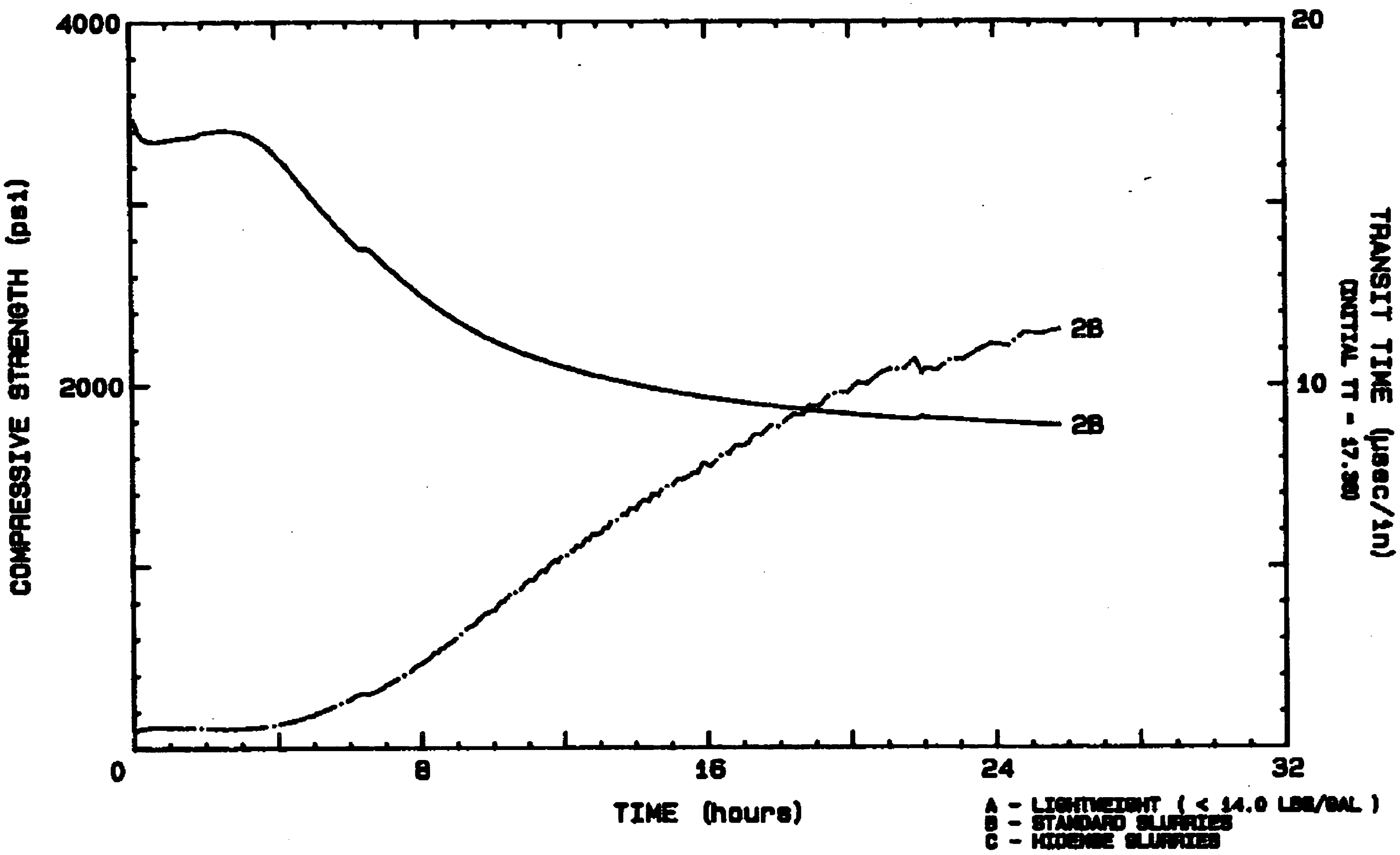
913712 542

PROJECT NO.: A43/068/Bendre 1/5c/A02
DATE: 27 July 2002
PRESSURE: 1000 psi
TEMPERATURE: 35°C

ULTRASONIC CEMENT ANALYZER
HALLIBURTON SERVICES

INITIAL SET: 50 @ :00
STRENGTH 1 : 500 @ 8:10
STRENGTH 2 : 19999
CURR. STR. : 2313 @ 25:54

CEMENT: AB Class G Cement Drillwater
15.8 ppg, yield 1.16 ft³/sk, mix fluid 5.11 gal/sk.



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HALLIBURTON

CEMENT SLURRY REPORT

Customer	:	Esso Australia Ltd	Date	:	1-Aug-02	
Well Name	:	Beardie #1	Reference	:	R47/OCB/Beardie#1/PA/M02	
Casing Size	:	13 3/8 in.				
Job Type	:	Plug 4				
Slurry Type	:	Single				
API Schedule	:					

RKB to Mudline	:	75	Meters	**Depth(TVD from RKB)**	:	125	Meters
Depth(MD from RKB)	:	125	Meters	**Temperature Gradient**	:		Deg.C./100M
Surface Temperature	:	27	Deg.C.	**BHCT (per API Spec 10)**	:	20	Deg.C.
BHST	:	15	Deg.C.	**Water Source**	:	Seawater	
Mud Weight	:		PPG	**Cl$^-$ Content**	:	-	mg/L

ABC Class 'G'	:	94.0	Lbs.	From Rig
Calcium Chloride	:	1.000	% BWOC	
NF-5	:	0.003	gal/sk	0.25 gal/10bbl Mix Fluid

Slurry Weight (Surface)	:	15.90	PPG	**Slurry Yield (Surface)**	:	1.16	CuFt/Sack
Mixing Water	:	5.15	Gals/Sack	**Total Mixing Fluid**	:	5.15	Gals/Sack

Thickening Time (Hrs:Mins)	:	**Initial BC**	**30 BC**	**50 BC**	**70 BC**	200 psi
		14	1:40	1:50	2:00	20 Deg.C.

500psi Compressive Strength **@ 1000 psi and 20 DegC** 10:44

Notes : Test was conducted to the specifications provided

Lab Technician : Adam Martin ____________________

Approved : Richard Taylor ____________________

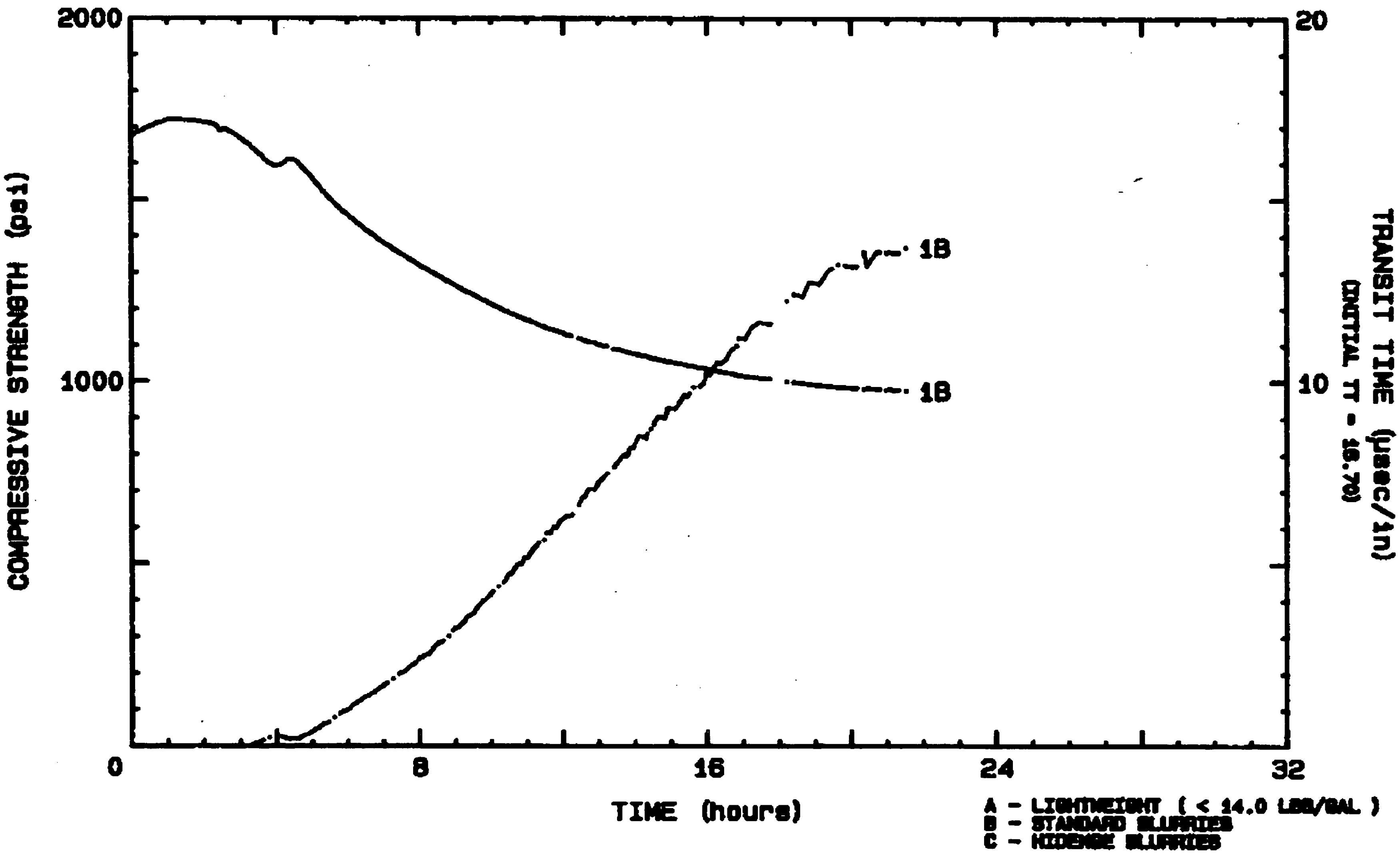
913712 544

PROJECT NO.: R47/ocB/Beardie 1/PA/1102
DATE: 1 Aug 2002
PRESSURE: 130 psi
TEMPERATURE: 17°C

ULTRASONIC CEMENT ANALYZER
HALLIBURTON SERVICES

INITIAL SET:	50	@	5:05
STRENGTH 1 :	500	@	10:44
STRENGTH 2 :	19999		
CURR. STR. :	1372	@	21:37

CEMENT: AB Class G Cement Sea water 1% BWOC $CaCl_2$.
15.9 ppg, Yield 1.16 ft³/sk, Mix Fluid 5.15 gal/sk.



HALLIBURTON

CEMENT SLURRY REPORT

Customer	: Esso Australia Ltd		Date	:	1-Aug-02	
Well Name	: Beardie #1		Reference	:	R48/OCB/Beardie#1/PA/M02	
Casing Size	: 13 3/8	in.				
Job Type	: Plug 3					
Slurry Type	: Single					
API Schedule	:					

RKB to Mudline	: 75	Meters	**Depth(TVD from RKB)**	:	850	Meters
Depth(MD from RKB)	: 850	Meters	**Temperature Gradient**	:		Deg.C./100M
Surface Temperature	: 27	Deg.C.	**BHCT (per API Spec 10)**	:	37	Deg.C.
BHST	: 50	Deg.C.	**Water Source**	:	Seawater	
Mud Weight	:	PPG	**Cl⁻ Content**	:	-	mg/L

ABC Class 'G'	: 94.0	Lbs.	From Rig
NF-5	: 0.003	gal/sk	0.25 gal/10bbl Mix Fluid

Slurry Weight (Surface)	: 15.90	PPG	**Slurry Yield (Surface)**	:	1.16	CuFt/Sack
Mixing Water	: 5.15	Gals/Sack	**Total Mixing Fluid**	:	5.15	Gals/Sack

Thickening Time (Hrs:Mins)	: **Initial BC**	**30 BC**	**50 BC**	**70 BC**	1,200	psi
	16	1:36	1:51	1:56	37	Deg.C.

500psi Compressive Strength **@ 1000 psi and 37 DegC** 4 hrs 51 mins

Notes : Test was conducted to the specifications provided

Lab Technician : Richard Taylor ______________________

Approved : Richard Taylor ______________________

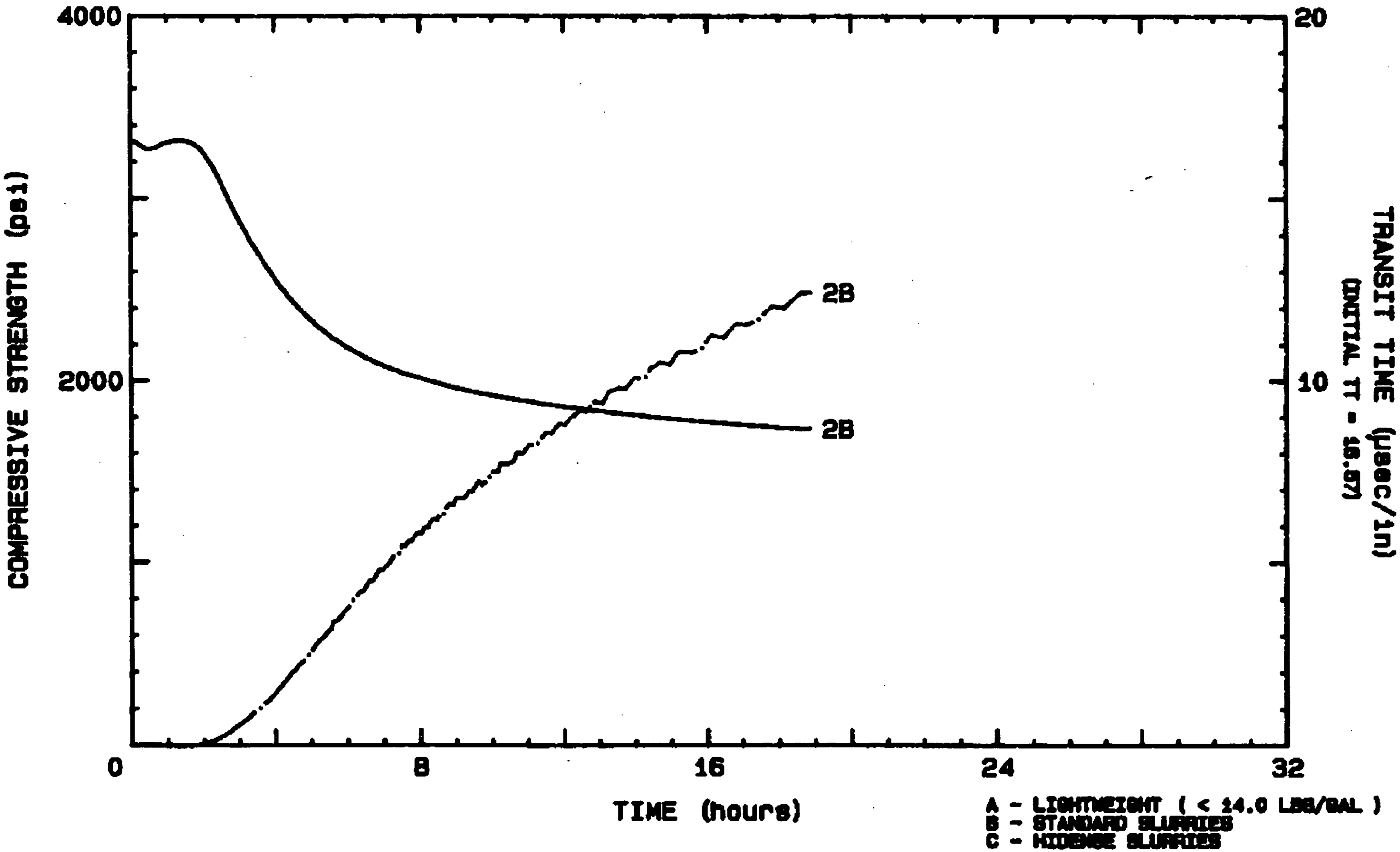
913712 546

PROJECT NO.: R48/OCB/Remedial/PA/ms2
DATE: 1 Aug 2002
PRESSURE: 1200 psi
TEMPERATURE: 37°C

ULTRASONIC CEMENT ANALYZER
HALLIBURTON SERVICES

INITIAL SET:	50	@	2:28
STRENGTH 1 :	500	@	4:51
STRENGTH 2 :	19999		
CURR. STR. :	2479	@	16:58

CEMENT: AB Class G Cement Sea water
15.9 ppg, yield 1.16 ft³/sk, mix fluid 5.15 gal/sk.



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HALLIBURTON

CEMENT SLURRY REPORT

Customer	: Esso Australia Ltd	Date	: 2-Aug-02
Well Name	: Beardie #1	Reference	: R49/OCB/Beardie#1/PA/M02
Casing Size	: 12 1/4" Openhole		
Job Type	: Plug 2		
Slurry Type	: Single		
API Schedule	:		

RKB to Mudline	: 75	Meters	**Depth(TVD from RKB)**	:	1184	Meters
Depth(MD from RKB)	: 1184	Meters	**Temperature Gradient**	:		Deg.C./100M
Surface Temperature	: 27	Deg.C.	**BHCT (per API Spec 10)**	:	46	Deg.C.
BHST	: 60	Deg.C.	**Water Source**	:	Drillwater	
Mud Weight	:	PPG	**Cl⁻ Content**	:	-	mg/L

ABC Class 'G'	: 94.0	Lbs.	From Rig
Halad-413 L	: 0.245	gal/sk	20 gal/10bbl Mix Fluid
NF-5	: 0.003	gal/sk	0.25 gal/10bbl Mix Fluid

Slurry Weight (Surface)	: 15.80	PPG	**Slurry Yield (Surface)**	:	1.16	CuFt/Sack
Mixing Water	: 4.90	Gals/Sack	**Total Mixing Fluid**	:	5.15	Gals/Sack

Thickening Time (Hrs:Mins)	: **Initial BC**	**30 BC**	**50 BC**	**70 BC**	2,000	psi
	8	2:03	2:19	2:29	46	Deg.C.

500psi Compressive Strength **@ 2000 psi and 46 DegC** 3 hrs 56 mins

Notes : Test was conducted to the specifications provided

Lab Technician : Adam Martin ____________________

Approved : Richard Taylor ____________________

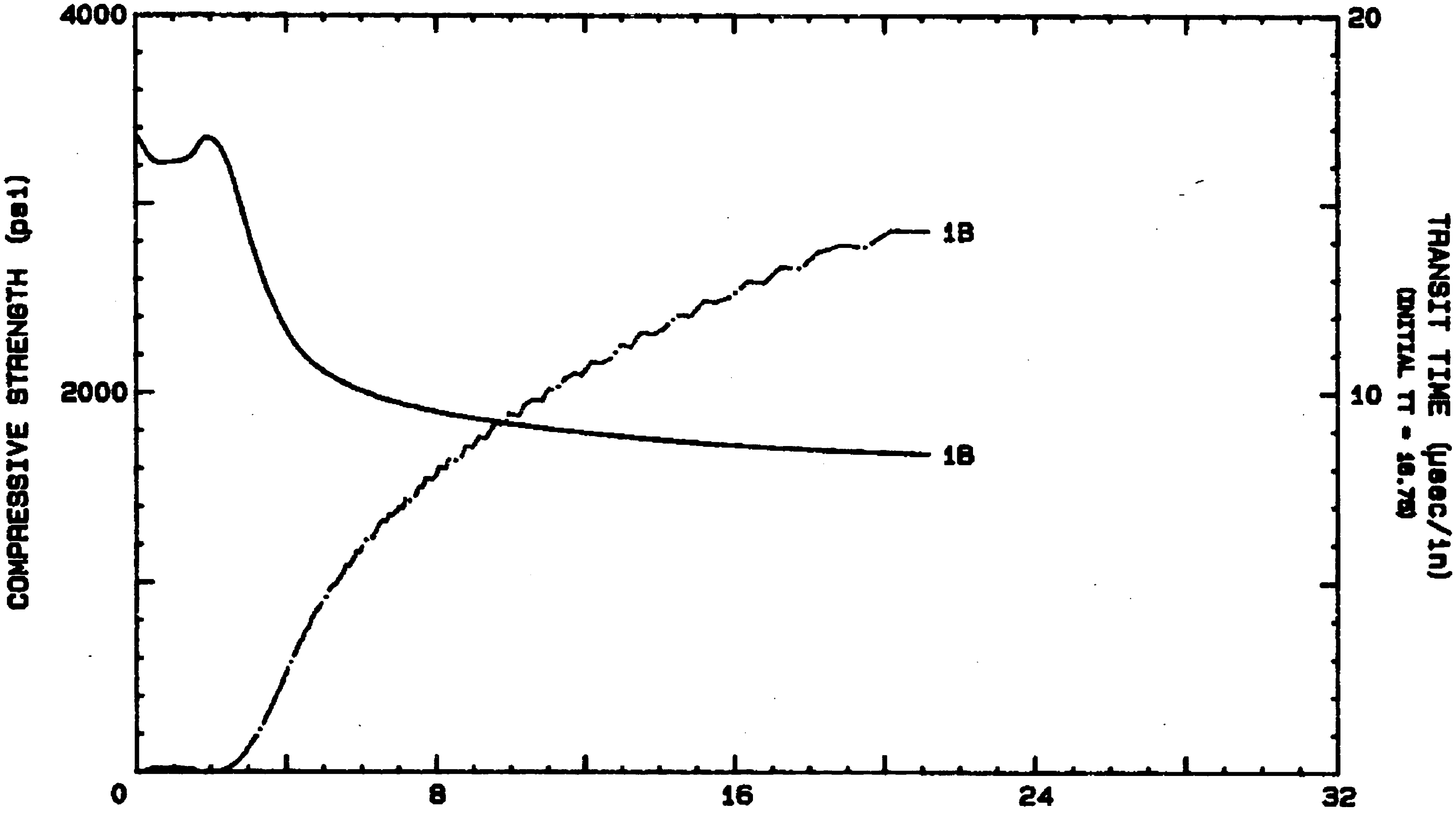
913712 548

PROJECT NO.: R49/OCB/Beardie 1/PA/1102
DATE: 3 Aug 2002
PRESSURE: 2000 psi
TEMPERATURE: 46°C

ULTRASONIC CEMENT ANALYZER
HALLIBURTON SERVICES

INITIAL SET:	50	@	2:38
STRENGTH 1 :	500	@	3:56
STRENGTH 2 :	19999		
CURR. STR. :	2862	@	21:17

CEMENT: AB Class G Cement Drillwater 20 gal Halad 413L/10 bbl mix fluid
15.8 ppg, Yield 1.16 ft3/sk, Mix water 4.90 gal/sk Mix fluid 5.15 gal/sk.



HALLIBURTON

CEMENT SLURRY REPORT

Customer	: Esso Australia Ltd	Date	:	2-Aug-02
Well Name	: Beardie #1	Reference	:	R50a/OCB/Beardie#1/PA/M02
Casing Size	: 12 1/4" Openhole			
Job Type	: Plug 1			
Slurry Type	: Single			
API Schedule	:			

RKB to Mudline	: 75	Meters	**Depth(TVD from RKB)**	:	1905	Meters
Depth(MD from RKB)	: 1905	Meters	**Temperature Gradient**	:		Deg.C./100M
Surface Temperature	: 27	Deg.C.	**BHCT (per API Spec 10)**	:	64	Deg.C.
BHST	: 88	Deg.C.	**Water Source**	:	Drillwater	
Mud Weight	:	PPG	**Cl⁻ Content**	:	-	mg/L

ABC Class 'G'	: 94.0	Lbs.	From Rig
Halad-413 L	: 0.245	gal/sk	20 gal/10bbl Mix Fluid
SCR-100L	: 0.025	gal/sk	2 gal/10bbl Mix Fluid
NF-5	: 0.003	gal/sk	0.25 gal/10bbl Mix Fluid

Slurry Weight (Surface)	: 15.80	PPG	**Slurry Yield (Surface)**	:	1.16	CuFt/Sack
Mixing Water	: 4.88	Gals/Sack	**Total Mixing Fluid**	:	5.15	Gals/Sack

Thickening Time (Hrs:Mins)	: **Initial BC**	**30 BC**	**50 BC**	**70 BC**	3,085	psi
	9	2:26	2:32	2:35	64	Deg.C.

500psi Compressive Strength **@ 3000 psi and 64 DegC** 4 hrs 17 mins

Notes : Test was conducted to the specifications provided

Lab Technician : Adam Martin ____________________

Approved : Richard Taylor ____________________

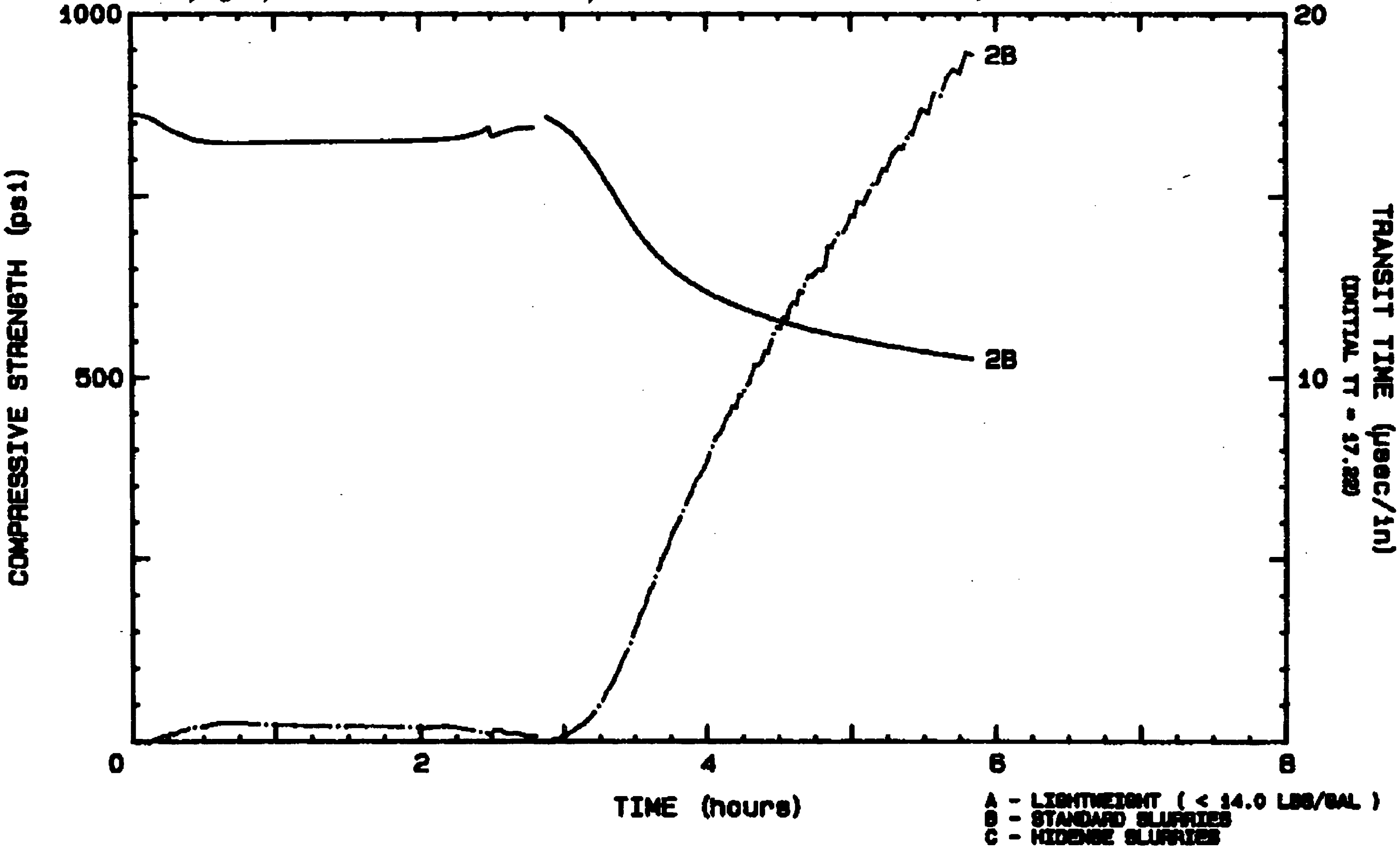
913712 550

PROJECT NO.: R50a/OCB/Bendel/AA/mo2
DATE: 3 Aug 2002
PRESSURE: 3000 psi
TEMPERATURE: 64 °C

ULTRASONIC CEMENT ANALYZER
HALLIBURTON SERVICES

INITIAL SET: 50 @ 3:13
STRENGTH 1 : 500 @ 4:17
STRENGTH 2 : 19999
CURR. STR. : 956 @ 5:54

CEMENT: AB Class G Cement Drillwater
2 gal SCR 100L/10bbl mix fluid 20 gal Halad 413L/10bbl mix fluid
15.8ppg, yield 1.16 ft³/sk, mix water 4.88 gal/sk, mix fluid 5.15 gal/sk.



913712 551

HALLIBURTON

CEMENT SLURRY REPORT

Customer	: Esso Australia Ltd	Date	: 2-Aug-02
Well Name	: Beardie #1	Reference	: R51/OCB/Beardie#1/PC/M02
Casing Size	: 9 5/8		
Job Type	: Production Casing		
Slurry Type	: Single		
API Schedule	:		

RKB to Mudline	: 75	Meters	**Depth(TVD from RKB)**	:	1905	Meters
Depth(MD from RKB)	: 1905	Meters	**Temperature Gradient**	:		Deg.C./100M
Surface Temperature	: 27	Deg.C.	**BHCT (per API Spec 10)**	:	74	Deg.C.
BHST	: 95	Deg.C.	**Water Source**	:	Drillwater	
Mud Weight	: 10.0	PPG	**Cl⁻ Content**	:	-	mg/L

ABC Class 'G'	: 94.0	Lbs.	From Rig
Halad-413 L	: 0.394	gal/sk	32 gal/10bbl Mix Fluid
SCR-100L	: 0.025	gal/sk	2 gal/10bbl Mix Fluid
NF-5	: 0.003	gal/sk	0.25 gal/10bbl Mix Fluid

Slurry Weight (Surface)	: 15.80	PPG	**Slurry Yield (Surface)**	:	1.16	CuFt/Sack
Mixing Water	: 4.75	Gals/Sack	**Total Mixing Fluid**	:	5.17	Gals/Sack

Thickening Time (Hrs:Mins)	: **Initial BC**	**30 BC**	**50 BC**	**70 BC**	3,245	psi
	8	3:11	3:20	3:24	74	Deg.C.

Free Water	: 0.0	%	Vertical				
Fluid Loss	: 42	cc/30 mins.	@ 74	Deg.C.	and	1,000	psi

500psi Compressive Strength **@ 3245 psi and 74 DegC** 6 hrs 04 mins

Notes : Test was conducted to the specifications provided

Lab Technician : Adam Martin ________________

Approved : Richard Taylor ________________

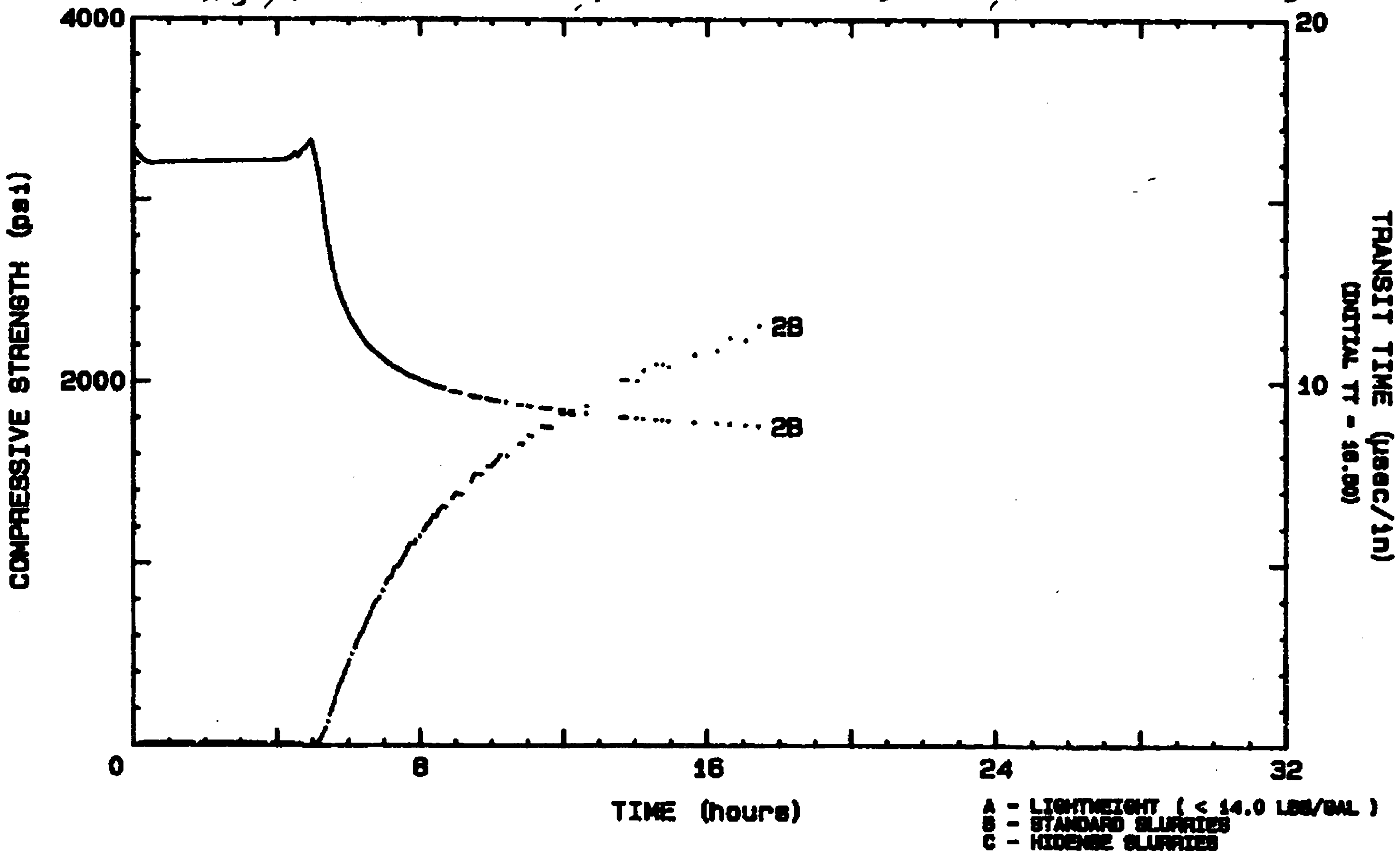
913712 552

PROJECT NO.: R51/OCB/Benedict 1/Pc/mo2
DATE: 3 Aug 2002
PRESSURE: 3295 psi
TEMPERATURE: 74°C

ULTRASONIC CEMENT ANALYZER
HALLIBURTON SERVICES

INITIAL SET:	50	@	5:14
STRENGTH 1 :	500	@	6:04
STRENGTH 2 :	19999		
CURR. STR. :	2318	@	17:31

CEMENT: AB Class G Cement Dillwater
2 gal SCR 100L / 10661 Mix fluid 32 gal Halad 413L / 10661 Mix fluid
15.8 ppg, Yield 1.16 ft3/sk, Mix water 4.75 gal/sk, Mix fluid 5.17 gal/sk.



HALLIBURTON

CEMENT SLURRY REPORT

Customer	: Esso Australia Ltd	Date	: 6-Aug-02
Well Name	: Beardie #1	Reference	: R53/OCB/Beardie#1/PA/M02
Casing Size	: 12 1/4" Openhole		
Job Type	: Plug 1		
Slurry Type	: Single		
API Schedule	:		

RKB to Mudline	: 75	Meters	**Depth(TVD from RKB)**	:	1450	Meters
Depth(MD from RKB)	: 1450	Meters	**Temperature Gradient**	:		Deg.C./100M
Surface Temperature	: 27	Deg.C.	**BHCT (per API Spec 10)**	:	55	Deg.C.
BHST	: 71	Deg.C.	**Water Source**	:	Drillwater	
Mud Weight	:	PPG	**Cl^- Content**	:	-	mg/L

ABC Class 'G'	: 94.0	Lbs.	From Rig
Halad-413 L	: 0.245	gal/sk	20 gal/10bbl Mix Fluid
SCR-100L	: 0.012	gal/sk	1 gal/10bbl Mix Fluid
NF-5	: 0.003	gal/sk	0.25 gal/10bbl Mix Fluid

Slurry Weight (Surface)	: 15.80	PPG	**Slurry Yield (Surface)**	:	1.16	CuFt/Sack
Mixing Water	: 4.89	Gals/Sack	**Total Mixing Fluid**	:	5.15	Gals/Sack

Thickening Time (Hrs:Mins)	: **Initial BC**	**30 BC**	**50 BC**	**70 BC**	2,100	psi
	11	2:51	3:03	3:08	55	Deg.C.

500psi Compressive Strength	**@ 2000 psi and 55 DegC**	5 hrs 21 mins

Notes : Test was conducted to the specifications provided

Lab Technician : Adam Martin ______________________

Approved : Richard Taylor ______________________

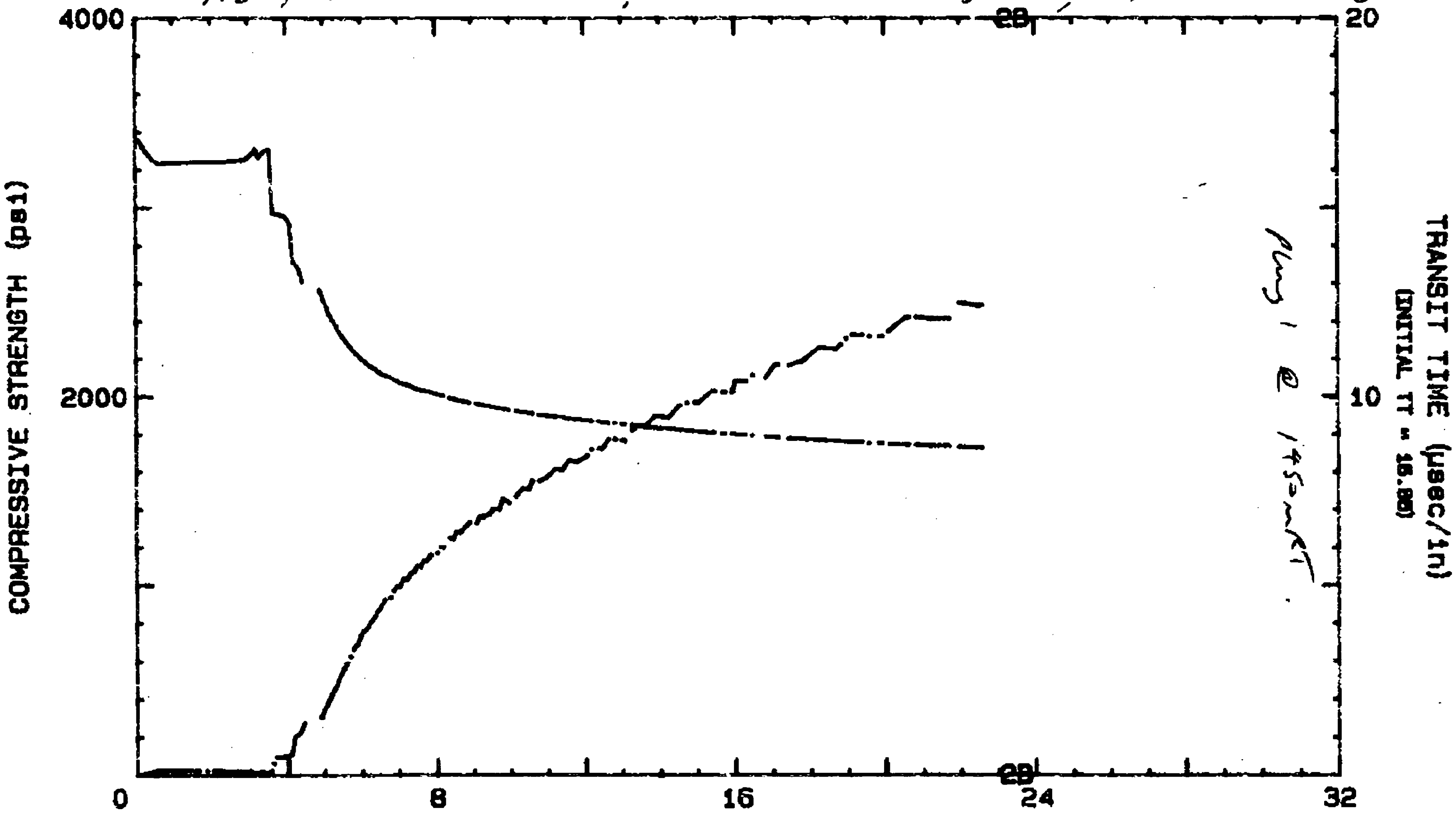
913712 554

PROJECT NO.: R53/OCB/Beardie#1/PA/Mo2
DATE: 6 Aug 2002
PRESSURE: 2000 psi
TEMPERATURE: 55°C

ULTRASONIC CEMENT ANALYZER
HALLIBURTON SERVICES

INITIAL SET:	50	@	3: 37
STRENGTH 1 :	500	@	5: 21
STRENGTH 2 :	19999		
CURR. STR. :	2484	@	22: 46

CEMENT: AB Class G Cement Drillwater
20 gal Halad 413L/10 bbl mix fluid 1 gal SCR 100L/10 bbl mix fluid
15.8 ppg, Yield 1.16 ft³/sk, Mix water 4.89 gal/sk, mix fluid 5.15 gal/sk.



