ESSO AUSTRALIA LIMITED

BLACKBACK-A2

FINAL WELL REPORT

Prepared By

Geoservices Overseas S.A.

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Esso Australia Ltd.
12 Riverside Quay
South Bank, Melbourne
Victoria 3006
Australia
Tel : (03) 9270-3625
Fax : (03) 9270-3593

Geoservices Overseas, S.A.
8/14-22 Farrall Road
Midvale, Perth
Western Australia 6056
Australia
Tel : (08) 9250-2010
Fax : (08) 9250-2715

CONTENTS

Section 1

General Well Summary

Revision	Date	Issued by	Approved by	Remarks
1	01/02/99	Geoservices Unit 093	Base Mudlogging Coordinator	

WELL DATA

Operator	: Esso Australia
Platform	: SEDCO 702 (semi-submersible)
Well name	: Blackback A-2
Country	: Australia
Location	: Gippsland Basin
Well Type	: Subsea Oil Development
Field	: Blackback

Local co-ordinates	Latitude = 148° 33' 11.596" E	Longitude = 38° 32' 31.273" S
AMG co-ordinates	X = 635 363.1 m E	Y = 5 732 885.7 m N

Profile	: Build and hold directional, maximum angle 48 degrees
Reference depth	: Rotary Table (RT)
Elevation RT A.M.S.L.	: 25.9 metres
Sea-water depth	: 395.0 metres
Proposed total depth (MDRT)	: 3828.0 m MDRT (2926.0 m TVDRT)
Actual total depth	: 3811.0 metres (12th May 1999)
True vertical depth	: 2909.2 metres
17.5" Hole Spudded on	: 24th April 1999

Drilling Contractor

Drilling Contractor	: Schlumberger Sedco Forex
Rig name	: SEDCO 702
Rig type	: Semi-Submersible

Drilling Phases

Diameter (inch)	From (m)	To (m)	Mud Type
36"	421 m	505 m	Seawater and High viscosity sweeps
26"	505 m	688 m	Seawater and High viscosity sweeps
17½"	688 m	1305 m	Gel Polymer
12¼"	1305 m	3811 m	Petrofree Synthetic Oil

Cased Hole

Casing Diameter (inch)	Casing Type	Shoe Depth (m)	Top Liner (m)
30"	Vetco- Surface	487 m	419 m
20"	Vetco	682 m	418 m
$13^3/_8$"	Buttress	1296 m	419 m
9 5/8"	Buttress	3803 m	418 m

MUD LOGGING

Logging Unit Number : 93

Engineers : Paul McGilveray
Noel Elliott
Stan Willson

Mudlogging Engineers : Joseph Hinton
Cherie Clark-Moore

Cuttings Collection

Sample Type	Number of sets	Quantity per set	Sampling interval	From (m)	To (m)
Washed and Dried	3	100 grams	10 metres	3450	3620
	3	100 grams	5 metres	3625	3811

Cuttings Distribution

Company	Washed and Dried Sample
Esso Australia	1 set
Victoria Department of Energy and Minerals	1 set
Australian Bureau of Resources	1 set

N.B. 30 metre spot samples collected from 688 m to 3450 m below which samples were collected and bagged for splits.

WELL SUMMARY

Blackback-A2 was designed to be drilled as a build and hold directional well at 48.0° maximum angle to a total depth of 3828 m MD, 2926 m TVD DF. It was programmed to encounter the highly productive Cretaceous Latrobe Formation, as found in the Blackback-2 exploration well. An oil column thickness of 31 m in two zones was expected. TD for this well was programmed at 66 m TVD below the OWC at 2834 m SS to allow logging over the reservoir section and a stratigraphic tie in for the VSP run. The Blacback A-1 well did not provide the data & reserves expected to aid in the drilling of A-2.

The exploration well Blackback-2 is the closest offset well located 2.2 km to the southwest of the A-2 surface location. Drilled as a vertical well to 3160 m in 1992, significant shows of oil and gas were encountered before Blackback-2 was plugged and suspended. Maximum MW was 9.5 ppg and the bottom hole temperature was 194°F. H2S was reported in the Terakihi-1 well 3 km to the north, with levels reaching 400 ppm from the formation fluid samples. CO2 levels have reached 0.35 % in the Blackback field. Abnormal formation pressures, CO2 and H2S were not encountered in the Blackback-2 well.

Permanent downhole pressure/temperature gauges, with surface readout capability back to the Mackerel platform will be installed in the Blackback wells to monitor reservoir performance.

