A/S Norske Shell

NSEP - 149

ORIGINAL

EXPLORATION WELL RESUME

WELL 31/2-4

TRADE VERSION

August 1982

A/S Norske Shell

WELL RESUME 31/2-4
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GENERAL INTRODUCTION

It had been proposed and agreed to locate the fourth exploration well in block 31/2 on seismic line 79-406 at shot point 540.

The coordinates of the proposed location were:

Lat.	60^{0} 51' 23.5" N
Long.	03^{0} 30' 45.6" E

This is some 10 km NNW of the discovery well 31/2-1. (Fig. 0/1)

The objectives of the well were two-fold:

a) The Palaeozoic or Early Triassic formations:
  - to test the possible presence of hydrocarbons in the structurally highest fault block of a deep structure in block 31/2.
  - to evaluate the reservoirs, seals and possible pre-Jurassic source rocks.
  - to determine the age of the as yet unpenetrated deeper horizons for a better understanding of the regional geologic setting.
  - to drill in a location without major faults.

b) The Jurassic gas accumulation:
  - to test hydrocarbons at a location of nearly maximum gross hydrocarbon column.
  - to test lateral variations in reservoir characteristics.

The well was spudded on September 1, 1980. After having set the 20" casing, the well was secured and temporarily suspended on September 10 due to a farm out of the rig to Statoil. The well was then re-entered on October 10 and suspended on April 6, 1981.

The well was drilled to 5035 m BDF into formations of Skythian age (Lower Triassic). This satisfies a concession requirement of one well out of six to be drilled to 5000 m subsea or Paleozoic formation, whichever comes first.

The well has not been tested, but the sand in the Humber Group is interpreted productive for gas and oil.

WELL 31/2-4.
SUMMARY OF WELL DATA.

Well Classification: New field well, Wildcat

Location Coordinates: 60° 51' 23.57" N
03° 30' 44.33" E

Water Depth: 336 m

Derrick Floor Elevation: 25 m

Contractor/Rig: Dolphin Services/Borgny Dolphin

BOP Stack: 10.000 psi/18 3/4" Hydril

Mudlogging Contractor: Geoservices

Start of operations: 28.08.80

Spudded: 01.09.80

Temporarily suspended: 10.09.80

Re-entered: 06.10.80

Suspended: 06.04.81

Objective: Evaluation of a) Jurassic sequence
b) Paleozoic or Early Triassic formations.

Total Depth: 5033 m (logger's depth)
5035 m (driller's depth)

Formation at TD: New Red Group of Skythian age

Results: Sandstones in Humber Group interpreted productive for gas and oil

Present Status: Suspended

Casing Record (driller's depth):

30"	csg	446 m
20"	csg	807 m
16"	liner	1272 m
13 3/8"	csg	1927 m
9 5/8"	csg	3983 m

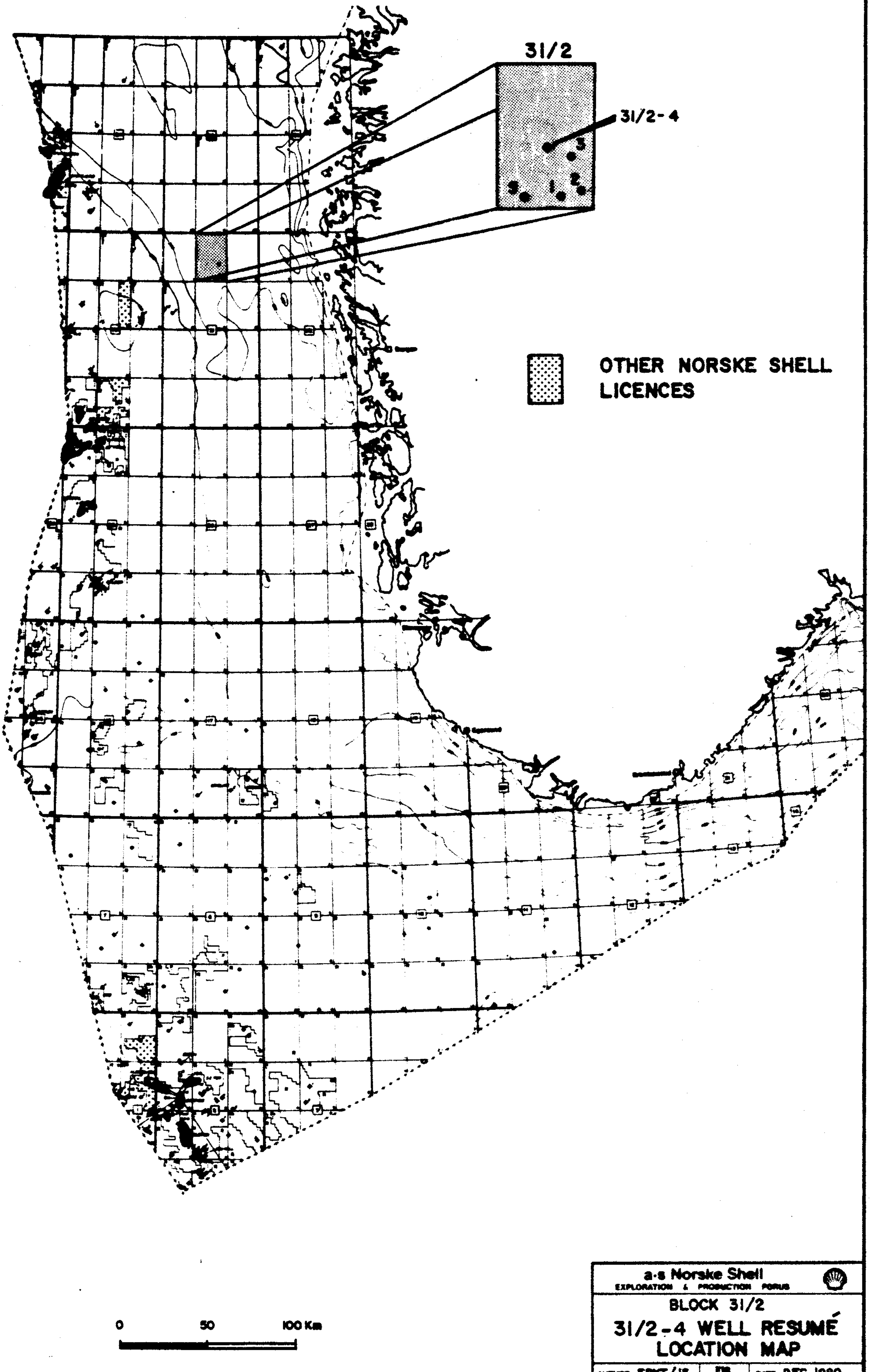
Logs:

ISF-BHC-GR-SP)
FDC-CNL-CAL-GR) whole well

BGT-GR)
DLL/MSFL/GR)
LDT/CNL-GR)
NGT)
LSS) partly
HDT)
RFT)
CBL-VDL-GR)

Production Licence PL 054 Group:

Statoil	50%
Norske Shell A/S	35%
Norske Conoco A/S	5%
Norsk Hydro Production A/S	5%
Superior Oil Norge A/S	5%



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EXPLORATION & PRODUCTION FORUS

BLOCK 31/2

31/2-4 WELL RESUMÉ
LOCATION MAP

AUTHOR: EPXT/15
FIG. 0/1
DATE: DEC. 1980
REPORT NO. NSEP146
DRAW NO. 6J096/4

PART 1

DRILLING AND ENGINEERING REPORT

1. DRILLING HISTORY

The "Borgny Dolphin", an Aker H3 design semi-submersible, owned by Fred Olsen, Oslo, and operated by Dolphin Services, Tananger, had been on hire to A/S Norske Shell since 25.03.80, drilling and testing well 31/2-3.

From 22.07.80, the rig was in Tananger Bay for inspection and repair. At 0300 hrs, 25.08.80, the anchors were pulled and the rig was towed into Åmøyfjord for a stability test which was concluded at 1400 hrs, 27.08.80 and resulted in a reduction of the maximum variable deck load from 2300 to 2000 tons.

The tow to location 31/2-D was commenced at 1650 hrs, 28.08.80. At 1445 hrs, 29.08.80, anchor no. 5 was dropped on bottom as the stop anchor. At 0114 hrs, 30.08.80, all anchors were run and subsequently left for a seven hour soaking period. All anchors were successfully tested to a test tension of 450,000 lbs, and the rig was ballasted down to 70' drilling draft at 1900 hrs, 30.08.80. The position of the rig was:

N 60 deg 51' 23.57"
E 03 deg 30' 44.33"

This is 19 m on bearing 25 deg from the proposed location. From the results of the penetration test the following was established:

DF - MSL = 25 m
DF - Seabed = 361 m

The temporary guide base, with a 5 m skirt, was landed and set level on drillpipe. A 26" bit and 36" hole opener were run and location 31/2-D was spudded as well 31/2-4 at 2330 hrs, 01.09.80. The 36" hole was drilled with seawater and with viscous pills spotted on connections to 450 m in 11-1/2 hrs, and subsequently displaced to viscous mud before running the 30" casing. Seven joints of 30", X-52, 310 lbs/ft, ATD-RB Squnch casing were run to 446 m and cemented with cement returns to seabed. When the displacing pressure was bled off, the shoe float did not hold and back pressure was applied for 2-1/2 hrs before backing off the drillpipe running string. The top of cement inside the casing was tagged at 437 m. The shoe was drilled out and 4 m of 17-1/2" pilot hole was drilled to 454 m. The 21" riser was run with the 30" pin connector and dump valve attached and a 17-1/2" pilot hole was drilled from 454 - 815 m in 22-1/2 hrs using seawater and viscous pills. Over the open hole section, 1.4 S.G. mud was spotted in order to stabilise the hole prior to running the ISF/SONIC and FDC/CNL logs. No signs of shallow gas were apparent from the logs and the well was circulated to seawater. The riser dump valve was opened and the well observed static prior to pulling the drill string out of the hole and retrieving the marine riser with the 30" pin connector. After opening the pilot hole to 26" and a pre-casing wipertrip, the bit was run back to bottom to spot 1100 bbls of 1.4 S.G. mud in order to maintain hole stability while running the 20" casing. A total of 36 joints of 20", K55, 133 lbs/ft casing were run to 807 m and cemented with returns to seabed.

The BOP stack was run on the 21" riser to within 30 m of the wellhead at 1230 hrs, 10.09.80. At this stage the operations on 31/2-4 were suspended and the well was secured prior to a farm out of the rig to Statoil. Statoil had requested the "Borgny Dolphin" to be released to secure their well 34/10-10, which was blowing gas from a shallow gas zone. (The "Borgny Dolphin", having just set 20" casing, was the only rig in the area readily available).

The BOP and marine riser were pulled and a low pressure corrosion cap was run. However, after several attempts to latch on to the 18-3/4" housing, the cap had to be pulled and re-dressed before it was successfully latched on to the wellhead. Divers managed to cut guide line no. 4, but while cutting line no. 1 a seal failed in the Mantis hydraulic cutter. It was not possible to repair the cutter on site, and an Oceaneering hydraulic cutter was brought over from the "West Venture" and was installed as a replacement. The remaining guide lines were cut without incident. A "Simrad" beacon was attached to guide post no. 4, to aid the subsequent re-entry of well 31/2-4 and a video survey of the wellhead and the immediate surroundings was carried out. The mud pits, containing 1460 bbls KCl/polymer mud, required for the 17-1/2" hole section, were dumped prior to deballasting the rig for anchor handling. Anchors nos. 3 and 7 were pulled and bolstered when deteriorating weather interrupted the operations at 0900 hrs, 12.09.80. Anchor handling was resumed at 1600 hrs, 13.09.80, and anchors nos. 6 and 2 were pulled and bolstered before the operations were again halted at 0100 hrs, 14.09.80 owing to bad weather. At 0630 hrs, 15.09.80, the operations were resumed and the anchor handling completed. The tow to well 34/10-10 was commenced at 1530 hrs, 15.09.80, and supervision of operations was handed over to Statoil.

After securing well 34/10-10, the tow back to well 31/2-4 was started at 0930 hrs, 04.10.80. Supervision of the operations was taken over by Norske Shell upon reentering block 31/2 at 1500 hrs, 04.10.80. The anchors were successfully tested to 450,000 lbs before the rig was positioned over the wellhead (guided by the Simrad transponder on guide post no. 4 and the underwater TV). After the guide posts on the wellhead were cleared of the old guidline stubs, using the Mantis submarine, four new guidelines were stabbed. The wellhead corrosion cap was pulled without incident and the BOP and riser run. At 2300 hrs, 06.10.80, the rig was back in the same position as at 1230 hrs, 10.09.80, when operations had been suspended.

The wellhead collet connector and the BOP stack were pressure tested successfully. On 08.10.80, the wearbushing was set and a 17-1/2" bit was run inside the 20" casing. The diverter, flowline and overboard valves were function tested prior to drilling out the cement. The 20" casing shoe track and the rat hole were cleaned out and 3 m of new hole was drilled to 818 m. A leak off test was performed showing a maximum equivalent mud weight of 1.71 S.G. The 17-1/2" bit was pulled and a 12-1/4" BHA was run to provide better control when drilling through a section where the seismic survey indicated a possible presence of shallow gas. The hole was displaced to a KCl/polymer mud (1.28 S.G.) and drilled to 1050 m. Indications of gas bearing layers were seen from background gas readings and trip gas but all flowchecks were negative. The hole was circulated clean prior to pulling out with the 12-1/4" assembly. After 2 stands were pulled, the hole started swabbing. The bit was run back to bottom and the hole was circulated clean. Swabbing also occured on the next attempt to come out of the hole and the drill string was "pumped" single by single into the 20" shoe. The hole was opened to 17-1/2" down to 1050 m and new hole was drilled to 1280 m, the 16" liner setting depth. On three occasions drilling was stopped and the hole circulated due to high gas readings, although all flow checks were negative. While comming out of the hole tight spots were experienced and the string was run back to bottom from the 20" shoe and the hole was circulated clean before a wiper trip to the shoe was made. Tight spots, with overpulls of up to 125,000 lbs, were again experienced and the bit was run back in to ream the tight sections.

The following logging suite was run in the 17-1/2" pilot hole:

ISF/SONIC/GR/SP	(run no. 2)	from 1269 - 807 m
FDC/CNL/GR/CAL	(run no. 2)	from 1270 - 807 m
CST	(run no. 1, 30 shots; 18 recovered, 9 lost, 3 empty)	

The hole was underreamed to 22" down to 1280 m and circulated clean. The 22" underreamer was pulled, redressed and rerun. Several tight spots were encountered and opened up, and two 50 bbls viscous pills were pumped around to clean the hole. After running a BGT to check the hole size, 44 joints of 16", K-55, 109 lbs/ft, LTC liner were run. The casing stood up at 912 m which was initially believed to be a tight spot and the liner was pulled back to allow for reaming of the tight spot. (Later it was found that the OD of the liner setting sleeve (17.75") was too big to pass through the 18-3/4" (min. ID 17.625") wellhead housing). The liner running equipment was rigged down, but attempts to set the wear bushing in the wellhead were unsuccesful as was an attempt to run through the wellhead with a 17-1/2" bit and 22" underreamer. The rig proved to be off location owing to the heavy weather and was pulled back onto location using the winches. The underreaming assembly was run back in and successfully guided through the wellhead using the annular preventer. However, the weather had deteriorated and it was decided to suspend drilling operations.

After waiting for 18-1/2 hrs on the weather to improve the interval 810 - 966 m was underreamed. An unsuccessful attempt to back off the oversize sleeve of the 16" casing was made, and the casing had to be cut to get the sleeve off. While waiting for a new liner setting sleeve, a 17-1/2" bit and 22" underreamer were run to clean out the hole. The wearbushing was pulled and the 16" liner re-run. The liner stood up at 1269 m and was washed down to 1273 m. The running tool could not be backed off, but the string did back off on a tool joint. An overshot was run and engaged onto the fish on the first attempt and the 16" liner was pulled back until the setting tool was in the rotary table. The liner was rerun, again stood up at 1260 m and was washed down to 1272 m, with the liner top at 718 m. The running tool was backed off and the liner cemented. The cement was displaced to the float collar, one joint above the shoe. A total of 97 bbls were lost during the displacement.

The running string was pulled up and an unsuccessful attempt to reverse circulate was made. The string was pulled wet and the plug launching dart was found jammed inside the running tool and the cement stinger below filled with cement. After a scheduled BOP test, a 17-1/2" bit was run to tag the cement. Firm cement was found at 603 m and drilled out to the liner top at 718 m. The 89 m liner lap between the 16" liner and the 20" casing was successfully pressure tested to 1000 psi for 15 minutes. The 17-1/2" assembly was pulled and a 12-1/4" drilling assembly was run to drill out the 16" liner. Cement, seal sub and plug holder sub were drilled out from 718 - 750 m. The liner wiper plug, which had stood up at 1128 m, and the float collar were drilled out. The 16" liner was pressure tested but could not hold a pressure of more than 700 psi (1.65 S.G. equivalent mud weight). The shoe was drilled out and new hole drilled to 1285 m but no cement was encountered in the shoetrack or below the shoe.

The 12-1/4" assembly was retrieved and a 14" bit with a 14-1/2" mill was run in to clean out the 16" liner. A leak off test was performed at the 16" shoe, giving a maximum allowable mud weight of 1.51 SG. The 14-1/2" assembly was then pulled and a CBL/VDL was run, revealing a poor cement bond and no cement around the shoe. Open ended drillpipe was run and 31 bbls of 14.5 ppg cement were squeezed away with a maximum surface pressure of 750 psi. A 14-1/2" mill was run and tagged cement at 1235 m. The cement was drilled out to 1280 m and a 12-1/4" assembly was run and new hole was drilled to 1290 m. A leak off test indicated a maximum equivalent mud weight of 1.71 SG.

The 12-1/4" hole was drilled to 1320 m where coring was commenced. Glass fiber inner barrels were used to improve recovery of the unconsolidated sands from 1326 m. The interval 1334 - 1338 m was drilled with a 12-1/4" bit after two unsuccessful runs with the coring assembly and a run with a reverse circulating junk sub. Coring was continued, interrupted by 16 1/2 hrs waiting on weather from 2100 hrs, 01.11.80 during which the string was hung off. The "Navidrill" mudmotor was tried out on core no. 10. This trial was not successful as only 1% of the 17 m cored was recoverd. The low recovery was believed to be caused by the high pump rate (320 GPM) needed to prevent the "Navidrill" from stalling while coring through coarse grained sandstone. Coring was continued with a rotary driven assembly. At 1621 m, the "Navidrill" was given a second trial on core no 26. After 6 m, the corebarrel was pulled being jammed, but until then the penetration rate was 10-15 min/m and 5.12 m (85%) was recovered. Another two cores using the rotary table were cut down to 1663 m when coring was concluded since no more oilshows were observed. The 8-15/32" hole was opened to 12-1/4" down to 1663 m and new hole was drilled to 1950 m, the setting depth for the 13-3/8" casing. The following logging suite was run in the 12-1/4" pilot hole:

DLL/MSFL/GR/SP/CAL	(run no. 1)	from 1936 - 1271 m
LDT/CNL/GR	(run no. 1)	from 1937 - 1271 m
FDC/CNL/NGL/CAL/GR	(run no. 1)	from 1939 - 1271 m
ISF/SONIC/GR/SP	(run no. 3)	from 1938 - 1271 m

Non-coplanar SHDT	(run no. 1)	from 1934 - 1271 m
HDT	(run no. 1)	from 1934 - 1271 m
LSS/GR	(run no. 19	from 1700 - 1350 m

In addition, a CBL was run over the 16" liner from 1272 m to 718 m. A wiper trip was made prior to running an RFT and two CST guns. On the RFT run, 25 pressure tests were made and 1 sample taken. Of the 60 CST bullets shot, 47 samples were recoverd, 6 misfired, 5 were lost and 2 were empty.

The hole was underreamed to 15-3/4" to a depth of 1993 m. A BGT log was run which showed the interval from 1365 - 1567 m to be undergauge (12-1/4"). Extensive reaming (103 hrs) with a underreamer and a 14" bit was required before the entire open hole was considered large enough to run casing. 134 joints 13-3/8", L-80, 72 lbs/ft, BTC casing were run to a depth of 1927 m. The 14.375" OD collars over the 16" liner interval 692 - 1928 m had been turned down to 14" OD in order to reduce pressure losses during cementing. The casing was cemented without losses. The floats did not hold and back pressure was applied for 9 hrs after which the well was observed to be static.

Whilst running in with a 12-1/4" bit, it stood up at 977 m. The string was washed and reamed through and in the cuttings coming to surface, rubber and cement were found indicating that the casing plug had stood up at this point. The cement top inside the casing was found at 1850 m and the cement was dressed to 8 m above the shoe.

The cased hole was circulated clean before a CBL/VDL/CCL/GR was run indicating the cement top to be at 810 m. A 12-1/4" BHA with a junk sub was run and the shoe was drilled out to 1950 m where the bit was worked on junk. A reverse circulation junk sub was run in an attempt to recover the chain tong handle lost in the hole on 30.11.80, but no junk was recovered. A RTTS packer was run in the hole and the string (with a Gray check valve) was hung off in the BOP. The lower marine riser (LMR) package was unlatched and the riser was pulled for repair of the BOP control system. The BOP control system was repaired (77 hrs) and the LMR package and riser was rerun. A leak in the hydraulic fluid system on the yellow pod developed after latching the LMR package to the BOP. Consequently, the yellow pod was pulled for repair but considerable amounts of time and work were required to release the pod. In the meantime, the hang off tool was run to retrieve the drill string. Pulling the string proved not possible, as the RTTS packer had set in the casing. After several attemps the packer was unseated and the hang off tool was pulled to surface. The RTTS was inspected and run back into the hole, where it was set above the reservoir at 1175 m. The top of the 13-3/8" casing was successfully pressure tested to 3000 psi. The RTTS packer was then set at 1840 m and a leak off test below the 13-3/8" casing shoe was made to an equivalent mud weight of 1.72 SG without observing leak-off.

The 12-1/4" hole was drilled to 2201 m during which the mud weight was reduced from 1.35 to 1.25 SG. During a roundtrip the bit stuck without rotation at 2197 m. Circulation was maintained, however, and the bit was worked down to 2201 m where rotation was regained. Extensive reaming was required before the bit could be retrieved. The 12-1/4" hole was continued to 3222 m during which the mud weight was further reduced to 1.18 SG. During a roundtrip the string became stuck at 2481 m and was freed after spotting a 'Pipefree' pill. Drilling was continued to 3896 m when the string parted in the bumper sub. The 4.09 m fish was retrieved at the first attempt.

On recommencing drilling a washout was observed in the cross-over from the 8" drillcollars to the 5" HWDP. Drilling was resumed but at 3955 m the string again parted in the jar. The 179 m fish was retrieved on first attempt. Drilling was continued to 3991 m.

The following logs were run:

1.	ISF/SONIC/SP/GR	(run no. 4),	3988 - 1927 m
2.	FDC/CNL/CAL/GR	(run no. 3),	3990 - 1927 m
3.	HDT	(run no. 2),	3990 - 1927 m

A pressure survey was carried out with an RFT. The cable became stuck at the end of the programme and had to be stripped over before the RFT tool could be recovered.

Drilling recommenced with the objective of setting the 9-5/8" casing as deep as possible as no hole problems had been encountered, sands were water bearing and little indication of overpressure was observed. Further problems, this time in the mud pumps, caused this decision to be reversed. Three CST guns were run and a McCullough casing inspection tool run to evaluate possible casing wear caused by 470 rotating hours in the 13-3/8" casing. The 9-5/8" casing was run and cemented at 3983 m. A subsequent leak off test gave a maximum equivalent mud weight of SG 1.80.

Drilling was continued to 4634 m, alternately using diamond bits and rock bits in order to combine sufficient penetration with geological information through cuttings. At this depth a bit cone was lost. The cone was retrieved with a 7-7/8" reverse circulation junk basket. Drilling was continued until at 4964 m, drilling was interrupted to repair a heave compensator airhose. While the airhose was repaired, the drill string parted below the slips and fell 16 m leaving a 4948 m fish in the hole. (Subsequent investigation identified drillpipe fatigue as the main reason for failure). The fish was successfully recovered but, due to severe bending, half the drill string and all of the bottom hole assembly were changed out.

Drilling was continued to 5025 m. A 10 m core (8.4 m recovery) was taken and the following logs run:

1. ISF/SONIC/SP/GR (run no. 5) from 5032 - 3983 m
2. FDC/CNL/CAL/GR (run no. 4) from 5032 - 3983 m
3. HDT (run no. 3) from 5033 - 3983 m
4. RFT - 3 pretest
5. Seismic velocity survey - 80 levels
6. CST - 60 bullets shot, 29 samples recovered, 17 bullets were empty, 9 misfired and 5 were lost.

7.	CBL/VDL/GR/CCL	(run no. 5)	from 3983 - 1798 m
8.	GR	(run no. 1)	from 5020 - 3983 m

After the logging programme, five cement plugs of 200 m each were set from 5000 - 3907 m. The last cement plug was tagged with 30,000 lbs WOB and pressure tested with 4500 psi BHP. The marine swivel was landed in the wellhead and the 9-5/8" casing was cut at 1919 m. The cut-off casing was successfully retrieved at the second attempt. A CBL/VDL/GR/CCL was run over the 13-3/8" casing section prior to abandoning the 9-5/8" casing by setting a cement plug from 2000 - 1815 m. The plug was tagged with 15,000 lbs WOB and pressure tested using an RTTS packer to a differential pressure of 1000 psi. The 13-3/8" casing was suspended by setting a cement plug from 1300 - 1171 m.

Due to damage to the slip joint of the marine riser, the BOP stack and the marine riser had to be pulled separately. The corrosion cap was set after an unsuccessful attempt was made to retrieve the AX-gasket ring. The well was then left suspended for subsequent re-entry and testing.

The rig was deballasted and all anchors were racked at 2030 hrs, 06.04.81, when the rig went on hire to Shell UK Exploration and Production.

SUSPENSION STATUS DIAGRAM 31/2-4

(NB. ALL DEPTHS QUOTED BDF)

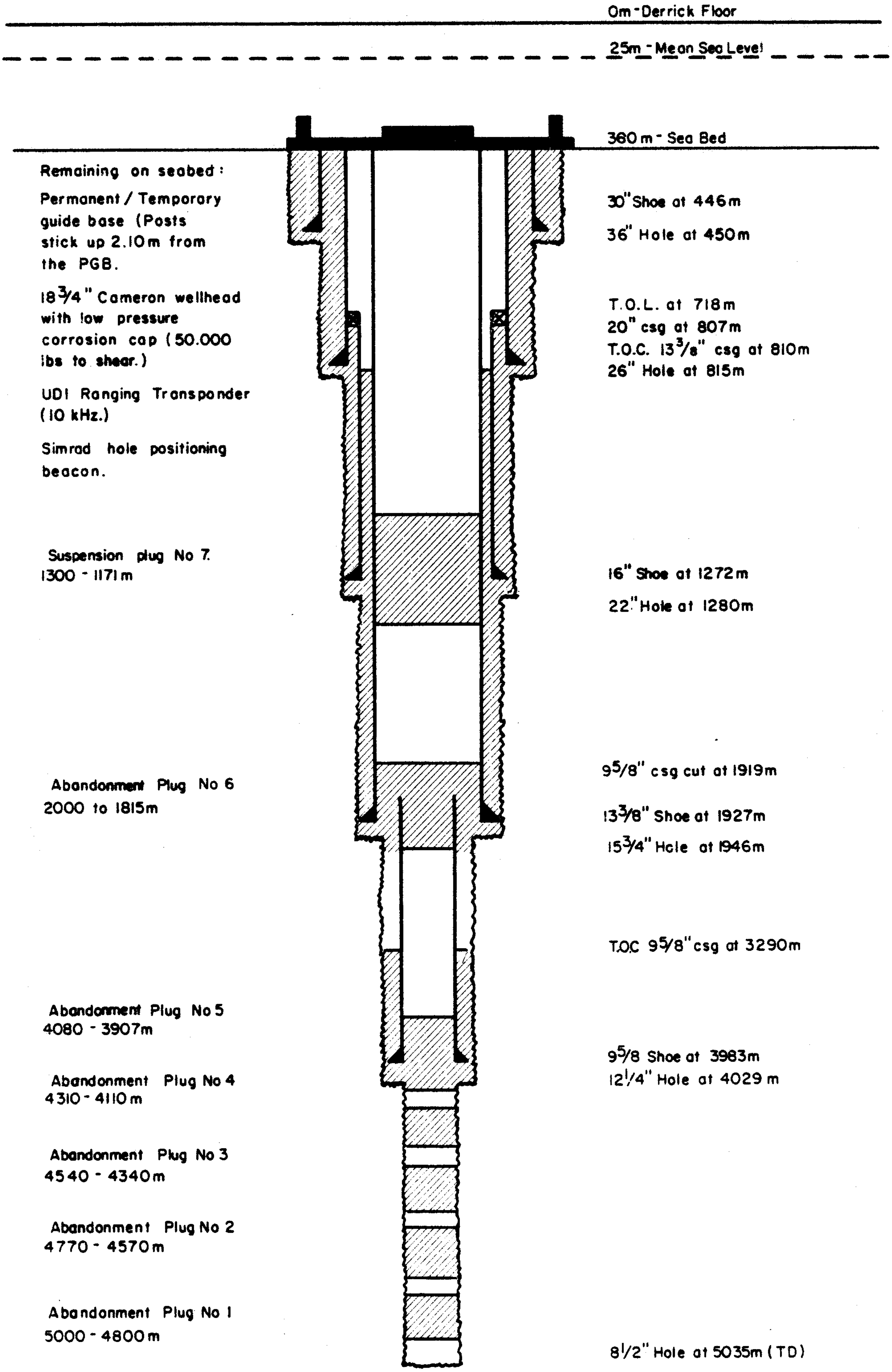


FIG. I/1.1

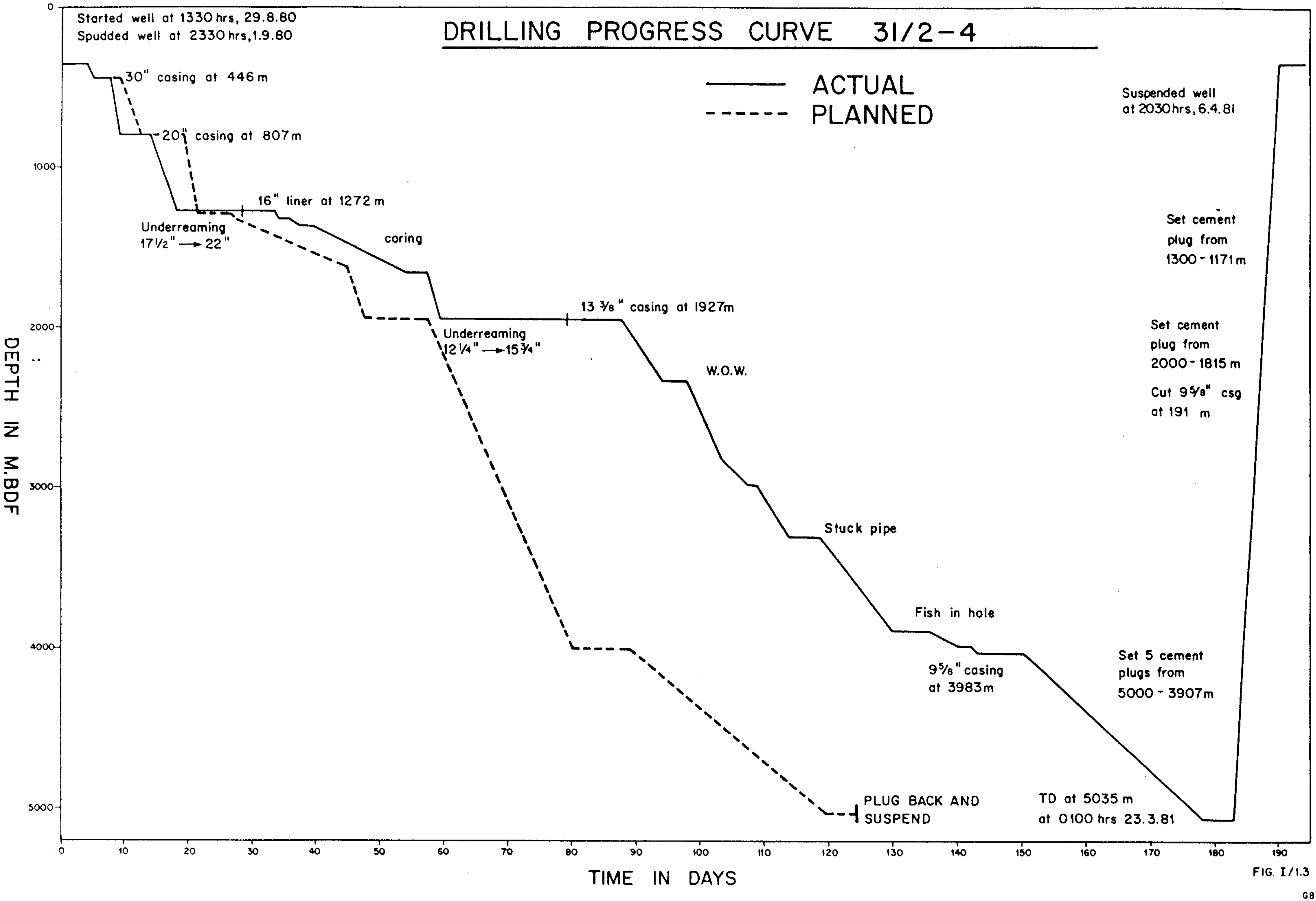

Started well at 1330 hrs, 29.8.80
Spudded well at 2330 hrs, 1.9.80
DRILLING PROGRESS CURVE 31/2-4
ACTUAL
PLANNED
30" casing at 446 m
20" casing at 807 m
16" liner at 1272 m
Underreaming
17 1/2" → 22"
coring
13 3/8" casing at 1927m
Underreaming
12 1/4" → 15 3/4"
W.O.W.
Stuck pipe
Fish in hole
9 5/8" casing
at 3983m
PLUG BACK AND
SUSPEND
TD at 5035 m
at 0100 hrs 23.3.81
Set 5 cement
plugs from
5000 - 3907m
Suspended well
at 2030 hrs, 6.4.81
Set cement
plug from
1300 - 1171 m
Set cement
plug from
2000 - 1815 m
Cut 9 5/8" csg
at 191 m
0
1000
2000
3000
4000
5000
DEPTH IN M.BDF
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
TIME IN DAYS

FIG. I/1.3

CASING DATA WELL No. 31/2-4

DATE RUN	SIZE	GRADE	WT/FT(LBS)	COUPLING	SHOE DEPTH(MBDF)	REMARKS
3.9.80	30"	X-52	310 (1" W.T.)	Vetco ATD-RB Squnch	446	Housing joint 1½ W.T.
8.9.80	20"	K-55	133	BTC/ Vetco LS-LH	807	Top 3 joints BTC coupling Top of 18 3/4" W.H.H. at 359 m BDF
22.10.80	16" Liner	K-55	109	LTC	1272	Liner landed on bottom. TOL at 718 m.
14.12.80	13 3/8"	L-80	72	BTC	1927	Collars from 692-1928 m, turned down to 14" OD (from 14.375")
19.2.81	9 5/8"	C-95	53.5	VAM	3983	-

Table 1/1.1

BIT RECORD SUMMARY WELL NO. 31/2-4

RUN No.	BIT No.	BIT Size	MFGR/TPE	JET SIZE 1 2 3	DEPTH OUT	METRES	HOURS	WOB 1000 LBS	RPM	PUMP PRESS	GPM	MUD WT	MUD VIS	CODE T B G	REMARKS
1	1	26"	OSC/3AJ	22 22 22	450	89	11½	0-10	100-120	1450	1110	Seawater/ visc.pills		2 3 i	Ran with 36" HO
2	2	17½"	OSC/3AJ	24 24 24	454	4	1	10	80	1300	1100	Seawater/ visc.pills		0 0 i	Also drilled 13 m cement
3	RR2	17½"	OSC/3AJ	22 18 18	815	361(365)	23½(24½)	5-15	150	2500	1100	Seawater/ visc.pills		4 5 i	Pilothole
4	RR2	17½"	OSC/3AJ	24 24 22	815	-	-	0-10	120	1300	1100	Seawater visc.pills		4 5 i	Ran with 26" HO from 454-815 m.
5	3	17½"	OSC/3AJ	32 32 32	818	3	3½	20	80-120	1800	1100	Seawater		1 1 i	Also drilled 22 m cement.
6	4	12 1/4"	HTC/X3A	22 22 22	1050	232	17	10-20	140	1500	700	1.28	53	3 1 i	Pilothole
7	RR3	17½"	OSC/3AJ	22 20 20	1280	230	17½(33)	10-20	150	3200	1100	1.34	55	3 6 i	Pilot hole for logging. Also opened 232 m 12 1/4" hole.
8	5	17½"	OSC/1GJ	24 22 20	1280	-	28	10	120	2600	1100	1.34	56	3 6 i	Ran with 22" UR.
9	RR5	17½"	OSC/1GJ	24 22 20	1280	-	10½(38½)	10	120	2600	1100	1.34	56	3 6 i	Ran with 22" UR.
10	RR3	17½"	OSC/3AJ	32 32 32	-	-	3(36)	15-18	110	1950	1000	1.35	55	2 4 i	Drilled 116 m cement above TOL.
11	6	12 1/4"	HTC/XV	32 32 32	1285	5	1	20-30	90	1400	1000	1.32	52	7 7 1/8	Also drilled 13 m cement.
12	7	14"	SMTH/F2	32 32 32	1285	-	4½	10-15	40-110	1700	950	1.32	52	1 1 i	Milling cement in 16" liner.
13	RR7	14"	SMTH/F2	32 32 32	1285	-	2(6½)	4	110	1700	950	1.32	52	2 2 i	Drilled 45 m cement after squeeze.
14	8	12 1/4"	SMTH/X3AJ	14 14 14	1320	35	3.5	40-45	110	2460	600	1.32	52	4 2 1/8	(BT).POH for coring.
15	CHI	8 15/32"	CB303(9)	- - -	1326	6	4	5-25	80-120	1100	250	1.32	53	85 %	Core no.1
16	CH2	8 15/32"	CB 17(2)	- - -	1334	8	12	5-25	80-120	800	250	1.32	48	95 %	Core no.2
17	CH3	8 15/32"	CB303(2)	- - -	1334	0	2½	5-25	80-120	750	280	1.32	48	90 %	Misrun
18	CH4	8½"	Stratapax	- - -	1334	0	2½	0-8	50-120	600	300	1.32	49	95 %	Misrun.
19	9	12 1/4"	HTC/X1G	15 15 15	1338	4	1	5-30	80-150	1400	600	1.32	46	0 1	(Split body) also opened 14 m 8½" hole, in 3 hrs.
20	CH5	8 15/32"	CB303(9)	- - -	1347	9	5½	5-18	80-130	750	275	1.32	46	100 %	Core no.3
21	RRCH5	8 15/32"	CB303(9)	- - -	1365	18(27)	9½(15)	5-25	80-130	1100	350	1.31	45	95 %	Core no.4
22	RRCH5	8 15/32"	CB303(9)	- - -	1379	14(41)	6(21)	5-10	80	700	250	1.32	48	70 %	Core no.5
23	RRCH4	8½"	Stratapax	- - -	1397	18(18)	3½(6)	5	130	600	300	1.32	48	90 %	Core no.6
24	RRCH4	8½"	Stratapax	- - -	1410	13(31)	6(12)	2-10	140	600	270	1.32	46	60 %	Core no.7
25	CH6	8 15/32"	CB 17(2)	- - -	1415.5	5.5	4½	5-20	80-120	700	250	1.32	46	95 %	Core no.8
26	CH7	8 15/32"	CB303(9)	- - -	1426.5	11	9½	5-25	70-200	650	250	1.32	47	100 %	Core no.9
27	CH8	8½"	Stratapax	- - -	1443.5	17	12	0-2	318	900	320	1.32	45	70 %	Core no.10.Ran with Navi-drill.
28	CH9	8 15/32"	CB303(2)	- - -	1452.5	9	4½	10-20	90	600	240	1.32	45	95 %	Core no.11
29	CH10	8 15/32"	CB17(2)	- - -	1454.5	2	3½	10-25	90	675	210	1.32	45	80 %	Core no.12
30	RRCH9	8 15/32"	CB303(2)	- - -	1472.5	18(27)	12(16½)	10-25	80-120	700	225	1.31	47	95 %	Core no.13
31	RRCH9	8 15/32"	CB303(2)	- - -	1482.5	10(37)	6(22½)	5-20	70-130	700	230	1.31	47	95 %	Core no.14
32	RRCH9	8 15/32"	CB303(2)	- - -	1484.5	2(39)	2½(25)	5-20	70-130	700	230	1.31	47	95 %	Core no.15
33	RRCH9	8 15/32"	CB303(2)	- - -	1490	5.5(44.5)	3½(28½)	5-12	80-120	700	250	1.31	47	95 %	Core no.16
34	RRCH7	8 15/32"	CB303(9)	- - -	1508	18(29)	7½(17)	15	110	850	260	1.31	47	95 %	Core no.17
35	RRCH7	8 15/32"	CB303(9)	- - -	1526	18(47)	7½(24½)	15	110	850	260	1.32	47	95 %	Core no.18
36	RRCH7	8 15/32"	CB303(9)	- - -	1544	18(65)	9(33½)	15	110	800	250	1.32	47	95 %	Core no.19
37	RRCH7	8 15/32"	CB303(9)	- - -	1562	18(83)	11(44½)	5-20	50-120	800	250	1.31	47	95 %	Core no.20
38	RRCH7	8 15/32"	CB303(9)	- - -	1567	5(88)	3½(48)	5-25	50-120	800	250	1.31	47	95 %	Core no.21
39	RRCH7	8 15/32"	CB303(9)	- - -	1585	18(106)	10½(58½)	25	100	800	250	1.31	50	95 %	Core no.22
40	RRCH7	8 15/32"	CB303(9)	- - -	1603	18(124)	11½(70)	5-25	70-120	800	260	1.31	49	95 %	Core no.23
41	RRCH7	8 15/32"	CB303(9)	- - -	1607	4(128)	5½(75½)	2-25	70-120	800	260	1.31	49	95 %	Core no.24
42	CH11	8½"	Stratapax	- - -	1621	14	6	0-5	150	500	250	1.31	49	100 %	Core no.25
43	RRCH11	8½"	Stratapax	- - -	1627	20	3	0-5	350-450	1100	350-450	1.31	49	95 %	Core no.26.Ran with Navi-drill.
44	CH12	8 15/32"	CB303(4)	- - -	1645	18	10	15	110-120	800	250	1.31	49	95 %	Core no. 27
45	RRCH12	8 15/32"	CB303(4)	- - -	1663	18(36)	9(19)	15	110	800	245	1.31	50	90 %	Core no. 28
46	10	12 1/4"	HTC/X1G	14 14 14	(1446)	-	14	5	130	2700	600	1.32	50	5 4 3/8	Reamed 108 m.
47	11	12 1/4"	HTC/J22	14 14 14	1666	3	1	25-30	100	2800	600	1.32	51	4 4 i	Also reamed 217 m, in 21 hrs.
48	12	12 1/4"	SMTH/SDGH	15 13 13	1821	155	15	30-65	120-150	3000	590	1.32	50	4 4 1/8	Full bit run.
49	13	12 1/4"	HTC/XV	13 12 12	1950	129	11½	50-65	120	3200	570	1.32	50	3 3 i	POH at csg depth

Table I/1.2

BIT RECORD SUMMARY WELL NO. 31/2-4

RUN No.	No.	BIT Size	MFGR/TPE	JET SIZE 1 2 3	DEPTH OUT	METRES	HOURS	WOB 1000 LBS	RPM	PUMP PRESS	GPM	MUD WT	MUD VIS	CODE T B G	REMARKS
50	RR13	12 1/4"	HTC/XV	22 22 22	(1555)	-	14	0-15	80	1900	700	1.32	50	3 3 i	Ran with UR no.1 (Servco, 15 3/4").Reamed 280 m.
51	RR13	12 1/4"	HTC/XV	22 22 22	(1609)	-	8	5-15	80	1900	700	1.32	50	3 3 i	Ran with UR no.2.Reamed 54 m.
52	RR13	12 1/4"	HTC/XV	22 22 22	(1659)	-	14	10-20	80	1900	700	1.32	50	3 3 i	Ran with UR no.3. Reamed 50 m.
53	RR13	12 1/4"	SMTH/SDT	22 22 22	(1704)	-	13	15-20	80	1900	700	1.32	52	3 3 i	Ran with UR no.2. Reamed 45 m.
54	14	12 1/4"	SMTH/SDT	22 22 22	(1749)	-	14½	10-15	80	1900	700	1.32	51	1 1 i	Ran with UR no.5. Reamed 45 m.
55	RR14	12 1/4"	SMTH/SDT	22 22 22	(1858)	-	16½	15-20	80	2100	750	1.32	51	1 1 i	Ran with UR no.6. Reamed 109 m.
56	RR14	12 1/4"	SMTH/SDT	22 22 22	(1943)	-	17	15-20	80	2100	750	1.32	52	1 1 i	Ran with UR no.7. Reamed 85 m.
57	RR14	12 1/4"	SMTH/SDT	22 22 22	(1413)	-	13½	10-20	80-100	2000	750	1.32	55	1 1 i	Ran with UR no.8.Rereamed 141 m.
58	RR14	12 1/4"	SMTH/SDT	22 22 22	(1513)	-	14	5-20	70-100	2000	750	1.32	53	1 2 i	Ran with UR no.9.Rereamed 100 m.
59	RR14	12 1/4"	SMTH/SDT	22 22 22	(1599)	-	14	5-20	70-100	2000	750	1.32	55	2 2 i	Ran with UR no.10.Rereamed 85 m.
60	RR14	12 1/4"	SMTH/SDT	22 22 22	(1948)	-	14½	0-5	100	2000	750	1.32	53	2 2 i	Ran with UR no.11.Rereamed 349 m.
61	RR7	14"	SMTH/F2	22 22 22	(1809)	-	23	0-5	120	2200	700	1.32	53	0 1 i	Ran with UR no.12.Rereamed 459 m.
62	RR7	14"	SMTH/F2	18 18 18	(1946)	-	6½	0-5	120	2200	700	1.32	53	0 1 i	Ran with ur no.13.Rereamed 61 m.
63	RR7	14"	SMTH/F2	16 16 18	(1946)	-	18	0-10	70-120	2500	700	1.32	50	0 1 i	Ran with UR no.13.Rereamed 117 m.
64	15	12 1/4"	HTC/X3	15 15 14	(1920)	-	6	20	70	3000	700	1.32	51	1 1 i	Drilled 61 m cement inside 13 3/8" csg.
65	RR15	12 1/4"	HTC/X3	15 15 14	1950	-	2½	10-15	70	3000	700	1.32	50	4 4 i	Drilled 30 m cement. Worked on junk.
66	RR15	12 1/4"	HTC/X3	15 15 14	1980	30	4½	30	140	3000	700	1.32	50	6 5 i	Drilling on junk.
67	16	12 1/4"	SMTH/SDGH	15 15 14	2071	91	9	45-60	120-140	3000	680	1.26	50	3 2 i	Full bit run.
68	17	12 1/4"	SMTH/SDGH	15 15 14	2192	121	16½	20-50	130	3000	680	1.23	50	6 4 1/4	Full bit run.
69	18	12 1/4"	SMTH/3JS	15 15 14	2201	9	3	20-40	60-160	3000	680	1.23	50	1 1 i	Damage skirt tail.
70	JM1	12 3/16"	Servco/junk mill	- - -	2203	2	5	5-10	70-100	1000	500	1.23	50	As new	Milling on junk.
71	19	12 1/4"	SMTH/SVH	15 15 14	2206	3	½	20	130	3000	680	1.21	49	1 1 1/8	Bit stuck, reamed up.
72	20	12 1/4"	SMTH/SVH	15 15 14	2341	135	19	30-60	125	2100-2500	575-650	1.21	50	5 6 1/8	Pump no.2, max 50 spm.
73	21	12 1/4"	SMTH/F3	15 15 14	2452	111	30	15-70	50-70	2250	575	1.20	50	0 7 i	Pump no.2 down.
74	22	12 1/4"	SMTH/2JS	15 15 14	2712	260	48	50-70	100-120	2450	575	1.20	50	0 7 i	Pump no.2 down.
75	23	12 1/4"	SMTH/3JS	15 15 14	2845	133	31½	60	120	2450	575	1.20	48	1 8 i	Pump no.2 down.
76	24	12 1/4"	SMTH/2JS	15 15 14	2941	96	31	50-70	100-120	3200	700	1.19	47	4 8 i	Full bit run.
77	25	12 1/4"	SMTH/3JS	15 15 14	3000	59	15½	50-70	100-130	3200	700	1.19	48	0 8 i	Full bit run.
78	26	12 1/4"	SMTH/F3	15 15 14	3082	82	19½	50-60	70	3200	700	1.18	49	2 8 i	Full bit run.
79	27	12 1/4"	SMTH/2JS	15 15 14	3222	140	28½	60	80	3000	650	1.18	48	1 8 i	Full bit run.
80	28	12 1/4"	HTC/XV	16 14 14	3311	89	27	70-75	100-120	3050	650	1.18	49	6 6 i	Full bit run.
81	29	12 1/4"	HTC/J22	16 14 14	-	-	-	0-5	160	2400	575	1.18	47	1 1 i	Reamed 63 m/9½ hrs.
82	30	12 1/4"	HTC/XV	16 14 14	3410	99	20½	65	115	3000	650	1.20	50	4 5 1/8	Full bit run.
83	31	12 1/4"	SMTH/2JS	14 14 14	3525	115	27	45	110	3000	630	1.18	49	1 8 i	Full bit run.
84	29RR	12 1/4"	HTC/J22	14 14 14	3738	213	56	50-70	65	3150	650	1.18	50	7 8 1/8	(B.T.) Full bit run.
85	32	12 1/4"	SMTH/F3	14 14 14	3820	82	20	50-65	60-65	3200	650	1.18	50	8 8 1/8	Full bit run.
86	33	12 1/4"	SMTH/2JS	14 14 14	3896	76	19	50-70	60-100	3200	650	1.19	52	3 4 i	Fished after shock sub parted.
87	34	12 1/4"	SMTH/FVH	22 22 22	3896	-	-	0-10	100	1400	650	1.19	51	0 0 i	Reamed between fishing runs.
88	34RR	12 1/4"	SMTH/FVH	22 22 22	3896	-	-	10	50-100	3200	870	1.19	50	1 1 i	Reamed between fishing runs.
89	35	12 1/4"	SMTH/2JS	16 13 13	3955	59	20½	50-70	90-110	3000	580	1.19	49	2 8 i	Fished after up-jar parted.
90	36	12 1/4"	HTC/XV	14 14 14	3991	36	11½	45-65	80-120	3000	580	1.19	50	7 7 i	POH after wash out on DC.
91	37	12 1/4"	HTC/XV	13 13 13	4028	37	14	55	110	2900	508	1.23	52	8 5 1/4	POH on pressure loss. M.W. correction on RFT data.
92	30RR	12 1/4"	HTC/XV	14 14 14	4029	1	1	25-30	110	3000	580	1.23	50	4 5 1/8	Ran on pre-casing wiper trip.
93	38	8½"	HTC/X1G	14 14 14	4034	5	2½	20-25	100	2400	500	1.23	53	3 3 1/8	Drilled rat hole for leak off test. Also drilled 28 m cement.
94	39	8½"	HTC/W7R2J	10 10 10	4059	25	8½	20-35	65-100	2600	343	1.19	55	7 6 1/8	Full bit run.
95	40	8½"	HTC/J44	10 10 10	4184	125	41½	40	60	2400	350	1.20	56	4 7 -	Lost cone.
96	41	8½"	HTC/W7R	10 10 10	4190	6	4,5	0-5	40	2800	360	1.19	52	5 7 i	Drilled 2½ hrs on junk.
97	42	8½"	Christ/MT51PP	- - -	4230	40	10	5-25	900	3800	571	1.19	52	80 %	20 % ringed out.
98	43	8½"	HTC/J44	10 10 10	4291	61	26	40	60	2400	335	1.19	50	0 6 i	Full bit run.
99	44	8½"	Christ/MT51PP	- - -	4324	33	6½	5-25	900	3200	546	1.19	50	90 %	Full bit run. 10 % ringed out.
100	45	8½"	HTC/J33	10 10 9	4430	106	29½	30-40	50-60	2750	336	1.20	53	0 6 i	Full bit run.
101	46	8½"	DB/TB521	- - -	4473	43	11	5-25	900	3250	546	1.19	51	100 %	Gauge pads 3/32" undergauge.

Table I/1.2

BIT RECORD SUMMARY WELL NO. 31/2-4

RUN No.	BIT No.	BIT Size	MFGR/TPE	JET SIZE			DEPTH OUT	METRES	HOURS	WOB 1000 LBS	RPM	PUMP PRESS	GPM	MUD		CODE	REMARKS
				1	2	3								WT	VIS	T B G	
102	47	8½"	DB/SD01	-	-	-	4547	74	15 -	5-25	900	3500	546	1.19	54	10 %	Full bit run 90 % worn
103	48	8½"	HTC/J22	10	9	9	4634	87	23½ -	40	65	3250	336	1.19	52	8 6 -	Lost 1 cone.
104	49	8½"	HTC/J55	10	10	10	4705	71	24 -	40-45	60-65	2500	336	1.19	50	0 5 i	Full bit run.
105	50	8½"	HTC/J33	10	9	9	4793	88	28-	40	40-60	3000	336	1.20	52	1 6 i	Full bit run.
106	51	8½"	SMTH/F4	10	9	9	4872	79	30½ —	45-50	45	3250	350	1.19	51	3 7 i	Full bit run.
107	52	8½"	SMTH/F4	10	9	9	4964	92	27 —	45	40	3200	360	1.20	55	4 8 3/4	Full bit run.
108	53	8½"	HTC/J44	9	9	10	5025	61	24 -	40	40	3200	360	1.19	53	2 5 1/32	(B.T.) TD
109	CH13	8 15/32"	CB303(9)	-	-	-	5035	10	4	10-25	70-80	1600	306	1.19	53	30 %	Core no.29.

Table I/1.2

CEMENTATION DATA WELL No. 31/2-4

JOB DATE	JOB DESCRIPTION	HOLE SIZE/ DEPTH(M.BDF)	CASING SHOE(M.BDF)	CEMENT TYPE	SACKS USED	SLURRY WEIGHT(PPG)	MIXWATER	ADDITIVES	LOSSES (BBLS)	REMARKS.
3.9 1980	30" casing	36"/450	446	Class G Class G	838 659	13.2 15.8	Freshwater Freshwater	0.36 gps Econolite 3% BWOC CaCl2 -	Nil	Cement returns observed at seabed. Float shoe did not hold.
9.9 1980	20" casing	26"/815	807	Class G Class G	1931 762	13.2 15.8	Seawater Seawater	0.36 gps Econolite 2% BWOC CaCl2	Nil	Cement returns observed at seabed
22.10 1980	16" liner	22"/1280	1272	Class G	2448	14.5	Seawater	0.2 gps Econolite 0.1 gps HR-6L	97	Liner wiper plug was not released by the dart.
26.10 1980	Cement squeeze at 16" shoe	22"/1280 12 1/4"/ 1285	1272	Class G	400	14.5	Freshwater	0.75% BWOC CFR-2 0.20% BWOC Halad-9 0.20% BWOC HR-5	23	Squeezed 33 bbls at 750 psi maximum surface pressure.
15.12 1980	13 3/8" casing	15 3/4"/ 1946	1927	Class G Class G	85 1185	13.5 15.2	Freshwater Freshwater	0.35 gps CFR-2L 0.16 gps Econolite 0.68 gps HLX-C248 (5% solution) 0.22 gps CFR-2L 0.10 gps Econolite 0.45 gps HLX-C248 (5% solution)	Nil	SSR top plug was not released by the dart. Float shoe did not hold. TOC at 810 m.
19.2 1981	9 5/8" casing	12 1/4"/ 4029	3983	Class G Class G	817 534	13.5 15.8	Freshwater Freshwater	0.30 gps Econolite 0.15 gps CFR-2L 0.07 gps HR-12L 0.29 gps CFR-2L 0.90 gps HLX-C248 (5% solution) 0.17 gps HR-12L	Nil	TOC at 3290 m (based on volumetric calculations using HDT-caliper)
27.3 1981	8½" hole abandonment plug	8½"/5035	3983	Class G	331	15.9	Freshwater	0.75 gps HLX-C248 0.3 gps HR-12L	-	Interval covered: 5000 - 4800 m BDF
27.3 1981	8½" hole abandonment plug	8½"/4800	3983	Class G	342	15.9	Freshwater	0.75 gps HLX-C248 0.3 gps HR-12L	-	Plug (2) set immediately after plug (1) to cover interval 4770 - 4570 m BDF.
27.3 1981	8½" hole abandonment plug	8½"/4570	3983	Class G	304	15.9	Freshwater	0.75 gps HLX-C248 0.3 gps HR-12L	-	Plug (3) set immediately after plug (2) to cover interval 4540 - 4340 m BDF.
27.3 1981	8½" hole abandonment plug	8½"/4340	3983	Class G	382	15.9	Freshwater	0.75 gps HLX-C248 0.3 gps HR-12L	-	Plug (4) set immediately after plug (3) to cover interval 4310 - 4110 m BDF.

Table I/1.3

CEMENTATION DATA WELL No.

JOB DATE	JOB DESCRIPTION	HOLE SIZE/ DEPTH(M.BDF)	CASING SHOE(M.BDF)	CEMENT TYPE	SACKS USED	SLURRY WEIGHT(PPG)	MIXWATER	ADDITIVES	LOSSES (BBLS)	REMARKS.
27.3 1981	8½" hole/ 9 5/8" csg. abandonment plug	-	-	Class G	472	15.9	Freshwater	0.75 gps HLX-C248 0.3 gps HR-12L	-	Plug (5) set immediately after plug (4) to cover interval 4080 - 3880 m BDF. TOC tagged at 3907 m BDF.
31.3 1981	Abandonment plug in 9 5/8" stump and 13 3/8" casing	-	-	Class G	373	15.8	Freshwater	0.03 gps HR-6L	-	Plug (6) set to cover interval 2000 - 1800 m BDF. TOC tagged at 1815 m BDF.
1.4 1981	Suspension plug in 13 3/8" casing	-	-	Class G	356	15.8	Freshwater	-	-	Plug (7) set to cover interval 1300 - 1150 m BDF. TOC tagged at 1171 m BDF.

DEVIATION DATA WELL No. 31/2-4

(MAGNETIC DECLINATION 6° W. OF TRUE NORTH)

DEPTH A.H. (M.BDF)	ANGLE (°FROM VERT.)	AZIMUTH (MAGNETIC)	AZIMUTH (TRUE)	DEPTH T.V. (M.SS)	NORTHING (M.FROM LOCN.)	EASTING (M.FROM LOCN.)	DOG LEG (°/100M)
360	0.00	-	-	335	-	-	-
378	0.00	-	-	353	0.00	0.00	0.00
407	0.00	-	-	382	0.00	0.00	0.00
435	0.00	-	-	410	0.00	0.00	0.00
450	0.50	303	297	425	0.03	-0.06	3.33
637	0.50	055	049	612	0.94	-0.17	0.44
721	0.25	315	309	696	1.29	-0.04	0.71
815	0.00	-	-	790	1.42	-0.19	0.27
908	1.00	122	116	883	1.06	0.53	1.08
1050	0.50	074	068	1025	0.75	2.22	0.54
1167	0.50	218	212	1142	0.51	2.43	0.81
1280	0.00	-	-	1255	0.09	2.16	0.44
1380	0.75	020	014	1355	0.73	2.32	0.75
1558	0.50	175	169	1533	1.10	2.75	0.69
1666	0.00	-	-	1641	0.63	2.84	0.46
1820	1.00	125	119	1795	0.02	4.02	0.65
1950	0.75	158	152	1925	-1.32	5.41	0.42
2040	1.00	183	177	2015	-2.62	5.73	0.50
2124	1.50	212	206	2099	-4.34	5.28	0.94
185	1.25	238	232	2160	-5.47	4.41	1.09
2273	1.50	230	224	2248	-6.89	2.85	0.36
2442	1.50	170	164	2417	-10.61	1.93	0.89
2573	2.75	232	226	2548	-14.44	0.14	1.86
2668	4.00	235	229	2643	-18.20	-4.00	1.33
2763	3.50	240	234	2737	-22.07	-8.85	0.63
2835	3.00	238	232	2809	-24.53	-12.11	0.71
2885	2.25	237	231	2859	-25.91	-13.91	1.50
2931	2.25	243	237	2905	-27.01	-15.36	0.51
2990	1.75	215	209	2964	-28.43	-16.77	1.83
3072	1.00	232	226	3046	-30.02	-17.89	1.03
3212	0.75	288	282	3186	-30.68	-19.67	0.61
301	0.75	240	234	3275	-30.90	-20.71	0.69
402	1.00	295	289	3376	-31.00	-22.08	0.83

Table I/1.4

PTH A.H. (M.BDF)	ANGLE (^{o}FROM VERT)	AZIMUTH (MAGNETIC)	AZIMUTH (TRUE)	DEPTH T.V. (M.SS)	NORTHING (M.FROM LOCN.)	EASTING (M.FROM LOCN.)	DOG LEG (^{o}/100M)
3516	0.75	250	244	3490	-31.00	-23.69	0.62
3639	1.00	320	314	3613	-30.61	-25.18	0.83
3730	1.00	333	327	3704	-29.39	-26.19	0.25
3812	1.50	017	011	3786	-27.74	-26.37	1.27
3904	1.00	018	012	3878	-25.77	-25.98	0.54
4021	0.75	315	309	3995	-24.29	-26.36	0.80
4049	0.75	010	004	4023	-23.99	-26.49	2.47
4179	1.00	355	349	4153	-22.03	-26.65	0.26
4280	1.50	310	304	4254	-20.43	-27.91	1.05
9	1.75	315	309	4393	-18.07	-31.07	0.21
4528	2.50	294	288	4502	-16.29	-34.62	0.98
4693	3.50	280	274	4667	-14.83	-43.07	0.75
5024	5.50	TOTCO					

Table I/1

FORMATION LEAK OFF TEST DATA WELL No. 31/2-4

No.	DATE	CASING		HOLE		MUD Wt. IN USE		MAX EQUIVALENT MUD Wt.		REMARKS.
		SIZE (")	DEPTH(m)	SIZE (")	DEPTH(m)	S.G.	PSI/1000 FT	S.G.	PSI/1000 FT	
1	8.10.80	20	807	17½	818	1.28	554	1.71	740	-
2	25.10.80	16	1272	12 1/4	1285	1.32	572	1.51	654	-
3	27.10.80	16	1272	12 1/4	1290	1.32	572	1.71	740	After cement squeeze at 16" casing shoe.
4	22.12.80	13 3/8	1927	12 1/4	1950	1.32	572	1.72	745	Limit test to 1.72 S.G. equivalent mud weight. No leak off observed.
5	22.2.81	9 5/8"	3983	8½	4034	1.23	533	1.80	781	Limit test to 1.80 S.G. equivalent mud weight. No leak off observed.

Table I/1.5

TIME ALLOCATION 31/2-4

Started well at 1650 hrs, 28.8.80. Spudded well at 2330 hrs, 01.09.80, and suspended well at 1230 hrs, 10.9.80. Resumed well after the rig was farmed out to Statoil at 2300 hrs, 6.10.80 and suspended well at 2030 hrs, 6.4.81.

PHASE/ITEM	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	TOT HOURS	%
Preparation											
- towing	21									21.0	0.4
- laying/pulling anchors	29									29.0	0.6
- preparation TGB/PGB		23.5	4.5							28.0	0.6
- preparing for move											
- WOW			7							7.0	0.1
Drilling											
- bit on bottom		36	43.5	27.5	57.5	351.5	131.5	249.5		897.0	19.2
- round tripping	2	31.5	121.5	75.5	193	205.5	178	187.5		994.5	21.3
- reaming/enlarging		17.5	91.5	53	163.5	22	12.5	8.5		368.5	7.9
- circulation/cond. mud		6.5	36	1.5	10.5	14	9	5		82.5	1.8
- condition hole for casing		4	5				5.5			14.5	0.3
- running csg./ drilling out cement leak off tests etc.		39	92.5		37		56			224.5	4.8
- cementing/WOC		10.5	11.5		17		3.5			42.5	0.9
- running/pulling riser/ and/or BOP's		27	5.5		5.5					38.0	0.8
- testing BOP's etc.		16	27	17.5	30.5	23	10.5	10		134.5	2.9
- repairs	27	1	7.5	28	151.5	44.5	31	23.5	11	325.0	7.0
- surveys		5	2.5	4	1	15.5	2.5	2		32.5	0.7
- fishing + milling			15		15	19	155.5	25		229.5	4.9
- WOW			18.5	17.5	23.5	42.5	11.5			113.5	2.4
- miscellaneous				8.5		1	2	3		14.5	0.3
Evaluation											
- coring on bottom			26.5	177				4		207.5	4.4
- tripping with core barrel			41.5	157				18		216.5	4.6
- condition hole for coring			4.5	13.5				3.5		21.5	0.5
- recovery of core			7.5	32.5						40.0	0.9
- opening cored hole			3	37						40.0	0.9
- condition hole for logging		1.5	2.5	6.5	6.5			18		35.0	0.7
- logging		9.5	22.5	63.5	26		61.5	63		246.0	5.3
- circulating for samples			4		6	5.5	1.5	7		24.0	0.5
Abandonment											
- plugging back/ WOC/testing								54.5	12	66.5	1.4
- cut/pull csg.								43.5		43.5	0.9
Suspension											
- plugging back/WOC testing									12	12.0	0.3
- laying down string								10.5	3	13.5	0.3
- pulling riser and BOP's/inst. corr. cap/cut guidelines, inst. guidelines									64	64.0	1.4
- pulling anchors									28.5	28.5	0.6
- WOW								7		7.0	0.2
- Miscellaneous									10	10.0	0.2
TOTAL HOURS										4672.0	100.0

Miscellaneous includes:-

- Function tested Navidrill 3 hours
- Tested 13 3/8" centralizers inside 16" casing 5,5 hours in Nov.
- Working on RTTS packer in Jan.
- Tested standpipe, surface equipment for leaks in Feb.
- April: 10 hrs repairs on Mantis submarine, 11 hrs repair on slipjoint, lockdogs Rucker ring.

Table I/1.6

2. MUD REPORT

See special report from Anchor Drilling Fluid A/S.

3. RIG MOVE AND ANCHORING

REPORT ON RIG MOVE OF THE BORGNY DOLPHIN FROM TANANGER TO BLOCK 31/2-D

The move went very smoothly, after some initial delays waiting for weather and stability tests.

All Survey equipment performed well and the task was completed within 30 hours of arriving on location.

Sequence of events:

Monday, 18th August - Sunday 24th August 1980

Waiting on weather at Tananger Base.

Monday, 25th August - Thursday 28th August 1980

1650 hours, carrying out stability test in Fjords area near Stavanger.

Thursday 28th August at 1337 hours

On tow to location.

Friday 29th August at 1337 hours

6 miles off location and approaching for anchor drop number 5.
2201 hours, complete running anchors and soak period.

Saturday 30th August at 0800 hours

Commenced test-tensioning of anchors.

1100 hours complete test and commenced deballasting.

1900 hours gave go-ahead to spud after mean of 7 SATnav 2 D passes showed rig approximately 25 metres from location.

Pulse 8 shows rig approximately 8 metres from location-

Commenced satellite 3D passes.

Sunday 31st August at 0800 hours

Initial 3D passes confirm rig location.

0940 hours Shell Surveyor and Towmaster depart rig by Helicopter to Bergen, together with Pulse 8 equipment and Decca Engineer.

UDI REPORT ON THE MOVE BY SATELLITE NAVIGATION PULSE 8 OF THE DRILLING RIG "BORGNY DOLPHIN"

General Remarks

Two UDI personnel and one Decca Engineer were mobilised on Monday, 18th August. After making contact with the Norske Shell office at Tananger, the equipment was installed and checked by 2030 the same day.

Due to the completion of repairs and then the awaiting of acceptable weather conditions, the rig did not leave Tananger Base until 0300 on 25th August to carry out ballasting tests in Stavanger Fjord.

When the tests were completed on Thursday, 28th August the rig departed from Stavanger to its new intended location at 31/2-D.

After leaving at 1600 on 28th August, the initial course of 322 degrees and for a distance of 140 miles, was covered by 1444 on 29th August when the drop anchor (Anchor No. 5) was lowered.

The rig was over the location by 1508 when the sequence of running seven remaining anchors commenced. At 0115 on 30th August all the anchors were laid and a six hour period was required to allow them to "soak".

During this period five satellite passes were recorded and plotted together with the Decca Pulse 8 position to analyse the offsets required for the rig to be positioned over the required location.

At 0800 tensioning of the anchors commenced and was completed at 0905 on 30 th August. During the tensioning the rig was positioned 14 metres from the required location, which was acceptably within the 75 metre tolerance.