A - LIGHTWEIGHT (< 14.0 LBS/GAL)
B - STANDARD SLURRIES
C - HIDENSE SLURRIES

3.0 CEMENT JOB LOGS AND HALWIN DATA

913712 556

HALLIBURTON ZI - Job Log Summary	SALES ORDER # (If applicable) 1969654	JOB DATE 27-7-02	ON SITE HES REP R. Stares
COUNTRY Australia	BDA Perth	LOCATION/FIELD NAME Bass Strait	JOB SITE Offshore-Other < 1500ft
CUSTOMER Esso	CUSTOMER REPRESENTATIVE B. Bigby		WELL NAME & NUMBER Beardie 1
PSL GROUP - LEVEL 1 Cementing	PSL GROUP - LEVEL 2 Zonal Isolation		PSL GROUP - LEVEL 3 Cementing Services & Materials
JOB TYPE CODE CEMENT JOB	JOB PURPOSE CODE CEMENT CONDUCTOR CASING 14161		JOB CLASS RTO

HES EMP NAME (EXPOSURE HRS)	HRS	HES EMP NAME (EXPOSURE HRS)	HRS	HES EMP NAME (EXPOSURE HRS)	HRS
R. Stares	2				

HES UNIT NUMBERS	HOURS	HES UNIT NUMBERS	HOURS	HES UNIT NUMBERS	HOURS
SK 10444	2				

Form Name: Type:
Form Thickness: From: To.
Packer Type: Set At:
Bottom Hole Temp.: Pressure:
Mics. Data: Total Depth:

	Called Out	On Location	Job Started	Job Completed
DATE	22-7-02	23-7-02	27-7-02	27-7-02
TIME	12:00	9:00	7:20	8:45

TOOLS & ACCESSORIES

TYPE & SIZE	QTY	MAKE
Float Collar		
Float Shoe	1	Weatherford
Guide Shoe		
Centralizers		
Bottom Plug		
Top Plug		
Head		
Packer		
Other		

WELL DATA

	NEW/USED	WEIGHT	SIZE	FROM	TO	MAX ALLOW
Casing	NEW	310 ppf	30"	73	122	
Casing						
Casing						
EZSV						
cmt plug						
Open Hole						
Perforations						
Perforations						
Perforations						

Treat Fluid Density Lb/Gal
Disp. Fluid Density Lb/Gal
Prop.Type Size Lb
Prop.Type Size Lb
Acid Type Gal. %
Acid Type Gal. %
Surfactant Gal. In
NE Agent Gal. In
Fluid Loss Gal/Lb In
Gelling Agent Gal/Lb In
Fric. Red Gal/Lb In
Breaker Gal/Lb In
Blocking Agent Gal/Lb
Perfpac Balls Qty
Other
Other

Hours on Location Date	Hours	Operating Hours Date	Hours	DESCRIPTION OF JOB
				Cement 30" Conductor
27-7-02	24	27-7-02	12	
TOTAL	24	TOTAL	12	

HYDRAULIC HORSEPOWER
ORDERED Avail. Used

AVERAGE RATES IN BPM
TREATED Disp. Overall

CEMENT LEFT IN PIPE
FEET Reason

CEMENT DATA

STAGE	SACKS	CEMENT	BULK/SKS	ADDITIVES	YIELD	LBS/GAL
1	1228	ABC Class G	BULK	Calcium Chloride 1%BWOC, NF-5	1.17	15.9

Circulating Displacement Preflush: Gal - bbl Type
Breakdown Maximum Load & Bkdn: Gal - bbl Pad: bbl - Gal
Average Frac Gradient Treatment: Gal - bbl Disp: bbl - Gal
Shut In: Instant 5 Min 15 Min Cement Slurry: Gal - bbl
Pipe Movement Total Volume : Gal - bbl

	CIRCULATION	SPACER / FLUSH	CEMENT	DISPLACEMENT
Fluid type/Density	Seawater	Seawater	15.9 ppg	Seawater
Rate		6 bpm	5 bpm	5 bpm
Volume	180	20 bbls	256 bbls	18 bbls

Frac Ring #1	Frac Ring #2	Frac Ring #3	Frac Ring #4

THE INFORMATION STATED HEREIN IS CORRECT — CUSTOMER'S REPRESENTATIVE SIGNATURE

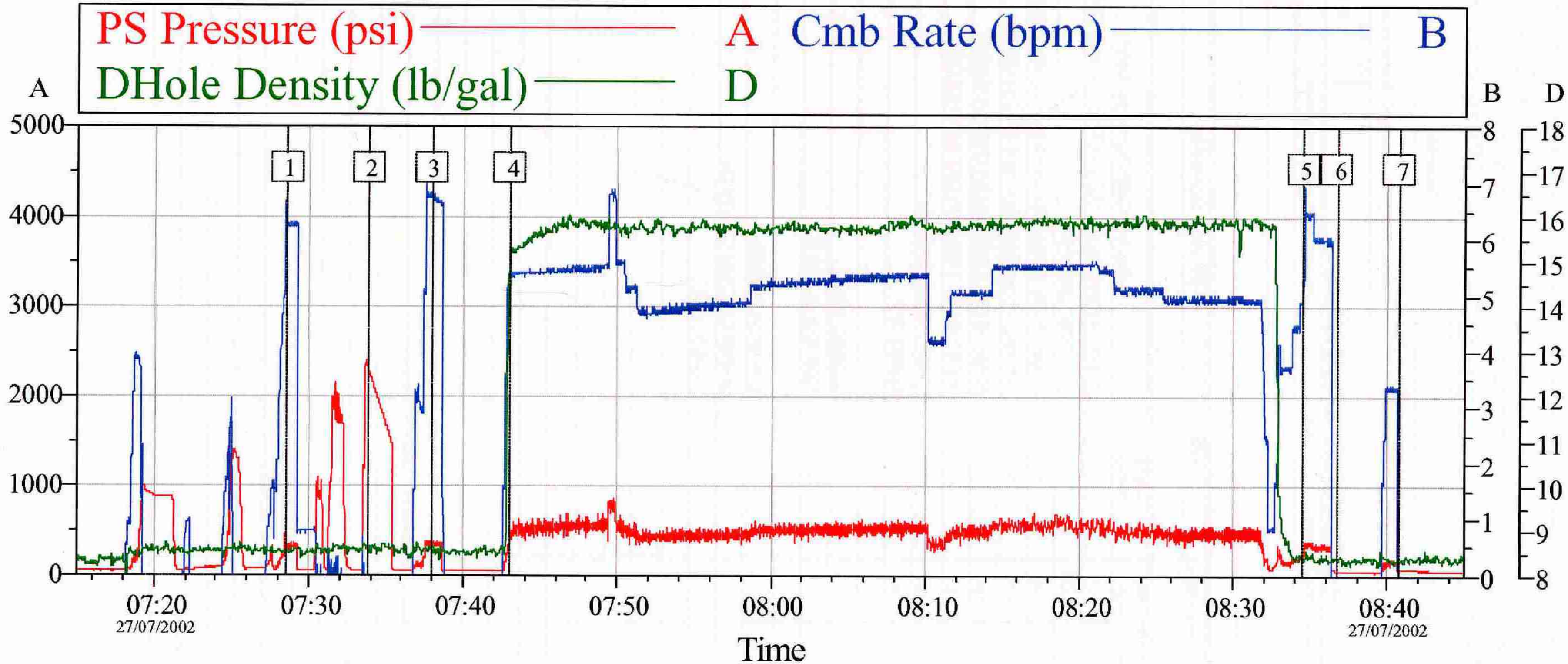
913712 557

HALLIBURTON ZI - Job Log Summary		SALES ORDER # (if applicable) 0	JOB DATE 27-7-02	ON SITE HES REP R. Stares
COUNTRY Australia	STATE/OPERATIONAL AREA Perth	LOCATION/FIELD NAME Bass Strait		JOB SITE Offshore-Other < 1500ft
CUSTOMER Esso	CUSTOMER REPRESENTATIVE B. Bigby		WELL NAME & NUMBER Beardie 1	
PSL GROUP - LEVEL 1 Cementing	PSL GROUP - LEVEL 2 Zonal Isolation		PSL GROUP - LEVEL 3 Cementing Services & Materials	
JOB TYPE CODE CEMENT JOB	JOB PURPOSE CODE CEMENT CONDUCTOR CASING 14161			JOB CLASS RTO

HES EMP NAME (EXPOSURE HRS)	HRS	HES EMP NAME (EXPOSURE HRS)	HRS	HES EMP NAME (EXPOSURE HRS)	HRS

HES UNIT NUMBERS	HRS	HES UNIT NUMBERS	HRS	HES UNIT NUMBERS	HRS

CHART #	TIME	PUMPS T	PUMPS C	VOLUME (BBL)(GAL)	PRESS (PSI) Low	PRESS (PSI) High	RATE (BPM)	JOB DESCRIPTION / REMARKS
	7:28			10		300	6	PUMP 10 BBLS SEAWATER WITH FLOUROSCEINE
	7:33					2000		LINE TEST 2000 PSI
	7:37			10		300	6	PUMP 10 BBLS SEAWATER WITH FLOUROSCEINE
	7:42			256		500	5	MIX AND PUMP 256 BBLS 15.9 PPG SLURRY
	8:34			18		150	5	PUMP 18 BBLS SEAWATER DISPLACEMENT
	8:36			3		0		BLEED BACK 3 BBLS, FLOAT NOT HOLDING
	8:40			3		50	3	PUMP 3 BBLS, SHUT IN
	12:00			0		0		BLEED OFF
								CEMENT USED
								1228 SXS CLASS G
								CHEMICALS USED
								25 SXS CALCIUM CHLORIDE
								3 GALS NF-5



Event Log

			PP	CR				PP	CR
1	Pump 10 bbls seawater	07:28:36	338.7	6.222	2	Line Test	07:33:51	2291	0.000
3	Pump 10 bbls seawater	07:37:55	340.9	6.802	4	Pump 256 bbls 15.9 ppg slurry	07:42:58	331.6	5.378
5	Displace 18 bbls seawater	08:34:30	200.1	4.851	6	Bleed back 3 bbls, float not holding	08:36:40	47.47	0.000
7	Pump 3 bbls, shut in	08:40:42	66.01	0.000					

Customer: Esso Well : Beardie 1	Job Date: 27-2-02 Job: 30" Conductor

HALLIBURTON
CemWin v1.4.0
18-Sep-02 11:56

913712 558

913712 559

EJCS No: 639705

HALLIBURTON — CEMENTING END OF JOB CUSTOMER SATISFACTION	SALES ORDER # / TICKET # / JOB #	JOB DATE	ON SITE HES REP
		27-7-02	R. Stares

COUNTRY	BDA	LOCATION	JOB SITE TYPE
Australia	Perth	Bass Strait	Offshore-Other < 1500ft

CUSTOMER	CUSTOMER REPRESENTATIVE	WELL NAME & NUMBER
Esso	B. Bigby	Beardie 1

PSL GROUP - LEVEL 1	PSL GROUP - LEVEL 2	PSL GROUP - LEVEL 3
Cementing	Zonal Isolation	Cementing Services & Materials

JOB TYPE CODE	JOB PURPOSE CODE	JOB CLASS
CEMENT JOB	CEMENT CONDUCTOR CASING 14161	RTO

HSE Incident? (Accident Injury etc) ☐ YES ☑ NO | Operating Time 2 | Customer Completed ☑

SPECIAL TOOLS

Complete if a Special Tools Job was performed

JOB TYPE CODE	JOB PURPOSE CODE

Dear Customer,

We hope that you were satisfied with the service quality of this job performed by Halliburton. It is the aim of our management and service personnel to deliver equipment and service of a standard unmatched in the service sector of the energy industry.

Please take the time to let us know if our perfomance met with your satisfaction. Please be as critical as possible to ensure we constantly improve our service. Your comments are of great value to us and are intended for the exclusive use of Halliburton.

ENTERED

Please indicate your response by placing a tick in the box underneath the rating that best matches your opinion.

DESCRIPTION	**Superior Performance** (New quality performance standard - Best Practice) 5	**Exceeded Expectations** (Provided more than required - Potential Best Practice) 4	**Met Exectations** (Did what was expected - Prevention/Improvement) 3	**Below Expectations** (Did not do as expected, Recovery Made - CPI Required) 2	**Poor Performance** (Job problems/failures, some recovery made - CPI Required) 1
Did our personnel perform the job to your satisfaction?		✓			
Did our equipment perform the job to your satisfaction?		✓			
Did we perform the job to the agreed upon design?		✓			
Did our products and materials perform as you expected?		✓			
Did we perform in a safe & careful manner?		✓			
Did we perform in an environmentally sound manner?		✓			
Was the job performed as scheduled?		✓			
Did the equipment condition & appearance meet you expectations?		✓			
How well did our personnel communicate during mobilisation, rig-up and job execution?		✓			

What can we do to improve our service? (Any further comments may be completed on the back of this form)

Customer Comments (Any further comments may be completed on the back of this form)

Equipment & Operator excellent

Customer Signature: [signature] **Date:** 30 July 02

All data collected is for trend analysis and business process improvement only.

913712 559

HALLIBURTON ZI - Job Log Summary

SALES ORDER # (If applicable): 1969654	JOB DATE: 29-7-02	ON SITE HES REP: R. Stares	
COUNTRY: Australia	BDA: Perth	LOCATION/FIELD NAME: Bass Strait	JOB SITE: Offshore-Other < 1500ft
CUSTOMER: Esso	CUSTOMER REPRESENTATIVE: B. Bigby	WELL NAME & NUMBER: Beardie 1	
PSL GROUP LEVEL 1: Cementing	PSL GROUP LEVEL 2: Zonal Isolation	PSL GROUP - LEVEL 3: Cementing Services & Materials	
JOB TYPE CODE: CEMENT JOB	JOB PURPOSE CODE: SURFACE CASING 7521	JOB CLASS: RTO	

HES EMP NAME (EXPOSURE HRS)	HRS	HES EMP NAME (EXPOSURE HRS)	HRS	HES EMP NAME (EXPOSURE HRS)	HRS
R. Stares	3				

HES UNIT NUMBERS	HOURS	HES UNIT NUMBERS	HOURS	HES UNIT NUMBERS	HOURS
SK 10444	2				

Form Name: Type:
Form Thickness: From: To:
Packer Type: Set At:
Bottom Hole Temp.: Pressure:
Mics. Data: Total Depth:

	Called Out	On Location	Job Started	Job Completed
DATE	22-7-02	23-7-02	29-7-02	29-7-02
TIME	12:00	9:00	12:45	16:00

TOOLS & ACCESSORIES

TYPE & SIZE	QTY	MAKE
Float Collar	1	Halliburton NR
Float Shoe	1	Halliburton NR
Guide Shoe		
Centralizers		
Bottom Plug		
Top Plug	1	SSR Top plug
Head	1	Nodeco
Packer		
Other		

WELL DATA

	NEW/USED	WEIGHT	SIZE	FROM	TO	MAX ALLOW
Casing	NEW	310 ppf	30"	73	122	
Casing	NEW	68	13 3/8	73	848.2	
Casing						
EZSV						
cmt plug						
Open Hole						
Perforations						
Perforations						
Perforations						

Treat Fluid Density Lb/Gal
Disp. Fluid Density Lb/Gal
Prop.Type Size Lb.
Prop.Type Size Lb.
Acid Type Gal. %
Acid Type Gal. %
Surfactant Gal. In
NE Agent Gal. In
Fluid Loss Gal/Lb In
Gelling Agent Gal/Lb In
Fric. Red. Gal/Lb In
Breaker Gal/Lb In
Blocking Agent Gal/Lb
Perfpac Balls Qty
Other
Other

Hours on Location Date	Hours	Operating Hours Date	Hours	DESCRIPTION OF JOB
				Cement 13 3/8 Surface Casing
29-7-02	24	29-7-02	12	
TOTAL	24	TOTAL	12	

HYDRAULIC HORSEPOWER
ORDERED Avail. Used

AVERAGE RATES IN BPM
TREATED Disp. Overall

CEMENT LEFT IN PIPE
FEET Reason

CEMENT DATA

STAGE	SACKS	CEMENT	BULK/SKS	ADDITIVES	YIELD	LBS/GAL
1	1335	ABC Class G	BULK	Econolite 14.6 gal/10bbls	2.21	12.5
2	726	ABC Class G	BULK	Neat	1.16 .	15.8

Circulating Displacement Preflush: Gal - bbl Type
Breakdown Maximum Load & Bkdn: Gal - bbl Pad: bbl - Gal
Average Frac Gradient Treatment: Gal - bbl Disp: bbl - Gal
Shut In: Instant 5 Min 15 Min Cement Slurry: Gal - bbl
Pipe Movement Total Volume : Gal - bbl

	CIRCULATION	SPACER / FLUSH	CEMENT	DISPLACEMENT
Fluid type/Density	Seawater	Seawater	12.5 / 15.8	Seawater
Rate		7 bpm	8 bpm / 5 bpm	14 bpm
Volume		50 bbls	523 bbls/150 bbls	373 bbls

Frac Ring #1 Frac Ring #2 Frac Ring #3 Frac Ring #4

THE INFORMATION STATED HEREIN IS CORRECT — CUSTOMER'S REPRESENTATIVE SIGNATURE

913712 560

HALLIBURTON ZI - Job Log Summary	SALES ORDER # (if applicable) 0	JOB DATE 29-7-02	ON SITE HES REP R. Stares
COUNTRY Australia	STATE/OPERATIONAL AREA Perth	LOCATION/FIELD NAME Bass Strait	JOB SITE Offshore-Other < 1500ft
CUSTOMER Esso	CUSTOMER REPRESENTATIVE B. Bigby	WELL NAME & NUMBER Beardie 1	
PSL GROUP - LEVEL 1 Cementing	PSL GROUP - LEVEL 2 Zonal Isolation	PSL GROUP - LEVEL 3 Cementing Services & Materials	
JOB TYPE CODE CEMENT JOB	JOB PURPOSE CODE SURFACE CASING 7521		JOB CLASS RTO

HES EMP NAME (EXPOSURE HRS)	HRS	HES EMP NAME (EXPOSURE HRS)	HRS	HES EMP NAME (EXPOSURE HRS)	HRS

HES UNIT NUMBERS	HRS	HES UNIT NUMBERS	HRS	HES UNIT NUMBERS	HRS

CHART #	TIME	PUMPS T	PUMPS C	VOLUME (BBL)(GAL)	PRESS (PSI) Low	PRESS (PSI) High	RATE (BPM)	JOB DESCRIPTION / REMARKS
	12:50			5		300	7	PUMP 5 BBLS SEAWATER WITH FLOUROSCEINE
	12:53					2500		TEST LINES 2500 PSI
	12:58			45		300	7	PUMP 45 BBLS SEAWATER WITH FLOUROSCEINE
	13:10			523		600	8	MIX AND PUMP 523 BBLS 12.5 PPG SLURRY 1335 SXS
								CLASS G IN 413 BBLS SEAWATER WITH 14.6 GALS/
								10 BBLS ECONOLITE
	14:29			150		450	5	MIX AND PUMP 150 BBLS 15.8 PPG SLURRY 726 SXS
								CLASS G IN 90 BBLS DRILLWATER
	15:01							RELEASE DART
	15:06			5		2450	1	PUMP 5 BBLS DRILLWATER TO SHEAR PLUG
	15:07			5		250	8	PUMP 5 BBLS DRILLWATER
	15:08			363				RIG DISPLACE 363 BBLS SEAWATER
	15:56					700		PLUG BUMPS, BLEED OFF
								1.5 BBLS RETURN, FLOATS HOLDING
	16:00							END JOB
								CEMENT USED
								LEAD 1335 SXS CLASS G
								TAIL 726 SXS CLASS G
								CHEMICALS USED
								636 GALS ECONOLITE
								7 GALS NF-5

EJCS No: 639707

913712 561

[redacted]

CEMENTING END OF JOB CUSTOMER SATISFACTION	SALES ORDER # / TICKET # / JOB #	JOB DATE: 29-7-02	ON SITE HES REP: R. Stares
COUNTRY: Australia	BDA: Perth	LOCATION: Bass Strait	JOB SITE TYPE: Offshore-Other < 1500ft
CUSTOMER: Esso	CUSTOMER REPRESENTATIVE: B. Bigby	WELL NAME & NUMBER: Beardie 1	
PSL GROUP - LEVEL 1: Cementing	PSL GROUP - LEVEL 2: Zonal Isolation	PSL GROUP - LEVEL 3: Cementing Services & Materials	
JOB TYPE CODE: CEMENT JOB	JOB PURPOSE CODE: SURFACE CASING 7521		JOB CLASS: RTO
HSE Incident? (Accident Injury etc) ☐ YES ☑ NO	Operating Time: 3	Customer Completed ☑	

SPECIAL TOOLS

Complete if a Special Tools Job was performed

JOB TYPE CODE	JOB PURPOSE CODE

Dear Customer,

We hope that you were satisfied with the service quality of this job performed by Halliburton. It is the aim of our management and service personnel to deliver equipment and service of a standard unmatched in the service sector of the energy industry

Please take the time to let us know if our perfomance met with your satisfaction. Please be as critical as possible to ensure we constantly improve our service. Your comments are of great value to us and are intended for the exclusive use of Halliburton

ENTERED

Please indicate your response by placing a tick in the box underneath the rating that best matches your opinion.

DESCRIPTION	Superior Performance (New quality performance standard - Best Practice) 5	Exceeded Expectations (Provided more than required - Potential Best Practice) 4	Met Exectations (Did what was expected - Prevention/Improvement) 3	Below Expectations (Did not do as expected, Recovery Made - CPI Required) 2	Poor Performance (Job problems/failures, some recovery made - CPI Required) 1
Did our personnel perform the job to your satisfaction?		✓			
Did our equipment perform the job to your satisfaction?		✓			
Did we perform the job to the agreed upon design?		✓			
Did our products and materials perform as you expected?		✓			
Did we perform in a safe & careful manner?		✓			
Did we perform in an environmentally sound manner?		✓			
Was the job performed as scheduled?		✓			
Did the equipment condition & appearance meet you expectations?		✓			
How well did our personnel communicate during mobilisation, rig-up and job execution?		✓			

What can we do to improve our service? (Any further comments may be completed on the back of this form)

Customer Comments (Any further comments may be completed on the back of this form)

Equipment & Operator very good

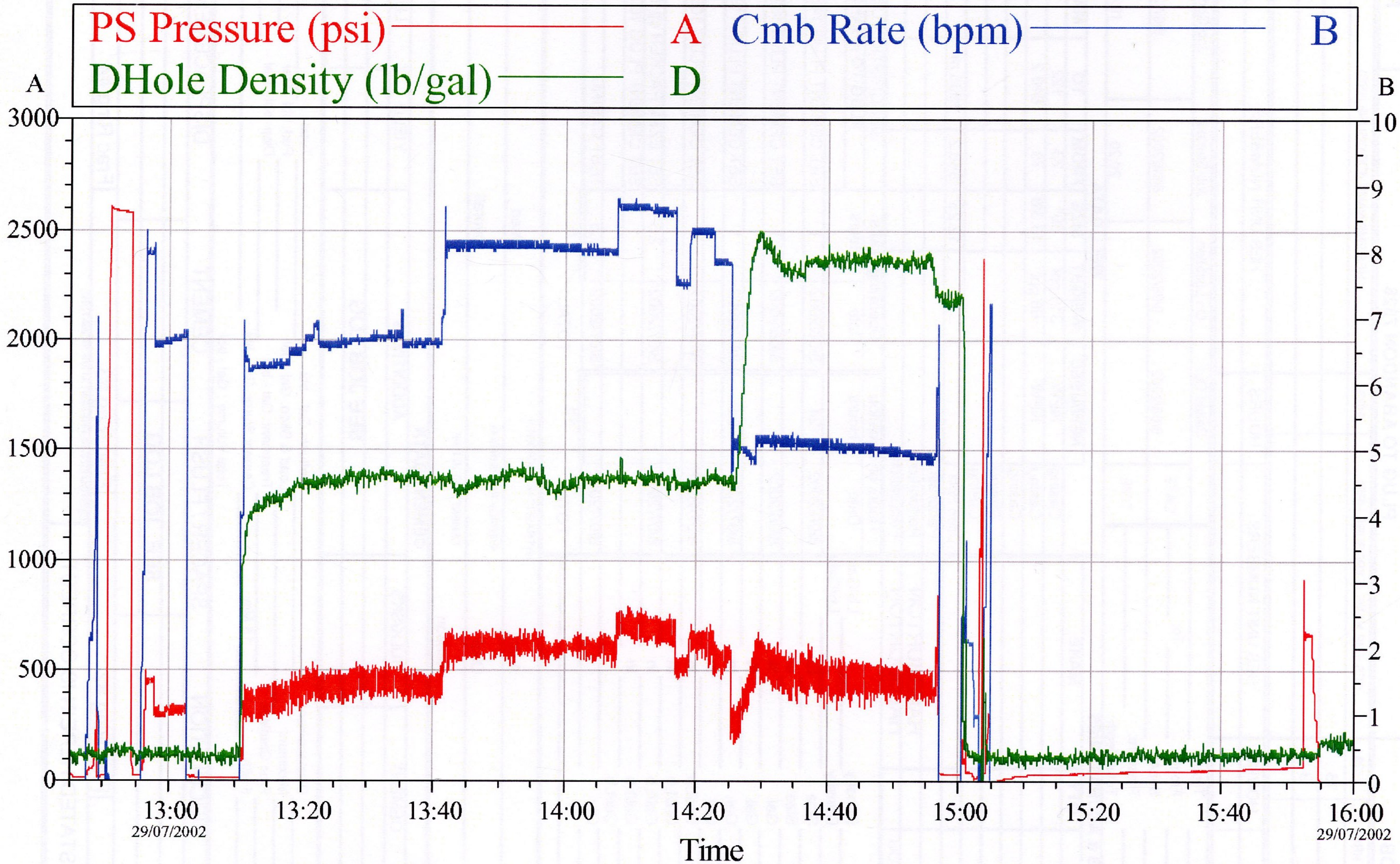
Customer Signature: [signature] **Date:** 30 July 02

All data collected is for trend analysis and business process improvement only.

Revised: 19 Feb 2002

FO-OAP-HES-QM-EJCS(CMT)-002

Pe913712 - colour Ø34



Customer: Esso Well : Beardie 1	Job Date: 29-7-02 Job: 13 3/8" Casing

HALLIBURTON
CemWin v1.4.0
18-Sep-02 12:01

913712 562

913712 563

HALLIBURTON ZI - Job Log Summary	SALES ORDER # (If applicable): 0	JOB DATE: 7-Aug-02	ON SITE HES REP: CAM SETH
COUNTRY: Australia	BDA: Perth	LOCATION/FIELD NAME: Bass Strait	JOB SITE: Offshore-Other < 1500ft
CUSTOMER: ESSO AUSTRALIA	CUSTOMER REPRESENTATIVE: BRIGHAM BIGBY / GEORGE SHARKEY	WELL NAME & NUMBER: BEARDIE # 1	
PSL GROUP - LEVEL 1: Cementing	PSL GROUP - LEVEL 2: Zonal Isolation	PSL GROUP - LEVEL 3: Cementing Services & Materials	
JOB TYPE CODE: CEMENT JOB	JOB PURPOSE CODE: PLUG TO ABANDON 7528	JOB CLASS: RTO	

HES EMP NAME (EXPOSURE HRS)	HRS	HES EMP NAME (EXPOSURE HRS)	HRS	HES EMP NAME (EXPOSURE HRS)	HRS
CAM SETH	18				
ROD STARES	9				

HES UNIT NUMBERS	HOURS	HES UNIT NUMBERS	HOURS	HES UNIT NUMBERS	HOURS

Form Name: Type:
Form Thickness: From: To:
Packer Type: Set At:
Bottom Hole Temp.: Pressure:
Mics. Data: Total Depth:

	Called Out	On Location	Job Started	Job Completed
DATE	8/06/2002	8/06/2002	8/06/2002	8/07/2002
TIME			20:20	19:45

TOOLS & ACCESSORIES

TYPE & SIZE	QTY	MAKE
Float Collar		
Float Shoe		
Guide Shoe		
Centralizers		
Bottom Plug		
Top Plug		
Head		
Packer 13.3/8 EZSV		HALLIBURTON
Other 13.3/8 BRIDGING PLUG		HALLIBURTON

WELL DATA

	NEW/USED	WEIGHT	SIZE	FROM	TO	MAX ALLOW
Casing	NEW	310 ppf	30"	73	122	
Casing	NEW	68 ppf	13.3/8	73	848.2	
Casing						
Casing						
Casing						
Open Hole			12.25"	848.2	1905 m	
Perforations						
Perforations						
Perforations						

Treat Fluid Density Lb/Gal
Disp. Fluid Density Lb/Gal
Prop.Type Size Lb.
Prop.Type Size Lb.
Acid Type Gal. %
Acid Type Gal. %
Surfactant Gal. In
NE Agent Gal. In
Fluid Loss Gal/Lb In
Gelling Agent Gal/Lb In
Fric. Red. Gal/Lb In
Breaker Gal/Lb In
Blocking Agent Gal/Lb
Perfpac Balls Qty
Other
Other

Hours on Location Date	Hours	Operating Hours Date	Hours	DESCRIPTION OF JOB: PLUG TO ABANDON
8/06/2002	24	8/06/2002	1	SET CEMENT PLUG 1460 m-1325
8/06/2002		8/06/2002	1	SET CEMENT PLUG 1325 m-1190
8/07/2002	24	8/07/2002	1	SET CEMENT PLUG 1190 m-1055
8/07/2002		8/07/2002	1	SET CEMENT PLUG 1055 m-920
8/07/2002		8/07/2002	2.5	SET EZSV PACKER @ 160 m
				SET CEMENT PLUG 160 m-100
8/07/2002		8/07/2002	0.5	TEST CASING
TOTAL	48	TOTAL	7	

HYDRAULIC HORSEPOWER
ORDERED Avail. Used

AVERAGE RATES IN BPM
TREATED Disp. Overall

CEMENT LEFT IN PIPE
FEET Reason

CEMENT DATA

PLUG	SACKS	CEMENT	BULK/SKS	ADDDITIVES	YIELD	LBS/GAL
				SEE JOB LOG		

Circulating Displacement Preflush: Gal - bbl Tupe
Breakdown Maximum Load & Bkdn: Gal - bbl Pad: bbl - Gal
Average Frac Gradient Treatment: Gal - bbl Disp: bbl - Gal
Shut In: Instant 5 Min 15 Min Cement Slurry: Gal - bbl
Pipe Movement Total Volume : Gal - bbl

	CIRCULATION	SPACER / FLUSH	CEMENT	DISPLACEMENT
Fluid type/Density				
Rate		SEE JOB LOG		
Volume				

Frac Ring #1	Frac Ring #2	Frac Ring #3	Frac Ring #4

THE INFORMATION STATED HEREIN IS CORRECT

CUSTOMER'S REPRESENTATIVE SIGNATURE

HALLIBURTON ZI - Job Log Summary	SALES ORDER # (If applicable)	JOB DATE	ON SITE HES REP
	0	7-Aug-02	CAM SETH

COUNTRY	STATE/OPERATIONAL AREA	LOCATION/FIELD NAME	JOB SITE
Australia	Perth	Bass Strait	Offshore-Other < 1500ft

CUSTOMER	CUSTOMER REPRESENTATIVE	WELL NAME & NUMBER
ESSO AUSTRALIA	BRIGHAM BIGBY / GEORGE SHARKEY	BEARDIE # 1

PSL GROUP - LEVEL 1	PSL GROUP - LEVEL 2	PSL GROUP - LEVEL 3
Cementing	Zonal Isolation	Cementing Services & Materials

JOB TYPE CODE	JOB PURPOSE CODE	JOB CLASS
CEMENT JOB	PLUG TO ABANDON 7528	RTO

HES EMP NAME (EXPOSURE HRS)	HRS	HES EMP NAME (EXPOSURE HRS)	HRS	HES EMP NAME (EXPOSURE HRS)	HRS

HES UNIT NUMBERS	HRS	HES UNIT NUMBERS	HRS	HES UNIT NUMBERS	HRS

CHART #	TIME	PUMPS T C	VOLUME (BBL)(GAL)	PRESS (PSI) Tbg	PRESS (PSI) Csg	RATE (BPM)	JOB DESCRIPTION / REMARKS
							PLUG # 1 A
	20:00	T	609			20	RIG CIRCULATE WITH 9.7 ppg MUD
	20:28	T	2	486		5	PUMP FRESHWATER SPACER
	20:35	T		2339			TEST CEMENT LINE
	20:39	T	28	828		8	PUMP FRESHWATER SPACER
	20:55	T	69.2	1000		6	MIX & PUMP TAIL SLURRY (335 SX CLASS " G ")
							20 gls/10bbl halad 413 - L & 1 gl/10 bbl SCR 100 -L
	21:10	T	2	30		4	PUMP FRESHWATER TO BALANCE PLUG
	21:13	T	73	408		8	DISPLACE SLURRY WITH 9.7 ppg MUD
							PLUG # 1 B
	20:10	T	517			20	RIG CIRCULATE WITH 9.7 ppg MUD
	22:53	T	2	29		3	PUMP FRESHWATER SPACER
	22:57	T		2300			TEST CEMENT LINE
	23:01	T	28	474		7	PUMP FRESHWATER SPACER
	23:11	T	69.2	440		4.5	MIX & PUMP TAIL SLURRY (335 SX CLASS " G ")
							20 gls/10bbl halad 413 - L & 1 gl/10 bbl SCR 100 -L
	23:26	T	2	211		4	PUMP FRESHWATER TO BALANCE PLUG
	23:30	T	64	527		9	DISPLACE SLURRY WITH 9.7 ppg MUD

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HALLIBURTON ZI - Job Log Summary	SALES ORDER # (If applicable) 0	JOB DATE 7-Aug-02	ON SITE HES REP CAM SETH
COUNTRY Australia	STATE/OPERATIONAL AREA Perth	LOCATION/FIELD NAME Bass Strait	JOB SITE Offshore-Other < 1500ft
CUSTOMER ESSO AUSTRALIA	CUSTOMER REPRESENTATIVE BRIGHAM BIGBY / GEORGE SHARKEY	WELL NAME & NUMBER BEARDIE # 1	
PSL GROUP - LEVEL 1 Cementing	PSL GROUP - LEVEL 2 Zonal Isolation	PSL GROUP - LEVEL 3 Cementing Services & Materials	
JOB TYPE CODE CEMENT JOB	JOB PURPOSE CODE PLUG TO ABANDON 7528		JOB CLASS RTO

HES EMP NAME (EXPOSURE HRS)	HRS	HES EMP NAME (EXPOSURE HRS)	HRS	HES EMP NAME (EXPOSURE HRS)	HRS

HES UNIT NUMBERS	HRS	HES UNIT NUMBERS	HRS	HES UNIT NUMBERS	HRS

CHART #	TIME	PUMPS T C	VOLUME (BBL)(GAL)	PRESS (PSI) Tbg	PRESS (PSI) Csg	RATE (BPM)	JOB DESCRIPTION / REMARKS
							PLUG # 1 C
	12:45	T	461			20	RIG CIRCULATE WITH 9.7 ppg MUD
	0:53	T	2	60		4	PUMP FRESHWATER SPACER
	0:56	T		1000			TEST CEMENT LINE
	0:58	T	28	319		5.5	PUMP FRESHWATER SPACER
	1:14	T	69.2	380		5	MIX & PUMP TAIL SLURRY (335 SX CLASS " G ")
							20 gls/10bbl halad 413 - L
	1:28	T	2	90		4	PUMP FRESHWATER TO BALANCE PLUG
	1:30	T	56	225		7.5	DISPLACE SLURRY WITH 9.7 ppg MUD
							PLUG # 1 D
	2:35	T	321			20	RIG CIRCULATE WITH 9.7 ppg MUD
	2:50	T	2	40		2	PUMP FRESHWATER SPACER
	2:53	T		1035			TEST CEMENT LINE
	2:56	T	154	154		5	PUMP FRESHWATER SPACER
	3:11	T	69.2	540		5	MIX & PUMP TAIL SLURRY (335 SX CLASS " G ")
							20 gls/10bbl halad 413 - L
	3:24	T	2	68		3	PUMP FRESHWATER TO BALANCE PLUG
	3:26	T	48.5	116		6	DISPLACE SLURRY WITH 9.7 ppg MUD

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HALLIBURTON ZI - Job Log Summary	SALES ORDER # (If applicable) 0	JOB DATE 7-Aug-02	ON SITE HES REP CAM SETH
COUNTRY Australia	STATE/OPERATIONAL AREA Perth	LOCATION/FIELD NAME Bass Strait	JOB SITE Offshore-Other < 1500ft
CUSTOMER ESSO AUSTRALIA	CUSTOMER REPRESENTATIVE BRIGHAM BIGBY / GEORGE SHARKEY	WELL NAME & NUMBER BEARDIE # 1	
PSL GROUP - LEVEL 1 Cementing	PSL GROUP - LEVEL 2 Zonal Isolation	PSL GROUP - LEVEL 3 Cementing Services & Materials	
JOB TYPE CODE CEMENT JOB	JOB PURPOSE CODE PLUG TO ABANDON 7528		JOB CLASS RTO

HES EMP NAME (EXPOSURE HRS)	HRS	HES EMP NAME (EXPOSURE HRS)	HRS	HES EMP NAME (EXPOSURE HRS)	HRS

HES UNIT NUMBERS	HRS	HES UNIT NUMBERS	HRS	HES UNIT NUMBERS	HRS

CHART #	TIME	PUMPS T C	VOLUME (BBL)(GAL)	PRESS (PSI) Tbg	PRESS (PSI) Csg	RATE (BPM)	JOB DESCRIPTION / REMARKS
							PLUG # 1 E
	4:30	T	241			20	RIG CIRCULATE WITH 9.7 ppg MUD
	4:49	T	2	301		6	PUMP SEAWATER SPACER
	4:51	T		1050			TEST CEMENT LINE
	4:54	T	28	344		6	PUMP SEAWATER SPACER
	5:07	T	84	532		5	MIX & PUMP TAIL SLURRY (407 SX CLASS " G ")
	5:23	T	3	60		3	PUMP SEAWATER TO BALANCE PLUG
	5:26	T	39.6	249		7	DISPLACE SLURRY WITH 9.7 ppg MUD

913712 567

HALLIBURTON ZI - Job Log Summary	SALES ORDER # (If applicable)	JOB DATE	ON SITE HES REP
	0	7-Aug-02	CAM SETH

COUNTRY	STATE/OPERATIONAL AREA	LOCATION/FIELD NAME	JOB SITE
Australia	Perth	Bass Strait	Offshore-Other < 1500ft

CUSTOMER	CUSTOMER REPRESENTATIVE	WELL NAME & NUMBER
ESSO AUSTRALIA	BRIGHAM BIGBY / GEORGE SHARKEY	BEARDIE # 1

PSL GROUP - LEVEL 1	PSL GROUP - LEVEL 2	PSL GROUP - LEVEL 3
Cementing	Zonal Isolation	Cementing Services & Materials

JOB TYPE CODE	JOB PURPOSE CODE	JOB CLASS
CEMENT JOB	PLUG TO ABANDON 7528	RTO

HES EMP NAME (EXPOSURE HRS)	HRS	HES EMP NAME (EXPOSURE HRS)	HRS	HES EMP NAME (EXPOSURE HRS)	HRS

HES UNIT NUMBERS	HRS	HES UNIT NUMBERS	HRS	HES UNIT NUMBERS	HRS

CHART #	TIME	PUMPS T C	VOLUME (BBL)(GAL)	PRESS (PSI) Tbg	PRESS (PSI) Csg	RATE (BPM)	JOB DESCRIPTION / REMARKS
	16:00						MAKE UP MST & EZSV PACKER
							RIH TO 160 M
	17:05						RIG FILL PIPE WITH SEAWATER
	17:30						ROTATE 35 TURNS TO RIGHT TO SET PACKER
	17:33						OVERPULL STRING 15,000 lbs (175,000 lbs)
	17:35						OVERPULL STRING 15,000 lbs (190,000 lbs)
	17:38						SHEAR OFF TENSION SLEEVE TO SET PACKER (205,000 lbs)
	17:40						SET 5,000 lbs DOWN ON EZSV PACKER TO CONFIRM SET
							PICK UP OFF EZSV PACKER
							PLUG # 2
	17:45	T	120			20	RIG CIRCULATE WITH SEAWATER
	17:56	T	5		289	7	PUMP SEAWATER SPACER
	18:00	T			1066		TEST CEMENT LINE
	18:05	T	15		262	6	PUMP SEAWATER SPACER
	18:15	T	31		376	5	MIX & PUMP TAIL SLURRY (150 SX CLASS " G ")
	18:20	T	5.5		320	7	DISPLACE SLURRY
	19:20	T	3.8		48	5	CIRCULATE SEAWATER
	19:24	T	1		1060	0.5	TEST CASING AGAINST EZSV PACKER & MIDDLE RAMS
							1897 SX CLASS "G"
							400 GLS HALAD 413 - L
							10 GLS SCR 100 - L
							10 GLS NF - 5 DEFOAMER
							1 x 13.3/8 EZSV PACKER & 1 x BRIDGING PLUG

4.0 CEMENT JOB SUMMARIES

913712 569

HALLIBURTON

Cement Job Summary

Platform	:	**Diamond Offshore**	**Measured Depth**	:	**124 m**
Rig	:	**Ocean Bounty**	**Vertical Depth**	:	**124 m**
Job Date	:	**27/07/2002**	**Casing Size**	:	**30"**
Well no.	:	**Beardie #1**	**Cement Type**	:	**Adelaide Brighton**
Job Type	:	**Conductor Casing**	**Cement Class**	:	**Class G**

Well Data :-

BHST (Deg C)	BHCT (Deg C)	Hole Size (inches)	Mud Type / Weight	OGOC (Metres)	OOWC (Metres)	Deviation @ TD (degs)	Deviation Max. (degs)
12	14	36.0	Seawater	na	na	0.0	0.0

Casing Data :-

Centralisers	
Shoe Size / Arrangement	Weatherford Float shoe
Perforations	Na

Cement Data :-

Stage	Water / Density (ppg)	Additives (% bwoc)		Thick. time (hrs:mins) BHCT time	Fluid Loss (cc/30mins)	Free Water (%)	Compressive strength (psi)	Rheologies 3 / 6 , 100 / 200, 300 / 600 RPM
Single	Sea/	1	Calcium Chloride	3:43	na	<1.4%	500 @ 10:02	na

Cement Job

Pre job	Casing Move't Circulation	Seawater 10bpm
Cement Job	Flush / Spacer Cement Displacement	Pump 10bbs of seawater with flourosceine Mix and pump 256 bbls (1228sxs) of cement slurry Pump 18 bbls of seawater
Post job	Plug Pressure test	Bleed off, floats not holding. Shut in well.

