WCR VOL 1

PERCH-2

SO EXPLORATION AND PRODUCTION
AUSTRALIA INC.

WELL COMPLETION REPORT

PERCH-2

VOLUME I

BASIC DATA

GIPPSLAND BASIN
VICTORIA

ESSO AUSTRALIA LIMITED

Compiled by: P.A.ARDITTO

JULY.1985

PERCH-2

WELL COMPLETION REPORT

VOLUME 1

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APPENDICES

1096L/12

1.

ESSO AUSTRALIA LTD

COMPLETION REPORT

WELL	:	PERCH-2
LOCATION	:	Latitude : 38°34' 23.11"S Longitude : 147°19' 57.61"E X = 528,978.9mE Y = 5,730,529.5m N Map Projection: AMG Zone 55 Geographical Location: Bass Strait, Victoria Field: Perch
PERMIT	:	VIC/P1
ELEVATION	:	21m KB
WATER DEPTH	:	43m
TOTAL DEPTH	:	1321m MDKB
PLUG BACK TYPE	:	Cement Plug
REASONS FOR PLUGGING BACK	:	Plug and Abandonment
MOVE IN	:	0200hrs 11th February 1985
SPUDDED	:	2145 hrs 11th February 1985
REACHED T.D.	:	28th February 1985
RIG RELEASED	:	1815 hours 6th March 1985
OPERATOR	:	Esso Exploration and Production Australia Inc
PERMITTEE OR LICENCEE	:	BHP Petroleum Pty Ltd.
ESSO INTEREST	:	0%
BHP INTEREST	:	100%
CONTRACTOR	:	South Seas Drilling Company
RIG NAME	:	Southern Cross
EQUIPMENT TYPE	:	Semi-submersible
TOTAL RIG DAYS	:	24
DRILLING AFE NO.	:	235005
TYPE COMPLETION	:	Plug and Abandonment
WELL CLASSIFICATION	:	Before Drilling: Extension/New Pool Test After Drilling: Extension

ESSO AUSTRALIA LTD

PERCH-2

SEQUENTIAL OPERATIONS

MOVING/MOORING

The Southern Cross departed the Barracouta-5 location at 1900 hours February 10, 1985 and arrived at the Perch-2 location at 0200 hours February 11, 1985. The 22 nautical mile tow was completed in 7 hours at an average speed of 3.14 knots using the Atlas Dampier as the tow boat.

Anchor No. 8 was dropped by the rig and the remaining anchors were run by the workboats Atlas Dampier and Torrens Tide in seven hours. All anchors were pretensioned to 200 kips. Final rig position was:

Latitude:	38° 34' 23.11"S
Longitude:	147° 19' 57.61"E
X:	528,978.9m E
Y:	5,730,529.5mN

AMG Zone 55, Universal Transverse Projection,
Australian Geodetic Datum.

The rig was located 0.5m at 190° from the called location and approximately 96kms at 220° from Lakes Entrance.

DRILL 26" HOLE FOR 20" CONDUCTOR

The drilling template was run and landed at a seafloor depth of 64m RKB. The 26" hole was drilled to 211m using seawater and high viscosity gel slugs to clean the hole. At TD the hole was displaced with high viscosity mud and a wiper trip was made to the seafloor. The 18-3/4" wellhead/pile joint and 20" casing were run and cemented with the casing shoe at 200m. The BOP stack and riser were run and the casing and collet connector tested against the shear rams to 500 psi.

DRILL 17-1/2" HOLE FOR 13-3/8" CASING

The cement inside the 20" casing was tagged high at 140m as had happened on Barracouta-5. After drilling out the excess cement and the casing shoe, the 17-1/2" hole was drilled to 815m using a seawater/gel mud system. A wiper trip was made to the 20" shoe and the hole was conditioned prior to running a sonic log. Operations were delayed for 6.25 hours when the Australian Workers Union members left the rig to attend a union meeting.

Following the return of drill crew to the rig, the hole was conditioned and 13-3/8" casing was run and cemented with the 13-3/8" casing shoe at 800m. The maximum displacement pressure observed was 1250 psi and the plug was not bumped.

A 13-3/8" Cameron Lo Torque seal assembly was run, set and tested to 5000 psi. The BOP rams and C&K valves were tested to 200/5000 psi and the annular preventers were tested to 200/3500 psi.

At 1315 hours February 15, 1985, the rig crews withdrew their labour and left the rig as the result of an industrial dispute.

After waiting 6 days without resolution of the dispute, a 125 sack cement plug was set inside the 13-3/8" casing from 150m to 100m pending temporary abandonment of the well if further delays were anticipated. After the casing and riser were displaced with seawater, a leak was detected in the riser. The divers were jumped and a leak was found in the box end of the first riser connector above the Regan FC-7 riser adaptor. The riser and stack were pulled and new seals were installed. During the dispute general maintenance was carried out by staff personnel.

The rig crews returned to work at 1530 hours February 25, 1985. Approximately 11.2 days were lost because of the industrial dispute. The divers untangled the guidelines which were fouled on the guide base when the stack was pulled and the rig moved off location. The stack was rerun and tested.

DRILL 12-1/4" HOLE

The temporary abandonment plug, float collar and cement were drilled out to 797m and the casing was tested against the pipe rams to 1500 psi. The float shoe and new hole were drilled to 820m and a Phase II PIT was run to leak-off at an EMW of 16.2 ppg.

The 12-1/4" hole was drilled to 1146m using a 10.1 ppg seawater/gel mud. The 10.1 ppg mud weight was programmed to provide a 300 psi overbalance based on a pore pressure of 8.4 ppg EMW at the top of the "coarse clastics". Two cores were cut to 1164m. After reaming out the core hole, drilling continued to the FTD of 1321m.

Five electric logs, two RFT's one CST and a velocity survey were run at TD. One RFT run was aborted after a fault was detected in the tool. RFT pressure data confirmed initial predictions that Perch-2 was "normally" pressured.

PLUG AND ABANDONMENT

A 255 sack cement plug was set in open hole across the top of Latrobe formation from 1190m to 1090m. After waiting on cement for 4 hours, the plug was tagged at 1102m with 15 kips. A second 275 sack cement plug was set across the 13-3/8" casing shoe from 850m to 750m and tested to 1300 psi.

After making a gauge ring and junk basket run to 720m, a 13-3/8" EZSV bridge plug was run and set at 710m. The 13-3/8" casing was cut at 165m with a Pengo explosive casing cutter. The 13-3/8" casing was recovered with a casing spear.

A 485 sack cement plug was set across the casing stub from 200m to 95m and pressure tested to 500 psi. The riser and BOP stack were pulled. Two attempts were required to mechanically cut the 20" casing at 75m. The 20" casing could not be explosively cut since the hull to explosive charge depth was less than the 61m depth criteria required by South Seas Drilling. The drilling template, 4 post guidebase and pile joint were recovered using the wellhead running tool.

PULLING ANCHORS

After WOW for 1.94 days, all anchors were recovered in 10.75 hours. Approximately 4 hours were lost due to fouled pendant wires on Anchor Numbers 2,4,5 and 6.

The Southern Cross was taken under tow by the Atlas Dampier and departed the Perch-2 location at 1815 hours March 6, 1985, enroute to the Turrum-3 location.

1546L/25-56

3. CASING DATA

WELL PERCH-2

CSG O.D. IN.	WT. LBS/FT	GRADE	CONN.	CSG LENGTH METRES	SHOE DEPTH R.K.B. (m)	CENTRALIZER POSITION	REMARKS
20	94	X52	JV	13.56		ACROSS COLLARS ON FIRST 5 JOINTS	FLOAT SHOE JOINT.
20	94	X52	JV	100.94			7 JOINTS.
20	129	X52	CCxJV	12.57			CROSSOVER JOINT.
24	670		CC	11.05	200		WELLHEAD/PILE JOINT EP 1-2-3
13-3/8	54.4	K55	BUTT			MIDWAY UP FLOAT SHOE SECURED W/ 2 STOP RINGS	FLOAT SHOE JOINT.
13-3/8	54.5	K55	BUTT				FLOAT COLLAR JOINT
13-3/8	54.5	K55	BUTT				59 JOINTS.
13-3/8	54.5	K55	BUTT		800	ACROSS COLLARS ON FIRST 6 JOINTS	HANGER JOINT EH 315 ES 31-1

4. CEMENT DATA

WELL PERCH-2

DATE	DEPTH METRES	TYPE JOB	TYPE CEMENT	AMOUNT	ADDITIVES	REMARKS
FEB 12	200	20" PRIMARY LEAD SLURRY	CLASS "G"	750 SX	2.2% GEL	AVG SLURRY WT 13.8 PPG
		TAIL SLURRY	CLASS "G"	350 SX	SEAWATER	AVG SLURRY WT 15.8 PPG. FLOAT HELD. CMT TAGGED HIGH @ 140.64m.
FEB 15	800	13-3/8" PRIMARY	CLASS "G"	1050 SX	SEAWATER	AVG SLURRY WT 15.8 PPG DID NOT BUMP PLUG
MAR 02	1190 - 1102	P&A PLUG #1	CLASS "G"	255 SX	SEAWATER	AVG SLURRY WT 15.8 PPG. TAG W/15 KIPS.
MAR 02	850 - 750	P&A PLUG #2	CLASS "G"	275 SX	SEAWATER	AVG SLURRY WT 15.8 PPG TESTED TO 1300 PSI.
MAR 03	710	13-3/8" BRIDGE PLUG				
MAR 03	200 - 95	P&A PLUG #3	CLASS "G"	485 SX	SEAWATER	AVG SLURRY WT 15.8 PPG TESTED TO 500 PSI

5.

WELL: PERCH-2

SAMPLES, CONVENTIONAL CORES, SIDEWALL CORES

INTERVAL	TYPE
210-1321m	Cuttings Samples - 5 sets of washed and oven dried and 1 set of bagged and air dried cuttings: from 210m-810m every 10m from 810m-1146m every 5m from 1164m-1321m every 5m
1146-1155m	Plastic sleeve Core No. 1, recovered 75% (6.76m)
1155-1164m	Plastic sleeve Core No. 2, recovered 67% (6.00m)
1075.0-1303.9m	Sidewall Cores:- Run 1 - shot 30, recovered 29.
210-1321m	Unwashed canned samples every 15m (Geochem).
910-1321m	Washed and air dried canned samples every 30m (for fission track analysis).

6.

WELL: PERCH-2

WIRELINE LOGS AND SURVEYS

Type and Scale		From	To
	Suite 1		
BHC-GR	1:200 1:500	814	199m
	Suite 2		
DLT-MSFL-GR	1:200 1:500	1320	804m
LDTC-CNTH-SGR	1:200 1:500	1322	1100m
HDT-GR	1:200	1323	940m
BHC-GR-SP	1:200 1:500	1314	803m
WST	SHOT 9 LEVELS	1310	600m
RFT RUN 1 (TOOL FAILURE)			
CST RUN 1		1303.9	1075.0m
RFT-GR RUN 2 (PRESSURE RECORDED AND SAMPLE TAKEN) RFT-HP RUN 2 (PRESSURE RECORDED AND SAMPLE TAKEN)			

7.

SUMMARY OF WIRELINE FORMATION TEST PROGRAMME - PERCH-2

TEST	SEAT	DEPTH (METRES) K.B.	RECOVERY (LITRES) CHAMBER	OIL	COND.	GAS	WATER FILTRATE	OTHERS	HEWLETT-PACKARD FORMATION PRESSURE MPaa	Psia	HEWLETT-PACKARD HYDROSTATIC PRESSURE MPaa	Psia	REMARKS
			Litres	Litres	Litres	m^3	Litres	Litres					
1	-	RFT tool failed											RFT tool failed - no measurements made
2	1	1261.5	Pretest						12.51	1814.6	14.95	2168.4	Valid
2	2	1180.0	Pretest						11.72	1699.3	13.99	2029.4	Valid
2	3	1155.0	Pretest						11.48	1665.6	13.70	1986.7	Valid
2	4	1152.5	Pretest						11.46	1661.4	13.66	1981.7	Valid
2	5	1146.0	Pretest						11.40	1653.6	13.58	1969.9	Valid
2	6	1145.0	Pretest						11.39	1652.1	13.57	1967.9	Valid
2	7	1151.0	22.7 10.4	20.4	-	0.18	0.5	2.0 (emulsion)	11.44	1658.9	13.63	1977.6	Valid pretest, sample taken sample preserved.

