AMBERJACK-1

WELL COMPLETION REPORT

BASIC DATA

VOLUME 1

J. PHIPPS

JUNE, 1990

BHP Petroleum
BHP Petroleum Pty. Ltd.
Incorporated in Victoria

AMBERJACK-1 WELL COMPLETION REPORT

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SECTION 1

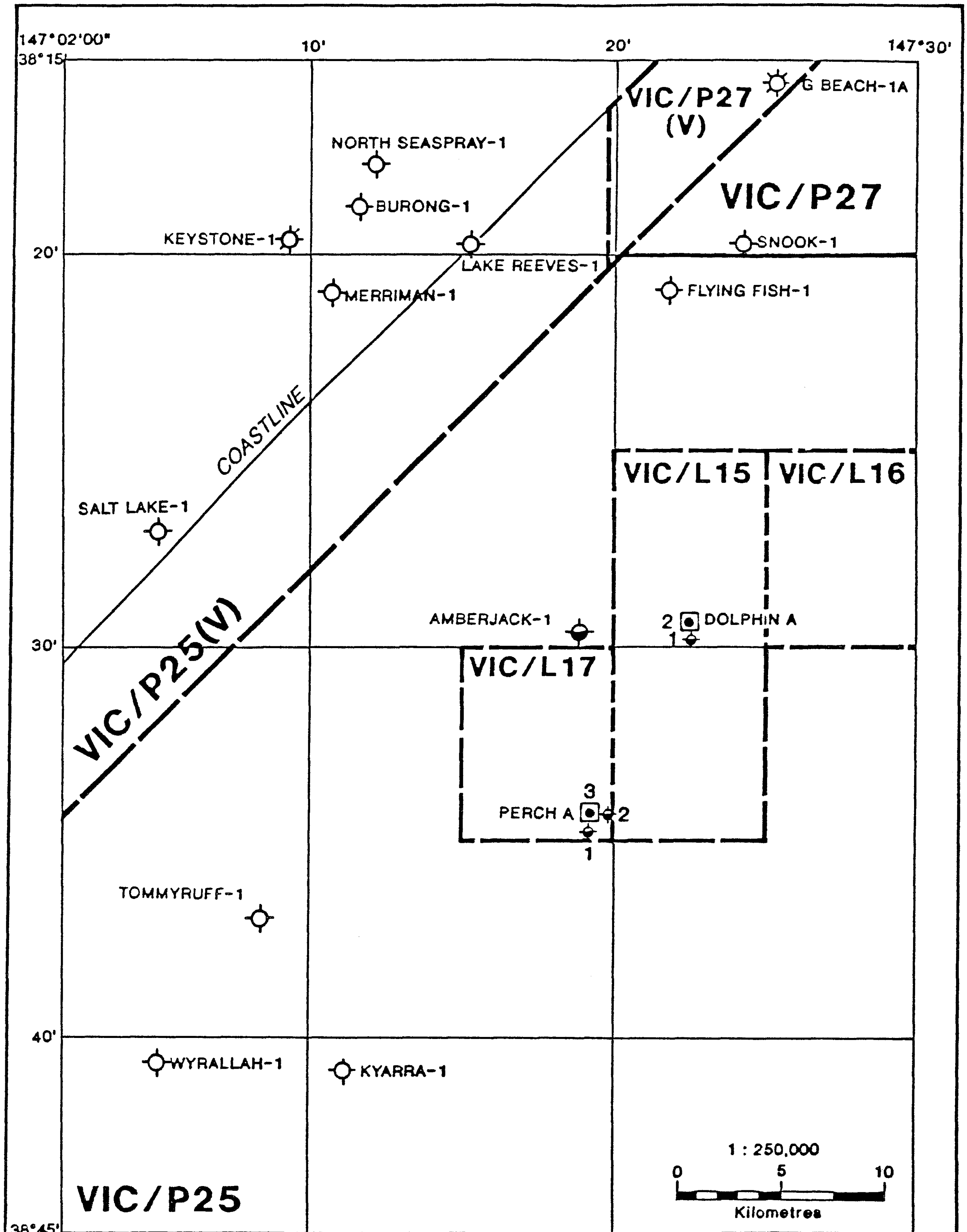
1. WELL SUMMARY SHEET

Well:	AMBERJACK-1
Permit:	VIC/P25
District:	Gippsland Basin
Planned Location:	Latitude : 38° 29' 33.5" South Longitude : 147° 18' 55.4" East A.M.G. : X = 527504m E Y = 5739460m N
Actual Location:	Latitude : 38° 29' 33.44" South Longitude : 147° 18' 55.05" East A.M.G. : X = 527495.7m E Y = 5739463.4m N
Seismic Reference:	Line GSE89A-58 SP 305
Elevation (KB to MSL)	21 m
Water Depth:	37 m
Total Depth:	1750 mRKB
Rig Released from Previous Location:	1st May 1990, 2100 hrs
Spud Date:	4th May 1990, 0215 hrs
Total Depth Date:	13th May 1990
Rig Released:	17th May 1990, 1700hrs
Days from Spud to Total Depth:	9
Total Days on Well:	17
Operator:	BHP Petroleum Pty. Ltd.
Drilling Contractor:	South Seas Drilling Co.
Rig:	Southern Cross
Well Status:	Plugged and Abandoned
Total Cost:	$2,532,512 (wellsite estimate)

Permit Interests:

Austin Oil Exploration N.L. 19th Floor 60 Albert Road **SOUTH MELBOURNE VIC 3205**	9.25%
BHP Petroleum (Victoria) Pty. Ltd. Collins Tower 35 Collins Street **MELBOURNE VIC 3000**	56.70%
Peko Exploration Ltd. 476 St Kilda Road **MELBOURNE VIC 3004**	9.25%
Pursuit Exploration Pty. Ltd. 27th Floor 12 Creek Street **BRISBANE QLD 4000**	15.55%
TMOC Exploration Pty Ltd. AGL House 60 Edward Street **BRISBANE QLD 4000**	9.25%

SECTION 2



BHP Petroleum

GIPPSLAND BASIN
VIC/P25
AMBERJACK-1
LOCATION MAP

Figure 1

Author : L.Jordan Date : February 1990

OG 23401

Base OG 22523

BHP PETROLEUM PTY. LTD.

WELL COMPLETION REPORT

PERMIT: VIC/P25

WELL: AMBERJACK-1

MAY 1990

AMBERJACK-1

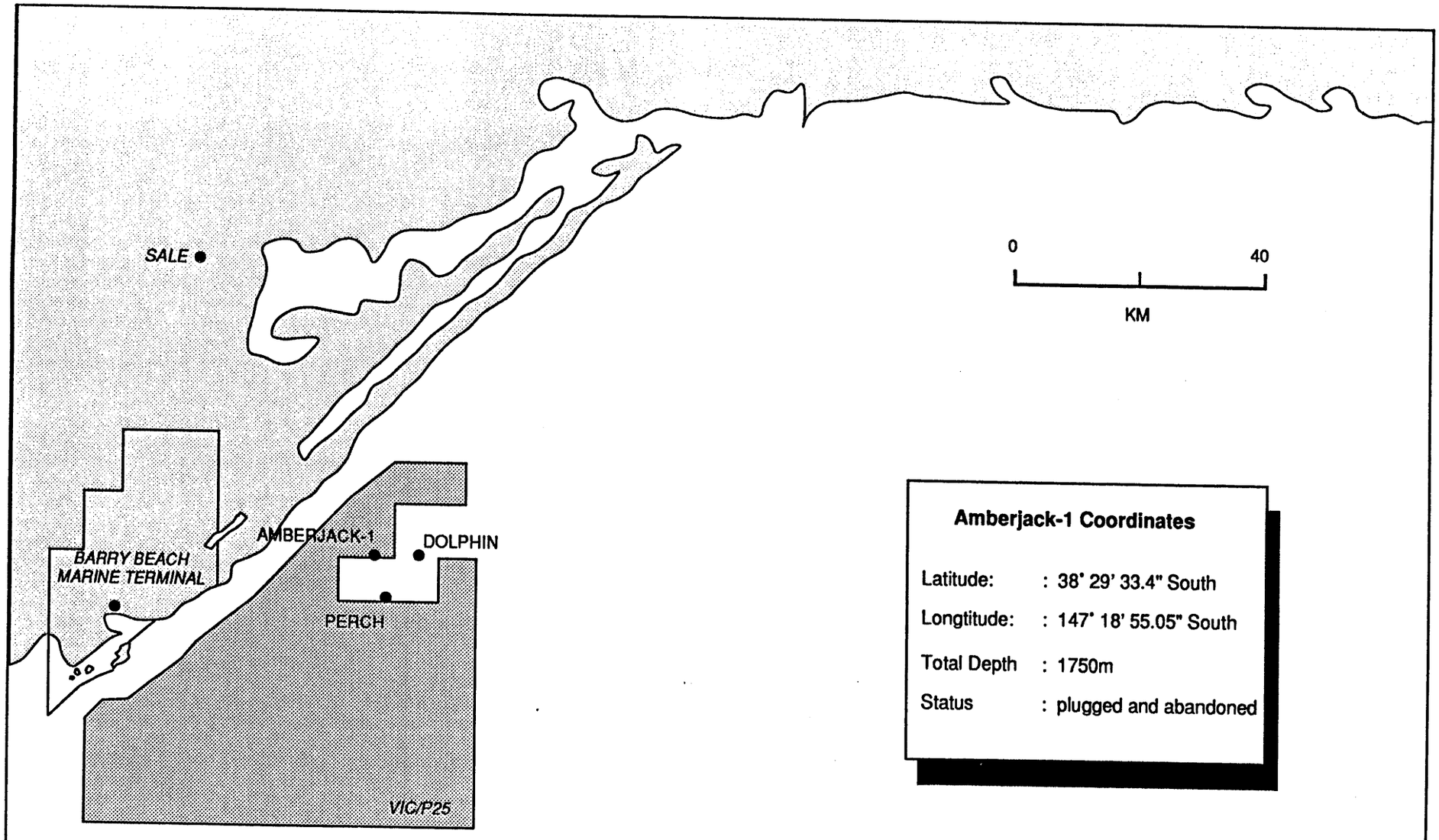
WELL COMPLETION REPORT CONTENTS

1.0 GENERAL WELL DATA

Well Name:	Amberjack-1
Permit:	Vic/P25
Classification:	Wildcat
Proposed Location:	Latitude 38 29' 33.5" South
	Longitude 147 18' 55.4" East
	Easting 527504 m E
	Northing 5739460 m N
Actual Location:	Latitude 38 29' 33.4" South
	Longitude 147 18' 55.05" East
	Easting 527495.7
	Northing 5739463.4
	Heading 233
Rig:	"Southern Cross"
Drilling Contractor:	South Seas Drilling Company
Water Depth:	37 m
RKB to M.S.L.	21 m
Total Depth:	1750 m RKB
Rig on Contract:	1 May 1990 - 21:00 hours
Arrived Location	3 May 1990 - 06:45 hours
Spud Date:	4 May 1990 - 02:15 hours
T.D. Date:	12 May 1990 - 14:40 hours
Rig Release:	17 May 1990 - 17:00 hours
Spud to T.D. Days:	9
Total Days:	17
Well Status	Plugged and abandoned

2.0 CONTRACTORS

Drilling:	South Seas Drilling Company
Supply Vessels:	Tidewater Marine
Helicopter:	Lloyd Aviation
Mud:	Baroid
Cementing:	Halliburton
Wireline Logging:	Schlumberger
Mud Logging:	Exlog
R.O.V:	Sonsub Services/EAL
Casing Running:	Frank's Casing crew
Coring:	Eastman Christensen
Drilling Tools:	Austoil
Abandonment:	Austoil



Amberjack-1 Coordinates

Latitude:	: 38° 29' 33.4" South
Longtitude:	: 147° 18' 55.05" South
Total Depth	: 1750m
Status	: plugged and abandoned

BHP Petroleum

AMBERJACK-1
3.0 LOCATION MAP

Author	: C.Gregory	Date :	25/05/90
Drawn	: V.N.D'Souza	File :	AMB_LOC2
Checked	: C.Gregory		

4.0 OPERATIONS SUMMARY

4.1 Rig Move and Positioning

The semi-submersible Southern Cross was released from Esso's Terakihi No. 1 location at 21:00 hours, 1 May 1990. The rig went undertow to the Amberjack-1 location via the supply vessel, "Lady Penelope". Deteriorating weather conditions caused a delay of nine hours as the rig was towed south in a wide arc, approaching the Amberjack-1 location at 0600 hours on the 3rd May. The first anchor was dropped at 0645, 3rd May 1990, the final anchor was in place 7 3/4 hours later. The rig was ballasted to operating draft and positioned two metres on a bearing of 7 deg 46' 34" from the intended location.

4.2 Spud and 26" Hole

The TGB was run and landed on the seabed establishing the water depth at 37 m and confirming that the seabed was relatively firm. The 26" BHA was made up and the well spudded at 2:15 am on the 4th May. 26" hole was drilled from 58 m to 202 m using seawater and Hi-Vis lime flocculated gel sweeps. At T.D. a 100 bbl Hi-vis sweep was circulated and a totco survey dropped indicating a hole deviation of 0.5 degrees. After a wiper trip to the mudline the hole was displaced to Hi-vis mud before pulling out to run casing. Eleven joints of 20" casing, a wellhead/pile joint and permanent guidebase were run. The casing encountered an obstruction at 193 m and had to be worked and circulated down to 196 m to land the PGB out in the TGB. The casing string was cemented with a 1.5 sg lead slurry consisting of 200 sxs of cement in 48 bbls of seawater containing 2.2% gel and a 1.9 sg tail slurry consisting of 890 sxs of cement mixed with 106 bbls of seawater.

The Bop's were then landed and pressure tested.

4.3 17 1/2" Hole - 13 3/8" Casing

The twenty inch shoe track was drilled out and 17 1/2" hole drilled through the Gippsland Limestone to 1010 metres, using a seawater gel mud system. Major sandstone interbeds were encountered from 400 m resulting in severe mud losses over the surface equipment due to blinding of the shaker screens. At T.D. the hole was swept with 100 bbls of Hi-vis and a wiper trip made to the 20" shoe. On RIH it was necessary to wash and ream from 878 to 901 m. Seven metres of fill had accumulated on bottom. On POOH to log a 200 bbl KCL polymer pill was spotted on bottom to reduce possible swelling of the Lakes Entrance claystone/marl sediments.

Eighty joints of 13 3/8" casing were run to a shoe depth of 1,000 m. The casing was landed and cemented with a lead slurry (1.5 sg) consisting of 891 sxs of cement mixed with 252 bbls of drill water containing 3.1% BWOW of prehydrated bentonite, and a tail slurry (1.9 sg) containing 508 sxs of cement mixed with 60.5 bbls of seawater. The pack off was set and surface equipment and BOP's tested as per schedule.

4.4 12 1/4" Hole

The shoe track and four metres of new hole were drilled prior to performing a leak off test to 1.67 sg. The hole was displaced to KCL/polymer mud and 12 1/4" hole drilled to 1271 m where the bit was pulled to core.

A Schlumberger GCT survey tool was run to survey the hole from 1000 m to surface. The survey was run at this time rather than earlier because the tool was in use on the Bream platform. A 5 1/4" core was cut from 1271 to 1290 m. The cored section was reamed and 12 1/4" hole continued to T.D. at 1750 m. A wiper trip was made to the shoe and final logs run.

4.5 Abandonment

Cement plugs numbers one and two were set in 12 1/4 " open hole from 1575-1420 m and from 1320-1220 m respectively. Cement plug number three was set across the 13 3/8" casing shoe from 1050 to 950 m. 13 3/8" casing was then cut using a Schlumberger Pengo cutter at 146 metres. Seven joints of 13 3/8" casing were retrieved using a casing spear assembly. Cement plug number four was set across the 13 3/8" casing stump from 200 to 80 metres. Bop's were pulled, the 20" casing cut mechanically at 66.8 m, and the wellhead and guidebases retrieved. A seabed survey found the area to be free of debris.

The rig was deballasted and anchor retrieval commenced. The rig was released and went undertow to the Tommyruff-1 location at 1700 hours on the 17th May 1990.

5.0 DAILY OPERATIONS

Date	Depth	Operation
1/5/90		Rig on contract at 21:00 hours. On tow to Amberjack-1 location Vic P25. Towboat Lady Penelope. Position at Midnight: Distance travelled - 11 miles Distance to go - 52 miles Speed - 3.67 kts Latitude - 38 35.5' south Longitude - 148o 21' east Course - 241o ETA - 1300 hrs 2/5/90
2/5/90		On tow to Amberjack-1 location. Due to deteriorating weather conditions rig was towed south for a wide turn into location, delaying anchor running until seas decrease. Maximum seas 16 ft, wind 50 kts. Position at Midnight: Latitude - 38^{o} 36.3' south Longitude - 147^{o} 11.9' east Course - 023^{o}
3/5/90		Turn into location and make approach for handling anchors at Amberjack-1. # 8 anchor on bottom 06:45 hours # 4 " " 08:55 hours # 5 " " 11:40 hours # 6 " " 12:40 hours # 7 " " 14:00 hours # 3 anchor on bottom 14:30 hours Ballast rig to operating draft (47 ft). Pretension anchors to 170 kips. Run TGB and land on seabed. Bullseye 1/2 degree. Water depth 37m, air gap 21m, RKB 58 m. Make up 26" BHA.

4/5/90	202 m	Continue to make up BHA. Repair compensator lock bar. Spud in and drill 26" hole from 58 m to 202 m - sweep 30 bbls Hi-vis on connections. Sweep 100 bbl's Hi-vis and circulate out of hole. Drop totco survey. Spot 50 bbl Hi-vis on bottom POOH to mud line (good hole). Retrieve survey (misrun). RIH (no fill). Displace hole with 200 BBl's Hi-vis. POOH with BHA, retrieve survey. Rig up and run 20" casing - obstruction at 193 m. Circulate and work casing down to 196 m and land out PGB in TGB. PGB bullseye 1/2 deg. RKB top of wellhead 55.3 m.
5/5/90	269 m	Pump 10 barrels seawater ahead. Test lines to 2000 psi. Mix and pump 200 sks lead cement followed by 890 sks of tail. Displace with 32 barrels of seawater. Back out running tool with stinger and POOH. Rig up and run Bop's. Land Bop - overpull 50,000 on latch - land and nipple up diverter. Test connector against casing and shear rams to 500 psi (ok). Make up test plug and RIH. Test Bop's - rams and failsafe valves to 250/3500 psi annulars to 250/2500. POOH with test plug, RIH and set wear bushing. Make up 17 1/2" BHA. RIH - lay down excess drill pipe. Tag cement and float collar at 141 m. Drill out float, firm cement and shoe at 196 m. Clean out rathole to 202 m. Drill 17 1/2" hole from 202 m to 269 m. Sweep each connection with 30 BBI Hi-vis mud.
6/5/90	903 m	Drill 17 1/2" hole from 269 metres to 393 metres. Repair mud pump. Drill 17 1/2" hole from 393 to 903 m. Good hole no drag on connections.
7/5/90	1010 m	Drill 17 1/2" hole from 902 to 1010m. Sweep hole with 100 bbl's of hi-vis and circulate out. Drop totco survey. POOH to shoe maximum overpull 80,000 lbs. Retrieve survey at shoe. RIH obstruction at 878 m, ream to 901 m. Continue RIH to 1010 m, 7 m of fill. Circulate hole clean spot 200 bbls kcl/polymer on bottom. POOH to log. Rig up Schlumberger - run log #1 sonic, DLL, MSFL, GR, AMS. Rig down Schlumberger, retrieve wear bushing. Rig up and run 13 3/8" casing.

8/5/90	1014 m	Run 13 3/8" casing. Make up hanger and land same. Circulate casing. Test surface lines to 2500 psi. Cement casing with 891 sks of lead followed by 501 sks of tail. Displace with 468 bbl's mud. Back out running tool and energise seal assembly with 8 1/2 turns to 18,000 ft lbs. Test to 2500 psi/10 mins (ok). Test Bop's to 2000 psi (ok). Lay out Kelly - POOH with running string lay down running tool. Run and set wear bushing test standpipe manifold, Kelly and inside Bop's to 3000 psi. Service break cement Kelly. Make up 12 1/4 BHA - RIH, lay down excess drill pipe. Tag plugs at 975 metres. Drill out shoe track. Drill 12 1/4" hole from 1010 to 1014 m. Circulate and displace hole to KCL/polymer mud system.
9/5/90	1271 m	Circulate prior to leak off test. Test surface lines to 2000 psi and perform LOT to 1.67 sg EMW. Drill 12 1/4" hole from 1014 to 1219 m, 1239 m, and 1271 m. Drop survey and POOH. Rig up Schlumberger and run GCT survey. Restriction at 864 m. POOH rig down Schlumberger, make up core barrel and RIH.
10/5/90	1354 m	Continue RIH with core barrel. Obstruction at 969 m. Wash and ream to bottom at 1271 m. Circulate, drop ball and cut core from 1271 to 1290 m. Pull back three joints with Kelly. Continue to POOH with core barrel. Recover core, stand core barrel in derrick. Make up BHA and RIH. Wash and ream from 1255 to 1290 m. Drill 12 1/4 hole from 1290 to 1354 m. Circulate sample.
11/5/90	1610 m	Drill 12 1/4 hole from 1354 to 1500 m. Circulate. Drop survey, POOH to shoe (good hole). Retrieve survey. RIH to 1478 m. Ream from 1478 m to bottom 1500 m. Drill 12 1/4" hole from 1500 to 1510 m. Circulate up samples at 1536 and 1544 metres.
12/5/90	1750 m	Drill 12 1/4" hole from 1610 to 1750 m. Circulate bottoms up. Drop survey. RIH, ream tight spot from 1612 to 1635 metres. RIH to 1718 m and wash and ream to bottom at 1750 m. Circulate shakers clean. POOH to log.

13/5/90	1750 m	Rig up Schlumberger run log #1 DLL-MSFL-LDL-CNL-NGT-SDT-CAL-AMS Supercombo. Rig down log one and run log two SHDT-GR-AMS. Make up BHA and run in hole to shoe. Slip and cut drill line. Continue to RIH to 1727 m. Wash and ream from 1727 to bottom 1750. Circulate bottoms up. POOH to log. Rig up Schlumberger RFT. Run log number three, RFT.
14/5/90	1750 m	Continue number three log, first RFT. RIH with number two RFT, recover same RIH with number three RFT, recover same. RIH with number four RFT recover same. Rig up Vsp. RIH with number four log-Vsp. Rig up number five log-Cst (60 shot). Rig down Schlumberger. RIH with O.E.D.P. to 1575 m. Circulate and condition hole.
15/5/90	1750 m	Set number one cement plug from 1575-1420 metres. POOH seven stands. Circulate. Lay down excess drill pipe and wait on cement. RIH and tag plug at 1422 m with 15 klb. Pull back to 1320 m and circulate. Pump cement plug two from 1320 to 1220 m. Pull back five stands and circulate, lay down excess drill pipe and wait on cement. RIH and tag cement at 1220 m with 10,000 lbs. Pull back to 1050 m and circulate. Pump cement plug three from 1050 to 950 m. Pull back seven stands and circulate. Lay down excess drill pipe and BHA. RIH to 200 m. Displace hole to seawater - flush choke and kill lines. Continue to lay down BHA - test number three cement plug to 1500 psi. Rig up Schlumberger, RIH with pengo cutter to 164 m and cut casing. No losses or gains evident. Retrieve wear bushing. Make up 13 3/8" casing spear and retrieve 13 3/8" casing and lay down.
16/5/90	1750 m	Lay down seven joints of 13 3/8" casing and casing spear assembly. RIH to 200 m. Circulate bottoms up record 0.0144% c1 gas. Set cement plug number four from 200 to 80 metres. Pull back to 70 m, circulate pipe clean. Lay down excess drill pipe. Test cement plug to 500 psi (ok). Unlatch and pull Bop's. Make up 20" casing cutter. RIH and cut 20" casing at 66.8 m. POOH and lay down 20" cutting assembly. Make up 18 3/4" running tool, RIH and make up into wellhead. POOH with wellhead pile joint and PGB, land on beams and lay down. Lay down excess drill collars. Retrieve TGB using running tool. De-ballast rig for move.

17/5/90

Continue to de-ballast rig. Pull anchors. Final anchor racked at 1700 hrs. Rig on tow to Tommyruff location. Tow boat Lady Caroline.

6.0 DISCUSSION BY INTERVAL

6.1 26" Hole: 58-202m

Drilling

The 26" section was drilled using a 26" Hughes R1 bit with 3 x 20" jets, followed by a 26" Grant hole opener with 3 x 16" jets. The practice of running the 26" hole opener behind the 26" bit was adapted from Esso practices in the area. Essentially, the hole opener has the same effect as a near bit stabiliser and may help to knock off any ledges or boulders that are reportedly encountered in the area. The 26" section was drilled in 7 1/4 hours through loose sands and carbonates. On POOH the bit was graded 1.1.1 and showed no signs of any serious work. It is doubtful whether the hole opener served any useful purpose. A wiper trip to the surface was carried out and hole condition was good with no fill or tight spots.

Mud

The section was drilled using seawater with 30 BBl Hi-vis sweeps prior to connections. 200 BBls of Hi-vis was spotted on bottom after the wiper trip. Three stands were pulled and another 200 bbls of Hi-vis spotted before pulling out of hole.

Casing and Cementing

Eleven joints of 20", 94 lb/ft, X 56, RL-4S conn. casing and an 18 3/4" wellhead/pilejoint were run to a shoe depth of 196 metres. The casing hung up 5 1/2 metres above the landing point. The casing took weight with the pumps off and weight fell away once circulation had commenced suggesting that the fill was loose sands which had compacted and packed off. The excessive amount of fill (approximately 11 m) may have been caused when pulling up three stands to spot more Hi-vis possibly washing out a loose sand section. Slow progress was made by working the casing and circulating with seawater while more Hi-vis was prepared. By circulating Hi-vis sweeps the casing was able to be successfully landed. The casing was cemented with 379 ft^3 of lead slurry @ 13.2 ppg consisting of 48.6 bbls of freshwater containing 2.2% prehydrated gel mixed with 200 sks of class G cement, and 1024 ft^3 of 15.8 ppg tail slurry consisting of 890 sks of cement mixed with 105 bbls of freshwater containing 1.5% CaCl2 as an accelerator. Returns were observed at the surface throughout the job although no cement was sighted. The volumes used allowed for 100% excess on theoretical gauge hole.

6.2 17 1/2" Hole 202 - 1010 m (Gippsland Limestone)

Drilling

The 17 1/2" hole section was drilled in 21.25 hours at an average rop of 38 m/hr. The interval was drilled using a Reed S11 CJB with 2 x 18 and 1 x 16 jets. The bit comes with a port for a centre jet which was blocked by welding a ball bearing in the port, because no centre jet nozzles were avalable on the rig. Penetration rate was controlled to avoid hole cleaning problems.

Significant clays were encountered at 740 m causing a reduction in rop from 40 m/hr to 10-20 m/hr. It is possible that the centre jet, had it been installed, would have alleviated the problem by cleaning the bit better. Up to 100 klbs overpull was experienced on the wiper trip but this was eliminated by a light wash and ream. 7 m of fill was encountered on return to bottom.

Mud

The 20" shoetrack and cement were drilled using seawater with returns dumped overboard. Once new formation was encountered the system was closed in and 30 bbl Hi-vis prehydrated gel sweeps were incorporated into the system, each single, to build viscosity. Additional gel was added directly to the system to give a viscosity of 32 and a yield point of 10 by 269 metres. Continuing additions of prehydrated gel had the yield point above 20 by 369 m. Major sands were encountered from 400-600 m resulting in high surface losses as a result of screen blinding (screens B40/B60). Shakers had to be partially bypassed to reduce losses and system volume was maintained with seawater causing the viscosity to fall to 30 seconds. Major additions of gel were used to maintain viscosity until about 740 metres when significant natural clays were encountered. The system was maintained using seawater, lime and caustic only from 740 m to T.D. at 1010m. A 200 bbl KCL polymer pill was spotted on bottom prior to POOH to log.

Static losses of 30 bbl/hour probably seepage losses in loose sands, were noted while tripping. Losses reduced to 15 bbl/hr after two hours. Logs through the sand sections showed the hole to be significantly overgauge (greater than 20.5" diameter) in some sections.

Casing and Cementing

Eighty joints of 13 3/8", K55, BTC casing was run to a shoe depth of 1000 m. UP to 40 klb drag was experienced from 880 m to T.D.

Due to the flourescence encountered in the upper sands 480-400 m, the cement program had to be revised to obtain isolation of the zone. The cement job consisted of 1851 ft^3 of 12.5 ppg tail slurry comprised of 252 bbls of drillwater containing 3.1% BWOW bentonite combined with 891 sks of cement followed by 584.5 ft^3 of 15.8 ppg neat seawater tail slurry. 27 bbls of mud was lost while mixing the cement and 100 bbls lost while displacing. The absence of any fluid loss additives or thixotropic cements on the rig prevented the use of alternative cement slurry designs. A sonic log taken across the interval 525 to 300 m suggests ratty cement from 325 to 400 m, very little if any cement from 400 to 480 m, (where the casing transit time is evident) and further ratty cement to 525 m. Following the cement job the packoff was set with 8 1/2 turns to 18,000 ft. lbs torque and successfully tested. No lock ring was run.

6.3 12 1/4" hole - 1010m - 1750 m (Latrobe Sequence)

Drilling

A Hughes ATJ1 with 3 x 16" jets was used to drill the Lakes Entrance and Gurnard formations to the top of the Latrobe group. The bit was pulled to core after drilling 261 metres in 12.25 hours at an average rop of 21.3 m/hr. On surface, the bit was graded 2.4.1 with some evidence of self-sharpening on the inner row teeth. After POOH the GCT survey tool, which had previously been unavailable because it was in use on the Bream platform, was run. The tool encountered obstructions within the casing at 862 metres. After attempting to dislodge the obstruction with the logging tool, 1500 lbs overpull was required to get the tool moving. The stickiness of the obstruction suggests that it was a piece of clay dragged up into the casing by the bit on the trip out. The GCT survey was run from 860 m to surface and recorded an essentially straight hole with maximum deviation of 0.5 degrees at 800 m.

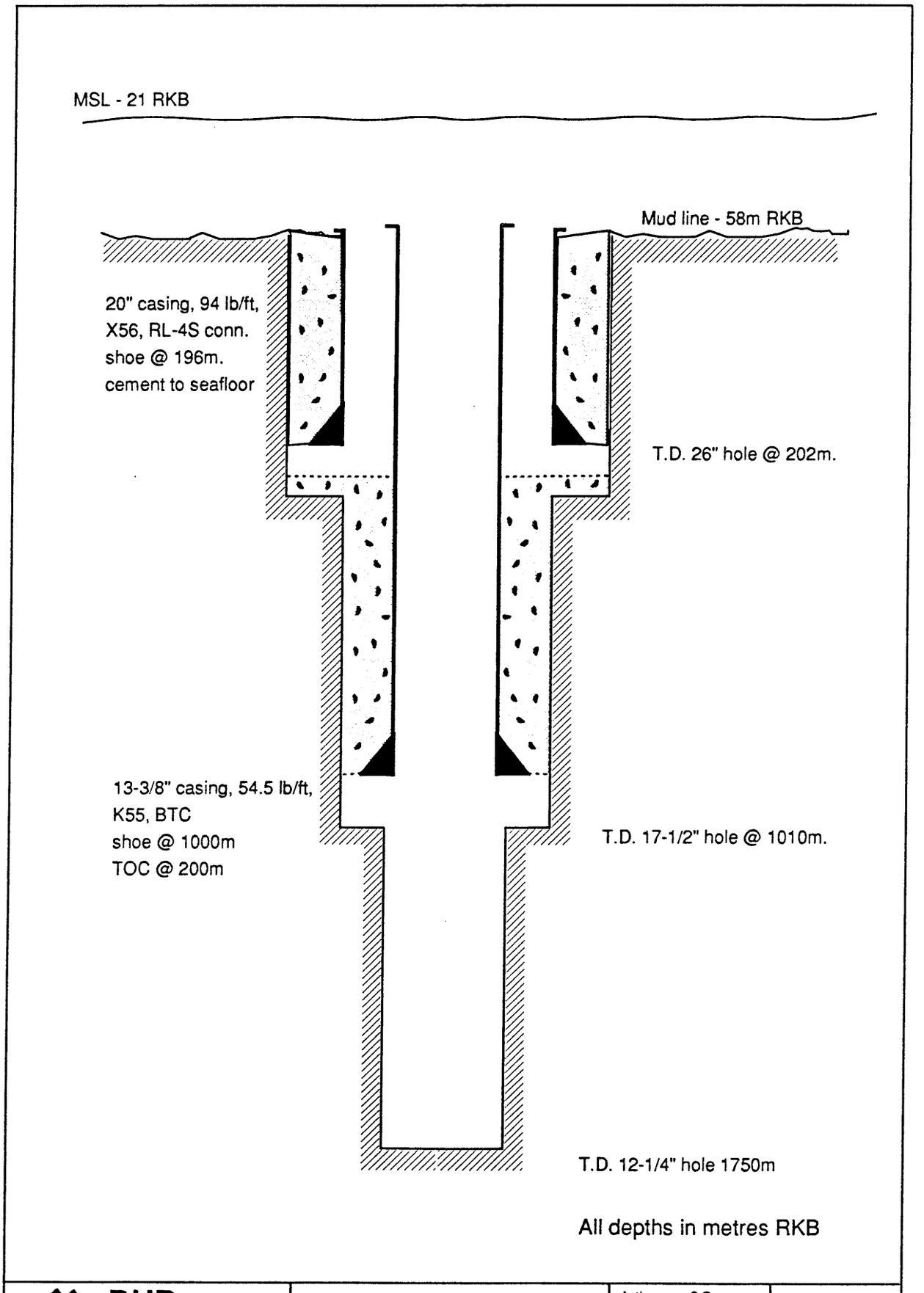
Coring

An Eastman Christensen 12.25" RC 476 bit was used with aluminium inner core barrels to core from 1271 m to 1290 m. The RC 476 bit is a PDC core bit which was 45% worn when run. The bit cored the section at between 5 and 20 m/hr and suffered little additional wear. Core recovery was 94% with the core exhibiting a strong hydrocarbon odour with 100% direct flourescence and instant stream and cut flourescence. On running in the hole with the core barrel it stood up at 969 m and the assembly had to be washed and reamed to bottom.

A Hughes ATJ-22 with 2 x 16 and 1 x 14 nozzles was run to drill from 1290 m to TD @ 1750 m through the interbedded claystone, sandstone, coals, sequence of the Latrobe group. The bit drilled 460 m in 38.5 hours at an average rop of 12 m/hr. From approximately 1450 m to T.D. the bit would drill at rop's of 20-30 m/hr for 1 1/2 to 2 metres and then torque up suggesting that the bit was undergauge. This was particularly evident while drilling through coal stringers and the lower claystone siltstone sections from 1620 m to T.D. On surface the bit was graded 3/4/1. A wiper trip to the shoe was made prior to POOH to log. Tight spots were encountered in the siltstone/claystone section from 1612 to 1635 m and it was necessary to wash and ream from 1718 m to bottom.

Mud

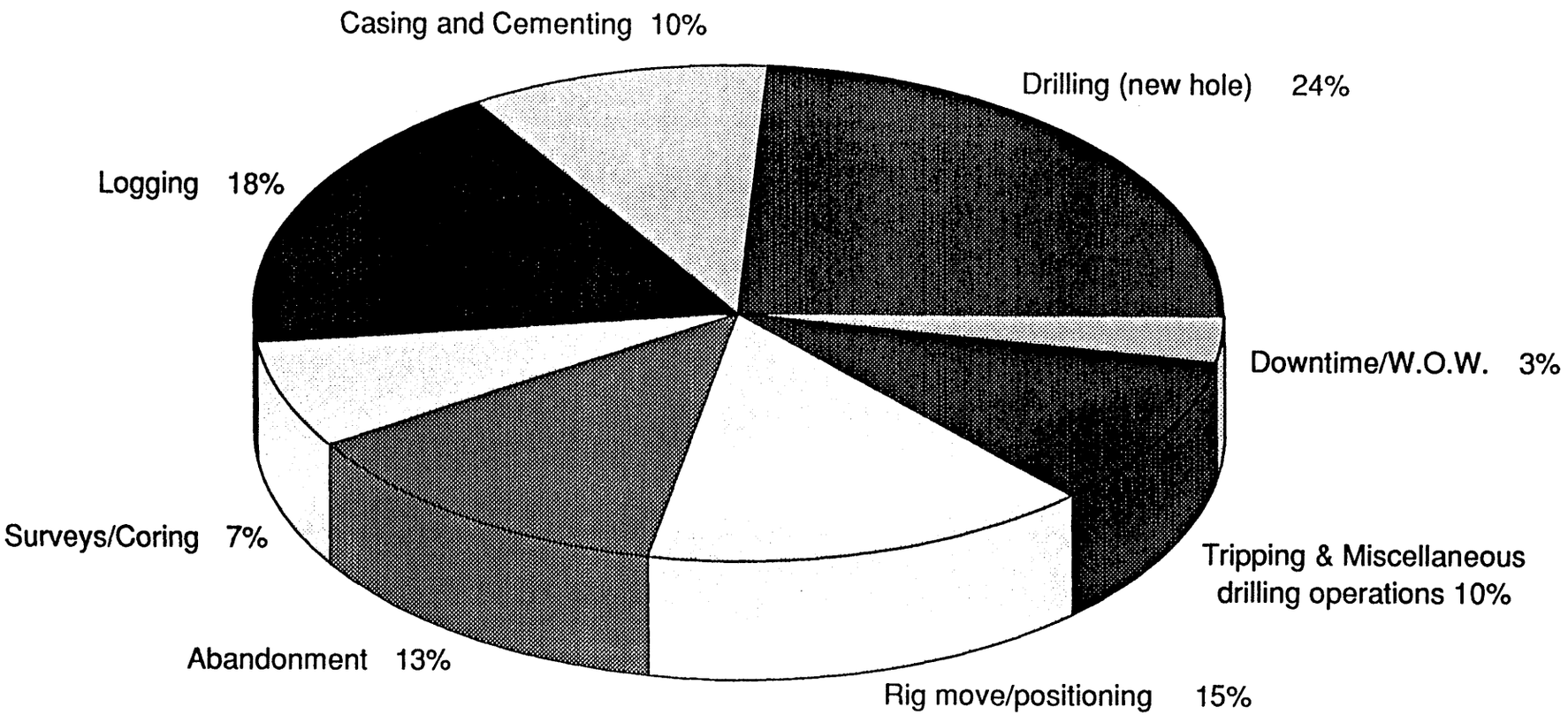
The hole was displaced to KCL/polymer mud at 1014 m prior to performing a leak off test. Barite was used to weight the mud up to 1.09 sg prior to drilling into the Latrobe group. KCL content was run at around 3.4 - 3.8% and polymer content approximately 1.5 ppb. Heavy losses were again incurred because of the inability of the shakers to handle the sands. The desander and desilter were run from below 1500 m to control the mud weight which had built up to 1.11 sg from the increased sand content in the mud.