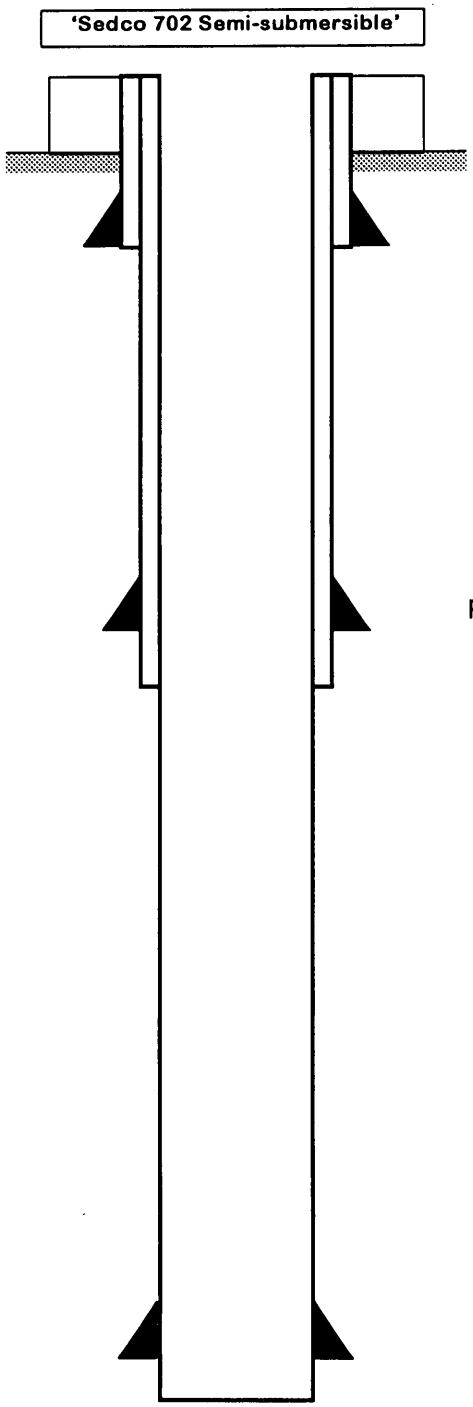
The Blackback A-2 well was drilled using the semi-submersible rig Sedco Forex 702 in 395 metres of water and was the second of three subsea development wells on the Blackback structure located in Bass Strait, Australia, in license VIC L-20. Blackback A-2 was drilled as a directional build and hold hole from after batch setting 30" and 20" casing in both A-2 and A-3 wells. The well was spudded on April 24 1999 and reached TD at 3811 m MDRT, 2909.2 m TVDRT on May 12 1999, a total of 18 drilling days. TD for the well was made shallower due to slow drilling performance in the hard sandstones in the Latrobe Formation. The well encountered 24 m of oil column and the final status was cased and suspended.

36" hole and 26" hole were cased in a batch drilling manner along with Blackback-A3. 17½" hole was drilled from 688 m (20" casing shoe at 682.6 m) to 1305 m (1242.1 m TVD) using one bit run. A pressure integrity test below the 20" shoe was performed to 10.5 ppg. The 17½" phase was drilled while building angle from vertical to the target inclination of 48°. Average penetration rate for this phase was 21.6 m/hr, with ROP slowing as hole angle increased. Gas levels ranged from trace to 3.5% C1, trace to 3.0% CO2 and no H2S detected. At the end of this phase the bit was graded as 2/0/IN (see bit record). 13 3/8" casing was run smoothly and the shoe was set at 1296.3 m.

12¼" hole was drilled from 1305 m to TD at 3811 m (2909.2 m TVD). Five bits were needed to complete this phase, three in the final 90 m due to the hard, abrasive nature of some strongly cemented sandstones. Hole angle was held from between 45.56° at 2750 m to 51.03° at 1361 m. Average penetration rates started faster than the previous phase (29.4 m/hr from 1305 m to 2731 m) in the upper limestones but slowed with depth to just 1.9 m/hr for the bit run from 3764 m to 3775 m in harder sandstones. Gas levels were mostly between 0.5% and 1.0% C1 only until the Latrobe Formation where they rose to a maximum of over 19% C1 with C2 to C5 present, at 3120 m. No CO2 or H2S were detected in this phase. After a short logging program, 9 5/8" casing was run with the hole in good condition and the shoe was set at 3803.5 m. Slow losses to the Latrobe sandstones were cured with CaCO3 LCM pills while drilling and were not a problem while logging or running casing. However, returns were lost while displacing cement and the plug was not bumped. Subsequent casing pressure tests failed, with a leak at the shoe suspected. The well was displaced to 8.9 ppg completion brine and the completion program was carried out.

In this well, the practice of backreaming each stand at connections and circulating until the hole was clean before tripping was successful in maintaining good hole conditions. Monitoring overpull / drag and torque at connections and studying trends was useful in determining when a wiper trip was necessary. Circulating out large gas peaks in the productive zone helped keep mud densities constant. A better choice of bit in the hard LaTrobe Formation sands however, would have saved some otherwise unnecessary bit trips.