After de-ballasting the rig, collection of the required 30 x 3-D passes commenced. After five, the position computed was 20 metres on a bearing of 280 degrees, which was acceptable, and the Decca Pulse 8 equipment, plus Engineer and Shell Survey Representative, departed from the rig at 0945 on 31 August 1980.

During the following two days the collection of satellites continued, and at 0530 on 2nd September the 40th was recorded.

This positioned the derrick at:-

Lat 60° 51' 23."57 N. Lon 03° 30' 44."33 E.

This placed the rig at a distance of 18.9 metres on a bearing of 279.7 degrees fromthe required location.

All survey aid equipment departed from "Borgny Dolphin" at 1940 on 2nd September, arriving Bergen 2020. The UDI personnel and equipment arrived in Aberdeen at 1900 on 3rd September 1980.

HYDROGRAPHIC SURVEYOR : A. Parker

ELECTRONICS ENGINEER : R. Barron

DECCA ENGINEER : R. Rae

"BORGNY DOLPHIN"

SEQUENCE OF EVENTS

DATE	TIME	EVENT
18.08.80	13.57	Personnel and equipment depart Aberdeen Airport.
	15.42	Arrive Stavanger.
	1600	Arrive Norske Shell, Tananger.
	1705	Arrive on "Borgny Dolphin".
	1810	Equipment arrives on rig. Set up and check equipment.
	2030	All UDI/Decca equipment operational.
19.08.80	AM/PM	Awaiting repairs.
20.08.80	AM/PM	Awaiting repairs.
21.08.80	AM/PM	Awaiting weather.
22.08.80	AM/PM	Awaiting weather.
23.08.80	AM/PM	Awaiting weather.
24.08.80	AM/PM	Awaiting weather.
25.08.80	0300	Commence preparations for moving rig from Tananger Harbour.
	1030	Clear of quay.
	1500	Arrive Stavanger Fjord for tests.
26.08.80	AM/PM	Carry out tests.
27.08.80	AM/PM	Carry out tests.
28.08.80	1600	Depart Fjord to new location 31/2-D.
29.08.80	1237	10 nautical miles from location.
	1444	Drop anchor No.5.
	1445	Anchor No. 5 on bottom.
	1508	On location.
	1520	Buoy No. 5 in water.
	1525	Anchor 1 pennant passed.
	1627	Anchor 1 on bottom.
	1720	Pennant No. 8 passed.
	1805	Buoy No. 1 in water.
	1830	Anchor No. 8 on bottom.

	1841	Pennant No. 4 passed.
29.08.80	1908	Anchor No. 8 buoy in water.
	1954	No.2 pennant passed.
	2010	No.7 pennant passed.
		Anchor No.4 on bottom.
	2047	Buoy No. 4 in water.
	2055	Anchor No. 7 on bottom.
	2100	Anchor No. 2 on bottom.
	2140	No 7 buoy in water.
	2201	No. 2 buoy in water.
	2343	No. 6 pennant passed.
	2345	No. 3 pennant passed.
30.08.80	0000	Anchor No. 6 on bottom.
	0032	Buoy No. 6 in water.
	0045	Anchor No. 3 on bottom.
	0015	Buoy No. 3 in water.
	0800	Commence tensioning anchors.
	0905	Completed tensioning.
	0915	Pulling in anchor No. 1.
	0924	Anchor 1 on bottom.
	0930	Re-tension anchors.
	1050	Commence de-ballasting.
	1200	Start collection of satellite passes.
	1940	Rig down to drilling draft.
		Re-commence collection.
	2010	Interference from existing aerials onboard.
		Sattellite passes interrupted.
	2345	Re-site satellite antenna.
		New offset and initialisation.
31.08.80	0045	Collection of satellite passes commenced.
01.09.80	AM/PM	Collection of satellites.
02.09.80	0530	40th satellite passes.
	1940	Depart "Borgny Dolphin".
	2020	Arrive Bergen.
03.09.80	1745	Depart Bergen.
	1900	Arrive Aberdeen.
		Off hire.

FINAL POSITION OF "BORGNY DOLPHIN"

BLOCK 31/2-D

LAT 60° 51' 23."57 NORTH

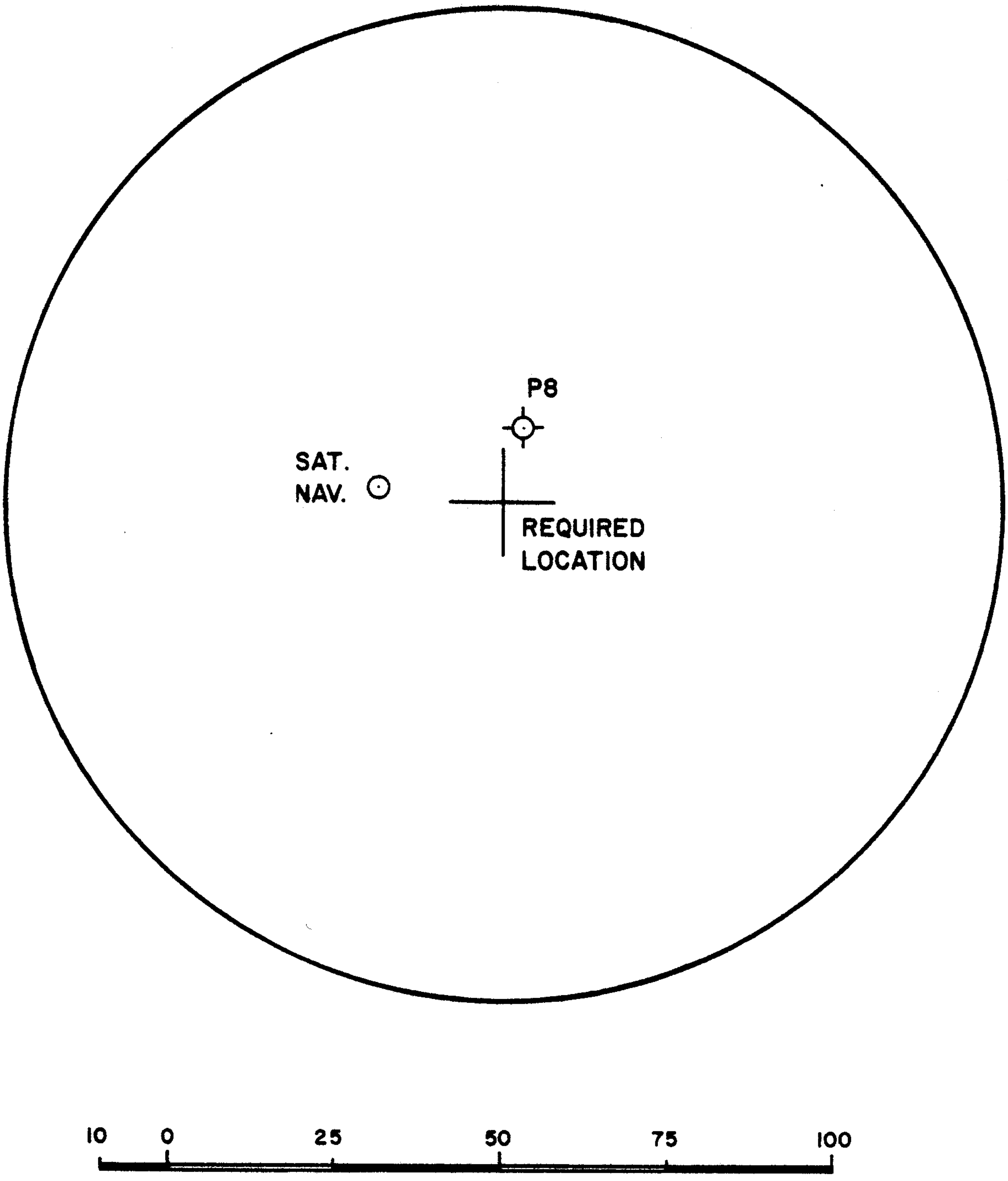
LON 03° 30' 44."33 EAST

THIS IS IN TERMS OF E.D. 50 INTERNATIONAL SPHEROID BASED ON TRANSFORMATION CONSTANTS AND COVERSION PARAMETERS USED ON THE ACCOMPANYING SYSTEM COMPARISON FORM INCLUDED WITH THIS REPORT.

REQUIRED LOCATION:-

LAT 60° 51' 23."5 NORTH
LON 03° 30' 45."6 EAST

THIS PLACES THE RIG AT A DISTANCE OF 18.9 METRES ON A BEARING OF 279.7° FROM THE REQUIRED LOCATION.



SCALE 1 : 1000

a·s Norske Shell
EXPLORATION & PRODUCTION FORUS

31/2 -4 WELL RESUMÉ
FINAL POSITION OF
"BORGNY DOLPHIN"

AUTHOR EPPP/21
DATE JUNE 1982
REPORT NO NSEP 149
DRAW NO G 1096/8

PULSE 8/SAT NAV COMPARISON

LOCATION: 31/2-D NORWAY **RIG** BORGNY DOLPHIN

FINAL PULSE 8 CO-ORDS ANTENNA (ED 50)	LAT 60° 51' 24.79"N LONG 03° 30' 44.63"E/W
FINAL SAT NAV CO-ORDS ANTENNA (ED 50)	LAT 60° 51' 25.14"N LONG 03° 30' 44.69"E/W
FINAL PULSE 8 CO-ORDS DERRICK (ED 50)	LAT 60° 51' 23.86"N LONG 03° 30' 45.77"E/W
FINAL SAT NAV CO-ORDS DERRICK (EE 50)	LAT 60° 51' 23.57"N LONG 03° 30' 44.33"E/W

PULSE 8 PATTERNS USED:	PATT 1: 1-2	PATT 2: 1-3	PATT 3: 1-4
PULSE 8 C-O's USED:	PATT 1: -0.08	PATT 2: +0.05	PATT 3: +0.16
FINAL PUSE 8 READINGS:	PATT 1: 11951.12	PATT 2: 23006.57	PATT 3: 34490.77

PULSE 8 ANGULAR OFFSET:	+9.22°	FROM RIG'S HEAD
PULSE 8 DISTANCE OFFSET:	33.27	M FROM DERRICK CENTRE TO ANTENNA
SAT NAV ANGULAR OFFSET:	+45.37°	FROM RIG'S HEAD
SAT NAV DISTANCE OFFSET:	48.84	M FROM DERRICK CENTRE TO ANTENNA
FINAL RIG'S HEADING:	321	DEGREES TRUE

DIFF IN METRES PULSE 8/SAT NAV (DERRICK): 8.7 N 21.88 E

HT ANTENNA PULSE 8:	20.7	M ABOVE MEAN SEA LEVEL
HT ANTENNA SAT NAV:	20.7	M ABOVE MEAN SEA LEVEL
PULSE 8 MODEL USED:	MR II	1048.

RIG AND PLATFORM POSITIONAL DATA FOR COMPARISON OF POSITIONAL VARIATION BETWEEN SATELLITE AND LAND BASED RADIO SYSTEM FIXES

RIG: BORGNY DOPHIN SITED IN BLOCK: 31/2-D Norway OPERATOR: SHELL

SATELLITE DERIVED POSITION

FINAL FIX:

LATITUDE: 60° 51' 23.57" North LONGITUDE: 03° 30' 44.33" East

HEIGT OF AERIAL ABOVE MEAN SEA LEVEL: 20.7 metres

HEIGHT OF AERIAL ABOVE SPHEROID: 50.5 metres BY 3-D FIX

POINT ON STRUCTURE FIXES: Centre of Derrick

OFFSET TO POINT FIXED BY RADIO SYSTEM: 45.37 M AT 150.22° TRUE

DATES AND TIMES OF OBSERVATIONS: 31 August 1980 - 2nd September 1980

FIXING METHOD: 3-D GEOID MAP USED: UDI

NO. OF 2-D PASSESS RECORDED -

NO. OF 3-D FIXES EVALUATED 40

PASS ALTITUDE RESTRICTION ON OTHER MANUAL DATA EDITING APPLIED:

DATUM SHIFTS APPLIED FROM W.G.S. 72 DATUM TO E.D. 50 DATUM

X: +84 Y: +103 Z: +127

SPHEROIDAL PARAMETERS USED FOR SATELLITE DATUM: a = 6378135 $\frac{1}{f}$ 298.26

SPHERODIDAL PARAMETERS USED FOR FINAL FIX DATUM: a = 6378388 $\frac{1}{f}$ 297.00

FINAL SPREAD OF 3-D FIXES: LAT. ± 3.5 m APPROX. LONG ± 3.5 m APPROX

SURVEY CONTRACTOR: UDI EQUIPMENT USED: Magnavox

4. SITE SURVEY 31/2-4

Survey vessel M/V "Bømmeløy".

A/S Geoteam was commissioned by A/S Norske Shell Exploration and Production to perform a geophysical and bathymetric site survey in Block 31/2.

The survey programme was an extension to a site survey performed in May 1979.

The coordinates for Well 31/2-4:

Latitude	60° 51' 23.57" N
Longitude	03° 30' 44.33" E

The field work started 3 January 1980 but was temporarily stopped after one hour due to extremely bad weather conditions and due to problems with the vessel. The work was resumed on 6 January 1980 and completed 9 January.

Analog Profiling: echo sounder, side scan sonar and sparker, deep tow boomer.

For this location 9 lines - dir 135°/315° - with a spacing of 170 metres were to be run to the south-west of the area earlier covered and 8 lines - dir 45°/225° - with the same spacing to the north-west of the area covered before. In addition 5 cross lines were recorded.

The profile lines were run according to the programme with the exception that the cross lines were not run with side scan sonar. The data from the Deep Tow Boomer showed to be deteriorated by noise and the analog sparker was therefore utilised on all profiles since it gave a rather good data quality.

Digital profiling: high energy sparker.

Within the inner area 13 lines were to be run in a direction of $45^0/315^0$ and 3 cross lines in a direction $135^0/315^0$, utilising high energy sparker with multichannel recording.

Three soil samples - penetration 6 metres - were taken in the area covered with analog profiling equipment.

5. GEOLOGICAL SAMPLES

Ditch Cuttings

Cutting samples were collected every 10 m from 450 m to 1170 m. In the interval 1170 m to 5035 m (TD) samples were taken every 3 m.

The cuttings were described by Geoservices geologists supervised by the Shell wellsite geologists.

Descriptions of the cuttings are represented in the Geoservice Master Log and in the Wellsite geologist's cutting log.

Cores

For making a detailed evaluation of the reservoir it was decided to cut diamond bit cores over the entire hydrocarbon bearing Middle/Upper Jurassic interval.

To get information about the cap rock and the interface between cap and reservoir rock, coring was commenced in Paleocene claystone at 1320 m. Altogether 28 cores were cut before coring terminated below the oil/water contact at 1663 m. However the interval 1334 - 1338 m was drilled with a normal bit and junk basket/junk sub. Thus a total of 339 m of cores were cut and 281 m or 83% of cores were recovered.

In order to avoid the cored unconsolidated sand in the upper part of the reservoir from falling apart, this interval was cored with a fibre glass sleeve inner core barrel.

For details see core description sheets and Geoservice Master Log/Cuttings Log.

Core	no	1	1320	-	1326	m	recovery	96	%
"	"	2	1326	-	1334	m	"	5	%
"	"	3	1338	-	1347	m	"	100	%
"	"	4	1347	-	1365	m	"	56	%
"	"	5	1365	-	1379	m	"	93	%
"	"	6	1379	-	1397	m	"	100	%
"	"	7	1397	-	1410	m	"	100	%
"	"	8	1410	-	1415.5	m	"	91	%
"	"	9	1415.5	-	1426.6	m	"	86	%
"	"	10	1426.6	-	1443.5	m	"	1	%
"	"	11	1443.5	-	1452.5	m	"	100	%
"	"	12	1452.5	-	1454.5	m	"	90	%
"	"	13	1454.5	-	1472.5	m	"	68	%
"	"	14	1472.5	-	1482.5	m	"	70	%
"	"	15	1482.5	-	1484.5	m	"	33	%
"	"	16	1484.5	-	1490	m	"	100	%
"	"	17	1490	-	1508	m	"	91	%
"	"	18	1508	-	1526	m	"	92	%
"	"	19	1526	-	1544	m	"	96	%
"	"	20	1544	-	1562	m	"	100	%
"	"	21	1562	-	1567	m	"	97	%
"	"	22	1567	-	1585	m	"	87	%
"	"	23	1585	-	1603	m	"	79	%
"	"	24	1603	-	1607	m	"	89	%
"	"	25	1607	-	1621	m	"	100	%
"	"	26	1621	-	1627	m	"	85	%
"	"	27	1627	-	1645	m	"	97	%
"	"	28	1645	-	1663	m	"	99	%

Core nos. 3-21 were taken with fibre glass sleeve inner core barrel. The rest were taken with a coventional core barrel.

The low recovery percent in core no. 10 is due to failed "Navidrill" downhole turbine experiment.

At TD one core was taken with a conventional core barrel.

Core no. 29 5025 - 5035 m recovery 84%

Sidewall Cores (CST)

During 4 logging runs a total of 240 shots were attempted. 170 samples were recovered.

Description of samples is enclosed in Enclosure 2.

SUMMARY OF LITHOLOGY

(A more detailed description is presented in chapter II/2 Stratigraphy).

448	-	1203 m	Claystones, silty and sandy with minor sandstone beds. Trace lignite. Calcareous bands towards base.
1203	-	1234 m	Claystones, silty, tuffaceous.
1234	-	1356.5 m	Claystones, slightly silty.
1356.5	-	1364.5 m	Marl grading to echinoderm spine wackestone with pieces of chalk.
1364.5	-	1460 m	Sandstones, fine to coarse grained, calcite cemented bands.
1460	-	1520 m	Sandstones, very fine to fine grained, grading to siltstones. Calcareously cemented stringers.
1520	-	1652 m	Fine-grained, micaceous, sandstones interlayered with fine to coarse sandstones.
1652	-	1667 m	Fine, medium and coarse grained sandstones.
1667	-	1784 m	Very fine grained micaceous sandstones and siltstones. Calcareously cemented stringers.
1784	-	1901.5 m	Fine to coarse sandstones, some siltstones, shales and claystones. Coal beds. Calcareous bands.

1901.5	-	2007.5 m	Claystones/siltstones with minor sandstones. Calcareous stringers.
2007.5	-	2107 m	Claystones and sandstones interbedded. Calcareously cemented bands.
2107	-	2125.5 m	Claystones.
2125.5	-	2241 m	Sandstones, fine to coarse. Calcareously cemented bands.
2241	-	2256 m	Claystones.
2256	-	2393.5 m	Sandstones, fine to coarse with some grey to reddish claystones. Trace coal. Calcite cemented bands.
2393.5	-	3345 m	Claystones/siltstones interbedded with sandstones. Claystones dominates towards base.
3345	-	5035 m(TD)	Predominantly sandstones. Several claystone and siltstone beds do, however, occur.

6. HYDROCARBON INDICATIONS FROM SAMPLES

Tertiary

In the interval 990 - 1365.5 m (drillers depth) a spotty gold direct fluorescence together with a milky white - yellow cut fluorescence occasionally occurred in cuttings, SWS or cores.

Traces of gas are also recorded.

Upper/Middle Jurassic

Hydrocarbons were encountered in samples of Jurassic sandstone.

Gas shows:	1365.5 - 1567 m
Oil shows:	1564 - 1690 m (partly discontinuous)
Good oil shows:	1567 - 1580 m

During coring operations a relatively high mud weight was used (1.33 kg/l). In addition the gas often was not circulated out completely. Accordingly rather modest gas shows were encountered. The highest reading (at 1545m) in the gas bearing zone showed:

1.9% C_1
0.34% C_2

On recovery of the core from the gas zone a strong gassy smell was apparent on the drill floor and a weak milky white cut fluorescence was observed. Direct fluorescence was pale yellow or absent. Cut dicolouration was not noted.

At 1564 m a patchy pale yellow direct fluorescence accompanied by a weak milky white cut fluorescence appeared and at 1566 m a weak yellowish cut was recorded in addition.

With an exception for the doggers a uniform yellow direct fluorescence accompanied by a streaming, moderately strong, yellowish brown cut discolouration and a moderate, milky white, streaming cut fluorescence occurred between 1567 and 1580 m. Oil bleeds and irridiscence were also observed.

Further down the intensity of shows decreased to a patchy or spotty pale yellow direct fluorescence together with none or very light yellow cut discolouration.

In the interval 1627 to 1644 m, however, the intensity of fluorescence increased to patchy - uniform pale - bright yellow with a cut discolouration of light yellow - yellowish brown.

Below 1644 m the cores revealed no oil shows.

The cutting from the interval 1665 to 1690 m gave traces of yellow sample fluorescence and a weak yellow crush cut.

Below 1690 m no oil shows were encountered. However traces of gas prevails.

Lower Jurassic/Triassic

Traces of gas appear down to 2236 m and in the intervals 2367 - 2375 m, 2423 - 2442 m and at 2764 m.

7. PETROPHYSICAL REPORT

General

A petrophysical evaluation has been made from the top of the Jurassic sands at 1364.5 m downwards. The interpretation is based on a suite of Schlumberger logs, a complete listing of which is presented in table I/7.1.

The Jurassic sands are interpreted to be gasbearing from 1364.5 m to ca. 1568 m and oilbearing down to ca. 1580 m; below this depth no moveable hydrocarbons are encountered, although less clean sands still may contain some residual saturation.

The presence and extent of the gas column is apparent both from the logs (negative separation between FDC and CNL logs in clean sands) and from a graph of RFT-pressures versus depth (see: reservoir engineering section); down to 1556 m it is confirmed by a RFT gas sample. However, the accurate pick of the GOC is hampered severely by the lithology effect on the logs, placing the GOC somewhere between 1567 and 1573 m, the most likely place from logs being 1568m.

The oil water contact at ca. 1580 m is best visible from the difference in resistivity above and below this depth; since it does not occur in a clean sand and also a tight stringer is present, influencing the resistivity profile, the contact is not as well defined as in other wells like 31/2-2 and 31/2-5.

Due to the relative small difference in density between oil and water the inaccuracy of the RFT-tool and the limited extent of the oil column a graph of RFT-pressures versus depth does not conlusively show the oil-water contact and also no RFT-sample has been taken to confirm presence of oil.

Results of the evaluations are presented as a depth plot of porosities and hydrocarbon saturations on the Log and Core Compilation Sheet.

Overview of Schlumberger logging operations on well 31/2-4

Casing depth	Drilling depth	Bit size	Operation	Log run	Interval (m)	Date
450	815	17½	ISF/BHC/GR/SP	1	450-818	6/9/80
"	"		FDC/CNL/GR/CAL	1	450-818	6/9/80
807	1280	17½	ISF/BHC/GR/SP	2	807-1269	12/10/80
"	"	17½	FDC/CNL/GR/CAL	2	807-1270	13/10/80
"	"	22	BGT	1	807-1274	16/10/80
		17½	CST			
1271	1950	12-1/4	ISF/BHC/GR/SP	3	1271-1938	24/11/80
"	"		FDC/CNL/GR/CAL	3	1271-1938	"
"	"		DLL/MSFL/GR	1	1271-1936	"
"	"		LDT	1,1A	1271-1936	"
"	"		NGT	1	1350-1635	"
"	"		LSS	1	1271-1940	25/11/80
"	"		HDT	1	1271-1934	"
"	"		HDT-2	1	1271-1934	"
"	"		RFT	1		26/11/80
"	"		CST			"
"	"		BGT	2-5		5-14/12/80
1920			CBL/VDL	1	352-1913	17/12/80
1926	3991	12-1/4	ISF/BHC/GR/SP	4	1926-3988	12/2/80
"	"		FDC/CNL/GR/CAL	4	1926-3990	"
"	"		HDT	2	1926-3990	13/2/80
"	"		RFT	2		"
"	"		CST			16/2/81
3983			CBL/VDL	2	1800-3985	25/3/81
3985	5034	8½	ISF/BHC/GR/SP	5	3985-5031	23/3/81
"	"		FDC/CNL/GR/CAL	5	3985-5032	"
"	"		HDT	3	3985-5032	"
"	"		RFT	3		24/3/81
"	"		CST			25/3/81
"	"		CIS			"
"	"		GR	6		26/3/81

Table I/7.1

List Of Abbreviations

BGT	Borehole Geometry Tool
BHC	Borehole Compensated Sonic
CAL	Caliper
CBL	Cement Bond Log
CIS	Customer Instrument Service
CNL	Compensated Neutron Log
CST	Chronological Sample Taker
DLL	Duall Laterolog
FDC	Formation Density Compensated
GR	Gamma Ray
HDT	High Resolution Dipmeter Tool
HDT-2	High Resolution Dipmeter Tool (experimental)
ISF	Induction Spherically Focused
LDT	Litho Density Log
LSS	Long Spacing Sonic
MSFL	Micro Spherically Focused Log
NGL	Natural Gammaray Spectroscopy Log
RFT	Repeat Formation Tester

SP	Spontaneous Potential
VDL	Variable Density Log

8. WIRELINE FORMATION TESTS

Objectives

Between the top of the reservoir at 1364.5 m BDF and the final depth of 5035 m BDF three runs were made with the Schlumberger Repeat Formation Tester (RFT) at different stages during the drilling of the well. The objectives of these surveys were:

1. Confirm formation fluid pressures and pressure gradients obtained from RFT's in previous wells in block 31/2.

2. Assist in determining fluid contacts.

3. Obtain preliminary fluid samples.

4. Determine the vertical extent of the aquifer below the hydrocarbon bearing reservoir.

Summary

The first RFT run covering the hydrocarbon bearing interval and the upper 265 metres of underlying aquifer established gas and water gradients of 0.058 and 0.45 psi/ft respectively (see Fig. I/8.1). An oil gradient could not be indentified from the RFT pressures. It was not possible to accurately define the GOC because of lithological effects on the electrical logs, but the depths of 1572 m BDF is consistent with interpretations in other wells. The OWC was picked from logs at 1580 m BDF. The gas gradient line confirms the reservoir pressure of about 2280 psig at GOC.

The two other RFT runs, covering the interval down to 4969 m BDF indicate a change in pressure regime between 2713 and 3262 m BDF. This is identified by a shift of some 100 psi in reservoir pressure and a higher water gradient (0.46 psi/ft). (See Fig. I/8.2). This shift represents the downward extent of the aquifer beneath the reservoir.

The two observed water gradient lines intersect close to seabottom suggesting two hydrostatic pressure regimes.

Operational Aspects

As in previous wells in block 31/2 cuttings and recovered cores from 31/2-4 had suggested the existence of an oil layer between the gas and water bearing parts of the reservoir. Subsequent electic logs indicated a gas/oil contact somewhere between 1567 and 1573 m BDF. A tight calcareous zone at this interval makes it impossible to accurately determine the GOC. However, the latter depth, 1572m BDF (1547 m s.s.), is consistent with observations in other wells. The oil/water contact was determined at 1580 m BDF which gives an 8 metre oil column.

Since 31/2-4 was a socalled "deep test" drilled to a total depth of 5035 m BDF, information from the formations below the main reservoir could be obtained. Although electric logs had indicated these to be water bearing, the RFT was used to establish the general pressure regime and pressure barriers.

The first RFT run was made prior to setting the 13-3/8" casing (shoe at 1927 m BDF). It covered the hydrocarbon bearing reservoir and the upper part of the aquifer below. Twenty pressure readings were taken going down the hole from 1396.5 to 1845.5 m BDF (see Fig. I/8.1). The eight upper readings indicate a reasonable gas gradient of 0.058 psi/ft down to 1568.5m BDF. The gas gradient line indicate a reservoir pressure of 2278 psig at the GOC (1572 m BDF) which is consistent with the value of 2280 psig suggested by RFT's and build-ups in other wells in 31/2. On the way out of the hole the hole a preliminary gas sample was taken at 1566 m BDF. All pressure point below 1568.5 m BDF seem to fall on the water gradient line (0.45 psi/ft). There is no indication from the pressures of an oil gradient between the gas and water. However, with limited data available in the transition between the gas and water lines, the existence of an 8 metre oil gradient cannot be excluded.

The second RFT run was made prior to setting the 9-5/8" casing (shoe at 3983 m BDF) and covered the interval from 2142 to 3585.5 m BDF with 9 fluid pressure readings. The upper 6 pressure values extended the water gradient from the first run (0.45 psi/ft) down to 2713 m BDF (see Fig. I/8.2). The three remaining pressures (3262, 3402 and 3585.5 m BDF) belong to a different gradient line. A shift of some 100 psi occurs between 2713 and 3262 m BDF which might be explained by a change in lithology around 3226 m BDF.

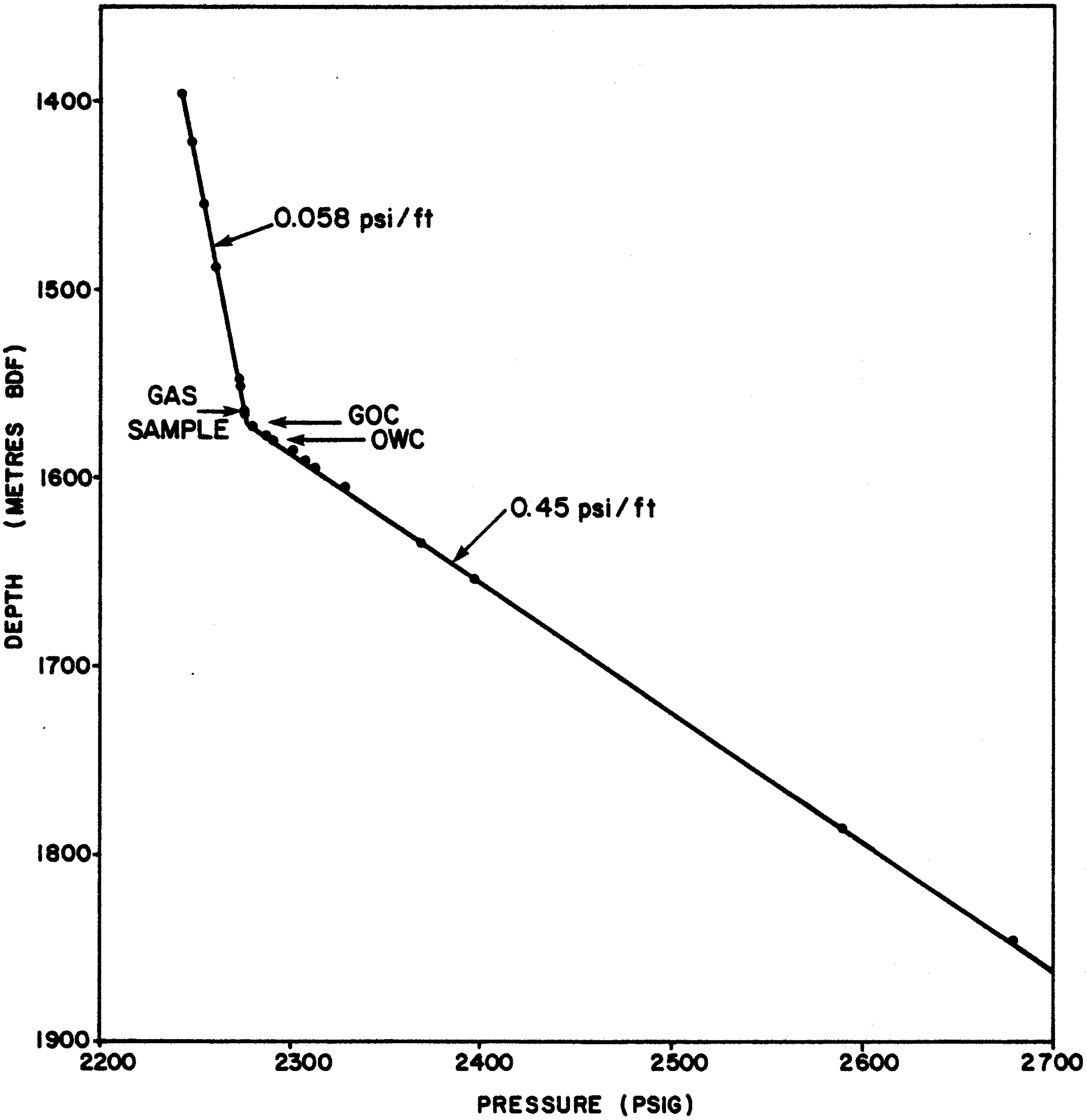
In the third and last RFT run three more pressures were obtained over the interval 4303 to 4969 m BDF. These three points together with the three last readings from run 2 define a second gradient line of 0.46 psi/ft suggesting a more saline water than that of the aquifer immediately below the hydrocarbon reservoir. (see Fig. I/8.2).

It is interesting to note that the two water gradient lines intersect close to a seabottom at a pressure equivalent to seabottom pressure. This suggests that both pressure required are virtually hydrostatic.

31/2-4

RFT PRESSURES vs DEPTH

RFT RUN I



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31/2-4
EXPLORATION WELL RESUMÉ
PRESSURES RFT RUN I

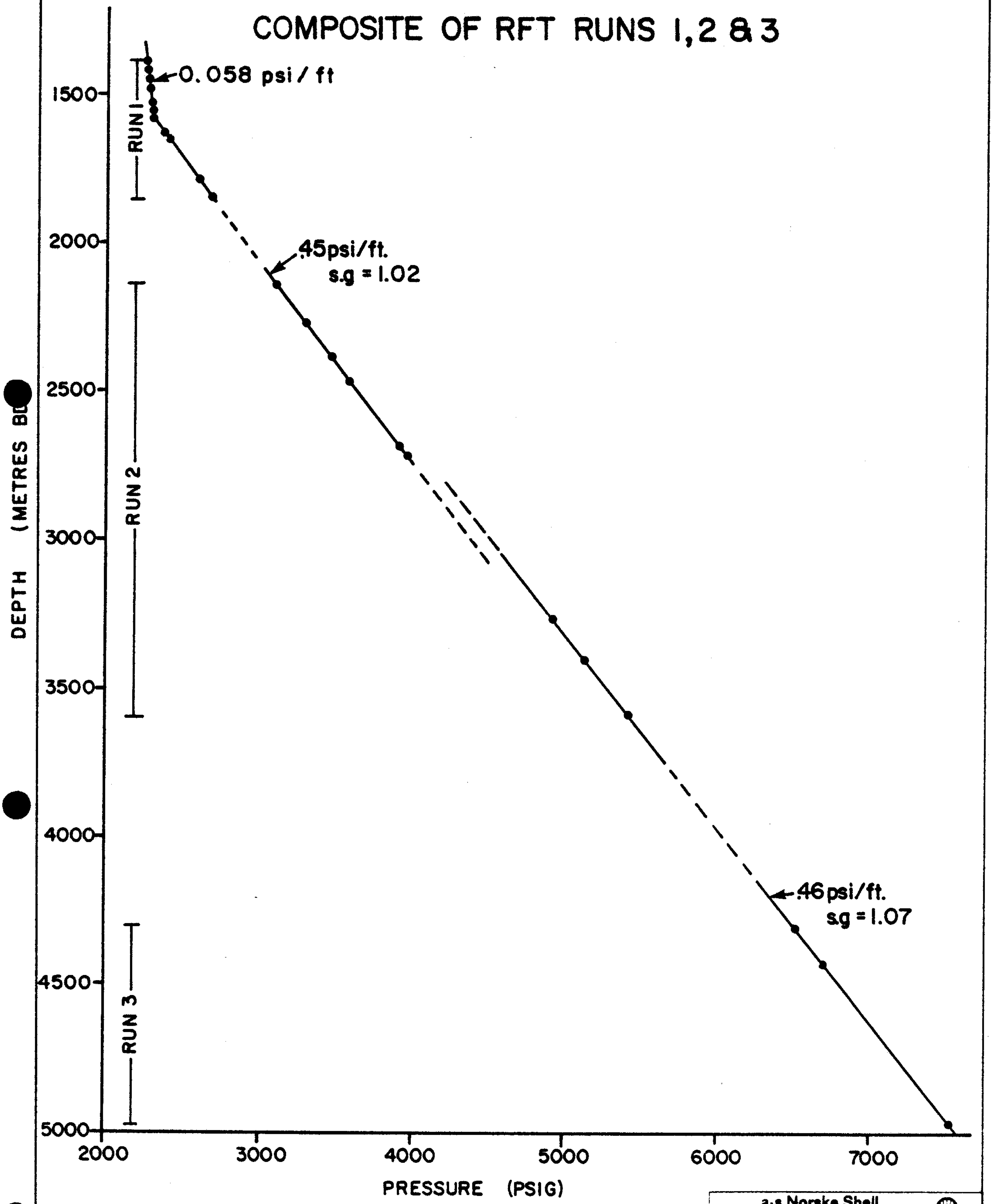
AUTHOR EPPP/22
REPORT NO. NSEP149
FIG. I/8.1
DATE FEB. '82
DRAW. NO. G.1096/5

25·2·82 C.

31/2-4

RFT PRESSURES vs DEPTH

COMPOSITE OF RFT RUNS 1,2 & 3



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31/2-4

EXPLORATION WELL RESUME

PRESSURES RFT RUN 1,2 & 3

AUTHOR EPPP/22	FIG.	DATE MAY 1982	
REPORT NO NSEP 149	I/82	DRAW NO G.1096/6	

PART II

GEOLOGICAL REPORT

1. INTRODUCTION

The well 31/2-4 is located some 10 km NNW of the discovery well 31/2-1 in a separate fault compartment near the crest of the Jurassic gas accumulation (Fig. II/1). This crestal area appears also to coincide with the culminations of all deeper horizons that can be mapped.

TD of the well was proposed to be 5000 m below sea level or in Paleozoic formations whatever came first. This would satisfy the concession commitment of a deep test in block 31/2.

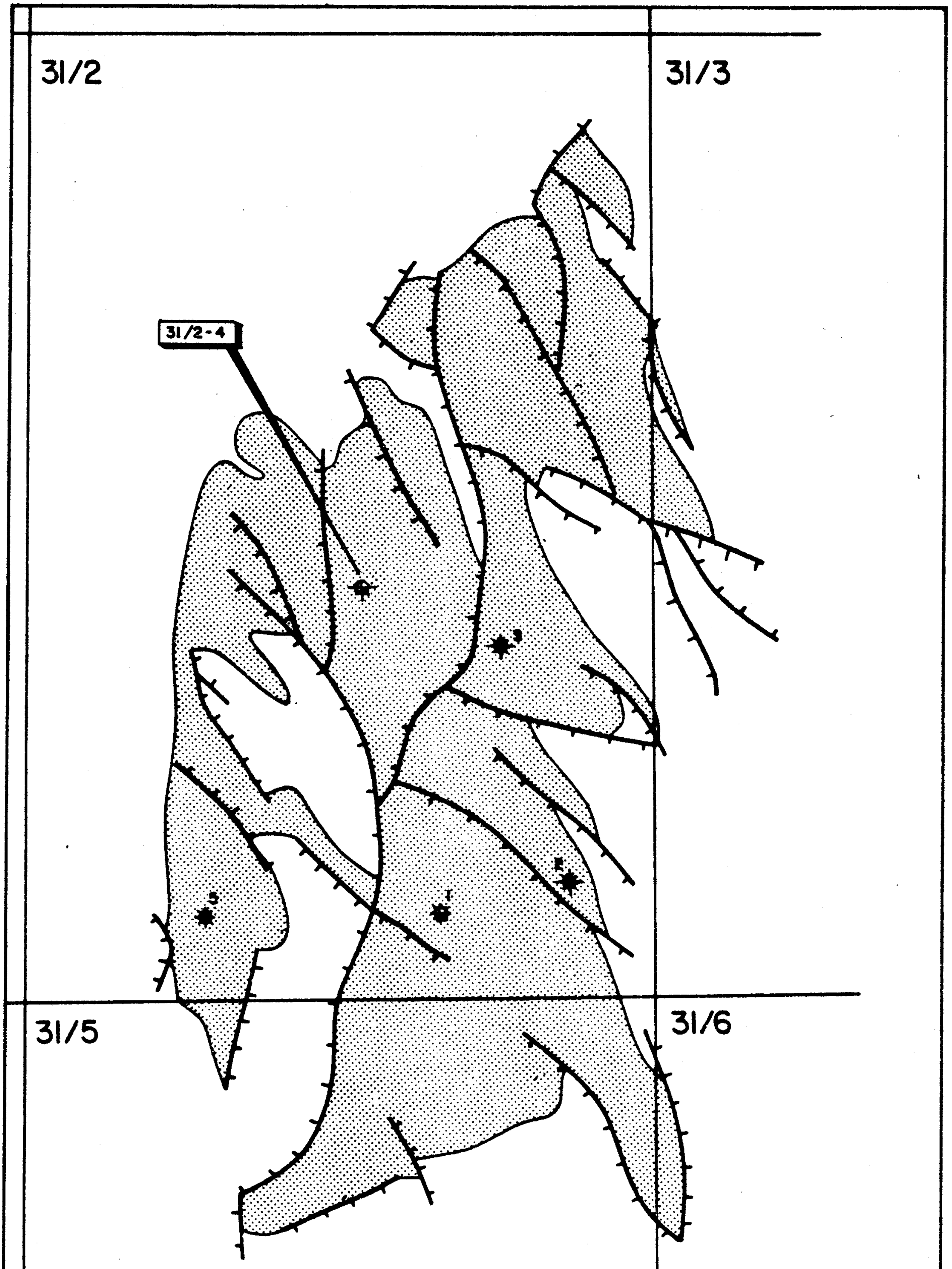
The objectives of the well were two-fold:

a) The Paleozoic or Early Triassic formations

- to test the possible presence of hydrocarbons in the structurally highest fault block of a deep structure in block 31/2.
- to evaluate the reservoirs, seals and possible pre-Jurassic source rocks.
- to determine the age of the as yet unpenetrated deeper horizons for a better understanding of the regional geologic setting.
- to drill in a location without major faults.

b) The Jurassic gas accumulation

- test hydrocarbons at a location of nearly maximum gross hydrocarbon column.
- test lateral variations in reservoir characteristics



▨ CLOSURE AT UPPER-MIDDLE JURASSIC RESERVOIR LEVEL

SCALE 1: 150 000

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BLOCK 31/2

WELL LOCATION MAP

AUTHOR EPPP/21	FIG.	DATE JULY 1981
REPORT NO. NSEP149	II/1	DRAWING NO. G.1096/7

2. STRATIGRAPHY

Lithostratigraphy

The lithologies drilled in 31/2-4 can be subdivided as follwos:

Nordland & Hordaland Group (Recent-Eocene)	Claystones, silty and sandy, with minor Sandstone beds. Trace lignite. Calcareous bands occur towards base of Hordaland Group.	361-1203 m
Rogaland Group (Eocene-Paleocene)	Claystones, silty and occasional tuffaceous. Marl towards base.	1203-1364.5m
Humber Group (Early Kimmeridgian -Bathonian)	Sand-Sandstones and Siltstones. Numerous calcareously cemented bands.	1364.5-1784m
Brent Group (?Bathonian-?Toarcian)	Sandstones with minor Siltstones, Shales and Claystones, Coal layers. Few bands of calcareous sandstones.	1784-1901.5m
Dunlin Group Equivalent (Toarcian-Pliensbachian/ Hettangian)	Sandstones and silty Claystones. Numerous calcareously cemented sandstone bands.	1901.5-2256m
New Red Group (?Hettangian/?Rhaetian-Skythian)	Sandstones, Siltstones and Claystones. Calcareously cemented bands most frequently in upper part. Predominantly sandstones in lower part.	2256-5035m

Table II/2.1

a) Nordland and Hordaland Groups

361-1203 m

Between seabed at 361 m and 446 m the well was neither sampled nor logged.

From 446 to 494 m soft grey brown sandy clays were encountered. The interval between 494 and 528 m is dominated by fine to medium sands. From 528 to 724 m soft grey brown sandy clays were again encountered with lignitic layers near the top. The interval between 724 and 1203 m consists of grey brown, olive, and blue to green, silty claystones, which occasionally grade to siltstones. This section is marly towards the base with lime-mudstone bands.

b) Rogaland Group

1203-1364.5 m

Four formations are present:

1) Balder Formation

1203-1234 m

This formation is composed of grey to blue green, silty claystone which is tuffaceous in places. Traces of yellow brown sandy siltstones and grey to orange lime-mudstones are also described.

2) Sele Formation

1234-1256 m

This formation is made up of grey to brown, micaceous, slightly silty and laminated claystone.

3) Lista Formation

1256-1356.5 m

This consists of grey green, slightly silty, slightly fissile and micromicaceous claystones with rare sandgrains. In the bottompart slickensides, siderite, pyrite, and calcareous mudstones occur.

4) Maureen Formation

1356,5-1364.5 m

The upper part of this unit is composed of light grey to green marl with pyrite and foraminiferas. The lower part consists of a light grey green marl grading to echinoderm spine wackestone. This part comprises chalk pieces, glauconite, foraminifera and occasionally darker lenses showing soft sediment deformation.

c) Humber Group

1364.5 - 1784 m

This group is subdivided into five formations:

1) Sogn Formation

1364.5 - 1460 m

This interval is dominated by fine to coarse, light grey to grey moderately to occasionally well sorted, loose to friable sand/sandstones. However, the area 1437 - 1460 m is more consolidated, and calcareously cemented bands occur throughout the section. The content of mica and carbonaceous material is generally on the low side except in the intervals 1367 - 1381.5 m and 1408 - 1415 m, in which grey, very fine to fine, well sorted sandstones are present. In some layers coarse shell debris is abundant. Low angle crossbedding is common in the cleaner sandstones. The more fine grained ones are generally strongly bioturbated.

2) Middle Heather Formation
1460 - 1520 m

This section consists of a well sorted, friable to moderately hard, grey to dark grey, silty sandstone grading to siltstone. This deposit is very rich in mica. Carbonaceous material is common to abundant, and small shell fragments are common. The sediments are generally heavily bioturbated, but occasionally primary structures are preserved. Occasionally thin, more poorly sorted, coarser-grained beds occur. Calcareously cemented stringers are common.

3) Fens Formation
1520 - 1652 m

The formation comprises grey to dark grey, very fine, well sorted, micaceous sandstones interlayered with fine to coarse, light grey to grey, poorly to well sorted sandstones. Between 1568 and 1644 brown oil stain is usual. The formation is loose to moderately hard with some calcareously cemented bands. Primary structures are usual, but especially in the finest sediments often destroyed by bioturbation.

4) Kross Formation
1652 - 1667 m

Grey, very fine, well sorted, micaceous sandstones are interbedded with light grey to grey, moderately to well sorted, fine to coarse sandstones.

5) Lower Heather Formation
1667 - 1784 m

This section consist of grey to dark grey, very fine, argillaceous sandstones grading towards base to light grey sandy siltstone. Some calcareously cemented bands are also present.

d) Brent Group

1784 - 1901.5 m

In this group, very fine to very coarse, poorly to well sorted sands/sandstones dominate. In the intervals 1808-1824 m and 1856 - 1863 m black to dark brown coal beds interlayered with light grey siltstones and light grey to dark grey brown shales/claystones occur. Towards the base several calcareously cemented sandstone bands appear.

e) Dunlin Group Equivalent

1901.5 - 2256 m

This group comprises the following five formations:

1) Drake Formation

1901.5 - 2007.5 m

The top part (1901.5 - 1930 m) is made up of light to medium grey siltstones which occasionally grade towards shale. In the middle part poorly sorted sandstones are interlayered with siltstones. The bottom part (1951.5 - 2007.5 m) consists of light grey, silty, sticky clays.

2) Cook Formation

2007.5 - 2107 m

This formation comprises very thick beds of fine to very coarse, moderately to well sorted sands/sandstones in between very thick beds of light grey, sticky clays. Mica, pyrite, shell debris and calcareous bands are also present.

3) Upper Amundsen Formation

2107 - 2125.5 m

Medium grey, sticky, silty clays/claystones were encountered.

4) Johansen Formation
2125.5 - 2241 m

This is a sandstone section, coarse and moderately sorted in the upper part, becoming finer, better sorted and micaceous towards the base. Calcareously cemented bands and pyrite occur throughout the section.

5) Lower Amundsen Formation
2241 - 2256 m

The interval is built up of light grey, sticky, silty clay.

f) New Red Group
2256 - 5033 m

The group is subdivided into three formations:

1) Statfjord Formation
2256 - 2393.5 m

It is dominated by poorly to moderately sorted, fine to very coarse sand/sandstone, which is conglomeratic in parts. At 2277 m black to dark brown coal is observed. In the interval 2295 to 2324 m, however, there is a white to light grey brown claystone becoming red brown, pink and purple towards the base. Occasionally calcareously cemented bands occur.

2) Cormorant Formation
2393.5 - 3345 m

This interval consists of claystones/siltstones interbedded with sandstones. From 2802 m claystones/siltstones dominate. The sandstones are very fine to very coarse, poorly to well sorted with colours varying from greyish to reddish. Feldspars, as well as igneous and metamorphic rock fragments occasionally occur. The claystones/siltstones are grey, brown, orange brown, yellowish brown, red brown, purple brown and grey green in colour and occasionally sandy. In the top part calcareously cemented bands are common.

New Red Group undifferentiated

3345 - 5035 m

This section is dominated by sandstones. Several claystone and siltstone beds do however occur.

Between 3345 and 3469 m a fine to very coarse poorly to moderately sorted sandstone occasionally containing feldspars and heavy minerals occurs. Argillaceous bands are subordinate. In the interval 3469 to 3682 m dark red brown, occasionally orange to grey green silty claystones interbedded with very fine to coarse sandstones occur. The section 3682 to 3896 m is dominated by very fine to very coarse sandstones with occasional potassium feldpars, heavy minerals and schist fragments. From 3896 to 4482 m claystones, siltstones and sandstones are interlayered. Sandstones are constituting the largest fraction. The claystones/siltstones are light to dark red brown, orange brown, brown, dark grey and grey green. In the intervals 4056 to 4061 m and 4072 to 4077 m bituminous material is encountered. The sandstones are very fine to very coarse, poorly to well sorted and layers rich in feldspars, heavy minerals, mica or metamorphic rock fragments occur. The interval 4482 to 5035 m (TD) is dominated by very fine to very coarse, poorly to well sorted sandstones, occasionally with feldspars, heavy minerals and metamorphic fragments. Layers of dark red, red brown, yellow brown and brown claystones/siltstones occasionally occur.

Biostratigraphy

In a study by EP/12 SIPM the following biostratigraphical subdivision were established:

994.3 - 1234 m : Eocene
1246.3 - 1364.3 : Paleocene
1368.2* : Early Kimmeridgion
1371.1*-1382.9* : late Late Oxfordian
1385.6*-1415*m : early Late Oxfordian
1444.4*-1487.3*m : Early Oxfordian
1489.1*-1537*m : Late Callovian
1539.7*-1709.0 m : Middle Callovian
1713.2-1728.6 m : Late Bathonian - Early Callovian
1739.6-1773 m : Middle Bathonian
1902-2005.9 m : Toarcian
2028.5-2075.5 m : Pliensbachian
2114.7-2246.6 m : Hettangian - Pliensbachian
2400* m : Rhaetian - Hettangian
2406* m : Rhaetian
3297* m : Carnian
3813* m : Ladinian
4041* m : Anisian
4740*-5025.1*m : Skythian

* Driller's depth

Table II/2.2

3. SEISMO STRATIGRAPHY

Velocity Survey

A comprehensive velocity survey was carried out by SSL. A total of 82 records were obtained over the depth interval 1100 to 5020 m RKB.

Stratigraphic Identification of Reflections

The stratigraphic tie to the reflection section is shown in enclosure 4.

In the following all depths are measured from RKB and the corresponding seismic times from MSL.

The most important ties are:

- Top Hordaland group,	724 m	ties at 818 ms
- Top Balder formation,	1203 m	ties at 1316 ms
- Top Maureen formation,	1356.5 m	ties at 1468 ms
- Top Sogn formation,	1364.5 m	ties at 1475 ms
- Top "Heather formation middle,"	1460 m	ties at 1557 ms
- Top Fens formation,	1520 m	ties at 1610 ms
- GOC,	1567-1573 m	ties at 1650-1654 ms
- Top Kross formation,	1652 m	ties at 1710 ms
- Top "Heather formation lower,"	1667 m	ties at 1720 ms
- Top Brent group,	1784 m	ties at 1798 ms
- Top Dunlin group,	1901.5 m	ties at 1877 ms
- Top New Red group,	2256 m	ties at 2099 ms
- TD	5035 m	ties at 3433 ms

A band-limited impedance log has been generated for the upper 2770 m (2.4 sec) of well 31/2-4 and tied to impedance sections passing through the well location (enclosure 5).

The quality of the tie is variable, and a time shift has been applied. Some of the apparent shift in the deeper part is due to incomplete migration of lines not running in the dip direction.

4. RESERVOIR CONDITIONS

Well 31/2-4 was drilled near the crest of the 'A' structure in the 31/2 block.

The top of the gas bearing reservoir is at 1364.5 m. The accurate pick of the GOC from logs is hampered severely by the lithology effect placing the GOC somewhere between 1567 and 1573 m, with 1568 m as a likely place. A depth of 1572 m is however, more consistent with other wells in the field. OWC is at 1580 m.

Lithologically, the reservoir sequence in 31/2-4 is similar to that encountered in earlier wells in the block. A largely unconsolidated high porosity - high permeability sand occurs in the top part of the reservoir. This is underlain by a finer grained, better consolidated, but strongly micaceous sandstone, in which porosity is somewhat reduced and permeability is low. Beneath this micaceous interval is a zone of more variable lithology, comprising interbeds of fine, micaceous sands and coarser cleaner sands. In 31/2-4 the GOC and OWC occur in the latter, 'variable sand' zone.

Thin (generally less than 1 m thick) carbonate cemented bands occur throughout the reservoir and form very low porosity - permeability horizons. Carbonate cementation does not appear to be restricted to any one particular litho-type, but individual bands are not believed to be of significant lateral extent, (lateral contacts between cemented and non-cemented lithologies have been cored). However, it is possible that these bands have preferentially occurred along certain horizons forming 'stringers' of discontinuous 'nodular' carbonate.

Seal

The seal in 31/2-4 is formed by a thick sequence of Palaeocene claystones. Reworked Upper Cretaceous fauna occur in these claystones immediately above the reservoir.

5. GEOCHEMICAL REPORT

Geochemical investigations were carried out by Shell's Exploration and Production Research Laboratory in Holland.

6. DIPMETER SURVEY

A dipmeter survey was carried out between 13 3/8" casing shoe (1271 m) and TD (5032,5 m) and is included in the appendix in uninterpreted form.

Structural dip within the reservoir section and in the underlying Dunlin is approx. 4° on azimuth 60° E of N.

CONCLUSIONS

Well 31/2-4 was spudded 01.09.80 and suspended 06.04.81.

The well was drilled to 5035 m BDF into formations of Skythian age which satisfies the deep test requirement of the concession agreement.

The well encountered gas above a thin oil rim in sandstones belonging to the Humber Group.

The top of the gas bearing reservoir is at 1364,5 m. The accurate position of the GOC is difficult to define due to poor reservoir quality at this level. From logs it seems to be somewhere between 1567 and 1573 m, with 1568 m as a likely place. However, a depth of 1572 m is more consistent with data from other wells in the field. OWC is at 1580 m.

No significant hydrocarbon indications were seen in the section below the main Jurassic accumulation.

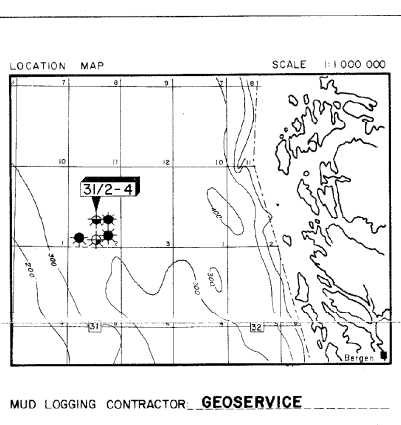
The well has not been tested. It is interpreted productive for gas and oil.

ENCL. I

a·s Norske Shell, E & P

COMPLETION LOG WELL: 31/2-4

LOCATION MAP SCALE 1:1 000 000



MUD LOGGING CONTRACTOR: GEOSERVICE
SHELL GEOLOGISTS: CHRIS JONES, MAGNAR LARSEN, OLAV NORVIK, RUSS QUICK

LICENCE: PL 054
FIELD: TROLL
COORDINATES: 60°51'23.57"N 03°30'44.33"E
SPUD DATE: 1.09.80. TEMP. SUSP. 10.09.80. RE-ENTERED 06.10.80
COMPLETION DATE: 6.04.81
RIG: BORGNY DOLPHIN
CONTRACTOR: DOLPHIN SERVICES
K.B. ELEVATION: 25m
WATER DEPTH: 336m
T.D. (DRILLER): 5035m
T.D. (LOGGER): 5033m
T.D. FORMATION: LOWER TRIASSIC RED BEDS
STATUS: SUSPENDED, INTERPRETED PRODUCTIVE FOR GAS & OIL
CASING RECORD: 30" at 446m, 20" at 807m, 16" liner at 1272 m, 13 3/8" at 1927m, 9 5/8" at 3983m

LITHOLOGY SYMBOLS

- CLAY
- CLAYSTONE
- SHALE
- SILT
- SILTSTONE
- SAND
- SANDSTONE
- LIGNITE/COAL
- CARBONACEOUS
- BITUMINOUS
- GRAVEL / CONGLOMERATE
- MARL
- CHALK
- LIMESTONE
- DOLOMITE
- SALT
- GYPSUM
- ANHYDRITE
- TUFF
- CHERT
- FOSSIL FRAGS, GEN

HYDROCARBON INDICATIONS

- WEAK OIL SHOWS
- STRONG OIL SHOWS
- PROVED PRODUCTIVE
- WEAK GAS SHOWS
- STRONG GAS SHOWS
- PROVED PRODUCTIVE

LOG and RUN No.	DATE	MEASURED	BIT SIZE	BHT°F	MUD TYPE	GRAD psi	API WL	RESISTIVITY SCHLUMBERGER SURFACE	RESISTIVITY SCHLUMBERGER BHT°F	MUD FILTRATE RESISTIVITY
ISF-BHC-GR-SP 1	6/9-80	450-816	17 1/2	77	BENT/S.W.		1.40	0,71/63	0,65/77	0,52/63
FDC-CNL-GR-CAL 1	6/9-80	450-816	17 1/2	79	BENT/S.W.		1.40	0,71/63		0,52/63
ISF-BHC-GR-SP 2	12/10-80	807-1269	17 1/2	90	KCL/POLY		1.34	0,096/71	0,075/90	0,072/71
FDC-CNL-GR-CAL 2	13/10-80	807-1270	17 1/2	93	KCL/POLY		1.34			
BGT-GR 1	16/10-80	807-1274	22	95	KCL/POLY			0,088/99	0,077/95	
CBL-VDL-GR 1	25/10-80	719-1275	22	88						
ISF-BHC-GR-SP 3	24/11-80	1271-1938	12 1/4	144	S.W./GEL/DISP		1,32	0,25/66	0,11/144	0,18/66
FDC-CNL-GR-CAL 3	24/11-80	1271-1939,5	12 1/4	138	S.W./GEL/DISP		1,32	0,25/66	0,12/138	0,18/66
LDT-CNL-GR 1	24/11-80	1271-1936,5	12 1/4	132	S.W./GEL/DISP		1,32	0,25/66	0,12/132	0,18/66
MST 1	25/11-80	1271-1938,5	12 1/4	138	S.W./GEL/DISP		1,32	0,25/66	0,12/138	0,18/66
HDT 4-HDT-S 1	25/11-80	1271-1934	12 1/4	146	S.W./GEL/DISP		1,32	0,25/66	0,11/146	0,18/66
CBL-VDL-GR 1	25/11-80	719-1271	12 1/4		S.W./GEL/DISP		1,32	0,25/66	0,17/97	0,16/66
DDBHC-GR 1 LDT-CNL-GR 5A	25/11-80 26/11-80	1271-1940 1300-1939	12 1/4	[illegible]	S.W./GEL/DISP		1,32 1,32	0,25/66 0,25/66	0,11/150 0,14/190	0,18/66 0,18/66
DLL/MSFL-GR 1	24/11-80	1271-1936,5	12 1/4	116	S.W./GEL/DISP		1,32	0,25/66	0,14/116	0,18/66
RFT		1396,5-1645,5								
BGT-GR 2	5/12-80	1271-1940	8 3/4		GEL/S.W./GEL		1,32			
BGT-GR 3	9/12-80	1270-1933	8 1/2	109	GEL/LIGN		1,32			
BGT-GR 4	11/12-80	1270-1939	8 1/2	104	GEL/LIGN		1,32			
BGT-GR 5	14/12-80	1270-1930	8 1/2	108	GEL/LIGN		1,32			
CBL-VDL-GR-CCL 1	17/12-80	352-1913		120	S.W./GEL/DISP		1,32	0,25/66	0,13/120	0,18/66
ISF-BHC-GR-SP 4	12/2-81	1926-3989	12 1/4	212	S.W./GEL/LIGNO		1,2	0,34/55	0,09/212	0,25/55
FDC-CNL-GR-CAL 4	12/2-81	1926-3990	12 1/4	226	S.W./GEL/LIGNO		1,2	0,34/55	0,08/226	0,22/55
MST 2	13/2-81	1926-3990	12 1/4	240	S.W./GEL/LIGNO		1,2	0,34/55	0,07/250	0,25/55
RFT-GR 2	13/2-81	3142-3685,5	12 1/4	250	S.W./GEL/LIGNO		1,2	0,34/55	0,07/250	0,25/55
ISF-BHC-GR-SP 5		3985,5-5031,5	8 1/2		GYP/LIGNO		1,2			
ISF-BHC-GR-SP 5A	23/3-81	3965-5031,5	8 1/2	280	GYP/LIGNO		1,2	0,37/56	0,07/280	0,26/53
FDC-CNL-GR-CAL 5 RFT-GR 3	23/3-81 24/3-81	3963-5032 4104-4968	8 1/2 8 1/2	285 256	GYP/LIGNO GYP/LIGNO		1,2 1,2			
CBL-VDL-GR-CCL 2 GR-N	26/3-81 26/3-81	1800-3985	8 1/2 8 1/2	300 283	GYP/LIGNO		1,2	0,37/56 0,37/56	0,04/300 0,07/283	0,26/53 0,26/53
HDT 3		3985-5031,5	8 1/2							
CBL-VDL-GR 2	31/3-81	800-1504								

CORES. Driller Depth.

1. 1320.0 - 1326.0 rec. 5.75m, 96%
2. 1326.0 - 1334.0 rec. 0.45m, 6%
Int 1334.0 - 1338.0 Drilled with normal bit
*3. 1338.0 - 1347.0 rec. 9.00m, 100%
4. 1347.0 - 1365.0 rec. 10.00m, 56%
5. 1365.0 - 1379.0 rec. 13.00m, 93%
6. 1379.0 - 1397.0 rec. 18.00m, 100%
7. 1397.0 - 1410.0 rec. 13.00m, 100%
8. 1410.0 - 1415.5 rec. 5.00m, 91%
9. 1415.5 - 1426.5 rec. 9.50m, 86%
10. 1426.5 - 1443.5 rec. 0.18m, 1%
11. 1443.5 - 1452.5 rec. 9.00m, 100%
12. 1452.5 - 1454.5 rec. 1.80m, 90%
13. 1454.5 - 1472.5 rec. 12.30m, 68%
14. 1472.5 - 1482.5 rec. 7.00m, 70%
15. 1482.5 - 1484.5 rec. 0.65m, 33%
16. 1484.5 - 1490.0 rec. 5.50m, 100%
17. 1490.0 - 1508.0 rec. 16.30m, 91%
18. 1508.0 - 1526.0 rec. 16.60m, 92%
19. 1526.0 - 1544.0 rec. 17.30m, 96%
20. 1544.0 - 1562.0 rec. 18.00m, 100%
*21. 1562.0 - 1567.0 rec. 4.85m, 97%
22. 1567.0 - 1585.0 rec. 15.69m, 87%
23. 1585.0 - 1603.0 rec. 14.16m, 79%
24. 1603.0 - 1607.0 rec. 3.55m, 89%
25. 1607.0 - 1621.0 rec. 14.00m, 100%
26. 1621.0 - 1627.0 rec. 5.12m, 85%
27. 1627.0 - 1645.0 rec. 17.37m, 97%
28. 1645.0 - 1663.0 rec. 17.88m, 99%
29. 5025.0 - 5035.0 rec. 8.38m, 84%

*CORES 3 - 21 taken with fibreglass sleeve.