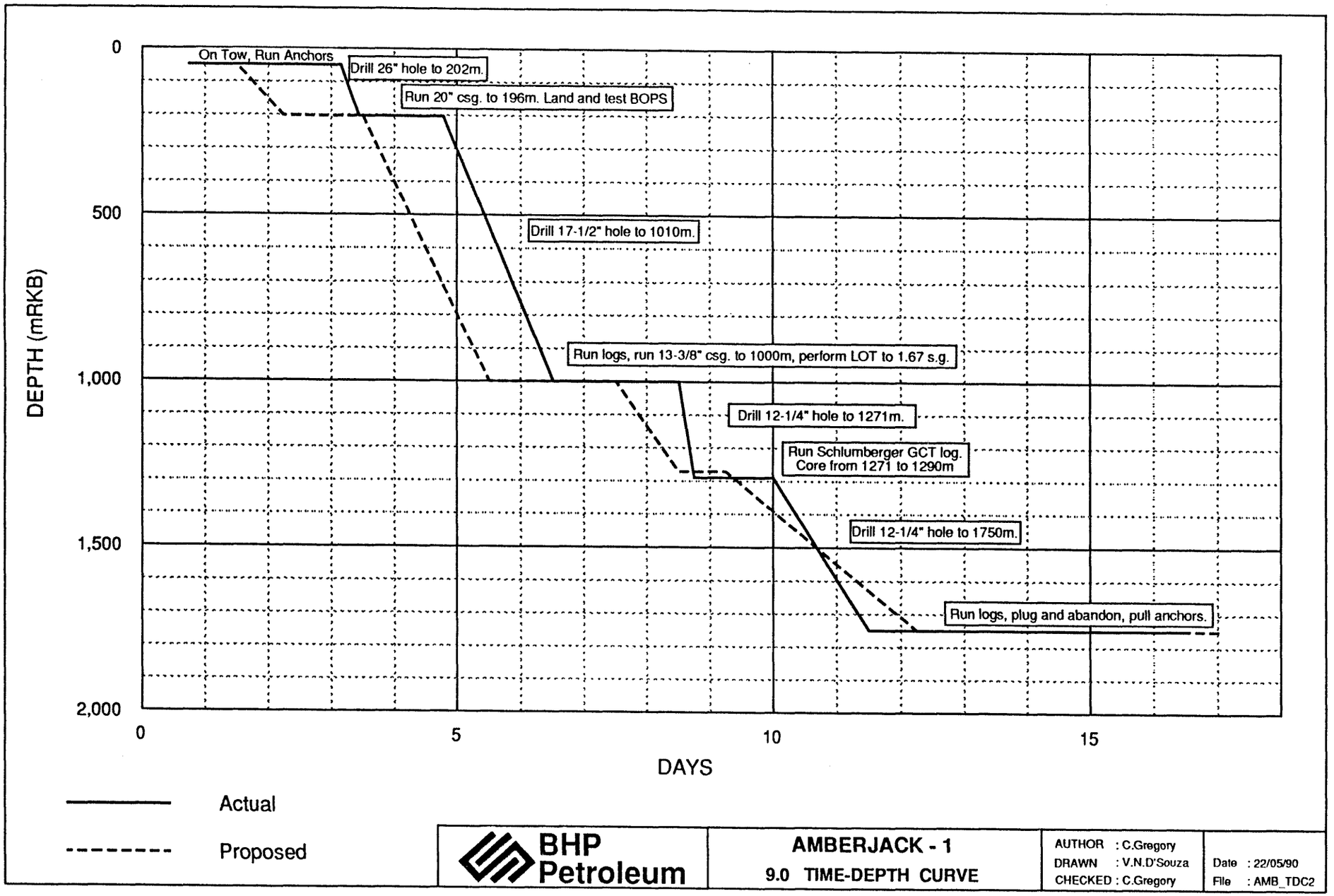
BHP Petroleum	AMBERJACK - 1 7.0 WELL SCHEMATIC	Author : C.Gregory Drawn : V.N.D'Souza Checked : C.Gregory	Date : 22/05/90 File : AMB_WS2

8.0 TIME BREAKDOWN

DAY:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Move Rig	3.00	15.00	6.75														
Run Anchors			14.75														
Drilling				7.00	2.25	23.25	7.25	0.25	12.00	4.75	19.25	14.50					
Bit Trip			0.50	1.50									0.75				
Wiper Trip				0.75							2.25						
Survey				0.75			0.50				0.50	0.50					
Circ/Cond				1.00					2.00	0.75	1.50						
Ream/Wash							0.50				0.50	1.00	0.50				
Coring										2.50							
Core Prep									5.75	16.00							
Logging							12.00		3.50			8.00	22.75	20.75			
CSG, Cmtg				12.25	6.25		3.50	15.50									
Wellhead			2.00		0.50		0.25	1.25									
BOP's					15.00			6.50									
L.O.T.								0.50	0.75								
Rep. Surf.				0.75		0.75											
Aban/Susp.														3.25	24.00	24.00	
W.O.W.		9.00															
Pull Anch.																	17.00



BHP Petroleum	AMBERJACK - 1 8.0 TIME BREAKDOWN	Author : C.Gregory Drawn : V.N.D'Souza Checked : C.Gregory	Date : 24/05/90 File : AMB_TB1


On Tow, Run Anchors
Drill 26" hole to 202m.
Run 20" csg. to 196m. Land and test BOPS
Drill 17-1/2" hole to 1010m.
Run logs, run 13-3/8" csg. to 1000m, perform LOT to 1.67 s.g.
Drill 12-1/4" hole to 1271m.
Run Schlumberger GCT log.
Core from 1271 to 1290m
Drill 12-1/4" hole to 1750m.
Run logs, plug and abandon, pull anchors.
DEPTH (mRKB)
0
500
1,000
1,500
2,000
0
5
10
15
DAYS
Actual
Proposed
BHP Petroleum
AMBERJACK - 1
9.0 TIME-DEPTH CURVE
AUTHOR : C.Gregory
DRAWN : V.N.D'Souza
CHECKED : C.Gregory
Date : 22/05/90
File : AMB_TDC2

10. DRILLING COSTS

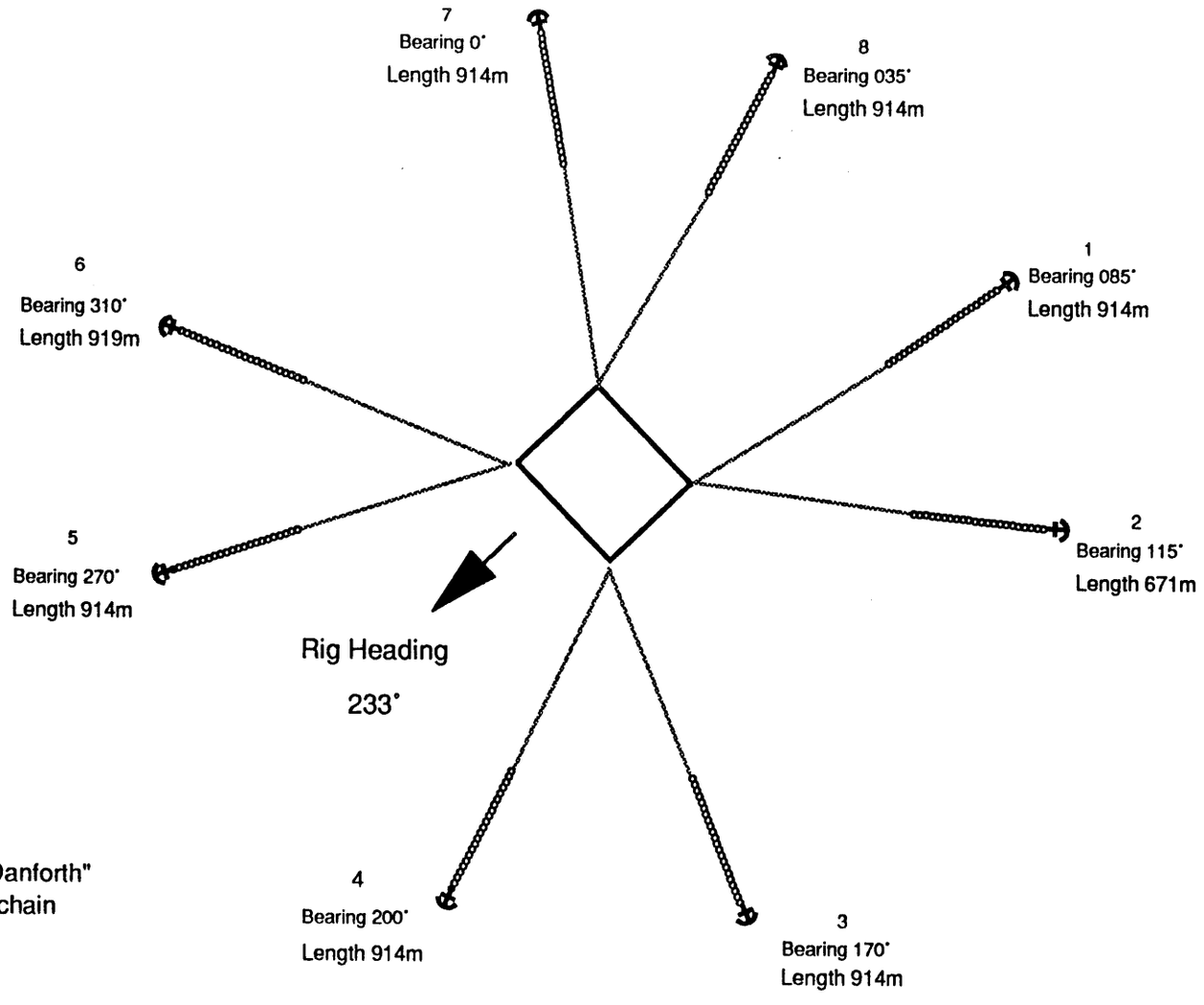
Date	Day	Prespud Costs	Fixed Daily Costs	Variable Drilling Costs	Variable Logistics Costs	Total Daily	Cumulative Costs
29Apr	0	83,827				83,827	83,827
30	0	7,359				7,359	91,186
1May	1	8,000	12,560			20,560	111,746
2	2	4,914	100,962	5,000	15,066	125,942	237,688
3	3	5,066	100,962	36,203	1,168	143,399	381,087
4	4		100,962	140,757	2,936	244,682	625,769
5	5		100,962	21,664	-	122,626	748,395
6	6		100,962	12,216	-	113,178	861,573
7	7	50,000	100,962	6,043	6,894	163,899	1,025,472
8	8		100,962	166,649	808	268,419	1,293,891
9	9		100,962	43,930	596	145,488	1,439,379
10	10		100,962	17,445	3,682	122,089	1,561,468
11	11		100,962	11,183	1,080	113,225	1,674,693
12	12		100,962	9,081	-	110,043	1,784,736
13	13		100,962	4,707	808	106,477	1,891,213
14	14		100,962	5,630	808	107,400	1,998,613
15	15		100,962	232,688	12,406	346,056	2,344,669
16	16		100,962	7,593	1,194	109,749	2,454,418
17	17		71,515	4,154	2,425	78,094	2,532,512

Total well cost: $A 2,532,512

Note:

(1) The above drilling costs are based on estimates and quotations provided for the AFE, and as such do not take into account factors such as discounts, escalations or estimation errors. They are therefore useful only as a guide or a means of cost control and may not reflect the actual cost of drilling the well.

(2) All costs in Australian dollars.



All moorings consist of 15T "Danforth" type anchors and 610m of 2" chain outboard of wire.

BHP Petroleum

AMBERJACK - 1
"SOUTHERN CROSS"
VIC/P25
11.0 MOORING DIAGRAM

Author	: C.Gregory		
Drawn	: V.N.D'Souza	Date	: 21/05/90
Checked	: C.Gregory	File	: AMB_SMP2

12.0 WEATHER AND SEASTATE DATA

DATE	DAY	WIND VEL/DIR	TEMP (C)	VISI (NM)	WEATHER STATE	SWELL HT/PER/DIR (SECS)	WAVES HT/PER/DIR (SECS)	HEAVE M	PITCH (DEG)	ROLL (DEG)	BAR (MBARS)
1/5/90	1	30-300	17	10	Lt. Cloud	3/16/300	1/ 2/300	-	6.0	1.5	1012
2/5/90	2	20-280	15	10	Lt. Cloud/rain	2.4/ 7/260	0.6/14/280	-	2.6	2.2	1011
3/5/90	3	18-90	17	10	Partly cloudy	2/ 7/280	1.2/ 6/230	-	0.6	0.8	1022
4/5/90	4	24-320	16	10	Fine	1.8/ 6/090	0.6/ 2/320	-	0.6	0.6	1012
5/5/90	5	30-320	17	10	Showers	1.8/10/230	0.3/ 2/320	0.4	0.6	0.8	1012
6/5/90	6	35-280	15	10	Cloudy	2.4/ 6/230	1.2/ 3/280	0.4	0.8	0.9	1015
7/5/90	7	22-300	13	12	Fine	2.4/ 6/200	0.9/ 2/300	0.3	0.6	0.9	1022
8/5/90	8	15-300	14	12	Fine	1.8/ 6/200	0.3/ 1/300	0.3	0.6	0.7	1014
9/5/90	9	23-300	20	17	fine	1.2/ 6/050	0.3/ 1/300	0.2	0.6	0.6	1014
10/5/90	10	20-300	19	12	Cloudy	1.2/ 8/050	0.6/ 2/300	0.2	0.6	0.6	1025
11/5/90	11	18-290	18	12	Cloudy	1.2/ 6/220	0.3/ 1/290	0.2	0.6	0.6	1026
12/5/90	12	45-280	18	12	Windy	4.8/ 6/250	1.2/ 3/270	0.3	2.0	2.0	1021
13/5/90	13	32-270	14	10	Cloudy	4.2/ 6/250	0.9/ 2/270	0.3	1.5	1.8	1023
14/5/90	14	26-270	15	10	Cloudy	2.4/ 6/200	0.6/ 2/270	0.3	1.0	1.2	1024
15/5/90	15	25-90	16	10	Fine	0.3/ 9/120	0.6/ 2/90	1.5	1.0	2.1	1024
16/5/90	16	20-45	17	12	Fine	3/ 9/120	0.6/ 2/30	0.9	0.8	2.0	1020
17/5/90	17	35-240	17	10	Cloudy	2.4/ 7/170	1.2/ 3/240	-	1.5	2.5	1006

13.0 BIT RECORD

DATE:	4 MAY	7 MAY	9 MAY	12 MAY
Bit No.	1	2	3	4
Size	26"	17 1/2	12 1/4	12 1/4
Manufacturer	HTC	Reed	HTC	HTC
Type	R1	SIIJ	ATJ-1	ATJ-22
Serial number	VJ161	N15847	P35EB	PW580
Jets	3 x 20	2x19,1x16	3 x 16	2x16,1x14
Depth out (m)	202	1010	1271	1750
Metres (rkb)	144	808	261	460
Hours	7.5	32.75	12.25	38.5
Weight (klb)	10	35	40	40
Rpm	95	14\30	130	90
Pumppress (psi)	900	2800	1750	2300
Strokes	200	180	70	70
Mud weight (s.g.)	seawater	1.08	1.08	1.10
Viscosity	-	34	42	41
Grading	1.1.I	2.2.I	2.4.I	3.4.1/16
Remarks	Pulled for casing point. Drilled limestones and loose sands.	Pulled for casing point. Drilled limestone and loose sands.	Pulled for core point Drilled predoment. Marls and claystones	Pulled at T.D. Drilled interbedded sands, coals, and claystones

Core bit: Eastman Christensen RC476. Drilled 19 metres from 1271 to 1290 m. Zero wear. Drilling time 2 1/2 hours.

1. 2 pumps with 6 1/2" liners

14.0 BHA SUMMARY

BHA NO.	INTERVAL	DESCRIPTION
1.	58- 202 m	26" bit, 26" hole opener, bitsub, 2 x 9 3/4" D.C., cross over, 4 x 8" D.C., crossover, 9 x HWDP
2.	202-1010 m	17 1/2" bit, bitsub, 2 x 9 3/4" DC, cross over, 17 1/2" stabiliser, 10 x 8" D.C., jars, 2 x 8" D.C., cross over, 9 x HWDP
3.	1010-1271 m	12 1/4" bit, floatsub, monel D.C., 1 x 8" DC, 12 1/4" Stabiliser, 13 x 8" D.C. Jars, 2 x 8" D.C., crossover, 9 x HWDP.
4.	1271-1290 m	12 1/4" corehead, 8" x 5 1/4" corebarrel, 13 x 8" D.C., Jars, 2 x 8", D.C., crossover, 9 x HWDP
5.	1290-1750 m	12 1/4" bit, floatsub, monel D.C., 1 x 8" DC, 12 1/4" Stabiliser, 13 x 8" D.C. Jars, 2 x 8" D.C., crossover, 9 x HWDP.

No metres	Interval	PENETRATION RATE MINUTES PER METRE	ROP m/hr	PSI	WEIGHT	ROTATING RPM	FLUID GPM	REMARKS
		1 2 3 5 10 20 30	OPERATING CONDITIONS					
0	1271.4			400	-	20	200	
1	2		4.6	500	5.10	80	200	
2	3		15	550	15	110	204	
3	4		8.6	550	15	110	204	
4	5		30	550	15	110	204	
5	6		10	550	15	110	204	
6	7		6	550	15	110	204	
7	8		4.3	550	15	110	204	
8	9		7.5	550	15	110	204	
9	1280		7.5	550	15	110	204	
10	1		10	550	15	110	204	Connection
11	2		10	550	15	110	204	
12	3		15	550	15	110	204	
13	4		7.5	550	15	110	204	
14	5		20	550	15	110	204	
15	6		20	550	15	110	204	
16	7		20	550	15	110	204	
17	8		20	550	15	110	204	
18	9		20	550	15	110	204	
19	1290.6		20	550	15	110	204	
20								
21								
22								

Bit/Size : 12-1/4" Type : RC 476
Ser/No. : 1490098
Interval Drilled : 1290 M Finish
Interval Drilled : 1271.4 M Start
Total Footage : 18.6 metres
Bit Cond.: : before 45% after 45%

BHP Petroleum

AMBERJACK - 1

15.0 CORE RECORD

Author : C.Gregory
Drawn : V.N.D'Souza
Checked : C.Gregory

Date : 28/05/90
File : AMB_PR1

16.0 MUD PROPERTIES - 17 1/2" HOLE (SEAWATER/GEL SYSTEM)

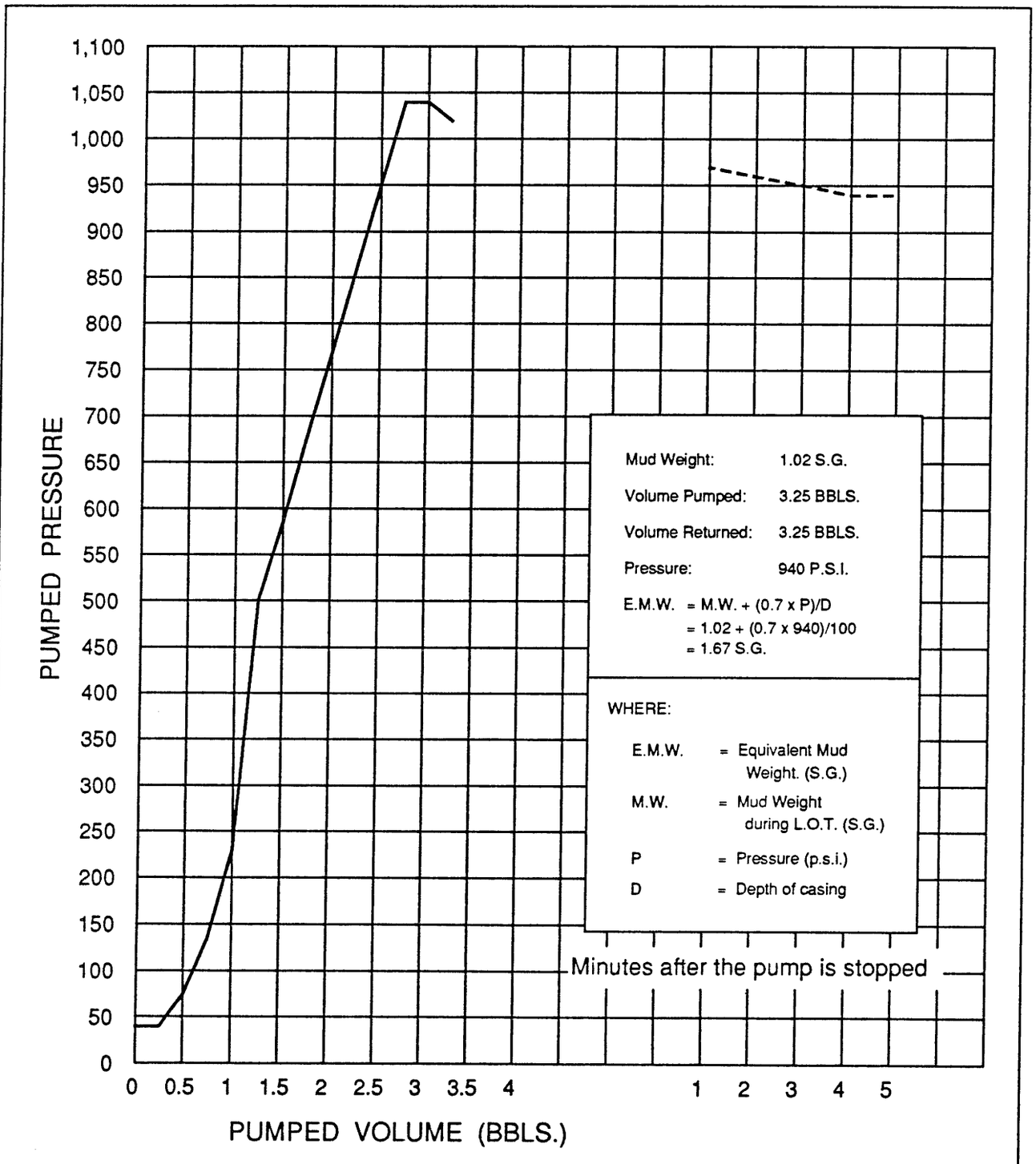
Date	5	6	6	7
Day	5	6	6	7
Temperature (deg C)	33	35	40	41
Depth (m)	269	623	902	1010
Weight (sg)	1.06	1.07	1.08	1.08
Viscosity (sec/qt)	32	35	36	37
PV (cp)	4	5	6	6
YP (lb/100 ft 2)	10	22	25	25
Gel strength	7/10	15/17	15/20	16/22
Solids content (%)	2	3	3	3
Liquid content (o/w)%	-/98	-/97	-/97	-/97
Sand content (%)	Trace	0.1	0.1	0.1
MBT (lb/BBl equiv.)	-	12	13	14
pH	9.0	8.7	8.7	8.9
Chlorides (1000's)	13	12.5	14.5	15
Calcium	1200	1200	1300	1240

17.0 MUD PROPERTIES 12 1/4" HOLE (KCL/PHPA SYSTEM)

Date	9	9	10	10	11	11	12	12
Day	9	9	10	10	11	11	12	12
Temperature (C^{o})	31	31	31	32	33	37	38	38
Depth (m)	1214	1271	1289	1351	1500	1594	1726	1750
Weight (sg)	1.08	1.09	1.10	1.10	1.11	1.10	1.10	1.10
Viscosity (sec/qt)	38	42	43	42	42	41	41	41
PV (cp)	10	11	14	13	15	14	15	15
Yp ($lb/100\ ft^2$)	16	18	20	19	17	17	20	19
Gel Strength	315	315	315	315	315	315	316	316
Solids Content (%)	5	6	6	6	6	6	6	6
Liquid Content (O/W) %	0/95	0/94	0/94	0/94	0/94	0/94	0/94	0/94
Sand Content (%)	0.1	0.1	0.2	0.25	0.4	0.25	0.35	0.30
MBT (lb/BBl equiv.)	8	8	8	8	8	9	9	9
PH	9.4	9.2	9.2	9.0	9.2	9.4	9.3	9.2
Chlorides (1000's)	21	21	22	22	22	22	23	23
Calcium (mg/L)	200	220	320	260	140	80	200	200
KCL (% by wt.)	3.8	3.6	3.3	3.4	3.2	3.5	3.6	3.8

18.0 HYDRAULICS SUMMARY

Date	Depth (mRkB)	Circ. Rate (GPM)	Press (psi)	SPM (1)	SPM (2)	Nozzle Veloc. ft/sec	Annular Veloc. ft/min	MMP Bit	Notes
4/5/90	202	1000	900	100	100	-	-	-	26" hole
5/5/90	269	1020	3170	100	100	472	67	1044	20" shoe at 196 m
6/5/90	903	970	3112	97	97	444	63	916	
7/5/90	1010	948	2800	90	90	438.5	61.9	854.1	13 3/8" shoe @ 1000 m
8/5/90	1014	700	1600	70	70	-	-	-	Not recorded
9/5/90	1271	700	1750	70	70	408	147	586	12 1/4" hole
10/5/90	1354	700	2300	70	70	441	146	698	
11/5/90	1610	700	2250	70	70	428	142	634	
12/5/90	1750	700	2300	70	70	425	120	622	T.D.



WELL	: Amberjack-1
MEASURED DEPTH	: 1014m
CASING DIAM.	: 13.375, 54.5 lbs/ft.
SHOE MEASURED DEPTH	: 1000m.

BHP Petroleum	AMBERJACK - 1 19.0 LEAK OFF TEST DIAGRAM	AUTHOR : C.Gregory DRAWN : V.N.D'Souza CHECKED : C.Gregory	Date : 22/05/90 File : AMB_LOT1

20.0 CASING RUNNING AND CEMENTING REPORT

BHP Petroleum

Well: AMBERJACK-1 Date: 4/5/90 Casing Type: 94# X 56 O.D.: 20"
Hanger Depth: ..... I.D.: 19.124"

GENERAL

RKB-MSL meters 21	HOLE - Size - Depth (m)	26" 202						
WATER DEPTH meters 37	PREVIOUS CASING - Size Depth (m)	-						

HOLE CONDITIONS

Mud: Type : SEAWATER
P.V. : .....
Cake : .....
API Water Loss : .....
Hole: Open Hole Time: .....

W. t. : .....
YP : .....
Solids : .....
Salinity: .....
Caliper Survey: .....

M.F. Visc : .....
0/10 Gels: .....
Sand : .....
Max Deviation: 1/2 DEG.

RUNNING

Total No. of Joints : 19
Start Running Casing at : 2.00 p.m.
No. of Joints per Hour : 6
Make Up Torque : 25,000
Pip Tag : .....

No. of Joints Run : 11
Finish Running Casing at: 5.30 p.m.
Fill-up Points : each joint.
Thread Type : RL-4S

No. of Joints Left : 8
Total Time Taken : 3.5 hours
Casing Length : 141 m
Lock Ring : -

CIRCULATING

Start : .....
Pressure: .....
% Returns: .....

Finish : .....
SPM : .....

Time Circulating: .....
Circulating Rate: .....

CEMENTING

Start Mixing : 23:57
Finish Displacing: 00:41
Bump Pressure : -
Displaced with : Seawater
Pump Used : Howco

Finish Mixing : 00:30
Total Time Taken: 44 mins
Pressure Held for: -
of: 32 bbls
Pump Efficiency : -

Start Displacing: 00:34
WOC Time : -

LEAD

Type of Cement: Class "G"
Mixing Water : 48.6 bbls
Thickening Time: -
Bottomhole Temp : -
Returns : yes
Additives : 2.2% gel

Volume Required: 397 ft^3
Type Of Water : Freshwater
Spacer Before : 5 bbls s/w
Yield : 1.89 Cuft/sx
Theoretical TOC : Seabed
Excess : 100%

Slurry Weight : 13.2 ppg
No. Sacks (1bs/sk): 200
Max Pump Pressure: 650 psi
Comp Strength : -
Actual TOC : -

TAIL

Type of Cement: Class "G"
Mixing Water : 106 bbls
Thickening Time: -
Bottomhole Temp : -
Returns : Yes
Additives : 1.5% $CaCl_2$

Volume Required: 1074
Type Of Water : Freshwater
Spacer Before : -
Yield : 1.15 Cu ft/sx
Theoretical TOC : -
Excess : 100%

Slurry Weight : 15.3 ppg
No. Sacks (1bs/sk): 890
Max Pump Pressure: 660 psi
Comp Strength : -
Actual TOC : -

Release Dart: ..... Delta P prior to Plug Bump: ..... Total Pack Off Turns: ..... Max Torque: .....

Comments: Shoe at 196.33 m
10 intermediate joints - 105.77 m
x/o joint - 11.61 m
Pile joint - 11.65 m

COLEMANS PRINTING DARWIN

20.0 CASING RUNNING AND CEMENTING REPORT

BHP Petroleum

Well: AMBERJACK-1 Date: 8TH MAY 1990 Casing Type: K5.5,BTC O.D.: 13.375
Hanger Depth: 56.3 m I.D.: 12.615

GENERAL

RKB-MSL	meters 21	HOLE	- Size - Depth (m)	26" 202	17 1/2" 1010 m			
WATER DEPTH	meters 37	PREVIOUS CASING	- Size Depth (m)	20" 196	13 3/8" 1000 m			

HOLE CONDITIONS

Mud: Type : Seawater/gel W. t. : 1.08 M.F. Visc : 37
P.V. : 6 YP : 25 0/10 Gels : 16/22
Cake : - Solids : 3% Sand : 0.1%
API Water Loss : - Salinity : 15K
Hole: Open Hole Time : 12 hours Caliper Survey : yes Max Deviation : 1/2 deg.

RUNNING

Total No. of Joints : 94 No. of Joints Run : 80 No. of Joints Left : 14
Start Running Casing at : 23:30 (7th) Finish Running Casing at : 5:00 Total Time Taken : 5.5 hrs
No. of Joints per Hour : 17 Fill-up Points : 3 lts. Casing Length : 943.5 m
Make Up Torque : 8200 ft lbs Thread Type : Buttress Lock Ring : Net run
Pip Tag :

CIRCULATING

Start : 05:00 Finish : 06:30 Time Circulating : 1.5 hours
Pressure : 800 psi SPM : 196 Circulating Rate : 500 gpm
% Returns : 95%

CEMENTING

Start Mixing : 07:00 Finish Mixing : 08:25 Start Displacing : 08:25
Finish Displacing : 09:15 Total Time Taken : 2 1/4 hrs. WOC Time :
Bump Pressure : 1500 psi Pressure Held for : 5 minutes
Displaced with : 468 bbls of : mud
Pump Used : rig Pump Efficiency : 97%

LEAD

Type of Cement : Class G Volume Required : 1851 ft^3 Slurry Weight : 12.5 ppg
Mixing Water : 252 bbls Type Of Water : drill No. Sacks (1bs/sk) : 891 (94*)
Thickening Time : Spacer Before : 10 bbl Max Pump Pressure : 500
Bottomhole Temp : 42°C Yield : 2.11 ft^3/sk Comp Strength :
Returns : Yes Theoretical TOC : 200 m Actual TOC :
Additives : 3.1% BWOW Bentonite (10.85 lb/bbl mixwater)

TAIL

Type of Cement : Class G Volume Required : 584.4 ft^3 Slurry Weight : 15.8 ppg
Mixing Water : 60.5 bbls Type Of Water : Seawater No. Sacks (1bs/sk) : 508 (94*)
kening Time : 3:18 hrs/min Spacer Before : - Max Pump Pressure : 550
Bottomhole Temp : 42°C Yield : 1.15 ft^3/sk Comp Strength :
Returns : Yes Theoretical TOC : 800 m Actual TOC :
Additives : Neat

Release Dart: 3500 Delta P prior to Plug Bump: 900 psi Total Pack Off Turns: 8 1/2 Max Torque: 18,000
Comments: (1) Ball released bottom plug at 1400 psi (2) 27 bbls lost while mixing, 100 bbls lost during displacement. (3) Ran 5 centralisers. One in the middle of the first two joints and one across the connections of the three joints above the float collar.

COLEMANS PRINTING DARWIN

21.0 ABANDONMENT PLUGS

PLUG # 1 1575 M TO 1422 M

Mix Water	43 bbls fresh
10 bbls	ahead
1.5 bbls	behind
363 sx	CMT
Start	0036 hours - 15th May
Finish	0050 hours
Displace	0050 hours - 80.5 bbls mud
Finish	0103 hours
Press	500 psi
11.8 m^3	Capacity

Tag CMT @ 1422 m

PLUG #2 1320 M TO 1220 M

Mix Water	31 bbls seawater
10 bbls	ahead
1.5 bbls	behind
261 sx	CMT
Start	0715 hours - 15th May
Finish	0725 hours
Displace	0726 hours - 70.5 bbls mud
Finish	0736 hours
Press	550 psi
8.4 m^3	Capacity

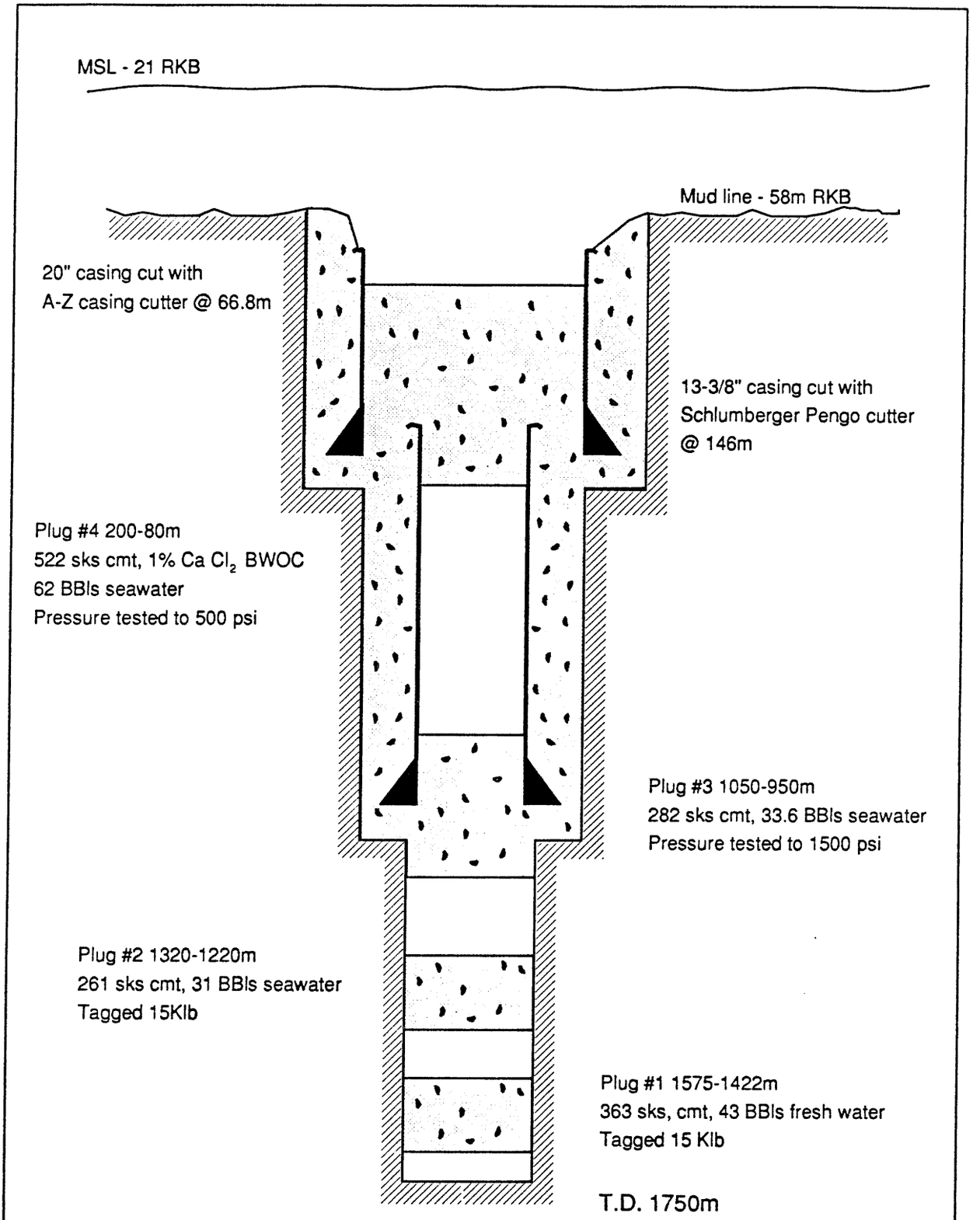
Tag CMT @ 1220 m

PLUG # 3 1050 M TO 950 M

Mix water	33.6 seawater
10 bbls	ahead
1.4 bbls	behind
282 sxs	CMT
Start	1220 hours - 15th May 1990
Finish	1227 hours
Displace	1228 hours - 53.5 bbls mud
Finish	1238 hours
5.15 m^3	Open hole
Press	450 psi
Tested Casing to 1500 psi	

PLUG # 4 200 M TO 80 M

Mix Water	62 bbls seawater 1% CaCl2
10 bbls	ahead
1/2 bbl	behind
522 sks	CMT
Start	3:05 - 16th May 1990
Finish	3:25
Displace	3:26 - 2.5 bbls seawater
Press	500 psi
Tested Casing to 500 psi	



BHP Petroleum	AMBERJACK - 1 21.0 ABANDONMENT PLUGS	Author : C.Gregory Drawn : V.N.D'Souza Checked : C.Gregory	Date : 22/05/90 File : AMB_AS2

22.0 ELECTRIC LOGS

The following logs were run:

Schlumberger

Suite #1:	Run #1	DLL/MSFL/SDT/GR/CAL/SP/AMS from 1010 m to 200 m Gamma ray to surface
Suite #2:	Run #1	GCT Survey, from 860 m to KB
Suite #3:	Run #1	DLT/LDT/CNT/GR/MSFL/AMS from 1732.5 to 999 m
	Run #2	SHDT/GR/AMS from 1732 to 999 m
	Run #3	RFT's
	Run #4	SAT - Velocity check shots
	Run #5	CST's - 60 sidewall cores shot

Mud Logs From 200 m to 1750 m. Details - lithology, rop, and calcimetry.

APPROVALS:

PREPARED BY: .....

DRILLING ENGINEER

APPROVED BY: .....

DRILLING SUPERINTENDENT

..... 6-6-90 .....

MANAGER DRILLING NEW VENTURS

SECTION 3

3.0 FORMATION SAMPLING

3.1 Ditch Cuttings

Two sets of unwashed cuttings and four sets of washed and air dried cuttings were collected from below the 20" casing to Total Depth. Samples were collected at 10 m intervals from 210-1010 m (13-3/8" casing point) and at 3 m intervals from 1010-1750 m (Total Depth).

Table 1 summarises the sampling program and cuttings distribution.

TABLE 1

DITCH CUTTINGS SAMPLING SUMMARY

Depth Interval	Collection Interval	Treatment and Purpose	Distribution	
210 - 1010m	10m	Washed and split into 100 g samples	BHPP DIEP BMR	(1 set) (1 set) (1 set)
210 - 1010m	10m	Washed and split into sample vials/samplex trays	BHPP Pursuit	(1 set) (1 set)
210 - 1010m	10m	Unwashed for bulk storage, palaeontological/ palynological analysis and fission track analysis.	BHPP	(2 sets)
1010 - 1750m	3m	Washed and split into 100 g samples	BHPP DIEP BMR	(1 set) (1 set) (1 set)
1010 - 1750m	3m	Washed and split into sample vials/samplex trays	BHPP Pursuit	(1 set) (1 set)
1010 - 1750m	3m	Unwashed for bulk storage, palaeontological/ palynological analysis and fission track analysis.	BHPP	(2 sets)

Summary of Cuttings Descriptions

DEPTH	DESCRIPTION
58-210m	No samples as cuttings circulated to seafloor.
210-400m	CALCARENITE: Light to medium grey, moderately firm, friable, medium to very coarse, grading to CALCIRUDITE, poorly to very poorly sorted, common sucrosic texture, common microcrystalline calcite cement, occasional light yellow-brown ?phosphatic cement, abundant fossil fragments including bivalves, gastropods, bryozoa, foraminifera and echinoderms, occasional whole bivalve shells to 2cm diameter, occasional fine quartz grains, common black specks (?black chert or heavy minerals), trace fine white mica flakes, good inferred porosity, mineral fluorescence only.
400-480m	SANDSTONE WITH MINOR INTERBEDDED CALCARENITE. SANDSTONE: Clear to light yellow-brown translucent quartz, unconsolidated, fine to medium, dominantly medium, occasionally coarse, moderately well to well sorted, well rounded to subrounded, common frosted grains, occasional green staining, trace glauconite, trace lithic grains, trace jasper, occasional black chert/heavy minerals, excellent porosity. CALCARENITE: Light grey, moderately firm, friable, medium to very coarse, poorly to very poorly sorted, common sucrosic texture, common microcrystalline calcite cement, abundant fossil fragments including bivalves, gastropods, bryozoa, foraminifera and echinoderms, trace fine white mica flakes, good inferred porosity. **FLUORESCENCE: Trace very dull yellowish-white to greenish-white direct fluorescence associated with sandstone and occasional calcarenite cuttings, no cut, trace very weak, faint to moderate milky white crush cut, yellowish-white to cream residual ring.**

DEPTH	DESCRIPTION
480-750m	PREDOMINANTLY CALCARENITE WITH OCCASIONAL INTERBEDDED SANDSTONE. CALCARENITE: Light grey to light cream to white, firm, friable, fine to medium, grading to CALCISILTITE in part, occasional coarse to very coarse fossil fragments, moderately sorted, angular, sucrosic texture, microcrystalline calcite cement and matrix, common to abundant fossil fragments, dominantly bryozoa, trace glauconite, occasional yellow-brown stained grains, good to excellent porosity. SANDSTONE: Clear to milky white to translucent light brown, unconsolidated, very fine to fine, well sorted, rounded to subangular, dominantly rounded, no cement, trace lithic grains, excellent porosity, no shows.
750-830m	PREDOMINANTLY CALCARENITE WITH OCCASIONAL INTERBEDDED SANDSTONE. CALCARENITE: Light to medium grey to light yellow-grey, firm, friable, fine to medium, predominantly medium, moderately sorted, angular, sucrosic texture, microcrystalline calcite cement and matrix, argillaceous matrix increasing with depth, common to abundant fossil fragments, mostly bryozoa, trace glauconite, trace microcrystalline pyrite, occasional yellow-brown stained grains, fair to poor porosity. SANDSTONE: Clear to milky white to translucent light brown, unconsolidated, fine to medium, moderatley well sorted, rounded to subangular, dominantly rounded, no cement, trace lithic grains, excellent porosity, no shows.
830-910m	CALCARENITE GRADING TO MARL: Light to medium grey, firm, becoming soft with depth, fine to medium, silty, abundant argillaceous matrix, dispersive in part, common to abundant fossil fragments, decreasing with depth, calcareous matrix, trace quartz grains, trace glauconite, trace microcrystalline pyrite, poor porosity.
910-1220m	MARL: Light to medium grey, dominantly light grey, soft to moderately firm, sticky in part, silty, occasionally grading to ARGILLACEOUS CALCISILTITE / CALCARENITE, blocky to sub-blocky cuttings, occasional fossil fragments, mostly foraminifera, occasional very fine quartz grains, trace glauconite, occasional black chert/heavy minerals, no shows.
1220-1259m	MARL: Very light grey, soft to moderately firm, silty, grading to ARGILLACEOUS CALCISILTITE in part, dispersive argillaceous matrix, trace glauconite grains increasing to 5% below 1240m, very slightly dolomitic in part, no shows.
1259-1268m	CLAYSTONE: Medium grey-green to medium green, soft to very soft, dispersive in part, calcareous to slightly calcareous, abundant disseminated glauconite, common to abundant fine dark green to black glauconite grains, trace to common disseminated microcrystalline pyrite.