WELL PROFILE



Rotary Table to Mean Sea Level
25.9 metres

Rotary Table to Sea Bed
421 metres

Blackback A-2 well

20" Conductor set at 682.57 m

26" hole drilled to 688 mMD

PIT at 690 m, EMW = 10.5 ppg

$13^3/_8$" Casing Shoe at 1296.3 m

17½" hole drilled to 1305 mMD

PIT at 1307 m, EMW =.12.5 ppg

9 5/8" casing shoe at 3803.5 m

Drill 12¼" hole to 3811 mMD

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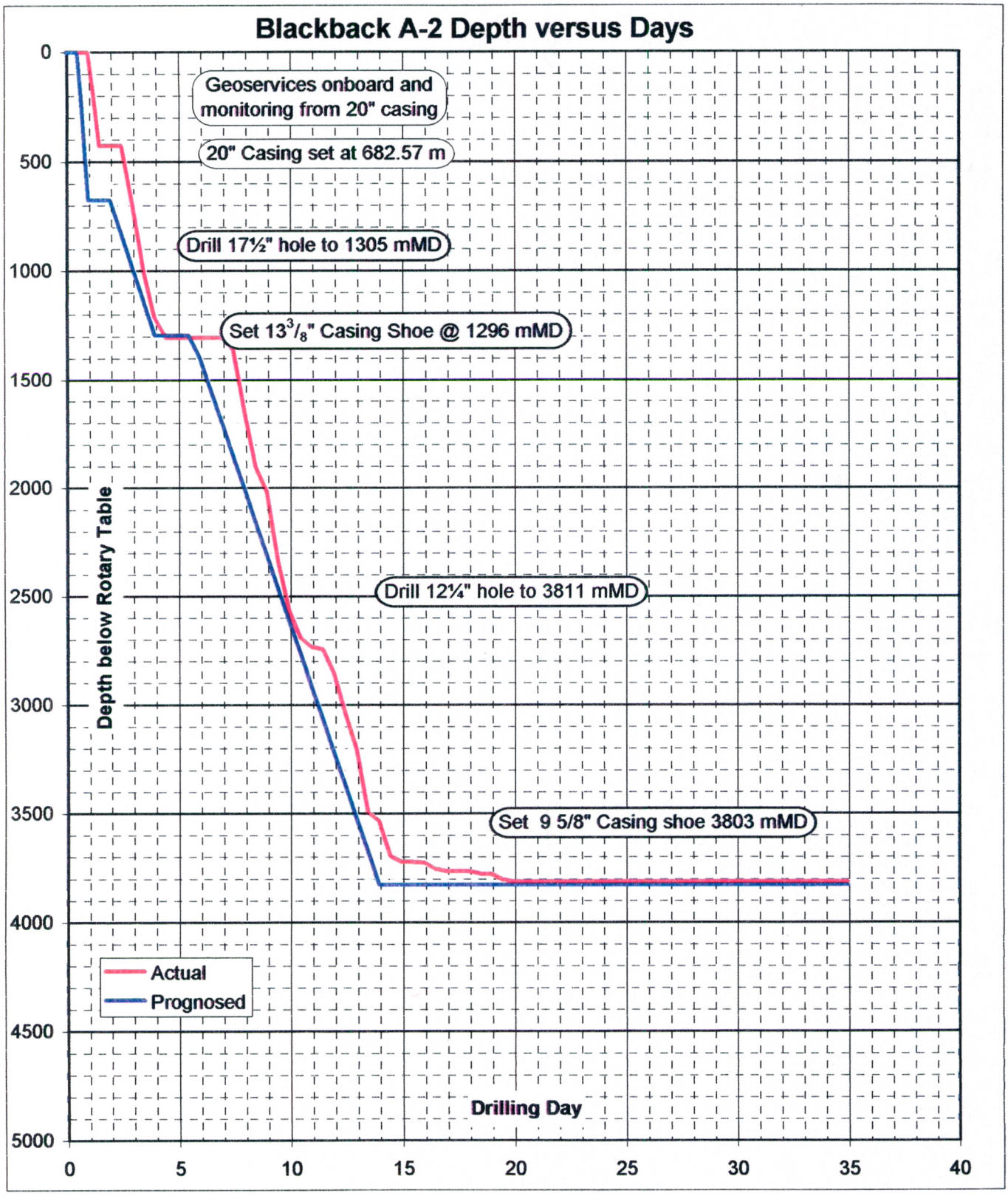

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CEMENTING DATA

CASING DETAILS	CEMENT TYPE	DRY CMT VOLUME	CMT ADDITIVES	MIX WATER	SLURRY VOL.	SLURRY DENSITY	CEMENT to/from
$13^3/_8$"	Class G	948 sx	Nil	5.11 gps fresh	196 bbls	15.8 ppg	1296 m
9 5/8" Lead slurry	Class C	552 sx	0.14 gps SCR-1001 retarder 0.75 gps Gas Con stabiliser 0.01 gps NFS antifoamer	9.0 gps fresh	176 bbls	13.2 ppg	3499 m to 2779 m
9 5/8" Tail slurry	Class G	372 sx	0.02 gps SCR-1001 retarder 0.39 gps Halad-413 fluid loss additive 0.02 Gas Con-469 stabiliser	4.73 gps fresh	76 bbls	15.8 ppg	3803 m to 3499 m

WELL DIARY

23 April 1999 Pumped slug A-1 well, pulled out from 1154m to surface and layed out mule shoe. Cleaned rig floor, layed out 3.5" drill pipe singles and diverter element. Made up flex joint wear bushing running tool and run in hole, recover and lay out. Make up 5" mule shoe, tag top of cement plug @ 1197m, confirm with 20 klbs. Stringer of cement @ 1188m. Pump 30 bbl hi-vis, displace petro-free to seawater followed by inhibited seawater in casing, 386 bbl. Slip & cut. Service TDS, pull out mule shoe, clear rig floor. Set up BOP, 500t handling equipment. JHA prior to pulling diverter, pin slip joint & unlatch BOP. Engage run tool, lay out diverter, rig draft to 80 feet. Make up landing joint, pin slip joint. ROV operations, unlatch BOP and pick up clear of posts, release guide lines from post caps.

24 April 1999 Move rig to VX ring release area, back out ring gaskets, trouble trying to dislodge, troubleshoot. ROV brought to surface with operating arm problem, rectify & attempt to remove VX ring, finally successful. Move over A-2 wellhead location, establish guide lines, lower BOP & latch. Pressure test casing against shear rams. Install diverter. Run in with test plug to pres sure test BOP. Pressure test lines & manifold during ROV operations.

25 April 1999 Pressure test lines & BOP. Make up 13 3/8" casing hanger assembly and rack back. Make up 17.5" BHA & run in the hole. Precautionary wash from 660-674 m top of cement. Drill cement from 674 m, 20" shoe and 2m new formation to 690 m while displacing to gel mud. Circulate hole clean ready to perform PIT.

26 April 1999 Continue to circulate bottoms up at 680 m, inside the 20" shoe. PIT done using 8.5 ppg mud, results EMW==10.56 ppg. Drilled 17.5" hole from 690 to 1004 m. Backream each stand on connections and take surveys, hole condition good. Drill 17.5" hole to 1213 m.

27 April 1999 Drill 17.5" hole from 1213 m to 1305 m TD. Surveys & backream each connection. Circulate bottoms up, pump 100 bbl hi-vis, circulate clean shakers, work string. Continue to circulate to increase viscosity of mud 40 vis to 80 vis, work string. Spot 150 bbl hi-vis on bottom and slug pipe to pull out. Flow check and pull out string, 30 klb maximum drag, pull to 1161 m. Condition mud due to unbalance and inconsistency and run in to 1305 mMD. Circulate, pull out and break down BHA. Run in to jet well head.