RFT PRESSURE

INTERVAL	PRESSURE GRADIENT
1396.5 - 1568.5	0.058 psi/ft
1572 - 1580	*
1580 - 2713	0.45 psi/ft
3262 - 4969	0.46 psi/ft

* Not possible to define accurately

Sidewall Core Descriptions

31/2-4

31/2-4
Exploration Well Resume
Enclosure No. 2

SIDEWALL SAMPLE DESCRIPTION WELL 31/2-4 (Encl. 2)

DEPTH (m)	RECOVERY (mm)	LITHOLOGY
994,3	55	CLST, DK BRN, SLT, NON-SWELLING, NON CALC, MOD HD, mMIC, GN MINERAL, SPOTTY YEL FLU, CUT FLU MILKY WH
1009,3	53	CLST, GY-GN MOTTLED BRN, SLT, (HYGROTURGID), NON CALC, MOD HD, mMIC, ((CARB)), WH NON CALC FOSSIL LIKE FRAGM, SPOTTY YEL FLU
1021,4	20	CLST, GY GN (BRN), SLT, NON-SWELLING, ((CALC)), MOD HD, mMIC, ((CARB)), (GN MINERAL)
1052,9	10	CLST, GY-GN, SLT, NON SWELLING, NON CALC, SFT, mMIC, ((CARB)), ((PY))
1086,2	60	CLST, GY-GN, (SLT), NON-SWELLING, NON CALC, MOD HD, (mMIC), ((CARB))
1147,5	48	CLST, BRN, SLT, NON-SWELLING, NON CALC, SFT-MOD HD, mMIC, (CARB), (ORGANIC, WAXY) SPOTTY YEL FLU
1166,9	54	CLST, GY BRN, (SLT), (HYGROTURGID), NON CALC, MOD HD, (mMIC), (ORGANIC, WAXY), YEL, FLU ALONG HOR FRACT
1172,4	52	CLTS, A.A, SLT
1197,8	20	CLST, GY-GN, SLT, NON-SWELLING, NON CALC, SFT-MOD HD, mMIC
1200,0	25	CLST, A.A, MOD HD, PY, YEL FLUORESCENCE
1204,2	53	CLST, OLV, SLT, HYGROTURGID, NON CALC, MOD HD, mMIC, ((CARB)) SPOTTY YEL FLU
1211,5	50	CLST, GN, SLT, HYGROTURGID, NON CALC, MOD HD, (PY), LAM, YEL FLU IN LAM AND ALONG SLICKENSIDE
1215,0	44	CLST, GY-GN, SLT, (HYGROTURGID), (CALC), MOD HD, (mMIC), ((LAM)), TR YEL FLU
1219,0	49	CLST, GN(GY) MOTTLED WH/LT GY, SLT, CRYPTOFISSILE, NON CALC, MOD HD, (mMIC), ((CARB)), LAM
1234,0	49	CLST, A.A MOTTLED BRN, (CRYPTOFISSILE), YEL FLU IN LAM
1246,3	53	CLST, GY-GN SPOTTED YEL/WH, SLT, HYGROTURGID, NON CALC, MOD HD, mMIC, ((CARB)), LAM, YEL FLU IN LAM MILKY WH CUT FLU
1253,2	53	CLST, GY-GN, (SLT), (HYGROTURGID), NON CALC, MOD HD, (mMIC), ((CARB)), LAM, YEL FLU IN LAM

1265,5	50	CLST, GY-GN, (SLT), HYGROTURGID, NON CALC, MOD HD, mMIC, ((CARB)), YEL FLU, MILKY WH, CUT FLU
1285,2	45	CLST, MED GY, ANG-BLKY, CONS, FRM
1287,8	50	CLST, LT GY-GN, ANG-BLKY, CONS, FRM
1293,2	55	CLST, LT GY BRN, CMB-BLKY, CONS, (HD), DOL, STRONG GOLD DIRECT FLU, STRONG YEL STRM CUT FLU, DK BRN CUT COLOUR, AROMATIC HC ODOUR
1296,3	60	CLST, MED GY GN, SMOOTH BRK, CONS, FRM, TR DULL GOLD DIR FLU, MOD YEL CRUSH CUT, NO CUT COLOUR, SLIGHT HC ODOUR
1300,2	45	CLST, MED GY GN DK GN MOTTLED, ANG-BLKY, CONS, FRM, GLC, PYR, (DOL), TR YEL DIR FLU, WEAK YEL CRUSH CUT, NO CUT COLOUR
1304,0	60	CLST, MED GY GN OCC MOTTLED MED GY, SMOOTH-WAXY, CONS, FRM, PY, (DOL), MOD FULL GOLD DIR FLU, STRONG BRN YEL STRM CUT FLU, LT BRN CUT COLOUR, TR CH ODOUR
1307,0	55	SH, MED GY GN, (FIS), CONS, (HD) TR YEL DIR FLU, NO CUT FLU, WEAK HC ODOUR
1310,5	45	CLST, MED GY GN, SMOOTH-(FIS), CONS, FRM, PY, TR MICROFOSSILS, TR YEL DIR FLU, WEAK YEL VERY SLOW STRM CUT FLU, NO CUT COLOUR, VERY WEAK HC ODOUR
1317,2	55	CLST, LT GY BRN-DK GY GN MOTTLED, CMB, CONS, FRM, PY, GLC, DOL, GOOD CRN YEL DIR FLU, BRN YEL STRM CUT FLU, DK BRN CUT COLOUR, AROM HC ODOUR
1328,0	35	CLST, LT GY GN, SMOOTH-(FIS), CONS, FRM, (PY), (CARB), (DOL), OCCHD BRN NODULES, MOD SPOTTY YEL DIR FLU, STRONG YEL STRM CUT FLU, LT BRN CUT COLOUR, SLIGHTLY HC ODOUR
1336,0	50	CLST, DK GY GN, SMOOTH-WAXY BRK, (CONS), FRM, (DOL), NO FLU
1358,4	55	MARL, MED BY GN-MED GY BRN MOTTLED, SMOOTH BRK, CONS, FRM, GY GRN FRAG IN GY GN MATRIX, DULL GOLD DIR FLU, BRN YEL STRM CUT FLU, LT BRN CUT COLOUR, HC ODOUR
1360,6	50	MARL, MED GY GN DOTTED WH, SMOOTH BRK, CONS, FRM, GLC, NO FLU
1362,6	40	MARL, MED GY GN DOTTED WH, SMOOTH BRK, CONS, FRM, GLC, OCC FOSS FRAGM, OCC CALC WH BANDS NO FLU
1364,3	15	SST, (POR), LT GY GN-DK GN MOTTLED, FSU -CRS SL, (SRT), ANG, ELONG, CMB, CONS, FRI, MIC, GLC, CALC, ARG, (PY), GLD OCC CONC IN ZONES, QTZ CLR-MILKY. OCC YEL MIN FLU IN MILKY QTZ, PA BL-SPOTTED YEL DIR FLU, NO CRUSH CUT, WEAK YEL ACID CUT, STRONG HC ODOUR

1428,2	40	SST, POR, LT GY, FSL-CRS SU, (SRT), ANG, (ELONG), CMB, (CONS), FRI, MIC, (PY), (CALC), CLR-MILKY-SMOKY QTZ, YEL MIN FLU IN MILKY QTZ, PA BL-SPOTTED YEL DIR FLU, WEAK WH CRUSH CUT, STRONG HC ODOUR
1431,0	40	SST, POR, LT GY, FSL-CRS SU, (SRT), ANG, (ELONG), CMB, (CONS), FRI, PY, (MIC), (CALC), CLR-MILKY QTZ OCC YEL MIN FLU IN MILKY QTZ, PA BL DIR FLU SPOTTED YEL, WEAK WH CRUSH CUT, STRONG HC ODOUR
1433,8	40	SST, POR, LT GY, FSL-CRS SU, (SRT) (ANG)-RND, (ELONG), CMB, (DONS), FRI, (MIC), (CALC), CLR-MILKY QTZ, OCC YEL MIN FLU IN MILKY QTZ, PA BL SPOTTED YEL DIR FLU, WEAK WH CRUSH CUT FLU, STRONG HC ODOUR
1439,0	30	SST, POR, LT GY, MSL-CRS SU, (SRT), ANG-RND, (ELONG),-SPH, CMB, (CONS), FRI, (CALC), CLR-MILKY SMOKY QTZ, OCC YEL MIN FLU IN MILKY QTZ, PA BL-SPOTTED YEL DIR FLU, WEAK WH CRUSH CUT, STRONG HC ODOUR
1667,8	40	SST, POR, LT GY, FSL-FSU, SRT, (RND), SPH, CMB, (CONS), FRI, (CARB), MIC, VERY F CARB LAM, NO FLU
1672,0	40	SST, (POR) LT-MED GY, FSL-FSL, SRT, ANG, SPH, CMB, CONS, FRI, SLT, MIC, ARG, (MIC LAM), NO FLU
1676,2	35	SST, (POR), MED GY, FSL, SRT, (ANG), SPH, CMB, CONS, FRI, SLT, MIC, (CARB), FINE BRN CARB LAM, NO FLU
1685,7	35	SST, (POR), LT-MED GY MOTTLED, FSL-FSU, SRT, ANG, SPH, CMB, CONS, FRI, MIC, ARG, (CARB), SLT, FINE CARB/MIC LAM, NO FLU
1690,0	30	SLTST, MED GY, SRT, ANG, SPH, CMB, CONS, FRM, MIC, ARG, S, NO FLU
1694,0	30	SLTS, LT-MED GY MOTTLED, CMB, CONS, FRI, MIC, ARG, S, INTERBEDDED WITH SST, (POR), LT-GY WH, FSL-FSL, SRT, ANG, (SPH), CMB, CONS, FRI, MIC, OCC OVERGROWTH ON QTZ, NO FLU
1702,5	30	SLTS, MED GY, CMB, CONS, FRM, MIC, ARG, (S, FSL, SRT, (ANG), SPH), NO FLU
1713,2	30	SLTST, A.A
1723,3	25	SLST, A.A
1728,6	25	SLST, MED GY, CMB, CONS, FRM, (CARB), MIC, ARG, (S, FSL, SRT, ANG, (SPH)), DISCONT CARB/MIC LAM, NO FLU
1739,6	25	SST, (POR), MED GY, FSL, SRT, ANG, SPH, CMB, CONS, FRI, MIC, ARG, VERY FINE MIC LAM, NO FLU
1745,6	25	SST, (POR), MED GY, FSL-FSU, SRT, ANG, (SPH), CMB, CONS, FRI, MIC, ARG, CONTORT DISCONT MIC LAM, NO FLU

1755,2	30	SST, (POR), MED GY LT-GY MOTTLED, FSL, SRT, ANG, SPH, CMB, CONS, FRM, ARG, MIC, CALC, LT BRN BELEMNITE, NO FLU
1758,0	20	SLTST, MED GY BRNLT BRN MOTTLED, CMB, CONS, FRM(HD), MIC, ARG, GLC NODULES-FSU, CALC CALC, LT BRN CALC ZONES, NO FLU
1767.8	30	SST, (POR), DK GY, FSL, SRT, ANG, (SPH), CMB, CONS, FRM, MIC, ARG, (CARB), VERY FINE DISCONT CARB LAM, VERY FINE LT GY CONT S LAM, NO FLU
1773,0	25	SLTST, MED-DK GY, CMB, CONS, FRI, MIC, ARG, (S, FSL, SRT, ANG, (SPH), MIC, S AS VERY FINE DISCONT LAM, OCC MICROFLASER BD, POSS BIOTURBATED), FOSS FRAGM, LARGE CALC NOD/FOSS FRAGM, NO FLU
1789,4	35	SST, (POR), LT-MED GY, FSL-FSL, SRT, (ANG), (SPH), CMB, CONS, FRI, ARG, MIC, LAM, NO FLU
1801,0	35	SST, (POR), LT-MED GY, FSL-FSL, SRT, (ANG), CMB, CONS, FRI, ARG, MIC, LAM, NO FLU
1819,0	40	CLST, MED GY GRN, SMOOTH BRK, CONS, FRM, (CARB), SKS, OCC FINE LINEAR CARB FRAGM, NO FLU
1829,4	20	SST, (POR), LT GY BRN, FSL, SRT, (ANG), (SPH), CMB, CONS, FRI, ARG, MIC, ((DOL)), VERY FINE GY ARG LAM, NO FLU
1855,4	40	CLST; MED GY BRN; SMOOTH(FIS), CONS, FRM, (MIC), (CARB), SKS, OCC VERY FINE LINEAR CARB FRAGM, NO FLU
1858,2	30	SH, DK GY BRN, (FIS), CONS, FRM, SLT, MIC, VERY FINE LT GY SLT LAM, NO FLU
1861,1	20	SLTST, DK GY, ANG BRK, CONS, FRM, MIC, SLT, (DOL), INTERBEDDED SST, (POR), LT GY, FSL, MSU, (SRT), (ANG), SPH-(ELONG), CMB, CONS, FRM, (ARG), GRADED, MM BED, VERY FINE LAM AT CONTACT OR AS ISOLATED LENSES, NO FLU
1902,0	30	SST, (POR), LT-MED GY, FSL-FSL, SRT, (ANG), SPH, CMB, CONS, FRM, ARG, MIC, NO FLU
1907,	40	SH, DK GY, (FIS), CONS, FRM, MIC, SLT, OCC (S), NO FLU
1912,0	25	SH, DK GY, (FIS), CONS, FRM, (DOL), INTERBEDDED SST STREAKS, LT GY, FSL-FSL, SRT, (ANG), SPH, CMB, CONS, (HD), (MIC), KAOL, NO FLU
1924,0	25	SLTST, MED GY, (FIS), CONS, (HD), MIC, (DOL), INTERBEDDED SST STREAKS, (POR), WH-LT GY, FSL-FSU, SRT, (ANG), SPH, CMB, CONS, (HD), MIC, KAOL, NO FLU
1929,4	45	CLST, MED GY, S, SMOOTH-(FIS), CONS, (HD), (DOL), ABNT F WH SST LAM: FSL, SRT, MIC, NIL FLU

1942,5	25	CLST, MED-DK GY, (S), (SLT), EARTHY-(FIS), CONS, (HD), (MIC), W F SST LAM FSL, SRT, NIL FLU
1968,0	40	SLTS, MED GY, (S), BLKY-SMOOTH, CONS, (HD), W F WH-GY SST LAM: FSL, SRT, MIC, NIL FLU
1982,5	35	CLST, MED GY, (S), BLKY-(FIS), SKS, CONS, (HD), W F WH SST LAM: FSL, SRT, NIL FLU
1991,8	50	CLST, MED GY, (S), BLKY-(FIS), CONS, (HD), OCC F GY WH SST LAM: FSL, SRT, MIC, NIL FLU
1999,7	30	SH, MED GY, (FIS), WAXY, CONS, (HD), (MIC), NIL FLU
2005,9	25	SH, DK GY OCC MED GY, (SLT), (FIS), CONS, (HD), MIC, NIL FLU
2028,5	25	SH, DK GY, S, FIS-(FIS), CONS, (HD), MIC, W F MM BD WH SST LAM: FSL, SRT, W DEV OSCILL RIPPLES, (HOR) S-FILLED BURROW, NIL FLU
2059,5	30	SST, (POR), MED GY, FSL, SRT, (ANG), (SPH), HKLY-CMB, CONS FRI-(HD), ARG, MIC, F DK GY ARG LAM, (HOR) S FILLED BURROWS, NIL FLU
2075,5	35	CLST, DK GY, S, SLT, BLKY-(FIS), CONS, (HD), PY, W F WH MM BD SST LAM: FSL, SRT, W POORLY DEV. RIPPLES, NIL FLU
2114,7	35	CLST, MED GY, (SLT), S, BLKY-(FIS), CONS, (HD), W F MM BD SST: FSL, SRT, STRAVED RIPPLES, NIL FLU
2124,0	30	SLST, MED GY-MED GY BRN, SLT, S BLKY, CONS, (HD), W F SST LAM AND LENSES: SRT, MM BD, NIL FLU
2246,6	30	SST, (POR), MD GY, FSL, SRT, ANG, (ELONG), HKLY-(FIS), CONS, FRI, ARG, MIC, (DOL), W F DK GY ARG LAM, NIL FLU
2260,2	25	SLTST, LT GY BRN, CMB, CONS, FRI, (MIC), ARG, (KAOL), (SEATEARTH), NIL FLU
2296,9	30	CLST, DK GY, WAXY-HKLY, CONS, (HD), (CARB), NIL FLU
2308,2	65	CLST, (CONG), DK GY GN MED YEL BRN, WAXY, CONS, (HD), W FRAG CLST: A/A, CRS SU+, RND, HD, NIL FLU
2322,5	60	CLST, (CONG), DK BRN-YEL BRN-DK GY GN, MTL, BLKY, CONS, (HD), W FRAG CLST: A/A, CRS, RND, HD, OCC F GY GN ARG LAM, NIL FLU
2330,0	45	SST, (POR), LT GY GN, FSL-CRS SU, (SRT), ANG, ELONG, CMB, ARG CMT, FRI, CLR-FRST QTZ, NIL FLU
2343,4	20	CL (GOUGE?), MED GY GN-MED YEL BRN, HYGROTURGID, UNCONS, SFT, W FRAG CLST: MED GY GN-MED YEL BRN, CRS, RND, ANG BRK, CONS. (HD)-HD, OCC FERRUG, NIL FLU

2398,8	45	CLST (CONTACT), YEL BRN, SLT ON CONTACT BETWEEN 1) CLST, DK BRN, (S), SLT, CMB, CONS, (HD), MIC, S: FSL, SRT, AND 2) CLSTS, MED GY GN OCC, RD BRN, SLT, CMB, CONS, (HD), (MIC), NIL FLU
2413,4	50	CLST, MED GY GN, S, (SLT), CMB, CONS, FRI-(HD), MIC, S: FSL-MSU, SRT, ANG, (ELONG), NIL FLU
2418,0	35	SST, (POR), LT GY GN, SLT-MSU, PRED FSL-FSL, SRT, (ANG), (SPH), CMB, (CMT), ARG CMT, FRI, MIC, CLR-FRS QTZ, MED GY GN ARG LAM, OCC WH SPOTS (KAOL?), NIL FLU
2439,0	65	CLST, DK RD BRN, MED GY GN REDUCT SPOTS, SLT, EARTHY, CONS, (HD), MIC, CRS SU+, CONCRETIONS: RED BRN-GY GN, CALC, ARG, RND, HD, (CALICHE), NIL FLU
2529,5	50	SLTST, DK RED BRN, (S), CMB, CONS, (HD), ARG, MIC, S: FSL, SRT, NIL FLU
2545,0	35	SLTST, DK RED BRN, (S), CMB, CONS, (HD), ARG, MIC, S: FSL-FLS, SRT, NIL FLU
2569,2	55	CLST, DK RED BRN, (SLT), EARTGY-BLKY, CONS, (HD), MIC, NIL FLU
2591,7	40	CLST, DK RED BRN, SLT, EARTHY-(FIS), CONS, (HD), (CALC), MIC, NIL FLU
2609,4	60	CLST, DK RED BRN, MED GY GN REDUCT SPOTS, WAXY BRK, SKS, CONS, (HD), ABNT CALC CONCR: DK RED-BRN MED GY GN, ARG, CRS SW+ SIZE, RND, (CALCICHE), NIL FLU
2642,6	50	CLST, DK RED BRN OCC MED GY GN REDUCT SPOTS, EARTHY, CONS, (HD), MIC, CALC, OCC W CALC CONCR: DK RED BRN, CRS SU+, SIZE, RND, ARG, (CALICHE), NIL FLU
2675,6	50	CLST, DK RED BRN, SLT, EARTHY, CONS, (HD), MIC, NIL FLU
2728,0	50	CLST, DK RED BRN OCC GY GN REDUCT SPOTS, SLT, S, CMB, CONS, (HD), MIC, CALC, S: FSL-MSL, SRT, ABNT CONR: DK RED BRN, CRS SU SIZE, RND, CALC, ARG, (CALCICHE), NIL FLU
2751,8	50	SH, DK RED BRN OCC GY GN REDUCT SPOTS, (FIS), CONS, HD, (CALC), MIC, NIL FLU
2766,0	40	CLST, DK RED BRN-DK PURP GY, OCC GY GN REDUCT SPOTS, BLKY-HKLY, CONS, (HD), MIC, CALC, W WH-GY CALC VEINLETS AND CONCR: CRS SU+ SIZE, RND, DK RED BRN, ARG, CALC, (CALICHE), NIL FLU
2782,4	50	SLTST, DK RED BRN, HKLY, CONS, (HD), MIC, ARG, CALC, NIL FLU
2808,6	40	CLST, DK RED BRN, (FIS), CONS, (HD), (CALC), MIC, CONCR: CRS SU+ SIZE, RND, DK RED BRN, ARG, CALC, (CALCICHE), NI FLU

2843,8	35	SLTST, LT-DK RED BRN, OCC LT GY GN REDUCT SPOTS, CONS, HD, ARG, CALC, WH CALC VEINLETS, DISCONT DK RED BRN CLST LAM: OCC HD QTZ CMT, NIL FLU
2870,0	30	SLTST, DK RED BRN, (S), CMB, CONS, FRI-(HD), ARG, (CALC), MIC, S: FSL, SRT, NIL FLU
2887,7	25	SST, (POR), DK RED BRN OCC LT GY GN REDUCT SPOTS, SLT-CRS SU, PRED FSL-FSL, SRT, (ANG), (ELONG), CMB, ARG, CMT FRI MIC ARGPRED RED BRN STAINED QTZ, OCC CLR, NIL FLU
2905,2	40	CLST, DK RED BRN, (S), EARTHY, CONS, FRM, MIC, S: FSL-MSL, NIL FLU
2931,4	30	SLTST, LT-DK RED BRN OCC LT GY GN REDUCT SPOTS, (S), CONS, HD, CALC, (ARG), ABNT INTERSTIT WH TRANS SPAR, S: FSL-FSU, SRT, NIL FLU
2950,8	20	CLST, LT-DK RED BRN OCC LT GY GN REDUCT SPOTS, (SLT), EARTHY-HACKLY, CONS-CMT, (HD)-HD, CALC-CALC, MIC, ABNT CALC CONCR: OCC SFT LT RED BRN, OCC F GRAINED SUCR: PRED DK RED BRN, ARG, RND, (CALICHE)
2963,8	30	SLTST, MED RED BRN, CMB, CONS, (HD), (ARG), (CALC), MIC, NIL FLU
2983,8	30	CLST, DK RED BRN, SLT, S, EARTHY, CONS, (HD), (CALC), (DOL), MIC, S: FSL-MSU, SRT, NIL FLU
3011,6	35	CLST, DK RED BRN, BLKY, CONS, (HD), MIC, CLR SPAR CONCR MSU SIZE, OCC CONCR CRS SU SIZE: DK RED BRN, RND, ARG, (CALCICHE), NIL FLU
3033,2	40	CLST, DK RED BRN, BLKY-(FIS), CONS, (HD), MIC, CLR SPAR CONCR MSL SIZE, NIL FLU
3054.0	25	CLST, DK RED BRN, MTL WH, SLT, S, CMB, CONS, (HD), MIC, ABNT WH CALC CONCR, S: FSL-MSU, (SRT), (ANG), (ELONG), NIL FLU
3071,8	30	SLTST, DK RED BRN, S, EARTHY, CONS, (HD), ARG, (CALC), MIC, S: FSL OCC WH-TRANSP SPAR CONCR, NIL FLU
3120,2	25	SST, (POR), DK RED BRN OCC GY GN REDUCT SPOTS, SLT-CRS SU, PRED FSL-FSU, SRT, (ANG), (SPH), CMB, (CMT), ARG CMT, FRI, ARG, (CALC), PRED CLR-RESTD QTZ OCC RED BRN STN, NIL FLU
3184,8	15	SLTST, DK RED BRN, (S), CMB, CONS, HD, MIC, ARG, (CALC), S: FSL-MSU PRED FSL, SRT, NIL FLU
3202,0	20	SLTST, DK RED BRN LT GY GN REDUCT SPOTS, S, CMB, CONS, FRI, MIC, ARG, (CALC), S: FSL-CRS SL, PRED FSL-FSU SRT, NIL FLU

3219,4	20	SLTST, DK RED BRN OCC LT GY GN REDUCT SPOTS, S, CMB, CONS, (HD), ARG, CALC, OCC CLST: (FIS), MIC, LAM, S: FSL MSL, SRT, OCC CALC PARTS: LT RED BRN W WH SPAR CONCR, NIL FLU
3255,2	15	CLST, DK RED BRN, S, SLT, EARTHY, CONC, FRI, (CALC), MIC, CONCR: LT-DK RED BRN, ARG, CALC, S: FSL-CRS SU, CLR-RED BRN STN QTZ, (CALICHE), NIL FLU
3289,6	20	SLTST, DK RED BRN OCC LT GY GN REDUCT SPOTS, S, CMB, CONS, FRI, ARG, (CALC), S: FSL-CRS SL, (SRT), CONCR: WH-TRANSP SPAR OCC RED BRN CALC, CRS SU SIZE, RND, MIC, (CALCICHE), NIL FLU
3296,4	15	SLTST, DK RED BRN OCC GY GN REDUCT SPOTS, CMB, CONS, FRI, ARG, MIC, OCC WH SPAR CONCR (CALICHE), NIL FLU
3308,2	20	SLTST, DK RED BRN OCC LT GY GN REDUCT SPOTS, CMB, CONS, FRI, ARG, CALC, MIC, WH SPAR WEINS AND CONCR, NIL FLU
3313,8	20	CLST, DK RED BRN, SLT, (S), EARTHY, CONS, FRM, (CALC), MIC, TR MSU, ABNT WH SPAR CONCR, NIL FLU
3323,0	15	CLST, DK RED BRN, SLT, (S), EARTHY-BLKY, CONS, FRM, MIC, S: FSL-MSU, SRT, NIL FLU
3323,1	10	CLST, DK RED BRN OCC GY GN REDUCT SPOTS, SLT, (S), EARTHY-BLKY, CONS, (HD), CALC, MIC, ABNT WH SPAR CONCR, S: FSL-MSU, SRT, NIL FLU
3327,4	20	CLST, DK RED BRN, SLT, (S), EARTHY-BLKY, CONS, FRM, (CALC), MIC, S: FSL-MSU, NIL FLU
3419,4	20	CLST, DK RED BRN, SLT, EARTHY, CONS, (HD), (CALC), MIC, NIL FLU
3471,6	15	CLST, A.A, FRM
3538,5	15	SLTST, DK RED BRN, EARTHY, CONS, FRI, ARG, MIC, NIL FLU
3590,0	15	SLTST, DK RED BRN W LT GY GN REDUCT SPOTS, (S), CMB, CONS, HD, ARG, MIC, S: FSL-MSU, SRT, OCC CONCR: DK RED BRN, CRS, SU+ SIZE, RND, (CALICHE), NIL FLU
3649,4	15	CLST, DK RED BRN, S, CONS, FRM, MIC, S: FSL-CRS SU, (SRT), DIS PERSED IN MATRIX OCC GY GN CLST FRAG OF CRS SL SIZE, NIL FLU
3756,5	20	CONG, (POR), MTL, WH, MED GY, DK GY GN, ORNG, FSL-CRS SU+, PRED CRS SU, SRT, (RND), (ELONG), CMB, QTZ-CALC-ARG CMT, OVER GROWTHS ON QTZ, PRED CLR QTZ, ORNG FELDSPAR, ABNT CRS CLST FRAG: DK RED BRN, MED GY, DK GY GN, NIL FLU

3810,8	30	SST, (POR), LT GY GN SPOTTED ORNG-GY GN, FSU-CRS SU, PRED FSU, SRT, (ANG), (SPH), CMB, CONS, ARG CMT, FRI, MUSC, (KAOL), RED BRN+ GY GN INTERSTIT CL, PRED CLR QTZ, NIL FLU
3832,0	20	SST, (POR), MTL, WH, ORNG, GY GN, FSU-CRS SL, (SRT), ANG, (SPH), CMB, CONS, CALC-ARG CMT, FRI, ARG, MIC (MUSC), RED BRN-GY GN INTERSTIT CL, ABNT ORNG FSP, PRED CLR QTZ, NIL FLU
3856,2	40	CLST, DK RED BRN, CMB-(FIS), CONS, (HD), MIC, NIL FLU
3884,2	20	SST, (POR), DK RED BRN, FSL-CRS SL, (SRT), ANG, (SPH), CMB, CMT, RED BRN ARG CMT, (HD), MIC (MUSC+OCC CHL), ARG, PRED CLR+ FRST QTZ, ORNG FELSP, OCC RED BRN STN QTZ, NIL FLU
3941,8	35	SLTST, RED BRN W LT GY GN REDUCT SPOTS, S, CMB, CONS, FRI, (CALC), S: FSL-FSL, NIL FLU
3961,4	30	CLST, DK RED BRN, SLT, S, CMB, CONS, (HD), MIC, CHL
3969,4	35	CLST/SST CONTACT, CLST: DK RED BRN OCC MED GY REDUCT SPOTS, (FIS), CONS, (HD), MIC SHARP UNDULATING CONTACT WITH SST: NON POR, WH SPOTTED ORNG+GN, FSL-CRS SL, (SRT), (ANG), (ELONG), CMB, ARG-CALC CMT, HD, PRED FRST QTZ, ORNG FSP, KAOL, CONTAINING F CLST FRAG: GY GN, MIC (MUSC), PY ALONG ONE CONTACT, POSS LARGE CLST FRAG IN CONG, NIL FLU
3976,0	25	SST, (POR), LT GY SPOTTED ORNG-GN, FSL CRS SL PRED FSU, SRT, ANG, (ELONG), CMB, (CONS), CALC-ARG CMT, FRI, MIC (MUSC), KAOL, PRED FRST QTZ, ORNG FELDSP, RED BRN-GY GN CLST FRAGS, F BLK HEAVY MINS, OCC CHL, NIL FLU
4037,3	25	SST, (POR), LT GY GN, SPOTTED ORNG, FSL-CRS SL, PRED MSL, SRT, ANG, (ELONG), (SPH), CMB, CMT-QTZ+ CALC CMT, PRED QTZ CMT, HD, (CALC), PRED CLRF-RST QTZ, ORNG FELD, (MIC), GY GN INTERSTIT CL, OCC DK GY SCHIST FRAG, OCC FG BLK HEAVY MIN, NIL FLU
4120,8	25	SST, (POR), DK RED BRN, FSL-MSL, PRED FSU, SRT, ANG, (SPH), CMB, CMT, QTZ+ CALC+ ARG CMT, PRED QTZ+ ARG CMT, (HD), ARG, CALC, PRED CLR QTZ, ABNT RED BRN INTERSTIT CL, MIC (MUSC), FG BLK HEAVY MIN, OCC W CALC PATCHES PRED CALC CMT, NIL FLU
4162,1	25	CLST, DK RED BRN, SLT, NON-SWL, BLKY, CONS, (HD), MIC, NIL FLU
4175,8	30	CLST, DK RED BRN, SLT, NON-SWL, BLKY-(FIS), CONS, (HD), (MIC), NIL FLU
4203,8	20	SLTST, DK RED BRN, BLKY, CONS, HD, ARG, MIC, (CONTAMINATED WITH JUNK), NIL FLU

4233,6	20	SLTST, DK RED BRN, CMB, CONS, (HD), ARG, (CALC), MIC, NIL FLU
4233,9*	10	SLTST, DK RED BRN, CMB, CONS, HD, ARG, (CALC), MIC, NIL FLU
4248,7	20	SLTST, DK RED BRN, CMB, CONS, (HD), ARG, MIC, NIL FLU
4271,8	20	SLTST, DK RED BRN, BLKY, CONS, (HD), ARG, MIC, NIL FLU
4316,3	25	SLTST, DK RED BRN, (S), CMB-BLKY, CONS, ARG, HD, MIC, S: FSL-MSU, (SRT), NIL FLU
4355,3	25	SLTST, (CALC), DK RED BRN, CMB-BLKY, CONS, HD, ARG, MIC, NIL FLU
4387,4	25	CLST, SLT, (S), DK RED BRN, NON SWL, BLKY, CONS, HD, (CALC), MIC, OCC S STRKS, FSL-FSU, SRT, NIL FLU
4411,9	20	SLTST, DK RED BRN, CMB-BLKY, CONS, HD, ARG, (CALC), MIC, NIL FLU
4435,9	25	SLTST, DK RED BRN, (S), EARTHY, CONS, (HD), (ARG), (MIC), S: FSL-MSL, PRED, FSL, SRT, NIL FLU
4454,7	20	CLST, DK RED BRN, (SLT), NO SWL, CMB-BLKY, CONS, (HD), (MID), S: FSL-CRSSL, PRED FSL, SRT, NIL FLU
4463,0	25	CLST, DK RED BRN, (SLT), S, NON SWL, CMB, CON, (HD), MIC, S: FSL-CRSSU, (SRT), NIL FLU
4473,8	20	CLST, DK RED BRN, (SLT), S, NON-SWL, CMB-BLKY, CONS, (HD), (CALC), MIC, S, FSL-CRSSU, (SRT), NIL FLU
4488,2	20	SST, (POR), DK RED BRN, FSL-CRSSL, PRED FSU, SRT, (ANG), (ELONG), CMB, CMT, QTZ-ARG CMT, (HD), ARG, PRED CLR FRST-QTZ, ABNT RED BRN INTESTIT CL, MIC-MUSC, OCC ORNG FELD, OCC DK GY SCHIST FRAG, NIL FLU
4504,6	20	SST, (POR), LT RED BRN, FSL-MSU, PRED MSL, SRT, (ANG), (ELONG), CMB, CMT, QTZ-CALC CMT, PRED QTZ CMT, (HD), (CALC), PRED FRST QTZ, ORGN FELD, (MIC), FG BLK HEAVY MIN, OCC GN METAM FRAG, OCC GY GN INTERSTIT CL, NIL FLU
4518,6	20	SST, POR, MED RED BRN, FSL-CRSSL, PRED FSU, SRT, (ANG), (ELONG), CMB, CMT, QTZ-CALC-ARG CMT, (HD), ARG, (CALC), PRED CLR QTZ, OCC ORNG FELD, MIC, OCC FG BLK HEAVY MIN, OCC DK GN METAM FRAGM, ABNT RED BRN, OCC GY GN INTERSTIT CL, RED BRN CLST FRAG, NIL FLU
4524,5	20	CLST, DK RED BRN, S, NON-SWL, CMB, CONS, (HD), (MIC), S: FSL-MSL, SRT, W FG BLK HEAVY MIN, NIL FLU

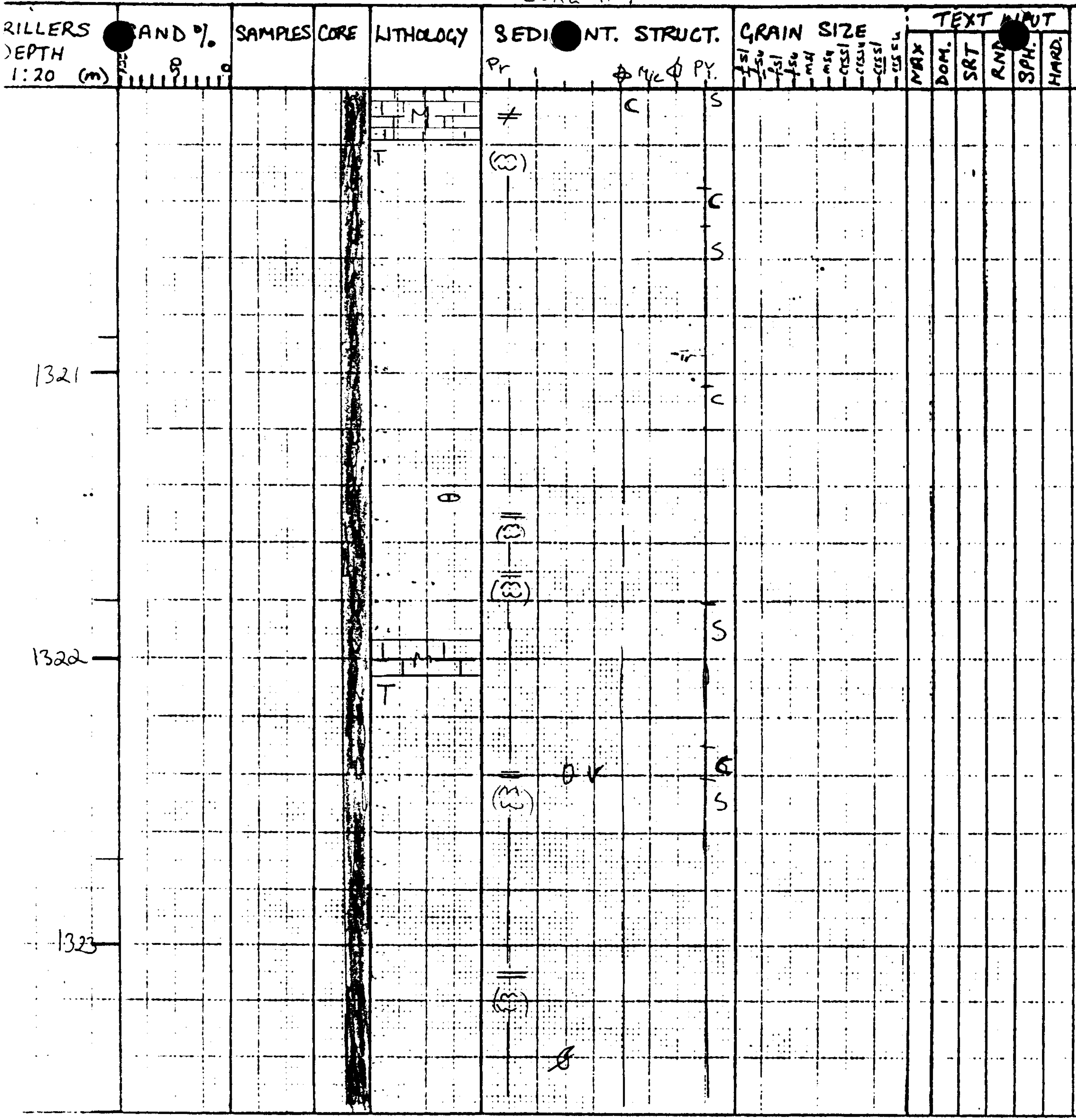
4550,3	20	SST, (POR), LT RED BRN, FSL-CRSSU, PRED MSU, SRT, (ANG), (ELONG), (SPH), CMB, CMT, QTZ+ CALC, CMT, PRED QTZ, CMT, (HD), (ARG), (CALC), PRED FRST QTZ, RED BRN STN QTZ, ORNG FELD, FG BLK HEAVY MIN, OCC DK GY SCHIST FRAG, (MIC) MUSC RED BNR OCC GY GN INTERSTIT CL, NIL FLU
4637,3	20	SST, (POR), LT RED BRN, FSL-CRSSU, (SRT), ANG, (ELONG), CMB, CMT, QTZ CMT, HD, PRED CLR-FRST QTZ, ABNT ORNG FELD, FG BLK HEAVY MIN, OCC GY GN-RED BRN INTERSTIT CL, CONTACT W RED BRN CLST ON EGE OF SAMPLE, NIL FLU
4813,0	20	CLST, DK RED BRN, S, HYGROCLASTIC, BLKY-CMB, CONS, (HD), MIC, S AS ARG SST LENSE: FSL_FSU, PRED FSL, SRT, NIL FLU
4860,7	20	CLST, MED DK RED BRN, NON-SWL, ANG-BLKY, CONS, (HD)-HD CALC MED RED BRN ZONES CALC, HD (CONCR) W OCC WH CALC INCL, NIL FLU
4873,0	25	CLST, DK RED BRN, NO-SWL, BLKY, CONS, HD, MIC, NIL FLU
4910,0	20	CLST, DK RED BRN, SLT, NON SWL, BLKY-ANG, CONS, HD, MIC, NIL FLU
4928,0	20	SST, (POR), LT GY GN, FSL-CRSSL, PRED FSU, SRT, (ANG), (SPH), CMB, CMT, QTZ-ARG, CMT, PRED QTZ CMT, HD, PRED CLR QTZ, OCC ORNG FELD, (MIC)-MUSC, FG BLK HEAVY MIN, GY GN INTERSTIT CL, NIL FLU
4941,8	25	SLTST, DK RED BRN, S, CMB, CONS, FRI, MIC, (MUSC) S: FSL, SRT, ANG, (ELONG), NIL FLU
4960,8	20	SST, (POR), LT GY GN, SPK ORNG, FSL-SPBL, PRED FSL, (SRT), (ANG), (SPH), CMB, (CMT), QTZ-ARG CMT, (HD), PRED CLR QTZ, ORNG FELD, OCC DK GY SCHIST FRAG, OCC FG BLK HEAVY MIN, GY GN INTERSTIT CL, OCC DK RED BRN CLST FRAG, OCC YEL GN METAM FRAG, (MID)-MUSC, NIL FLU
4988,3	26	SST, (POR), DK RED BRN, SLT-CRS SL, PRED FSL, (SRT) (ANG), (ELONG), CMT QZT-ARG CMT, PRED ARG CMT, (HD), ARG, PRED FRST QTZ, MIC, ABNT DK RED BRN INTERSTIT CL, OCC GY GN METAM FRAG, NIL FLU
5002,0	8	CLST, DK RED BRN, SLT, NON SWL, BLKY, CONS, HD, (MIC), NIL FLU

Core Description Sheets

31/2-4

31/2-4
Exploration Well Resume
Enclosure No. 3

CORE #1



DESCRIPTION

Lmdst, ltgygn. slt, hd, Calc

Clst, medgygn, smooth-(fis), cons
frm, slt, py, weakly lam. i.e
lighter and darker colours.
hygroturgid

1cm layer oxydized py

4 1-5mm thick lt brn,
lamina with oxydized Fe min

Calcerous nodule with rim of
lt brn Fe min : Siderite ?

Jr mS-crsS, ω_{3}

Lmdst a.a. but with brn
ferraginous 1cm big spheres

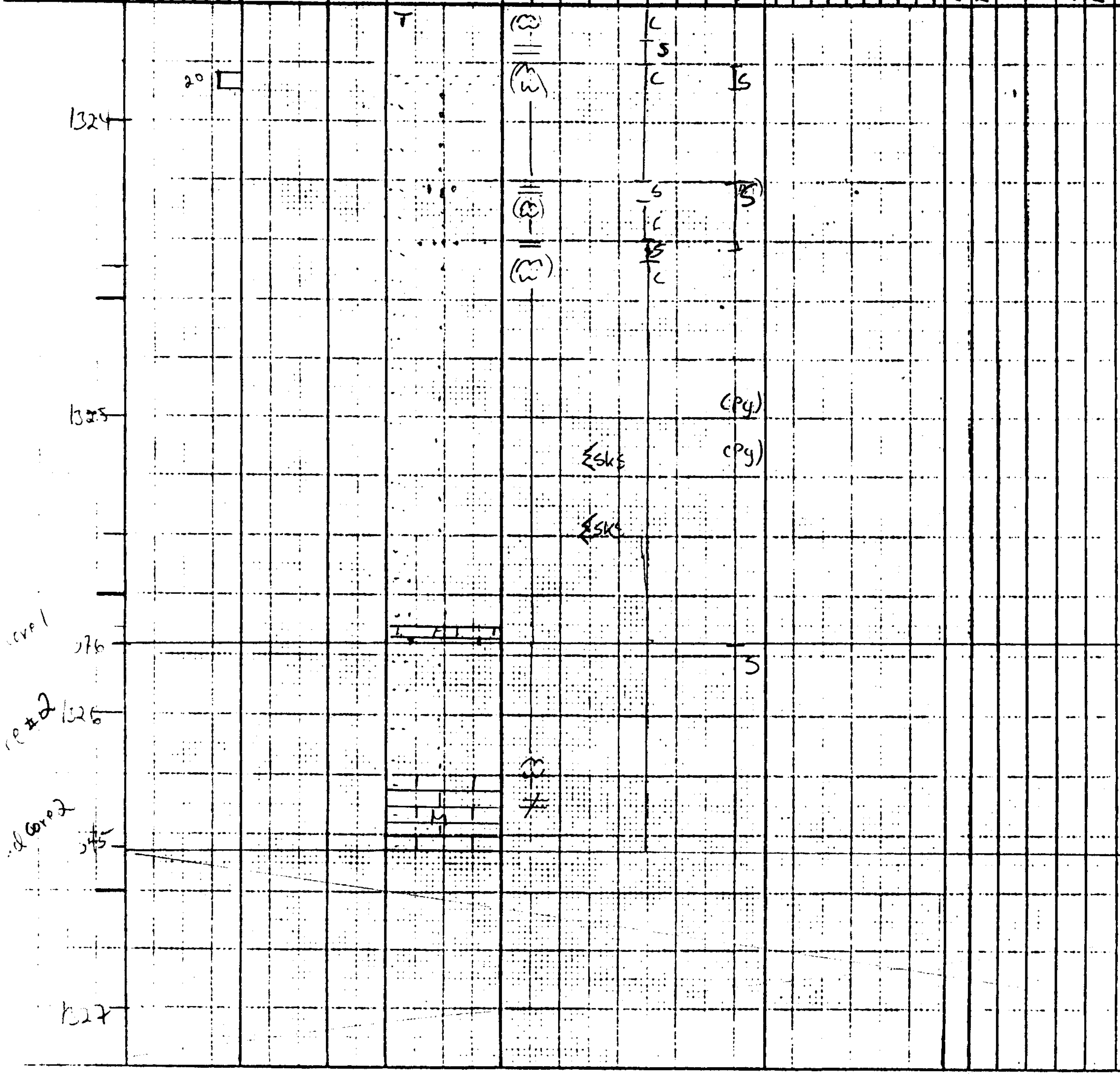
Clst a.a

Lam. gy brn with wh non
calc soft spots.
occ mm sized darker lenses

PALAEO

MUD

RILLERS DEPTH 1:20 (m) | SAND % | SAMPLES | CORE | LITHOLOGY | SEDIMENT. STRUCT. | GRAIN SIZE | TEXTURE: MAX. DOM. SRT. RND. SPH. HARD. | DESCRIPTION | PALAEO | MUD



Clst, med gy, gn, smooth (fis), (hygroturq)
cons. firm, slt. py, weak lam. occ mm
lenses of darker colours. Tr. Org S
Sandy, silty clst. lt brn

(mmics)

Tr S, + hqtz granule

Slickenside: dip ~ 70°

LMcst, hd
2-3cm big brownish spheres

RILLERS EPTH 1:20 (m)	SAND % 100 50 0	SAMPLES	CORE	LITHOLOGY	SEDIMENT. STRUCT.	GRAIN SIZE vfsl vfsu fsl fsu msl msu csl csu vcsl vcsu	TEXT[illegible]UT MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
1328															
1329															
1330															

RILLERS DEPTH 1:20 (m)	SAND % 100 50 0	SAMPLES	CORE	LITHOLOGY	SED ENT. STRUCT.	GRAIN SIZE vfsl vfsu fsl fsu msl msu csl csu vcsl vcsu	TEXT UT MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
1331															
1332															
1332															
1333															

RILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	CORE	LITHOLOGY	SED[illegible]ENT. STRUCT.	GRAIN SIZE	TEXT [illegible]PUT						DESCRIPTION	PALAEO	MUD
	50 0						MAX	DOM.	SRT	RN[illegible]	SPH.	HARD.			
1334															
														H	
1335															
1336															
1337															

RILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	CORE	LITHOLOGY	SEDIMENT. STRUCT.	GRAIN SIZE	TEXT UT MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
1338													Clst, mod gy gn (ang) - (fis), bnygretnrg id, cons, frm, (mmic), ((c calc))) irreg. bedding with lenses of darker mat. 3 mm thicklamina 1-2cm big lump of dk brn Clst, cons. frm, (((calc)))	H	
1339													Microloss. Lmdst, gy-lt brn, CaCO$_3$ filled 1mm thick fractures dipping 0-45°; hd with spherical lt brn concretions Sideritic? Frac: dip 0-90°, Breccia: sharpangled ~~Varingated~~ lumps Clst a.a		
1340															

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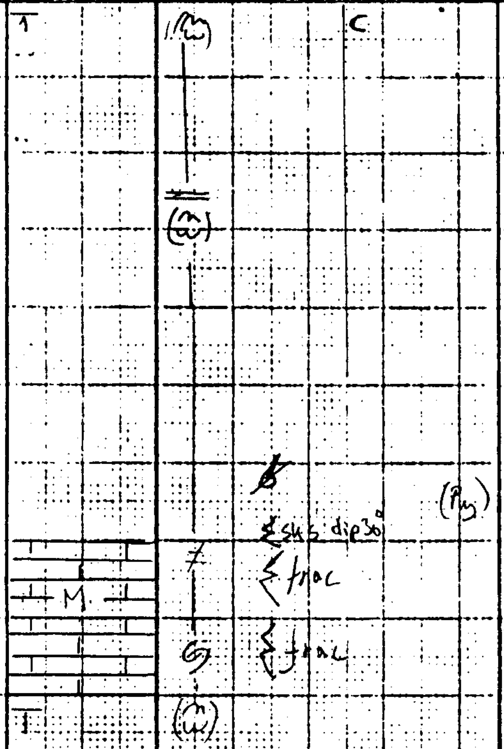
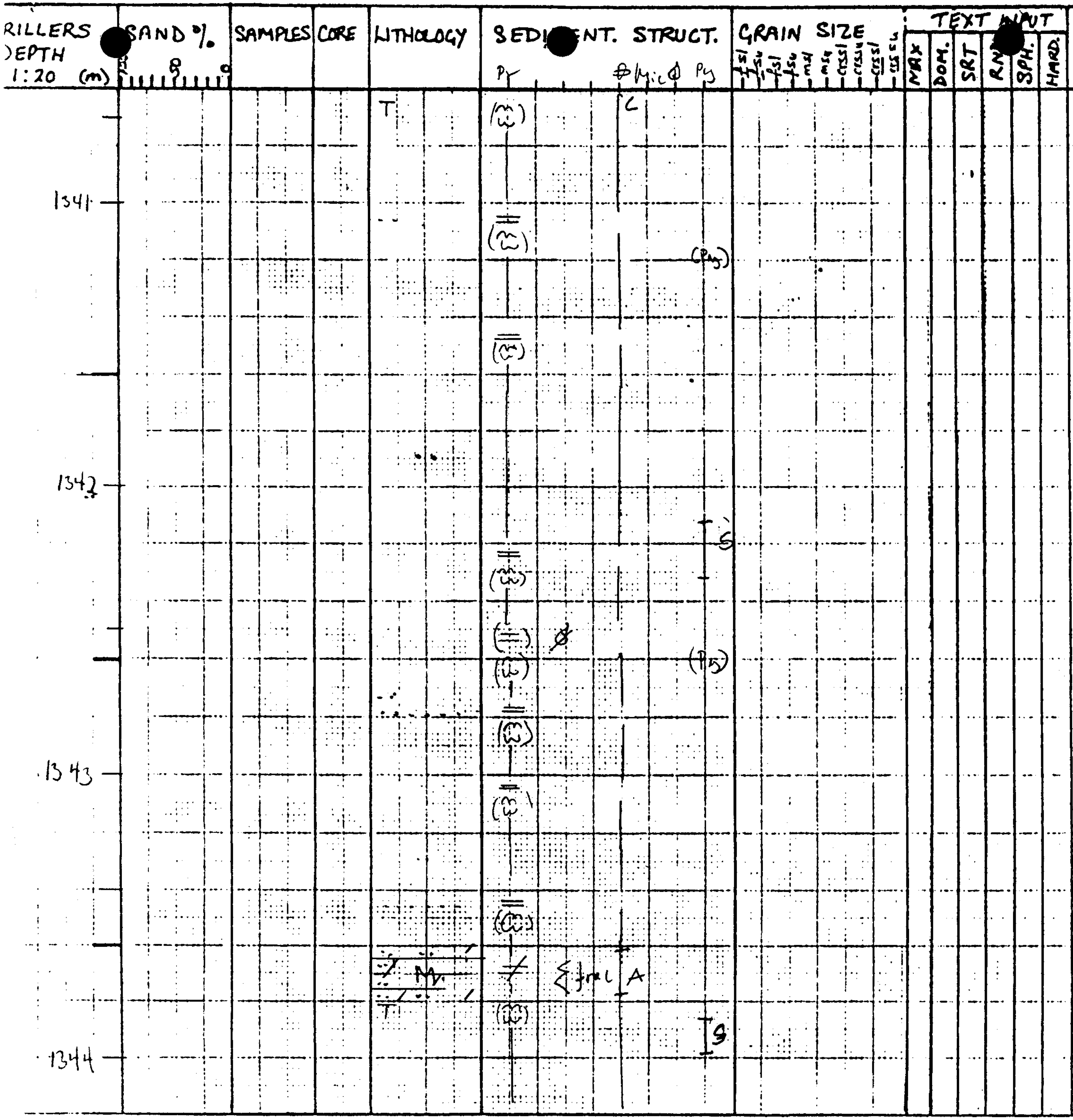




DESCRIPTION | PALAEO | MUD

Clst, med gy gn, burgd (fis), lingrotury id, cons, frm, (mmnic), (((calc))). 1cm sized darker lenses

3mm thick dk brn layer

Clst a.a

Qtz grain

H

½cm brown sph. spots; Clst

Foraminifera

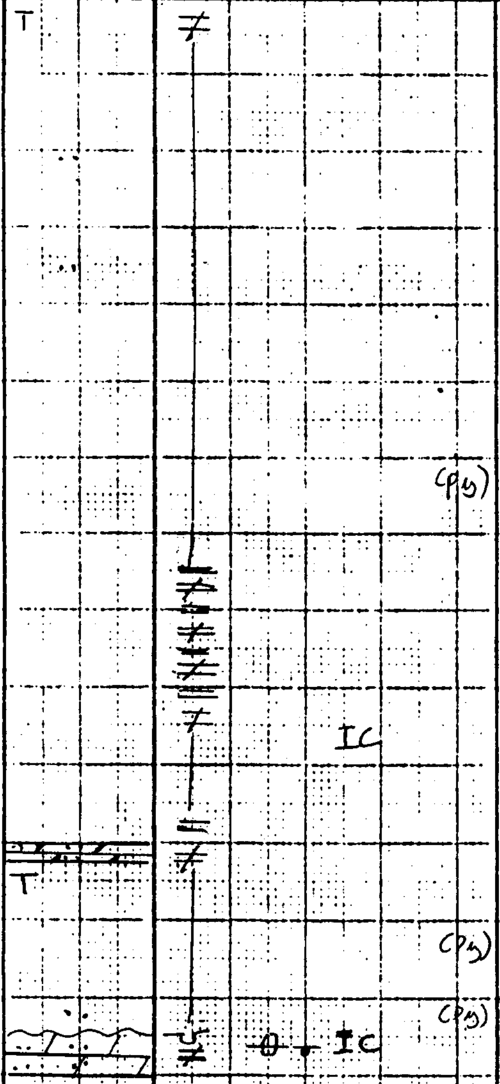
1cm thick silty sandy layer

l. ms Translluc Qtz grain

mm thick layer of brn fsh, srt

1mm thick fractures dipping 0–30° in (lt) brn dolomitized, sideritized silty mudstone, burrows

RILLERS DEPTH 1:20 (m) | SAND % | SAMPLES | CORE | LITHOLOGY | SEDIMENT. STRUCT. | GRAIN SIZE | TEXTURE: MAX, DOM., SRT, RND, SPH., HARD. | DESCRIPTION | PALAEO | MUD



1345

1346

.nd core 3
re #4 1347

Clst, med gy gn, (aug)-(fis), lag grotur gid, Cous. frm, (mmic), (((calc))), ((mmic))

H

occ. mm sized variagated lenses

lindineations of wh sandsized soft, clayey dots

variagated horis.-vert. lenses

Lineation of wh. dots a.a.

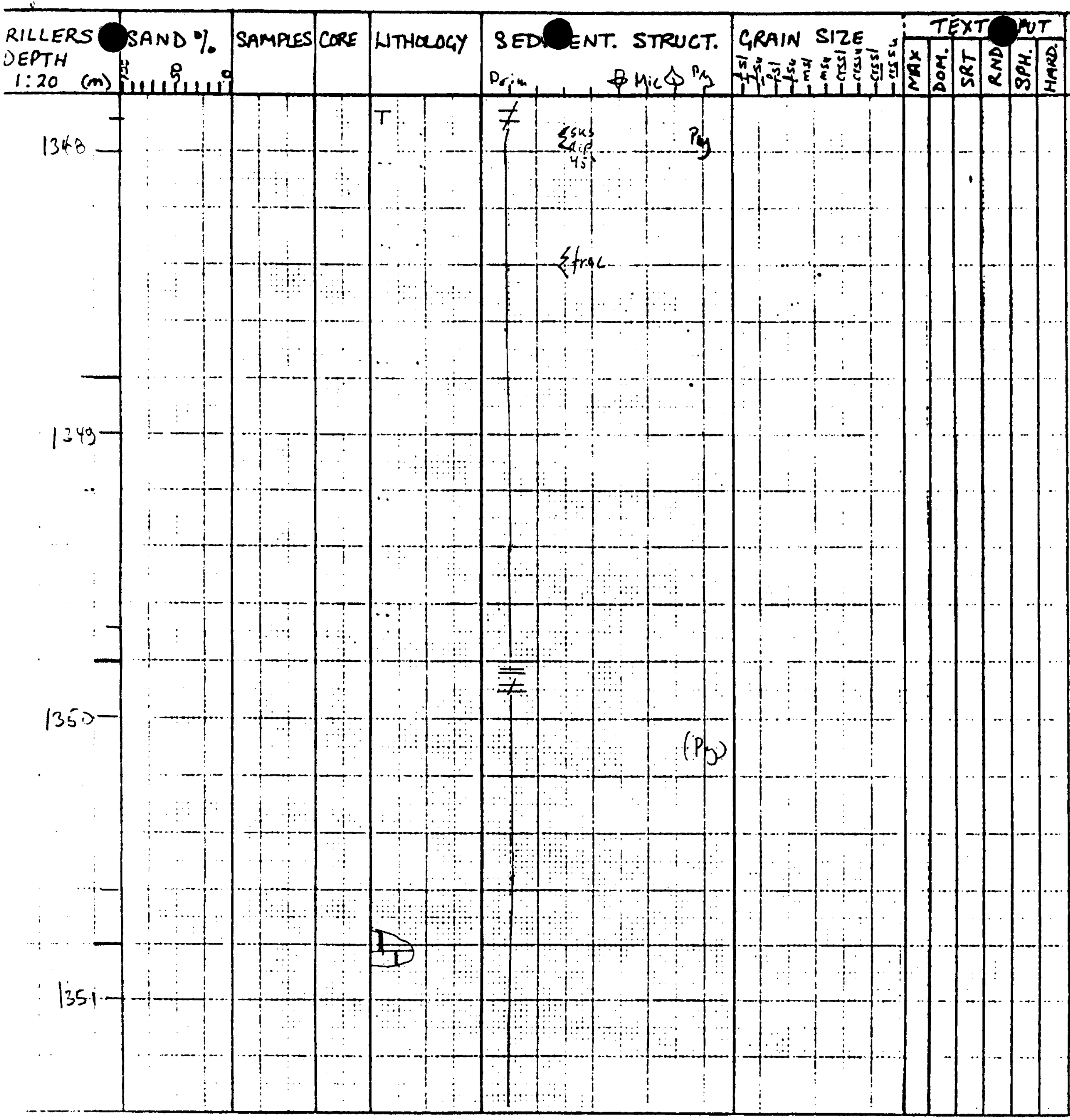
Lt brn sand dolomitized Lmdst, hd, sideritic?

Clst a.a.

Translusc. qtz 3 grain

Iregular boundary: hardground? with boring?

Gy (brn) silty dolimitized mudstone with burrows



DESCRIPTION

PALAEO

MUD

clst, (dk) gy gn, (ang) (fis), hygroturg, cons, frm ((mmic)) ((calc)).

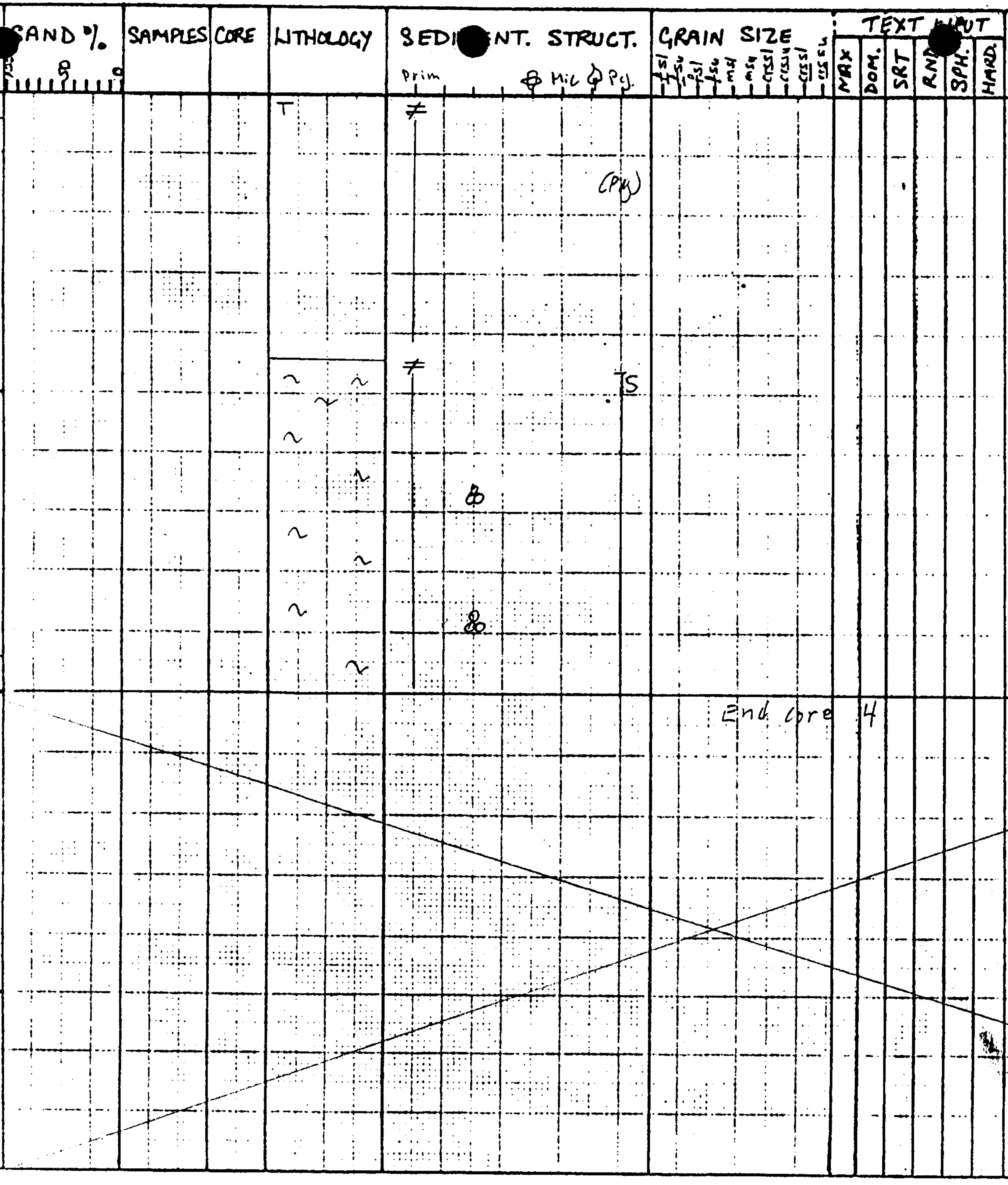
~~1mm~~ fS filled fracture, dip 20°

H

Lmdst, buff, hd

RILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	CORE	LITHOLOGY	SEDI ENT. STRUCT. Prin Mic Py.	GRAIN SIZE	TEXT INPUT MAX	 DOM.	 SRT	 RN	 SPH.	 HARD.	DESCRIPTION	PALAEO	MUD
				T	≠								Cst, (dk) gy gn. (ang) (fis), hygrokarg, cons. frm. (mm cl) (((calc)) - (calc)		
1352															
					{SKS								SkS, dip ~20°		
														H	
1353															
					(=) ≠										
													3x1cm lump of brn Sst, fS, srt		
1354															
					Py								5X10 mm py concretion		

RILLERS
)EPTH
1:20 (m)



DESCRIPTION

Clst, (lt) gygn, (ang) (fis) blk,
(hygrotungid, cons. frm,
((mmic)), ((calc))

1356

Sharp contact
Marl, (lt gygn, (ang) smooth
brk, cons. frm, (hygroturg),
Calc

Foraminifera

Mottled med gygn - ltbrn

PALAEO
H

MUD

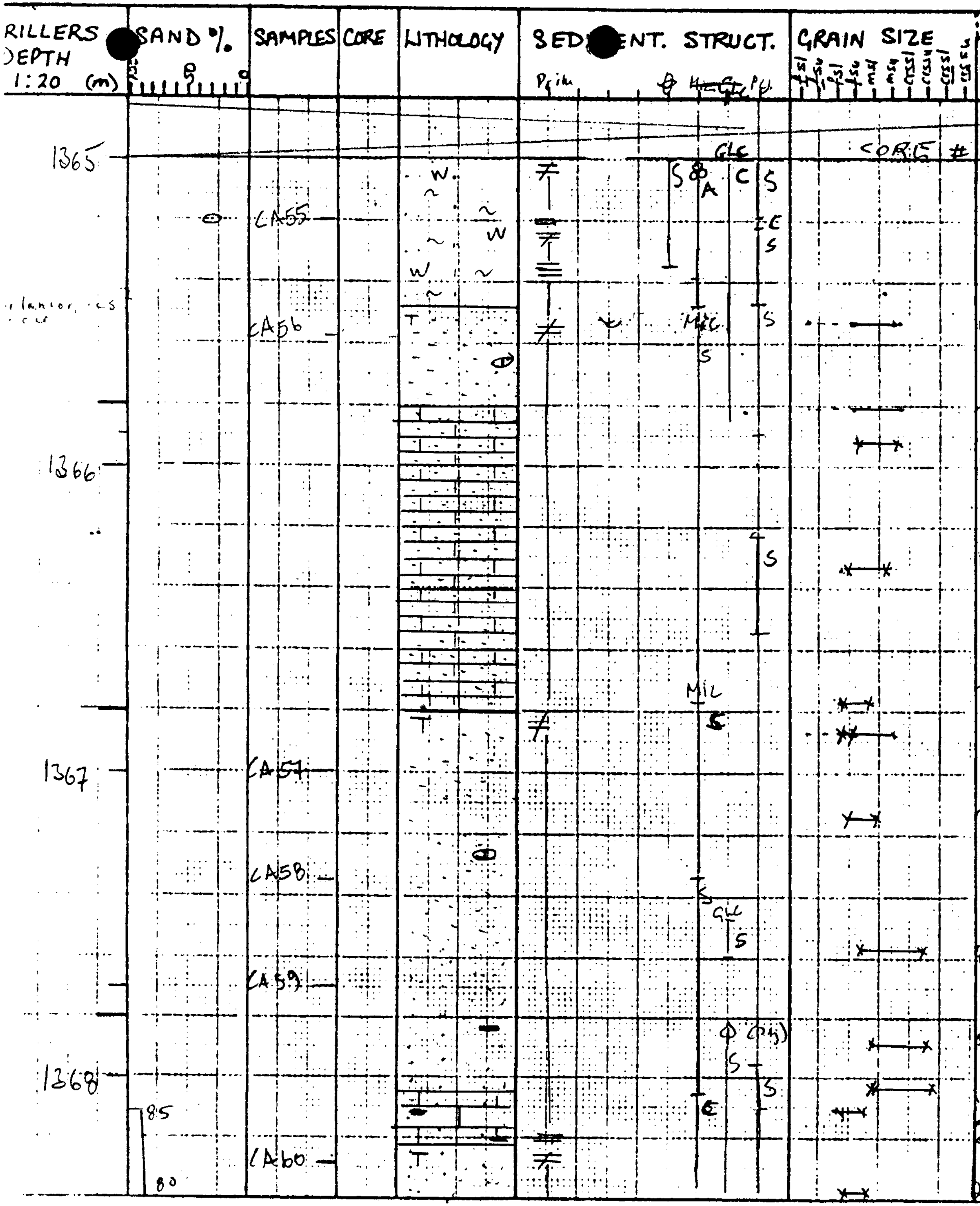
1357

End core 4

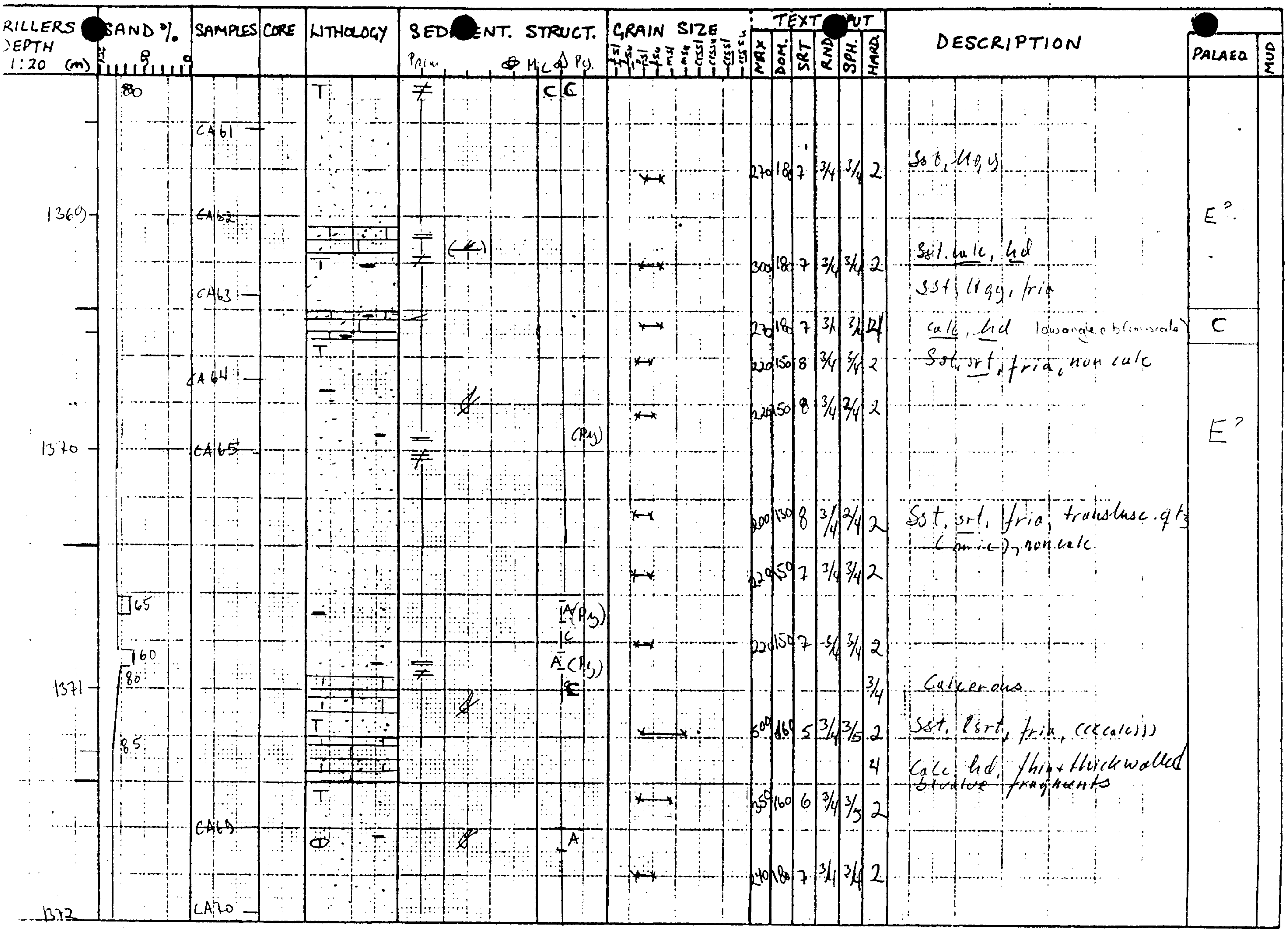
1358

RILLERS DEPTH 1:20 (m)	SAND % 100 50 0	SAMPLES	CORE	LITHOLOGY	SEDIMENT. STRUCT.	GRAIN SIZE	TEXT INPUT MAX	TEXT INPUT DOM.	TEXT INPUT SRT	TEXT INPUT RND	TEXT INPUT SPH.	TEXT INPUT HARD.	DESCRIPTION	PALAEO	MUD
1359															
1360															
1361															
1362															

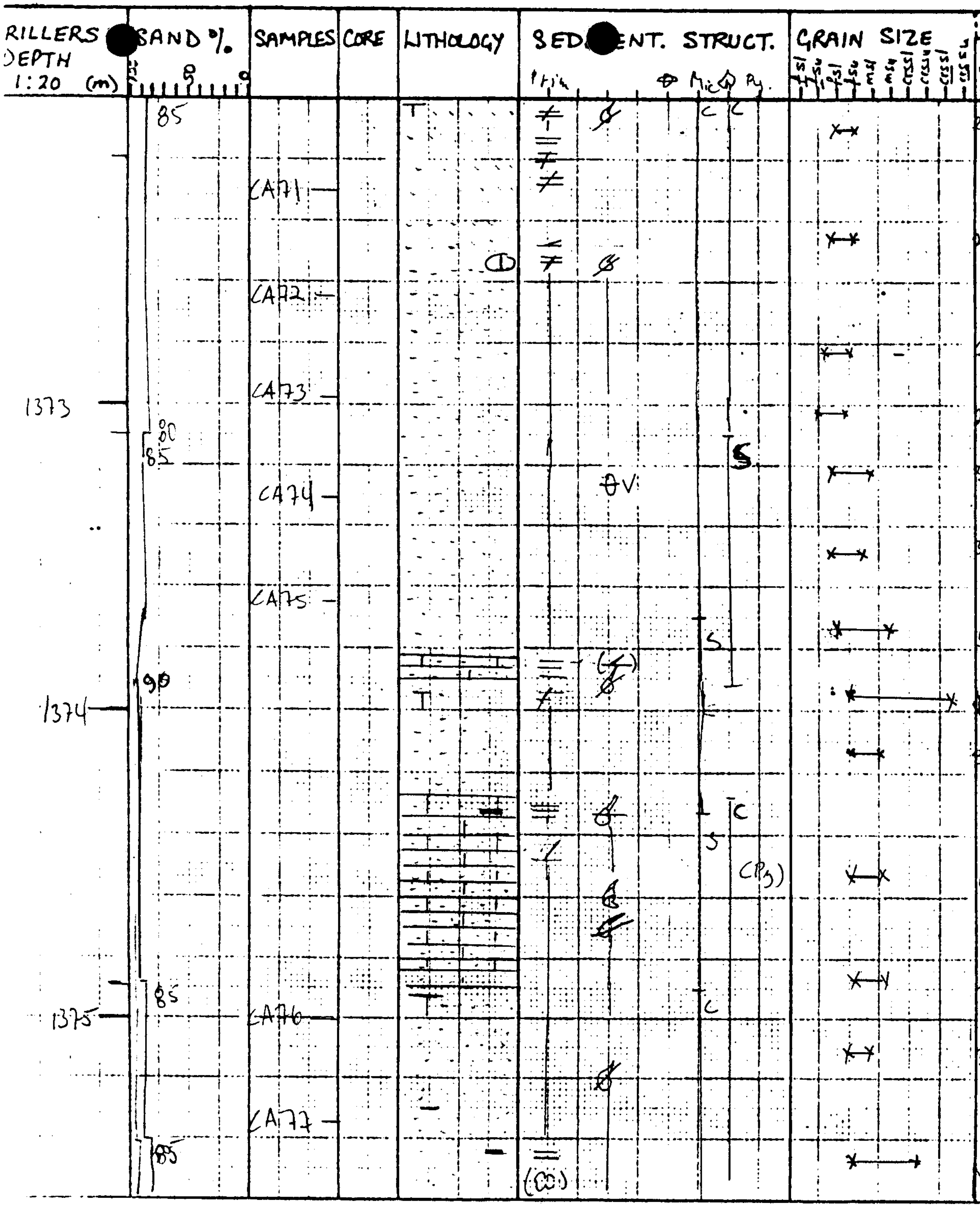
RILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	CORE	LITHOLOGY	SED ENT. STRUCT.	GRAIN SIZE	TEXT PUT MAX	DOM.	SRT	RN	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
1363															
1363															
1364															



TEXT INPUT								
MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
						~~/Echinoderm spine wackestone~~		
						Mrl, ltgygn, smooth, hygroturg, cons, fria-med hd, calc, glc, cpy), (Slt), (s) (calcite xtls), occ. lam. darker lenses, occ. wh. clr. big chalk pieces, lam. lenses often showing soft sed. deformation	?	
600	200	3	3	3/4	2	Sst, ltgy, fsd-crs sd, srt (ang), (sph)-rnd), transl. qtz tr py, rglc)		
700	200	4	3	3/4	4/5			
600	270	5	3	3/4	4/5	Calc Sst, ltgy, hd		
400	180	6	3/4	3/4	4/5		D ?	
300	180	6	3/4	3/4	4/5			
500	180	5	3/4	3/4	2	Sst, ltgy, ((mic)), tr roseqtz		
330	230	6	3/4	3/4	2	Sst, fsd- msd, tr. chlorite		
800	290	4	3/4	3/4	2	Sst, ltgy, fsd- crs sd		
800	380	4	3/4	3/4	2	pyritized wood fragm.		
1000	320	4	3/4	3/4	4			
300	180	7	3/4	3/4	4		E	
260	160	7	3/4	3/4	2	Sst, ltgy, fria, (mic)		



TEXT UT MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO
270	180	7	3/4	3/4	2	Sst, llq,y	
							E?
300	180	7	3/4	3/4	2	Ssl. calc, hd	
						Sst, llqy, fria	
270	180	7	3/4	3/4	2/	calc, hd lowangle x bl (m-scale)	C
220	150	8	3/4	3/4	2	Sst, srt, fria, non calc	
220	150	8	3/4	2/4	2		E?
200	130	8	3/4	2/4	2	Sst, srt, fria, translusc. qtz (mic), non calc	
220	150	7	3/4	3/4	2		
220	150	7	3/4	3/4	2		
					3/4	Calcerous	
500	160	5	3/4	3/5	2	Sst, lsrt, fria, ((calc))	
					4	Calc, hd, thin + thickwalled bivalve fragments	
350	160	6	3/4	3/5	2		
240	180	7	3/4	3/4	2		



TEXT INPUT

MAX	DOM.	SRT	RND.	SPH.	HARD.
250	180	7	3/4	3/4	2
270	170	7	3/4	3/4	2
250	150	7	3/4	3/4	2
200	125	7	3/4	3/4	2
350	180	6	3/4	3/5	2
300	180	7	3/4	3/4	2
500	200	6	3/4	3	
1400	250	5	3/4	3/5	2
360	200	6	3/4	3/5	2
400	200	6	3/4	3/5	4
400	207	6	3/4	3/5	4
300	200	7	3/4	3/4	2
600	180	5	3/4	3/5	2

DESCRIPTION

dip ~ 15°-20°
Thin walled bivalve fragm.