DEPTH	DESCRIPTION
1268-1271m	CLAYSTONE WITH MINOR SANDSTONE. CLAYSTONE: Medium grey-green to medium green, soft to very soft, dispersive in part, calcareous to slightly calcareous, abundant disseminated glauconite, common to abundant fine dark green to black glauconite grains, trace to common disseminated microcrystalline pyrite. SANDSTONE: Clear, unconsolidated, fine to medium grained, well sorted, rounded to subangular, silty, dispersive argillaceous matrix, trace glauconite, trace microcrystalline mica, good to excellent porosity. **FLUORESCENCE: Moderately bright bluish-white direct fluorescence associated with sandstone, moderately fast dull milky white cut, fast to instantaneous milky white crush cut, bright milky yellow-white residual ring.**
1271-1290m	Samples not circulated up while coring.
1290-1325m	SANDSTONE: Clear to translucent light grey, unconsolidated, fine to medium, occasionally coarse, silty in part, moderately to poorly sorted, unconsolidated quartz, subrounded to subangular, trace to common black to dark green glauconite grains, trace lithic grains, slightly calcareous, trace microcrystalline pyrite, trace to common very fine white mica flakes, trace black chert/heavy minerals, good to excellent porosity, no shows.
1325-1340m	CLAYSTONE WITH MINOR COAL INTERBEDS. CLAYSTONE: Dusky brown to dark grey-brown, soft, dispersive in part, sticky, silty, slightly calcareous. COAL: Black, firm to hard, brittle generally blocky, subfissile in part, vitreous lustre, occasionally dull.
1340-1349m	COAL: Black, firm to hard, brittle, generally blocky, subfissile in part, vitreous lustre, occasionally dull.
1349-1361m	INTERBEDDED SILTSTONE AND SANDSTONE. SILTSTONE: Light to medium grey-brown, mottled with light grey, moderately firm, blocky cuttings, calcareous, argillaceous, grades to very fine silty sandstone in part, occasional disseminated glauconite, occasional microcrystalline pyrite, very poor porosity. SANDSTONE: Clear to translucent greyish white, unconsolidated, fine to coarse, poorly sorted, subangular to rounded, no cement, excellent porosity. **FLUORESCENCE: Trace to 15% dull to moderately bright yellow to yellowish-orange direct fluorescence associated with siltstone, no cut, fast to instantaneous weak to moderate milky white crush cut, white residual ring.**
1361-1370m	COAL: Black, firm to hard, brittle, generally blocky, subfissile in part, vitreous lustre, occasionally dull.
1370-1376m	CLAYSTONE GRADING TO SILTSTONE: Light grey, soft, dispersive in part, silty, slightly calcareous, trace glauconite.

DEPTH	DESCRIPTION
1376-1439m	SANDSTONE WITH MINOR INTERBEDDED COALS AND RARE SILTSTONE. SANDSTONE: Translucent white to light grey, friable to unconsolidated, very fine to very coarse, grading to gravel in part, very poorly sorted, angular to subrounded, occasional silty matrix, no cement, ocasionally slightly calcareous, trace microcrystalline pyrite, excellent porosity, no shows. COAL: Black, firm to hard, brittle, generally blocky, subfissile in part, vitreous lustre, occasionally dull. SILTSTONE: light grey to light grey-brown, soft, grades to very fine SANDSTONE in part, slightly calcareous.
1439-1490m	INTERBEDDED CLAYSTONE AND SANDSTONE WITH OCCASIONAL THIN COALS. CLAYSTONE: Light olive-grey to cream, occasionally white, soft to very soft, sticky, dispersive in part, silty, grading to ARGILLACEOUS SILTSTONE in part, calcareous to slightly calcareous. SANDSTONE: Translucent white to light grey, friable to unconsolidated, very fine to very coarse, grading to gravel in part, very poorly sorted, angular to subrounded, occasional silty matrix, no cement, ocasionally slightly calcareous, trace microcrystalline pyrite, excellent porosity. COAL: Black, firm to hard, brittle, generally blocky, subfissile in part, vitreous lustre, occasionally dull. **FLUORESCENCE: 1472-1478 m, Trace to 5% moderately bright yellow direct fluorescence, slow very weak milky cut, weak milky crush cut, pale white residual ring.**
1490-1499m	CLAYSTONE: Medium dusky brown to brown-grey, soft, sticky, silty, grading to ARGILLACEOUS SILTSTONE in part, non- to very slightly calcareous, carbonaceous.
1499-1514m	SANDSTONE: Clear to translucent white to light grey, unconsolidated, very fine to coarse, poorly sorted, angular to subrounded, occasional silty matrix, good to excellent porosity, no shows.
1514-1526m	INTERBEDDED SANDSTONE AND CLAYSTONE. SANDSTONE: Clear to translucent white to light grey, unconsolidated, very fine to coarse, poorly sorted, angular to subrounded, occasional silty matrix, good to excellent porosity, no shows. CLAYSTONE: Light olive-grey to cream, occasionally white, soft to very soft, sticky, dispersive in part, silty, grading to ARGILLACEOUS SILTSTONE in part, calcareous to slightly calcareous.
1526-1532m	COAL: Black, firm to hard, brittle, generally blocky, subfissile in part, vitreous lustre, occasionally dull.

DEPTH	DESCRIPTION
1532-1568m	SANDSTONE WITH MINOR INTERBEDDED CLAYSTONE AND COAL. SANDSTONE: Clear to translucent white to light grey, unconsolidated, fine to very coarse, very poorly sorted, rounded to subangular, slightly calcareous in part, trace microcrystalline pyrite, occasional silty matrix, good to excellent porosity, no shows. CLAYSTONE: White to light grey, soft to very soft, sticky, occasionally dispersive, ?kaolinite, non- to very slightly calcareous, very slightly dolomitic in part. COAL: Black, firm to hard, brittle, generally blocky, occasionally subfissile, vitreous lustre, occasionally dull.
1568-1592m	CLAYSTONE WITH MINOR INTERBEDDED SANDSTONE AND THIN COALS. CLAYSTONE: White to light grey, soft to very soft, sticky, occasionally dispersive, ?kaolinite, non- to very slightly calcareous, very slightly dolomitic in part. SANDSTONE: Clear to translucent white to light grey, unconsolidated, fine to very coarse, very poorly sorted, rounded to subangular, slightly calcareous in part, trace microcrystalline pyrite, occasional silty matrix, good to excellent porosity, no shows. COAL: Black, firm to hard, brittle, generally blocky, occasionally subfissile, vitreous lustre, occasionally dull.
1592-1679m	SANDSTONE WITH MINOR CLAYSTONE INTERBEDS UP TO 3m THICK. SANDSTONE: Clear to translucent white to light grey, friable to unconsolidated, medium to very coarse, occasionally grading to gravel, dominantly medium, very poorly sorted, rounded to subangular, very slightly calcareous in part, trace microcrystalline pyrite cement, trace mica, occasional silty matrix, excellent porosity, no shows. CLAYSTONE: White to light olive-grey, grading to medium olive-grey in part, soft to very soft, sticky, dispersive in part, slightly calcareous, kaolinitic.
1679-1724m	CLAYSTONE WITH SANDSTONE INTERBEDS UP TO 5m THICK. CLAYSTONE: Light olive-grey to light grey, soft to very soft, sticky, dispersive in part, slightly silty, slightly calcareous, kaolinitic, micromicaceous. SANDSTONE: Clear to translucent white, unconsolidated, medium to coarse, moderately to poorly sorted, angular to subrounded, non calcareous, trace pyrite cement, minor trace glauconite, occasional mica flakes, excellent porosity, no shows.
1724-1742m	SANDSTONE WITH MINOR CLAYSTONE. SANDSTONE: Clear to translucent white, friable to unconsolidated, generally medium to coarse, occasional fine grained aggregates, moderately to poorly sorted, silty in part, angular to subrounded, non calcareous, trace pyrite cement, minor trace glauconite, occasional mica flakes, excellent porosity, no shows. CLAYSTONE: Light olive-grey to light grey, occasionally white, soft, sticky, dispersive in part, silty, grading in part to ARGILLACEOUS SILTSTONE, slightly calcareous, common rounded cuttings.

DEPTH	DESCRIPTION
1742-1745m	COAL: Black, firm.to hard, brittle, blocky, vitreous lustre, occasionally dull.
1745-1750m	SANDSTONE WITH MINOR COAL. SANDSTONE: Clear to translucent white, friable to unconsolidated, medium to coarse, dominantly medium, moderately sorted, silty in part, angular to subrounded, non calcareous, trace pyrite cement, trace glauconite, occasional mica flakes, excellent porosity, no shows. COAL: Black, firm to hard, brittle, blocky, vitreous lustre, occasionally dull.

3.2 Sidewall Cores

A 60 shot CST program was run in Amberjack-1 in the 12-1/4" hole section from 1725-1010 m. Of the 60 shots fired, 56 successfully recovered cores, two bullets were lost and two were empty (overall 93% recovery). No misfires were reported.

The remains of sidewall cores subsequent to palynological, geochemical and petrographic analysis are stored by BHP Petroleum Pty. Ltd. at Kestrel Management (Australia) Pty. Ltd., Unit 58, Slough Estate, 170 Forster Road, Mt. Waverley, Victoria, 3149.

Table 2 summarises the sidewall core recoveries.

Table 2

Sidewall Core Summary

Sample No	Depth (mRKB)	Recovery (cm)	Lithology	Sample No.	Depth (mRKB)	Recovery (cm)	Lithology
1	1725.0	2.0	Argil Sst	31	1284.1	4.0	Argil Sst
2	1714.0	2.5	Argil Sst	32	1282.0	4.5	Slty Sst
3	1698.0	2.0	Argil Sltst	33	1279.9	4.5	Slty Sst
4	1684.0	Nil	-	34	1277.0	4.5	Slty Sst
5	1660.2	Nil	-	35	1275.0	3.0	Sst
6	1633.0	2.5	Clyst	36	1272.9	4.0	Slty Sst
7	1589.0	2.0	Clyst	37	1270.5	4.0	Slty Sst
8	1575.0	2.0	Clyst	38	1269.1	4.5	Slty Sst
9	1566.4	2.0	Clyst	39	1268.6	4.0	Slty Sst
10	1542.5	4.0	Slty Sst	40	1268.0	Nil	-
11	1519.0	2.5	Slty Sst	41	1267.5	5.0	Argil Sst
12	1495.5	3.5	Clyst	42	1264.0	3.5	Argil Sst
13	1489.0	2.0	Sltst/Sst	43	1263.0	6.0	Argil Sst
14	1485.0	4.5	Slty Sst	44	1260.9	7.0	Argil Sst
15	1482.0	4.0	Sst	45	1259.1	5.2	Argil Sst
16	1478.0	3.0	Sst	46	1255.0	7.0	Clyst
17	1461.5	1.5	Argil Sst	47	1248.1	7.0	Marl
18	1452.0	Nil	-	48	1236.0	3.5	Marl
19	1441.0	2.0	Sltst	49	1226.6	3.0	Marl
20	1421.1	3.0	Slty Sst	50	1218.8	4.0	Marl
21	1409.0	4.0	Carb Sst	51	1215.2	4.5	Marl
22	1374.5	5.0	Argil Sst	52	1212.9	4.5	Calc Clyst
23	1360.1	3.0	Clyst	53	1210.4	4.2	Calc Clyst
24	1355.0	3.0	Argil Sst	54	1160.0	6.0	Marl
25	1353.1	4.0	Sst	55	1138.8	3.4	Marl
26	1351.0	2.0	Sltst	56	1111.5	3.0	Marl
27	1339.0	3.0	Lamin Sltst	57	1095.9	4.0	Marl
28	1333.0	3.5	Slty Sst	58	1050.0	3.8	Marl
29	1325.0	2.5	Slty Clyst	59	1031.0	2.0	Marl
30	1294.1	4.0	Sst	60	1010.0	2.0	Marl

SIDEWALL CORE DESCRIPTIONS

SAMPLE NO.	(mRKB)	DEPTH (cm.)	RECOVERY DESCRIPTION
1	1725.0	2.0	ARGILLACEOUS SANDSTONE: White to light yellow-grey, friable, very fine to coarse grained, very poorly sorted, subangular, white to light grey argillaceous matrix, slightly calcareous, trace lithic grains, rare carbonaceous specks, no bedding, massive, poor to fair porosity, no shows.
2	1714.0	2.5	ARGILLACEOUS SANDSTONE: White to light yellow-grey, friable, very fine to coarse, dominantly very fine to fine, poorly to moderately sorted, white to light grey argillaceous matrix, non-calcareous, trace lithic grains, rare carbonaceous specks, poor to fair porosity; with minor interbeds of ARGILLACEOUS SANDSTONE: Light to medium olive-grey, firm, silty to very fine, occasion coarse grains, angular to sub angular, abundant light to medium olive-grey argillaceous matrix, non-calcareous, poor porosity, trace pinpoint very dull yellow mineral fluorescence.
3	1698.0	2.0	ARGILLACEOUS SILTSTONE: Light olive-grey, friable, grades to very fine ARGILLACEOUS SANDSTONE, abundant medium olive-grey argillaceous matrix, trace mica flakes, occasional thin subparallel carbonaceous stringers, poor to very poor porosity, no shows.
4	1684.0	NIL	Bullet Empty
5	1660.2	NIL	Bullet Lost
6	1633.0	2.5	CLAYSTONE: Light to medium grey to olive-grey, soft to moderately firm, blocky fracture, soapy texture, non-calcareous, no visible bedding.
7	1589.0	2.0	CLAYSTONE: White to light yellow-grey, soft silty, non-calcareous, trace microcrystalline mica, occasional subparallel dark grey-brown carbonaceous streaks.
8	1575.0	2.0	CLAYSTONE: White to light yellow-grey, soft silty, conchoidal fracture, non-calcareous, trace microcrystalline mica, occasional subparallel dark grey-brown carbonaceous streaks.
9	1566.4	2.0	CLAYSTONE: Light yellow grey, soft, silty, conchoidal to blocky fracture, soapy texture, slightly dispersive in fresh water, non-calcareous, trace microcrystalline mica, trace carbonaceous fragments.
10	1542.5	4.0	SILTY SANDSTONE: White to light grey, friable, very fine to medium, dominantly very fine, silty, moderately well sorted, angular to subangular, trace white argillaceous matrix, trace mica flakes, trace black chert/heavy mineral grains, no visible bedding, poor porosity. **FLUORESCENCE: 5-10% pinpoint dull yellow direct fluorescence, slow weak milky yellow-white cut, moderate milky yellow-white crush cut, moderate yellow-white residual ring.**
11	1519.0	2.5	SILTY SANDSTONE: White to light yellow-grey, friable, very fine to fine, dominantly very fine, silty, moderately well to well sorted, angular to subangular, trace white argillaceous matrix, non-calcareous, trace microcrystalline mica, trace black specks, no bedding, poor porosity. **FLUORESCENCE: Trace very dull yellowish orange direct fluorescence, slow, very weak milky cut, slow milky yellowish white crush cut, patchy yellowish white residual ring.**

12	1495.5	3.5	CLAYSTONE: Light olive-grey, soft, slightly silty, conchoidal fracture, occasionally blocky, non-calcareous, trace microcrystalline mica, trace carbonaceous fragments, no visible bedding.
13	1489.0	2.0	ARGILLACEOUS SILTSTONE grading to and interbedded with ARGILLACEOUS SANDSTONE: mottled light olive-grey and medium grey, occasionally white, soft, friable, siltstone grading to very fine sandstone, moderately sorted, variable argillaceous matrix, non-calcareous, trace microcrystalline mica, bioturbated, occasional relict burrows, poor porosity, no shows.
14	1485.0	4.5	SILTY SANDSTONE: White to light yellow-grey, friable, very fine to medium, poorly to moderately sorted, common to abundant silty matrix, angular, non-calcareous, trace fine mica flakes, occasional dark grey lithic grains, massive, no bedding, fair to poor porosity, no shows.
15	1482.0	4.0	SANDSTONE: White to light grey to yellowish grey, friable, very fine to medium, dominantly medium, poorly to moderately sorted, occasional white silty matrix, non-calcareous, trace fine mica flakes, trace pyrite cemented grains, trace carbonaceous specks, massive, no visible bedding, fair to good porosity, no shows.
16	1478.0	3.0	SILTY SANDSTONE: White, soft, friable, very fine, well sorted, abundant silty matrix, non-calcareous, trace to common very fine mica flakes/ microcrystalline mica, trace to common carbonaceous specks, no visible bedding, poor porosity. **FLUORESCENCE: Trace pinpoint dull yellow direct fluorescence, no cut, very weak, dull milky yellow crush cut, very pale milky residual ring.**
17	1461.5	1.5	ARGILLACEOUS SANDSTONE: Mottled white, light brown and light olive-grey, very fine, well sorted, abundant silty matrix, non-calcareous, common microcrystalline mica, common carbonaceous specks, common subparallel carbonaceous streaks, faint subparallel laminations, poor porosity. **FLUORESCENCE: Trace to 5% pinpoint moderately bright yellow direct fluorescence, streaming instant light yellow cut, yellow residual ring.**
18	1452.0	NIL	Bullet Lost
19	1441.0	2.5	SILTSTONE: light to medium olive-grey, soft, grades to very fine sandstone in part, argillaceous matrix, non-calcareous, common microcrystalline mica, common carbonaceous specks, minor COAL laminae and wispy streaks, subparallel laminations, very poor porosity, no shows.
20	1421.1	3.0	SILTY SANDSTONE: White to light yellow-grey, friable, very fine, well sorted, silty, angular, occasional argillaceous matrix, common microcrystalline mica, common carbonaceous specks, trace wispy subparallel COAL stringers, no visible bedding, fair to poor porosity, no shows.
21	1409.0	4.0	CARBONACEOUS SANDSTONE: Light olive-grey, soft, friable, fine to very fine, well sorted, angular, non-calcareous, micromicaceous, common to abundant subparallel carbonaceous streaks, common carbonaceous specks, subparallel bedding, fair to poor porosity, no shows.
22	1374.5	5.0	ARGILLACEOUS SANDSTONE: White to light yellow-grey, friable, fine to very fine, well sorted, angular, silty, variable argillaceous matrix, non-calcareous, common microcrystalline mica, trace to common microcrystalline pyrite, subparallel bedding, fair to poor porosity, no shows.
23	1360.1	3.0	CLAYSTONE: Medium to dark olive-grey, soft to moderately firm, silty, non-calcareous, common microcrystalline mica, massive, no visible bedding.

24	1355.0	3.0	ARGILLACEOUS SANDSTONE: Medium olive-grey, soft, friable, fine to very fine, well sorted, olive-grey argillaceous matrix, non-calcareous, micromicaceous, mottled, bioturbated, fair to poor porosity.
25	1353.1	4.0	SANDSTONE: Light to very light olive-grey, friable, very fine to medium, moderately poorly sorted, slightly silty. trace carbonaceous specks, massive, no visible bedding, good porosity, no shows.
26	1351.0	2.0	SILTSTONE: Dark olive-grey to dusky grey, soft, crumbly, argillaceous matrix, slightly arenaceous in part, non-calcareous, micromicaceous, massive, no visible bedding, poor porosity, no shows.
27	1339.0	3.0	LAMINATED SILTSTONE: Subparallel interbeds of medium to dark olive-grey to dusky grey and light olive-grey, soft to moderately firm, non-calcareous, micromicaceous, occasional fine quartz grains, occasional burrows cutting laminations, poor porosity, no shows.
28	1333.0	3.5	ARGILLACEOUS SANDSTONE interbedded with SILTSTONE. ARGILLACEOUS SANDSTONE: Medium olive-grey, firm, friable, very fine, well sorted, abundant argillaceous matrix, non-calcareous, micromicaceous, poor porosity; grading to and interbedded with SILTSTONE: Medium to dark grey, soft to moderately firm, non-calcareous, micromicaceous, micro cross-bedding, poor porosity, no shows.
29	1325.0	2.5	CLAYSTONE: Medium to dark grey-brown to olive-grey, soft to moderately firm, silty, non-calcareous, micromicaceous, no visible bedding.
30	1284.1	4.0	SANDSTONE: Light to medium grey, soft to moderately firm, fin to medium, dominantly fine, moderately well sorted, angular to subrounded, trace argillaceous matrix, slightly calcareous, trace black chert/ heavy minerals, massive, excellent porosity, no shows.
31	1284.1	4.0	ARGILLACEOUS SANDSTONE: Medium grey, friable, very fine to medium, subangular to subrounded, silty, abundant dispersive dark grey argillaceous matrix, disseminated microcrystalline pyrite, massive, poor porosity, no shows.
32	1282.0	4.5	SILTY SANDSTONE: Light to medium grey, friable, very fine grading to SILTSTONE in part, well sorted, angular to subrounded, argillaceous matrix, non-calcareous, trace to common mica flakes, trace black chert/ heavy mineral grains, massive, good to excellent porosity, no shows.
33	1279.9	4.5	SILTY SANDSTONE: Light to medium grey, friable, very fine, well sorted, angular to subangular, silty, slightly calcareous, micromicaceous, trace to common black grains, occasional carbonaceous fragments, very faint subparallel bedding, good to excellent porosity. **FLUORESCENCE: 100% Bright yellowish-white to greenish-white direct fluorescence, instant streaming yellowish-white cut, thick yellowish-white residual ring. Light straw colour to solvent in white light. Strong petroliferous odour. Oily sheen on grains.**
34	1277.0	4.5	SILTY SANDSTONE: Light to medium grey, friable, very fine, well sorted, angular to subangular, silty, slightly calcareous, micromicaceous, trace to common black grains, occasional carbonaceous fragments, very faint subparallel bedding, good to excellent porosity. **FLUORESCENCE: 100% Bright yellowish-white to greenish-white direct fluorescence, instant streaming yellowish-white cut, thick yellowish-white residual ring. Light straw colour to solvent in white light. Strong petroliferous odour. Oily sheen on grains.**

35	1275.0	3.0	SANDSTONE: Light to medium grey, friable to unconsolidated, medium to coarse, angular to subangular, moderately poorly sorted, trace silty matrix, trace argillaceous matrix, trace fine mica flakes, excellent porosity. **FLUORESCENCE: 100% Moderately bright yellowish-white direct fluorescence, instant streaming yellowish-white cut, thick yellowish-white residual ring. Light straw colour to solvent in white light. Strong petroliferous odour. Oily sheen on grains.**
36	1272.9	4.0	SILTY SANDSTONE: Light to medium olive-grey, friable to unconsolidated, very fine, very well sorted, angular to subrounded, silty, argillaceous matrix, non-calcareous, micromicaceous, trace disseminated glauconite, good to excellent porosity. **FLUORESCENCE: 100% Bright yellowish-white direct fluorescence, instant streaming yellowish-white cut, thick yellowish-white residual ring. Light straw colour to solvent in white light. Strong petroliferous odour. Oily sheen on grains.**
37	1370.5	4.0	SILTY SANDSTONE: Light to medium olive-grey, friable to unconsolidated, very fine, very well sorted, angular to subrounded, silty, argillaceous matrix, non-calcareous, micromicaceous, trace disseminated glauconite, good to excellent porosity. **FLUORESCENCE: 100% Bright yellowish-white direct fluorescence, instant streaming yellowish-white cut, thick yellowish-white residual ring. Light straw colour to solvent in white light. Strong petroliferous odour. Oily sheen on grains.**
38	1269.1	4.5	SILTY SANDSTONE: Light to medium olive-grey, friable to unconsolidated, very fine, very well sorted, angular to subrounded, silty, argillaceous matrix, non-calcareous, micromicaceous, trace disseminated glauconite, good to excellent porosity; interbedded with SILTY ARGILLACEOUS SANDSTONE: Medium grey, friable, very fine, well sorted, abundant argillaceous matrix, silty, trace microcrystalline mica, trace glauconite, subparallel bedding, poor porosity. **FLUORESCENCE: 70% Bright yellowish-white direct fluorescence associated with cleaner interbeds, instant streaming yellowish-white cut, thick yellowish-white residual ring. Moderate petroliferous odour.**
39	1268.6	4.0	SILTY ARGILLACEOUS SANDSTONE: Slightly mottled medium grey to olive-grey, occasionally light olive-grey, soft, friable, very fine, well sorted, angular to subangular, silty, variable argillaceous matrix, slightly calcareous, micromicaceous, occasional coarse quartz grains, trace subparallel microlaminations, bioturbated, poor to fair porosity. **FLUORESCENCE: 5% Bright yellow-white direct fluorescence, instant streaming cut, yellow-white residual ring. Faint petroliferous odour.**
40	1268.0	NIL	Bullet Empty
41	1267.5	5.0	ARGILLACEOUS GLAUCONITIC SANDSTONE: Medium to dark olive-grey, soft to moderately firm, fine to medium, occasionally coarse, poorly sorted, subrounded to subangular, abundant silty and argillaceous matrix, matrix supported, common disseminated glauconite, common glauconite grains, common disseminated microcrystalline pyrite, non-calcareous, micromicaceous, nil to very poor porosity, no shows.

42	1264.0	3.5	ARGILLACEOUS GLAUCONITIC SANDSTONE grading to ARGILLACEOUS SILTSTONE: Medium to dark olive-grey, soft to moderately firm, fine to medium, occasionally coarse, poorly sorted, subrounded to subangular, abundant silty and argillaceous matrix, matrix supported, common disseminated glauconite, common to abundant well rounded black glauconite grains, common disseminated microcrystalline pyrite, non-calcareous, micromicaceous, nil to very poor porosity, no shows.
43	1263.0	6.0	ARGILLACEOUS GLAUCONITIC SANDSTONE grading to ARGILLACEOUS SILTSTONE: Medium to dark olive-grey, soft to moderately firm, fine to medium, occasionally coarse, poorly sorted, subrounded to subangular, abundant silty and argillaceous matrix, matrix supported, common disseminated glauconite, common to abundant well rounded black glauconite grains, common disseminated microcrystalline pyrite, non-calcareous, micromicaceous, nil to very poor porosity, no shows.
44	1260.9	7.0	ARGILLACEOUS GLAUCONITIC SANDSTONE: Medium olive-grey to dark greenish grey, soft to moderately firm, very fine, occasionally medium, poorly sorted, well rounded to subrounded, abundant silty and argillaceous matrix, matrix supported, common disseminated glauconite, common to abundant well rounded black glauconite grains, common disseminated microcrystalline pyrite, non-calcareous, micromicaceous, nil to very poor porosity, no shows.
45	1259.1	5.2	ARGILLACEOUS GLAUCONITIC SANDSTONE: Medium olive-grey to dark greenish grey, soft to moderately firm, very fine, occasionally medium, poorly sorted, well rounded to subrounded, abundant silty and argillaceous matrix, matrix supported, common disseminated glauconite, common to abundant subrounded black glauconite grains, common disseminated microcrystalline pyrite, non-calcareous, micromicaceous, nil to very poor porosity, no shows.
46	1255.0	7.0	CLAYSTONE: Medium olive-grey to grey-brown, soft to firm, slightly silty, non-calcareous, with 1 mm thick band containing abundant very fine glauconite and pyrite grains.
47	1248.1	7.0	MARL: Light to medium olive-grey, soft, argillaceous, occasional fine subrounded glauconite grains, occasional very fine quartz grains, trace microcrystalline mica, trace microcrystalline pyrite, trace fossil fragments, no visible bedding, no visible porosity, no shows.
48	1236.0	3.5	MARL: Light grey, firm, argillaceous, common glauconite grains, trace microcrystalline mica, trace disseminated microcrystalline pyrite, trace fossil fragments, no visible bedding, very poor porosity, no shows, trace to 5% dull orange mineral fluorescence.
49	1226.6	3.0	MARL: Light grey, firm, argillaceous, rare glauconite grains, trace microcrystalline mica, trace disseminated microcrystalline pyrite, trace fossil fragments, no visible bedding, no shows.
50	1218.8	4.0	MARL: Light grey, firm, silty, argillaceous, rare glauconite grains, trace microcrystalline mica, trace disseminated microcrystalline pyrite, trace fossil fragments, no visible bedding, no shows.
51	1215.2	4.5	MARL: Medium olive-grey, firm, argillaceous, slightly silty, rare fossil fragments, trace microcrystalline mica, no shows.
52	1212.9	4.5	MARL grading to CALCAREOUS CLAYSTONE in part: Medium olive-grey, firm, argillaceous, slightly silty, rare fossil fragments, trace microcrystalline mica, no shows.

53	1210.4	4.2	CALCAREOUS CLAYSTONE: Medium olive-grey, soft to moderately firm, blocky fracture, trace white fossil fragments.
54	1160.0	6.0	MARL: Light to medium olive-grey to grey, firm, blocky fracture, common to abundant fossil fragments, mostly foraminifera, trace microcrystalline mica, no shows.
55	1138.8	3.5	MARL: Light olive-grey, firm friable, silty, patchy calcareous cement, common to abundant fossil fragments, trace glauconite grains, no shows, trace dull yellow mineral fluorescence.
56	1111.5	3.0	MARL: Light olive-grey, firm friable, silty, patchy calcareous cement, common to abundant fossil fragments, trace glauconite grains, no shows, trace dull yellow mineral fluorescence.
57	1095.9	4.0	MARL: Light olive-grey, firm friable, silty, patchy calcareous cement, occasional calcareous concretions to 3mm diameter, possibly burrow infilling, common to abundant fossil fragments, trace glauconite grains, bioturbated, poor porosity. **FLUORESCENCE: 5-10% moderately bright yellowish-green direct fluorescence associated with calcareous concretions, no cut, instant streaming crush cut, faint yellow residual ring.**
58	1050.0	3.8	MARL: Light olive-grey, firm, friable, slightly silty, common calcareous cement, common fossil fragments, trace glauconite, very faint, subparallel laminations, no shows.
59	1031.0	2.0	MARL grading to ARGILLACEOUS CALCISILTITE: Light olive-grey, firm, friable, silty, occasional calcareous cement, common fossil fragments, no shows, trace dull yellow mineral fluorescence.
60	1010.0	2.0	MARL: Light olive-grey, firm, friable, silty, common fossil fragments, common calcareous concretions to 1 mm diameter, common white calcareous streaks to 2 mm long, possibly burrow infilling or relict fossils, no visible bedding, poor porosity. **FLUORESCENCE: 5% Moderately bright yellow-white direct fluorescence, no cut, moderate milky yellow crush cut, faint yellow residual ring.**

3.3 Conventional Cores

One 18 m conventional core was cut in Amberjack-1 in the 12-2/4" hole section from 1271.4-1290 m, recovering 17.56 m (94%).

Remains of the core subsequent to sampling for routine and special core analysis are stored as follows:

- 1/2 core — BHP Petroleum Core Store
  c/o Kestrel Management (Australia) Pty. Ltd.
  Unit 58,
  Slough Estate,
  170 Forster Road,
  MT WAVERLEY, VIC., 3149.

- 1/4 core — BMR Core and Cuttings Laboratory,
  80 Collie Street,
  FYSHWICK, A.C.T., 2609.

- 1/4 core — DIEP Corelab,
  196 Turner Street,
  PORT MELBOURNE, VIC., 3207.

AMBERJACK-1 CONVENTIONAL CORE # 1 DESCRIPTION

1271.4-1271.7m	SANDSTONE: light-medium olive grey, moderately cemented, friable, fine grained occasionally medium grained, angular-subangular, moderate-well sorted, very fine grained quartz matrix, occasional fine carbonate inclusions, moderately bioturbated, micromicaceous, trace glauconite. SHOW: strong hydrocarbon odour, visible oil in core, 100% bright white/yellow-white direct fluorescence instant streaming milky yellow-white cut, straw colouring to solvent thick yellow-white residual ring.
1271.7-1272.3m	SANDSTONE: light-dark grey, moderately cemented, friable,very fine to fine grained occasionally medium grained, angular-subangular, moderate to well sorted, very fine grained quartz matrix, micromicaceous, abundant carbonaceous matter and laminae, highly bioturbated. SHOW: strong hydrocarbon odour, visible oil in core 100% bright white/yellow-white direct fluorescence instant streaming yellow-white cut thick yellow-white residual ring
1272.3-1273.5m	SANDSTONE: light grey, fine grained, moderately cemented, friable, angular-subangular, well sorted, very fine grained quartz matrix, micromicaceous, occasional fine carbonaceous inclusions, moderately bioturbated. SHOW: strong hydrocarbon odour, visible oil in core 100% bright white/yellow-white direct fluorescence instant streaming yellow-white cut thick yellow-white residual ring
1273.5-1273.8m	SANDSTONE: light grey, fine to very coarse grained occasionally granular, angular-subangular, very friable-loose, poorly sorted, very fine grained quartz matrix, occasional fine carbonaceous inclusions. SHOW: strong hydrocarbon odour, visible oil in core 100% bright white/yellow white direct fluorescence instant streaming yellow-white cut thick yellow-white residual ring.

1273.8-1274.1m	SANDSTONE: medium grey, fine grained occasionally medium, angular-subangular, moderately cemented, friable, moderately well sorted, carbonaceous laminae, micromicaceous. SHOW: strong hydrocarbon odour, visible oil in core 100% bright white/yellow-white direct fluorescence instant streaming yellow-white cut thick yellow-white residual ring.
1274.1-1274.8m	SANDSTONE: light grey, coarse to very coarse grained, subangular-subround, poor-moderate cement, well sorted, clay coating around very coarse grains, very fine grained quartz matrix, occasional fine carbonaceous inclusions SHOW: strong hydrocarbon odour, visible oil in core 100% bright white/yellow-white direct fluorescence instant streaming white cut thick yellow-white residual ring.
1274.8-1275.9m	SANDSTONE: light grey, very fine to fine grained,moderatley cemented, friable, angular-subangular, well sorted, argillaceous matrix, abundant carbonate inclusions and laminae, micromicaceous, bioturbated. SHOW: strong hydrocarbon odour, visible oil in core 100% bright white/yellow white direct fluorescence instant streaming yellow-white cut thick yellow-white residual ring.
1275.9-1276.5m	SANDSTONE: light to medium grey, fine grained,angular-subangular, moderately cemented, well sorted, very fine grained quartz matrix, abundant carbonaceous inclusions and laminae, micromicaceous, bioturbated. SHOW: strong hydrocarbon odour, visible oil in core 100% bright white/yellow direct fluorescence instant streaming yellow-white cut thick yellow-white residual ring.
1276.5-1278.6m	SANDSTONE: light to dark grey,very fine to fine grained,angular-subangular, well cemented, well sorted, abundant argillaceous matrix, occasional carbonate inclusions and common carbonate laminae, micromicaceous, bioturbated. SHOW: strong hydrocarbon odour, visible oil in core 100% bright white/yellow direct fluorescence instant streaming yellow-white cut thick yellow-white residual ring.

1278.6-1279.2m	SANDSTONE: medium to dark grey, very fine to fine grained, angular-subangular, moderately cemented, moderate to well sorted, argillaceous matrix, abundant carbonaceous laminae, micromicaceous, bioturbated. SHOW: strong hydrocarbon odour, visible oil in core 100% bright white/yellow direct fluorescence instant streaming yellow-white cut thick yellow-white residual ring.
1279.2-1281.3m	SANDSTONE: light grey, fine grained, angular-subangular, moderatley cemented, friable, well sorted, occasional carbonaceous material, micromicaceous. SHOW: trace pinpoint dull yellow direct fluorescence. No instant/crush cut, no residue.
1281.3-1282.2m	SANDSTONE: medium grey, fine grained occasionally mediumgrained, angular-subangular, moderately cemented, friable, moderate carbonaceous specks and disrupted carbonate laminae, micromicaceous. No shows.
1282.2-1283.0m	SANDSTONE: dark grey, fine grained occasionally mediumgrained, angular-subangular, moderately cemented, friable, abundant carbonaceous laminae, bioturbated, micromicaceous. No shows.
1283.2-1283.6m	SANDSTONE: medium to dark grey, medium to coarse grained, (coarse grains rare), firm to firable, angular-subangular, poorly sorted, moderately cemented, disseminated pyrite, micromicaceous, trace glauconite. No shows.
1283.6-1285.5m	SANDSTONE: grey brown to light grey brown, fine to mediumgrained, very friable, angular-subangular, moderately well sorted, poorly cemented, minor carbonaceous inclusions, trace micromicaceous, massive. No shows.

1285.5-1287.0m	SANDSTONE: light grey brown, predominately medium grained,angular-subangular, moderatley well sorted, poorly cemented, trace micromicaceous, rare carbonate inclusions, massive. No shows.
1287.0-1288.8m	SANDSTONE: light grey brown, occasionally coarse grained,angular-subangular, moderate sorting, poorly cemented, rare carbonate inclusions, micromicaceous, massive.

31 May 1990

BHP Petroleum
35 Collins Street
MELBOURNE VIC 3000

Attention: Dr R V Halyburton

FINAL DATA REPORT - CONVENTIONAL CORE ANALYSIS

REPORT: 005/008 - AMBERJACK #1

Core No 1, 1271.40-1288.96 (17.56m) was collected from the Heliport at Port Welshpool Airport on 10 May 1990.

The following report includes tabular data of permeability to air, helium injection porosity, summation of fluids porosity, residual fluid saturations and density determinations. Data presented graphically includes a continuous core gamma log, a core log plot and a porosity versus permeability to air plot.

The data contained in this report has been derived by the following methods:

1. CONTINUOUS CORE GAMMA

The core is laid out according to the depths marked on it and a continuous core gamma trace produced by passing the core beneath a gamma radiation detector which is protected from extraneous radiation by a lead tunnel. The speed at which the core is passed beneath the detector is adjusted so as to reproduce the required vertical scale; electronic amplification and digitization are used to produce a gamma trace similar to that of the downhole log.

2. FLUID SATURATIONS

After completion of the core gamma work the core is laid out according to the depth and oriented so as to present the maximum dip of the bedding. Approximately 2 cm of core is dry-trimmed from the whole core pieces at intervals of approximately 30 cms. About 100 gms of this broken material is utilized to determine the residual oil and water saturations. This is done using a thermostatically controlled high temperature retort which is initially heated to 160°C and water produced from the core is recorded versus time. When the initial water production reaches a constant level the temperature is increased to 650°C and residual hydrocarbons and remaining bound water are recovered.

3. SUMMATION OF FLUIDS POROSITY

A small irregular sample is taken from the broken portion of core obtained as in Section 2, above, and this is used for the determination of bulk volume and gas volume. The latter is measured by recording the volume of mercury injected into the sample at 750 psig (5200 kpa). The summation of fluids porosity is then calculated by summing the 3 values: initial water produced, oil produced and gas volume. The porosity is calculated by expressing the sum of these as a percentage of the bulk volume (determined by mercury immersion).

4. PLUG CUTTING & DRYING

Two 1½" diameter plugs are taken at 30 cm intervals adjacent to the core section taken for residual fluids. Liquid nitrogen was used as bit lubricant on first 42 samples due to the soft and friable nature of core. For the remaining 17 samples, tapwater was used as the bit lubricant. One sample is cut parallel, and the second at 90° to the bedding plane, thus giving theoretical maximum and minimum permeability into the well bore. Samples are trimmed square and the offcuts retained. Residual hydrocarbon are extracted from the plugs using toluene in a Soxhlet extractor. The density of the recycled toluene is compared to clean toluene as a control to ensure that no extractable oil remains in the plugs.

After cleaning, the plugs are dried in a controlled humidity environment at temperatures not exceeding 105°C and are then stored in an airtight plastic container and allowed to cool to room temperature.

5. NATURAL DENSITY

The natural density is the bulk density of the rock containing, as near as possible, the in-situ fluids. This density value is determined by mercury immersion, which gives the sample bulk volume, and by weighing the sample in its natural state.

6. PERMEABILITY TO AIR

A plug sample is used for this measurement and is placed in a Hassler cell to which a confining pressure of 200 psig (1380 kpa) is applied; this pressure is used to prevent bypassing of air around the sides of the sample when the measurement is made. A known pressure is then applied to the upstream sample face and the differential pressure (between the upstream and downstream faces) is monitored at the downstream face. Permeability is then calculated using Darcy's Law.