28 April 1999 JSA to run tubular. Run in to well head, jet well, latch wear bushing 60 klb. Pull out, strap pipe, break out wear bushing running tool. Clear rig floor. JSA for rig up casing equipment. Pick up shoe/float. Tampacker rig up & test. Run in hole, fill every joint to 236 m. Inflate tampacker and pump through casing to full capacity to check float. Run casing and fill every 5 stands, backream at shoe. Displace mud to sea water, circulate hole clean for cementing. Pressure test surface lines to 3000 psi. Drop ball and pump cement slurry. Displace with rig pump and bump plug at 1500 psi. Check for backflow and rig down cement head. Engage seal assembly. Flush linesand set seal assembly. Pressure test seal assembly. Pressure test BOPs.

29 April 1999 Continue pressure testing BOPs. Retrieve and lay out hanger running tool. Change out bails. Make up and run in wear bushing. Lay out cement sub and cement head from derrick. Rig up to test surface equipment. Pressure test surface eqipment to 5000 psi. Rig down test equipment. Lay down 17.5" BHA. Make up flex joint wear bushing and set. Service rig and TDS, drawworks etc. Hold JSA and pick up 12.25" BHA. Run in 12.25" bit on 5" DP to 480 m and test MWD tool. Continue to run in to 1140 m and pressure test rams and hold choke drill. Run in to 1210 m and wash down. Tag TOC at 1267 m. Hold emergency disconnect drill. Pump 40 bbl spacer and displace hole to 100.5 ppg OBM. Drill out cement while still displacing mud.

30 April 1999 Continue drilling cement while displacing to OBM. Tag top of plug at 1271 m and drill out plug and float collar to 1272.5 m. Continue drilling cement to the casing shoe at 1296 m. Clean rathole from

1296 m to 1305 m TD with no hard cement below the shoe. Drill 12.25" hole from 1305 m to 1308 m and circulate and condition mud to 10.5 ppg. Perform pressure integrity test to 12.5 ppg EMW. Pull back inside the shoe and service rig and repair mudloggers RPM sensor on TDS. Begin drilling 12.25" hole from 1308 m to 1651 m, backreaming each stand, measuring string weights and taking surveys

01 May 1999 Continue to directionally drill 12.25" hole from 1651 m to 1870 m., backreaming each stand, and recording torque and drag. At 1870 m the drillstring was reciprocated and the flow rate increased to 930 gpm, until the hole was clean. Drilling resumed to a depth of 1928 m, where bottoms up were circulated and the drillstring pulled back to the shoe. The drillstring was run back to bottom and drilling resumed to 2019 m.

02 May 1999 Drilling of 12.25" hole continued to 2334 m. At this point the hole was circulated and the riser boosted until the returns were clean. Drilling resumed to a depth of 2451 m where the hole was once again circulated clean. When clean, drilling resumed to a depth of 2565 m.

03 May 1999 Circulate bottoms up twice at 2565 m and flowcheck well. Hold JSA on tripping. Pump out 2 stands to 2508 m with maximum overpull 35 klbs. Slug pipe and pull out of hole from 2508 m to 1428 m, maximum overpull 40 klbs. Run back to bottom with maximum drag 30 klbs, hole in good condition. Tag bottom with no fill. Set variable gauge stabiliser and resume drilling 12.25" hole from 2565 m to 2731 m. Circulate bottoms up twice and until shakers are clean. Hold JSA on tripping. Pump out of hole from 2731 m to 2685 m. Pull out of hole from 2685 m to 2656 m with maximum overpull 40 klbs. Flowcheck, pump slug and continue POOH to shoe, hole in good condition. Perform H2S drill. Service rig, TDS, DRW etc. Continue to POOH, flowcheck before pulling BHA through BOPs.

04 May 1999 POOH and lay down BHA, NB stabiliser 1/16" undergauge. Function test variable gauge stabiliser OK. Lay out bit etc. Make up new bit and BHA and run in to the shoe. Break circulation and continue RIH to 2651 m, maximum drag 35 klbs. Wash and ream from 2651 m to bottom at 2731 m. No fill on bottom, hole in good condition. Function test stabiliser OK. Resume drilling 12¼" hole from 2731 m to 2768 m. Circulate and work string while repairing pump #3. Continue drilling from 2768 m to 2854 m.

05 May 1999 Continue drilling 12¼" directional hole from 2854 m to 3027 m. Flowcheck, jet riser and circulate bottoms up until shakers are clean. Resume drilling from 3027 m to 3202 m. Circulate bottoms up twice and boost riser. Perform flowcheck and pump out of hole from 3202 m to 3118 m. Pump slug and continue POOH to 2731 m with no hole problems.

06 May 1999 Run back in to 3176 m from 2731 m, maximum drag 30 klbs, hole in good condition. Wash and ream down to bottom at 3202 m with no fill. Resume drilling 12¼" directional hole from 3202 m to 3492 m. Circulate twice bottoms up and work string. Boost riser. Hold JSA for tripping and pump out of hole from 3492 m to 2973 m. Circulate until shakers are clean and pull 2 stands out to 2915 m with 40 klbs maximum overpull. Run back in hole from 2915 m to 3436 m, maximum drag 30 klbs. Wash and ream from 3436 m to bottom at 3492 m with no fill. Set variable gauge stabilisers and drill 12¼" directional hole from 3492 m to 3532 m.

07 May 1999 Continue drilling 12¼" directional hole from 3532 m in99to the top of the target sand at 3660 m. Flowcheck and circulate bottoms up, maximum gas 1320 units Continue drilling 12¼" hole from 3660 m to 3680 m. Circulate bottoms up, maximum gas 1175 units. Continue drilling 12¼" hole from 3680 m to 3703 m. Flowcheck drill break (4 bbl/hr losses) and continue drilling to 3715 m. Circulate while evaluate slow ROP and continue to drill to 3717 m. Flowcheck well (2 bbl/hr losses) and continue drilling down to 3721 m. Circulate and pump LCM pill. Back ream out of hole from 3721 m to 3610 m. Pump out of hole from 3610 m to 3147 m.