Cement Logs :-

Not run

Job Comments : After displacement it was found that the float was not holding..
Shut in and allowed the cement to set before disconnecting.

Cement Job Summary

Platform	:	**Diamond Offshore**	**Measured Depth**	:	**850 m**
Rig	:	**Ocean Bounty**	**Vertical Depth**	:	**850 m**
Job Date	:	**29/07/2001**	**Casing Size**	:	**13-3/8"**
Well no.	:	**Beardie #1**	**Cement Type**	:	**Adelaide Brighton**
Job Type	:	**Surface Casing**	**Cement Class**	:	**Class G**

Well Data :-

BHST (Deg C)	BHCT (Deg C)	Hole Size (inches)	Mud Type / Weight	OGOC (Metres)	OOWC (Metres)	Deviation @ TD (degs)	Deviation Max. (degs)
50	35	17.5	Seawater			0.0	0.0

Casing Data :-

Centralisers	.
Shoe Size / Arrangement	Halliburton float shoe, 1 jts of 13-3/8" 68 ppf casing, Halliburton float collar.
Perforations	N/A

Cement Data :-

Stage	Water / Density (ppg)	Additives (Gals/10bbls Mix Fluid)		Thick. time (hrs:mins) BHCT time	Fluid Loss (cc/30mins)	Free Water (%)	Compressive strength (psi)	Rheologies 3 / 6, 100 / 200, 300 / 600 RPM
Lead	Sea	14.6	gal Econolite /10bbl	4:13	na	<1.4%	500 @ 17:56	na
	12.5							
Tail	Drill		Neat	4:29	na	<1.4%	500 @ 8:10	na
	15.8							

Cement Job

Pre job	Casing Move't Circulation	 Seawater @ 8bpm
Cement Job	Flush / Spacer Cement Displacement	50bbls of seawater with flourosceine Mix and pump 523 bbls (1335 sxs) of lead slurry and 150 bbls (726 sxs) of tail slurry. Pump 10 bbls of freshwater (spacer) and 363 bbls of seawater
Post job	Plug Pressure test	Bump the plug and floats held. 700psi for 5mins

Cement Logs :-

Not run

Job Comments : Job went operationally well.

913712 571

Material Consumption Summary

Material Consumption Summary

913712 572

ExxonMobil
MEMORANDUM
Drilling

TO: Tanya Bush | DATE: 14 August 2002

FROM: Chris Meakin
Southbank, Melbourne

cc: Kim Moore
Vince Rizzo

SUBJECT: **Beardie-1 Statement of Facts**

Attached please find the following Statement of Facts for the Beardie-1 drilling program in Vic/L2:

1. Rig Move 24/07/2002 Sole-2 to Beardie-1. Last Anchor racked 24/07/02 at 1700. Ocean Bounty released to Esso 27/07/02 at 1700;
2. Rig Move 10/08/2002 Beardie-1 to Sole-2. Last Anchor racked 10/08/02 at 0030. Ocean Bounty released to OMV 10/08/02 at 0030.

as agreed in the Rig Cost Sharing Agreement between Esso Australia Pty Ltd and Basin Oil Pty Ltd and Santos Ltd and Diamond Offshore General Company dated 9th May 2002.

OMV drilled Sole-2 on behalf of Santos.

Please arrange for the payments for and invoicing of these materials as appropriate. The Beardie-1 AFE Number is L.0501B003.

Chris Meakin

Chris Meakin

/Attach.

File: Beardie-1 File 12.2 Rig Inventories
Beardie-1 Final Well Report - Material Consumption Summary
Beardie-1 Well Planning & Surveillance

913712 573

RIG MOVE 24/07/2002 **SOLE 2 TO BEARDIE 1**	OCEAN BOUNTY **STATEMENT OF FACTS (OMV / Esso Operators)** **Last anchor racked 24107/02 at 1700. Ocean Bounty released to Esso 24/07/02 at 1700.**			
COMMODITY	**RIG**	**PACIFIC CONQUEROR**	**PACIFIC SENTINEL**	**UNITS**
FUEL	**380800**	**Esso 185000 OMV 84900**	**339100**	**LITRES**
POT WATER	**98**	**147**	**220**	**M. TONNES**
DRILL WATER	**498**	**Esso 260 OMV 390**	**680**	**M. TONNES**
CEMENT G	**332**		**Esso 1826**	**SACKS**
CEMENT HTB	**-**	**-**	**-**	**SACKS**
BARITE	**1182**			**SACKS**
BENTONITE	**662**	**-**	**Esso 1422**	**SACKS**
***HELIFUEL (OMV to retain ownership)**	***3653 on rig *4500 tote tank**	**-**	**-**	**LITRES**
BRINE	**-**	**-**	**-**	**BARRELS**
LIQUID MUD	**-**	**-**	**-**	**BARRELS**
OILS		**MOTOR OILS**	**MOTOR OILS**	
GAD 40	**-**	**14773**	**14006**	**LITRES**
AIRCOL SN100	**-**	**-**	**-**	**LITRES**
MADRELLA AP68		**-**	**-**	**LITRES**
MADRELLA APIO0		**-**		**LITRES**
SN100	**-**	**123**	**-**	**LITRES**
TELLUS 68	**-**	**-**	**-**	**LITRES**
TELLUS-T100	**-**	**4495**	**3968**	**LITRES**
TELLUS-T46		**894**	**1056**	**LITRES**
OMALA-150	**-**	**3691**	**124**	**LITRES**
OMALA-220	**-**	**71**	**89**	**LITRES**
CLAVIS-68	**-**	**33**	**67**	**LITRES**
TURBO-68	**-**	**60**	**48**	**LITRES**
CORENA-68	**-**	**-**	**244**	**LITRES**
CORENA - P 100	**-**	**28**	**-**	**LITRES**
LOBE OIL		**-**	**-**	**LITRES**
HYDRAULIC OIL			**-**	**LITRES**
GEAR OIL		**-**	**-**	**LITRES**
TOTAL OILS		**24168**	**19601**	**LITRES**

*OMV to retain ownership of Jet A fuel. Not sure who pays for lubes used by [illegible] vessels. Items listed by Esso have been purchased directly by Esso.

Signed............................ D Dance O.I.M. Ocean Bounty.

Signed............................ G. Gibson OMV Representative

Signed............................ D. Bigby Esso Representative

RIG MOVE 10/2002 BEARDIE 1 to SOLE-2	OCEAN- BOUNTY STATEMENT OF FACTS (Esso/OMV Operators) Last anchor racked 10th August 2002 at 0030. Ocean Bounty released to OMV 10/08/02 at 0030.			
COMMODITY	**RIG**	**PACIFIC CONQUEROR**	**PACIFIC SENTINEL**	**UNITS**
FUEL	352000	378000	299300	LITRES
POT WATER	98	195	235	M. TONNES
DRILL WATER	350	580	450	M. TONNES
CEMENT G	200	-	500	SACKS
CEMENT HTB	-	-	-	SACKS
BARITE	2115	1146	1000	SACKS
BENTONITE	772	635	-	SACKS
*HELIFUEL (OMV owns)	OMV *3653	-	-	LITRES
BRINE	-	-	-	BARRELS
LIQUID MUD	-	-	-	BARRELS
OILS		MOTOR OILS	MOTOR OILS	
GAD 40	-	14710	15039	LITRES
AIRCOL SN100	-	-	-	LITRES
MADRELLA AP68	-	-	-	LITRES
MADRELLA AP100	-	-	-	LITRES
SN100	-	123	-	LITRES
TELLUS 68	-	-	-	LITRES
TELLUS-T100	-	4495	3968	LITRES
TELLUS-T46	-	882	1190	LITRES
OMALA-150	-	3953	124	LITRES
OMALA-220		71	77	LITRES
CLAVIS-68	-	33	67	LITRES
TURBO-68	-	31	46	LITRES
CORENA-68	-	-	238	LITRES
CORENA - P 100	-	68	-	LITRES
LUBE OIL	11240	-	-	LITRES
HYDRAULIC OIL	3490	-	-	LITRES
GEAR OIL	1785	-	-	LITRES
TOTAL OILS	16515	24366	20749	LITRES

*OMV owns Jet A fuel. Not sure who pays for lubes used by the Swire vessels.

Signed.................................... G. Johnson O.I.M. Ocean Bounty

Signed.................................... G. Olsen OMV Representative

Signed. George K. Sharkey G. Sharkey Esso Representative

913712 575

BEARDIE-1 BULK CONSUMPTION REPORT

ExxonMobil Drilling

Bulk Consumption Report

Well ID	(All)
AFE Number	(All)
Job Type	(All)

					Data		
Supply	Report Date	MD	TVD	PBTD	Amount Received	Amount Used	Inventory
Barite	25-Jul-02	0	0	-	1,182	0	1,182
	27-Jul-02	122.5	122.5	-	0	511	-511
	28-Jul-02	533	533	-	2,978	2,581	397
	30-Jul-02	863	863	-	1,500	0	1,500
	31-Jul-02	884	884	-	0	159	-159
	01-Aug-02	1380	1380	-	0	68	-68
	02-Aug-02	1579	1579	-	0	68	-68
	04-Aug-02	1905	1905	-	0	158	-158
Barite Total					5,660	3,545	2,115
Cement	25-Jul-02	0	0	-	332	0	332
	27-Jul-02	122.5	122.5	-	4,226	0	4,226
	28-Jul-02	533	533	-	0	1,263	-1,263
	30-Jul-02	863	863	-	0	2,270	-2,270
	01-Aug-02	1380	1380	-	1,170	0	1,170
	08-Aug-02	1905	1905	-	0	1,995	-1,995
Cement Total					5,728	5,528	200
Drill Water	25-Jul-02	0	0	-	498	0	498
	26-Jul-02	0	0	-	0	13,000	-13,000
	27-Jul-02	122.5	122.5	-	803,000	408,000	395,000
	28-Jul-02	533	533	-	770,000	376,000	394,000
	29-Jul-02	863	863	-	256,000	265,000	-9,000
	30-Jul-02	863	863	-	49,502	275,000	-225,498
	31-Jul-02	884	884	-	385,000	74,000	311,000
	01-Aug-02	1380	1380	-	0	97,000	-97,000
	02-Aug-02	1579	1579	-	0	82,000	-82,000
	03-Aug-02	1793	1793	-	0	95,000	-95,000
	04-Aug-02	1905	1905	-	310,000	150,000	160,000
	06-Aug-02	1905	1905	-	0	38,000	-38,000
	07-Aug-02	1905	1905	-	0	119,000	-119,000
	08-Aug-02	1905	1905	-	0	132	-132
	09-Aug-02	1905	1905	-	0	187,868	-187,868
	10-Aug-02	1905	1905	-	0	44,000	-44,000
Drill Water Total					2,574,000	2,224,000	350,000
Fuel	25-Jul-02	0	0	-	380,800	0	380,800
	26-Jul-02	0	0	-	0	4,800	-4,800
	27-Jul-02	122.5	122.5	-	0	9,500	-9,500
	28-Jul-02	533	533	-	0	8,400	-8,400
	29-Jul-02	863	863	-	0	18,000	-18,000
	30-Jul-02	863	863	-	62,500	72,000	-9,500
	31-Jul-02	884	884	-	0	8,400	-8,400
	01-Aug-02	1380	1380	-	150,000	19,200	130,800
	02-Aug-02	1579	1579	-	0	18,000	-18,000
	03-Aug-02	1793	1793	-	0	14,300	-14,300
	04-Aug-02	1905	1905	-	0	16,700	-16,700
	05-Aug-02	1905	1905	-	0	9,500	-9,500
	06-Aug-02	1905	1905	-	0	7,200	-7,200
	07-Aug-02	1905	1905	-	0	7,500	-7,500
	08-Aug-02	1905	1905	-	0	9,700	-9,700
	09-Aug-02	1905	1905	-	0	9,500	-9,500
	10-Aug-02	1905	1905	-	0	8,400	-8,400
Fuel Total					593,300	241,100	352,200
Gel	25-Jul-02	0	0	-	662	0	662
	27-Jul-02	122.5	122.5	-	1,422	751	671
	28-Jul-02	533	533	-	0	500	-500
	29-Jul-02	863	863	-	500	561	-61
Gel Total					2,584	1,812	772

913712 576

Directional Survey
Plots & Data

Directional Survey
Plots & Data

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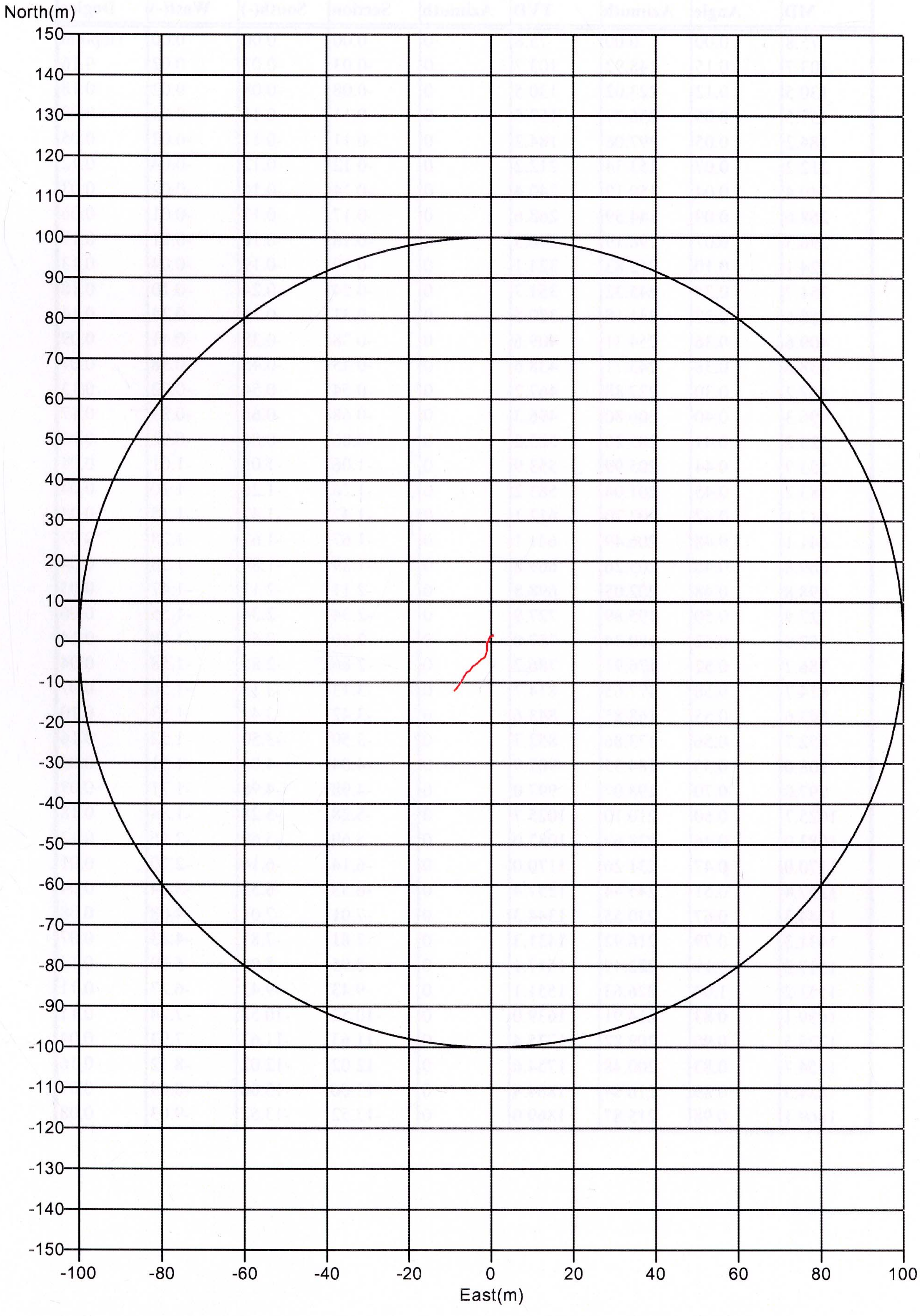
Beardie-1 Target and Actual Well Path



913712 578

BEARDIE-1
DRS Survey Report

MD	Angle	Azimuth	TVD	Target Azimuth	Vertical Section	North(+)/ South(-)	East(+)/ West(-)	Dogleg
75.8	0.00	0.00	75.8	0	0.00	0.00	0.00	Tiepoint
103.7	0.15	148.92	103.7	0	-0.03	-0.03	0.02	0.16
130.5	0.12	223.02	130.5	0	-0.08	-0.08	0.02	0.18
157.5	0.05	236.77	157.5	0	-0.11	-0.11	-0.01	0.08
184.2	0.05	297.06	184.2	0	-0.11	-0.11	-0.03	0.05
212.2	0.07	153.34	212.2	0	-0.12	-0.12	-0.04	0.12
240.4	0.04	159.19	240.4	0	-0.14	-0.14	-0.02	0.03
268.6	0.09	144.59	268.6	0	-0.17	-0.17	-0.01	0.06
296.3	0.07	298.19	296.3	0	-0.18	-0.18	-0.01	0.17
324.1	0.10	212.83	324.1	0	-0.19	-0.19	-0.04	0.13
351.7	0.24	245.32	351.7	0	-0.24	-0.24	-0.10	0.18
380.5	0.37	241.18	380.5	0	-0.31	-0.31	-0.24	0.14
409.6	0.36	254.31	409.6	0	-0.38	-0.38	-0.41	0.09
438.6	0.38	243.71	438.6	0	-0.45	-0.45	-0.58	0.07
467.2	0.30	227.88	467.2	0	-0.54	-0.54	-0.72	0.13
496.3	0.40	206.80	496.3	0	-0.68	-0.68	-0.83	0.17
525.2	0.41	205.20	525.2	0	-0.86	-0.86	-0.92	0.02
553.9	0.44	205.99	553.9	0	-1.06	-1.06	-1.01	0.04
583.2	0.45	201.04	583.2	0	-1.26	-1.26	-1.10	0.04
612.1	0.42	202.70	612.1	0	-1.47	-1.47	-1.18	0.04
641.1	0.48	206.49	641.1	0	-1.67	-1.67	-1.28	0.07
669.8	0.46	203.26	669.8	0	-1.89	-1.89	-1.38	0.04
698.8	0.48	202.05	698.8	0	-2.11	-2.11	-1.47	0.03
727.9	0.50	195.89	727.9	0	-2.34	-2.34	-1.55	0.06
757.0	0.52	180.34	757.0	0	-2.60	-2.60	-1.58	0.14
786.2	0.52	176.91	786.2	0	-2.86	-2.86	-1.58	0.04
814.7	0.58	177.65	814.7	0	-3.13	-3.13	-1.56	0.07
843.6	0.55	168.87	843.6	0	-3.42	-3.42	-1.53	0.10
852.7	0.56	173.86	852.7	0	-3.50	-3.50	-1.52	0.16
908.0	0.55	184.35	907.9	0	-4.04	-4.04	-1.51	0.05
997.0	0.70	198.07	997.0	0	-4.98	-4.98	-1.71	0.07
1025.7	0.60	210.10	1025.7	0	-5.28	-5.28	-1.84	0.18
1083.0	0.46	228.69	1083.0	0	-5.69	-5.69	-2.16	0.12
1170.0	0.47	231.26	1170.0	0	-6.14	-6.14	-2.70	0.01
1257.4	0.51	245.44	1257.4	0	-6.53	-6.53	-3.34	0.04
1344.3	0.67	230.55	1344.3	0	-7.01	-7.01	-4.08	0.08
1431.3	0.79	216.92	1431.3	0	-7.81	-7.81	-4.83	0.07
1517.2	1.19	222.49	1517.1	0	-8.95	-8.95	-5.79	0.14
1551.2	1.09	226.63	1551.1	0	-9.43	-9.43	-6.27	0.11
1639.1	0.83	214.91	1639.0	0	-10.52	-10.52	-7.24	0.11
1725.5	0.90	209.82	1725.4	0	-11.63	-11.63	-7.93	0.04
1754.7	0.83	200.48	1754.6	0	-12.02	-12.02	-8.12	0.16
1834.5	0.89	216.64	1834.4	0	-13.06	-13.06	-8.69	0.09
1869.1	0.98	215.87	1869.0	0	-13.52	-13.52	-9.03	0.08

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WELLPATH(02.01.00) Survey - Beardie1 Act
Comments: Actual Beardie-1 Survey. RT:SL 25m. All depths LAT. Water Depth 51.23m.
Seeker Gyro to 852.7m, MWD below.

Well Name: Beardie-1
Azimuth for vertical section plane based on: Bottomhole

MD (m)	Inclin. (deg)	Azimuth (deg)	TVD (m)	North (m)	East (m)	V. Sect (m)	D/L Sev (deg/30m	Cum D/L (deg)
0.0	0.00	0.00	0.0	1.8	0.4	0.0	0.00	0.00
75.8	0.00	0.00	75.8	1.8	0.4	0.0	0.00	0.00
103.7	0.15	148.92	103.7	1.8	0.4	0.0	0.16	0.15
130.5	0.12	223.02	130.5	1.7	0.4	0.1	0.18	0.31
157.5	0.05	236.77	157.5	1.7	0.4	0.1	0.08	0.39
184.2	0.05	297.06	184.2	1.7	0.4	0.1	0.06	0.44
212.2	0.07	153.34	212.2	1.7	0.4	0.1	0.12	0.55
240.4	0.04	159.19	240.4	1.7	0.4	0.1	0.03	0.58
268.6	0.09	144.59	268.6	1.6	0.4	0.1	0.06	0.63
296.3	0.07	298.19	296.3	1.6	0.4	0.2	0.17	0.79
324.1	0.10	212.83	324.1	1.6	0.4	0.2	0.13	0.91
351.7	0.24	245.32	351.7	1.6	0.3	0.3	0.18	1.07
380.5	0.37	241.18	380.5	1.5	0.2	0.4	0.14	1.20
409.6	0.36	254.31	409.6	1.4	-0.0	0.5	0.09	1.29
438.6	0.38	243.71	438.6	1.4	-0.2	0.7	0.07	1.36
467.2	0.30	227.88	467.2	1.3	-0.3	0.8	0.13	1.48
496.3	0.40	206.80	496.3	1.1	-0.4	1.0	0.17	1.64
525.2	0.41	205.20	525.2	0.9	-0.5	1.2	0.02	1.66
553.9	0.44	205.99	553.9	0.7	-0.6	1.4	0.03	1.69
583.2	0.45	201.04	583.2	0.5	-0.7	1.7	0.04	1.73
612.1	0.42	202.70	612.1	0.3	-0.8	1.9	0.03	1.76
641.1	0.48	206.49	641.1	0.1	-0.9	2.1	0.07	1.83
669.8	0.46	203.26	669.8	-0.1	-1.0	2.3	0.03	1.86
698.8	0.48	202.05	698.8	-0.3	-1.1	2.6	0.02	1.88
727.9	0.50	195.89	727.9	-0.5	-1.1	2.8	0.06	1.94
757.0	0.52	180.34	757.0	-0.8	-1.2	3.0	0.14	2.08
786.2	0.52	176.91	786.2	-1.1	-1.2	3.3	0.03	2.11
814.7	0.58	177.65	814.7	-1.3	-1.2	3.5	0.06	2.17
843.6	0.55	168.87	843.6	-1.6	-1.1	3.7	0.10	2.26
852.7	0.56	173.86	852.7	-1.7	-1.1	3.8	0.16	2.31
908.0	0.55	184.35	907.9	-2.2	-1.1	4.2	0.06	2.41
997.0	0.70	198.07	997.0	-3.2	-1.3	5.1	0.07	2.62
1025.7	0.60	210.10	1025.7	-3.5	-1.4	5.4	0.18	2.79
1083.0	0.46	228.69	1083.0	-3.9	-1.8	5.9	0.12	3.01
1170.0	0.47	231.23	1170.0	-4.3	-2.3	6.6	0.01	3.04
1257.4	0.51	245.44	1257.4	-4.7	-2.9	7.3	0.04	3.16
1344.3	0.67	230.55	1344.3	-5.2	-3.7	8.1	0.08	3.38
1431.3	0.79	216.92	1431.3	-6.0	-4.4	9.2	0.07	3.59
1517.2	1.19	222.49	1517.1	-7.1	-5.4	10.7	0.14	4.00
1551.2	1.09	226.63	1551.1	-7.6	-5.9	11.3	0.11	4.13
1639.1	0.83	214.91	1639.0	-8.7	-6.8	12.8	0.11	4.46
1725.5	0.90	209.82	1725.4	-9.8	-7.5	14.1	0.04	4.56
1754.7	0.83	200.48	1754.6	-10.2	-7.7	14.5	0.16	4.72

913712 580

WELLPATH(02.01.00) Survey - Beardie1 Act
Comments: Actual Beardie-1 Survey. RT:SL 25m. All depths LAT. Water Depth 51.23m. Seeker Gyro to 852.7m, MWD below.

Well Name: Beardie-1
Azimuth for vertical section plane based on: Bottomhole

MD (m)	Inclin. (deg)	Azimuth (deg)	TVD (m)	North (m)	East (m)	V. Sect (m)	D/L Sev (deg/30m	Cum D/L (deg)
1834.5	0.89	216.64	1834.4	-11.3	-8.3	15.7	0.09	4.97
1869.1	0.98	215.87	1869.0	-11.7	-8.6	16.3	0.08	5.06
1905.0	0.98	215.87	1904.9	-12.2	-9.0	16.9	0.00	5.06

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Schlumberger

Survey Report - Geodetic

Report Date:	24-Sep-2002	**Survey / DLS Computation Method:**	Minimum Curvature / Lubinski
Client:	Esso Australia Ltd	**Vertical Section Azimuth:**	0.000°
Field:	Beardie Gippsland Offshore	**Vertical Section Origin:**	N 0.000 m, E 0.000 m
Structure / Slot:	Beardie Ocean Bounty / Beardie - 1	**TVD Reference Datum:**	Rotary Table
Well:	Beardie - 1	**TVD Reference Elevation:**	25.000 m relative to MSL
Borehole:	Beardie -1	**Sea Bed / Ground Level Elevation:**	0.000 m relative to MSL
UWI/API#:		**Magnetic Declination:**	+12.938°
Survey Name / Date:	Beardie #1 Final Survey / September 24, 2002	**Total Field Strength:**	60124.698 nT
Tort / AHD / DDI / ERD ratio:	4.941° / 17.62 m / 2.456 / 0.009	**Magnetic Dip:**	-68.820°
Grid Coordinate System:	UTM Zone 55 S on Australian Datum 1984	**Declination Date:**	September 24, 2002
Location Lat/Long:	S 38 15 16.214, E 147 48 24.643	**Magnetic Declination Model:**	BGGM 2002
Location Grid N/E Y/X:	N 5765624.146 m, E 570594.150 m	**North Reference:**	Grid North
Grid Convergence Angle:	-0.49958345°	**Total Corr Mag North -> Grid North:**	+13.438°
Grid Scale Factor:	0.99966137	**Local Coordinates Referenced To:**	Well Head

Station ID	MD (m)	Incl (°)	Azim (°)	TVD (m)	VSec (m)	N/-S (m)	E/-W (m)	DLS (°/30m)	Grid Coordinates: Northing (m)	Grid Coordinates: Easting (m)	Geographic Coordinates: Latitude	Geographic Coordinates: Longitude
Tie-In	0.00	0.00	0.00	0.00	0.00	0.00	0.00		5765624.15	570594.15	S 38 15 16.214	E 147 48 24.643
	75.80	0.00	0.00	75.80	0.00	0.00	0.00	0.00	5765624.15	570594.15	S 38 15 16.214	E 147 48 24.643
	103.70	0.15	148.92	103.70	-0.03	-0.03	0.02	0.16	5765624.11	570594.17	S 38 15 16.215	E 147 48 24.644
	130.50	0.12	223.02	130.50	-0.08	-0.08	0.02	0.18	5765624.06	570594.17	S 38 15 16.217	E 147 48 24.644
	157.50	0.05	236.77	157.50	-0.11	-0.11	-0.01	0.08	5765624.04	570594.14	S 38 15 16.218	E 147 48 24.643
	184.20	0.05	297.06	184.20	-0.11	-0.11	-0.03	0.06	5765624.04	570594.12	S 38 15 16.218	E 147 48 24.642
	212.20	0.07	153.34	212.20	-0.12	-0.12	-0.03	0.12	5765624.03	570594.12	S 38 15 16.218	E 147 48 24.642
	240.40	0.04	159.19	240.40	-0.14	-0.14	-0.02	0.03	5765624.00	570594.13	S 38 15 16.219	E 147 48 24.642
	268.60	0.09	144.59	268.60	-0.17	-0.17	-0.01	0.06	5765623.97	570594.14	S 38 15 16.220	E 147 48 24.643
	296.30	0.07	298.19	296.30	-0.18	-0.18	-0.01	0.17	5765623.96	570594.14	S 38 15 16.220	E 147 48 24.643
	324.10	0.10	212.83	324.10	-0.19	-0.19	-0.04	0.13	5765623.95	570594.11	S 38 15 16.220	E 147 48 24.642
	351.70	0.24	245.32	351.70	-0.24	-0.24	-0.10	0.18	5765623.91	570594.05	S 38 15 16.222	E 147 48 24.639
	380.50	0.37	241.18	380.50	-0.31	-0.31	-0.24	0.14	5765623.84	570593.91	S 38 15 16.224	E 147 48 24.633
	409.60	0.36	254.31	409.60	-0.38	-0.38	-0.41	0.09	5765623.77	570593.74	S 38 15 16.226	E 147 48 24.626
	438.60	0.38	243.71	438.60	-0.45	-0.45	-0.58	0.07	5765623.70	570593.57	S 38 15 16.229	E 147 48 24.619
	467.20	0.30	227.88	467.20	-0.54	-0.54	-0.72	0.13	5765623.61	570593.43	S 38 15 16.232	E 147 48 24.613
	496.30	0.40	206.80	496.30	-0.68	-0.68	-0.83	0.17	5765623.47	570593.32	S 38 15 16.236	E 147 48 24.609
	525.20	0.41	205.20	525.20	-0.86	-0.86	-0.92	0.02	5765623.28	570593.23	S 38 15 16.242	E 147 48 24.606
	553.90	0.44	205.99	553.90	-1.05	-1.05	-1.01	0.03	5765623.09	570593.14	S 38 15 16.248	E 147 48 24.602
	583.20	0.45	201.04	583.19	-1.26	-1.26	-1.10	0.04	5765622.88	570593.05	S 38 15 16.255	E 147 48 24.598
	612.10	0.42	202.70	612.09	-1.47	-1.47	-1.18	0.03	5765622.68	570592.97	S 38 15 16.262	E 147 48 24.595
	641.10	0.48	206.49	641.09	-1.67	-1.67	-1.28	0.07	5765622.47	570592.87	S 38 15 16.269	E 147 48 24.591
	669.80	0.46	203.26	669.79	-1.89	-1.89	-1.37	0.03	5765622.26	570592.78	S 38 15 16.276	E 147 48 24.587
	698.80	0.48	202.05	698.79	-2.11	-2.11	-1.47	0.02	5765622.04	570592.68	S 38 15 16.283	E 147 48 24.583
	727.90	0.50	195.89	727.89	-2.34	-2.34	-1.55	0.06	5765621.80	570592.60	S 38 15 16.290	E 147 48 24.580
	757.00	0.52	180.34	756.99	-2.60	-2.60	-1.58	0.14	5765621.55	570592.57	S 38 15 16.299	E 147 48 24.579
	786.20	0.52	176.91	786.19	-2.86	-2.86	-1.58	0.03	5765621.29	570592.57	S 38 15 16.307	E 147 48 24.579
	814.70	0.58	177.65	814.69	-3.13	-3.13	-1.56	0.06	5765621.01	570592.59	S 38 15 16.316	E 147 48 24.580
	843.60	0.55	168.87	843.58	-3.42	-3.42	-1.53	0.10	5765620.73	570592.62	S 38 15 16.325	E 147 48 24.581
	852.70	0.56	173.86	852.68	-3.50	-3.50	-1.52	0.16	5765620.64	570592.63	S 38 15 16.328	E 147 48 24.582
	907.95	0.55	184.35	907.93	-4.04	-4.04	-1.51	0.06	5765620.11	570592.64	S 38 15 16.345	E 147 48 24.582
	1025.73	0.60	210.10	1025.71	-5.13	-5.13	-1.86	0.07	5765619.01	570592.29	S 38 15 16.381	E 147 48 24.568
	1083.00	0.46	228.69	1082.97	-5.54	-5.54	-2.18	0.12	5765618.60	570591.97	S 38 15 16.394	E 147 48 24.555
	1169.99	0.47	231.26	1169.96	-6.00	-6.00	-2.72	0.01	5765618.15	570591.43	S 38 15 16.409	E 147 48 24.533
	1257.42	0.51	245.44	1257.39	-6.38	-6.38	-3.36	0.04	5765617.76	570590.79	S 38 15 16.422	E 147 48 24.507
	1344.31	0.67	230.55	1344.27	-6.87	-6.87	-4.10	0.08	5765617.28	570590.05	S 38 15 16.438	E 147 48 24.477
	1431.33	0.79	216.92	1431.29	-7.67	-7.67	-4.85	0.07	5765616.48	570589.30	S 38 15 16.464	E 147 48 24.446
	1517.17	1.19	222.49	1517.11	-8.80	-8.80	-5.81	0.14	5765615.35	570588.34	S 38 15 16.501	E 147 48 24.407
	1551.21	1.09	226.63	1551.15	-9.28	-9.28	-6.29	0.11	5765614.86	570587.87	S 38 15 16.517	E 147 48 24.388
	1639.11	0.83	214.91	1639.03	-10.38	-10.38	-7.26	0.11	5765613.77	570586.89	S 38 15 16.553	E 147 48 24.348
	1725.47	0.90	209.82	1725.38	-11.48	-11.48	-7.95	0.04	5765612.67	570586.20	S 38 15 16.589	E 147 48 24.320
	1754.65	0.83	200.48	1754.56	-11.88	-11.88	-8.14	0.16	5765612.27	570586.01	S 38 15 16.602	E 147 48 24.312
	1834.52	0.89	216.64	1834.42	-12.92	-12.92	-8.71	0.09	5765611.23	570585.44	S 38 15 16.635	E 147 48 24.289
	1869.06	0.98	215.87	1868.96	-13.37	-13.37	-9.05	0.08	5765610.78	570585.11	S 38 15 16.650	E 147 48 24.276
Projected to TD	1905.00	0.98	215.87	1904.89	-13.87	-13.87	-9.41	0.00	5765610.28	570584.75	S 38 15 16.667	E 147 48 24.261

Survey Error Model: **Wolff & deWardt 2.0000 sigma**

Surveying Programme:

MD From (m)	MD To (m)	EOU Freq	Survey Tool Type
0.00	907.95	Act-Stns	Rate Gyro
907.95	1905.00	Act-Stns	Anadrill MWD

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Drilling Emissions & Waste Record

Drilling Emissions &
Waste Record

ExxonMobil Development

Environmental Performance Indicators Report

Well:	Beadie -1	**Country:**	Australia
Rig:	Ocean Bounty	**FRR Date:**	August 10, 2002
Offshore or Onshore:	Offshore		

Emissions Data

Rig Fuel Consumption 123,906 gallons (U.S.)

Environmental Regulatory Compliance Data

Exceedances reported to regulatory authorities*

No. to air	Nil	No. to water	Nil	No. of NOV's	Nil
No. to Land	Nil	Other	Nil		
No. R.Q. Exceedances	Nil			No. Fines	Nil
Total Exceedances	Nil			Fines Amount ($US)	Nil

Oil Spills* > 1 bbl.	No. to land	Nil	Vol. to land	Nil	bbls.
	No. to water	Nil	Vol. to water	Nil	bbls.
Chemical Spills* > 100 kg.	No. to land	Nil	Vol. to land	Nil	kgs.
	No. to water	Nil	Vol. to water	Nil	kgs.

[Vol.(gal.)*Specific Gravity *(8.3 lbs./1 gal)*(1kg/2.2 lbs.)] =Mass(kg)

Drilling Fluid Spills* > 1 bbl.	No. to land	Nil	Vol. to land	Nil	bbls.
(Indicate Water-Based or NAF)	No. to water	Nil	Vol. to water	Nil	bbls.

Report Water-Based Drilling Fluid Spills, regardless of volume, if reportable to a regulatory authority.

*Please send all spill (form D-020) or exceedance reports to Drilling Environmental Coordinator fax 281-654-4337

Waste Data

Drilling Fluid Type: Water-Based or *Non-Aqueous Fluid (**NAF**) Water Based

*If NAF please indicate type (oil/mineral/synthetic) and trade name Nil

Drill Cuttings (Only complete for NAF drill cuttings discharged to sea)

NAF Drill Cuttings disposed at sea Vol. Nil bbls. Nil Wet Wt% NAF on Cuttings

Use gauge hole volume

Hazardous Waste (classified as Hazardous Waste by regulatory authorities)
Please see Instructions for more detail and examples.

Net Generated (lbs.)	Nil	External Recycled (lbs.)	Nil
Waste Type	Nil	Waste Type	Nil

Engineer: Chris P Meakin Eng. Manager: Colin A Johancsik

Send completed copy to EMDC Drilling Environmental Coordinator and include copy in Final Well Report

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Management of Change Summary

Management of Change Summary

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OPERATIONS INTEGRITY MANAGEMENT SYSTEM
BRIDGING DOCUMENT

BEARDIE-1

The objectives of this document are to:

- Specify organisational roles and responsibilities for Beardie-1;
- Document OIMS implementation for the program.

Table 1 defines the agreed roles and responsibilities for all activities involved in the project for each organisation involved.

The Operation Integrity Management System of the organisation responsible for taking the lead role in the activity will be the OIMS implemented.

For EMDC Drilling, Australia Offshore this will be the ExxonMobil Development Drilling Drilling OIMS Manual (latest edition);

For EMPL Esso Australia Pty Ltd this will be the Esso Australia Pty Ltd OIMS Management System (System Description) manual (latest edition), except for areas where this manual is silent, for example geoscience, where the ExxonMobil Australia OIMS Implementation manual (latest edition) will apply.

