

Esso Australia Ltd.

W1072

PETROLEUM DIVISION
WELL COMPLETION REPORT

VOLUME 1 04 MAY 1993
BASIC DATA

BLACKBACK-2

GIPPSLAND BASIN
VICTORIA

ESSO AUSTRALIA LIMITED

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April 1993

WELL COMPLETION REPORT

VOLUME 1: BASIC DATA

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1. WELL DATA RECORD

LOCATION : Latitude : 38° 33' 28.25" South
Longitude : 148° 32' 36.09" East
X= 634474 mE
Y=5731144 mN
Map Projection: UTM Zone 55
Geographical Location: Bass Strait, Victoria

FIELD : Blackback

PERMIT : Vic/P24

ELEVATION : 22.3 m

WATER DEPTH : 370.38 m

TOTAL DEPTH : 3160m (Driller) 3152 m (Logger)

PLUG BACK TYPE : Cement plugs

REASONS FOR PLUGGING BACK : Plug and abandon

MOVE IN : 19:00 hrs 15/9/92

SPUDDED : 19:15 hrs 18/9/92

REACHED TD : 06:00 hrs 4/10/92

RIG RELEASED : 15:15 hrs 1/11/92

OPERATOR : Esso Australia Resources Ltd.

PERMITTEE OR LICENCEE : BHP Petroleum (Australia) Pty Ltd and Esso Australia Resources Ltd.

ESSO INTEREST : 50 %

OTHER INTEREST : BHPP - 50%

CONTRACTOR : Atwood Oceanics

RIG NAME : Atwood Falcon

EQUIPMENT TYPE : Semi-submersible

TOTAL RIG DAYS : 47

DRILLING AFE NO : L66012002

TYPE COMPLETION : Plug and abandon

WELL CLASSIFICATION : Appraisal

2.

OPERATIONS SUMMARY

The Atwood Falcon arrived at the Blackback 2 location at 19:00 hours on September 15th 1992. The MV Lady Caroline and the MV Maersk Lifter ran and set anchors 3 and 7 before the rig was ballasted to survival draft to wait on weather. The Maersk Lifter resumed running the remaining anchors at 06:30 hours on September 17th. The final anchor was set at 23:30 hours on September 17th and the rig was ballasted down to a 55 foot drilling draft. The final location was 13 metres on a true bearing of 104 degrees from the called location in a water depth of 370.38 metres.

a) 36" HOLE SECTION

The TGB running tool and bumper sub were picked and the TGB tripped to the seabed. After the TGB was set, the TGB running tool was released, tripped out and layed down. MWD was picked up and TIH with a 17.5" drilling assembly. The MWD was tested prior to stabbing into the TGB and monitoring with the ROV. The ROV was then removed and a survey taken with MWD which indicated a 0.88 degree deviation. Blackback 2 was spudded at 19:15 hours on September 18th. The pilot hole was drilled from 392.63 to 433 metres, sweeping the hole with high viscosity pills as needed and reaming each joint drilled. A survey was taken at 433 metres and indicated a 1.1 degree deviation. The hole was then swept with a 50 barrel pill before pulling out the 17.5" drilling assembly. A bottom hole assembly consisting of a 17.5" bit, a 26" hole opener, a 36" hole opener and MWD was made up. The MWD was downloaded and initialised before running in the hole. The 17.5" hole was opened to 36" from 392.6 to 427 metres. The hole was then swept with a high viscosity pill before making a wiper trip to within 5 metres of the seabed. The bottom hole assembly was pulled out of the hole and the hole displaced with 205 barrels of gel mud. The permanent guide base and 30" casing were then picked up and run. The 30" casing shoe was set at 427 metres and the casing cemented with 500 sacks of class 'G' cement mixed with 2% CaCl₂ and 60 barrels of water, at a slurry density of 15.8 ppg. The 36" drilling assembly was then picked and layed out and a 26" bit made up and run in the hole. The top of cement was tagged at 420 metres and cement drilled from 420 to 430 metres. The hole was then wiped, reamed and flushed with a 75 barrel high viscosity pill before pulling out with the 26" bit.

b) 17 1/2" HOLE SECTION

A new 17 1/2" bit was picked up and run in the hole to 430 metres. The 17 1/2" hole was drilled from 430 to 1168 metres and swept with high viscosity pills as needed. The hole was then swept with a 100 barrel high viscosity pill and a survey dropped. The bottom hole assembly was then pulled out to the 30" casing shoe and the survey recovered, indicating 0.25 degrees of deviation. The bit was run back in the hole to 1149 metres and the hole washed from 1149 to 1168 metres. The hole was swept with another 100 barrel high viscosity pill and a spot 600 barrel high viscosity pill before again pulling out to the 30" casing shoe. A spot 120 barrel high viscosity pill was pumped at the 30" casing shoe before pulling out of the hole and rigging up to run casing. A total of 53 joints of 54.5 lb/ft K55 and 10 joints of 68 lb/ft K55 13 3/8" casing were run, along with a 13 3/8" X 20" swedge and one joint of 133 lb/ft 20" casing. The 13 3/8" casing shoe landed at 1152.61 meters. The casing was cemented with a lead slurry of 1500 sacks of class 'G' cement mixed with 430 barrels of water and 3.1% PH gel to a density of 12.5 ppg. A tail slurry of 670 sacks of class 'G' cement in 80 bbls of seawater was then pumped at a slurry density of 15.8 ppg. The BOP was rigged up and run on 21" x 5/8" wall thickness Vetco riser. The BOP was latched to the 18 3/4" wellhead and pull tested to 50 kips overpull. The connector was pressure tested (300/1500 psi) and the

choke and kill lines tested to 200/5000 psi every five joints. The slip joint was scoped out and the diverter installed. The shear rams, well head connection and casing string were then tested to 1500 psi. The 17 1/2" drilling assembly was layed out and the BOP/riser running gear removed from the rig floor.

c) 12 1/4" HOLE SECTION

A 12 1/4" bottom hole assembly consisting of a 12 1/4" PDC (DS40H) bit, 9 5/8" mud motor and MWD was made up and run in the hole to 711 metres, where the mud motor and MWD were tested. The bottom hole assembly was then run to the top of cement at 1124 metres. The cement and shoe were drilled out and the rat hole cleaned out. 12 1/4" hole was drilled from 1168 to 1171 meters, where a high viscosity slug was pumped and bottoms up circulated. The phase-2 PIT was then performed to a maximum of 950 psi (13.0 ppg equivalent). The 12 1/4" hole was then drilled using the mud motor and MWD from 1171 to 2767 metres, with the riser flushed at 1513, 1831, 2090, 2375 and 2577 metres. Samples were circulated at 2768 and at 2778 meters prior to pulling out with the bottom hole assembly to cut core # 1. A new 9 5/8" RC412 Coreguard bit was made up on an 8" X 5 1/4" barrell and run in the hole to cut core # 1. The hole was washed and reamed from 2761 to 2778 metres and bottoms up circulated before cutting the core. Core #1 was cut from 2778 to 2780 metres. The core bit was pulled out of the hole due to an extremely slow penetration rate. No core was recovered. A new Reed HP51AJ bit was made up with a junk sub and MWD and run in the hole to drill ahead. The 12 1/4" hole was drilled from 2780 to 2790 metres before circulating bottoms up. As no shows were recorded, drilling continued from 2790 to 2797 metres, where a drilling break was flow checked and bottoms up circulated. The bottom hole assembly was pulled out of the hole. A 9 7/8" RC412 coreguard bit was made up on an 18 metre core barrel and run in the hole to cut core #2. Bottoms up were circulated prior to cutting core #2 from 2797 to 2814 metres. The core barrel was then pulled out of the hole and 16.5 metres of core (97%) recovered. The core barrell was then serviced and made up with a rerun RC412 coreguard bit. The coring assembly was run in the hole and core #3 cut 2814 to 2831 metres. The core barrel was pulled out of the hole and 16.4 metres of core (96%) recovered. The weekly BOP pressure testing program was conducted before making up a 12 1/4" drilling assembly. The 12 1/4" drilling assembly was run in the hole and the cored section opened from 9 7/8" to 12 1/4" from 2801 to 2831 metres while logging with MWD. The 12 1/4" hole was then drilled from 2831 to 2832 metres before circulating bottoms up and pulling out of the hole to continue coring. The core barrel was dressed and made up with a rerun 9 7/8" Coreguard RC 412 bit. The coring assembly was run in the hole and core #4 cut from 2832 to 2850.5 metres. The coring assembly was pulled out of the hole and 18.5 meters (100%) of core recovered. The core barrel and stabilizers were serviced and run in the hole to cut core # 5 from 2850.5 to 2869 metres. The coring assembly was then pulled out of the hole and 18.5 metres of core (100%) recovered. The coring equipment was then layed down. A 12 1/4" drilling assembly was made up with MWD and run in the hole to 2799 metres. The hole was washed and reamed from 2799 to 2832 metres. The cored section was then reamed from 9 7/8" to 12 1/4" from 2832 to 2869 metres before drilling ahead. TD was called at a depth of 3160 metres at 06:00 hours on the 4th of October 1992. A slug was pumped prior to pulling back to 3096 metres. The hole was back reamed from 3096 to 2827 metres, where another slug was pumped. The bit was then pulled out to 1150 metres before breaking the collar from the 9 5/8" casing hanger and rigging down the Sperry-Sun heave indicator. The bit was then run back to 3142 metres and the hole washed from 3142 to 3160 metres. An 80 barrel high viscosity slug was pumped and bottoms up circulated. A further slug was pumped before pulling out to 2856 metres, with back reaming between 3160 and 2885 metres. The bit was again run to 3142 and the hole washed to TD. A 60 barrel high viscosity pill was pumped and bottoms up circulated. The riser was flushed before pulling out of the hole,

with precautionary back reaming between 3160 and 2971 metres. The MWD was downloaded and layed down before rigging up Schlumberger.

Schlumberger were rigged up to run suite 1 logs. DLL-MSFL-SDL-SP-GR-AMS was run first, followed by FMS-LDL-CNL-NGS-AMS and MDT-GR-AMS (pretests, vertical/horizontal permeability tests and samples). Two CSAT tools were then picked up and run in the hole for the walkaway VSP survey, using the Flinders Tide to tow the source. The tool became stuck with the top of the tool at 1826 metres. The Schlumberger logging sheaves were rigged down and equipment rigged up to cut and strip over the wireline. The stripping was run in the hole over the wireline and the tool became free with the bottom of the pipe at 1638 metres. The tools were then pulled out of the hole and layed down and the fishing equipment rigged down. The weekly BOP tests were conducted before picking up a 12 1/4" drilling assembly to ream the hole. The drilling assembly was tripped in to 1600 metres and the hole washed and reamed from 1600 to 1900 metres. The drilling assembly was then tripped to 2715 metres and the hole washed and reamed from 2715 to 2863 metres. Gas was circulated out at 2863 metres with a maximum reading of 1008 units. Reaming was then continued from 2863 to 3149 metres before a 100 barrel gel sweep was circulated. The hole was then back reamed from 3149 to 2737 metres before tripping back down to 3111 metres and washing and reaming from 3111 to 3149 metres. A 50 barrel gel sweep and bottoms up were circulated before back reaming from 3149 to 3025 metres and pulling out of the hole. Schlumberger were then rigged up to continue running MDT samples. The tool could not pass 2649 metres and was pulled out of the hole. Schlumberger were rigged down and a 12 1/4" drilling assembly picked up and run in hole to 2584 metres. The hole was washed and reamed from 2584 to 2808 metres, where bottoms up was circulated. Washing and reaming was then continued from 2808 to 3149 metres while raising the mud weight from 9.5 to 10.0 ppg. The hole was then circulated clean and back reaming performed from 3149 to 2600 metres. The hole was then reamed from 2600 to 3149 metres before circulating a 50 barrel gel sweep and pulling out of the hole with back reaming between 3149 and 2953 metres. Schlumberger were then rigged up and the CSAT checkshot and zero offset VSP surveys run. The CST sidewall cores were then run, with 38 of the 60 shots recovered. Schlumberger were then rigged down. The 9 5/8" casing hanger and running tools were made up and stood back in the derrick. A 12 1/4" drilling assembly was made up and run in the hole to 2877 metres. The hole was washed and reamed from 2877 to 3050 metres. Mud was circulated and conditioned for two hours before pulling out to run casing. 213 joints of 47 lbs/ft 9 5/8" casing were run with two pip tags and 3 pup joints. The casing shoe landed at 2946.2 metres and the casing was cemented with 703 sacks of class 'G' cement. The weekly BOP pressure test was conducted before displacing the surface lines and riser with 8.8 ppg brine. The 9 5/8" wear bushing was run and set and 8" drill collars layed down. The casing scraper was picked along with a 8 1/2" bit and run in the hole on the end of 3 1/2" tubing to 2911 metres and washed down to 2919 metres (float collar set at 2921 metres). The casing was circulated and swept with a high viscosity pill prior to pulling out to run Schlumberger cement/casing logs. CBL-CET-VDL-CCL-GR logs were run from 2919 to 2520 with the top of cement logged at 2570 metres. Schlumberger were then rigged down and production test equipment rigged up and pressure tested.

The test string was run in the hole, filling the tubing with diesel every ten stands and pressure testing the tubing to 3000 psi. The subsea test tree was rigged up and run in the hole. Schlumberger were rigged up to run GR-CCL for the perforations. Production test zone #1 was perforated between 2840.5 to 2846 metres and flowed for 15 minutes. The well was then shut in to monitor pressure build up. Failure to latch into the model E valve with SRO gauges meant shut in pressures could not be monitored. The gauges were pulled out of the hole and the well flowed in an attempt to clean possible debris from the valve. The well was then shut in and the

gauges rerun. The gauges did not appear to be reading formation pressure and failed when the well was opened. The well was shut in again and an attempt made to pull the gauges out on wireline. The gauges became stuck at 2770 metres before the well was opened and flowed at 1602 barrels of oil and 1.71 MSCF of gas per day. The well was then shut in and killed before again attempting to pull out the Schlumberger wireline. After the wireline failed, the test tree was rigged down and the test string pulled out of the hole. The test tools and top drive were serviced before tripping back in the hole to retest zone #1. The surface test tree was rigged up and tested and the test tubing tested to 3000 psi. The well was opened and allowed to clean up. The final stabilised flow rate was 6640 barrels of oil and 7.88 MSCF of gas per day. The well was shut in prior to flowing for 30 minutes and shutting in again to run HRS bottom hole sample tools on Schlumberger wireline. The well was then flowed for 15 minutes before the sample tool was fired and the well shut in while the sample tool was pulled out of the hole. The well was then killed and the test string pulled out of the hole. Schlumberger were then rigged up to run and set an EZSV bridge plug at 2838.1 metres. The test string was then run in the hole for production test zone #2 and Schlumberger rigged up to run a GR-CCL log for the perforations. Production test zone #2 was perforated between 2829.5 and 2834 metres. The well was flowed and shut in before being reopened and yielding a final flow rate of 5659 barrels of oil per day. The well was again shut in before running in with a mechanical clock bottom hole sampler on Schlumberger wireline and flowing the well to take a bottom hole sample. The bottom hole sampler was then pulled out of the hole and the well killed.

Following the completion of the production testing program, Schlumberger were rigged up to run cased hole RFT samples. Three segregated samples were collected before an EZSV bridge plug was run in on Schlumberger wireline and set at 2827 metres. Schlumberger were rigged down and a 3 1/2" tubing stinger run in the hole. The top of the bridge plug was tagged at 2826 metres and bottoms up circulated with a maximum gas reading of 1568 units. Cement plug #1 was then set from 2823 to 2673 metres using 175 sacks of class 'G' cement at slurry density of 15.8 ppg. The cementing equipment was then pulled out of the hole and Schlumberger rigged up to run a 9 5/8" Pingo casing cutter. After cutting the casing, Schlumberger were rigged down and the hole was circulated with sea water. The 9 5/8" casing was then pulled out of the hole and Schlumberger rigged up to finish running the walkaway VSP survey using the Maersk Lifter to tow the source. Three levels were shot to complete the VSP and Schlumberger were rigged down.

The 3 1/2" tubing stinger was then run in the hole and cement plug #2 set from 1841 to 1691 metres using 375 sacks of class 'G' cement at a slurry density of 15.8 ppg. The stinger was then pulled out to 1183 metres and cement plug #3 set using 430 sacks of class 'G' cement at a slurry density of 15.8 ppg. The stinger was then pulled out to 1000 metres and bottoms up circulated while waiting on cement. The top of cement plug #3 was tagged at 1052 metres before pulling out to 525 metres and setting cement plug #4 with 250 sacks of class 'G' cement at a slurry density of 15.8 ppg. After circulating the hole while waiting on cement, the top of cement plug #4 was tagged at 426 metres. The stinger and drill pipe were then pulled out of the hole and the BOP and riser pulled. The rig was then deballasted and the anchors pulled using the Maersk Lifter and the Lady Caroline. The Atwood Falcon was released at 15:15 hours on November 1st, 1992.

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 BLACKBACK-2 FINAL WELL REPORT
 CASING DATA

OD (In.)	WEIGHT (LB/FT)	GRADE	CONNECTION	LENGTH (M)	SHOE DEPTH (mMD-RKB)	CENTRALIZER POSITION	REMARKS
30	310	X-52	ST-2	12.06	427.0	NONE	FLOAT SHOE JOINT
30	310	X-52	ST-2 x ALT-2	11.96		NONE	1 INTERMEDIATE JOINT-XO
30	457	X-52	ALT-2 x WH	12.33		NONE	CIW TGB USED FROM T-4 TOP OF 30" WH @ 390.65m
				=====			
				36.35			
13-3/8	54.5	K-55	BTC	11.98	1152.61	2 ACROSS MIDDLE	FLOAT SHOE JOINT (BTM)
13-3/8	54.5	K-55	BTC	12.34			FLOAT JOINT
13-3/8	54.5	K-55	BTC	597.78		1 ACROSS FIRST SIX COLLARS	51 INTERMEDIATE JOINTS
13-3/8	68	K-55	BTC	118.24			10 INTERMEDIATE JOINTS
20	133	X-56	ALT-2	13.37			WITH 13-3/8" x 20" XO
18-3/4" WH				8.18			VETCO SG-5 WELLHEAD (NEW) RATED TO 10K PSI. TWO STOP RINGS LOCATED ON LOWEST TWO CENTRALIZERS TOP OF WH @ 389.72m
				=====			
				761.89			

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 CASING DATA

OD (In.)	WEIGHT (LB/FT)	GRADE	CONNECTION	LENGTH (M)	SHOE DEPTH (mMD-RKB)	CENTRALIZER POSITION	REMARKS
9-5/8	47	N-80	BTC	0.50	2946.16	NONE	FLOAT SHOE
	47	N-80	BTC	24.16		PER PROGRAM	FLOAT JOINTS WITH 0.44 FC
	47	N-80	BTC	60.04		"	5 INTERMEDIATE JOINTS
	47	N-80	BTC	2.90		NONE	CASING PUP JOINT
	47	N-80	BTC	35.72		PER PROGRAM	3 INTERMEDIATE JOINTS
	47	N-80	BTC	3.13		NONE	CASING PUP JOINT
	47	N-80	BTC	1045.49		PER PROGRAM	88 INTERMEDIATE JOINTS
	47	N-80	BTC	2.86		NONE	CASING PUP JOINT
	47	N-80	BTC	1378.50		PER PROGRAM	115 INTERMEDIATE JOINTS
	47	N-80	BTC	3.16		NONE	CASING HANGER PUP JOINT
				=====			-CSG HANGER: SG-5-0.48m
				2556.46			TOP OF HGR @ 389.70m

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 BLACKBACK-2 FINAL WELL REPORT
 CEMENT DATA

DATE (1992)	TYPE JOB	INTERVAL (mMD-RKB)	TYPE CEMENT	VOLUME (SX)	SLURRY WEIGHT (PPG)	ADDITIVES		MIX WATER	REMARKS
						2% CaCl2	3.1% PH GEL		
19-SEP	30" PRIMARY	427-393	CLASS "G"	500	15.8	2% CaCl2		SW	VOLUME CALCULATED TO PROVIDE 150% EXCESS ABOVE GAUGE HOLE.
21-SEP	13-3/8" LEAD	1001-393	CLASS "G"	1500	12.5	3.1% PH GEL		FW	BUMPED PLUG WITH 1500 PSI FLOATS HELD OK, DISPLACED W/SW.
	13-3/8" TAIL	1153-1001	CLASS "G"	670	15.8	NEAT		SW	CEMENTED TO MUDLINE.
13-OCT	9-5/8" PRIMARY	2946-2572	CLASS "G"	703	15.8	3 GP10B HR-6L		FW	BUMPED PLUG WITH 1500 PSI. DISPL. WITH BRINE; CALIPER + 20% EXCESS.
26-Oct	P & A PLUG No.1	2823-2673	CLASS "G"	175	15.8	2 GP10B HR-6L		FW	SET ACROSS RFT PERFS IN 9-5/8".
27-Oct	P & A PLUG No.2	1841-1691	CLASS "G"	375	15.8	----		FW	SET ACROSS 9-5/8" STUB.
28-Oct	P & A PLUG No.3	1183-1052	CLASS "G"	430	15.8	----		SW	SET ACROSS 13-3/8" SHOE. TAGGED WITH 15K# S/O @ 1052m. TESTED TO 1500 PSI.
29-Oct	P & A PLUG No.4	525-426	CLASS "G"	250	15.8	2% CaCl2		SW	SET AS SURFACE PLUG AND TAGGED @ 426m WITH 15K#.

5. SAMPLES, CONVENTIONAL CORES, SIDEWALL CORES

CUTTINGS

1180-2020m 3 sets of washed and oven dried plus 1 set of washed and air dried samples collected at 30m intervals.
 2020-2500m 3 sets of washed and oven dried plus 1 set of washed and air dried samples collected at 10m intervals.
 2500-3160m 3 sets of washed and oven dried plus 1 set of washed and air dried samples collected at 5m intervals.

CORES

2778.0-2780.0m Core # 1 - cut 2m no recovery.
 2797.0-2814.0m Core # 2 - Cut 17m, recovered 16.5m (97%)
 2814.0-2831.0m Core # 3 - Cut 17m, recovered 16.4m (96%)
 2832.0-2850.5m Core # 4 - Cut 18.5m, recovered 18.5m (100%)
 2850.5-2869.0m Core # 5 - Cut 18.5m, recovered 18.5m (100%)

SIDEWALL CORES

1175-3141m 2 guns. Shot 60, recovered 38 including 4 misfires and 2 empty, lost 22, bought 32.