7. HELIUM INJECTION POROSITY

The porosity of a clean dry core plug is determined as follows: it is first placed in a matrix cup where the grain volume is measured by helium injection: a known volume of helium at a known pressure is expanded into the matrix cup which contains the core plug; the resulting pressure is recorded and the unknown volume (that is, the volume of the grains) is determined using Boyle's Law. The bulk volume is determined by mercury immersion. The difference between the grain volume and the bulk volume is the pore volume and from this the porosity is calculated as the volume percentage of pores with respect to the bulk volume.

8. APPARENT GRAIN DENSITY

The apparent grain density is derived from the measurements described in Section 7, above, and is the ratio of the weight of the core plug divided by the grain volume determined as in paragraph 7.

9. POROSITY AND PERMEABILITY AT OVERBURDEN PRESSURE

To determine the porosity and permeability of the core plug at overburden pressure, the sample is first placed in a cylindrical neoprene sheath and this assembly is loaded into a triaxial hydrostatic cell. The pore volume is then determined at "ambient" pressure. The overburden pressure (the value as supplied by the client) is then applied to the sample in the cell and the pore volume reduction caused by this increase in pressure, is measured. By this means the actual overburden pore volume and the bulk volume can be determined and are used to derive a value for the porosity at the applied overburden pressure. The permeability at overburden pressure is then measured in the hydrostatic cell exactly as described in paragraph 7.

10. API GRAVITY

Composite samples from a particular reservoir are collected from the retort during fluid saturation determinations. Specific gravity is measured by the pycnometer method and converted mathematically to degrees API to comply with Industry standards.

11. ROLLING AND SPECIFIED AVERAGES

These averages of both Helium injection porosity and permeability are obtained by using a "rolling" three (3) point method. In the case of porosity a weighted arithmetic average is used:

$$\phi \text{ av}_{(i+1)} = [\phi_i + 2\phi_{(i+1)} + \phi_{(i+2)}] /4$$

In the case of permeability a weighted geometric average is used:

$$K \text{ av}_{(i+1)} = 10^{[(\log_{10} K_i + 2 \log_{10} K_{(i+1)} + \log_{10} K_{(i+2)}) /4]}$$

At any sample point, excluding the first and last, a rolling average is obtained by using the value at the specified sample point, the value before it and the value of the sample point after it. In the cases of the first and last sample points, only 2 sample points are used.

Using porosity as an example, the average of the first data point is obtained from the formula:

$$\phi \text{ av}_{(i)} = [2\phi_i + \phi_{(i+1)}] /3$$

The average at the final data point is obtained by:

$$\phi \text{ av}_{(f)} = [\phi_{(f-1)} + 2\phi_{(f)}] /3$$

The same method is used for permeability averages. At any break in the data the rolling averages are "re-started".

Data Key:

ϕ	=	porosity
K	=	permeability
i	=	initial
av	=	average
f	=	final

Specified averages are normal arithmetic averages which can be taken over any specified section of the core, as well as over the whole core.

On completion of the analysis the core was slabbed into one half, and two quarter slabs using water as the lubricating medium. One quarter was packed and shipped to the WA Department of Mines & Energy Core Library. The remaining quarter was packed and shipped to the BMR, Canberra. The one half slab was photographed under both white light and ultra-violet light. this half was then packed and shipped to the BHPP core store in Melbourne.

We have enjoyed working with BHPP and look forward to working with you again in the near future.

END OF REPORT

NB

Routine quality control checks identified relatively low porosity results for preliminary data of samples 12, 40, 41, 9A, 11A, 12A, 40A and 41A.

During bulk volume determinations, mercury was found to slightly penetrate the extremities of the sample and thus effectively lowering porosity data.

Appropriate corrections were made to all relevant samples and reported.

Amdel Core Services Pty. Limited
Petroleum Reservoir Engineering Data

PO Box 523 Strathpine Q 4500 Aust.
Tel : (07) 298-5272

CORE ANALYSIS FINAL REPORT

Company : BHP PETROLEUM PTY. LTD.
Well : AMBERJACK #1
Field : WILDCAT (Vic-P-25) Date : 11/05/90
Core Interval : 1271.40 - 1288.96
Core Interval :
File No. : 5-008
Country : AUSTRALIA State : VICTORIA

Sample No.	Depth	Porosity HeInj	Porosity RollPor	Density Nat	Density Grain	Permeability (md) KH	Permeability (md) Roll KH	Summation of Fluids Por	Summation of Fluids Oil	Summation of Fluids Water	Remarks See Below
1	1271.50	32.2	31.8	2.04	2.66	784	821	27.5	5.9	77.1	C# SP
1A	1271.50	31.4	31.3		2.66	672	653				SP
2	1271.70	31.0	31.0	2.05	2.67	902	714	30.0	4.1	75.4	
2A	1271.70	31.0	30.4		2.66	616	510				
3	1272.00	29.8	30.9	2.10	2.66	407	691	28.1	5.2	78.6	
3A	1272.00	28.3	30.0		2.64	266	502				
4	1272.30	32.9	32.3	2.03	2.65	1523	1135	33.2	2.4	80.8	
4A	1272.30	32.3	31.6		2.65	1455	1035				
5	1272.60	33.4	33.2	2.05	2.66	1760	1741	33.2	1.9	85.2	
5A	1272.60	33.4	33.0		2.65	2040	1969				
6	1272.90	33.1	33.3	2.07	2.66	1948	1794	33.7	3.7	85.9	
6A	1272.90	33.0	33.3		2.65	2482	2194				SP
7	1273.20	33.5	33.4	2.07	2.65	1552	1556	33.0	1.3	84.3	
7A	1273.20	33.7	32.8		2.65	1844	1571				
8	1273.50	33.4	32.3	2.04	2.67	1250	1410	33.9	5.4	78.3	SP*
8A	1273.50	30.9	31.1		2.66	721	1169				SP*
9	1273.80	29.0	31.3	2.15	2.65	1629	1417	25.8	2.5	76.8	SP*
9A	1273.80	29.0	30.6		2.65	1948	1435				SP*
10	1274.10	33.7	32.6	2.04	2.66	1216	2852	25.0	.8	82.4	SP*
10A	1274.10	33.4	31.9		2.66	1551	2877				SP*
11	1274.40	34.0	32.9	2.16	2.65	27469	12107	30.0	1.4	90.6	
11A	1274.40	31.8	31.7		2.65	14630	8604				
12	1274.70	29.8	31.5	2.16	2.65	23419	10821	28.6	1.5	90.7	
12A	1274.70	29.7	31.1		2.66	16511	8275				
13	1275.00	32.4	31.5	2.07	2.64	910	1979	33.0	3.1	84.6	SP*
13A	1275.00	33.4	31.4		2.66	1176	1658				SP*
14	1275.30	31.4	31.3	2.10	2.66	792	934	31.5	2.7	88.5	
14A	1275.30	29.1	30.5		2.65	331	511				
15	1275.60	30.0	29.9	2.14	2.67	1335	767	31.8	3.4	84.6	
15A	1275.60	30.5	29.7		2.65	530	442				
16	1275.90	28.3	29.1	2.09	2.65	245	418	30.9	4.7	78.6	
16A	1275.90	28.9	28.9		2.65	411	356				
17	1276.20	29.8	29.4	2.12	2.66	380	324	20.2	3.1	72.3	
17A	1276.20	27.5	28.5		2.65	180	269				
18	1276.50	29.7	29.0	2.10	2.66	310	269	29.3	5.0	81.1	
18A	1276.50	30.1	29.0		2.65	395	293				
19	1276.80	27.0	28.4	2.15	2.66	143	218	30.4	2.1	84.2	
19A	1276.80	28.3	29.4		2.66	261	348				SP*
20	1277.10	30.0	29.3	2.12	2.66	357	293	27.1	1.6	84.6	
20A	1277.10	31.0	30.3		2.67	544	422				SP

BHP PETROLEUM PTY. LTD. :
AMBERJACK #1 : Analysis by
Amdel Core Services Pty. Limited

Sample No.	Depth	Porosity HeInj	Porosity RollPor	Density Nat	Density Grain	Permeability (md) KH	Permeability (md) Roll KH	Summation of Fluids Por	Summation of Fluids Oil	Summation of Fluids Water	Remarks See Below
21	1277.40	30.1	29.3	2.10	2.68	408	319	28.5	2.2	82.1	
21A	1277.40	30.8	30.1		2.68	411	416				SP*
22	1277.70	26.9	28.8	2.17	2.67	175	285	27.2	4.8	82.2	
22A	1277.70	27.7	29.3		2.67	326	413				
23	1278.00	31.4	29.5	2.08	2.68	533	325	31.6	3.9	81.6	
23A	1278.00	31.0	29.6		2.66	668	459				SP*
24	1278.30	28.3	29.8	2.14	2.69	225	357	29.9	5.0	79.2	
24A	1278.30	28.7	30.1		2.67	305	486				
25	1278.60	31.1	30.7	2.09	2.67	603	554	31.9	3.9	83.1	
25A	1278.60	32.0	30.5		2.68	902	649				
26	1278.90	32.5	30.9	2.09	2.67	1150	625	32.2	3.9	83.0	SP
26A	1278.90	29.4	29.1		2.67	716	516				SP*
27	1279.20	27.6	29.9	2.13	2.66	192	489	29.7	2.9	81.0	
27A	1279.20	25.5	28.1		2.64	154	419				
28	1279.50	31.7	31.0	2.08	2.68	1360	920	33.4	4.4	84.9	
28A	1279.50	31.9	30.2		2.67	1823	970				
29	1279.80	32.9	32.1	2.03	2.68	2022	1671	32.0	3.2	81.9	
29A	1279.80	31.3	31.7		2.66	1734	1778				SP
30	1280.10	31.0	31.7	2.10	2.67	1403	1479	30.1	1.4	89.3	
30A	1280.10	32.1	32.1		2.66	1823	1827				
31	1280.40	32.0	31.9	2.07	2.67	1202	1300	29.7	1.4	88.0	OWC
31A	1280.40	32.7	32.2		2.66	1931	1934				
32	1280.70	32.6	32.7	2.10	2.67	1409	1365	31.6	.0	93.7	
32A	1280.70	31.2	32.2		2.66	2058	2009				
33	1281.00	33.5	33.2	2.04	2.67	1454	1435	33.8	.0	89.6	
33A	1281.00	33.5	32.9		2.67	1992	2050				
34	1281.30	33.3	33.1	2.09	2.67	1425	1470	32.8	.0	93.5	
34A	1281.30	33.4	32.9		2.67	2161	2097				
35	1281.60	32.5	32.7	2.09	2.68	1584	1523	32.0	.0	90.3	
35A	1281.60	31.3	32.1		2.68	2078	2082				
36	1281.90	32.6	32.5	2.07	2.68	1505	1429	29.4	.0	90.3	
36A	1281.90	32.5	32.2		2.67	2014	1932				
37	1282.20	32.3	31.2	2.11	2.68	1163	983	32.2	.0	94.3	
37A	1282.20	32.3	31.4		2.67	1652	1147				
38	1282.50	27.4	29.0	2.18	2.68	459	536	26.4	.0	89.3	
38A	1282.50	28.7	28.8		2.67	315	339				
39	1282.80	28.8	27.7	2.15	2.67	338	723	14.6	.0	75.2	
39A	1282.80	25.5	26.4		2.65	81	299				
40	1283.10	25.6	26.1	2.29	2.79	5218	2703	29.8	.0	86.9	
40A	1283.10	25.7	24.8		2.77	3877	1500				
41	1283.40	24.4	25.7	2.30	2.72	5798	6016	16.7	.0	79.9	
41A	1283.40	22.1	24.2		2.70	4168	3900				
42	1283.70	28.3	27.6	2.18	2.67	7469	5827	27.2	.0	95.5	
42A	1283.70	26.8	26.4		2.66	3435	3539				
43	1284.00	29.5	29.4	2.11	2.67	3564	4699	31.2	.0	92.2	
43A	1284.00	30.0	29.1		2.65	3191	3526				
44	1284.30	30.1	29.8	2.10	2.66	5138	4716	31.5	.0	91.4	
44A	1284.30	29.5	29.6		2.65	4420	4074				
45	1284.60	29.5	29.8	2.13	2.66	5257	5172	28.1	.0	93.1	
45A	1284.60	29.2	29.6		2.65	4420	4156				
46	1284.90	30.0	29.8	2.12	2.66	5038	4927	30.5	.0	92.3	
46A	1284.90	30.4	30.3		2.65	3455	3584				

BHP PETROLEUM PTY. LTD. :
AMBERJACK #1 : Analysis by
Amdel Core Services Pty. Limited

Sample No.	Depth	Porosity HeInj	Porosity RollPor	Density Nat	Density Grain	Permeability (md) KH	Permeability (md) Roll KH	Summation of Fluids Por	Summation of Fluids Oil	Summation of Fluids Water	Remarks See Below
47	1285.20	29.4	30.1	2.05	2.66	4416	3987	33.2	.0	84.6	
47A	1285.20	31.0	30.7		2.65	3128	3574				
48	1285.50	31.6	31.1	2.10	2.66	2572	3284	28.0	.0	89.3	
48A	1285.50	30.3	30.6		2.65	4826	4356				
49	1285.80	31.8	31.5	2.08	2.66	3983	3868	33.7	.0	83.4	
49A	1285.80	30.6	31.0		2.66	4943	4459				
50	1286.10	30.6	31.4	2.12	2.67	5484	4809	26.4	.0	93.9	
50A	1286.10	32.2	31.7		2.66	3351	3738				
51	1286.40	32.6	31.5	2.09	2.66	4466	5133	30.9	.0	92.6	
51A	1286.40	31.8	31.7		2.66	3517	3519				
52	1286.70	30.3	31.0	2.08	2.66	6348	5285	32.0	.0	90.5	
52A	1286.70	30.9	31.3		2.66	3699	3744				
53	1287.00	30.8	30.5	2.11	2.66	4334	4845	32.2	.0	92.3	
53A	1287.00	31.7	31.3		2.66	4086	4064				
54	1287.30	30.2	30.1	2.09	2.66	4621	4592	31.5	.0	90.5	
54A	1287.30	30.6	30.2		2.65	4420	4300				
55	1287.60	29.0	29.8	2.10	2.66	4803	4497	31.9	.0	87.0	
55A	1287.60	27.9	29.1		2.66	4282	4109				
56	1287.90	30.8	30.6	2.10	2.66	3836	4316	32.0	.0	92.0	
56A	1287.90	29.9	29.8		2.65	3517	3481				
57	1288.20	32.0	31.2	2.07	2.66	4911	4104	32.8	.0	87.3	
57A	1288.20	31.4	30.6		2.65	2772	2879				
58	1288.50	30.1	30.7	2.13	2.66	3065	3485	26.6	.0	88.0	
58A	1288.50	29.6	30.3		2.65	2541	2570				
59	1288.80	30.7	30.5	2.06	2.66	3196	3152	33.1	.0	82.9	B#
59A	1288.80	30.6	30.2		2.65	2437	2471				

VF = Vertical Fracture; HF = Horizontal Fracture; MP = Mounted Plug; SP= Short Plug
C# = Top of Core; B# = Bottom of Core; OWC = Probable Oil/Water Contact
Tr = Probable Transition Zone; GC = Probable Gas Cap

Amdel Core Services Pty. Limited
Petroleum Reservoir Engineering Data

PO Box 523 Strathpine Q 4500 Aust.
Tel : (07) 298-5272

CORE ANALYSIS FINAL REPORT

Company : BHP PETROLEUM PTY. LTD.
Well : AMBERJACK #1
Field : WILDCAT (Vic-P-25) Date : 11/05/90
Core Interval : 1271.40 - 1288.96
Core Interval :
File No. : 5-008
Country : AUSTRALIA State : VICTORIA

Sample No.	Depth	Porosity HeInj	Porosity RollPor	Density Nat	Density Grain	Permeability (md) KH	Permeability (md) Roll KH	Summation of Fluids Por	Summation of Fluids Oil	Summation of Fluids Water	Remarks See Below
1	1271.50	32.2	31.8	2.04	2.66	784	821	27.5	5.9	77.1	C# SP
2	1271.70	31.0	31.0	2.05	2.67	902	714	30.0	4.1	75.4	
3	1272.00	29.8	30.9	2.10	2.66	407	691	28.1	5.2	78.6	
4	1272.30	32.9	32.3	2.03	2.65	1523	1135	33.2	2.4	80.8	
5	1272.60	33.4	33.2	2.05	2.66	1760	1741	33.2	1.9	85.2	
6	1272.90	33.1	33.3	2.07	2.66	1948	1794	33.7	3.7	85.9	
7	1273.20	33.5	33.4	2.07	2.65	1552	1556	33.0	1.3	84.3	
8	1273.50	33.4	32.3	2.04	2.67	1250	1410	33.9	5.4	78.3	SP*
9	1273.80	29.0	31.3	2.15	2.65	1629	1417	25.8	2.5	76.8	SP*
10	1274.10	33.7	32.6	2.04	2.66	1216	2852	25.0	.8	82.4	SP*
11	1274.40	34.0	32.9	2.16	2.65	27469	12107	30.0	1.4	90.6	
12	1274.70	29.8	31.5	2.16	2.65	23419	10821	28.6	1.5	90.7	
13	1275.00	32.4	31.5	2.07	2.64	910	1979	33.0	3.1	84.6	SP*
14	1275.30	31.4	31.3	2.10	2.66	792	934	31.5	2.7	88.5	
15	1275.60	30.0	29.9	2.14	2.67	1335	767	31.8	3.4	84.6	
16	1275.90	28.3	29.1	2.09	2.65	245	418	30.9	4.7	78.6	
17	1276.20	29.8	29.4	2.12	2.66	380	324	20.2	3.1	72.3	
18	1276.50	29.7	29.0	2.10	2.66	310	269	29.3	5.0	81.1	
19	1276.80	27.0	28.4	2.15	2.66	143	218	30.4	2.1	84.2	
20	1277.10	30.0	29.3	2.12	2.66	357	293	27.1	1.6	84.6	
21	1277.40	30.1	29.3	2.10	2.68	408	319	28.5	2.2	82.1	
22	1277.70	26.9	28.8	2.17	2.67	175	285	27.2	4.8	82.2	
23	1278.00	31.4	29.5	2.08	2.68	533	325	31.6	3.9	81.6	
24	1278.30	28.3	29.8	2.14	2.69	225	357	29.9	5.0	79.2	
25	1278.60	31.1	30.7	2.09	2.67	603	554	31.9	3.9	83.1	
26	1278.90	32.5	30.9	2.09	2.67	1150	625	32.2	3.9	83.0	SP
27	1279.20	27.6	29.9	2.13	2.66	192	489	29.7	2.9	81.0	
28	1279.50	31.7	31.0	2.08	2.68	1360	920	33.4	4.4	84.9	
29	1279.80	32.9	32.1	2.03	2.68	2022	1671	32.0	3.2	81.9	
30	1280.10	31.0	31.7	2.10	2.67	1403	1479	30.1	1.4	89.3	
31	1280.40	32.0	31.9	2.07	2.67	1202	1300	29.7	1.4	88.0	OWC
32	1280.70	32.6	32.7	2.10	2.67	1409	1365	31.6	.0	93.7	
33	1281.00	33.5	33.2	2.04	2.67	1454	1435	33.8	.0	89.6	
34	1281.30	33.3	33.1	2.09	2.67	1425	1470	32.8	.0	93.5	
35	1281.60	32.5	32.7	2.09	2.68	1584	1523	32.0	.0	90.3	
36	1281.90	32.6	32.5	2.07	2.68	1505	1429	29.4	.0	90.3	
37	1282.20	32.3	31.2	2.11	2.68	1163	983	32.2	.0	94.3	
38	1282.50	27.4	29.0	2.18	2.68	459	536	26.4	.0	89.3	
39	1282.80	28.8	27.7	2.15	2.67	338	723	14.6	.0	75.2	

BHP PETROLEUM PTY. LTD. :
AMBERJACK #1 : Analysis by
Amdel Core Services Pty. Limited

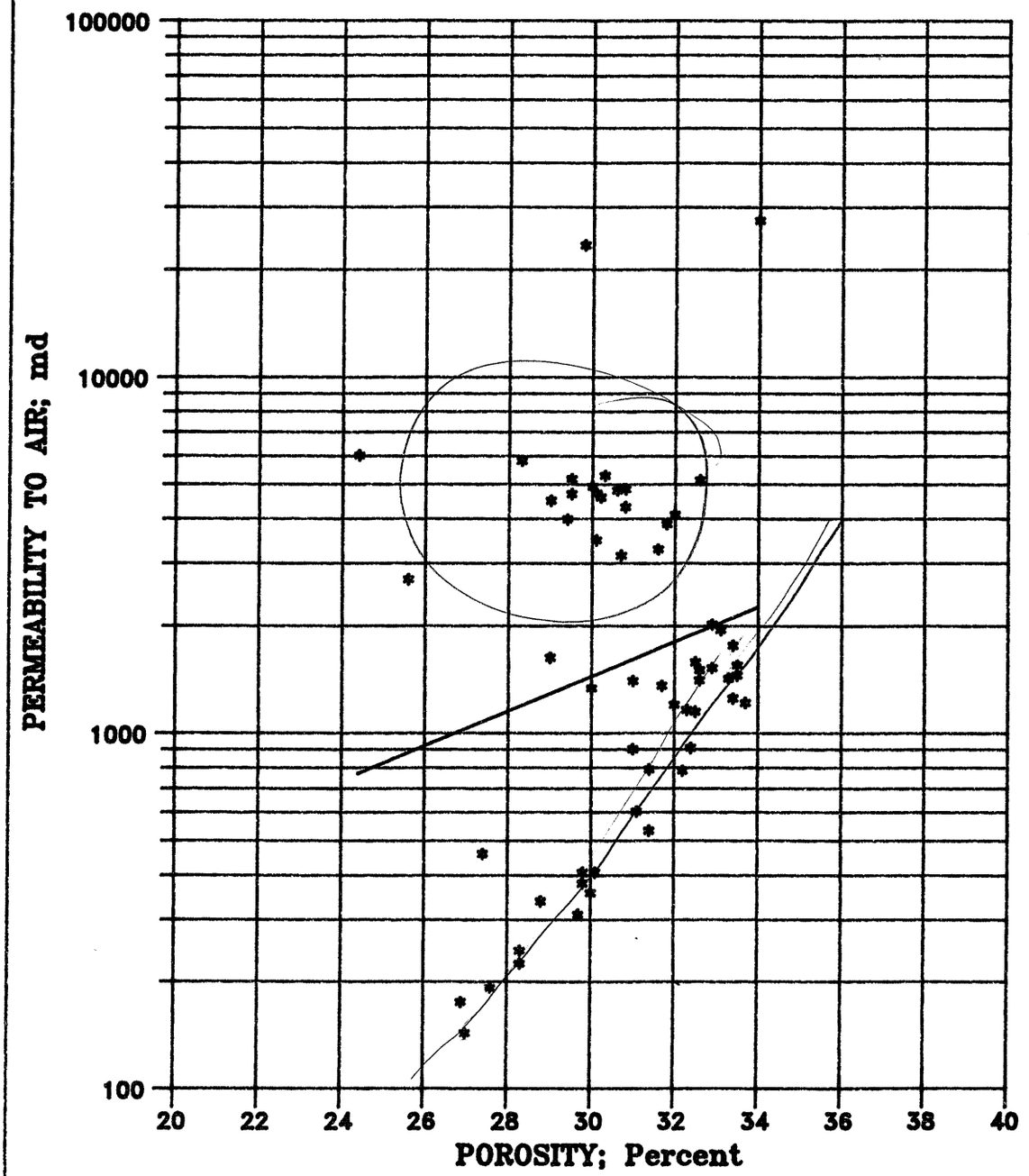
Sample No.	Depth	Porosity HeInj	Porosity RollPor	Density Nat	Density Grain	Permeability (md) KH	Permeability (md) Roll KH	Summation of Fluids Por	Summation of Fluids Oil	Summation of Fluids Water	Remarks See Below
40	1283.10	25.6	26.1	2.29	2.79	5218	2703	29.8	.0	86.9	
41	1283.40	24.4	25.7	2.30	2.72	5798	6016	16.7	.0	79.9	
42	1283.70	28.3	27.6	2.18	2.67	7469	5827	27.2	.0	95.5	
43	1284.00	29.5	29.4	2.11	2.67	3564	4699	31.2	.0	92.2	
44	1284.30	30.1	29.8	2.10	2.66	5138	4716	31.5	.0	91.4	
45	1284.60	29.5	29.8	2.13	2.66	5257	5172	28.1	.0	93.1	
46	1284.90	30.0	29.8	2.12	2.66	5038	4927	30.5	.0	92.3	
47	1285.20	29.4	30.1	2.05	2.66	4416	3987	33.2	.0	84.6	
48	1285.50	31.6	31.1	2.10	2.66	2572	3284	28.0	.0	89.3	
49	1285.80	31.8	31.5	2.08	2.66	3983	3868	33.7	.0	83.4	
50	1286.10	30.6	31.4	2.12	2.67	5484	4809	26.4	.0	93.9	
51	1286.40	32.6	31.5	2.09	2.66	4466	5133	30.9	.0	92.6	
52	1286.70	30.3	31.0	2.08	2.66	6348	5285	32.0	.0	90.5	
53	1287.00	30.8	30.5	2.11	2.66	4334	4845	32.2	.0	92.3	
54	1287.30	30.2	30.1	2.09	2.66	4621	4592	31.5	.0	90.5	
55	1287.60	29.0	29.8	2.10	2.66	4803	4497	31.9	.0	87.0	
56	1287.90	30.8	30.6	2.10	2.66	3836	4316	32.0	.0	92.0	
57	1288.20	32.0	31.2	2.07	2.66	4911	4104	32.8	.0	87.3	
58	1288.50	30.1	30.7	2.13	2.66	3065	3485	26.6	.0	88.0	
59	1288.80	30.7	30.5	2.06	2.66	3196	3152	33.1	.0	82.9	B#

VF = Vertical Fracture; HF = Horizontal Fracture; MP = Mounted Plug; SP= Short Plug
C# = Top of Core; B# = Bottom of Core; OWC = Probable Oil/Water Contact
Tr = Probable Transition Zone; GC = Probable Gas Cap

POROSITY vs PERMEABILITY

Company: BHP Petroleum Pty. Ltd.
Well : Amberjack No. 1

Ambient Y= EXP(0.1122X) * 49.86



Porosity & Perm Arithmetic Average Specified Interval :5-008

Start Sample :	1	End Sample :	31
Depth :	1271.50	Depth :	1280.40

POROSITY Average : 30.9 over 31 Samples
0 Samples with a ZERO Porosity Value Ignored

Sample Type :R

PERMEABILITY Average : 2503 over 31 Samples
0 Samples with a ZERO Permeablity Value Ignored

Porosity & Perm Arithmetic Average Specified Interval :5-008

Start Sample :	32	End Sample :	59
Depth :	1280.70	Depth :	1288.80

POROSITY Average : 30.3 over 28 Samples
0 Samples with a ZERO Porosity Value Ignored

Sample Type :R

PERMEABILITY Average : 3673 over 28 Samples
0 Samples with a ZERO Permeablity Value Ignored

Amdel Core Services Pty. Limited
Petroleum Reservoir Engineering Data

PO Box 523 Strathpine Q 4500 Aust.
Tel : (07) 298-5272

CORE ANALYSIS FINAL REPORT

Company : BHP PETROLEUM PTY. LTD.
Well : AMBERJACK #1
Field : WILDCAT (Vic-P-25) Date : 11/05/90
Core Interval : 1271.40 - 1288.96
Core Interval :
File No. : 5-008
Country : AUSTRALIA State : VICTORIA

Sample No.	Depth	Porosity HeInj	Porosity RollPor	Density Nat	Density Grain	Permeability (md) KH	Permeability (md) Roll KH	Summation of Fluids Por	Summation of Fluids Oil	Summation of Fluids Water	Remarks See Below
1A	1271.50	31.4	31.3		2.66	672	653				SP
2A	1271.70	31.0	30.4		2.66	616	510				
3A	1272.00	28.3	30.0		2.64	266	502				
4A	1272.30	32.3	31.6		2.65	1455	1035				
5A	1272.60	33.4	33.0		2.65	2040	1969				
6A	1272.90	33.0	33.3		2.65	2482	2194				SP
7A	1273.20	33.7	32.8		2.65	1844	1571				
8A	1273.50	30.9	31.1		2.66	721	1169				SP*
9A	1273.80	29.0	30.6		2.65	1948	1435				SP*
10A	1274.10	33.4	31.9		2.66	1551	2877				SP*
11A	1274.40	31.8	31.7		2.65	14630	8604				
12A	1274.70	29.7	31.1		2.66	16511	8275				
13A	1275.00	33.4	31.4		2.66	1176	1658				SP*
14A	1275.30	29.1	30.5		2.65	331	511				
15A	1275.60	30.5	29.7		2.65	530	442				
16A	1275.90	28.9	28.9		2.65	411	356				
17A	1276.20	27.5	28.5		2.65	180	269				
18A	1276.50	30.1	29.0		2.65	395	293				
19A	1276.80	28.3	29.4		2.66	261	348				SP*
20A	1277.10	31.0	30.3		2.67	544	422				SP
21A	1277.40	30.8	30.1		2.68	411	416				SP*
22A	1277.70	27.7	29.3		2.67	326	413				
23A	1278.00	31.0	29.6		2.66	668	459				SP*
24A	1278.30	28.7	30.1		2.67	305	486				
25A	1278.60	32.0	30.5		2.68	902	649				
26A	1278.90	29.4	29.1		2.67	716	516				SP*
27A	1279.20	25.5	28.1		2.64	154	419				
28A	1279.50	31.9	30.2		2.67	1823	970				
29A	1279.80	31.3	31.7		2.66	1734	1778				SP
30A	1280.10	32.1	32.1		2.66	1823	1827				
31A	1280.40	32.7	32.2		2.66	1931	1934				
32A	1280.70	31.2	32.2		2.66	2058	2009				
33A	1281.00	33.5	32.9		2.67	1992	2050				
34A	1281.30	33.4	32.9		2.67	2161	2097				
35A	1281.60	31.3	32.1		2.68	2078	2082				
36A	1281.90	32.5	32.2		2.67	2014	1932				
37A	1282.20	32.3	31.4		2.67	1652	1147				
38A	1282.50	28.7	28.8		2.67	315	339				
39A	1282.80	25.5	26.4		2.65	81	299				

BHP PETROLEUM PTY. LTD. :
AMBERJACK #1 : Analysis by
Amdel Core Services Pty. Limited

Sample No.	Depth	Porosity HeInj	Porosity RollPor	Density Nat	Density Grain	Permeability (md) KH	Permeability (md) Roll KH	Summation of Fluids Por	Summation of Fluids Oil	Summation of Fluids Water	Remarks See Below
40A	1283.10	25.7	24.8	2.77		3877	1500				
41A	1283.40	22.1	24.2	2.70		4168	3900				
42A	1283.70	26.8	26.4	2.66		3435	3539				
43A	1284.00	30.0	29.1	2.65		3191	3526				
44A	1284.30	29.5	29.6	2.65		4420	4074				
45A	1284.60	29.2	29.6	2.65		4420	4156				
46A	1284.90	30.4	30.3	2.65		3455	3584				
47A	1285.20	31.0	30.7	2.65		3128	3574				
48A	1285.50	30.3	30.6	2.65		4826	4356				
49A	1285.80	30.6	31.0	2.66		4943	4459				
50A	1286.10	32.2	31.7	2.66		3351	3738				
51A	1286.40	31.8	31.7	2.66		3517	3519				
52A	1286.70	30.9	31.3	2.66		3699	3744				
53A	1287.00	31.7	31.3	2.66		4086	4064				
54A	1287.30	30.6	30.2	2.65		4420	4300				
55A	1287.60	27.9	29.1	2.66		4282	4109				
56A	1287.90	29.9	29.8	2.65		3517	3481				
57A	1288.20	31.4	30.6	2.65		2772	2879				
58A	1288.50	29.6	30.3	2.65		2541	2570				
59A	1288.80	30.6	30.2	2.65		2437	2471				

VF = Vertical Fracture; HF = Horizontal Fracture; MP = Mounted Plug; SP= Short Plug
C# = Top of Core; B# = Bottom of Core; OWC = Probable Oil/Water Contact
Tr = Probable Transition Zone; GC = Probable Gas Cap

Porosity & Perm Arithmetic Average Specified Interval :5-008

Start Sample :	1	End Sample :	59
Depth :	1271.50	Depth :	1288.80

POROSITY Average : 30.3 over 59 Samples
0 Samples with a ZERO Porosity Value Ignored

Sample Type :A

PERMEABILITY Average : 2477 over 59 Samples
0 Samples with a ZERO Permeablity Value Ignored

Porosity & Perm Arithmetic Average Specified Interval :5-008

Start Sample :	1	End Sample :	29
Depth :	1271.50	Depth :	1279.80

POROSITY Average : 30.5 over 29 Samples
0 Samples with a ZERO Porosity Value Ignored

Sample Type :A

PERMEABILITY Average : 1917 over 29 Samples
0 Samples with a ZERO Permeablity Value Ignored

Porosity & Perm Arithmetic Average Specified Interval :5-008

Start Sample :	1	End Sample :	31
Depth :	1271.50	Depth :	1280.40

POROSITY Average : 30.6 over 31 Samples
0 Samples with a ZERO Porosity Value Ignored

Sample Type :A

PERMEABILITY Average : 1914 over 31 Samples
0 Samples with a ZERO Permeablity Value Ignored

Porosity & Perm Arithmetic Average Specified Interval :5-008

Start Sample :	32	End Sample :	59
Depth :	1280.70	Depth :	1288.80

POROSITY Average : 30.0 over 28 Samples
0 Samples with a ZERO Porosity Value Ignored

Sample Type :A

PERMEABILITY Average : 3101 over 28 Samples
0 Samples with a ZERO Permeablity Value Ignored

Amdel Core Services Pty. Limited
Petroleum Reservoir Engineering Data

PO Box 523 Strathpine Q 4500 Aust.
Tel : (07) 298-5272

CORE ANALYSIS FINAL REPORT

Company : BHP PETROLEUM PTY. LTD.
Well : AMBERJACK #1
Field : WILDCAT (Vic-P-25) Date : 11/05/90
Core Interval : 1271.40 - 1288.96
Core Interval :
File No. : 5-008
Country : AUSTRALIA State : VICTORIA

Sample No.	Depth	Porosity HeInj	Porosity RollPor	Density Nat	Density Grain	Permeability (md) KH	Permeability (md) Roll KH	Summation of Fluids Por	Summation of Fluids Oil	Summation of Fluids Water	Remarks See Below
V Samples											
1	2171.90					142					
2	1273.70					806					
3	1275.20					554					
4	1277.30					171					
5	1279.20					90					
6	1281.00					1036					
7	1282.80					34					
8	1284.90					3795					
9	1286.70					2762					
10	1288.50					2202					

VF = Vertical Fracture; HF = Horizontal Fracture; MP = Mounted Plug; SP= Short Plug
C# = Top of Core; B# = Bottom of Core; OWC = Probable Oil/Water Contact
Tr = Probable Transition Zone; GC = Probable Gas Cap

Porosity & Perm Arithmetic Average Specified Interval :5-008

Start Sample :	1	End Sample :	10
Depth :	2171.90	Depth :	1288.50

POROSITY Average : .0 over 0 Samples
10 Samples with a ZERO Porosity Value Ignored

Sample Type :V

PERMEABILITY Average : 1159 over 10 Samples
0 Samples with a ZERO Permeablity Value Ignored

Amdel Core Services Pty. Limited
Petroleum Reservoir Engineering Data

PO Box 523 Strathpine Q 4500 Aust.
Tel : (07) 298-5272

OVERBURDEN ANALYSIS FINAL REPORT

Company : BHP PETROLEUM PTY. LTD.
Well : AMBERJACK #1
Field : WILDCAT (Vic-P-25) Date : 11/05/90
Core Interval : 1271.40 - 1288.96
Core Interval :
File No. : 5-008
Country : AUSTRALIA State : VICTORIA

SAMPLE NUMBER	DEPTH	POROSITY at OVERBURDEN Pressures Ambient	psi 1900	psi 2400	psi 2900	psi 0	psi 0	Porosity Rolling Average	PERMEABILITY at OVERBURDEN Pressures Ambient 200 psi	psi 1900	psi 2400	psi 2900	psi 0	psi 0	PERMEAB Rolling Average
				2400											2400
1	1271.50	32.2	29.5	29.1	28.8			28.5	784	579	545	514			440.3
3	1272.00	29.8	27.5	27.3	27.2			28.7	407	306	287	274			486.6
5	1272.60	33.4	31.3	31.1	30.8			28.4	1760	1281	1248	1137			800.1
7	1273.20	33.5	24.1	24.0	23.9			27.3	1552	960	918	884			930.0
10	1274.10	33.7	30.3	30.1	29.9			28.0	1216	822	712	629			1649.4
12	1274.70	29.8	27.7	27.6	27.5			28.7	23419	16107	15911	15213			3105.0
14	1275.30	31.4	29.6	29.4	29.2			27.9	792	539	516	499			896.3
16	1275.90	28.3	25.4	25.1	25.0			26.6	245	163	153	145			221.9
18	1276.50	29.7	27.0	26.8	26.5			26.5	310	222	202	188			204.1
20	1277.10	30.0	27.7	27.5	27.2			26.5	357	321	278	254			205.7
22	1277.70	26.9	24.6	24.4	24.3			25.6	175	120	114	112			149.5
24	1278.30	28.3	26.1	25.9	25.8			26.1	225	154	137	124			179.2
25	1278.60	31.1	28.1	28.0	27.8			26.6	603	517	482	459			259.7
27	1279.20	27.6	24.5	24.4	24.2			26.7	192	151	143	137			332.6
29	1279.80	32.9	30.4	30.3	30.1			28.6	2022	1331	1237	1139			615.7
31	1280.40	32.0	29.7	29.5	29.4			30.0	1202	709	655	652			817.6
33	1281.00	33.5	30.9	30.7	30.5			30.2	1454	920	841	762			818.9
35	1281.60	32.5	30.0	29.9	29.7			30.1	1584	1114	971	881			908.5
37	1282.20	32.3	29.9	29.8	29.7			28.9	1163	919	860	821			660.0
39	1282.80	28.8	26.3	26.1	25.9			26.3	338	277	264	257			739.3
41	1283.40	24.4	23.2	23.1	23.0			25.0	5798	5163	4973	4776			2088.7
43	1284.00	29.5	27.9	27.8	27.7			26.6	3564	3127	2911	2747			3668.5
45	1284.60	29.5	28.4	27.9	27.8			27.7	5257	5183	4298	3780			3685.6
47	1285.20	29.4	27.5	27.4	27.2			28.1	4416	3874	3432	3092			3458.3
49	1285.80	31.8	30.0	29.9	29.8			29.4	3983	3290	2826	2412			3029.6
51	1286.40	32.6	30.5	30.4	30.3			29.9	4466	3397	3074	2869			2920.8
53	1287.00	30.8	29.0	28.8	28.7			28.8	4334	3130	2726	2415			2906.2
55	1287.60	29.0	27.3	27.2	27.1			28.2	4803	3571	3123	2937			2962.0
57	1288.20	32.0	29.8	29.7	29.5			28.7	4911	3285	2895	2588			2887.8
59	1288.80	30.7	28.5	28.4	28.2			28.8	3196	2756	2657	2511			2734.4

1	Sst	med gry, f-occ med gr, ang-sbang, mod-wl srt, mod cmt, f carb incl, mic sft, fri
1A	Sst	med gry, f-occ med gr, ang-sbang, mod-wl srt, mod cmt, f carb incl, mic sft, fri
2	Sst	med gry, f-occ med gr, ang-sbang, mod-wl srt, mod cmt, f carb incl, mic sft, fri
2A	Sst	med gry, f-occ med gr, ang-sbang, mod-wl srt, mod cmt, f carb incl, mic sft, fri
3	Sst	lt-dk gry, vf-f gr, occ med gr, ang-sbang, mod wl srt, mod cmt, abd carb mat + lam, mic, sft, fri
3A	Sst	lt-dk gry, vf-f gr, occ med gr, ang-sbang, mod wl srt, mod cmt, abd carb mat + lam, mic, sft, fri
4	Sst	lt gry, f gr, ang-sbang, wl srt, mod cmt, card incl, sft, fri
4A	Sst	lt gry, f gr, ang-sbang, wl srt, mod cmt, card incl, sft, fri
5	Sst	lt gry, f gr, ang-sbang, wl srt, mod cmt, card incl, sft, fri
5A	Sst	lt gry, f gr, ang-sbang, wl srt, mod cmt, card incl, sft, fri
6	Sst	lt gry, f gr, ang-sbang, wl srt, mod cmt, card incl, sft, fri
6A	Sst	lt gry, f gr, ang-sbang, wl srt, mod cmt, card incl, sft, fri
7	Sst	lt gry, f gr, ang-sbang, wl srt, mod cmt, card incl, sft, fri
7A	Sst	lt gry, f gr, ang-sbang, wl srt, mod cmt, card incl, sft, fri
8	Sst	lt gry, f gr, ang-sbang, wl srt, mod cmt, card incl, sft, fri
8A	Sst	lt gry, f gr, ang-sbang, wl srt, mod cmt, card incl, sft, fri
9	Sst	lt gry, f-vcrs gr, occ gran, ang-sbang, prly srt, occ carb incl, sft, fri
9A	Sst	lt gry, med v/crs gr, gran, ang-sbang, prly srt, occ carb incl, v-fri-lse
10	Sst	med gry, f-occ med gr, ang-sbang, mod-wl srt, carb incl + lam, mic, sft, fri