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RFT PRESSURE DATA

WELL: PERCH-2

GEOLOGIST/ENGINEER: J.L. ROCHE/P.FELL

DATE: 2.3.85

RFT No. Run/Seat		Depth m MDKB	Depth m TVDSS KB=21	Initial Hydrostatic HP / RFT gauge psia / psig	ppg	Time Set	Minimum Flowing Pressure psia (Pretest)	Formation Pressure HP / RFT gauge psia / psig	ppg	Temp °C	Time Retract	Final Hydrostatic HP psia	ppg	Comments (include Probe type)	
2/1	PT	1261.5	1240.5	2168.40	2143 / 10.0 ppg	08:42	1667.67	1814.56	1789 / 8.5 ppg	125.4	08:45	2168.0	2142 / 10.0 ppg	Good pretest Good build up	M
2/2	PT	1180.0	1159.0	2029.35	2004 / 10.0 ppg	09:00	1610.96	1699.33	1674 / 8.5 ppg	125.9	09:03	2028.75	2004 / 10.0 ppg	Good pretest Good build up	M
2/3	PT	1155.0	1134.0	1986.65	1962 / 10.0 ppg	09:11	1643.11	1665.60	1641 / 8.5 ppg	125.3	09:15	1986.45	1961 / 10.0 ppg	Good pretest Good build up	M
2/4	PT	1152.5	1131.5	1981.7	1956 / 10.0 ppg	09:19	549.14	1661.44	1635 / 8.5 ppg	125.3	09:23	1981.47	1955 / 10.0 ppg	Good pretest but tight	M
2/5	PT	1146.0	1125.0	1969.9	1944 / 10.0 ppg	09:29	1479.18	1653.56	1628 / 8.5 ppg	125.3	09:31	1969.65	1943 / 10.0 ppg	Good pretest	M
2/6	PT	1145.0	1124.0	1967.9	1942 / 10.0 ppg	09.36	1544.95	1652.12	1627 / 8.5 ppg	125.5	09:39	1967.12	1942	Good pretest	M
2/7	SPT	1151.0	1130.0	1997.6	1952 / 10.0 ppg	09:45	1627.03	1658.9	1634 / 8.5 ppg	125.8	-	1977.8*	1953 / 10.0 ppg	Valid Pretest Took sample	M

PT = Pretest
SPT = Sample

L = Long nose probe
M = Martineau probe

N.B. Tool failed during Run 1 - no tests were made.

* = Not stabilised

TEMPERATURE RECORD - PERCH-2

LOGGING RUN	THERMOMETER DEPTH (m)	MAX. RECORDED TEMPERATURE (C^O)	CIRCULATION TIME (t_k) (hours)	TIME AFTER CIRCULATION STOPPED (t) (hours)	HORNER TEMPERATURE (C^O)	GEOTHERMAL GRADIENT (C^O/km)
Suite 1						
BHC-GR	814.0	35.00	1.00	2.58	-	-
Suite 2						
DLT-MSFL-GR	1320.0	60.00	1.75	3.83	75	51.71
LDT-CNTH-SGR	1322.0	64.45	1.75	7.83	75	51.71
HDT-GR	1323	66.66	1.75	10.53	75	51.71
BHC-GR-SP	1314	71.10	1.75	14.50	75	51.71