6. WIRELINE LOGS AND SURVEYS

<u>Type and Scale</u>	<u>Suite 1</u>	<u>From</u>	<u>To</u>
DLL-MSFL-AS-GR-AMS	1:200	2720	3147
AS-GR-AMS (continued)	1:200	1152.5	2720
GR-AMS (continued)	1:200	370.4	1152.5
FMS-LDL-CNL-NGS-AMS	1:200, 1:48	2750	3147
MDT-GR-AMS	39 pretests, 4 perm tests	2800.5	3013.1
MDT-GR-AMS	2 sample runs	2800	2841.6
CSAT-GR	Checkshots	580	3109
CSAT-GR	Zero offset VSP	1680	3100
CSAT-GR	Walkaway VSP	1710	1850
CST-GR	Shot 60, recovered 38	1175	3141
CBL-VDL-GR-CCL (cased hole)	1:200	2520	2919
CET-GR-CCL (cased hole)	1:200	2520	2911
RFT-GR-AMS (cased hole)	3 segregated samples	2800.7	2820.7

Ref:black42.doc

**SUMMARY OF WIRELINE FORMATION TEST PROGRAMME
BLACKBACK 2**

Test	Depth (m)	Type	Oil (l)	Recovery Gas (ft3)	Water (l)	Filt (l)	Form Press. (Psia)	Hydro Press. (Psia)	Remarks
1/1	2800.5	Pretest					4059.2	4569	Good Test
1/2	2803.0	Pretest					4060.2	4573	Good test
1/3	2807.2	Pretest					-	4580	Tight
1/4	2809.6	Pretest					4044.4	4583	Good test
1/5	2811.6	Pretest					4045.2	4587	Good test
1/6	2814.0	Pretest					4046.4	4591	Good test
1/7	2814.8	Pretest					4046.8	4592	Good test
1/8	2816.8	Pretest					4047.8	4596	Good test
1/9	2820.6	Pretest					4049.9	4602	Good test
1/10	2823.7	Pretest					-	4607	Tight
1/11	2825.4	Pretest					4017.1	4610	Tight ?
1/12	2827.5	Pretest					-	4613	Tight
1/13	2832.0	Pretest					4005.3	4620	Good test
1/14	2833.0	Pretest					4006.2	4622	Good test
1/15	2836.5	Pretest					4014.7	4627	Low perm
1/16	2838.0	Pretest					4013.0	4630	Good. low perm
1/17	2840.3	Pretest					4011.8	4634	Good test
1/18	2843.0	Pretest					4013.8	4638	Good test
1/19	2846.5	Pretest					4016.5	4644	Good test
1/20	2847.9	Pretest					4017.6	4646	Good test
1/21	2852.9	Pretest					4018.5	4654	Low perm
1/22	2855.7	Pretest					4023.9	4659	Good test
1/23	2856.8	Pretest					4025.5	4660	Good test
1/24	2861.0	Pretest					4031.0	4667	Good test
1/25	2868.0	Pretest					4041.6	4678	Good test
1/26	2875.1	Pretest					4051.4	4690	Good test
1/27	2882.0	Pretest					4061.8	4701	Good test
1/28	2890.4	Pretest					4073.3	4715	Good test
1/29	2914.0	Pretest					4107.0	4753	Good test
1/30	2941.0	Pretest					4146.1	4798	Good test
1/31	2953.0	Pretest					4163.3	4817	Good test

**SUMMARY OF WIRELINE FORMATION TEST PROGRAMME
BLACKBACK 2**

Test	Depth (m)	Type	Oil (l)	Recovery Gas (ft3)	Water (l)	Filt (l)	Form Press. (Psia)	Hydro Press. (Psia)	Remarks
1/32	2964.0	Pretest					4178.9	4835	Good test
1/33	2987.1	Pretest					4211.7	4873	Good test
1/34	3013.1	Pretest					4248.9	4915	Good test
1/35	2854.2	Pretest					4022.9	4656	Good test
1/36	2833.8	Pretest					4007.2	4622	Good test
1/37	2817.9	Pretest					-	4596	Plugged
1/38	2817.7	Pretest					-	-	Plugged
1/39	2809.5	Pretest					-	-	Plugged
2/40	2800.1	Vert					4064.1	4570	Vert perm test
	2800.8	Sink					4064.3	4572	Good Test
	2800.8	Horiz					4062.3	4569	Horiz perm test
2/41	2815.9	Vert					4052.4	4596	Vert perm test
	2816.6	Sink					4052.8	4598	Good test
	2816.6	Horiz					4049.8	4595	Horiz perm test
2/42	2832.3	Vert					4010.7	4623	Plugged
	2833.0	Sink					4010.7	4624	Plugged
	2833.0	Horiz					4008.7	4622	Plugged
2/43	2841.3	Vert					4017.4	4637	Plugged
	2842.0	Sink					4018.0	4638	Plugged
	2842.0	Horiz					4015.3	4637	Plugged
3/44	2800.5	10.4				10.4	4194	4566	Invalid form press
3/45-1	2800.0	3.8		1.76		3.5	4058.8	4566	Segregated sample
3/45-2	2800.4	10.4	0.5 cor	37.1		5.5	4056.9	4566	Segregated sample
3/46	2820.6	3.8					4048	4599	Poor seat-retract
3/47	2820.5	10.4					4049	4599	Probe plugged
4/48	2841.6	Pretest					4016	4630	Low perm
4/49	2841.6	45.4	26.0	176.6	-	3.0	4011.0	4630	Segregated sample
	2841.6	10.4	Pres	Pres	Pres	Pres	4011.0	4631	Preserved sample

**SUMMARY OF WIRELINE FORMATION TEST PROGRAMME
BLACKBACK 2**

Test	Depth (m)	Type	Oil (l)	Recovery Gas (ft3)	Water (l)	Filt (l)	Form Press. (Psia)	Hydro Press. (Psia)	Remarks
	2841.6	3.8	Pres	Pres	Pres	Pres	4011.9	4631	Preserved sample
4/50	2820.5	10.4		0.05		8.5	4049	4598	Lost seat
4/51	2820.7	3.8		4.6		3.0	4049.2	4598	Sample throttled
CASED HOLE RFT									
5/52	2817.8	45.4	5.3 cor	328.4			4049.3	4209	
		3.8	0.3 cor	18.0			4048.0	4210	
6/53	2820.7	22.7						4215	Perf misfired
		3.8						4215	Perf misfired
7/54	2820.7	22.7	0.4 cor	28		5.1	4051.0	4217	
		3.8	Pres	Pres	Pres	Pres	4048.3	4214	Preserved sample
8/55	2800.7	45.4	1.4 cond	81.2	2.2		4052.5	4186	Form press low
		3.8	Pres	Pres	Pres	Pres	4059.9	4185	Preserved sample

Ref:black40.doc

BLACKBACK-2 WELL TESTS

RESULTS AND DATA SUMMARY

TEST 1		
Perforations:	2841.0-2846.5 (5.5m) MDRKB (m)	
Stabilised Flow:	Oil	1602.00stb/d
	Gas	1710.00 kscf/d
	Water	0.00 std/d
	GOR	1067.42 scf/stb
	THP	600.00 psig
	Choke	48/64 inch
	Reservoir	Drawdown
	PI	182 stb/d/psi

TEST 1A		
Perforations:	2841.0-2846.5 (5.5m) MDRKB (m)	
Stabilised Flow:	Oil	6640.0 stb/d
	Gas	7880.00 kscf/d
	Water	0.00 std/d
	GOR	1186.75 scf/stb
	THP	930.00 psig
	Choke	64/64 inch
	Reservoir	Drawdown
	PI	87 stb/d/psi

TEST 2		
Perforations:	2829.5-2834.0 (4.5m) MDRKB (m)	
Stabilised Flow:	Oil	5659.00 stb/d
	Gas	8240.00 kscf/d
	Water	0.00 std/d
	GOR	1456.09 scf/d
	THP	929.00 psig
	Choke	64/64 inch
	Reservoir	Drawdown
	PI	23 stb/d/psi

**TEMPERATURE RECORD
BLACKBACK-2**

LOGGING RUN	THERMO DEPTH (M)	MAX-REC TEMP (C°)	CIRCULATION TIME (t _k) (hours)	TIME AFTER CIRCULATION STOPPED (t)	HORNER TEMP (C°)	GEOHERMAL GRADIENT (C°/km)
DLL-MSFL-AS-GR-AMS	3122	70	1.5	11.00	82.4	31.33
FMS-LDL-CNL-NGS-AMS	3126	78	1.5	20.5	82.4	31.33
MDT-GR-AMS (Pretests)	3013	78	1.5	35.25	82.4	31.33
MDT-GR-AMS (samples)	2841	74	1.5	52.5	82.4	31.33
CAGED HOLE LOGS						
CBL-VDL-GR-CCL	2901	70	1.5	7.0		
CET-GR-CCL	2901	70	1.5	7.0		
RFT-GR-AMS	2812	83	1.5	31.5		

FIGURES



5th Cut
A4 Dividers
Re-order code 97052

BLACKBACK-2 LOCALITY MAP

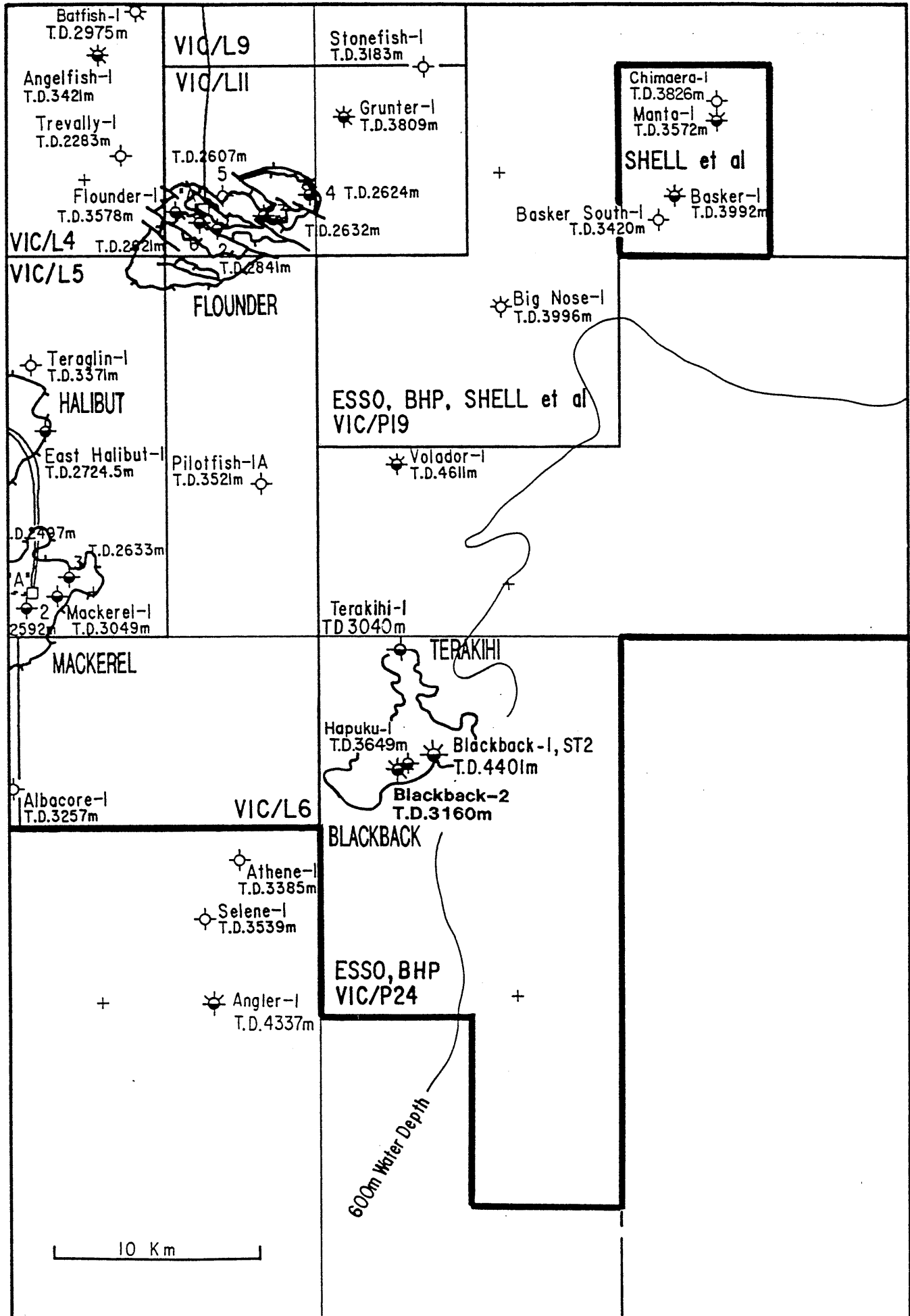


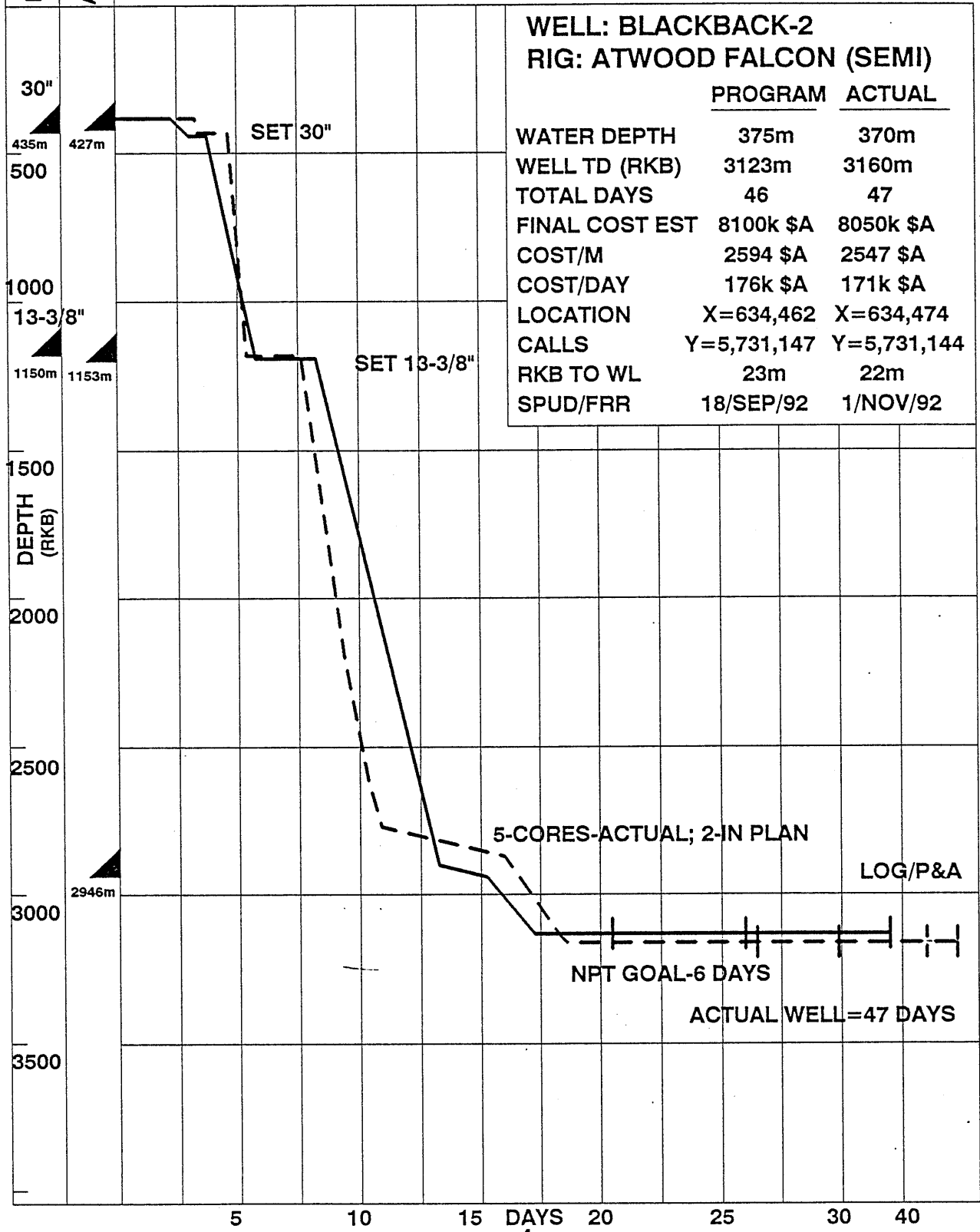
FIGURE 1

ESSO AUSTRALIA LTD

WELL PROGRESS CURVE

CSG PTS

PLAN	ACTUAL
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ESSO AUSTRALIA LTD. BLACKBACK-2 FINALIZED WELL SKETCH

RKB

MSL @ 22 m RKB

ALL DEPTHS FROM RKB

WATER DEPTH = 370 m

30" SUSPENSION JT
TOP @ 391m RKB
ML @ 392 m RKB

TOP OF WH @ 390m RKB
18-3/4" 10k# SG-5 WH
WITH 20" 129# EXT
ABOVE 20" 133# X-56
ALT-2 SWEGE TO 13-3/8"

TOC @ SEAFLOOR
BOTH CASINGS

TOC TAIL @ 1001m

30" 457# X-52 ALT-2
310# X-52 ST-2 W/SHOE
SHOE @ 427m
26" X 36" HOLE TO 433m

13-3/8" 54.4/68# K-55 BTC
SHOE @ 1153m
(WITH 20" JT/XO/HPWH)

"STRAIGHT HOLE"
MAX ANGLE = 3.4 DEG

17-1/2" HOLE TO 1168m

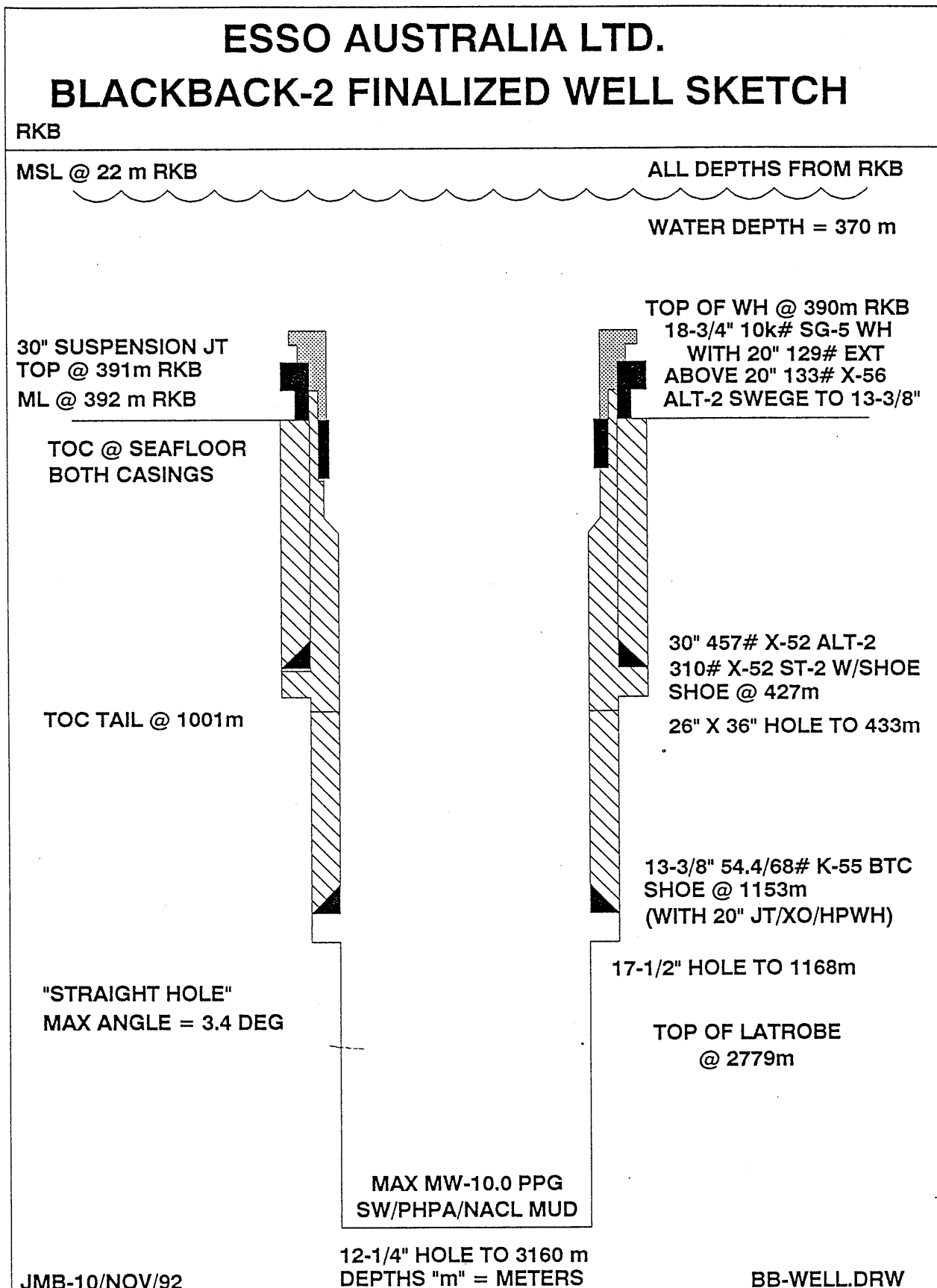
TOP OF LATROBE
@ 2779m

MAX MW-10.0 PPG
SW/PHPA/NAACL MUD

12-1/4" HOLE TO 3160 m
DEPTHS "m" = METERS

JMB-10/NOV/92

BB-WELL.DRW



ESSO AUSTRALIA LTD.