Sst, gy, slt-msn,
8cm long 4mm thick Endichnia
(clay filled burrow)

Calcareous
Sst, gy, fria

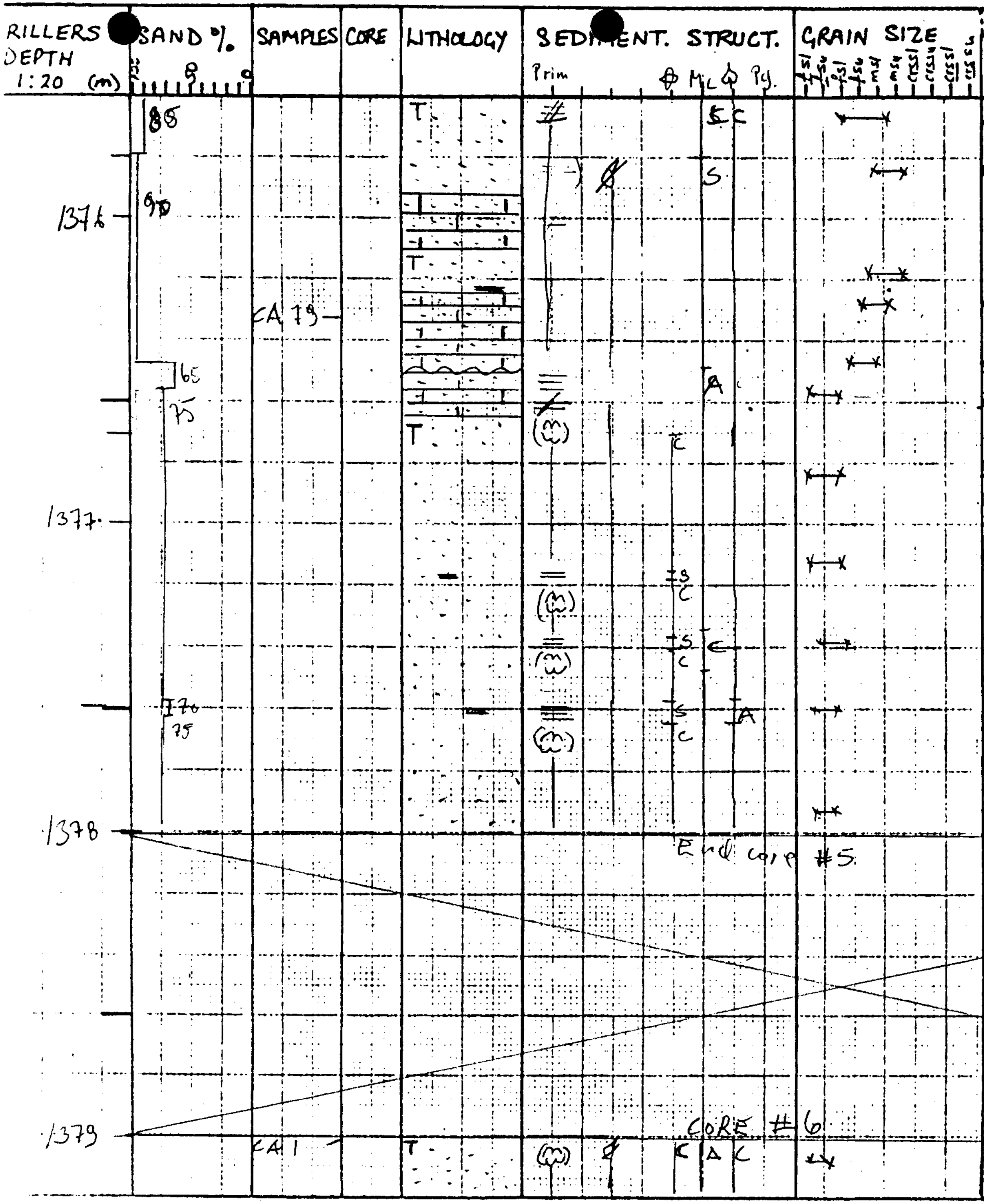
~~gastropod~~
(dm-scale cross-bedding)

~~Thick~~ walled bivalve fragments

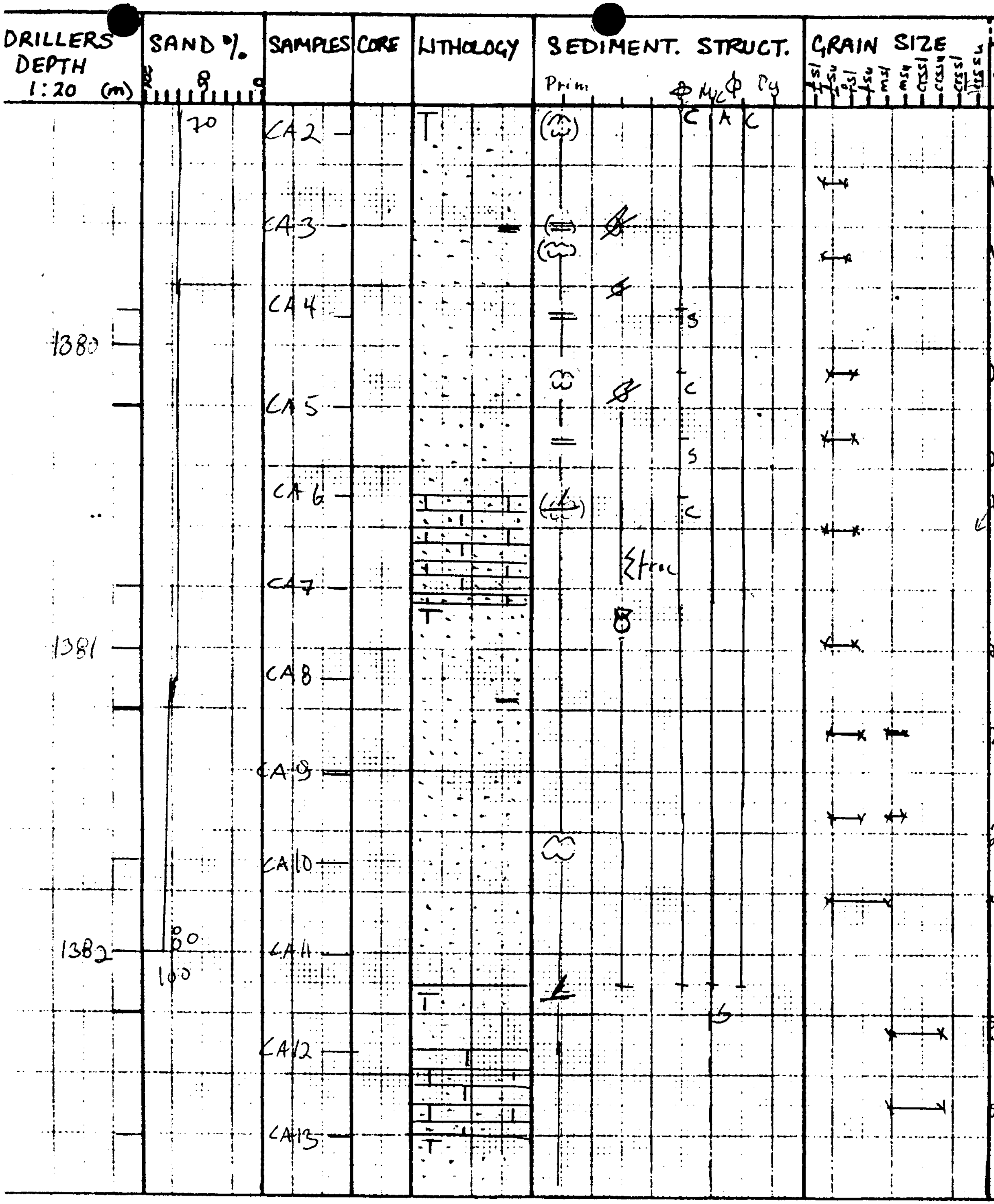
PALAEO | MUD

E

D



TEXTURE						DESCRIPTION	PALAEO	MUD
MAX	DOM.	SRT	RND	SPH.	HARD.			
400	180	6	3/4	3/5	2	Sst, gy, slt-crssl, srt, fria (m,c), carb, transl. qtz	(loose)	
600	350	6	3/4	3/5	2	milk qtz, ((fsp)), ((calc)) dm-scale cross-bedding		
					3/4	Thick + thin walled bivalve fragments	D	
600	300	6	3/4	3/5	3	~~dm-scale cross-bedding.~~		
400	250	6	3/4	3/4	3/4	Calc sst, gy		
300	180	7	3/4	3/4	3/4			
200	100	7	3/4	3/4	4	well lam. lt-dk gy		
200	125	7	2/4	3/4	2	Sst, gy, srt, mic, carb		
190	125	8	2/4	3/4	2	Generally small bivalve fragments	E	
240	150	7	2/3	3/4	2			
150	100	8	2/3	3/4	2			
180	125	8	2/3	3/4	2	Sst, gy, slt-fsu, srt, mic, carb, transluc. qtz		
160	100	8	3/4	3/4	2		E	



TEXT INPUT

MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION
150	100	8	2/4	3/4	2	
160	100	8	2/4	3/4	2	Sst, qy, slt- fsu, srt, mic, carb ((calc))
200	120	7	2/4	3/4	2	
200	120	7	2/4	3/4	2	
190	110	7	2/4	3/4	4	Sst. lt qy. calc. bd
						mm thic CaCO3 filled fracture dm-scale cross bedding
200	100	6	2/4	3/4	2	Abundant bivalves; often thick walled, one ostrocode? at 1380,96
250	100	6	2/4	3/4	2	Sst, qy, mic, carb, ((calc)) slt- msu
250	100	6	2/4	3/4	2	
350	110	5	2/4	2/5	2	S st, qy, fsu-msu, srt, mic carb, abundant bivalves (dm-scale cross-bedding.
300	100	6	3/4	3/5	1/2	Sst, lt qy (brn), fsu-crs su Transl, milk qt3, (rose qt3) non calc
300	35	6	3/4	3/5	1/2	Calc Sst. lt qy. bd

PALAEO

E

D

MUD

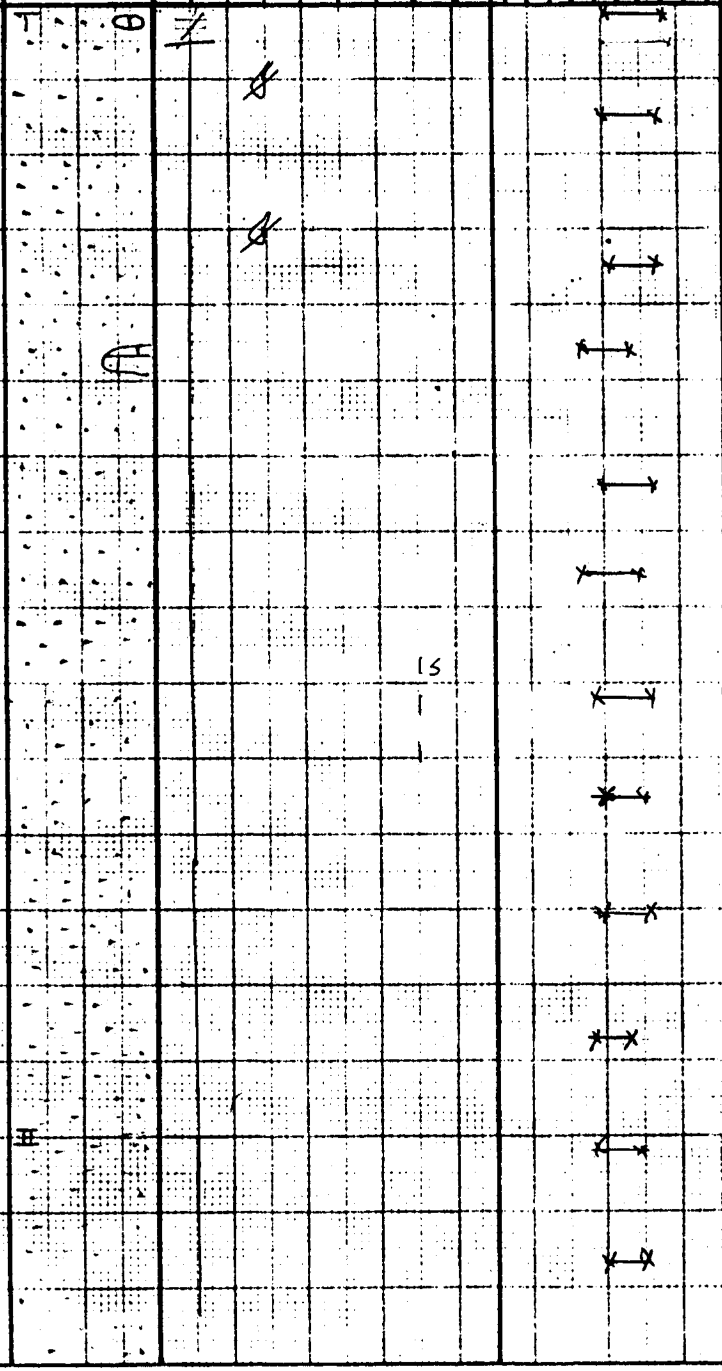
dm -scale cross-bedding
Surface generally (partly) covered by mudcake

DRILLERS DEPTH 1:20 (m) | SAND % | SAMPLES | CORE | LITHOLOGY | SEDIMENT. STRUCT. | GRAIN SIZE | TEXTURE INPUT | DESCRIPTION | PALAEO | MUD

DRILLERS DEPTH: 1383, 1384, 1385, 1386

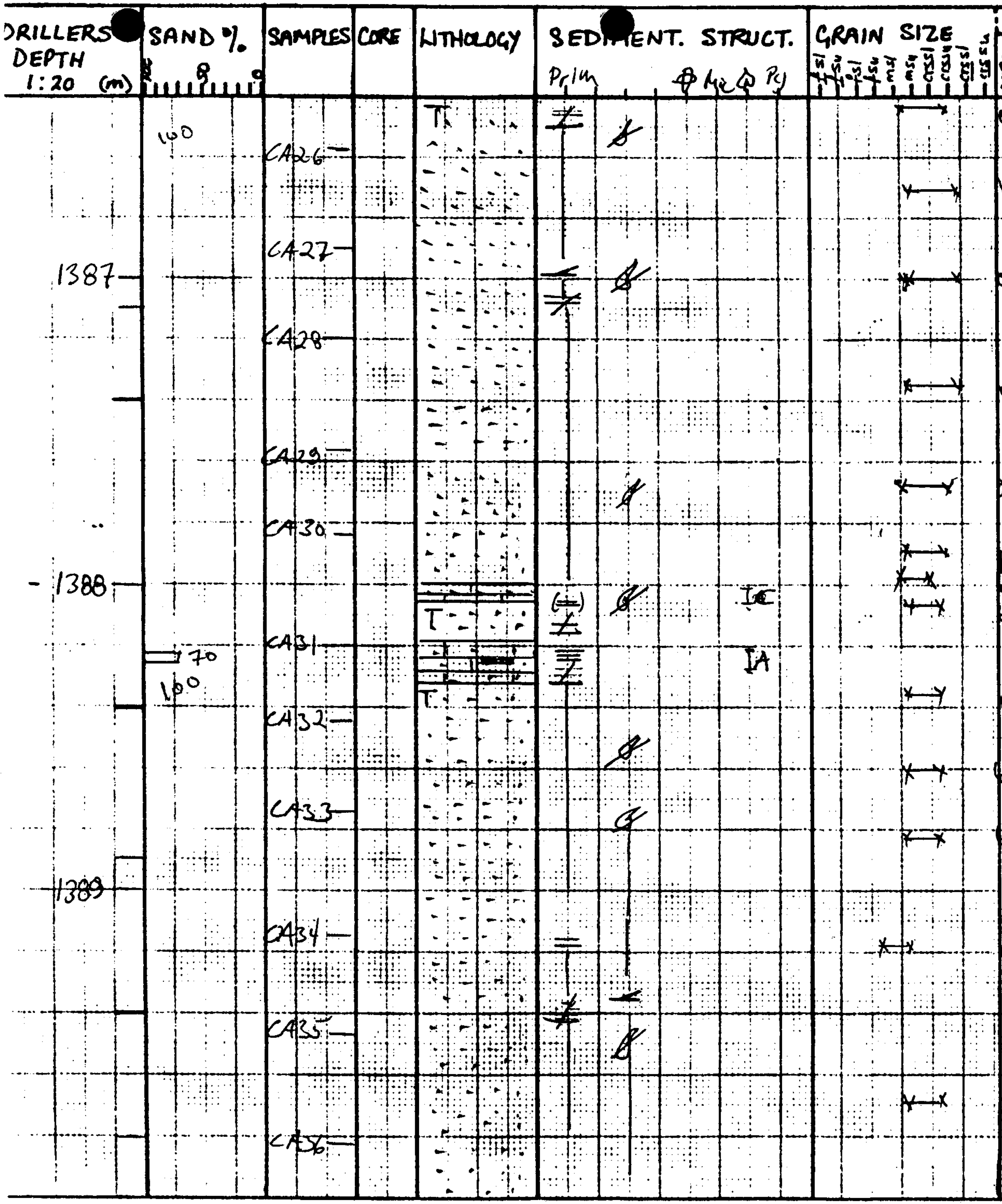
SAND %: 100

SAMPLES: CA14, CA15, CA16, CA17, CA18, CA19, CA20, CA21, CA22, CA23, CA24, CA25



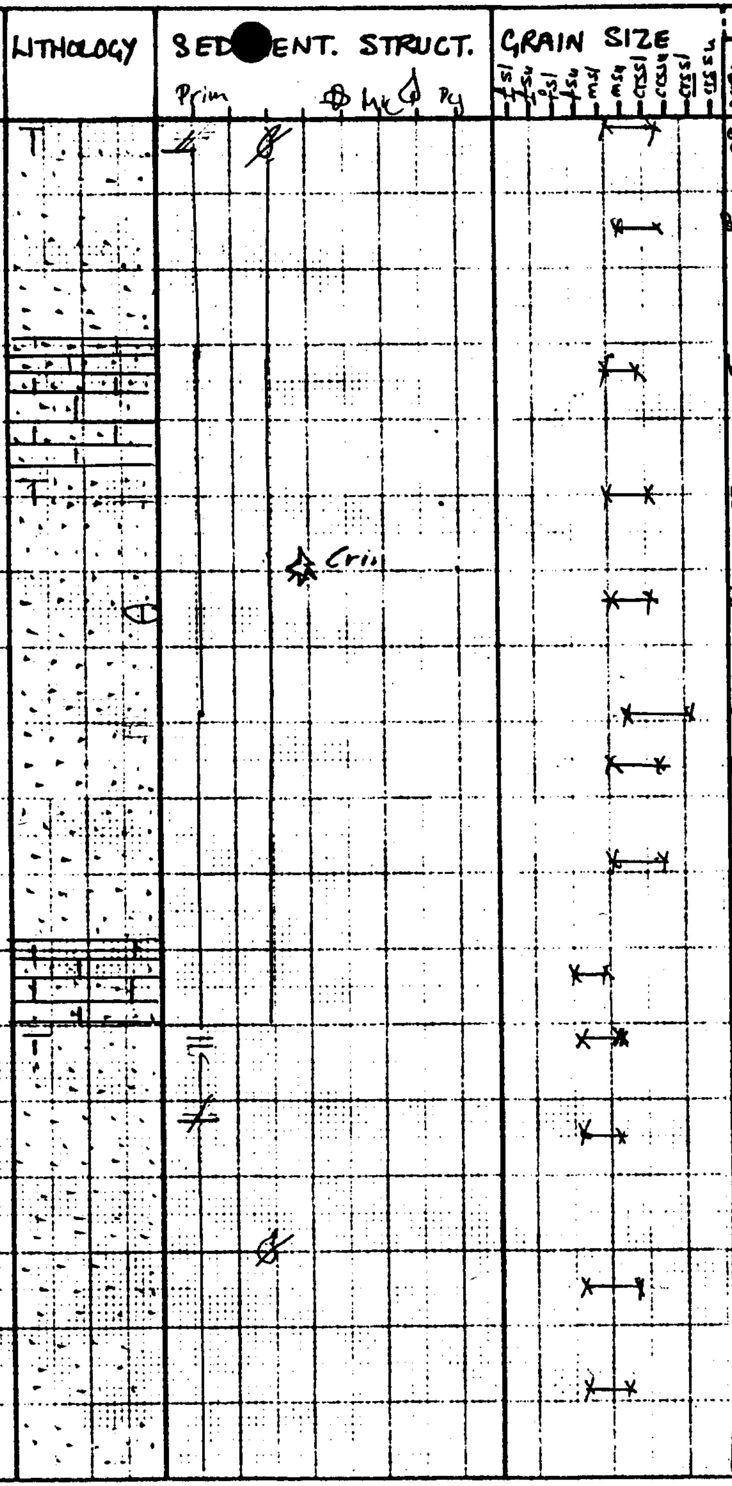
MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO
1100	400	6	3/4	3/5	1/2	Sst, qy, srt, (loose)-fria, (((mic))), translucent qtz, (milk qtz) (((fsp))), (((carb))), noncalc-calc qtz with mineral (rutile?) inclusions. Tr lid. siltst fragments dm scale cross-bedding	
800	370	6	3/4	3/5	1/2		
800	360	6	3/4	3/5	1/2		
480	300	6	3/4	3/5	2	Sst a.a.	
800	350	6	3/4	3/5	1/2	Sst, fsL-crsSL a.a	D
700	220	7	3/4	3/5	2	Sst, fsL-crsSL, noncalc-(((calc)))	
900	340	6	3/4	3/5	2	Sst, qy, fsL-crsSL, fria. noncalc, (((mic))) (((carb))), translucent qtz, smoke qtz, milk qtz qtz with mineral inclusions	
700	370	6	3/4	3/5	1/2	S/Sst a.a., qy(brn)	
800	380	6	3/4	3/5	2	Sst qy a.a.	
500	320	6	3/4	3/5	2	Sst, qy, fsL-crsSL	
600	300	6	3/4	3/5	2/3	Sst, brn qy, fsL-crsSL Tr roseqtz (calc)-calc	
800	400	5	3/4	3/5	2	Sst, qy, (((calc)))	

(dm - scale cross bedding)

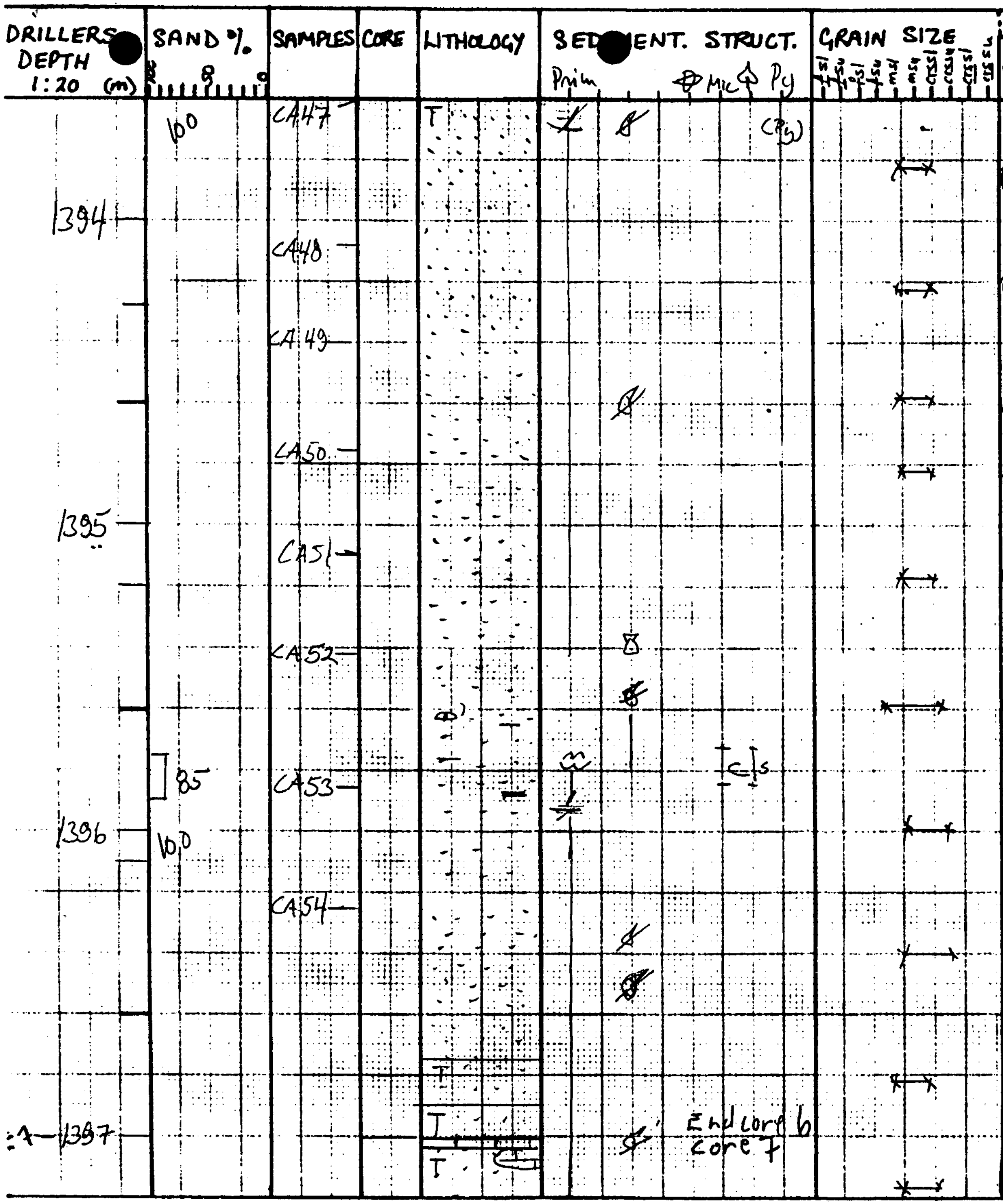


MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
900	400	6	3/4	3/5	2	Sst, gy (brn), fsL-crs sL, srt, Translucent qtz, milk qtz		
1000	450	5	3/4	3/5	1/2	Smoke qtz, ((fsp)), (((mic))), (((carb))) Qtz with min. inclusions noncalc - (((calc))), Tr rose qtz		
900	450	6	3/4	3/5	2	Dip ≈ 15° dm-scale cross-bedding		
1000	420	6	3/4	3/5	1/2	Sst/Ss, gy		
900	370	6	3/4	3/5	1/2	Sst/Ss, gy brn, fsL-crs sL		
650	360	7	3/4	3/5	2		D	
450	300	6	3/4	3/5	2			
600	340	6	3/4	3/5	3/4			
650	350	6	3/4	3/5	2	Sst, gy, fsL-crs sU, non calc - (((calc)))		
650	320	6	3/4	3/5	2	small bivalve(?) fragments dm-scale cross bedding		
600	320	6	3/4	3/5	2			
400	240	7	3/4	3/5	2	Sst, gy, fsU-msU, domin. transl. qtz (((fsp))), (((carb))), (((mic))), non calc gy brn dm-scale cross-bedding		
500	340	6	3/4	3/5	2	Sst, fsL- crs sL, gy a a Generally small & thin shell fragments dm-scale cross-bedding		

dm - scale cb ↓

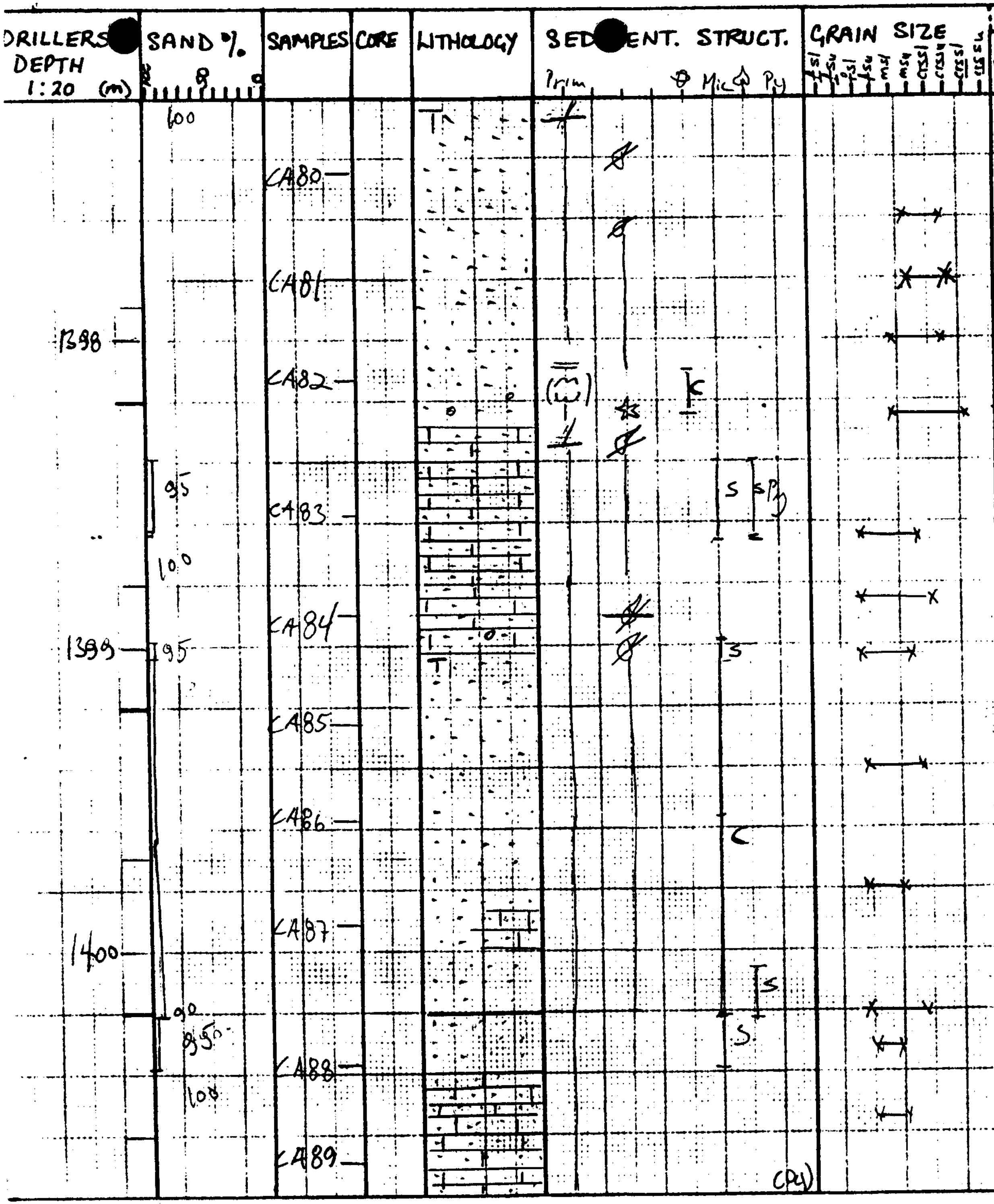


DRILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	CORE	MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
1390	100	CA37		900	400	5	3/4	2/5	2	Sst, gy, fsu - crs su, Translusc qtz, milkand smoke qtz, qtz with mineral inclus. ((pyr)) ((mic)), (((carb))) ((calc))		
				800	450	6	3/4	2/5	1/2			
		CA38		600	350	6	3/4	3/5	4	Generally small thin shell fragments. Calc Sst, lt gy, hd		
		CA39										
1391				800	340	6	3/4	3/5	2	Sst, gy, fsL - crs SL		
		CA40		900	360	6	3/4	3/5	2	Sst aa	D	
		CA41		1400	480	5	3/4	2/5	2	Sst, fsL - crs SU ua		
				900	360	5	3/4	2/5	2	Sst, fsU - crs SL, translusc. qtz, milk-smoke qtz, (((mic))), ((calc)), small shell fragments		
		CA42		800	350	5	3/4	2/5	2			
1392												
		CA43		350	220	6	3/4	2/5	3/4	Sst, gy, fsL - msu, calc, hd		
				450	300	7	3/4	2/5	2	Sst, gy, cm scale bedding		
		CA44		400	300	7	3/4	2/5	2	Sst aa		
		CA45								very small shell fragment		
1393				600	320	6	3/4	2/5	1/2	Sst/S, gy(brn)		
		CA46		450	300	6	3/4	2/5	2	Sst, gy		



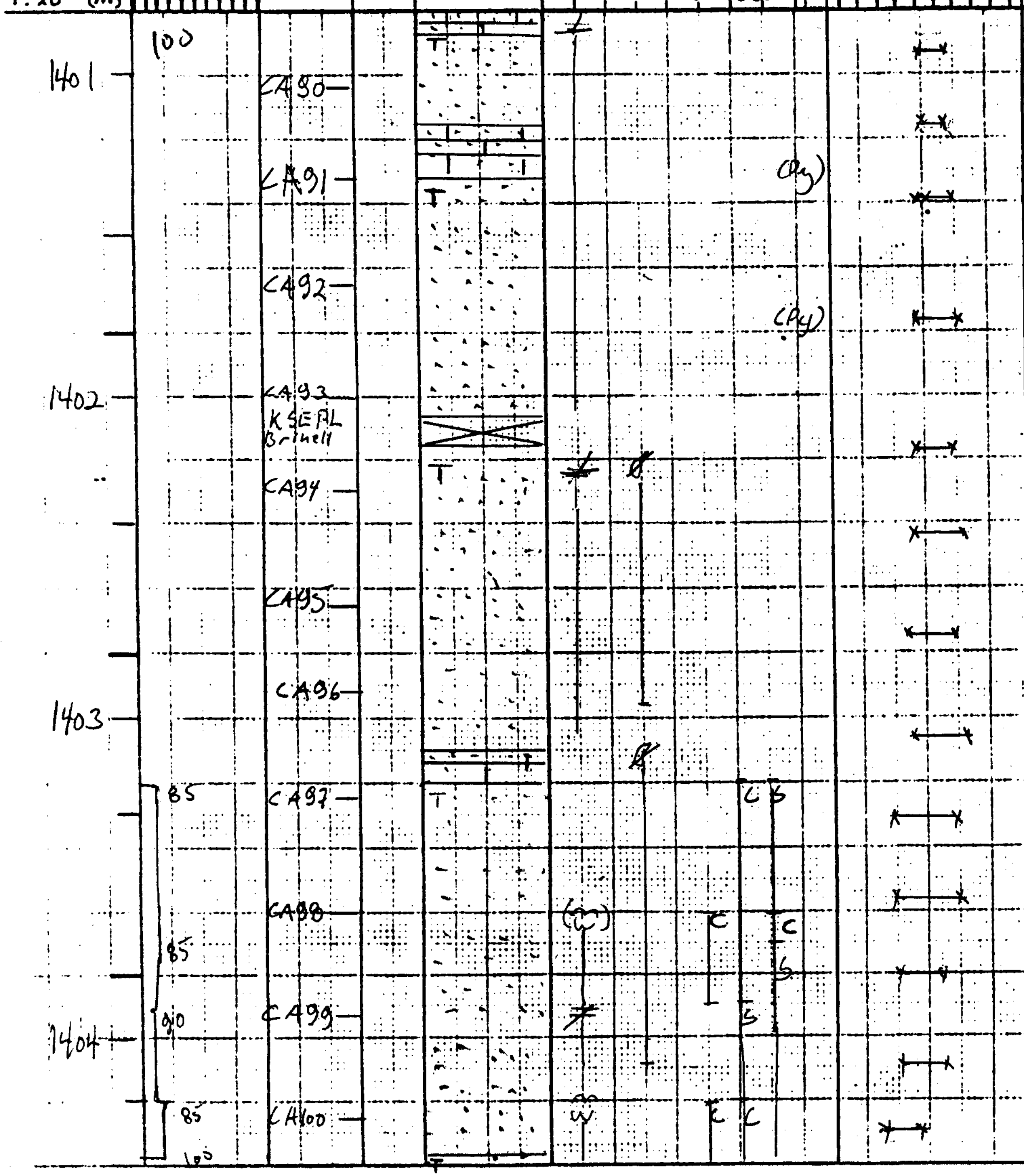
TEXT INPUT

MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
						very small Shell fragm.		
600	350	5	3/4	2/5	2/3	Sst qy, f SU - crs 3L, Domin. translusc. qtz, Smoke qtz, qtz with mineral inclusions Jr. rose qtz, (((fsp)) (((mic))) (((carb))), ((calc)) dcm-scale cb		
500	320	6	3/4	2/5	2			
600	350	6	3/4	2/5	2	Sst, qy a.a very small Shell fragm.		
620	320	6	3/4	2/5	2	Sst, qy, f SU - crs 3L a.a		
620	350	6	3/4	3/5	2	Sst, qy a a	D	
800	250	5	3/4	3/5	2	Sst, qy, f SU - crs SU domin. translusc qtz, milk qtz smoke qtz, Jr roseqtz, qtz with min inclus. ((fsp)) (((mic))), (((carb))) ((calc)) dm-scale cb		
1000	400	5	3/4	3/5	2			
900	370	5	3/4	2/5	2	Sst, qy a a		
500	300	6	3/4	2/5	3	Sst, qy, mod hd, calc		
600	350	6	3/4	2/5	2	Small thinwalled Shellfragments sst qy (brh)		

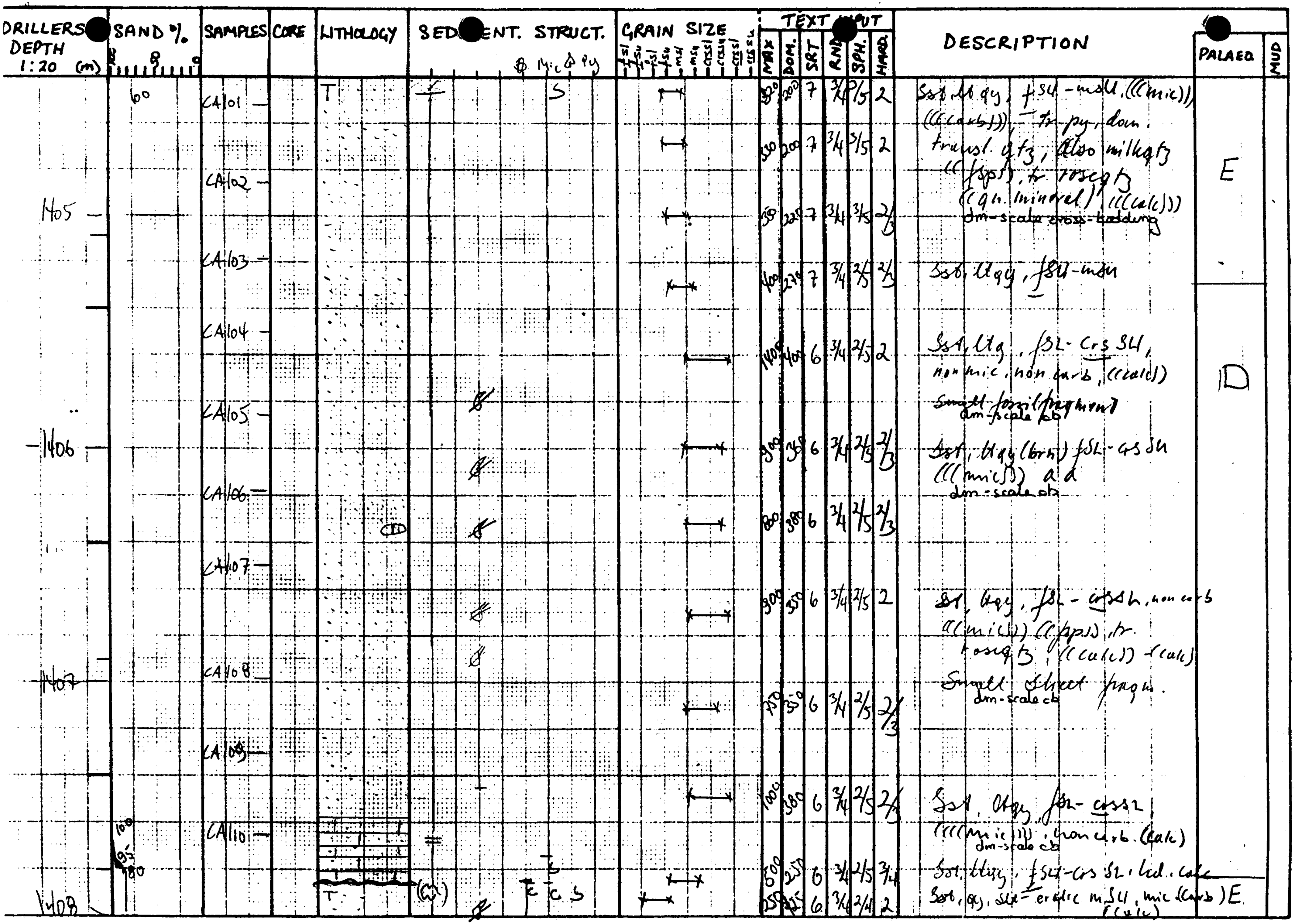


TEXT INPUT								
MAX	DOM.	SRT	RND	SPH.	HARD	DESCRIPTION	PALAEO	MUD
900	400	5	3/4	2/5	1/2	Sst, fSU - crs SL, gy (brn) Translusc. qtz, milk qtz Smoke qtz; Qtz with min. inclusions, ((fsp)), (((carb))), ((mic)) ((calc)) (dm-scale cross-bedding)		
1000	420	6	3/4	2/5	2			
800	320	6	3/4	2/5	2			
1400	300	5	3/4	2/5	2	Sst, gy, fSU - gran aa.		
710	220	5	3/4	2/5	4	Sst, ltgy, fSL - crs SL, (mic) ((carb)), calc, hd occ. very small calc filled fractures	D	
1000	240	5	3/4	2/5	4	Many bivalves (dm-scale) cb		
600	240	5	3/4	2/5	2	Sst, gy, slt - crs SU, (mic) ((calc)) - (calc). dom. translusc. qtz; milk qtz both biotite and muscov.		
650	240	5	3/4	2/5	2	Sst, gy, slt - crs SU, (mic)		
570	200	6	3/4	2/5	2	Sst, slt - crs SL, aa		
700	230	5	3/4	2/5	2	Sst, gy, slt - crs SU, (mic), ((carb)). ((calc)). ((rosey qtz)). dom. translusc. qtz, small shell fragments		
550	220	7	3/4	2/5	1/2			
400	210	7	3/4	2/5	4	Calc. Sst ltgy		

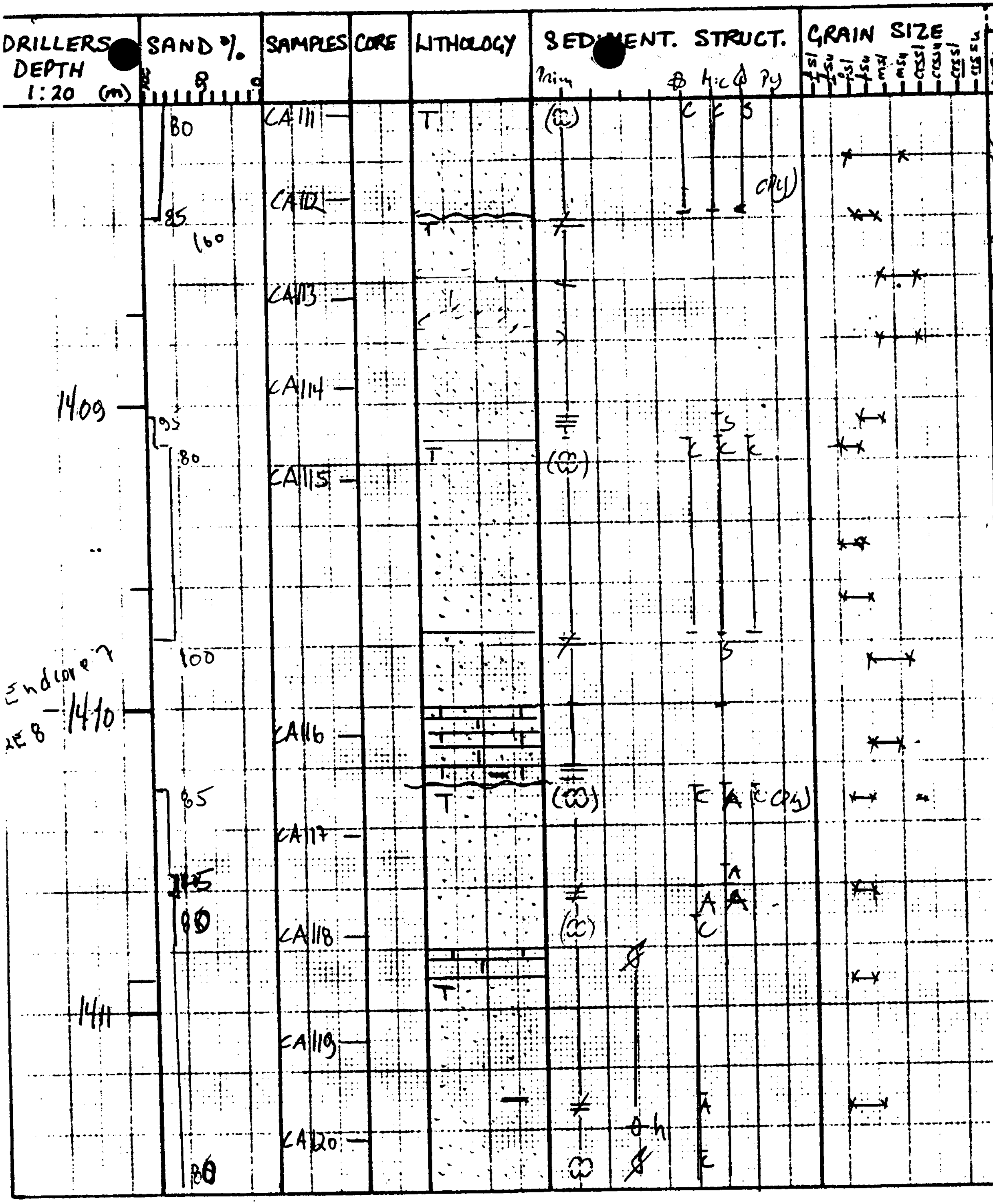
DRILLERS DEPTH 1:20 (m) | SAND % | SAMPLES | CORE | LITHOLOGY | SEDIMENT. STRUCT. | GRAIN SIZE | TEXT INPUT | DESCRIPTION | AEQ | MUD



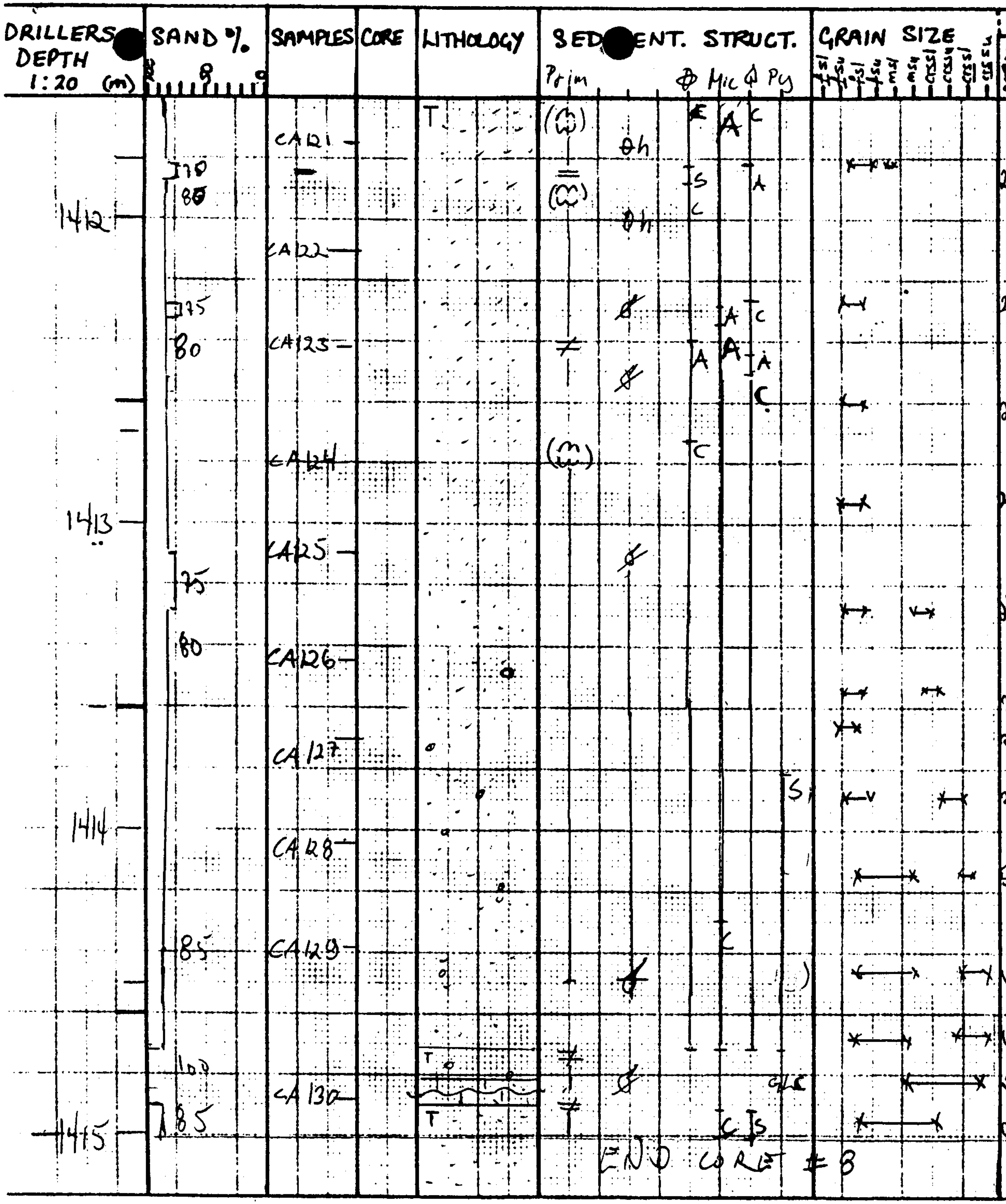
MAX	DOM.	SRT	R	SPH.	HARD.	DESCRIPTION	AEQ
500	360	7	3/4	2/5	2/3	Sst, ltgy, fSL-crsSL, dominantly transluc. qtz, milk qtz, smoky qtz, qtz with mica inclusions, (((fsp))), (((mic))), ((carb)), calc (dm-scale cross-bedding)	D
500	350	7	3/4	2/5	3		
400	300	7	3/4	2/5	2		
650	300	6	3/4	2/5	2/3	Sst, ltgy, fSL-crsSL a.a. ((mic)), ((carb)) tr py, ((calc))	
600	300	6	3/4	2/5	2	Sst, ltgy, fSL-crsSL (((mic))), (((carb))), (((calc))) Traces of very small thin shell fragments dm-scale cross-bedding	
800	320	6	3/4	2/5	2		
700	300	6	3/4	2/5	2	Sst, ltgy, fSL-crsSL	
800	320	6	3/4	2/5	2	~~Ss~~	
600	170	4	3/4	2/5	2	Sst, gy, slt-crs SL, mic, ((carb)), (((calc)))	E
600	160	4	3/4	2/5	2	Sst, gy, slt-crs SL, dom. transluc. qtz, also milk qtz tr rose qtz mic, (carb), ((calc)) Small pieces of thin walled bivalves	
400	200	6	3/4	2/5	2		
300	200	6	3/4	2/5	2		
300	140	5	3/4	2/5	2	Sst, gy a.a.	



DRILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
	60	CA101	320	200	7	3/4	3/5	2	Sst, lt qy, fSU-mdU, (((mic))) (((carb))), tr py, dom.		
			350	200	7	3/4	3/5	2	transl. qtz, also milkqtz		
		CA102							((fsp)), tr roseqtz	E	
1405			350	220	7	3/4	3/5	2/3	((gn. mineral)) (((calc))) dm-scale cross-bedding		
		CA103									
			400	270	7	3/4	2/5	2/3	Sst, ltqy, fSU-mdU		
		CA104									
			1400	400	6	3/4	2/5	2	Sst, ltg, fSL-crsSU, non mic, non carb, ((calc))	D	
		CA105							Small fossil (fragment) dm-scale cb		
1406			900	350	6	3/4	2/5	2/3	Sst, ltqy (brn) fSL-crsSU (((mic))) a.a		
		CA106							dm-scale cb		
			800	380	6	3/4	2/5	2/3			
		CA107									
			900	350	6	3/4	2/5	2	Sst, ltqy, fSL-crsSU, non carb ((mic)) ((fsp)), tr roseqtz, ((calc)) f(calc)		
		CA108							Small shell fragm. dm-scale cb		
1407											
			750	350	6	3/4	2/5	2/3			
		CA109									
			1000	380	6	3/4	2/5	2/3	Sst, ltqy, fSL-crsSL,		
	100	CA110							((((mic)))), non carb. (calc) dm-scale cb		
	95										
	100		500	250	6	3/4	2/5	3/4	Sst, ltqy, fSU-crsSL, lcd. calc		
1408			250	225	6	3/4	2/4	2	Sst, qy, SLt- erratic mSU, mic (carb) f(calc)	E.	



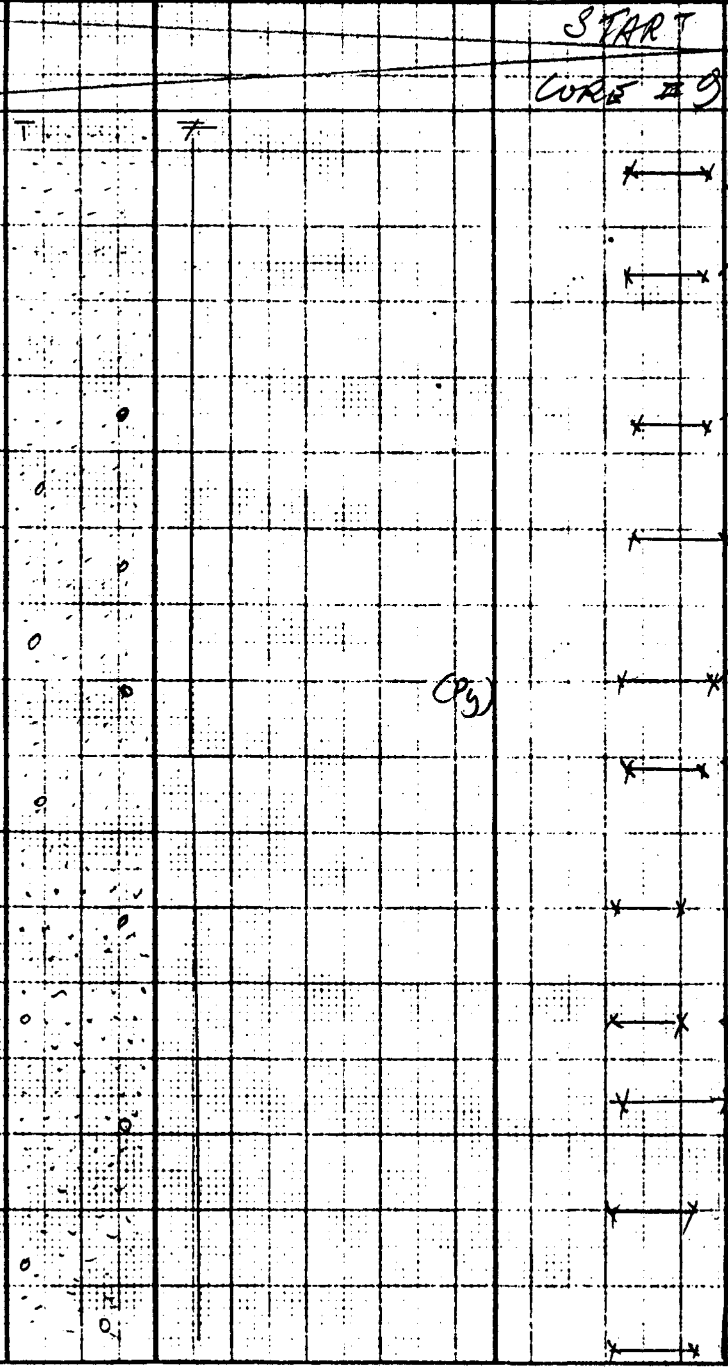
MAX	DOM.	SRT	R	SPH.	HARD.	DESCRIPTION	FACIES
400	150	5	3/4	3/5	2	Sst, gy, slt-mSh, mic, (carb) ((calc))	D
800	200	7	3/4	3/5	2	Sst, lt gy (brn), fSh-mSh ((mic)) (((carb)))	very small E A
600	300	6	3/4	3/5	1/2	(coarser than above)	
500	300	7	3/4	3/5	2	Sst, lt gy, fSh-mSh ((mic)) non carb, (((calc))), dom transp. qtz, milky qtz ((f/Sp))	E
250	190	7	3/4	3/5	2		
220	130	6	3/4	3/5	2	Sst, gy, slt-mSh, mic, (carb) carb, ((calc))	
220	130	6	3/4	3/5	2	Sst aa	E
250	150	6	3/4	3/5	2	Remnants of horizontal burrows	
500	280	7	3/4	2/5	1	S, gy brn	
400	250	7	3/4	2/5	3/4	Sst. calc, hd	A
250	150	6	3/4	3/5	2	Sst, gy, slt-fSh, a few coarse grains, mic, carb, ((calc))	
250	150	6	3/4	3/5	2	Sst aa	E
250	150	7	3/4	3/5	2	A few small shell pieces	
300	160	6	3/4	3/5	2	gy min. Both muscovite and biotite Scattered small shell frag.	

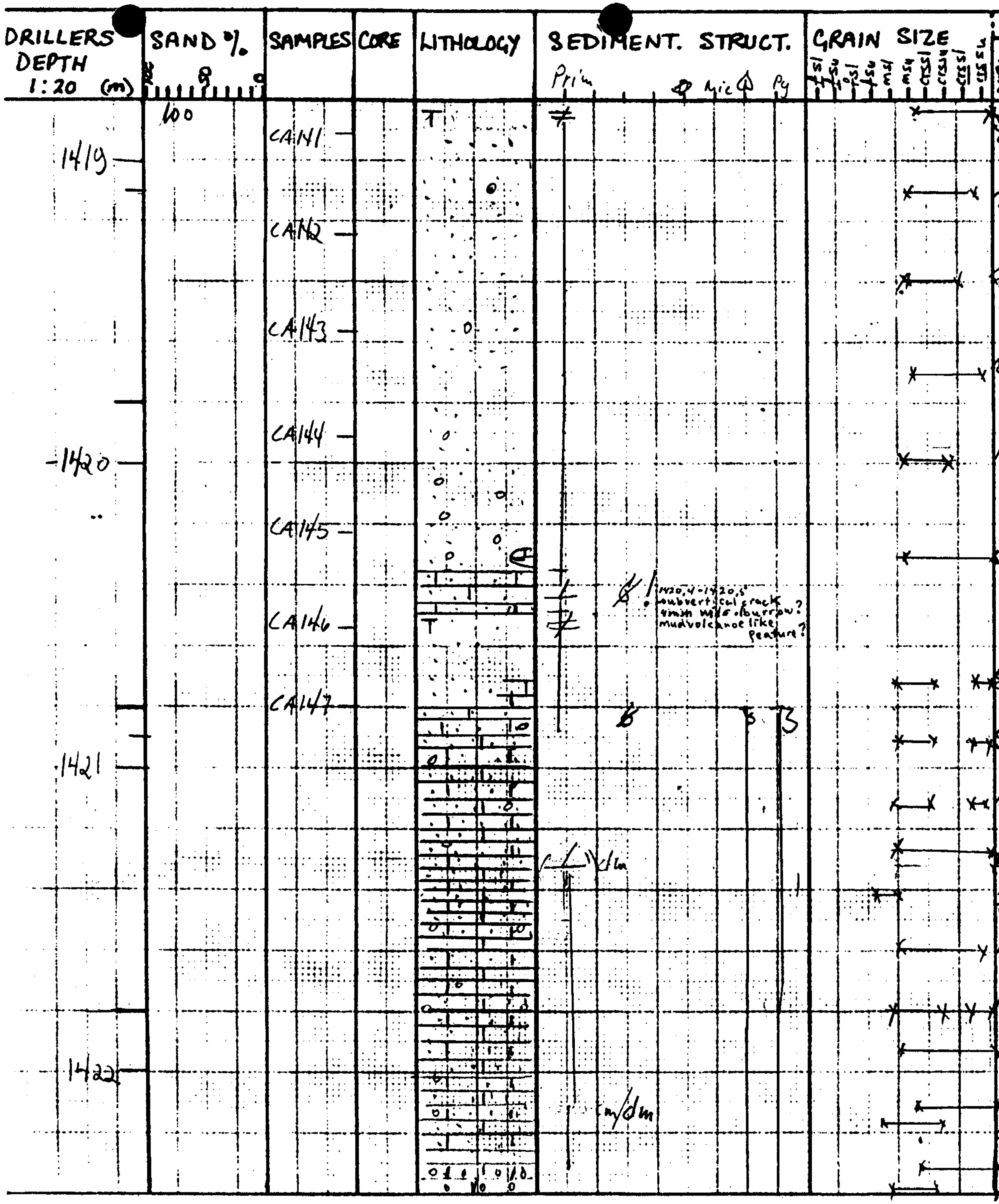


MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
						Bioturbation on the Scale in this core		
240	140	6	2/4	3/5	2	Sst. gy, slt-msk, dom. transl. qtz, milk qtz, mic, carb, ((calc))		
250	125	7	2/4	3/5	2			
						very thin walled shell fragm.	E	
240	140	8	2/4	3/5	2	Sst, gy, slt-fsk aa		
220	140	8	2/4	3/5	2	Sst aa		
						Small thin shell fragm.		
240	140	7	2/4	3/5	2	Sst aa but bimodal with a few crs S grains		
240	140	7	2/4	3/5	2	Sst aa		
200	100	8	2/4	3/5	2		B	
220	120	5	2/4	2/5	2	Sst, gy, strongly bimodal		
500	160	4	2/4	2/5	2	Sst, gy, bimodal, transl. qtz, milk qtz, mic, carb py, tr rose qtz, ((calc))		
600	160	4	2/4	2/5	2			
600	160	4	2/4	2/5	2			
1300	375	6	3/4	2/5	2/3	Sst, (lt) gy, dom qtz, ((calc)) Tr glc.	A	
800	160	4	3/4	2/5	2/3	Sst, gy brn, mic, (carb), c(calc) silty clayey lumps	E ?	