Original signed
Approved by: ***Daniel L. Whiteman*** Date: *22-Jan-2002*

Daniel L. Whiteman
EMDC Field Drilling Manager

Original signed
Approved by: ***Glen Nash*** Date: *22-Jan-2002*

G. A. Nash
Gippsland Geoscience Manager

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Management of Change Summary

Well: BEARDIE-1 Country: Australia

#	Description & Reason for Change	Risk Mitigation Measures Implemented	Approved By	Date
1	OIMS Bridging Document - Beardie-1	N/A	D.L. Whiteman & Glen Nash	22-Jan-2002
2	Accept single compartment 50 bbl trip tank – exception to EMDC standard.	No additional risk mitigation measures implemented.	D.L. Whiteman	26-Apr-2002
3	Dispensation from wearing exposure suits on helicopter flights to Ocean Bounty.	No additional risk mitigation measures implemented.	D.L. Whiteman	25-Jun-2002
4	Dispensation for Ocean Bounty diverter lines which doesn't meet design standards.	No additional risk mitigation measures implemented.	D.L. Whiteman	25-Jun-2002
5	Dispensation from the OIMS requirement for a pre-contract inspection of marine service vessels.	No additional risk mitigation measures implemented.	D.L. Whiteman	25-Jun-2002
6	Dispensation from the OIMS requirement to conduct a structural assessment of the Ocxean Bounty.	No additional risk mitigation measures implemented.	J. Kiker	11-Jul-2002
7	Change of Beardie-1 Location	No additional risk mitigation measures implemented.	D.L. Whiteman	22-Jul-2002
8	Cut-off the 30" conductor and 20" x 13-3/8" surface casing less than 5m but more than 1.5m below the seafloor.	No additional risk mitigation measures implemented.	D.L. Whiteman	6-Aug-2002
9	Change the planned exit route for the Ocean Bounty to allow return to the Sole-2 well location.	No additional risk mitigation measures implemented.	D.L. Whiteman	8-Aug-2002
10				

Recommendations for future drilling programs:
None.

Recommendations to upgrade the Management of Change System:
None.

Please attach a copy of the documentation for each change listed.
Use additional pages as necessary.

mocsummary.doc
5/01/00

TABLE 1. Beardie-1 Roles and Responsibilities

Activity	EMPC Australia	EMDC Drilling Australia	EAPL Crisis Management Team	Other Groups (Law, Controllers, Tax, Public Affairs, SRO etc.)
P&B PLANNING & PROJECT BUDGET				
- Preliminary Timing & Cost Estimates	***Lead***	*S*		*S (RSG)*
DRILL WELL PROJECT				
- Project Assessment				
+ Geological Risk & Probabilistic Assessment	***Lead***			
+ Assess economic viability	***Lead***	*S*		*S (RSG,RT,Ops Tech,Planning)*
- Project Planning				
+ NFW Well - Event I review	***Lead***	*S*		
+ Project Description and Objectives	***Lead***	*S*		
o Prepare/submit *NFW Well Team Charter*	***Lead***	*S*		*S as needed*
o Identify Primary Well Objectives / Scope of Operations (ie. Well Logging program)	***Lead***	*S (cost estimates, well design issues)*		*S as needed*
o Identify potential Contingent Operations (ie. Coring, Well Testing, Geological Sidetrack)	***Lead***	*S (cost estimates, well design issues)*		*S as needed*
+ Prepare/submit Exploration *Well Planning Checklist*	***Lead***			
- Drill Well Design				
+ Offset well review	*S*	***Lead***		
+ Drilling well design (i.e. casing, mud, BHA, drill string, hydraulics, bits)	*S*	***Lead***		
+ Drilling program	*S*	***Lead***		
+ AFE preparation	*S*	***Lead***		
+ AFE approval	***Lead***	*S*		
+ Material procurement	*S*	***Lead***		*S (Procurement)*
- Obtain necessary ExxonMobil & Joint Venture technical & budget approvals	***Lead***	*S*		
DRILL WELL OPERATIONS - SHE, OIMS & REGULATORY COMPLIANCE				
- Drilling SHE / OIMS				
+ Conduct Risk Assessment	*S*	***Lead***		
+ Prepare/submit *OIMS bridging document* (between EMEC, EMPC, EMDC & in	*S*	***Lead***		

Lead = Lead Responsibility
O = Oversight
S = Support Role

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TABLE 1. Beardie-1 Roles and Responsibilities

Activity	EMPC Australia	EMDC Drilling Australia	EAPL Crisis Management Team	Other Groups (Law, Controllers, Tax, Public Affairs, SRO etc.)
country CMT as necessary for project)				
+ Prepare/submit Regulatory Plan.	***Lead***	*S*		*S as needed (SRO)*
+ Prepare/submit Environment Plan.	*S*	***Lead***		*S as needed (SRO)*
+ Prepare/submit Community Awareness Plan.	***Lead***	*S*		*S as needed (Public Affairs)*
+ Prepare/submit Final Well Report.	*S*	***Lead***		*S as needed*
+ Prepare/submit *Change Management Authority document - for EMPL Australia lead activities.*	***Lead***	*S*		*S as needed*
+ Prepare/submit *Change Management Authority document - for EMDC Drilling Australia lead activities.*	*S*	***Lead***		*S as needed*
- Regulatory Compliance / Permitting / Environmental Impact Assessment				
+ Identify Appropriate In-Country Regulations / Permits	***Lead***	*S*		
o Prepare/submit *Notice of Referral* to EA (as per EPBC)	*S*	***Lead***		*S (SRO)*
o Prepare/submit *Environmental Plan* (per PSLA)	*S*	***Lead***		*S (SRO)*
o Prepare/submit *Authorisation to Drill document*	***Lead***	*S*		
o Prepare/submit *Safety Case bridging document* (per PSLA) including bridging Emergency Response Plan	*S*	***Lead***		
o Prepare/submit *Application to Use MODU* (per PSLA)	*S*	***Lead***		
o Prepare/submit *Application to Move MODU* (per PSLA)	*S*	***Lead***		
o Prepare/submit *Approval to Drill letter, Drilling Program and Drilling Operations Manual (per PSLA)*	*S*	***Lead***		
o Prepare/submit *Application to P&A or C&S*	*S*	***Lead***		
o Prepare/submit *Report on the Modification, Abandonment or Suspension of a Well*	*S*	***Lead***		
o Prepare/submit *post-drill Well Completion report* (per PSLA)	***Lead***	*S*		
+ Obtain all necessary permits	***Lead***	*S*		

Lead = Lead Responsibility
O = Oversight
S = Support Role

TABLE 1. Beardie-1 Roles and Responsibilities

Activity	EMPC Australia	EMDC Drilling Australia	EAPL Crisis Management Team	Other Groups (Law, Controllers, Tax, Public Affairs, SRO etc.)
+ Regulatory / Permit Compliance during Operations	S	**Lead**		
+ Identify Procedures for Damage Compensation	S	S		**Lead**
o Compensation / Gov't Relations	S	S		**Lead**
- Drill Well Operations				
- Rig & 3rd Party Contracts (except as noted below[1])				
+ Funding Approval	**Lead**	S		
+ Contract Plan (SEQREQ) Development and Approval.	S	**Lead**		S (Procurement)
+ Technical Specification Preparation, Review and Approval.	S	**Lead**		S
+ Tender Planning, Preparation, Review and Approval.	S	S		**Lead (Procurement)**
+ Contract Development and Approval.	S	S		**Lead (Procurement)**
- Pre-Mobilization Planning	S	**Lead**		S as needed
+ Rig Operating Strategies	S	**Lead**		S as needed
- Field Operations	S	**Lead**		
+ Drilling & 3rd Party Contractor Management	S	**Lead**		S as needed (Procurement)
+ Incident Management including ERP	S	**Lead**	S as needed	S as needed
+ Project Schedule & AFE Stewardship	O / S	**Lead**		S as needed
- Invoice Processing				
+ Receive Invoice	S	S		**Lead (Accounts)**
+ Verify Prices	S	S		**Lead (Accounts)**
+ Verify Services Received	S	**Lead**		S (Accounts)
+ Process / Approve Invoice	S	S		**Lead (Accounts)**
- Post Drill Close Out (*Final Well Report*)	S	**Lead**		

[1] For Mud Logging and Petrolab contracts EMDC will take the lead for Contract Administration but EMA Australia will provide the technical support. For the ACS and AIPC contracts EMA Australia will take the lead for both Contract Administration and technical support. EMA = ExxonMobil Australia Exploration group.

Lead = Lead Responsibility
O = Oversight
S = Support Role

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TABLE 1. Beardie-1 Roles and Responsibilities

Activity	EMPC Australia	EMDC Drilling Australia	EAPL Crisis Management Team	Other Groups (Law, Controllers, Tax, Public Affairs, SRO etc.)
IN-COUNTRY SERVICES EXCLUDING DRILLING ACTIVITIES (AVIATION, SECURITY, MEDICAL, PERMITTING, TECHNICAL DATA ACQUISITION, ETC.)				
- Contracting, EMPC lead activities	***Lead***	*S*		*S as needed (Procurement)*
- Contractor Management, EMPC lead activities	***Lead***	*S*		*S as needed (Procurement)*
- Technical Issues / Data Quality (EMPC/EMEC Contractors)	***Lead***	*S*		*S as needed (Procurement)*
- Contracting, EMDC lead activities	*S*	***Lead***		*S as needed (Procurement)*
- Contractor Management, EMDC lead activities	*S*	***Lead***		*S as needed (Procurement)*
- Technical Issues / Data Quality (EMDC Contractors)	*S*	***Lead***		*S as needed (Procurement)*
INTERFACING (GOVERNMENT / PARTNERS / PRODUCTION)				
- Enhancing Government Relations	***Lead***	*S*		*S as needed (SRO)*
- Co-Venturer / Partner Relations	***Lead***	*S*	*S as needed*	*S as needed (SRO)*
- Community Relations	***Lead***	*S*	*S as needed*	*S as needed (Public Affairs)*
+ Community Awareness for Drilling Project (i.e. Fishing Community)	*S*	***Lead***		*S as needed (Public Affairs)*
- External Communications (Emergency)	*S*	*S*	***Lead***	
- Contribution Budget	***Lead***			

Lead = Lead Responsibility
O = Oversight
S = Support Role

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Change Worksheet

WELL: BEARDIE-1 Exploration Well	COUNTRY: AUSTRALIA
RIG: OCEAN BOUNTY SEMISUBMERSIBLE	DATE INITIATED: 26/APRIL/2002

TYPE OF CHANGE (CHECK ONE):

☐ WELL DESIGN	☐ PERSONNEL
☐ DRILLING PROGRAM/PROCEDURE	☐ OPERATIONS MANUAL PROCEDURE
☑ CRITICAL EQUIPMENT/EQUIPMENT O&M	☐ RISK ASSESSMENT FOLLOW-UP
☐ RESPONSE TO UNEXPECTED EVENTS	☐ SPECIFICATION/STANDARD

DESCRIPTION/REASON FOR CHANGE:

1 **TRIP TANK**

USE THE OCEAN BOUNTY TRIP TANK.

THIS IS A SINGLE COMPARTMENT 50-BBL TANK WITH A 4" RETURN LINE TO THE BELL NIPPLE. IT DOES NOT COMPLY WITH THE EXXON SURFACE BLOWOUT PREVENTION AND WELL CONTROL EQUIPMENT MANUAL, VERSION JULY 2000, SECTION 7.1 STANDARD'S REQUIREMENTS FOR:

- THE TRIP TANK *SHALL* HAVE A MINIMUM CAPACITY OF 40 BARRELS DIVIDED INTO TWO COMPARTMENTS.

BEARDIE-1 IS EXECTED TO TAKE 21 DAYS INCLUDING APPROX. 12 DAYS WITH THE BOP STACK NIPPLED UP. ALL ZONES ARE NORMALLY PRESSURED AND MODIFICATION TO THE RIG WOULD BE A SIGNIFICANT COST.

NO CHANGE IS PROPOSED FOR THE USE OF THE RIG FOR THE BEARDIE-1 EXPLORATION WELL.

AS PER PAGE 3-24 OF THE EMDC DRILLING OIMS MANUAL (JANUARY 2002) EXCEPTION **APPROVAL AUTHORITY FOR ALL OTHER BOP EQUIPMENT EXCEPTIONS:** FIELD DRILLING MANAGER.

(APPROVAL AUTHORITY FOR EXCEPTIONS TO THE BOP STACK AND FOR EXCEPTIONS TO THE DESIGN GUIDANCE STANDARDS, PART 3: DRILLING OPERATIONS MANAGER, WITH NOTIFICATION TO THE DRILLING TECHNICAL MANAGER)

RISK ASSESSMENT SUMMARY (USE RISK MATRIX - SEE ELEMENT 2 IN DRILLING OIMS MANUAL):

PROBABILITY: A ☐ B ☐ C ☐ D ☒ E ☐ **CONSEQUENCE:** I ☐ II ☒ III ☐ IV ☐

RISK MITIGATION MEASURES (PRESCRIBED PROGRAM LIMITS):

NO ADDITIONAL RISK MITIGATION MEASURES ARE PROPOSED.

TRAINING/COMMUNICATION REQUIRED TO IMPLEMENT CHANGE? ☑ **NO** ☐ **YES (DESCRIBE)**

NO ADDITIONAL DOCUMENTATION IS PROPOSED.

PERMIT NOTIFICATIONS REQUIRED TO IMPLEMENT CHANGE? ☑ **NO** ☐ **YES (DESCRIBE)**

NOTE: THIS IS AN EXCEPTION APPROVAL, NOT A SIGNIFICANT CHANGE INCREASING RISK.

EFFECTIVE DATE: 26 APRIL 2002 **TIME:** 1500 HRS **DURATION:** UNTIL 1/DEC/2002

INITIATED BY: ANDY MCGREGOR	REVIEWED BY: FRANK KRATZER
APPROVED BY: DANIEL L. WHITEMAN	DATE APPROVED: *ORIGINAL SIGNED BY DANIEL L. WHITEMAN*

INSTRUCTIONS:
This form may be used to document significant drilling and operating plan changes. A significant change is one that increases health, safety, public, environmental, or major financial risk; for example any change that will increase the probability of occurrence or increase the severity of consequences for a given risk scenario is considered significant. The individual initiating a change has responsibility for describing the change, assessing risks, ensuring mitigation measures are implemented and obtaining the necessary approvals. For additional information, see Element 7 - Management of Change in the Drilling OIMS Manual.

I:\EMDC Drilling\EMDC Exploration\Beardie-1\Management Of Change\MOC-TRIP TANK.Doc

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"Eric Jacobsen" <ejacobsen@dogc.com.au>

26/04/2002 11:23 AM

To: <andrew.mcgregor@exxonmobil.com>
cc:
Subject: RE: Ocean Bounty Trip Tank Exception

Andrew
No, there have been no modifications done to the trip tank.
Regards, Eric

-----Original Message-----
From: andrew.mcgregor@exxonmobil.com
[mailto:andrew.mcgregor@exxonmobil.com]
Sent: Thursday, 25 April 2002 2:50 PM
To: Eric Jacobsen
Cc: chris.p.meakin@exxonmobil.com
Subject: Ocean Bounty Trip Tank Exception

Hi Eric,

I'm looking at exceptions required to the EMDC OIMS Drilling Manual for the Ocean Bounty drilling Beardie-1 for Esso.

I note from the East Pilchard well drilled last year that an exception was required for the Bounty's trip tank in that the trip tank was a single compartment 50bbl tank with 4" return line where as OIMS requirement is for minimum 40 bbls 2 compartment trip tank.

Before progressing this exception could you please advise if any modifications have been done to the trip tank on the Bounty.

Thanks

Andy

Cementing Program

A cementing procedure shall be prepared and approved for each cementing operation.

Basic Standards:
- API Spec 10A, " Well Cements - Specification"
- API RP 10B, "Testing Well Cements"
- API Spec 10D, "Bow Spring Casing Centralizers"
- API RP 10F, "Performance Testing of Cementing Float Equipment"
- ISO 10427-1, "International Standard for Casing Centralizers"

Cementing procedures may be included in the drilling program or issued separately.

The procedures shall include slurry composition, volume, properties, thickening time, cement displacement schedule, wiper plug requirements, pre-job line testing, and a contingency displacement plan.

Materials Specification: Cement materials used deeper than 500 feet will be manufactured and supplied according to the Basic Standard.

Cement Testing shall conform to the Basic Standard recommendations for test procedures, sampling and testing. The API temperature test schedules shall be tailored to individual situations, unless site-specific schedules are developed.

Samples of mix water and cement materials and additives shall be tested before complex jobs to ensure proper materials are used.

Responsibility: Engineering Manager, Supervising Engineer

Approval Authority: Field Drilling Manager (**including alternatives/exceptions**)

Blowout Prevention Equipment

A Blowout Preventer Stack and Choke Manifold shall be installed and specified auxiliary equipment provided for all drilling and completion operations after setting surface casing (conductor casing for subsea BOP) and prior to drilling into known hydrocarbon or charged zones.

The planned stack arrangement shall be described in the Drilling/Completion Programs or Drilling Standard Operations Manual.

Basic Standards:
- EMDC Drilling Surface Blowout Prevention and Well Control Equipment Manual
- ECI Floating Drilling Blowout Prevention and Well Control Equipment Manual
- ExxonMobil Drilling Standard Operations Manual -- Land Drilling
- ExxonMobil Drilling Standard Operations Manual -- Floating Drilling
- ExxonMobil Drilling Standard Operations Manual -- Jack-up Drilling

Diverter Systems

In areas of suspected or potential shallow gas and all water operations, a Diverter

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System shall be installed on all casing strings which do not have a BOP Stack, and, for floating rigs, whenever the marine riser is installed.

Basic Standards:
- EMDC Drilling Surface Blowout Prevention and Well Control Equipment Manual
- Exxon Upstream Design Guidance Document - Offshore Drilling Vent & Discharge Systems (Design Guidance Standard)

Surface BOP Stack Arrangement (Drilling)

The requirements in the Surface Blowout Prevention and Well Control Equipment Manual shall apply, with the following clarifications and changes:

- The Field Drilling Manager has the authority to approve all exceptions to the BOP stack's ram type and ram type location as specified in Section's 3 and 4 of the ExxonMobil Surface BOP and Well Control Equipment Manual under the following conditions:
  - The BOP stack meets or exceeds the BOP requirements specified in the Blowout Preventer Stack Selection table in Section 3.5 of the Surface BOP Manual.
  - The lowermost ram (LMR) body contains a fixed-bore pipe ram (not a VBR) sized for the largest drill pipe in the drill string.
  - All BOP stacks with at least two ram preventers contain at least one blind ram (except when casing rams or tubing rams are installed on a two ram stack in lieu of blind rams).
  - The BOP stack including ram type, number, placement, working pressure, etc. meets or exceeds any regulatory requirement.
- The BOP stack arrangement consists of the annular, the rams, the drilling spool and the choke and kill line side outlet valves.
- Only the Drilling Operations Manager may approve an exception to use a VBR in the LMR position.

Surface BOP Stack Arrangement (Completion and Testing)

Surface BOP stack requirements during completion and testing are the same as drilling operations above, with the following changes:
- One set of pipe rams shall be changed to the completion or test string diameter. For a tapered string, the lower pipe rams shall be sized for the larger size tubing.
- When testing with an electric submersible pump, the test string shall include a mandrel spaced out so that the annular can be closed on it. The mandrel shall provide a seal around the electric cable to withstand any expected well pressure.

Subsea BOP Stack Arrangement

Subsea BOP Stacks shall have at least one annular BOP and four ram-type preventers, configured (bottom up): pipe, pipe, pipe, shear, annular. VBRs are acceptable except in the LMR position. Only the Drilling Operations Manager may approve an exception to use a VBR in the LMR position.

The stack arrangement employed shall provide the capability for the following operations:

- Close in on the drill string and on casing or liner and allow circulation
- Close and seal on open hole and allow volumetric well control operations
- Strip the drill string using annular preventer(s)
- Hanging off the drill pipe and controlling the well
  - Disconnect the riser from the BOP stack
  - Circulate a hung-off drill string below shear rams
  - Circulate/U-tube to remove trapped gas below a closed preventer/annular
  - In addition to a choke line connection below the middle pipe (hang-off) ram, provide a kill line connection below the lower pipe ram to provide an inactive (static) BOP pressure monitoring line during well control circulation.

Information on BOP stack arrangements is contained in the Floating Drilling Blowout Prevention and Well Control Equipment Manual.

For production testing, the arrangement shall enable closing the shear ram above the suspended sub-sea test tree.

BOPE - General

Only OEM (original equipment manufacturer) or OEM-licensed parts shall be used on blowout preventers, choke manifolds, and all BOPE valves.

Field welding on BOP bodies and choke and kill line valves is not permitted.

Subsea BOP Control Systems

Prevention of Accidental Disconnects

Subsea BOP control systems shall include the accidental disconnect prevention measures identified in the IADC Well Control Guidelines Manual, Supplement 2000 Section. An aid is the OIMS form "Subsea BOP Accidental Disconnect Prevention Checklist" available on the LAN at I:\Emdc\Drilling\Technical\OIMS\Forms. There shall also be at least one backup BOP control system such as ROV stabs with onboard ROV and crew, autoshear and deadman systems, and/or acoustic backup controls.

Reference: IADC Deepwater Well Control Guidelines

Closing Units

Basic Standards:

- EMDC Drilling Surface Blowout Prevention and Well Control Equipment Manual (surface stacks)
- ECI Floating Drilling Blowout Prevention and Well Control Equipment Manual (subsea stacks)

Accumulator capacity shall be checked against the following design criteria:

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API RP 16E Control Systems for Drilling Well Control Equipment, plus:

- Surface BOP stacks: Close all BOPs and open the HCR valve (a) with 50% reserve and a minimum remaining accumulator pressure of 1200 psi, or (b) with a minimum remaining accumulator pressure sufficient to close any pipe ram at the BOP Working Pressure, whichever is greater.
- Subsea BOP stacks: Open and close all rams and 1 annular (a) with 50% reserve, or (b) with a remaining minimum accumulator pressure sufficient to close any pipe ram or open any choke valve at the Maximum Anticipated Surface Pressure (MASP), whichever is greater.

API RP 16E considers the effect of high wellbore pressures on BOP ram closing pressure.

Note: Under this standard, a higher precharge pressure may be used to reduce the number of required bottles, if desired.

The PC program BOPACCUM can evaluate accumulator capacity using ExxonMobil, API, U.S. MMS, and Norwegian sizing standards.

Choke Manifold

Basic Standards:

- EMDC Drilling Surface Blowout Prevention and Well Control Equipment Manual
- ECI Floating Drilling Blowout Prevention and Well Control Equipment Manual
- Exxon Upstream Design Guidance Document - Offshore Drilling Vent & Discharge Systems (Design Guidance Standard)

Choke Manifold -- Deep Water

In water depths greater than 1500 feet, three pressure gauges shall be provided at the remotely controlled choke panel indicating pressures on (1) drill pipe, (2) upstream of choke, and (3) the inactive Choke & Kill line to the BOP stack.

Mud/Gas Separator

Basic Standards:

- EMDC Drilling Surface Blowout Prevention and Well Control Equipment Manual (surface stacks)
- ECI Floating Drilling Blowout Prevention and Well Control Equipment Manual (subsea stacks)
- Exxon Upstream Design Guidance Document - Offshore Drilling Vent & Discharge Systems (Design Guidance Standard)

As a minimum, a mud/gas separator of the atmospheric-pressure type with a closed bottom shall be provided on all wells except for wells with 2000 psi WP BOP stacks unless regulatory requirements stipulate otherwise.

Dimensions smaller than the recommended standard must be justified and approved by the Field Drilling Manager using the KIK program (which is based on the criteria in the Surface Blowout Prevention and Well Control Equipment Manual).

Auxiliary Well Control Equipment/Services

The following auxiliary equipment and services shall be provided:

- Mud logging (May not be required on all wells)
- Gas detector
- Gas explosive mixture meter
- Trip tank
- If employed, Top Drives shall include a remotely operated safety valve

For all Items in the above section on Blowout Prevention Equipment :

Responsibility: Operations Superintendent, Engineering Manager, Supervising Engineer

Approval Authority: Field Drilling Manager

Approval Authority for Exceptions to the BOP Stack Arrangement , for a VBR in the LMR and to the Design Guidance Standards, Part 3: Drilling Operations Manager, with notification to the Drilling Technical Manager

Approval Authority for all other BOP Equipment Exceptions: Field Drilling Manager

References:

- API Spec 16A, "Drill Through Equipment"
- API Spec 16C, "Choke and Kill Systems
- API Spec 16D, "Control Systems for Drilling Well Control Equipment"
- API RP 16E, "Control Systems for Drilling Well Control Equipment"
- API RP 53, "BOP Equipment for Drilling Operations
- API RP 64, "Diverter Systems Equipment and Operations"

Electrical Equipment Classification

Basic Standards:

- API RP 500, "Classification of Locations for Electrical Installations (land and platform rigs)"
- For MODUs, electrical classification is addressed by classification society rules and applicable International Maritime Organization (IMO), such as IMO MODU Code, ABS and DnV Hazardous Area Classification Codes

Clarifications:

- Drawworks induction motors are exempted.
- Top Drives shall be classed assuming it is positioned at the mid-point of its vertical travel. For example, in open derricks, they would generally not require classification, but for enclosed derricks, they would be considered Division 2.

Responsibility: Operations Superintendent

Approval Authority: Field Drilling Manager (**including alternatives/exceptions**)

7.0 TRIP TANK SPECIFICATIONS

7.1 GENERAL

In the past, most blowouts occurred due to swabbing or not keeping the hole filled while tripping the drill string out of the hole. To provide more exact fluid measurements for pipe displacement, trip tanks were developed to accurately measure within ± ½ barrel the fluid gain or loss from the wellbore. As the drill string is pulled from the hole, the mud level can drop due to the volume of metal being removed. If mud is not added to the hole as pipe is pulled, it is possible to reduce hydrostatic pressure to less than formation pressure. When this happens, a kick can occur. Swabbing can occur when pipe is pulled too fast, and friction between the pipe and the mud column causes a reduction in hydrostatic pressure to a value less than formation pressure.

To prevent loss of hydrostatic pressure, it is **required** to keep the hole full continuously, using a trip tank and to keep track of the fluid volume **required**. The metal volume of the pipe being pulled can be calculated, but mud additions necessary to replace hole seepage losses due to filtration effects can only be predicted by comparison to the mud volumes needed to keep the hole properly filled on previous trips. For this reason, it is **required** that a record of mud volume needed versus number of stands pulled be maintained on the rig in a trip book for every trip made.

It is **required** practice when using the pump-fill trip tank to accurately measure mud volume which flows from the well as the drill string is run back in the hole. In some instances, partial lost returns or swabbed-in gas have resulted in kicks while going in the hole. Also, plugged pipe which unplugs while going in the hole can result in a drop in the annular fluid level which allows the well to come in.

Use of a trip tank is **required** on all ExxonMobil wells. The trip tank **must** be operable prior to spud. The drilling program **will** specify whether ExxonMobil or the Contractor **will** furnish and maintain the trip tank for use on each well. Correct installation of the trip tank prior to spudding the well **shall** be verified by the ExxonMobil Drilling Supervisor.

There are two types of trip tank installations: the pump-fill trip tank and the gravity-fill trip tank.

7.2 PUMP-FILL TRIP TANK

Pump-fill trip tanks **must** be used on **all wells**. As illustrated in Figure 7-A, centrifugal pumps take suction from the trip tank and fill the hole through a line into the bell nipple. The pump runs constantly while the drill string is pulled from the hole. The hole stays full as each stand of pipe is pulled and excess mud returns to the trip tank through an outlet on the main flow line. A valve **must** be installed in the flow line downstream of this outlet to block all flow to the shale shakers while making a trip. This closed circulation system can be monitored with a float system and a digital readout in ½-barrel increments on the driller's console.

Component Description for Typical Pump-Fill Trip Tank (Figure 7-A)

1. The trip tank ***shall*** have a minimum capacity of 40 barrels divided into two compartments.
2. Each compartment ***shall*** be equipped with a float and a barrel marker (See Figure 7-C).
3. A pit level ***shall*** be installed with a recorder located near the driller.

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Change Worksheet

WELL: BEARDIE-1	COUNTRY: BASS STRAIT, AUSTRALIA
RIG: OCEAN BOUNTY SEMISUBMERSIBLE	DATE INITIATED: 14 JUNE/02

TYPE OF CHANGE (CHECK ONE):

- ☐ WELL DESIGN
- ☐ DRILLING PROGRAM/PROCEDURE
- ☐ CRITICAL EQUIPMENT/EQUIPMENT O&M
- ☐ RESPONSE TO UNEXPECTED EVENTS
- ☐ PERSONNEL
- ☐ OPERATIONS MANUAL PROCEDURE
- ☐ RISK ASSESSMENT FOLLOW-UP
- [+] SPECIFICATION/STANDARD: UPSTREAM DESIGN GUIDANCE MANUAL - EXPOSURE SUITS

DESCRIPTION/REASON FOR CHANGE:

EMDC OIMS Exposure Suits - EMDC OIMS Section 8-10

Exposure suits shall be provided on MODU and for Drilling-associated helicopter operations if the expected rescue time exceeds the estimated the estimated hypothermia survival time.

Reference to exposure suits also includes survival suits. Exposure suits shall be provided during any month that: (a) there is less than 95% propability that the average water temperature will be above 68degrees F. (20 degrees C.): or (b) estimated in-water survival time is less than the estimated rescue time. A chart "Estimated Survival Time for Anti Exposure Garment"

Scenario Search and Rescue (SAR) plans shall consider the probable cumulative time to mobilize SAR equipment, locate personnel in the water and recover them

-For helicopter operations, scenarios shall include ditching anywhere along over water transportation routes (with personnel in the water)

The type of exposure suits to be provided is often dictated by regulations. For marine operations, exposure suits may be approved by the U.S. Coast Guard, Norwegian Marine Directorate, or the Canadian Coast Guard. For Helicopters, aviation suits, such as those approved by the U.S. Federal Aviation Agency, are acceptable.

Responsibility: Operations Superintendent

Approval Authority: Field Drilling Manager (including alternatives, exceptions)

Reference: Exxon Guidelines for the Provision and Use of Exposure Suits on Mobile Off-shore Drilling Units

Background

The water temperature in Bass Strait is 15.5° C or less from May to November with an expected 12° C lowest temperature. Without exposure suits survival time in the water will be between 1 and 2 hours.

Subsequently OIMS 8-10 "Exposure Suits" above requires that exposure suits shall be provided.

DOGC confirm the MODU Ocean Bounty is kitted out with survival suits to satisfy that part of OIMs requirements.

The Safety Cases for Bass Strait platforms have addressed the issue of exposure suits on platforms (not provided) and exposure suits for helicopter operations:

"A dedicated, winch equipped SAR aircraft is held on stand-by at Longford during routine flying hours through the months (typically May to November inclusive) when the Bass Strait water temperature is 15.5 degrees C or less. At temperatures above 15.5° C the minimum sea survival time is estimated to be more than the SAR time to the most distant incident location by as raft-drop aircraft. At the 12° C lowest water temperature the SAR time achieved to the most distant incident location by the dedicated SAR aircraft on stand-by at Longford is less than the estimated minimum sea survival time. As such the dedication of a SAR aircraft is a suitable alternative to immersion suits with the additional benefit of providing the shortest incident to hospital time. The Esso aircraft cannot perform the same function in the event of a night time incident and therefore immersion suits have been introduced for all crew and passengers on night flights:

Beardie-1 drilling location is close to Barracouta and Whiting platforms and, at about 60Km distance from Longford, is about 50% of the most distant incident location in Bass Strait from Longford. While the water temperature at Beardie-1 location requires exposure suits for drilling-associated helicopter operationsthe provision of search and rescue aircraft and planning, as detailed in the platform Safety Cases, will provide rapid rescue well within the estimated survival time.

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DESCRIPTION/REASON FOR CHANGE:

Based on this assessment, which details Bass Strait Platform Safety Case risk analysis, we recommend the following of local accepted practices and that your exception approval be given to waive the requirement for the use of exposure suits for Drilling-related helicopter operations on daylight flights during the drilling of Beardie-1 well.

RISK ASSESSMENT SUMMARY (USE RISK MATRIX - SEE ELEMENT 2 IN DRILLING OIMS MANUAL):

HSE PROBABILITY: A ☐ B ☐ C ☐ D ☒ E ☒ CONSEQUENCE: I ☒ II ☒ III ☐ IV ☐

FINANCIAL PROBABILITY: A ☐ B ☐ C ☐ D ☐ E ☒ CONSEQUENCE: I ☐ II ☒ III ☐ IV ☐

RISK MITIGATION MEASURES (PRESCRIBED PROGRAM LIMITS):

None required

TRAINING/COMMUNICATION REQUIRED TO IMPLEMENT CHANGE? ☒ NO ☐ YES (DESCRIBE)

EFFECTIVE DATE: 18/ JUNE/02 TIME: 1500 HR	DURATION: UNTIL 1/DEC/02
	REVIEWED BY: F.W. KRATZER
INITIATED BY: ANDY MCGREGOR	DATE APPROVED: 25/06/2002
APPROVED BY: D.L. WHITEMAN	ORIGINAL SIGNED BY DAN WHITEMAN

INSTRUCTIONS:
This form may be used to document significant drilling and operating plan changes. A significant change is one that increases health, safety, public, environmental, or major financial risk; for example any change that will increase the probability of occurrence or increase the severity of consequences for a given risk scenario is considered significant. The individual initiating a change has responsibility for describing the change, assessing risks, ensuring mitigation measures are implemented and obtaining the necessary approvals. For additional information, see Element 7 - Management of Change in the Drilling OIMS Manual.

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Exposure Suits

Exposure suits shall be provided on MODU and for Drilling-associated helicopter operations if the expected rescue time exceeds the estimated hypothermia survival time.

Reference to **exposure suits** also includes **survival suits**. Exposure suits shall be provided during any month that: (a) there is less than a 95% probability that the average water temperature will be above 68°F. (20°C.); or (b) estimated in-water survival time is less than the estimated rescue time. A chart "Estimated Survival Time for Anti-Exposure Garments" is in this section's Appendix. Number of suits to be at least 150% of certified crew complement.

Scenario Search and Rescue (SAR) plans shall consider the probable cumulative time to mobilize SAR equipment, locate personnel in the water and recover them.

- For helicopter operations, scenarios shall include ditching anywhere along over water transportation routes (with personnel in the water).

The type of exposure suits to be provided is often dictated by regulations. For the marine operations, exposure suits may be approved by the U. S. Coast Guard, Norwegian Maritime Directorate, or the Canadian Coast Guard. For helicopters, aviation type suits, such as those approved by the U. S. Federal Aviation Agency, are acceptable.

Responsibility: Operations Superintendent

Approval Authority: Field Drilling Manager (**including alternatives/exceptions**)

Reference: Exxon Guidelines for the Provision and Use of Exposure Suits on Mobile Offshore Drilling Units

Non-Aqueous Drilling Fluids

If non-aqueous drilling fluid (NAF) is to be used in the operation, the rig specifications shall include equipment and provisions for personnel protection.

The technical specifications shall include special considerations for the following requirements when using NAFs (diesel oil, mineral oil or synthetic oil-based muds):

- Oil-resistant materials in BOP elements, drill pipe rubbers, and pump seals
- Adequate drip pans and floor drains
- Steam cleaners or high-pressure wash-down
- Steel mud tanks with covers or other means to protect against rain.
- Splash guards in areas of high mud agitation
- Mechanical seals or oil compatible packing in centrifugal pumps on the mud system
- Adequate lighting on and around mud pits
- Mud saver valve
- Mud bucket
- Blowers or other forced air moving equipment
- Appropriate ventilation of all areas affected by vapors from the circulating and storage system

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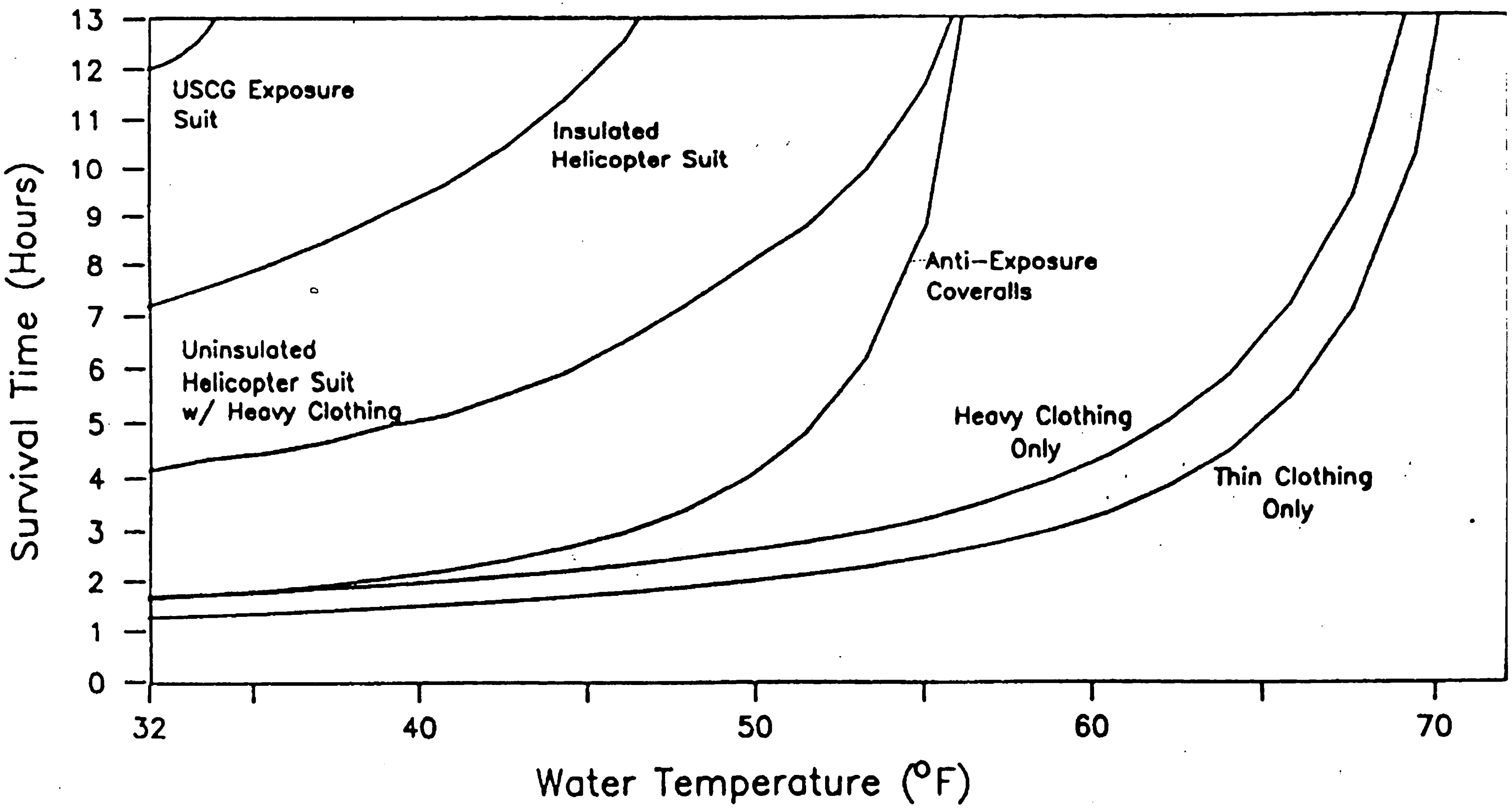
Estimated Survival Time for Anti-Exposure Garments



*Survival Time based on 91°F Core Temperature

RWH: 6/23/88

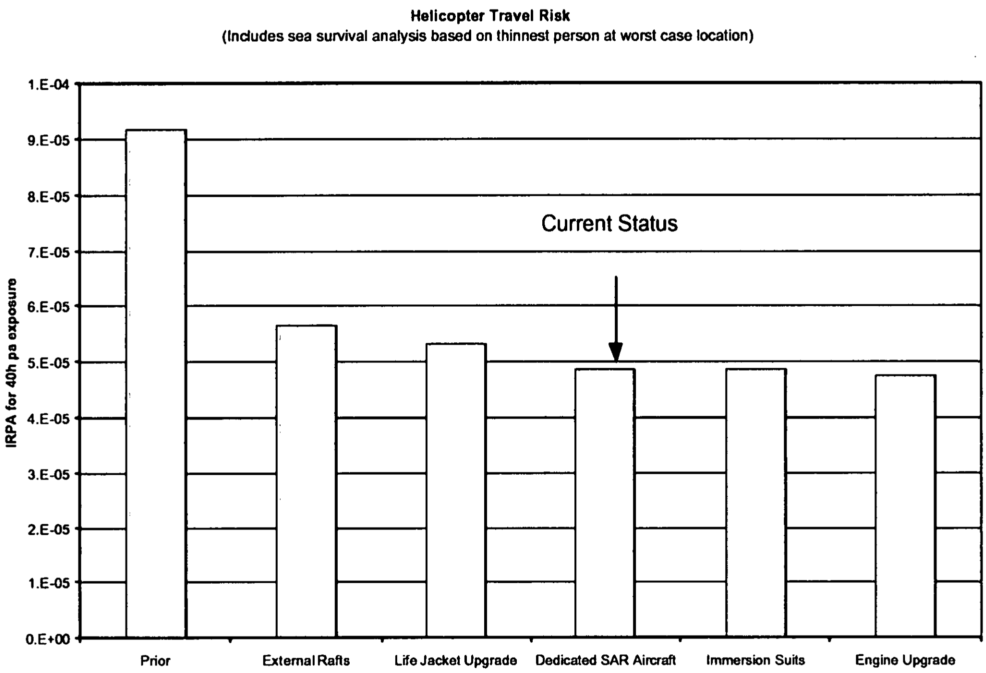
Helicopter Travel

Helicopter travel risk appears as the top contributor in Table 4.3.11. It contributes 14.4% of the total quantified risk after adoption of the risk reduction measures proposed for implementation in this Formal Safety Assessment.