BLACKBACK-2 P&A WELLBORE SKETCH

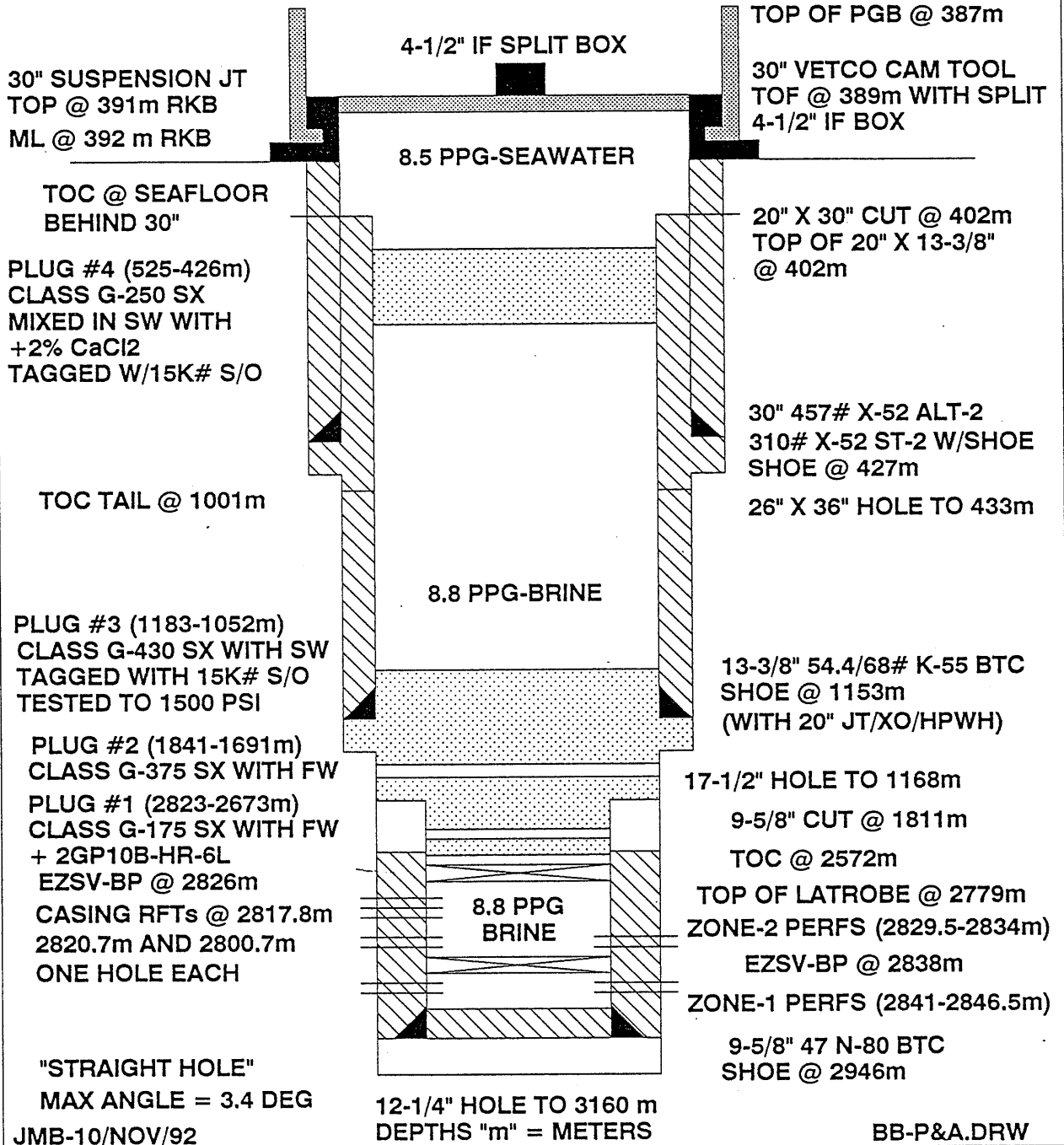
RKB

MSL @ 22 m RKB

ALL DEPTHS FROM RKB

30" CSG/TGB/PGB LEFT AT SEAFLOOR

WATER DEPTH = 370 m



BLACKBACK 2 HORNER TEMPERATURE PLOT

WIRELINE LOGGING SUITE 1

NOTE: MEASURED DOWNHOLE TEMPERATURES HAVE BEEN CORRECTED TO A DATUM DEPTH OF 3000m BEFORE PLOTTING

$t_k = 1.5$ hrs

$\Delta t =$ time since circulation stopped

Geothermal gradient = $0.03133^\circ\text{C}/\text{m}$

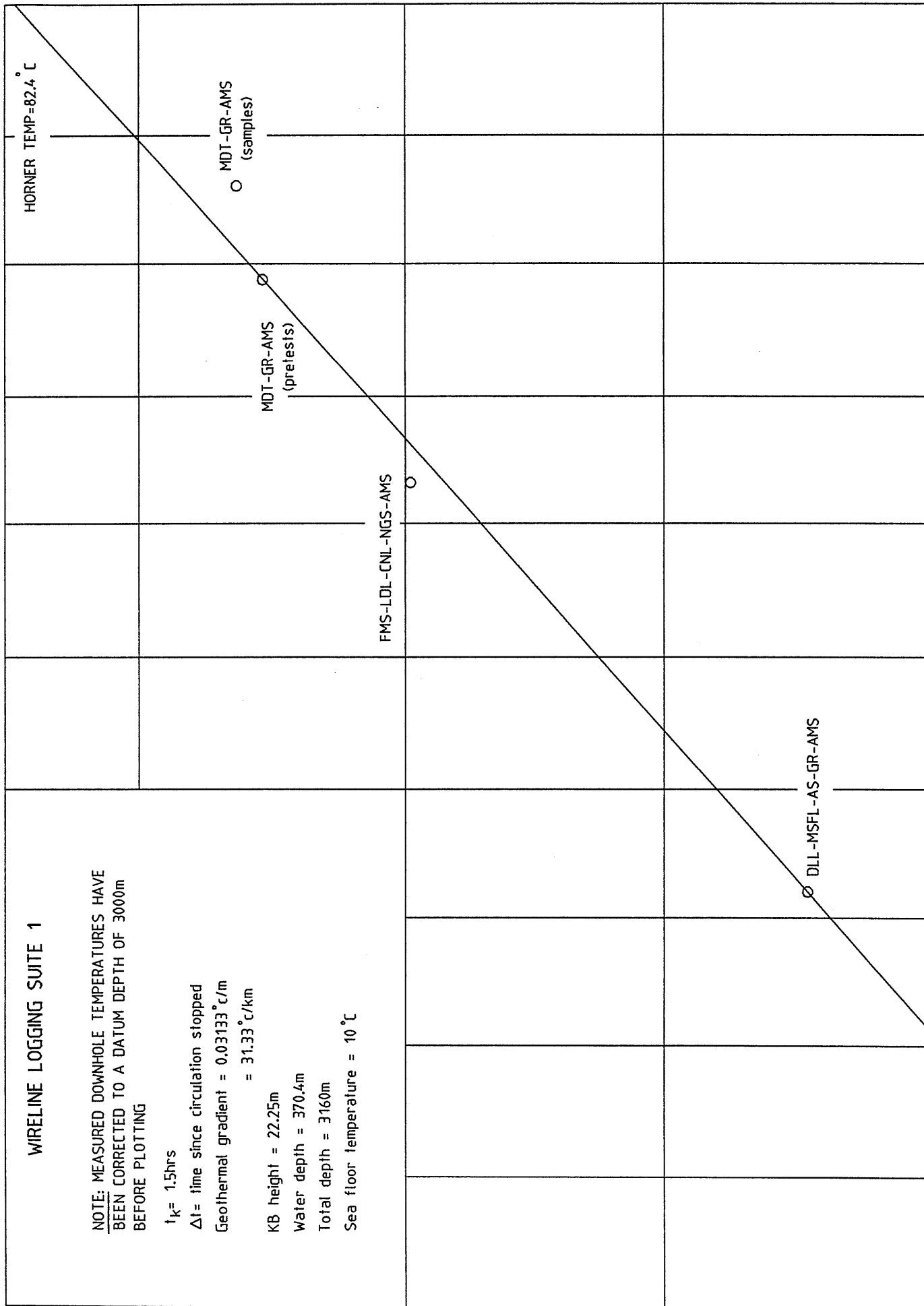
= $31.33^\circ\text{C}/\text{km}$

KB height = 22.25m

Water depth = 370.4m

Total depth = 3160m

Sea floor temperature = 10°C



**APPENDIX
1**

APPENDIX 1



5th Cut
A4 Dividers
Re-order code 97052

APPENDIX 1:

BLACKBACK 2

LITHOLOGICAL DESCRIPTIONS

BLACKBACK-2

Lithology Descriptions

<u>Depth m</u>	<u>%</u>	<u>Description</u>
1152-1210	100	LIMESTONE: Off white to light grey, pale blue grey, calcilutite to occasionally calcisiltite, common light grey to brown argillaceous matrix, occasional carbonaceous flecks, locally minor quartz, soft to firm, poor visible porosity, trace mineral fluorescence.
1210-40	100	LIMESTONE: Generally as above, becoming dominantly calcisiltite, common argillaceous matrix, soft to firm, poor visible porosity, occasional forams.
1240-1270	100	LIMESTONE: Off white to light brown, buff, dominantly calcisiltite, common pale green argillaceous matrix, trace carbonaceous flecks and forams, soft to firm, poor visible porosity, mineral fluorescence.
1270-1300	100	LIMESTONE: Off white to light brown, buff, occasionally pale blue grey, calcisiltite to calcilutite, common argillaceous matrix, soft to firm, crumbly, trace glauconite, trace carbonaceous flecks, occasional forams, poor visible porosity, no shows.
1300-30	100	LIMESTONE: Generally as above, dominantly calcisiltite, poor visible porosity, no shows.
1330-60	100	LIMESTONE: Off white to light grey, pale brown, calcisiltite, occasional calcarenite, occasional to common argillaceous matrix, occasional quartz, trace glauconite, minor carbonaceous matter, occasional mineral fluorescence, poor visible porosity, no shows.
1360-90	100	LIMESTONE: Light brown to buff, occasionally pale blue grey, dominantly calcisiltite, argillaceous matrix, firm, crumbly, occasional carbonaceous flecks, occasional forams, poor visible porosity, no shows.
1390-1420	100	LIMESTONE: As above.
1420-50	100	LIMESTONE: Off white to pale brown, buff, light blue grey, calcilutite to calcisiltite, common argillaceous matrix, minor carbonaceous matter, trace glauconite, poor visible porosity, no show.

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
1450-80	100	LIMESTONE: Off white to light grey, pale brown, buff, calcisiltite, occasional calcarenite, occasional to moderate argillaceous matrix, occasional carbonaceous flecks, common forams, trace glauconite, poor visible porosity, no shows.
1480-1510	100	LIMESTONE: Off white to pale brown, buff, occasionally pale blue grey, calcisiltite to calcarenite, common pale brown to off white argillaceous matrix, occasional carbonaceous flecks, occasional forams, trace glauconite, firm, poor visible porosity, no shows.
1510-40	100	LIMESTONE: Off white to light grey, pale brown, calcarenite, very fine to fine, moderate to well sorted, argillaceous matrix, micaceous in part, slightly carbonaceous, occasional forams, poor visible porosity.
1540-70	100	LIMESTONE: Generally as above, poor visible porosity, no shows.
1570-1600	100	LIMESTONE: Light to medium grey, grey brown, occasionally off white, calcarenite, locally calcisiltite, very fine to fine calcareous sand, occasional to minor carbonaceous flecks, occasional lithics, no visible porosity, no shows, occasional mineral fluorescence.
1600-30	100	LIMESTONE: Light to medium grey, off white, grey brown, calcarenite, very fine to fine, argillaceous matrix, firm to occasionally moderately hard, crumbly to blocky, no visible porosity, no shows.
1630-60	100	LIMESTONE: Light to medium grey, brown grey, calcarenite, very fine to fine, common argillaceous matrix, friable to firm, occasionally moderately hard, occasional carbonaceous flecks, occasional forams, trace glauconite, occasional lithics, poor visible porosity, no shows, mineral fluorescence.
1660-90	100	LIMESTONE: Light to medium grey, dominantly brown grey, calcarenite, very fine to fine, crystalline, locally moderate argillaceous matrix, occasional carbonaceous matter, rare glauconite, occasional lithics, firm to occasionally moderately hard, occasional forams, poor to nil visible porosity, no shows, mineral fluorescence.
1690-1720	100	LIMESTONE: Generally as above, poor to nil visible porosity, no shows, mineral fluorescence.

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
1720-1750	100	LIMESTONE: Light to medium grey, brown, off white very fine to fine, calcarenite, calcisiltite, crystalline, common argillaceous matrix, friable, firm, occasionally moderately hard, occasional fossil fragments, forams, poor visible porosity, no shows, mineral fluorescence.
1750-80	100	LIMESTONE: Light to medium grey brown, calcilutite to calcisiltite, rare calcarenite, abundant argillaceous matrix, soft to firm, occasionally moderately hard, occasional carbonaceous flecks, rare glauconite, no visible porosity, no shows, mineral fluorescence in part.
1780-1810	100	LIMESTONE: Light to medium brown, calcisiltite to calcilutite, common argillaceous/micritic matrix, occasional carbonaceous flecks, trace glauconite, firm to occasionally moderately hard, no visible porosity, no shows.
1810-40	100	LIMESTONE: Generally as above, dominantly calcisiltite, no visible porosity, no shows.
1840-70	100	LIMESTONE: Light grey to off white, light grey brown, calcisiltite to calcilutite, common to abundant argillaceous/micritic matrix, firm to occasionally moderately hard, crumbly to blocky, minor glauconite, occasional carbonaceous flecks, nil to poor visible porosity.
1870-1900	100	LIMESTONE: Light to medium grey, grey brown, calcisiltite to occasionally calcarenite, common argillaceous matrix, micritic, minor glauconite, carbonaceous flecks, firm to moderately hard, nil visible porosity, no shows.
1900-1930	100	LIMESTONE: Generally as above, nil porosity, no shows.
1930-60	100	LIMESTONE: Off white to dominantly medium brown grey, calcisiltite, common micritic/argillaceous matrix, firm, blocky to crumbly, trace glauconite, minor carbonaceous flecks, nil visible porosity, no shows.
1960-90	100	LIMESTONE: Medium brown grey, occasionally off white, calcisiltite, occasionally grading to calcarenite, common argillaceous (micritic) matrix, firm to occasionally moderately hard, occasional

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
		glauconite, occasional carbonaceous flecks, lithics in part, poor visible porosity, no shows.
1990-2020	100	LIMESTONE: Generally as above.
2020-2030	100	LIMESTONE: Light to medium grey brown, off white in part, calcisiltite to very fine calcarenite, common to abundant argillaceous matrix, firm to occasionally moderately hard, blocky, occasional glauconite, occasional carbonaceous flecks, occasional forams, very poor visible porosity.
2030-40	100	LIMESTONE: Generally as above, no show.
2040-50	100	LIMESTONE: Off white to light grey, pale brown, calcisiltite to calcarenite, common white to pale brown argillaceous matrix (micritic), occasional glauconite, occasional carbonaceous specks, firm to occasionally moderately hard, blocky to crumbly, occasional forams, nil to very poor visible porosity, no shows.
2050-60	100	LIMESTONE: Generally as above, generally very fine calcarenite, nil to very poor visible porosity, no shows.
2060-70	100	LIMESTONE: Light to medium grey to brown, dominantly calcisiltite, grading to calcilutite, commonly argillaceous, firm to friable, blocky, rare to locally common glauconite, occasional carbonaceous flecks, occasional to rare forams, nil visible porosity, no show.
2070-80	100	LIMESTONE: Light to medium brown grey, occasionally off white, buff, generally calcisiltite, commonly argillaceous, locally common glauconite, occasional carbonaceous matter, firm, blocky to crumbly, nil visible porosity.
2080-90	100	LIMESTONE: Light to medium brown grey, off white, calcisiltite, grading to very fine calcarenite, common argillaceous/micritic matrix, occasional to locally common glauconite, occasional carbonaceous specks, rare to occasional forams and microfossils, firm to occasionally moderately hard, nil to very poor porosity, no show.
2090-2100	100	LIMESTONE: Light to medium brown grey, light to medium grey, calcisiltite to very fine calcarenite, common argillaceous/micritic matrix, trace to locally common glauconite,

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
		trace carbonaceous specks, trace forams and microfossils, trace vein calcite, firm to moderately hard, blocky, nil visible porosity, trace mineral fluorescence.
2100-10	100	LIMESTONE: Light grey, light to medium brown grey, calcisiltite to very fine calcarenite, common argillaceous matrix, trace glauconite, trace carbonaceous specks, trace vein calcite, trace forams, soft to firm, occasionally moderately hard, blocky, nil visible porosity, trace mineral fluorescence.
2110-20	100	LIMESTONE: Medium brown grey, grey, occasionally off white to light grey, calcisiltite to very fine calcarenite, common argillaceous/micritic matrix, trace to common glauconite, trace to locally common carbonaceous specks, trace to common vein calcite, trace forams, firm to hard, blocky to platy, nil visible porosity, trace to common mineral fluorescence.
2120-30	100	LIMESTONE: Light to predominantly medium brown grey, grey, occasionally off white, predominantly calcisiltite, occasionally very fine calcarenite, abundant argillaceous matrix, trace glauconite, trace carbonaceous specks, trace vein calcite, firm to moderately hard, occasionally hard, blocky to occasionally platy, nil visible porosity, trace mineral fluorescence.
2130-40	100	LIMESTONE: Light to medium brown grey to grey, calcisiltite to very fine calcarenite, abundant argillaceous matrix, trace glauconite, trace carbonaceous specks, firm to moderately hard, occasionally hard, blocky to occasionally platy, nil visible porosity.
2140-50	100	LIMESTONE: As above.
2150-60	100	LIMESTONE: Light grey to brown grey, occasionally off white, occasionally medium brown grey, common argillaceous and micritic matrix, trace to locally common glauconite and carbonaceous specks, trace forams and microfossils, trace vein calcite, firm to moderately hard, blocky, nil visible porosity, calcisiltite to very fine calcarenite.
2160-70	100	LIMESTONE: Light to predominantly medium brown grey, occasionally light grey, calcisiltite to very fine calcarenite, common argillaceous matrix, trace to locally common glauconite and carbonaceous specks, firm to moderately hard, nil visible porosity.

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
2170-80	100	LIMESTONE: As above, glauconite and carbonaceous specks less common, blocky to occasionally platy.
2180-90	100	LIMESTONE: Light to medium brown grey to grey, as above, common to abundant micritic/argillaceous matrix.
2190-2200	100	LIMESTONE: Light to predominantly medium grey, occasionally brown grey, calcisiltite, occasionally very fine calcarenite, common argillaceous matrix, trace glauconite, trace carbonaceous specks, rare mica, firm, blocky to platy, nil visible porosity.
2200-10	100	LIMESTONE: Light to medium brown grey to grey, calcisiltite to very fine calcarenite, common argillaceous/micritic matrix, trace glauconite, trace to locally common carbonaceous specks, firm to occasionally moderately hard, nil visible porosity.
2210-20	100	LIMESTONE: As above, soft to firm, occasionally moderately hard, trace microfossils.
2220-30	100	LIMESTONE: As above.
2230-40	100	LIMESTONE: As above, trace forams, trace vein calcite.
2240-50		No returns - displacing to KCL/PHPA mud.
2250-60	100	LIMESTONE: Light to medium brown grey, calcisiltite, grading to calcilutite in part, common micritic/argillaceous matrix, firm to hard, blocky to subplaty, occasional glauconite, occasional carbonaceous flecks, nil visible porosity, no shows.
2260-70	100	LIMESTONE: Generally as above.
2270-80	100	LIMESTONE: Light to medium grey brown, calcisiltite to calcilutite, argillaceous matrix, firm to hard, occasional glauconite, occasional fossil fragments, forams, nil visible porosity, no show.
2280-90	100	LIMESTONE: Light to medium brown grey, olive green grey, calcisiltite to calcilutite, argillaceous, occasional glauconite and carbonaceous matter, firm to dominantly moderately hard, blocky to subplaty, nil visible porosity, no shows.
2290-2300	100	LIMESTONE: Generally as above.

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
2300-10	100	LIMESTONE: Light to medium brown grey, occasionally olive green grey, calcisiltite to calcilutite in part, argillaceous to micritic matrix, occasional fossil fragments, forams, nil to very poor porosity, no shows.
2310-20	100	LIMESTONE: Light to medium grey, occasionally grey brown, dominantly calcisiltite, commonly argillaceous, occasional glauconite and carbonaceous specks, rarely grades to calcarenite, firm to moderately hard, blocky, nil to very poor visible porosity, no shows.
2320-30	100	LIMESTONE: As above, no visible porosity, no shows.
2330-40	100	LIMESTONE: Light to medium grey, calcisiltite, firm to moderately hard, argillaceous, no visible porosity, no shows.
2340-50	100	LIMESTONE: Generally as above.
2350-60	100	LIMESTONE: Light to medium grey, dominant calcisiltite, occasionally grades to calcarenite, common off white to light grey argillaceous matrix (micritic), occasional glauconite and carbonaceous flecks, nil to poor visible porosity, no shows.
2360-70	100	LIMESTONE: Off white to light grey, medium grey brown, calcisiltite, firm to moderately hard, very poor to nil porosity.
2370-80	100	LIMESTONE: Light to medium grey, off white to light grey brown, calcisiltite, commonly argillaceous, occasional glauconite and carbonaceous flecks, occasional forams, nil to very poor visible porosity, no shows.
2380-90	100	LIMESTONE: Generally as above, nil visible porosity, no shows.
2390-2400	100	LIMESTONE: Light to medium grey, grey brown, calcisiltite, grades to calcilutite, commonly argillaceous, minor glauconite, occasional carbonaceous matter, firm to occasionally moderately hard, nil visible porosity, no shows.
2400-10	100	LIMESTONE: Off white to light grey, occasionally light to medium grey brown, dominantly calcilutite, occasionally calcisiltite, commonly argillaceous, minor glauconite, occasional carbonaceous flecks, soft to firm,

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
		amorphous to blocky, nil visible porosity, no shows.
2410-20	100	LIMESTONE: Off white to light grey, occasionally light to medium grey brown, calcilutite to calcisiltite, common to abundant argillaceous matrix, minor glauconite, occasional to minor carbonaceous specks, soft to firm, amorphous to blocky, nil visible porosity, no shows.
2420-40	100	LIMESTONE: Light grey, occasional light to medium grey brown, calcilutite, occasionally calcisiltite, moderately to very argillaceous, slightly micritic in part, trace carbonaceous specks, soft, occasionally moderately hard, amorphous to blocky, nil visible porosity, no shows.
2440-50	100	LIMESTONE: Off white to light grey, calcilutite, very argillaceous, trace carbonaceous specks, trace glauconite, soft to dispersive, amorphous to blocky, nil visible porosity, no shows.
2450-60	80	LIMESTONE: Off white to light grey, occasionally medium grey, grey brown, calcilutite, very argillaceous, grades to calcareous claystone, minor glauconite, occasional disseminated pyrite, soft to occasionally firm, amorphous to blocky, nil visible porosity, no shows.
	20	CLAYSTONE: Off white to light grey, soft to firm, very calcareous, grades to argillaceous limestone, amorphous to blocky, slightly dispersive.
2460-70	60	CLAYSTONE: Off white to light grey, soft to firm, amorphous to subblocky, very calcareous, grades to argillaceous limestone.
	40	LIMESTONE: Light to medium grey, off white, calcilutite, very argillaceous, grades to calcareous claystone, firm, blocky, no visible porosity, no shows.
2470-80	80	CLAYSTONE: Light to medium grey, occasionally blue grey, soft to occasionally firm, amorphous to subblocky, very calcareous grades to argillaceous limestone (calcilutite), trace disseminated pyrite, occasional carbonaceous flecks, occasional forams.
	20	LIMESTONE: Dominantly as above, nil visible porosity, no shows.
2480-90	100	CLAYSTONE: Light to medium grey, off white, soft to moderately firm in part,

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
		amorphous, slightly dispersive, sticky, very calcareous, grades to argillaceous limestone, occasional glauconite and carbonaceous specks.
2490-2500	100	CLAYSTONE: Light grey, moderately to very calcareous, trace glauconite, trace carbonaceous specks, trace pyrite, soft to firm in part, amorphous, slightly dispersive.
2500-05	100	CLAYSTONE: Light to medium grey, very calcareous, trace to locally common glauconite and carbonaceous specks, trace pyrite, soft to firm, amorphous to blocky, slightly silty in part.
2505-10	100	CLAYSTONE: Off white to light grey, very calcareous, locally grades to argillaceous limestone (calcilutite), trace glauconite, trace carbonaceous specks, trace pyrite, soft, slightly to moderately dispersive, amorphous.
2510-15	100	CLAYSTONE: Off white to light grey, occasionally medium grey, very calcareous, trace carbonaceous specks, trace pyrite, soft, rarely firm to moderately hard, slightly dispersive, amorphous to occasionally blocky, trace forams.
2515-20	100	CLAYSTONE: As above, trace glauconite.
2520-30	100	CLAYSTONE: Off white to light grey, very calcareous, trace carbonaceous specks, trace forams and microfossils, soft, moderately dispersive, amorphous to occasionally blocky.
2530-35	100	CLAYSTONE: As above, trace disseminated pyrite, occasionally firm to moderately hard.
2535-40	100	CLAYSTONE: Off white to light grey, very calcareous, trace carbonaceous specks, trace pyrite, soft, slightly dispersive, amorphous to occasionally blocky.
2540-45	100	CLAYSTONE: Light to medium grey, occasionally off white, medium grey, trace carbonaceous specks, soft to firm, slightly dispersive, amorphous to blocky, slightly silty in part, very calcareous.
2545-50	100	CLAYSTONE: Predominantly light grey, occasionally off white, occasionally medium grey, trace carbonaceous specks, soft to firm, slightly dispersive, amorphous to blocky, slightly silty in part, very calcareous.