10A	Sst	med gry, f-occ med gr, ang-sbang, mod-wl srt, carb incl + lam, mic, sft, fri
11	Sst	lt gry, crs-v crs gr, ang, w srt, p-mod cmt, cly coating around gr, rr alt qtz gr
11A	Sst	lt gry, crs-v crs gr, ang, w srt, p-mod cmt, cly coating around gr, rr alt qtz gr
12	Sst	lt gry, crs-v crs gr, ang-rr sbang, w srt, mod w cmt, cly coating around gr, rr sil cmt, rr gtz o'gth, carb incl
12A	Sst	lt gry, m-vcrs gr, ang-rr sbang, w srt, mod w cmt, cly coating around gr, rr sil cmt, rr gtz o'glh, carb incl
13	Sst	lt gry, vf-f gr, ang-sbang, mod cmt, arg mtrx, carb incl + lam, mic, sft, fri
13A	Sst	lt gry, vf-f gr, ang-sbang, mod cmt, arg mtrx, carb incl + lam, mic, sft, fri
14	Sst	lt gry, vf-f gr, ang-sbang, mod cmt, arg mtrx, carb incl + lam, mic, sft, fri
14A	Sst	lt gry, vf-f gr, ang-sbang, mod cmt, arg mtrx, carb incl + lam, mic, sft, fri
15	Sst	lt gry, vf-f gr, ang-sbang, mod cmt, arg mtrx, carb incl + lam, mic, sft, fri
15A	Sst	lt gry, vf-f gr, ang-sbang, mod cmt, arg mtrx, carb incl + lam, mic, sft, fri, abb carb rvel
16	Sst	lt gry, vf-f gr, ang-sbang, mod cmt, arg mtrx, carb incl + lam, mic, sft, fri
16A	Sst	lt-med gry, f gr, ang-sbang, mod-wl srt, mod cmt, carb incl + lam, mic, sft, fri
17	Sst	lt-med gry, f gr, ang-sbang, mod-wl srt, mod cmt, carb incl + lam, mic, sft, fri
17A	Sst	lt-med gry, f gr, ang-sbang, mod-wl srt, mod cmt, carb incl + lam, mic, sft, fri
18	Sst	lt-med gry, f gr, ang-sbang, mod-wl srt, mod cmt, carb incl + lam, mic, sft, fri
18A	Sst	lt-med gry, f gr, ang-sbang, mod-wl srt, mod cmt, carb incl + lam, mic, sft, fri
19	Sst	lt-dk gry, vf-f gr, ang-sbang, w srt, w cmt, abd arg mtrx + cmt, abd carb mat thru + lam, tr mic
19A	Sst	lt-dk gry, vf-f gr, ang-sbang, w srt, w cmt, abd arg mtrx + cmt, abd carb mat thru + lam, tr mic

20	Sst	As in 19
20A	Sst	As in 19
21	Sst	As in 19
21A	Sst	As in 19
22	Sst	As in 19
22A	Sst	As in 19
23	Sst	As in 19
23A	Sst	As in 19
24	Sst	As in 19
24A	Sst	As in 19
25	Sst	med-dk gry, vf-f gr, ang-sbang, mod w srt, p-mod cmt, arg mtrx, abd carb mat + lam, mic, sft, fri
25A	Sst	As in 28
26	Sst	As in 28
26A	Sst	As in 28
27	Sst	As in 28
27A	Sst	As in 28
28	Sst	lt gry, f gr, ang-sbang, mod cmt, occ carb mat, mic, sft-fri
28A	Sst	As in 28
29	Sst	As in 28
29A	Sst	As in 28
30	Sst	As in 28
30A	Sst	As in 28
31	Sst	As in 28
31A	Sst	As in 28
32	Sst	As in 28
32A	Sst	As in 28
33	Sst	As in 28
33A	Sst	As in 28

34	Sst	As in 28
34A	Sst	As in 28
35	Sst	med gry, f gr - occ med gr, ang-sbang, mod cmt, mic, carb, fri
35A	Sst	As in 35
36	Sst	As in 35
36A	Sst	As in 35
37	Sst	As in 35
37A	Sst	As in 35
38	Sst	dk gry, f-occ med gr, ang-sbang, mod cmt, mic, carb, lam
38A	Sst	As in 38
39	Sst	As in 38
39A	Sst	As in 38
40	Sst	med-dk gry, f-med-crs gr, rr v crs gr thru, sbang-ang, p/srt, mod w cmt, pyr, glauc? frm-fri
40A	Sst	med dk gry, f-med-crs gr, rr v crs gr thru, sbang-ang, p/srt, mod w cmt, pyr, glauc? frm-fri
41	Sst	med-gry, f-med-crs gr, rr v crs gr thru, sbang-ang, p srt, mod w cmt, pyr, glauc? frm-fri
41A	Sst	As in 41
42	Sst	gry-brn, f-med gr, ang-sbang, mod-w srtd, prly cmt, mnr carb incl, tr mic, v fri
42A	Sst	gry-brn, f-med gr, occ v crs gr, ang-sbang, mod-w srtd, prly cmt, mnr carb incl, tr mic, v fri
43	Sst	lt gry-brn, f-med gr, ang-sbang, mod-w srtd, prly cmt, mnr carb incl, tr mic, v fri
43A	Sst	As in 43
44	Sst	As in 43
44A	Sst	As in 43
45	Sst	As in 43
45A	Sst	As in 43
46	Sst	As in 43
46A	Sst	As in 43

47	Sst	As in 43
47A	Sst	As in 43
48	Sst	lt gry brn, pred med gr, ang-sbang, mod w srt, prly cmt, occ carb incl, tr mic, v fri
48A	Sst	As in 48
49	Sst	As in 48
49A	Sst	As in 48
50	Sst	As in 48
50A	Sst	As in 48
51	Sst	As in 48
51A	Sst	As in 48
52	Sst	lt gry-brn, f-occ med gr, ang-sbang, mod w srt, mod-prly cmt, rr tr mic, occ carb incl, v fri
52A	Sst	As in 52
53	Sst	As in 52
53A	Sst	As in 52
54	Sst	As in 52
54A	Sst	As in 52
55	Sst	lt gry-brn, f-med gr, occ crs gr, ang-sbang, occ sbrnd, mod w srt, mod-prly cmt, rr tr mic, occ carb incl, v fri
55A	Sst	As in 55
56	Sst	lt gry-brn, f-med gr, ang-sbang, mod w srt, prly cmt, mic, v fri
56A	Sst	As in 56
57	Sst	As in 56
57A	Sst	As in 56
58	Sst	As in 56
58A	Sst	As in 56
59	Sst	As in 56
59A	Sst	As in 56

VERTICALS

1V	Sst	lt-dk gry, vf-f gr, ang-sbang, mod w srt, mod w cmt, abd carb mat + lam, mic, sft, fri
2V	Sst	lt-dk gry, vf-f gr, ang-sbang, mod w srt, mod w cmt, abd carb mat + lam, mic, sft, fri
3V	Sst	lt gry, vf-f gr, ang-sbang, mod cmt, arg mtrx, carb incl + lam, mic, v sft, fri
4V	Sst	lt gry, vf-f gr, ang-sbang, mod cmt, arg mtrx, carb incl + lam, mic, v sft, fri
5V	Sst	med-dk gry, vf-f gr, ang-sbang, arg mtrx, abd carb mat + lam, mic, sft, fri
6V	Sst	lt med gry, fn gr, ang-sbang, mod cmt, occ carb mat, mic, sft, fri
7V	Sst	med-dk gry, f-occ med gr, ang-sbang, mod cmt, abd carb mat + lam, mic, fri
8V	Sst	gry-brn, f-med gr, ang-sbang, mod w srt, prly cmt, mnr carb incl, tr mic, v fri
9V	Sst	lt gry-brn, f-med gr, ang-sbang, mod w srt, prly cmt, mnr carb incl, tr mic, v fri
10V	Sst	lt gry brn, f-med gr, ang-sbang, mod w srt, prly cmt, mic, v fri

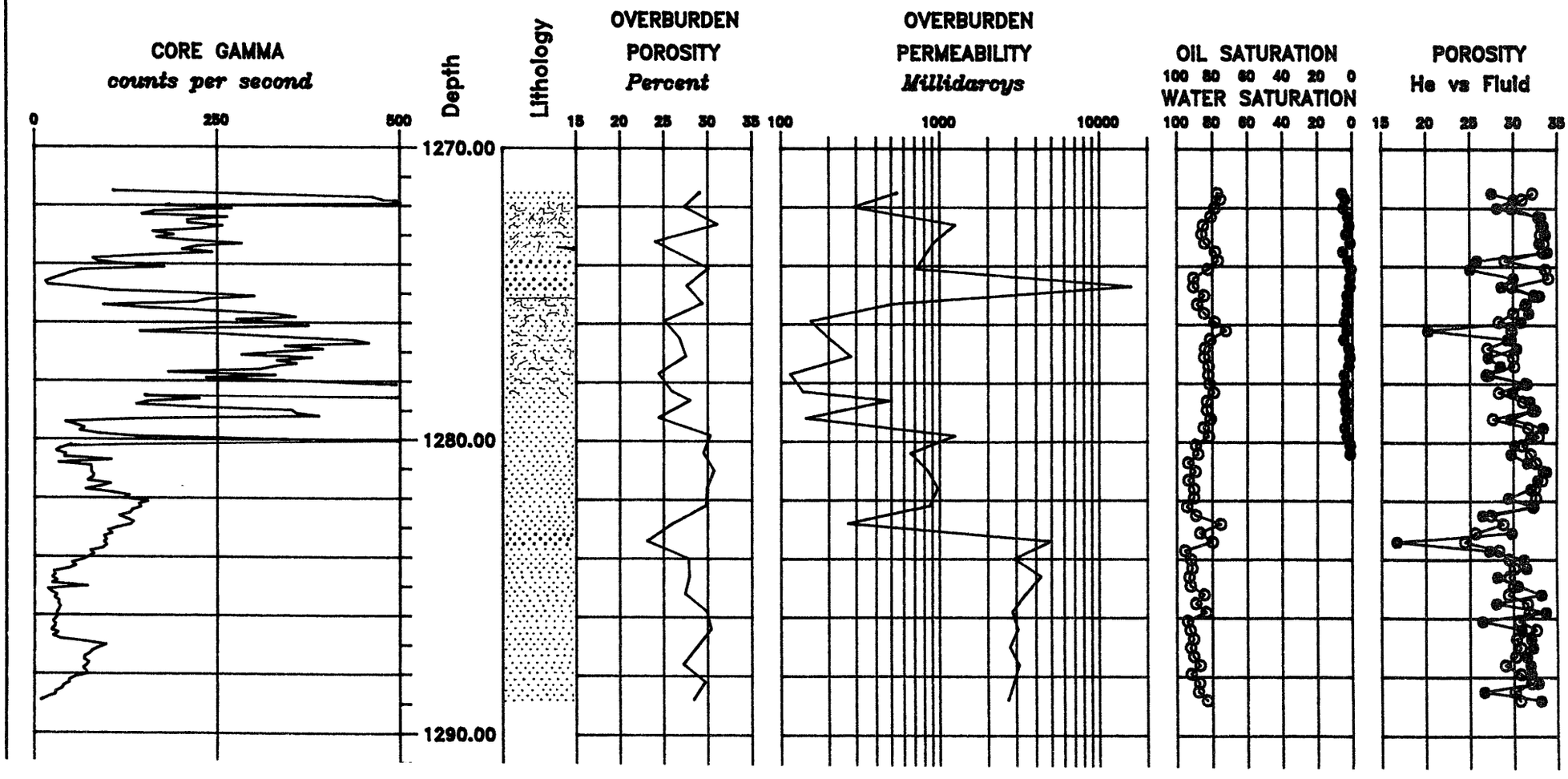
CORE PLOT

AMDEL CORE SERVICES PTY. LIMITED
Incorporated in South Australia

Scale 1 : 200

Company: BHP Petroleum Pty. Ltd.
Well : Amberjack No. 1
Field : Wildcat

Core Interval: 1271.40 – 1288.96 m
Location : Offshore Victoria VIC–P–25
File : 005/008



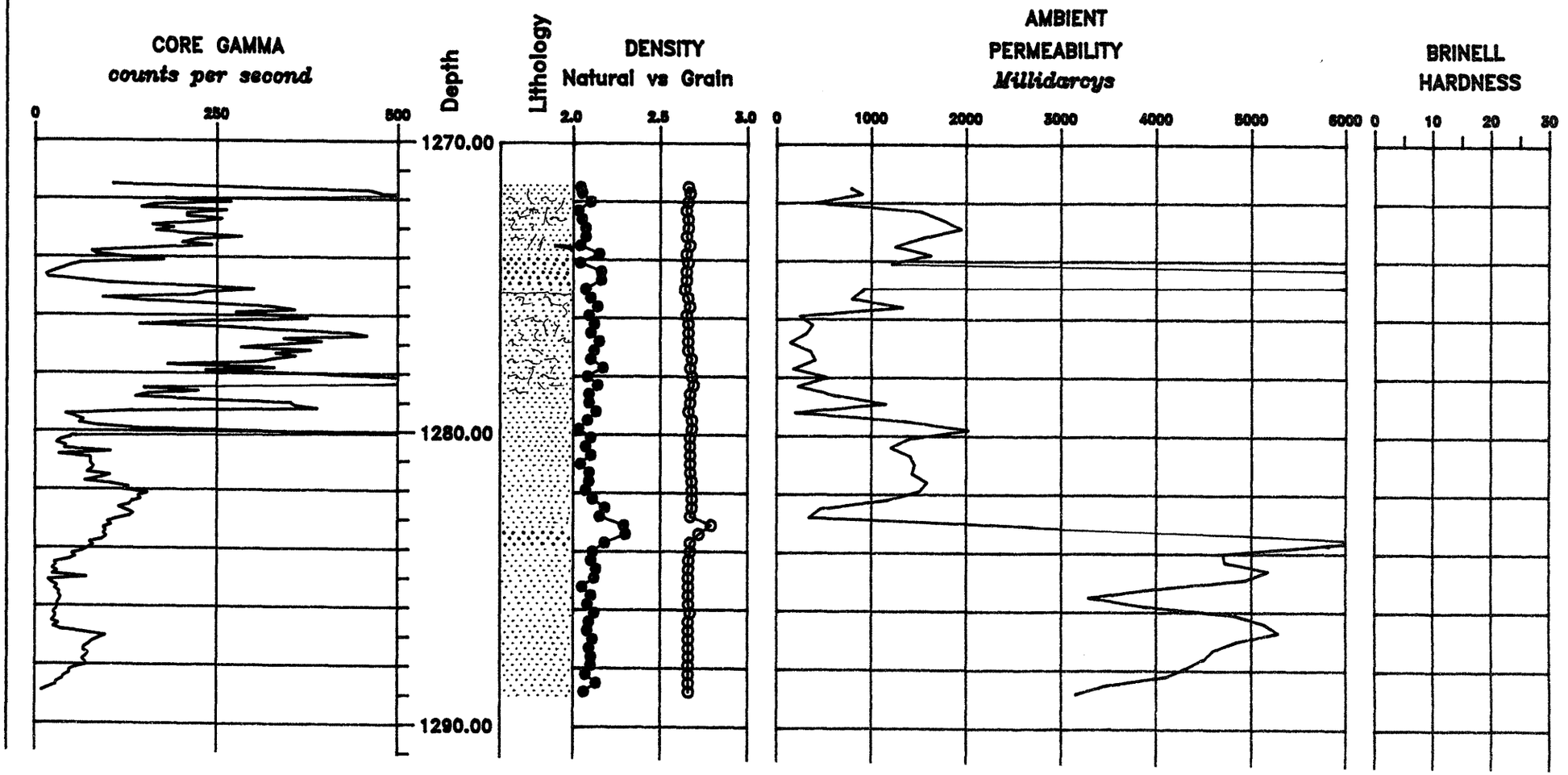
AMDEL CORE SERVICES PTY. LIMITED
Incorporated in South Australia

CORE PLOT

Scale 1 : 200

Company: BHP Petroleum Pty. Ltd.
Well : Amberjack No. 1
Field : Wildcat

Core Interval: 1271.40 - 1288.96 m
Location : Offshore Victoria VIC-P-25
File : 005/008



Porosity & Perm Arithmetic Average Specified Interval :5-008

Start Sample	:	1	End Sample	:	59
Depth	:	1271.50	Depth	:	1288.80

POROSITY Average : 30.6 over 59 Samples
0 Samples with a ZERO Porosity Value Ignored

Sample Type :R

PERMEABILITY Average : 3058 over 59 Samples
0 Samples with a ZERO Permeablity Value Ignored

Porosity & Perm Arithmetic Average Specified Interval :5-008

Start Sample	:	1	End Sample	:	29
Depth	:	1271.50	Depth	:	1279.80

POROSITY Average : 30.9 over 29 Samples
0 Samples with a ZERO Porosity Value Ignored

Sample Type :R

PERMEABILITY Average : 2586 over 29 Samples
0 Samples with a ZERO Permeablity Value Ignored

PE905416

This is an enclosure indicator page.
The enclosure PE905416 is enclosed within the container PE902075 at this location in this document.

The enclosure PE905416 has the following characteristics:

ITEM_BARCODE	= PE905416
CONTAINER_BARCODE	= PE902075
NAME	= Amberjack 1 core photographs (1271.4m-1275m)
BASIN	= GIPPSLAND
PERMIT	= VIC/P25
TYPE	= WELL
SUBTYPE	= CORE_PHOTOS
DESCRIPTION	= Amberjack 1 core photos (1271.4m-1475m)
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	= 24/10/90
W_NO	= W1029
WELL_NAME	= Amberjack-1
CONTRACTOR	= BHP Petroleum Pty Ltd
CLIENT_OP_CO	= BHP Petroleum Pty Ltd

(Inserted by DNRE - Vic Govt Mines Dept)

PE905417

This is an enclosure indicator page.
The enclosure PE905417 is enclosed within the container PE902075 at this location in this document.

The enclosure PE905417 has the following characteristics:

ITEM_BARCODE	= PE905417
CONTAINER_BARCODE	= PE902075
NAME	= Amberjack 1 core photographs (1276m-1280m)
BASIN	= GIPPSLAND
PERMIT	= VIC/P25
TYPE	= WELL
SUBTYPE	= CORE_PHOTOS
DESCRIPTION	= Amberjack 1 core photos (1276m-1280m)
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	= 24/10/90
W_NO	= W1029
WELL_NAME	= Amberjack-1
CONTRACTOR	= BHP Petroleum Pty Ltd
CLIENT_OP_CO	= BHP Petroleum Pty Ltd

(Inserted by DNRE - Vic Govt Mines Dept)

PE905418

This is an enclosure indicator page.
The enclosure PE905418 is enclosed within the container PE902075 at this location in this document.

The enclosure PE905418 has the following characteristics:

ITEM_BARCODE	= PE905418
CONTAINER_BARCODE	= PE902075
NAME	= Amberjack 1 core photographs (1281m-1285m)
BASIN	= GIPPSLAND
PERMIT	= VIC/P25
TYPE	= WELL
SUBTYPE	= CORE_PHOTOS
DESCRIPTION	= Amberjack 1 core photos (1281m-1285m)
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	= 24/10/90
W_NO	= W1029
WELL_NAME	= Amberjack-1
CONTRACTOR	= BHP Petroleum Pty Ltd
CLIENT_OP_CO	= BHP Petroleum Pty Ltd

(Inserted by DNRE - Vic Govt Mines Dept)

PE905419

This is an enclosure indicator page.
The enclosure PE905419 is enclosed within the container PE902075 at this location in this document.

The enclosure PE905419 has the following characteristics:

ITEM_BARCODE	= PE905419
CONTAINER_BARCODE	= PE902075
NAME	= Amberjack 1 core photographs (1286m-1288.96m)
BASIN	= GIPPSLAND
PERMIT	= VIC/P25
TYPE	= WELL
SUBTYPE	= CORE_PHOTOS
DESCRIPTION	= Amberjack 1 core photos (1286m-12888.96m)
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	= 24/10/90
W_NO	= W1029
WELL_NAME	= Amberjack-1
CONTRACTOR	= BHP Petroleum Pty Ltd
CLIENT_OP_CO	= BHP Petroleum Pty Ltd

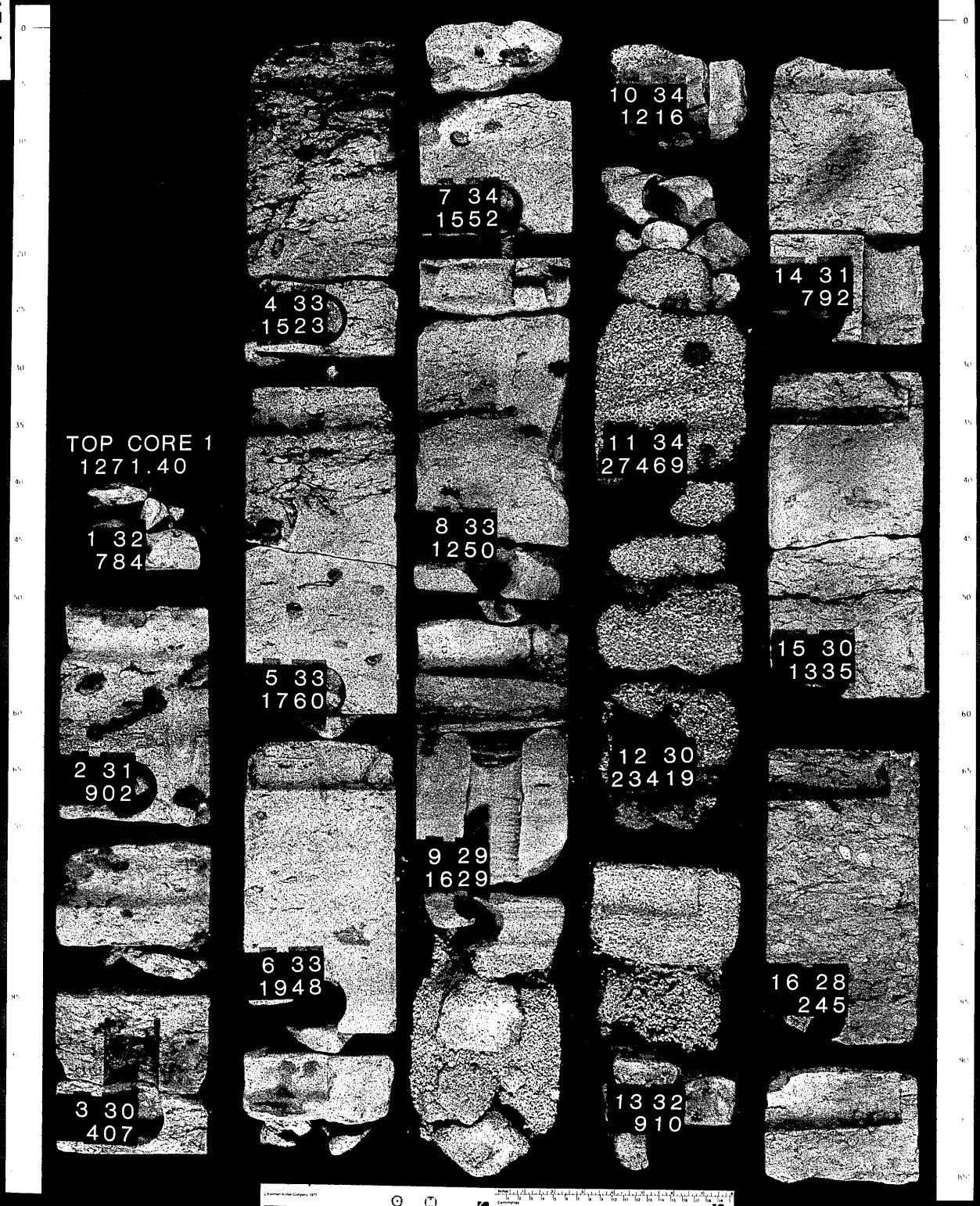
(Inserted by DNRE - Vic Govt Mines Dept)

BHP PETROLEUM PTY. LTD.

AMBERJACK No.1 CORE No.1

KEY
PLUG ϕ
K

1271.40 1272.00 1273.00 1274.00 1275.00

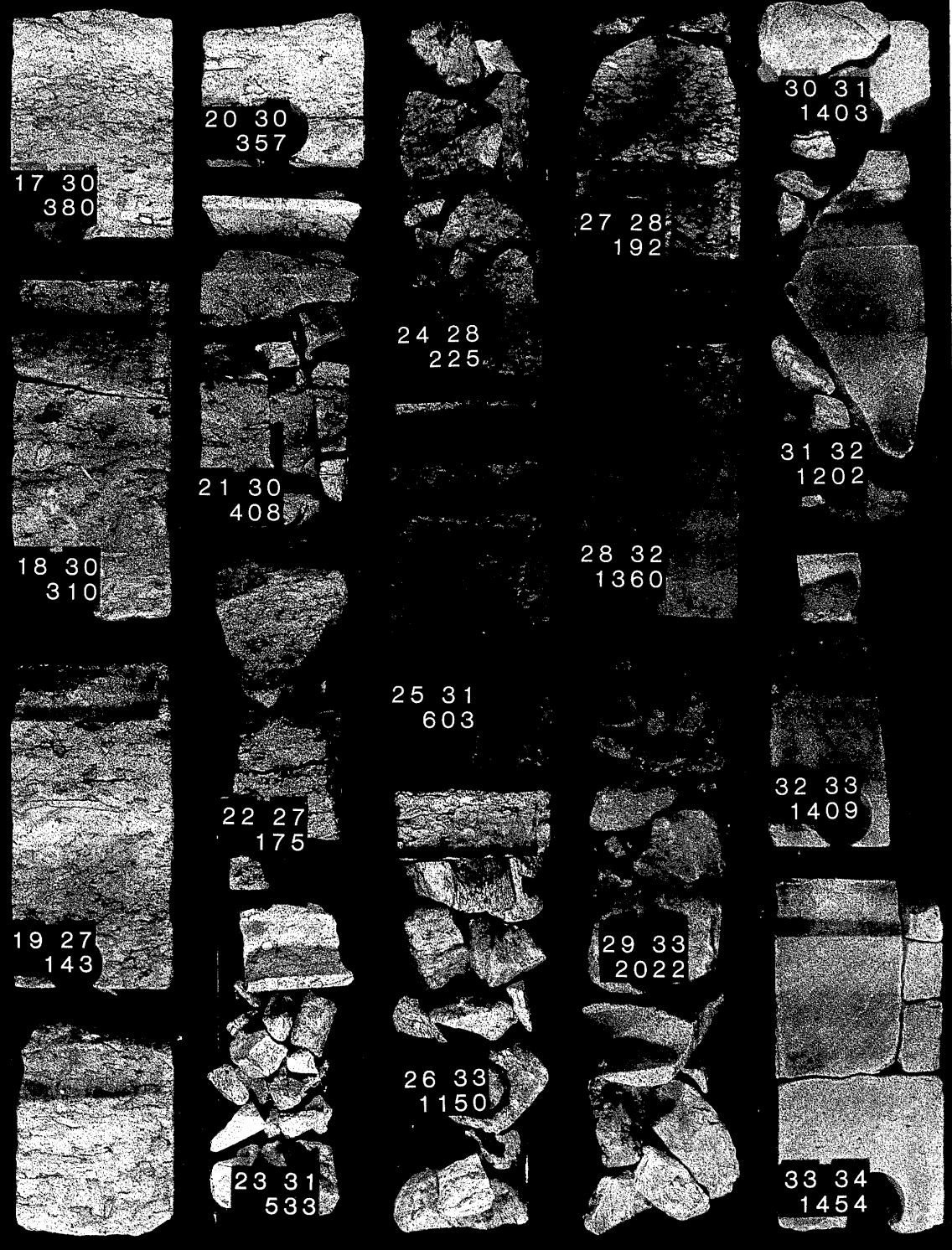


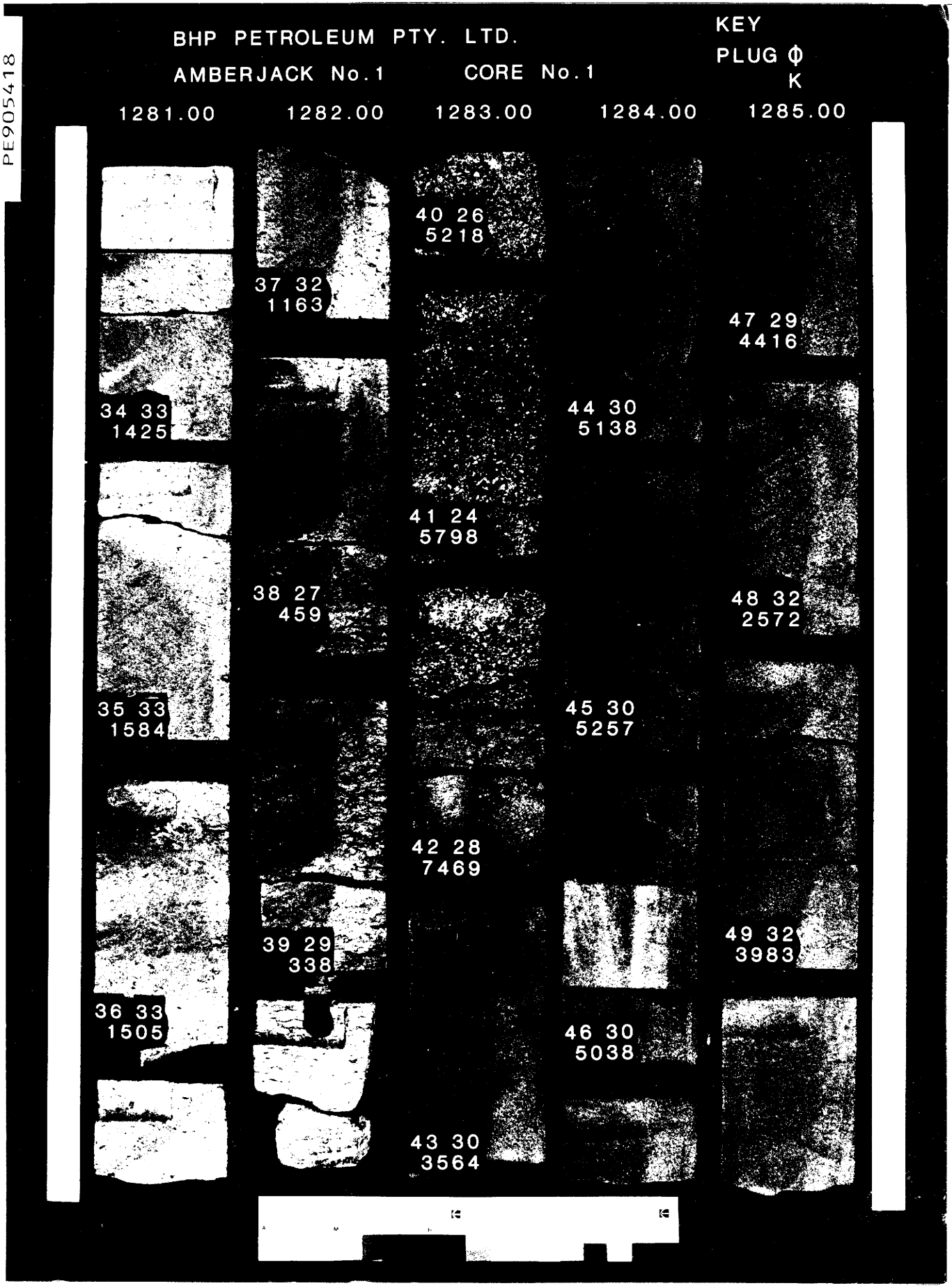
BHP PETROLEUM PTY. LTD.

AMBERJACK No.1 CORE No.1

KEY
PLUG ϕ
K

1276.00 1277.00 1278.00 1279.00 1280.00



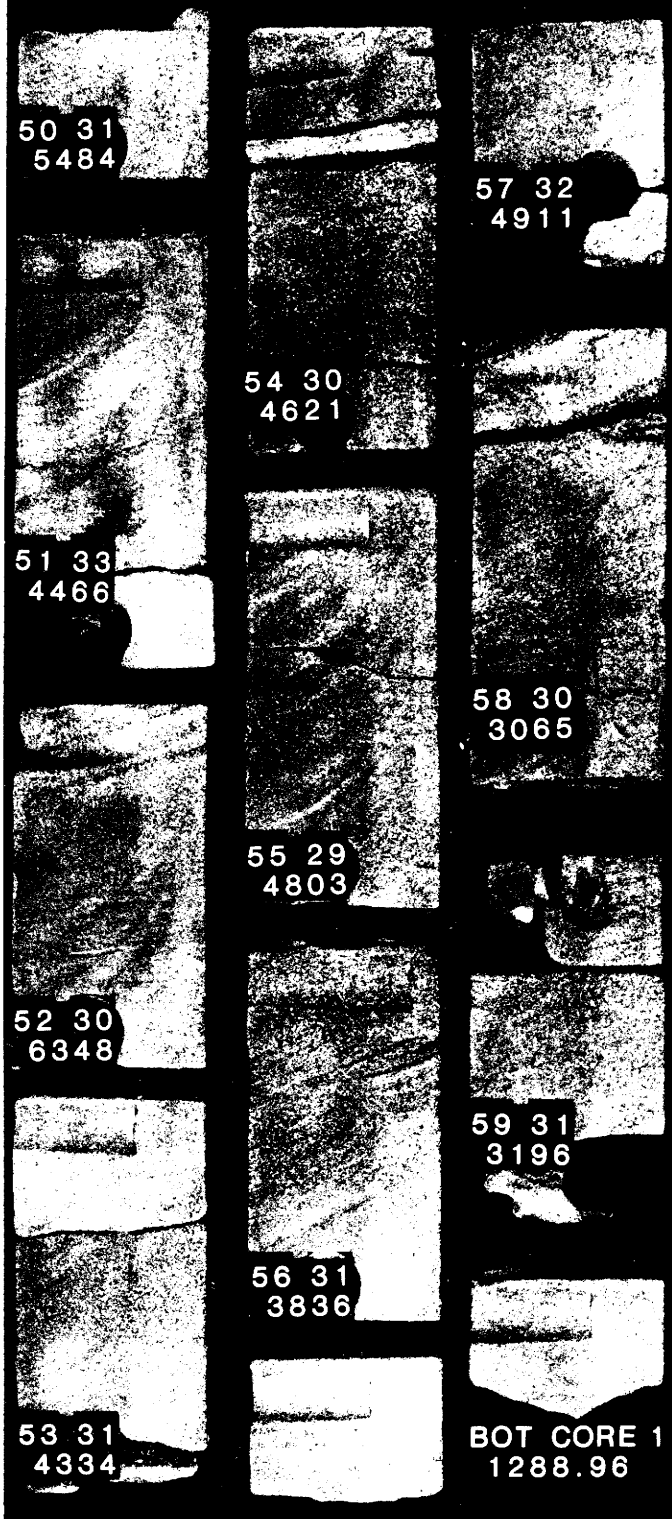

BHP PETROLEUM PTY. LTD.
AMBERJACK No.1
CORE No.1
KEY
PLUG ϕ
K
1281.00
1282.00
1283.00
1284.00
1285.00
34 33
1425
35 33
1584
36 33
1505
37 32
1163
38 27
459
39 29
338
40 26
5218
41 24
5798
42 28
7469
43 30
3564
44 30
5138
45 30
5257
46 30
5038
47 29
4416
48 32
2572
49 32
3983

BHP PETROLEUM PTY. LTD.

AMBERJACK No.1 CORE No.1

KEY
PLUG ϕ
K

1286.00 1287.00 1288.00



PE905420

This is an enclosure indicator page.
The enclosure PE905420 is enclosed within the container PE902075 at this location in this document.

The enclosure PE905420 has the following characteristics:

ITEM_BARCODE	= PE905420
CONTAINER_BARCODE	= PE902075
NAME	= Amberjack 1 core photographs (1271.4m-1275m)
BASIN	= GIPPSLAND
PERMIT	= VIC/P25
TYPE	= WELL
SUBTYPE	= CORE_PHOTOS
DESCRIPTION	= Amberjack 1 core photos (1271.4m-1475m) UV lilght
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	= 24/10/90
W_NO	= W1029
WELL_NAME	= Amberjack-1
CONTRACTOR	= BHP Petroleum Pty Ltd
CLIENT_OP_CO	= BHP Petroleum Pty Ltd

(Inserted by DNRE - Vic Govt Mines Dept)

PE905421

This is an enclosure indicator page.
The enclosure PE905421 is enclosed within the container PE902075 at this location in this document.

The enclosure PE905421 has the following characteristics:

ITEM_BARCODE	= PE905421
CONTAINER_BARCODE	= PE902075
NAME	= Amberjack 1 core photographs (1276m-1280m)
BASIN	= GIPPSLAND
PERMIT	= VIC/P25
TYPE	= WELL
SUBTYPE	= CORE_PHOTOS
DESCRIPTION	= Amberjack 1 core photos (1276m-1280m) UV light
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	= 24/10/90
W_NO	= W1029
WELL_NAME	= Amberjack-1
CONTRACTOR	= BHP Petroleum Pty Ltd
CLIENT_OP_CO	= BHP Petroleum Pty Ltd

(Inserted by DNRE - Vic Govt Mines Dept)

PE905422

This is an enclosure indicator page.
The enclosure PE905422 is enclosed within the container PE902075 at this location in this document.