The MAE Hazards associated with helicopter operations in Bass Strait are identified in the MAE Register (MAE Nos 40 and 41) and a number of potential further risk reduction measures have been noted:

40.1 Issue immersion suits to passengers
40.2 Upgrade aircraft engines to 2S1 model
41.1 Install beacon on crane to warn of crane operation or approaching aircraft
41.2 Helicopter Handler to direct waiting passengers to safest location
41.3 Review pfm helicopter fire fighting and rescue requirements and facilities
41.4 Establish wind speed limit for access to helideck
41.5 Install additional folding gate to box in north-east corner of helideck

Figure 4.3.10



Items 41.1 through to 41.5 have been assessed qualitatively as reported in Section 4.3.2 . Items 40.1 and 40.2 are assessed quantitatively below in conjunction with an illustration of the benefits of external life rafts, life jacket upgrades and a dedicated SAR aircraft in winter - all of which were introduced in 1999.

Immersion suits and an aircraft engine upgrade have been identified as available measures that may provide a risk reduction benefit that is justified within the ALARP criteria.

Immersion suits are employed in helicopter operations in cold climates to extend the survival time of a person in the water to match the SAR response time.

A dedicated, winch equipped SAR aircraft is held on standby at Longford during routine flying hours through the months (typically May to November inclusive) when the Bass Strait water temperature is 15.5°C or less. At temperatures above 15.5°C the minimum sea survival time is estimated to be more than the predicted SAR time to the most distant incident location by a raft-drop aircraft. At the 12°C lowest water temperature the SAR time achieved to the most distant incident location by the dedicated SAR aircraft on standby at Longford is less than the estimated minimum sea survival time. As such the dedication of a SAR aircraft is a suitable alternative to immersion suits with the additional benefit of providing the shortest incident to hospital time. The Esso aircraft cannot perform the same function in the event of a night-time incident and therefore immersion suits have been introduced for all crew and passengers on night flights ie night training and emergency flights. The cost of introducing immersion suits on routine flights is estimated to be $0.60M initially and $0.35M pa to maintain. This cost is not justified in the absence of an incremental risk benefit and the risk on routine flights is considered ALARP without immersion suits. Air crew fatigue and unsealed suits are concerns that would need to be addressed if immersion suits were introduced due to what is typically a warm cabin environment in the S76C even in winter.

The Sikorsky S76C aircraft are now marketed as the S76C+ with upgraded engines that produce 18% more power on take off and increase the single engine capability of the aircraft. The offshore platform departure procedure for the current S76C's is to initially hover 5 ft above the helideck and check engine parameters before climbing to at least 25 ft above the helideck and rotating into forward flight in excess of 60 kts as soon as possible. This is used to minimise the period that the aircraft do not have single engine capability, which is the case on hot days with light winds when engine power and rotor lift are diminished by the environmental conditions. The elevation is used to provide an opportunity to gain air speed in descent and fly away from the platform on 1 engine if required. An S76C+ aircraft would place less reliance on this procedure due to the additional available power. The S76C aircraft do not have single engine capability on take-off for approximately 1% of time due to the combination of environment and load conditions. There have been 2 cases of engine failure on take-off in the 183 thousand flying hour history of Esso Bass Strait helicopter operations. These facts have been used to assess the risk benefit of an engine upgrade to the 2S1 engine in the S76C+ model. The result is a 1.9% risk reduction. Fatality probability assumptions for impact and failing to exit the aircraft are unchanged in this assessment, and all persons successfully exiting the aircraft are assumed to survive until rescue given that this scenario requires high temperatures and light winds. The cost of a S76C+ aircraft is approximately US$7M. Given the high cost and small risk benefit, upgrade to the later specification aircraft will be deferred until the fleet is changed out in approximately 2004 in much the same way as the S76A fleet was changed out with the current S76C aircraft in 1994.

HIR Apac	Hazard Identification & Risk Assessment Register	Date : 12/06/2002 Page No. : 5

Project : Beardie-1 **Event No. :** 1

System/Operation : Aviation transport

Event : Helicopter flight incident

Causes :

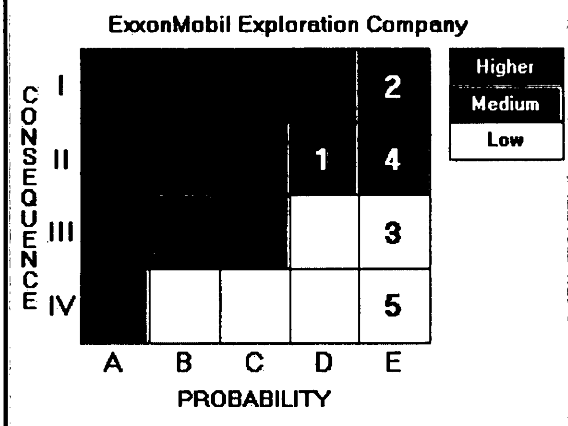
Adverse or rapidly changing weather
Pilot incapacitation (fatigue, A&D abuse, medical)
Lack of pilot/engineer skill/experience
Aircraft mechanical, hydraulic or electrical failure
Inadequate helipad condition/lighting
Contaminated fuel, Fuel starvation
Poor air traffic control / collision with other aircraft
Communication failure
Overload
Hazardous cargo (flammable or explosive)
Passenger or other person comes too close to rotating propellers
Inappropriate passenger behaviour
Debris on helipad
Movement of rig

	Consequence	Consequence Type	Consequence Category	Probability Category
1	Injury (LTI)	Health/Safety	II	D
2	Fatality	Health/Safety	I	E
3	Project delay	Financial	III	E
4	Damage to assets	Financial	II	E
5	Public reaction	Public disrupt	IV	E

Risk Controls :

PREVENTION:
ExxonMobil aviation standards
Inspection and maintenance program
Civil aviation standards
Normal helicopter operations in daylight only
Aviation audits/assessments
Quality checks of fuel supply
Adherence to procedures
EAPL aviation policy
Flight following with live tracking
Co-pilot in each helicopter
Project-specific training
Helicopter induction briefing
Controls on arrival and departure by helideck crew
Markings on helideck
Inspection of helideck by aviation
Training for rig crew and all passengers on S76 helicopter

MITIGATION:
Emergency communication capability/ELT
EAPL ERP incl Public Affairs procedures
Search and Rescue
Flight following
Survival kits
Aircraft first aid kits
HUET training



Drilling	
Exploration	
ALARP?	
Action Item/s?	Five

Project File : BeardieDeepened1.mdb

913712 606

Shelley A Beer

20/05/2002 06:06 PM

To: Andrew McGregor/U-SouthPacific/ExxonMobil@xom
cc:
Subject: Immersion Suits

Andy,

Further to your query relating to exemptions for exposure suits in Bass Strait, I have been able to establish the following:

It appears that there is no historic basis for the use of exposure/immersion suits on Bass Strait production facilities. Historic Schedule of Specific Directions require immersion suits on mobile drilling units, but only life jackets on platforms. Following the implementation of the PSL (Management of Safety Regulations) Regulations, this direction (318 attached below) was revoked and is addressed via the Safety Case regime. Whilst Marine Order 25 does stipulate requirements for cargo ships of 500 ton and upwards to carry immersion suits, these do not apply to Bass Strait platforms.

I have researched our historic files and have found no reference to historic exemptions sought at the time that 318 was in effect.

Please let me know if you have any further information or confirmation that an exemption was once in place as this may prompt looking at the scenario from a alternative angle with different success.

Under **historic** Schedule of Specific Directions, expose suits were required as per 318:
318* **(1) A platform shall carry lifejackets -immersion suits, and lifebuoys***
(a) in number 135% of the number of persons on the platform;
(b) complying with the provisions of Marine Orders Part 25 (Equipment Life-saving) issued pursuant to the Navigation (Orders) Regulations made under the
Navigation Act 1912;
(c) kept in approved places that are readily accessible and prominently indicated; and
(d) available for inspection at least once in each year by an approved body or person at a time and place determined by the Director.
(2) A mobile drilling unit operating in waters south of 35° south latitude shall carry approved immersion suits for protection against hypothermia -
(a) in number 135% of the number of persons on the platform;
(b) kept in approved places that are readily accessible and prominently indicated; and
(c) available for inspection at least once in each year by an approved body or person at a time and place determined by the Director.

Regards,

Shelley Beer
Compliance Coordinator
Safety, Regulatory & OIMS Division
Telephone: +61 3 9270 3481
Room: 10.18

913712 607

Andy
I've been back to the Rig Safety man and can confirm that the Rig meets your requirements.
Regards, Eric

-----Original Message-----
From: andrew.mcgregor@exxonmobil.com
[mailto:andrew.mcgregor@exxonmobil.com]
Sent: 17 June 2002 07:15
To: Eric Jacobsen
Cc: chris.p.meakin@exxonmobil.com; frank.w.kratzer@exxonmobil.com;
brigham.e.bigby@exxonmobil.com
Subject: Ocean Bounty Survival Suits

Hi Eric,

Continuing on the Survival Suits issue:

ExxonMobil requires that the number of survival/exposure suits provided
on
a MODU for Bass Strait winter conditions is "at least 150% of the
certified
crew complement" and that the make and type be approved by the "US Coast
Guard, Marine Norwegian Directorate, or the Canadian Coast Guard".

Please confirm the quantity of approved survival suits, in good
condition,
on the Bounty satisfies this requirement.

Regards

Andy McGregor

"Eric Jacobsen"
<ejacobsen@dogc.com.au>

To: <andrew.mcgregor@exxonmobil.com>
cc:
Subject: RE: Survival Suits

24/05/2002
10:56 AM

Correct Andy. We have survival suits on board.
Regards, Eric

-----Original Message-----
From: andrew.mcgregor@exxonmobil.com

913712 608

[mailto:andrew.mcgregor@exxonmobil.com]
Sent: 23 May 2002 11:35
To: Eric Jacobsen
Subject: Survival Suits

Hi Eric,

I'm pretty sure I remember them but: can you please confirm that the
Bounty is equipped with survival/exposure suits. I seem to remember
them
stored in the rooms.

Cheers

Andy

913712 609

Change Worksheet

WELL: BEARDIE-1	COUNTRY: BASS STRAIT, AUSTRALIA
RIG: OCEAN BOUNTY SEMISUBMERSIBLE	DATE INITIATED: 14 JUNE/02

TYPE OF CHANGE (CHECK ONE):

☐ WELL DESIGN

☐ DRILLING PROGRAM/PROCEDURE

☐ CRITICAL EQUIPMENT/EQUIPMENT O&M

☐ RESPONSE TO UNEXPECTED EVENTS

☐ PERSONNEL

☐ OPERATIONS MANUAL PROCEDURE

☐ RISK ASSESSMENT FOLLOW-UP

☒ SPECIFICATION/STANDARD: UPSTREAM DESIGN GUIDANCE MANUAL - EXCEPTION TO DESIGN STANDARDS – BOP EQUIPMENT (DIVERTERS) DIVERTER LINES

DESCRIPTION/REASON FOR CHANGE:

EMDC OIMS

EMDC OIMS Section 7.6, requires review and documentation of Exceptions to Design Standards. Equipment specifications for Diverter Design requires diverter lines to have "sweeping turns or targeted tees".

DESCRIPTION/REASON FOR CHANGE:

Based on this assessment, we recommend that your exception approval be given for the duration of the drilling of the Beardie-1 well to waive the requirement for targeted tees in the recently modified diverter lines on the Ocean Bounty. On Beardie-1 surface hole will drill riserless. On the main hole the diverter lines would only be used to divert minor trapped gas above the BOPs and would not be used for diverting major well flow.

IOMS Section 7.6 Design Standard Exceptions Needing Review and Documentation

EMDC OIMS Section 7.6, requires review and documentation of Exceptions to Design Standards. BOP equipment specifications for Diverter Design requires diverter lines to have "sweeping turns or targeted tees".

Each exception to a design standard will be documented " with the Approval Authority of the Field Driling Manager or commensurate with the level of anticipated risk.

Design Standard for Exception

EMDC Floating Drilling Blowout Prevention and Well Control Equipment Manual, Table 2.2.1 **FLOATER DIVERTER SYSTEM EQUIPMENT GUIDELINES** requires that Diverter Line "90-degree and sharp turns must be targeted".

Description of the Design Standard Exception

Recent Fabrication of a cellar deck on the Oceean Bounty for handling production trees has resulted in to both diverter lines modifications, identified recently by MODUSPEC, which now includes a total of three short radius 90 degree bends. These bends have been fabricated without the provision of targets to reduce the risk of washing out the diverter line at the direction change in a well divert emergency.

DOGC will need to rectify this situation with long radius bends or targeted tees to restore the design integrity of the diverter system.

Reason for Exception

For the drilling of Beardie-1 with the Ocean Bounty surface hole is being drilled with returns to the seabed.

With the BOPs and riser run the diverter system is only likely to be used for safely removing small volumes of gas above the BOPs in the riser.

With many wells drilled in Bass Strait formation pressures are generally normal and well understood. Major kick surprises are unlikely.

A scenario with the well diverted after the BOPs are installed is almost impossible to rationalise, therefore the risk with this exception is very very small but the consequences for the rig and personnel are high .

Duration of the Exception

Duration of the drilling of Beardie-1 only

913712 610

RISK ASSESSMENT SUMMARY (USE RISK MATRIX - SEE ELEMENT 2 IN DRILLING OIMS MANUAL):
HSE PROBABILITY: A ☐ B ☐ C ☐ D ☐ E ☒ CONSEQUENCE: I ☒ II ☒ III ☐ IV ☐ FINANCIAL PROBABILITY: A ☐ B ☐ C ☐ D ☐ E ☒ CONSEQUENCE: I ☐ II ☒ III ☐ IV ☐
RISK MITIGATION MEASURES (PRESCRIBED PROGRAM LIMITS):
TRAINING/COMMUNICATION REQUIRED TO IMPLEMENT CHANGE? ☐ NO ☒ YES (DESCRIBE)
DOGC to be advised of the need to modify the diverter lines on the Ocean Bounty if the lines are to comply with EMDC OIMS requirements

EFFECTIVE	DATE: 20/ JUNE/02 TIME: 1500 HR	DURATION: UNTIL 1/DEC/02 REVIEWED BY: F.W. KRATZER
INITIATED BY: ANDY MCGREGOR		DATE APPROVED: 25/06/2002
APPROVED BY: D.L. WHITEMAN		ORIGINAL SIGNED BY DAN WHITEMAN

INSTRUCTIONS:
This form may be used to document significant drilling and operating plan changes. A significant change is one that increases health, safety, public, environmental, or major financial risk; for example any change that will increase the probability of occurrence or increase the severity of consequences for a given risk scenario is considered significant. The individual initiating a change has responsibility for describing the change, assessing risks, ensuring mitigation measures are implemented and obtaining the necessary approvals. For additional information, see Element 7 - Management of Change in the Drilling OIMS Manual.

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diverter unit, that incorporates an annular-type packing element to close on open hole. The CSO has a 21 1/4-inch through-bore and is rated for 1000 psi wellbore pressure on 5-inch pipe and 500 psi wellbore pressure on open hole. Generally, the standard KFDS diverter units cannot be directly retrofitted with the CSO design because of the additional height and structural support requirements for the CSO unit. Vetco KFDS-CSO units are in field service.

+ The Hydril FS 21-500 (21-inch bore, 500 psi working pressure) diverter combines Hydril's MSP low pressure annular with an internal integrated piston sleeve arrangement so that line outlets are opened and closed when the annular element is closed and opened. Hydril FS units are in field service.

• MMS: The Houma Louisiana District MMS issued a stipulation in 1988 to prohibit the removal of the Regan diverter packer insert without ensuring back-up diverter or shut-in capability. The apparent intent is to preclude operating with an unprotected wellbore (i.e., shut-in or diverting capability is lost when the packer insert is removed to run or pull bottom hole assemblies or while changing out the insert to run casing). The subsea BOP stack provides the backup closure capability when drilling below conductor casing. A site specific alternative procedure will be necessary in the Houma District for drilling the conductor hole with a riser and a KFDS type diverter unit.

2.2.4. Diverter Lines:

+ The typical 12-inch nominal size (12.75-inch OD) diverter lines are Schedule 30 or 40, Grade B pipe with 0.33 or 0.406-inch wall thickness, respectively. Wall thickness is the primary consideration to minimize the effects from erosion. Note however, that 12-inch nominal, schedule 40 (or higher) wall thickness will have less than the 12-inch ID required in the current MMS regulation. The MMS will normally grant an exception to this requirement which will permit 12-inch nominal, schedule 40 (or higher) diverter lines. Table 2.2.2 shows the API RP 14 E description for platform piping and is the recommended guideline for diverter piping.

+ All diverter line connections should be welded or have ANSI-API flanges. Metal ring gaskets are preferred. However, Flectualic-type fire retardant gaskets are acceptable. Flexible hoses, dresser-type sleeves, and victaulic or hammer type connections are not acceptable.

+ Erosion should be anticipated at bends, turns, changes in pipe ID, welds, and downstream of valves. The preferred order of discharge line configuration is (1) straight lines, (2) gradual pipe turns of long radius bends (where a long radius pipe bend is normally 10 times pipe diameter), and (3) extra-long turn ells or elbows (where extra-long turn radius is normally 3 times pipe diameter). The most undesirable arrangement is a sharp right-angle turn into a vertical line.

+ The wall thickness at potential erosion and corrosion sections in the diverter lines should be checked by ultrasonic inspection if the pipe wall thickness is suspect. A wall thickness check at least once every 3 years is recommended.

+ The fill line, trip tank line, or any other auxiliary line connected to the diverter unit should have a rated working pressure remote operated valve or a check valve near the diverter unit.

+ Provisions should be made for flushing the diverter line(s). Cleanout ports are normally upstream of all valves and sharp direction changes, with flushing jets located to aid removal of sand, gumbo, etc. The cleanout points should be isolated with rated working pressure valves or plugs.

- MMS: No spool outlet or diverter line internal diameter shall be less than 12 inches if the diverter unit has only one outlet; branched lines should be used to provide optional downwind discharge. A single diverter line is acceptable on a dynamically positioned drillship.
- MMS: The diverter line(s) should have a minimum number of turns, the radius of the turns as large as practical, and all right-angle and sharp turns are required to be targeted.
- MMS: The entire diverter system should be firmly anchored and supported to prevent whipping and vibration.

2.2.5. Diverter Valves:

+ Diverter valves for 300 psi working pressure diverter systems should conform to API Spec 6D, Specification for Pipeline Valves, and have a minimum rated working pressure equivalent to a Class 300 valve of 720 psi (100°F), or greater. Industrial classified WOG (water-oil-gas) class valves are typically cast-iron material and designed for non-shock loading low pressure service. They are not recommended for a diverter system.
+ Ball valves are recommended in the flowline and the diverter lines because they provide a full open, non-restricted flow path with a 1/4-turn actuation.
+ Butterfly valves are not acceptable in diverter installations.
+ API gate valves are acceptable but seldom used because of their large size and the large space necessary for installation and repair.
+ For 150 psi working pressure diverter systems, guillotine knife-type valves are acceptable but not the preferred type because of the low pressure seal mechanism, the exposed gate feature and the split-body design. A gate/seal leak may not necessarily be confined within the body of the valve.
+ When the diverter system is used as the primary response method in a well control situation;
    - The diverter line valves should be equipped with actuators that cause the valve to fail open, and the flowline valve should be equipped with actuators that cause the valve to fail close. Normally a manual override is also provided as a redundant method to close the valve and keep gas from the shaker room.
+ The two primary types of valve actuators are pneumatic and hydraulic. Hydraulic actuators are typically designed for 1500 psi operating pressure and are preferred due to their reliability. The hydraulic valve actuator is generally smaller due to the higher supply pressure. The BOP accumulator system is normally used to provide the hydraulics to the actuators. Pressure regulators may be necessary in the control line and should be checked for proper operation.
+ Air actuators are normally designed for 80 to 120 psi operating pressure and are generally much larger and require more maintenance. If rig air pressure drops lightly below the minimum air pressure requirement to the actuator, the actuator torque could be reduced and the valve may be slow opening or not fully opened. Where an air system is used, the air supply and the air line must be adequate to achieve minimum valve operating time in conjunction with other air demand operations.
+ Actuators should be sized to operate the valves with the minimum rated working pressure of the system applied across the valve. For example, if the diverter system is rated as a 300 psi system, the actuators should be capable of operating the valves against 300 psi pressure.

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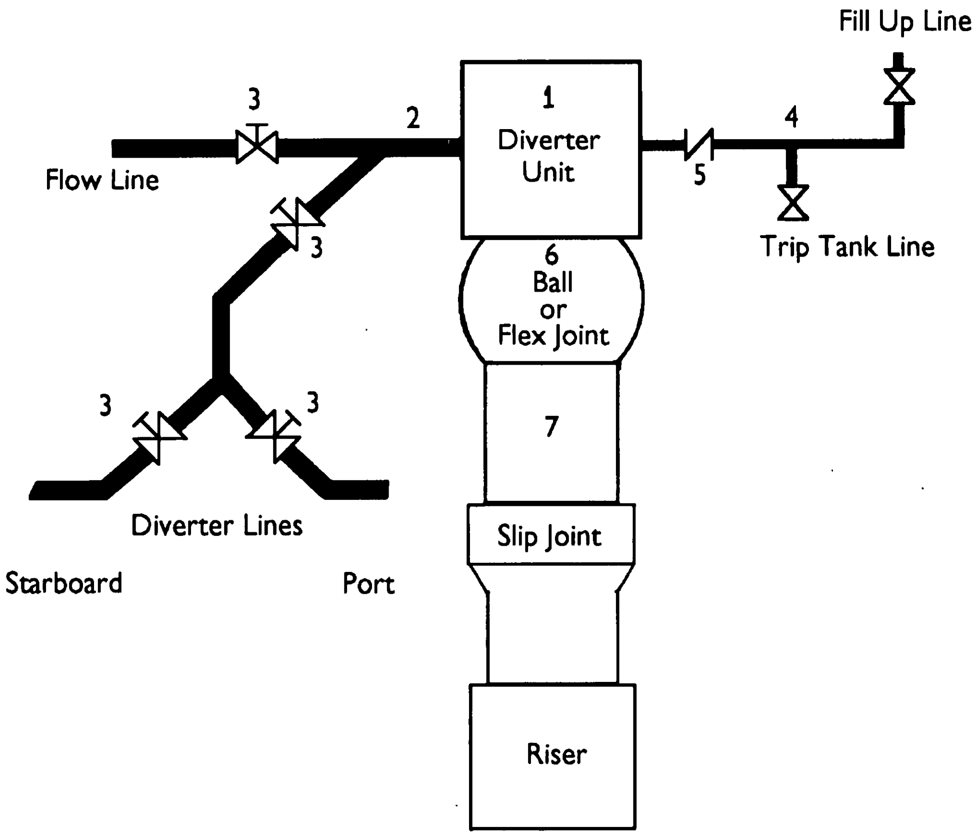
Figure 2.2.1

EXAMPLE DIVERTER SYSTEM FOR A FLOATING RIG



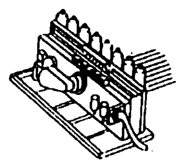


TABLE 2.2.1

FLOATER DIVERTER SYSTEM EQUIPMENT GUIDELINES

IT IS RECOMMENDED THAT ALL COMPONENTS OF THE DIVERTER SYSTEM HAVE A WORKING PRESSURE OF AT LEAST 300 PSI WHEN THE DIVERTER SYSTEM IS TO BE USED AS THE PRIMARY RESPONSE METHOD IN A WELL CONTROL SITUATION.

1. *Acceptable Diverter Units*	• The Regan KFDS is the prevalent diverter unit on existing floating rigs. Vetco KFDS-CSO and Hydril FS 21-500 units have been placed in field service in the late 1980's.
2. *Diverter Lines*	• A minimum of one 12-inch nominal (12.75 inch OD) or larger diverter line, with branch lines for downwind diversion capability. MMS requires a minimum 12.0 inch ID.
	• The lines should be at least Schedule 30, Grade B pipe with 0.33-inch or greater wall thickness.
	• Diverter line connections should be welded or ANSI/API flange connections; metal ring gaskets are preferred.
	• 90-degree and sharp turns must be targeted. Gradual turns should be long radius ells, elbows, or pipe turns.
	• Turns, welds, and pipe sections downstream of valves should be ultrasonically inspected if remaining wall thickness is suspect.
	• Lines must be secured to structural members and supported to handle dynamic loading.
3. *Flowline and* Diverter Line Valves	• Air or hydraulic remote operated full opening valves are required. API ball or gate valves are preferred. Butterfly valves are not acceptable. Knife gate valves are acceptable on 150 psi working pressure systems.
	• When used as the primary response to well control situations, the diverter line valves should be equipped to fail open, and the flowline valve should be equipped to fail close and also have a manual override.
	• Valves must be capable of being opened against working pressure of the diverter system.
4. *Auxiliary Line* Diverter	• A 2-inch or larger OD line to provide pump-in capability to the annulus.
5. *Auxiliary Line* Valve	• A remote operated valve or a check valve should be installed near the diverter unit.
6. *Ball Joint or* Flex Joint	• A low pressure ball joint with mechanical/grease seal or a flex joint with an elastomer seal.

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~~PE 913 712 colour Ø37~~

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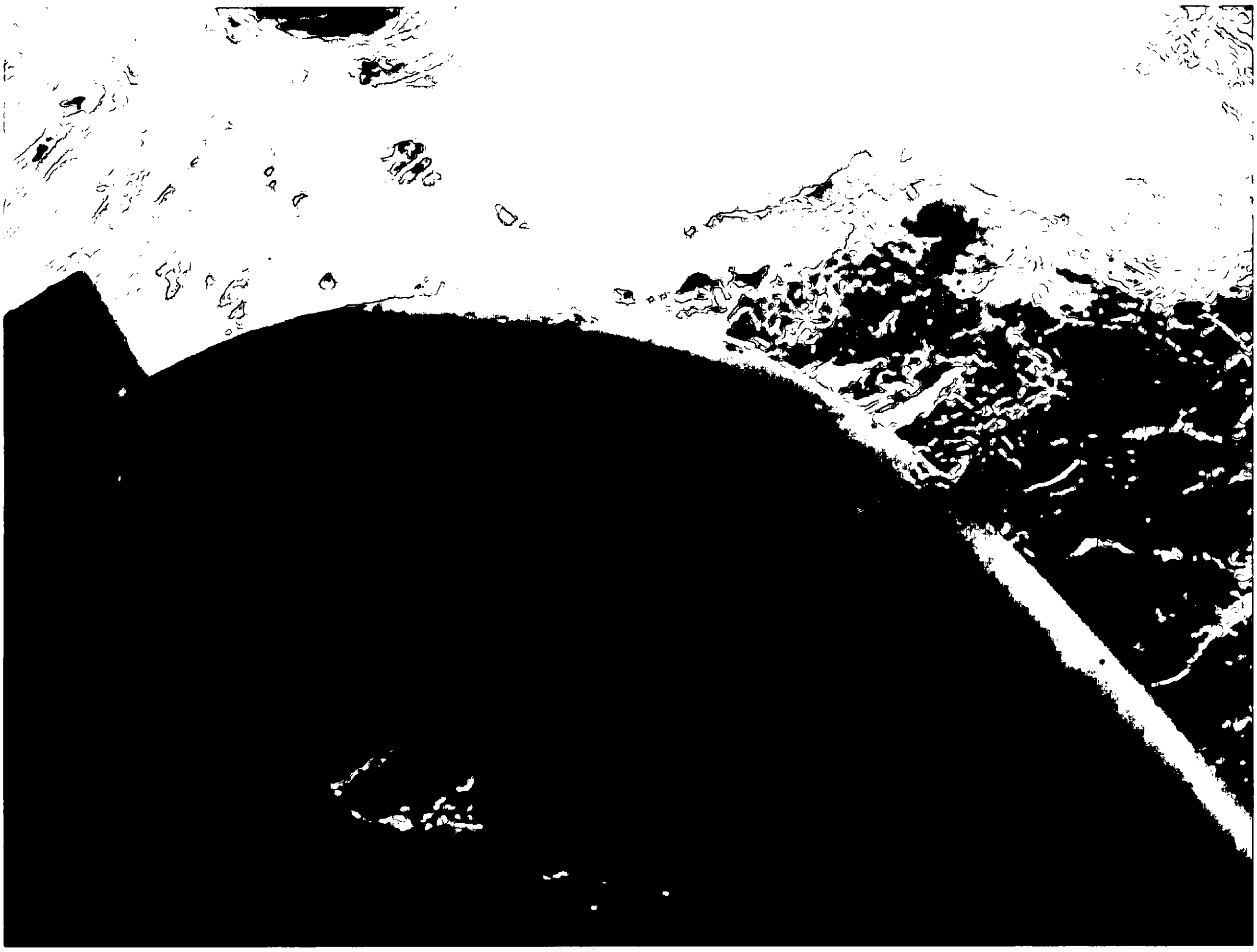
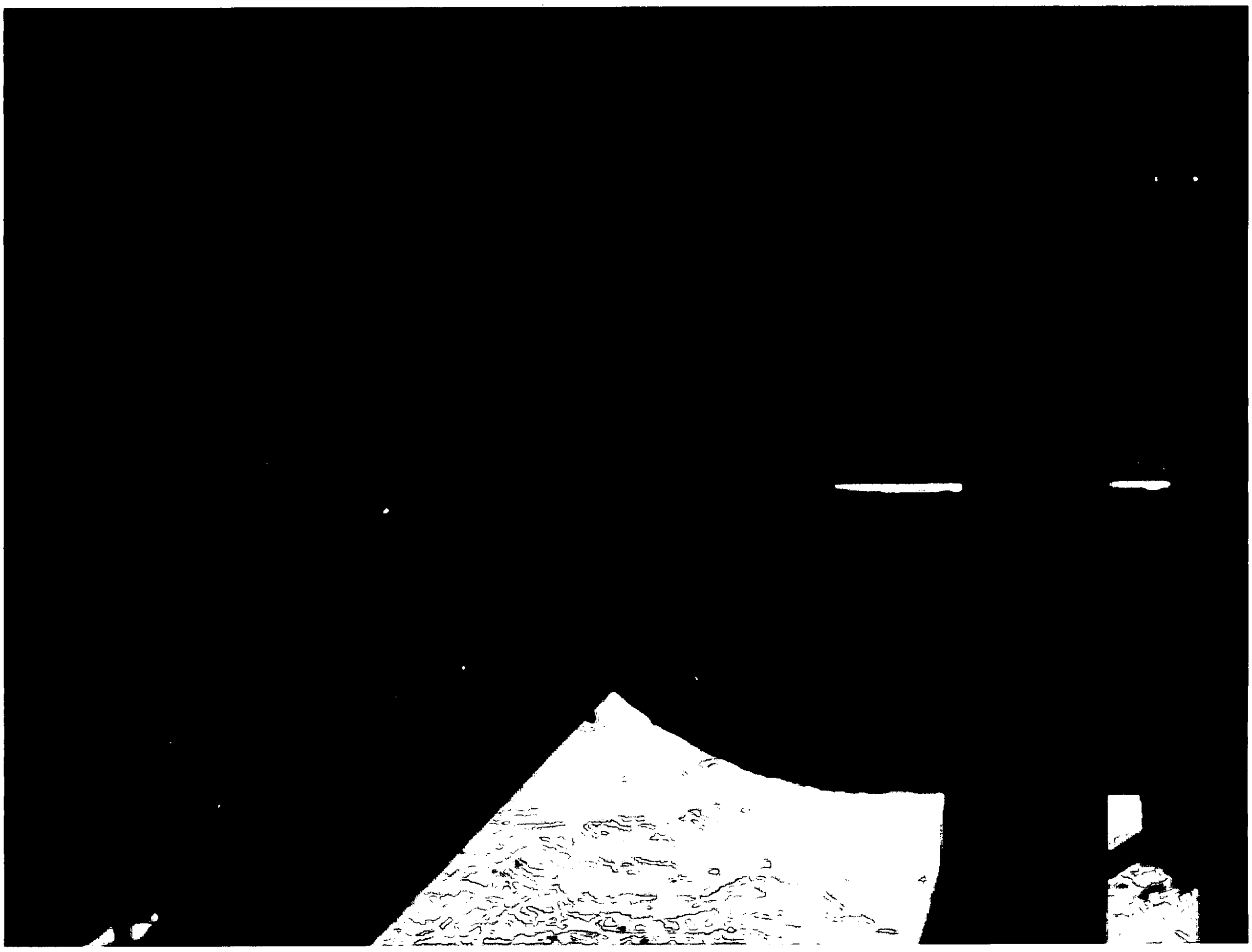


Pe 913712 - colour Ø39

913712 618



Pe913712_colour Ø40

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System 3B: Design Standards

SCOPE AND OBJECTIVES

The system objective is the maintenance and availability of standards and other useful reference information addressing critical aspects of programs, equipment, and procedures.

PROCESSES AND PROCEDURES/RESPONSIBLE AND ACCOUNTABLE RESOURCES

A. GENERAL STANDARDS AND REFERENCES

A system shall be maintained to ensure that the latest versions of design standards and references are readily available to ExxonMobil Drilling personnel.

Current Standards and References

An updated **Current Version List of Standards and References** shall be issued at least annually. The current list is provided in the Appendix to this Element.

Additions to and/or Changes in Drilling Standards

Accessibility, additions to and/or changes in the Drilling Standards will be reviewed and approved by appropriate management prior to acceptance and implementation.

Review and Approval Process: See Process Flow Diagram **Review of New/Revised Standards** in the Appendix to this Element.

Responsibility: Drilling Technical Manager

Approval Authority: Drilling Manager

Distribution of Drilling Standards

Company Manuals and References

Company manuals are generally distributed through attendance at Company-sponsored schools and seminars. Company manuals may also be acquired through the Records Technician.

Responsibility: Records Technician

Industry Standards Publications (API, IADC, etc.)

Industry Standards shall be maintained in the Drilling Technical Library.

Responsibility: Records Technician

Vendor Documents

Vendor documents typically shall be obtained directly from the vendors.

Responsibility: Drill Team members

System 7: Management of Change

SCOPE AND OBJECTIVES

The system objective is to assure that significant changes in plans, procedures, equipment, or personnel for critical operations receive adequate review and approval. This includes the identification and implementation of regulatory changes.

PROCESSES AND PROCEDURES/RESPONSIBLE AND ACCOUNTABLE RESOURCES

A. CHANGES IN PLANS AND PROCEDURES

Appropriate documentation, management level and appropriate engineering review and approval of significant changes to approved drilling plans and procedures, and response actions to unexpected events will be conducted at a level commensurate with potential risk. If there is doubt regarding a decision involving safety, health or environmental risk, the decision shall be reviewed with management.

A ***significant change*** is defined as any change (including **permanent**, **temporary** and **emergency changes**) that increases health, safety, public, environmental, or financial risk. Any change in the Risk Matrix (See System 2) that will **increase** either the probability of occurrence or the severity of consequences for a given risk scenario is considered a significant change. (For example, changing probability from D to C, or consequence from III to II, is considered significant even if the risk category did not change.) These ***significant*** operational changes will typically occur after original well planning and during drilling and completion operations. Non-adherence to design standards should be authorized with exceptions as described in Section B in this System.

Plan/Procedure Changes Needing Review and Documentation

The following changes could be deemed significant and would then require approval by the same level as original approver (prior approval is not required, but is encouraged if time permits):

Well Design:

- Casing size, weight, grade, connection (excluding design and safety factors)
- Wellhead and Christmas tree equipment (excluding design and materials)

Programs and Standard Operations Manual Procedures:

- Mud density outside of Drilling Program tolerance or range
- Change in any number outside of a critical specified range

Drilling Equipment:

- BOP stack equipment, control system and capacity

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- Diverter equipment (except as defined in design standards)
- Mooring system (except as defined in design standards)

Exceptions to the Drilling Standard Operations Manual are not subject to the Change Management System requirements unless they specifically meet the definition of a significant change, "...increases health, safety, public, environmental, or financial risk".

Plan/Procedure Change Documentation and Review/Approval Process

Each significant change will be documented by providing the following information:
- Description and reason for the change
- Nature and level of engineering review made
- Risk mitigation measures to be implemented
- Name of the individual approving the change
- Date the change was approved
- Duration of the change, i.e., on-going, duration of well or specified operation, until specified date or point in the well

The required information shall be documented on the Daily Drilling Report, in an Email note, or on a **Management of Change Worksheet** (See form in appendix to this Element), and reviewed/approved by Management. In any case, all MOCs for the well should also be captured in the **Management of Change Summary** (See the Management of Change Summary form in the Appendix).

Responsibilities:
- Identification and Documentation: Drilling Supervisors and Drilling Engineers
- Review: Operations Superintendent, Engineering Manager, Supervising Engineer

Approval Authority: Field Drilling Manager or commensurate with the level of anticipated risk (Higher, Medium or Low – See System 2)

B. KEY PERSONNEL REPLACEMENT

Appropriate documentation and management level review and approval of replacement of key personnel will be conducted at a level commensurate with potential risk.

The Senior Drilling Leadership Team (VP Drilling, Drilling Manager, Operations Managers (3), Technical Manager, Planning Manager and HR Manager) has identified the following Drill Team positions as **Key Personnel**. Replacement of these key Drill Team personnel will be considered a ***significant change*** and will require adequate documentation, review, and management approval prior to replacement.

- Field Drilling Manager
- Operations Superintendent
- Engineering Manager

Key Personnel Replacement Documentation and Review/Approval Process

The Senior Drilling Leadership Team meets on an as needed basis to identify and develop action items for Key Personnel replacement. Each proposed Key Personnel change is documented, an action item created, and a member of the Senior Drilling Leadership Team is assigned to seek the proper levels of endorsement and approval.

Responsibilities:

- Identification of Key Personnel replacement is the responsibility of the Senior Drilling Leadership Team
- Documentation consist of a Key Personnel replacement spreadsheet and action item list which is maintained by the Technical Manager
- Appropriate level of review and/or endorsement could include all or part of the following: EMDC Vice President of Drilling, EMDC Employee Development Council (EDC), Upstream Engineering Resource Council (ERC)

Approval Authority:

Vice President of Drilling will approve Engineering Managers and Operations Superintendents, CL 28 and below that do not require EMDC Compensation and Executive Development (COED) Committee approval. The EMDC COED Committee will approve all Field Drilling Managers and Operations Superintendents, CL 29 and above.

C. EXCEPTIONS TO DESIGN STANDARDS

Appropriate documentation, engineering analysis, management level and approval of significant exceptions to design standards will be conducted at a level commensurate with potential risk. If there is doubt regarding a decision involving safety or environmental risk, the decision shall be reviewed with management.

Exceptions to design standards will typically be done during well planning and prior to drilling operations. Changes during the operational phase will normally be through the MOC process described in Section A above.

Design Standard Exceptions Needing Review and Documentation

There are occasions where it is acceptable to relax design standards after assessing the potential for increased health, safety, public, environmental or financial risk. Design standards for which exceptions might be requested include areas such as:

- Casing design (design and safety factors)
- Wellhead and Christmas tree equipment (design and materials)
- BOP equipment (diverters, choke and kill lines)
- MODUs (safety, mooring)
- Service vessels
- Drill string design

Design Standard Exception Change Documentation and Review/Approval Process

Each exception to a design standard will be documented by providing the following information:

- Design standard, including version, for which the exception is requested
- Description and reason for the exception
- Recommended alternative to the standard with justification
- Nature and level of engineering review made (including experts consulted, potential impact on safety/health/environment and consequences)
- Risk mitigation measures to be implemented
- Name of the person approving the exception
- Date the exception was approved
- Duration of the exception, i.e., on-going, duration of well or specified operation, until specified date or point in the well

The required information shall be documented on a **Management of Change Worksheet** (See form in the Appendix to this Element) with supporting documentation attached as required, and reviewed/approved by Management. Authority approval guidelines for exceptions to design standards are given in System 3B (Drilling Design Standards). A copy shall be sent to the Drilling Technical Manager.