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
2550-55	100	CLAYSTONE: Light grey, very calcareous, trace carbonaceous specks, trace glauconite, soft, rarely firm, slightly dispersive in part, amorphous to blocky, trace mineral fluorescence.
2555-60	100	CLAYSTONE: Light grey, occasionally off white to light grey brown, moderately to very calcareous, trace carbonaceous specks, soft, moderately dispersive, amorphous to blocky, slightly sticky in part.
2560-65	100	CLAYSTONE: Light to occasionally medium grey, occasionally off white, moderately to predominantly very calcareous, trace carbonaceous specks, soft, slightly dispersive, amorphous to blocky.
2565-75	100	CLAYSTONE: As above, trace glauconite, trace pyrite, slightly sticky in part.
2575-85	100	CLAYSTONE: Off white to light grey, medium grey to grey green, moderately to very calcareous, trace carbonaceous specks, trace to locally common glauconite where grey green, trace disseminated pyrite, trace forams, soft, slightly dispersive, amorphous to blocky.
2585-95	100	CLAYSTONE: As above, very calcareous, trace vein pyrite.
2595-2605	100	CLAYSTONE: Light grey, medium grey to grey green, moderately to predominantly very calcareous, trace carbonaceous specks and microlaminae, trace to locally common glauconite, trace disseminated and vein pyrite, trace forams and microfossils, trace lithics, soft to firm, slightly dispersive, amorphous to blocky, slightly silty in part.
2605-10	100	CLAYSTONE: Light to medium grey, moderately to occasionally very calcareous, trace carbonaceous specks, trace glauconite, trace to locally common disseminated and vein pyrite, trace to locally common forams and microfossils, trace lithics, soft to firm, slightly dispersive, amorphous to blocky.
2610-20	100	CLAYSTONE: As above, predominantly very calcareous.
2620-25	100	CLAYSTONE: Light to medium grey, off white, moderately calcareous, trace carbonaceous specks, trace glauconite, trace forams and microfossils, trace to common vein and disseminated pyrite, soft to firm,

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
		slightly dispersive, amorphous to blocky, subfissile in part.
2625-30	100	CLAYSTONE: Light to medium grey, very calcareous, trace carbonaceous specks, trace glauconite, trace forams, trace vein and disseminated pyrite, soft to occasionally firm, slightly dispersive, amorphous to blocky.
2630-40	100	CLAYSTONE: Predominantly as above, off white to light grey, occasionally medium grey, trace to common pyrite, moderately to very calcareous, slightly dispersive in part.
2640-45	100	CLAYSTONE: As above, very calcareous.
2645-50	100	CLAYSTONE: Off white to light grey, very calcareous, trace glauconite, trace carbonaceous specks and microlaminae, trace pyrite, trace microfossils, soft, moderately dispersive, amorphous to blocky.
2650-55	100	CLAYSTONE: As above, micromicaceous in part, trace forams.
2655-65	100	CLAYSTONE: Off white to light grey, moderately calcareous, trace carbonaceous specks, trace glauconite, trace to locally common disseminated and vein pyrite, trace forams, soft, slightly dispersive, amorphous to predominantly blocky.
2665-70	100	CLAYSTONE: Predominantly as above, very calcareous, moderately dispersive.
2670-75	100	CLAYSTONE: Predominantly as above, no forams or glauconite, slightly dispersive.
2675-80	100	CLAYSTONE: As above, moderately calcareous, moderately dispersive.
2680-85	100	CLAYSTONE: As above.
2685-90	100	CLAYSTONE: Off white to light grey, moderately calcareous, trace carbonaceous specks, trace pyrite, trace microfossils, soft to dispersive, predominantly amorphous to occasionally blocky.
2690-95	100	CLAYSTONE: Off white to light grey, pale grey brown, soft, amorphous, slightly dispersive, common calcite, occasional disseminated pyrite.
2695-2700	100	CLAYSTONE: Off white to light grey, pale grey brown, soft, amorphous to blocky,

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
		slightly dispersive, common calcite, trace disseminated pyrite.
2700-05	100	CLAYSTONE: Predominantly as above, soft to occasionally firm, amorphous to blocky, commonly calcareous, occasional nodular pyrite.
2705-10	100	CLAYSTONE: Light to medium grey, pale grey brown, predominantly soft to occasionally firm, amorphous to blocky, moderately calcareous, occasional nodular and disseminated pyrite, slightly silty in part.
2710-15	100	CLAYSTONE: Light to medium grey, occasionally medium grey brown, soft to firm, amorphous to blocky, commonly calcareous, moderate to locally common disseminated and nodular pyrite, silty in part.
2715-2720	80	CLAYSTONE: Off white to light grey, soft to firm, amorphous to blocky, commonly calcareous, occasional disseminated pyrite.
	20	SILTSTONE: Medium grey, firm to moderately hard, blocky, moderately calcareous, common disseminated pyrite, occasional pyrite veins, commonly argillaceous, grades to claystone.
2720-25	80	CLAYSTONE: Predominantly as above.
	20	SILTSTONE: Medium blue grey, firm to moderately hard, slightly to moderately calcareous, commonly argillaceous, locally common disseminated to nodular pyrite.
2725-30	90	CLAYSTONE: Light to medium grey, off white, soft to firm, amorphous to blocky, slightly dispersive, moderately calcareous, locally common disseminated pyrite, minor carbonaceous flecks, slightly silty.
	10	SILTSTONE: Generally as above.
2730-35	90	CLAYSTONE: Light to medium grey, off white, soft to firm, amorphous to blocky, moderately calcareous, slightly silty, locally common disseminated pyrite, minor carbonaceous flecks.
	10	SILTSTONE: Predominantly as above.
2735-40	90	CLAYSTONE: Light grey brown to off white, soft to occasional firm, amorphous to blocky in part, slightly dispersive, sticky, moderately calcareous, occasional disseminated to nodular pyrite, occasional carbonaceous flecks, slightly silty.
	10	SILTSTONE: Light to medium grey, medium grey brown, firm, blocky, moderately

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
		argillaceous, moderately calcareous, common disseminated pyrite, carbonaceous flecks in part.
2740-45	100	CLAYSTONE: Predominantly as above, slightly silty.
2745-50	100	CLAYSTONE: Off white to light grey, pale grey brown, soft to occasionally firm, amorphous, to occasionally blocky, slightly dispersive, sticky in part, moderately calcareous, occasional disseminated pyrite, silty in part.
2750-55	90 10	CLAYSTONE: Predominantly as above. SILTSTONE: Medium to dark grey, firm, blocky, slightly calcareous, common disseminated nodular pyrite, occasional carbonaceous specks.
2755-60	90 10	CLAYSTONE: Off white to light grey, pale green grey, soft to occasionally firm, amorphous, slightly to moderately calcareous, occasional disseminated pyrite, slightly silty. SILTSTONE: Medium to dark grey, firm, blocky, slightly calcareous, commonly argillaceous, common disseminated pyrite, trace arenaceous inclusions.
2760-65	90 10	CLAYSTONE: As above. SILTSTONE: As above.
2765-70	80 20	CLAYSTONE; Off white to light grey, pale green grey, soft, amorphous, dispersive, moderately calcareous, occasional disseminated pyrite, occasional glauconite, slightly silty. Light to medium grey, green grey in part, occasionally dark grey, firm, blocky, common disseminated pyrite, occasional glauconite, commonly argillaceous, occasionally calcareous, trace arenaceous inclusions.
2770-75	60 35 5	SILTSTONE: Medium to dark brown, grey brown, soft to firm, subblocky, non to slightly calcareous, common glauconite, generally arenaceous, trace very fine sand, common disseminated pyrite, micaceous. CLAYSTONE: Dominantly as above. SANDSTONE: Clear to translucent, off white to medium brown, very fine to fine, very rarely medium, moderate sorting, abundant argillaceous matrix, siderite cement in part, common glauconite, micromicaceous in part, very poor visible porosity, trace mineral fluorescence, no fluorescence, slow milky white crush cut, faint yellow green ring

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
		residue (cut possibly from dark brown arenaceous siltstone - unable to separate from siltstone easily).
2780-85	100	SILTSTONE: Medium to dark brown, medium brown grey, non to slightly calcareous, common disseminated and nodular pyrite, common glauconite (peletal in part), very arenaceous, commonly grades to very fine sand, locally micromicaceous, soft to firm, blocky.
2785-90	100	SILTSTONE: Generally as above, slightly to moderately argillaceous, firm to soft, blocky.
2790-95	60	SILTSTONE: Dominantly as above, glauconite, pyritic.
	40	SANDSTONE: Clear to translucent, feldspars, medium to coarse, occasionally very coarse, moderately to well sorted, subrounded to subangular, weak cement, loose, abundant glauconite (5%), occasional to minor altered feldspar, good inferred porosity.
2795-2797	100	SANDSTONE: Clear to translucent, frosted, dominantly medium to coarse, rarely very coarse, moderately to well sorted, subangular to subrounded, weak silica cement, generally clean, loose, abundant glauconite (peletal in part, 5%), minor dolomite, occasional altered feldspar, good inferred porosity, no fluorescence, no cut.
2797-2869		SEE CORE DESCRIPTIONS.
2869-70	100	SANDSTONE: Clear to translucent, fine to coarse, moderate sorting, angular to subrounded, trace to locally common white to pale brown argillaceous matrix, trace to common glauconite, trace mica, trace calcareous claystone and siltstone cavings, common to abundant smoky quartz, trace milky quartz, loose, good inferred porosity, no show.
2870-75	100	SANDSTONE: Dominantly as above, trace patchy weak silica cement, loose, friable where cemented, good inferred porosity, no shows.
2875-80	100	SANDSTONE: Clear to translucent, medium to coarse, good sorting, angular to subrounded, trace argillaceous matrix, trace smoky quartz, abundant milky quartz, loose, inferred very good porosity, no shows.

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
2880-85	100	SANDSTONE: Clear to translucent, fine to coarse, moderate to good sorting, angular to subrounded, trace to common argillaceous matrix, trace to common glauconite, trace mica, slightly chloritic in part, trace to locally common milky quartz, loose, inferred good porosity, no shows.
2885-90	100	SANDSTONE: Dominantly as above, poor to moderate sorting, loose, inferred good porosity, no shows.
2890-95	100	SANDSTONE: Clear to translucent, light grey to grey brown, fine to coarse, moderate sorting, angular to subrounded, abundant silty to argillaceous matrix, trace glauconite, slightly chloritic in part, common very fine disseminated pyrite, trace mica, loose, inferred poor porosity, no shows.
2895-2900	100	SANDSTONE: Clear to translucent, light green, frosted, fine to coarse, dominantly medium to coarse, poorly sorted, subangular to subrounded, minor silica cement, abundant light grey to off white argillaceous matrix, occasional very fine sand matrix, silty in part, occasional glauconite, chlorite, common very fine disseminated pyrite, occasional mica, dominantly loose, poor to locally fair inferred porosity.
2900-05	100	SANDSTONE: Dominantly as above, poor inferred porosity, no shows.
2905-10	100	SANDSTONE: Clear to translucent, milky, off white, medium to coarse, poor to moderate sorting, argillaceous to subrounded, weak silica cement, very abundant light grey to off white argillaceous matrix, occasional very fine sand matrix in part, common very fine disseminated pyrite, occasional glauconite and chlorite, poor inferred porosity.
2910-15	100	SANDSTONE: Dominantly as above.
2915-20	90	SANDSTONE: Clear to translucent, light grey, medium to coarse, occasionally very coarse, poorly sorted, angular to subrounded, weak silica cement, very abundant white to light grey argillaceous matrix, occasional very fine sand matrix, silty in part, occasional glauconite, slightly chloritic in part, poor inferred porosity, no shows.
	10	SILTSTONE: Medium to dark brown, commonly arenaceous, common very fine disseminated pyrite, occasional nodular pyrite, firm to friable, blocky.

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
2920-25	70	SANDSTONE: Clear to translucent, light grey, frosted, fine to coarse, dominantly medium to coarse, angular to subrounded, weak silica cement, very abundant white to light grey argillaceous matrix, occasional fine sand matrix, silty in part, occasional glauconite, slightly chloritic in part, trace inferred porosity, no shows.
	30	SILTSTONE: Medium to dark brown, commonly arenaceous, common very fine disseminated pyrite, occasional nodular pyrite, firm to friable, blocky.
2925-30	80	SANDSTONE: Clear to translucent, medium to very coarse, dominantly medium to coarse, moderately to poorly sorted, angular to subrounded, abundant pale brown to off white argillaceous matrix, very fine sand matrix in part, common glauconite, loose, poor to locally fair inferred porosity.
	20	CLAYSTONE: Dominantly as above.
2930-35	100	SANDSTONE: Clear to translucent, light grey, fine to very coarse, dominantly medium to coarse, common pale brown argillaceous matrix, slightly glauconitic to chloritic, fair to good inferred porosity.
2935-40	100	SANDSTONE: Clear to translucent, medium to coarse, well sorted, subangular to occasionally rounded, nil to trace silica cement, minor white to light brown argillaceous matrix, minor glauconite, occasional disseminated pyrite, generally clean, loose, good to very good inferred porosity, no shows.
2940-45	100	SANDSTONE: Clear to translucent, frosted, coarse to very coarse, moderately to well sorted, dominantly subrounded, generally clean, minor glauconite, loose, good to very good inferred porosity, no shows.
2945-50	100	SANDSTONE: Dominantly as above, good to very good inferred porosity.
2950-55	100	SANDSTONE: Clear to translucent, frosted, occasionally milky, coarse to dominantly very coarse, well sorted, subrounded to occasionally rounded, clean loose, very good inferred porosity, minor pyrite, minor glauconite, no shows.
2955-60	100	SANDSTONE: Clear to translucent, light grey, smoky, frosted, coarse to very coarse, occasionally granular, well to moderately

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
		sorted, subrounded to occasionally rounded, nil silica cement, minor white argillaceous matrix, trace to minor glauconite, clean, loose, very good inferred porosity, no shows.
2960-65	100	SANDSTONE: Clear to translucent, coarse to very coarse, moderate to good sorting, subangular to subrounded, occasionally rounded, trace to locally common white to light brown argillaceous matrix, common very fine disseminated pyrite in matrix, trace smoky quartz, trace to common milky quartz, trace glauconite, very good inferred porosity, no shows.
2965-70	100	SANDSTONE: Clear to translucent, medium to coarse, good sorting, subangular to subrounded, trace white to light brown argillaceous matrix, trace smoky quartz, trace milky quartz, trace pyrite, trace glauconite, loose, very good inferred porosity, no shows.
2970-75	100	SANDSTONE: Clear to translucent, fine to predominantly medium to coarse, moderate sorting, subangular to subrounded, trace white to light brown argillaceous matrix, trace glauconite, trace mica, trace chlorite, trace pyrite, loose, good to very good inferred porosity, no shows.
2975-80	100	SANDSTONE: Clear to translucent, light grey, medium to coarse, moderate to good sorting, subangular to subrounded, common white to light brown argillaceous matrix, trace smoky quartz, trace milky quartz, trace pyrite, trace glauconite, slightly chloritic in part, trace mica, loose, inferred good porosity, no shows.
2980-85	100	SANDSTONE: Clear to translucent, light to medium grey, medium to coarse, occasionally very coarse, subangular to subrounded, occasionally rounded, common light grey brown argillaceous matrix, trace smoky and milky quartz, trace mica, trace pyrite, loose inferred fair to good porosity, no shows.
2985-90	100	SANDSTONE: Clear to translucent, medium grey brown, medium to coarse, good sorting, subangular to subrounded, common grey brown argillaceous matrix, trace to common smoky and milky quartz, trace mica, trace glauconite, trace pyrite, loose, inferred fair porosity, no shows.
2990-95	100	SANDSTONE: Clear to translucent, light grey, fine to predominantly medium to coarse,

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
		moderate sorting, angular to subrounded, trace to common off white to light grey argillaceous matrix, trace mica, trace glauconite, trace pyrite, loose, inferred good porosity, no shows.
2995-3000	100	SANDSTONE: Clear to translucent, off white to light grey, fine to coarse, occasionally very coarse, poor sorting, subangular to rounded, common off white to light grey brown argillaceous matrix, trace glauconite, trace mica, trace nodular pyrite, slightly chloritic in part, loose, inferred fair to good porosity, no shows.
3000-05	100	SANDSTONE: Clear to translucent, light to medium grey, fine to coarse, moderate sorting, common to locally abundant off white to light grey brown argillaceous matrix, matrix occasionally medium grey brown, trace mica, trace glauconite, trace chlorite, trace to common smoky and milky quartz, trace pyrite, loose, inferred fair porosity.
3005-10	100	SANDSTONE: Clear to translucent, light grey, very fine to coarse, subangular to subrounded, poor sorting, trace light to medium grey brown argillaceous matrix, trace mica, trace pyrite, trace chlorite, trace smoky and milky quartz, loose, inferred good porosity, no shows.
3010-15	100	SANDSTONE: Clear to translucent, off white to light grey, medium to coarse, good sorting, subangular to subrounded, slight trace white argillaceous matrix, trace pyrite, trace lithics, loose, inferred very good to excellent porosity, no show.
3015-20	100	SANDSTONE: Clear to translucent, white to light grey, milky, medium to very coarse, dominantly coarse, subrounded to rounded, minor white argillaceous matrix, trace nodular pyrite, commonly clean, loose, good to very good inferred porosity, no shows.
3020-25	100	SANDSTONE: Clear to translucent, white to light grey, medium to very coarse, moderate to well sorted, subangular to occasionally round, minor white argillaceous matrix, common loose, clean, very good inferred porosity, no shows.
3025-30	30	CLAYSTONE: Medium to dark grey, dominantly medium grey, occasionally grey brown, soft, streaky, slightly arenaceous, grades to siltstone in part.

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
	10	SILTSTONE: Medium to dark grey, locally arenaceous, slightly carbonaceous, micromicaceous, firm, blocky.
	60	SANDSTONE: Dominantly as above.
3030-35	50	CLAYSTONE: Light to dominantly medium grey, occasionally dark grey, grey brown in part, soft, sticky, amorphous, slightly arenaceous, micromicaceous grades to siltstone in part.
	10	SILTSTONE: Medium to dark grey, brown grey in part, commonly arenaceous, micromicaceous, slightly carbonaceous, firm, blocky.
	40	SANDSTONE: Clear to translucent, white to light grey, medium to very coarse, dominantly coarse, moderately sorted, subrounded, moderate argillaceous matrix, loose, poor to fair inferred porosity.
3035-40	70	CLAYSTONE: Light to dominantly medium grey, occasionally dark grey, soft, streaky, amorphous to blocky, slightly arenaceous, occasional very fine sand, micromicaceous.
	10	SILTSTONE: Dominantly as above, grades to claystone.
	20	SANDSTONE: Dominantly as above, no shows.
3040-45	30	CLAYSTONE: Light to medium grey, pale brown to medium brown grey, slightly to moderately arenaceous, grades to siltstone, soft, sticky, amorphous.
	20	SILTSTONE: Light to medium grey, medium brown grey, commonly arenaceous, micromicaceous, slightly carbonaceous, occasional nodular pyrite, firm, blocky.
	50	SANDSTONE: Clear to translucent, white to light grey, medium to very coarse, dominantly coarse, moderately to well sorted, subrounded to occasionally rounded, moderate argillaceous matrix in part, generally loose, poor to locally fair inferred porosity, no shows.
3045-50	80	SANDSTONE: Clear to translucent, light grey, milky to smoky quartz, medium to very coarse, moderate sorting, angular to dominantly subrounded, no visible cement, trace white argillaceous matrix, loose, good inferred porosity, no shows.
	10	SILTSTONE: Light to medium grey, moderately to commonly arenaceous, common very fine disseminated pyrite, firm, blocky, slightly carbonaceous in part.
	10	CLAYSTONE: Light to medium grey, pale brown, slightly arenaceous, soft, streaky, amorphous.

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
3050-55	50	CLAYSTONE: Light to medium grey, brown grey, off white, slightly arenaceous, soft, sticky, amorphous.
	50	SANDSTONE: Clear to translucent, light grey, frosted, medium to coarse, occasionally very coarse, moderately sorted, angular to subrounded, dominantly subrounded, weak silica cement, occasional to locally common pale brown to off white argillaceous matrix, occasional orange mineral? dominantly loose, poor to fair inferred porosity.
3055-60	60	SANDSTONE: Dominantly as above, occasional nodular pyrite.
	40	CLAYSTONE: Dominantly as above.
3060-65	60	SANDSTONE: Clear to translucent, light grey to off white, frosted, medium to very coarse, dominantly coarse, moderate sorting, subangular to subrounded, minor white to light brown argillaceous matrix, common pyrite nodules, dominantly loose, fair to good inferred porosity, no shows.
	40	CLAYSTONE: Light to medium brown, grey brown, occasionally off white, very slightly arenaceous, commonly silty, dominantly soft, sticky, amorphous.
3065-70	80	CLAYSTONE: Light to medium brown, grey brown, slightly arenaceous, common pyrite nodules, slightly silty, occasional very fine sand, firm to dominantly soft, sticky, amorphous to occasionally subblocky.
	20	SANDSTONE: Dominantly as above.
3070-75	100	CLAYSTONE: Pale brown to medium grey brown, soft, slightly dispersive, occasional to common pyrite nodules, amorphous.
3075-80	100	CLAYSTONE: Dominantly as above, slightly arenaceous, commonly dispersive, soft, amorphous.
3080-85	100	CLAYSTONE: Medium to dark brown, brown grey, soft, slightly dispersive, sticky, non calcareous, amorphous.
3085-90	60	SANDSTONE: Clear to translucent, smoky, frosted fine to very coarse dominantly medium to coarse, poorly sorted, angular to subrounded, moderate silica cement, common white argillaceous matrix, friable to loose, poor to locally fair inferred porosity. 20% Very dull patchy yellow green fluorescence, no cut.
	40	CLAYSTONE: Dominantly as above.

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
3090-95	70	SANDSTONE: Clear to translucent, light grey, smoky, frosted in part, fine to very coarse, dominantly medium, poorly sorted, angular to occasionally subrounded, weak to moderate silica cement, white argillaceous matrix, occasional mica, minor very fine disseminated pyrite, occasional nodular pyrite, friable to loose, poor to locally fair inferred porosity, 20% dull to very dull pale yellow green spotted to patchy fluorescence, very weak faint pale yellow green crush cut, faint residue ring.
	30	CLAYSTONE: Dominantly as above.
3095-3100	70	SANDSTONE: Dominantly as above, predominantly medium to coarse, poor to moderate sorting, angular to subrounded, weak to locally moderate silica cement, common white argillaceous matrix, generally friable to loose, poor to locally fair inferred porosity, 20% moderately bright yellow green solid fluorescence as above.
	30	CLAYSTONE: Light to medium brown, grey brown, commonly arenaceous, grades to siltstone in part, micromicaceous, soft to occasionally firm, amorphous to blocky.
3100-05	50	SANDSTONE: Clear to translucent, light grey, fine to very coarse, dominantly fine to medium, very poorly sorted, angular to subrounded, common to abundant silica cement, quartz overgrowths, common white argillaceous matrix, common disseminated pyrite, occasional mica, moderately hard to friable, occasionally loose, poor visible porosity, 20% very dull yellow green patchy fluorescence, very weak faint pale yellow green crush cut, faint trace residue ring.
	50	CLAYSTONE: Medium to pale brown, light grey, grey brown, slightly arenaceous, micromicaceous, occasional very fine disseminated pyrite, soft to firm, firm, slightly dispersive, occasionally silty, blocky to amorphous.
3105-3110	70	SANDSTONE: Clear to translucent, light grey, medium to coarse, occasionally fine, poorly sorted, angular to subrounded, moderate to common silica cement, common white argillaceous matrix, friable to loose, poor inferred porosity, 30% very dull to dull pale yellow green patchy fluorescence, very weak cut to faint pale yellow green crush cut, faint residue ring.
	30	CLAYSTONE: Dominantly as above.

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
3110-15	90	CLAYSTONE: Pale brown to medium brown, light grey, common very fine sand inclusions, silty in part, micromicaceous, occasional nodular pyrite, soft, dispersive, amorphous.
	10	SANDSTONE: Dominantly as above, trace fluorescence as above.
3115-20	70	CLAYSTONE: Light to medium brown, light grey, off white, common very fine sand, silty, micromicaceous, soft to occasionally firm, slightly silty, amorphous to subblocky.
	30	SANDSTONE: Clear to translucent, light grey, fine to coarse, dominantly medium, poorly sorted, angular to subrounded, moderate silica cement, common pale brown to light grey argillaceous matrix, occasional very fine disseminated pyrite coating grains, friable to brittle, poor inferred porosity, trace fluorescence as above.
3120-25	40	SANDSTONE: As above, trace very dull yellow green patchy to speckled fluorescence, very weak faint crush cut, trace ring residue.
	60	CLAYSTONE: Pale to medium brown, light grey to off white, occasional to common very fine sand, micromicaceous in part, soft to occasionally firm, amorphous to blocky.
3125-30	80	SANDSTONE: Clear to translucent, light grey, frosted, smoky quartz, commonly very coarse to coarse, moderate sorting, angular to subrounded, occasional silica cement, occasional fractured quartz grains, minor argillaceous matrix, occasional pyrite nodules, commonly loose, good inferred porosity nil to trace fluorescence dominantly as above.
	20	CLAYSTONE: As above.
3130-35	80	SANDSTONE: Dominantly as above, loose, generally clean, good inferred porosity.
	20	CLAYSTONE: Generally as above.
3135-3140	90	SANDSTONE: Clear to translucent, medium to very coarse, dominantly medium to coarse, poor to moderate sorting, angular to subrounded, occasional silica cement, no visible matrix, occasional disseminated pyrite, dominantly clean, loose, fair to good inferred porosity, 20% very dull to occasionally moderately bright yellow green speckled to patchy fluorescence, no cut, very weak pale yellow green crush cut, nil to trace residue ring.
	10	CLAYSTONE: As above.

BLACKBACK-2

<u>Depth m</u>	<u>%</u>	<u>Description</u>
3140-45	100	SANDSTONE: Clear to translucent, medium to very coarse, dominantly medium to coarse, poor to moderate sorting, angular to subrounded, weak silica cement in part, locally common white argillaceous matrix, occasional pyrite nodules, clean in part, loose, fair inferred porosity, 40-50% very dull to dull occasionally moderate bright pale yellow green patchy fluorescence, no cut, very faint pale yellow green crush cut, no residue to very faint pale yellow green residue ring.
3145-50	80	SANDSTONE: Dominantly as above, fair inferred porosity, 30-40% very dull yellow green patchy fluorescence as above.
	20	CLAYSTONE: Light to medium brown, grey brown, slightly arenaceous in part, commonly soft to firm, amorphous to blocky.