08 May 1999 Continue to pump out of hole from 3147 m to 2943 m with maximum overpull 60 klbs. Work string and circulate bottoms up until shakers clean. POOH from 2943 m to 2857 m, maximum overpull 50 klbs. Flowcheck and pump slug. Continue POOH from 2857 m to the shoe, maximum overpull 50 klbs. Flowcheck and function test BOPs. Service rig, TDS, drawworks etc. Continue POOH from shoe and flowcheck before pulling out and racking back BHA. Break out bit. Function test rams. Pick up new bit and make up new BHA and RIH. Test MWD tool. Break circulation at the shoe. Hold BOP drill. Slip and cut drill line. Continue RIH from shoe to 3612 m, maximum drag 40 klbs. Wash down to bottom from 3612 m and tag bottom with no fill. Circulate and condition mud. Break in bit and drill 12¼" hole from 3721 m to 3725 m.

09 May 1999 Continue drilling 12¼" hole from 3725 m to 3764 m with slow ROP. Backream out of hole from 3764 m to 3612 m. Flowcheck, losses 3 bbl/hr. POOH from 3612 m to 3554 m and pump slug. Continue to POOH from 3554 m to the shoe, maximum overpull 70 klbs. Flowcheck at shoe, losses 3 bbls/hr. Continue POOH from shoe to top of BHA and flowcheck when BHA at BOPs.

10 May 1999 Continue to POOH , rack BHA and break out bit. . Hold JSA prior rig up and runing wireline logs. Pick up and make up tools for log #1 and run them in the hole. After run wireline was rig down and HWDP were rearrange in derrikc prior to pick upcements stands for 9 5/8" casing. Pick up and make up cement head to 5 ½" HWDP, cross overes and Hydrill valve assembly. Lay down equipment and make up and RIH with 12¼" drilling assembly to shoe (1296 m), filling pipe every 15 stands, continue to 1700 m filling up every 20 stands and circulate for 10 minutes every fill up.

11 May 1999 Continue to RIH from 1700 m to 3620 m . Wash down form 3620 m to bottome (3764 m). Fan bottom for possible junk and start to drill with light parameters. Drill 12¼" hole from 3764 m to 3775 m and pump out of hole from 3775 m to 3583 m, flow checked well and pumped slug and POOH to shoe (1296 m) where another flow check was performed. Service on top drive and block was done and continue to POOH . Flow check was also done prior BHA went through BOP's. Rack back BHA and break off bit. Make up new bit and RIH . Fill every 20 stands on the way in.

12 May 1999 Continue to RIH from 770 m to 3746 m. Precautionary wash from 3741 m to bottom at 3775 m. Fan bottom for possible junk and start to drill with light parameters. Drill 12¼" hole from 3775 m to 3778 m. After connection circulate bottoms up maximum gas 717 units. Continue to drill 12¼" hole from 3778 m to 3811 m TD. Circulate hole clean and flush riser. Flowcheck with no static losses. Pump out of hole from 3811 m to 3620 m, strap pipe on way out. Pump 50 bbl LCM pill at 3620 m. Flowcheck with no static losses. POOH from 3620 m to 3475 m and pump slug. Continue POOH to 2200 m, strap pipe on way out.

13 May 1999 Continue to POOH from 2200 m to the shoe, hole in good condition. Flowcheck at the shoe. Continue POOH and rack back BHA. Hold JSA and break out 12¼" bit and lay down BHA. RIH and recover wear bushing. Lay out wear bushing and running tool. Make up ABB tool and jetting assembly and RIH, flushing wellhead on way in. Engage ABB bushing and shear out with 90 klbs overpull. POOH with ABB bushing. Lay out ABB bushing and ABB tools. Prepare floor and rig up for casing job. Hold JSA for running 9 5/8" casing. Pick up shoe joint. Make up TAM packer and function test. Change out bails to 500 ton. Begin RIH shoe track and 9 5/8" casing. Lay out joint of casing due to over torque. Check and recalibrate casing tongs. Continue to RIH 9 5/8" casing to 1155 m. Install tag between joints 22 and 23.

14 May 1999 Lay out joint. Change out side doors and pick up 350 ton elevators. Fix 350 ton elevators (could not stay open). Continue to RIH 9 5/8" casing from 1155 m to shoe at 1296 m. Break circulation at shoe. Continue RIH casing from 1296 m to 2635 m, filling every joint. Break circulation at 2635 m and change out 350 ton elevators to 500 ton elevators. RIH with 10 3/4" casing from 2641 m to 3382 m, filling every joint. Break circulation and work casing, 430 klbs down and 550 klbs up weight. Lay out 10 3/4" elevators and TAM packer. Rig up to run 5½" HWDP. Pick up hanger assembly and check. Lay out FHS. RIH casing from 3382 m on 5½" HWDP from derrick. Land out hanger at

417.75 m with casing shoe at 3803.54 m. Slacken landing string. Rig up cement hose and surface lines. Circulate and condition mud through casing. maximum gas 613 units, no mud losses.

15 May 1999

Continue to circulate casing. Pump 20 bbls base oil spacer followed by 250 bbls of 11.0 ppg KCl / Polymer mud with the rig pump. Hold JHA on cement job. With Dowell unit, pump 40 bbls 12 ppg surfactant spacer and pressure test surface lines to 3000 psi. Drop ball and pump cement as per program (see cementing data table). Shear bottom plug at 900 psi. Drop dart and shear wiper plug at 2400 psi. Pump seawater with rig pumps to bump plug. Hold 2300 psi for 10 min and bleed off with 4 bbls returns. Displace cement and lose returns at 8800 stks. Regain partial returns at 9700 stks. Lose approximately 100 bbls during cement job. Rig down cement lines. Set down with 5 klbs to set seal assembly. Check with 70 klbs overpull and pressure test to 5000 psi OK. Displace riser, choke and kill lines and manifold to seawater. Release running tool and POOH with HWDP landing string. Hold JSA and continue POOH landing string. Lay out hanger running tool. Clear rig floor of excess equipment. Change out bails to drilling bails. Pick up and check BOP test tool. RIH test tool and land out. Pressure test BOPs to 5000 psi on yellow pod. Function test BOPs on blue pod. POOH and lay down BOP test tool. Pick up, check and make up Chert tool. RIH and land out Chert in wellhead.