Surface covered by mud

DRILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	CORE	LITHOLOGY	SEDIMENT. STRUCT. Prim	GRAIN SIZE	TEXT INPUT MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
						START CORE # 9									
	100						1500	500	6	3/4	2/5	1/2	Sst (C.S.), ltgy, fsu-gran dom translusen qtz, milk qtz, smoky qtz, tr. roseqtz, tr. dkgy sltst, tr. py. Tr. gn. min assoc. with dissemin. py, (kaol), ((calc)), nonmic very small tr. carb		
		CA131													
1416							1400	450	6	3/4	2/5	1/2			
		CA132													
							1600	550	6	3/4	2/5	1/2	Sst aa		
		CA133													
							2350	550	5	3/4	2/5	1/2	Sst aa. tr. gn. clay min.	?	
		CA134													
1417					(Py)		1800	450	6	3/4	2/5	1/2	Sst, aa		
		CA135													
							1500	500	6	3/4	2/5	1/2			
													Sst, ltgy, fsu-~~crs~~ gran dom transl. qtz, milk qtz smoky qtz, with min. incl. muscovite flakes, very small tr. carb. mat, tr py. tr. roseqtz, ((calc)) (kaol.),	black pumice?	
		CA136													
							1200	400	5	3/4	2/5	2			
		CA137													
1418							1200	450	6	3/4	2/5	2			
		CA138													
							2300	500	5	3/4	2/5	1/2			
		CA139													
							1300	400	6	3/4	2/5	1/2	Sst aa		
		CA140													
							1400	350	5	3/4	2/5	2			





TEXT INPUT

MAX	DOM.	SRT	RND	SPH.	HARD.
2000	550	5	3/5	2/5	1/2
1700	400	5	3/4	2/5	2
1200	500	6	3/4	2/5	2
1800	450	5	3/4	2/5	2
1000	450	6	3/4	2/5	1/2
3000	450	5	3/4	3/4	2/3
800	380	5	3/4	2/4	2
900	350	6	3/4	2/4	4
180	350	6	3/4	2/4	4
280	380	5	3/4	2/4	4
350	250	7	3/4	2/4	4
1400	350	5	3/4	2/4	4
1800	380	5	3/5	2/4	4
3000	450	5	3/5	2/4	4
1400	500	5	3/4	2/4	4
600	250	6	3/4	2/4	4
250	400	5	3/4	2/4	3
1400	300	6	3/4	2/4	4

DESCRIPTION

Sst/S. lt gy, fSL-gran. spbl
observed, dom transluc.
qtz. also milk + Smoke qtz.
tr. quartsitic fragm. tr.
wh fsp. very small trace
muscovite, (kaol), (calc)
(tr. gn min)

S/Sst gy brn a

Sst lt gy (brn), fdL-spbl, bimodal
transluc. qtz, milk qtz
qtz with min inclusion
Smoke qtz, tr. rose qtz. whitish
kaolinitized(?) fsp. tr.
mikrolin fsp., tr. bluish qtz
tr. lid laminated siltstone. calc

Sst, lt gy wc, lid dm-scale
cross-bedding

~~Sst, dk gy, calc. lid,~~
tr. k-fsp with perthite
lamels also 5% opaque min
dm-scale cross-bedding also yell qtz

Sst, lid aa but also 5%
opaque minerals
dm-scale cross-bedding

PALAEO

?

D

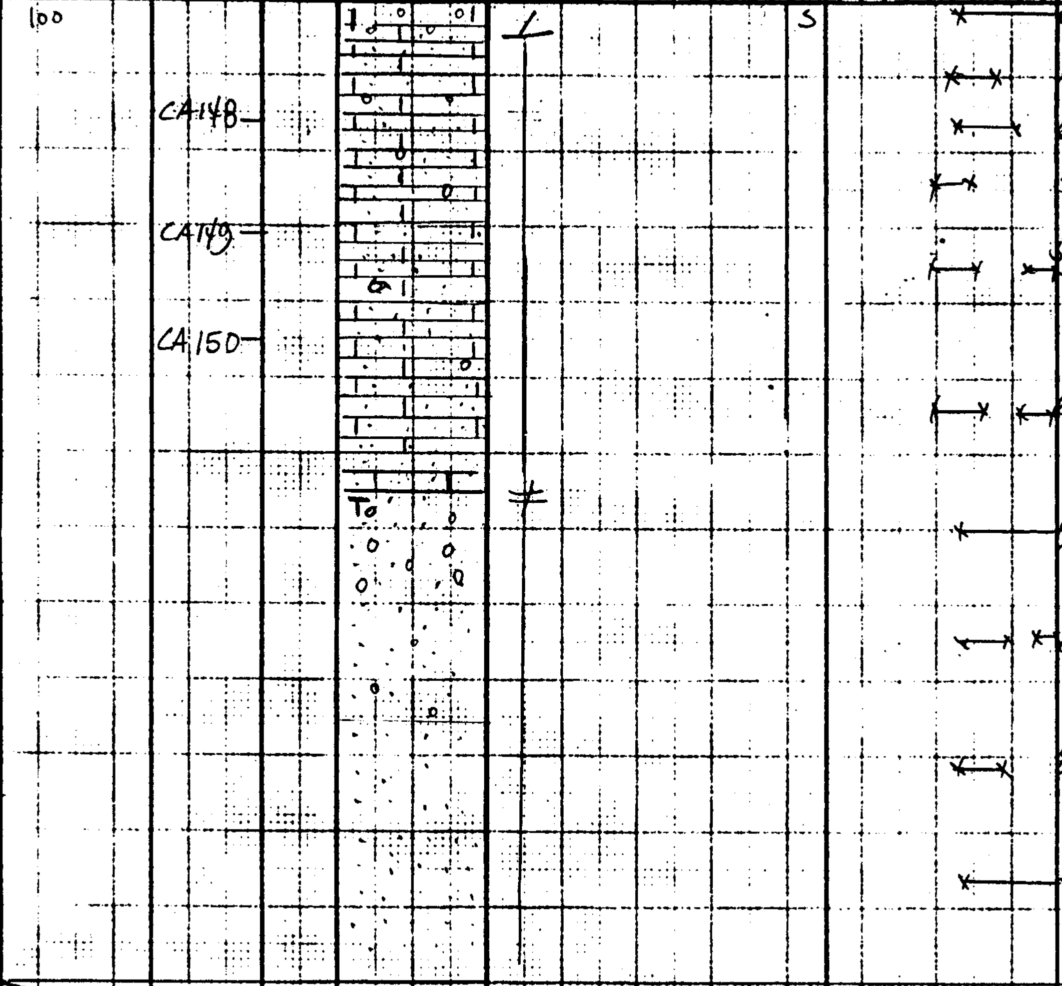
?

D

MUD

← conti
?
sawed

DRILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	CORE	LITHOLOGY	SEDIMENT. STRUCT. Prim Mic Py	GRAIN SIZE	TEXT INPUT	DESCRIPTION	PALAEO	MUD



1423

1424

1425

End core # 9

1426

MAX	DOM.	SRT	R	SPH.	HARD.	DESCRIPTION	PALAEO
1000	350	5	3/4	2/5	4	Sst, ltgy, hd fSL - spbl bimodal	
1000	300	6	3/4	2/5	4		
1200	380	5	3/4	2/5	4		
500	320	6	3/4	2/5	4	dom translucse qtz milk qtz rosy qtz, qtz w. min. inclusion opaque min. & carb)), (K/fsp)) calc	
500	250	5	3/4	2/5	4		D
600	300	5	3/4	2/5	4		
1800	350	5	3/4	2/5	2	Sst, ltgy (lamn), fSL - mbpl translucse qtz, milk qtz, (lithic fragm), (fsp) tr. muscovite, ((calc))	
800	450	5	3/4	2/5	2		?
800	400	6	3/4	2/5	1/2	S/sst a a fSL - crs SL	
2200	400	5	3/4	2/5	1/2	S/sst a a fSL - gran	

DRILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	CORE	LITHOLOGY	SEDIMENT. STRUCT. Prim ⊕ Mic ⊕ Py	GRAIN SIZE	TEXT INPUT MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
					core 10										
	100				≠		900	280	5	3/4	2/5	4	Sst, lt gy, fsl - cr sl, calc cmt, vugs after aragonitic shell; thin calc. filled fracture	?	
							1800	400	5	3/4	2/5	4			
					END CORE 10										
1427															
1428															
1429															

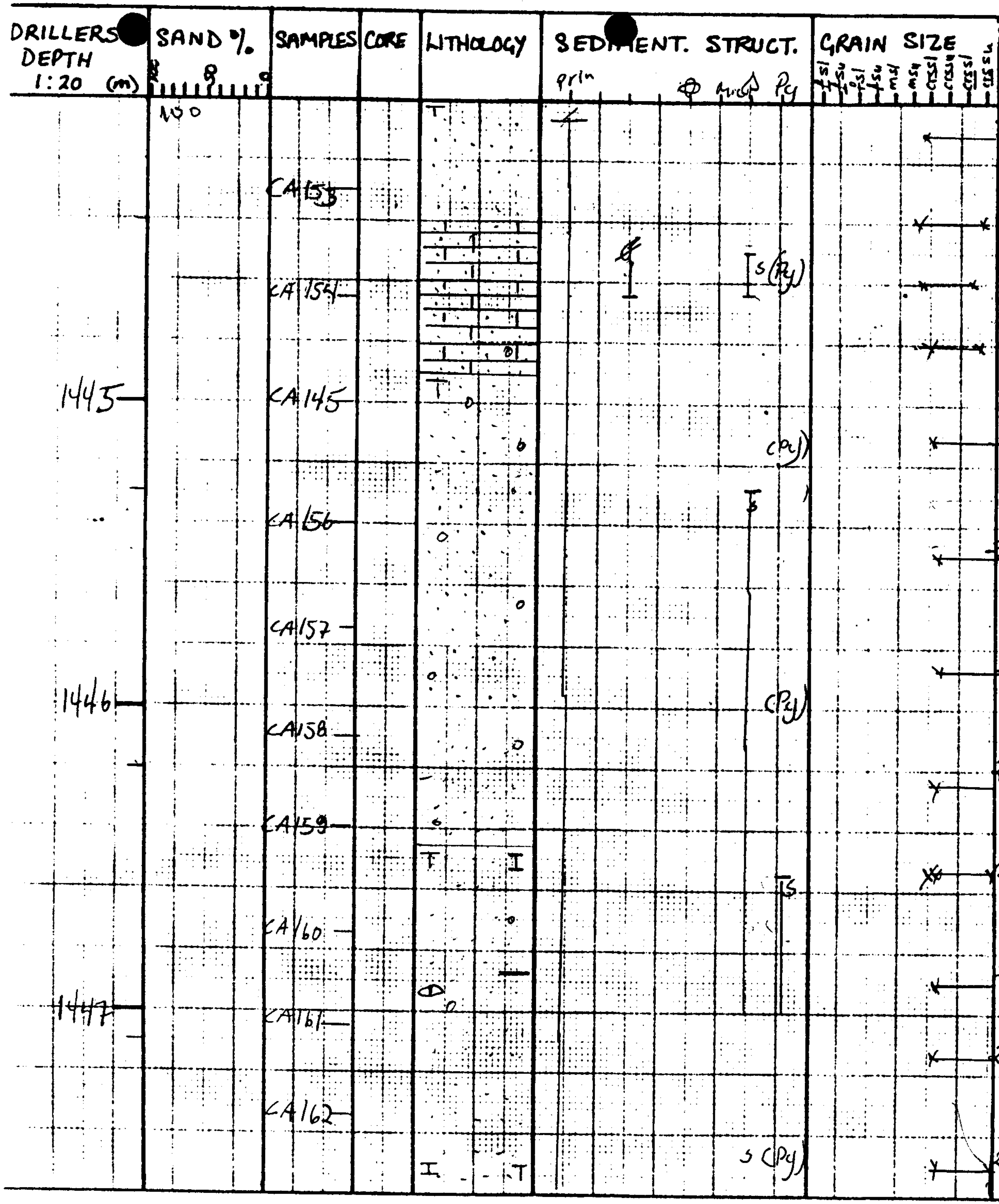
DRILLERS DEPTH 1:20 (m)	SAND % 100 50 0	SAMPLES	CORE	LITHOLOGY	SED ENT. STRUCT.	GRAIN SIZE fsl fsu fsl fsu msl msu cssl cssu cssl cssu	TEXT NPUT MAX	DOM.	SRT	RN	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
1430															
1431															
1432															
1433															

DRILLERS DEPTH 1:20 (m)	SAND % 100 50 0	SAMPLES	CORE	LITHOLOGY	SED ENT. STRUCT.	GRAIN SIZE vfsl vfsu fsl fsu msl msu csl csu vcsl vcsu	TEXT PUT MAX	DOM.	SRT	RN	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
1434															
1435															
1436															

DRILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	CORE	LITHOLOGY	SEDIMENT. STRUCT.	GRAIN SIZE	TEXT INPUT						DESCRIPTION	PALAEO	MUD
							MAX	DOM.	SRT	RND	SPH.	HARD.			
1437															
1438															
1439															
1440															

DRILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	CORE	LITHOLOGY	SEDIMENT. STRUCT.	GRAIN SIZE	TEXT INPUT MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
1441															
1442															
1443															
						CORE # 11									
	100	CA151 CA152		T			2/0	5/5	5	3/5	2/5	2/3	dst cavings from above reservoir sst, vy, f sh-gran, (calc cmt) transl. qtz, (smoke qtz, milk qtz lithic fragm), tr wh. fsp, tr carb mat calc	D	

Surface often covered with drill mud.



TEXTURE MAX	DOM.	SRT	RND	SPH.	HARD.
330	850	5	3/4	2/5	2/3
1800	450	5	3/4	2/5	2/3
1400	450	6	3/4	2/3	3/4
1500	500	6	3/4	2/5	3/4
300	600	5	3/4	2/5	1/2
2200	550	4	3/4	2/5	2
2200	600	5	3/4	2/5	2
2500	550	5	3/4	2/5	2
1900	550	6	3/4	2/5	3
2200	700	6	3/4	2/5	3
2600	700	6	3/4	2/5	3
2800	750	6	3/4	2/5	3

DESCRIPTION

Sst, gy, fsL-gran, (a cmt(m))
translucse qtz, (smoke qtz, milk qtz, lithic fragm, fsp)
tr carb mat - dm-scale cross-bedding

Sst, gy, calc.
thin walled bivalve
Dark vertical carbon. Streak
dm-scale cross-bedding

S/Sst, ltgy aa but not cmt, calc, fsL-spbl. D
dm-scale cross-bedding

Sst, ltgy, slt-gran
translucse qtz, (milk qtz, quarsitite, qtz with min. inclusions, smoke qtz)
tr. opaque min.
tr carbon. mat, tr py
calc
dm-scale cross-bedding D

Sst, ltgy, fsL-gran
aa, calc, (calc cmt)
dm-scale cross-bedding

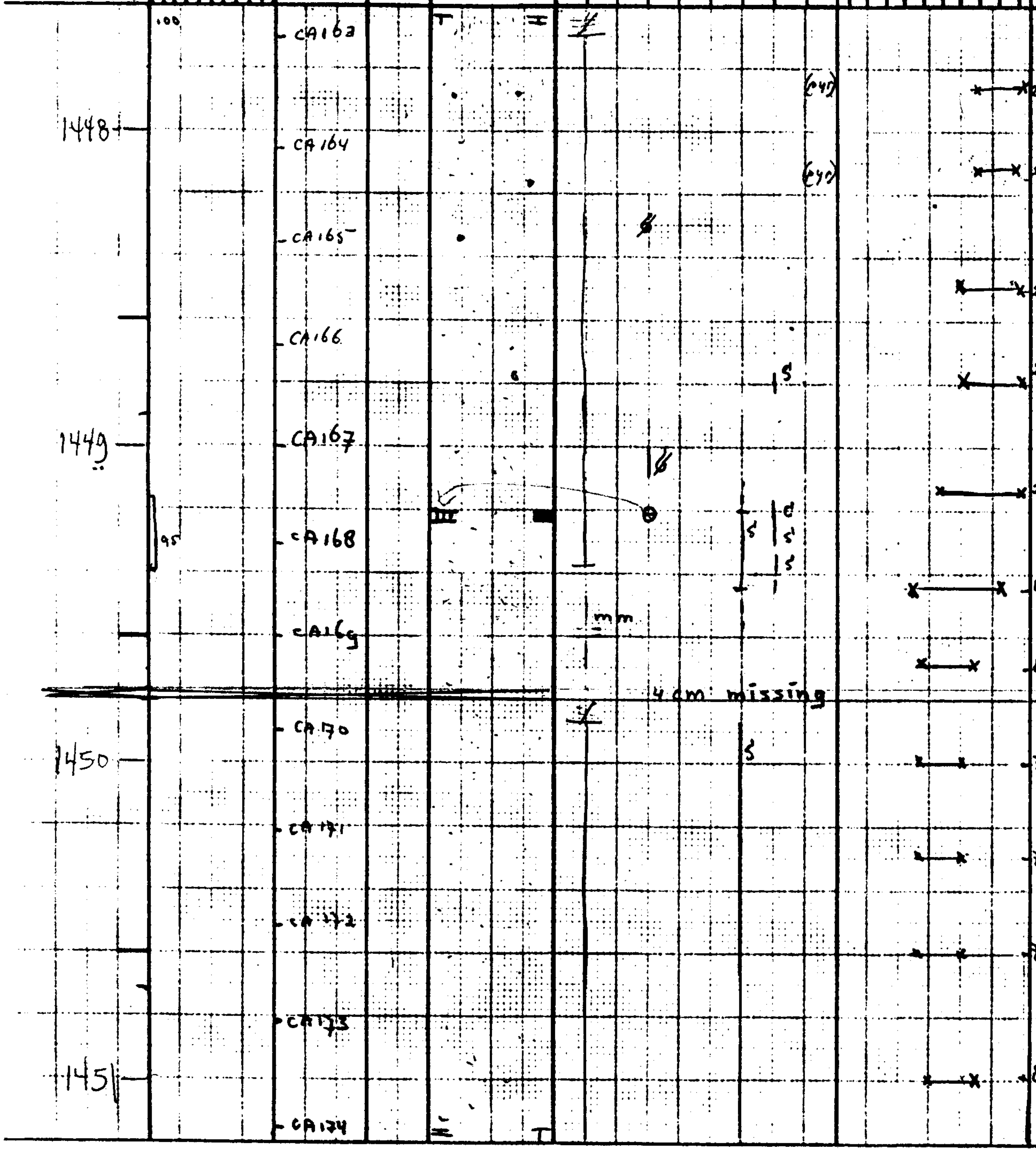
Sst, ltgy, fsL-gran
translucse qtz, milk qtz (smoke qtz, tr. yell qtz)
tr. wh. fsp, calc
dm-scale cross-bedding

Sst aa

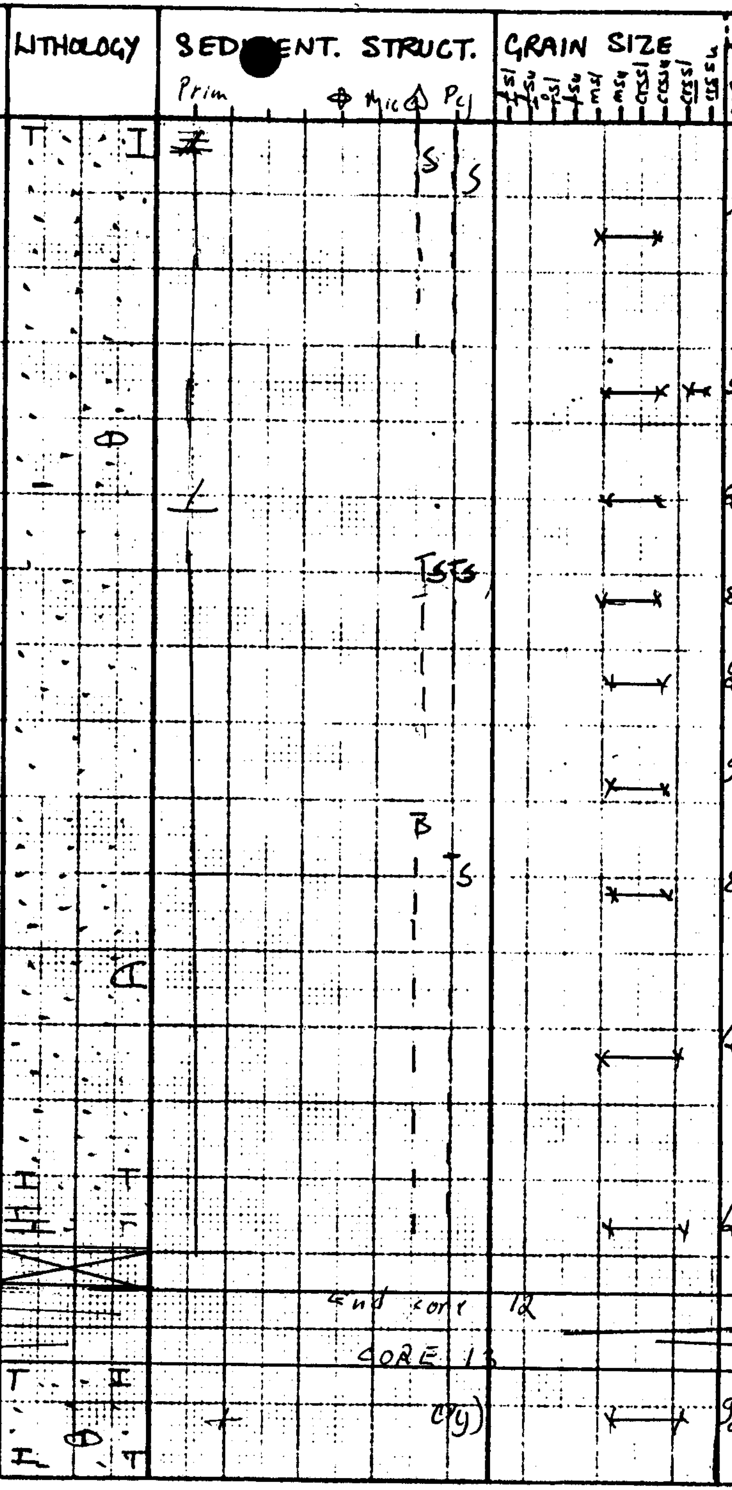
PALAEO

MUD

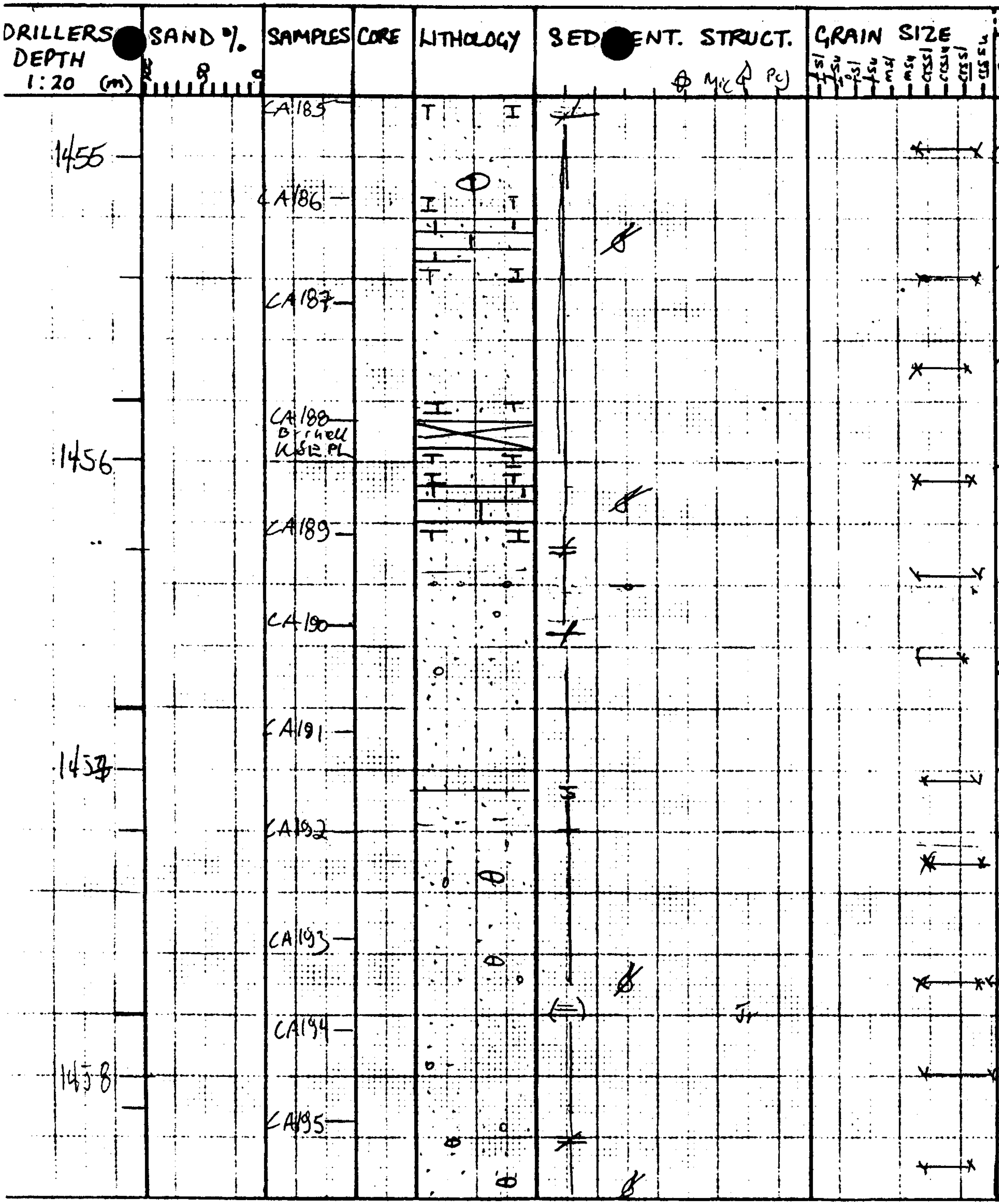
DRILLERS DEPTH 1:20 (m) | SAND % | SAMPLES | CORE | LITHOLOGY | SEDIMENT. STRUCT. | GRAIN SIZE | TEXT INPUT | DESCRIPTION | PALAEO | MUD



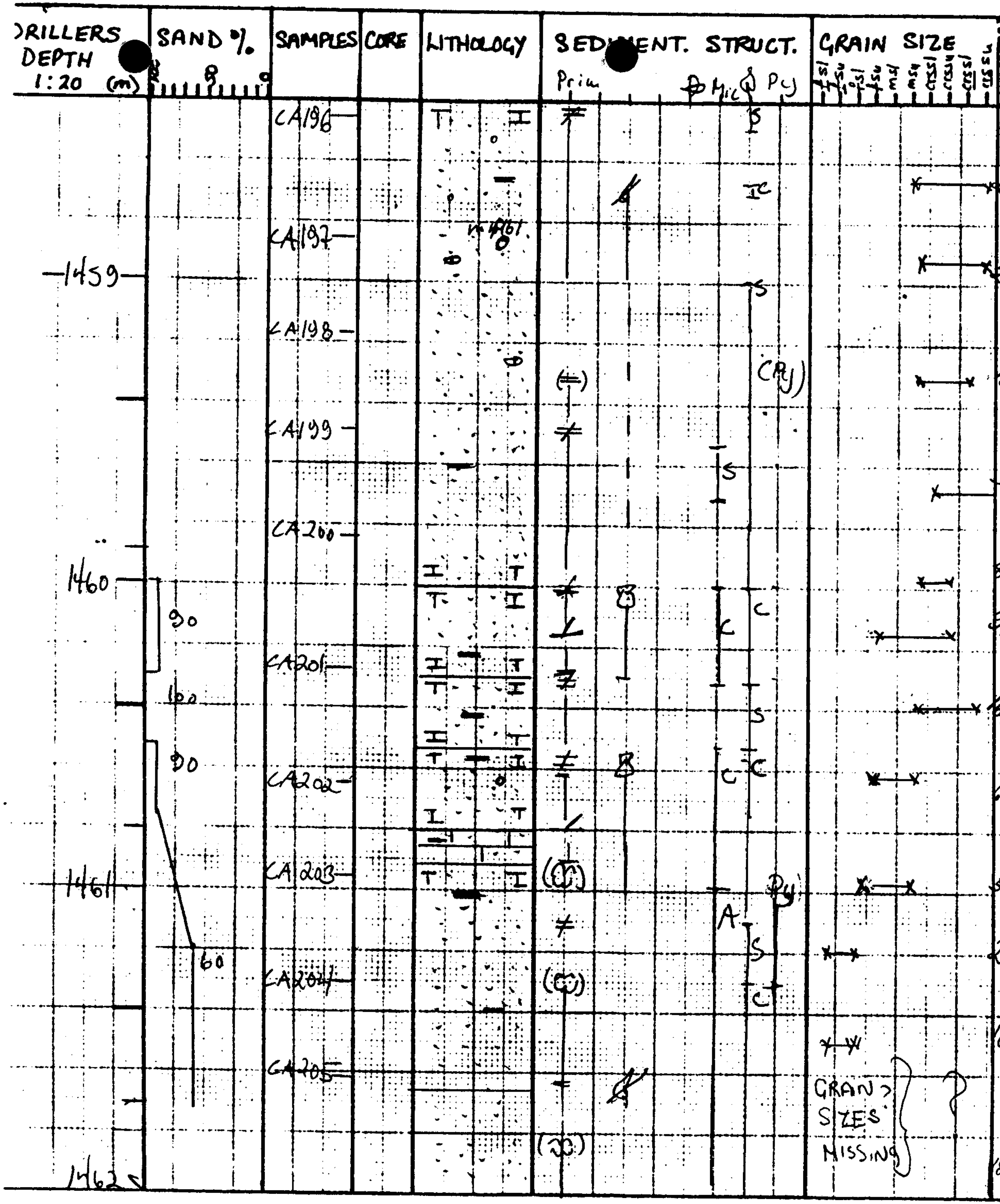
MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
2000	750	4	2/4	3/5	3	SST, LTGY, fsL-gran, transluc qtz, milky qtz, smoke qtz, cmT, calc cmT, 1 gran LS, LTBRN, subround.		
2000	750	6	2/5	2/6	3	SST, LTGY, fsL-crs sU, transluc qtz, milky qtz, smoke qtz, cmt, calc cmt, (kaol. cmt) (veldsp), (blnish qtz) (kaol) dm-scale c bedding.	D	
2000	600	6	3/5	3/5	3	SST. a.a plus 1 qtz grn, rose.		
2000	600	5	3/4	3/5	3	SST, LTGY, fsL-gran, transluc qtz milky qtz, smoke qtz, qtz with mineral inclusions, cmt, calc cmt.		
2000	400	5	3/4	3/5	2/3	SST. a.a plus (veldsp) (yl qtz) (muscov)	brown wood fragment 3×4cm adjacent to calc cmt sst nodule.	
1400	250	7	3/4	3/5	2/3	SST, LTGY, fsL-crssL, transluc qtz milky qtz, smoke qtz, qtz with miner. inclusions, (rose qtz) (veldsp), (pyr), (kaol), muscov., (cmt) calc cmt.		
800	250	9	3/4	3/5	2/3			
700	250	8	3/4	3/5	3	SST, LTGY, fsL-crssL, transl qtz, milky qtz, smoke qtz, (qtz with miner. inclus) (rose qtz) (veldsp) muscov, cmt, calc cmt. dm-scale cross bedding	D	
700	250	8	3/4	3/5	3	SST a.a		
700	250	8	3/4	3/5	3	SST a.a		
800	350	8	3/4	3/5	2/3	SST a.a., fsL-crssU.		



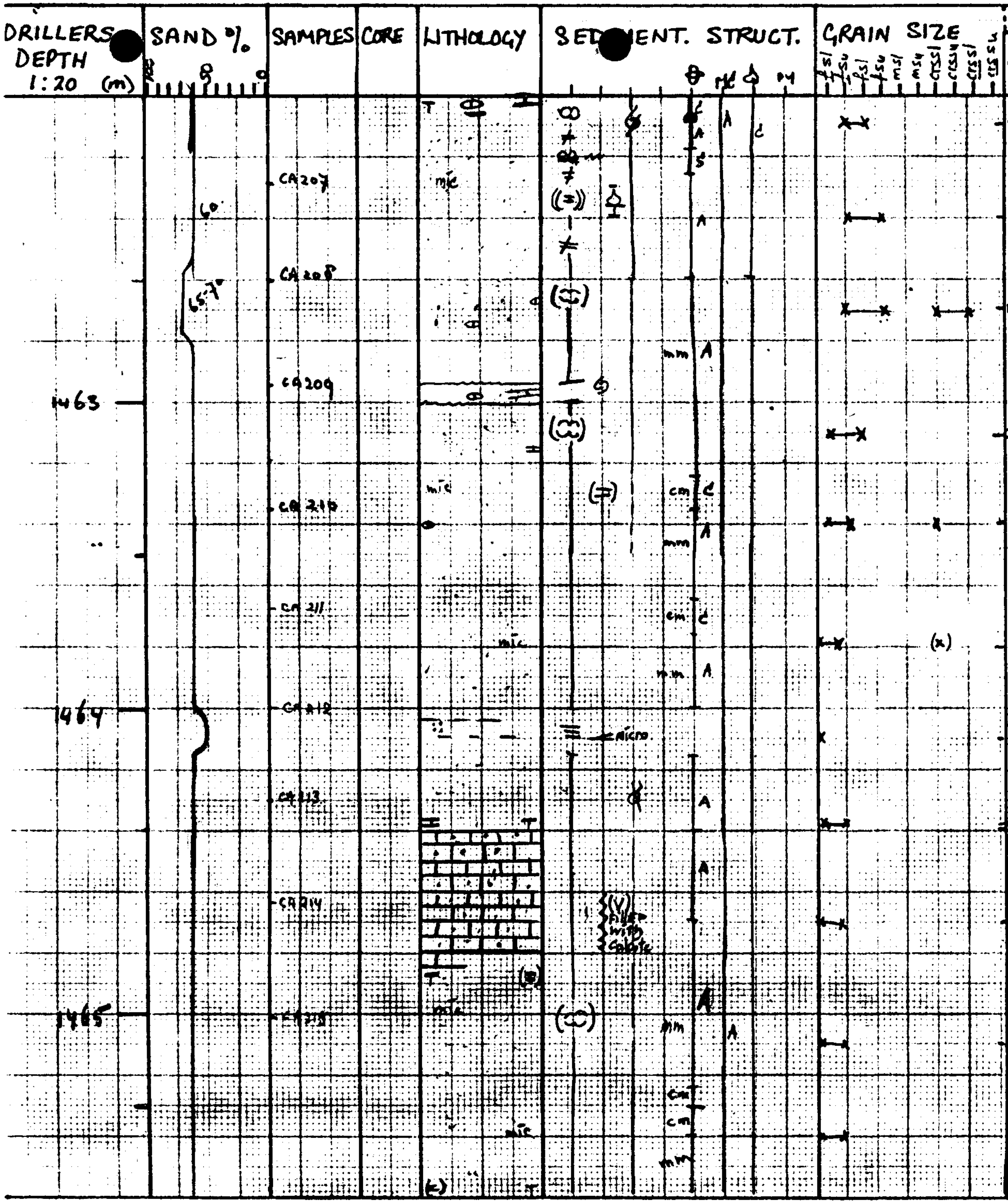
DRILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	CORE	MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
	100%											
		CA175		1000	360	6	3/4	3/5	3	Sst, lt gy, f/ml-crs SL Transluc qtz, milk qtz, (Smoke qtz, tr. fsp) lithic fragm. , calc (calc cmt) dm scale cross bedding		
		CA176										
1452				900	360	6	3/4	3/5	3	Sst a.a. a few crs S grains (slightly bimodal)		
		CA177										
				800	350	6	3/4	3/5	3	Sst. lt gy, unimodal aa ((((mic)))) dm-scale eb.		
End core 11		CA178										
CORE 12		CA179		800	330	6	3/4	3/5	3	Sst aa	D	
				800	350	6	3/4	3/5	3	aa		
		CA180										
1453				900	400	6	3/4	2/5	3	Sst aa		
		CA181		800	400	6	3/4	2/5	3	aa		
		CA182										
				1200	360	6	3/4	2/5	3	Sst. lt gy, slt-crs SL transluc qtz, milk qtz, (Smoke qtz, quartzitic fragm.) very small tr. mica dm-scale c.b.		
		CA183										
1454				1200	400	6	3/5	2/5	3	Sst aa		
		K-SEPk Brinell										
		CA184		900	58	6	3/5	2/5	3	Sst aa	D	



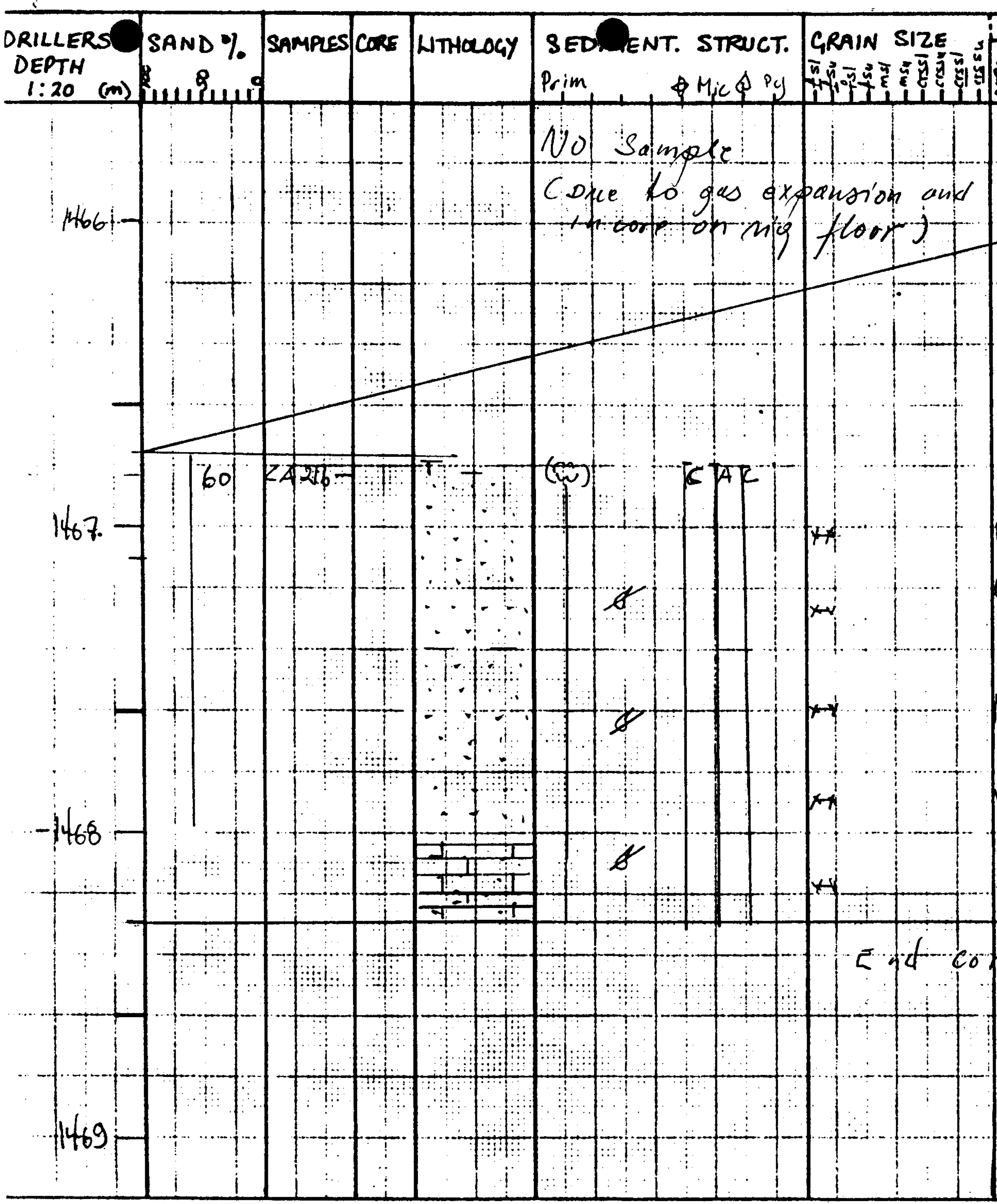
TEXT INPUT								
MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
/500	5/20	5	3/4	2/5	3	Ssr lt-med gy, slt – crs SL, translu qtz, (milk qtz, qtz with mineral inclusions) very small trace muscovite tr carb, mat calc. Leached aragonitic shells in dogger. (calc cmt)	D	
/700	5/80	5	3/4	2/5	3			
/800	5/00	6	3/4	2/5	3	Sst aa, tr carb. dm-scale cross bedding		
/400	5/50	6	3/4	2/5	3	Sst aa Vugs after aragonitic shell fragments.		
/500	4/80	5	3/4	2/5	3	Sst, lt-med gy, slt-crs SL translu. qtz, milk qtz, smoke qtz, (quartsitic fragm). tr. muscovite flakes, calc, (calc cmt) dm-scale cross-bedding	A	
/300	4/80	6	3/4	2/5	3		D	
/800	5/00	6	3/4	2/5	3	Ssr aa		
/800	4/50	6	3/4	2/5	3	Sst aa but bimodal with a few crs SL-gran.		
/1200	4/50	6	3/4	2/5	3	Bimodal aa	A	
/2000	5/50	6	3/4	2/5	3	Faint bedding dip 3-5° Sst. less bimodal, more crs SS grain + a few gran.		
/100	4/50	6	3/4	2/5	3	Sst med gy, SLt-crs SL tr. muscovite		



TEXT INPUT						DESCRIPTION	PALAEO	MUD
MAX	DOM.	SRT	RND	SPH.	HARD			
220	450	5	3/4	2/5	3	Sst, med gy, ~~f~~Sh-gran, translusc. qtz, milk qtz, quartsitic metamorfic fragm, ~~tr muscovite~~, tr carbon. mat. calc (calc. cmt)	A	
200	500	6	3/4	2/5	3			
158	450	6	3/4	2/5	3	weak bedding on a cm scale		
3000	700	5	3/4	2/5	3	Sst med gy aa but, (mic), (carb), and traces brown thin muds? dm-scale c.b.		
800	450	6	3/4	2/5	3		D	
900	220	5	3/4	2/5	3	Sst, med gy, slt- crs SH, ~~bimodal~~, translusc. qtz milk qtz, (blue qtz) carb mic calc, lots of thick walled bivalve fragm. (calc. cmt) dm		
1600	450	6	3/4	2/5	3		Oyster A	sst, with out shells
400	220	5	3/4	2/5	3	Sst as described above but ~~brown~~ sub black carb mat dm-scale cb	D	
500	160	4	3/4	2/5	3	Brown "tree trunk" with diss. pyrite		
200	100	7	3/4	3/5	3	~~Sst~~, med-dk gy, slt-fsH translusc. qtz, (milk qtz), mic, carb, calc	E	
180	90	8	3/4	3/5	3	Sst a/a (silt)		
							A?	
180	90						E	



TEXT INPUT						DESCRIPTION	PALAEO	MUD
MAX	DOM.	SRT	R	SPH.	HARD.			
175	100	8	3/4	3/5	3	SST, DKqy, fsL - fsL, transluc qTz, mic, muscov, chlorite?, (milky qTz), (feldsp), (kaol), (carb), cmt, calc cmt?.	biot.	
250	100	7	3/4	3/5	3	SST, DKqy, fsL - fsu, a.a.	E	
1000	100	3	3/4	3/5	3	sst, dkqy, fsL - crssL, bimodal, transluc qTz, mic, milky qTz, smoke qTz, (feldsp) (carb), cmt, calc cmt? qTz with mineral inclusions	shell fragm. thinwalled	A.
						(disturbed zone with chalky LS) qTz granule)		
200	85	7	3/4	3/5	3	SST, (SLT), dkqy, SLT - fsL, transl. qTz, mic, milky qTz, smoke qTz, (feld sp) (carb), cmt, calc cmt? qTz with mineral inclusions		
600	85	6	3/4	3/5	3	SST, (SLT) a.a. now slightly bimod.	F	
600	70	8	3/4	3/5	2/3	SST, SLT, SLT - fsu, + few grains 600μ, mic, transluc qTz, milky qTz, (feldsp) (carb), cmt, (calc) cmt?		
62	55	9	3/4	3/5	2	ClST, SILTY, (SANDY), mic, transl qTz, (carb), (cmt), (calc) cmt.	0,5cm thick layer with micro (climbing) x lam	
100	70	9	3/4	3/5	2/3	SST, SLT, dkqy, SLT - fsu, transluc qTz, milky qTz, smoke qTz, (feldsp), mic, (carb), cmt calc cmt.	F	
100	70	9	3/4	3/5	4	SST, SLT Lbgy, SLT - fsu, transluc qTz, mic, (feldsp), carb, cmt, calc cmt	FRAC. subvert, FILLED W. calcite	
100	70	9	3/4	3/5	2	SST, SLTST, dkqy, SLT - fsu, transluc qTz, 1 grain qTz 1000μ, mic, (feldsp) (carb) (cmt), calc cmt.	F	
100	70	9	3/4	3/5	2	SST, SLTST a.a.		



NO Sample
(Due to gas expansion and thereby split in core on rig floor)

TEXT MAX	DOM.	SRT	RND	SPH.	HARD.
120	80	8	2/4	3/5	2
120	80	8	2/4	3/5	2
110	75	8	2/4	3/5	2
110	75	8	2/4	3/5	2
110	75	8	2/4	3/5	2

DESCRIPTION

Sst, (slt) med-dkgy, slt-fsL, mic, carb, dom. transl. qtz, (((calc))), bio-turbation on cm scale

1cm thick clst layer seeming to protrude through primary layering; clst, dkgy, hygro fissile soft, ((calc)), might be drilling mud which have protruded into cracks in core

Small thinwall shell fragm.

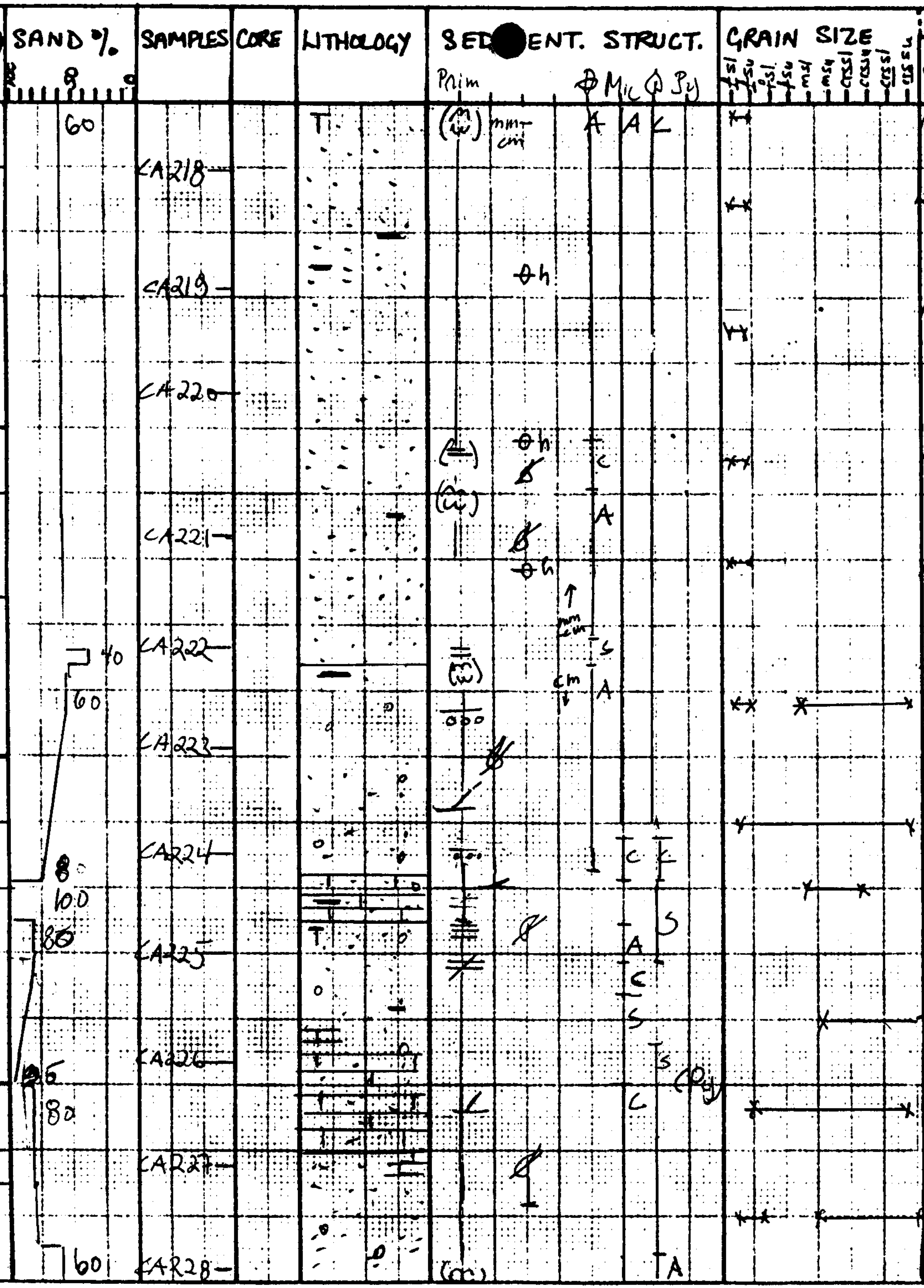
Sst, ltgy, calc

PALAEO F

MUD

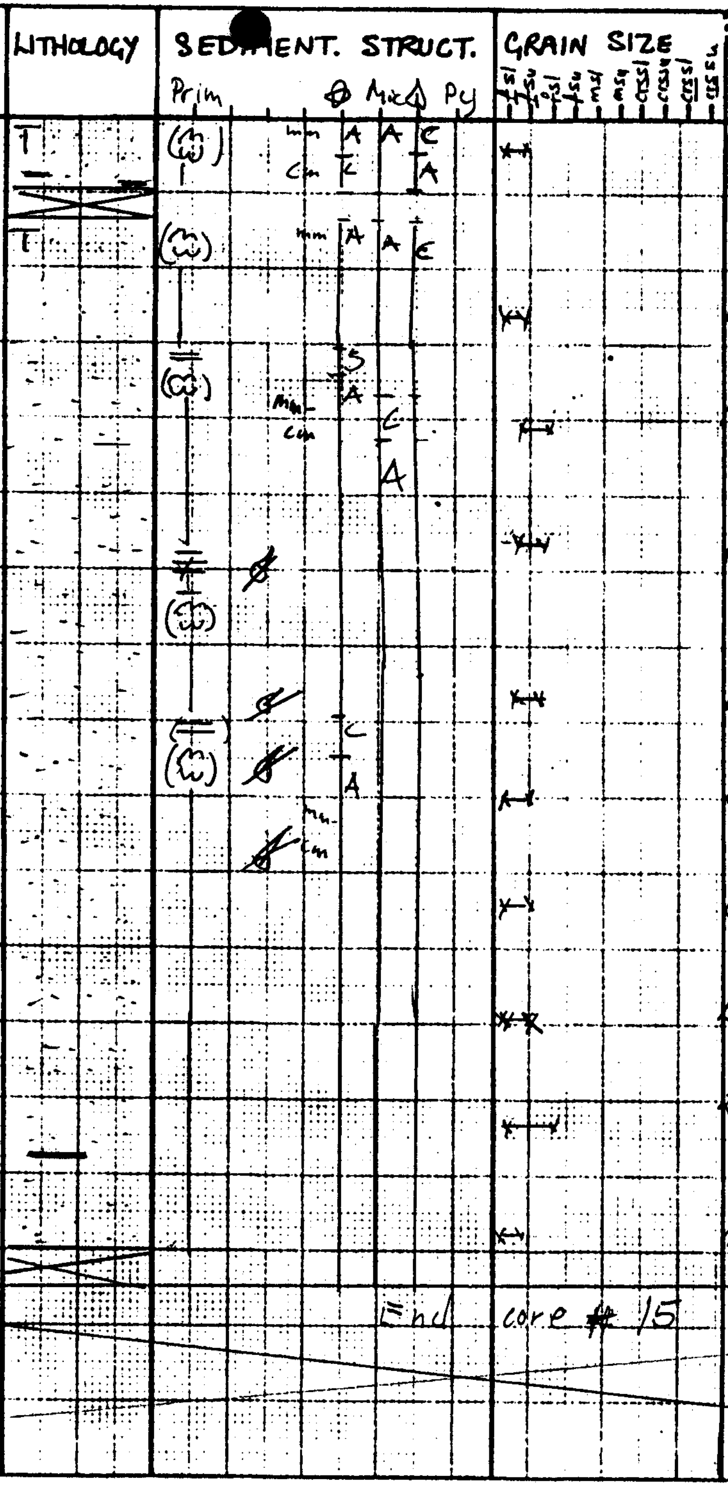
End core #13

DRILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	CORE	LITHOLOGY	SED ENT. STRUCT. Prim Mic Pt	GRAIN SIZE	MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
1470															
1471															
1472															
	60	A217		T	(C) (=) ≠	CORE # 14 A A K C A **	12	80	8	2/4	3/5	2	(slt) sst, v med-dk gy, slt – f Sd dom translucnt q 4/3, (m lkqtz) mic, carb, (cc calc))	F	

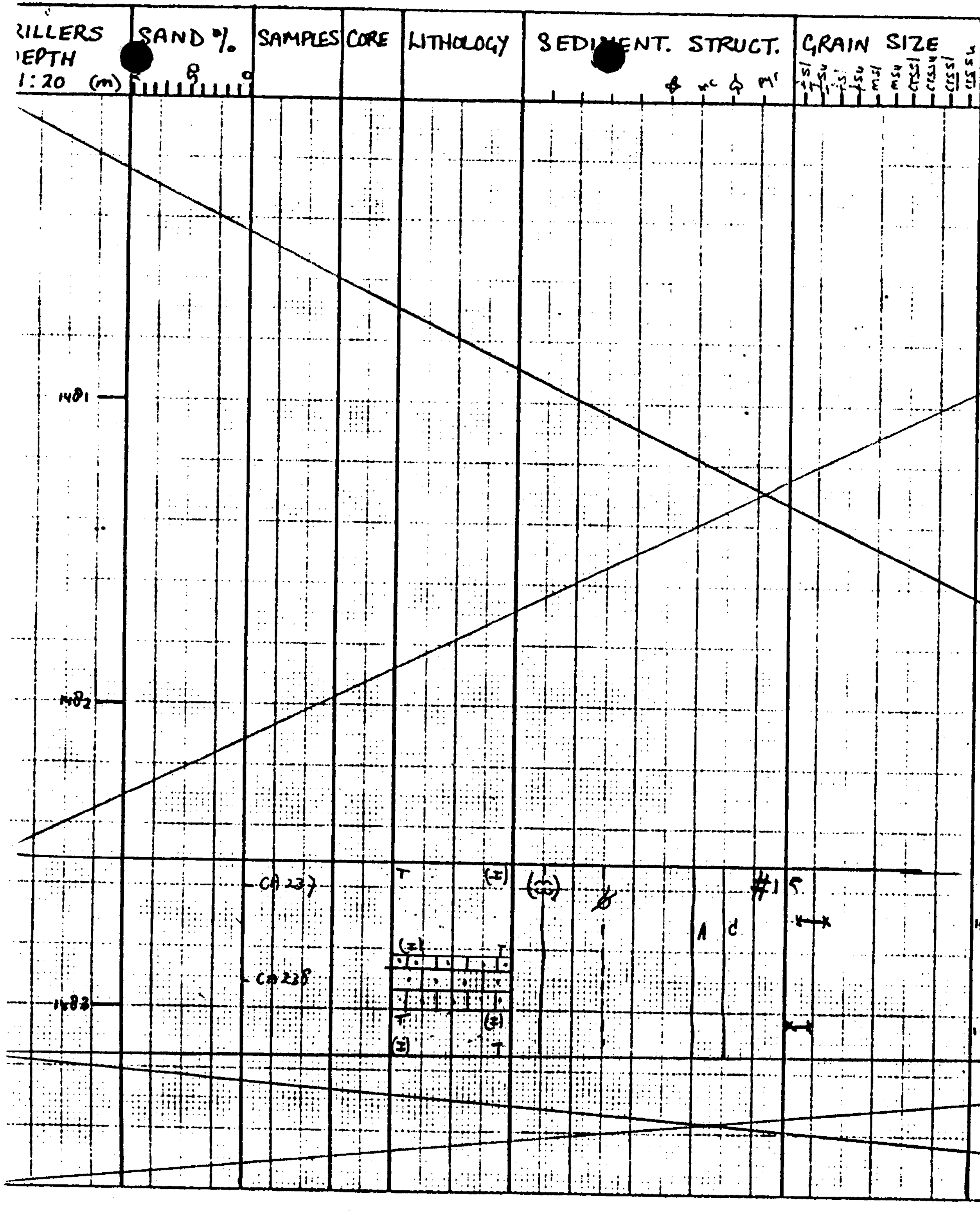


DRILLERS DEPTH 1:20 (m)	SAMPLES	MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
		120	80	8	2/4	3/5	2	(slt) Sst, med-dk gy, slt-fsd		
1473	CA218									
		120	80	8	2/4	3/5	2	dom translusc. qtz (milk qtz), mic, carb (((calc)))		
	CA219									
		110	70	8	2/4	3/5	2	Sst (slt) aa	F	
	CA220									
		110	75	8	2/4	3/5	2	Sst (slt)		
1474	CA221									
		110	70	8	2/4	3/5	2	Sst (slt) aa		
	CA222									
		200 110	250 80	6	2/4	3/5	2	(slt) Sst, med-dk gy, slt-gran. bimodal domin. fs Semielliptical fossil		
	CA223									
1475		2000	100	3	2/4	3/5	2	Sst	D	
	CA224	300	350	6	3/4	2/5	4	Sst lt gy. hd. calc		
	CA225							Fine mic sst interlayered with MS		
		2600	400	4	2/4	2/5	2/3	Sst, med gy (dom), slt-gran. translus. qtz, (milk qtz) (quartzite) (mic), ((carb)), ((calc))		
	CA226	1800	150	3	2/4	2/5	4		D	
1476	CA227							Several thick walled bivalve fragm	P	
	CA228	2200 120	400 100	4	2/4	2/5	2	Sst, med-dk gy. bimodal	F	

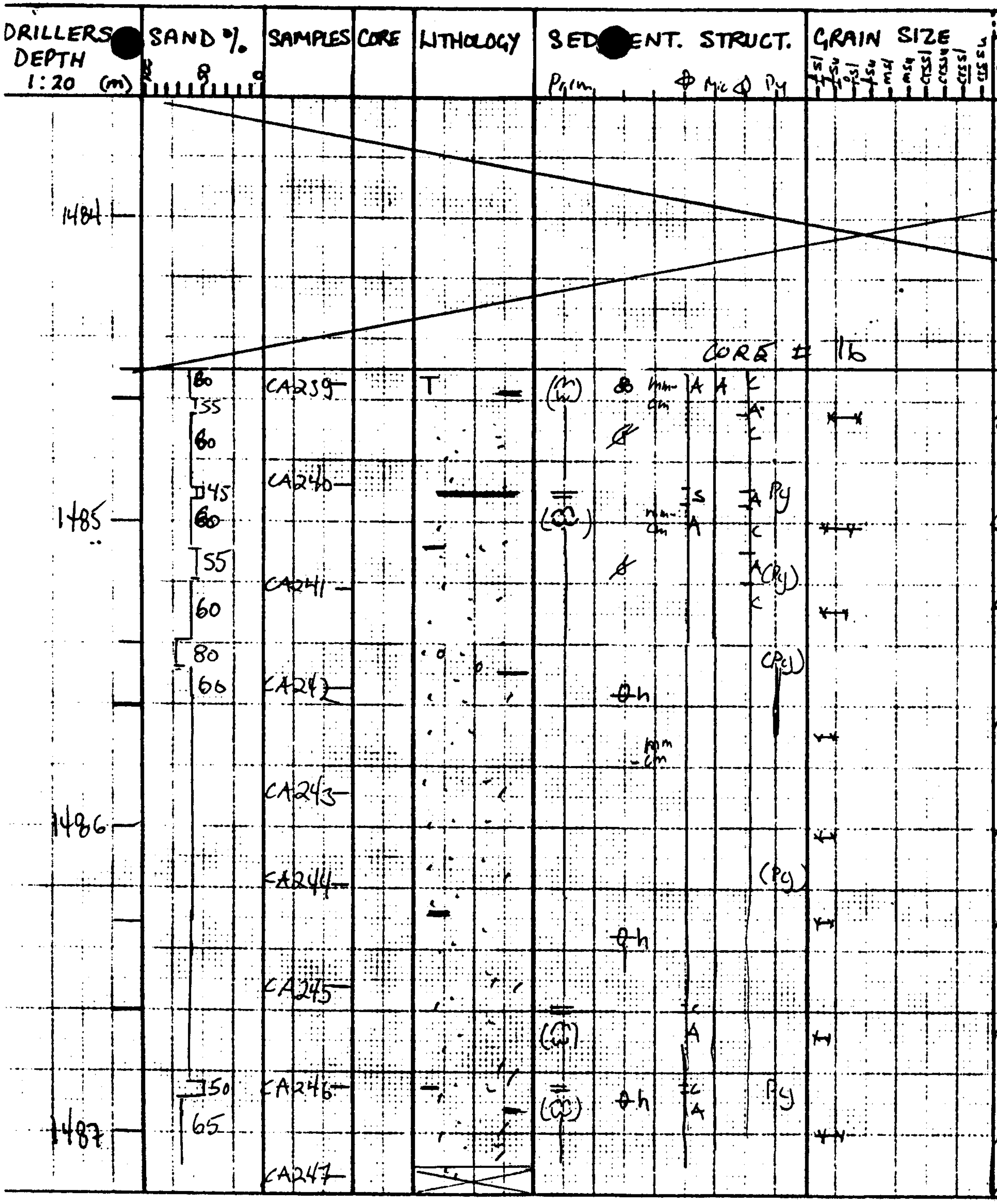
DRILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	CORE	TEXT INPUT						DESCRIPTION	PALAEO	MUD
				MAX	DOM.	SRT	RND	SPH.	HARD.			
	60			120	80	7	2/4	3/5	2	Sst, slt, slt-fsh, a few m.S, dom. transluc. qtz (milk qtz), mic, carb. ((calc))		
		USEPL CA229										
1477		CA230		120	80	8	2/3	3/5	2	Sst, slt, slt-fsh, med-dk gy aa	F	
	80			180	100	8	2/3	3/5	2	Sst, slt, slt-fsh, med gy, mic, (carb)		
	60	CA231										
		CA232		180	120	8	2/3	3/5	2	Sst, slt, slt-fsh, med-dk gy, mic, carb		
1478		CA233		180	120	8	2/3	3/5	2	Sst aa small shell fragm.		
		CA234		165	90	8	2/4	3/5	2	Sst, slt, med-dk gy, slt-fsh, dom. transluc. qtz, mic, carb, ((calc))		
				120	80	8	2/4	3/5	2			
		CA235		130	100	8	2/4	3/5	2	Sst aa	F	
1479		CA236		250	100	6	2/4	3/5	2	Sst, med gy, slt-msh		
	70											
	60											
		sample removed		110	70	8	2/4	3/5	2	Sst, med-dk gy, slt-fsh		
1480												



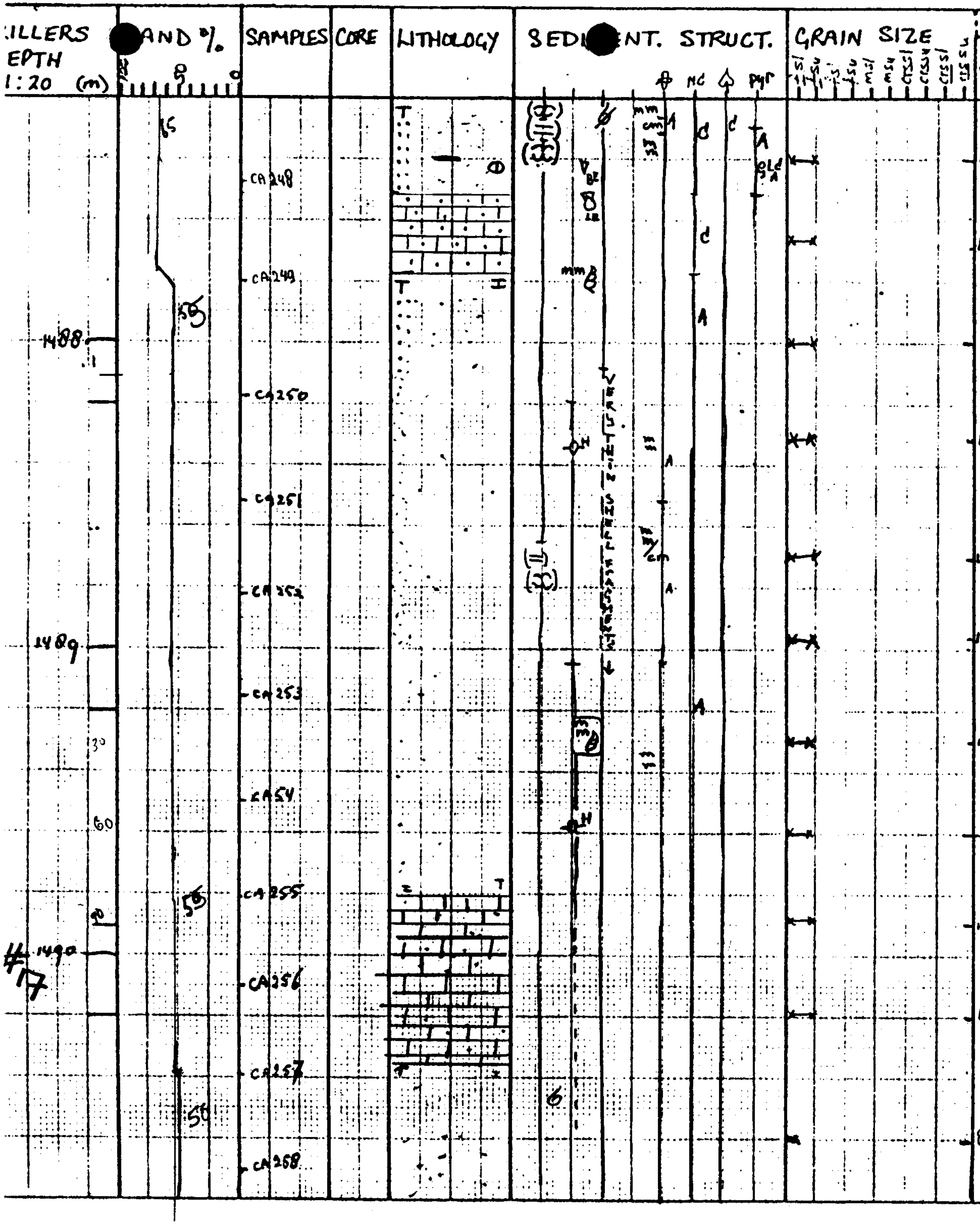
RILLERS EPTH 1:20 (m) | SAND % | SAMPLES | CORE | LITHOLOGY | SEDIMENT. STRUCT. | GRAIN SIZE



TEXT INPUT								
MAX	DOM.	SRT	RN	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
150	100	9	3/4	3/5	2	SST, SLTST, LT qY, silt - fsh, Translucent qTz mTc (feldsp), carb, (cmt), calc cmt. BioT, muscov, chlorite	F	
100	65	9	3/4	3/5	2	a - a, silt - fsu,		