Responsibilities:
- Identification and Documentation: Drilling Supervisors and Drilling Engineers
- Review: Operations Superintendent, Engineering Manager, Supervising Engineer

Approval Authority: Field Drilling Manager or commensurate with the level of anticipated risk (Higher, Medium or Low – See System 2)

D. MANAGEMENT OF CHANGE SUMMARIES

Drill Teams shall maintain a record of all significant changes and exceptions and prepare a listing of these on the **Management of Change Summary** (See the Management of Change Summary form in the Appendix). This Summary shall be included in the **Final Well Report** and maintained in the Drill Team files. All MOC Summary forms shall be forwarded to the Drilling OIMS Coordinator at year end (See Annual MOC Report below). Learnings resulting from such changes that could impact all ExxonMobil Drilling operations shall also be included with the **Preliminary Well Cost Reconciliation Summary** for the well, if applicable.

Responsibilities: Initiator of Change, Field Drilling Manager

E. ANNUAL MANAGEMENT OF CHANGE REPORT

Once each year, ExxonMobil Drilling will compile and analyze the Management of Change Summaries for all wells drilled during the year in an **Annual Management of Change Report**. The resulting report, which will be disseminated throughout the Drilling Organization, will contain an analysis of the MOC data, along with conclusions and recommendations for improving the MOC System. Exception change data may be used as feedback for making changes to published design standards. An evaluation of whether changes should be made to either the Drilling OIMS Manual and/or the Drilling Standard Operations Manuals will also be included.

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Change Worksheet

WELL: BEARDIE-1	COUNTRY: BASS STRAIT, AUSTRALIA
RIG: OCEAN BOUNTY SEMISUBMERSIBLE	DATE INITIATED: 14 JUNE/02

TYPE OF CHANGE (CHECK ONE):

☐ WELL DESIGN
☐ DRILLING PROGRAM/PROCEDURE
☐ CRITICAL EQUIPMENT/EQUIPMENT O&M
☐ RESPONSE TO UNEXPECTED EVENTS
☐ PERSONNEL
☐ OPERATIONS MANUAL PROCEDURE
☐ RISK ASSESSMENT FOLLOW-UP
☒ SPECIFICATION/STANDARD: UPSTREAM DESIGN GUIDANCE MANUAL - SERVICE VESSEL SAFETY

DESCRIPTION/REASON FOR CHANGE:

EMDC OIMS

EMDC OIMS Section 8-16 requires pre-contract inspections of marine Service Vessels

DESCRIPTION/REASON FOR CHANGE

With it being unclear if previous marine service vessel inspections satisfy OIMS, and based on this assessment, we recommend your exception approval be given to waive further inspections of the Swire Pacific Conqueror and Pacific Sentinal for one well drilling programme for Beardie-1.

Marine Service Vessel Acceptance - EMDC OIMS Section 8-16

Work boats and anchor handling vessels shall be inspected against the Basic Standard and contract specifications either before acceptance or as soon as practical thereafter. If the vessel has been or is contracted by an affiliate such as EMPC, the Operations Superintendent should work with that Affiliate and modify the inspection timing/process accordingly.

A Service Vessel Inspection Checklist (Service Vessel Checklist .doc) is available on the LAN at................and contains both initial and periodic inspection sections.

Marine Service Vessel Acceptance Inspections should be performed by a qualified Contractor or ExxonMobil personnel.

Responsibility: Operations Superintendent

Approval Authority for Exceptions to the Design Guidance Standad, Part 3:

Drilling Operations Manager, with notification to the Drilling Technical Manager. Field Drilling Manager for all other exceptions.

Previous Vessel Inspections:

In May 2001, Prior to the drilling of East Pilchard-1, full pre-charter inspections of the Swire Marine Service Vessels, Pacific Conqueror and Pacific Sentinal, were initiated by Esso and undertaken at Launceston and Portland by Marine Surveyor Sorab C Bilimoria. A list of observations was prepared for each vessel.

For the drilling of Beardie-1 in July 2002 with the same MODU and utilising the same two service vessels it is not planned that the full pre-charter inspections will be repeated. To close out important action items Swire have provided comments on the previous observation lists and Esso's Ray Prain has reviewed Swires comments.

Swire have confirmed that the vessels have not been modified since the previous inspection. Esso Marine Supervisor, Ray Prain, has indicated his satisfaction with Swires response to Observations from the May 2001 inspections.

RISK ASSESSMENT SUMMARY (USE RISK MATRIX - SEE ELEMENT 2 IN DRILLING OIMS MANUAL):

HSE PROBABILITY: A☐ B☐ C☐ D☐ E☒ CONSEQUENCE: I☒ II☒ III☐ IV☐
FINANCIAL PROBABILITY: A☐ B☐ C☐ D☐ E☒ CONSEQUENCE: I☐ II☐ III☒ IV☐

EMDC RISK MATRIX: - MEDIUM LOW

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RISK MITIGATION MEASURES (PRESCRIBED PROGRAM LIMITS):	
The Esso Drilling Supervisor will oversee a Periodic Service Vessel Inspection prior to the drilling of Beardie-1, or as early as practical.	
TRAINING/COMMUNICATION REQUIRED TO IMPLEMENT CHANGE? ☐ NO ☒ YES (DESCRIBE)	
The requirement for the Periodic Service Vessel Inspection prior to the drilling of Beardie-1, or as early as practical, will be conveyed to the Esso Drilling Supervisor on the Ocean Bounty.	
DATE: 14/ JUNE/02 TIME: 1500 HR	DURATION: UNTIL 1/DEC/02
EFFECTIVE	REVIEWED BY: F.W. KRATZER
INITIATED BY: ANDY MCGREGOR	DATE APPROVED: 25/06/2002
APPROVED BY: D.L. WHITEMAN	ORIGINAL SIGNED BY DAN WHITEMAN

INSTRUCTIONS:
This form may be used to document significant drilling and operating plan changes. A significant change is one that increases health, safety, public, environmental, or major financial risk; for example any change that will increase the probability of occurrence or increase the severity of consequences for a given risk scenario is considered significant. The individual initiating a change has responsibility for describing the change, assessing risks, ensuring mitigation measures are implemented and obtaining the necessary approvals. For additional information, see Element 7 - Management of Change in the Drilling OIMS Manual.

formmoc.doc 5/01/00

- API RP 2I, "In-service Inspection of Mooring Hardware for Floating Drilling Units"

Checklist

A mooring equipment inspection checklist shall be developed, customized for the specific rig and anchor handling vessels, including the following:

- Magnetic particle inspection (MPI) of chain connecting links (i.e. Baldt, Kenter links)
- No links from castings. Forged links only.
- No field welds on chain links or studs
- Covers on chain lockers
- Pendant buoy lights and/or radar reflectors may be required by local regulations

Responsibilities: Operations Superintendent, assisted by Engineering Manager, Supervising Engineer and Drilling Technical Section

Approval Authority for Exceptions to the Design Guidance Standard, Part 3: Drilling Operations Manager, with notification to Drilling Technical Manager. Field Drilling Manager for all other exceptions.

Marine Service Vessel Acceptance

Basic Standard: Exxon Upstream Design Guidance Document - Service Vessel Safety (Design Guidance Standard)

Work boats and anchor handling vessels shall be inspected against the Basic Standard and contract specifications either before acceptance or as soon as practical thereafter. If the vessel has been or is contracted by an Affiliate such as EMPC, the Operations Superintendent should work with that Affiliate and modify the inspection timing/process accordingly.

A Service Vessel Inspection Checklist (Service Vessel Checklist.doc) is available on the LAN at I:Emdc/Drilling/Technical/OIMS/Forms and contains both initial acceptance and periodic inspection sections.

Marine Service Vessel Acceptance Inspections should be performed by a qualified Contractor or ExxonMobil personnel.

Responsibility: Operation Superintendent

Approval Authority for Exceptions to the Design Guidance Standard, Part 3: Drilling Operations Manager, with notification to Drilling Technical Manager. Field Drilling Manager for all other exceptions

Occupational Health Inspection

Basic Standard: Occupational Health Inspection Guidelines for Upstream Operations (in Drilling Safety Management Program Manual Appendix)

For operations in regions where occupational health is an issue, an inspection by ExxonMobil IMOH may be required as soon as practical after ExxonMobil Drilling personnel are onsite. See System 2 for determination if an inspection is required. The

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Operations Superintendent may also determine that a re-inspection by IMOH is warranted based on contractor performance and/or the results of a rig inspection.

Responsibility: Operations Superintendent to contact IMOH to initiate inspection (IMOH, or its designee, to conduct inspection).

Approval Authority: Field Drilling Manager (**including alternatives/exceptions**)

E. CONTRACTOR SAFETY STRATEGIES

The Safety Program, including Contractor Safety, is documented in the EMDC Drilling Safety Management Program Manual (See System 5D).

F. CONTRACTOR PERIODIC EQUIPMENT INSPECTIONS

Periodic Drilling Rig Inspections

Rig safety inspections shall be made at least once each calendar month.

(If rig is active less than one-half month, an inspection is not required in that month.)

- The Operations Superintendent will typically lead the Inspection Team on-site. The Inspection Team Leader may be delegated by the Field Drilling Manager to another person, but at a frequency not to exceed once every six months for each rig.
- Drilling contractor and other third party representation shall be rotated.
- The "Operations Superintendent Rig Inspection Report" in the Drilling SMP Manual shall be used for these inspections.
- The inspection date shall be entered in the DRS Daily Drilling Report , but only if the inspection was personally led on-site by the Operations Superintendent.
- The completed Inspection Report shall be given to the Field Drilling Manager, along with a short, written report detailing action items. Copies of the report shall be maintained by the Field Drill Team for the duration of the drilling campaign.

Responsibility: Operations Superintendent

Approval Authority: Field Drilling Manager (**including alternatives/exceptions**)

Periodic Marine Vessel Inspections

Marine Service Vessel inspections shall be made monthly.

If the vessel has been or is contracted by an Affiliate such as EMPC, the Operations Superintendent or assigned Drilling Supervisor should work with that Affiliate and modify the inspection timing/process accordingly.

- Check general safety and housekeeping effectiveness
- Verify compliance with written preventive maintenance schedule.

A Service Vessel Inspection Checklist (Service Vessel Checklist.doc) is available on the LAN at I:Emdc/Drilling/Technical/OIMS/Forms and contains both initial acceptance and

Response to ESSO's Observations of the Pacific Conqueror And Pacific Sentinel, May 2001
Monday, 27 May 2002

Pacific Conqueror

1: Unchanged
2: Unchanged
3: Unchanged
4: Unchanged
5: Unchanged, 2 x pelican hooks onboard for backup in the event of the failure of the sharks jaws.
6: Unchanged
7: Unchanged
8: Vessel hull insurance is current, expiry date is 18th August 03
9: Fire extinguishers last service on the 30th July 01, next service is on or before the 30th July 02
10: Rubber seals have been repaired/replaced as required.
11: Unchanged
12: Safety Maintenance records are only filed at the end of each month, during the month the records are kept on the computer hard drive.
13: Cylinders in use are together, but spare cylinders are stowed apart.
14: No individual training records are kept onboard the vessel.
15: Unchanged
16: New scramble nets have been fitted and are presently in good condition
17: Light has been repaired
18: Current certificates are presently not posted, vessel has been instructed to post current certificates
19: New tank capacity plans have been posted
20: There is no Kg vs. Draft or GM vs. Draft graphs available for the vessel.
21: The vessel has a painted and marked rescue zone on each side.
22: 200Litre drums have been removed; there is unrestricted access to the life raft.
23: Raft has not been moved; lights vision complies with the COREGS.
24: The manual release for the starboard aft life raft is still on the outboard side.
25: The fire hose nozzles are stowed in the boxes along with the hoses, but are not left attached.
26: New brake drum and bands have been fitted.

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Response to ESSO's Observations of the Pacific Conqueror And Pacific Sentinel, May 2001
Monday, 27 May 2002

Pacific Sentinel

1: Unchanged
2: Unchanged
3: Unchanged
4: Unchanged
5: Radio's that were on order have been supplied, 3 units onboard
6: A new EPIRB was fitted during the dry dock May 2001.
7: Unchanged
8: Unchanged, 2 x pelican hooks onboard for backup in the event of the failure of the sharks jaws.
9: All machinery onboard is in running condition
10: Unchanged
11: Unchanged
12: Hull insurance is current and expiry date is 18th August 2003
13:Fire extinguishers last serviced 14th May 2002.
14: Rubber seals have been repaired/replaced as required.
15: Unchanged
16: Safety maintenance records are filed at the end of each month, during the month they are maintained on the computer hard drive.
17: Oxygen and acetylene cylinders in use are stowed together, spare cylinders are stowed apart.
18: No individual training records are kept onboard the vessel.
19: Unchanged

"Sam Pullan"
<spullan@spopty.com.au
>

13/06/2002 09:55 AM
Please respond to
spullan

To: <andrew.mcgregor@exxonmobil.com>
cc:
Subject: RE: FW: Vessel Inspections

913712 632

Andy,

No modifications have been made to either vessel since they last worked with Esso in mid 2001.

Kind Regards.

-----Original Message-----
From: andrew.mcgregor@exxonmobil.com
[mailto:andrew.mcgregor@exxonmobil.com]
Sent: Thursday, 13 June 2002 6:27 AM
To: spullan@spopty.com.au
Cc: ray.prain@exxonmobil.com; frank.w.kratzer@exxonmobil.com; chris.p.meakin@exxonmobil.com; brigham.e.bigby@exxonmobil.com
Subject: Re: FW: Vessel Inspections

Hi Sam,

Thanks for the response. I will forward these to Ray Prain for review.

Could you also respond to my e-mail of May 24th, copied below, asking if any modifications have been made to the vessels.

I'm still to locate the Esso Periodic Service Vessel Inspection Checklist and will fax to you shortly.

Thanks

Andy

----- Forwarded by Andrew McGregor/U-SouthPacific/ExxonMobil on 13/06/2002 08:28 AM -----

Andrew McGregor
To: spullan@spopty.com.au
cc: Chris P Meakin/U-SouthPacific/ExxonMobil@xom, Frank W Kratzer/U-SouthPacific/ExxonMobil@xom, Ray Prain/U-SouthPacific/ExxonMobil@xom
24/05/2002
09:16 AM
Subject: Beardie-1 Pacific Sentinel and Pacific Conqueror

Hi Sam,

Esso would also appreciate advice from Swire of all modifications made to the Sentinel and the Conqueror since the May 2001 inspections, for our review as to whether or not these modifications may be outside Esso Basic Standard Guidelines.

We also anticipate that Esso "Periodic Service Vessel Inspection" requirements will be satisfied with the completion of a brief inspection under the control of the Esso Drilling Supervisor when Esso pick up the vessels.

I'll send you a copy of this checklist as a guide to the vessel Captains as to what is involved.

Regards

Andy McGregor

"Sam Pullan"
<spullan@spopty To:
<andrew.mcgregor@exxonmobil.com>
.com.au> cc:
Subject: FW: Vessel
Inspections

27/05/2002
06:06 PM
Please respond
to spullan

Reference your fax of 23rd May and e-mail of 24th May.

Please note the attached remarks from John Nash who is the Swire Technical Manager.

Kind Regards.

-----Original Message-----
From: John Nash [mailto:jnash@spopty.com.au]
Sent: Monday, 27 May 2002 4:04 PM
To: Sam J Pullan
Subject: Vessel Inspections

Sam,

Please find attached the responce to the vessel inspections carried out on the P. CQE and the P. SEN by ESSO in May 01.

Rgds
John

Incoming mail is certified Virus Free.
Checked by AVG anti-virus system (http://www.grisoft.com).
Version: 6.0.363 / Virus Database: 201 - Release Date: 21/05/2002
(See attached file: Response to ESSO.doc)

Incoming mail is certified Virus Free.
Checked by AVG anti-virus system (http://www.grisoft.com).
Version: 6.0.365 / Virus Database: 202 - Release Date: 24/05/2002

913712 634

Andrew McGregor

14/06/2002 01:16 PM

To: Ray Prain/U-SouthPacific/ExxonMobil@xom
cc:
Subject: Re: Esso Beardie-1, Service Vessel Acceptance

Hi Ray,

With confirmation passed on to you that Swire have not modified the Vessels since last years inspections, and Swire's comments on the observations in the inspections, can I conclude that you are happy that all appropriate checks have been completed?

We would plan that a Periodic Service Vessel Inspection be conducted before Beardie-1, or as soon as practical thereafter, (probably directed by the Esso Drilling Supervisor?), generally along the lines of the OIMS form for Periodic Service Vessel Inspection Checklist.

Cheers

Andy

Ray Prain

Ray Prain

24/05/2002 06:23 AM

To: Andrew McGregor/U-SouthPacific/ExxonMobil@xom
cc: David W Bailey/U-SouthPacific/ExxonMobil@xom, Frank W Kratzer/U-SouthPacific/ExxonMobil@xom
Subject: Re: Esso Beardie-1, Service Vessel Acceptance

Andrew
The only other check to complete is that there has been no modifications to the boat that would put it outside the guidelines.

Cheers

Ray Prain
Acting Terminal Superintendent
Barry Beach
Ph 0356-880225
Pager 96250728
Fax 0356881555

Andrew McGregor

Andrew McGregor

05/22/02 04:47 PM

To: spullan@spopty.com.au
cc: Chris P Meakin/U-SouthPacific/ExxonMobil@xom, Ray Prain/U-SouthPacific/ExxonMobil@xom, Frank W Kratzer/U-SouthPacific/ExxonMobil@xom, Colin A Johancsik/U-SouthPacific/ExxonMobil@xom, Daniel L Whiteman/U-SouthPacific/ExxonMobil@xom
Subject: Esso Beardie-1, Service Vessel Acceptance

Hi Sam,

I'm currently working the Esso process of Service Vessel Acceptance for the forthcoming drilling operation at Beardie-1 with the Ocean Bounty.

Esso process requires an inspection of the MV Pacific Conqueror and MV Pacific Sentinel against an EMPC Service Vessel Inspection Checklist prior to acceptance.

This process was completed for the Conqueror and the Sentinel prior to the East Pilchard drilling operation in 2001 with a detailed inspection undertaken at Portland in May 2001.

I been advised by Esso's Ray Prain that the inspection last May fulfils Esso process requirements for Service Vessel Acceptance for Beardie-1 operations subject to an update report from Swire on the list of observations that came out of the 2001 inspections.

Please provide me with an update report with confirmation that all items from these Lists of Observations for the two vessels, that require action, have been closed out.

Regards

Andy McGregor

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M.V. PACIFIC SENTINEL
At Launceston Dry-Dock

List of Observations

Vessel was in Launceston dry-dock. This was an unscheduled dry-dock to rectify the loose rudder pin problem.
DNV surveyors were in attendance and conducting various surveys.
Numerous technicians, repair and dry dock personnel were around the vessel.

1. Main winch controls located in wheelhouse. Tugger winch controls are next to the winches, but the winches have a metal framework with a strong mesh to protect the operator.

2. Fuel oil capacity listed is the total capacity available on board. This can be split up as desired bearing in mind the need of the vessel employed.
3. No additional refrigerated capacity is available for stores except for own use.
4. Starboard radar was being serviced by the attending technician.
5. Only one hand held portable VHF radio was on board. We were made to understand that two were on order.
6. The emergency beacon (EPIRB) was found to be defective and a new one was ordered by the attending technician.
7. The chain lockers were capable of self-tiering only in the sense of piling up as in a normal chain locker. They do not have any other means of self-tiering.
8. Two portable Pelican hooks are available on board. The vessel can be instructed to land these ashore.
9. No machinery was tested/operated due limited resources and power supply available.
10. No life boats on board. Their life saving requirement is fulfilled by the life rafts.
11 No emergency generator on board. The batteries fulfill all emergency power requirements and are accepted by DNV.
12. The hull insurance was not current and was noted to have expired on 18th August 2000.
13. The portable and fixed fire extinguishing equipment was serviced and surveyed by AMDAC on 29th Nov 2000
14. Rubber coaming (packing) was mainly soft, but few were noted to be hard, with cracks, and/or paint.
15. No stern gate is fitted on the vessel. Provision exists to stretch a wire rail across the stern as a single tier rail.
16. Current safety maintenance records were not on file, but were noted to have been updated on their computer hardware.
17. Oxygen and acetylene bottles are stowed in the same compartment.
18. Unable to locate any training certificates for "Basic sea survival", "Basic seamanship" or refresher training courses".
19. Emergency fire pump is located on the main deck in front of the main wire reels and is driven by a diesel engine.

M.V. PACIFIC CONQUERER
At Portland Berth Number 6

List of Observations

Vessel was at Portland berth number 6. We noted that she discharged containers, bunkered and conducted repairs to her stern during her stay.

1. Main winch controls located in wheelhouse. Tugger winch controls are next to the winches, but the winches have a metal framework with a strong mesh to protect the operator.
2. Fuel oil capacity listed is the total capacity available on board. This can be split up as desired bearing in mind the need of the vessel employed.
3. No additional refrigerated capacity is available for stores except for own use. Loading reefer containers on deck and plugging them into power sockets can obtain refrigerated capacity.
4. The chain lockers were capable of self-tiering only in the sense of piling up as in a normal chain locker. They do not have any other means of self-tiering.
5. Two portable Pelican hooks are available on board. The vessel can be instructed to land these ashore.
6. No life boats on board. Their life saving requirement is fulfilled by the life rafts.
7. No emergency generator on board. The batteries fulfill all emergency power requirements and are accepted by DNV.
8. The hull insurance was not current and was noted to have expired on 18th August 2000.
9. The portable and fixed fire extinguishing equipment was serviced and surveyed by private companies.
10. Rubber coaming (packing) was mainly soft, but few were noted to be hard, with cracks, and/or paint. In a few locations we noted gaps at the joints of these packings.
11. No stern gate is fitted on the vessel. Provision exists to stretch a wire rail across the stern as a single tier rail.
12. Current safety maintenance records were not on file, but were noted to have been updated on their computer hard drive. The staff were awaiting the end of the month prior to printing.
13. Oxygen and acetylene bottles are stowed in the same compartment.
14. We were unable to locate any training certificates for "Basic sea survival", "Basic seamanship" or refresher training courses".
15. Emergency fire pump is a portable pump.
16. The scramble nets on both sides are showing signs of deterioration and sections appear to have been affected by chemicals and/or ultra violet rays.
17. The starboard side tugger winch deck self-igniting light does not work.
18. Certificates posted are old and not current.
19. Tank and capacity drawings are posted, but they appear faded and are hard to read.
20. KG vs. Draft or GM vs. Draft graph was not available on board.
21. Rescue zones are not painted/marked.
22. Access to port forward life raft is restricted by the 200 L drums stored alongside the rail.

23. Port and Starboard side forward life rafts hamper the clear and unobstructed view of the sidelights.
24. Starboard aft life raft manual release is located on the outboard side and is not accessible.
25. No fire nozzles were connected to the fire hoses.
26. Port tugger winch brake band area is covered with thick rust scale.

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ExxonMobil Development Company
Drilling

Service Vessel Inspection Checklist

Vessel: **M.V. Pacific Highway**

Inspection Date: **09th May 2001**

Inspection Site: **Launceston Dry Dock**

Surveyor(s): **Sorab C. Bilimoria**

____

Source file (LAN): i:\Emdc\Drilling\Technical\OIMS\forms\service vessel checklist.doc

913712 640

Executive Summary

*The **Service Vessel Inspection Checklist** was prepared to provide:*

- *assistance in inspecting service vessels before and during charter hire periods, and*
- *a systematic basis for documenting the results of these surveys.*

This document also formalizes the inspections in accordance with Operating Integrity Management System (OIMS) objectives.

This booklet is divided into three sections:

- Vessel description and desired specifications

  The vessel description section provides an overall description of the vessel and its equipment. Where appropriate, example specifications are noted.
- Acceptance test inspection checklist

  The acceptance test inspection section identifies tests and verifications that should be considered prior to placing the vessel under charter.
- Periodic in-service inspection checklist

  The in-service inspection section provides an itemized checklist for use during inspections after the vessel is placed on hire.

The acceptance test and in-service inspection checklists are based on current industry practice so some of the items may not be applicable to every service vessel in the fleet because vessels only have to comply with Rules and Regulations in effect at the time of construction unless local authorities dictate otherwise. In addition, requirements for some marine safety equipment are based on vessel size and gross tonnage.

The Service Vessel Inspection Checklist booklet is intended to be a guide. The actual scope of the inspection should be based on the type service, length of the charter, the area of operation, and past experience. The final decision rests with the operating management.

Table of Contents

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1. Introduction

The Service Vessel Inspection Checklist provides assistance in inspecting service vessels before and during charter hire periods.

This booklet is divided into three sections:

- *Vessel description and desired specifications*
- *Acceptance test inspection checklist*
- *Periodic in-service inspection checklist*

The vessel description section provides a place to enter a general description of the vessel and equipment for reference during the inspections. Desired specifications are also noted in the last column on every page. Particular attention should be paid to areas where the vessel fails to comply with specifications - both from an operational standpoint and from a documentation standpoint.

The Desired values listed in this section are an example. Vessel specifications will vary in other areas so appropriate changes should be made.

The acceptance test and in-service inspection checklists are intended to confirm that essential documentation is available on the vessel and that critical equipment is operational and properly maintained. The Checklists are based on current industry practice so some of the items may not be applicable to every service vessel in the fleet because vessels only have to comply with Rules and Regulations in effect at the time of construction unless local authorities dictate otherwise. Furthermore, requirements for some marine safety equipment are based on vessel size and gross tonnage (load carrying capacity). The Cargo Ship Safety Equipment Certificate for the vessel is intended to verify that the vessel's safety equipment meets applicable standards.

Note: The date of the next dry-docking inspection should be checked to determine if it falls within the Charter Period. If a scheduled inspection is due within the Charter Period, this subject should be addressed in the Charter Party.

2. General Vessel Description

Name of Vessel	M.V. Pacific Sentinel IMO Number 8126991
Type of Vessel	Anchor Handling and Tug Supply Vessel
Call Sign	HP7667
Date Constructed	1983
Ship Yard	Kaarbosmek Versted A/S, Norway
Class	DNV +1A1 – EO – Tug – SF Worldwide service
Flag	Panama
Port of Registry	Panama
Owner	
Name	Swire Pacific Offshore Pty. Ltd.
Address	300 Beach Road, The Concourse, Singapore
Telephone No.	
Fax No.	
Agents	
Name	Swire Pacific Offshore Pty. Ltd
Address	P.O. Box 666, Fremantle, Western Australia 6160
Telephone No.	61 8 9430 5434
Fax No.	61 8 9430 7849
Operator (If other than Owner)	
Name	Swire Pacific Offshore Pty. Ltd.
Address	2nd Floor, Queensgate Centre (cnr Williams & Newman Street) Fremantle,
Telephone No.	61 8 9430 5434
Fax No.	61 8 9430 7849

Vessel Particulars

		Actual	Desired
Length, Overall, ft.		64.88 m	190 - 225
Between perpendiculars, ft.		56.40 m	
Beam, Overall, ft.		N/A	40 - 52
Molded, ft.		13.8 m	
Depth, ft.		6.90 m	16 - 24
Draft, ft	Winter Loadline	5.776 m	
	Summer Loadline	5.899 m	14-20
Freeboard, ft	Winter Loadline	732 mm	
	Summer Loadline	609 mm	
Min. Stern Freeboard (@ maximum load condition), ft.		N/A	2
Displacement, MT		3250.3 MT	
Lightship, MT		1400.8 MT	
Total Deadweight, MT		1849.5 MT	850 min.
Gross Tonnage		1316	
Net Tonnage		395	
Arrangements			
Stack Location		Mezzanine deck, aft of accommodation	
Engine Room Location		Midships	
Winch Control Stations		Main winches' control in wheelhouse	
Cargo Deck Dimensions, ft. x ft.		11m X 38 m	30 x 100
Double bottom tanks around:			
Engine Room		Yes	Req'd
Bulk Cargo Tanks		Yes	Req'd
Steering Engine Space		Yes	Req'd
Liquid Mud Tanks		No	
Accommodations			
Crew		9 X 1 Berth	
Passengers		1 X 2 Berths	
		2 X 6 Berths	

Propulsion

		Actual	Desired
Main Propulsion			
	BHP Continuous	2 X 4080=8160 BHP	6140
	BHP Intermittent	N/A	
	Bollard Pull (at zero speed of advance)		
	Ahead, Kips	100 Tonnes	165 T
	Astern, Kips	N/A	
	Propellers		
	Twin/Single Screw	Twin screw	Twin
	Fixed/Controllable Pitch	Controllable pitch	
	Kort Nozzle	Yes	
*	Twin/Single Rudder	Twin spade	Twin
	Speed		
	Maximum, kts	15.3 Knots	
	Cruising, kts	12 Knots	
Bow Thruster			
	BHP Continuous	1 X 800 BHP	500
*	Thrust, kips	9.7tonnes	10
Fuel Consumption			
	Maximum speed, Kts @ MT/Day	15.3 kts @ 28 MT/day	
	Cruising, Kts @ MT/Day	12 knots @ 12.5 MT/day	
	Standby (port/anchored on location), MT/Day	0.7 MT/day	

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Cargo Capacity

	Actual	Desired
Fuel (for drilling rig), gallons	*Total 826 cubic metres*	75,000 gal
Fuel (for own consumption), gallons	*See above. Can be split as desired*	
Drill Water, Bbls.	*815 cubic metres*	3000 Bbl
Potable Water, Bbls.	*254 cubic metres*	1000 Bbl
Lube Oil, Bbls.	*7130 litres*	
Maximum Deck Load, MT	*700 metric tones*	650 (Min.)
Max. Below Deck Load with Max. Deck Load, MT	*1149 metric tonnes*	
Bulk Capacity (total), ft^3.	*170 cubic metres*	4000
No. Bulk Tanks	*4 tanks*	
Refrigerated Stores		
* Cold Storage, ft^3.	*For own use only*	200
Cool Storage, ft^3.	__________	200
Transfer Rates		
Fuel, Bbl/Hr. with 100 ft. head	*160m^3/hr at 80m head*	300
Potable Water, Bbl/Hr. with 100 ft. head	*100m^3/hr at 80m head*	300
Drill Water, Bbl/Hr. with 100 ft. head	*160m^3/hr at 80m head*	300
Bulk, cu. ft./hr.	*80mt/hr for delivery to semisubs*	20

Hose/Coupling	Size, in.	Male/Female
Fuel	4 inches	*Camlock female*
Drill Water	4 inches	*Camlock female*
Potable Water	4 inches	*Camlock female*

Navigation - Communication Equipment

		Manufacturer	Desired
Navigation Equipment			
	Magnetic Compass	HIVERSENS	Req'd
	Gyro Compass	Anschutz	Req'd
	Automatic Pilot	Anschutz Kiel, Standard 12	Req'd
*	Radar	Furuno FR 1011 & Tokimec BR 1510	Req'd
	Direction Finder	N/A	
	Fathometer	Furuno FE 881 Digital with graph	Req'd
	Decca Navigator	N/A	
	Wind Sensor	Thomas Walker	
	Loran	N/A	
Communication Equipment			
	Ship-to-shore Communications	Sat C	Req'd
	SSB	Sailor	Req'd
	VHF Radio	2 X Sailor	Req'd
*	Portable VHF Radios	1 + 2 on order	Req'd
	Number ____		2
	Internal Communication	Steenhans telephone	Req'd
	Fax	Sat C	
	Communication	Mobile 0427 103 859	
	Weather	Furuno Weather Fax	
	International Signal Flags	Yes	
	Ship-to-Helicopter	N/A	
*	Emergency Beacon	New on order	

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Anchor Handling System (Rig Mooring)

	Actual	Desired
Chain Lockers		
Number	*Two*	
Capacity, ft.	*117.8 m^3*	3000
Chain Size, in.	*76 mm*	3.25
Self Tiering	*Partially*	Req'd
Chain Wildcats		
Chain Size, in.	*76 mm*	3.25
Max. Pull, Kips	*250 tonnes*	
Max. Payout Load, Kips	*N/A*	
Anchor Handling Winch		
Bare Drum Diameter, in.	*N/A*	
Full Drum Diameter, in.	*N/A*	
Width Between Flanges, in.	*N/A*	
Drum Capacity, ft.	*1400 m*	3000
Wire Rope Diameter, in.	*64 mm*	3.0
Line Pull at stall		
Bare Drum, Kips	*250 tonnes*	350
Mid Drum, Kips	*N/A*	
Full Drum, Kips	*N/A*	
Brake Capacity, Kips	*350 tonnes*	
Brake Type(s)		
Drum	*Yes - Hydraulic*	
Disk	________	
Water	________	
Regenerative	________	

Anchor Handling System (cont'd)

	Actual	Desired
Towing Winch		
Bare Drum Diameter, in.	*N/A*	
Full Drum Diameter, in.	*N/A*	
Width Between Flanges, in.	*N/A*	
Drum Capacity, ft.	*1400 m*	3000
Wire Rope Diameter, in.	*64 mm*	3.0
Line Pull at stall		
Bare Drum, Kips	*250 tonnes*	200
Mid Drum, Kips	*N/A*	
Full Drum, Kips	*N/A*	
Brake Capacity, Kips	*350 tonnes*	
Brake Type(s)		
Drum	*Yes - hydraulic*	
Disk	__________	
Water	__________	
Regenerative	__________	

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Anchor Handling System (cont'd)

	Actual	Desired
Third Winch (if applicable)		
Bare Drum Diameter	__________	
Full Drum Diameter	__________	
Width Between Flanges	__________	
Drum Capacity, ft.	__________	
Wire Rope Diameter, in.	__________	
Line Pull at stall		
Bare Drum, Kips	__________	
Mid Drum, Kips	__________	
Full Drum, Kips	__________	
Brake Capacity, Kips	__________	
Brake Type(s)		
Drum	__________	
Disk	__________	
Water	__________	
Regenerative	__________	

Anchor Handling System (cont'd)

	Actual	Desired
Sharks Jaw/Karm Fork	*Ulstein – sharks jaw*	Req'd
* Pelican Hooks	2 on board	not permitted
Deck Tuggers		
Number	Two	
Max. Pull, Kips	10 tonnes	
Pendant Line Storage Reels		
Number	Two	
Capacity, ea.	1000 m	
Wire Rope Diameter, in.	76 mm	
Stern Roller		
Length, ft.	3.6 m	8
Diameter, ft.	2.45 m	5 (Min.)
Powered	No	
Towing Capability	Yes	Req'd
Pop-Up Bollards/Guide Pins	2 X Ulstein	Req'd

Service Vessel Mooring System

	Actual	Desired
Maximum Water Depth, ft.	14 port / 17 stbd shackles available	400
Mooring Line		
No. Lines	6 + 1 spare coil	
Type	polypropylene plaited	
Diameter, in.	64 mm	
Length, ft.	50 m	
Anchors		
Type	stockless	
Weight, kips	1.4 tonnes	

Life Saving Equipment

The Desired values shown in the last column are based on requirements contained in the SOLAS 1974 Requirements and 1983 Amendments.

		Actual	Desired
Life Boats: Number		***NO LIFEBOATS ON BOARD***	2
Capacity, ea. (total >= on-board complement)		__________	
Manufacturer		__________	
Totally/Partially Enclosed		__________	
Type Release Hook			
	On-load	__________	
	Off-load	__________	
	On/Off load	__________	Req'd
Location	boat #1	__________	
	boat #2	__________	
Life Rafts: Number (each side >= on-board complement)		4	
Capacity, ea.		20 / 20 / 15 / 16	
Location	raft #1	Mezzanine deck stbd ford	
	raft #2	Mezzanine deck port ford	
	raft #3	Mezzanine deck stbd aft	
	raft #4	Mezzanine deck port aft	
Scramble Net		Yes	Req'd
Man-Overboard Boat (Rescue Boat)			Req'd
Inflatable/Rigid		Rigid	
Davit/Crane launched?		Crane	
Life Buoys			
Number (total)		9	
(Total number depends on vessel length)			
Number with self-igniting lights		4	min. 50%
Number with self-activating smoke signals		2	min. 2
Survival (Exposure) Suits			
Number		14	min. 3 per lifeboat
Manufacturer		See below	

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Type	Immersion / Survival
10 X Fitzwright type 9700	*Immersion suits*
2 X Stearns	*Immersion suits*
1 X	*Immersion suit*
1 X Helly Hanson Suit E 305	*Survival suit*

Fire Fighting Equipment

	Actual	Desired
Number of fire pumps	2 + 1 emergency	
Location of pumps	2 in Engine room + 1 on main deck	
Number and size of fire monitors	None	
Location of monitors	N/A	
Fire Detection and Alarm System	Autronic	
Location of Fire Alarm Panel	Bridge	
Type of Extinguishing Medium (Halon/CO_2 /Water)		
Main Engine Room	CO_2	
Steering gear space	Portable foam	
Accommodations	Portable CO_2 / powder	
Paint Lockers	CO_2	
Galley	Portable powder	
Bridge	Portable powder	

Emergency Power System

**Emergency generator capacity, kw	2 X 350 kVa, 440V, 60hz, 3 ph
Physically separated from main generator	N/A
Location	In Engine room

*** Emergency generator not available, emergency power supplied by batteries alone. Above as separate from shaft generators.*

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Personnel

	Actual	Desired
Crew Complement (On-board)	10	
Master		
Name	David J. Smith	
Nationality	New Zealand	
Certificate of Competency for position	Master Class 1, UK	
Experience in position, years	20 years	
Mate		
Name	Carey Jon McIntosh	
Nationality	Australain	
Certificate of Competency for position	Master Class 2	
Experience in position, years	10 years	
Chief Engineer		
Name	Kenneth W. Watson	
Nationality	Australain	
Certificate of Competency for position	Engineer Class 1 (motor)	
Experience in position, years	1 year	
Able-Bodied Seaman (A/B)		
Name	Trevor Brown	
Nationality	Australian	
Certificate of Competency for position	IR	
Experience in position, years	15 years	
2nd Engineer		
Name	Hans Bentzen	
Nationality	Australian	
Certificate of Competency for position	2nd Engineer (motor)	
Experience in position, years	4 years	

Personnel (Cont'd)

	Actual	Desired
Bosun		
Name	**N/A**	
Nationality		
Certificate of Competency for position		
Experience in position, years		
Assistant Engineer		
Name	**N/A**	
Nationality		
Certificate of Competency for position		
Experience in position, years		
Other (IR)		
Name	John Fullwood	
Nationality	Australian	
Certificate of Competency for position	IR	
Experience in position, years	7 years	
Other (IR)		
Name	Conrad Von Lichtan	
Nationality	Australian	
Certificate of Competency for position	IR	
Experience in position, years	7 years	
Other (IR)		
Name	Mike Corcorin	
Nationality	Australian	
Certificate of Competency for position	IR	
Experience in position, years	7 years	

Personnel (Cont'd)

	Actual	Desired
Other (IR)		
Name	Leonard Gidney	
Nationality	Australian	
Certificate of Competency for position	IR	
Experience in position, years	20 years	
Second Officer		
Name	Still to join	
Nationality	____________	
Certificate of Competency for position	____________	
Experience in position, years	________	

3. Service Vessel Acceptance Test Inspection Checklist

The following **Service Vessel Acceptance Test Inspection Checklists** are intended to provide a basis for evaluating the suitability of the service vessel for the intended service. Any deficiencies noted during this inspection should be discussed with the Contractor and a schedule should be agreed upon to remedy all outstanding items.

Check lists are provided for:

- Documentation
- Drawings
- Emergency Response Plans
- Stability
- Cargo Handling
- Anchor Handling Equipment
- Service Vessel Mooring System
- Life Saving Equipment
- Fire Fighting Equipment
- Emergency Power System
- Communication - Navigation Equipment
- Main Propulsion/Steering
- Bilge System
- Miscellaneous
- Personnel

The type service, length of service, area of operation and past experience all influence the level of the required inspection prior to initiating the vessel charter. The final decision rests with operating management.