16 May 1999

Land out Chert tool in wellhead and pressure test to 1500 psi. Release tool, POOH and lay out tool. Rig up and test surface equipment to 5000 psi. Make up jetting tool and wellhead wear bushing and RIH. Jet wellhead and set wellhead wear bushing. POOH, jetting BOPs and riser on way out. Boost riser while jetting riser. Lay out jet tool and running tool. Pressure test casing against shear rams, failed test at 2500 psi. Lay out cement head and rack back HWDP. Lay out 500 ton bails and 5½" elevators. Pick up drilling bails and 5" DP elevators. Pick up wear bushing running tool, check, RIH and set wear bushing. POOH and lay out running tool. Make up 8½" bit and 9 5/8" and 10 3/4" casing scrapers. RIH to 3410 m.

17 May 1999

Continue RIH casing scraper assembly to 3669 m. Wash down from 3669 m to 3777 m. Circulate casing clean with seawater. Hang off string on middle pipe rams and pressure test casing - failed at 2000 psi. Pump 50 bbls XCD and continue to circulate with seawater while cleaning pits and surface lines etc. Pump Baraklean down string and choke and kill lines. Displace with seawater and continue to pump seawater while cleaining pits.

18 May 1999

Continue to circulate casing with seawater while cleaning pits and surface lines etc. Prepare completion brine in clean pits. Secure well and hold simulated collision drill. Continue to circulate with seawater and prepare completion brine. Displace well with 8.9 ppg completion brine. Pump 800 bbls inhibited brine and POOH with 8½" bit.

Section 2

Geological Summary

Revision	Date	Issued by	Approved by	Remarks
1	01/02/99	Geoservices Unit 093	Base Mudlogging Coordinator	

FORMATION TOPS (WELLSITE PICKS)

DESCRIPTION	MD (m) - RT	TVD (m) (26m RT)
GIPPSLAND LIMESTONE	421	421
LAKES ENTRANCE FORMATION	3175	2489
LaTROBE FORMATION	3630	2791
COARSE CLASTICS	3640	2797
TOTAL DEPTH	3811	2909

GEOLOGICAL SUMMARY

688-836 m TMD **LIMESTONE**

LIMESTONE Light green grey, occasionally translucent brown, light grey, calcarenite, fossiliferous, common forams, dispersive to hard.

836-925 m TMD **LIMESTONE**

LIMESTONE Yellow grey, light olive grey, rarely medium grey, calcisiltite grading to calcilutite, common fossil fragments, trace carbonaceous specks, very soft to firm.

925-1286 m TMD **LIMESTONE**

LIMESTONE Light olive grey, green grey, mainly calcarenite and calcisiltite, common to abundant fossil fragments, trace to occasional carbonaceous specks, trace Glauconite and Pyrite nodules in parts, very soft to firm, becoming soft to moderately hard with depth.

1286-3175 m TMD **LIMESTONE**

LIMESTONE Light grey, medium grey, light olive grey, very light grey to white in parts, calcisiltite to calcarenite, common carbonaceous specks becoming rarer with depth, trace Glauconite in parts, firm to moderately, blocky to subblocky, grading to calcareous claystone at base of interval.

3175 m TMD (2489 m TVD) **LAKES ENTRANCE FORMATION**

3175-3630 m TMD **CLAYSTONE**

CLAYSTONE Light grey, light bluish grey, medium grey, grades to calcilutite at top of interval becoming less calcareous with depth, trace disseminated Pyrite with rare nodular Pyrite in parts, rare carbonaceous specks, rare local Glauconite at top of interval, soft to firm, blocky to amorphous.

3630 m TMD (2791 m TVD) **LATROBE GROUP**

3630-3740 m TMD **SANDSTONE and SILTSTONE with minor CLAYSTONE**

SANDSTONE Clear to translucent, frosted grains, medium to coarse grained, poorly sorted, angular to subangular, rarely subrounded, clean and loose at top of interval, with strong siliceous cement and Kaolinite matrix appearing later, common coarse milky Quartz and occasional Iron (Limonite) stained grains, trace nodular Pyrite, common Glauconite, very good to good inferred

porosity at top of interval, becoming fair to poor, trace to 10% fluorescence, dull to moderately bright, patchy to pinpoint, yellow-green, feint, weak instant cut, nil to trace residual ring.

SILTSTONE Dark brown, brown, brown-black, brown-grey, argillaceous, micromicaceous, common pelletal Glauconite, trace lithic and very fine Quartz grains, very soft and sticky to firm in parts, amorphous and massive.

CLAYSTONE Dark grey, brown-grey, slightly silty, micromicaceous, homogenous, firm to moderately hard, blocky to platy.

3740-3811 m TMD **SANDSTONE with minor CLAYSTONE**

SANDSTONE: Clear to translucent, frosted grains, medium to coarse grained, moderately sorted, subrounded to angular, strong siliceous or dolocalcareous cement in parts, mainly weak siliceous cement, common Kaolinite matrix in parts, trace quartz overgrowths in parts, common Glauconite, common very coarse milky Quartz grains, trace Pyrite nodules and pyritic cement, predominantly clean to loose grains, fair to good inferred porosity, no fluorescence.

CLAYSTONE: Medium to dark grey, brown-grey, moderately silty in parts, common Glauconite in parts, trace disseminated Pyrite, micromicaceous, trace of carbonaceous material, becoming rarer with depth, soft, massive to amorphous.