APPENDIX 2

APPENDIX 2



5th Cut
A4 Dividers
Re-order code 97052

APPENDIX 2:

BLACKBACK 2

CORE DESCRIPTIONS

ESSO AUSTRALIA LTD CORE DESCRIPTION

CORE No.: 2
 Interval cored: 2797-2814m
 Cut: 17m
 Bit type: Coreguard RC 412
 Described by: Boothby

WELL: Blackback 2
 Recovered: 16.5m (97%)
 Bit Size: 9 7/8"
 Date: 28th September 1992

Interval	Depth & ROP	Graphic	Shows	Descriptive Lithology
(m)	(m/hr)			
2797	40 30 20 10 0			2797.0 SANDSTONE: Clear to translucent, frosted, dominantly medium to coarse, occasionally very coarse to granular, poorly to moderately sorted, subangular to subrounded, weak silica cement, common silty/argillaceous matrix, common glauconite, occasional dolomite cement, occasional muscovite mica, friable to firm, poor to dominantly fair visible porosity, faint hydrocarbon odour, no fluorescence, no cut.
2798				2798.2 SANDSTONE: Clear to translucent, frosted in part, dominantly fine to medium, occasionally coarse, occasional floating very coarse to granular quartz, poorly sorted, subangular to subrounded, weak silica cement, moderate dolomite cement, common silty matrix, abundant glauconite, occasional muscovite mica, friable, fair visible porosity, no fluorescence, no cut.
2799				2799.4 SILTY SANDSTONE: Clear to translucent, frosted, fine to very coarse, very poorly sorted, subrounded, weak to nil silica cement, abundant pale brown to medium brown silty matrix, occasionally grades to very fine sand, commonly argillaceous, common glauconite, common dolomite, slightly calcareous, micromicaceous, very poor visible porosity, no fluorescence, no cut.
2800				2800.6 SANDSTONE: Pale brown to off white, clear to translucent, very fine to fine, occasional medium to coarse floating quartz grains, moderately sorted, subangular to subrounded, weak silica cement, moderate patchy dolomite cement, common argillaceous matrix (altered feldspar?), abundant glauconite, occasional muscovite mica, firm to moderately hard, poor visible porosity, no fluorescence, very weak pale yellow green crush cut, thin ring residue.
2801				2801.8 SANDSTONE: Pale brown to off white, clear to translucent, very fine to medium, dominantly very fine to fine, moderately to well sorted, subangular to subrounded, minor silica cement, locally common dolomitic cement/matrix, abundant nodular glauconite, occasionally peletal, occasional to common pale brown to off white argillaceous matrix (altered feldspars in part), occasional mica, firm to moderately hard, poor visible porosity, no fluorescence, very weak diffuse crush cut, thin ring residue.
2802				2803.0 SANDSTONE: Dominantly as for 2801.8, poor visible porosity, trace to nil fluorescence, weak to very weak milky white diffuse cut, thin ring residue.
2803				2803.8 SANDSTONE: Clear to translucent, off white, dominantly fine to medium, occasionally coarse, moderately sorted, subangular to subrounded, weak to moderate silica cement, occasional dolomitic cement/matrix, common glauconite, occasional disseminated and nodular pyrite, friable, fair visible porosity.
2804				2804.2 SANDSTONE: Clear to translucent, frosted, medium to very coarse, dominantly coarse, moderately sorted, subrounded to subangular, nil silica cement, commonly loose to friable, unconsolidated, moderate glauconite, good visible porosity, no fluorescence, very fine pale milky yellow green diffuse crush cut, faint ring residue.
2805				2805.2 SANDSTONE: Dominantly as above, with occasional to locally minor dolomitic cement, very friable, unconsolidated, good visible porosity, no fluorescence, very faint weak pale milky white diffuse crush cut, trace residue ring.
2806				2806.4 SANDSTONE: Clear to translucent, off white, frosted, fine to very coarse, dominantly fine to medium, poorly sorted, subangular to subrounded, weak to nil silica cement, occasional minor patchy dolomitic cement, minor argillaceous matrix, occasional to moderate glauconite, friable, fair to good visible porosity, no fluorescence, faint weak pale milky white diffuse crush cut, trace residue ring.
2807				

**ESSO AUSTRALIA LTD
CORE DESCRIPTION**

CORE No.: 2
Interval cored: 2797-2814m
Cut: 17m
Bit type: Coreguard RC 412
Described by: Boothby

WELL: Blackback 2
Recovered: 16.5m (97%)
Bit Size: 9 7/8"
Date: 28th September 1992

Interval	Depth & ROP	Graphic	Shows	Descriptive Lithology
(m) 2807	(m/hr) 40 30 20 10 0			
2807.6				SILTSTONE: Medium to dark brown, locally arenaceous, grades to very fine sand in part, glauconitic, occasionally dolomitic, micromicaceous, firm to moderately hard, blocky to subfissile, no fluorescence, very weak slow diffuse milky white crush cut, faint residue ring.
2808				2808.8 SANDSTONE: Pale to medium brown, off white, very fine to fine, occasionally medium, rarely coarse, well sorted, subangular to subrounded, moderate dolomitic cement, common argillaceous matrix, occasional to common muscovite mica, occasional feldspar, common glauconite, firm to moderately hard, poor visible porosity.
2809				2810.0 SANDSTONE: Clear to translucent, frosted, off white, fine to coarse, dominantly fine to medium, poorly to moderately sorted, angular to subrounded, weak to moderate silica cement, dolomitic in part, minor argillaceous matrix, minor to common glauconite, common muscovite mica, minor chlorite, firm to moderately hard, poor to fair visible porosity, no visible fluorescence, weak to moderate slow milky white cut, good crush cut, thin to thick residue ring.
2810				2811.2 SANDSTONE: Clear to translucent, light grey to off white, fine to coarse, dominantly medium, poorly to moderately sorted, subangular to subrounded, generally friable, unconsolidated, minor argillaceous matrix, occasional glauconite and mica, good visible porosity, no fluorescence, very weak pale milky white diffuse crush cut, trace residue ring.
2811				2812.4 SANDSTONE: Generally as above, occasional to moderate silica cement, dominantly friable to unconsolidated, good visible porosity, no visible fluorescence, weak to moderate slow diffuse cut, good crush cut, moderate ring residue.
2812				2813.0 SANDSTONE: Clear to translucent, fine to medium, occasionally coarse, moderately to well sorted, angular to subrounded, weak to nil silica cement, minor dolomitic cement, trace argillaceous matrix, common glauconite, trace chlorite? occasional muscovite mica, loose, unconsolidated, good visible porosity, no fluorescence, very weak slow dull pale green cut, trace residue ring.
2813				2813.5 SANDSTONE: Pale brown to off white, occasionally clear to translucent, very fine to coarse, dominantly very fine to fine, poorly to moderately sorted, subangular to subrounded, minor silica cement, abundant pale brown argillaceous matrix, silty in part, occasional glauconite, local muscovite mica, firm to moderately hard, poor visible porosity, no fluorescence, weak slow pale yellow green diffuse cut, thin residue ring.
2814				

ESSO AUSTRALIA LTD CORE DESCRIPTION

CORE No.: 3
 Interval cored: 2814-2831m
 Cut: 17m
 Bit type: Coreguard RC 412
 Described by: Boothby

WELL: Blackback 2
 Recovered: 16.4m
 Bit Size: 9 7/8"
 Date: 29th September 1992

Interval	Depth & ROP	Graphic	Shows	Descriptive Lithology
(m) 2814	(m/hr) 40 30 20 10 0			
2814.0				SILTY SANDSTONE: Off white, very fine to fine, rarely medium, dominantly very fine, moderately to well sorted, subangular to subrounded, moderate silica/dolomitic cement, moderate argillaceous/silty matrix, common to abundant glauconite, muscovite mica, commonly grades to arenaceous siltstone, firm to moderately hard, poor visible porosity, 5-10% dull to moderately bright yellow green patchy fluorescence, fast milky white crush cut, faint residue ring.
2815				
2815.2				SANDSTONE: Off white to light grey, clear to translucent, very fine to fine, rarely medium, well sorted, subangular to subrounded, moderate silica cement, common dolomitic cement, minor argillaceous/silty matrix, common to abundant glauconite, moderate to locally common disseminated pyrite, occasional muscovite mica, firm to hard, poor visible porosity, trace very dull yellow patchy fluorescence, slow pale green crush cut, faint to thin residue ring.
2816				
2816.4				SANDSTONE: Off white to light grey, clear to translucent, very fine to fine, well sorted, subangular to subrounded, moderate dolomitic/silica cement, common glauconite, common disseminated pyrite (replacement), muscovite mica, firm to hard, poor visible porosity, 10-20% dull pale green yellow patchy fluorescence, slow milky pale green streaming cut, moderate residue ring.
2817				
2817.6				SANDSTONE: Dominantly as above, common to abundant disseminated pyrite, occasional nodular pyrite, firm to hard, poor visible porosity, no visible fluorescence, faint pale yellow green diffuse crush cut, trace pale yellow residue ring.
2818				
2818.8				SANDSTONE: Pale brown to off white, light grey, clear to translucent, very fine to fine, occasionally medium, dominantly very fine, well sorted, subangular to subrounded, weak to moderate silica/dolomitic cement, minor argillaceous matrix, common to abundant disseminated pyrite, locally abundant muscovite mica, common glauconite, firm to hard, poor visible porosity, 70% dull to moderately bright yellow green patchy fluorescence, weak to moderate pale green crush cut, thin residue ring.
2819				
2820.0				SANDSTONE: Pale brown to off white, light grey, clear to translucent, very fine to fine, rarely medium, well sorted, subrounded to subangular, dolomitic/silica cement, common disseminated pyrite, common argillaceous matrix (altered feldspar), occasional clear feldspar flecks, occasional chlorite, common muscovite mica, common glauconite nodules, firm to hard, poor visible porosity, trace very dull patchy yellow green fluorescence, very weak faint yellow green crush cut, trace residue ring.
2820				
2820.8				SANDSTONE: Pale brown to off white, (oil staining in part), clear to translucent, fine to coarse, dominantly fine to medium, poorly to moderately sorted, subangular to subrounded, weak silica cement, locally common dolomitic cement, common feldspar, chlorite, common glauconite, muscovite mica, moderate disseminated pyrite, poor visible porosity, 10-15% spotted yellow green fluorescence, moderately pale green milky streaming cut, moderately thin residue ring.
2821				
2822				
2822.0				SANDSTONE: Pale brown to off white, light grey, very fine to fine, occasional coarse floating quartz grains, moderately to well sorted, subangular to occasionally angular, moderate silica cement, dolomitic in part, minor argillaceous matrix, occasional chlorite, common glauconite, common to abundant finely disseminated pyrite, occasional feldspar (altered in part), common muscovite mica, firm to moderately hard, friable in part, poor visible porosity, 5-10% very dull pinpoint patchy yellow green fluorescence, very slow pale green streaming cut, moderate slow crush cut, thin residue ring.
2823				
2823.2				SANDSTONE: Pale brown to off white, clear to translucent, very fine to fine, occasionally medium, very rarely coarse, well sorted, subangular to subrounded, moderate silica cement, occasional dolomitic cement, common to abundant glauconite nodules, common finely disseminated pyrite, common muscovite mica, occasional feldspar, minor chlorite, firm to moderately hard occasionally friable, poor visible porosity, locally fair, 10-30% dull pale yellow green patchy fluorescence, slow pale green
2824				

**ESSO AUSTRALIA LTD
CORE DESCRIPTION**

CORE No.: 3
Interval cored: 2814-2831m
Cut: 17m
Bit type: Coreguard RC 412
Described by: Boothby

WELL: Blackback 2
Recovered: 16.4m
Bit Size: 9 7/8"
Date: 29th September 1992

Interval	Depth & ROP	Graphic	Shows	Descriptive Lithology
(m) 2824	(m/hr) 40 30 20 10 0			
2824.4				SANDSTONE: Pale brown to off white, light grey, very fine to coarse, dominantly fine, moderate sorting, angular to subrounded, white silica cement, minor dolomite, common glauconite, occasional chlorite, common muscovite mica, occasional feldspar, occasional cubic pyrite, common finely disseminated pyrite, friable to firm, occasionally hard, poor visible porosity, occasionally fair, faint to good hydrocarbon odour, 30-40% dull pale yellow green spotted to patchy fluorescence, moderate to good pale green milky streaming cut, thin to thick pale green milky residue ring.
2825				
2825.6				2825.6 SANDSTONE: Dominantly as above, fluorescence 20-30% as above.
2826				
2826.8				2826.8 SANDSTONE: Pale brown (oil staining) to off white, light grey, clear to translucent, fine to coarse, dominantly medium, poorly sorted, angular to subrounded, weak silica cement, occasional argillaceous matrix, occasional glauconite, minor chlorite, moderate to common muscovite mica, dominantly friable, firm, fair to good visible porosity, strong hydrocarbon odour, 70-80% dull to moderately bright yellow green spotted to patchy fluorescence, instant streaming to blooming pale green milky cut, thick residue ring.
2827				
2828				2828.0 SANDSTONE: Clear to translucent, white to light grey, dominantly medium, occasionally coarse, well sorted, subangular to subrounded, weak silica cement, minor argillaceous (altered feldspar) matrix, occasional to common glauconite nodules, minor chlorite, friable to loose, good visible porosity, strong hydrocarbon odour. 70-80% dull to moderately bright yellow green spotted to patchy fluorescence, instant streaming to blooming pale green milky cut, thick residue ring.
2829				2829.2 SANDSTONE: Dominantly as above, very weak cement, commonly loose, good to excellent porosity, strong hydrocarbon odour, fluorescence 80% dominantly as for 2828.0.
2830				2830.4 SANDSTONE: Pale brown to off white, clear to translucent, very fine to fine, well sorted, subangular to subrounded, moderate silica cement, occasional silty matrix, common glauconite, common muscovite mica, firm to moderately hard, poor visible porosity, moderate hydrocarbon odour, 30-40% dull to moderately bright solid yellow green fluorescence, slow pale green milky streaming cut, thick to thin pale green milky residue ring.
2831				

**ESSO AUSTRALIA LTD
CORE DESCRIPTION**

CORE No.:	4	WELL:	Blackback 2
Interval cored:	2832-2850.5m	Recovered:	18.5m (100%)
Cut:	18.5m	Bit Size:	9 7/8"
Bit type:	Coreguard RC 412	Date:	1st October 1992
Described by:	Boothby		

Interval	Depth & ROP	Graphic	Shows	Descriptive Lithology
(m) 2832	(m/hr) 40 30 20 10 0			
2832		✓	◆	2832.0 SANDSTONE: Pale brown to light grey, clear to translucent, very fine to dominantly fine, occasional floating medium to coarse quartz grains, well sorted, subangular to subrounded, moderate to strong silica cement, common glauconite, chloritic, moderate to common feldspar, finely disseminated pyrite, firm to moderately hard, poor to locally fair visible porosity, occasional pale brown oil staining, strong hydrocarbon odour, 60% dull yellow green spotted fluorescence, moderate to good milky pale green streaming cut, thick pale green residue ring.
2833		✓	◆	2833.0 SANDSTONE: Pale brown to light grey, clear to translucent, very fine to dominantly fine, occasional to common medium to coarse quartz grains, moderately sorted, subangular to subrounded, moderate silica cement, pyrite replacement?, common glauconite, occasional chlorite, abundant very finely disseminated pyrite, occasional feldspar, micromicaceous, firm to moderately hard, poor to locally fair visible porosity, strong hydrocarbon odour, 60% dull to moderately bright yellow green spotted fluorescence, moderate to good milky pale green streaming cut, thick milky pale green residue ring.
2834		✓	◆	2834.2 SANDSTONE: Clear to translucent, off white to light grey, medium to coarse, occasionally fine, poorly to moderately sorted, angular to subrounded, moderate silica cement, moderate to common glauconite, occasional chlorite, occasional muscovite mica, minor pyrite, firm to friable, poor to fair visible porosity, strong hydrocarbon odour, 80-100% moderately bright to bright yellow green patchy fluorescence, instant streaming to blooming bright milky pale green cut, thick residue ring.
2835		✓	┘	2835.4 SANDSTONE: Clear to translucent, dominantly medium to coarse, occasionally very coarse to granular, poorly sorted, angular to subrounded, weak to locally moderate silica cement, common glauconite, common muscovite mica, firm to commonly friable, fair to locally very good visible porosity, very strong hydrocarbon odour, bright yellow green patchy to solid fluorescence, instant bright yellow green milky streaming to blooming cut, thick residue ring.
2836		✓	┘	2836.6 SANDSTONE: Dominantly as above (2835.4), dominantly coarse, poorly sorted, subangular to subrounded, weak silica cement, common glauconite, occasional muscovite mica, friable, good to very good visible porosity, strong hydrocarbon odour, 80-100% bright yellow green patchy to solid fluorescence, instant milky to pale yellow green streaming to blooming cut, thick ring to thin film residue.
2837		✓	┘	2837.8 SANDSTONE: Clear to translucent, light grey, dominantly medium, occasionally coarse, well sorted, subangular to subrounded weak silica cement, minor to trace argillaceous matrix, moderate to common glauconite, moderate muscovite mica, friable, good to very good visible porosity, strong hydrocarbon odour, 100% moderately bright to bright yellow green patchy to solid fluorescence, instant blooming to streaming milky to pale green cut, thick milky residue ring.
2838		✓	┘	2839.0 SANDSTONE: Clear to translucent, medium to coarse, occasionally very coarse, moderately sorted, angular to subrounded, weak silica cement, moderate to common glauconite, occasional muscovite mica, rare chlorite, friable, good visible porosity, strong hydrocarbon odour, 100% bright yellow green solid patchy fluorescence, instant streaming to blooming milky pale green cut, thick residue ring.
2839		✓	┘	2840.2 SANDSTONE: Clear to translucent, light grey, dominantly fine, occasionally medium, well sorted, subangular to subrounded, common to abundant silica cement, occasional very fine to silty quartz matrix, common muscovite mica, common glauconite, minor chlorite, firm to hard, poor visible porosity, minor hydrocarbon odour, 20-30% dull to moderately bright yellow to yellow green patchy fluorescence, very weak pale green slow streaming cut, thin residue ring.
2840		✓	┘	2841.02 SANDSTONE: Clear to translucent, light grey, medium to coarse, occasionally very coarse, moderately to well sorted, subangular to subrounded, weak to locally moderate silica cement, occasional to common glauconite, muscovite mica, friable to firm, good visible porosity, strong hydrocarbon odour, 100% bright
2841		✓	┘	
2842				

**ESSO AUSTRALIA LTD
CORE DESCRIPTION**

CORE No.: 4
Interval cored: 2832-2850.5m
Cut: 18.5m
Bit type: Coreguard RC 412
Described by: Boothby








WELL: Blackback 2
Recovered: 18.5m
Bit Size: 9 7/8"
Date: 1st October 1992

Interval	Depth & ROP	Graphic	Shows	Descriptive Lithology
	(m) 2842	(m/hr) 40 30 20 10 0		
			✓ 7	2842.2 SANDSTONE: Clear to translucent, light grey, fine to very coarse, dominantly medium to coarse, poorly sorted, angular to subrounded, dominantly weak to moderate silica cement, locally abundant strong silica cement (overgrowths), minor white argillaceous matrix, occasional glauconite, occasional muscovite mica, firm to friable, locally very hard, poor to locally fair visible porosity, moderately hydrocarbon odour, 80-100% bright yellow green solid to patchy fluorescence, moderate fast streaming cut, thick residue ring.
	2843		✓ 7	2843.4 SANDSTONE: Dominantly as above, commonly coarse, locally abundant silica cement, common overgrowths, glauconitic and micromicaceous, poor to locally fair visible porosity, moderate hydrocarbon odour, 40-60% moderately bright to bright yellow gold patchy fluorescence, strong bright yellow gold streaming cut, thick residue ring.
	2844		✓ 7	2844.6 SANDSTONE: Clear to translucent, light grey, medium to very coarse, dominantly medium to coarse, poorly sorted, angular to subrounded, moderate to locally abundant silica cement, occasional overgrowths, occasional white silty quartz matrix, occasional glauconite, occasional mica, firm to locally very hard, poor to locally fair visible porosity, moderate hydrocarbon odour, 80-100% moderately bright yellow/green patchy to solid fluorescence, weak to moderate pale yellow green streaming cut, thin pale yellow residue ring.
	2845		✓ 7	2845.8 SANDSTONE: Clear to translucent, fine to very coarse, dominantly medium to coarse, poorly sorted, angular to subrounded, locally strong silica cement, occasional overgrowths, minor matrix, occasional to common glauconite, occasional pyrite, minor muscovite mica, firm to locally hard, poor to locally fair visible porosity, moderate hydrocarbon odour, 80-100% moderately bright yellow green patchy to solid fluorescence, instant blooming cut, thick residue ring.
	2846		✓ 7	2847.0 SANDSTONE: Clear to translucent, frosted, light grey, medium to very coarse, dominantly coarse, poorly to moderately sorted, angular to subangular, strong silica cement, common overgrowths, occasional glauconite, minor mica, hard, poor visible porosity, weak hydrocarbon odour, 20-30% dull to moderately bright yellow green gold patchy fluorescence, weak pale yellow streaming cut, thin pale yellow residue ring.
	2847		✓ 7	2848.2 SANDSTONE: Clear to translucent, frosted, off white to light grey, fine to coarse, dominantly medium to coarse, poorly sorted, angular to subrounded, locally abundant silica cement, occasional overgrowths, occasional glauconite, minor mica, firm to hard, poor to fair visible porosity, moderate hydrocarbon odour, 60-80% moderately bright to bright yellow patchy fluorescence, slow very pale yellow green streaming cut, thin pale yellow green residue ring.
	2848		✓ 7	2849.4 SANDSTONE: Clear to translucent, frosted, light grey, smoky quartz, fine to very coarse, occasionally granular, dominantly medium to coarse, very poorly sorted, angular to subrounded, locally common patchy silica cement, overgrowths, occasional glauconite, firm to friable, locally hard, poor to locally fair visible porosity, moderate hydrocarbon odour, 80% moderately bright to bright yellow patchy fluorescence, strong yellow green milky streaming cut, thick moderately bright residue ring.
	2849		✓ 7	2850.24 SANDSTONE: Clear to translucent, light grey, medium to coarse, dominantly medium, moderately to well sorted, angular to subrounded, moderate to weak silica cement, occasional glauconite, occasional muscovite mica, friable to firm, occasionally moderately hard, poor to fair visible porosity, strong hydrocarbon odour, 100% moderately bright to bright yellow gold fluorescence, instant bright yellow green streaming cut, thick residue ring.
	2850		✓ 7	
	2851		✓ 7	

**ESSO AUSTRALIA LTD
CORE DESCRIPTION**

CORE No.: 5
Interval cored: 2850.5-2869.0m
Cut: 18.5m
Bit type: Coreguard RC 412
Described by: Boothby