Documentation

- *Confirm that the following documentation is on board. Where applicable, note the issuing authority and the expiration date.*

Certificates	Issued By	Expiry Date
Certificate of Registry	Panama	08/09/03
SOLAS	Panama	03/11/04
International Loadline	DNV	31/08/03
Bollard Pull	DNV	Issued 27/04/89
Cargo Ship Safety Construction (Valid 5 years)	DNV	31/08/03
Cargo Ship Safety Equipment (2 years)	DNV	06/01/02
Cargo Ship Safety Radio Telephone (2 years)	DNV	10/01/02
Cargo Gear Safety	DOT	Various dates
Deratting	Dept. of Agriculture, Fisheries and Forestry	22/07/01
*Hull Insurance	Swire	18/08/00
Fuel Meter Calibration	N/A	
Certificate of Fitness	N/A	
Booklets		
Minimum Safe Manning Document	Panama	Issued 15/02/00
Intact Stability Booklet	DNV	N/A
Stability Letter	N/A	
Logs		
Company (Owner) Log		Yes
Engine and Deck Log		Yes
Masters Standing/Night Order Book		Yes
Oil Record Book		
Weekly Fire/Boat Drill (if not entered in the Deck Log)		Yes – Official Log Book
GMDSS	DNV	survey in progress

Surveys	Issued By	Expiry Date
Annual Classification Survey Report	DNV	Last done 03/08/00
Annual Load Line	DNV	30/11/01
Hull & Equipment	DNV	30/11/01
Main Engine	Continuous Machinery Survey	
Auxiliary Engine	Continuous Machinery Survey	
Steering Engine	Continuous Machinery Survey	
Propeller shaft	Continuous Machinery Survey	
Cranes	Continuous Machinery Survey	
CO_2/Halon System	AMDAC	done 29/11/00
Portable Extinguishers	AMDAC	done 29/11/00
Navigation Systems	N/A	
Bridge Systems	N/A	

Date of Next Dry Docking — Vessel currently in dry dock

Are all certificates posted? — Yes

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Drawings

- Verify that the following drawings are on board:

General Arrangement	
Profile	✓☐
Main Deck	✓☐
Hold Plan	☐
Tween Deck	☐
Bridge	✓☐
Tank Drawings	✓☐
Capacity Drawing	✓☐

Emergency Response Plans

- Verify that the following emergency response plans are available on the vessel:

Fire	✓☐
Abandon ship	✓☐
Damage/Collision	✓☐
Man-Overboard	✓☐
Oil Spill	✓☐

- Review emergency response plans for content and consistency with emergency response plans ✓☐
- Confirm that the Station Bill is Posted ✓☐
- Confirm that the Chain of Command is Posted and understood by the crew ✓☐

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Stability

Review Stability Booklet	✓☐

All vessels will have a stability booklet, but U. S. Flag vessels also have a stability letter which states the maximum deck load, the maximum center of gravity of the deck load, and the maximum resulting below deck load. Often, the stability letter guidance is all that is used by Masters on these vessels and true stability calculations are not made on a routine basis.

Review the Lightship weight and center of gravity records in the Stability Booklet plus all changes to lightship. Do results appear reasonable and accurate?	✓☐
Confirm that a KG vs. draft or GM vs. draft curve is onboard	✓☐
Confirm that stability calculations are made prior to each loadout	✓☐
Review Stability Letter, if applicable	☐
Confirm Stability Letter posted, if applicable	☐
Verify that tank sensor readings compare with tank soundings (fuel, drill water, potable water, ballast, bulk material)	☐
Check condition of coaming on all exterior doors, windows, and hatches	✓☐
Confirm coaming soft, pliable	*✓☐
Confirm that coaming is not cracked	*✓☐
Confirm that coaming has not been painted	*✓☐
Verify that all hydraulic watertight doors operate properly and closure surfaces are free of paint	✓☐
Confirm that watertight doors and hatches are kept closed	**☐
Verify that cross flooding instructions are available	✓☐
Confirm that damage/collision procedures are in place	✓☐

**Few of the rubbers were noted to be hard and with paint streaks*

*** Vessel currently in drydock*

Cargo Handling

Confirm that all loading/discharge lines have blanking caps	✓☐
Confirm that loading/discharge line caps are in place	✓☐
Confirm that hose connections are quick release design	Camlock✓☐
Verify that bulk system dryers (if required) are operational	✓☐
Confirm that the vessel has suitable appliances and fittings for securing cargo; confirm that certificates are current	✓☐
Verify that a cargo handling, securing, and lifting manual is onboard	✓☐
Confirm that procedures are in place for handling non-containerized cargo	✓☐
Confirm that hazardous cargo procedures are in place	✓☐
Confirm that cargo decks and walk ways are covered with non-skid material	✓☐
Verify that rigging and lifting gear has been inspected and tested	✓☐

Determine transfer rates for:

Fuel	160 m^3/hr at 80m head✓☐
Drill Water	160 m^3/hr at 80m head ✓☐
Potable Water	100 m^3/hr at 80m head ✓☐
Bulk	80 mt/hr for delivery to submersibles ✓☐

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Anchor Handling Equipment (Rig Mooring)

Confirm that the winch control console is located so that operator has a clear, unobstructed view of the deck	✓☐
Spool out work wire and observe wire rope condition (number of broken wires, kinks, shackle damage, etc.)	*☐
Operate lower winch drum (lower anchor over stern, recover anchor)	*☐
Operate from primary winch control station and back-up control station	
Observe temperature and amperage to ensure that the winch is operating within design limits	
Operate upper winch drum (lower anchor over stern, recover anchor)	*☐
Operate third winch drum (if applicable - lower anchor over stern, recover anchor)	*☐
Determine length of work wire	*☐
Confirm that the vessel has a Shark's jaw or Karm Fork	*☐
Confirm that Pelican Hooks are not on board 2 portable hooks on board	☐
Raise and lower Shark's jaw/Karm Fork	*☐
Confirm that the vessel has pop-up bollards/guide pins	✓☐
Raise and lower pop-up bollards/guide pins	*☐
Determine if the stern roller is powered Not powered	☐
Operate stern roller, if applicable	☐
Confirm all shackles are forged	✓☐
Confirm chain lockers are self tiering by stowing chain	*☐
Verify stated chain locker capacity	☐
Check condition of grappels, chain chasers	✓☐
Operate pendant reels (if available)	✓☐
Operate tuggers	✓☐

*Vessel in drydock with limited resources available

Service Vessel Mooring System

Operate winch #1, lower anchor to the sea floor, recover anchor ☐

Operate winch #2, lower anchor to the sea floor, recover anchor ☐

Operate winch #3, lower anchor to the sea floor, recover anchor ☐

Observe condition of vessel's mooring lines ☐

Check to ensure that the clutch on the windlass can be engaged and disengaged without difficulty ☐

*Vessel in drydock with limited resources available

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Life Saving Equipment

Life Boats ***NO LIFE BOATS ON BOARD***

Verify that one lifeboat is located on the port and starboard sides of the vessel ☐

Vessels less than 85 M in length may substitute life rafts for lifeboats

Verify/confirm that all life boats are:

- *Totally enclosed* ☐
- *Self-righting* ☐
- *Fire-protected (with sprinkler system)* ☐
- *Equipped with on-load release hooks or off-load release hooks with on-load backup* ☐
- *Motor propelled* ☐
- *Equipped with emergency lighting inside and strobe light outside* ☐
- *Equipped with radar transponder/EPIRB* ☐
- *Equipped with a permanently installed VHF radio* ☐

SOLAS requires 3 VHF radios onboard the service vessel if the gross tonnage is 500 tons or greater; 2 VHF radios if the gross tonnage is between 300 and 500 tons

If radios are not permanently installed inside the lifeboats, the radios must be located at each lifeboat embarkation station

- *Equipped with a full tank of fuel* ☐
- *Equipped with towing harness* ☐
- *Equipped with signal flares, potable water, flashlight, first-aid kit, food, fire extinguisher, and sea anchor* ☐
- *Equipped with breathing air bottles charged to pressure specified in operating manual* ☐
- *Equipped with a permanently installed trickle charger for the battery* ☐

Properly maintained:

- *All above equipment is operational* ☐
- *Windows clean and not broken* ☐
- *Door and window gaskets intact and undamaged* ☐
- *Placards with operating instructions located in each lifeboat* ☐
- *Engine starts with primary means and with back-up procedure* ☐
- *Steering wheel marked with proper center and turns freely* ☐

Engine pressure and temperature gauges functional and stable when lifeboat engine started ☐

Falls operated and in good condition ☐

Sprinkler system functions and covers the entire boat ☐

Bilge pump functional ☐

Steering system functions under power ☐

Lower each lifeboat down to water and recover ☐

Life Rafts

Verify/confirm:

Current expiration date for each life raft ✓☐

Sufficient life rafts are located on each side of vessel to accommodate entire crew ✓☐

Sea painters are connected with weak link and hydrostatic tie-down releases ✓☐

Davit lines connected to rafts N/A☐

No damage to life rafts ✓☐

Escape Routes

Verify that two escape routes are available from every normally manned space ✓☐

Survival (Exposure) Suits

Confirm that a suit is available for each member of the rescue boat crew ✓☐

Confirm that three suits are available for each member of the lifeboat crew ☐

Not required if lifeboats are totally enclosed, and

Not required if lifeboats were constructed before July 1, 1986

Confirm that suits are not damaged or torn ✓☐

Life Jackets

Confirm that life jackets are placed near each bunk and abandonment stations ✓☐

Verify that expiration date for life jacket lights is current ✓☐

Life Buoys

Determine number of buoys onboard (Number: 9) ✓☐

Vessel Length, M	*Min. Number*
<100	*8*
100 < 150	*10*
150 < 200	*12*
200 -	*14*

Determine number of buoys with lights (Number: 5) ✓☐

Determine number of buoys with smoke generators (Number:2) ✓☐

Confirm expiration date on each buoy is current ✓☐

Confirm that at least one buoy has a retrieving line ✓☐

Man Overboard Boat (MOB)

Verify that MOB boat is operational This is their work boat as well ✓☐

Maintenance

Confirm that someone is assigned the responsibility for performing routine maintenance for all life-saving systems ✓☐

Verify that records indicate that routine maintenance of all lifesaving systems is being performed ✓☐

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Fire Fighting Equipment

Verify number of independently powered fire pumps available for fire fighting. (Number of pumps: Two)	✓☐
- Two pumps required for vessels with gross tonnage >= 1000 tons	
- One pump required for vessels with gross tonnage < 1000 tons	
Confirm one fire pump dedicated to fire fighting	✓☐
Determine primary service for back-up pump (if any):	
- dedicated to fire fighting	☐
- sanitary pump	☐
- ballast pump	☐
- bilge pump	☐
- general service pump	✓☐
Confirm fire pumps are physically separated?	✓☐
Test each fire pump for output pressure with two hoses open	*☐
- 40 psi required for vessels with gross tonnage >= 1000 tons	*☐
- 35 psi required for vessels with gross tonnage < 1000 tons	*☐
Main engine space protected by:	
- inert gas system CO_2	✓☐
- foam system	☐
- water spray (sprinkler)	☐
Verify that one portable foam unit is available in main engine space	✓☐
Identify areas protected by inert gas (CO_2) flooding system	☐
Engine Room ________ ____________________	
Bow Thruster ________ ____________________	
____________________ ____________________	
Confirm that all areas protected by the CO_2 flooding system have alarms?	✓☐
Inspect each fire station	✓☐
- Confirm the following equipment is available and in good condition:	✓☐
a) 50 ft of hose (minimum) in good condition	✓☐
b) Combination fog and straight stream nozzle	✓☐
c) Hose wrench, if applicable	✓☐

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- Check hydrants for leaks *☐
- Verify equipment operation *☐
- Check nozzle gaskets for wear ✓☐
- Check hoses for leaks *☐
- Check performance of monitors N/A☐

Verify visible and audible alarms are located in high noise areas; test ✓☐

Verify two types of fire detectors are installed in machinery spaces ✓☐

Test all installed fire detectors and alarms *☐

Confirm that alarms go off automatically prior to the release of any fixed extinguishing medium ✓☐

Confirm fire detection and alarm system connected to the emergency switchboard ✓☐

Confirm that one fire pump is connected directly to the emergency switchboard **☐

Operate fire pump with the emergency generator **☐

Verify that portable extinguishers are located near known fire hazards ✓☐

Inspect portable extinguishers (check date, charge, hoses and general condition of extinguisher) ✓☐

Determine number of portable fire extinguishers on board 25 ✓☐

- Min. 5 on vessels with 1,000 tons gross tonnage or greater

Verify that at least two complete fireman's outfits are available ✓☐

- bunker coat
- helmet with face shield Beirut
- boots
- gloves
- self contained breathing apparatus
- flashlight
- spare SCBA bottles
- safety line and harness (one per team)

Verify that the fire station bill is posted ✓☐

Test the sprinkler system ☐

Locate fire main isolation valves ✓☐

Confirm that the fire main servicing the main engine space can be isolated ✓☐

** Vessel currently in drydock with drydock personnel, surveyors and technicians on board*

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Emergency Power System

Verify that emergency power is supplied directly to the following loads:

- Emergency lighting at muster and embarkation stations ✓☐
- Emergency lighting in all service areas and control areas ✓☐
- Emergency lighting in accommodation spaces, stairways and exits ✓☐
- Emergency lighting in the machinery spaces ✓☐
- Emergency lighting in the main power generation space ✓☐
- Emergency lighting on the bridge ✓☐
- Emergency lighting at the main and emergency switchboards ✓☐
- Emergency lighting for fire stations ✓☐
- Emergency lighting in the steering gear area ✓☐
- Emergency lighting at the fire pump ✓☐
- Emergency lighting at the sprinkler system booster pump N/A☐
- Emergency lighting at the emergency bilge pump Portable pump☐
- Navigation lighting ✓☐
- VHF radio ✓☐
- Internal communication equipment NO☐
- Navigation equipment (GPS, Echo sounder, Gyro, Compass lighting) ✓☐
- Fire detection and alarm system ✓☐
- One fire pump, if electrically operated) -☐
- Steering gear -☐

Identify which loads are connected to the emergency switchboard and which loads have an independent power source **No emergency generator on board**

Verify that the emergency generator is capable of operating simultaneously all of the above loads tied directly to the emergency switchboard -

Verify that the emergency generator starts automatically ☐

Confirm that the emergency generator is tested weekly under partial load (20-30% capacity, minimum); 30 minutes minimum ☐

Confirm that the emergency generator is tested annually under full load; 30 minutes minimum ☐

Operate the emergency generator under full load for 30 minutes; monitor temperature ☐

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Verify that the emergency power system is physically separated from the main power system ✓☐

Confirm that the emergency power system will operate when inclined 22.5 degrees to port/starboard, 10 degrees fore/aft or any combination of these limits ✓☐

Verify that the emergency source of electrical power and the emergency switchboard are located above the uppermost continuous deck and are readily accessible from the main deck. ☐

* No emergency generator on board – emergency power supplied by battery

Communications - Navigation Equipment

Verify proper operation of the following equipment:

• Magnetic compass	✓☐
• Gyro compass	✓☐
• Automatic pilot	*☐
• Radar	Repairs in progress ☐
• Direction finder	N/A☐
• Fathometer	*☐
• Decca Navigator	N/A☐
• Wind Sensor	✓☐
• Loran	N/A☐
• Ship-to-Shore communications	✓☐
• SSB	✓☐
• VHF Radio	✓☐
• Portable VHF radios	☐

**Main Propulsion/Steering*

***Main Propulsion**

Conduct a one-hour speed run at maximum power and check for overheating and screw vibration. ☐

Stop and then back down in reverse to demonstrate maneuverability. ☐

Operate bow thruster in one direction and then the other at full power. ☐

***Steering**

Conduct a steering maneuver as follows:

- Move forward at cruising speed ☐
- Put rudder to full right and hold for 10 seconds ☐
- Put rudder to full left and hold for 10 seconds ☐
- Put rudder to full right and hold for 10 seconds ☐
- Put rudder at amidships and conclude steering test ☐

**** Vessel in drydock***

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Bilge System

Confirm vessel has two independent bilge pumps? ✓☐

Are bilge pumps located in the same space? ✓☐

Are bilge pumps dedicated to bilge service, or ✓☐

Do bilge pumps also service:

- sanitary ☐
- ballast ☐
- other ☐

Determine limiting vessel and trim angles for bilge pumps (pumps should be able to dewater any watertight compartment)No limits claimed as pumps are positive displacement type☐

Miscellaneous

Verify that a continuous crash barrier is fitted along each side of the vessel's working deck ✓☐

Verify that the **Rescue Zone** for personnel recovery is clearly defined (if applicable)

No zone marked, and no openings available – vessel hull being grit blasted and claimed zones will be marked during painting operations ☐

Check tail shafts for signs of leaking ✓☐

Check main engine space for signs of oil leaks ✓☐

Assess overall house keeping, signs of rust, etc. ✓☐

Review equipment downtime record; note major problems ✓☐

Confirm vessel has an electric welding machine ✓☐

Verify that vessel has oxy-acetylene equipment ✓☐

Downtime: March 2001 – main emgine piston failure.

Downtime: May 2001 – starboard rudder pin loose.
Tailshaft leakage record – inboard port shaft consumption 10m³ per week

Personnel

Review personnel resumes for entire crew ☐

Confirm licenses for each crew member are current ✓☐

Confirm each crew member is qualified for assigned position ✓☐

Confirm that all crew members have received the following minimum training:

- Survival at Sea -☐
- Basic seamanship and general service vessel operation -☐

Confirm that at least two crew members possess a first aid at sea certificate ✓☐

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4. Periodic In-service Inspection Checklist

The Periodic In-Service Inspection Checklists are designed to verify the operational status of equipment, to confirm that routine maintenance is being performed, and to check the preparedness of the crew to respond to emergencies.

The in-service checklists address:

- *Stability*
- *Cargo Handling*
- *Life Saving Equipment*
- *Fire Fighting Equipment*
- *Emergency Power System*
- *Anchor Handling System (Rig Mooring)*
- *Navigation - Communication Systems*
- *Bilge System*
- *General Maintenance*
- *Drills*

Certain parts of the stability and cargo handling sections should be addressed in port prior to the vessel departing for location. The other sections can be addressed at any time.

The check lists should also be supplemented by problem areas that have developed during the Charter Term.

Vessels should be inspected at least once every 3 months. Action items identified during these periodic inspections should be prioritized and followed up until fully closed.

Stability

Confirm that stability calculations are made prior to each cargo loadout ☐

Verify that stability calculations are checked to reflect actual loadout ☐

Confirm that results appear complete and accurate

- correct value of lightship and center of gravity used ☐
- worksheet contains both the calculated displacement and the displacement determined from vessel draft ☐
- containerized cargo weight estimates are based on dockside scale measurements ☐

Verify that tank soundings are compared with sensor readings monthly ☐

If a Stability Letter is available, confirm that the center of gravity of the deck load does not exceed Stability Letter guidelines ☐

Confirm that stability guidelines are satisfied during anchor handling operations ☐

Check condition of coaming on all exterior doors, windows, and hatches ☐

Confirm coaming soft, pliable ☐

Confirm that coaming is not cracked ☐

Confirm that coaming has not been painted ☐

Verify that all hydraulic watertight doors operate properly and closure surfaces are free of paint ☐

Confirm that watertight doors and hatches are kept closed ☐

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Cargo Handling

- Confirm that cargo is containerized to extent possible ☐
- Verify that weights of heavy cargo are labeled on the cargo/container ☐
- Confirm that gas bottles (empty or full) are transferred in bottle racks ☐
- Confirm that casing is properly secured ☐
- Confirm that drill pipe is secured in bundles and pre-slung to permit easy lifts ☐
- Verify that an accurate cargo manifest is available ☐
- Confirm that a pre-arrival cargo transfer checklist is on board ☐
- Verify that cargo is secured to deck when not undergoing transfer ☐
- Confirm that safety zones are maintained on deck ☐
- Verify that pre-job safety meetings held before transferring cargo ☐
- Confirm that the Master or designated mate supervises cargo transfer operations ☐
- Confirm that the deck crew is in control of the cargo transfer rate ☐
- Verify that buoyant life/work vests are worn by all hands on deck ☐
- Confirm that vessel roll is minimized during cargo transfer operations ☐

Life Saving Equipment

Life boats

Verify/confirm the following:

- Lifeboat launching devices are visually inspected weekly ☐
- Fuel tank is full ☐
- Inventory list is posted in each lifeboat ☐
- Lifeboat equipment is checked monthly (i.e. signal flares, potable water, flashlight, first-aid it, food, fire extinguisher, sea anchor, and rope ladder) ☐
- Breathing air bottles are charged to pressure specified in the operating manual ☐
- Windows are clean and not broken ☐
- Door and window gaskets are intact and undamaged ☐
- Placards with operating instructions are in each lifeboat ☐
- Engine starts with primary means and with back-up procedure ☐
- Engine is run ahead and astern for at least 3 minutes each week ☐
- Engine pressure and temperature gauges functional and stable when lifeboat engine is started and run ☐
- Bilge pump is operational ☐
- Lifeboats are lowered down to the water and recovered monthly ☐
- Interior lights work ☐
- Trickle charge battery charger operational; check battery charge ☐
- Lifeboat launching areas are illuminated when main power is lost ☐
- Emergency transmitters operate properly ☐

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Life Saving Equipment (cont'd)

Life rafts

Verify/confirm the following:

- Confirm life rate expiration date is current (renewal period - 12 months) ☐
- Hydrostatic release mechanism is serviced every 12 months ☐
- No visible damage ☐
- Life raft containers are marked in accordance with SOLAS, Chapter III, 39.7.3 ☐
- Davit lines connected to rafts ☐

Escape Routes

Verify that escape routes to life boats are free of obstructions ☐

Survival Suits

Verify that suits are not damaged or torn ☐

Life Jackets

Verify that expiration date for life jacket lights is current ☐

Confirm that life jackets are located near each bunk and abandonment stations ☐

Life Buoys

Confirm that the expiration date for each buoy is current ☐

Man Overboard Boat

Verify that man-overboard boat is operational ☐

Maintenance

Verify that periodic maintenance is being performed in accordance with manufacturer's guidelines ☐

Fire Fighting Equipment

Verify that fire pumps start ☐

Operate fire pump with the emergency generator ☐

Test each fire pump for output pressure with two hoses open ☐

Verify that portable extinguishers are in place ☐

Inspect each fire station:

- Confirm all equipment is available and in good condition ☐
- Confirm hydrants do not leak ☐

Operate the fire pump with the emergency generator ☐

Inspect portable extinguishers ☐

Confirm that one spare charge for each extinguisher is on board ☐

Verify that visible and audible alarms in high noise areas are operational ☐

Test all detectors and alarms ☐

Confirm fireman's outfits are complete ☐

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Emergency Power System

Verify that the emergency generator starts automatically ☐

Verify that a partial load (20-30% capacity, minimum) is applied to the emergency generator weekly ☐

Confirm that a full load (100% capacity) is applied to the emergency generator annually ☐

Operate the emergency generator under partial load for 30 minutes; monitor temperature and check for overheating ☐

Anchor Handling System (Rig Mooring)

Confirm that Pelican Hooks are not on board ☐

Check condition of work wire ☐

Check condition of grappels, chain chasers ☐

Check condition of pendants ☐

Check condition of anchor buoys ☐

Communication - Navigation Equipment

Confirm that all navigation equipment is operational ☐

Confirm that all communication equipment is operational ☐

Bilge System

Confirm bilge pumps are operational ☐

Confirm that pumps do not have any leaks ☐

General Maintenance

Review maintenance logs

- Verify that routine maintenance is being performed ☐
- Confirm that outstanding items are being corrected in a timely manner ☐

Drills

Confirm that the following drills are conducted:
- Abandon ship ☐
- Fire ☐
- Loss of Engine Power ☐
- Man Overboard ☐
- Search and Rescue ☐
- Oil and Fuel Spills ☐

Fire and abandonment drills should be conducted prior to leaving port and at least weekly for voyages longer than a week. ☐

Verify that drills are varied with regard to day and time of day ☐

Confirm that drills are reviewed with the crew immediately after undertaking the drill. ☐

Confirm that scenario emergency drills are conducted periodically to test the overall field or offshore installation emergency response plan. Service vessels should take part in emergency drills of the offshore installation. ☐

Observe a fire and abandonment drill ☐

Confirm that each member of the crew participates in at least one abandonment drill and one fire drill each month ☐

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ExxonMobil Development Company
Drilling

Service Vessel Inspection Checklist

Vessel: **M.V. Pacific Conquerer**

Inspection Date: **30th – 31st May 2001**

Inspection Site: **Portland Berth number 6**

Surveyor(s): **Sorab C. Bilimoria**

830-194/01-45

Source file (LAN): i:\Emdc\Drilling\Technical\OIMS\forms\service vessel checklist.doc

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Executive Summary

*The **Service Vessel Inspection Checklist** was prepared to provide:*
- *assistance in inspecting service vessels before and during charter hire periods, and*
- *a systematic basis for documenting the results of these surveys.*

This document also formalizes the inspections in accordance with Operating Integrity Management System (OIMS) objectives.

This booklet is divided into three sections:
- Vessel description and desired specifications
  The vessel description section provides an overall description of the vessel and its equipment. Where appropriate, example specifications are noted.
- Acceptance test inspection checklist
  The acceptance test inspection section identifies tests and verifications that should be considered prior to placing the vessel under charter.
- Periodic in-service inspection checklist
  The in-service inspection section provides an itemized checklist for use during inspections after the vessel is placed on hire.

The acceptance test and in-service inspection checklists are based on current industry practice so some of the items may not be applicable to every service vessel in the fleet because vessels only have to comply with Rules and Regulations in effect at the time of construction unless local authorities dictate otherwise. In addition, requirements for some marine safety equipment are based on vessel size and gross tonnage.

The Service Vessel Inspection Checklist booklet is intended to be a guide. The actual scope of the inspection should be based on the type service, length of the charter, the area of operation, and past experience. The final decision rests with the operating management.

Table of Contents

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1. Introduction

The Service Vessel Inspection Checklist provides assistance in inspecting service vessels before and during charter hire periods.

This booklet is divided into three sections:

- *Vessel description and desired specifications*
- *Acceptance test inspection checklist*
- *Periodic in-service inspection checklist*

The vessel description section provides a place to enter a general description of the vessel and equipment for reference during the inspections. Desired specifications are also noted in the last column on every page. Particular attention should be paid to areas where the vessel fails to comply with specifications - both from an operational standpoint and from a documentation standpoint.

The Desired values listed in this section are an example. Vessel specifications will vary in other areas so appropriate changes should be made.

The acceptance test and in-service inspection checklists are intended to confirm that essential documentation is available on the vessel and that critical equipment is operational and properly maintained. The Checklists are based on current industry practice so some of the items may not be applicable to every service vessel in the fleet because vessels only have to comply with Rules and Regulations in effect at the time of construction unless local authorities dictate otherwise. Furthermore, requirements for some marine safety equipment are based on vessel size and gross tonnage (load carrying capacity). The Cargo Ship Safety Equipment Certificate for the vessel is intended to verify that the vessel's safety equipment meets applicable standards.

Note: The date of the next dry-docking inspection should be checked to determine if it falls within the Charter Period. If a scheduled inspection is due within the Charter Period, this subject should be addressed in the Charter Party.

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2. General Vessel Description

Name of Vessel	M.V. Pacific Conquerer IMO Number 8102529
Type of Vessel	Anchor Handling and Tug Supply Vessel
Call Sign	9V5926
Date Constructed	1982
Ship Yard	Aker Vinholmen, Arendal
Class	DNV +1A1 – EO – Tug – AHTS - SF
Flag	Singapore
Port of Registry	Singapore
Owner	
Name	Swire Pacific Offshore Pty. Ltd.
Address	300 Beach Road, The Concourse, Singapore
Telephone No.	
Fax No.	
Agents	
Name	Swire Pacific Offshore Pty. Ltd
Address	P.O. Box 666, Fremantle, Western Australia 6160
Telephone No.	61 8 9430 5434
Fax No.	61 8 9430 7849
Operator (If other than Owner)	
Name	Swire Pacific Offshore Pty. Ltd.
Address	2nd Floor, Queensgate Centre (cnr Williams & Newman Street) Fremantle,
Telephone No.	61 8 9430 5434
Fax No.	61 8 9430 7849

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Vessel Particulars

		Actual	Desired
Length, Overall, ft.		64.40 m	190 - 225
Between perpendiculars, ft.		56.40 m	
Beam, Overall, ft.		N/A	40 - 52
Molded, ft.		13.8 m	
Depth, ft.		6.90 m	16 - 24
Draft, ft	Winter Loadline	5.76 m	
	Summer Loadline	5.887 m	14-20
Freeboard, ft	Winter Loadline	644 mm	
	Summer Loadline	521 mm	
Min. Stern Freeboard (@ maximum load condition), ft.		N/A	2
Displacement, MT		3238 MT	
Lightship, MT		1280 MT	
Total Deadweight, MT		1958 MT	850 min.
Gross Tonnage		1316	
Net Tonnage		395	
Arrangements			
Stack Location		Mezzanine deck, aft of accommodation	
Engine Room Location		Midships	
Winch Control Stations		Main winches' control in wheelhouse	
Cargo Deck Dimensions, ft. x ft.		11m X 38 m	30 x 100
Double bottom tanks around:			
Engine Room		Yes	Req'd
Bulk Cargo Tanks		Yes	Req'd
Steering Engine Space		Yes	Req'd
Liquid Mud Tanks		Yes	
Accommodations			
Crew		8 X 1 Berth	
Passengers		1 X 4 Berths	
		1 X 8 Berths	

Propulsion

	Actual	Desired
Main Propulsion		
BHP Continuous	2 X 4080=8160 BHP	6140
BHP Intermittent	N/A	
Bollard Pull (at zero speed of advance)		
Ahead, Kips	100 Tonnes	165 T
Astern, Kips	N/A	
Propellers		
Twin/Single Screw	Twin screw	Twin
Fixed/Controllable Pitch	Controllable pitch	
Kort Nozzle	Yes - Twin	
Twin/Single Rudder	Twin spade	Twin
Speed		
Maximum, kts	15.3 Knots	
Cruising, kts	12 Knots	
Bow Thruster		
BHP Continuous	1 X 800 BHP	500
Thrust, kips	10 tonnes	10
Fuel Consumption		
Maximum speed, Kts @ MT/Day	15.3 kts @ 25 MT/day	
Cruising, Kts @ MT/Day	12 knots @ 12.5 MT/day	
Standby (port/anchored on location), MT/Day	0.7 MT/day	

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Cargo Capacity

	Actual	Desired
Fuel (for drilling rig), gallons	*Total 821 cubic metres*	75,000 gal
Fuel (for own consumption), gallons	*See above. Can be split as desired*	
Drill Water, Bbls.	*813 cubic metres*	3000 Bbl
Potable Water, Bbls.	*255 cubic metres*	1000 Bbl
Lube Oil, Bbls.	*22,000 litres*	
Maximum Deck Load, MT	*700 metric tones*	650 (Min.)
Max. Below Deck Load with Max. Deck Load, MT	*450 metric tonnes*	
Bulk Capacity (total), ft^3.	*170 cubic metres*	4000
No. Bulk Tanks	*4 tanks*	
Refrigerated Stores		
* Cold Storage, ft^3.	*For own use only*	200
Cool Storage, ft^3.	Sockets available for reefer containers	200
Transfer Rates		
Fuel, Bbl/Hr. with 100 ft. head	*$100m^3/hr$ at 60m head*	300
Potable Water, Bbl/Hr. with 100 ft. head	*$108m^3/hr$ at 80m head*	300
Drill Water, Bbl/Hr. with 100 ft. head	*$150m^3/hr$ at 60m head*	300
Bulk, cu. ft./hr.	*75mt/hr for delivery to semisubs*	20

Hose/Coupling	Size, in.	Male/Female
Fuel	4 inches	*Camlock female*
Drill Water	4 inches	*Camlock female*
Potable Water	4 inches	*Camlock female*

Navigation - Communication Equipment

Navigation Equipment		Manufacturer	Desired
Magnetic Compass		*J.C. Browne*	Req'd
Gyro Compass		*Anschutz*	Req'd
Automatic Pilot		*Robertson 12*	Req'd
Radar		*Furuno FR 1011 & Anritsu RA 726UA*	Req'd
Direction Finder		*N/A*	
Fathometer		*JRC*	Req'd
Decca Navigator		*N/A*	
Wind Sensor		*N/A*	
Loran		*N/A*	
Communication Equipment			
Ship-to-shore Communications		*Sailor*	Req'd
SSB		*Sailor*	Req'd
VHF Radio		*Sailor*	Req'd
Portable VHF Radios		*ICM*	Req'd
	Number *3*		2
Internal Communication		*Telephone*	Req'd
Fax		*Nil*	
Communication		*Mobile 0427 103 865*	
Weather		*Furuno Weather Fax*	
International Signal Flags		*Yes*	
Ship-to-Helicopter		*N/A*	
Emergency Beacon		*EPIRB*	

Anchor Handling System (Rig Mooring)

	Actual	Desired
Chain Lockers		
Number	*Two*	
Capacity, ft.	*2 lockers X total capacity 1100 m*	3000
Chain Size, in.	*3.25"*	3.25
Self Tiering	*Partially*	Req'd
Chain Wildcats		
Chain Size, in.	*2 X 3" + 1 spare 3.25"*	3.25
Max. Pull, Kips	*250 tonnes*	
Max. Payout Load, Kips	*100 tonnes*	
Anchor Handling Winch		
Bare Drum Diameter, in.	*0.9 m*	
Full Drum Diameter, in.	*2.04 m*	
Width Between Flanges, in.	*1.6 m*	
Drum Capacity, ft.	*1000 m*	3000
Wire Rope Diameter, in.	*76 mm*	3.0
Line Pull at stall		
Bare Drum, Kips	*250 tonnes*	350
Mid Drum, Kips	*175 tonnes*	
Full Drum, Kips	*120 tonnes*	
Brake Capacity, Kips	*350 tonnes*	
Brake Type(s)		
Drum	*Yes - Hydraulic*	
Disk	________	
Water	________	
Regenerative	________	

Anchor Handling System (cont'd)

	Actual	Desired
Towing Winch		
Bare Drum Diameter, in.	*0.9 m*	
Full Drum Diameter, in.	*2.04 m*	
Width Between Flanges, in.	*1.6 m*	
Drum Capacity, ft.	*1200 m*	3000
Wire Rope Diameter, in.	*64 mm*	3.0
Line Pull at stall		
Bare Drum, Kips	*250 tonnes*	200
Mid Drum, Kips	*175 tonnes*	
Full Drum, Kips	*120 tonnes*	
Brake Capacity, Kips	*350 tonnes*	
Brake Type(s)		
Drum	*Yes - hydraulic*	
Disk	__________	
Water	__________	
Regenerative	__________	

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Anchor Handling System (cont'd)

	Actual	Desired
Third Winch (if applicable)		
Bare Drum Diameter	___________	
Full Drum Diameter	___________	
Width Between Flanges	___________	
Drum Capacity, ft.	___________	
Wire Rope Diameter, in.	___________	
Line Pull at stall		
Bare Drum, Kips	___________	
Mid Drum, Kips	___________	
Full Drum, Kips	___________	
Brake Capacity, Kips	___________	
Brake Type(s)		
Drum	___________	
Disk	___________	
Water	___________	
Regenerative	___________	

Anchor Handling System (cont'd)

	Actual	Desired
Sharks Jaw/Karm Fork	*Triplex – sharks jaw*	Req'd
* Pelican Hooks	2 on board	not permitted
Deck Tuggers		
Number	Two	
Max. Pull, Kips	10 tonnes	
Pendant Line Storage Reels	Powered	
Number	Two	
Capacity, ea.	1000 m	
Wire Rope Diameter, in.	56 mm	
Stern Roller		
Length, ft.	3.7 m	8
Diameter, ft.	1.8 m	5 (Min.)
Powered	No	
Towing Capability	Yes	Req'd
Pop-Up Bollards/Guide Pins	2 X Ulstein	Req'd

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Service Vessel Mooring System

	Actual	Desired
Maximum Water Depth, ft.	15 port / 15 stbd shackles available	400
Mooring Line		
No. Lines	8	
Type	polypropylene plaited	
Diameter, in.	3 inches	
Length, ft.	Various	
Anchors		
Type	Danforth stockless	
Weight, kips	1740 kg	

Life Saving Equipment

The Desired values shown in the last column are based on requirements contained in the SOLAS 1974 Requirements and 1983 Amendments.

	Actual	Desired
Life Boats: Number	***NO LIFEBOATS ON BOARD***	2
Capacity, ea. (total >= on-board complement)	__________	
Manufacturer	__________	
Totally/Partially Enclosed	__________	
Type Release Hook		
On-load	__________	
Off-load	__________	
On/Off load	__________	Req'd
Location boat #1	__________	
boat #2	__________	
Life Rafts: Number (each side >= on-board complement)	4	
Capacity, ea.	20 / 20 / 15 / 16	
Location raft #1	Mezzanine deck stbd ford x 20 persons	
raft #2	Mezzanine deck port ford X 16 persons	
raft #3	Mezzanine deck stbd aft X 16 persons	
raft #4	Mezzanine deck port aft X 20 persons	
Scramble Net	Yes	Req'd
Man-Overboard Boat (Rescue Boat)		Req'd
Inflatable/Rigid	Rigid hull + inflatable buoyancy sides	
Davit/Crane launched?	Crane	
Life Buoys		
Number (total)	8	
(Total number depends on vessel length)		
Number with self-igniting lights	4	min. 50%
Number with self-activating smoke signals	2	min. 2
Survival (Exposure) Suits		
Number	23	min. 3 per lifeboat
Manufacturer	See below	

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Type	Immersion / Survival
23 X Helly Hanson Suit E 305	*Survival suit*

Fire Fighting Equipment

	Actual	Desired
Number of fire pumps	2 + 1 emergency	
Location of pumps	2 in Engine room + 1 emergency portable	
Number and size of fire monitors	None	
Location of monitors	N/A	
Fire Detection and Alarm System	Autronic	
Location of Fire Alarm Panel	Bridge	
Type of Extinguishing Medium (Halon/CO_2 /Water)		
Main Engine Room	Fixed CO_2	
Steering gear space	Portable powder	
Accommodations	Portable CO_2 / powder	
Paint Lockers	Fixed CO_2	
Galley	Portable powder	
Bridge	Portable CO_2	

Emergency Power System

**Emergency generator capacity, kw	2 X 305 kVa, 440V, 60hz, 3 ph
Physically separated from main generator	N/A
Location	In Engine room

*** Emergency generator not available, emergency power supplied by batteries alone. Above as separate from shaft generators.*

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Personnel

	Actual	Desired
Crew Complement (On-board)	10	
Master		
Name	Ian Vredenbregt	
Nationality	Australian	
Certificate of Competency for position	Master Class 2	
Experience in position, years	7 years	
Mate		
Name	Gunnar Artman	
Nationality	Australain	
Certificate of Competency for position	Master Class 1	
Experience in position, years	1 year	
Chief Engineer		
Name	J. S. Jones	
Nationality	Australain	
Certificate of Competency for position	Engineer Class 1 (motor)	
Experience in position, years	8 years	
Able-Bodied Seaman (A/B)		
Name	G. W. Smith	
Nationality	Australian	
Certificate of Competency for position	IR	
Experience in position, years	15 years	
2nd Engineer		
Name	R. G. Pinkerton	
Nationality	Australian	
Certificate of Competency for position	Engineer Class 1 (motor)	
Experience in position, years	3 years	

Personnel (Cont'd)

	Actual	Desired
Bosun		
Name	**N/A**	
Nationality		
Certificate of Competency for position		
Experience in position, years		
Assistant Engineer		
Name	**N/A**	
Nationality		
Certificate of Competency for position		
Experience in position, years		
Other (IR)		
Name	M.R. Ward	
Nationality	Australian	
Certificate of Competency for position	AB	
Experience in position, years	22 years	
Other (IR)		
Name	C. N. Hardy	
Nationality	Australian	
Certificate of Competency for position	IR	
Experience in position, years	5 years	
Other (IR)		
Name	S.J. Atkins	
Nationality	Australian	
Certificate of Competency for position	IR	
Experience in position, years	5 years	

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Personnel (Cont'd)

	Actual	Desired
Other (IR)		
Name	G. D. Foot	
Nationality	Australian	
Certificate of Competency for position	IR	
Experience in position, years	3 years	
Second Officer		
Name	**(Still to join)** K. Hardiman	
Nationality	Australian	
Certificate of Competency for position	Masters Class 3	
Experience in position, years	15 Years	

3. Service Vessel Acceptance Test Inspection Checklist

The following **Service Vessel Acceptance Test Inspection Checklists** are intended to provide a basis for evaluating the suitability of the service vessel for the intended service. Any deficiencies noted during this inspection should be discussed with the Contractor and a schedule should be agreed upon to remedy all outstanding items.

Check lists are provided for:

- Documentation
- Drawings
- Emergency Response Plans
- Stability
- Cargo Handling
- Anchor Handling Equipment
- Service Vessel Mooring System
- Life Saving Equipment
- Fire Fighting Equipment
- Emergency Power System
- Communication - Navigation Equipment
- Main Propulsion/Steering
- Bilge System
- Miscellaneous
- Personnel

The type service, length of service, area of operation and past experience all influence the level of the required inspection prior to initiating the vessel charter. The final decision rests with operating management.