FLUORESCENCE REPORT

DEPTH 3688-3721 m TMD

SANDSTONE Clear to translucent, frosted grains, medium to coarse grained, occasionally very coarse, poorly sorted, angular to subangular, clean and loose, trace nodular Pyrite, common Glauconite, occasional Limonite stained Quartz grains, good inferred porosity.

FLUORESCENCE Trace to 10%, dull to moderately bright, patchy to pinpoint, yellow-green fluorescence, feint, weak instant cut, nil to trace residual ring.

ASSOCIATED GAS

Depth	Tot Gas	C1	C2	C3	iC4	nC4	iC5	nC5
3689.0	185.1	2.11	0.22	0.07	tr	tr	tr	tr
3692.5	221.8	2.75	0.23	0.07	0.01	0.02	tr	tr
3700.5	249.5	3.30	0.27	0.09	0.01	0.01	tr	tr
3703.5	325.4	3.56	0.35	0.12	0.01	0.01	tr	tr
3709.0	287.4	3.55	0.36	0.15	0.02	0.02	tr	tr
3712.5	426.0	5.05	0.51	0.20	0.02	0.03	tr	tr
3719.0	169.0	1.82	0.29	0.16	0.07	0.08	tr	tr

DEPTH 3721-3740 m TMD

SANDSTONE Clear to translucent, frosted grains, medium to coarse grained, poorly sorted, angular to subround, strong siliceous cement in part, trace pyritic cement, locally common Kaolinite inclusions, common coarse milky Quartz, trace Iron stained grains, common Glauconite, mainly loose with occasional hard aggregates, poor to fair inferred porosity.

FLUORESCENCE 10% to 20%, bright, solid, pale yellow fluorescence, fast streaming cut, moderately thick residual ring.

ASSOCIATED GAS

Depth	Tot Gas	C1	C2	C3	iC4	nC4	iC5	nC5
3728.5	49.9	0.87	0.09	0.04	0.02	0.02	tr	tr
3740.0	27.4	0.40	0.04	0.02	0.01	0.01	tr	tr

GAS REPORT

Gas levels while drilling Blackback-A2 remained mostly below 100 units (<2% C1) of methane only until approaching the Latrobe Formation top at 3640 m. Two sections, from 750 m to 866 m and from 2004 m to 2278 m stood out, with higher background gas levels of between 100 and 200 units (2%-4% C1) but again the gas was methane only. Some CO2 was detected in top hole (0.2% to 3.8% from 688 m to 1305 m) but no H2S was detected in this well.

From 3540 m, ethane began to become present as the pay zone neared. The gas cap in the Latrobe Formation top at 3640 m produced an immediate, large rise in background gas, with propane and butane being detected for the first time. Gas here was very dry in composition and pentane was only seen in trace amounts. As drilling progressed through the productive zone, gas composition became wetter and heavier hydrocarbons were detected in increasing relative quantities, however butane and pentane were not present as much as might be expected. This is possibly as a consequence of remaining in solution in the ester-based drilling fluid, as could be seen by the ease in which gas peaks eg. trip gas could be recirculated through the system three or four times.

The Gas Ratio plot shows a zone of rich oil-indicating gas from 3729 m to 3763 m MD. In this section, the wetness is around 20, indicating oil, and the balance is slightly less than the wetness, indicating a medium-light oil API. The gas character in this section is around 1.6, which confirms an oil zone.

A summary of trip gas peaks appears below. For gas peaks while drilling the LaTrobe Formation, see the Fluorescence section on the previous page.

TRIP GAS PEAKS

Depth (m MD)	Type	MW (ppg)	Tot. Gas (units)
1305	circ after run casing	9.3	34
1929	wiper trip	10.7	51
2565	wiper trip	10.7	0
2731	bit trip	10.8	65
3202	wiper trip	11.1	56
3492	wiper trip	11.2	57
3721	bit trip	11.3	365
3764	bit trip	11.2	1265
3775	bit trip	11.2	752
3811	circ after run casing	11.2	613

OVERPRESSURE SUMMARY

The following techniques were utilized as indicators of abnormal formation pressures during the drilling of Blackback A-2:

D-EXPONENT: This is a normalised rate of penetration which takes into account variables such as weight on bit, rotation, and mud weight. It is designed to quantitatively predict pore pressures in shaley formations. It may also be used as an indicator in siltstones, silty shales and calcareous claystones since the fundamental principle that underbalanced bottom hole conditions result in faster drilling applies to all these formations. A shift in the normal trend (representing a normal compaction trend) to the left (representing relative undercompaction) may indicate overpressure or increased porosity due to lithological changes.

GAS: Overpressure may be indicated by increases in the background gas, trip gas, and connection gas readings. Similar changes may however also occur as a result of formation porosity changes which are unrelated to pore pressures.

CUTTINGS: Small splintery cuttings indicate overpressured formations. Long propeller-shaped cavings are usually caused by overpressure or by the hydration of reactive or swelling clays.

HOLE CONDITIONS: As mentioned above, cavings resulting from overpressure may be introduced into the hole. Subsequently, increased overpull and drag on the drill collars and stabilizers during connections and trips may occur. Increasing torque trends show deteriorating hole condition for similar reasons. Encountering hole fill on running back to bottom may also be indicative of overpressure.

TEMPERATURE: Changes in downhole temperature can be measured at the surface by means of a temperature sensor positioned in the flow line. The primary factor that enables this measurement to be of use in overpressure studies, is thermal conductivity. In an undercompacted sequence, the presence of an abnormally high percentage of pore fluids causes heat to be trapped. Hence the area immediately above the overpressured unit is a zone of heat starvation. Changes in thermal gradient can therefore be used to map a transition from normally pressured to overpressured environments. Limitations of this technique include riser cooling by seawater, surface mud additions, circulation breaks, changes in ROP, hole size and flow rate, all of which may mask or distort surface mud temperature readings.