WELL: Blackback 2
Recovered: 18.5m
Bit Size: 9 7/8"
Date: 2nd October 1992

Interval	Depth & ROP	Graphic	Shows	Descriptive Lithology
(m) 2850	(m/hr) 40 30 20 10 0			
2851		✓		2850.5 SANDSTONE: Clear to translucent, milky, light grey, medium to very coarse, dominantly coarse, moderately sorted, angular to subrounded, moderate to locally common silica cement, minor argillaceous matrix, common glauconite, firm to hard, poor to locally fair visible porosity, weak to moderate hydrocarbon odour 60-80% dominantly bright yellow/green patchy to solid fluorescence, good fast streaming milky yellow/green cut, thick milky residue ring.
2852		✓		2851.7 SANDSTONE: Dominantly as above, firm to hard, dominantly poor visible to occasionally fair visible porosity, strong hydrocarbon odour, 100% bright yellow/gold fluorescence, instant streaming/blooming cut, thick residue ring.
2853		✓ 7		2852.9 SANDSTONE: Clear to translucent, milky, dominantly medium to coarse, moderately sorted, dominantly subangular, moderate to locally common silica cement, occasionally pale brown to off white argillaceous matrix, common glauconite, muscovite mica, dominantly firm to friable, poor to locally fair visible porosity, strong hydrocarbon odour, 80% bright yellow/gold solid to patchy fluorescence, instant bright yellow/gold blooming cut, thick residue ring.
2854		✓ 7		2854.1 SANDSTONE: Clear to translucent, medium to coarse, occasionally very coarse, moderately sorted, angular to subrounded, moderate to locally common silica cement, occasional overgrowths, minor matrix, common glauconite, muscovite mica, firm to hard, poor to locally fair visible porosity, moderate to strong hydrocarbon odour, 80% bright yellow/gold patchy to solid fluorescence, instant bright yellow/gold blooming cut, thick residue ring.
2855		✓ 7		2855.3 SANDSTONE: Clear to translucent, colourless, fine to medium, occasionally coarse, moderately to well sorted, subangular to subrounded, moderate to locally common silica cement, common glauconite, common muscovite mica, dominantly firm to moderately hard, poor to fair visible porosity, moderate hydrocarbon odour, 60-80% bright yellow/gold patchy fluorescence, instant bright yellow gold milky streaming cut, thick residue ring.
2856		✓ 7		2856.5 SANDSTONE: Clear to translucent, dominantly medium to coarse, well sorted, subangular to subrounded, moderate silica cement, trace argillaceous matrix, common glauconite and muscovite mica, firm, good visible porosity, moderate hydrocarbon odour, trace spotted dull yellow/green fluorescence, very weak faint yellow/green crush cut, trace residue ring.
2857		✓ 7		2857.7 SANDSTONE: Clear to translucent, light to medium grey, milky, fine to very coarse, dominantly fine to medium, rarely granular, very poorly sorted, angular to subrounded, common to abundant silica cement, minor to locally common dolomitic cement/matrix, argillaceous/silty matrix in part, feldspar, chlorite, common muscovite mica, common very fine disseminated pyrite, opaques, abundant glauconite, hard to very hard, very poor visible porosity, no hydrocarbon odour, no shows.
2858		✓ ♦ M T L		2858.9 SANDSTONE: Dominantly as above, abundant pale brown buff argillaceous matrix, abundant glauconite, muscovite mica, pyrite, hard to very hard, very poor visible porosity, no shows.
2859		✓ ♦ M T L		2859.33 SANDSTONE: Dominantly as above, commonly medium to coarse, abundant silica cement, dolomitic in part, firm to very hard, poor visible porosity, no shows.
2860		✓ ♦ M T L		

**ESSO AUSTRALIA LTD
CORE DESCRIPTION**

CORE No.:	5	WELL:	Blackback 2
Interval cored:	2850.5-2869.0m	Recovered:	18.5m (100%)
Cut:	18.5m	Bit Size:	9 7/8"
Bit type:	Coreguard RC 412	Date:	2nd October 1992
Described by:	Boothby		

Interval	Depth & ROP	Graphic	Shows	Descriptive Lithology
(m) 2860	(m/hr) 40 30 20 10 0			
2861				2860.5 SANDSTONE: Dominantly as above, no shows, poor visible porosity.
2862				2861.7 SANDSTONE: Light grey to medium grey, off white, milky, fine to coarse, occasionally very coarse, very poorly sorted, angular to subrounded, common silica cement, minor to moderate argillaceous matrix, common glauconite, common muscovite mica, occasional chlorite, firm to moderately hard, poor to fair visible porosity, no odour, no shows.
2863				2862.9 SANDSTONE: Pale brown to light grey, clear to translucent, off white to milky, fine to coarse, dominantly fine to medium, poorly sorted, angular to subrounded, moderate silica cement, occasional dolomite, moderate argillaceous matrix, common glauconite, common muscovite mica, friable to firm, poor to fair visible porosity, no shows.
2864	Black 41.2			2864.1 SANDSTONE: Pale brown to off white, clear to translucent, fine to coarse, dominantly medium to coarse, poorly sorted, angular to subrounded, silica cement in part, common white to pale brown argillaceous matrix, common glauconite, common muscovite mica, occasional disseminated pyrite, firm to friable, poor to fair visible porosity, no shows.
2865				2865.3 SANDSTONE: Light grey to off white, clear to translucent, occasionally milky, fine to very coarse, dominantly medium to coarse, very poorly sorted, angular to subrounded, moderate silica cement, abundant pale brown argillaceous matrix, common glauconite, common mica, occasional disseminated pyrite, friable to firm, poor to fair visible porosity, no shows.
2866				2866.5 SANDSTONE: Dominantly as above, no shows.
2867				2867.7 SANDSTONE: Clear to translucent, pale brown, fine to coarse, dominantly medium, moderately sorted, subangular to subrounded, moderate silica cement, minor to moderate argillaceous matrix, common glauconite, mica, occasional disseminated pyrite, friable to firm, poor to fair visible porosity, no shows.
2868				2868.55 SANDSTONE: Light grey, clear to translucent, fine to coarse, dominantly medium to coarse, moderately to poorly sorted, angular to subrounded, moderate silica cement, common glauconite, muscovite mica, friable to firm, poor to fair visible porosity.
2869				2869.0 SANDSTONE: Clear to translucent, medium to coarse, moderately sorted, angular to subrounded, minor silica cement, minor argillaceous matrix, moderate to common glauconite, occasional mica, friable, good visible porosity, no shows.

APPENDIX 3

APPENDIX 3



5th Cut
A4 Dividers
Re-order code 97052

APPENDIX 3:

BLACKBACK 2

SIDEWALL CORE DESCRIPTIONS

BLACKBACK-2

Sidewall Core Descriptions

<u>No.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Description</u> (GAS: C ₁ /C ₂ /C ₃ /C ₄ /C ₅)
1	3141.0	25	CLAYSTONE: Medium to pale brown, non calcareous, local very fine sand, moderate to common very fine disseminated pyrite, soft to firm, blocky. (GAS: 16/8/18/42/16)
2	3139.0	25	SANDSTONE: Clear to translucent, white to light grey, very fine to medium, dominantly fine, moderately to well sorted, angular to subrounded, weak silica cement, abundant white argillaceous matrix, occasional pale to medium brown claystone laminae, occasional mica, minor very fine disseminated pyrite, soft to friable, poor visible porosity, no show. (GAS: 4/4/10/32/50)
3	3132.5	25	SANDSTONE: Clear to translucent, off white, light grey, fine to moderate, occasionally coarse, moderately sorted, angular to subrounded, weak silica cement, common white argillaceous matrix, occasional very fine sand/silt matrix, occasional to common very fine disseminated pyrite, occasional mica, soft to friable, locally fair visible porosity, no show. (GAS: 4/4/9/33/50)
4	3127.0	-	Bullet lost.
5	3117.0	20	SANDSTONE: Off white to pale brown, very fine, grades to siltstone in part, well sorted, angular to subrounded, weak silica cement, abundant white to pale brown argillaceous matrix, common argillaceous to silty and slightly carbonaceous laminae, common very pyritic laminae, micaceous in part, firm to friable, poor visible porosity. (GAS: 13/5/22/33/27)
6	3094.5	20	SANDSTONE: Clear to translucent, light grey to off white, dominantly fine to medium, occasionally coarse, moderately sorted, angular to subrounded, weak silica cement in part, abundant white argillaceous matrix, occasional very fine sand matrix, occasionally silty, locally common very fine disseminated pyrite, firm, poor visible porosity, 20-30% very dull to dull pale yellow green spotted to patchy fluorescence, weak pale green crush cut, thin pale yellow green residue ring, no odour. (GAS: 10/11/17/24/38)

Sidewall Core Descriptions

<u>No.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Description</u> (GAS: C ₁ /C ₂ /C ₃ /C ₄ /C ₅)
7	3091.0	10	SANDSTONE: Clear to translucent, light grey to off white, fine to coarse, poorly sorted, angular to subrounded, weak silica cement, abundant white to light brown argillaceous matrix, silty in part, common very fine disseminated pyrite, friable, poor visible porosity, no hydrocarbon odour, 30% very dull to dim pale yellow to orange fluorescence, no cut, very weak pale green milky crush cut, trace residue ring. (GAS: 21/8/10/28/33)
8	3087.5	-	Bullet lost.
9	3071.5	-	Bullet lost.
10	3036.5	-	Bullet lost.
11	3010.0	-	Bullet lost.
12	2996.5	40	SANDSTONE: Clear to translucent, off white, dominantly fine, occasionally medium, angular to subrounded, very weak silica cement, minor to locally common argillaceous matrix, occasional glauconite, (chlorite?), occasional medium brown mica, friable, fair to locally good visible porosity, 20-30% dim to very dull pale yellow green spotted fluorescence, no cut, trace weak pale green crush cut, trace residue ring, no hydrocarbon odour. (GAS: 4/2/10/41/43)
13	2991.5	-	Bullet lost.
14	2954.0	-	Bullet lost.
15	2929.0	-	Bullet lost.
16	2924.0	40	SANDSTONE: Clear to translucent, light grey, off white, very fine to fine, dominantly fine, well sorted, angular to subrounded, weak cement, moderate to common white argillaceous matrix, common glauconite, common medium to dark brown mica, friable, fair to good visible porosity, no hydrocarbon odour, no shows. (GAS: 3/2/12/40/44)
17	2912.5	40	SANDSTONE: Clear to translucent, off white, very fine to dominantly fine, occasionally medium, well sorted, angular to subrounded, weak silica cement, common to locally abundant white argillaceous matrix, occasional silty/slightly carbonaceous laminae, common to locally abundant mica and, glauconite, common very fine disseminated pyrite, friable to firm in part, dominantly fair visible porosity, no hydrocarbon odour, no show. (GAS: 3/7/33/38/19)

Sidewall Core Descriptions

<u>No.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Description</u> (GAS: C ₁ /C ₂ /C ₃ /C ₄ /C ₅)
18	2899.5	35	SANDSTONE: Clear to translucent, off white, very fine to dominantly fine, well sorted, angular to subrounded, weak silica cement, common to locally abundant white argillaceous matrix, abundant medium brown mica (muscovite), common glauconite (chlorite), occasional silty laminae, common very fine disseminated pyrite, friable, poor to dominantly fair visible porosity, no hydrocarbon odour, no show. (GAS: 4/4/22/47/23)
19	2883.5	-	Bullet lost.
20	2878.5	40	SANDSTONE: Clear to translucent, light to medium grey, fine to medium, occasional very coarse quartz grains, poor to moderately sorted, subangular to subrounded, occasionally rounded, weak to moderate silica cement, abundant very fine sand matrix, occasionally argillaceous, abundant glauconite, common mica, friable to firm, fair visible porosity, no hydrocarbon odour, no show. (GAS: 16/3/9/24/48)
21	2872.0	35	SANDSTONE: Clear to translucent, light grey, fine to coarse, dominantly fine to medium, poorly sorted, angular to subrounded, occasional rounded coarse quartz grains, weak to trace silica cement, common abundant pale brown to off white argillaceous matrix, common very fine sand matrix, common to abundant glauconite, occasional mica, friable to firm, poor to locally fair visible porosity, no hydrocarbon odour, no show. (GAS: 18/3/6/28/45)
22	2869.0	-	Bullet lost.
23	2866.5	-	Bullet lost.
24	2863.5	-	Bullet lost.
25	2859.5	30	SANDSTONE: Clear to translucent, off white, occasionally light grey, very fine to dominantly fine, occasionally medium, well sorted, subangular, weak silica cement, common white argillaceous matrix, common very fine sand matrix, altered feldspar in part, common glauconite, occasional mica, friable to firm, poor to locally fair visible porosity, moderate to strong hydrocarbon odour, 60-70% moderately bright to bright yellow green to yellow gold patchy fluorescence, weak pale yellow green crush cut, thin to moderate residue ring. (GAS: 8/6/11/21/60)

Sidewall Core Descriptions

<u>No.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Description</u> (GAS: C ₁ /C ₂ /C ₃ /C ₄ /C ₅)
26	2839.5	40	SANDSTONE: Clear to translucent, light grey to off white, very fine to fine, occasionally medium, well sorted, subangular to subrounded, moderate silica cement, moderate to common pale brown argillaceous matrix, silty in part, abundant glauconite, common mica, firm, poor visible porosity, strong hydrocarbon odour, 30-40% dim to dull very pale yellow green patchy fluorescence, slow pale yellow green streaming cut, thin to thick residue ring. (GAS: TR/TR/2/26/72)
27	2835.5	40	SANDSTONE: Clear to translucent, off white to pale brown, very fine to fine, well sorted, subangular to subrounded, weak silica cement, abundant pale brown to off white argillaceous matrix, abundant glauconite, common mica, firm, abundant very fine disseminated pyrite, poor visible porosity, moderate hydrocarbon odour, 20-30% dim to dull pale yellow green patchy fluorescence, weak to moderate pale green crush cut, thin residue ring. (GAS: TR/TR/5/45/50)
28	2833.5	-	Bullet lost.
29	2829.0	35	SANDSTONE: Dominantly as for core 27, dominantly fine, well sorted, abundant pale brown argillaceous matrix, abundant glauconite, common to locally abundant very fine disseminated pyrite, poor to locally fair visible porosity, strong hydrocarbon odour, 20% very dim to dull yellow green fluorescence, weak to moderate slow pale green streaming cut, weak to moderate crush cut, trace to thin residue ring. (GAS: TR/TR/8/55/37)
30	2824.0	-	Bullet lost.
31	2819.0	-	Bullet lost.
32	2812.5	30	SANDSTONE: Clear to translucent, off white, dominantly fine to medium, occasionally coarse, poorly to moderately sorted, angular to subrounded, occasional rounded coarse quartz grains, weak silica cement, abundant white argillaceous matrix, common glauconite, fair visible porosity, strong hydrocarbon odour, 30% dim to very dull yellow green patchy fluorescence, faint pale yellow green crush cut, thin ring residue, (flushed). (GAS: TR/TR/7/30/63)
33	2806.5	-	Misfire.
34	2804.5	-	Bullet lost.

Sidewall Core Descriptions

<u>No.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Description</u> (GAS: C ₁ /C ₂ /C ₃ /C ₄ /C ₅)
35	2799.5	-	Misfire.
36	2798.5	-	Bullet lost.
37	2796.5	40	SILTSTONE WITH CALCAREOUS SANDSTONE AND CALCAREOUS CLAYSTONE INCLUSIONS/LAMINATIONS. SILTSTONE: Medium to dark brown, arenaceous, glauconitic, non calcareous, firm to crumbly, blocky. CLAYSTONE: Pale blue grey, commonly calcareous, grades to argillaceous limestone, soft, pasty in part, amporhous. SANDSTONE: Off white to pale brown, very fine well sorted, angular to subrounded, moderate to weak calcareous cement, common matrix, poor visible porosity, no shows. (GAS: TR/5/22/43/30)
38	2795.0	40	SILTSTONE: Medium to dark brown, commonly arenaceous, abundant glauconite, common very fine disseminated pyrite veins/laminations, firm, blocky. (GAS: TR/2/20/48/30)
39	2789.5	-	Misfire.
40	2787.5	25	SILTSTONE: Dominantly as above, commonly very arenaceous, grades to very fine sandstone in part, abundant glauconite, micromicaceous in part, slightly carbonaceous, occasional pyrite nodules, firm, blocky. (GAS: TR/3/27/46/24)
41	2783.5	-	Misfire.
42	2780.5	40	SILTSTONE: Dominantly as above. (GAS: TR/2/28/50/20)
43	2778.5	30	CLAYSTONE: Off white to pale brown, light blue grey, commonly very calcareous, grades to argillaceous limestone, slightly arenaceous, soft to firm, amorphous to blocky. (GAS: 4/5/23/38/30)
44	2777.0	-	Empty.
45	2774.0	-	CLAYSTONE: Off white to pale brown, light blue grey, very calcareous, slightly arenaceous, grades to calcilutite, occasional glauconite, firm, blocky. (GAS: 9/10/26/35/20)
46	2766.0	-	Bullet lost.

Sidewall Core Descriptions

<u>No.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Description</u> (GAS: C ₁ /C ₂ /C ₃ /C ₄ /C ₅)
47	2725.0	30	ARGILLACEOUS LIMESTONE/CALCAREOUS CLAYSTONE: Dominantly as above, firm, blocky. (GAS:35/12/13/18/22)
48	2675.0	45	ARGILLACEOUS LIMESTONE/CALCAREOUS CLAYSTONE: Pale blue grey, pale brown, off white, very calcareous, occasional glauconite, firm, blocky to subfissile. (GAS: 35/9/15/19/22)
49	2657.0	40	CALCAREOUS CLAYSTONE/ARGILLACEOUS LIMESTONE: Dominantly as above. (GAS: 67/6/8/13/6)
50	2575.0	-	Bullet lost.
51	2545.0	-	Bullet lost.
52	2420.0	-	Bullet lost.
53	2275.0	25	LIMESTONE: Off white to pale brown, calcilutite, occasional grades to calcarenite, moderately to slightly argillaceous, firm, blocky. (GAS: 16/8/21/27/28)
54	2090.0	30	LIMESTONE: Dominantly as above, grades to calcarenite, slightly argillaceous, firm to moderately hard, blocky, very poor visible porosity, no shows. (GAS: 24/4/14/26/32)
55	2003.0	30	LIMESTONE: Off white to pale brown, calcarenite, slightly argillaceous, common very fine glauconite, firm to moderately hard, very poor visible porosity, no shows. (GAS: 30/13/15/32/10)
56	1885.0	-	Empty.
57	1755.0	20	LIMESTONE: Off white to pale brown, very fine calcarenite, grades to calcisiltite, common argillaceous/micritic matrix, common glauconite, firm to moderately hard, very poor visible porosity, no shows. (GAS: 67/4/3/16/10)
58	1682.0	-	Bullet lost.
59	1410.0	15	LIMESTONE: Off white to light brown, calcisiltite to calcilutite, common argillaceous matrix, occasional to common glauconite, firm to moderately hard, very poor visible porosity, no shows. (GAS: 55/4/17/16/8)

Sidewall Core Descriptions

<u>No.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Description</u> (GAS: C ₁ /C ₂ /C ₃ /C ₄ /C ₅)
60	1175.0	35	LIMESTONE: Off white to pale brown, calcarenite, argillaceous matrix, locally common glauconite, firm to moderately hard, very poor visible porosity, no shows. (GAS: 7/1/9/65/18)

APPENDIX

4



5th Cut
A4 Dividers
Re-order code 97052

APPENDIX 4:

BLACKBACK 2

RFT/MDT SAMPLE REPORTS

RFT SAMPLE TEST REPORT

WELL: Blackback 2

OBSERVER:

DATE: 6.10.92

RUN: 3

	CHAMBER 4 (10.4 l)	CHAMBER 3 (3.8 l)
SEAT NO	3/44	3/45-1
DEPTH	2800.5 m	2800.0 m
A. RECORDING TIMES		
Tool Set	18:37 hrs	18:50 hrs
Pretest Duration	1 mins	2 mins
Chamber Open	18:39 hrs	18:52 hrs
Chamber Full	1 mins	1 mins
Seal Chamber	18:42 hrs	18:55 hrs
Fill Time	1 mins	1 mins
Finish Build Up	18:42 hrs	18:55 hrs
Build Up Time	1 mins	1 mins
Tool Retract	18:44 hrs	hrs
Total Time	7 mins	5 mins
B. SAMPLE PRESSURE		
Initial Hydrostatic	4566 psia	4566 psia
Initial Form'n Press (Pretest)	4058.8 psia	4058.8 psia
Initial Flowing Press	4191 psia	592 psia
Final Flowing Press	4188 psia	4058 psia
Final Form'n Press	4194 psia	4058.8 psia
Final Hydrostatic	4566 psia	psia
C. TEMPERATURE		
Temp @ Sample Depth (AMS)	76 deg C	73 deg C
Rm @ Sample Depth (AMS)	0.04 ohm-m	ohm-m
D. SAMPLE RECOVERY		
Surface Pressure	2300 psia	2000 psia
Amt Gas	0 cu ft	1.76 cu ft
Amt Oil	0 lit	0 lit
Amt Water (Total)	10.4 lit	3.5 lit
Amt Others	0 lit	0 lit

WELL: Blackback 2

OBSERVER:

DATE: 6.10.92

RUN: 3

E. SAMPLE PROPERTIES		
Gas Composition		
C1	- ppm	- ppm
C2	- ppm	- ppm
C3	- ppm	- ppm
C4	- ppm	- ppm
C5	- ppm	- ppm
C6+	- ppm	- ppm
CO2/H2S	- % /ppm	- % /ppm
Oil Properties	- deg API @ - deg C	- deg API @ - deg C
Colour	-	-
Flourescence	-	-
GOR	-	-
Pour Point	-	-
Water Properties	-	-
Resistivity	0.134 ohm-m @ 20 deg C	0.145 ohm-m @ 19 deg C
NaCl Equivalent	59,000 ppm	ppm
Cl-titrated	- ppm	ppm
Tritium	- DPM/ml	DPM/ml
pH		
Est Water Type	Mud/Filtrate	Mud/Filtrate
F. MUD FILTRATE PROPERTIES		
Resistivity	0.120 ohm-m @ 16 deg C	0.12 ohm-m @ 16 deg C
NaCl Equivalent	70,000 ppm	70,000 ppm
Cl-titrated	38,000 ppm	38,000 ppm
pH	8.4	8.4
Tritium in Mud	3010 DPM/ml	3010 DPM/ml
G. GENERAL CALIBRATION		
Mud Weight	9.4 ppg	9.4 ppg
Calc Hydrostatic	psi	psi
Serial No. (Preserved)	-	-
Choke Size/Probe Type	Martineau Probe	Martineau Probe
REMARKS		
	Seal failure - invalid formation and flowing pressures.	Segregated chamber - used to draw down filtrate.

RFT SAMPLE TEST REPORT

WELL: Blackback 2

OBSERVER:

DATE: 6.10.92

RUN: 3

	CHAMBER 5 (10.4 l)	CHAMBER
SEAT NO	3/45-2	
DEPTH	2800.4 m	m
A. RECORDING TIMES		
Tool Set	- hrs	- hrs
Pretest Duration	- mins	- mins
Chamber Open	18:59 hrs	hrs
Chamber Full	6 mins	mins
Seal Chamber	19:15 hrs	hrs
Fill Time	6 mins	mins
Finish Build Up	19:15 hrs	hrs
Build Up Time	10 mins	mins
Tool Retract	19:16 hrs	hrs
Total Time	17 mins	mins
B. SAMPLE PRESSURE		
Initial Hydrostatic	- psia	psia
Initial Form'n Press (Pretest)	4058.8 psia	psia
Initial Flowing Press	289 psia	psia
Final Flowing Press	4057 psia	psia
Final Form'n Press	4056.9 psia	psia
Final Hydrostatic	4566 psia	psia
C. TEMPERATURE		
Temp @ Sample Depth (AMS)	73 deg C	deg C
Rm @ Sample Depth (AMS)	ohm-m	ohm-m
D. SAMPLE RECOVERY		
Surface Pressure	2100 psia	psia
Amt Gas	37.1 cu ft	cu ft
Amt Oil	- lit	lit
Amt Condensate	0.5 lit	lit
Amt Water (Total)	5.5 lit	lit

WELL: Blackback 2

OBSERVER:

DATE: 6.10.92

RUN: 3

E. SAMPLE PROPERTIES			
Gas Composition			
C1	144000	ppm	ppm
C2	26000	ppm	ppm
C3	13000	ppm	ppm
C4	8700	ppm	ppm
C5	760	ppm	ppm
C6		ppm	ppm
CO2/H2S		- % /ppm	% /ppm
Oil Properties	53.3 deg API @ 15.5 deg C		deg API @ deg C
Colour	Pale yellow		
Flourescence	Bright white		
GOR	-		
Pour Point	<4 deg C		
Water Properties			
Resistivity	0.143 ohm-m @ 20 deg C		ohm-m @ deg C
NaCl Equivalent	58,000 ppm		ppm
Cl-titrated	32,500 ppm		ppm
Tritium	2450	DPM/ml	DPM
pH			
Est Water Type	Mud Filtrate		
F. MUD FILTRATE PROPERTIES			
Resistivity	0.120 ohm-m @ 16 deg C		ohm-m @ deg C
NaCl Equivalent	-		ppm
Cl-titrated	38,000		ppm
pH	8.4		
Tritium in Mud	3010	DPM/ml	DPM/ml
G. GENERAL CALIBRATION			
Mud Weight	9.4	ppg	ppg
Calc Hydrostatic	4490	psi	psi
Serial No. (Preserved)	-		
Choke Size/Probe Type			
REMARKS			
Chambers 3 & 4 used to draw down filtrate prior to flowing to this chamber.			