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Documentation

- *Confirm that the following documentation is on board. Where applicable, note the issuing authority and the expiration date.*

Certificates	Issued By	Expiry Date
Certificate of Registry	Singapore issued 20/12/00	
SOLAS	ABS	03/11/04
International Loadline	DNV	30/06/01
Bollard Pull	DNV	Issued 22/02/91
Cargo Ship Safety Construction (Valid 5 years)	DNV	30/06/01
Cargo Ship Safety Equipment (2 years)	DNV	30/06/01
Cargo Ship Safety Radio Telephone (2 years)	DNV	30/06/01
Cargo Gear Safety	DOT and as per owners maintenance log	Various dates
Deratting	Dept. of Agriculture, Fisheries and Forestry	13/02/02
*Hull Insurance	Swire	18/08/00
Fuel Meter Calibration	N/A	
Certificate of Fitness	N/A	
Booklets		
Minimum Safe Manning Document	Singapore	Issued 17/10/00
Intact Stability Booklet	DNV issued	24/10/97
Stability Letter	N/A	
Logs		
Company (Owner) Log		Yes
Engine and Deck Log		Yes
Masters Standing/Night Order Book		Yes
Oil Record Book		
Weekly Fire/Boat Drill (if not entered in the Deck Log)		Yes – Official Log Book

Surveys	Issued By	Expiry Date
Annual Classification Survey Report	DNV	Last done 30/06/01
Annual Load Line	DNV	30/06/01
Hull & Equipment	DNV	30/06/01
Main Engine	Continuous Machinery Survey	
Auxiliary Engine	Continuous Machinery Survey	
Steering Engine	Continuous Machinery Survey	
Propeller shaft	Continuous Machinery Survey	
Cranes	A. Noble and Sons	01/07/01
CO_2/Halon System	Australian Willtrading	done 02/06/00
Portable Extinguishers	Oceania Fire & Safety	done 08/06/00
Navigation Systems	N/A	
Bridge Systems	N/A	

Date of Next Dry Docking	2002
Are all certificates posted?	To be replaced by current certificates

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Drawings

- Verify that the following drawings are on board:

General Arrangement	
Profile	✓☐
Main Deck	✓☐
Hold Plan	☐
Tween Deck	☐
Bridge	✓☐
Tank Drawings	Faded✓☐
Capacity Drawing	Faded✓☐

Emergency Response Plans

- Verify that the following emergency response plans are available on the vessel:

Fire	✓☐
Abandon ship	✓☐
Damage/Collision	✓☐
Man-Overboard	✓☐
Oil Spill	✓☐

- Review emergency response plans for content and consistency with emergency response plans ✓☐
- Confirm that the Station Bill is Posted ✓☐
- Confirm that the Chain of Command is Posted and understood by the crew ✓☐

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Stability

Review Stability Booklet ✓☐

All vessels will have a stability booklet, but U. S. Flag vessels also have a stability letter which states the maximum deck load, the maximum center of gravity of the deck load, and the maximum resulting below deck load. Often, the stability letter guidance is all that is used by Masters on these vessels and true stability calculations are not made on a routine basis.

Review the Lightship weight and center of gravity records in the Stability Booklet plus all changes to lightship. Do results appear reasonable and accurate? ✓☐

Confirm that a KG vs. draft or GM vs. draft curve is onboard X☐

Confirm that stability calculations are made prior to each loadout ✓☐

Review Stability Letter, if applicable ☐

Confirm Stability Letter posted, if applicable ☐

Verify that tank sensor readings compare with tank soundings (fuel, drill water, potable water, ballast, bulk material) ☐

Check condition of coaming on all exterior doors, windows, and hatches ✓☐

Confirm coaming soft, pliable *✓☐

Confirm that coaming is not cracked *✓☐

Confirm that coaming has not been painted *✓☐

Verify that all hydraulic watertight doors operate properly and closure surfaces are free of paint ✓☐

Confirm that watertight doors and hatches are kept closed **☐

Verify that cross flooding instructions are available ✓☐

Confirm that damage/collision procedures are in place ✓☐

**Few of the rubbers were noted to be hard and with paint streaks, newly fitted rubbers were noted with gaps at seams*

***Vessel in port and water tight doors were in open position as work was in progress.*

Cargo Handling

Confirm that all loading/discharge lines have blanking caps	✓☐
Confirm that loading/discharge line caps are in place	✓☐
Confirm that hose connections are quick release design	Camlock✓☐
Verify that bulk system dryers (if required) are operational	**N/A**☐
Confirm that the vessel has suitable appliances and fittings for securing cargo; confirm that certificates are current	✓☐
Verify that a cargo handling, securing, and lifting manual is onboard	✓☐
Confirm that procedures are in place for handling non-containerized cargo	✓☐
Confirm that hazardous cargo procedures are in place	✓☐
Confirm that cargo decks and walk ways are covered with non-skid material	✓☐
Verify that rigging and lifting gear has been inspected and tested	✓☐

Determine transfer rates for:

Fuel	100 m^3/hr at 60m head	✓☐
Drill Water	150 m^3/hr at 60m head	✓☐
Potable Water	108 m^3/hr at 80m head	✓☐
Bulk	75 mt/hr	✓☐

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Anchor Handling Equipment (Rig Mooring)

Confirm that the winch control console is located so that operator has a clear, unobstructed view of the deck ✓☐

Spool out work wire and observe wire rope condition (number of broken wires, kinks, shackle damage, etc.) ☐

Operate lower winch drum (lower anchor over stern, recover anchor) ☐

Operate from primary winch control station and back-up control station

Observe temperature and amperage to ensure that the winch is operating within design limits

Operate upper winch drum (lower anchor over stern, recover anchor) ☐

Operate third winch drum (if applicable - lower anchor over stern, recover anchor) ☐

Determine length of work wire ☐

Confirm that the vessel has a Shark's jaw or Karm Fork ✓☐

Confirm that Pelican Hooks are not on board 2 portable hooks on board ☐

Raise and lower Shark's jaw/Karm Fork ✓☐

Confirm that the vessel has pop-up bollards/guide pins ✓☐

Raise and lower pop-up bollards/guide pins ✓☐

Determine if the stern roller is powered Not powered ☐

Operate stern roller, if applicable ☐

Confirm all shackles are forged ✓☐

Confirm chain lockers are self tiering by stowing chain ☐

Verify stated chain locker capacity ☐

Check condition of grappels, chain chasers ✓☐

Operate pendant reels (if available) ✓☐

Operate tuggers ✓☐

Service Vessel Mooring System

Operate winch #1, lower anchor to the sea floor, recover anchor ☐

Operate winch #2, lower anchor to the sea floor, recover anchor ☐

Operate winch #3, lower anchor to the sea floor, recover anchor ☐

Observe condition of vessel's mooring lines ✓☐

Check to ensure that the clutch on the windlass can be engaged and disengaged without difficulty ✓☐

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Life Saving Equipment

Life Boats ***NO LIFE BOATS ON BOARD***

Verify that one lifeboat is located on the port and starboard sides of the vessel ☐

Vessels less than 85 M in length may substitute life rafts for lifeboats

Verify/confirm that all life boats are:

- *Totally enclosed* ☐
- *Self-righting* ☐
- *Fire-protected (with sprinkler system)* ☐
- *Equipped with on-load release hooks or off-load release hooks with on-load backup* ☐
- *Motor propelled* ☐
- *Equipped with emergency lighting inside and strobe light outside* ☐
- *Equipped with radar transponder/EPIRB* ☐
- *Equipped with a permanently installed VHF radio* ☐

SOLAS requires 3 VHF radios onboard the service vessel if the gross tonnage is 500 tons or greater; 2 VHF radios if the gross tonnage is between 300 and 500 tons

If radios are not permanently installed inside the lifeboats, the radios must be located at each lifeboat embarkation station

- *Equipped with a full tank of fuel* ☐
- *Equipped with towing harness* ☐
- *Equipped with signal flares, potable water, flashlight, first-aid kit, food, fire extinguisher, and sea anchor* ☐
- *Equipped with breathing air bottles charged to pressure specified in operating manual* ☐
- *Equipped with a permanently installed trickle charger for the battery* ☐

Properly maintained:

- *All above equipment is operational* ☐
- *Windows clean and not broken* ☐
- *Door and window gaskets intact and undamaged* ☐
- *Placards with operating instructions located in each lifeboat* ☐
- *Engine starts with primary means and with back-up procedure* ☐
- *Steering wheel marked with proper center and turns freely* ☐

Engine pressure and temperature gauges functional and stable when lifeboat engine started ☐

Falls operated and in good condition ☐

Sprinkler system functions and covers the entire boat ☐

Bilge pump functional ☐

Steering system functions under power ☐

Lower each lifeboat down to water and recover ☐

Life Rafts

Verify/confirm:

Current expiration date for each life raft ✓☐

Sufficient life rafts are located on each side of vessel to accommodate entire crew ✓☐

Sea painters are connected with weak link and hydrostatic tie-down releases ✓☐

Davit lines connected to rafts N/A☐

No damage to life rafts ✓☐

Escape Routes

Verify that two escape routes are available from every normally manned space ✓☐

Survival (Exposure) Suits

Confirm that a suit is available for each member of the rescue boat crew ✓☐

Confirm that three suits are available for each member of the lifeboat crew ☐

Not required if lifeboats are totally enclosed, and

Not required if lifeboats were constructed before July 1, 1986

Confirm that suits are not damaged or torn ✓☐

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Life Jackets

Confirm that life jackets are placed near each bunk and abandonment stations ✓☐

Verify that expiration date for life jacket lights is current ✓☐

Life Buoys

Determine number of buoys onboard (Number: 8) ✓☐

Vessel Length, M	*Min. Number*
<100	*8*
100 < 150	*10*
150 < 200	*12*
200 -	*14*

Determine number of buoys with lights (Number: 4) ✓☐

Determine number of buoys with smoke generators (Number:2) ✓☐

Confirm expiration date on each buoy is current ✓☐

Confirm that at least one buoy has a retrieving line ✓☐

Man Overboard Boat (MOB)

Verify that MOB boat is operational This is their work boat as well ✓☐

Maintenance

Confirm that someone is assigned the responsibility for performing routine maintenance for all life-saving systems ✓☐

Verify that records indicate that routine maintenance of all lifesaving systems is being performed ✓☐

Fire Fighting Equipment

Verify number of independently powered fire pumps available for fire fighting. (Number of pumps: Two) ✓☐
- Two pumps required for vessels with gross tonnage >= 1000 tons
- One pump required for vessels with gross tonnage < 1000 tons

Confirm one fire pump dedicated to fire fighting ✓☐

Determine primary service for back-up pump (if any):
- dedicated to fire fighting ☐
- sanitary pump ☐
- ballast pump ☐
- bilge pump ☐
- general service pump ✓☐

Confirm fire pumps are physically separated? ✓☐

Test each fire pump for output pressure with two hoses open ☐
- 40 psi required for vessels with gross tonnage >= 1000 tons ✓☐
- 35 psi required for vessels with gross tonnage < 1000 tons ☐

Main engine space protected by:
- inert gas system **CO_2** ✓☐
- foam system ☐
- water spray (sprinkler) ☐

Verify that one portable foam unit is available in main engine space **Powder** X☐

Identify areas protected by inert gas (CO_2) flooding system ☐

Engine Room ________ ____________________

Paint Lockerr ________ ____________________

____________________ ____________________

Confirm that all areas protected by the CO_2 flooding system have alarms? ✓☐

Inspect each fire station ✓☐

- Confirm the following equipment is available and in good condition: ✓☐
  - a) 50 ft of hose (minimum) in good condition ✓☐
  - b) Combination fog and straight stream nozzle ✓☐
  - c) Hose wrench, if applicable ✓☐

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- Check hydrants for leaks *✓☐
- Verify equipment operation ✓☐
- Check nozzle gaskets for wear *✓☐
- Check hoses for leaks *✓☐
- Check performance of monitors N/A☐

Verify visible and audible alarms are located in high noise areas; test ✓☐

Verify two types of fire detectors are installed in machinery spaces ✓☐

Test all installed fire detectors and alarms ☐

Confirm that alarms go off automatically prior to the release of any fixed extinguishing medium ✓☐

Confirm fire detection and alarm system connected to the emergency switchboard ✓☐

Confirm that one fire pump is connected directly to the emergency switchboard **☐

Operate fire pump with the emergency generator **☐

Verify that portable extinguishers are located near known fire hazards ✓☐

Inspect portable extinguishers (check date, charge, hoses and general condition of extinguisher) ✓☐

Determine number of portable fire extinguishers on board 23 ✓☐

- Min. 5 on vessels with 1,000 tons gross tonnage or greater

Verify that at least two complete fireman's outfits are available ✓☐

- bunker coat
- helmet with face shield Beirut
- boots
- gloves
- self contained breathing apparatus
- flashlight
- spare SCBA bottles
- safety line and harness (one per team)

Verify that the fire station bill is posted ✓☐

Test the sprinkler system ☐

Locate fire main isolation valves ✓☐

Confirm that the fire main servicing the main engine space can be isolated ✓☐

Random checks only

***Emergency fire pump is a portable pump*

Emergency Power System

Verify that emergency power is supplied directly to the following loads:

- Emergency lighting at muster and embarkation stations ✓☐
- Emergency lighting in all service areas and control areas ✓☐
- Emergency lighting in accommodation spaces, stairways and exits ✓☐
- Emergency lighting in the machinery spaces ✓☐
- Emergency lighting in the main power generation space ✓☐
- Emergency lighting on the bridge ✓☐
- Emergency lighting at the main and emergency switchboards ✓☐
- Emergency lighting for fire stations ✓☐
- Emergency lighting in the steering gear area ✓☐
- Emergency lighting at the fire pump ✓☐
- Emergency lighting at the sprinkler system booster pump N/A☐
- Emergency lighting at the emergency bilge pump Portable pump☐
- Navigation lighting ✓☐
- VHF radio ✓☐
- Internal communication equipment NO☐
- Navigation equipment (GPS, Echo sounder, Gyro, Compass lighting) ✓☐
- Fire detection and alarm system ✓☐
- One fire pump, if electrically operated) -☐
- Steering gear -☐

Identify which loads are connected to the emergency switchboard and which loads have an independent power source **No emergency generator on board**

Verify that the emergency generator is capable of operating simultaneously all of the above loads tied directly to the emergency switchboard -

Verify that the emergency generator starts automatically ☐

Confirm that the emergency generator is tested weekly under partial load (20-30% capacity, minimum); 30 minutes minimum ☐

Confirm that the emergency generator is tested annually under full load; 30 minutes minimum ☐

Operate the emergency generator under full load for 30 minutes; monitor temperature ☐

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Verify that the emergency power system is physically separated from the main power system ✓☐

Confirm that the emergency power system will operate when inclined 22.5 degrees to port/starboard, 10 degrees fore/aft or any combination of these limits ✓☐

Verify that the emergency source of electrical power and the emergency switchboard are located above the uppermost continuous deck and are readily accessible from the main deck. ☐

* <u>No emergency generator on board – emergency power supplied by battery</u>

Communications - Navigation Equipment

Verify proper operation of the following equipment:

• Magnetic compass	✓☐
• Gyro compass	✓☐
• Automatic pilot	*☐
• Radar	✓☐
• Direction finder	N/A☐
• Fathometer	✓☐
• Decca Navigator	N/A☐
• Wind Sensor	N/A☐
• Loran	N/A☐
• Ship-to-Shore communications	✓☐
• SSB	✓☐
• VHF Radio	✓☐
• Portable VHF radios	✓☐

Main Propulsion/Steering

Main Propulsion

Conduct a one-hour speed run at maximum power and check for overheating and screw vibration. ☐

Stop and then back down in reverse to demonstrate maneuverability. ☐

Operate bow thruster in one direction and then the other at full power. ☐

Steering

Conduct a steering maneuver as follows:

- Move forward at cruising speed ☐
- Put rudder to full right and hold for 10 seconds ☐
- Put rudder to full left and hold for 10 seconds ☐
- Put rudder to full right and hold for 10 seconds ☐
- Put rudder at amidships and conclude steering test ☐

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Bilge System

Confirm vessel has two independent bilge pumps? ✓☐

Are bilge pumps located in the same space? ✓☐

Are bilge pumps dedicated to bilge service, or ✓☐

Do bilge pumps also service:

- sanitary ☐
- ballast ☐
- other ☐

Determine limiting vessel and trim angles for bilge pumps (pumps should be able to dewater any watertight compartment)<u>No limits claimed as pumps are positive displacement type☐</u>

Miscellaneous

Verify that a continuous crash barrier is fitted along each side of the vessel's working deck ✓☐

Verify that the **Rescue Zone** for personnel recovery is clearly defined (if applicable)

<u>No zone marked, and no openings available – vessel hull being grit blasted and claimed zones will be marked during painting operations</u> ☐

Check tail shafts for signs of leaking ✓☐

Check main engine space for signs of oil leaks ✓☐

Assess overall house keeping, signs of rust, etc. ✓☐

Review equipment downtime record; note major problems ✓☐

Confirm vessel has an electric welding machine ✓☐

Verify that vessel has oxy-acetylene equipment ✓☐

Personnel

Review personnel resumes for entire crew	☐
Confirm licenses for each crew member are current	✓☐
Confirm each crew member is qualified for assigned position	✓☐
Confirm that all crew members have received the following minimum training:	
- Survival at Sea	-☐
- Basic seamanship and general service vessel operation	-☐
Confirm that at least two crew members possess a first aid at sea certificate	✓☐

4. Periodic In-service Inspection Checklist

The Periodic In-Service Inspection Checklists are designed to verify the operational status of equipment, to confirm that routine maintenance is being performed, and to check the preparedness of the crew to respond to emergencies.

The in-service checklists address:

- *Stability*
- *Cargo Handling*
- *Life Saving Equipment*
- *Fire Fighting Equipment*
- *Emergency Power System*
- *Anchor Handling System (Rig Mooring)*
- *Navigation - Communication Systems*
- *Bilge System*
- *General Maintenance*
- *Drills*

Certain parts of the stability and cargo handling sections should be addressed in port prior to the vessel departing for location. The other sections can be addressed at any time.

The check lists should also be supplemented by problem areas that have developed during the Charter Term.

Vessels should be inspected at least once every 3 months. Action items identified during these periodic inspections should be prioritized and followed up until fully closed.

Stability

Confirm that stability calculations are made prior to each cargo loadout ☐

Verify that stability calculations are checked to reflect actual loadout ☐

Confirm that results appear complete and accurate

- correct value of lightship and center of gravity used ☐
- worksheet contains both the calculated displacement and the displacement determined from vessel draft ☐
- containerized cargo weight estimates are based on dockside scale measurements ☐

Verify that tank soundings are compared with sensor readings monthly ☐

If a Stability Letter is available, confirm that the center of gravity of the deck load does not exceed Stability Letter guidelines ☐

Confirm that stability guidelines are satisfied during anchor handling operations ☐

Check condition of coaming on all exterior doors, windows, and hatches ☐

Confirm coaming soft, pliable ☐

Confirm that coaming is not cracked ☐

Confirm that coaming has not been painted ☐

Verify that all hydraulic watertight doors operate properly and closure surfaces are free of paint ☐

Confirm that watertight doors and hatches are kept closed ☐

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Cargo Handling

- Confirm that cargo is containerized to extent possible ☐
- Verify that weights of heavy cargo are labeled on the cargo/container ☐
- Confirm that gas bottles (empty or full) are transferred in bottle racks ☐
- Confirm that casing is properly secured ☐
- Confirm that drill pipe is secured in bundles and pre-slung to permit easy lifts ☐
- Verify that an accurate cargo manifest is available ☐
- Confirm that a pre-arrival cargo transfer checklist is on board ☐
- Verify that cargo is secured to deck when not undergoing transfer ☐
- Confirm that safety zones are maintained on deck ☐
- Verify that pre-job safety meetings held before transferring cargo ☐
- Confirm that the Master or designated mate supervises cargo transfer operations ☐
- Confirm that the deck crew is in control of the cargo transfer rate ☐
- Verify that buoyant life/work vests are worn by all hands on deck ☐
- Confirm that vessel roll is minimized during cargo transfer operations ☐

Life Saving Equipment

Life boats

Verify/confirm the following:

- Lifeboat launching devices are visually inspected weekly ☐
- Fuel tank is full ☐
- Inventory list is posted in each lifeboat ☐
- Lifeboat equipment is checked monthly (i.e. signal flares, potable water, flashlight, first-aid it, food, fire extinguisher, sea anchor, and rope ladder) ☐
- Breathing air bottles are charged to pressure specified in the operating manual ☐
- Windows are clean and not broken ☐
- Door and window gaskets are intact and undamaged ☐
- Placards with operating instructions are in each lifeboat ☐
- Engine starts with primary means and with back-up procedure ☐
- Engine is run ahead and astern for at least 3 minutes each week ☐
- Engine pressure and temperature gauges functional and stable when lifeboat engine is started and run ☐
- Bilge pump is operational ☐
- Lifeboats are lowered down to the water and recovered monthly ☐
- Interior lights work ☐
- Trickle charge battery charger operational; check battery charge ☐
- Lifeboat launching areas are illuminated when main power is lost ☐
- Emergency transmitters operate properly ☐

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Life Saving Equipment (cont'd)

Life rafts

Verify/confirm the following:

- Confirm life rate expiration date is current (renewal period - 12 months) ☐
- Hydrostatic release mechanism is serviced every 12 months ☐
- No visible damage ☐
- Life raft containers are marked in accordance with SOLAS, Chapter III, 39.7.3 ☐
- Davit lines connected to rafts ☐

Escape Routes

Verify that escape routes to life boats are free of obstructions ☐

Survival Suits

Verify that suits are not damaged or torn ☐

Life Jackets

Verify that expiration date for life jacket lights is current ☐

Confirm that life jackets are located near each bunk and abandonment stations ☐

Life Buoys

Confirm that the expiration date for each buoy is current ☐

Man Overboard Boat

Verify that man-overboard boat is operational ☐

Maintenance

Verify that periodic maintenance is being performed in accordance with manufacturer's guidelines ☐

Fire Fighting Equipment

- Verify that fire pumps start ☐
- Operate fire pump with the emergency generator ☐
- Test each fire pump for output pressure with two hoses open ☐
- Verify that portable extinguishers are in place ☐
- Inspect each fire station:
  - Confirm all equipment is available and in good condition ☐
  - Confirm hydrants do not leak ☐
- Operate the fire pump with the emergency generator ☐
- Inspect portable extinguishers ☐
- Confirm that one spare charge for each extinguisher is on board ☐
- Verify that visible and audible alarms in high noise areas are operational ☐
- Test all detectors and alarms ☐
- Confirm fireman's outfits are complete ☐

Emergency Power System

- Verify that the emergency generator starts automatically ☐
- Verify that a partial load (20-30% capacity, minimum) is applied to the emergency generator weekly ☐
- Confirm that a full load (100% capacity) is applied to the emergency generator annually ☐
- Operate the emergency generator under partial load for 30 minutes; monitor temperature and check for overheating ☐

Anchor Handling System (Rig Mooring)

- Confirm that Pelican Hooks are not on board ☐
- Check condition of work wire ☐
- Check condition of grappels, chain chasers ☐
- Check condition of pendants ☐
- Check condition of anchor buoys ☐

Communication - Navigation Equipment

Confirm that all navigation equipment is operational ☐

Confirm that all communication equipment is operational ☐

Bilge System

Confirm bilge pumps are operational ☐

Confirm that pumps do not have any leaks ☐

General Maintenance

Review maintenance logs

- Verify that routine maintenance is being performed ☐
- Confirm that outstanding items are being corrected in a timely manner ☐

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Drills

Confirm that the following drills are conducted:

- Abandon ship ☐
- Fire ☐
- Loss of Engine Power ☐
- Man Overboard ☐
- Search and Rescue ☐
- Oil and Fuel Spills ☐

Fire and abandonment drills should be conducted prior to leaving port and at least weekly for voyages longer than a week. ☐

Verify that drills are varied with regard to day and time of day ☐

Confirm that drills are reviewed with the crew immediately after undertaking the drill. ☐

Confirm that scenario emergency drills are conducted periodically to test the overall field or offshore installation emergency response plan. Service vessels should take part in emergency drills of the offshore installation. ☐

Observe a fire and abandonment drill ☐

Confirm that each member of the crew participates in at least one abandonment drill and one fire drill each month ☐

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Change Worksheet

WELL: BEARDIE-1	COUNTRY: BASS STRAIT, AUSTRALIA
RIG: OCEAN BOUNTY SEMISUBMERSIBLE	DATE INITIATED: 8 AUGUST 2002

TYPE OF CHANGE (CHECK ONE):

☐ WELL DESIGN	☐ PERSONNEL
☑ DRILLING PROGRAM/PROCEDURE	☐ OPERATIONS MANUAL PROCEDURE
☐ CRITICAL EQUIPMENT/EQUIPMENT O&M	☐ RISK ASSESSMENT FOLLOW-UP
☐ RESPONSE TO UNEXPECTED EVENTS	☐ SPECIFICATION/STANDARD:

DESCRIPTION OF CHANGE:

The planned exit route of the rig from the Beardie-1 location has been changed.

The Ocean Bounty will now return to Sole-2 along the **Approach Tow Route** used to move the rig from Sole-2 to Beardie-1.

REASON FOR CHANGE:

The original plan was to exit to the south-west on-route to Casino-1 in the Otway Basin. As the rig is returning to Sole-2 the plan now is to exit Beardie-1 returning to Sole-2 along the Approach Tow Route used for the move from Sole-2 to Beardie-1.

RISK ASSESSMENT SUMMARY (USE RISK MATRIX - SEE ELEMENT 2 IN DRILLING OIMS MANUAL):

HSE PROBABILITY: A ☐ B ☐ C ☐ D ☐ E ☐ CONSEQUENCE: I ☐ II ☐ III ☐ IV ☐

FINANCIAL PROBABILITY: A ☐ B ☐ C ☐ D ☑ E ☐ CONSEQUENCE: I ☐ II ☑ III ☐ IV ☐

RISK MITIGATION MEASURES (PRESCRIBED PROGRAM LIMITS):

This change of tow route does not change the previous risk assessment that evaluated collison with ship, platform or pipeline as Medium (D2). The Approach Tow Route maintains at least 2 nm separation from platforms, and is to the leeward side of platforms relative to the prevailing southerly metocean conditions.

TRAINING/COMMUNICATION REQUIRED TO IMPLEMENT CHANGE? ☐ NO ☑ YES (DESCRIBE)

Communicate change to Ocean Bounty and inerested parties, eg. BBMT Marine Superintendent and CMT Leader.

DATE: 8 AUGUST 2002 TIME: 1100 HR	DURATION: UNTIL COMPLETION OF TOW
EFFECTIVE: IMMEDIATE	REVIEWED BY: F.W. KRATZER
INITIATED BY: C.P. MEAKIN	DATE APPROVED: *8-AUG-2002*
APPROVED BY: DANIEL .L. WHITEMAN	*ORIGINAL SIGNED BY DANIEL L. WHITEMAN*

INSTRUCTIONS:
This form may be used to document significant drilling and operating plan changes. A significant change is one that increases health, safety, public, environmental, or major financial risk; for example any change that will increase the probability of occurrence or increase the severity of consequences for a given risk scenario is considered significant. The individual initiating a change has responsibility for describing the change, assessing risks, ensuring mitigation measures are implemented and obtaining the necessary approvals. For additional information, see Element 7 - Management of Change in the Drilling OIMS Manual.

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Change Worksheet

WELL: BEARDIE-1	**COUNTRY: BASS STRAIT, AUSTRALIA**
RIG: OCEAN BOUNTY SEMISUBMERSIBLE	**DATE INITIATED: 6 AUGUST 2002**

TYPE OF CHANGE (CHECK ONE):

☐ **WELL DESIGN**	☐ **PERSONNEL**
☐ **DRILLING PROGRAM/PROCEDURE**	☑ **OPERATIONS MANUAL PROCEDURE**
☐ **CRITICAL EQUIPMENT/EQUIPMENT O&M**	☐ **RISK ASSESSMENT FOLLOW-UP**
☐ **RESPONSE TO UNEXPECTED EVENTS**	☐ **SPECIFICATION/STANDARD:**

DESCRIPTION OF CHANGE:

Cut-off 30" conductor and 20" x 13-3/8" surface casing shallower than the minimum of 5m below the mudline specified in the Plug and Abandonment section of the Standard Operations Manual - Floating Drilling, but at least 1.5m below the seafloor.

REASON FOR CHANGE:

As the 30" conductor has been cemented in 36" diameter hole, either the 30" stub may not be able to be recovered, or excessive force may be required in the recovery operation.

At Beardie-1 the seafloor consists of medium to coarse silty sands with some shell fragments (Beardie-1 Site Survey Report, 2002). Black *et al.* (1992)[1] observed that at water depth of about 42-45 m and deeper well defined wave-generated parallel bedforms no longer occur, and that this is one of the major features of the bedform patterns in eastern Bass Strait. Furthermore, the 42-45m limit coincides with a continental mud depositional limit discussed by Jones and Davies (1983)[2]. As Beardie-1, at 51m water depth, is below this region of wave generated influence, and as the sediment consists of medium to coarse sand, scouring to a depth of at least 1.5 metres to expose the cut stub is unlikely.

RISK ASSESSMENT SUMMARY (USE RISK MATRIX - SEE ELEMENT 2 IN DRILLING OIMS MANUAL):

HSE PROBABILITY: A ☐ B ☐ C ☐ D ☐ E ☐ **CONSEQUENCE:** I ☐ II ☐ III ☐ IV ☐

FINANCIAL PROBABILITY: A ☐ B ☐ C ☐ D ☐ E ☐ **CONSEQUENCE:** I ☐ II ☐ III ☐ IV ☐

RISK MITIGATION MEASURES (PRESCRIBED PROGRAM LIMITS):

This change reduces the risk for the well.

TRAINING/COMMUNICATION REQUIRED TO IMPLEMENT CHANGE? ☐ **NO** ☑ **YES (DESCRIBE)**

This change requires dispensation from P(SL)A Clause 514(10) which requires cutting casing strings to surface at least 5m below the seafloor. The Regulator has granted dispensation requiring only that casing be cut at least 1.5m below the seafloor.

DATE: 6 AUGUST 2002 **TIME: 1600 HR** **DURATION: INDEFINITE**

EFFECTIVE: IMMEDIATE **REVIEWED BY: C.A. JOHANCSIK**

INITIATED BY: C.P. MEAKIN	**DATE APPROVED:** ***6-AUG-2002***
APPROVED BY: DANIEL .L. WHITEMAN	***ORIGINAL SIGNED BY DANIEL L. WHITEMAN***

INSTRUCTIONS:
This form may be used to document significant drilling and operating plan changes. A significant change is one that increases health, safety, public, environmental, or major financial risk; for example any change that will increase the probability of occurrence or increase the severity of consequences for a given risk scenario is considered significant. The individual initiating a change has responsibility for describing the change, assessing risks, ensuring mitigation measures are implemented and obtaining the necessary approvals. For additional information, see Element 7 - Management of Change in the Drilling OIMS Manual.

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[1] Black, K., Rosenberg, M., Symonds, G., Simons, R., Pattiaratchi, C., Nielsen, P., (1992) Measurements of wave, current and sea level dynamics of an exposed coastal site. In: International Biennial Conference on Physics of Estuaries and Coastal Seas. W. Australia, December 1992.

[2] Jones, H.A. and Davies, P.J. (1983). Surficial Sediments of the Tasmanian Continental Shelf and Part of Bass Strait. Bureau Mineral Resources, Geology and Geophysics Bulletin 218, Australian Government Publication, ACT, 25 p.

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Change Worksheet

WELL: BEARDIE-1	COUNTRY: BASS STRAIT, AUSTRALIA
RIG: OCEAN BOUNTY SEMISUBMERSIBLE	DATE INITIATED: 22 JULY 2002

TYPE OF CHANGE (CHECK ONE):

☑ WELL DESIGN	☐ PERSONNEL
☐ DRILLING PROGRAM/PROCEDURE	☐ OPERATIONS MANUAL PROCEDURE
☐ CRITICAL EQUIPMENT/EQUIPMENT O&M	☐ RISK ASSESSMENT FOLLOW-UP
☐ RESPONSE TO UNEXPECTED EVENTS	☐ SPECIFICATION/STANDARD:

DESCRIPTION/REASON FOR CHANGE:

Change the existing well location from:

Latitude: 38° 15' 16.3"S; Longitude 147° 48' 24.6"E; AMG Zone 55 Easting 570,593m; Northing 5,765,623m

To a new location offset by 1.0m at:

Latitude: 38° 15' 16.27"S; Longitude 147° 48' 24.63"E; AMG Zone 55 Easting 570,593.8m; Northing 5,765,622.4m

DESCRIPTION/REASON FOR CHANGE:

The change is required to match the drilling location to the final version of the Beardie-1 Authority to Drill, dated May 2002

RISK ASSESSMENT SUMMARY (USE RISK MATRIX - SEE ELEMENT 2 IN DRILLING OIMS MANUAL):

HSE PROBABILITY: A ☐ B ☐ C ☐ D ☐ E ☒ CONSEQUENCE: I ☒ II ☒ III ☐ IV ☐
FINANCIAL PROBABILITY: A ☐ B ☐ C ☐ D ☐ E ☒ CONSEQUENCE: I ☐ II ☒ III ☐ IV ☐

RISK MITIGATION MEASURES (PRESCRIBED PROGRAM LIMITS):

This change has no impact on risk for the well.

TRAINING/COMMUNICATION REQUIRED TO IMPLEMENT CHANGE? ☐ NO ☑ YES (DESCRIBE)

A copy of the approved Management of Change will be given to the Esso Drilling Supervisors, Ocean Bounty OIM, Thales Geosolution rig positioning contractors and the Esso rig positioning QA contractor.

DATE: 22 JULY 2002 TIME: 1500 HR	DURATION: INDEFINITE
EFFECTIVE	REVIEWED BY: C.A. JOHANCSIK
INITIATED BY: C.P. MEAKIN	DATE APPROVED: 22-JUL-2002
APPROVED BY: DANIEL .L. WHITEMAN	*ORIGINAL SIGNED BY DANIEL L. WHITEMAN*

INSTRUCTIONS:
This form may be used to document significant drilling and operating plan changes. A significant change is one that increases health, safety, public, environmental, or major financial risk; for example any change that will increase the probability of occurrence or increase the severity of consequences for a given risk scenario is considered significant. The individual initiating a change has responsibility for describing the change, assessing risks, ensuring mitigation measures are implemented and obtaining the necessary approvals. For additional information, see Element 7 - Management of Change in the Drilling OIMS Manual.

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	DATE: 14/ MAY/02 TIME: 1500 HR DURATION: UNTIL 1/DEC/02
EFFECTIVE	REVIEWED BY: D.L. WHITEMAN
INITIATED BY: ANDY MCGREGOR	DATE APPROVED:
APPROVED BY: J.W. KIKER	*Exception endorsed by Stan Christman 7-Oct-2002 and approved by J.W. Kiker (10-Oct-2002)*

INSTRUCTIONS:
This form may be used to document significant drilling and operating plan changes. A significant change is one that increases health, safety, public, environmental, or major financial risk; for example any change that will increase the probability of occurrence or increase the severity of consequences for a given risk scenario is considered significant. The individual initiating a change has responsibility for describing the change, assessing risks, ensuring mitigation measures are implemented and obtaining the necessary approvals. For additional information, see Element 7 - Management of Change in the Drilling OIMS Manual.

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The 1998 Survey is the ABS Specific Periodic Survey (5 yearly). During that survey DOGC used ITC to inspect the accessible structural nodes and used Stolt to inspect the critical nodes that are not easily accessible by lowering inspectors using rope/body harness. As the nodes were painted, inspection was conducted using the Eddy Current method. Contract Diving Service was used to perform underwater visual inspection. MPI & UT equipment was made available but given the condition and knowledge of the history of the rig, NDT inspection was waived by the ABS surveyor (Section 1.4.2 of the Inspection Report). In Sep 2000, an intermediate survey was carried out (Underwater in Lieu of Dry Dock - UWILDD). ABS approved this UWILDD Survey in accordance to ABS rules (documentation in the report). During this survey, column to pontoon welds, diagonal member welds and bracing member welds were cleaned, MPI inspected and the result indicated that the welds were sound. Based on the above survey, ABS certificates of fitness (attached in the survey reports) were issued.

Prior to contracting the Ocean Bounty for the Beardie-1 well in 2002 we requested and received details documenting the ABS Inspection survey for the rig conducted in Dec 2001 from Diamond Offshore General Company. The rig is due for its next ABS SPS survey #5 in March 2003 when all the structural side of the rig is to be inspected.

A MODU Spec Marine Safety Equipment Inspection was conducted during 2002 mobilization of the rig to Bass Strait. This survey commented that " the underwatership from below the drilling draft could be visually inspected; no signs of coating was present and the sacrificial anodes were in bad condition. A few on the topsides of the cross tubulars were replaced (aft side of the rig). Recommend to do a separate hull survey."

General Background

The Beardie-1 well will take about 40 days to drill and evaluate. No production test will be performed. All periodical surveys for the rig are up to date and an additional "mid-survey", 9 months before a full ABS SPS survey is due, would be a significant cost to the well.

A representative of DOGC has advised that the company is not aware of any structural problems with the Ocean Bounty over the past 12 months.

From 1998 the rig has worked in the Timor Sea, Bass Strait and Southern Ocean areas where the seastates have varied from relatively calm to very rough, with some intermediate stacking periods in Darwin. The rig is an Enhanced Victory Class, Crucifix Form semisubmersible, designed for 1500 ft water depth and North Sea weather/seastate conditions.

The rig will drill Beardie-1 in 51m of water in close proximity to Bass Strait platforms (5.9km from Whiting and 12.5km from Barracouta) and helicopter base. Two dedicated boats will be supporting the operations with other service boats working in the area.

RISK ASSESSMENT SUMMARY (USE RISK MATRIX - SEE ELEMENT 2 IN DRILLING OIMS MANUAL):

HSE PROBABILITY: A ☐ B ☐ C ☐ D ☐ E ☒ **CONSEQUENCE:** I ☒ II ☒ III ☐ IV ☐

FINANCIAL PROBABILITY: A ☐ B ☐ C ☐ D ☐ E ☒ **CONSEQUENCE:** I ☐ II ☒ III ☐ IV ☐

RISK MITIGATION MEASURES (PRESCRIBED PROGRAM LIMITS):

None Planned.

TRAINING/COMMUNICATION REQUIRED TO IMPLEMENT CHANGE? ☒ **NO** ☐ **YES (DESCRIBE)**

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Change Worksheet

WELL: BEARDIE-1	COUNTRY: BASS STRAIT, AUSTRALIA
RIG: OCEAN BOUNTY SEMISUBMERSIBLE	DATE INITIATED: 14 JUNE/02

TYPE OF CHANGE (CHECK ONE):

☐ WELL DESIGN	☐ PERSONNEL
☐ DRILLING PROGRAM/PROCEDURE	☐ OPERATIONS MANUAL PROCEDURE
☐ CRITICAL EQUIPMENT/EQUIPMENT O&M	☐ RISK ASSESSMENT FOLLOW-UP
☐ RESPONSE TO UNEXPECTED EVENTS	☒ SPECIFICATION/STANDARD: UPSTREAM DESIGN GUIDANCE MANUAL - MODU MARINE SAFETY

DESCRIPTION/REASON FOR CHANGE:

EMDC OIMS:

EMDC OIMS Section 8-15 requires Initial MODU Structural and Marine Safety Equipment Inspections as part of a rig mobilisation.

DESCRIPTION/REASON FOR CHANGE

Considering the practicality and cost of a rig structural inspection for a one well program 9 months before an ABS Inspection, we recommend that, as per the approval given for East Pilchard-1 in 2001 and subsequent to the Structural Assessment completed at that time, your exception approval be given to waive a further structural assessment and inspection prior to commencement of drilling of Beardie-1 well.

Initial MODU Structural and Marine Safety Equipment Inspections - EMDC OIMS Section 8-15

A Structural Assessment shall be made to determine if a Structural Inspection is warranted. A Marine Safety Equipment Inspection shall be performed as part of the Rig Mobilization or during the first three weeks of operations.

Basic Standard: Exxon Upstream Design Guidance Document "Mobile Offshore Unit Marine Safety" (Design Guidance Standard)

Purposes and implementation

Purpose of an ExxonMobil structural inspection (if the need for one is determined by The Structural Assessment) is to assure:

- adequacy of classification society inspection and, ultimately, the MODU structural integrity

MODU Structual and Marine Safety Equipment Inspections or Surveys are performed by a qualified Marine Safety Survey Contractor (ie MODU Spec) and/or an ExxoMobil team.

Ocean Bounty Assessments and Inspections:
The inspection certifications for the Ocean Bounty have been sighted. The rig has a current ABS Specific Periodic Survey and is due for re-inspection in 2003.

Prior to contracting the Ocean Bounty for the East Pilchard well in 2001, we requested and received details documenting the ABS Inspection survey for the rig conducted in 1998 and Sep 2000 from Diamond Offshore General Company. As part of the Structural Assessment, the Inspection Reports were reviewed at that time by EMDC Deep Water Mooring Engineering Advisor who advised that an **Exception Approval** is required if a Structural Inspection prior to the drilling operations is to be waived. The concern raised at that time were:

The most recent Special Periodic Survey (SPS) and Intermediate Survey are found inadequate in:
- Extent and location of inspection coverage of critical areas (compared to assessor's judgment as critical to structural integrity)

For the drilling of Beardie-1 in 2002 a Structural Assessment has not been initiated but would be expected to raise similar concerns and also the requirement for an Exception Approval.