The use of all these methods in conjunction with each other will give the most reliable indication of any abnormal formation pressures. In non-shaley formations such as the limestones which make up the greater part of Blacback-A2, the D Exponent cannot be quantitative and since it is also affected by directional drilling practices, it must be ignored.

Background gas readings showed little character during this well while drilling through the long Lakes Entrance limestone sequence. The high gas levels in the LaTrobe Formation were due to lithological factors and not increased formation pressures. The table of trip gas peaks on the preceding page shows no excessive gas influx due to swabbing except for the trips made when the gas cap zone had been freshly drilled and gas bleeding into the hole would be expected.

No splintery or unusually shaped cuttings were observed in the cuttings samples during this well.

Hole conditions were closely monitored during this well. Drag, overpull and torque values were noted every connection while drilling the 12¼" phase. Increasing trends were generally cured with a wiper trip, showing that hole behaviour was related to cleaning or other factors, not formation pressures.

Mud temperature plots show no evidence of an abnormal temperature gradient.

From these observations, there is no evidence of overpressured formations in Blackback A-2. Abnormal pressures in this part of the Bass strait are known to come in below the massive P.Mawsonii marine shale at 4000 m +/- SS, much deeper than the top of the Latrobe Group development target proposed for the Blackback A-1, A-2 and A-3 wells.

PE614241

This is an enclosure indicator page.
The enclosure PE614241 is enclosed within the container PE908079 at this location in this document.

The enclosure PE614241 has the following characteristics:

ITEM_BARCODE	= PE614241
CONTAINER_BARCODE	= PE908079
NAME	= Mud Log for Blackback-A2. 1:500
BASIN	= GIPPSLAND
ONSHORE?	= N
DATA_TYPE	= WELL
DATA_SUB_TYPE	= MUD_LOG
DESCRIPTION	= Mud Log for Blackback-A2 (Master Log). 1:500. By Geoservices logging for Esso Australia Ltd. February 1999
REMARKS	=
DATE_WRITTEN	= 01-FEB-1999
DATE_PROCESSED	=
DATE_RECEIVED	= 16-JUN-1999
RECEIVED_FROM	= Esso Australia Ltd
WELL_NAME	= Blackback-A2
CONTRACTOR	= Geoservices
AUTHOR	=
ORIGINATOR	= Esso Australia Ltd
TOP_DEPTH	= 650
BOTTOM_DEPTH	= 3830
ROW_CREATED_BY	= DH00_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE614242

This is an enclosure indicator page.
The enclosure PE614242 is enclosed within the container PE908079 at this location in this document.

The enclosure PE614242 has the following characteristics:

ITEM_BARCODE	= PE614242
CONTAINER_BARCODE	= PE908079
NAME	= Mud Log for Blackback-A2. 1:200
BASIN	= GIPPSLAND
ONSHORE?	= N
DATA_TYPE	= WELL
DATA_SUB_TYPE	= MUD_LOG
DESCRIPTION	= Mud Log for Blackback-A2 (Master Log). 1:200. By Geoservices logging for Esso Australia Ltd. February 1999
REMARKS	=
DATE_WRITTEN	= 01-FEB-1999
DATE_PROCESSED	=
DATE_RECEIVED	= 16-JUN-1999
RECEIVED_FROM	= Esso Australia Ltd
WELL_NAME	= Blackback-A2
CONTRACTOR	= Geoservices
AUTHOR	=
ORIGINATOR	= Esso Australia Ltd
TOP_DEPTH	= 3580
BOTTOM_DEPTH	= 3820
ROW_CREATED_BY	= DH00_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE614243

This is an enclosure indicator page.
The enclosure PE614243 is enclosed within the container PE908079 at this location in this document.

The enclosure PE614243 has the following characteristics:

ITEM_BARCODE	PE614243
CONTAINER_BARCODE	PE908079
NAME	Drilling Log for Blackback-A2. 1:1000
BASIN	GIPPSLAND
ONSHORE?	N
DATA_TYPE	WELL
DATA_SUB_TYPE	WELL_LOG
DESCRIPTION	Drilling Log for Blackback-A2. 1:1000. By Geoservices logging for Esso Australia Ltd. February 1999
REMARKS	
DATE_WRITTEN	01-FEB-1999
DATE_PROCESSED	
DATE_RECEIVED	16-JUN-1999
RECEIVED_FROM	Esso Australia Ltd
WELL_NAME	Blackback-A2
CONTRACTOR	Geoservices
AUTHOR	
ORIGINATOR	Esso Australia Ltd
TOP_DEPTH	650
BOTTOM_DEPTH	3830
ROW_CREATED_BY	DH00_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE614244

This is an enclosure indicator page.
The enclosure PE614244 is enclosed within the container PE908079 at this location in this document.

The enclosure PE614244 has the following characteristics:

ITEM_BARCODE	PE614244
CONTAINER_BARCODE	PE908079
NAME	Gas Ratio Log for Blackback-A2. 1:500
BASIN	GIPPSLAND
ONSHORE?	N
DATA_TYPE	WELL
DATA_SUB_TYPE	WELL_LOG
DESCRIPTION	Gas Ratio Log for Blackback-A2. 1:500. By Geoservices logging for Esso Australia Ltd. February 1999
REMARKS	
DATE_WRITTEN	01-FEB-1999
DATE_PROCESSED	
DATE_RECEIVED	16-JUN-1999
RECEIVED_FROM	Esso Australia Ltd
WELL_NAME	Blackback-A2
CONTRACTOR	Geoservices
AUTHOR	
ORIGINATOR	Esso Australia Ltd
TOP_DEPTH	3580
BOTTOM_DEPTH	3810
ROW_CREATED_BY	DH00_SW

(Inserted by DNRE - Vic Govt Mines Dept)