FIGURES

LOCALITY MAP

PERCH – 2

SCALE 1 : 250 000

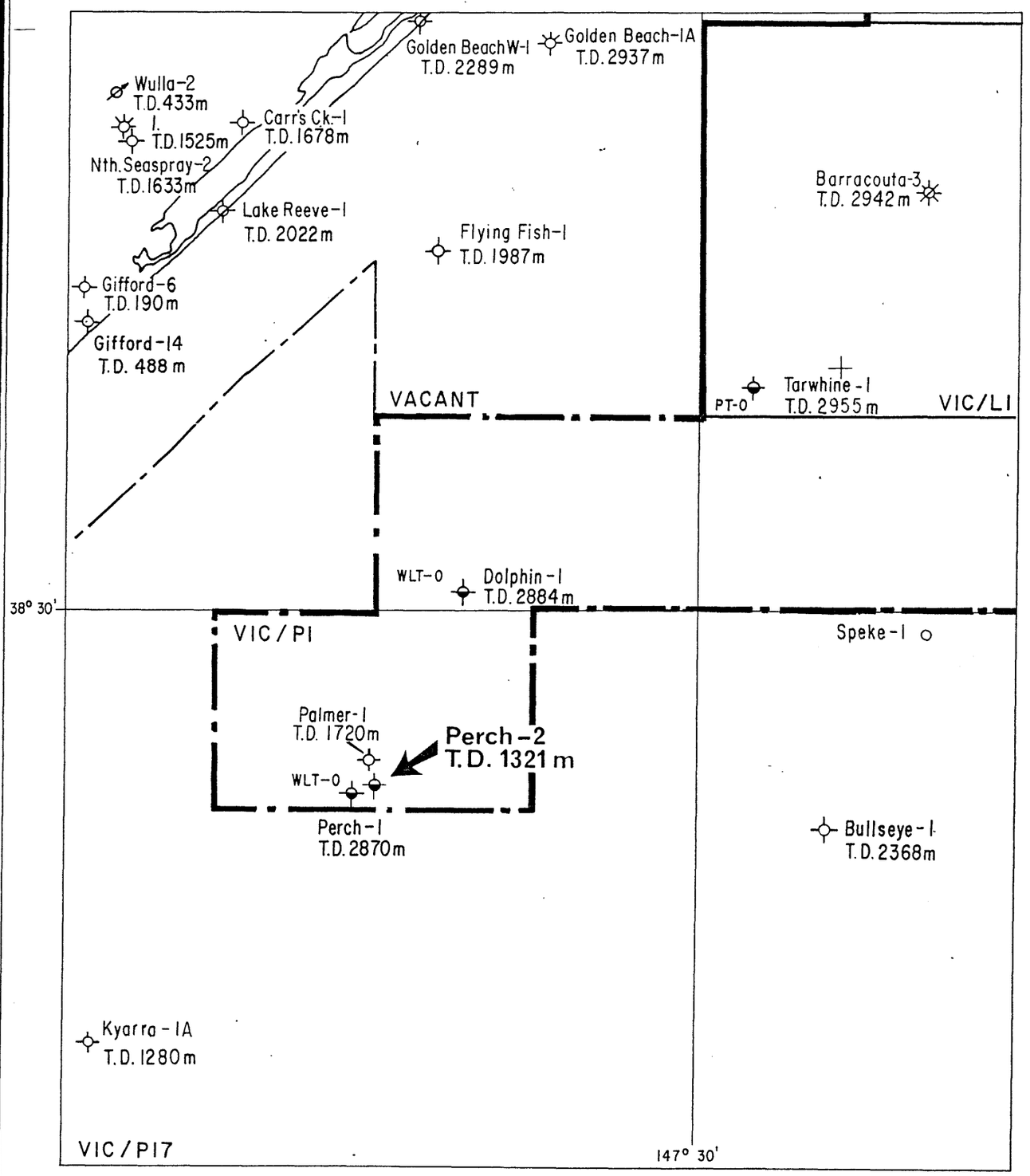

Figure 1

Dwg. 2290/OP/2

FIGURE 2

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WELL PROGRESS CURVE

WELL PERCH-2

RIG: SOUTHERN CROSS

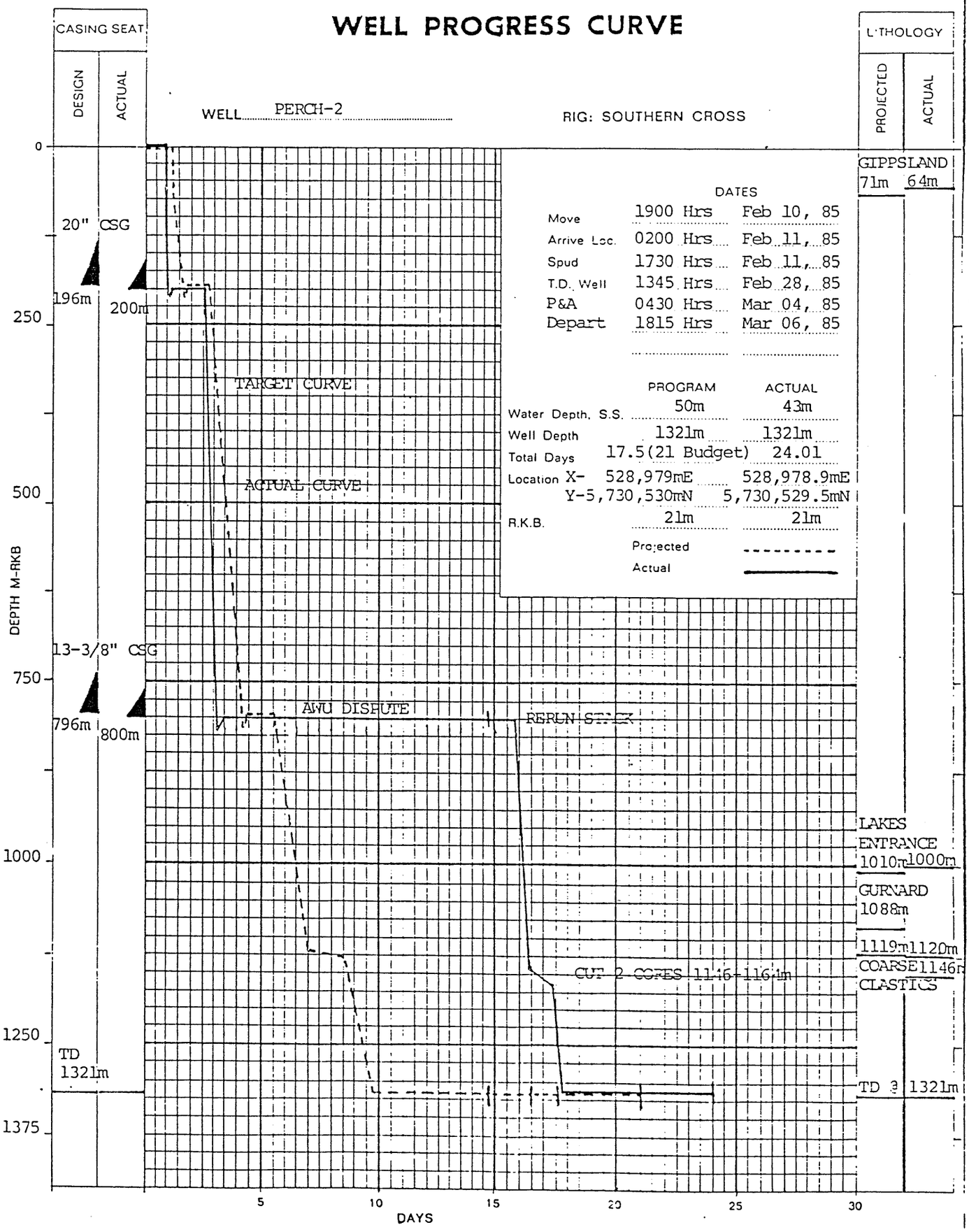


FIGURE 3

PERCH-2
WELLBORE SCHEMATIC

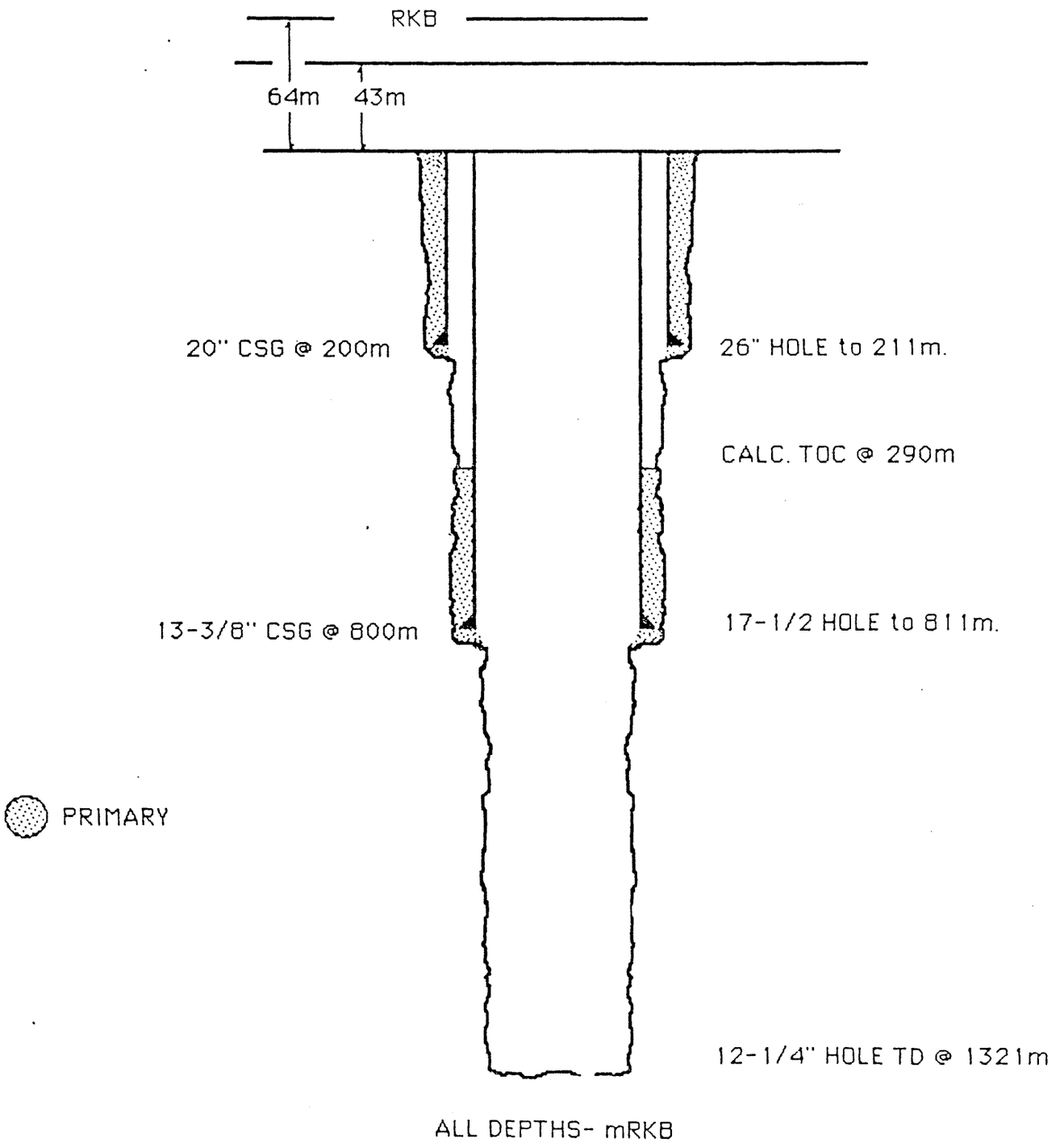
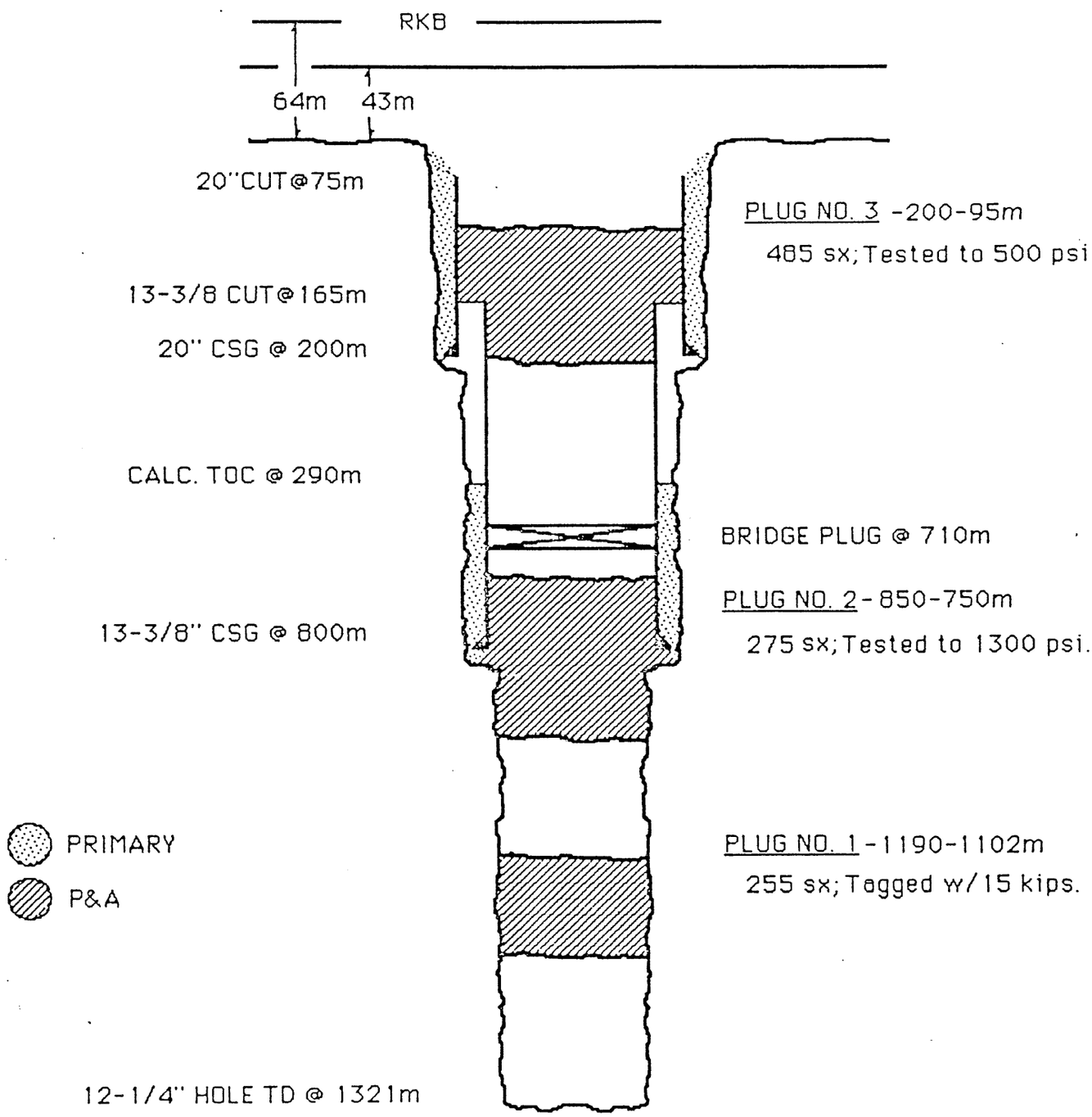
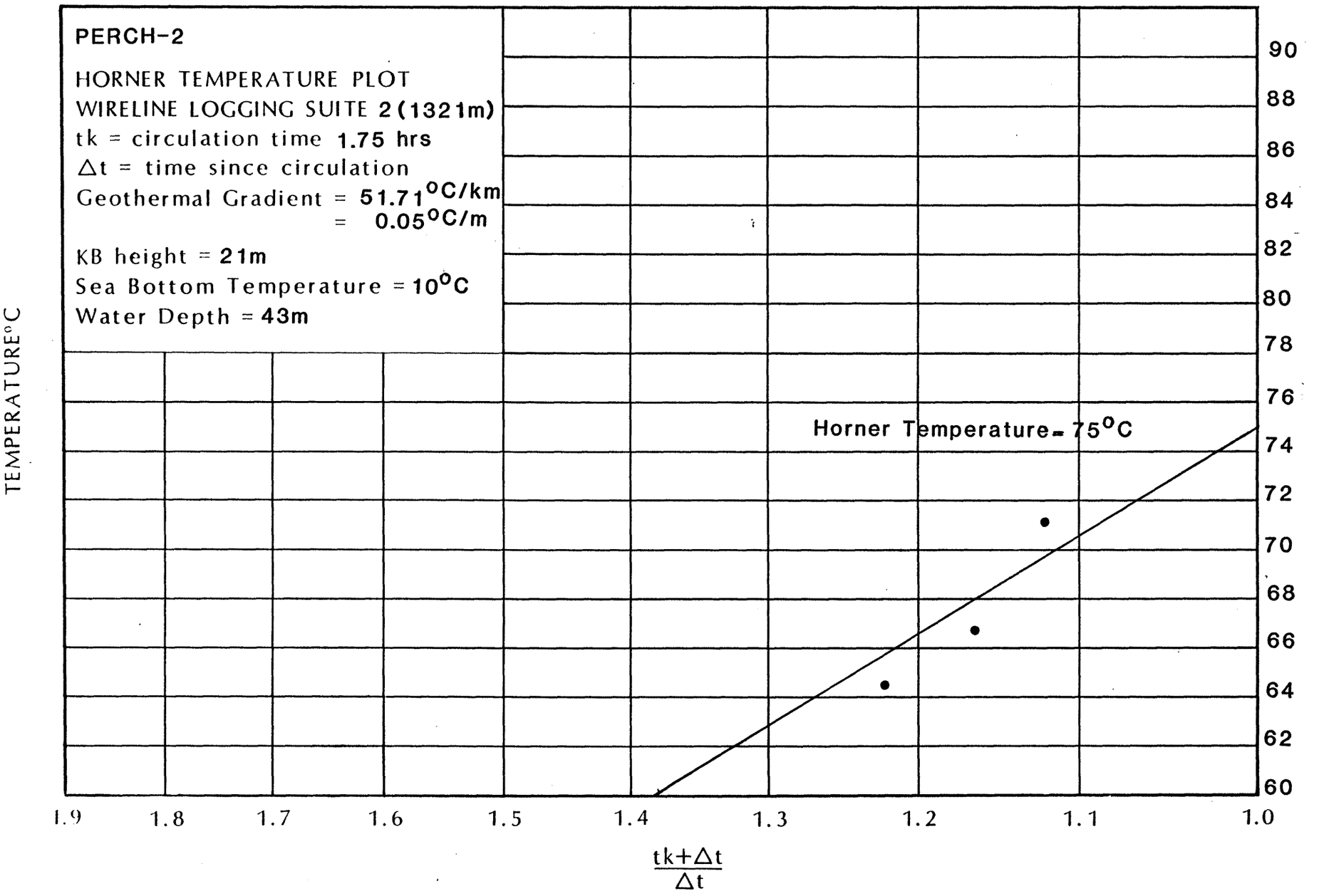


FIGURE 4

PERCH-2
ABANDONMENT SCHEMATIC



ALL DEPTHS- mRKB


PERCH-2
HORNER TEMPERATURE PLOT
WIRELINE LOGGING SUITE 2 (1321m)
tk = circulation time 1.75 hrs
Δt = time since circulation
Geothermal Gradient = 51.71°C/km
= 0.05°C/m
KB height = 21m
Sea Bottom Temperature = 10°C
Water Depth = 43m
Horner Temperature = 75°C
TEMPERATURE°C
90
88
86
84
82
80
78
76
74
72
70
68
66
64
62
60
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
tk+Δt / Δt

APPENDIX 1

PERCH-2

Lithology Descriptions

Depth	%	Descriptions
210-220m	80	LIMESTONE: Calcisiltite: dark to medium grey, soft to pliable, well sorted siltstone.
	15	FOSSILS: Bryozoan, forams, minor cephalopods.
	8	SANDSTONE: Tan to white coarse grained, subrounded to well rounded, quartz aggregates and individual grains.
220-230m	80	LIMESTONE: as above: more light grey.
	20	FOSSILS: as above, numerous biological fragments.
	trace	SANDSTONE: as above.
230-240m	80	FOSSILIFEROUS LIMESTONE: Dominantly bryozoan, intermixed with calcisiltite.
	20	LIMESTONE: as above
	trace	SANDSTONE: as above
240-250m	80	FOSSILIFEROUS LIMESTONE: as above.
	20	LIMESTONE: as above.
250-260m	75	FOSSILIFEROUS LIMESTONE: as above.
	25	LIMESTONE: as above.
260-270m	80	FOSSILIFEROUS LIMESTONE: as above.
	20	LIMESTONE: as above.
270-280m	90	FOSSILIFEROUS LIMESTONE: As above.
	10	LIMESTONE: as above.
280-290m	90	FOSSILIFEROUS LIMESTONE: as above
	10	LIMESTONE: as above.
290-300m	95	FOSSILIFEROUS LIMESTONE: as above
	5	LIMESTONE: as above
	trace	SANDSTONE: as above
300-310m	100	FOSSILIFEROUS LIMESTONE: as above.
	trace	LIMESTONE: as above
310-320m	100	FOSSILIFEROUS LIMESTONE: as above.
320-330	100	FOSSILIFEROUS LIMESTONE: as above.
330-340	100	FOSSILIFEROUS LIMESTONE: as above.
340-350m	100	FOSSILIFEROUS LIMESTONE: light grey to off white, medium to very coarse grained, fragments of predominantly bryozoan fossils, loose to poorly cemented and poorly sorted.
350-360m	100	FOSSILIFEROUS LIMESTONE: as above.
360-370m	100	FOSSILIFEROUS LIMESTONE: as above, with recognizable forams and gastropods.
370-380m	100	FOSSILIFEROUS LIMESTONE: as above.