RFT SAMPLE TEST REPORT

WELL: Blackback 2

OBSERVER:

DATE: 6.10.92 - 7.10.92

RUN: 4

	CHAMBER 1 (45.4 l)	CHAMBER 4 (10.4 l)
SEAT NO	4/49	4/49
DEPTH	2841.6 m	2841.6 m
A. RECORDING TIMES		
Tool Set	23:37 hrs	- hrs
Pretest Duration	20 secs	- mins
Chamber Open	23:45 hrs	23:53 hrs
Chamber Full	4 mins	0.5 mins
Seal Chamber	23:52 hrs	23:55 hrs
Fill Time	4 mins	0.5 mins
Finish Build Up	23:52 hrs	- hrs
Build Up Time	4 mins	0.5 mins
Tool Retract	hrs	hrs
Total Time	30 mins	3 mins
B. SAMPLE PRESSURE		
Initial Hydrostatic	4630 psia	- psia
Initial Form'n Press (Pretest)	4011.2 psia	4011.0 psia
Initial Flowing Press	2184 psia	1591 psia
Final Flowing Press	4011 psia	4011.7 psia
Final Form'n Press	4011.0 psia	4011.9 psia
Final Hydrostatic	psia	4631 psia
C. TEMPERATURE		
Temp @ Sample Depth (AMS)	75 deg C	76 deg C
Rm @ Sample Depth (AMS)	0.04 ohm-m	0.04 ohm-m
D. SAMPLE RECOVERY		
Surface Pressure	2000 psia	Preserved psia
Amt Gas	176.6 cu ft	Sample cu ft
Amt Oil	26.0 lit	lit
Amt Water (Total)	3.0 lit	lit
Amt Others	lit	lit

WELL: Blackback 2

OBSERVER:

DATE: 6.10.92- 7.10.92

RUN: 4

E. SAMPLE PROPERTIES			
Gas Composition		(%BD)	
C1	498960	ppm (68)	ppm
C2	127296	ppm (17)	ppm
C3	73382	ppm (10)	ppm
C4	31602	ppm (4)	ppm
C5	5840	ppm (4)	ppm
C6		ppm (1)	ppm
CO2/H2S		- % /ppm	% /ppm
Oil Properties	50.0 deg API @ 15.55 deg C		deg API @ deg C
Colour	Moderate yellowish brown		
Flourescence	Bright yellow green		
GOR	1080 cuft/bbl		
Pour Point	-		
Water Properties			
Resistivity	0.137 ohm-m @ 19 deg C		ohm-m @ deg C
NaCl Equivalent	55,000	ppm	ppm
Cl-titrated		ppm	ppm
Tritium (see attached report)	2792	DPM/ml	DPM/ml
pH			
Est Water Type			
F. MUD FILTRATE PROPERTIES			
Resistivity	ohm-m @	deg C	ohm-m @ deg C
NaCl Equivalent		ppm	ppm
Cl-titrated		ppm	ppm
pH			
Tritium in Mud	3010	DPM/ml	DPM/ml
G. GENERAL CALIBRATION			
Mud Weight	9.4	ppg	ppg
Calc Hydrostatic		psi	psi
Serial No. (Preserved)			MRSC DA 016
Choke Size/Probe Type	Martineau Probe		Martineau Probe
REMARKS	Segregated sample.		Preserved sample

RFT SAMPLE TEST REPORT

WELL: Blackback 2

OBSERVER:

DATE: 6.10.92 - 7.10.92

RUN: 4

	CHAMBER 2 (3.8 l)	CHAMBER 5 (10.4 l)
SEAT NO	4/49	4/50
DEPTH	2841.6 m	2820.5 m
A. RECORDING TIMES		
Tool Set	- hrs	00:06 hrs
Pretest Duration	- mins	1.3 mins
Chamber Open	23:56 hrs	00:07 hrs
Chamber Full	0.5 mins	0.3 mins
Seal Chamber	23:58 hrs	Lost seat hrs
Fill Time	0.5 mins	attempted to mins
Finish Build Up	23:58 hrs	re establish. hrs
Build Up Time	2.5 mins	Chamber full mins
Tool Retract	23:59 hrs	of mud. hrs
Total Time	3 mins	mins
B. SAMPLE PRESSURE		
Initial Hydrostatic	- psia	4598 psia
Initial Form'n Press (Pretest)	4011.9 psia	4049 psia
Initial Flowing Press	2394 psia	3289.5 psia
Final Flowing Press	4011.8 psia	psia
Final Form'n Press	4011.9 psia	Lost seat psia
Final Hydrostatic	4631 psia	4598 psia
C. TEMPERATURE		
Temp @ Sample Depth (AMS)	76 deg C	76 deg C
Rm @ Sample Depth (AMS)	0.04 ohm-m	0.04 ohm-m
D. SAMPLE RECOVERY		
Surface Pressure	Preserved psia	2200 psia
Amt Gas	sample cu ft	0.05 cu ft
Amt Oil	- lit	- lit
Amt Condensate	- lit	- lit
Amt Others (Mud)	- lit	8.5 lit

WELL: Blackback 2

OBSERVER:

DATE: 7.10.92

RUN: 4

E. SAMPLE PROPERTIES		
Gas Composition		
C1	ppm	ppm
C2	ppm	ppm
C3	ppm	ppm
C4	ppm	ppm
C5	ppm	ppm
C6	ppm	ppm
CO2/H2S	% /ppm	% /ppm
Oil Properties	deg API @ deg C	deg API @ deg C
Colour		
Flourescence		
GOR		
Pour Point		
Water Properties		
Resistivity	ohm-m @ deg C	ohm-m @ deg C
NaCl Equivalent	55,000 ppm	ppm
Cl-titrated	ppm	ppm
Tritium (see attached report)	2792 DPM/ml	DPM/ml
pH		
Est Water Type		Mud
F. MUD FILTRATE PROPERTIES		
Resistivity	ohm-m @ deg C	ohm-m @ deg C
NaCl Equivalent	ppm	ppm
Cl-titrated	ppm	ppm
pH		
Tritium in Mud	DPM/ml	DPM/ml
G. GENERAL CALIBRATION		
Mud Weight	ppg	ppg
Calc Hydrostatic	psi	psi
Serial No. (Preserved)	MRSC-BA 021	
Choke Size/Probe Type	Martineau Probe	Martineau Probe
REMARKS	Preserved sample	Mud sample.

RFT SAMPLE TEST REPORT

WELL: Blackback 2

OBSERVER:

DATE: 7.10.92

RUN: 4

	CHAMBER 3 (3.8 l)	CHAMBER
SEAT NO	4/51	
DEPTH	2820.7 m	m
A. RECORDING TIMES		
Tool Set	hrs	hrs
Pretest Duration	mins	mins
Chamber Open	00:21 hrs	hrs
Chamber Full	1 mins	mins
Seal Chamber	00:28 hrs	hrs
Fill Time	1 mins	mins
Finish Build Up	- hrs	hrs
Build Up Time	- mins	mins
Tool Retract	00:29 hrs	hrs
Total Time	8 mins	mins
B. SAMPLE PRESSURE		
Initial Hydrostatic	4598 psia	psia
Initial Form'n Press (Pretest)	4049.2 psia	psia
Initial Flowing Press	Sample psia	psia
Final Flowing Press	throttled psia	psia
Final Form'n Press	4049.2 psia	psia
Final Hydrostatic	4598 psia	psia
C. TEMPERATURE		
Temp @ Sample Depth (AMS)	75 deg C	deg C
Rm @ Sample Depth (AMS)	0.04 ohm-m	ohm-m
D. SAMPLE RECOVERY		
Surface Pressure	1750 psia	psia
Amt Gas	4.59 cu ft	cu ft
Amt Oil	- lit	lit
Amt Condensate	Emulsion 0.175 lit	lit
Amt Water (Total)	3.0 lit	lit

WELL: Blackback 2

OBSERVER:

DATE: 7.10.92

RUN: 4

E. SAMPLE PROPERTIES		
Gas Composition	(%BD)	
C1	12593 ppm (56)	ppm
C2	5117 ppm (23)	ppm
C3	3356 ppm (15)	ppm
C4	1184 ppm (5)	ppm
C5	233 ppm (1)	ppm
C6	ppm	ppm
CO2/H2S	% /ppm	% /ppm
Oil Properties	deg API @ deg C	deg API @ deg C
Colour		
Flourescence		
GOR		
Pour Point		
Water Properties		
Resistivity	0.121 ohm-m @ 16.5 deg C	ohm-m @ deg C
NaCl Equivalent	70,000 ppm	ppm
Cl-titrated	ppm	ppm
Tritium	DPM/ml	DPM/ml
pH		
Est Water Type	Filtrate	
F. MUD FILTRATE PROPERTIES		
Resistivity	0.12 ohm-m @ 16 deg C	ohm-m @ deg C
NaCl Equivalent	70,000 ppm	ppm
Cl-titrated	38,000 ppm	ppm
pH	8.4	
Tritium in Mud	3010 DPM/ml	DPM/ml
G. GENERAL CALIBRATION		
Mud Weight	9.4 ppg	ppg
Calc Hydrostatic	4523.5 psi	psi
Serial No. (Preserved)	-	
Choke Size/Probe Type	Martineau Probe	
REMARKS		

RFT SAMPLE TEST REPORT

WELL: Blackback 2

OBSERVER: M Schapper

DATE: 24.10.92

RUN: 5

	CHAMBER 1 (45.4 lit)	CHAMBER 2 (3.8 lit)
SEAT NO	5/52-1	5/52-2
DEPTH	2817.8 m	2817.8 m
A. RECORDING TIMES		
Tool Set	15:43 hrs	hrs
Pretest Duration	4.5 mins	mins
Chamber Open	15:51 hrs	17:44 hrs
Chamber Full	12 mins	2 mins
Seal Chamber	17:43 hrs	18:26 hrs
Fill Time	112 mins	42 mins
Finish Build Up	17:44 hrs	18:33 hrs
Build Up Time	1 mins	7 mins
Tool Retract	hrs	18:34 hrs
Total Time	mins	171 mins
B. SAMPLE PRESSURE		
Initial Hydrostatic	4209 psia	psia
Initial Form'n Press (Pretest)	4049.3 psia	4049.2 psia
Initial Flowing Press	123 psia	761 psia
Final Flowing Press	3969 psia	4047.3 psia
Final Form'n Press	4049.2 psia	4048.0 psia
Final Hydrostatic	psia	4210 psia
C. TEMPERATURE		
Temp @ Sample Depth (AMS)	82.7 deg C	82.7 deg C
Rm @ Sample Depth (AMS)	0.03 ohm-m	0.03 ohm-m
D. SAMPLE RECOVERY		
Surface Pressure	2250 psia	1800 psia
Amt Gas	328.4 cu ft	18 cu ft
Amt Oil	- lit	- lit
Amt Condensate	5.3 lit	0.3 lit
Amt Others	- lit	- lit

WELL: Blackback 2

OBSERVER: M Schapper

DATE: 25.10.92

RUN: 5

E. SAMPLE PROPERTIES		
Gas Composition		
C1	(77.0%) ppm	(55.0%) ppm
C2	(12.0%) ppm	(16.5%) ppm
C3	(7.5%) ppm	(19.0%) ppm
C4	(3.0%) ppm	(7.0%) ppm
C5	(0.3%) ppm	(1.0%) ppm
C6	- ppm	(1.5%) ppm
CO2/H2S	0.2 % /ppm	% /ppm
Oil Properties	54.9 deg API @ 15.6 deg C	54.9 deg API @ 15.6 deg C
Colour	Pale yellow/green	Pale yellow/green
Flourescence	Blue - white	Blue - white
GOR	9852 cuft/bbl	9540 cuft/bbl
Pour Point	- Did not freeze	- Did not freeze
Water Properties		
Resistivity	ohm-m @ deg C	ohm-m @ deg C
NaCl Equivalent	ppm	ppm
Cl-titrated	ppm	ppm
Tritium	5 DPM/ml	DPM/ml
pH		
Est Water Type		
F. MUD FILTRATE PROPERTIES		
Resistivity	0.108 ohm-m @ 18 deg C	0.108 ohm-m @ 18 deg C
NaCl Equivalent	71775 ppm	71775 ppm
Cl-titrated	43500 ppm	43500 ppm
pH	7.3	7.3
Tritium in Mud	3007 DPM/ml	3007 DPM/ml
G. GENERAL CALIBRATION		
Mud Weight	8.8 ppg	8.8 ppg
Calc Hydrostatic	psi	psi
Serial No. (Preserved)		
Choke Size/Probe Type	Cased hole perf	Cased hole perf
REMARKS	Water not recovered as separate phase. 5 DPM tritium measured in condensate indicates 99.8% formation fluid.	Transport valve failed - sample could not be preserved. Actual gas rec greater than 18 cuft but not fully measured due to transport valve leak.

RFT SAMPLE TEST REPORT

WELL: Blackback 2

OBSERVER: M Schapper

DATE: 25.10.92

RUN: 6

	CHAMBER 1 (22.7 lit)	CHAMBER 2 (3.8 lit)
SEAT NO	6/53-1	6/53-2
DEPTH	2820.7 m	2820.7 m
A. RECORDING TIMES		
Tool Set	01:18 hrs	hrs
Pretest Duration	mins	mins
Chamber Open	hrs	hrs
Chamber Full	mins	mins
Seal Chamber	hrs	hrs
Fill Time	mins	mins
Finish Build Up	hrs	hrs
Build Up Time	mins	mins
Tool Retract	hrs	hrs
Total Time	mins	mins
B. SAMPLE PRESSURE		
Initial Hydrostatic	4215 psia	psia
Initial Form'n Press (Pretest)	psia	psia
Initial Flowing Press	psia	psia
Final Flowing Press	psia	psia
Final Form'n Press	psia	psia
Final Hydrostatic	psia	psia
C. TEMPERATURE		
Temp @ Sample Depth (AMS)	82.6 deg C	82.6 deg C
Rm @ Sample Depth (AMS)	0.04 ohm-m	0.04 ohm-m
D. SAMPLE RECOVERY		
Surface Pressure	psia	psia
Amt Gas	cu ft	cu ft
Amt Oil	lit	lit
Amt Condensate	lit	lit
Amt Others	lit	lit

WELL: Blackback 2

OBSERVER: M Schapper

DATE: 25.10.92

RUN: 6

E. SAMPLE PROPERTIES		
Gas Composition		
C1	ppm	ppm
C2	ppm	ppm
C3	ppm	ppm
C4	ppm	ppm
C5	ppm	ppm
C6	ppm	ppm
CO2/H2S	% /ppm	% /ppm
Oil Properties	deg API @ deg C	deg API @ deg C
Colour		
Flourescence		
GOR		
Pour Point		
Water Properties		
Resistivity	ohm-m @ deg C	ohm-m @ deg C
NaCl Equivalent	ppm	ppm
Cl-titrated	ppm	ppm
Tritium	DPM/ml	DPM/ml
pH		
Est Water Type		
F. MUD FILTRATE PROPERTIES		
Resistivity	ohm-m @ deg C	ohm-m @ deg C
NaCl Equivalent	ppm	ppm
Cl-titrated	ppm	ppm
pH		
Tritium in Mud	DPM/ml	DPM/ml
G. GENERAL CALIBRATION		
Mud Weight	8.8 ppg	ppg
Calc Hydrostatic	psi	psi
Serial No. (Preserved)		
Choke Size/Probe Type		
REMARKS		
Shots 1 & 2 both misfired. Also having trouble with telemetry. POOH to check problems. 02:00 - 03:00 hours onset of daylight saving.		

RFT SAMPLE TEST REPORT

WELL: Blackback 2

OBSERVER: M Schapper

DATE: 25.10.92

RUN: 7

	CHAMBER 1 (22.7 lit)	CHAMBER 2 (3.8 lit)
SEAT NO	7/54-1	7/54-2
DEPTH	2820.7 m	2820.7 m
A. RECORDING TIMES		
Tool Set	06:53 hrs	hrs
Pretest Duration	8.5 mins	mins
Chamber Open	07:05 hrs	10:31 hrs
Chamber Full	Chamber not full mins	mins
Seal Chamber	10:27 hrs	14:02 hrs
Fill Time	202 mins	211 mins
Finish Build Up	10:31 hrs	14:15 hrs
Build Up Time	4 mins	13 mins
Tool Retract	hrs	14:16 hrs
Total Time	mins	503 mins
B. SAMPLE PRESSURE		
Initial Hydrostatic	4217 psia	psia
Initial Form'n Press (Pretest)	4051.0 psia	psia
Initial Flowing Press	51 psia	406 psia
Final Flowing Press	842 psia	4037.5 psia
Final Form'n Press	psia	4048.3 psia
Final Hydrostatic	psia	4214 psia
C. TEMPERATURE		
Temp @ Sample Depth (AMS)	82.9 deg C	82.9 deg C
Rm @ Sample Depth (AMS)	0.04 ohm-m	0.04 ohm-m
D. SAMPLE RECOVERY		
Surface Pressure	400 psia	Preserved psia
Amt Gas	28 cu ft	cu ft
Amt Oil	- lit	lit
Amt Condensate	0.4 lit	lit
Amt Others	5.1 lit	lit

WELL: Blackback 2

OBSERVER: M Schapper

DATE: 25.10.92

RUN: 7

E. SAMPLE PROPERTIES		
Gas Composition		
C1	52910 ppm	ppm
C2	8790 ppm	ppm
C3	4330 ppm	ppm
C4	1920 ppm	ppm
C5	400 ppm	ppm
C6	- ppm	ppm
CO ₂ /H ₂ S	0.2 - % /ppm	% /ppm
Oil Properties	46.5 deg API @ 15.56 deg C	deg API @ deg C
Colour	Yellow green	
Flourescence	Blue white	
GOR	11130 cuft/bbl	
Pour Point		
Water Properties		
Resistivity	0.128 ohm-m @ 20 deg C	ohm-m @ deg C
NaCl Equivalent	48,180 ppm	ppm
Cl-titrated	29 200 ppm	ppm
Tritium	2662 DPM/ml	DPM/ml
pH	7.8	
Est Water Type	Filtrate	
F. MUD FILTRATE PROPERTIES		
Resistivity	0.108 ohm-m @ 18 deg C	0.108 ohm-m @ 18 deg C
NaCl Equivalent	71,775 ppm	71,775 ppm
Cl-titrated	43,500 ppm	43 500 ppm
pH	7.3	
Tritium in Mud	3007 DPM/ml	3007 DPM/ml
G. GENERAL CALIBRATION		
Mud Weight	8.8 ppg	8.8 ppg
Calc Hydrostatic	psi	psi
Serial No. (Preserved)	RFS-AD 1131	
Choke Size/Probe Type	Cased hole perf	Cased hole perf
REMARKS	Strain gauge not working	Strain gauge not working

RFT SAMPLE TEST REPORT

WELL: Blackback 2

OBSERVER: M Schapper

DATE: 25.10.92

RUN: 8

	CHAMBER 1 (45.4 lit)	CHAMBER 2 (3.8 lit)
SEAT NO	8/55-1	8/55-2
DEPTH	2800.7 m	2800.7 m
A. RECORDING TIMES		
Tool Set	18:49 hrs	hrs
Pretest Duration	23 mins	mins
Chamber Open	19:55 hrs	23:10 hrs
Chamber Full	Chamber not full mins	mins
Seal Chamber	22:55 hrs	00:52 hrs
Fill Time	180 mins	102 mins
Finish Build Up	23:04 hrs	00:57 hrs
Build Up Time	9 mins	5 mins
Tool Retract	hrs	00:57 hrs
Total Time	mins	368 mins
B. SAMPLE PRESSURE		
Initial Hydrostatic	4186 psia	psia
Initial Form'n Press (Pretest)	4052.5 psia	4054.4 psia
Initial Flowing Press	60 psia	512.9 psia
Final Flowing Press	1018 psia	4059.0 psia
Final Form'n Press	4053.0 psia	4059.9 psia
Final Hydrostatic	psia	4185 psia
C. TEMPERATURE		
Temp @ Sample Depth (AMS)	82.0 deg C	82.0 deg C
Rm @ Sample Depth (AMS)	0.04 ohm-m	0.04 ohm-m
D. SAMPLE RECOVERY		
Surface Pressure	700 psia	Preserved psia
Amt Gas	81.2 cu ft	cu ft
Amt Oil	- lit	- lit
Amt Condensate	1.4 lit	lit
Amt Others	2.2 lit	- lit

WELL: Blackback 2

OBSERVER: M Schapper

DATE: 25.10.92

RUN: 8

E. SAMPLE PROPERTIES		
Gas Composition		
C1	45122 ppm	ppm
C2	6666 ppm	ppm
C3	3048 ppm	ppm
1C4	3818 ppm	ppm
NC4	533 ppm	ppm
C5	- ppm	ppm
CO2/H2S	0.2 % /ppm	% /ppm
Oil Properties	57.4 deg API @ 15.6 deg C	deg API @ deg C
Colour	Clear-very pale yellow/green	
Flourescence	Dull blue - white	
GOR	9222 cuft/bbl	
Pour Point	- Did not freeze	
Water Properties		
Resistivity	0.383 ohm-m @ 14 deg C	ohm-m @ deg C
NaCl Equivalent	10300 ppm	ppm
Cl-titrated	16995 ppm	ppm
Tritium	723 DPM/ml	DPM/ml
pH	8.7	
Est Water Type	Formation water & filtrate	
F. MUD FILTRATE PROPERTIES		
Resistivity	0.108 ohm-m @ 18 deg C	0.108 ohm-m @ 18 deg C
NaCl Equivalent	71275 ppm	71275 ppm
Cl-titrated	43000 ppm	43000 ppm
pH	7.3	
Tritium in Mud	3007 DPM/ml	3007 DPM/ml
G. GENERAL CALIBRATION		
Mud Weight	8.8 ppG	8.8 ppG
Calc Hydrostatic	psi	psi
Serial No. (Preserved)		
Choke Size/Probe Type	Cased hole perf	Cased hole perf
REMARKS	Formation pressure not stable on first shot - plugged? Shot second perf at 19:32 hrs. Formation pressure not fully built up due to slow rate.	Full build up for final formation pressure.

Ref:61:Black54.doc(wcr)

APPENDIX 5



5th Cut
A4 Dividers
Re-order code 97052

APPENDIX 5:

BLACKBACK 2

VELOCITY SURVEY REPORT

DISTRIBUTED UNDER SEPARATE COVER

APPENDIX 6

APPENDIX 6



5th Cut
A4 Dividers
Re-order code 97052

APPENDIX 6:

BLACKBACK 2

PRODUCTION TEST REPORT

BLACKBACK-2

WELL TESTING SUMMARY

GENERAL

On the Blackback-2 well, three separate production tests were conducted to evaluate two zones, from 2841-2846.5m and 2829.5-2834m. A retest of the lower zone was required when the tubing string became restricted by a Surface Read-Out (SRO) assembly which was blown up the tubing string on the initial test. This WL assembly acted as a downhole choke and limited the flow response on the first final flow period. A high rate test was conducted in each zone, which realized combined flow rates of 12,299 BOPD and 16.1 MMSCF/D of gas. These rates were mechanically limited due to tubing and surface facility restrictions and are not adjusted for combined zone drawdown effect. No water production was experienced. The testing program commenced with the after-logging clean-up trip performed on October 12, 1992, prior to running the 9-5/8" production casing. Testing was concluded on October 27, 1992, prior to final well abandonment and after three cased hole RFTs were completed. Total testing time was 13.4 days. A summary of individual test performance is included in the attachments along with tool schematics and stabilized flow plots for each test.