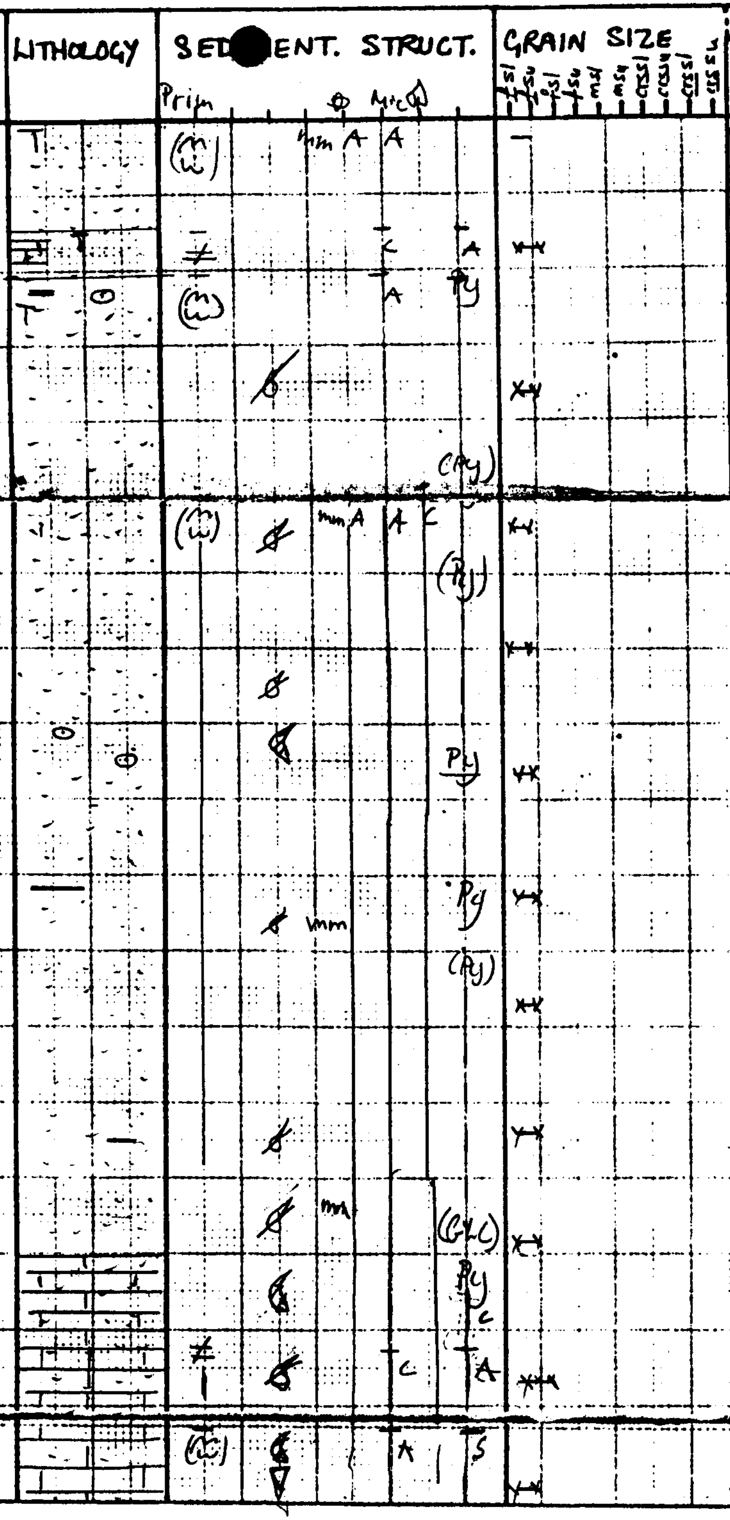


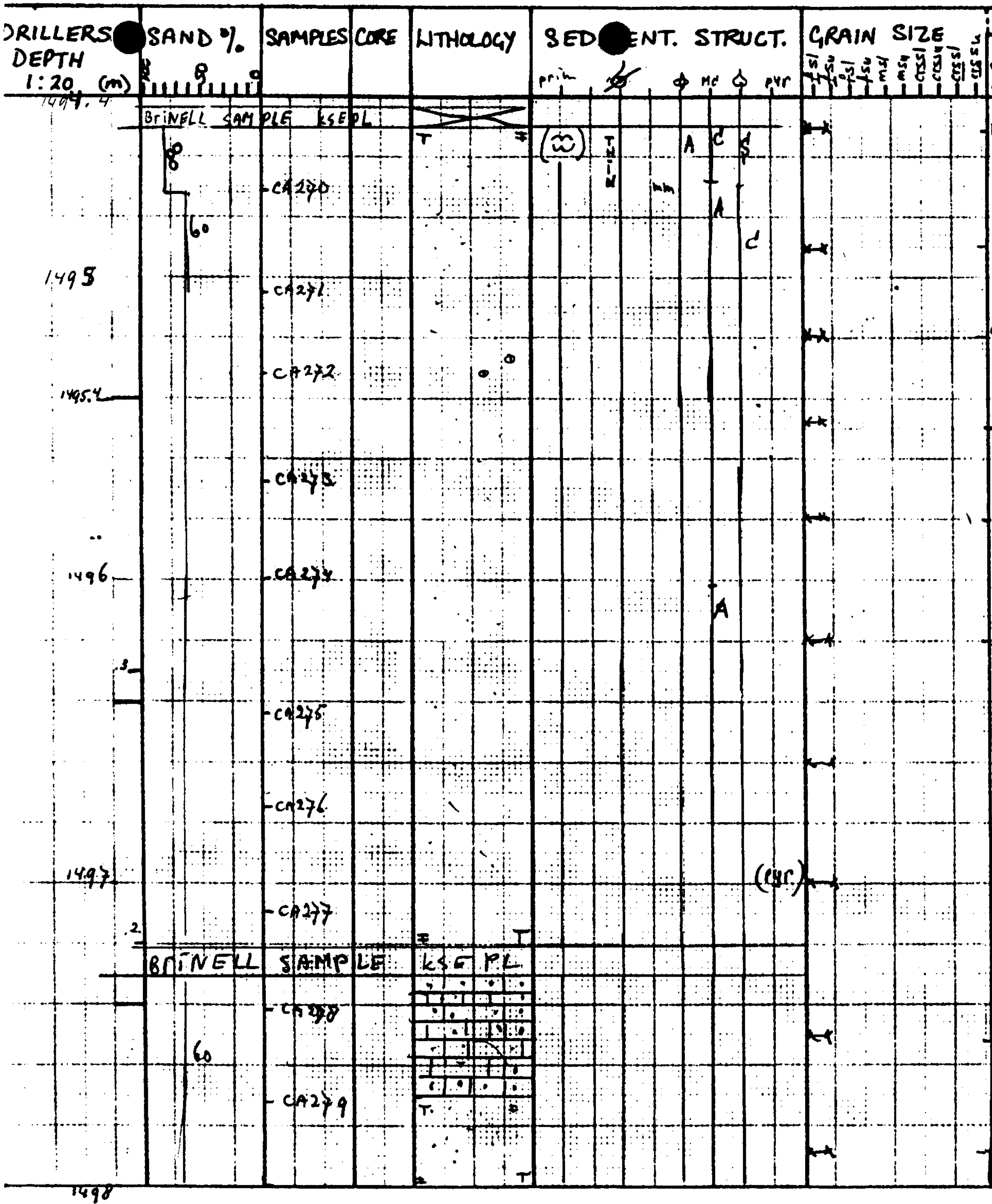
TEXT INPUT								
MAX	DOM.	SRT	RN	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
150	100	7	2/4	3/5	2	Sst, slt, mud (dk gy); slt-fsh, dom transl qtz, (milk qtz) mic, carb. (((calc)))		
130	95	8	2/4	3/5	2			
120	90	8	2/4	3/5	2	Small tiny shell fragments sst aa.	F	
110	70	8	2/4	3/5	2	Endomorpha sst, slt, mud (dk gy). dom translucc qtz, mic, carb, (((calc)))		
100	70	8	2/4	3/5	2	aa		
100	70	8	2/4	3/5	2	aa Endomorpha		
100	70	8	2/4	3/5	2	aa		
120	90	8	2/4	3/5	2			



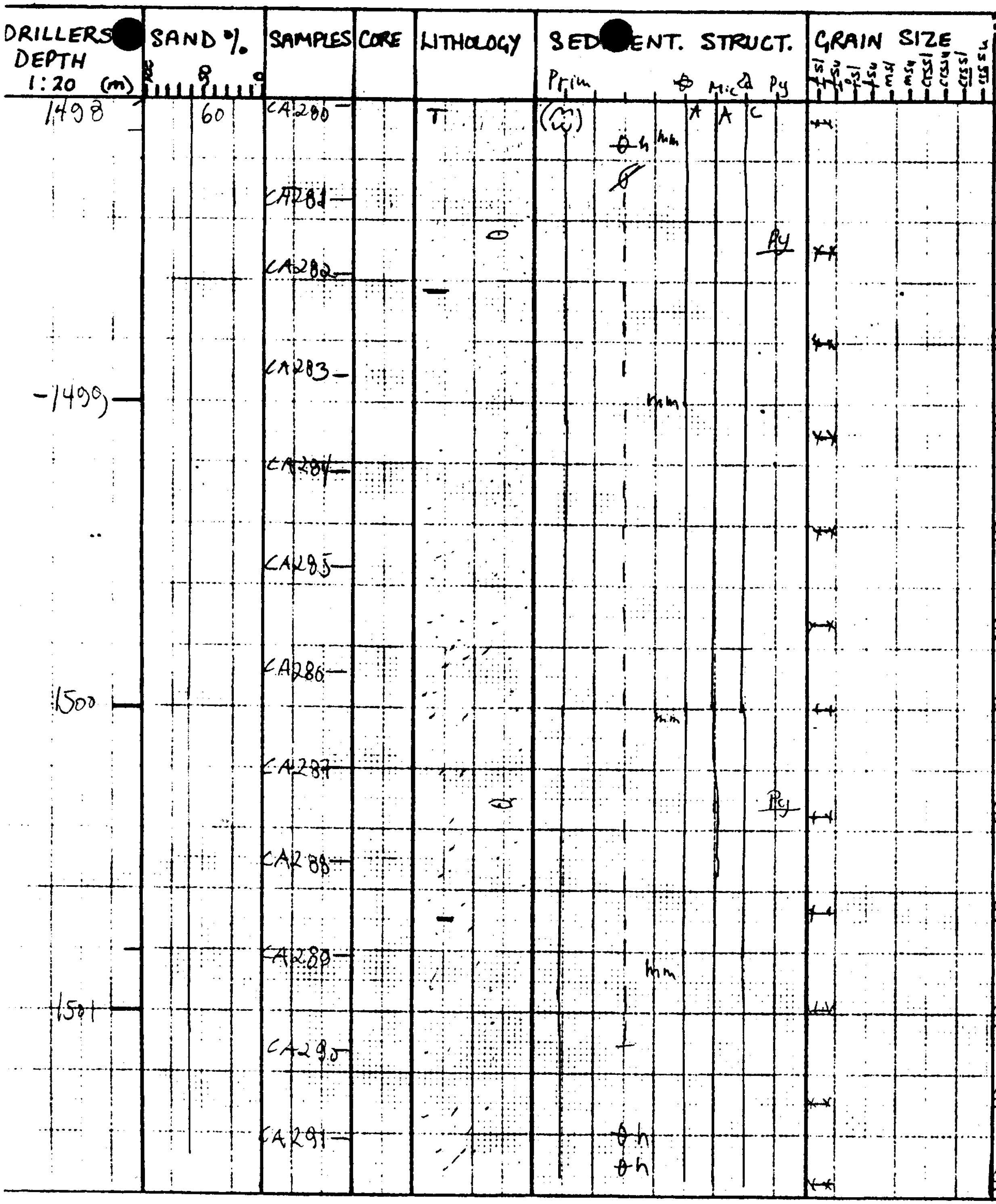
MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
125	90	g	2/4	3/5	2/3	SST, silt, LT yel gy, silt-fsu, transluc qts, milky qts, (rose qTz), mic, glauc, pyr (dissem.) (veldsp) [carb] cmt, (calc) cmt.		abund. glauc + pyr.
125	90	g	3/4	3/5	4	SST, silt, LT gy, silt-fsu, transluc qts, mic, cmt, calc cmt. ↳ biot, muscov		
100	65	g	2/4	3/5	2	SST, silt, LT gy, silt-fsu, transl qts, mic, cmt, (calc) cmt., muscv, biot. (carb) (veldsp).	F	
100	65	g	3/4	3/5	2	a a. (chlorite)		
125	85	g	3/4	3/5	2	a.a.		
100	65	g	3/4	3/5	2	a.a. bimodal (rose qTs) qTs grains (crssu - crssu), with mineral inclusions, smoke qTs.		
100	65	g	3/4	3/5	2	a.a unimodal.		
100	65	g	3/4	3/5	2	a a.	F	
100	65	g	3/4	3/5	4	a a but now cmt, calc cmt.		
100	65	g	3/4	3/5	4	a.a		
						← Echinoderm remain (spike) ?		
80	62	g	3/4	3/5	4	a.a but cmt, (calc) cmt		

DRILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	CORE	MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
	55			90	70	8	2/4	3/5	2	Sst, slt, med gy, dom transl. qtz, mic, (carb)-carb		
1491		CA259										
	75			80	90	8	3/4	3/5	2/3	Sst, gel gy, slt-fsl, dom translusc. qtz, py, mic, (carb) calc, gu min, (glauc?)		
	55	CA260										
				100	60	8	2/4	3/5	2	Sst, med gy Very small shell fragm.	F	
		CA261										
				90	70	8	2/4	3/5	2	Sst, slt, med- gy, slt-fsl, fnt, mic, carb, dom. transl. qtz, ((calc))		
1492		CA262										
	55			90	70	8	2/4	3/5	2			
		CA263										
				90	65	8	3/4	3/5	2	1cm big nodules with pyrite cnt		
	58	CA264										
	55			90	65	8	2/4	3/5	2	small thin walled shell piece	F	
1493		CA265										
				80	60	8	2/4	3/5	2			
		CA266										
				80	80	8	2/4	3/5	2	Sst, slt, med gy. transl. qtz slt-fSL, mic, carb, ((calc))		
		CA267										
				90	65	8	2/4	3/5	2	Big thin walled shell	F	
1494		CA268										
	60			120	80	8	2/4	3/5	3/4	Sst, gel gy, slt-fsl, (mic) py		
	55	CA269		90	60	8	2/4	3/5	4	Sst, lt bl. gy, mic lid (carb)-carb		

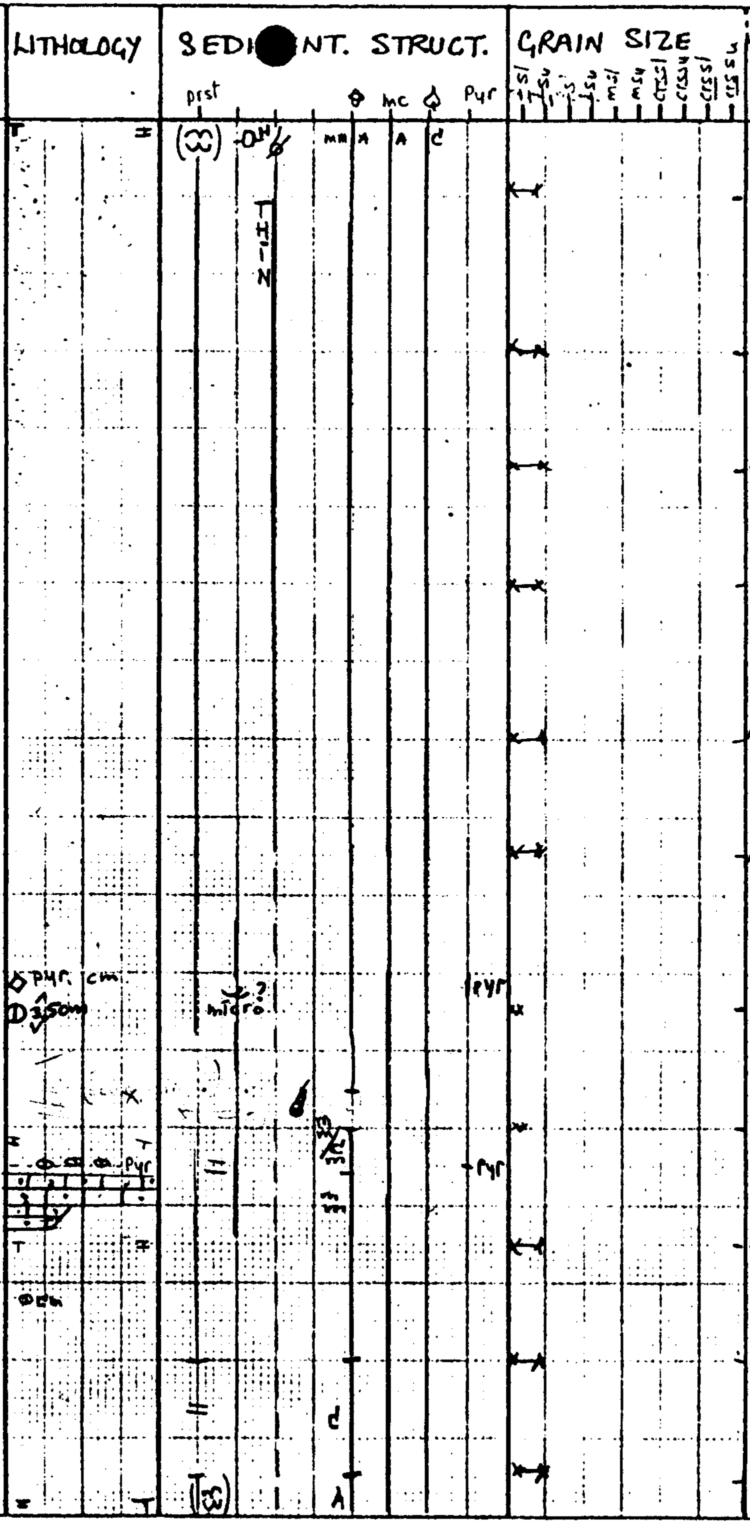




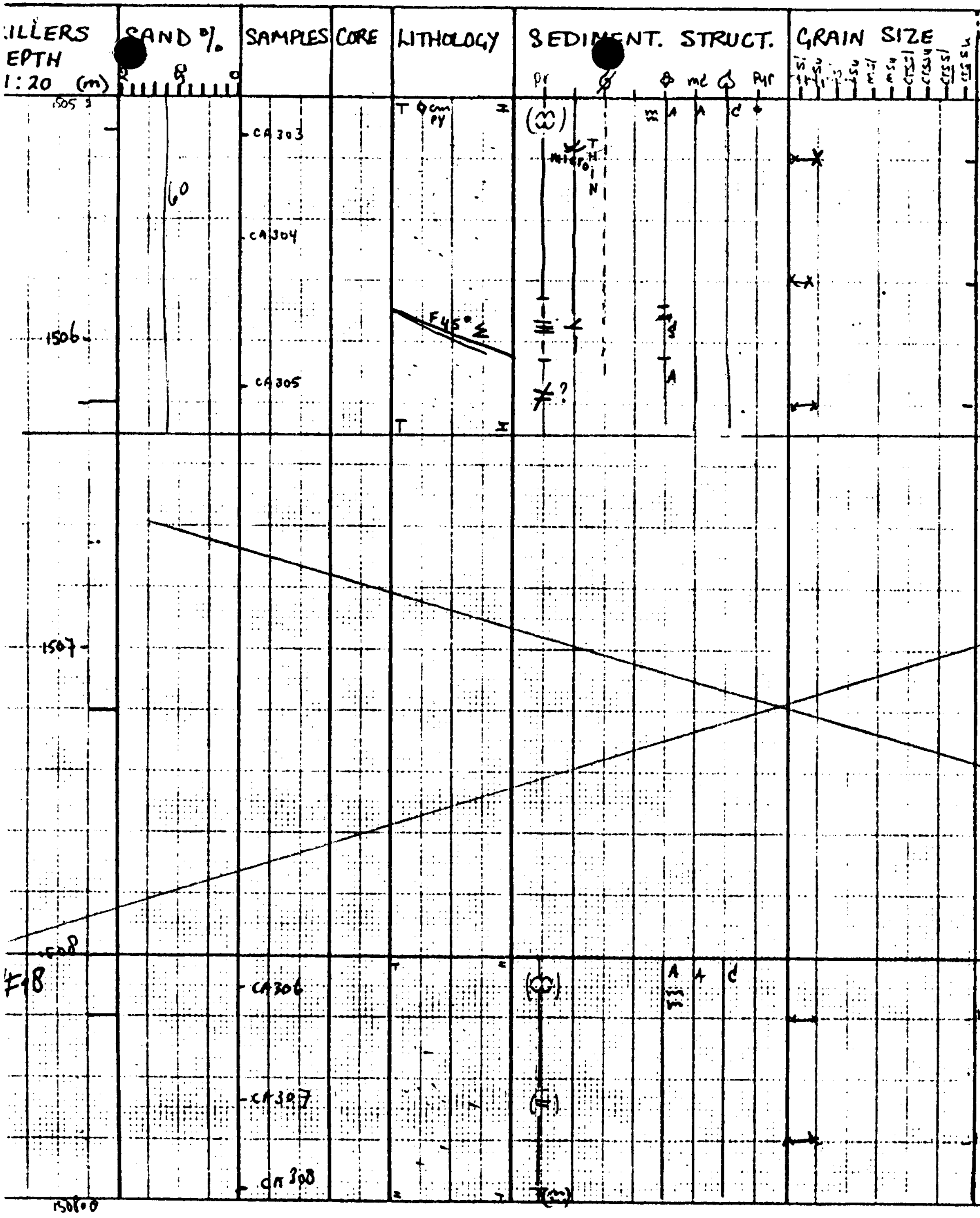
MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
100	65	g	3/4	3/5	2	sst, silt, Lgy yel, (silt-fsu), transluc qTs, mic (cmt) (calc) cmt, Brit: muscov-(chlor), milky qTs,	F	
90	65	g	3/4	3/5	2	sst, silt, Lgy-Mgy, (silt-fsu), transluc qTs mic, cmt (calc) cmt. (carb) , qTs with min inclus, , milky qTs		
90	65	g	2/4	3/5	2	a a	calcareous nodules 0,5-2cm DIAMETER → spherical	
90	65	g	2/4	3/5	2	a a		
90	65	g	3/4	3/5	2	a a		
90	65	g	3/4	3/5	2	a.a (less mic.?)		
90	65	g	3/4	3/5	2	a.a	F	
90	65	g	3/4	3/5	2	a.a.		
90	65	g	2/4	3/5	4	a.a cmt, calc cmt		
90	65	g	2/4	3/5	2/3	a. a cmt.		



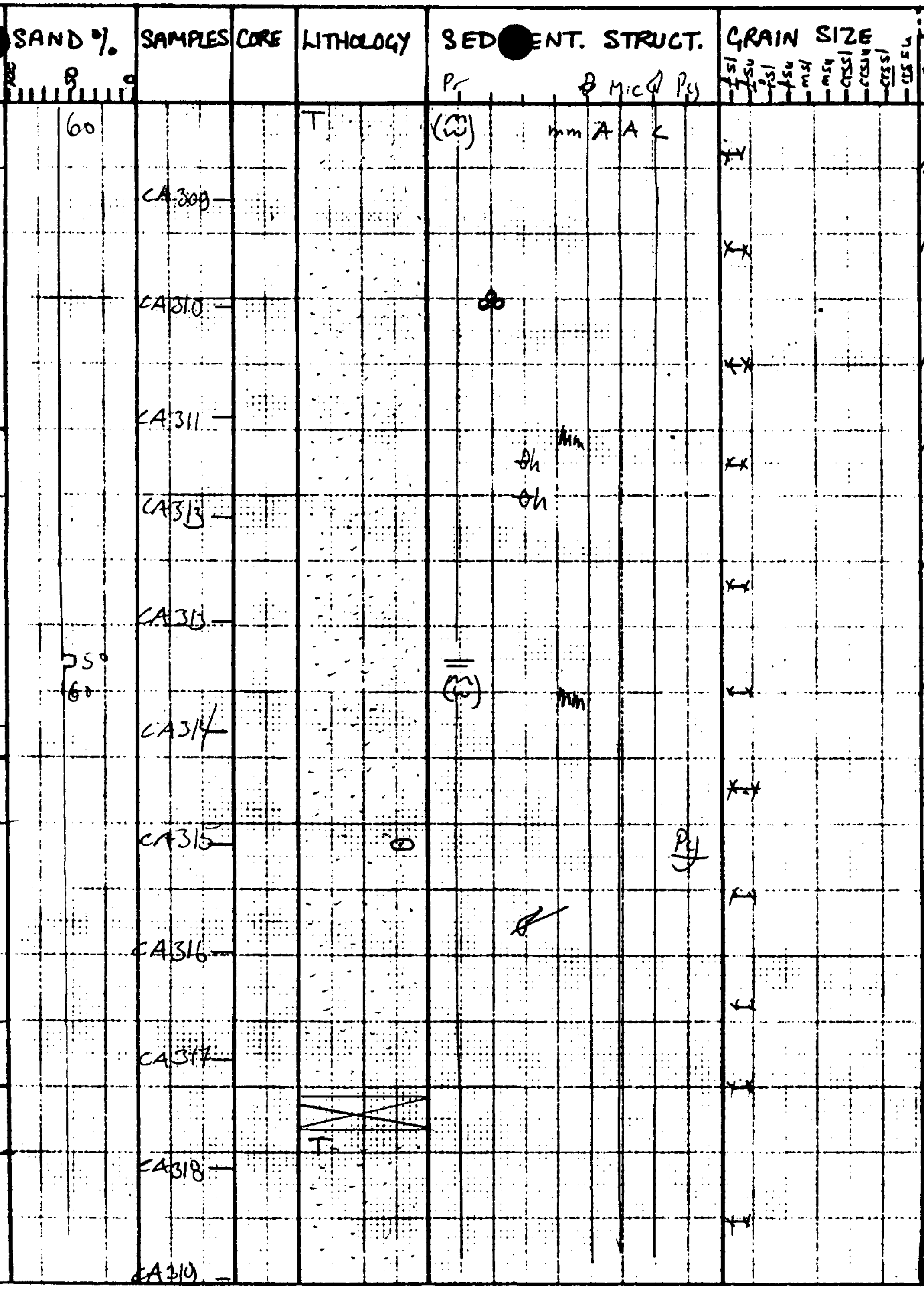
SAMPLES	MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
CA280	90	65	8	3/4	3/5	2	Endomorpha	F	
CA281	85	62	8	3/4	3/5	2	Sst, slt, med gy, slt-fsd, dom transl. qtz, mic, carb, ((calc))	A very few, very small, thin shell fragments	
CA282	90	65	8	3/4	3/5	2	a a	Ribbwalled shell	
CA283	90	70	8	3/4	3/5	2	a a		
CA284	90	65	8	3/4	3/5	2	a a		
CA285	90	65	8	3/4	3/5	2	a a		
CA286	90	65	8	3/4	3/5	2	A few small shell pieces Ebrongan!	F	
CA287	90	65	8	3/4	3/5	2	0.5cm py nodule		
CA288	90	70	8	3/4	3/5	2			
CA289	90	70	8	3/4	3/5	2			
CA290	90	70	8	3/4	3/5	2		Big rib walled shell piece	
CA291	90	70	8	3/4	3/5	2		Big sub horizont. 8mm thick brpt. Also endomorpha	



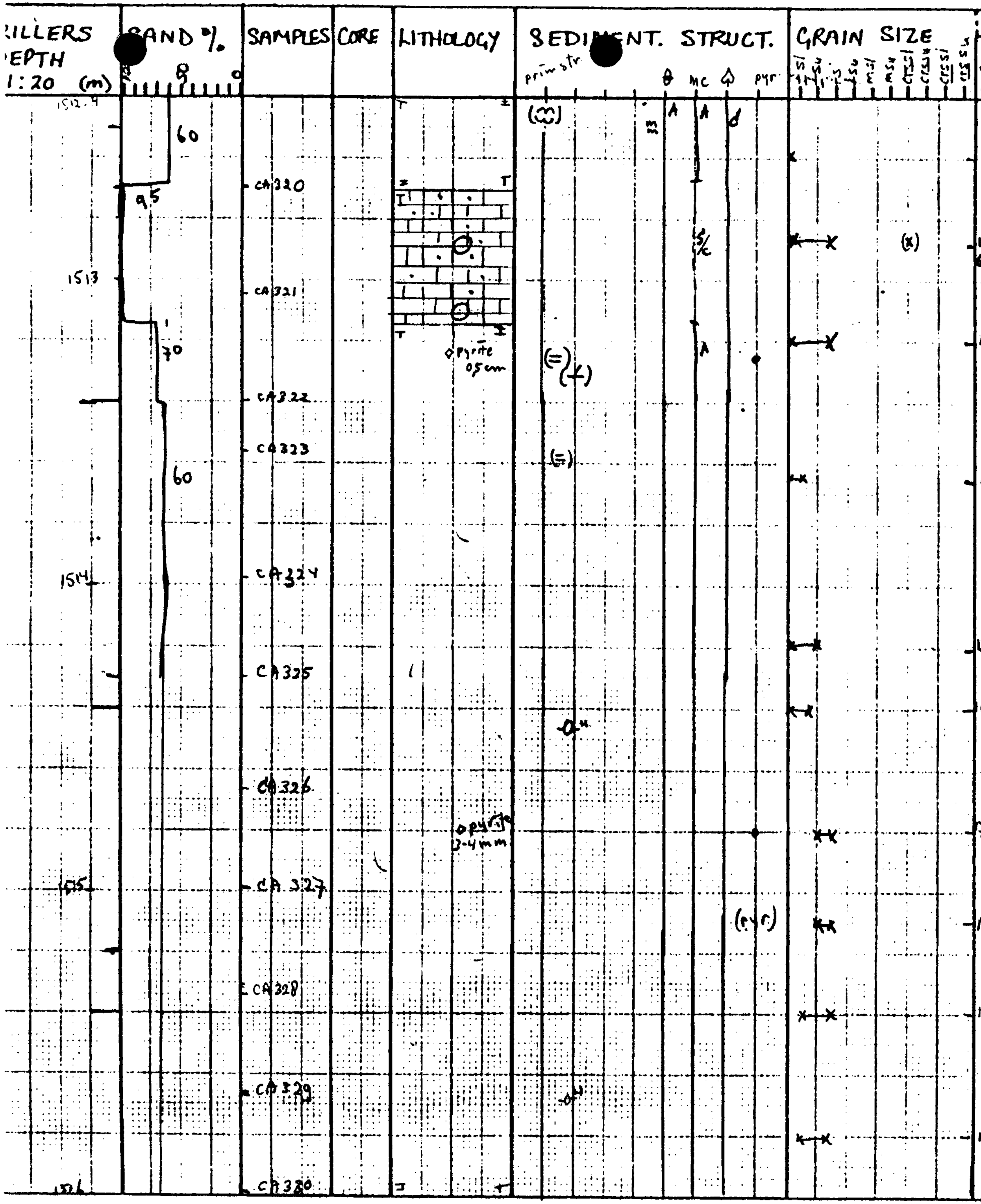
ILLERS EPTH 1:20 (m)	AND %	SAMPLES	CORE	MAX	DOM.	SRT	RN	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
1501.6	60	CA292		100	65	8	3/4	3/5	2	sst, silt, M-lqy, silt fsu, <u>transluc qts</u>, (milky qts), (qts with min inclus), <u>mic</u>, biot, muscov, (carb), cmt, calc cmt (chlorite)		
1502		CA 293		100	70	8	3/4	3/5	2	a.a	F	
		CA294		100	70	8	3/4	3/5	2/[illegible]	a.a		
		CA295		100	70	8	3/4	3/5	2	a.a	some "fossils"? silicified	
1503		CA296		100	70	8	3/4	3/5	2	a.a		
		CA297		100	70	8	3/4	3/5	2/3	a.a	F	
		CA298		80	55	8	3/4	3/5	2	sst, silst, Mgy, silt-fsL. <u>transluc</u> qts, futher a.a		
1504		CA299		80	55	8	3/4	3/5	2	a.a	discolouration. <u>bedding</u>? <u>angle</u> 30°	
		CA300		100	70	8	3/4	3/5	2	a.a. silt - fsu	small calcareous nod. layered with pyr.	
		CA301		125	80	8	3/4	3/5	2	a a (silt) fsL-fsL	F	
1505		C302		125	88	8	3/4	3/5	2	a.a		



TEXT INPUT MAX	DOM.	SRT	R	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
125	88	8	3/4	3/5	2	ssT, silt, m 94, silt-fsL, transluc qTs, milky qTs, smoke qTs?, qTs with min inclusion, mic, muscov, biot, (chlorite), (carb), cmt, calc cmt.	F	
100	70	8	3/4	3/5	2	a.a (silt-fsu)		
125	88	8	3/4	3/5	2	a.a	fault 45° (2 faults) secundaire	
125	88	8	3/4	3/5	2	a-a	F	
125	88	8	3/4	3/5	2/3	a-a		



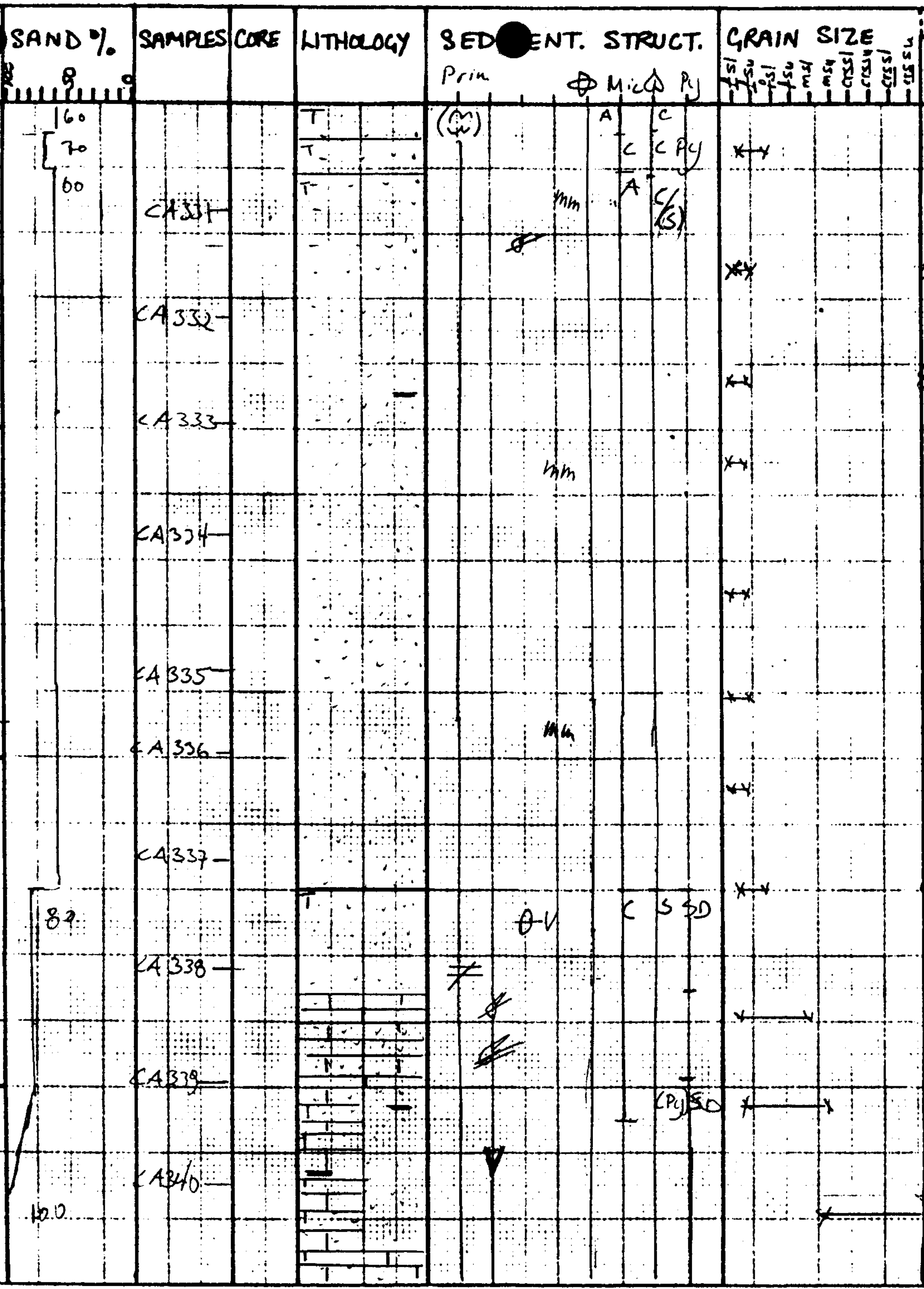
DRILLERS DEPTH 1:20 (m)	SAMPLES	TEXT INPUT MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
1509		110	80	8	3/4	3/5	2	~~Sst~~, slt, med gy, slt-fsd dom translusc. qtz, (m. tr qtz) mic, carb, noncalc (v calc))		
	CA309									
		110	80	8	3/4	3/5	2			
	CA310									
		110	80	8	3/4	3/5	2	aa	F	
	CA311									
		110	80	8	3/4	3/5	2	aa Endomorpha		
1510	CA312									
		110	80	8	3/4	3/5	2	aa		
	CA313									
		100	70	8	3/4	3/5	2	aa		
	CA314									
		120	80	8	3/4	3/5	2	~~Sst~~ slt, med gy, slt-fsd, dom transl. qtz, mic, carb, (calc)) 0.5cm Py nodule		
1511	CA315									
		110	70	8	3/4	3/5	2	aa Very small shell fragm.		
	CA316									
		110	70	8	3/4	3/5	2	aa	F	
	CA317									
		180	60	8	3/4	3/5	2	aa		
1512	CA318									
		180	60	8	3/4	3/5	2	aa		
	CA319									



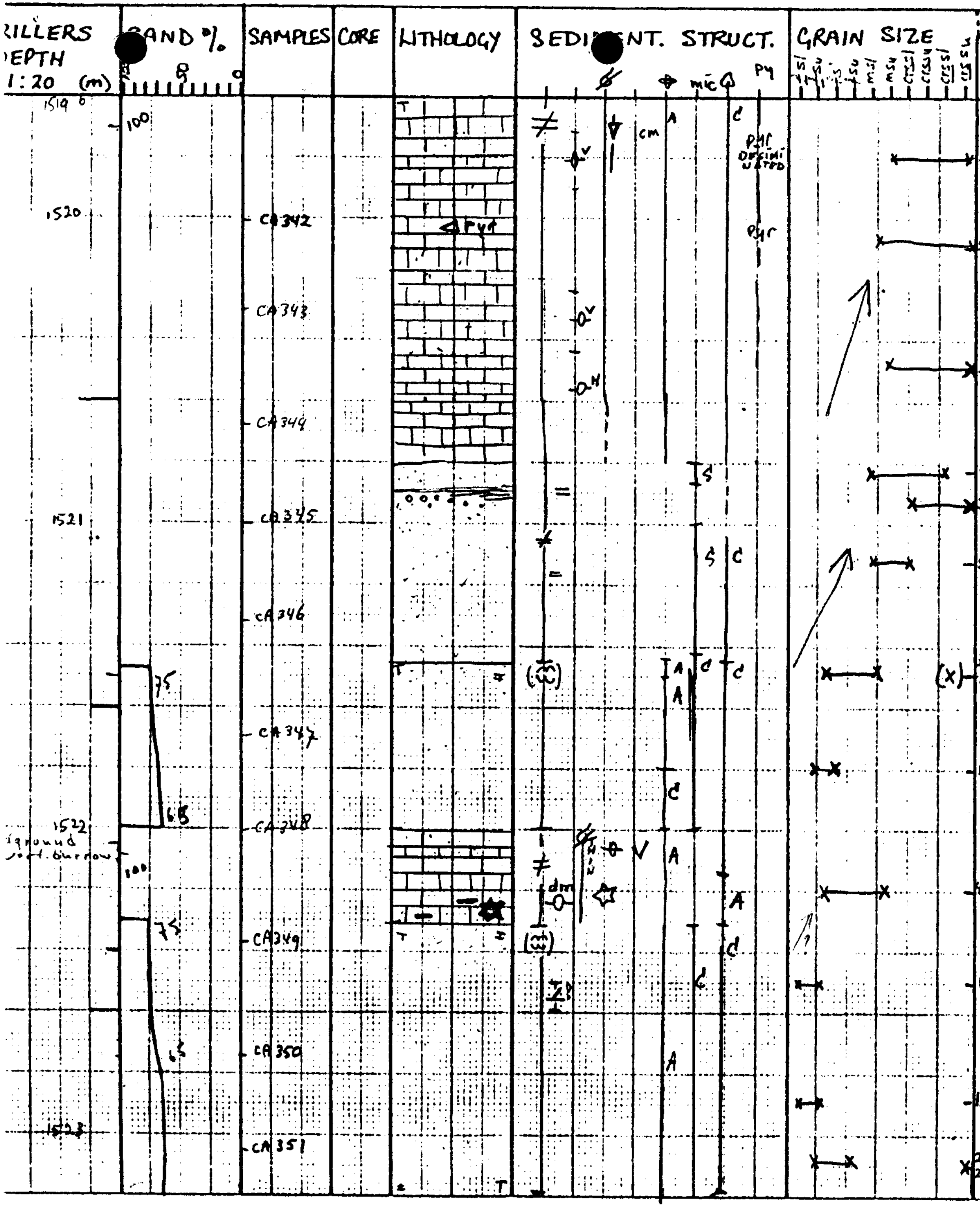
TEXT INPUT

MAX	DOM.	SRT	RA	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
62	55	8	3/4	3/5	2	M qu. siltst, S', transluc. qtz, milky qtz, mic, bio, muscv (chlorite).. (carb'), cmt, (calc) cmt,		
177 600	90	6	3/4	2/5	4	SST, qu bL, slight bimodal (in sample tray ± 6 grains ≈ 600 µ) (fsL-fsL) translucent qts, milky qts, qtz with mineral inclus, (mic) chlorite pred, (carb), cmt, calc cmt.	discoloration yellow halo around prim. feature? 2-3cm	
177	90	7	3/4	3/5	2		F	
						a.a, unimod, mic	ENDOMORPHA	
90	70	8	3/4	3/5	2	a a mic		
125	88	8	3/4	3/5	2	a.a	F	
100	70	8	3/4	3/5	2	a.a		
177	125	7	3/4	3/5	2	a.a couloration yel-brn (red) green min?	siderite?	
177	125	7	3/4	3/5	2	a.a	F	
177	100	7	3/4	3/5	2	a.a		
150	100	7	2/4	2/5	2	a a		

DRILLERS DEPTH 1:20 (m) | SAND % | SAMPLES | CORE | LITHOLOGY | SEDIMENT. STRUCT. | GRAIN SIZE | TEXT INPUT | DESCRIPTION | PALAEO | MUD



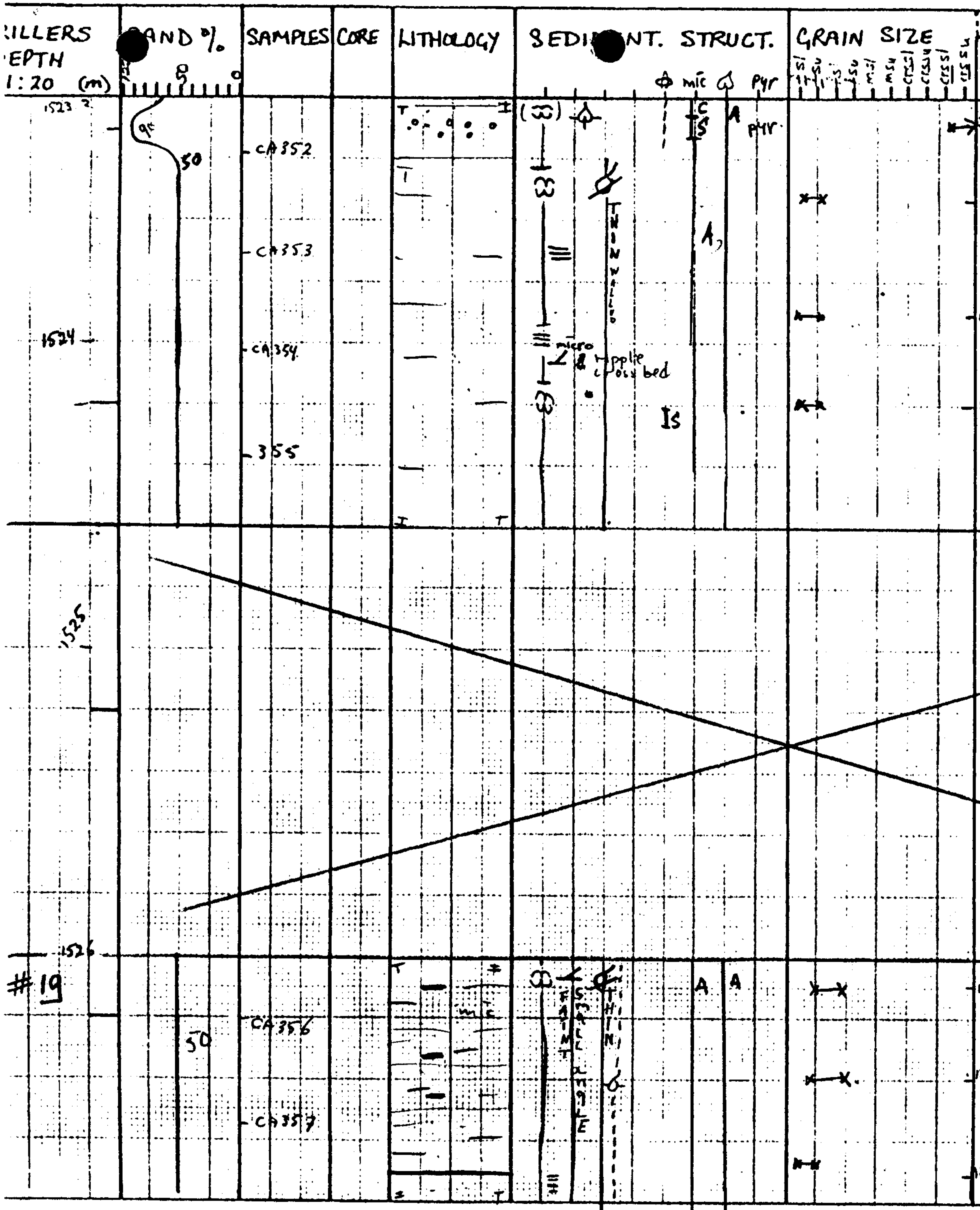
DRILLERS DEPTH 1:20 (m)	SAMPLES	MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
	CA331	140	80	8	3/4	3/5	2/3	Sst, yel-gy-brn, slt-fsL, mic, carb, ((calc))		
	CA332	85	65	8	3/4	3/5	2	Sst, med gy, slt, slt-fsL, dom trans qtz, mic ((milk qtz)), carb - (carb) non calc - ((calc)) 1 crs s grain		
1517	CA333	85	65	8	3/4	3/5	2	~~Sst~~ a/a		
	CA334	85	65	8	3/4	3/5	2	aa	F	
		8	60	8	3/4	3/5	2	a-a		
	CA335	80	60	8	3/4	3/5	2	aa		
1518	CA336	80	60	8	3/4	3/5	2	aa		
	CA337	700 125	90	7	3/4	3/5	3	Sst, gy-yel brn, slt-fsL a very few crs s grains, dom trans. qtz, mic, (carb)	1 crs s grain	
	CA338	350	90	6	3/4	3/5	4	Sst calc, lt-med gy bimodal very small tiny shell fragm.	vertical burrows 1-2 mm thick 7cm long	
1519	CA339	500	90	5	3/4	3/5	3	Sst, yel brn, bimodal ~~slt~~ crs sL, transl. qtz ((milk qtz)) (((rose qtz))) (mic), ((carb)), (((calc))) - calc siderite. occ py, belemnite	B	
	CA340	300 250	50	5	3/4	3/5	3			



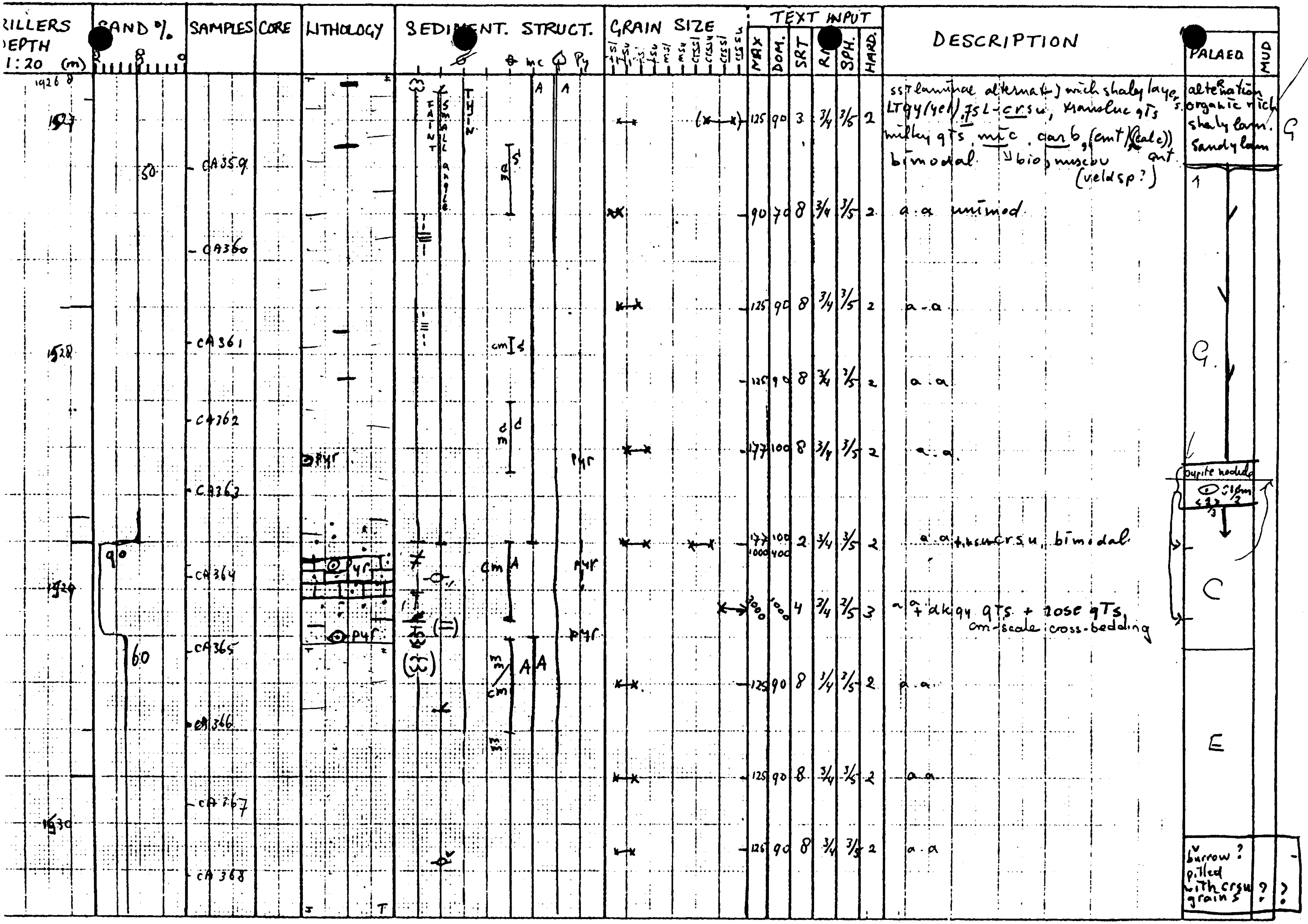
TEXT INPUT

MAX	DOM.	SRT	RN	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
2000	400	3	3/4	4/5	4	sst, blgy, brn blgy, fsL - gran, transluc qTs, milky qTs, roze qTs, smoke qTs, pyr, wood fragm (brn) qTz with miner inclusions | cmt. calc cmt. veldsp siderite nodules		
2000	300	3	3/4	4/5	4	a.a. ((chlorite)) bluisoh milky qTz. less pyr	B	
2000	400	3	3/4	3/5	4	a.a pyr very fine		
1300	250	4	3/4	3/5	1	Loose s LTgy a.a. + muscovite single grain 1500µ	Cu	
3500	650	2	3/4	2/5	1	max gran size 3500µ. more blgy qTz. Loose s	very fine grained (shaly layer)	
500	300	6	3/4	3/5	1/2	pred. transl qTz + muscov. ((chlorite)) LTgy	Cu	
(X) 350 1400	150	3	3/4	3/5	2	a.a. ((calc)) cmT biModail biotite	E	
125	100	8	3/4	3/5	2	a.a. unimod. more mic. LTgy		
400	125	5	3/4	3/5	4	a.a. cmt calc cmt LTblgy LTyelgy LBrN wood fragments cm size	~~big burrow filled~~ wood fragments + crinoid " "	
125	90	8	3/4	3/5	2	a.a. mic LTgy		
125	90	8	3/4	3/5	2	a.a. LTgy	E	
X 2000 200	125	3	3/4	3/5	2	a.a bimodal		

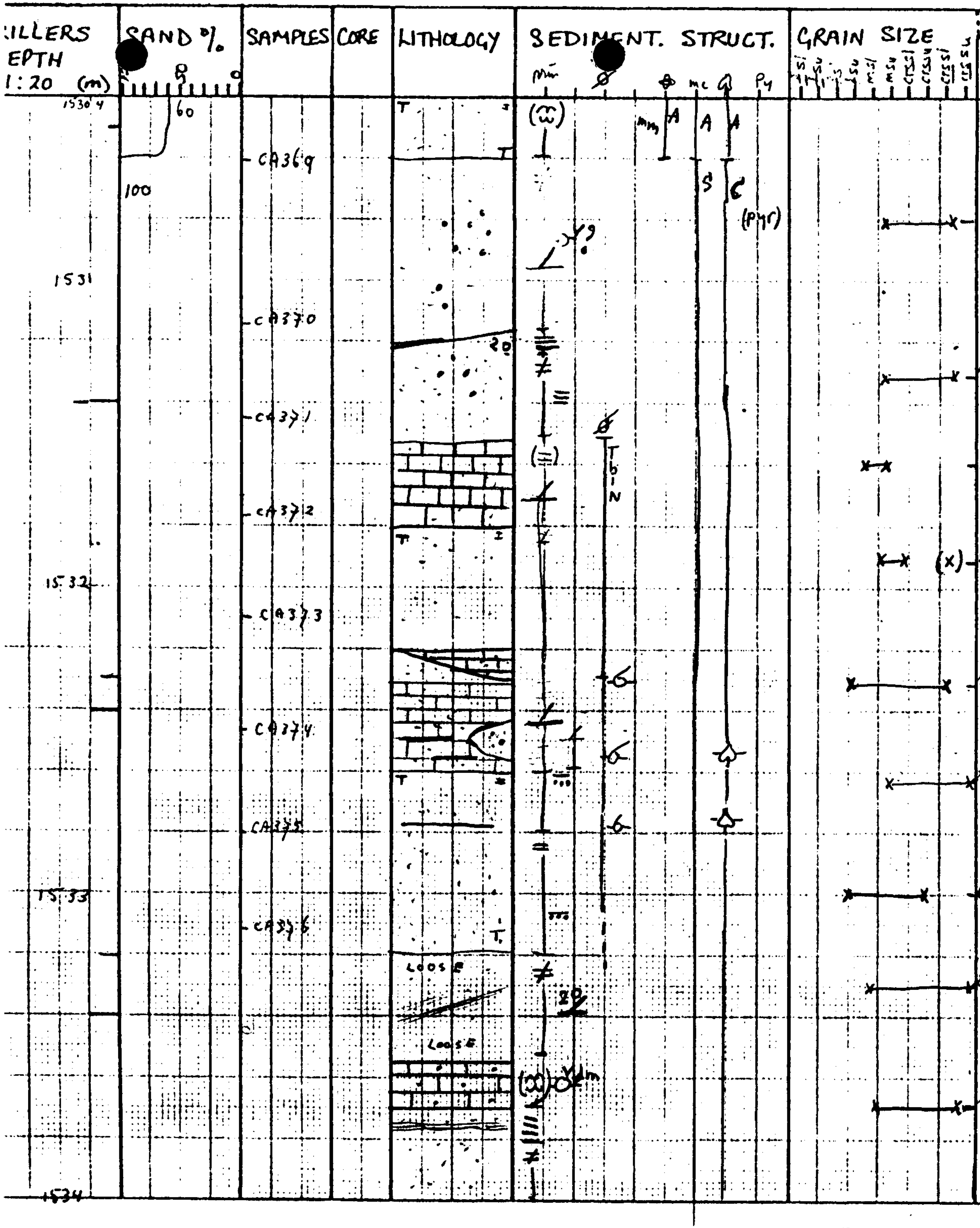
B2.
(A2)



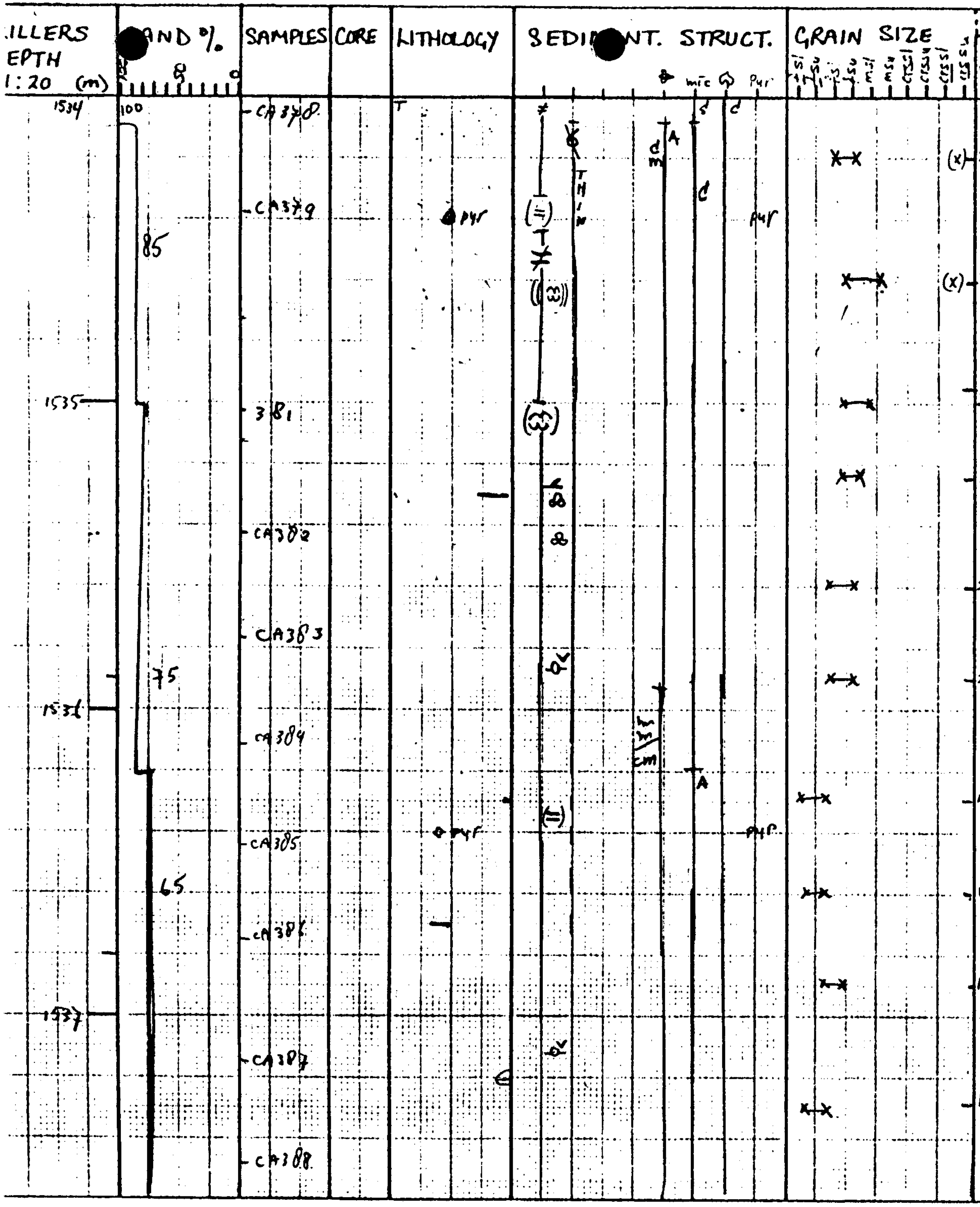
MAX	DOM.	SRT	RN	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
350	1200	3	3/4	3/5	2	SST, 94, fsu - sPbL, transluc qtz, qtz milky, smoke qTz ,(mic)(muscovite) (cmt) ((calc)) cmt (pyRite).(carb)	E ?	
125	90	8	3/4	3/5	2	SST, 94, fsl - ssL, qtz : transLuc, milky smoky, mic, muscov, biot, carb. (cmt), ((calc))		
150	90	8	3/4	3/5	2	a.a 1grain 1400 μ	G	
125	90	8	3/4	3/5	2	a.a	vertical bioturb	
177	100	7	3/4	3/5	2	SST, alternating with shale lam. SST a a.		
177	125	7	3/4	3/5	2.	a.a. 1 grain 500μ.	organic rich shaly Laminae	
125	90	7	3/4	3/5	2		G	



MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION
125	90	3	3/4	3/5	2	ssT laminae alternat.) with shaly layers, LTgy(yel), fsL-crsu, translnc qTs milky qTs, mic, carb, (cmt)(calc)) bimodal ↘bio, muscov qnt (veldsp?)
90	70	8	3/4	3/5	2	a.a unimod
125	90	8	3/4	3/5	2	a.a
125	90	8	3/4	3/5	2	a.a
177	100	8	3/4	3/5	2	a.a
177 1000	100 400	2	3/4	3/5	2	a.a + vcsu-crsu, bimodal
2000	1000	4	3/4	2/5	3	a.a + dkgy qTs + rose qTs, cm-scale cross-bedding
125	90	8	3/4	3/5	2	a.a
125	90	8	3/4	3/5	2	a.a
125	90	8	3/4	3/5	2	a.a

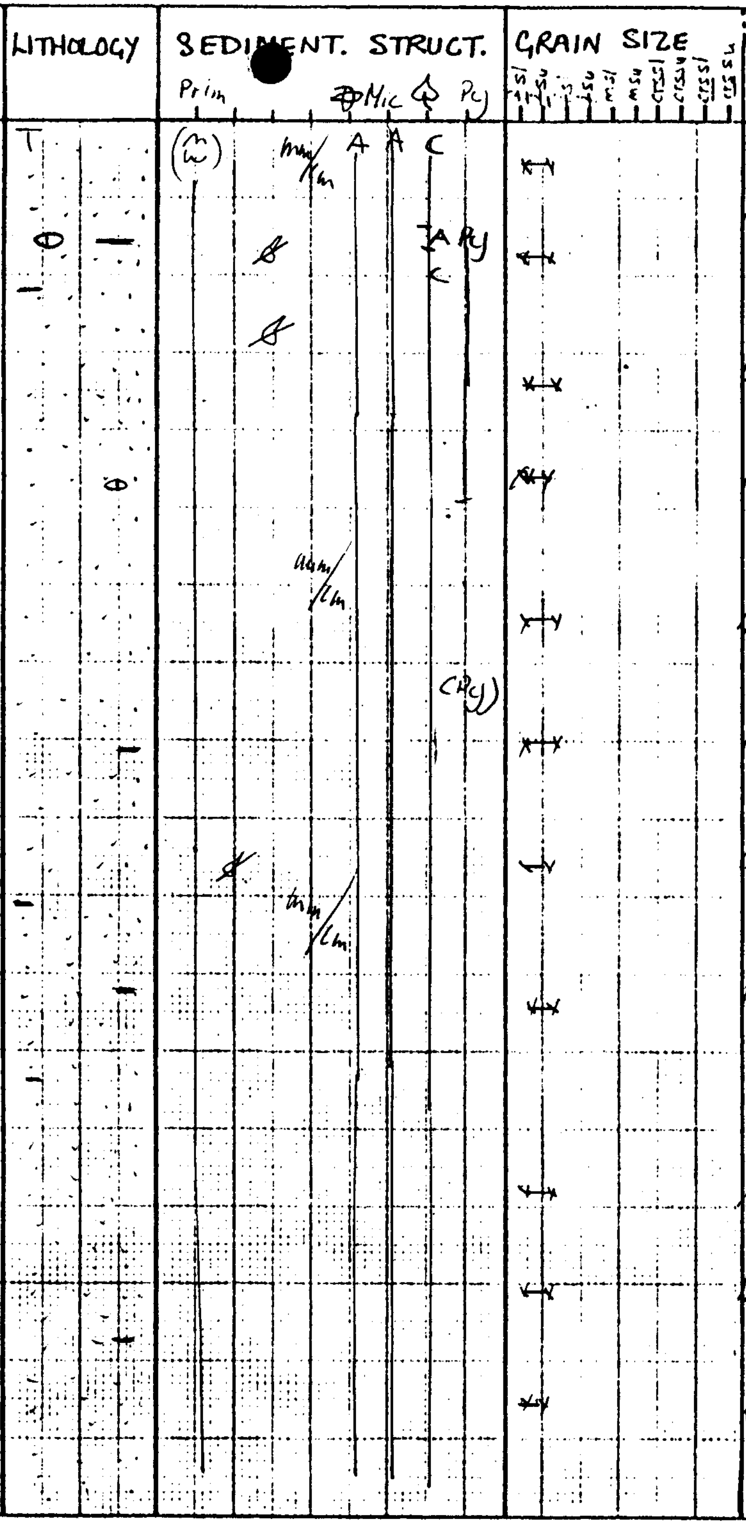


MAX	DOM.	SRT	R.	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
							E	
1200	350	3	3/4	3/5	1/2	St, LT gy(yel), fsu-crs L, predom transluc qtz, milk qTs, smoke qTs, (rose qTs). carb, green min?	• D	
1200	400	4	3/4	3/5	1	a.a	shaly layer mi 15 mm (silty) 20° angle	
350	250	7	3/4	3/5	4	sst cmt calc cmt further a.a. LT gy		
500	350	5	3/4	3/5	1/2	sst (cmt) further a.a. LT YEL (gy) 1 grain 1000µ	D	
1200	177	3	3/4	3/5	4	sst cmt calc cmt a.a. LT gy (bl)		
						– grain of 3000µ	∠ 30° } small? cu sequence	
1000	450	2	3/4	3/5	2	sst LT gy(yel) fsl-gran, transluc qts, smoky qtz, milky qtz, (rose qts), bluish qtz, (mic) muscov, carb, (cmt), (veldsp)		
800	177	5	3/4	3/5	2	a.a		
1000	300	5	3/4	3/5	1	a.a loose	C	
1600	350	5	3/4	3/5	1/2	a.a		
							E	

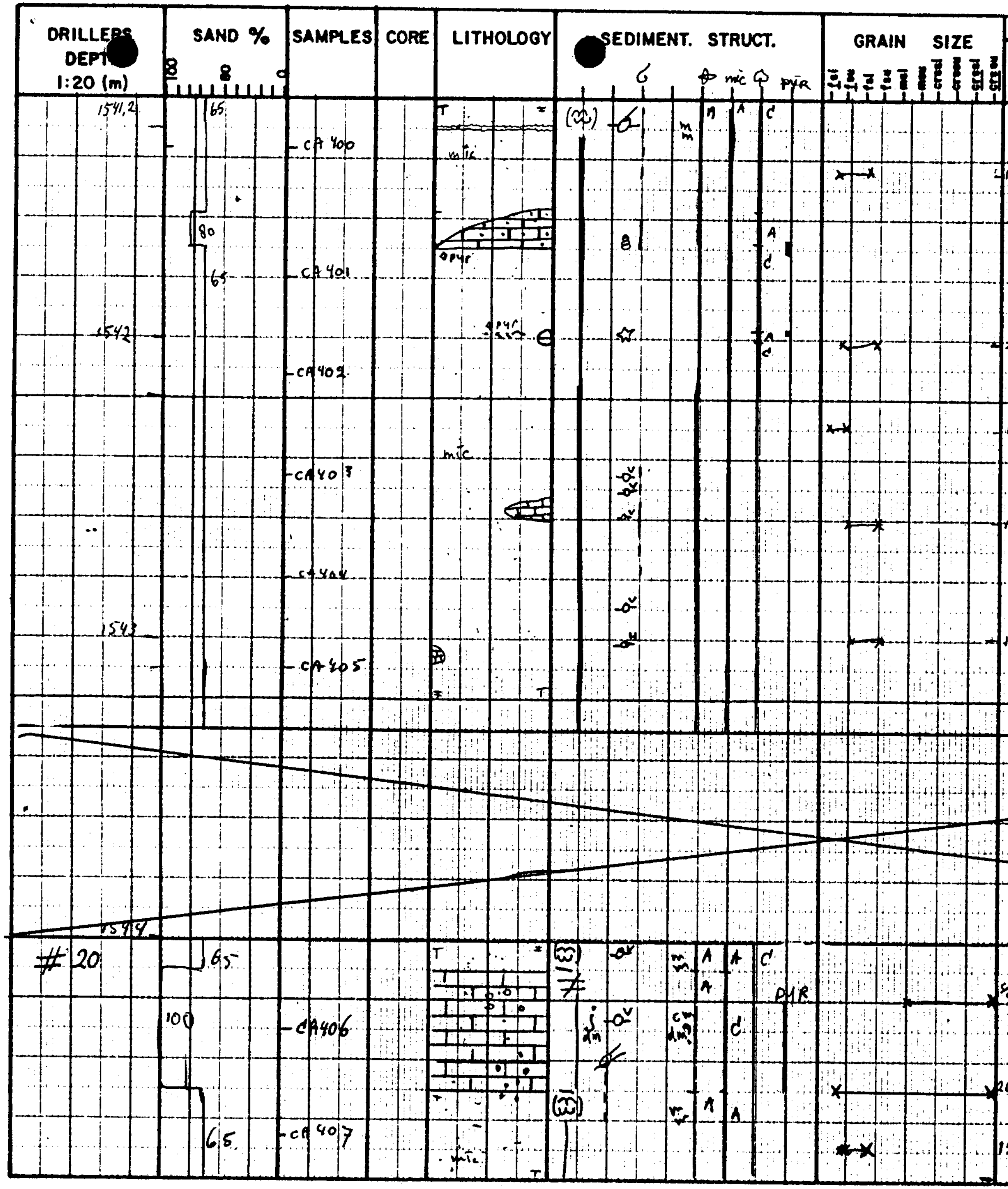


MAX	DOM.	SRT	RND.	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
250	150	7	3/4	3/5	2	→ grain 1500μ sst, m gy, fsu - lsu, transluc qTz, milky qTz, carb, mic, muscov, biot, Cmt, calc cmt.	E	
350	177	7	3/4	3/5	2	→ some grains 1200μ a.a.	yell. discoloration fiss. with HCl	
250	125	7	3/4	3/5	2	a. a.	E	
250	177	8	3/4	3/5	2	a. a bit more micA	8 ✿ porous	
200	125	8	3/4	3/5	2	a. a. ((calc))		
200	125	8	3/4	3/5	2	a a	E	
125	90	8	3/4	3/5	2	a a		
125	90	8	3/4	3/5	2	a. a	✿?☆?	
177	125	8	3/4	3/5	2	a - a.	E	
125	90	8	3/4	3/5	2	a - a.	calc concret.	