380-390m	95	FOSSILIFEROUS LIMESTONE: as above.
	5	LIMESTONE: light grey to white, soft calcisiltite cementing, fragments of fossiliferous limestone.
390-400m	100	FOSSILIFEROUS LIMESTONE: as above.
400-410m	90	FOSSILIFEROUS LIMESTONE: as above.
	10	LIMESTONE: as above.
410-420	95	FOSSILIFEROUS LIMESTONE: as above.
	5	LIMESTONE: as above.
420-430	85	FOSSILIFEROUS LIMESTONE: as above.
	15	LIMESTONE: as above.
430-440	40	FOSSILIFEROUS LIMESTONE: as above.
	40	LIMESTONE: as above.
	20	SANDSTONE: Tan to which, coarse to very coarse grained, subrounded to well rounded; well sorted quartz grains; good visible porosity; no shows.
440-450	35	FOSSILIFEROUS LIMESTONE: as above.
	35	LIMESTONE: as above.
	30	SANDSTONE: as above.
450-460	35	FOSSILIFEROUS LIMESTONE: as above.
	35	LIMESTONE: as above.
	30	SANDSTONE: as above.
460-470	40	SANDSTONE: as above.
	30	FOSSILIFEROUS LIMESTONE: as above.
	30	LIMESTONE: as above.
470-480	45	SANDSTONE: dominantly translucent to clear, coarse to very coarse grained, well rounded to rounded; well sorted quartz grains.
	30	FOSSILIFEROUS LIMESTONE: grey to tan fragments of dominantly bryozoan fossils; loose to poorly cemented.
	25	LIMESTONE: dark to mid grey, soft calcisiltite cementing fossil fragments.
480-490	75	SANDSTONE: as above.
	25	FOSSILIFEROUS LIMESTONE AND LIMESTONE: as above.
490-500	95	SANDSTONE: tan to white, translucent, medium to very coarse grained, rounded to well rounded; well sorted, quartz grains with minor calcareous cementing of grains into aggregate.
	5	FOSSILIFEROUS LIMESTONE/LIMESTONE: as above.
500-510	100	SANDSTONE: as above.
	trace	LIMESTONE: as above; Fossils: as above.
510-520	100	SANDSTONE: as above.
	trace	LIMESTONE: as above; Fossils: as above.
520-530	100	SANDSTONE: as above.
530-540	100	SANDSTONE: as above.
540-550	100	SANDSTONE: as above.

550-560	100	SANDSTONE: as above.
560-570	100	SANDSTONE: as above.
570-580	100	SANDSTONE: as above.
580-590	95	SANDSTONE: as above.
	85	LIMESTONE: dominantly fossil fragments showing some carbonate mineral fluorescence.
590-600	35	FOSSILIFEROUS LIMESTONE: as above.
	30	LIMESTONE: dominantly light grey, friable, very fine sandstone to siltstone grain sized; calcarenite.
	35	SANDSTONE: as above.
600-610	40	LIMESTONE: light grey, hard friable, very fine grained calcarenite and calcisiltite with common fossil fragments.
	30	FOSSILIFEROUS LIMESTONE: dominantly light grey to white fragments of bryozoans and other fossils, loose to poorly cemented.
	30	SANDSTONE: translucent to clear to tan, medium to very coarse grain, well rounded to rounded; well sorted quartz grains: good visible porosity; no shows.
610-620	50	LIMESTONE: as above.
	35	FOSSILIFEROUS LIMESTONE: as above.
	15	SANDSTONE: as above.
620-630	50	LIMESTONE: as above.
	40	FOSSILIFEROUS LIMESTONE: as above.
	10	SANDSTONE: as above.
630-640	50	LIMESTONE: as above: more dominantly calcisiltite.
	45	FOSSILIFEROUS LIMESTONE: as above; more dominantly brachiopod and pelecypod fragments.
	5	SANDSTONE: as above.
640-650	60	SANDSTONE: as above.
	20	LIMESTONE: as above.
	20	FOSSILIFEROUS LIMESTONE: as above.
650-660	50	SANDSTONE: as above; no fluorescence; no shows.
	30	FOSSILIFEROUS LIMESTONE: fossil fragments dominantly bryozoan, strong development of dull yellow mineral fluorescence.
	20	LIMESTONE: as above.
660-670	70	SANDSTONE: as above, some aggregates; no shows.
	20	FOSSILIFEROUS LIMESTONE: as above.
	10	LIMESTONE: dominantly calcarenite to calcisiltite.
	trace	Glauconite cement in the limestone.
670-680	60	SANDSTONE: as above.
	25	FOSSILIFEROUS LIMESTONE: as above.
	15	LIMESTONE: as above.
	trace	GLAUCONITE CEMENT.

680-690	55	SANDSTONE: dominantly translucent to white, medium to very coarse grained, subangular to well rounded; moderately well sorted; quartz grains, some clastic cemented aggregates, good visible porosity
	30	FOSSILIFEROUS LIMESTONE mainly white to light grey, fragments of predominantly bryozoans, forams and other fossils, mainly loose and poorly cemented. Strong dull yellow mineral fluorescence developed.
	15	LIMESTONE: light to dark grey, very fine grain, calcarenite and calcisiltite, hard to very friable, some with fossil fragments.
	trace	GLAUCONITIC CEMENT.
690-700	50	SANDSTONE: as above
	30	LIMESTONE: as above.
	20	FOSSILIFEROUS LIMESTONE.
	trace	GLAUCONITE CEMENT.
700-710	40	SANDSTONE: as above.
	35	FOSSILIFEROUS LIMESTONE: as above.
	25	LIMESTONE: as above.
710-720	50	FOSSILIFEROUS LIMESTONE: as above, dominantly bryozoans.
	30	LIMESTONE: as above.
	20	SANDSTONE: as above.
720-730	55	FOSSILIFEROUS LIMESTONE: as above, also forams., brachiopods.
	25	LIMESTONE: as above, mainly calcisiltite.
	20	SANDSTONE: as above.
730-740	50	FOSSILIFEROUS LIMESTONE: as above.
	30	LIMESTONE: as above.
	20	SANDSTONE: as above.
740-750	70	FOSSILIFEROUS LIMESTONE: as above: fossil fragments forming a medium grained calcarenite mixed with larger fossil fragments.
	25	LIMESTONE: as above: calcisiltite to very fine grain calcarenite, minor glauconite cement.
	5	SANDSTONE: as above
750-760	65	FOSSILIFEROUS LIMESTONE: white to light grey, firm to soft and friable, fine grained to very fine grained, calcarenite containing fossil fragments of various sizes and types (dominantly bryozoan); minor glauconite grains.
	35	LIMESTONE: dark to light grey, firm to soft calcisiltite containing glauconite and minor fossil fragments.
	trace	SANDSTONE: white to translucent, clear to tan, coarse to very coarse grained, well rounded to rounded; well sorted quartz grains; probably coming from main sand body higher in the sequence.
760-770	70	FOSSILIFEROUS LIMESTONE: as above.
	30	LIMESTONE: as above.
	trace	SANDSTONE: as above.
770-780	60	FOSSILIFEROUS CALCARENITE: as above, abundant forams.

	40	CALCISILTITE: light to dark grey, size variable, coarse to very coarse grained, moderately hard to friable.
	trace	GLAUCONITIC CEMENT:
780-790	50	FOSSILIFEROUS LIMESTONE: as above, abundant cemented aggregates of fossil fragments, forams abundant.
	45	LIMESTONE: as above, primarily fine to very fine grained calcarenite and calcisiltite.
	5	SANDSTONE: as above.
	trace	GLAUCONITE CEMENT.
790-800	55	FOSSILIFEROUS LIMESTONE: as above.
	45	LIMESTONE: as above, predominantly fine to very fine grained calcarenite.
	trace	SANDSTONE: as above.
800-810	50	FOSSILIFEROUS LIMESTONE: as above.
	50	LIMESTONE: as above.
	trace	SANDSTONE: as above.
	trace	GLAUCONITE CEMENT.
810-815	50	LIMESTONE:
	trace	SANDSTONE: as above.
	trace	GLAUCONITE CEMENT.
815-820	100	CALCISILTITE: white to medium grey, predominantly light grey, firm to consolidated, very fine to silt size grading in part to calcarenite, commonly fossiliferous, ranging from predominantly bryozoans to occasionally forams, trace very coarse buff opaque calcite fragments, well sorted.
820-830	50	CALCARENITE: white to light grey, predominantly white, moderate to hard, medium to very coarse clastic grains (predominantly fragmented bryozoans), predominantly medium, (cuttings very coarse), poorly sorted, common bryozoans.
	50	CALCISILTITE: as above.
830-835	70	CALCARENITE: occasional quartz grains, trace pyrite, otherwise as above.
	30	CEMENT:
	10	CALCISILTITE: medium to light grey, otherwise as above.
835-840	60	CALCARENITE: as above.
	30	CEMENT:
	10	CALCISILTITE: medium to light grey, medium to dark grey, predominantly medium to dark grey, otherwise as above.
840-845	50	CALCARENITE: as above.
	30	CEMENT:
	20	CALCISILTITE: medium to light grey to medium to dark grey, predominantly medium dark grey, otherwise as above.
845-850	60	CALCARENITE: as above.
	30	CALCISILTITE: as above.
	10	CEMENT: possible cavings.

850-855	70	CALCARENITE: as above.
	30	CALCISILTITE: as above.
855-860	60	CALCARENITE: as above.
	40	CALCISILTITE: as above.
860-865	40	CALCISILTITE: as above.
	60	CALCARENITE: as above.
865-870	50	CALCARENITE: as above. Becoming less fossiliferous.
	40	CALCISILTITE: as above.
	10	CALCILLITITE: light to dark grey, semi-friable, with occasional pyrite encrustations.
	trace	CRYPTOCYRSTALLINE LIMESTONE: coarse, subrounded to rounded yellow to deep red fragments, occasionally clear to clear quartzose fragments (possible cavings).
870-875	100	CALCARENITE/CALCISILTITE: as above.
875-880	100	CALCARENITE/CALCISILTITE: as above.
880-885	65	CALCARENITE: white buff to light grey, moderately hard to firm, medium grained clastic grains to occasionally coarse. Made up predominantly of clastic bryozoa with minor forams; poorly sorted.
	50	CALCISILTITE: light to dark grey, firm, an occasional silt calcisiltite grain in a predominantly calcareous ooze matrix, trace cryptocrystalline limestone, otherwise as above, trace pyrite.
885-890	50	CALCARENITE: as above.
	50	CALCISILTITE: as above.
890-895	50	CALCARENITE: as above.
	50	CALCISILTITE: as above.
895-900	90	CALCISILTITE: as above.
	10	CALCARENITE: as above.
900-905	100	CALCARENITE/CALCISILTITE: as above.
905-910	100	CALCARENITE/CALCISILTITE: as above.
910-915	70	CALCISILTITE: as above.
	30	CALCARENITE: bryozoans less common, otherwise as above.
915-920	90	CALCISILTITE: as above.
	10	CALCARENITE: occasional bryozoans, rare forams otherwise as above.
920-925	100	CALCISILTITE: medium light grey to medium dark grey, soft to firm, quartzose silt size grains.
	trace	CALCARENITE: as above, rare forams.
925-930	90	CALCISILTITE: as above, except firm only and rarely glauconitic.
	10	CALCARENITE: as above, occasional bryozoans.
	trace	DOLOMITE:

930-935	100	CALCISILTITE: firm, otherwise as above.
	trace	CALCARENITE: occasional bryozoans, otherwise as above.
	trace	PYRITE:
935-940	100	CALCISILTITE: light grey to medium dark grey, predominantly medium grey, trace pyrite, otherwise as above.
	trace	SANDSTONE: medium grained, milky to translucent quartz grains, subangular to subrounded, well sorted.
	trace	CALCARENITE: as above. occasional bryozoans.
940-945	90	CALCISILTITE: occasional quartz grains (medium grain) inset in silt matrix, otherwise as above, bryozoan fragments, occasionally set in matrix, otherwise as above.
	10	CRYPTOCRYSTALLINE/LIMESTONE: white or milky white or red brown, medium to coarse grained.
	trace	BRYOZOAN FRAGMENTS:
945-950	100	CALCISILTITE: as above. Rarely glauconite, occasional bryozoans, rare forams.
	trace	DOLOMITE:
950-955	95	CALCISILTITE: rarely glauconitic, occasional bryozoans, otherwise as above.
	5	SANDSTONE: coarse grained, translucent to tan, otherwise as above.
955-960	100	CALCISILTITE: medium to light grey, firm,. rarely glauconitic, quartzose in part; occasional bryozoan fragments.
960-965	95	CALCISILTITE: colour as above, but including greyish red, otherwise as above (glauconite becoming slightly more common). Note: bryozoans less common.
	5	SANDSTONE: translucent to brown, medium to coarse grained, otherwise as above
965-970	100	CALCISILTITE: as above.
970-975	100	CALCISILTITE: as above.
975-980	90	CALCISILTITE: as above, grading to calcarenite (fine to medium grain).
	10	CALCARENITE: white to translucent, medium coarse to predominantly medium grained, angular, hard, moderately sorted; grains predominantly of clastic calcite grains of unknown genetic origin.
980-985	80	CALCISILTITE: as above, grading to calcarenite, fine to medium grained.
	20	CALCARENITE: subangular to subrounded, dominantly medium grained, otherwise as above.
985-990	80	CALCISILTITE: as above.
	20	CALCARENITE: as 980-985
990-995	90	CALCISILTITE: as above.
	10	CALCARENITE: as 980-985.

995-1000	90	CALCISILTITE: as above.
	10	CALCARENITE: as 980-985.
1000-1005	90	CALCISILTITE: grading to very fine calcarenite, otherwise as above.
	10	CALCARENITE: as above, rare forams.
1005-1010	80	CALCISILTITE: slightly more glauconite than previous sample, otherwise as above.
	20	CALCARENITE: very light grey to light grey, creamy white, medium to coarse grained, moderately hard to predominantly coarse grained, moderately sorted; glauconitic occasionally, rare forams and bryozoans.
1010-1015	70	CALCISILTITE: slightly more glauconite than interval 1000-1005, otherwise as above.
	30	CALCARENITE: as above.
1015-1020	80	CALCISILTITE: as above, grading in part to marl.
	20	CALCARENITE: as above, trace glauconite.
1020-1025	80	CALCISILTITE: increasing glauconite otherwise as above.
	20	CALCARENITE: as above.
1025-1030	80	CALCARENITE: as above.
	80	CALCISILTITE: as above.
1030-1035	100	CALCISILTITE: as above.
1035-1040 marl.	80	CALCISILTITE: as above, grading in part to
	20	CALCARENITE: as above.
1040-1045	60	CALCISILTITE: buff to light grey, firm but easily broken, in an increasingly silt/argillaceous matrix, with trace bryozoa fragments within matrix; poorly sorted.
	30	CALCILUTITE: grey, friable to soft, calcarenite argillaceous to clay matrix.
	10	CALCARENITE: light grey, medium to occasionally coarse grained, firm, increasing fraction of coarse subangular to subrounded glauconite pellets, trace bryozoa and forams.
1045-1050	50	CALCISILTITE: as above.
	50	CALCILUTITE: as above.
1050-1055	50	CALCISILTITE: as above, trace cephalopod (mollusc).
	50	CALCILUTITE: as above.
1055-1060	50	CALCISILTITE: as above; grading in parts to calcarenite.
	50	CALCILUTITE: as above.
1060-1065	50	CALCISILTITE: as above, grading in parts to calcarenite.
	50	CALCILUTITE: as above.
1065-1070	50	CALCARENITE: as above.
	50	CALCISILTITE: as above.

1070-1075	50	CALCARENITE: as above.
	50	CALCISILTITE: as above.
1075-1080	50	CALCISILTITE: as above.
	50	CALCARENITE: as above.
1080-1085	50	CALCISILTITE: as above.
	50	CALCARENITE: as above.
1085-1090	50	CALCISILTITE: as above.
	50	CALCARENITE: as above.
1090-1095	50	CALCISILTITE: white to light grey, friable, trace fossils otherwise as above.
	50	CALCARENITE: grey, form, predominantly medium to occasionally coarse grained, occasionally medium to coarse grained, subrounded to subangular glauconite pellets, otherwise as above.
1095-1100	50	CALCARENITE: as above.
	50	CALCISILTITE: as above.
1100-1105	50	CALCARENITE: as above.
	50	CALCISILTITE: occasionally medium to coarse grained, subrounded to subangular glauconite pellets, otherwise as above.
1095-1100	50	CALCARENITE: as above.
	50	CALCISILTITE: as above.
1100-1105	50	CALCARENITE: as above.
	50	CALCISILTITE: as above.
1105-1110	50	CALCISILTITE: as above.
	50	CALCILUTITE: as above.
1110-1115	60	CALCARENITE: as above.
	40	CALCISILTITE: as above.
1115-1120	50	CALCARENITE: as above.
	50	CALCISILTITE: as above.
1120-1125	60	CALCARENITE: glauconite increasing, very fine grained, otherwise as above.
	40	CALCISILTITE: glauconitic in part, otherwise as above. Bottoms up sample.
	60	CALCARENITE: glauconite increasing, silt very fine grained, otherwise as above.
	40	CALCISILTITE: pyritic in part, glauconitic, otherwise as above.
1127-1130	70	CALCARENITE: as interval 1125-1127.
	30	CALCISILTITE: as above.
1130-1135	50	CALCARENITE: as above without abundant coarse subangular to subrounded glauconite.
	50	CALCISILTITE: as above.
1135-1140	30	CALCARENITE: as above.
	20	CALCISILTITE: as above.
	30	SANDSTONE: translucent to milky, medium to coarse grained, dominant to coarse grained, subrounded, loosed grained, poorly sorted; 10% fluorescence, blue to white to bright yellow, blue to white fluorescence has very slow diffuse crushed white cut, yellow fluorescence has no cut.

1140-1145	100	SANDSTONE: subangular to subrounded, translucent to milky white, medium granular, predominantly coarse grained, moderately sorted, loose grains, 10% fluorescence, blue to white to bright yellow, blue to white fluorescence, has very slow diffuse crushed white cut, which leaves a residue when dry, yellow fluorescence has no cut.
		Core #1 cut from 1146-1155m Core #2 cut from 1155-1164m
1164-1170	100	COAL: argillaceous darky grey to black, occasionally brown.
1170-1175	70	COAL: as above.
	30	SILTSTONE: brown, firm but friable, quartzose in parts, argillaceous.
1175-1179	100	SANDSTONE: Type (1), white, clear to translucent, loose, coarse to very coarse grained, subrounded quartz grains, good visible porosity, no shows; translucent medium grained argillaceous. Type (2), quartz aggregates in a dominant siliceous cement; no shows.
1179-1185	100	SANDSTONE: subangular to subrounded, predominantly subrounded and quartz aggregates in a dominant siliceous cement; otherwise as above.
1185-1190	100	SANDSTONE: Type (2) as above, except occasional grains in a silty matrix, type 1 as above; no shows.
1190-1195	95	SANDSTONE: Type (1): white, clear to translucent, loose, medium to granule, predominantly very coarse grained, subangular to subrounded, predominantly subrounded, good visible porosity; no shows.
	5	SANDSTONE Type (2): clear, medium grained aggregates in a siliceous, well sorted, subrounded; no shows.
1195-1200	100	SANDSTONE: Type (1) as above.
	tr	SANDSTONE: Type (2) as above.
1200-1205	90	COAL: grading to carbonaceous siltstone, clean coal has conchoidal fracture.
	10	SANDSTONE: Type (1): as above.
1205-1210	100	SANDSTONE: Type (1): as above; no shows.
1210-1215	100	SANDSTONE: Type (1): as above.
	trace	SANDSTONE: Type (2): as above; milky quartz and translucent quartz, predominantly very coarse.
1215-1220	100	SANDSTONE: translucent to milky, medium granule, subangular to subrounded, predominantly subangular, poorly sorted, loose grains; no shows, trace aggregates containing medium grained quartz.

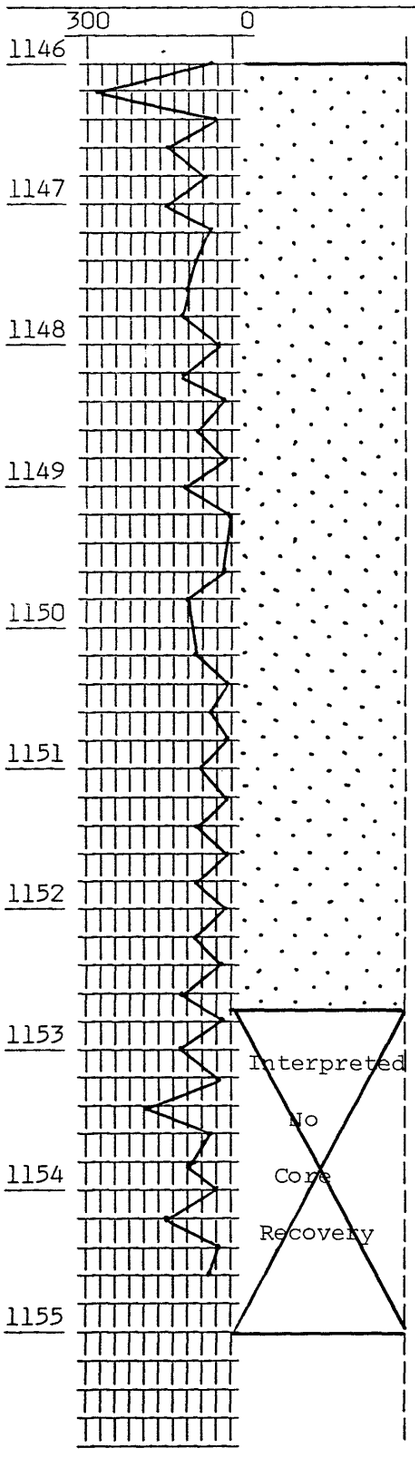
1220-1225	100	SANDSTONE: as above.
1225-1230	40	COAL: grading to slightly silty coal, conchoidal fracture, elongate chips.
	60	SANDSTONE: medium to very coarse grained, otherwise as above, trace aggregates as above.
1230-1235	95	COAL: as above.
	5	SANDSTONE: as above.
1235-1240	70	SANDSTONE: subangular to subrounded, predominantly subrounded, otherwise as above, no aggregates; no shows.
	30	COAL: with occasional silty laminae, otherwise as above.
1240-1245	100	SANDSTONE: medium to very coarse, predominantly coarse, otherwise as above; no shows.
1245-1250	80	SANDSTONE: as above; no shows.
	trace	CARBONACEOUS SILTSTONE: (carbonaceous laminae).
	20	COAL: as above.
1250-1255	45	COAL: as above.
	45	SANDSTONE: as above, except occasional aggregates consisting of medium grained translucent quartz; no shows.
	trace	PYRITE.
	10	CARBONACEOUS SILTSTONE: greyish red, carbonaceous laminae, firm to moderately hard, grading to very fine sandstone.
1255-1260	70	SANDSTONE: translucent to milky, coarse to granule, predominantly very coarse grained, subangular to subrounded, predominantly subrounded, well sorted, loose grained, good visible porosity; no shows.
	15	COAL: as above.
	5	SILTSTONE: carbonaceous, as above.
1260-1265	100	SANDSTONE: as above; no shows.
1265-1270	100	SANDSTONE: as above; no shows.
1270-1275	100	SANDSTONE: coarse to very coarse, predominantly very coarse, trace aggregates consisting of medium grained quartz, otherwise as above.
	trace	CARBONACEOUS SILTSTONE.
1275-1280	80	SANDSTONE: coarse to very coarse, predominantly very coarse; no shows, otherwise as above.
	20	SILTSTONE: carbonaceous in part, greyish red, flecks or laminae of carbonaceous material, soft to firm.
	50	SILTSTONE: as above. Note: a check of what was coming up over the shakers revealed very clayey material.
	30	SANDSTONE: occasional aggregates of coarse grained, otherwise as above.
	20	COAL: as above.