PREPARATION FOR TESTING

After completion of Sidewall Coring, operations to prepare the well for testing commenced and included a hole conditioning trip, 9-5/8" casing running, changing the well over to completion fluid and cased hole logging. The hole conditioning trip was conducted with a 12-1/4" bit and BHA to a depth of 3050m without incident. The 9-5/8" casing string was run in 14 hours and set with its shoe at 2946m, 100m below the lowermost planned perforation. It was cemented with 703 sacks of Class G cement mixed in freshwater with 3 GP10B of HR-6L retarder. Several pup joints and 2 pip tags were run to assist in cased hole logging tie-ins. The casing was displaced with 630 Bbls of 8.8 ppg brine and the top cement plug bumped with 1500 psi. The 8.8 ppg brine provided 8.7 ppg downhole density based on the well temperature profile, for a 0.3 ppg or 144 psi overbalance based on a 8.4 ppg pore pressure. After setting the 9-5/8" pack-off and testing it to 3000 psi, the BOP was tested and the fluted SSTT hanger run to perform the space-out calculations. The 3-1/2" test tubing was then picked up and RIH with a casing scraper. The TOC inside the casing was tagged at 2919m, 2m above the float collar casing talley measurement, and the hole was circulated clean prior to POH. Two WL cased hole logging runs were made incorporating the CBL/CET/AMS and CCL/GR/AMS tools. The CBL indicated a good cement bond with the TOC outside the 9-5/8" casing at 2572m. The CET showed isolation of the test intervals from above and below them, with 7m of solid cement isolation between the two zones. The casing was tested to 3000 psi before picking up the first TCP assembly.

TEST 1 (ZONE 1) (2841-2846.5m)

The test assembly utilised for this zone was run as shown in the attachments, with the LPR-N valve run closed and filling the test string above the valve with diesel every 10 stands. The tubing was tested to 3000 psi at several points while running it. Although three slip joints were run, WL correlation of the TCP guns indicated that the first zone had to be shot 1m deeper than desired due to space out limitations, including full slip joint collapse at the packer setting depth. The deeper perforating did not pose significant enough well evaluation problems to mandate tripping to the SSTT to adjust the spaceout. After opening the LPR-N valve with 1400 psi of annulus pressure, the tubing was pressured to 3100 psi and bled to zero to actuate the 12 SPF TCP guns. The well was shot with a differential of 620 psi +/- and allowed to commence the initial flow period immediately, which was run for 15 minutes on a 16/64 choke. Wellhead pressure increased during this flow period to 690 psi and 11 barrels of diesel was recovered for equivalent rate of 1056 BFPD. After the WL SRO gauges were unable to be latched into Model "E" Adapter Sub downhole, the WL assembly was POH and a second short flow period was conducted. This time the well was flowed for 20 minutes during which the wellhead pressured increased from 730-900 psig and 25 barrels of diesel was recovered for an equivalent rate of 1800 BFPD. The WL SRO gauge assembly was RIH a second time and was latched into its downhole mating sub and held in place with a 500# overpull. Upon opening the well for the final flow period, the gauges were blown up the hole into the lowermost slip joint. This event, associated with improper assembly of the Model E Adapter Sub, is discussed in detail in the Cost Deviation Summary and Equipment Failure Sections of the Drilling Follow-up Report. A decision was made to continue to test the zone with the WL assembly stuck in the well.

The final flow period of this well was continued from 12.7 hours, followed by an 18.7 hour shut-in period. Flow rates averaged 1602 BOPD and 1.71 MMSCF/D of gas at 600 PSIG FWHP on a 48/64 choke. An 8.8 psi drawdown was observed giving a PI of 182. Since this small drawdown confirmed that the struck WL assembly was acting as a downhole choke, a decision was made to RIH to retest the zone on a high rate test without the use of WL gauges in the well. It was ascertained at 3 TCP shots did not fire once the guns were retrieved to surface. These 3 shots were located at 2844.5m MD.

TEST 1A (ZONE 1) (2841-2846.5m)

The high rate retest on this zone was highly successful. In order to reduce the time consumed filling the test string and minimise the risk of running it with open perforations, the LPR-N valve was run pinned open. The string was displaced with 63 barrels of diesel prior to setting the packer and pressuring the annulus to 1450 psig to close the LPR-N valve. The well was then opened for an 8.2 hour flow period, followed by a 12.5 hour shut-in period. Rates of 6640 BOPD and 7.88 MMSCF/D of gas were experienced with 930 psig FWHP on a 64/64 choke. The heater had to be bypassed as its 1" diameter restricted well flow. During the last 1/2 hour of the flow period, the well was opened on a 96/64 choke to ascertain ultimate flow rates, which peaked at 7100 BOPD and 8.66 MSCF/D of gas.

At this time, the flow rates became separator limited. Before pulling the test string, one bottom-hole sampler run was attempted, during which the electronic closing device failed to actuate due to a O-ring seal leak and resultant electrical short. A 76.5 psi drawdown was observed, giving a PI of 87. The zone was abandoned by setting a 9-5/8" EZSV-BP at
MS:lt:93misc33

2838m and pressure testing it to 3000 psi. This plug was later swab tested to about 600 psig when the packer was set to test the upper set of perforations.

TEST 2 (ZONE 2) (2829.5-2834m)

Flow testing of this zone was also very successful. The test assembly utilised for this zone was run as shown in the attachments, but the LPR-N valve was run open to save time filling the tubing with diesel as noted on the prior test above. The tubing was tested to 2000 psi at several points while running it. Although only two slip joints were run (the other one had the WL gauge still stuck inside it at the surface), the WL log correlation enabled a space-out to perforate the zone in the correct place with the slip joints 1-1/2' from full collapse. After opening the LPR-N valve with 1400 psi of annulus pressure, the tubing was pressured to 3000 psi and bled to zero to actuate the 12 SPF TCP guns. The well was shot with a differential of 600 psi +/- and allowed to commence the initial flow period immediately, which was run from 15 minutes on a 16/64 choke. Wellhead pressure increased during this flow period to 630 psi and 11 barrels of diesel was recovered for equivalent rate of 1056 BFPD.

The final flow period of this well was continued for 8.2 hours, followed by an 12 hour shut-in period. Flow rates averaged 5659 BOPD and 8.24 MMSCF/D of gas at 929 PSIG FWHP on a 64/64 choke. Before pulling the test string, one bottom-hole sampling run was attempted, but was unsuccessful. It incorporated a mechanical closing device, which activated downhole. However, problems with the mercury pump and drainage system precluded recovery of the lower chamber sample. The sample in the upper chamber leaked out and was lost as the door to this chamber was lodged open with debris. A 247.9 psi drawdown was observed giving a PI of 23. After running 3 cased hole RFT's, this zone was abandoned by setting an EZSV-BP at 2826m and placing cement from 2823-2673m above the plug. The cement above the EZSV-BP was tested to 3000 psi prior to pulling the 9-5/8" casing. The 9-5/8" casing was then cut and pulled from 1811m to complete the Walkaway VSP run prior to final well abandonment. The final abandonment well sketch is in the Drilling Follow-up Report for the well.

CONCLUSIONS AND RECOMMENDATIONS

1. Overall testing time was 13.4 days including 3.0 days or 22.8% non-productive time (NPT). The most significant NPT event involved retesting of the lower zones as a result of improper assembly of the Model "E" adapter sub, which allow the SRO to be blown-up the test string.

Please see Blackback-2 Cost Deviation Summary and Final Well Report conclusions and recommendations concerning the use of WL SRO gauges in concert with downhole shut-in tools, as well as future Model "E" Sub use.

2. High rate testing of this well was very successful; however, both tests were mechanically limited. Higher flow rate tests in the future may require larger test tubing to be utilized and alternative surface test equipment to be procured. The heater unit had a 1" bore which limited high rate well flow and had to be bypassed. This contributed to the cold oil handling limitations at the separator. Use of a larger-bore heater and/or higher rate separator gear could improve test results. Provisions should be made for testing in warmer weather or for use of a heated or insulated flow system in the future, as pertinent.
3. No problems were experienced with hydrates during testing at this deepwater location with seafloor temperatures from 40-47 F. No hydrate inhibition chemicals were required to be injected into the system at any time, although provisions for this activity were made. No heated well fluids were circulated into the riser at any time while testing, as was done at Blackback-1.
4. Halliburton Reservoir Services (HRS) support in preparation for and execution of the test was substandard. Difficulties were experienced related to poor tool/TCP assembly and running procedures, lack of preparation and maintenance of tool string talleys, rupture of a downhole bypass tool, failure of the separator backpressure regulator system and two bottom-hole sampler misruns. These difficulties should be fully rectified and explained by HRS before using them on further Esso/ECI well tests. Both electronic and mechanical downhole samplers should be available in the future, which are not mercury-displaced, to be run by competent sampling staff onsite.
5. The HRS Memory Gauges successfully executed 12 out of 12 runs with good gauge repeatability. These gauges can be considered for use in future well testing operations within EAL. Esso affiliates have used them several times with excellent results.
6. Running of the LPR-N gauge in the well in the open position did save considerable time and allowed the tubing to be later filled with diesel in an expeditious manner. This technique can be considered for future well testing operations and can result in safer operations in some cases.
7. Running a welltest with the downhole shut-in LPR-N valve also enabled the collection of excellent reservoir data, almost completely removing wellbore storage effects in this volatile oil system. Its use should be considered for future welltests where wellbore storage may interfere with test interpretation.
8. Underbalanced TCP operations gave excellent perforations results using the pressure activated firing heads. This system should be considered for future wells executed, regardless of rig type.

Blackback-2 Test String (Test#1/Zone#1)

Perforations: MDRKB 2841.0 – 2846.5 (5.5m)

Measured RKB to Fluted hanger point (m)

390.085

			Cumulative MDRKB (m)	
			Depth (m)	Top Joint
Single joint		9.490	0.000	-3.800
1 Stand		28.220	9.490	5.690
Pick up sub		0.730	37.710	33.910
X-O		0.475	38.440	34.640
HRS SSLV		3.615	38.915	35.115
X-O		0.530	42.530	38.730
PUP Joint		2.250	43.060	39.260
3-1/2" PH6 (12 stds)		340.270	45.310	41.510
3-1/2" PH6		0.730	385.580	381.780
X-O		0.470	386.310	382.510
Sub		1.920	386.780	382.980
SSTT		1.710	388.700	384.900
5" slick joint		2.665	390.410	386.610
Fluted hanger (above)	■	0.810	393.075	389.275
Fluted hanger (below)	■	0.460	393.885	390.085
X-O		0.395	394.345	390.545
Pups		6.340	394.740	390.940 (2.26+0.75+1.66+1.67)
3-1/2" Tubing (78+D)		2228.198	401.080	397.280
X-O		0.280	2629.278	2625.478
3 x slip joints		18.090	2629.558	2625.758 (Closed)
X-O		0.305	2647.648	2643.848
4 x ST HWDP		110.970	2647.953	2644.153
X-O		0.250	2758.923	2755.123
RA-SUB		0.128	2759.173	2755.373
		0.128	2759.301	2755.500 TCP Correlation Depth
APR-M2 Valve	○	2.295	2759.428	2755.628
X-O		0.315	2761.723	2757.923
2 x ST HWDP		55.440	2762.038	2758.238
X-O		0.370	2817.478	2813.678
Model E SRO		4.120	2817.848	2814.048
LPR-N-Valve	○	4.750	2821.968	2818.168
Radial shock AB		1.160	2826.718	2822.918
Gauge bundle		2.365	2827.878	2824.078
Hydra-By Pass		2.185	2830.243	2826.442
Hydro Jars		1.820	2832.428	2828.627
Safety Joint		1.245	2834.248	2830.447
X-O		0.305	2835.493	2831.692
RTTS Packer	■	1.970	2835.798	2831.997
X-O		0.245	2837.768	2833.967
Vertical Shock AB		1.495	2838.013	2834.212
X-O		0.345	2839.508	2835.707
Perf Joint	○○○	3.000	2839.853	2836.052
Top firing head		2.030	2842.853	2839.052 (1.34+0.555+0.135)
TCP Gun	xxx	5.500	2844.883	2841.082 Perforations
Bottom firing head		1.165	2850.383	2846.582 (0.23+0.555+0.38)
			2851.548	2847.747

(mts/bb2test/oct92)

Blackback-2 Test String (Test#/A/Zone#1)

Perforations: MDRKB 2841.0 – 2846.5 (5.5m)

Measured RKB to Fluted hanger point (m) 390.085

			Cumulative MDRKB (m)	
			Depth (m)	Top Joint
Single joint		9.490	0.000	-3.800
1 Stand		28.220	9.490	5.690
Pick up sub		0.730	37.710	33.910
X-O		0.475	38.440	34.640
HRS SSLV		3.615	38.915	35.115
X-O		0.530	42.530	38.730
PUP Joint		2.250	43.060	39.260
3- 1/2" PH6 (12 stds)		340.270	45.310	41.510
3- 1/2" PH6		0.730	385.580	381.780
X-O		0.470	386.310	382.510
Sub		1.920	386.780	382.980
SSTT		1.710	388.700	384.900
5" slick joint		2.665	390.410	386.610
Fluted hanger (above)	■	0.810	393.075	389.275
Fluted hanger (below)	■	0.460	393.885	390.085
X-O		0.395	394.345	390.545
4 x Pups		6.340	394.740	390.940 (2.26+0.75+1.66+1.67)
3- 1/2" Tubing (78+D)		2228.198	401.080	397.280
X-O		0.280	2629.278	2625.478
2 x slip joints		13.584	2629.558	2625.758 (1 open/1 closed)
X-O		0.305	2643.142	2639.342
5 x ST HWDP		138.700	2643.447	2639.647
X-O		0.250	2782.147	2778.347
RA-SUB	*	0.256	2782.397	2778.597
APR-M2 Valve	○	2.295	2782.653	2778.853
X-O		0.315	2784.948	2781.148
1 x ST HWDP		27.710	2785.263	2781.463
X-O		0.370	2812.973	2809.173
LPR Drain Valve		0.300	2813.343	2809.543
LPR-N-Valve	○	4.750	2813.643	2809.843
Radial shock AB		1.160	2818.393	2814.593
Gauge bundle		2.365	2819.553	2815.753
Hydra-By Pass		2.185	2821.918	2818.118
Hydro Jars		1.820	2824.103	2820.303
Safety Joint		1.245	2825.923	2822.123
X-O		0.305	2827.168	2823.368
RTTS Packer	■	1.970	2827.473	2823.673
X-O		0.245	2829.443	2825.643
Vertical Shock AB		1.495	2829.688	2825.888
X-O		0.345	2831.183	2827.383
Perf Joint	○○○	3.000	2831.528	2827.728
			2834.528	2830.728

(mts/bb2test2/oct92)

Blackback-2 Test String (Test#2/Zone#2)

Perforations: MDRKB 2829.5 – 2834.0 (4.5m)

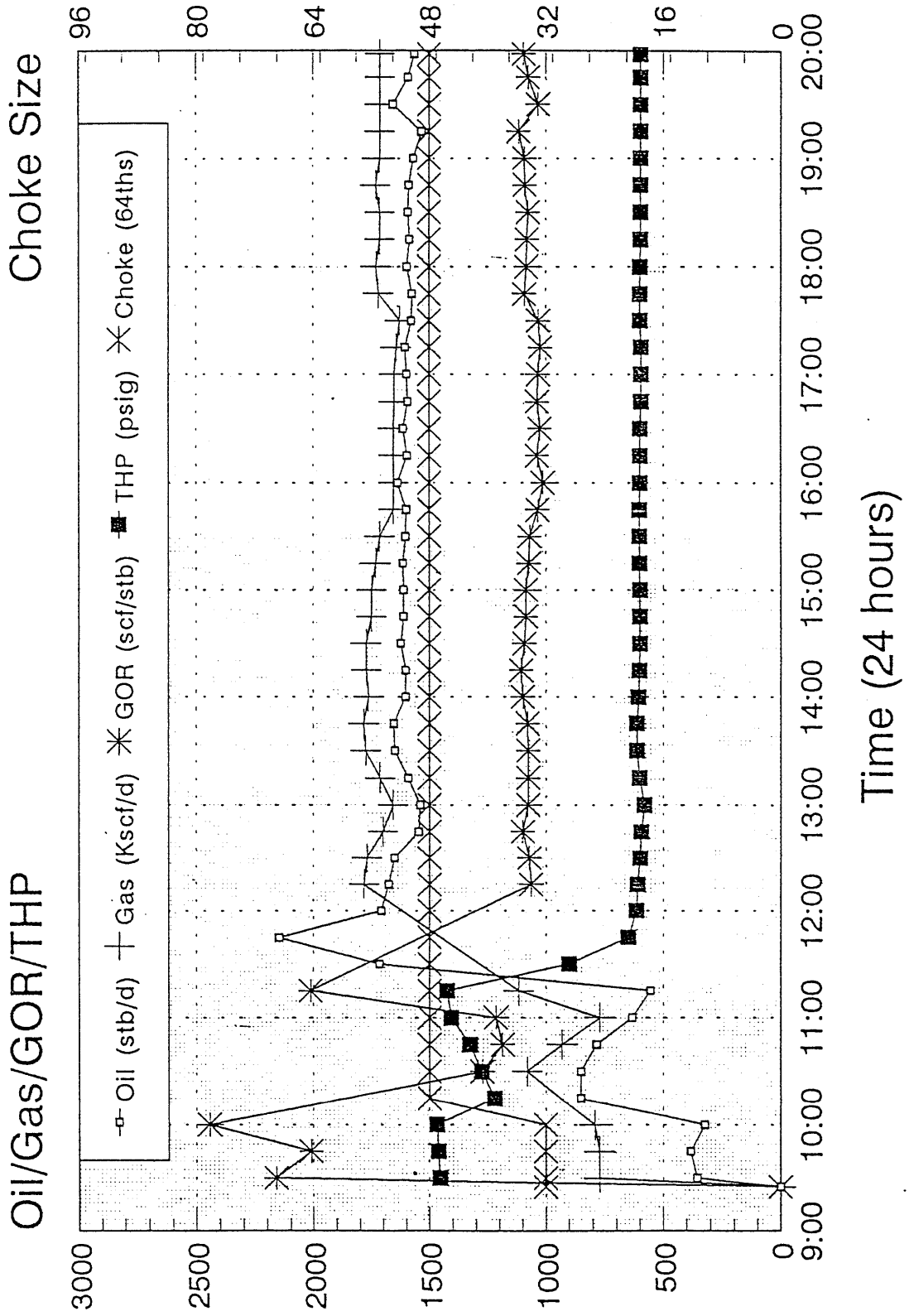
Measured RKB to Fluted hanger point (m) 390.085

	Measured Length (m)	Cumulative Length (m)	MDRKB (m) Top Joint	
Single joint	9.490	0.000	-3.800	
1 Stand	28.220	9.490	5.690	
Pick up sub	0.730	37.710	33.910	
X-O	0.475	38.440	34.640	
HRS SSLV	3.615	38.915	35.115	
X-O	0.530	42.530	38.730	
PUP Joint	2.250	43.060	39.260	
3-1/2" PH6 (12 stds)	340.270	45.310	41.510	
3-1/2" PH6 Pup/X-O	0.730	385.580	381.780	
X-O	0.470	386.310	382.510	
Sub	1.920	386.780	382.980	
SSTT	1.710	388.700	384.900	
5" slick joint	2.665	390.410	386.610	
Fluted hanger (above)	0.810	393.075	389.275	
Fluted hanger (below)	0.460	393.885	390.085	
X-O	0.395	394.345	390.545	
2 x Pups	3.230	394.740	390.940	
3-1/2" Tubing (78+D)	2228.198	397.970	394.170	
X-O	0.280	2626.168	2622.368	
2 x slip joints	13.446	2626.448	2622.648	
X-O	0.305	2639.894	2636.094	
5 x ST HWDP	138.700	2640.199	2636.399	
X-O	0.250	2778.899	2775.099	
RA-SUB	0.128	2779.149	2775.349	
	0.128	2779.277	2775.477	TCP Correlation Depth
APR-M2 Valve	2.295	2779.405	2775.605	
X-O	0.315	2781.700	2777.900	
1 x ST HWDP	27.710	2782.015	2778.215	
X-O	0.370	2809.725	2805.925	
LPR Drain Valve	0.300	2810.095	2806.295	
LPR-N-Valve	4.750	2810.395	2806.595	
Radial shock AB	1.160	2815.145	2811.345	
Gauge bundle	2.365	2816.305	2812.505	
RTTS Safety Circ. Valve	1.145	2818.670	2814.870	
Hydro Jars	1.820	2819.815	2816.015	
Safety Joint	1.245	2821.635	2817.835	
X-O	0.305	2822.880	2819.080	
RTTS Packer	1.970	2823.185	2819.385	
X-O	0.245	2825.155	2821.355	
Vertical Shock AB	1.495	2825.400	2821.600	
X-O	0.345	2826.895	2823.095	
Perf Joint	3.000	2827.240	2823.440	
Top Firing Head	3.060	2830.240	2826.440	
TCP Gun	4.500	2833.300	2829.500	Perforations
Bottom Firing Head	1.165	2837.800	2834.000	
		2838.965	2835.165	

(mts/bb2test3/oct92)

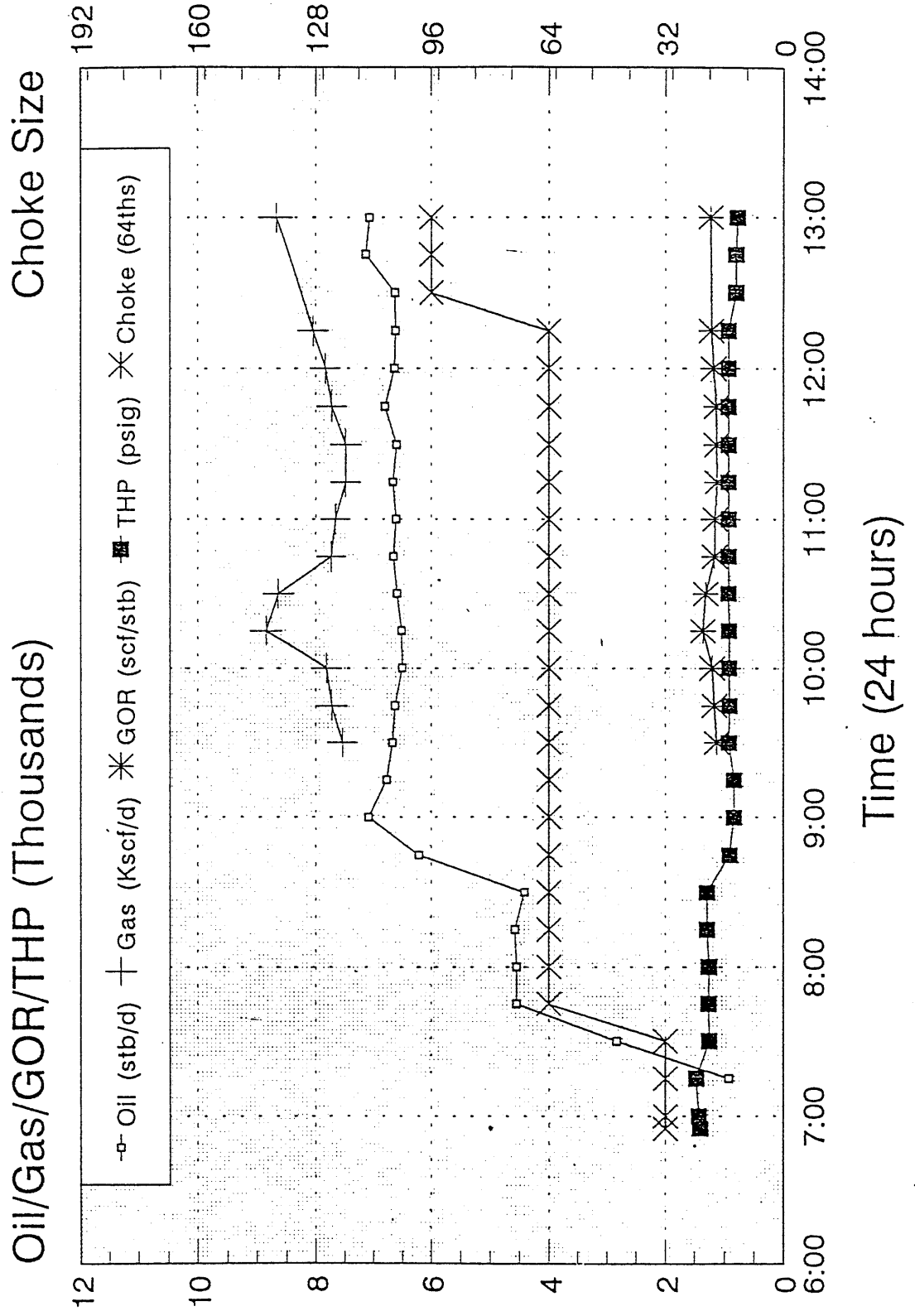
Blackback-2

Test 1/Zone 1



Blackback-2

Test #A/Zone #1



Blackback-2

Test #2/Zone #2