The enclosure PE905422 has the following characteristics:

ITEM_BARCODE	= PE905422
CONTAINER_BARCODE	= PE902075
NAME	= Amberjack 1 core photographs (1281m-1285m)
BASIN	= GIPPSLAND
PERMIT	= VIC/P25
TYPE	= WELL
SUBTYPE	= CORE_PHOTOS
DESCRIPTION	= Amberjack 1 core photos (1281m-1285m) UV light
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	= 24/10/90
W_NO	= W1029
WELL_NAME	= Amberjack-1
CONTRACTOR	= BHP Petroleum Pty Ltd
CLIENT_OP_CO	= BHP Petroleum Pty Ltd

(Inserted by DNRE - Vic Govt Mines Dept)

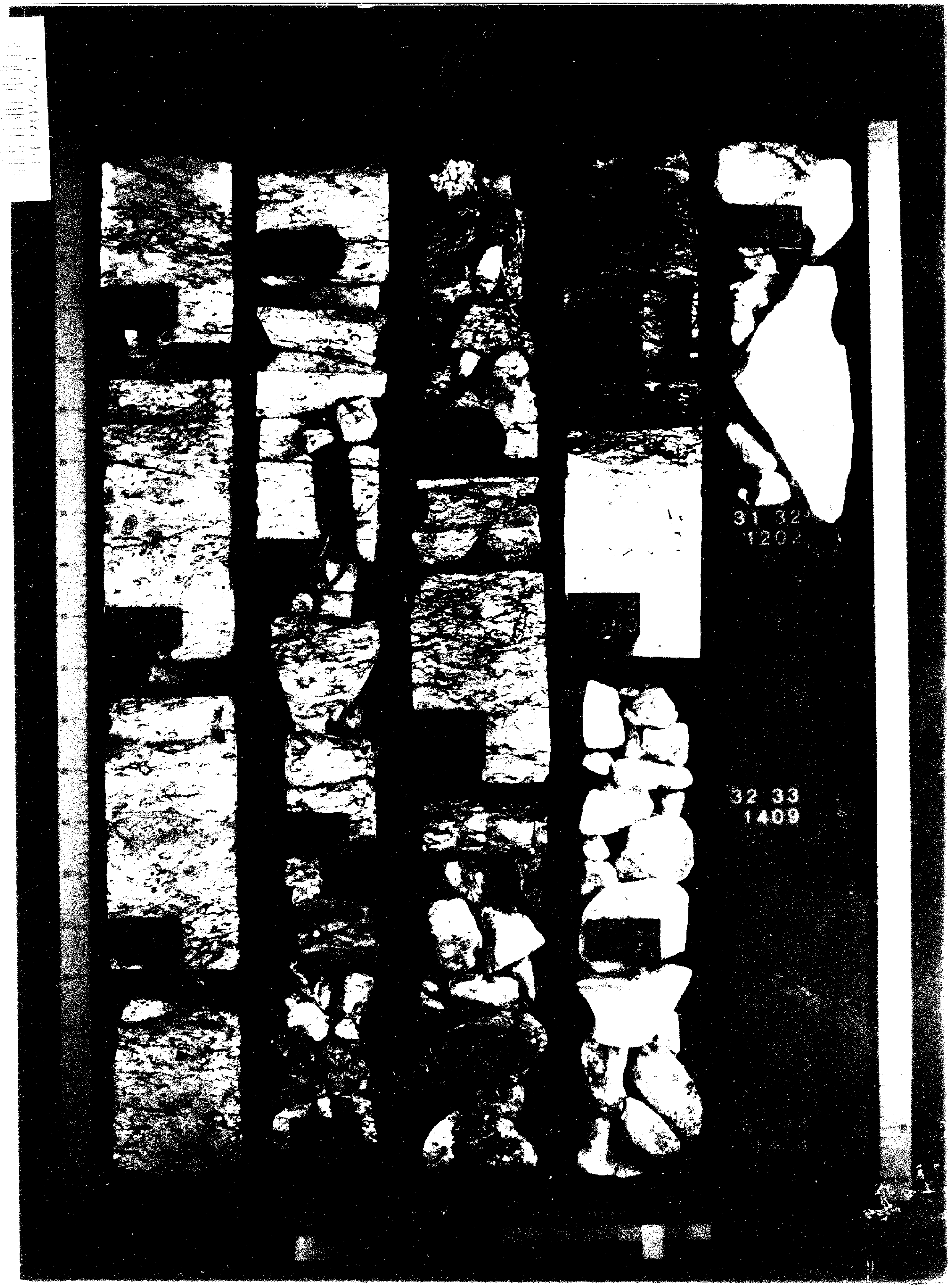
PE905423

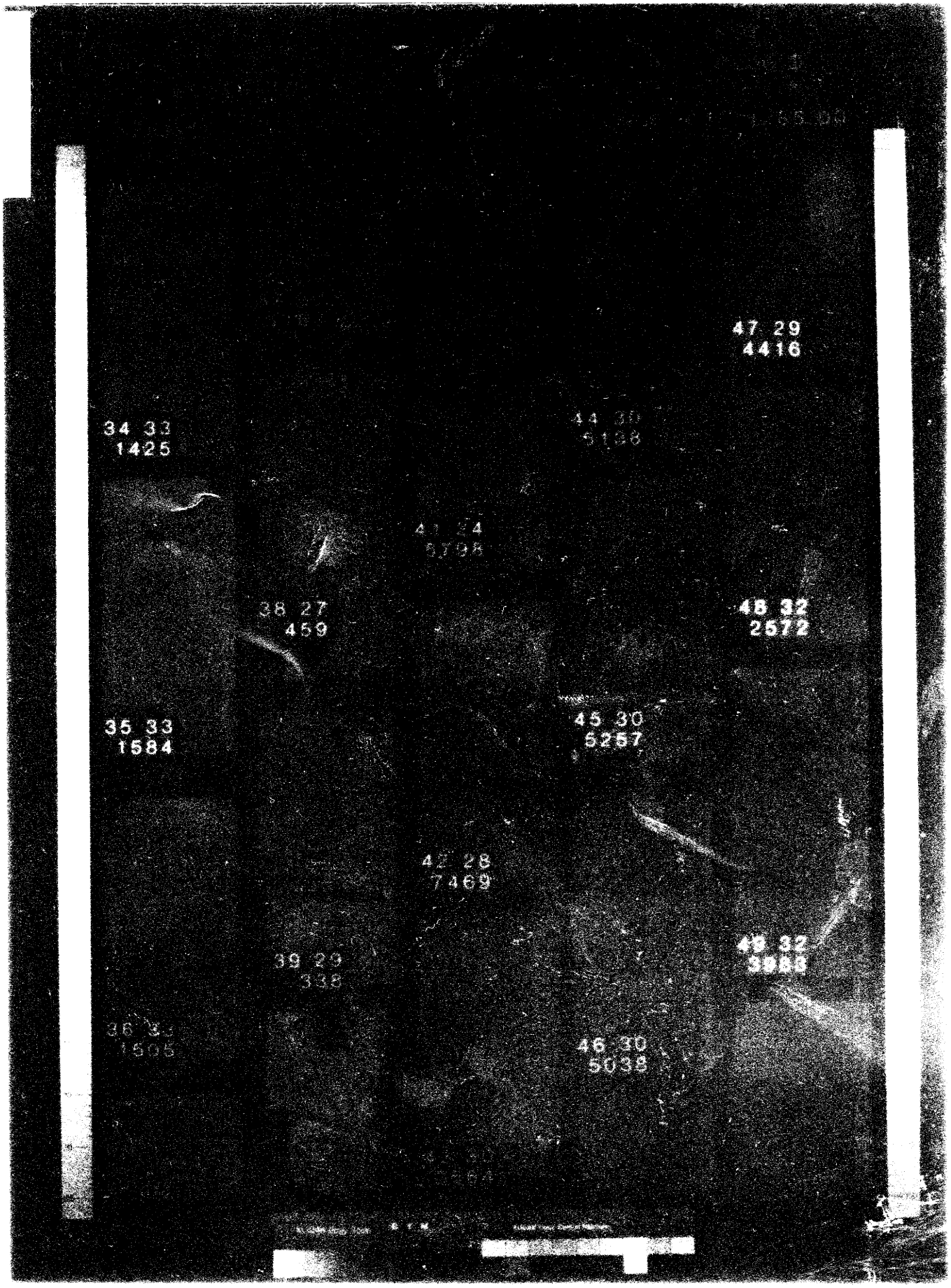
This is an enclosure indicator page.
The enclosure PE905423 is enclosed within the container PE902075 at this location in this document.

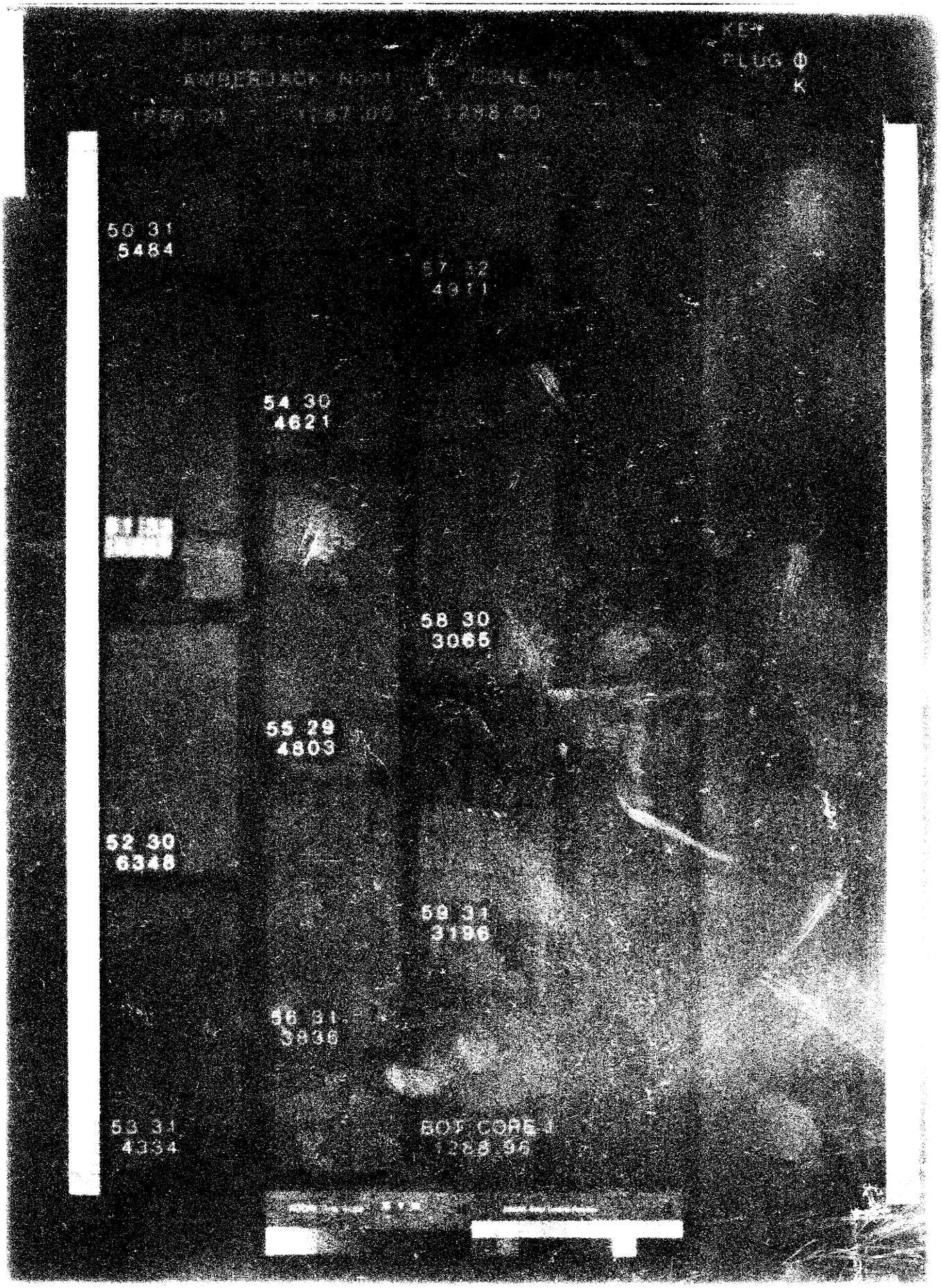
The enclosure PE905423 has the following characteristics:

ITEM_BARCODE	= PE905423
CONTAINER_BARCODE	= PE902075
NAME	= Amberjack 1 core photographs (1286m-1288.96m)
BASIN	= GIPPSLAND
PERMIT	= VIC/P25
TYPE	= WELL
SUBTYPE	= CORE_PHOTOS
DESCRIPTION	= Amberjack 1 core photos (1286m-12888.96m) UV light
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	= 24/10/90
W_NO	= W1029
WELL_NAME	= Amberjack-1
CONTRACTOR	= BHP Petroleum Pty Ltd
CLIENT_OP_CO	= BHP Petroleum Pty Ltd

(Inserted by DNRE - Vic Govt Mines Dept)


31 32
1202
32 33
1409


47 29
4416
34 33
1425
44 30
5138
41 24
5795
38 27
459
48 32
2572
35 33
1584
45 30
5267
42 28
7469
39 29
338
49 32
3988
46 30
5038


KB*
PLUG Φ
K
50 31
5484
57 32
4911
54 30
4621
58 30
3065
55 29
4803
52 30
6348
59 31
3196
56 31
3836
53 31
4334
BOT CORE 1

SUMMARY OF BASIC PALYNOLOGICAL DATA

SWC	DEPTH (m)	YIELD S-P	YIELD DINO	DIVERSITY S-P	DIVERSITY DINO	PRES.	LITH.*
60	1010.0	low	high	med.	med.	poor	marl
59	1031.0	med. v.	high	med.	med.	mod.	marl
58	1050.0	med.	high	med.	high	good	marl
57	1095.9	low	low	low	med.	mod.	marl
56	1111.5	med.	high	med.	med.	poor	marl
55	1138.8	med.	high	med.	med.	mod.	marl
54	1160.0	low v.	high	low	high	mod.	marl
53	1210.4	med.	high	med.	high	good	marl
51	1215.2	low	low	low	low	mod.	marl
50	1218.8	med.	high	med.	low	mod.	marl
49	1226.6	low	med.	low	low	mod.	marl
48	1236.0	low	med.	low	low	mod.	marl
47	1248.1	low	low	low	low	mod.	marl
46	1255.0	med. v.	high	med.	high	mod.	clst.
33	1279.9	med.	low	high	low	good	Slty sst
29	1325.0	high	low	med.	low	poor	clst.
28	1333.0	high	low	med.	low	good	slst.
26	1351.0	med.	low	med.	low	mod.	slst.
23	1360.1	high	low	high	low	mod.	clst.
19	1441.0	high	-	med.	-	mod.	slst.
12	1495.5	low	caved	low	low	mod.	clst.
11	1519.0	low	-	high	-	good	clst.
10	1542.5	low	caved	low	low	mod.	slst.
09	1566.4	low	caved	low	low	mod.	clst.
08	1575.0	low	-	low	-	mod.	clst.
07	1589.0	low	-	low	-	mod.	clst.
06	1633.0	high	-	med.	-	good	clst.
ctg	1697	med.	caved	med.	low	poor	clst.
03	1698.0	low	-	high	-	poor	Slst.
ctg	1700	med.	caved	med.	low	poor	clst.

* Lithological descriptions [main rock type only] taken from sidewall core sample description on transmittal sheets.

Well Name BHP AMBERJACK-1 Basin GIPPSLAND Sheet No. 1 of 5

SAMPLE TYPE OR NO. *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
FOSSIL NAMES / DEPTHS (m)	1010.0	1031.0	1050.0	1095.9	1111.5	1138.8	1160.0	1210.4	1215.2	1218.8	1226.6	1236.0	1248.1	1255.0	1279.9	1325.0	1333.0	1351.0	1360.1	1441.0	1495.5	1519.0	1542.5	1566.4	1575.0	1589.0	
Acaciapollenites myricsporites											•																
Aglaoreidia qualumis															•												
Anacolosidites sectus																	•										
Araucariacites australis	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•							
Australopollis obscurus																											
Baculatisporites disconformis																		•	•	•			•				
Banksieaeidites arcuatus																•	•		•								
B. elongatus	•		•		•					•									•								
Basopollis otwayensis															•												
Beaupreaidites elegansiformis														•													
B. trigonalis										•	•						•										
B. verrucosus														•		•	•	•	•	•							
Camarozonosporites bullatus																											
C. heskermensis					•										•												
Chenopodipollis chenopodiaceoides		•		•		•																					
Clavifera triplex																											
Conbaculites apiculatus																								•		•	
Concolpites leptos																				•							
Corollinia spp. R								•																			
Crassiretitriletes vanraadshooveni																											
Cupaneidites orthoteichus	•						•								•	•	•	•	•	•		•			•		
Cyatheacidites annulatus	•	•	•		•			•		•				•													
Cyathidites australis		•	•	•	•			•				•	•			•				•							
C. minor	•		•												•		•	•				•					
C. palaecspora	•	•	•		•	•		•	•	•					•												
C. splendens	•			•		•	•	•				•			•										•		
C. subtilis									•																		
Dacrycarpites australiensis							•					•			•					•							
Dicotetradites meridianus																		•				•					
Dictyophyllidites arcuatus		•				•	•	•																			
Dilwynites granulatus		•			•	•		•	•	•				•				•						•			
D. tuberculatus		•													•					•							
Diporites delicatus																						•					
Dodonaea triquetra-type																											
Elphedripites notensis																						•					
Ericipites scabratus			•			•	•			•						•	•	•	•	•			•				
Foveotriletes balteus																			•								
F. crater		•	•		•	•																					
F. lacunosus	•		•		•		•	•	•	•																	
Gambierina edwardsii																											
G. rudata																											
Gleicheniidites spp.	•	•			•	•		•				•	•	•	•				•	•	•		•	•	•	•	
Gothanipollis bassensis																	•		•	•							
Gramminidites media										•																	
Gyropollis psilatus																		•									
Haloragacidites cainozoica	•	•	•			•	•								•												
H. harrisii	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	
Herkosporites elliotii			•				•				•			•	•												
Ilexpollenites anguloclavatus							•			•			•	•	•	•	•	•	•				•				
Integricorpus antipoda																											
Intratriporopollenites notabilis																						•					
Ischyosporites gremius	•				•	•		•	•	•	•					•						•					
I. irregularis								•																			
Kuylisporites waterbolkii		•	•		•	•																•					
Laevigatosporites spp.	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•		•		

* C=CORE S=SIDEWALL CORE
T=CUTTINGS J=JUNK BASKET

R - REWORKED SP.
C - CONTAMINANT

Well Name _____ Basin _____

SAMPLE TYPE OR NO. *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
FOSSIL NAMES / DEPTHS (m)	1010.0	1031.0	1050.0	1095.9	1111.5	1138.8	1160.0	1210.4	1215.2	1218.8	1226.6	1236.0	1248.1	1255.0	1279.9	1325.0	1333.0	1351.0	1360.1	1441.0	1495.5	1519.0	1542.5	1566.4	1575.0	1589.0
Latrobosporites amplus																										
L. crassus					•									•					•							
L. marginis						•																				
Liliacidites lanceolatus															•											
L. spp.																			•							
Lygistepollenites balmei						R		R				R							R		R			R		R
L. florinii	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•		•				•	•		•
Malvacipollis diversus							•					•										•		•	•	
M. robustus			•			•						•				•	•	•	•							
M. subtilis			•			•		•	•							•	•	•	•	•	•	•	•		•	•
Matonisporites ornamentalis		•	•		•		•	•					•									•				
Microalatidites palaeogenicus		•			•		•		•	•					•	•	•			•						
Microcachrydites antarcticus	•						•	•							•		•			•						
Monogemmites gemmatus																	•		•							
Monolites alveolatus						•																				
Myrtaceidites eucalyptoides		•	•				•		•						•											
M. parvus-mesonesus	•	•	•			•	•					•		•	•		•		•	•			•			
M. tenuis		R													R						•	•				
M. verrucosus		•													•				•							
Nothofagidites asperus		•	•		•	•	•	•							•	•	•	•		•						
N. brachyspinulosus				•		•		•	•		•		•		•	•	•	•	•	•	•	•				
N. deminutus-vansteenii	•	•	•	•	•	•	•	•			•			•	•	•	•	•	•	•						•
N. emarcidus-heterus	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
N. endurus																										
N. falcatus					•	•	•	•		•	•		•		•	•	•	•	•							
N. flemingii					•	•		•	•	•					•	•	•	•	•	•		•	•	•		
N. goniatus															•	•	•			•		•				
Nuphariopollis						•																				
Peninsulapollis gillii																			•							
Periporopollenites demarcatus												•		•	•	•	•	•	•			•				
P. polyoratus																										
P. vesicus														•	•		•		•							
Peromonolites vellosus		•	•							•																
Phyllocladidites mawsonii	•	•	•		•	•		•	•	•		•	•	•	•	•	•	•	•	•	•	•		•		•
P. reticulosaccatus																										R
Pilosisporites parvisaccatus R																										
Podocarpidites exiguus							•																			
P. spp.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•
Podosporites microsaccatus						•		•				•	•				•									•
Polycolpites langstonii																										
P. reticulatus															•											
Polycolporopollenites esobalteus													•				•		•	•		•				
Polypodiaceoisporites varus																										
Polypodiisporites histeopteroides															•											
P. spp.	•	•		•				•		•				•	•	•										
Proteacidites adenanthoides																•	•	•	•							
P. annularis		•	•		•	•		•	•	•	•		•	•	•		•	•								
P. asperopolus																			•	•		•				
P. callosus	•																		•							
P. crassus						•										•	•	•	•							
P. differentipollis																						•	•			
P. kopiensis						•													•			•				
P. latrobensis																		•	•	•						
P. obscurus																•	•	•	•							
P. pachypolus		R					R	R	R						•	•	•	•	•	•		•	•			
P. rectus																										

* C=CORE S=SIDEWALL CORE
T=CUTTINGS J=JUNK BASKET

R - REWORKED SP.
C - CONTAMINANT

Well Name BMR AMBERJACK-1 Basin GIPPSLAND Sheet No. 3 of 5

SAMPLE TYPE OR NO. *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
FOSSIL NAMES / DEPTHS (m)	1010.0	1031.0	1050.0	1095.9	1111.5	1138.8	1160.0	1210.4	1215.2	1218.8	1226.6	1236.0	1248.1	1255.0	1279.9	1325.0	1333.0	1351.0	1360.1	1441.0	1495.5	1519.0	1542.5	1566.4	1575.0	1589.0	
Proteacidites recavus															•	•			•								
P. rectomarginis					•		•																				
P. reticuloscabratus																		•	•					•			
P. rugulatus																											
P. tenuiexinus																				•							
P. truncatus														•													
P. tuberculatus			•		•																						
P. spp.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•			•	
Pseudowinterapollis calathus								•																			
P. cranwellae		•													•		•										
Psilodiporites sp. [Alyxia]		•	•											•													
Quintiapollis psilatispora															•												
Retitriletes australoclavatidites									•																		
R. spp.		•						•							•												
Rhoipites sphaerica		•	•		•										•		•	•	•	•		•					
Rugulatisporites cowrensis																						C					
R. mallatus			•										•		•							•					
R. trophus							·											•									
Rubipollis oblatus																											
Santaluminidites cainozoicus													•				•	•	•			•					
Sapotaceoidaepollenites rotundus		•				•		•					•	•	•				•								
Simpsonipollis sp.						•																					
Stereisporites australis f. crassa			•		•					•		•															
S. (Tripunctisporis) sp.																		•	•	•		•					
S. spp.		•	•		•	•	•	•	•		•		•	•	•			•	•	•					•		
Tetracolporites multistrixus																						•					
T. verrucosus																											
Tricolpites phillipsii																	•	•									
T. reticulatus		•	•			•								•								•					
T. simatus															•		•	•	•	•							
Tricolporites adelaidensis								•						•	•	•		•	•								
T. angurium									•						•												
T. halis						•																					
T. leuros																•		•									
T. sp. cf T. leuros	•		•	•	•			•						•													
T. paenestriatus						•									•				•		•	•					
T. scabratus	•	•																•	•			•					
Indet. tricolpate/tricolporates	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	
Indet. trilete spores	•		•	•	•		•	•		•	•	•	•	•	•	•		•	•	•		•	•		•		
Triletes tuberculiformis						•							•	•	•	•			•			•					
Triporopollenites ambiguus															•				•								
T. heleosus																			•								
T. spinosus															•												
Tubulifloridites antipoda						•																					
Verrucosisporites cristatus			•			•																					
V. kopukuensis	•		•		•										•			•	•	•		•					
Anacolosidites acutullus																						•					
Cupanieidites reticularis																						•					
Milfordia homeopunctatus												•															
M. hypolaenoides									•																		
Nothofagidites longispina									•																		
Proteacidites grandis																						•					
P. stipplatus																				•							
Schizocolpus marlinensis																						•					
Triorites magnificus															•												

C=CORE S=SIDEWALL CORE
* T=CUTTINGS J=JUNK BASKET

R - REWORKED SP.
C - CONTAMINANT

Well Name [redacted] Basin GIPPSLAND Sheet No. 4 of 5

SAMPLE TYPE OR NO. *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
FOSSIL NAMES / DEPTHS (m)	1010.0	1031.0	1050.0	1095.9	1111.5	1138.8	1160.0	1210.4	1215.2	1218.8	1226.6	1236.0	1248.1	1255.0	1279.9	1325.0	1333.0	1351.0	1360.1	1441.0	1495.5	1519.0	1542.5	1566.4	1575.0	1589.0
DINOFLAGELLATES																										
Alisocysta sp.												•							•							
Areosphaeridium cf capricornum																			•		C					
Cleistosphaeridium epacrum								•					•	•		•		•								
Glaphyracysta sp. [Neogene]	•						•	•		•				•												
Hystrichokolpoma rigaude					•		•	•					•	•												
Schematophora speciosa						•							•													
Deflandrea sp. cf D. leptodermata														•												
Gippslandica extensa s.s.							R								•	•	•									
G. extensa (bald)																•	•									
"G." macmurdoensis																•										
Lejeunacysta																										
Achomosphaera alcicornu				•	•	•	•		•									•								
Impagidinium spp.		•	•	•	•		•	•	•	•	•	•		•							C					
Lingulodinium machaerophorum	•	•	•	•	•			•	•	•	•		•	•										C		
Nematosphaeropsis balcombiana-labrynthica	•	•	•	•		•		•	•	•		•	•	•										C		
Operculodinium centrocarpum	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•			C		C		
Pentadinium laticinctum			•	•	•		•																			
Protoellipsodinium clatatum		•	•	•	•																					
P. mammilatus							•	•	•	•	•			•												
P. simplex		•	•	•	•	•	•																			
Pyxidinopsis pontus	•	•	•	•	•	•	•					•		•												
Rottnestia borussica			•				•																			
Spiniferites spp.	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•			•				C			C
Tectatodinium pellitum			•										•													
Thalassiphora flammea/peligica								•						•												
Polysphaeridium zoharyii	•		•	•			•		•																	
Dapsilodinium pseudocolligerum												•														
Crassosphaera concinna						•																				
Cyclopsiella vieta s.l.		•			•			•																		
Holoroginella spinata																										
Tritonites sp. cf H. spinata													•													
MICROFAUNA																										
fish teeth		•	•		•		•	•																		
netatocysts [Cnidaria]				•	•							•		•												
trochospiral liners [Foraminifera]	•			•									•					•								

* C=CORE S=SIDEWALL CORE
T=CUTTINGS J=JUNK BASKET

R - REWORKED SP.
C - CONTAMINANT

Well Name BHP AMBERJACK-1 Basin GIPPSLAND Sheet No. 5 of 5

SAMPLE TYPE OR NO. *	S	T	S	T
FOSSIL NAMES / DEPTHS (m)	1633.0	1697	1698.0	1700
Araucariacites australis	•	•		•
Australopollis obscurus		•	•	•
Clavifera triplex	•			
Crassiretitriletes vanraadshooveni	•			
Cupaneidites orthoteichus	•	•	•	•
Cyathidites splendens	•	•	•	•
Dicotetradites meridianus				•
Ericipites scabratus		•		
Gambierina edwardsii		•		
G. rudata		•	•	•
Gleicheniidites spp.	•	•	•	•
Haloragacidites harrisii	•	•		•
Integricorpus antipoda		•		
Laevigatosporites spp.	•	•	•	•
Latrobosporites amplus			•	
Lygistepollenites balmei	R	•	•	•
L. florinii		•	•	•
Malvacipollis diversus	•	•		
M. subtilis	•	•		•
Microalatidites palaeogenicus		•		
Microcachrydites antarcticus				•
Nothofagidites asperus		•		
N. endurus		•	•	•
N. flemingii		•	•	•
Periporopollenites polyoratus		•		
Peromonolites densus				•
Phyllocladidites mawsonii		•	•	•
P. reticulosaccatus		•	•	•
Podocarpidites spp.		•	•	
Podosporites microsaccatus		•	•	
Polypodiaceoisporites varus	•			
Proteacidites annularis				•
P. pachypolus				C
P. rectus			•	•
P. spp.	•	•	•	•
Rugulatisporites mallatus	•	•		
Stereisporites antiquisporites			•	
S. (Tripunctisporis) sp.	•		•	
S. spp.		•		
Tetracolporites multistrixus		•	•	•
T. verrucosus		•		
Tricolpites phillipsii			•	•
T. simatus				C
Tricolporites marginatus		•		
undescribed tricolpate/tricolporates	•	•	•	•
undescribed trilte spores	•	•	•	•
Verrucosisporites kopukuensis				
Camarozonosporites bullatus				•
Glaphyracysta retiintextum [in situ?]		•		
Caved Lakes Entrance Fm. dinoflagellates		•	•	•

* C=CORE S=SIDEWALL CORE
T=CUTTINGS J=JUNK BASKET

R - REWORKED SP.
C - CONTAMINANT

SECTION 4

4.1 MUDLOGGING UNIT

Exploration Logging of Australia (EXLOG), provided a Geological Engineering Monitoring and Data Acquisition System (GEMDAS) service, with Formation Logging and Pressure Evaluation services on Amberjack-1 from the 20" casing shoe at 202m to total depth.

Surveillance of the potential abnormal pressure while drilling was assisted by the continuous computation of the D-exponent, formation fracture pressures were also calculated and recorded daily.

An FID total gas detector, FID chromatograph, CO2 detector and H2S sensors were used to analyse all formation gasses.

The EXLOG unit was operated throughout the well. Once returns were acheived, routine analyses for hydrocarbon fluorescence and cut in organic solvent, were carried out on all ditch samples and sidewall cores.

4.2 Wireline Logging

Three suites of wireline logs were run in Amberjack-1. Table 3. summarises the logs run.

TABLE 3.

Wireline Logging

Suite No.	Run No.	Log Type	Depth Interval (mRKB)	Date Run
1	1	DLL-MSFL-SDT-GR-SP-CAL-AMS	1010-200 (GR to seafloor)	7 May 1990
2	1	GCT-GR-AMS	1271.4 - 0.0	9 May 1990
3	1	DLL-MSFL-LDL-CNL-SDT-GR-SP-CAL-AMS (Supercombo) LDL-CNL-SDT-GR-AMS	1732.5 - 999.0 550.0 - 300.0	13 May 1990
3	1	SHDT-GR-AMS	1731.0 - 999.0	13 May 1990
3	1	RFT-HP-GR	1258.0 - 1570.0	13 May 1990
3	2	RFT-HP-GR (Sample)	1276.0	14 May 1990
3	3	RFT-HP-GR (Sample)	1480.0	14 May 1990
3	1	Velocity Survey	1727.0 - 120.0	14 May 1990
3	1	CST-GR (60 Shots)	1725.0 - 1010.0	14 May 1990

4.3 VELOCITY SURVEY

A check shot survey was carried out at Total Depth in Amberjack-1 for the purpose of calibrating the sonic log, with geophone levels spaced at a nominal 100m, plus extra levels at significant formation and sonic log boundaries - a total of 21 levels were recorded. Schlumberger used a single 200 c.i. airgun, offset 40m from the wellhead and submerged to a depth of 4.0m subsea. The source hydrophone, used to establish the timing of the shots, was submerged at 9.0m subsea.

Signals from the airgun gave good first breaks at all levels on the z-component well geophone, and generally three records were stacked together at each level (some required five or six). A good recording was even made inside the 20 inch casing at 62m below sea-bed, which aided the sonic calibration in the shallow section of this well.

The Schlumberger velocity survey processing report and time/depth listing follow. The drift corrected sonic and seismic calibration logs are included as Enclosure 2.

Schlumberger

BHP PETROLEUM

SONIC CALIBRATION

PROCESSING REPORT

AMBERJACK #1

FIELD	:	WILDCAT
STATE	:	VICTORIA
COUNTRY	:	AUSTRALIA
COORDINATES	:	038° 29' 33.44" S 147° 18' 55.05" E
LOCATION	:	BASS STRAIT VIC/P25 527495.7 ME 5739463.4 MN
DATE OF SURVEY	:	14 MAY 1990
REFERENCE NO.	:	SYJ-56592
INTERVAL	:	1727.0 - 203.0 M

1. Introduction

A checkshot survey of the Amberjack #1 well has been used to calibrate the sonic log and generate synthetic seismograms using 25,35 and 45 hertz zero phase Ricker wavelets. The final presentation includes synthetic seismograms at 10 and 20 cm/sec as well as a drift corrected sonic plot and a seismic calibration log.

2. Data Acquisition

The data was acquired with the SAT (Seismic Acquisition tool) tool. Recording was made on the Schlumberger Cyber Service Unit (CSU) using LIS format at a tape density of 1600 BPI.

Table 1: Survey Parameters

Datum	MSL
Elevation KB	21.0 metres AMSL
Elevation DF	20.7 metres AMSL
Elevation GL	-37.0 metres below MSL
Total Depth	1727.0 metres below KB
Energy Source	Airgun
Source Offset	40 metres
Source Depth	4.0 metres below MSL
Hydrophone Offset	40 metres
Hydrophone Depth	9.0 metres below MSL

3. Sonic Calibration Processing

3.1 Sonic Calibration

A 'drift' curve is obtained using the sonic log and the vertical check level times. The term 'drift' is defined as the seismic time (from check shots) minus the sonic time (from integration of edited sonic). Commonly the word 'drift' is used to identify the above difference, or to identify the gradient of drift versus increasing depth, or to identify a difference of drift between two levels.

The gradient of drift, that is the slope of the drift curve, can be negative or positive.

For a negative drift $\frac{\Delta drift}{\Delta depth} < 0$, the sonic time is greater than the seismic time over a certain section of the log.

For a positive drift $\frac{\Delta drift}{\Delta depth} > 0$, the sonic time is less than the seismic time over a certain section of the log.

The drift curve, between two levels, is then an indication of the error on the integrated sonic or an indication of the amount of correction required on the sonic to have the TTI of the corrected sonic match the check shot times.

Two methods of correction to the sonic log are used.

1. **Uniform or block shift** This method applies a uniform correction to all the sonic values over the interval. This uniform correction is applied in the case of positive drift and is the average correction represented by the drift curve gradient expressed in μsec/ft.

2. **ΔT Minimum** In the case of negative drift a second method is used, called Δt minimum. This applies a differential correction to the sonic log, where it is assumed that the greatest amount of transit time error is caused by the lower velocity sections of the log. Over a given interval the method will correct only Δt values which are higher than a threshold, the Δt_{min}. Values of Δt which are lower than the threshold are not corrected. The correction is a reduction of the excess of Δt over Δt_{min}, Δt - Δt_{min}.

   $\Delta t - \Delta t_{min}$ is reduced through multiplication by a reduction coefficient which remains constant over the interval. This reduction coefficient, named G, can be be defined as:

   $$G = 1 + \frac{drift}{\int (\Delta t - \Delta t_{min}) dZ}$$

   Where drift is the drift over the interval to be corrected and the value $\int (\Delta t - \Delta t_{min}) dZ$ is the time difference between the integrals of the two curves Δt and Δt_{min}, only over the intervals where $\Delta t > \Delta t_{min}$.

   Hence the corrected sonic: $\Delta t = G(\Delta t - \Delta t_{min}) + \Delta t_{min}$.

3.2 Correction to Datum

The corrected sonic log is indexed to true vertical depth and referenced to mean sea level (SRD).

3.3 Open Hole Logs

The sonic log has been recorded from 1727.0 to 203.0 metres below KB. The overall log quality is good with small zones of cycle skipping having been patched out.The density log was recorded over the interval 1727.0-1000.0 metres.

The gamma ray and caliper curves are included as correlation curves.

3.4 Sonic Calibration Results

The top of the sonic log (203.0 metres below KB) is chosen as the origin for the calibration drift curve. The drift curve indicates a number of corrections to be made to the sonic log. The adjusted sonic curve is considered to be the best result using the available data. A list of shifts used on the sonic data is given in the geophysical listings section.

A Summary of Geophysical Listings

Six geophysical data listings are appended to this report. Following is a brief description of the format of each listing.

A1 Geophysical Airgun Report

1. Level number : the level number starting from the top level (includes any imposed shots).

2. Measured depth from KB : *dkb*, the depth in meters from kelly bushing .

3. Vertical depth from SRD : *dsrd*, the depth in meters from seismic reference datum.

4. Observed travel time HYD to GEO : *tim*0, the transit time picked from the stacked data by subtracting the surface sensor first break time from the downhole sensor first break time.

5. Vertical travel time SRC to GEO : *timv*, is corrected for source to hydrophone distance and for source offset.

6. Vertical travel time SRD to GEO : *shtm*, is *timv* corrected for the vertical distance between source and datum.

7. Average velocity SRD to GEO : the average seismic velocity from datum to the corresponding checkshot level, $\frac{dsrd}{shtm}$.

8. Delta depth between shots : $\Delta depth$, the vertical distance between each level.

9. Delta time between shots : $\Delta time$, the difference in vertical travel time (*shtm*) between each level.

10. Interval velocity between shots : the average seismic velocity between each level, $\frac{\Delta depth}{\Delta time}$.

A2 Drift Computation Report

1. Level number : the level number starting from the top level (includes any imposed shots).

2. Vertical depth from KB : the depth in meters from kelly bushing .

3. Vertical depth from SRD : the depth in meters from seismic reference datum.

4. Vertical travel time SRD to GEO : the calculated vertical travel time from datum to downhole geophone (see column 7, Geophysical Airgun Report).

5. Integrated raw sonic time : the raw sonic log is integrated from top to bottom and listed at each level. An initial value at the top of the sonic log is set equal to the checkshot time at that level. This may be an imposed shot if a shot was not taken at the top of the sonic.

6. Computed drift at level : the checkshot time minus the integrated raw sonic time.

7. Computed blk-shft correction : the drift gradient between any two checkshot levels ($\frac{\Delta drift}{\Delta depth}$).

A3 Sonic Adjustment Parameter Report

1. Knee number : the knee number starting from the highest knee. (The first knees listed will generally be at SRD and the top of sonic. The drift imposed at these knees will normally be zero.)

2. Vertical depth from KB : the depth in meters from kelly bushing .

3. Vertical depth from SRD : the depth in meters from seismic reference datum.

4. Drift at knee : the value of drift imposed at each knee.

5. Blockshift used : the change in drift divided by the change in depth between any two levels.

6. Delta-T minimum used : see section 4 of report for an explanation of Δt_{min}.

7. Reduction factor : see section 4 of report.

8. Equivalent blockshift : the gradient of the imposed drift curve.

A4 Velocity Report

1. Level number : the level number starting from the top level (includes any imposed shots).

2. Vertical depth from KB : the depth in meters from kelly bushing .

3. Vertical depth from SRD : the depth in meters from seismic reference datum

4. Vertical travel time SRD to GEOPH : the vertical travel time from SRD to downhole geophone (see column 7, Geophysical Airgun Report)

5. Integrated adjusted sonic time : the adjusted sonic log is integrated from top to bottom. An initial value at the the top of the sonic is set equal the checkshot time at that level. (The adjusted sonic log is the drift corrected sonic log.)

6. Drift=shot time-raw sonic : the check shot time minus the raw integrated sonic time.

7. Residual=shot time-adj sonic : the check shot time minus the adjusted integrated sonic time. This is the difference between calculated drift and the imposed drift.

8. Adjusted interval velocity : the interval velocity calculated from the integrated adjusted sonic time at each level.

A5 Time Converted Velocity Report

The data in this listing has been resampled in time.

1. Two way travel time from SRD : This is the index for the data in this listing. The first value is at SRD (0 millisecs) and the sampling rate is 2 millisecs.

2. Measured depth from KB : the depth from KB at each corresponding value of two way time.

3. Vertical depth from SRD : the vertical depth from SRD at each corresponding value of two way time.

4. Average velocity SRD to GEO : the vertical depth from SRD divided by half the two way time.

5. RMS velocity : the root mean square velocity from datum to the corresponding value of two way time.

$$v_{rms} = \sqrt{\Sigma_1^n v_i^2 t_i / \Sigma_1^n t_i}$$

where v_i is the velocity between each 2 millisecs interval.

6. First normal moveout : the correction time in millisecs to be applied to the two way travel time for a specified moveout distance (default = 3000 feet).

$$\Delta t = \sqrt{t^2 + (\frac{X}{v_{rms}})^2} - t$$

where:

Δt = normal moveout (secs)
X = moveout distance (meters)
t = two way time (secs)
v_{rms} = rms velocity (meters /sec)

7. Second normal moveout : the correction time in millisecs to be applied to the two way travel time for a specified moveout distance (default = 4500 feet).

8. Third normal moveout : the correction time in millisecs to be applied to the two way travel time for a specified moveout distance (default = 6000 feet).

9. Interval velocity : the velocity between each sampled depth. Typically, the sampling rate is 2 millisecs two way time, (1 millisec one way time) therefore the interval velocity will be equal to the depth increment divided by 0.001. It is equivalent to column 9 from the the Velocity Report.