1285-1288 (Bottoms Up)	100	SANDSTONE: coarse to very coarse grained, predominantly very coarse; no shows, as above.
1285-1290	70	SANDSTONE: coarse to very coarse, predominantly very coarse, predominantly subangular, otherwise as above, slight mineral fluorescence (calcite).
	20	COAL: as above.
	10	SILTSTONE: as above.
1290-1295	90	COAL: as above.
	10	SANDSTONE: coarse to very coarse, predominantly very coarse, as above.
1295-1300	60	COAL: as above.
	30	SANDSTONE: as above.
	10	SILTSTONE: as above.
1300-1305	100	SANDSTONE: translucent to milky quartz grains, medium to very coarse grained, predominantly very coarse, subangular to subrounded, predominantly subrounded, moderately sorted, loose grains; no shows.
1305-1310	100	SANDSTONE: as above, trace pyrite.
1310-1315	100	SANDSTONE: as above, predominantly subangular.
1315-1320	100	SANDSTONE: slightly pyritic, rare aggregates, consisting of medium grain with siliceous cement, otherwise as above; no shows.

APPENDIX 2

Core No. 1 Well : PERCH-2

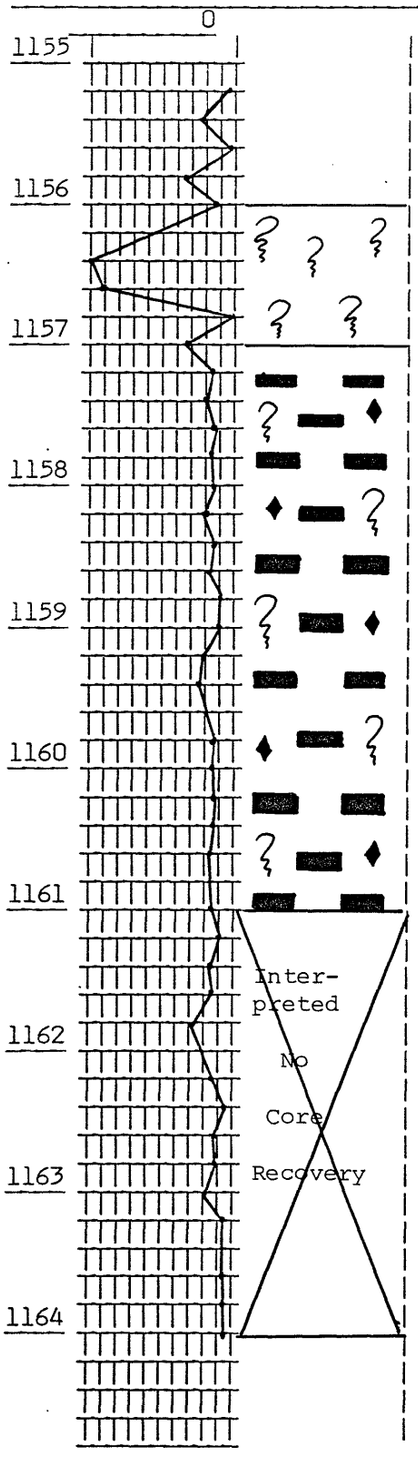
Interval Cored	:	1146-1155m			
Cut	:	9m	Recovered	:	6.76m (75%)
Bit Type	:	RC4	Bit Size	:	9 7/8" x 4 3/4"
Described by	:	P.Fell/J.Roche	Date	:	27/2/85

Int. (m)	Depth & ROP (m/hr)	Graphic	Shows	Descriptive Lithology
1146–1155	300 0			SANDSTONE - 2 types: Type (1) - translucent, loose, medium to very coarse grained predominantly coarse, subangular to subrounded, poorly sorted, good visible porosity; even blue white fluorescence throughout entire sample, moderate consistent slow streaming white cut, hydrocarbon odour (moderate). Type (2) - lithology as above, bright blue to even blue white fluorescence, uniform throughout, streams fast whilst cut as above, moderate to strong hydrocarbon odour. SANDSTONE Type (1) - fine to medium grained aggregates, dominantly fine, lithology as above. Remaining Type (2) as above. Fluorescence and cut as above, moderate hydrocarbon odour and trace pyrite. SANDSTONE Type (1) - strongly cemented (recrystallized?) grains, fine to medium grained, fair to good visible porosity, dull white fluorescence, sporadic, slow diffuse milky white cut. SANDSTONE Type (1) - as for 1149m, poor visible porosity, spotty dull yellow fluorescence, no observable cut, crushed or otherwise. SANDSTONE Type (1) - as for 1150m, fluorescence as above, very slow, diffuse milky white crushed cut. SANDSTONE Type (1) - lithology as for 1150m, dull blue white fluorescence, uniform throughout, slow diffuse milky white cut. SANDSTONE Type (1) - lithology as for 1150m, fluorescence as above, slow diffuse milky white crushed cut.

Core No. 2 Well : PERCH-2

Interval Cored : 1155-1164m
Cut : 9m Recovered : 6m (67%)
Bit Type : RC4 (re-run) Bit Size :
Described by : P.Fell/J.Roche Date : 28/2/85

Int. (m)	Depth & ROP (m/hr)	Graphic	Shows	Descriptive Lithology



1155-1156m No description - consolidated/soft mud pellets.

1156m MUDSTONE/CLAYSTONE - even brown, occasional subvertical cleavage partings, grading in part to argillaceous subfissile mudstone, trace pyrite clusters, occasionally clear coarse angular embedded quartz grains; no shows, tight.

1157-1161m ARGILLACEOUS COAL - predominantly argillaceous, discrete pyrite clusters and common thin pyrite laminae, trace scattered coarse angular quartz grains.

APPENDIX 3

PERCH-2

SIDEWALL CORE DESCRIPTIONS

No.	Depth	Rec. (mm)	Rock Type	Description
1	1304	38	SANDSTONE	medium to light grey, coarse grained, moderately sorted, angular, firm, argillaceous.
2	1299.5	18	COAL	black, firm, interbedded with siltstone.
3	1299	32	SANDSTONE	light grey, very fine grained, well sorted, subangular, firm, carbonaceous laminae, silty.
4	1295	34	COAL	black, moderately hard.
5	1288	29	SILTSTONE	greenish grey, silt grained, soft.
6	1278	25	SHALE	greenish grey, clay grained, moderately hard,.
7	1259.5	41	SILTSTONE	olive to grey, silt grained, moderately hard, carbonaceous laminae.
8	1256.2	39	SANDSTONE	light grey, fine grained, well sorted, subangular, soft, argillaceous.
9	1250.2	30	SHALE	light grey, clay grained, moderately hard.
10	1240.7	29	SHALE	greenish red, clay grained, firm.
11	1228.5	45	COAL	black, soft, argillaceous.
12	1212	41	SHALE	medium dark grey, clay grained, firm, fine sandy laminae.
13	1201.8	29	SILTSTONE	medium grey, silt grained, moderately hard, medium dark grey laminae.
14	1199	34	SANDSTONE	blue to grey, very fine grained, well sorted, subrounded, firm, argillaceous.
15	1178	32	SILTSTONE	dark grey, silt grained, firm, sandy laminae.
16	1175	30	COAL	black, brittle.
17	1168.3	44	SHALE	dark grey, clay grained, firm.
18	1159	38	SHALE	dark grey, clay grained, firm, micaceous (white).
19	1156.5	34	SANDSTONE	blue to grey, coarse grained, moderately sorted, subrounded; 100% uniform, low intensity, blue white fluorescence, no cut.
20	1155	27	SANDSTONE	blue to grey, coarse grained, moderately sorted, subrounded, soft; 100% uniform, low intensity, blue white fluorescence, no cut.

21	1154	38	SANDSTONE	blue to grey, medium grained, well sorted, subrounded, soft; 100% uniform, low intensity, blue white, no cut.
22	1153	20	SANDSTONE	blue to grey, medium grained, well sorted, subrounded, firm; 100% uniform, moderate intensity, blue white fluorescence, no cut.
23	1142	30	SILTSTONE	blue to grey, silt grained, firm, micaceous (white).
24	1131.5			NO RECOVERY
25	1126.2	43	CLAYSTONE	medium to dark grey, clay grained, firm.
26	1119.2	49	SILTSTONE	medium grey, silt grained, moderately hard, 50% calcareous, glauconitic.
27	1111.5	49	SHALE	medium grey, clay grained, firm, 50% calcareous.
28	1102	36	SILTSTONE	medium grey, silt grained, firm, 50% calcareous.
29	1088	35	SILTSTONE	medium grey, silt grained, moderately hard, 50% calcareous, glauconitic.
30	1075	31	CLAYSTONE	medium grey, clay grained, firm, 50% calcareous.

PERCH-2

SIDEWALL CORE GAS ANALYSIS

NO.	DEPTH	C1	C2	C3	C4	C5	C6
1	1304	42	TR				
2	1299.5	18					
3	1299	20					
4	1295	14					
5	1288	225	87	102	49	TR	
6	1278	235	82	90	37	TR	
7	1259.5	820	296	170	296	178	47
8	1256.2	286	41	34	18	11	TR
9	1250.2	656	82	34	55	38	TR
10	1240.7	1010	204	68	111	63	42
11	1228.5	1136	209	72	196	72	46
12	1212	1785	836	431	167	51	47
13	1201.8	1684	235	145	37	25	13
14	1199	202	76	56	41	16	
15	1178	1019	236	76	130	56	46
16	1175	1526	296	135	32	26	11
17	1168.3	2121	1020	579	593	210	105
18	1159	3906	612	272	631	559	162
19	1156.5	3368	163	51	93	76	21
20	1155	3907	571	247	668	560	126
21	1154	84.2	51	358	1132	509	252
22	1153	219	20.4	34	79	191	115
23	1142	1852	224	119	566	928	378
24	1131.5	MISFIRE					
25	1126.2	1886	255	136	658	1068	420
26	1119.2	1044	41	25	56	25	11
27	1111.5	2020	102	34	32	6.3	TR
28	1102	2222	102	43	92	38	21
29	1088	968	82	36	14	8	10.5
30	1075	1852	92	38	14	13	TR

APPENDIX 4

RFT SAMPLE TEST REPORT

Well :Perch-2

OBSERVER : P.Fell/J.Roach DATE : 2/3/85 RUN NO. : 2/7

	CHAMBER 1 (22.7 lit)		CHAMBER 2 (10.4 lit.)	
SEAT NO.	7		7	
DEPTH	1151m		1151m	
A. RECORDING TIMES				
Tool Set	0945			
Pretest Open	0945			
Time Open	0948		1001	
Chamber Open	0948		1001	
Chamber Full	0956		1009	
Fill Time	8		8	
Start Build Up	0948		1001	
Finish Build Up	0956		1009	
Build Up Time	8		8	
Seal Chamber	1000		1010	
Tool Retract			1012	
Total Time			27 mins.	
B. SAMPLE PRESSURE				
IHP	1977.5	psia		
ISIP	1658.9	psia		
Initial Flowing Press.	912.34	psia	1651.71	psia
Final Flowing Press.	1658.76	psia	1658.8	psia
Sampling Press Range	912.34-1658.76	psia	1651.71-1658.8	psia
FSIP	1658.87	psia	1658.9	psia
FHP			1977.82*	psia
C. TEMPERATURE				
Depth Tool Reached	1151	m		m
Max. Rec. Temp	125.8	deg C		deg C
Time Circ. Stopped	0115 - 2nd 2.85	hrs		
Time since Circ.	8.5	hrs		hrs
D. SAMPLE RECOVERY			SAMPLE	
Surface Pressure	200	psig	PRESERVED	psig
Amt Gas	6.2	cu ft		cu ft
Amt Oil	20.4	lit		lit
Amt Water (Total)	0.5	lit		lit
Amt Others Emulsion	2.0	lit		lit
E. SAMPLE PROPERTIES				
Gas Composition				
C1	336261	ppm		ppm
C2	16973	ppm		ppm
C3	5452	ppm		ppm
IC4/nC4	26726	ppm		ppm
C5	18316	ppm		ppm
C6+	546	ppm		ppm
CO2/H2S	4% tr	ppm		
Oil Properties	42 deg API @ 25 deg C			
Colour	Dark Brown			
Fluorescence	White			
GOR	48.3			
Water Properties				
Resistivity	.318 @ 70 deg F			
PH	7.6	ppm		ppm
Cl-titrated	11000	ppm		ppm
Est.Water Type/Tritium	2052			
Mud Filtrate Properties				
Resistivity	.363 @ deg C 67 deg F			
pH	9.7	ppm		
Cl-titrated	15000	ppm		ppm
General Calibration				
Mud Weight	10.1	ppg		ppg
Calc. Hydrostatic		ppg		ppg
RFT chokesize	1 x 20		1 x 30	
REMARKS	* = pressure not stabilised			

APPENDIX 5

VELOCITY SURVEY REPORT

1. Marine Velocity Survey Report.

2. Field Report from ESSO Representative.

3. Schlumberger Velocity Report.

    a. Data Acquisition
    b. Processing Parameters
    c. Shot Data
    d. Sonic Calibration
    e. Sonic Calibration Processing
    f. Geogram Processing

4. Schlumberger Field Report.

5. Check Shot Data Observed and Corrected.

FIGURES

1. Gun Geometry Sketch.

ENCLOSURES

1. Schlumberger Seismic Calibration Log (Drift Curve, Adjusted Continuous Velocity Log, and Time/Depth Log-Velocities).

2. Schlumberger WST - Raw and Stack Shots.

3. Schlumberger Geogram.

4. Time-Depth Curve.

1. MARINE VELOCITY SURVEY REPORT

CONTRACTOR	:	SCHLUMBERGER
BASIN	:	GIPPSLAND
WELL	:	PERCH-2
LEASE	:	"PERCH" LOCATION
CO-ORDINATES	:	38 DEG. 34' 23.11" S 147 DEG. 19' 57.61" E
RIG	:	SOUTHERN CROSS
ELEVATIONS	:	GROUND LEVEL AT -45.5M AMSL DERRICK FLOOR AT 20.7M AMSL
DATE OF SURVEY	:	MARCH 1, 1985
CASING DEPTHS	:	20" @ 200m, 13 3/8" @ 800m
TD AT SHOOTING	:	1321 mKB
NO OF SHOOTING LEVELS	:	9
RECORDED BY:		D. DAWSON
WITNESSED BY:		P. NAPIER

2. FIELD REPORT FROM ESSO REPRESENTATIVE

At 1135 hrs Schlumberger rigged up the guns and moonpool phone. Moonpool shots were completed at 1150 hrs.

The first level, 600m, was shot at 1215 hrs with no apparent casing break. At 1235 hrs, while shooting the second level at 820m it was noticed that the stack pick was 0.5 to 1msec longer than the longest individual shot. A problem suggested by the Schlumberger engineer as being due to the "picking" algorithm in the CSU unit. This was to be verified by the results from the Processing Centre.

The CSU tool was lowered to 1310m and 4 good shots were completed. At 1251 hrs the tool was at 1229 m.

At this level there were a number of faulty picks due to incorrect time breaks on the source signature. These were noted on the observers logs for deleting in Processing. At 1315 hrs, 5 good shoots were completed at 1229 m.

The tool was raised to 1143 m however it was not possible to obtain a good seat so it was moved up to 1141 m. At this level there was also a number of bad picks due to the above problem. As hole conditions were good and there was no noise on these picks, 3 shots were considered good enough for stacking.

No major problems were experienced after this level. The last shot, recorded at 1406 hrs was at 820 m for repeat-level.

NB: There was no gamma ray on tool so there is some error possible in relocating the repeat level, although results repeated well.

3. SCHLUMBERGER VELOCITY REPORT

a. DATA ACQUISITION

FIELD EQUIPMENT

Energy Source : Bolt airgun (model 1900B)
200 cu. in.

Source Offset : 32.6m

Source Depth : 9.1m below MSL

Source Azimuth : 40 Deg.

Reference Sensor : Accelerometer

Sensor Offset : 32.6m

Sensor Depth : 9.1m below MSL

Downhole Geophone : Geospace HS-1
High temperature (350 Deg. F), Coil Resistance 225 Ohms + 10%, Natural Frequency 8-12 Hz, Sensitivity 0.45 V/in/sec. Maximum tilt angle 60 Deg. Min.

Recording Instrument

Recording was made on the Schlumberger Computerised Service Unit (CSU) using LIS format recorded at 1ms sample interval.

b. PROCESSING PARAMETERS

Seismic Reference Datum (SRD) : Mean Sea Level

Elevation SRD : Mean Sea Level

Elevation Derrick Floor : 20.7m AMSL

Elevation Ground Level : 45.5m AMSL

Well Deviation : 0 Deg.

Total Depth : 1321m below DF

Sonic Log Interval : 199 - 1315m below DF

Density Log Interval : 1100 - 1315m below DF

c. SHOT DATA

Level Depth (m below KB)	Stacked Shots	Rejected Shots	Quality	Comment
1310	4	0	Good	
1229	9	1	Good	
1143	1	0	Good	Omitted
1141	6	0	Good	
1010	3	0	Good	
950	4	0	Good	
820	9	0	Good	
600	3	0	Good	
10(m below SRD)	4	1	Good	

Gun Offset

The shot at 10m (depth below SRD) was used to calculate the gun offset from the wellhead and has not been used in any further calculations. Using the measured transit time of 22 msec and water velocity of 1480m/s a gun offset distance of 32.6m was calculated.

d. SONIC CALIBRATION

Purpose: To adjust the sonic log using the vertical times obtained at each check level.

Method: A "drift" curve is obtained using the sonic log and the vertical check level times. The term "drift" is defined as seismic time (from check shots) minus 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 $\frac{\Delta \text{drift}}{\Delta \text{depth}} < 0$, and the sonic time is greater than the seismic time over a certain section of log.

For a positive drift $\frac{\Delta \text{drift}}{\Delta \text{depth}} > 0$, and the sonic time is smaller than the seismic time over that section of 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:

(a) Uniform or block shift.

This method applies a uniform correction to all 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 μs/ft.

(b) T Minimum

In the case of negative drift a second method is used, called t 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 log. Over a given interval the method will correct only t values which are higher than a threshold, the Δt minimum. Values of Δt which are lower than the threshold are not corrected. The correction is a reduction of the excess of Δt over Δt minimum, $\Delta t - \Delta t$ min.

t - t minimum is reduced through multiplication by a reduction coefficient which remains constant over the interval. This reduction coefficient, named G, can be defined as:

$$G = 1 + \frac{\text{Drift}}{\int (\Delta t - \Delta t \text{ minimum})\, dZ}$$

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

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

e. SONIC CALIBRATION PROCESSING

OPEN HOLE LOGS

Both the sonic and density logs used in this report have been edited prior to input into the WST chain. No density data is available above 1100m below DF and hence a constant density of 2.2 g/cc has been modelled from this depth to surface.

CORRECTION TO DATUM

Seismic reference Datum (SRD) is at Mean Sea Level. The airgun was positioned 9.1m below SRD and using a water velocity of 1480 m/s a correction of 6.15 msec was calculated between gun and SRD.

IMPOSED SHOTS

The check shot data only covers the lower section of well from 600m below DF to T.D. A correction was applied to the sonic data above 600m to that which was applied below 600m. To apply this correction it was necessary to incorporate an imposed shot at the top of the sonic log. The corrected transit time (97.76 msec) for this shot was calculated such that a drift of 4.7 μs/ft was imposed from the top of the sonic log down to 600m below DF.

An additional shot was imposed at the seabed using a velocity of 1480 m/s between SRD and this depth.

VELOCITY MODELLING

A water velocity of 1480 m/s was used between MSL and seabed. The velocity between seabed and the top of the sonic (1982 m/s) has been derived from time at the imposed check level at 199.03m below DF (top of sonic).

SONIC CALIBRATION RESULTS

The top of the sonic log is chosen as the origin for the calibration drift curve. All drift measurements are relative to this point.

After incorporating an additional shot at the top of the sonic (see IMPOSED SHOTS) the drift curve indicates a single block shift of 4.68 µs/ft to be applied to the sonic.

The adjusted sonic curve is considered to be the best result using the available data.

f. GEOGRAM PROCESSING

Geograms were generated using zero and minimum phase Ricker wavelets with frequencies at 20, 25, 30 and 35 Hz.

The presentations include both normal and reverse polarity at 3.75 in/sec.

Geogram processing produces synthetic seismic traces based on reflection coefficients generated from sonic and density measurements in the well-bore. The steps in the processing chain are the following:

Time to depth conversion
Generate reflection coefficients
Generate attenuation coefficients
Choose a suitable wavelet
Convolution
Output

5. PERCH-2 VELOCITY SURVEY

LEVEL NUMBER	MEASURED DEPTH FROM KB (m)	VERTICAL DEPTH FROM MSL (m)	OBSERVED TRAVEL TIME HYD/GEO (ms)*	VERTICAL TRAVEL TIME MSL/ GEOPHONE (ms)	AVERAGE VELOCITY MSL/GEOPHONE (m/s)	DELTA DEPTH BETWEEN SHOTS (m)	DELTA TIME BETWEEN SHOTS (ms)	INTERVAL VELOCITY BETWEEN SHOTS (m/s)
SEABED	66.20	45.50	33.02	30.75	1480			
						132.83	67.02	1982
IMPOSED	199.03	178.33	93.30	97.76	1824			
						400.97	171.95	2332
3.	600.00	579.30	264.00	269.72	2148			
						220.00	79.14	2780
4.	820.00	799.30	343.00	348.86	2291			
						130.00	48.05	2706
5.	950.00	929.30	391.00	396.90	2341			
						60.00	23.02	2607
6.	1010.00	989.30	414.00	419.92	2356			
						131.00	51.03	2567
7.	1141.00	1120.30	465.00	470.95	2379			
						88.00	33.02	2665
8.	1229.00	1208.30	498.00	503.96	2398			
						81.00	29.01	2792
9.	1310.00	1289.30	527.00	532.98	2419			

* The observed travel times listed here differ slightly to the field transit times. Schlumberger edit the field data and use a different picking algorithm for final processing. The final data is more reliable.

1175L/9

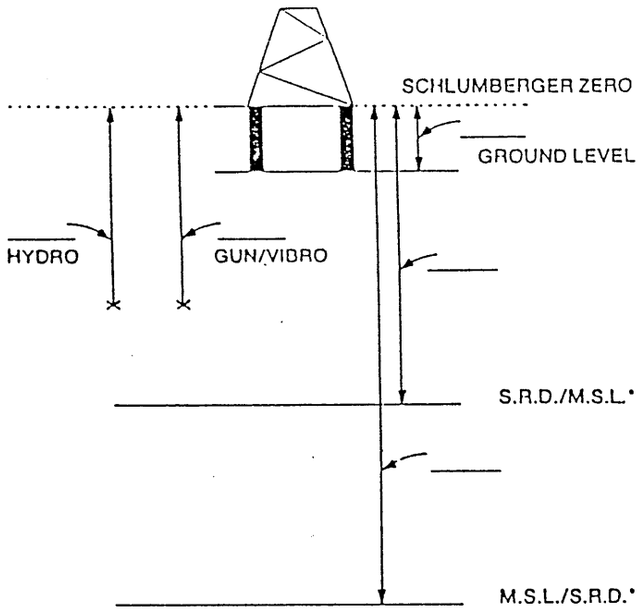
FIGURE 1.