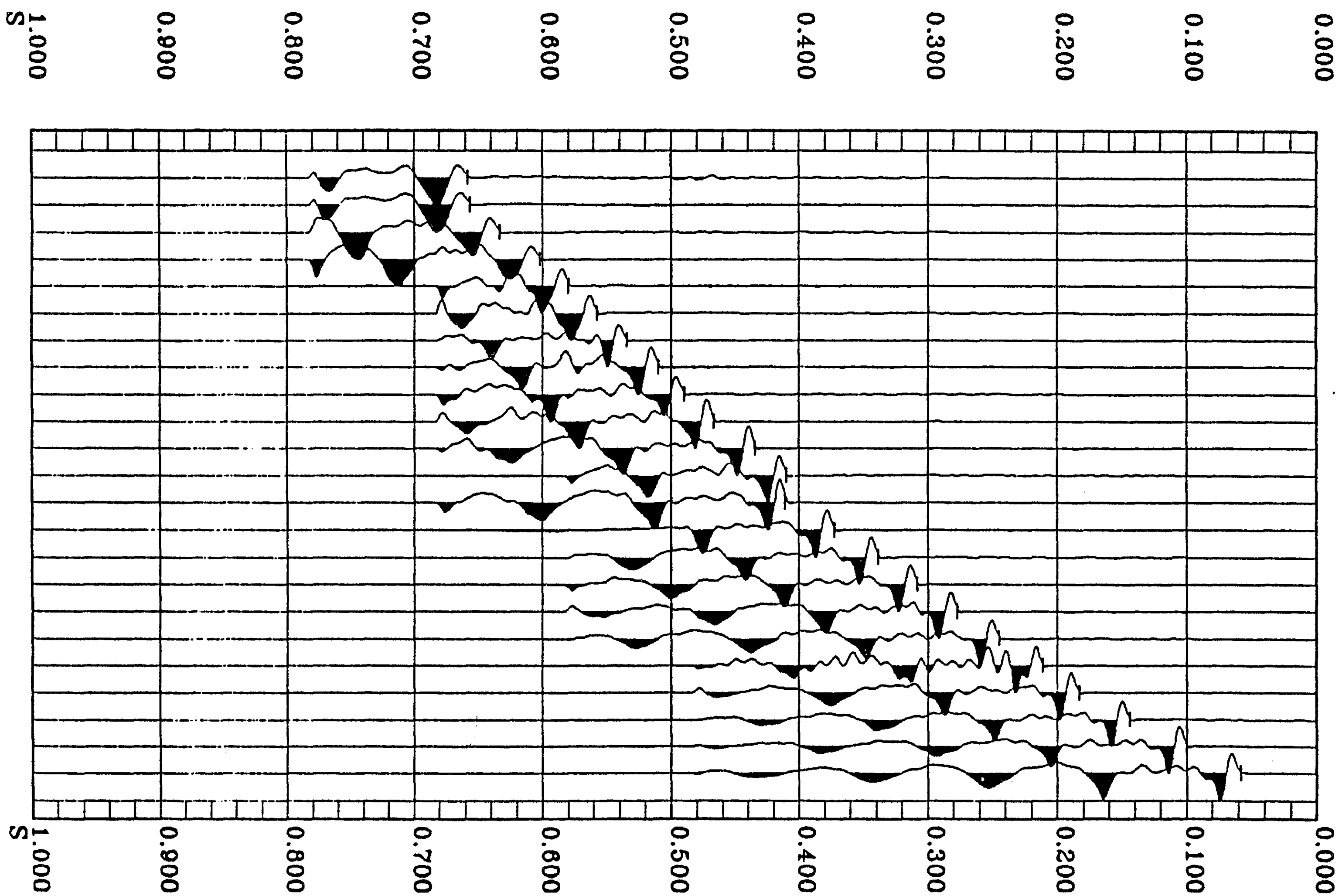
CLIENT = BHP PETROLEUM

FIELD = WILDCAT

WELL = AMBERJACK 1

FIG 2

RAW DEPTH (M)	TRANSIT TIME (S)	LEVEL NO
120.0	0.058	24
203.0	0.100	23
300.0	0.144	22
398.0	0.183	21
463.0	0.211	20
547.0	0.245	19
627.0	0.277	18
708.0	0.308	17
797.0	0.338	16
904.0	0.373	15
1011.0	0.411	14
1011.0	0.410	13
1076.0	0.434	12
1160.0	0.467	11
1216.0	0.490	10
1289.5	0.510	9
1340.0	0.534	8
1407.0	0.558	7
1474.0	0.580	6
1542.0	0.602	5
1640.0	0.633	4
1727.0	0.656	3
1738.0	0.658	2



PE905424

This is an enclosure indicator page.
The enclosure PE905424 is enclosed within the container PE902075 at this location in this document.

The enclosure PE905424 has the following characteristics:

ITEM_BARCODE	= PE905424
CONTAINER_BARCODE	= PE902075
NAME	= Amberjack 1 Schlumerger tape listing airgun report
BASIN	= GIPPSLAND
PERMIT	= VIC/P25
TYPE	= WELL
SUBTYPE	= REPORT
DESCRIPTION	= Amberjack 1 Schlumberger tape listing airgun report
REMARKS	=
DATE_CREATED	= 4/06/90
DATE_RECEIVED	= 24/10/90
W_NO	= W1029
WELL_NAME	= Amberjack-1
CONTRACTOR	= Schlumberger
CLIENT_OP_CO	= BHP Petroleum Pty Ltd

(Inserted by DNRE - Vic Govt Mines Dept)

ANALYST: Z.KATELIS 4-JUN-90 10:20:01 PROGRAM: GDRIFT 007.E09

SCHLUMBERGER

DRIFT COMPUTATION REPORT

COMPANY : BHP PETROLEUM
WELL : AMBERJACK #1
FIELD : WILDCAT
COUNTRY : AUSTRALIA
REFERENCE: SYJ-56592

LONG DEFINITIONS

GLOBAL

KB - ELEVATION OF THE KELLY-BUSHING ABOVE MSL OR MWL
SRD - ELEVATION OF THE SEISMIC REFERENCE DATUM ABOVE MSL OR MWL
EKB - ELEVATION OF KELLY BUSHING
GL - ELEVATION OF USERS REFERENCE (GENERALLY GROUND LEVEL) ABOVE SRD
XSTART - TOP OF ZONE PROCESSED BY WST
XSTOP - BOTTOM OF ZONE PROCESSED BY WST
GAD001 - RAW SONIC CHANNEL NAME USED FOR WST SONIC ADJUSTMENT
UNFDEN - UNIFORM DENSITY VALUE

ZONE

LOFDEN - LAYER OPTION FLAG FOR DENSITY : -1=NONE; 0=UNIFORM; 1=UNIFORM+LAYER
LAYDEN - USER SUPPLIED DENSITY DATA

SAMPLED

SHOT - SHOT NUMBER
DKB - MEASURED DEPTH FROM KELLY-BUSHING
DSRD - DEPTH FROM SRD
DGL - VERTICAL DEPTH RELATIVE TO GROUND LEVEL (USERS REFERENCE)
SHTM - SHOT TIME (WST)
RAWS - RAW SONIC (WST)
SHDR - DRIFT AT SHOT OR KNEE
BLSH - BLOCK SHIFT BETWEEN SHOTS OR KNEE

(GLOBAL PARAMETERS)		(VALUE)	
ELEV OF KB AB. MSL (WST)	KB	21.0000	M
ELEV OF SRD AB. MSL(WST)	SRD	0	M
ELEVATION OF KELLY BUSHI	EKB	21.0000	M
ELEV OF GL AB. SRD(WST)	GL	-37.0000	M
TOP OF ZONE PROCD (WST)	XSTART	0	M
BOT OF ZONE PROCD (WST)	XSTOP	0	M
RAW SONIC CH NAME (WST)	GAD001	DT.ATT.002.FLP.*	
UNIFORM DENSITY VALUE	UNFDEN	2.30000	G/C3

(ZONED PARAMETERS)		(VALUE)		(LIMITS)		
LAYER OPTION FLAG DENS	LOFDEN	1.000000		30479.7	-	0
USER SUPPLIED DENSITY DA	LAYDEN	0	G/C3	0	-	0

COMPANY : BHP PETROLEUM WELL : AMBERJACK #1

LEVEL NUMBER	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	VERTICAL DEPTH FROM GL M	VERTICAL TRAVEL TIME SRD/GEO MS	INTEGRATED RAW SONIC TIME MS	COMPUTED DRIFT AT LEVEL MS	COMPUTED BLK-SHFT CORRECTION US/F
1	58.00	37.00	0	25.00	25.00	0	0
2	120.00	99.00	62.00	59.36	59.36	0	0
3	203.00	182.00	145.00	103.08	103.08	0	0
4	300.00	279.00	242.00	148.15	146.49	1.66	5.22
5	398.00	377.00	340.00	187.72	185.18	2.54	2.74
6	463.00	442.00	405.00	216.39	210.59	5.80	15.28
7	547.00	526.00	489.00	250.06	243.57	6.49	2.50
8	627.00	606.00	569.00	282.07	274.79	7.27	2.98
9	706.00	685.00	648.00	313.25	306.72	6.53	-2.87
10	797.00	776.00	739.00	343.82	336.75	7.07	1.81
11	904.00	883.00	846.00	378.19	369.81	8.38	3.74
12	1011.00	990.00	953.00	416.34	407.14	9.20	2.34
13	1076.00	1055.00	1018.00	440.06	430.88	9.19	-.09
14	1160.00	1139.00	1102.00	472.39	462.43	9.96	2.79
15	1216.00	1195.00	1158.00	496.20	485.13	11.08	6.10
16	1269.50	1248.50	1211.50	515.52	504.38	11.14	.37
17	1340.00	1319.00	1282.00	540.13	528.91	11.22	.36
18	1407.00	1386.00	1349.00	563.45	552.08	11.37	.65
19	1474.00	1453.00	1416.00	586.26	573.25	13.01	7.45
20	1542.00	1521.00	1484.00	608.07	595.89	12.18	-3.70
21	1640.00	1619.00	1582.00	638.89	624.92	13.97	5.56
22	1727.00	1706.00	1669.00	662.28	651.12	11.16	-9.85

ANALYST: Z.KATELIS 4-JUN-90 11:04:39 PROGRAM: GADJST 008.E08

SCHLUMBERGER

SONIC ADJUSTMENT PARAMETER REPORT

COMPANY : BHP PETROLEUM
WELL : AMBERJACK #1
FIELD : WILDCAT
COUNTRY : AUSTRALIA
REFERENCE: SYJ-56592

LONG DEFINITIONS

GLOBAL

SRCDRF - ORIGIN OF ADJUSTMENT DATA
CONADJ - CONSTANT ADJUSTMENT TO AUTOMATIC DELTA-T MINIMUM = 7.5 US/F
UNERTH - UNIFORM EARTH VELOCITY (GTRFRM)

ZONE

ZDRIFT - USER DRIFT AT BOTTOM OF THE ZONE
ADJOPZ - TYPE OF ADJUSTMNENT IN THE DRIFT ZONE : 0=DELTA-T MIN, 1=BLOCKSHIFT
ADJUSZ - DELTA-T MINIMUM USED FOR ADJUSTMENT IN THE DRIFT ZONE
LOFVEL - LAYER OPTION FLAG FOR VELOCITY: -1=NONE; 0=UNIFORM; 1=UNIFORM+LAYER
LAYVEL - USER SUPPLIED VELOCITY DATA

SAMPLED

SHOT - SHOT NUMBER
VDKB - VERTICAL DEPTH RELATIVE TO KB
DSRD - DEPTH FROM SRD
DGL - VERTICAL DEPTH RELATIVE TO GROUND LEVEL (USERS REFERENCE)
KNEE - KNEE
BLSH - BLOCK SHIFT BETWEEN SHOTS OR KNEE
DTMI - VALUE OF DELTA-T MINIMUM USED
COEF - DELTA-T MIN COEFFICIENT USED IN THE DRIFT ZONE
DRGR - GRADIENT OF DRIFT CURVE

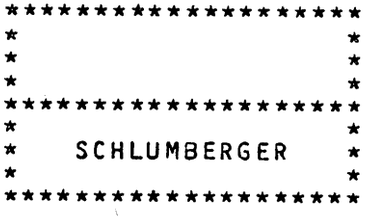
(GLOBAL PARAMETERS)		(VALUE)	
ORIG OF ADJ DATA (WST)	SRCDRF	: 2.00000	
CONS SONIC ADJST (WST)	CONADJ	: 7.50000	US/F
UNIFORM EARTH VELOCITY	UNERTH	: 1480.00	M/S

(ZONED PARAMETERS)		(VALUE)		(LIMITS)	
USER DRIFT ZONE (WST)	ZDRIFT	: 13.00000	MS	1727.00	- 1506.00
		12.00000		1506.00	1215.20
		11.08000		1215.20	908.800
		8.400000		908.800	470.000
		5.800000		470.000	203.000
		0		203.000	0
ADJUSMNT MODE (WST)	ADJOPZ	:-999.2500		30479.7	- 0
USER DELTA-T MIN (WST)	ADJUSZ	:-999.2500	US/F	30479.7	- 0
LAYER OPTION FLAG VELOC	LOFVEL	: 1.000000		30479.7	- 0
USER VELOC (WST)	LAYVEL	: 1899.000	M/S	203.000	- 120.000
		1804.000		120.000	58.0000
		1480.000		58.0000	0

COMPANY : BHP PETROLEUM WELL : AMBERJACK #1 PAGE 2

KNEE NUMBER	VERTICAL DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	VERTICAL DEPTH FROM GL M	DRIFT AT KNEE MS	BLOCKSHIFT USED US/F	DELTA-T MINIMUM USED US/F	REDUCTION FACTOR G	EQUIVALENT BLOCKSHIFT US/F
2	203.00	182.00	145.00	0	0			0
3	470.00	449.00	412.00	5.80	6.62			6.62
4	908.80	887.80	850.80	8.40	1.81			1.81
5	1215.20	1194.20	1157.20	11.08	2.67			2.67
6	1506.00	1485.00	1448.00	12.00	.96			.96
7	1727.00	1706.00	1669.00	13.00	1.38			1.38

ANALYST: Z.KATELIS 4-JUN-90 11:04:49 PROGRAM: GADJST 008.E03



VELOCITY REPORT

COMPANY : BHP PETROLEUM
WELL : AMBERJACK #1
FIELD : WILDCAT
COUNTRY : AUSTRALIA
REFERENCE: SYJ-56592

LONG DEFINITIONS

GLOBAL

KB - ELEVATION OF THE KELLY-BUSHING ABOVE MSL OR MWL
SRD - ELEVATION OF THE SEISMIC REFERENCE DATUM ABOVE MSL OR MWL
EKB - ELEVATION OF KELLY BUSHING
GL - ELEVATION OF USERS REFERENCE (GENERALLY GROUND LEVEL) ABOVE SRD
JNERTH - UNIFORM EARTH VELOCITY (GTRFRM)

ZONE

-OFVEL - LAYER OPTION FLAG FOR VELOCITY: -1=NONE; 0=UNIFORM; 1=UNIFORM+LAYER
-AYVEL - USER SUPPLIED VELOCITY DATA

SAMPLED

SHOT - SHOT NUMBER
DKB - MEASURED DEPTH FROM KELLY-BUSHING
DSRD - DEPTH FROM SRD
DGL - VERTICAL DEPTH RELATIVE TO GROUND LEVEL (USERS REFERENCE)
SHTM - SHOT TIME (WST)
ADJS - ADJUSTED SONIC TRAVEL TIME
SHDR - DRIFT AT SHOT OR KNEE
REST - RESIDUAL TRAVEL TIME AT KNEE
INTV - INTERNAL VELOCITY, AVERAGE

(GLOBAL PARAMETERS)		(VALUE)	
ELEV OF KB AB. MSL (WST)	KB	21.0000	M
ELEV OF SRD AB. MSL(WST)	SRD	0	M
ELEVATION OF KELLY BUSHI	EKB	21.0000	M
ELEV OF GL AB. SRD(WST)	GL	-37.0000	M
UNIFORM EARTH VELOCITY	UNERTH	1480.00	M/S

(ZONED PARAMETERS)		(VALUE)		(LIMITS)	
LAYER OPTION FLAG VELOC	LOFVEL	1.000000		30479.7	- 0
USER VELOC (WST)	LAYVEL	1899.000	M/S	203.000	- 120.000
		1804.000		120.000	58.0000
		1480.000		58.0000	0

COMPANY : BHP PETROLEUM WELL : AMBERJACK #1 PAGE 4

LEVEL NUMBER	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	VERTICAL DEPTH FROM GL M	VERTICAL TRAVEL TIME SRD/GEOPH MS	INTEGRATED ADJUSTED SONIC TIME MS	DRIFT = SHOT TIME - RAW SON MS	RESIDUAL = SHOT TIME - ADJ SON MS	ADJUSTED INTERVAL VELOCITY M/S
1	58.00	37.00	0	25.00	25.00	0	0	1480
2	120.00	99.00	62.00	59.36	59.36	0	0	1804
3	203.00	182.00	145.00	103.08	103.07	0	0	1899
4	300.00	279.00	242.00	148.15	148.58	1.66	-.43	2132
5	398.00	377.00	340.00	187.72	189.40	2.54	-1.68	2401
6	463.00	442.00	405.00	216.39	216.22	5.80	.17	2423
7	547.00	526.00	489.00	250.06	249.81	6.49	.25	2501
8	627.00	606.00	569.00	282.07	281.50	7.27	.56	2524
9	706.00	685.00	648.00	313.25	313.90	6.53	-.65	2439
10	797.00	776.00	739.00	343.82	344.47	7.07	-.65	2976
11	904.00	883.00	846.00	378.19	378.16	8.38	.03	3176
12	1011.00	990.00	953.00	416.34	416.41	9.20	-.07	2797
13	1076.00	1055.00	1018.00	440.06	440.72	9.19	-.66	2674
14	1160.00	1139.00	1102.00	472.39	473.01	9.96	-.62	2602
15	1216.00	1195.00	1158.00	496.20	496.19	11.08	.01	2416
16	1269.50	1248.50	1211.50	515.52	515.61	11.14	-.09	2755
17	1340.00	1319.00	1282.00	540.13	540.36	11.22	-.23	2848
18	1407.00	1386.00	1349.00	563.45	563.74	11.37	-.30	2866
19	1474.00	1453.00	1416.00	586.26	585.13	13.01	1.13	3133
20	1542.00	1521.00	1484.00	608.07	608.03	12.18	.04	2969
21	1640.00	1619.00	1582.00	638.89	637.50	13.97	1.38	3325
22	1727.00	1706.00	1669.00	662.28	664.09	11.16	-1.81	3272

ANALYST: Z.KATELIS 4-JUN-90 11:06:29 PROGRAM: GTRFRM 001.E12

SCHLUMBERGER

TIME CONVERTED VELOCITY REPORT

COMPANY : BHP PETROLEUM
WELL : AMBERJACK #1
FIELD : WILDCAT
COUNTRY : AUSTRALIA
REFERENCE: SYJ-56592

LONG DEFINITIONS

GLOBAL

KB - ELEVATION OF THE KELLY-BUSHING ABOVE MSL OR MWL
SRD - ELEVATION OF THE SEISMIC REFERENCE DATUM ABOVE MSL OR MWL
GL - ELEVATION OF USERS REFERENCE (GENERALLY GROUND LEVEL) ABOVE SRD
UNERTH - UNIFORM EARTH VELOCITY (GTRFRM)
UNFDEN - UNIFORM DENSITY VALUE

MATRIX

MVODIS - MOVE-OUT DISTANCE FROM BOREHOLE

ZONE

LOFVEL - LAYER OPTION FLAG FOR VELOCITY: -1=NONE; 0=UNIFORM; 1=UNIFORM+LAYER
LAYVEL - USER SUPPLIED VELOCITY DATA
LOFDEN - LAYER OPTION FLAG FOR DENSITY : -1=NONE; 0=UNIFORM; 1=UNIFORM+LAYER
LAYDEN - USER SUPPLIED DENSITY DATA

SAMPLED

TWOT - TWO WAY TRAVEL TIME (RELATIVE TO THE SEISMIC REFERENCE)
DKB - MEASURED DEPTH FROM KELLY-BUSHING
DSRD - DEPTH FROM SRD
AVGV - AVERAGE SEISMIC VELOCITY
RMSV - ROOT MEAN SQUARE VELOCITY (SEISMIC)
MVOT - NORMAL MOVE-OUT
MVOT - NORMAL MOVE-OUT
MVOT - NORMAL MOVE-OUT
INTV - INTERNAL VELOCITY, AVERAGE

(GLOBAL PARAMETERS)

			(VALUE)	
ELEV OF KB AB. MSL (WST)	KB	:	21.0000	M
ELEV OF SRD AB. MSL(WST)	SRD	:	0	M
ELEV OF GL AB. SRD(WST)	GL	:	-37.0000	M
UNIFORM EARTH VELOCITY	UNERTH	:	1480.00	M/S
UNIFORM DENSITY VALUE	UNFDEN	:	2.30000	G/C3

(MATRIX PARAMETERS)

	MVOUT DIST M
1	1000.0
2	1500.0
3	2000.0

(ZONED PARAMETERS)		(VALUE)		(LIMITS)
LAYER OPTION FLAG VELOC	LOFVEL	: 1.000000		30479.7 - 0
USER VELOC (WST)	LAYVEL	: 1899.000	M/S	203.000 - 120.000
		1804.000		120.000 58.0000
		1480.000		58.0000 0
LAYER OPTION FLAG DENS	LOFDEN	: 1.000000		30479.7 - 0
USER SUPPLIED DENSITY DA	LAYDEN	: 0	G/C3	0 - 0

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
0	21.00	0						1480
2.00	22.48	1.48	1480	1480	673.68	1011.52	1349.35	1480
4.00	23.96	2.96	1480	1480	671.69	1009.52	1347.36	1480
6.00	25.44	4.44	1480	1480	669.70	1007.53	1345.36	1480
8.00	26.92	5.92	1480	1480	667.72	1005.55	1343.38	1480
10.00	28.40	7.40	1480	1480	665.75	1003.56	1341.39	1480
12.00	29.88	8.88	1480	1480	663.78	1001.58	1339.40	1480
14.00	31.36	10.36	1480	1480	661.82	999.61	1337.42	1480
16.00	32.84	11.84	1480	1480	659.87	997.64	1335.45	1480
18.00	34.32	13.32	1480	1480	657.92	995.67	1333.47	1480
20.00	35.80	14.80	1480	1480	655.97	993.71	1331.50	1480
22.00	37.28	16.28	1480	1480	654.03	991.75	1329.53	1480
24.00	38.76	17.76	1480	1480	652.10	989.80	1327.56	1480
26.00	40.24	19.24	1480	1480	650.18	987.85	1325.60	1480
28.00	41.72	20.72	1480	1480	648.26	985.90	1323.64	1480
30.00	43.20	22.20	1480	1480	646.34	983.96	1321.68	1480
32.00	44.68	23.68	1480	1480	644.43	982.02	1319.73	1480
34.00	46.16	25.16	1480	1480	642.53	980.08	1317.78	1480
36.00	47.64	26.64	1480	1480	640.63	978.15	1315.83	1480
38.00	49.12	28.12	1480	1480	638.74	976.23	1313.89	1480
40.00	50.60	29.60	1480	1480	636.86	974.30	1311.94	1480
42.00	52.08	31.08	1480	1480	634.98	972.38	1310.00	1480
44.00	53.56	32.56	1480	1480	633.11	970.47	1308.07	1480
46.00	55.04	34.04	1480	1480	631.24	968.56	1306.13	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
48.00	56.52	35.52	1480	1480	629.38	966.65	1304.20	1480
50.00	58.03	37.03	1481	1481	627.04	964.03	1301.32	1506
52.00	59.83	38.83	1493	1495	619.01	952.84	1287.00	1804
54.00	61.63	40.63	1505	1507	611.60	942.57	1273.91	1304
56.00	63.44	42.44	1516	1519	604.71	933.09	1261.87	1804
58.00	65.24	44.24	1526	1530	598.29	924.30	1250.73	1804
60.00	67.05	46.05	1535	1540	592.27	916.10	1240.39	1804
62.00	68.85	47.85	1544	1549	586.60	908.42	1230.74	1804
64.00	70.66	49.66	1552	1558	581.24	901.21	1221.70	1804
66.00	72.46	51.46	1559	1566	576.15	894.40	1213.21	1804
68.00	74.26	53.26	1567	1573	571.32	887.96	1205.20	1804
70.00	76.07	55.07	1573	1580	566.71	881.85	1197.63	1804
72.00	77.87	56.87	1580	1587	562.29	876.03	1190.44	1804
74.00	79.68	58.68	1586	1593	558.06	870.47	1183.61	1804
76.00	81.48	60.48	1592	1599	553.99	865.16	1177.09	1804
78.00	83.29	62.29	1597	1605	550.07	860.07	1170.86	1804
80.00	85.09	64.09	1602	1610	546.29	855.17	1164.90	1804
82.00	86.89	65.89	1607	1615	542.64	850.46	1159.18	1804
84.00	88.70	67.70	1612	1620	539.10	845.92	1153.67	1804
86.00	90.50	69.50	1616	1624	535.66	841.53	1148.37	1804
88.00	92.31	71.31	1621	1629	532.33	837.28	1143.26	1804
90.00	94.11	73.11	1625	1633	529.09	833.16	1138.32	1804
92.00	95.92	74.92	1629	1637	525.93	829.17	1133.54	1804
94.00	97.72	76.72	1632	1640	522.85	825.29	1128.91	1804

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
96.00	99.52	78.52	1636	1644	519.85	821.51	1124.42	1804
98.00	101.33	80.33	1639	1647	516.91	817.83	1120.05	1804
100.00	103.13	82.13	1643	1651	514.04	814.25	1115.80	1804
102.00	104.94	83.94	1646	1654	511.23	810.75	1111.67	1804
104.00	106.74	85.74	1649	1657	508.48	807.33	1107.64	1804
106.00	108.55	87.55	1652	1660	505.78	803.99	1103.71	1804
108.00	110.35	89.35	1655	1662	503.13	800.71	1099.87	1804
110.00	112.15	91.15	1657	1665	500.54	797.51	1096.12	1804
112.00	113.96	92.96	1660	1668	497.98	794.37	1092.45	1304
114.00	115.76	94.76	1663	1670	495.48	791.29	1088.85	1804
116.00	117.57	96.57	1665	1673	493.01	788.26	1085.33	1804
118.00	119.37	98.37	1667	1675	490.58	785.29	1081.88	1804
120.00	121.24	100.24	1671	1678	487.77	781.73	1077.64	1871
122.00	123.14	102.14	1674	1682	484.84	777.97	1073.13	1899
124.00	125.04	104.04	1678	1686	481.96	774.30	1068.74	1899
126.00	126.94	105.94	1682	1690	479.14	770.71	1064.44	1899
128.00	128.84	107.84	1685	1693	476.38	767.20	1060.25	1899
130.00	130.74	109.74	1688	1696	473.66	763.75	1056.14	1899
132.00	132.63	111.63	1691	1700	471.00	760.38	1052.13	1899
134.00	134.53	113.53	1695	1703	468.38	757.06	1048.19	1899
136.00	136.43	115.43	1698	1706	465.81	753.81	1044.34	1899
138.00	138.33	117.33	1700	1709	463.28	750.62	1040.56	1899
140.00	140.23	119.23	1703	1712	460.79	747.48	1036.85	1899
142.00	142.13	121.13	1706	1714	458.34	744.40	1033.21	1899

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								1899
144.00	144.03	123.03	1709	1717	455.92	741.37	1029.64	
								1899
146.00	145.92	124.92	1711	1720	453.55	738.38	1026.13	
								1899
148.00	147.82	126.82	1714	1722	451.21	735.45	1022.67	
								1899
150.00	149.72	128.72	1716	1725	448.90	732.55	1019.28	
								1899
152.00	151.62	130.62	1719	1727	446.62	729.70	1015.94	
								1899
154.00	153.52	132.52	1721	1729	444.38	726.89	1012.65	
								1899
156.00	155.42	134.42	1723	1732	442.16	724.13	1009.41	
								1899
158.00	157.32	136.32	1726	1734	439.97	721.39	1006.22	
								1899
160.00	159.22	138.22	1728	1736	437.82	718.70	1003.07	
								1899
162.00	161.11	140.11	1730	1738	435.68	716.04	999.97	
								1899
164.00	163.01	142.01	1732	1740	433.58	713.41	996.91	
								1899
166.00	164.91	143.91	1734	1742	431.50	710.82	993.89	
								1899
168.00	166.81	145.81	1736	1744	429.44	708.26	990.91	
								1899
170.00	168.71	147.71	1738	1746	427.41	705.73	987.97	
								1899
172.00	170.61	149.61	1740	1748	425.40	703.23	985.07	
								1899
174.00	172.51	151.51	1741	1750	423.42	700.75	982.20	
								1899
176.00	174.41	153.41	1743	1751	421.45	698.31	979.36	
								1899
178.00	176.30	155.30	1745	1753	419.51	695.89	976.56	
								1899
180.00	178.20	157.20	1747	1755	417.59	693.50	973.79	
								1899
182.00	180.10	159.10	1748	1757	415.68	691.13	971.05	
								1899
184.00	182.00	161.00	1750	1758	413.80	688.78	968.34	
								1899
186.00	183.90	162.90	1752	1760	411.94	686.46	965.66	
								1899
188.00	185.80	164.80	1753	1761	410.09	684.17	963.01	
								1899
190.00	187.70	166.70	1755	1763	408.26	681.89	960.38	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
192.00	139.59	168.59	1756	1764	406.45	679.64	957.78	1899
194.00	191.49	170.49	1758	1766	404.66	677.41	955.21	1899
196.00	193.39	172.39	1759	1767	402.89	675.19	952.66	1899
198.00	195.29	174.29	1761	1768	401.13	673.00	950.13	1899
200.00	197.19	176.19	1762	1770	399.39	670.83	947.63	1899
202.00	199.09	178.09	1763	1771	397.66	668.67	945.15	1899
204.00	200.99	179.99	1765	1772	395.95	666.54	942.69	1899
206.00	202.89	181.89	1766	1774	394.25	664.42	940.25	1881
208.00	204.77	183.77	1767	1775	392.62	662.41	937.95	1972
210.00	206.74	185.74	1769	1777	390.73	659.97	935.08	1919
212.00	208.66	187.66	1770	1778	389.02	657.82	932.59	2054
214.00	210.71	189.71	1773	1781	386.91	655.03	929.23	2062
216.00	212.77	191.77	1776	1784	384.80	652.24	925.88	2083
218.00	214.86	193.86	1778	1787	382.65	649.39	922.42	2093
220.00	216.95	195.95	1781	1790	380.50	646.52	918.95	2066
222.00	219.02	198.02	1784	1792	378.46	643.82	915.70	2077
224.00	221.09	200.09	1787	1795	376.41	641.10	912.42	2086
226.00	223.18	202.18	1789	1798	374.36	638.37	909.13	2087
228.00	225.26	204.26	1792	1801	372.34	635.68	905.88	2099
230.00	227.36	206.36	1794	1803	370.30	632.96	902.59	2023
232.00	229.39	208.39	1796	1805	368.50	630.60	899.79	2024
234.00	231.41	210.41	1798	1807	366.72	628.26	897.01	2135
236.00	233.55	212.55	1801	1810	364.65	625.47	893.62	2097
238.00	235.64	214.64	1804	1813	362.71	622.88	890.49	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
240.00	237.71	216.71	1806	1815	360.89	620.46	837.59	2063
242.00	239.80	218.80	1808	1818	359.00	617.94	884.55	2095
244.00	241.91	220.91	1811	1820	357.09	615.37	881.44	2112
246.00	244.05	223.05	1813	1823	355.14	612.74	878.24	2135
248.00	246.20	225.20	1816	1826	353.18	610.08	875.00	2149
250.00	248.30	227.30	1818	1828	351.35	607.62	872.04	2107
252.00	250.45	229.45	1821	1831	349.43	605.02	868.88	2148
254.00	252.55	231.55	1823	1833	347.68	602.67	866.05	2093
256.00	254.66	233.66	1825	1836	345.89	600.27	863.15	2112
258.00	256.80	235.80	1828	1838	344.06	597.79	860.13	2140
260.00	258.89	237.89	1830	1840	342.36	595.51	857.39	2094
262.00	260.99	239.99	1832	1843	340.67	593.23	854.65	2098
264.00	263.12	242.12	1834	1845	338.93	590.88	851.80	2126
266.00	265.30	244.30	1837	1848	337.07	588.32	848.68	2187
268.00	267.52	246.52	1840	1851	335.15	585.67	845.41	2222
270.00	269.75	248.75	1843	1854	333.24	583.03	842.17	2226
272.00	271.93	250.93	1845	1856	331.46	580.57	839.17	2133
274.00	274.20	253.20	1848	1860	329.50	577.85	835.79	2266
276.00	276.41	255.41	1851	1863	327.70	575.35	832.73	2212
278.00	278.61	257.61	1853	1865	325.94	572.92	829.75	2200
280.00	280.78	259.78	1856	1868	324.26	570.62	826.95	2169
282.00	283.03	262.03	1858	1871	322.43	568.06	823.80	2251
284.00	285.27	264.27	1861	1873	320.65	565.57	820.72	2241
286.00	287.54	266.54	1864	1876	318.83	563.04	817.59	2263

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
288.00	289.75	268.75	1866	1879	317.15	560.69	814.72	2213
290.00	291.97	270.97	1869	1881	315.47	558.36	811.85	2217
292.00	294.24	273.24	1872	1884	313.69	555.86	808.76	2276
294.00	296.45	275.45	1874	1887	312.07	553.60	805.99	2209
296.00	298.70	277.70	1876	1889	310.40	551.26	803.11	2243
298.00	300.94	279.94	1879	1892	308.73	548.92	800.22	2250
300.00	303.28	282.28	1882	1895	306.93	546.35	797.02	2332
302.00	305.57	284.57	1885	1898	305.21	543.92	794.00	2296
304.00	307.80	286.80	1887	1901	303.64	541.72	791.30	2228
306.00	310.00	289.00	1889	1903	302.14	539.62	788.73	2202
308.00	312.22	291.22	1891	1905	300.62	537.50	786.12	2216
310.00	314.50	293.50	1894	1908	299.00	535.20	783.27	2284
312.00	316.75	295.75	1896	1910	297.46	533.02	780.58	2251
314.00	318.95	297.95	1898	1912	296.02	531.01	778.12	2196
316.00	321.11	300.11	1899	1914	294.66	529.11	775.80	2166
318.00	323.31	302.31	1901	1916	293.25	527.14	773.39	2195
320.00	325.58	304.58	1904	1918	291.74	524.98	770.73	2268
322.00	327.92	306.92	1906	1921	290.11	522.65	767.81	2339
324.00	330.28	309.28	1909	1924	288.46	520.26	764.82	2366
326.00	332.59	311.59	1912	1927	286.93	518.07	762.08	2308
328.00	334.94	313.94	1914	1929	285.36	515.80	759.24	2343
330.00	337.31	316.31	1917	1932	283.75	513.46	756.30	2376
332.00	339.59	318.59	1919	1935	282.31	511.39	753.74	2283
334.00	341.99	320.99	1922	1938	230.71	509.06	750.80	2393

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
336.00	344.41	323.41	1925	1941	279.07	506.67	747.78	2421
338.00	346.83	325.88	1928	1945	277.37	504.16	744.59	2476
340.00	349.36	328.36	1932	1948	275.70	501.69	741.45	2471
342.00	351.87	330.87	1935	1952	273.98	499.15	738.21	2510
344.00	354.27	333.27	1938	1955	272.47	496.92	735.40	2400
346.00	356.63	335.63	1940	1957	271.02	494.81	732.75	2365
348.00	359.05	338.05	1943	1960	269.50	492.57	729.93	2420
350.00	361.50	340.50	1946	1964	267.96	490.29	727.03	2449
352.00	364.00	343.00	1949	1967	266.36	487.91	723.99	2500
354.00	366.54	345.54	1952	1971	264.72	485.45	720.85	2536
356.00	369.12	348.12	1956	1975	263.03	482.91	717.58	2585
358.00	371.65	350.65	1959	1978	261.44	480.54	714.55	2527
360.00	374.22	353.22	1962	1982	259.82	478.09	711.40	2571
362.00	376.84	355.84	1966	1986	258.13	475.53	708.11	2623
364.00	379.35	358.35	1969	1989	256.64	473.29	705.24	2508
366.00	381.95	360.95	1972	1993	255.03	470.86	702.11	2597
368.00	384.57	363.57	1976	1997	253.41	468.39	698.92	2626
370.00	387.17	366.17	1979	2001	251.84	466.02	695.86	2596
372.00	389.66	368.66	1982	2004	250.45	463.93	693.20	2485
374.00	392.13	371.13	1985	2007	249.09	461.88	690.58	2475
376.00	394.63	373.63	1987	2009	247.72	459.81	637.94	2495
378.00	397.09	376.09	1990	2012	246.40	457.83	635.41	2462
380.00	399.34	378.34	1991	2014	245.35	456.29	633.50	2256
332.00	401.74	380.74	1993	2016	244.14	454.48	631.21	2395

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
384.00	404.21	383.21	1996	2018	242.85	452.53	678.72	2472
386.00	406.68	385.68	1998	2021	241.57	450.61	676.26	2468
388.00	409.14	388.14	2001	2023	240.32	448.71	673.83	2465
390.00	411.60	390.60	2003	2026	239.08	446.83	671.44	2461
392.00	414.06	393.06	2005	2028	237.85	444.98	669.07	2458
394.00	416.52	395.52	2008	2031	236.65	443.15	666.74	2454
396.00	418.97	397.97	2010	2033	235.46	441.34	664.43	2451
398.00	421.41	400.41	2012	2035	234.28	439.56	662.15	2447
400.00	423.86	402.86	2014	2038	233.13	437.80	659.90	2444
402.00	426.30	405.30	2016	2040	231.98	436.06	657.68	2441
404.00	428.74	407.74	2018	2042	230.85	434.34	655.48	2437
406.00	431.17	410.17	2021	2044	229.74	432.64	653.31	2434
408.00	433.60	412.60	2023	2046	228.63	430.96	651.16	2430
410.00	436.03	415.03	2025	2048	227.55	429.30	649.04	2427
412.00	438.45	417.45	2026	2050	226.47	427.66	646.94	2424
414.00	440.87	419.87	2028	2052	225.41	426.04	644.87	2420
416.00	443.29	422.29	2030	2054	224.37	424.44	642.82	2417
418.00	445.70	424.70	2032	2056	223.33	422.85	640.79	2414
420.00	448.11	427.11	2034	2058	222.31	421.28	638.79	2411
422.00	450.52	429.52	2036	2060	221.30	419.73	636.81	2407
424.00	452.92	431.92	2037	2061	220.30	418.20	634.85	2404
426.00	455.33	434.33	2039	2063	219.31	416.68	632.91	2401
428.00	457.72	436.72	2041	2065	218.34	415.18	630.99	2398
430.00	460.12	439.12	2042	2066	217.37	413.70	629.09	2394

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
432.00	462.51	441.51	2044	2068	216.42	412.23	627.21	2391
434.00	464.90	443.90	2046	2070	215.48	410.78	625.35	2388
436.00	467.36	446.36	2048	2072	214.48	409.22	623.33	2461
438.00	469.79	448.79	2049	2073	213.51	407.72	621.41	2428
440.00	472.33	451.33	2051	2076	212.46	406.06	619.24	2539
442.00	474.76	453.76	2053	2077	211.50	404.58	617.33	2435
444.00	477.25	456.25	2055	2079	210.51	403.02	615.31	2487
446.00	479.77	458.77	2057	2082	209.50	401.43	613.23	2522
448.00	482.39	461.39	2060	2084	208.40	399.68	610.93	2624
450.00	484.88	463.88	2062	2086	207.44	398.17	608.97	2486
452.00	487.40	466.40	2064	2089	206.46	396.61	606.94	2521
454.00	489.92	468.92	2066	2091	205.48	395.07	604.92	2521
456.00	492.48	471.48	2068	2093	204.48	393.48	602.84	2560
458.00	495.21	474.21	2071	2096	203.34	391.63	600.38	2730
460.00	498.12	477.12	2074	2100	202.04	389.51	597.54	2905
462.00	500.82	479.82	2077	2103	200.95	387.75	595.20	2701
464.00	503.55	482.55	2080	2106	199.84	385.95	592.80	2736
466.00	506.12	485.12	2082	2109	198.88	384.42	590.80	2566
468.00	508.66	487.66	2084	2111	197.97	382.95	588.87	2537
470.00	510.92	489.92	2085	2111	197.26	381.86	587.48	2265
472.00	513.51	492.51	2087	2114	196.32	380.34	585.47	2583
474.00	516.18	495.18	2089	2116	195.31	378.70	533.30	2672
476.00	518.67	497.67	2091	2118	194.46	377.35	581.52	2487
478.00	521.22	500.22	2093	2120	193.57	375.91	579.62	2555

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
480.00	523.70	502.70	2095	2121	192.75	374.59	577.90	2472
482.00	525.99	504.99	2095	2122	192.06	373.51	576.51	2293
484.00	528.36	507.36	2097	2123	191.32	372.33	574.99	2375
486.00	530.76	509.76	2098	2125	190.57	371.14	573.44	2396
488.00	533.13	512.13	2099	2126	189.85	369.99	571.94	2368
490.00	535.77	514.77	2101	2128	188.93	368.49	569.94	2639
492.00	538.27	517.27	2103	2130	188.12	367.18	568.22	2503
494.00	540.47	519.47	2103	2130	187.52	366.24	567.03	2203
496.00	543.08	522.08	2105	2132	186.65	364.82	565.13	2607
498.00	545.34	524.34	2106	2133	186.02	363.83	563.86	2262
500.00	547.56	526.56	2106	2133	185.43	362.90	562.67	2212
502.00	550.24	529.24	2109	2135	184.52	361.39	560.65	2686
504.00	552.91	531.91	2111	2138	183.63	359.92	558.68	2667
506.00	555.60	534.60	2113	2140	182.73	353.44	556.69	2689
508.00	558.05	537.05	2114	2142	182.01	357.26	555.14	2451
510.00	560.73	539.73	2117	2144	181.13	355.81	553.19	2680
512.00	563.50	542.50	2119	2147	180.20	354.25	551.08	2772
514.00	566.19	545.19	2121	2149	179.33	352.81	549.14	2691
516.00	569.04	548.04	2124	2152	178.36	351.18	546.92	2844
518.00	571.83	550.83	2127	2155	177.44	349.63	544.82	2795
520.00	574.74	553.74	2130	2158	176.44	347.94	542.51	2912
522.00	577.67	556.67	2133	2162	175.45	346.25	540.20	2926
524.00	580.56	559.56	2136	2165	174.49	344.63	537.98	2890
526.00	583.10	562.10	2137	2167	173.77	343.44	536.40	2538