Schlumberger

GUN GEOMETRY SKETCH

CLIENT: ESSO AUST. LTD. WELL: PERCH #2 DATE: MARCH 85

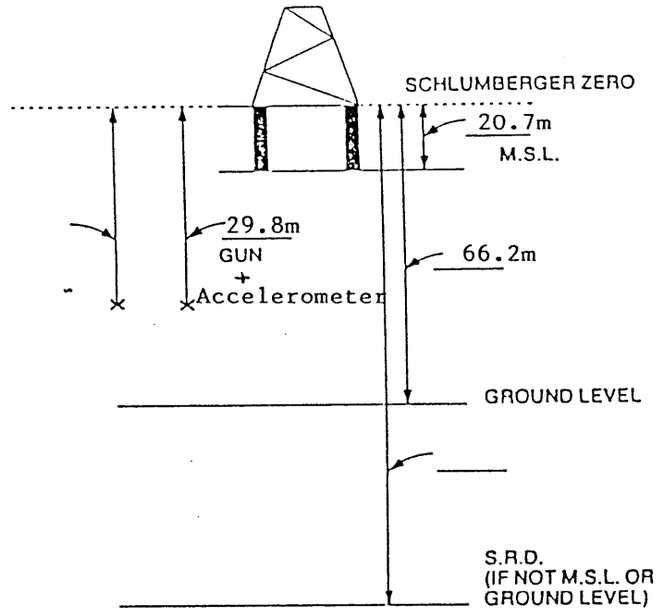
LAND ☐



INDICATE ALL DISTANCES RELATIVE TO SCHLUMBERGER ZERO

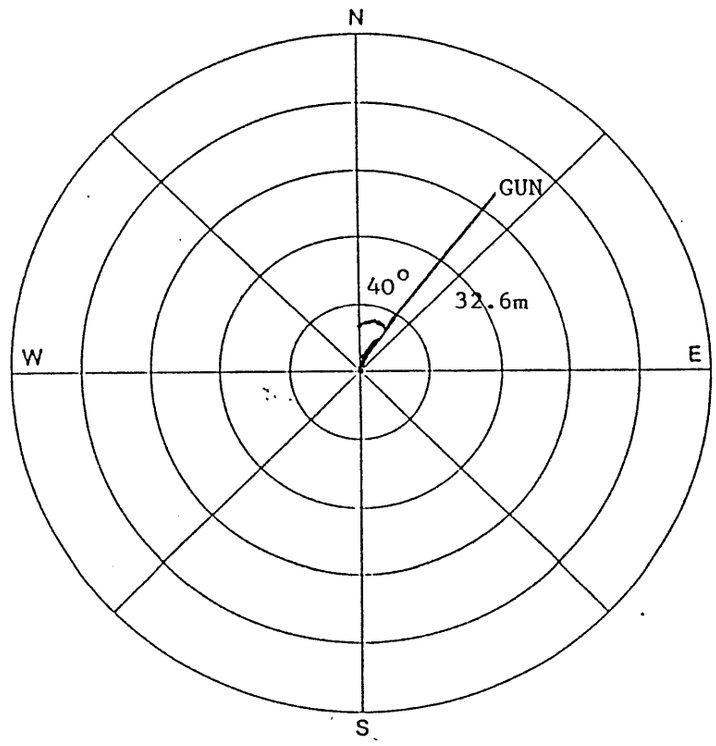
* DELETE AS APPLICABLE

OFFSHORE X



INDICATE ALL DISTANCES RELATIVE TO SCHLUMBERGER ZERO

SHOT POS'N	GUN OFFSET	HYDRO OFFSET	GUN DEPTH	HYDRO DEPTH
1	32.6m		9.1m	
2				
3				
4				
5				
6				
7				



INDICATE GUN/VIBRO AND HYDROPHONE OFFSET AND AZIMUTH RELATIVE TO NORTH

Schlumberger

WELL SEISMIC SERVICE FIELD REPORT

COMPANY	WELL	DATE	LOCATION	ENGINEER	WITNESSED BY
ESSO AUST.LTD.	PERCH #2	1.3.85	SEA	D. DAWSON	PETER NAPIER

FEET ☐ METRES ☒ | JACK UP ☐ PLATFORM ☐ SHIP ☐ SEMI-SUB ☒ | WEATHER: NO WIND/NO WAVES

SCHLUMBERGER ZERO	DF	AT ELEVATION	20.7M	RELATIVE TO MEAN SEA LEVEL (M.S L.)
LOG MEASURED FROM	DF	AT ELEVATION	0M	RELATIVE TO SCHLUMBERGER ZERO
DRILLING MEASURED FROM	DF	AT ELEVATION	0M	RELATIVE TO SCHLUMBERGER ZERO

SOURCE

GUN TYPE WATER ☐ AIR ☒
VOLUME 1 x 200 CU INCHES
PRESSURE 12 BARS
VIBRATOR TYPE –
SWEEP LENGTH – SECONDS
FROM – HZ TO – HZ

TIDEL INFORMATION DISTANCE HOUR DATE

TIDE LEVEL TO M.S.L.
(RECORD IF LEVEL VARIES
MORE THAN 2 METRES
DURING SURVEY)

CSU SOFTWARE VERSION: 26.4 | MAX. HOLE DEV: 0° AZIM:

NOTE: SHOTS HIGHLY RECOMMENDED AT TD, TOP EACH SONIC, ABOVE AND BELOW BAD HOLE INTERVALS

UNCORRECTED RESULTS Quality: G = Good, P = Poor, U = Unsatisfactory

SHOT NO.	DEPTH	GUN PRESSURE	FILTERS	TRANSIT TIME	HOUR SHOT	FILE	STACK	STACKED SHOTS	QUALITY / REMARKS
1	10m	120	–	20.4	11:37	1			MOONPOOL TEST
2		"		19.3	11:40		1		MOONPOOL
3		"		20.5	11:44				
4		"		20.5	11:46				
5		"		20.4	11:48				
6		"		21.3	11:50				
7	600m	"		263.8	12:05		2		
8		"		263.9	12:09				
9		"		263.7	12:11				
10	820m	"		342.5	12:20		3		
11		"		342.8	12:23				
12		"		342.7	12:25				
13		"		342.8	12:26				
14	1310m	"		526.8	12:38		4		
15		"		526.6	12:40				
16		"		527.1	12:43				
17		"		526.8	12:44				
18	1229m	"		498.8	12:50		5		
19		"		498.7	12:52				
20		"		576.7	12:53				POOR
21		"		498.5	12:55				
22		"		498.5	12:56				
23		"		–	12:57				POOR
24		"		498.3	12:58				
25		"		498.1	13:03		6		
26		"		515	13:05				POOR
27		"		497.6	13:08				
28	1143	"		–	13:20				POOR
29	1141	"		465.3	13:22		7		
30		"		465.5	13:23				
31		"		–	13:24				POOR
32		"		–	–				POOR
33		"		465.2	13:26				
34		"		465.0	13:28				

Distribution: White = computing centre; Green = District; Pink = Location

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Schlumberger

WELL SEISMIC SERVICE FIELD REPORT

COMPANY	WELL	DATE	LOCATION	ENGINEER	WITNESSED BY
ESSO AUST LTD	PERCH #2	1.3.85	SEA	D. DAWSON	PETER NAPIER

FEET ☐ METRES ☒ — JACK UP ☐ SHIP ☐ PLATFORM ☐ SEMI-SUB ☒ — WEATHER: NO WIND/NO WAVES

SCHLUMBERGER ZERO	DF	AT ELEVATION	20.7m	RELATIVE TO MEAN SEA LEVEL (M.S.L.)
LOG MEASURED FROM	DF	AT ELEVATION	0m	RELATIVE TO SCHLUMBERGER ZERO
DRILLING MEASURED FROM	DF	AT ELEVATION	0m	RELATIVE TO SCHLUMBERGER ZERO

SOURCE

GUN TYPE WATER ☐ AIR ☒
VOLUME 1 x 200 CU INCHES
PRESSURE 12 BARS
VIBRATOR TYPE –
SWEEP LENGTH – SECONDS
FROM – HZ TO – HZ

TIDEL INFORMATION DISTANCE HOUR DATE

TIDE LEVEL TO M.S.L.
(RECORD IF LEVEL VARIES
MORE THAN 2 METRES
DURING SURVEY)

CSU SOFTWARE VERSION: 26.4 | MAX. HOLE DEV: 0° AZIM:

NOTE: SHOTS HIGHLY RECOMMENDED AT TD, TOP EACH SONIC, ABOVE AND BELOW BAD HOLE INTERVALS

UNCORRECTED RESULTS Quality: G = Good, P = Poor, U = Unsatisfacto

SHOT NO.	DEPTH	GUN PRESSURE	FILTERS	TRANSIT TIME	HOUR SHOT	FILE	STACK	STACKED SHOTS	QUALITY / REMARKS
35	1010	120	–	413.7	13:34		8		
36		"		414.0	13:38				
37		"		413.9	13:40				
38	950	"		391.6	13:44		9		
39		"		391.5	13:46				
40		"		391.5	13:48				
41		"		391.6	13:48				
42	820	"		343.2	13:55		10		
43		"		343.0	13:57				
44		"		360.0	13:58				POOR
45		"		343.3	13:58				
46		"		343.2	14:03				

Distribution: White = computing centre; Green = District; Pink = Location

PE601184

This is an enclosure indicator page.
The enclosure PE601184 is enclosed within the container PE902431 at this location in this document.

The enclosure PE601184 has the following characteristics:

ITEM_BARCODE	= PE601184
CONTAINER_BARCODE	= PE902431
NAME	= Seismic Calibration Log
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= VELOCITY_CHART
DESCRIPTION	= Seismic Calibration Log
REMARKS	=
DATE_CREATED	= 14/03/85
DATE_RECEIVED	= 11/10/85
W_NO	= W898
WELL_NAME	= Perch-2
CONTRACTOR	= Schlumberger
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE601185

This is an enclosure indicator page.
The enclosure PE601185 is enclosed within the container PE902431 at this location in this document.

The enclosure PE601185 has the following characteristics:

ITEM_BARCODE	= PE601185
CONTAINER_BARCODE	= PE902431
NAME	= Seismic Calibration Log
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= VELOCITY_CHART
DESCRIPTION	= Seismic Calibration Log
REMARKS	=
DATE_CREATED	= 14/03/85
DATE_RECEIVED	= 11/10/85
W_NO	= W898
WELL_NAME	= Perch-2
CONTRACTOR	= Schlumberger
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902433

This is an enclosure indicator page.
The enclosure PE902433 is enclosed within the container PE902431 at this location in this document.

The enclosure PE902433 has the following characteristics:

ITEM_BARCODE	= PE902433
CONTAINER_BARCODE	= PE902431
NAME	= Raw and Stacked Shots - Velocity check shot survey
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= VELOCITY_CHART
DESCRIPTION	= Raw and Stacked Shots - Velocity check shot survey
REMARKS	=
DATE_CREATED	= 14/03/85
DATE_RECEIVED	= 11/10/85
W_NO	= W898
WELL_NAME	= Perch-2
CONTRACTOR	= Schlumberger
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE601186

This is an enclosure indicator page.
The enclosure PE601186 is enclosed within the container PE902431 at this location in this document.

The enclosure PE601186 has the following characteristics:

ITEM_BARCODE	= PE601186
CONTAINER_BARCODE	= PE902431
NAME	= Seismic Calibration Log
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= VELOCITY_CHART
DESCRIPTION	= Seismic Calibration Log
REMARKS	=
DATE_CREATED	= 14/03/85
DATE_RECEIVED	= 11/10/85
W_NO	= W898
WELL_NAME	= Perch-2
CONTRACTOR	= Schlumberger
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902432

This is an enclosure indicator page.
The enclosure PE902432 is enclosed within the container PE902431 at this location in this document.

The enclosure PE902432 has the following characteristics:

ITEM_BARCODE	= PE902432
CONTAINER_BARCODE	= PE902431
NAME	= Synthetic Seismogram - Geogram
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= SYNTH_SEISMOGRAM
DESCRIPTION	= Synthetic Seismogram - Geogram
REMARKS	=
DATE_CREATED	= 14/03/85
DATE_RECEIVED	= 11/10/85
W_NO	= W898
WELL_NAME	= Perch-2
CONTRACTOR	= Schlumberger
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902434

This is an enclosure indicator page.
The enclosure PE902434 is enclosed within the container PE902431 at this location in this document.

The enclosure PE902434 has the following characteristics:

ITEM_BARCODE	= PE902434
CONTAINER_BARCODE	= PE902431
NAME	= Time Depth Curve
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= VELOCITY_CHART
DESCRIPTION	= Time Depth Curve
REMARKS	=
DATE_CREATED	= 11/04/85
DATE_RECEIVED	= 11/10/85
W_NO	= W898
WELL_NAME	= Perch-2
CONTRACTOR	= Schlumberger
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)