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
528.00	585.57	564.57	2139	2168	173.10	342.35	534.94	2468
530.00	587.91	566.91	2139	2169	172.52	341.39	533.68	2341
532.00	590.26	569.26	2140	2169	171.93	340.42	532.41	2353
534.00	592.41	571.41	2140	2169	171.45	339.66	531.44	2152
536.00	594.65	573.65	2140	2170	170.93	338.82	530.35	2239
538.00	597.07	576.07	2142	2171	170.31	337.80	528.99	2419
540.00	599.48	578.48	2143	2171	169.70	336.79	527.66	2413
542.00	601.89	580.89	2144	2172	169.09	335.79	526.33	2412
544.00	604.32	583.32	2145	2173	168.49	334.79	524.99	2422
546.00	606.62	585.62	2145	2174	167.95	333.90	523.83	2301
548.00	609.00	588.00	2146	2175	167.37	332.95	522.57	2383
550.00	611.42	590.42	2147	2176	166.78	331.96	521.25	2416
552.00	613.82	592.82	2148	2176	166.19	330.99	519.96	2408
554.00	616.12	595.12	2148	2177	165.67	330.14	518.84	2294
556.00	618.52	597.52	2149	2178	165.10	329.19	517.57	2398
558.00	620.93	599.93	2150	2179	164.53	328.22	516.28	2415
560.00	623.26	602.26	2151	2179	164.00	327.35	515.12	2330
562.00	625.79	604.79	2152	2181	163.36	326.28	513.68	2534
564.00	628.30	607.30	2154	2182	162.75	325.24	512.28	2505
566.00	630.82	609.82	2155	2183	162.13	324.20	510.86	2523
568.00	633.53	612.53	2157	2185	161.41	322.97	509.18	2709
570.00	636.17	615.17	2158	2187	160.74	321.82	507.61	2640
572.00	638.82	617.82	2160	2189	160.07	320.66	506.03	2653
574.00	641.20	620.20	2161	2189	159.55	319.79	504.86	2372

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVECUT MS	INTERVAL VELOCITY M/S
576.00	643.60	622.60	2162	2190	159.01	318.89	503.65	2402
578.00	645.81	624.81	2162	2190	158.57	318.16	502.69	2208
580.00	648.37	627.37	2163	2192	157.96	317.12	501.27	2564
582.00	650.79	629.79	2164	2192	157.43	316.22	500.06	2421
584.00	653.57	632.57	2166	2195	156.71	314.97	498.33	2780
586.00	656.10	635.10	2168	2196	156.14	313.99	496.99	2524
588.00	658.83	637.83	2169	2198	155.46	312.81	495.37	2730
590.00	661.36	640.36	2171	2199	154.89	311.83	494.03	2536
592.00	663.96	642.96	2172	2201	154.29	310.80	492.61	2598
594.00	666.64	645.64	2174	2203	153.65	309.69	491.08	2682
596.00	668.81	647.81	2174	2202	153.25	309.03	490.22	2164
598.00	671.17	650.17	2174	2203	152.78	308.23	489.13	2359
600.00	673.51	652.51	2175	2203	152.31	307.43	488.07	2346
602.00	675.90	654.90	2176	2204	151.83	306.61	486.95	2388
604.00	678.09	657.09	2176	2204	151.43	305.95	486.07	2192
606.00	680.48	659.48	2177	2205	150.95	305.12	484.96	2394
608.00	682.67	661.67	2177	2205	150.56	304.47	484.09	2184
610.00	684.95	663.95	2177	2205	150.13	303.74	483.12	2283
612.00	687.29	666.29	2177	2205	149.68	302.98	482.08	2341
614.00	689.63	668.63	2178	2206	149.24	302.21	481.05	2337
616.00	691.99	670.99	2179	2206	148.78	301.44	480.00	2359
618.00	694.29	673.29	2179	2207	148.36	300.71	479.02	2299
620.00	696.57	675.57	2179	2207	147.94	300.01	478.07	2277
622.00	698.98	677.98	2180	2207	147.48	299.20	476.97	2411

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
624.00	701.35	680.35	2181	2208	147.03	298.42	475.91	2378
626.00	703.77	682.77	2181	2209	146.56	297.62	474.80	2420
628.00	706.35	685.35	2183	2210	146.03	296.69	473.52	2576
630.00	709.12	688.12	2185	2212	145.41	295.59	471.98	2771
632.00	712.08	691.08	2187	2215	144.71	294.34	470.20	2960
634.00	715.05	694.05	2189	2218	144.01	293.09	468.43	2966
636.00	717.64	696.64	2191	2219	143.49	292.17	467.16	2589
638.00	720.58	699.58	2193	2221	142.82	290.96	465.44	2944
640.00	723.47	702.47	2195	2224	142.17	289.81	463.80	2890
642.00	726.55	705.55	2198	2227	141.45	288.49	461.93	3075
644.00	729.39	708.39	2200	2229	140.84	287.40	460.38	2841
646.00	732.40	711.40	2202	2232	140.15	286.16	458.62	3016
648.00	735.29	714.29	2205	2234	139.53	285.05	457.04	2884
650.00	738.23	717.23	2207	2237	138.89	283.89	455.39	2945
652.00	741.24	720.24	2209	2240	138.23	282.69	453.67	3009
654.00	744.03	723.03	2211	2242	137.66	281.68	452.25	2790
656.00	747.12	726.12	2214	2245	136.97	280.43	450.45	3089
658.00	750.29	729.29	2217	2248	136.25	279.11	448.55	3172
660.00	753.50	732.50	2220	2252	135.52	277.77	446.62	3212
662.00	756.60	735.60	2222	2255	134.85	276.54	444.85	3097
664.00	759.56	738.56	2225	2257	134.24	275.45	443.23	2955
666.00	762.59	741.59	2227	2260	133.61	274.30	441.63	3033
668.00	765.79	744.79	2230	2263	132.91	273.01	439.77	3204
670.00	768.75	747.75	2232	2266	132.32	271.94	438.24	2952

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
672.00	771.48	750.48	2234	2267	131.83	271.05	436.97	2739
674.00	774.74	753.74	2237	2271	131.12	269.75	435.08	3252
676.00	777.86	756.86	2239	2274	130.48	268.57	433.38	3122
678.00	730.92	759.92	2242	2276	129.87	267.45	431.77	3063
680.00	784.08	763.08	2244	2280	129.23	266.26	430.04	3161
682.00	787.18	766.18	2247	2282	128.61	265.13	428.41	3099
684.00	790.00	769.00	2249	2284	128.11	264.22	427.11	2821
686.00	793.06	772.06	2251	2287	127.53	263.14	425.54	3058
688.00	795.74	774.74	2252	2288	127.09	262.34	424.40	2682
690.00	798.77	777.77	2254	2290	126.52	261.30	422.90	3023
692.00	801.92	780.92	2257	2293	125.91	260.17	421.26	3153
694.00	805.08	784.08	2260	2296	125.31	259.05	419.62	3158
696.00	808.29	787.29	2262	2300	124.68	257.89	417.93	3217
698.00	811.48	790.48	2265	2303	124.08	256.77	416.29	3186
700.00	814.65	793.65	2268	2306	123.49	255.66	414.68	3171
702.00	817.84	796.84	2270	2309	122.89	254.55	413.06	3188
704.00	821.06	800.06	2273	2312	122.29	253.43	411.43	3217
706.00	824.23	803.23	2275	2315	121.71	252.36	409.85	3172
708.00	827.28	806.28	2278	2317	121.18	251.38	408.42	3054
710.00	830.48	809.48	2280	2320	120.61	250.30	406.84	3201
712.00	833.71	812.71	2283	2323	120.03	249.21	405.25	3222
714.00	836.89	815.89	2285	2326	119.46	248.16	403.70	3189
716.00	840.16	819.16	2288	2329	118.88	247.06	402.09	3264
718.00	843.34	822.34	2291	2332	118.33	246.03	400.58	3179

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
720.00	846.57	825.57	2293	2335	117.77	244.97	399.02	3237
722.00	849.61	828.61	2295	2337	117.28	244.05	397.68	3040
724.00	852.69	831.69	2297	2339	116.78	243.12	396.31	3078
726.00	855.80	834.80	2300	2342	116.27	242.17	394.92	3107
728.00	858.96	837.96	2302	2344	115.75	241.19	393.48	3162
730.00	862.24	841.24	2305	2348	115.20	240.15	391.94	3276
732.00	865.35	844.35	2307	2350	114.71	239.22	390.57	3111
734.00	868.39	847.39	2309	2352	114.24	238.34	389.29	3041
736.00	871.49	850.49	2311	2354	113.76	237.43	387.95	3102
738.00	874.70	853.70	2314	2357	113.25	236.47	386.52	3205
740.00	877.61	856.61	2315	2359	112.83	235.69	385.38	2913
742.00	880.47	859.47	2317	2360	112.43	234.94	384.29	2861
744.00	883.53	862.53	2319	2363	111.98	234.08	383.02	3062
746.00	886.57	865.57	2321	2365	111.53	233.25	381.79	3039
748.00	889.99	868.99	2323	2368	110.97	232.18	380.19	3416
750.00	893.48	872.48	2327	2372	110.39	231.07	378.53	3492
752.00	896.70	875.70	2329	2374	109.90	230.14	377.16	3223
754.00	900.14	879.14	2332	2378	109.35	229.08	375.58	3434
756.00	903.56	882.56	2335	2381	108.81	228.05	374.04	3419
758.00	906.53	885.52	2336	2383	108.41	227.29	372.92	2969
760.00	909.60	888.60	2338	2385	107.99	226.48	371.72	3074
762.00	911.95	890.95	2338	2385	107.75	226.04	371.09	2349
764.00	915.35	894.35	2341	2388	107.23	225.04	369.60	3403
766.00	918.21	897.21	2343	2390	106.87	224.36	368.60	2857

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
768.00	921.09	900.09	2344	2391	106.50	223.68	367.59	2878
770.00	923.72	902.72	2345	2392	106.21	223.12	366.77	2630
772.00	926.38	905.38	2346	2392	105.90	222.55	365.94	2668
774.00	929.18	908.18	2347	2393	105.57	221.91	365.00	2796
776.00	932.33	911.33	2349	2396	105.14	221.10	363.79	3148
778.00	935.06	914.06	2350	2397	104.83	220.50	362.92	2731
780.00	937.57	916.57	2350	2397	104.57	220.01	362.20	2514
782.00	940.54	919.54	2352	2399	104.20	219.31	361.16	2961
784.00	943.51	922.51	2353	2400	103.83	218.61	360.11	2977
786.00	946.49	925.49	2355	2402	103.46	217.90	359.06	2982
788.00	949.65	928.65	2357	2404	103.05	217.11	357.88	3152
790.00	952.48	931.48	2358	2405	102.72	216.49	356.96	2835
792.00	955.16	934.16	2359	2406	102.44	215.95	356.16	2677
794.00	958.05	937.05	2360	2407	102.10	215.30	355.20	2894
796.00	960.99	939.99	2362	2409	101.75	214.64	354.21	2940
798.00	963.67	942.67	2363	2410	101.47	214.10	353.42	2679
800.00	966.90	945.90	2365	2412	101.06	213.30	352.22	3224
802.00	969.60	948.60	2366	2413	100.77	212.76	351.42	2707
804.00	972.54	951.54	2367	2414	100.43	212.11	350.45	2933
806.00	975.10	954.10	2367	2414	100.18	211.64	349.75	2556
808.00	978.12	957.12	2369	2416	99.83	210.95	348.73	3029
810.00	980.73	959.73	2370	2417	99.57	210.46	348.01	2606
812.00	983.25	962.25	2370	2417	99.33	210.01	347.34	2523
814.00	985.94	964.94	2371	2418	99.06	209.49	346.57	2689

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
816.00	938.50	967.50	2371	2418	98.82	209.03	345.89	2553
818.00	991.42	970.42	2373	2419	98.50	208.41	344.97	2922
820.00	993.95	972.95	2373	2420	98.26	207.96	344.31	2535
822.00	996.63	975.63	2374	2420	98.00	207.46	343.55	2678
824.00	999.27	978.27	2374	2421	97.74	206.97	342.83	2638
826.00	1001.65	980.65	2374	2421	97.54	206.53	342.27	2377
828.00	1004.34	983.34	2375	2421	97.27	206.08	341.52	2697
830.00	1006.97	985.97	2376	2422	97.02	205.60	340.81	2628
832.00	1009.85	988.85	2377	2423	96.72	205.02	339.94	2876
834.00	1012.67	991.67	2378	2424	96.44	204.47	339.11	2826
836.00	1015.48	994.48	2379	2425	96.16	203.92	338.30	2808
838.00	1018.41	997.41	2380	2427	95.85	203.33	337.40	2935
840.00	1021.53	1000.53	2382	2428	95.51	202.66	336.39	3113
842.00	1024.14	1003.14	2383	2429	95.27	202.20	335.71	2613
844.00	1026.78	1005.78	2383	2429	95.03	201.74	335.02	2637
846.00	1029.78	1008.78	2385	2431	94.71	201.13	334.09	3001
848.00	1032.52	1011.52	2386	2432	94.45	200.63	333.34	2739
850.00	1035.10	1014.10	2386	2432	94.23	200.19	332.70	2578
852.00	1037.67	1016.67	2387	2432	94.00	199.76	332.05	2574
854.00	1040.31	1019.31	2387	2433	93.77	199.30	331.37	2642
856.00	1042.87	1021.87	2388	2433	93.55	198.88	330.75	2553
858.00	1045.44	1024.44	2388	2434	93.33	198.46	330.11	2578
860.00	1047.93	1026.93	2388	2434	93.12	198.06	329.53	2484
862.00	1050.57	1029.57	2389	2434	92.89	197.62	328.86	2644

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
864.00	1053.16	1032.16	2389	2435	92.67	197.19	328.22	2590
866.00	1055.87	1034.87	2390	2435	92.43	196.72	327.51	2708
868.00	1058.46	1037.46	2390	2436	92.21	196.30	326.88	2586
870.00	1061.03	1040.03	2391	2436	91.99	195.88	326.26	2576
872.00	1063.58	1042.58	2391	2436	91.79	195.48	325.65	2548
874.00	1066.07	1045.07	2391	2436	91.59	195.09	325.08	2490
876.00	1068.69	1047.69	2392	2437	91.36	194.66	324.44	2624
878.00	1071.56	1050.56	2393	2438	91.10	194.15	323.65	2865
880.00	1074.10	1053.10	2393	2438	90.90	193.75	323.06	2542
882.00	1076.73	1055.73	2394	2438	90.68	193.32	322.42	2631
884.00	1079.31	1058.31	2394	2439	90.47	192.92	321.81	2581
886.00	1081.87	1060.87	2395	2439	90.26	192.52	321.21	2553
888.00	1084.41	1063.41	2395	2439	90.06	192.13	320.63	2541
890.00	1087.06	1066.06	2396	2440	89.84	191.70	319.99	2650
892.00	1089.67	1068.67	2396	2440	89.63	191.29	319.37	2606
894.00	1092.21	1071.21	2396	2440	89.43	190.91	318.79	2540
896.00	1094.73	1073.73	2397	2441	89.24	190.53	318.22	2525
898.00	1097.40	1076.40	2397	2441	89.02	190.10	317.58	2674
900.00	1099.98	1078.98	2398	2441	88.82	189.71	316.99	2573
902.00	1102.43	1081.43	2398	2441	88.64	189.36	316.46	2456
904.00	1104.98	1083.98	2398	2442	88.44	188.98	315.89	2542
906.00	1107.54	1086.54	2399	2442	88.25	188.60	315.31	2561
908.00	1110.15	1089.15	2399	2442	88.04	188.20	314.71	2614
910.00	1112.78	1091.78	2400	2443	87.84	187.80	314.10	2629

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
912.00	1115.41	1094.41	2400	2443	87.63	187.39	313.49	2634
914.00	1117.99	1096.99	2400	2444	87.44	187.01	312.91	2573
916.00	1120.67	1099.67	2401	2444	87.23	186.60	312.29	2674
918.00	1123.31	1102.31	2402	2445	87.02	186.20	311.67	2648
920.00	1125.99	1104.99	2402	2445	86.81	185.79	311.05	2673
922.00	1128.71	1107.71	2403	2446	86.60	185.36	310.41	2723
924.00	1131.47	1110.47	2404	2446	86.38	184.93	309.74	2762
926.00	1134.11	1113.11	2404	2447	86.18	184.53	309.14	2642
928.00	1136.97	1115.97	2405	2448	85.94	184.07	308.43	2862
930.00	1139.70	1118.70	2406	2448	85.73	183.65	307.80	2721
932.00	1142.20	1121.20	2406	2449	85.55	183.31	307.27	2508
934.00	1145.03	1124.03	2407	2449	85.33	182.86	306.59	2824
936.00	1147.46	1126.46	2407	2449	85.16	182.54	306.10	2437
938.00	1149.99	1128.99	2407	2450	84.99	182.19	305.57	2523
940.00	1152.43	1131.43	2407	2450	84.82	181.86	305.08	2448
942.00	1154.90	1133.90	2407	2450	84.65	181.53	304.58	2469
944.00	1157.41	1136.41	2408	2450	84.48	181.19	304.07	2510
946.00	1160.01	1139.01	2408	2450	84.29	180.83	303.51	2599
948.00	1162.56	1141.56	2408	2450	84.12	180.48	302.98	2551
950.00	1165.07	1144.07	2409	2450	83.95	180.14	302.47	2503
952.00	1167.38	1146.38	2408	2450	83.80	179.86	302.05	2313
954.00	1169.75	1148.75	2408	2450	83.65	179.57	301.60	2372
956.00	1172.14	1151.14	2408	2450	83.50	179.27	301.15	2389
958.00	1174.56	1153.56	2408	2450	83.34	178.96	300.68	2424

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
960.00	1177.01	1156.01	2408	2450	83.18	178.65	300.20	2448
962.00	1179.56	1158.56	2409	2450	83.01	178.31	299.68	2543
964.00	1181.97	1160.97	2409	2450	82.86	178.00	299.23	2413
966.00	1184.42	1163.42	2409	2450	82.70	177.69	298.76	2445
968.00	1186.76	1165.76	2409	2450	82.56	177.41	298.33	2341
970.00	1189.10	1168.10	2408	2449	82.41	177.13	297.91	2336
972.00	1191.50	1170.50	2408	2449	82.26	176.84	297.46	2403
974.00	1193.84	1172.84	2408	2449	82.12	176.56	297.04	2338
976.00	1196.20	1175.20	2408	2449	81.98	176.28	296.61	2366
978.00	1198.65	1177.65	2408	2449	81.82	175.97	296.14	2450
980.00	1201.07	1180.07	2408	2449	81.67	175.68	295.69	2413
982.00	1203.47	1182.47	2408	2449	81.53	175.38	295.25	2403
984.00	1205.91	1184.91	2408	2449	81.37	175.08	294.79	2445
986.00	1208.34	1187.34	2408	2449	81.22	174.79	294.34	2423
988.00	1210.69	1189.69	2408	2449	81.08	174.51	293.92	2355
990.00	1213.09	1192.09	2408	2448	80.94	174.23	293.49	2393
992.00	1215.54	1194.54	2408	2448	80.79	173.93	293.03	2453
994.00	1218.26	1197.26	2409	2449	80.60	173.55	292.45	2722
996.00	1220.83	1199.83	2409	2449	80.43	173.22	291.94	2573
998.00	1223.57	1202.57	2410	2450	80.25	172.85	291.36	2733
1000.00	1226.30	1205.30	2411	2450	80.06	172.47	290.79	2732
1002.00	1229.06	1208.06	2411	2451	79.87	172.10	290.20	2759
1004.00	1231.72	1210.72	2412	2452	79.70	171.75	289.66	2663
1006.00	1234.47	1213.47	2412	2452	79.51	171.37	289.08	2748

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1008.00	1237.12	1216.12	2413	2453	79.34	171.03	288.55	2648
1010.00	1239.59	1218.59	2413	2453	79.19	170.74	288.10	2475
1012.00	1242.34	1221.34	2414	2453	79.01	170.37	287.52	2747
1014.00	1245.27	1224.27	2415	2454	78.80	169.95	286.87	2933
1016.00	1248.08	1227.08	2416	2455	78.61	169.56	286.27	2812
1018.00	1250.81	1229.82	2416	2456	78.43	169.20	285.71	2731
1020.00	1253.71	1232.71	2417	2457	78.23	168.80	285.08	2895
1022.00	1256.69	1235.69	2418	2458	78.02	168.37	284.41	2984
1024.00	1259.43	1238.43	2419	2458	77.84	168.01	283.85	2735
1026.00	1262.13	1241.13	2419	2459	77.67	167.67	283.32	2703
1028.00	1264.91	1243.91	2420	2459	77.49	167.31	282.75	2778
1030.00	1267.55	1246.55	2420	2460	77.33	166.98	282.25	2637
1032.00	1270.72	1249.72	2422	2461	77.09	166.50	281.49	3172
1034.00	1273.50	1252.50	2423	2462	76.91	166.14	280.93	2786
1036.00	1276.31	1255.31	2423	2463	76.73	165.77	280.36	2810
1038.00	1279.15	1258.15	2424	2464	76.55	165.40	279.77	2833
1040.00	1281.97	1260.97	2425	2464	76.37	165.04	279.20	2825
1042.00	1284.93	1263.93	2426	2465	76.17	164.63	278.57	2957
1044.00	1287.89	1266.89	2427	2466	75.97	164.23	277.94	2958
1046.00	1290.88	1269.88	2428	2467	75.77	163.82	277.29	2991
1048.00	1293.92	1272.92	2429	2469	75.56	163.40	276.63	3040
1050.00	1296.89	1275.89	2430	2470	75.36	163.00	276.00	2974
1052.00	1299.99	1278.99	2432	2471	75.15	162.57	275.32	3095
1054.00	1303.02	1282.02	2433	2472	74.95	162.16	274.67	3032

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1056.00	1305.88	1284.88	2433	2473	74.77	161.79	274.09	2865
1058.00	1308.80	1287.80	2434	2474	74.58	161.42	273.50	2915
1060.00	1311.69	1290.69	2435	2475	74.40	161.05	272.92	2894
1062.00	1314.76	1293.76	2436	2476	74.20	160.63	272.26	3066
1064.00	1317.69	1296.69	2437	2477	74.01	160.26	271.67	2933
1066.00	1320.72	1299.72	2439	2478	73.82	159.86	271.04	3029
1068.00	1323.50	1302.50	2439	2479	73.65	159.52	270.52	2778
1070.00	1326.16	1305.16	2440	2479	73.51	159.22	270.05	2659
1072.00	1328.67	1307.67	2440	2479	73.37	158.96	269.63	2515
1074.00	1331.14	1310.14	2440	2479	73.25	158.70	269.23	2464
1076.00	1333.95	1312.95	2440	2480	73.08	158.37	268.71	2808
1078.00	1336.54	1315.54	2441	2480	72.94	158.08	268.27	2592
1080.00	1339.08	1318.08	2441	2480	72.81	157.82	267.85	2542
1082.00	1341.59	1320.59	2441	2480	72.68	157.55	267.44	2515
1084.00	1343.79	1322.79	2441	2480	72.58	157.36	267.14	2199
1086.00	1345.91	1324.91	2440	2479	72.49	157.18	266.86	2119
1088.00	1348.87	1327.87	2441	2480	72.31	156.81	266.28	2956
1090.00	1352.56	1331.56	2443	2483	72.03	156.23	265.35	3693
1092.00	1355.65	1334.65	2444	2484	71.84	155.83	264.72	3092
1094.00	1358.85	1337.85	2446	2486	71.63	155.41	264.05	3193
1096.00	1361.98	1340.98	2447	2487	71.44	155.01	263.40	3134
1098.00	1364.26	1343.26	2447	2487	71.33	154.80	263.09	2276
1100.00	1366.41	1345.41	2446	2486	71.24	154.62	262.81	2149
1102.00	1368.54	1347.54	2446	2485	71.16	154.45	262.54	2134

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1104.00	1371.10	1350.10	2446	2486	71.03	154.18	262.13	2557
1106.00	1374.05	1353.05	2447	2486	70.85	153.83	261.57	2957
1108.00	1377.22	1356.22	2448	2488	70.66	153.42	260.92	3169
1110.00	1380.49	1359.49	2450	2489	70.45	152.99	260.23	3272
1112.00	1383.71	1362.71	2451	2491	70.25	152.58	259.57	3217
1114.00	1386.75	1365.75	2452	2492	70.07	152.21	258.98	3035
1116.00	1389.86	1368.86	2453	2493	69.88	151.83	258.37	3114
1118.00	1392.86	1371.86	2454	2494	69.71	151.48	257.81	2996
1120.00	1395.77	1374.77	2455	2495	69.55	151.15	257.28	2914
1122.00	1398.69	1377.69	2456	2496	69.39	150.82	256.76	2917
1124.00	1401.66	1380.66	2457	2497	69.22	150.47	256.21	2974
1126.00	1404.73	1383.78	2458	2498	69.04	150.10	255.61	3114
1128.00	1407.85	1386.85	2459	2499	68.86	149.73	255.03	3078
1130.00	1410.74	1389.74	2460	2500	68.71	149.42	254.53	2886
1132.00	1413.81	1392.81	2461	2501	68.53	149.06	253.95	3072
1134.00	1416.98	1395.98	2462	2502	68.35	148.67	253.34	3173
1136.00	1419.44	1398.44	2462	2502	68.24	148.45	252.99	2458
1138.00	1422.68	1401.68	2463	2504	68.05	148.06	252.35	3238
1140.00	1425.92	1404.92	2465	2505	67.86	147.66	251.72	3242
1142.00	1429.28	1408.28	2466	2507	67.65	147.24	251.04	3362
1144.00	1432.70	1411.70	2468	2509	67.44	146.80	250.33	3420
1146.00	1436.00	1415.00	2469	2511	67.25	146.40	249.69	3297
1148.00	1439.25	1418.25	2471	2512	67.06	146.01	249.06	3245
1150.00	1442.19	1421.19	2472	2513	66.91	145.70	248.56	2944

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								3549
1152.00	1445.74	1424.74	2474	2515	66.69	145.23	247.82	3311
1154.00	1449.05	1428.05	2475	2517	66.50	144.84	247.18	3107
1156.00	1452.16	1431.16	2476	2518	66.33	144.49	246.62	2997
1158.00	1455.15	1434.15	2477	2519	66.17	144.17	246.11	3079
1160.00	1458.23	1437.23	2478	2520	66.01	143.83	245.57	2417
1162.00	1460.65	1439.65	2478	2520	65.91	143.63	245.25	3306
1164.00	1463.96	1442.96	2479	2521	65.73	143.24	244.62	3075
1166.00	1467.03	1446.03	2480	2522	65.57	142.91	244.09	3018
1168.00	1470.05	1449.05	2481	2523	65.41	142.60	243.58	3566
1170.00	1473.61	1452.61	2483	2525	65.20	142.15	242.86	2465
1172.00	1476.08	1455.08	2483	2525	65.10	141.94	242.53	3361
1174.00	1479.44	1458.44	2485	2527	64.91	141.55	241.90	3198
1176.00	1482.64	1461.64	2486	2528	64.74	141.20	241.33	3008
1178.00	1485.65	1464.65	2487	2529	64.59	140.89	240.83	3240
1180.00	1488.89	1467.89	2488	2530	64.42	140.53	240.26	2873
1182.00	1491.76	1470.76	2489	2531	64.29	140.26	239.81	2938
1184.00	1494.70	1473.70	2489	2532	64.15	139.97	239.34	3179
1186.00	1497.88	1476.88	2491	2533	63.98	139.63	238.80	3034
1188.00	1500.91	1479.91	2491	2534	63.84	139.32	238.30	2919
1190.00	1503.83	1482.83	2492	2535	63.70	139.04	237.85	2999
1192.00	1506.83	1485.83	2493	2535	63.56	138.74	237.37	2799
1194.00	1509.63	1488.63	2494	2536	63.43	138.48	236.96	2868
1196.00	1512.50	1491.50	2494	2537	63.30	138.21	236.53	3191
1198.00	1515.69	1494.69	2495	2538	63.14	137.88	235.98	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1200.00	1518.83	1497.83	2496	2539	62.99	137.56	235.47	3139
1202.00	1522.01	1501.01	2498	2540	62.83	137.23	234.93	3179
1204.00	1525.17	1504.17	2499	2541	62.68	136.91	234.41	3164
1206.00	1527.75	1506.75	2499	2541	62.57	136.70	234.07	2575
1208.00	1529.89	1508.89	2498	2541	62.51	136.56	233.85	2137
1210.00	1532.74	1511.74	2499	2541	62.38	136.30	233.44	2854
1212.00	1536.15	1515.15	2500	2543	62.20	135.93	232.83	3406
1214.00	1538.95	1517.95	2501	2543	62.08	135.68	232.43	2804
1216.00	1541.94	1520.94	2502	2544	61.95	135.40	231.98	2992
1218.00	1545.08	1524.08	2503	2545	61.80	135.09	231.48	3134
1220.00	1548.32	1527.32	2504	2547	61.64	134.76	230.94	3240
1222.00	1551.56	1530.56	2505	2548	61.49	134.43	230.41	3241
1224.00	1554.92	1533.92	2506	2549	61.32	134.08	229.83	3366
1226.00	1558.19	1537.19	2508	2551	61.16	133.75	229.30	3269
1228.00	1561.50	1540.50	2509	2552	61.00	133.41	228.75	3305
1230.00	1564.43	1543.43	2510	2553	60.87	133.15	228.33	2930
1232.00	1567.73	1546.73	2511	2554	60.71	132.81	227.78	3304
1234.00	1570.77	1549.77	2512	2555	60.58	132.53	227.33	3042
1236.00	1574.02	1553.02	2513	2556	60.43	132.21	226.81	3251
1238.00	1577.43	1556.43	2514	2558	60.26	131.87	226.24	3403
1240.00	1580.73	1559.73	2516	2559	60.11	131.54	225.71	3299
1242.00	1584.31	1563.31	2517	2561	59.92	131.15	225.08	3587
1244.00	1587.97	1566.97	2519	2563	59.73	130.75	224.42	3659
1246.00	1591.62	1570.62	2521	2566	59.55	130.36	223.78	3652

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1248.00	1594.88	1573.88	2522	2567	59.40	130.05	223.27	3252
1250.00	1598.13	1577.13	2523	2568	59.25	129.74	222.77	3249
1252.00	1601.34	1580.34	2525	2569	59.11	129.44	222.28	3211
1254.00	1604.85	1583.85	2526	2571	58.94	129.08	221.70	3516
1256.00	1608.04	1587.04	2527	2572	58.80	128.79	221.22	3189
1258.00	1611.32	1590.32	2528	2573	58.65	128.48	220.72	3279
1260.00	1614.59	1593.59	2530	2575	58.51	128.18	220.22	3263
1262.00	1617.91	1596.91	2531	2576	58.36	127.87	219.71	3330
1264.00	1621.30	1600.30	2532	2577	58.21	127.54	219.18	3386
1266.00	1624.65	1603.65	2533	2579	58.06	127.23	218.67	3345
1268.00	1627.96	1606.96	2535	2580	57.91	126.92	218.17	3311
1270.00	1631.45	1610.45	2536	2582	57.75	126.58	217.61	3489
1272.00	1635.13	1614.13	2538	2584	57.57	126.21	216.99	3680
1274.00	1638.43	1617.43	2539	2585	57.43	125.91	216.50	3301
1276.00	1641.69	1620.69	2540	2586	57.29	125.62	216.03	3259
1278.00	1645.08	1624.08	2542	2588	57.14	125.30	215.51	3397
1280.00	1648.43	1627.43	2543	2589	57.00	125.00	215.01	3346
1282.00	1651.92	1630.93	2544	2591	56.84	124.67	214.47	3497
1284.00	1655.32	1634.32	2546	2592	56.69	124.36	213.96	3398
1286.00	1658.78	1637.78	2547	2594	56.54	124.04	213.43	3459
1288.00	1662.11	1641.11	2548	2595	56.40	123.74	212.95	3323
1290.00	1665.46	1644.46	2550	2597	56.26	123.45	212.46	3354
1292.00	1668.81	1647.81	2551	2598	56.12	123.15	211.98	3348
1294.00	1672.14	1651.14	2552	2599	55.98	122.86	211.50	3337

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1296.00	1675.50	1654.50	2553	2601	55.85	122.56	211.02	3357
1298.00	1678.87	1657.87	2555	2602	55.71	122.27	210.53	3370
1300.00	1682.37	1661.37	2556	2603	55.56	121.95	210.01	3498
1302.00	1685.91	1664.91	2557	2605	55.40	121.63	209.48	3542
1304.00	1689.23	1668.23	2559	2606	55.27	121.35	209.02	3317
1306.00	1692.55	1671.55	2560	2608	55.14	121.07	208.56	3316
1308.00	1696.18	1675.18	2561	2610	54.98	120.73	208.00	3637
1310.00	1699.84	1678.84	2563	2611	54.82	120.39	207.44	3653
1312.00	1703.16	1682.16	2564	2613	54.69	120.12	206.99	3326
1314.00	1706.47	1685.47	2565	2614	54.56	119.84	206.54	3311
1316.00	1709.88	1688.88	2567	2615	54.42	119.55	206.06	3404
1318.00	1712.97	1691.97	2567	2616	54.31	119.32	205.68	3095
1320.00	1715.89	1694.89	2568	2617	54.21	119.11	205.34	2913
1322.00	1718.61	1697.61	2568	2617	54.13	118.93	205.04	2720
1324.00	1721.32	1700.32	2568	2617	54.04	118.75	204.75	2720
1326.00	1724.04	1703.04	2569	2617	53.96	118.58	204.46	2719
1328.00	1726.76	1705.76	2569	2617	53.87	118.40	204.17	2720

SECTION 5

BHP PETROLEUM

SATELLITE POSITIONING SURVEY
DEL NORTE TRISPONDER

AMBERJACK No. 1 WELL

SOUTHERN CROSS DRILL RIG

WOLLONGONG MAY 1990

BHP Engineering

BHP PETROLEUM

SATELLITE POSITIONING SURVEY

SURFACE POSITIONING

SOUTHERN CROSS DRILLING RIG

AMBERJACK LOCATION - BASS STRAIT

Ref: SD:MB
Doc No: 0207M
July 1990

Prepared by:
BHP Engineering Pty Ltd
(Incorporated in ACT)
Australia

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CONTENTS

1. COMMISSION

1.1.1 To verify the position of the Southern Cross drill platform whilst on location at Amberjack No.1 Well in Bass Strait.

1.2 A Del Norte Trisponder system, (an X-band surface radio positioning system), consisting of three shore based remote stations and two mobile Central Processing Units (CPU's), was used to obtain simultaneous range data for positioning the drill rig.

1.3 Three Del Norte remote stations are permanently established at co-ordinated survey stations which form part of the permanent survey control network previously established by Esso Australia Ltd to service the Bass Strait oil fields. The two CPU's were installed in the Canning Tide and onboard the Drill Rig Southern Cross respectively.

1.4 The system simultaneously displays the ranges in metres from the shore based remotes to the CPU antennas on the CPU monitor, and these displayed ranges were used to derive the position of the drill rig using dedicated proven software in a laptop computer.

1.5 All times quoted in this report are referred to Eastern Australia Standard Time unless otherwise stated.

2. RECEIVER SITE

2.1 The Southern Cross Drill Rig was anchored at Amberjack No.1 Well. The Del Norte master antenna was established above the drilling rig derrick crown, at a relative bearing of 100 degrees x 3.0 metres from the centre of the drill stem.

3. SURVEY OPERATION

3.1 Mr C Littoron had previously calibrated the Del Norte system and established the anchoring pattern from the my Canning Tide. BHPE Surveyor Mr Greg Halls established the Del Norte master in the Southern Cross on 3rd May 1990 at 0700 hrs as the rig was moving onto location.

3.2 Data was obtained to assist the rig onto location and the final fix was observed at 2300 hrs on the same day following ballasting down and the tensioning of anchors.

3.3 Check fixes were observed following spudding in the following day with no movement of position evident.

4. POST PROCESSING OF FIELD DATA

4.1 Intended Well Location:

STN. AMBERJACK 1

Latitude	38 deg 29 min 33.50 S
Longitude	147 deg 18 min 55.40 E
Conv.	0 °11' 46.69"
Zone	527 504.171 E
55	5 739 461.444 N
Scale	.99960932

4.2 Del Norte Reference Data:

1. Fixed station for survey control:

STATION NAME	EASTING	NORTHING	R.L.
LONGFORD	513 544.200	5 769 507.000	147.000m
BARRACOUTA	558 993.500	5 760 872.600	55.000m
CURRAJONG	471 713.000	5 752 633.000	647.000m

A.M.G. Zone = 55

Ht of antenna on Rig = 76.00m
Ins scale factor = 1.00

2. Instrument Calibration Corrections:

LONGFORD	.00
BARRACOUTA	.00
CURRAJONG	.00

3. PARAMETER SETTINGS

Offset angle of trans/anten 0-360 deg	100°00'00"
Offset distance	3.000m
Rig Heading	233°00'00"

4. AMBERJACK 1 LOCATION (as Way Point 1)

527504.171E 5739461.444N

4.3 Fixation Data:

INITITAL LOCATION RUNNING ANCHORS:

Fix No.1 03/05/90	10:28:41	527 557.8E	5 739 421.2N	
From Station	Raw Range	Red.Range	Residual	PPM
LONGFORD	33199.0	33198.9	.63	19.
BARRACOUTA	38072.0	38072.0	-.68	-18.
CARRAJONG	57411.0	57408.2	-.92	-16.

To Way Point 1 306° 53' 06" 67.1 metres

COMMENCE REPOSITIONING:

FIX No.14 03/05/90	14:31:30	527 504.1E	5 739 465.9N	
From Station	Raw Range	Red Range	Residual	PPM
LONGFORD	33136.0	33135.9	.38	11.
BARRACOUTA	38091.0	38091.0	-.41	-11.
CURRAJONG	57348.0	57345.2	-.55	-10.

To Way Point 1 178° 49' 33" 4.4 metres

FIX No.15 03/05/90 14:35:56		527 502.5E	5 739 462.4N	
From Station	Raw Range	Red Range	Residual	PPM
LONGFORD	33136.0	33135.9	2.90	88.
BARRACOUTA	38097.0	38097.0	-3.15	-83.
CURRAJONG	57351.0	57348.2	-4.25	-74.
To Way Point 1	119° 49' 26"	1.9 metres		

BALLAST DOWN & REPOSITION:

FIX No.20 03/05/90 19:12:26		527 503.5E	5 739 457.2N	
From Station	Raw Range	Red Range	Residual	PPM
LONGFORD	33144.0	33143.9	.05	2.
BARRACOUTA	38096.0	38096.0	-.06	-1.
CURRAJONG	57349.0	57346.2	-.07	-1.
To Way Point 1	119° 49' 26"	4.3 metres		

FIX No.22 03/05/90 20:35:06		527 496.8E	5 739 458.3N	
From Station	Raw Range	Red Range	Residual	PPM
LONGFORD	33141.0	33140.9	-.78	-24.
BARRACOUTA	38100.0	38100.0	.85	22.
CURRAJONG	57341.0	57338.2	1.15	20.
To Way Point 1	66° 45' 35"	8.0 metres		

FINAL FIX:

FIX No.23 03/05/90 23:07:23		527 495.7E	5 739 463.4N	
From Station	Raw Range	Red Range	Residual	PPM
LONGFORD	33135.0	33134.9	-.09	3.
BARRACOUTA	38099.0	38099.0	.09	-2.
CURRAJONG	57340.0	57337.2	-.13	-0.
To Way Point 1	103° 09' 44"	8.7 metres		

5. FINAL RESULTS

5.1 The final A.G.D. 66 position of the drillstem was calculated as:

STN. AMBERJACK 1

Latitude	38 deg 29 min 33.4375 S
Longitude	147 deg 18 min 55.0501 E
Zone	527 495.700 E
55	5 739 463.400 N

Rig Heading 240 degrees

5.2 This places the well 8.7 metres on a bearing of 283 degrees 10 minutes from the intended location.

ENCLOSURES

PE600923

This is an enclosure indicator page.
The enclosure PE600923 is enclosed within the container PE902075 at this location in this document.

The enclosure PE600923 has the following characteristics:

ITEM_BARCODE	= PE600923
CONTAINER_BARCODE	= PE902075
NAME	= Mud Log
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= MUD_LOG
DESCRIPTION	= Mud Log for Amberjack-1
REMARKS	=
DATE_CREATED	= 16/05/1990
DATE_RECEIVED	= 24/10/1990
W_NO	= W1029
WELL_NAME	= Amberjack-1
CONTRACTOR	= EXLOG
CLIENT_OP_CO	= BHP Petroleum

(Inserted by DNRE - Vic Govt Mines Dept)

PE600926

This is an enclosure indicator page.
The enclosure PE600926 is enclosed within the container PE902075 at this location in this document.

The enclosure PE600926 has the following characteristics:

ITEM_BARCODE	= PE600926
CONTAINER_BARCODE	= PE902075
NAME	= Seismic Claibration Log
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= Seismic Claibration Log
REMARKS	=
DATE_CREATED	= 14/05/1990
DATE_RECEIVED	= 22/02/1991
W_NO	= W1029
WELL_NAME	= Amberjack-1
CONTRACTOR	= Schlumberger
CLIENT_OP_CO	= BHP Petroleum

(Inserted by DNRE - Vic Govt Mines Dept)