RILLERS EPTH 1:20 (m)	SAND %	SAMPLES	CORE	MAX	DOM.	SRT	R.	SPH.	HARD.	DESCRIPTION	PALAEO	MUD
	65			125	90	8	3/4	3/5	2	Sst, slt-fsL, dom translusc		
		CA389								qtz. (milky qtz), mic, carb		
	50			130	95	8.	3/4	3/5	2	((py)), noncalc - ((calc))		
1538										1cm calc. nodule with py and shell and carb. mat.		
		CA390										
				130	90	8	3/4	3/5	2	Sst, med gy aa	E	
		CA391										
				110	80	8	3/4	3/5	2	aa		
		CA392										
				130	90	8	3/4	3/5	2	aa		
1539												
		CA393										
				130	90	8	3/4	3/5	2	aa		
		CA394										
				120	90	8	3/4	3/5	2	aa		
										2mm small spherical fossil fragm		
		CA395										
	65			140	100	8	3/4	3/5	2	aa		
1540												
		CA396										
											E	
		CA397		130	90	8	3/4	3/5	2	aa		
				125	85	8	3/4	3/5	2	aa		
	60 65	CA398										
				115	80	8	3/4	3/5	2	aa		
1541												
		CA399										

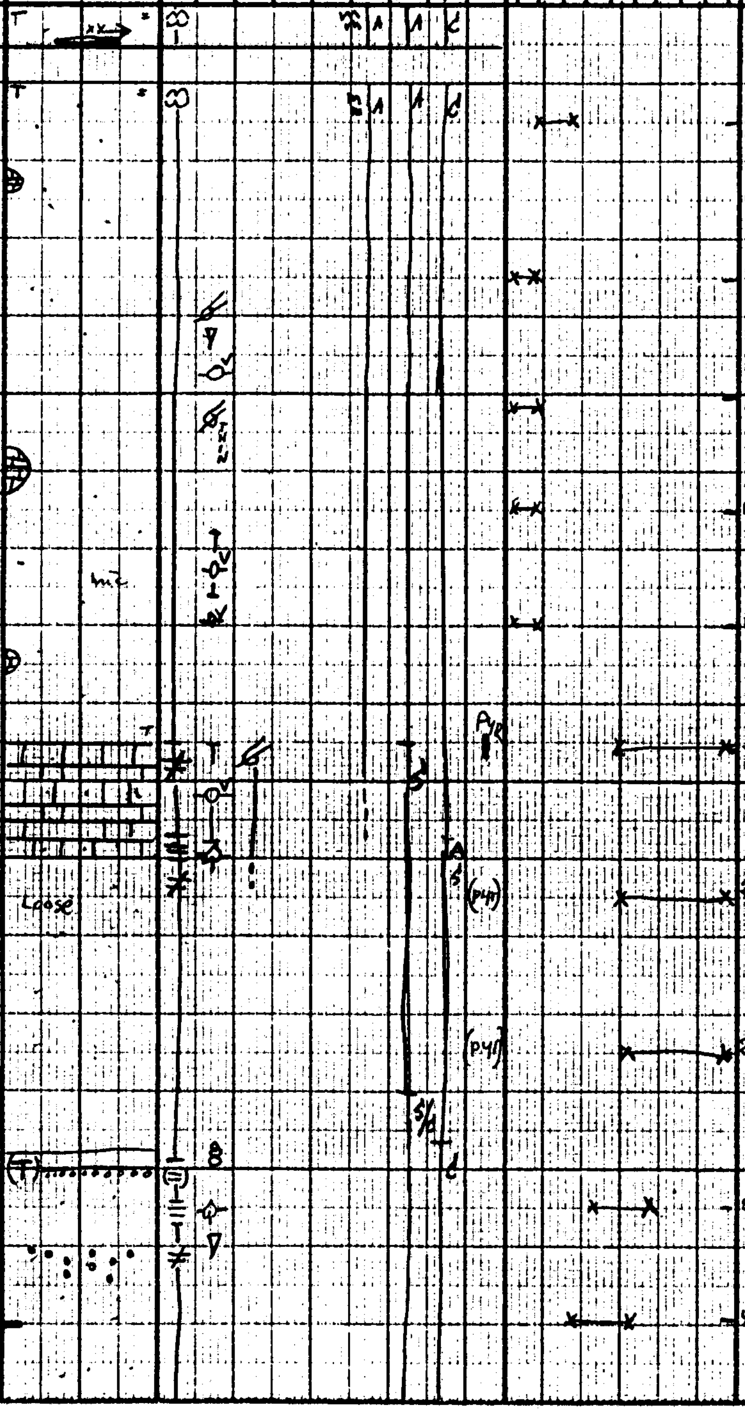


UFO: unidentified fossilized objects.

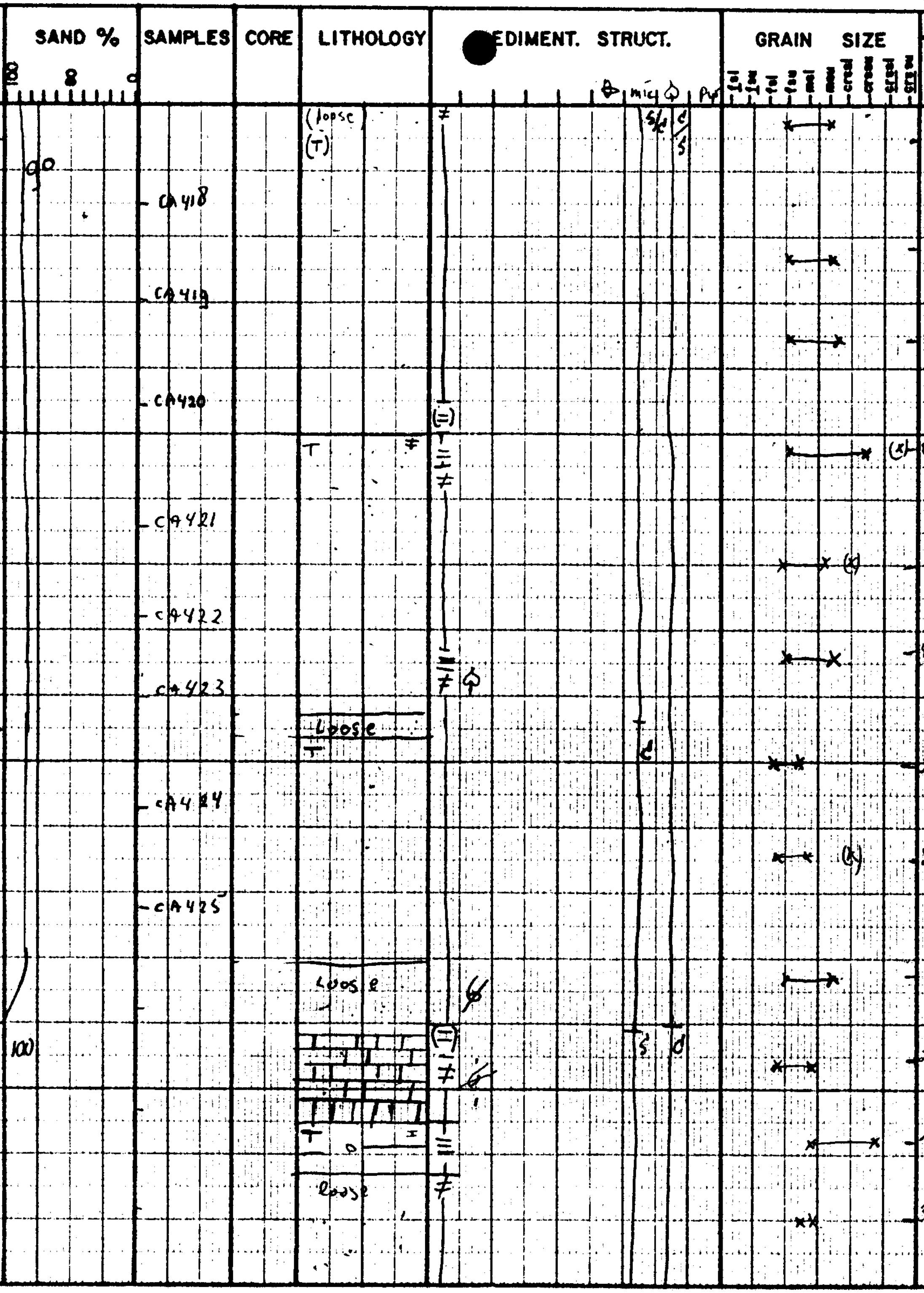


TEXT INPUT								
MAX	DO	SRT.	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
177	125	8	3/4	3/5	2	sst, m qy, fsL-fsu, translucqtz, milky qtz, smoky qtz, (qtz with min inclusions, carb, mic muscov, biot, (chloite), (cmt) ((calc))	two big thin well preserved shells (air walled) E unidentified brown fossils? UFO	
200	125	7	3/4	3/5	2	a.a	calc nodule E	
125	88	8	3/4	3/5	2	a.a		
177	125	8	3/4	3/5	2/3	a.a more calcareous	E	
177	125	8	3/4	3/5	2	a.a		
400	350	1	3/4	3/5	2/4	sst, bl (py), fsL – gran (smPb), translucqtz milk qtz smoke qtz blue qtz Rose qtz qtz with min inclusions PYR, carb, cmt, calc cmt.	B	
2000	125	1	3/4	3/5	3	a a mic, (bimodal ??)		
150	100	8	3/4	3/5	2	sst, mqy, fsL-fs4, transl qtz, milk qtz, smoke qtz mic	E	

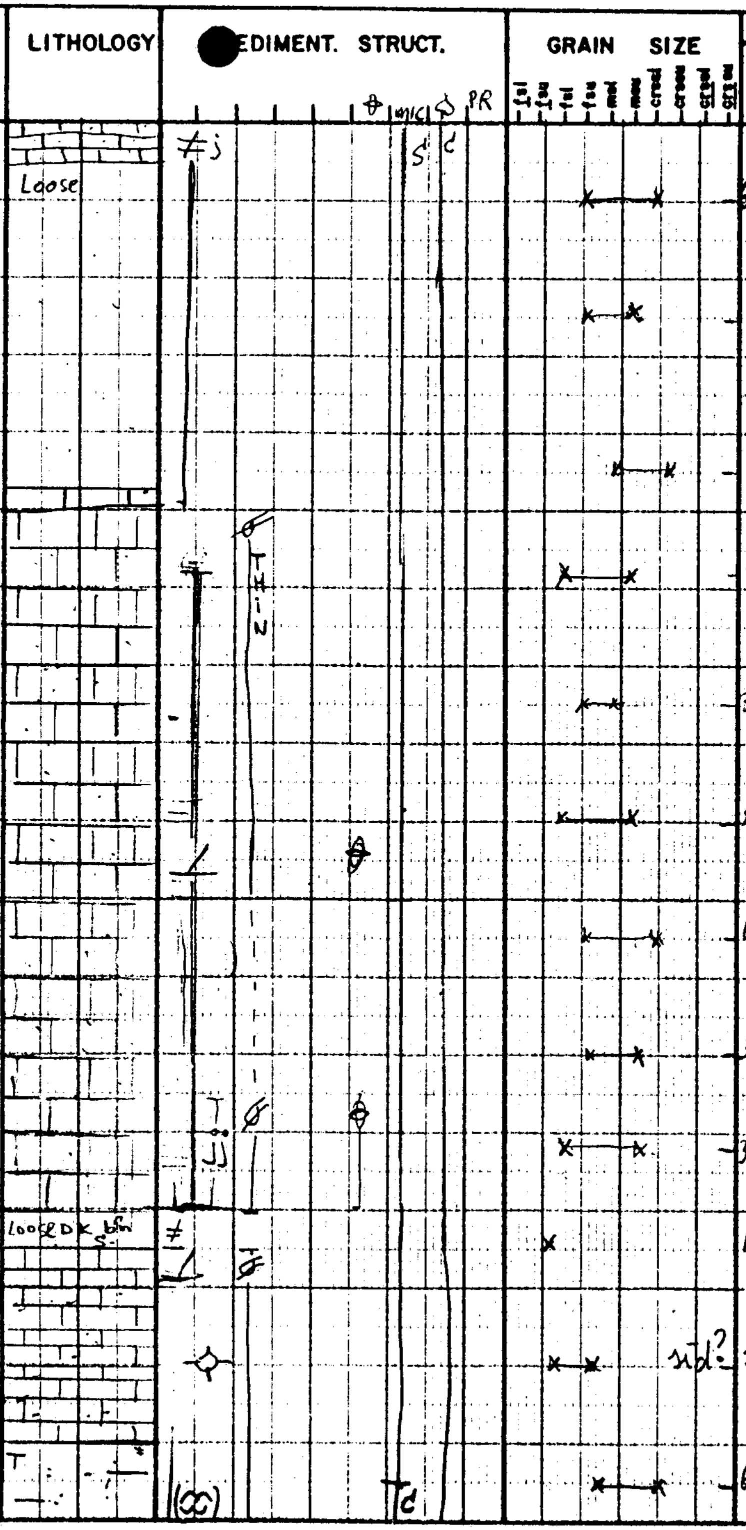
* change of place sed. struct.



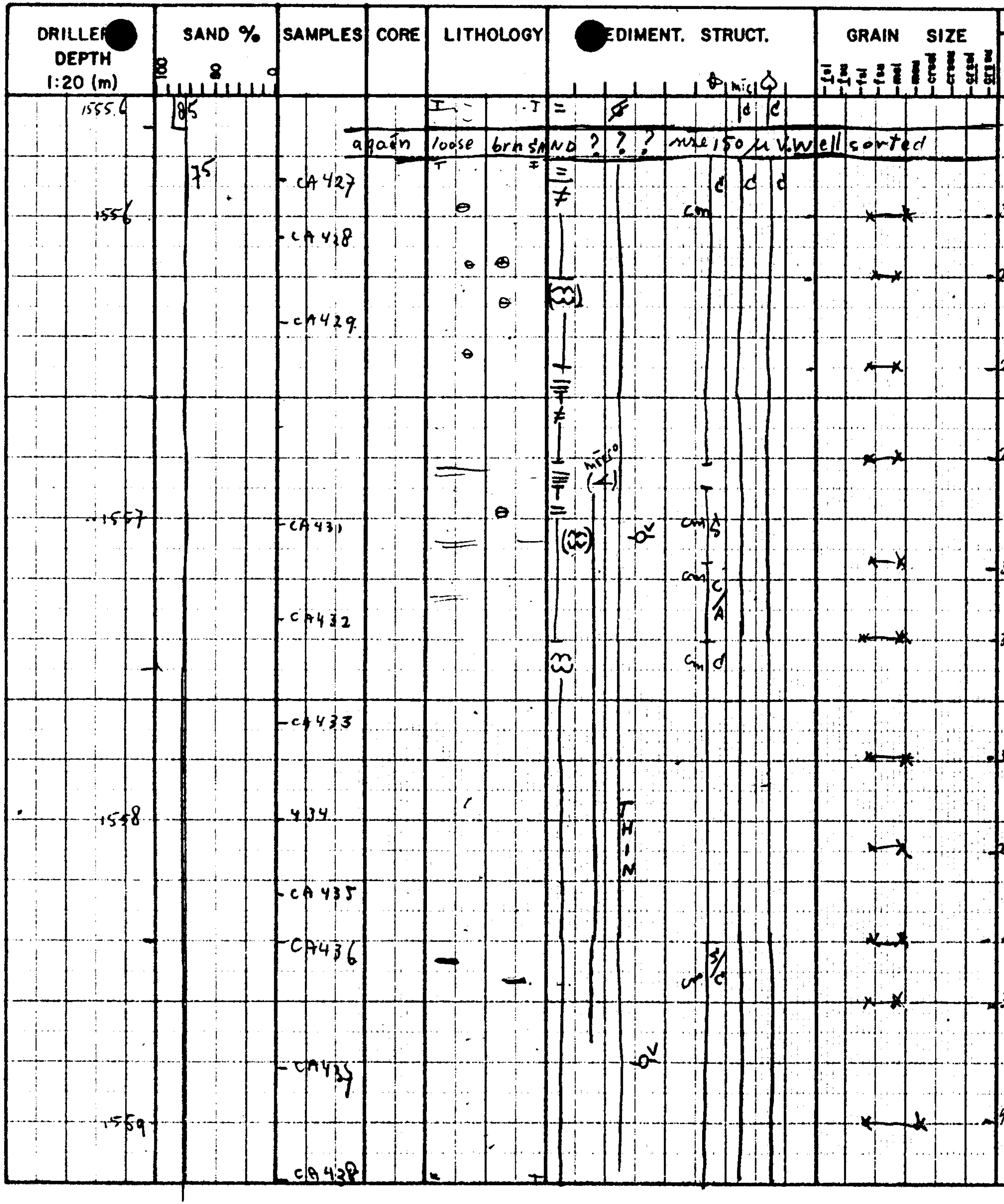
DRILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	MAX	DOM	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO.
	65	CA 408								xx→calc. concretion
1545	SAMPLE	TAKEN out								
			150	100	8	3/4	3/5	2	ssT, mgy, fsl - fsl, transl qTz, milky qTz, smoke qTz, carb, mic (cmt)	
	65	CA409								
			125	90	8	3/4	3/5	2	a. a	
		CA410								E
			125	100	8	3/4	3/5	2	a. a	
1546		CA411								
			125	90	8	3/4	3/5	2	a. a	
		CA412								
			125	90	8	3/4	3/5	2	a. a	
		CA413								
	100		200	350	2	3/4	3/5	4	ssT, gy(bl), fsL - crs u, transl-milky, smoke, rose qTz, qTz+miner incl, carb pyrite, cmt, calc cmt blue qTz	B
1547			200	350	3	3/4	3/5	1/2	sst, Ltgy(yell), fsl - crs u, transl, milky, smoke, rose, qTz (mic) (carb) (cmt), (calc) (pyr) blue qTz	
	100	CA414								?
			200	300	3	3/4	3/5	1	a. a B.T more muscov?	
	90	CA415								
1548			500	250	5	3/4	3/5	1/2	a. a more muscov. flakes	
		CA416								?
			400	177	6	3/4	3/5	1/2	a. a	
		CA417								



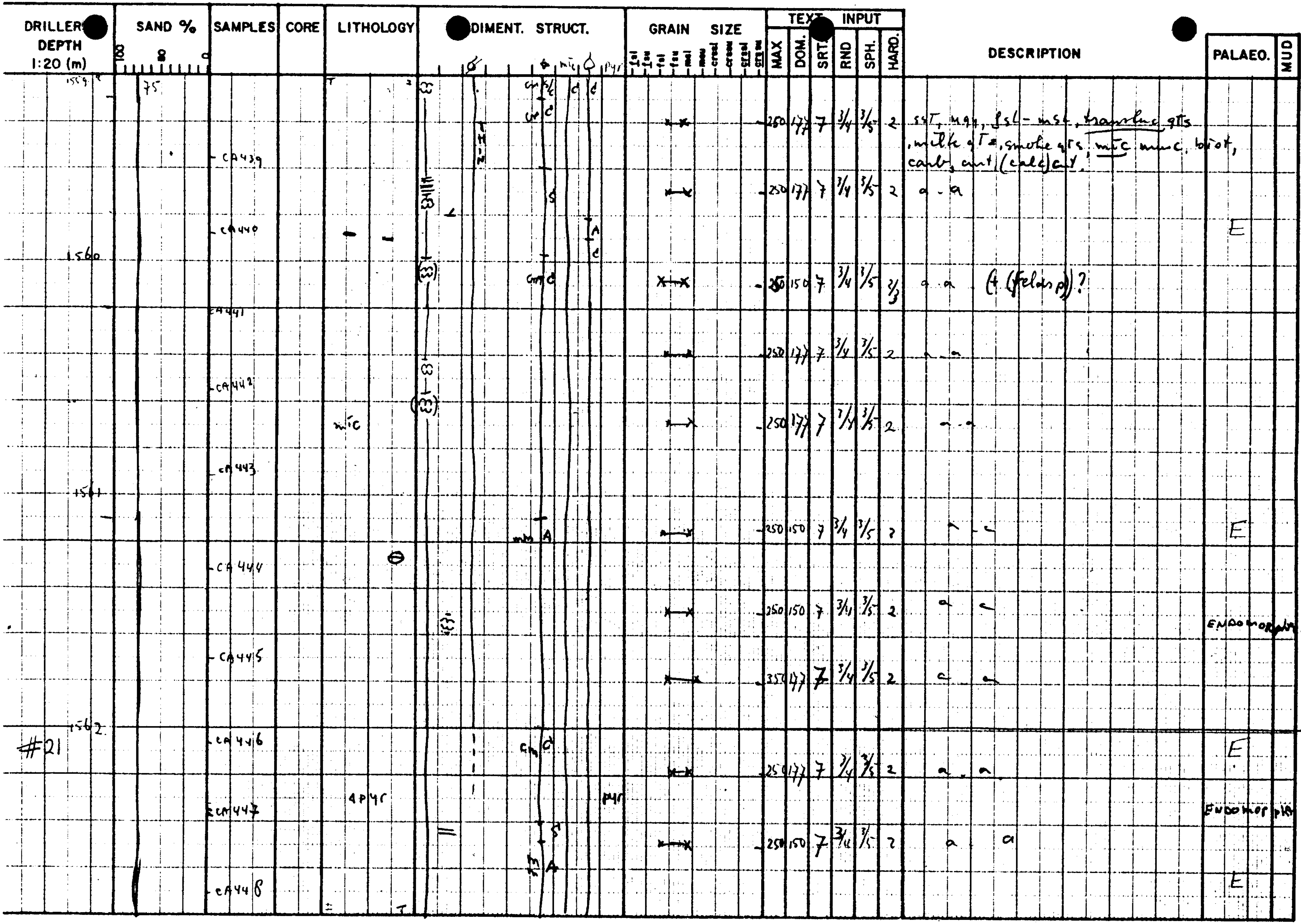
DRILLERS DEPTH 1:20 (m)	SAMPLES	MAX	DOM	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
1548.4										
		400	200	6	3/4	3/5	1/2	ssT, LT gy/yel)), fsl - msu, translu qtz milk qtz, smoke qts, mic pres muscov, carb		
	CA418									
		400	200	6	3/4	3/5	1/2	a-a		
1549	CA419									
		400	200	6	3/4	3/5	1/2	a-a	?	
	CA420									
		800	350	5	3/4	3/5	1/2	gran 1200 µ a.a ((calc))		
	CA421									
		400	175	6	3/4	3/5	1/2	gran 600 µ a.a		
1550	CA422								?	
		400	200	6	3/4	3/5	1/2	a-a	prob. leaf well preserved	
	CA423									
								loose S' (yel) discolouration		
		250	175	7	3/4	3/5	1/2			
	CA424									
		300	175	6	3/4	3/5	1/2	few gran 600 µ		
	CA425								?	
1551										
		400	200	6	3/4	3/5	1	loose S' (yel) discolouration		
		300	150	7	3/4	3/5	4	cmt calc further a.a.		
		1000	300	4	3/4	3/5	1/2	1 pebble .5		
		300	250	8	3/4	3/5	1	a-a		
1552										



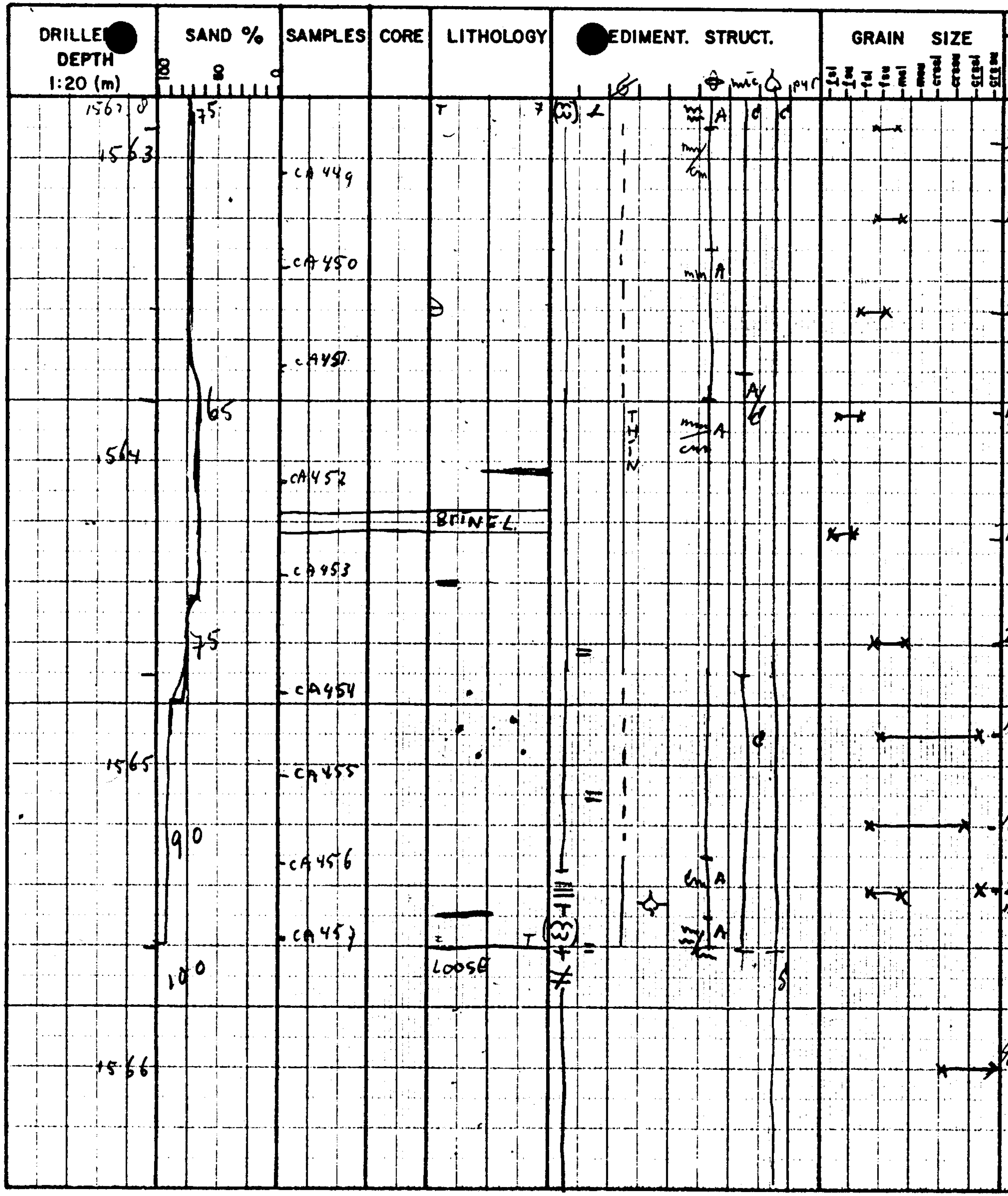
DRILLER DEPTH 1:20 (m)	SAND %	SAMPLES	CORE	MAX	DOM	SRT.	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
1552	100			600	200	6	3/4	3/5	1	s' LTgy, fsl- crsl, tranlac qTs, mod q qTz, milk qTz, mic (muscov), carb (rosc qTz)	?	
				400	200	7	3/4	3/5	1	a . a	?	
											?	
				600	300	6	3/4	3/5	1	a . a		
1553				400	177	6	3/4	3/5	4	SST a a cmt calc cmt. cm-dm scale cross-bedding		
				300	200	8	3/4	3/5	4	1 gran ~ 2000µ) a . a	D	
				400	177	6	3/4	3/c	4	a . a,		
1554				600	250	6	3/4	3/5	4	a a		
				350	250	8	3/4	3/5	4	a a		
				350	177	6	3/4	3/5	4	a a (glauc) wood clayisch material	siderite ? fisses with HCl	
				150	150	9	3/4	3/5	1	???? (cm-dm) scale cross-bedding	D	
1555				250	177	7	3/4	3/5	1	fisses remarkable better when heated Dolomite? or is this only due to siderite ? ??	D	
	85	CA426		600	250	5	3/4	3/5	2	a a more muscovite		



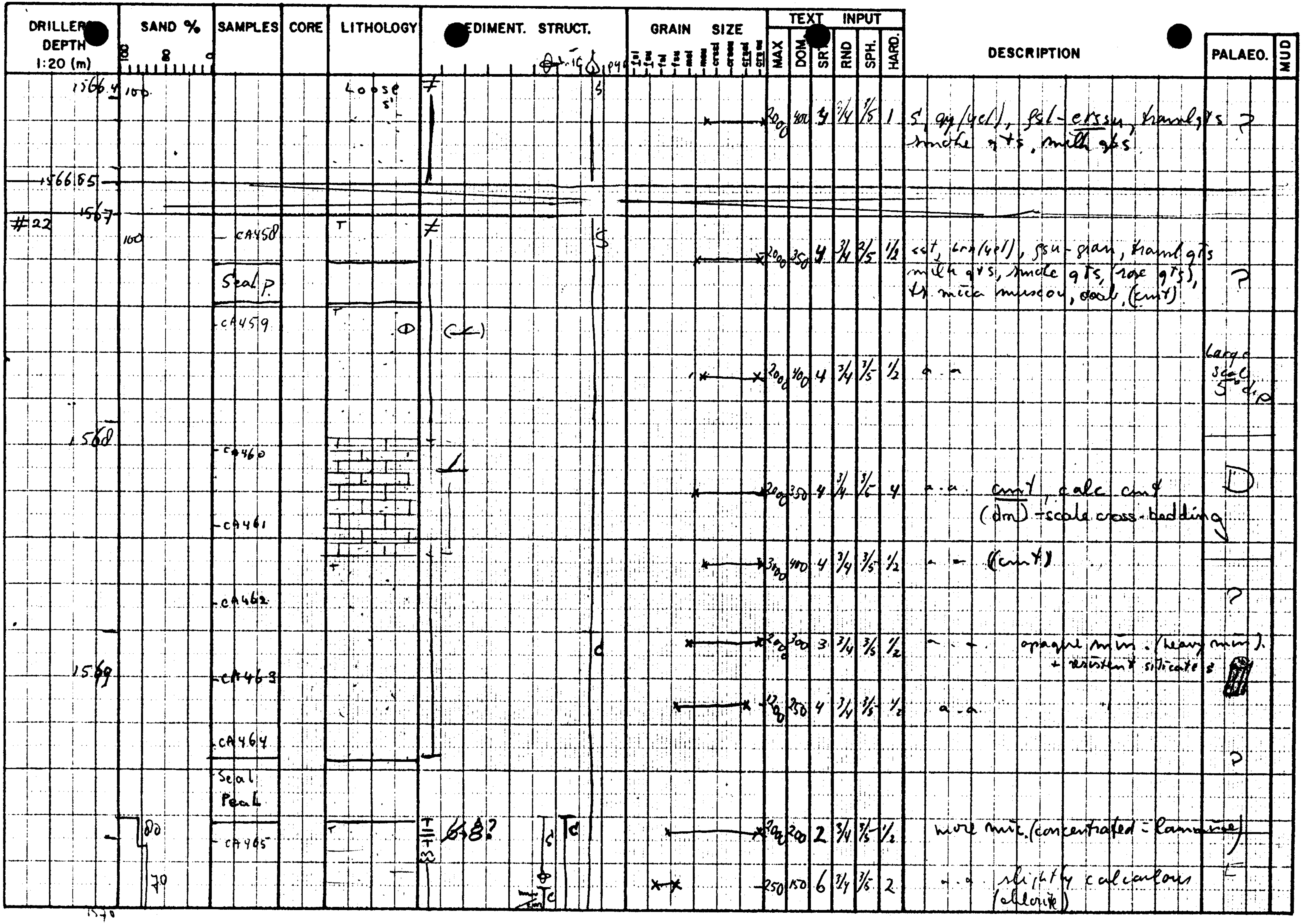
MAX	DOM	SRT.	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
						see 1584.8 m	?	
350	177	6	3/4	3/5	2	sst, m gq (psl - MSu), translucic qTs, milky qTs smoke qTz, mic, musc, biot carb, cmt, (calc) cmt. (chlo) (rose qTz).	yell. calc concret. 4 ± 3	
250	200	7	3/4	3/5	2			
250	177	7	3/4	3/5	2	a . a		
250	177	7	3/4	3/5	2	a . a	E	
300	200	7	3/4	3/5	2	a - a		
300	150	6	3/4	3/5	2	a - a		
350	177	6	3/4	3/5	2	a . a	med horiz burrow,	
250	177	7	3/4	3/5	2/3	a . a,		
250	177	7	3/4	3/5	2/3	a . a.		
300	177	7	3/4	3/5	2/3	a . a		
							E	
450	177	5	3/4	3/5	2/3	a . a		



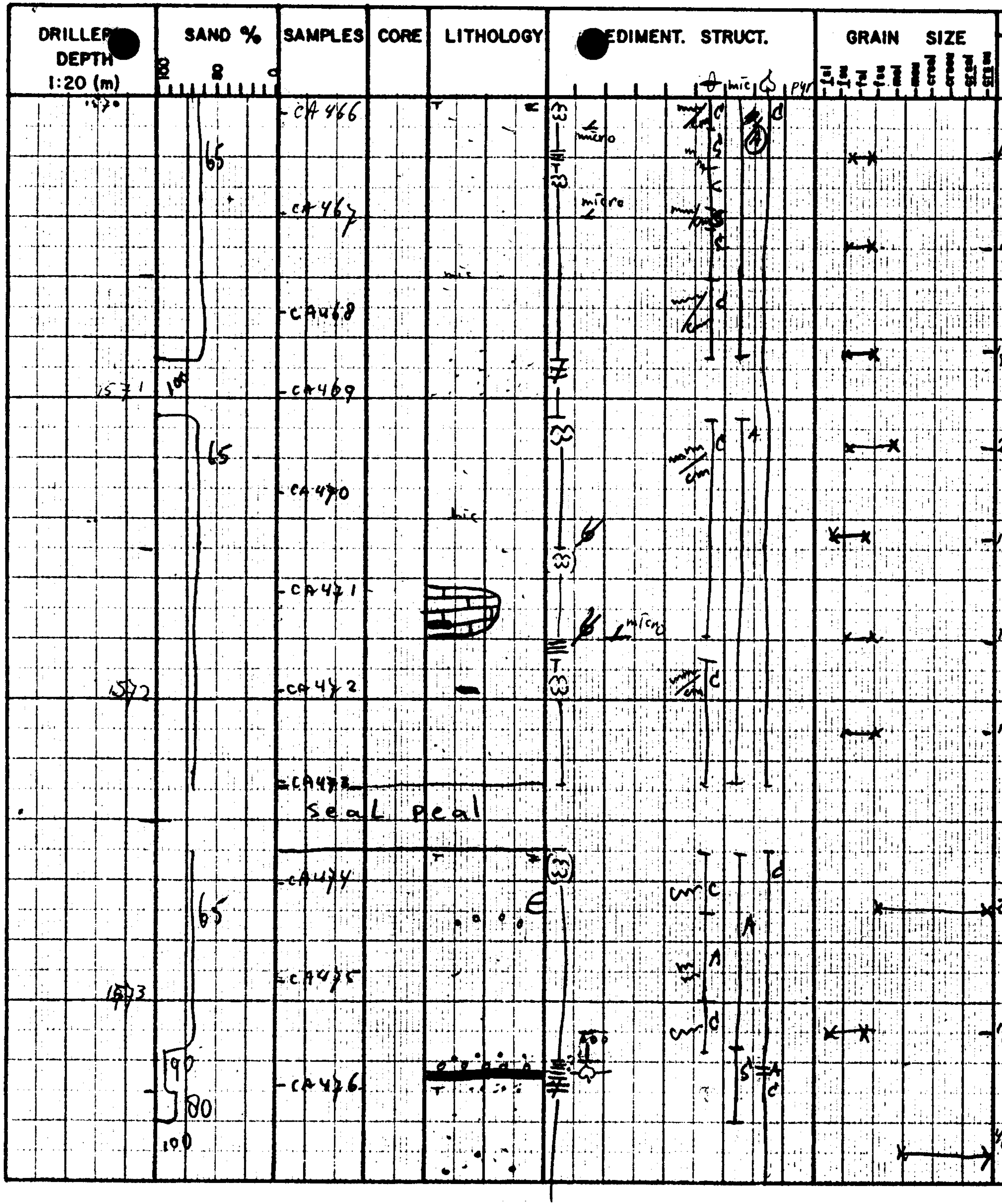
DRILLER DEPTH 1:20 (m)	SAND %	SAMPLES	CORE	LITHOLOGY	DIMENT. STRUCT.	GRAIN SIZE	MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
1559.	75			T	Cm s/c c c										
					Cm c		250	177	7	3/4	3/5	2	sst, mqz, fsl - msl, translucnt qts, milk qTz, smoke qts, mic musc, biot, carb, cmt (calc) cmt.		
		CA439													
					S		250	177	7	3/4	3/5	2	a - a		
		CA440			A c									E	
1560															
					Cm c		250	150	7	3/4	3/5	2/3	a . a (+ (feldsp)) ?		
		CA441													
							250	177	7	3/4	3/5	2	a - a		
		CA442													
				mic			250	177	7	3/4	3/5	2	a - a		
		CA443													
1561															
					mM A		250	150	7	3/4	3/5	2	a - a	E	
		CA444													
							250	150	7	3/4	3/5	2	a a	ENDOMORPHA.	
		CA445													
							350	177	7	3/4	3/5	2	a a		
#21 1562.															
		CA446			Cm c									E	
							250	177	7	3/4	3/5	2	a . a		
				4 pyr	pyr										
		CA447												Endomorpha	
					S		250	150	7	3/4	3/5	2	a a		
					m A									E	
		CA448		T											



TEXT INPUT						DESCRIPTION	PALAEO.	MUD
MAX	DOM	SRT.	RND	SPH.	HARD.			
250	177	7	3/4	3/5	2	sst, mgy, fsL-msl, translucr qts, smoke qts, milk qts, mic, biot, muscov, coal. cmt, ((calc)) cmt.	E	
250	177	7	3/4	3/5	2	″ ″		
200	150	7	3/4	3/5	2	″ ″		
							E	
177	125	7	3/4	3/5	2	″ ″		
150	110	8	3/4	3/5	2	″ ″		
250	177	7	3/4	3/5	2	″ ″		
1200	200	2	3/4	3/5	2	″ ″		
							E	
1000	177	3	3/4	3/5	2	″ ″		
250 1200	177	2	3/4	3/5	2	bimod ″ ″		
						core damaged		
						till 1566,85 due to? transport		
4000	710	2	3/4	3/5	1	sample randomly taken s, gy (yell), fsL gran, transl. qts, milk qts, smoke qts, carb,	?	?

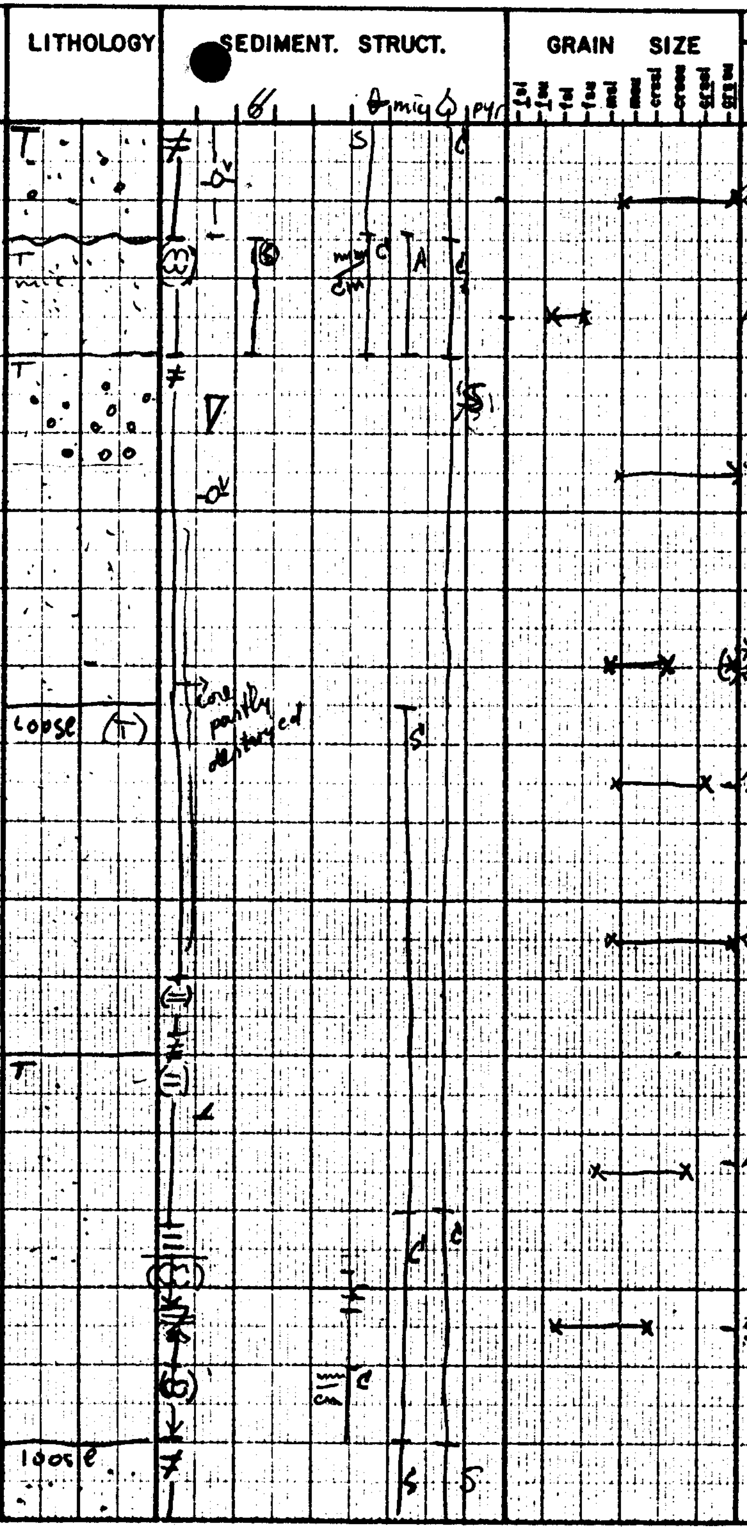


DRILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	MAX	DOM	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO.
1566.4	100		2000	400	4	3/4	3/5	1	S, gy (yel), fsl-crssu, transl qts, smoke qts, milk qts	?
1566.85										
1567 #22	100	CA458 Seal P.	2000	350	4	3/4	2/5	1/2	sst, brn (yel), fsu-gran, transl qts milk qts, smoke qts, (rose qts), tr mica muscov, dol, (cmt)	?
		CA459	2000	400	4	3/4	3/5	1/2	a.a	Large scale 5° dip
1568		CA460	2000	350	4	3/4	3/5	4	a.a. cmt, calc cmt (dm)-scale cross-bedding	D
		CA461	3000	400	4	3/4	3/5	1/2	a.a ((cmt))	
		CA462								?
			2000	300	3	3/4	3/5	1/2	a.a. opaque min. (heavy min). + resistant silicates	
1569		CA463	1200	250	4	3/4	3/5	1/2	a.a	
		CA464 Seal Peal								?
	80	CA465	2000	200	2	3/4	3/5	1/2	more mic. (concentrated = laminae)	
	70		250	150	6	3/4	3/5	2	a.a slightly calcareous (chlorite)	
1570										



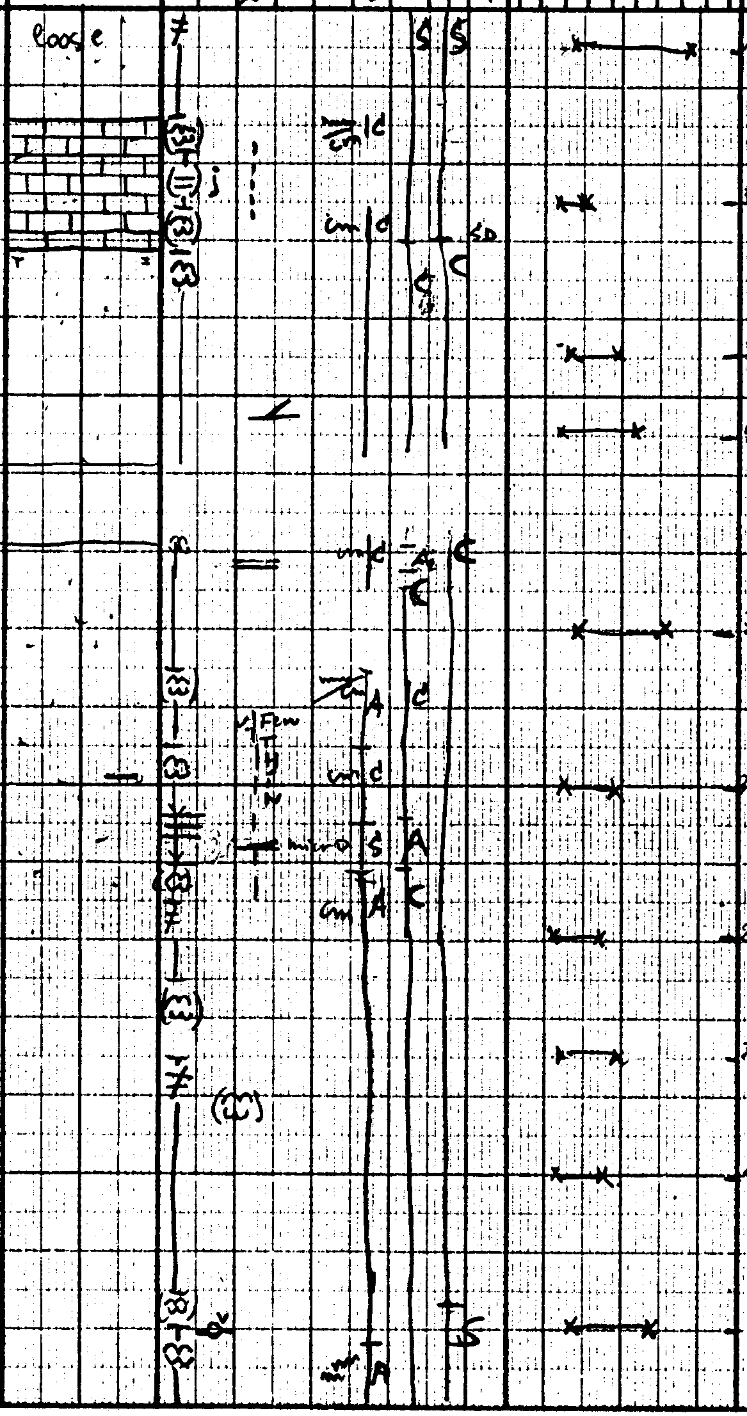
MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO.
177	125	7	3/4	3/5	2	sst, gy, fvL - fsu., transl qts milkqts, smoke qts, mic, musco, biot, carb, (cmt), (calc) cmt. (chlorite)	
177	125	7	3/4	3/5	2	a - a	E
177	100	8	3/4	3/5	2	a - a	
						pyrite in Bru ms sample wrongly put in?	
250	150	8	3/4	3/5	2	a . a	E
177	100	8	3/4	3/5	2	a - a	
						cm scale (2-4cm) ↑ cut & fill structure microcross lam	
177	125	8	3/4	3/5	2	a - a	
177	125	8	3/4	3/5	2	a - a	
							E
2000	177	2	3/4	3/5	2	a - a probl bimod.	
177	100	8	3/4	3/5	2	a - a	
						in wood calc concret.	3cm piece wood
4000	350	2	3/4	3/5	1/2	a - a + rose qts	

DRILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	CORE
1573.6		CA477	
	100		
		CA478	
1574	60		
	100	CA479	
		CA480	
1575			
	95		
		CA481	
		CA482	
1576			
		CA483	
		CA484	
	85		
	75		
1577			
	95		
		CA485	

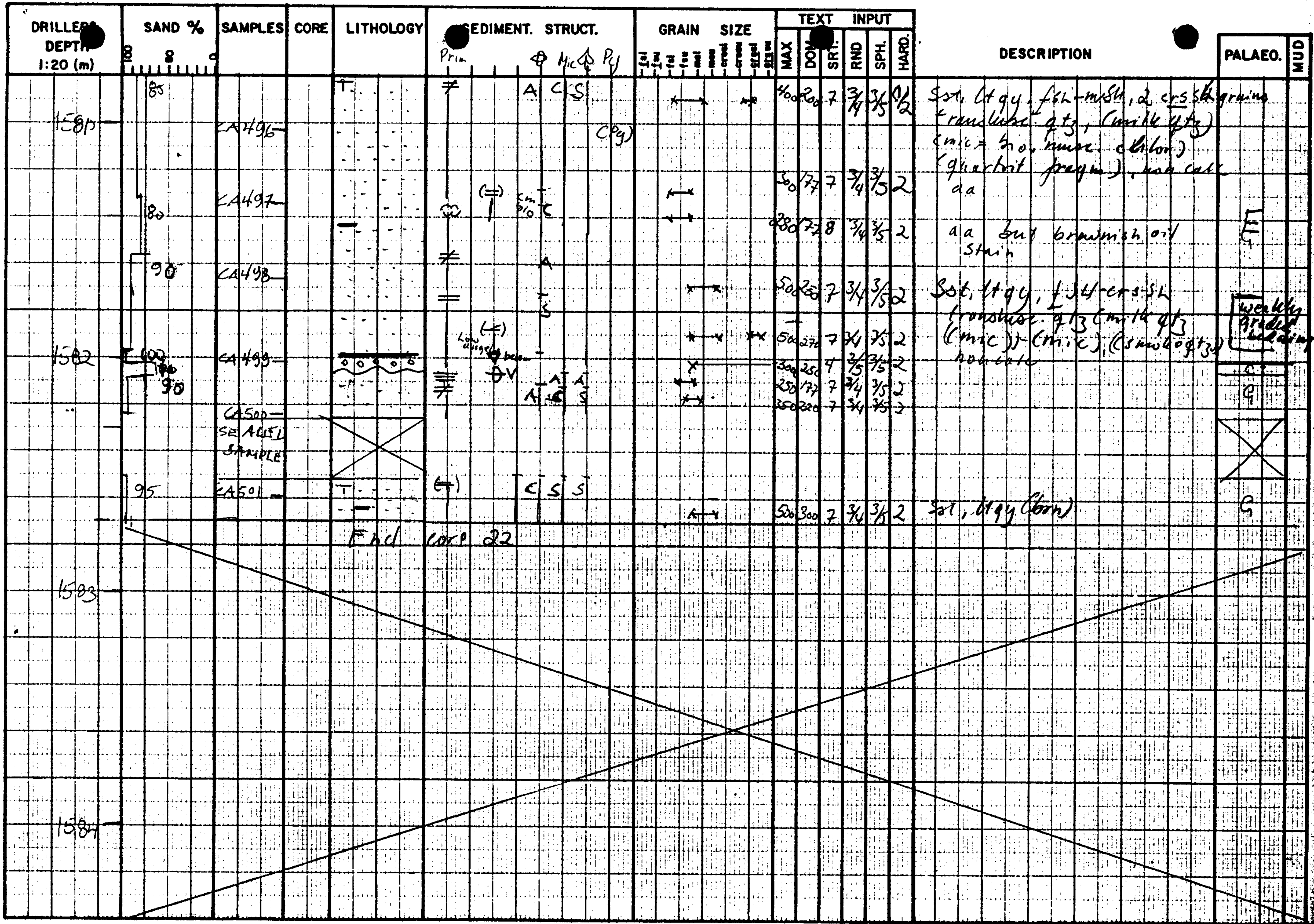


MAX	DOM	SRT.	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
2000	750	4	3/4	1/5	1/2	sst, brn (yel, gy), fsu - crsu, transl qts, smoke qts, milk qtz, rose qts - (cont), carb. tr mica. heavy mins	?	
77	125	8	3/4	1/5	2	sst, m gy, fsl - fsu, transl qts, smoke qts, milk qts, carb, mic musc, biot (chlorite) (cont)	✓	
5000	350	1	3/4	1/5	1/2	sst, brn (yel), fsl - sbbl, cgl, transl qts, smoke qts, milk qts, heavy min, carb, (rose + bluish qts)	Y	
700 (2000)	300	6	3/4	3/5	1/2	a.a + tr biotite. (probl stained muscov) single grain 2000 μ		
1400	300	6	3/4	3/5	1	a.a. more mica	?	
2000	300	4	3/4	3/5	1	a.a		
1000	250	6	3/4	2/5	1/2	a.a	?	
500	177	6	3/4	3/5	2	a.a more mica	?	

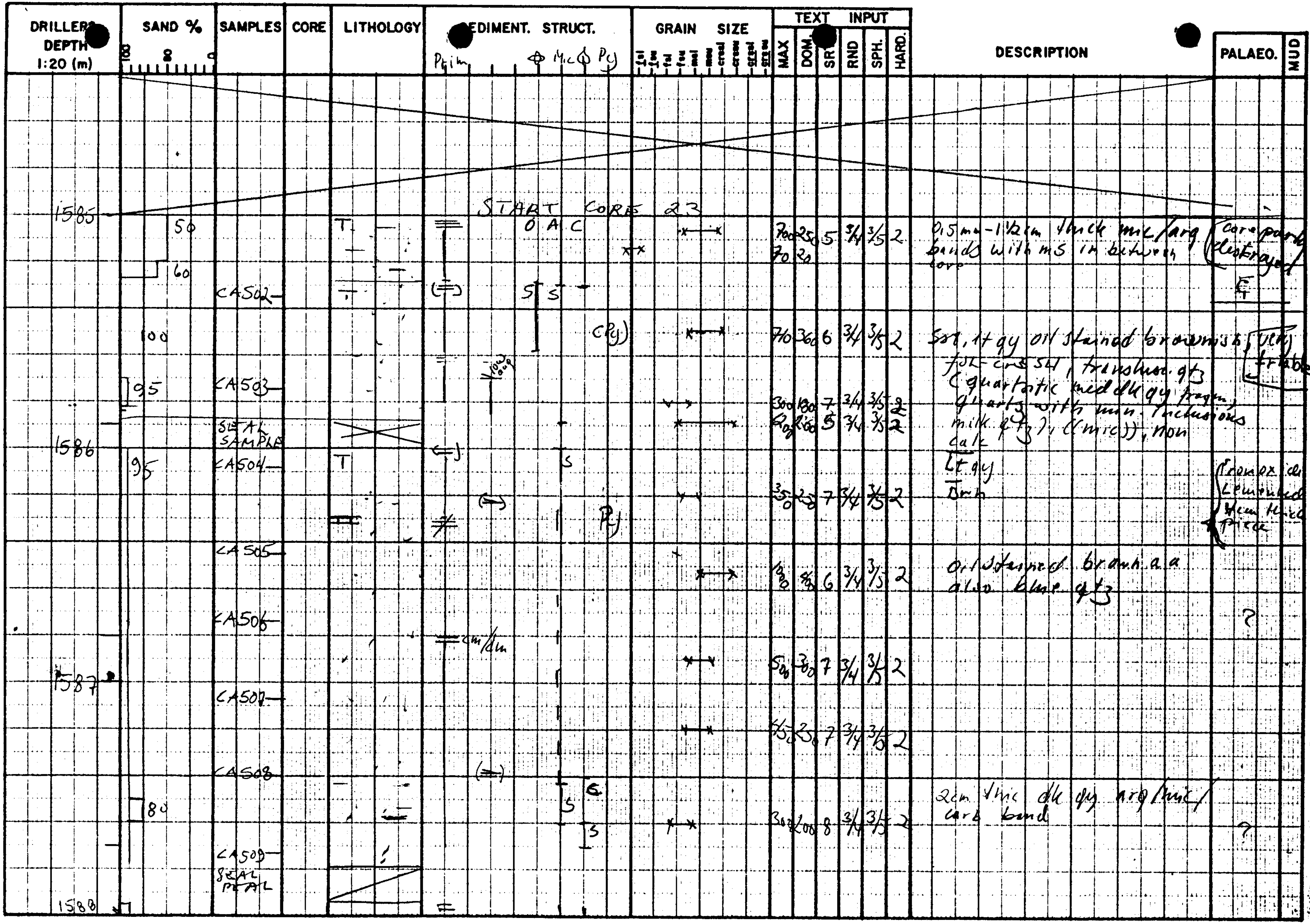
DRILLED DEPTH 1:20 (m)	SAND % (100 50 0)	SAMPLES	CORE	LITHOLOGY	SEDIMENT. STRUCT.	GRAIN SIZE



DRILLED DEPTH 1:20 (m)	SAND %	SAMPLES	TEXT INPUT MAX	DOM	SRT.	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
1577?	95		1000	200	5	3/4	3/5	1	S, brn (yel), ⨍ sl-crssu, transl qTs, smoke qTs, milk qts, (rose qTs), (muscov), carb,		
		CA486									
			350	125	7	3/4	3/5	4	a.a cmt, calc cmt ts muscov, biot (feldsp)?	{ fract	
		CA487									
1578	75										
			350	200	7	3/4	3/5	2	a a (cmt) ((calc)) cmt more mica singl grain 1000μ		
		CA488									
			400	180	6	3/4	3/5	2	a.a	Scn vert scale 4:1 [illegible]	
		seal peal									
		CA489									
			700	200	5	3/4	3/5	2	a.a single grain 1000μ		
1579		490 CA									
			350	177	7	3/4	3/5	2	a.a h		
	70	CA491									
	75										
			250	177	7	3/4	3/5	1/2	a.a		
		CA492							increasing mica content ?		
			350	177	7	3/4	3/5	2	a.a		
1580		CA493									
			250	177	7	3/4	3/5	2	a a.		
		CA494									
			600	200	5	3/4	2/5	2	a —		
	85	CA495									

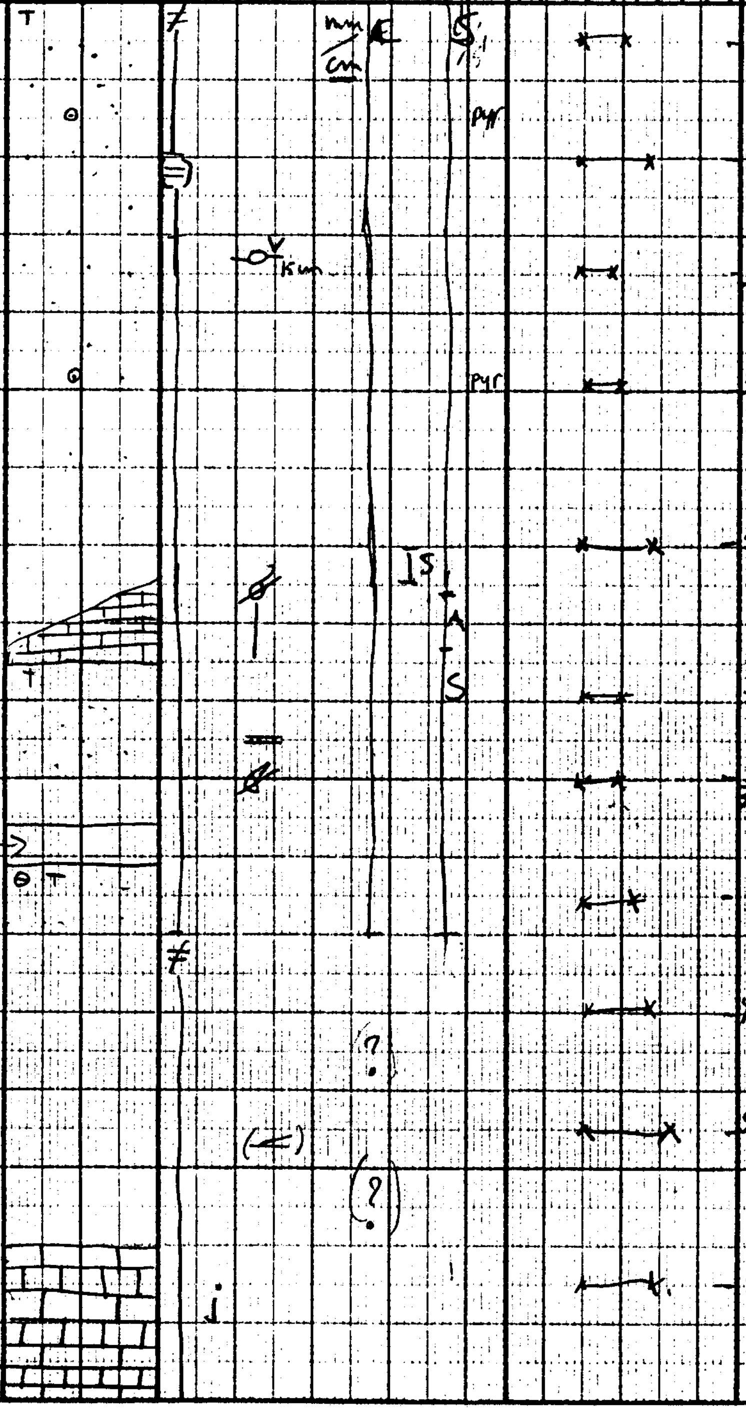


MAX	DOM	SRT.	RND	SPH.	HARD.	DESCRIPTION
400	200	7	3/4	3/5	1/2	Sst, ltgy, fsL-msH, ± crsSL grains translucse qtz, (milk qtz) (mic = Bio, musc. chlor.) (quartzit fragm), non calc
300	177	7	3/4	3/5	2	aa
280	177	8	3/4	3/5	2	aa but brownish oil stain
500	250	7	3/4	3/5	2	Sst, ltgy, ± fsH-crsSL translucse qtz (milk qtz) ((mic)) (mic), ((smoky qtz)) non calc
500	270	7	3/4	3/5	2	
300	250	4	3/5	3/5	2	
250	177	7	3/4	3/5	2	
350	220	7	3/4	3/5	2	
500	300	7	3/4	3/5	2	Sst, ltgy (brn)

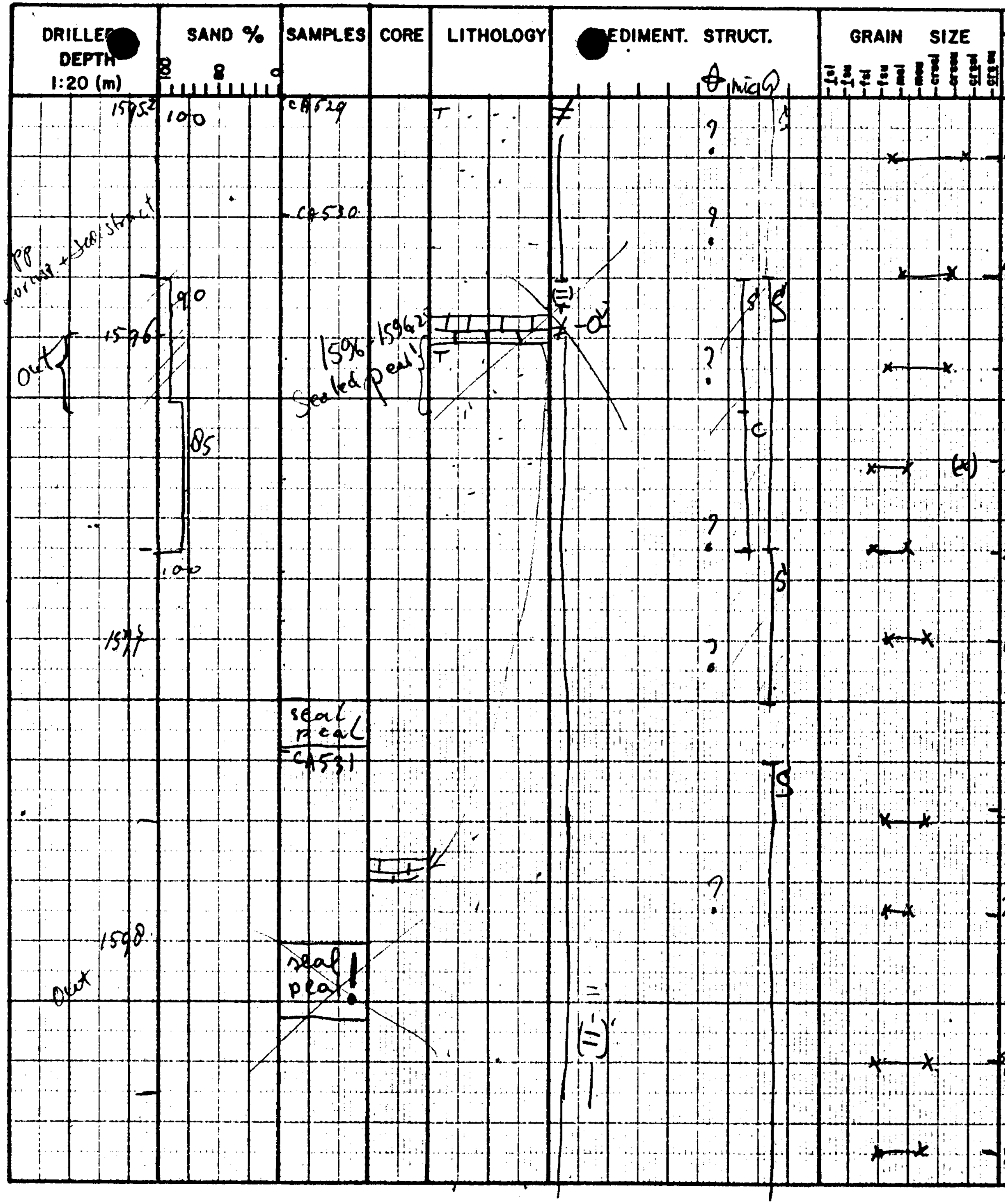


MAX	DOM.	SR	RND	SPH.	HARD.	DESCRIPTION	PALAEO.
700 70	250 20	5	3/4	3/5	2	0.5mm-1½cm thick mic/arg bands with ms in between core	core partly destroyed G
710	360	6	3/4	3/5	2	Sst, lt gy oil stained brownish, v.f-crs sd, translucent qtz (quartzitic med dk gy fragm, quartz with min. inclusions milk qtz), ((mic)), non calc	very friable
300 200	180 160	7 5	3/4 3/4	3/5 3/5	2 2		
350	250	7	3/4	3/5	2	Lt gy Brn	Iron oxide laminated 4cm thick piece
130	450	6	3/4	3/5	2	oil stained brown a.a also blue qtz	?
500	300	7	3/4	3/5	2		
450	250	7	3/4	3/5	2		
300	200	8	3/4	3/5	2	2cm thic dk gy arg/mic/carb band	?

DRILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	CORE	LITHOLOGY	SEDIMENT. STRUCT.	GRAIN SIZE	TEXT INPUT MAX	DOM	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
1588	100	CA510		T	Large scale ~8-~25°										
							710	200	6	3/4	3/5	2	SST/qy, fsl - crs m, transluc qts, multi qts, smoke qts (mica), musc, biot, (chlor), carb (cmt).	D	
		CA511													
							350	225	8	3/4	3/5	4	a-a cmt calc cmt (glauc?n?) green min		
					SD PYR		300	150	6	3/4	3/5	4	a-a bit shaly?		
1589		seal peal													
				T	j		140	200	4	3/4	3/5	2	a-a (cmt), calc cmt cm scale bedding		
		CA512		T											
							710	250	6	3/4	3/5	2	a-a	D	
		CA513												shale	
1590					(=)(PYR		500	250	6	3/4	3/5	2	a-a oxidized pyrite		
		CA514													
							710	225	6	3/4	3/5	2	a a		
		CA515			cm										
							400	250	7	3/4	3/5	2	a a	?	
		CA516													
1591		seal peal													
		CA517		T	(=)										
							350	177	7	3/4	3/5	2	a-a no calc		
		CA518			mm cm										



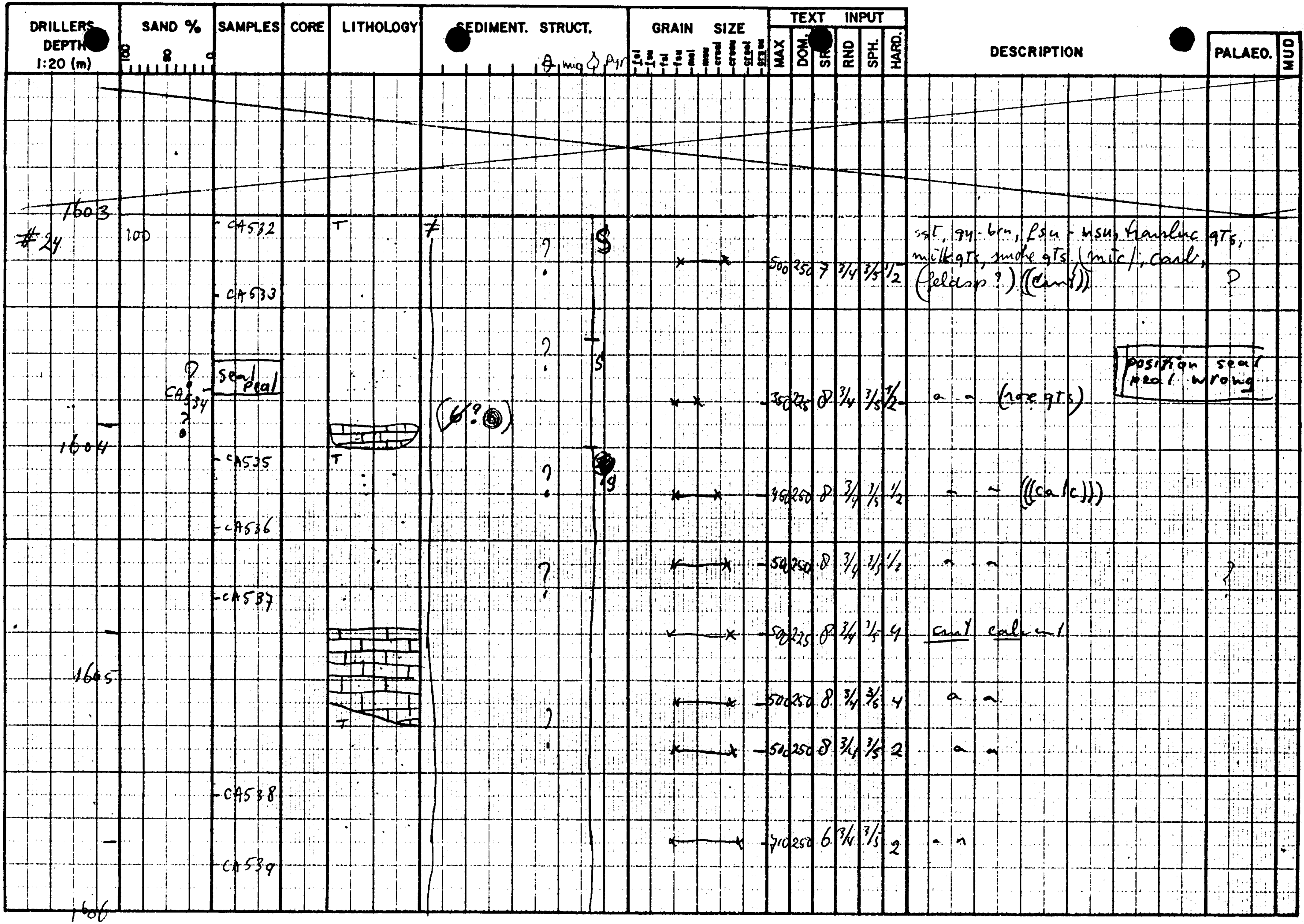
DRILLERS DEPTH 1:20 (m)	SAND % 100 50 0	SAMPLES	CORE	MAX	DOM	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
1591.6	100			350	200	8	3/4	3/5	2	sst, brn (yel, gy), f sl - m su, transluc qts, milk qts, smoke qts, carb, (mica), musc, biot, (cmt) (chlor)		
		CA519								prod. ox. pyrite		
1592				500	200	7	3/4	3/5	2	a a		
		CA520										
				300	200	8	3/4	3/5	2	a a		
		CA521									?	
				350	250	8	3/4	3/5	2	a a prob. ox. pyrite		
		CA522										
1593				500	250	7	3/4	3/5	2	a a		
		CA523									crinoid/?	
				350	250	8	3/4	3/5	2	a a		
		CA524									?	
				350	250	8	3/4	3/5	2	a a		
		CA525 seal peel										
				400	250	8	3/4	3/5	2	a a		
1594		CA526										
				450	250	8	3/4	3/5	2	a a (+ rose qts)	might be	
		CA527									lens	
				500	250	8	3/4	3/5	2	a a	bioturb.	
		CA528										
				450	250	8	3/4	3/5	4	cmt calc cmt		
1595		CA529										



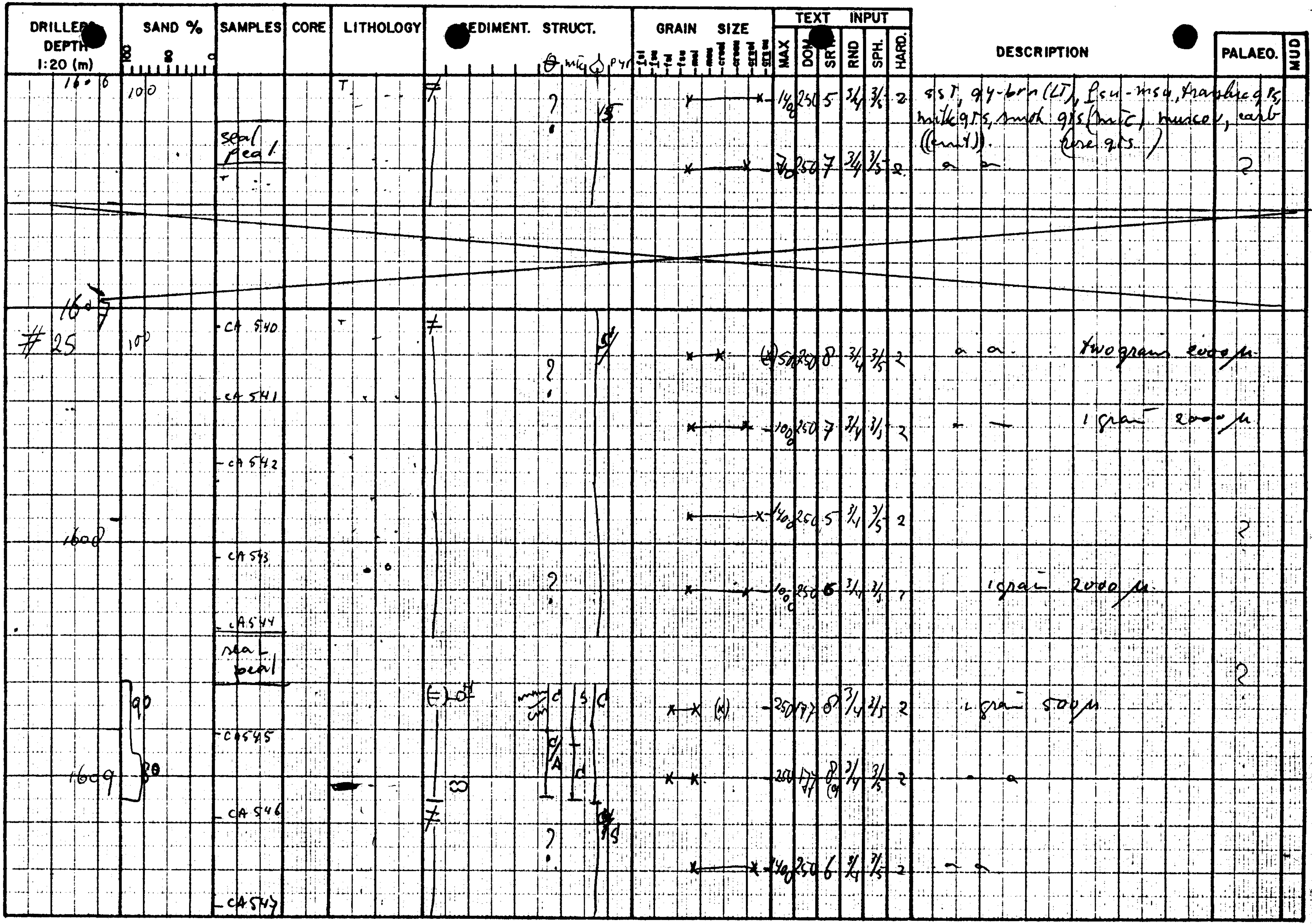
TEXT INPUT								
MAX	DOM	SRT	RND	SPH	HARD.	DESCRIPTION	PALAEO.	MUD
1000	250	5	3/4	3/5	2	s 87, L 94, f xL-crsL, translucent qTs, milk qTs, smoke qTs, (mic), (carb), (cmt). (rose qTs, muscv,))	completely bioturb	?
800	300	6	3/4	3/5	2	″ ″	?	
700	250	5	3/4	3/5	2	″ ″ more mic, carb	(	
350	177	6	3/4	3/5	2	″ ″ few grains 8-1000µ.	?	
350	177	8	3/4	3/5	2	″ ″		
600	250	8	3/4	3/5	2	″ ″	(	
500	250	8	3/4	3/5	2	″ ″	?	
350	250	8/9	3/4	3/5	2	(sample taken just under seal peal).		
500	200	8	3/4	3/5	2			
400	200	8	3/4	3/5	2			

labelling & position seal peal wrong! (stick upside-down?)

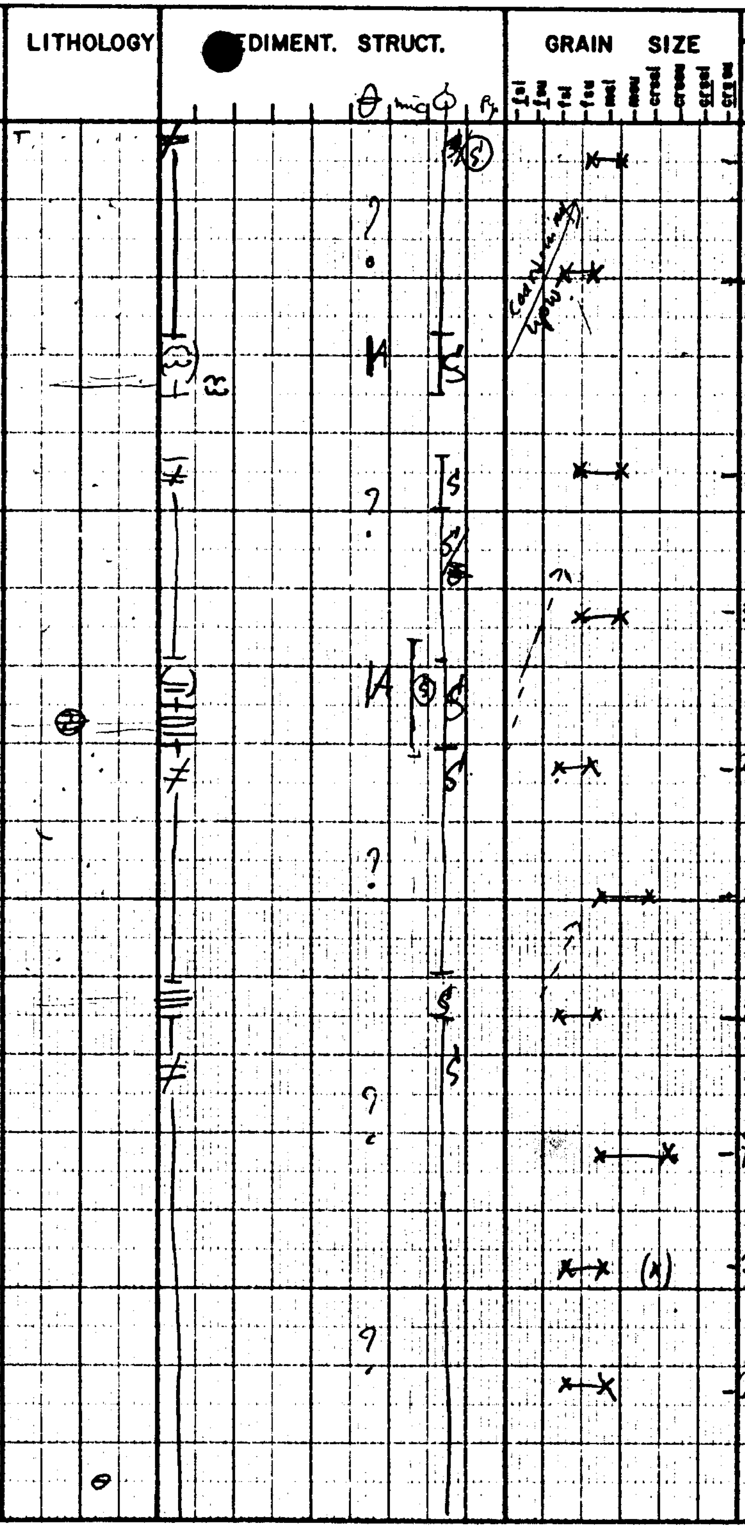
DRILLER DEPTH 1:20 (m)	SAND % 100 50 0	SAMPLES	CORE	LITHOLOGY	SEDIMENT. STRUCT. θ hig φ Py	GRAIN SIZE	TEXT INPUT MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
1599		fo45			≠								± 30cm core missing	? NO	
1600															
1601															
1602															



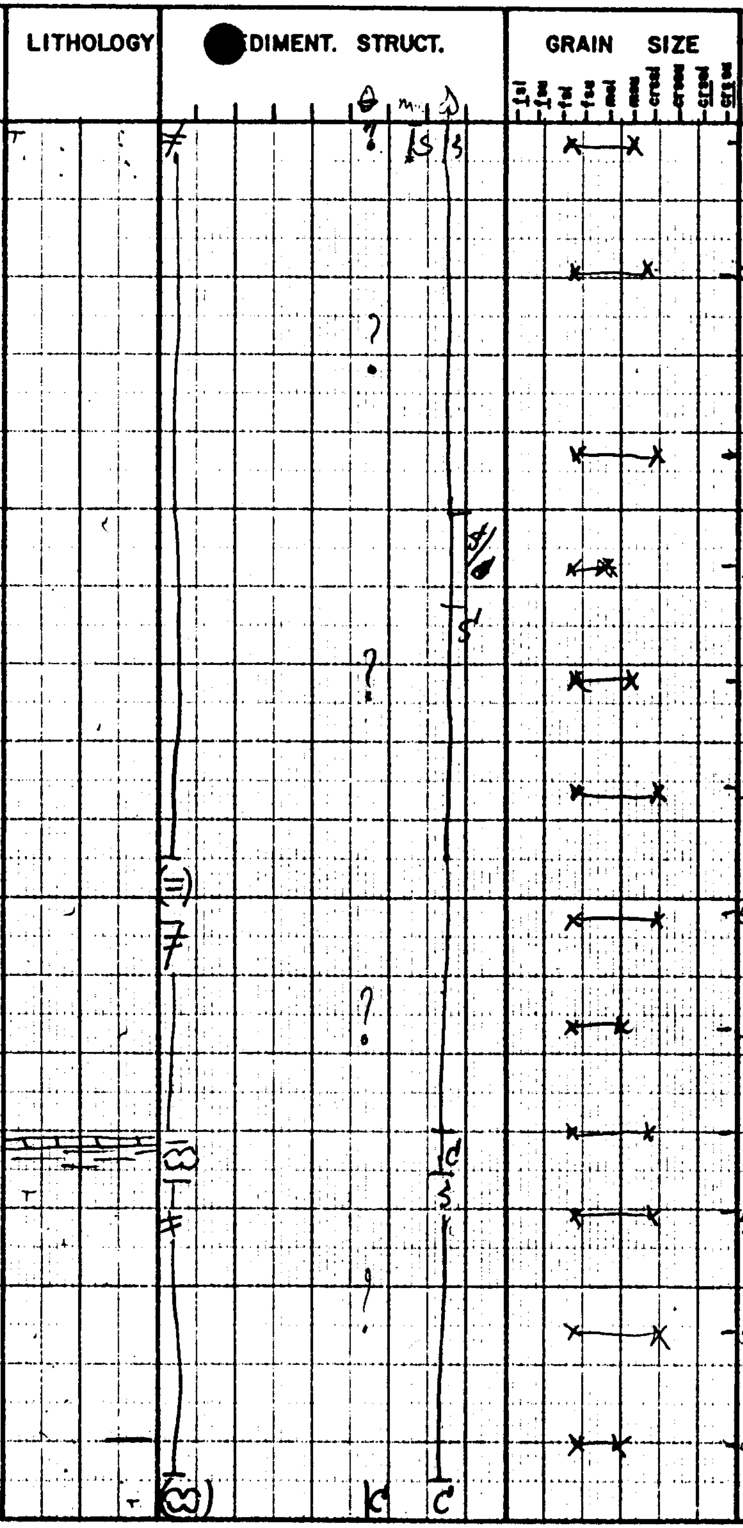
MAX	DOM.	SR	RND	SPH.	HARD.	DESCRIPTION	PALAEO.
500	250	7	3/4	3/5	1/2	sst, gy-brn, fsu - msu, transluc qTs, milk qTs, smoke qTs (mic), carb, (feldsp?) ((cmt))	?
350	225	8	3/4	3/5	1/2	〃 〃 (rose qTs)	position seal peal wrong
360	250	8	3/4	3/5	1/2	〃 〃 ((calc))	
500	250	8	3/4	3/5	1/2	〃 〃	?
500	225	8	3/4	3/5	4	cmt calc ~1	
500	250	8	3/4	3/5	4	〃 〃	
500	250	8	3/4	3/5	2	〃 〃	
710	250	6	3/4	3/5	2	〃 〃	



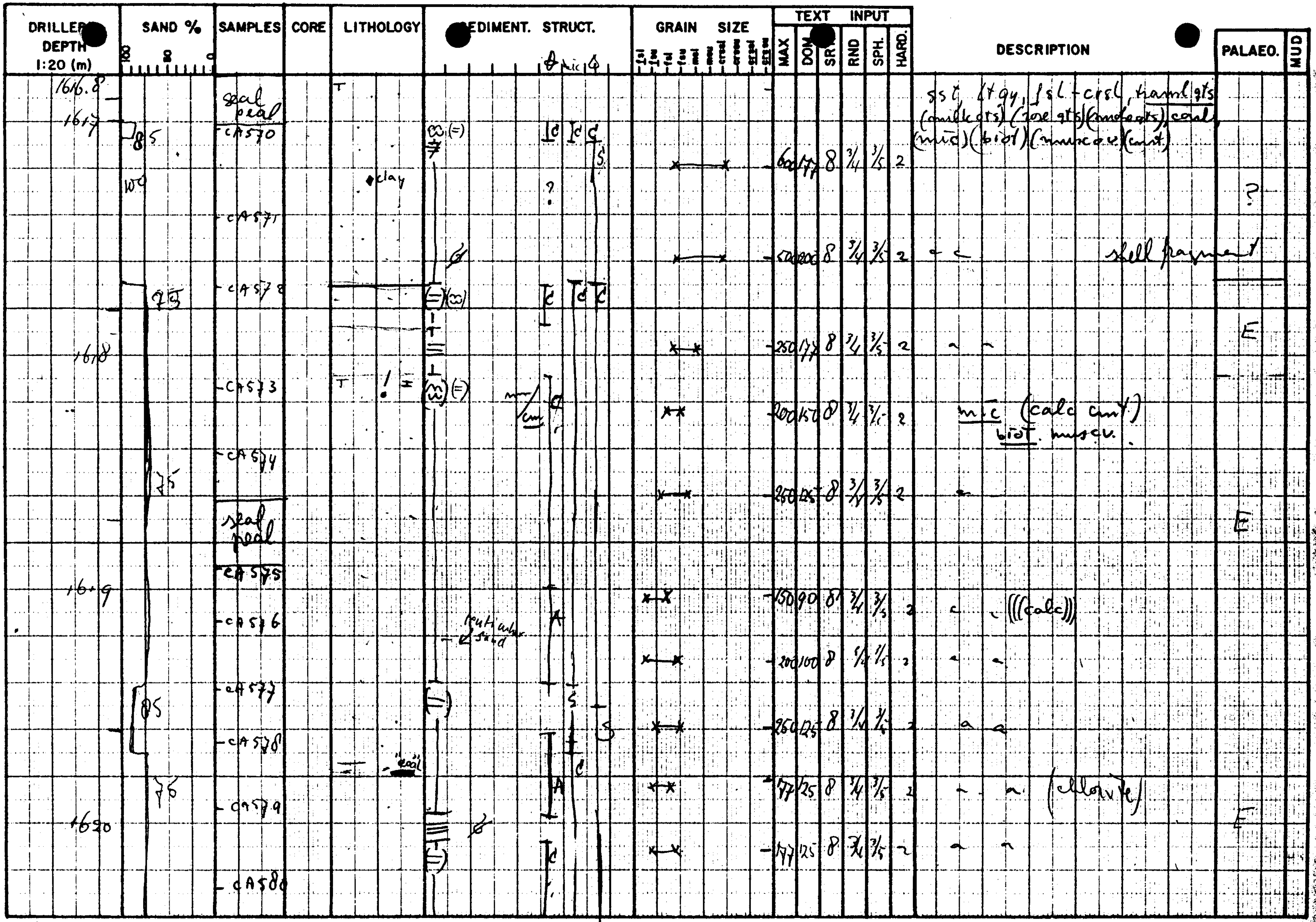
DRILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	MAX	DOM	SR	RND	SPH.	HARD.	DESCRIPTION	PALAEO.
1606	100		1400	250	5	3/4	3/5	2	sst, gy-brn (LT), fsu-msu, trasluc grs, milk grs, smok grs (m c) musco, carb ((cmt)). (rose grs.)	
		seal peal /								
			700	250	7	3/4	3/5	2	a a	2
1605 #25	100	CA 540	(2) 5000	250	8	3/4	3/5	2	a - a. two grains 2000 µ	
		CA 541								
			1000	250	7	3/4	3/5	2	- - 1 grain 2000 µ	
		CA 542								
1608			1400	250	5	3/1	3/5	2		2
		CA 543								
			1000	250	6	3/4	3/5	7	1 grain 2000 µ	
		CA 544								
		seal peal								2
	90		250	177	8	3/4	3/5	2	1 grain 500 µ	
		CA 545								
1609	80		200	177	8 (9)	3/4	3/5	2	- a	
		CA 546								
			1400	250	6	3/4	3/5	2	~ a	
		CA 547								



DRILLERS DEPTH 1:20 (m)	SAND %	SAMPLES	CORE	TEXT INPUT MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
1609.6	100			350	250	9	3/4	3/5	1/2 ②	sst, ltgy, (brn), fsl-msy, translqts, (milk qts) (smoke qts) (rose qts), carb, (mic) (cmt)		
		CA548										
1610.				250	177	8	3/4	3/5	1/2	〃 〃		
											?	
		CA549										
		~~seal~~ PEAL										
				350	225	8/9	3/4	3/5	1/2	〃 〃		
		CA550										
				350	225	8/9	3/4	3/5	2	〃 〃		
1611	95	CA551								brn(yel) calcareous (HCl) concretions		
				260	177	8/9	3/4	3/5	2	〃 〃		
		CA552										
				500	250	7	3/4	3/5	2	〃 〃 (biot)		
		CA553									?	
	100			260	177	8/9	3/4	3/5	2	〃 〃		
1612		seal peal										
		CA554										
				710	250	7	3/4	3/5	2	〃 〃		
		CA555										
				250	177	8/7	3/4	3/5	2	〃 〃 very few grains 600μm		
		CA556										
				250	177	8	3/4	3/5	2	〃 〃 1 grain 350		
1613		CA557								small calc brn. nod.		

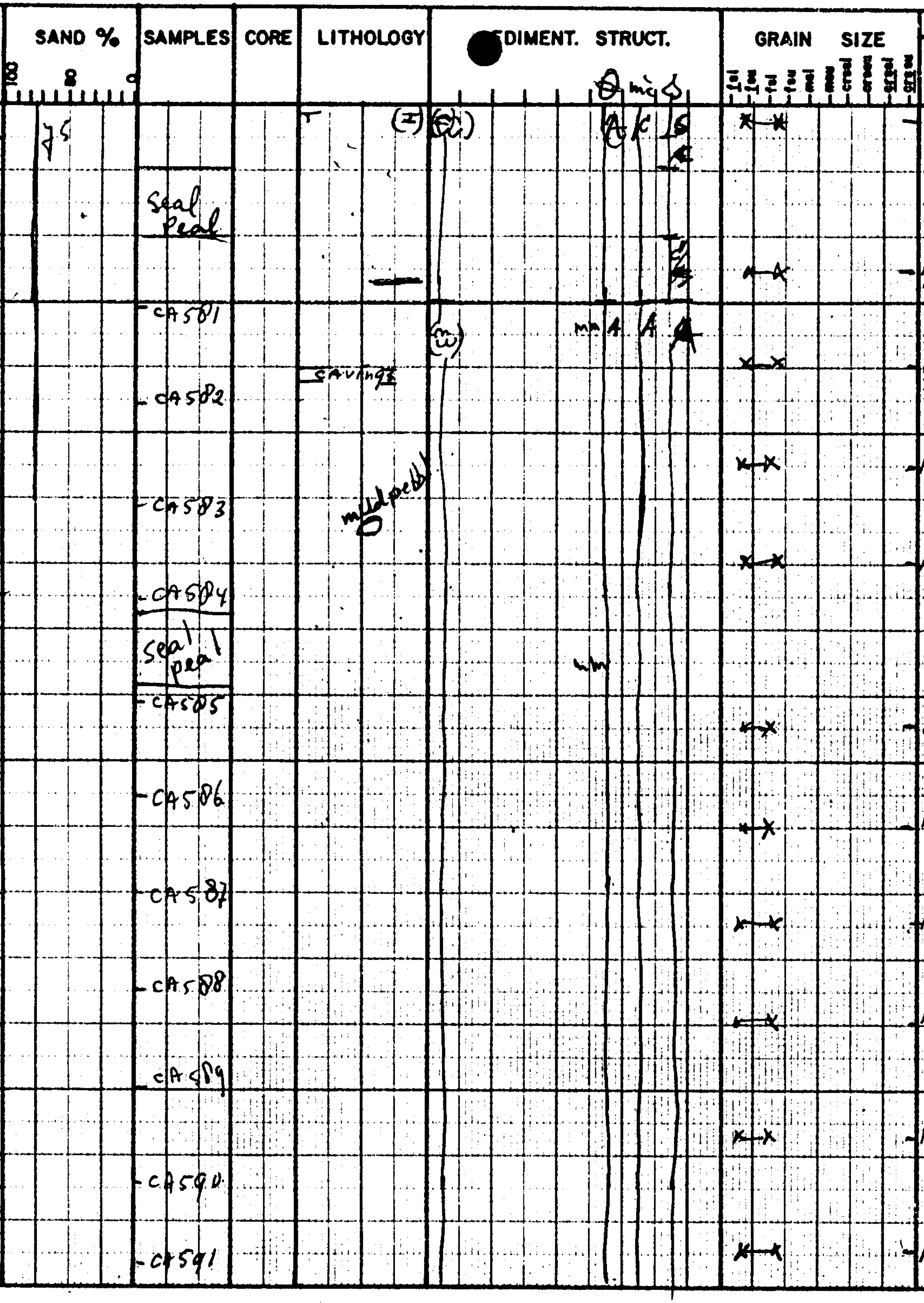


DRILLER DEPTH 1:20 (m)	SAND % 100 50 0	SAMPLES	MAX	DOM.	SRT.	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
1613.2	100		450	177	8	3/4	3/5	2	SST, LT gy, fsl – msu translqts (milk qts) (rose qts) (smoke qts) (mic) (musc. biot), (carb) (kaol)		
		CA558									
			500	177	7/8	3/4	3/5	2	" "		
		real peal									
		CA559									
1614			500	177	8	3/4	3/5	2	" "		
		CA560									
			250	177	8	3/4	3/5	2	" "		
		CA561								?	
			400	177	8	3/4	3/5	2	" "		
		CA562									
			500	177	8	3/4	3/5	2	" "		
1615		real peal									
		CA563									
			500	177	8	3/4	3/5	2	" "		
		CA564									
			350	177	8	3/4	3/5	2	" "		
		CA565								?	
		CA566	450	177	8	3/4	3/5	2	" "		
1616			450	177	8	3/4	3/5	2	" "		
		CA567									
			500	177	8	3/4	3/5	2	" "		
		CA568									
			350	200	8	3/4	3/5	2	" " grain 1400 μ		
		CA569									



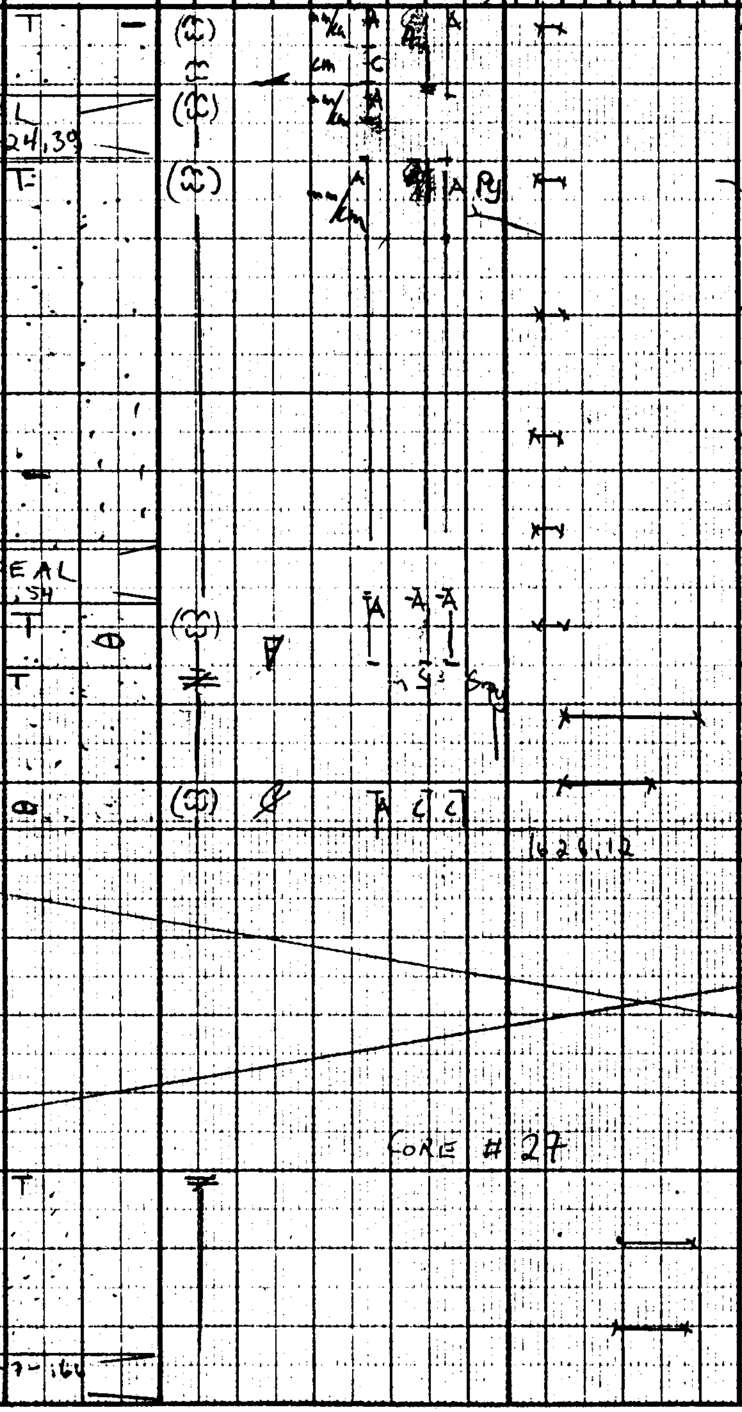
DRILLER DEPTH 1:20 (m)	SAND %	SAMPLES	CORE	LITHOLOGY	MAX	DOM	SR	RND	SPH.	HARD.	DESCRIPTION	PALAEO.
1616.8 1617		seal peal									sst, lt gy, fsl-crsl, transl qts (milk qts) (rose qts) (smoke qts), coal, (mud) (biot) (muscov) (cmt)	
	85	CA570										
					600	177	8	3/4	3/5	2		
	100			clay								?
		CA571										
					500	200	8	3/4	3/5	2	– c shell fragment	
	75	CA572										
1618					250	177	8	3/4	3/5	2	~ ~	E
		CA573										
					200	150	8	3/4	3/5	2	m-c (calc cmt) biot. muscv.	
	75	CA574										
					250	125	8	3/4	3/5	2	–	
		seal peal										E
		CA575										
1619					150	90	8	3/4	3/5	2	c c (((calc)))	
		CA576									particular sand	
					200	100	8	3/4	1/5	2	– –	
	85	CA577										
					250	125	8	3/4	3/5	2	a a	
		CA578		"coal"								
	76				177	125	8	3/4	3/5	2	– – (chlorite)	
1620		CA579										E
					177	125	8	3/4	3/5	2	– –	
		CA580										

mud covered surface



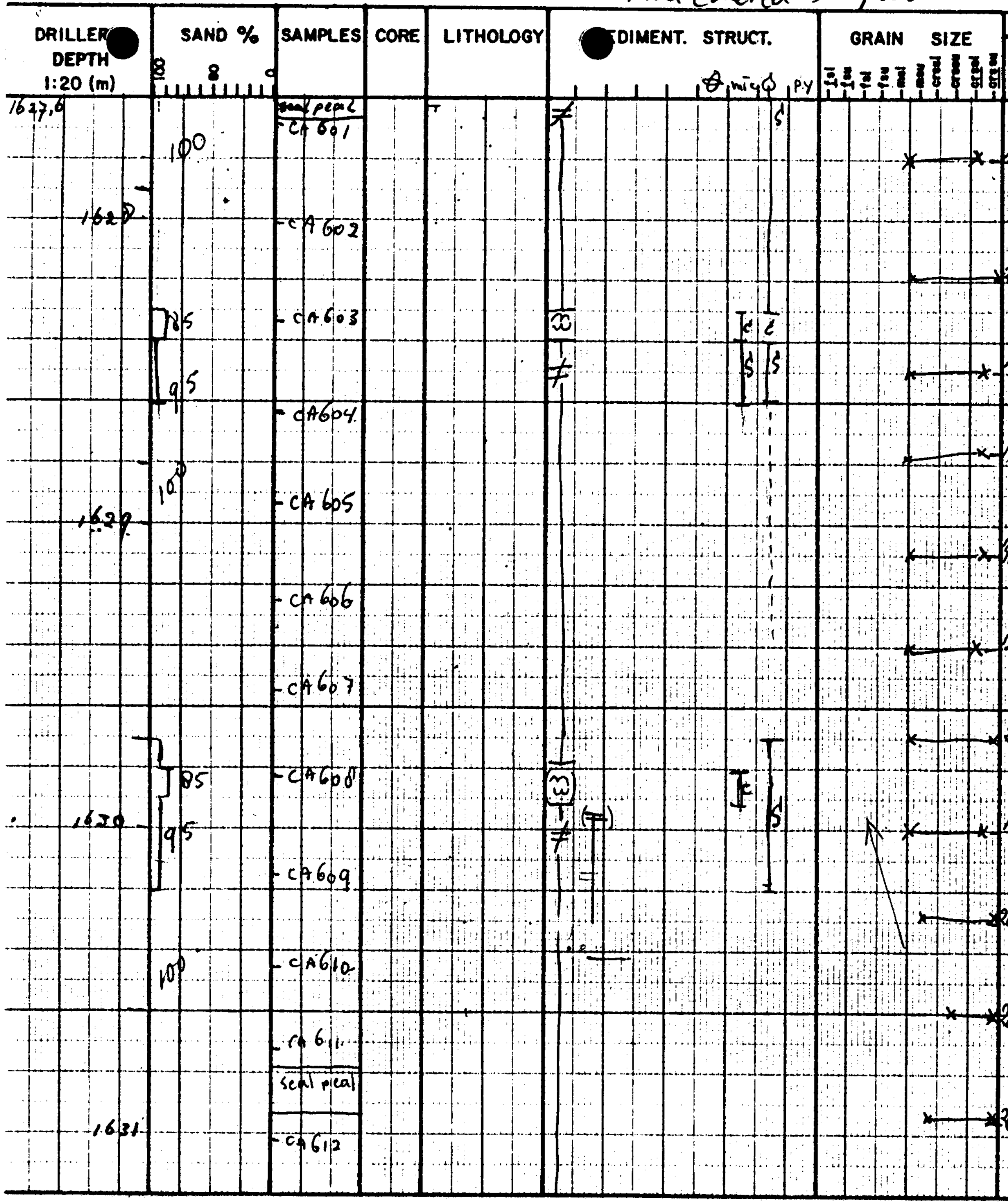
DRILLERS DEPTH 1:20 (m)	SAMPLES	TEXT INPUT MAX	DOM.	SR	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
1620.4		177	100	8	3/4	3/5	2	sst, m gy, fsl - msl, tranl qts, mic, biot, musc, (chlorite), rare qts, (carb, (cmt) ((calc)) cmt. milky qts, smoky qts. (silt?)		
	seal peal									
End #25 1621		177	125	8	3/4	3/5	~		E	
#26	CA581									
	CA582	177	125	8	3/4	3/5	2	sst, m gy, fsl - fsl, tranl qts, mic, biot, musc, carb, (cmt), ((calc)) cmt, ((chlor)).		
		150	100	8	3/4	3/5	2	- -		
	CA583								E	
		177	150	8	3/4	3/5	2	- -		
1622	CA584 seal peal									
	CA585	150	100	8	3/4	3/5	2	- - ((rare qts))		
	CA586	177	125	8	3/4	3/5	2	- - grain 500μ		
	CA587	177	125	8	3/4	3/5	2	- -	E	
1623	CA588	177	125	8	3/4	3/5	2	- -		
	CA589									
		150	100	8	3/4	3/5	2	- -	E	
	CA590									
	CA591	177	125	8	3/4	3/5	2	- -		
1624										

SURFACE



DRILLER DEPTH 1:20 (m)	SAND %	SAMPLES	CORE	MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
1624	75	CA592		1/7	125	8	3/4	3/5	2	Sst, med gy, slt - fSL, srt, transl qtz, mic, carb ((calc)), cons. fria	E Hir cross lam.	
		CA593		1/7	125	8	3/4	3/5	2	aa		
		CA594		1/7	125	8	3/4	3/5	2	aa		
1625		CA595		1/7	125	8	3/4	3/5	2	aa	E	
		CA596		1/7	125	8	3/4	3/5	2	aa		
		CA597										
	85	CA598		1/400	200	5	3/4	2/5	2	Sst, med gy, slt - crs SL, (srt) translucz qtz (smoke qtz) ((pyl)) ((mic)), (py))	?	
				1000	200	5	3/4	2/5	2			
1626 End core 26												
1627	100%	CA599		1100	350	6	3/4	2/5	1/2	Sst, lt gy, oil stained brn, fSL - crs SL, uncons - cons. loose - fria, transluc qtz (milk qtz) (quartzitic fragm) (((mic))), noncalc	?	
		CA600		800	280	6	3/4	2/5	2			

mud covered surface



TEXT INPUT

MAX	DOM.	SRT	RND	SPH.	HARD.
1200	350	5	3/4	3/5	1
2000	350	5	3/4	3/5	1
1400	350	6	3/4	3/5	1
1400	350	6	3/4	3/5	1
1400	350	6	3/4	3/5	1
1200	350	6	3/4	3/5	1
2000	350	6	3/4	3/5	1
1200	350	6	3/4	3/5	1
2000	500	5	3/4	3/5	1
2000	700	6	3/4	3/5	1
2000	500	6	3/4	3/5	1

DESCRIPTION

sst, lt brn (gy), ssl = crs u, translucent qtz, smoke qtz, qtz with min inclusions, (milk qtz), srt, ((mic)), musc, lse-fri

1 grain 2000μ

PALAEO.

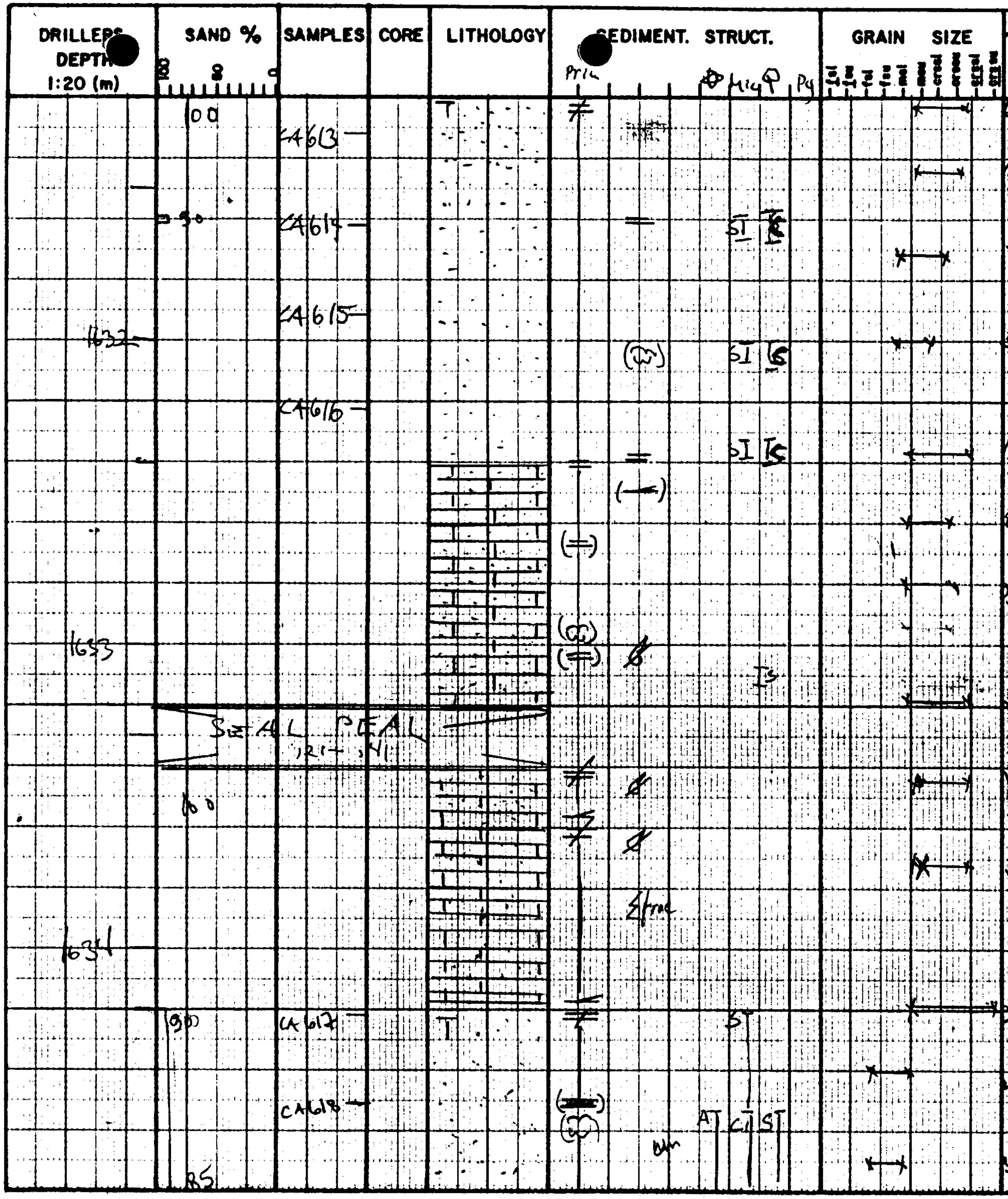
?

?

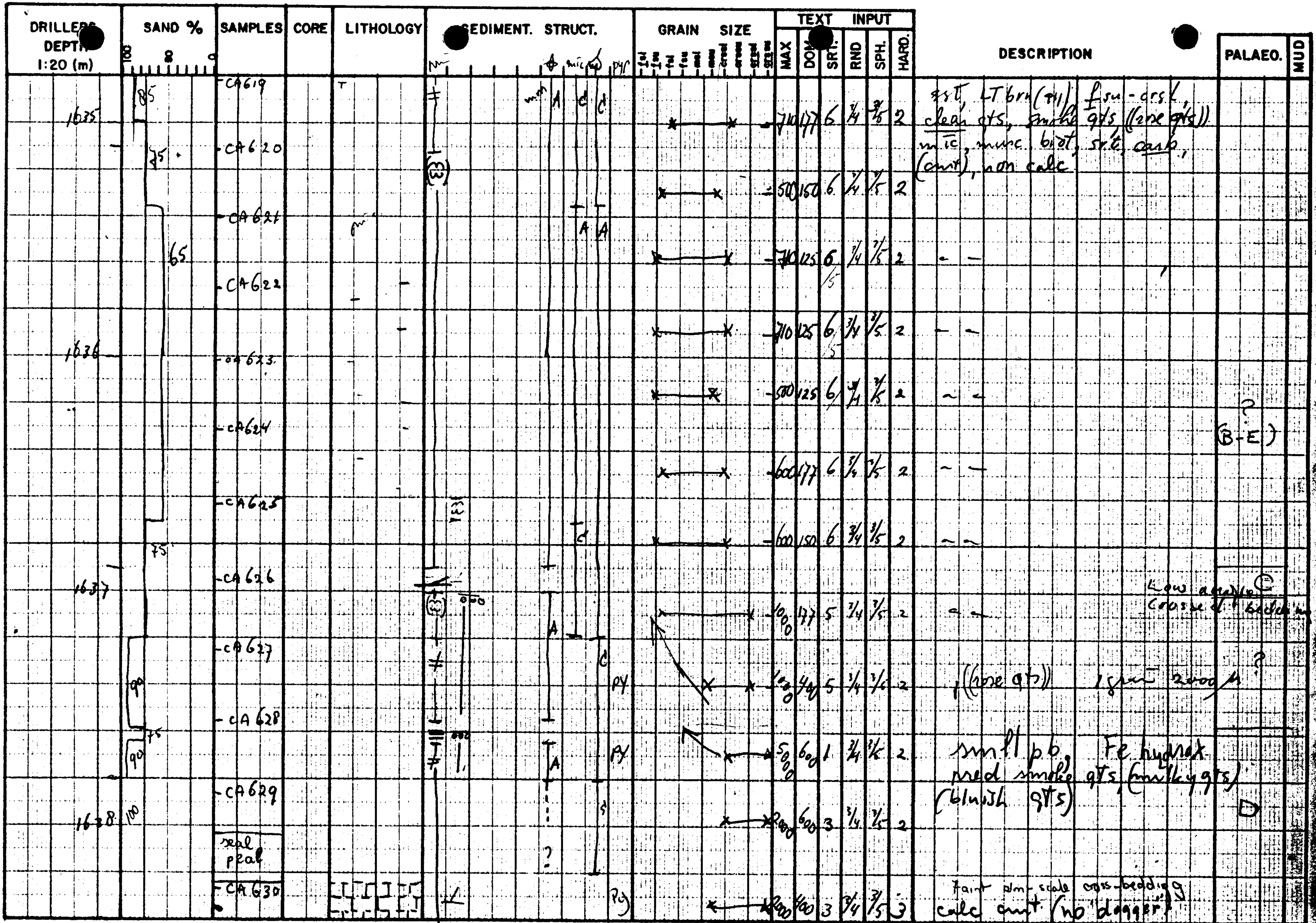
?

MUD

Surface covered by mud



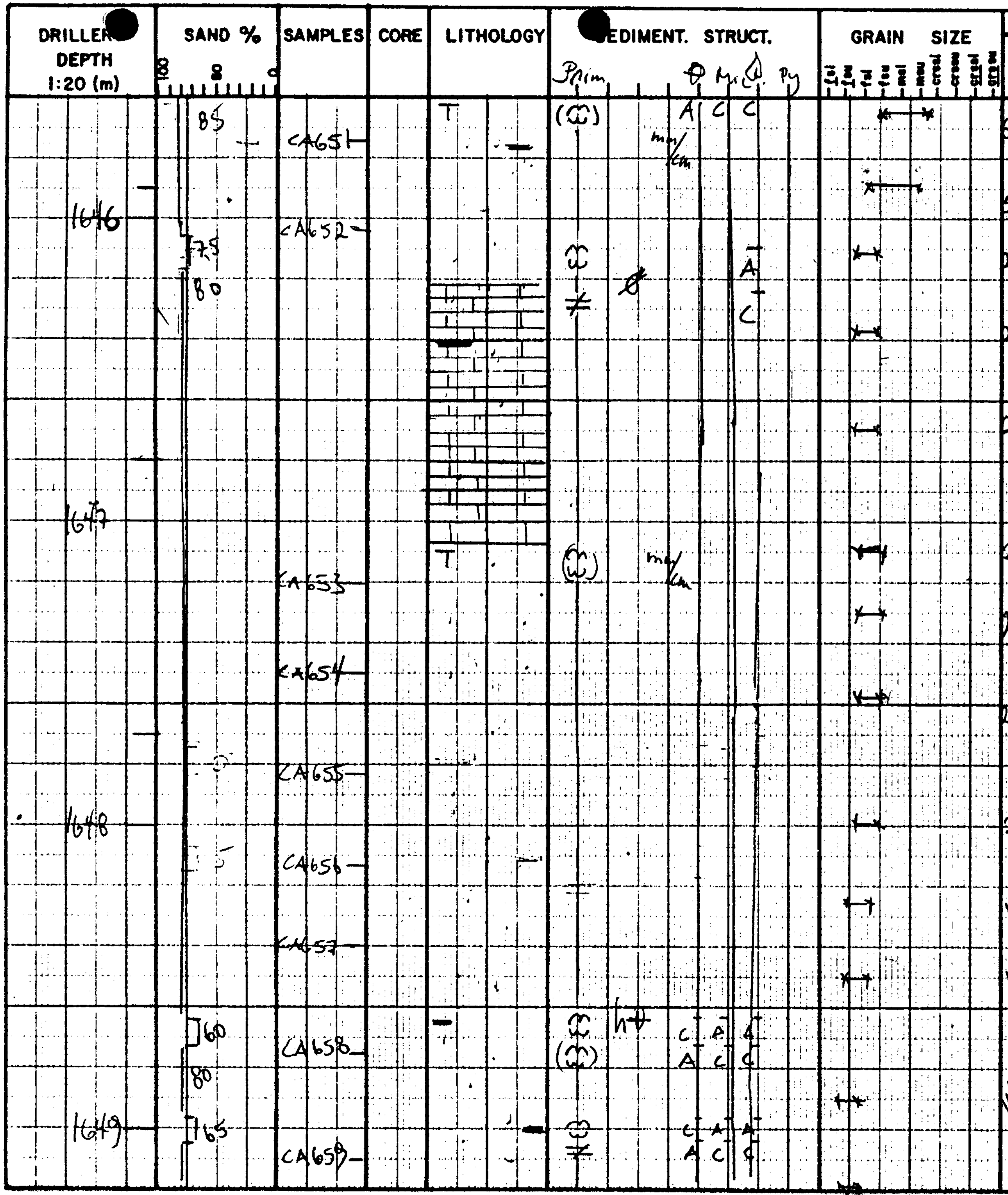
MAX	DOM	SR	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
1200	450	6	3/4	3/5	2	Sst, lt gy oil stained yel brn, fSL – crs SL, ((cms)) Translusc. qtz, (milk qtz, quartsitic fragm.), Tr blue qtz. Tr big mica flakes		
1300	450	6	3/4	2/5	2			
700	280	7	3/4	2/5	2		?	
500	200	7	3/4	2/5	2	a a		
1400	350	6	3/4	2/5	2	a a but (mic, ((carb) big mica flakes		
800	350	6	3/4	2/5	4	Sst, fSL – crs SL, calc cmt, hd, Translusc. qtz, (dk quartsitic fragm.), (milk qtz), Tr blue qtz, qtz with min. inclusions, tr. carb, Tr mic, calc	C	
900	350	6	3/4	2/5	4		Thick walled bivalve [illegible] fragments	
1200	400	6	3/4	2/5	4		C	
1000	450	6	3/4	2/5	4	aa	Thin walled	
1100	500	6	3/4	2/5	4		Thick walled bivalve C	
							mm thick [illegible] fragt.	
2000	380	5	3/4	2/5	2	a a but (strong qz) bimodal	Very [illegible] area, thick walled [illegible]	
1400	200	7	3/4	2/5	2	Sst, lt gy oil stained yel brn, Translusc. qtz (milk qtz), (qtz fragm) (mic), ((carb)) (((calc)))		
350	200	7	3/4	2/5	2			



DRILLERS DEPTH 1:20 (m)	SAMPLES	MAX	DOM	SRT.	RND	SPH.	HARD.	DESCRIPTION	PALAEO.
	CA619								
1635		710	177	6	3/4	3/5	2	sst, LT brn (ᵍ¹/₁) f su-crs L, clean qts, smoke qts ((rose qts)) mic, musc, biot, srt, carb, (cmt), non calc	
	CA620								
		500	150	6	3/4	3/5	2		
	CA621								
		710	125	6 /5	3/4	3/5	2	- -	
	CA622								
		710	125	6 /5	3/4	3/5	2	- -	
1636	CA623								
		500	125	6/5	3/4	3/5	2	~ -	?
	CA624								(B-E)
		600	177	6	3/4	3/5	2	~ -	
	CA625								
		600	150	6	3/4	3/5	2	~ ~	
1637	CA626								Low angle Ⓒ cross bedding
		1000	177	5	3/4	3/5	2	- -	
	CA627								?
		1000	400	5	3/4	3/6	2	((rose qts)) 1 grain 2000 µ	
	CA628								
		5000	600	1	3/4	3/5	2	small pb, Fe hydrox, red smoke qts, (milky qts) (bluish qts)	D
	CA629								
1638		2000	600	3	3/4	3/5	2		
	real peat								
	CA630	2000	400	3	3/4	3/5	3	faint dm-scale cross-bedding calc cmt (no 'dogger')	

DRILLER DEPTH 1:20 (m)	SAND % 100 80 0	SAMPLES	CORE	LITHOLOGY	DIMENT. STRUCT. Prim Mic Py	GRAIN SIZE	TEXT INPUT MAX	DOM.	SRT	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
	100				≠										
		CA631													
							1400	400	6	3/4	2/5	2	Sst, lt gy (brn), fSU- crs SU,		
													clns, Translsc. qtz,	?	
1639		CA632											cdk gy quartzitic		
							900	350	6	3/4	2/5	2	fragm. (tr mica), (qtz		
													with min inclus) non		
		CA633											cak		
							900	400	6	3/4	2/5	2			
		CA634													
							1000	500	6	3/4	2/5	2	Tr big muscovite flakes		
														?	
		CA635													
							600	350	7	3/4	2/5	2	l crs S, (tr mica)		
1640															
		CA636													
							600	350	7	3/4	2/5	2			
		CA637													
		SEAL PEAL ,62- ,82													
	100	CA638			≠		800	450	6	3/4	2/5	2	Tr. big muscov. flakes		
														?	
1641															
		CA639													
							800	400	6	3/4	2/5	1/2	aa		
		CA640			s										
							700	300	7	3/4	2/5	2	aa		
		CA641													
1642															

DRILLED DEPTH 1:20 (m)	SAND % 100 80 0	SAMPLES	CORE	LITHOLOGY	SEDIMENT. STRUCT.	GRAIN SIZE	TEXT INPUT MAX	DOM	SRT.	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
1642		CA 642		T	≠ Not → (A) tallo Complex ? S py								sst, lt brn (gy), clear qts, smoky qts		
					py		1000	400	4	3/4	1/5	2	bluish qts, milky qts, carb, (mic)		
					py		1200	350	5	3/4	3/5	2	rose qts.		
	100	CA643			S										
					py		1000	250	6	3/4	3/5	2			
1643		CA644												?	
					py		1200	400	5	3/4	3/5	2			
							700	350	8	3/4	3/5	2			
		CA645													
		seal peal					700	350	8	3/4	3/5	2	bad Quality core		
1644															
					?		700	350	8	3/4	3/5	1/2			
end #27															
1645															
#28	95	CA649		T	(w) A C C								sst, gy, clear qts, smoky qts, milky qts,		
		seal peal			py S		2000	350	5	3/4	3/5	2	qts with min inclus, mic, bio, musc.		
	80	CA650			A C C py S		2000	350	5	3/4	3/5	2		?	



TE	INPUT				
MAX	DOM.	SRT.	RND	SPH.	HARD.
600	250	6	3/4	2/5	2
500	180	6	3/4	2/5	2
250	150	7	3/4	3/5	2
240	140	8	3/4	3/5	4
240	140	7	3/4	3/5	4
270	160	7	3/4	3/5	4
240	140	7	3/4	3/5	2
240	140	8	3/4	3/5	2
200	140	8	3/4	3/5	2
180	120	8	3/4	3/5	2
170	120	7	3/4	3/5	2
140	110	8	3/4	3/5	2
140	110	8	3/4	3/5	2

DESCRIPTION

Sst, lt-med gy, slt-crs Sk
cons, fria, translucre
qtz, (milk qtz), ccd lt gy
qtzitic rock fragm)
Tr, fsp, mic, carb
both muscovite flakes
and biotite, non calc

Sst, lt gy, cmt, hd, slt-mSk, tr
crs S, dom translusc qtz
(milk qtz), mic, carb,
calc

tr crs S

Sst, med gy, slt-fSk,
cons, fria, dom transl.
qtz, (milk qtz) mic
carb dom biot. but also
muscovite, non calc

Sst, lt-med gy, slt-fSk
aa

tr crs S aa

tr crs S

PALAEO.

?

very small Sh frag

E

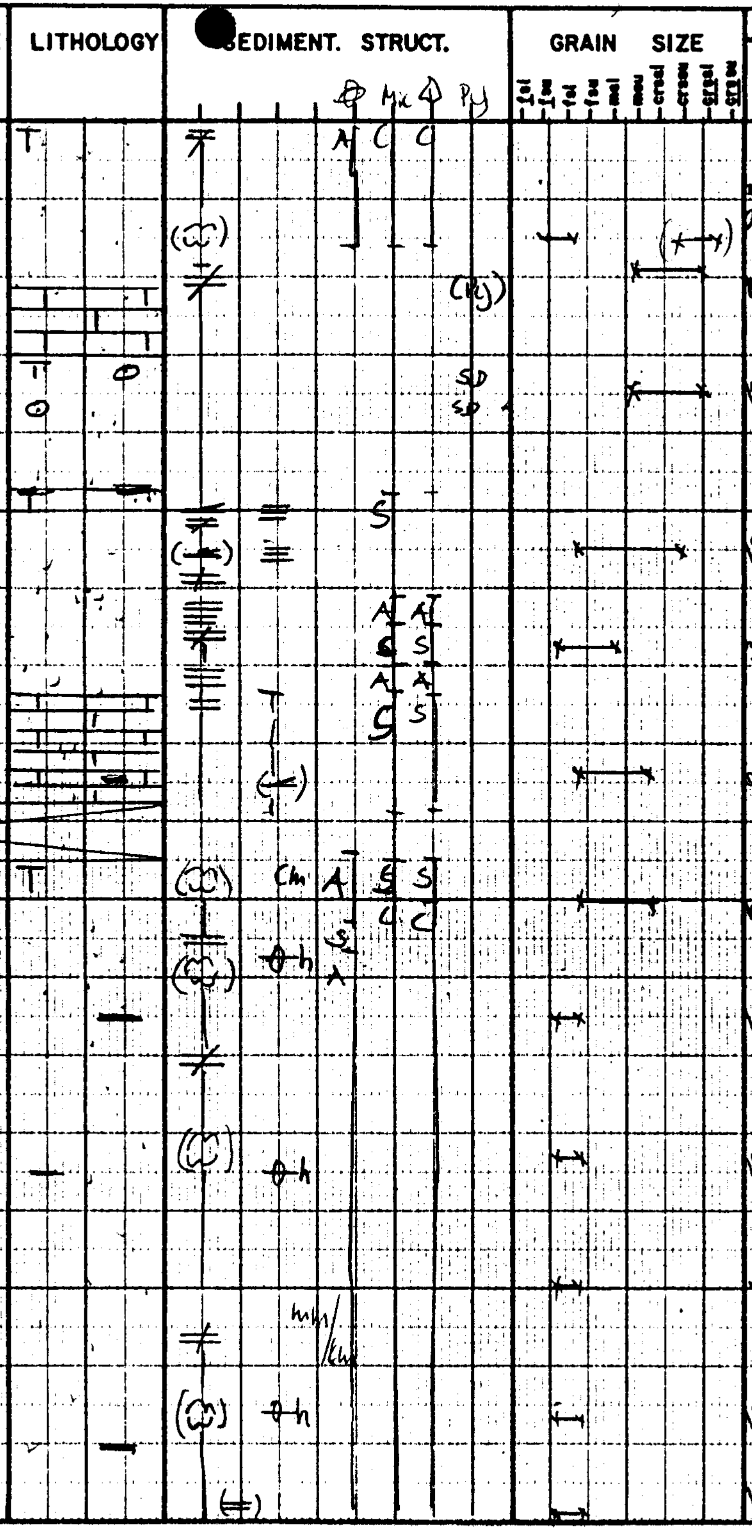
cm scale horizontal burrow

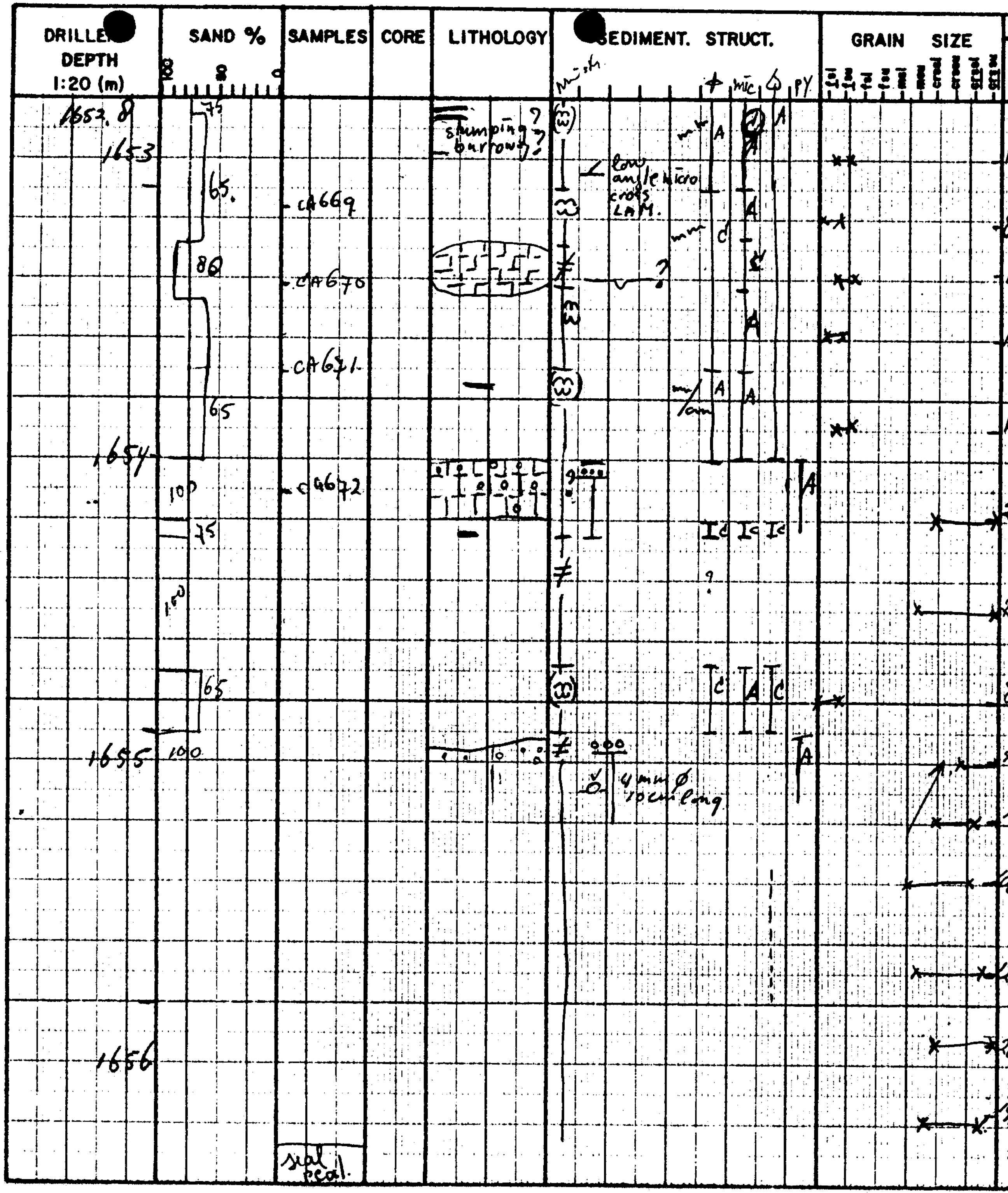
E

E

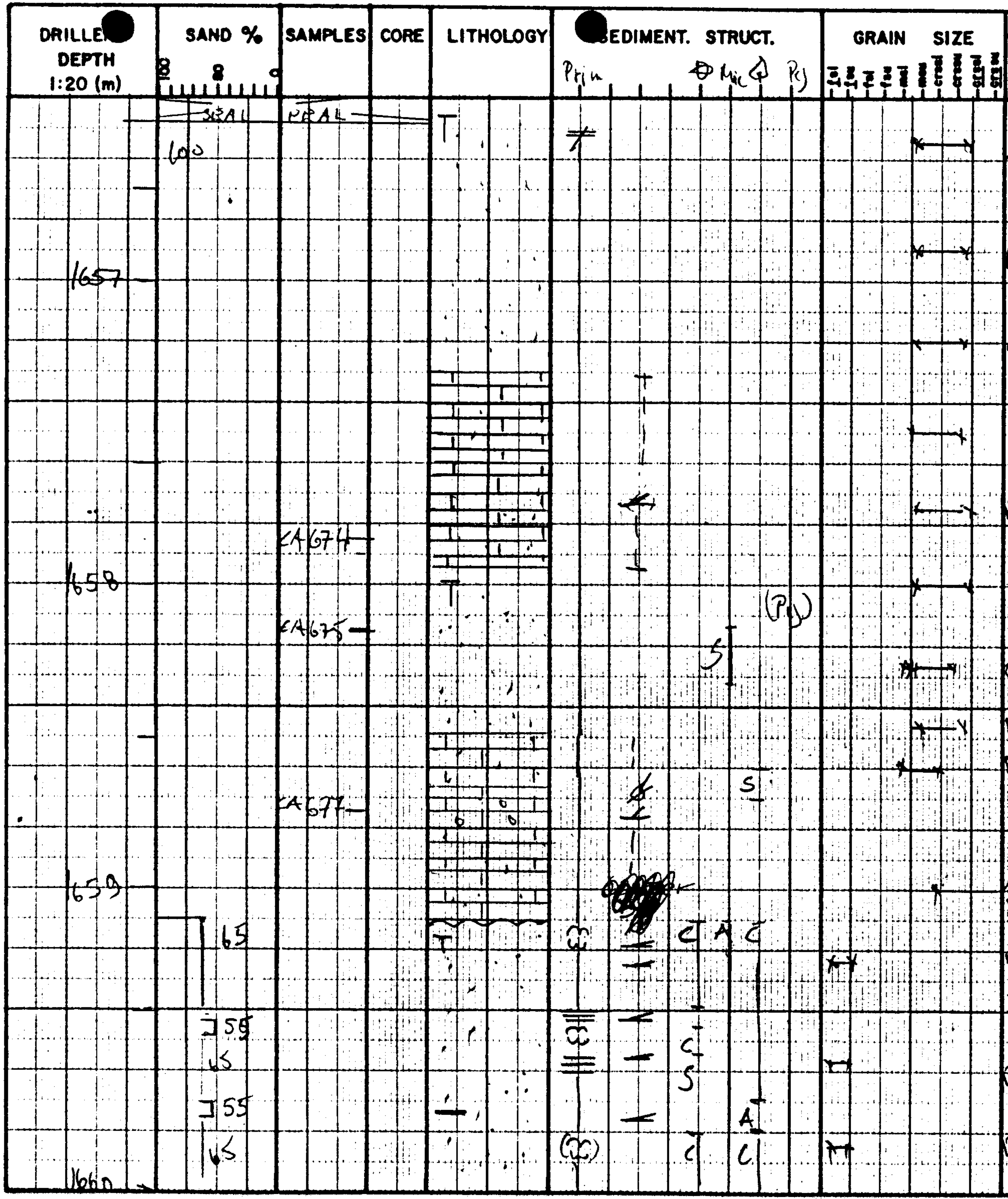
MUD

DRILLER DEPTH 1:20 (m)	SAND %	SAMPLES	MAX	DOM.	SRT.	RND	SPH.	HARD.	DESCRIPTION	PALAEO.
	80									
	85	CA660	2000 250	120	6	3/4	2/5	2	Sst, lt-med gy, slt-f S4 + crs S-crs S, bimodal, transl qtz, mic, carb	E
	100		140	500	5	3/4	2/5	3		
		CA661							Sst, lt gy, spotted brn, slt-crs SL	G
			140	50	6	3/4	2/5	2	transluc. qtz, (quartzitic fragm), (((mic)))	brown siderite (?) nod.
1650										small qtz spherical balls
	80	CA662								Low angle
			120	210	5	3/4	2/5	2	Sst, lt gy, cons fria bimodal, (mic)	
	65									
	90	CA663	350	150	7	3/4	3/5	2	Sst, lt gy, cons, fria, slt-m S4, transluc. qtz, (mlk qtz), mic, (carb)	G
	60									
	90									G
			600	180	6	3/4	3/5	4	Sst, lt gy, cmt, hd, calc Low angle (cm scale)	Low angle cross lam
1651	95-910	SEAL PEAL								
	90		600	180	6	3/4	2/5	2	Sst, gy, slt-cr S4	
	85									cm thick coarse and finer lam.
		CA664	180	140	8	3/4	3/5	2	Sst, gy, slt-f S4, mic (carb), (((calc)))	
		CA665								
			180	140	8	3/4	3/5	2	aa	E
1652										
		CA666	180	140	8	3/4	3/5	2	aa	
	95	CA667								
			150	90	8	3/4	3/5	2	aa	
	85	CA668	150	128	8	3/4	3/5	2	aa	

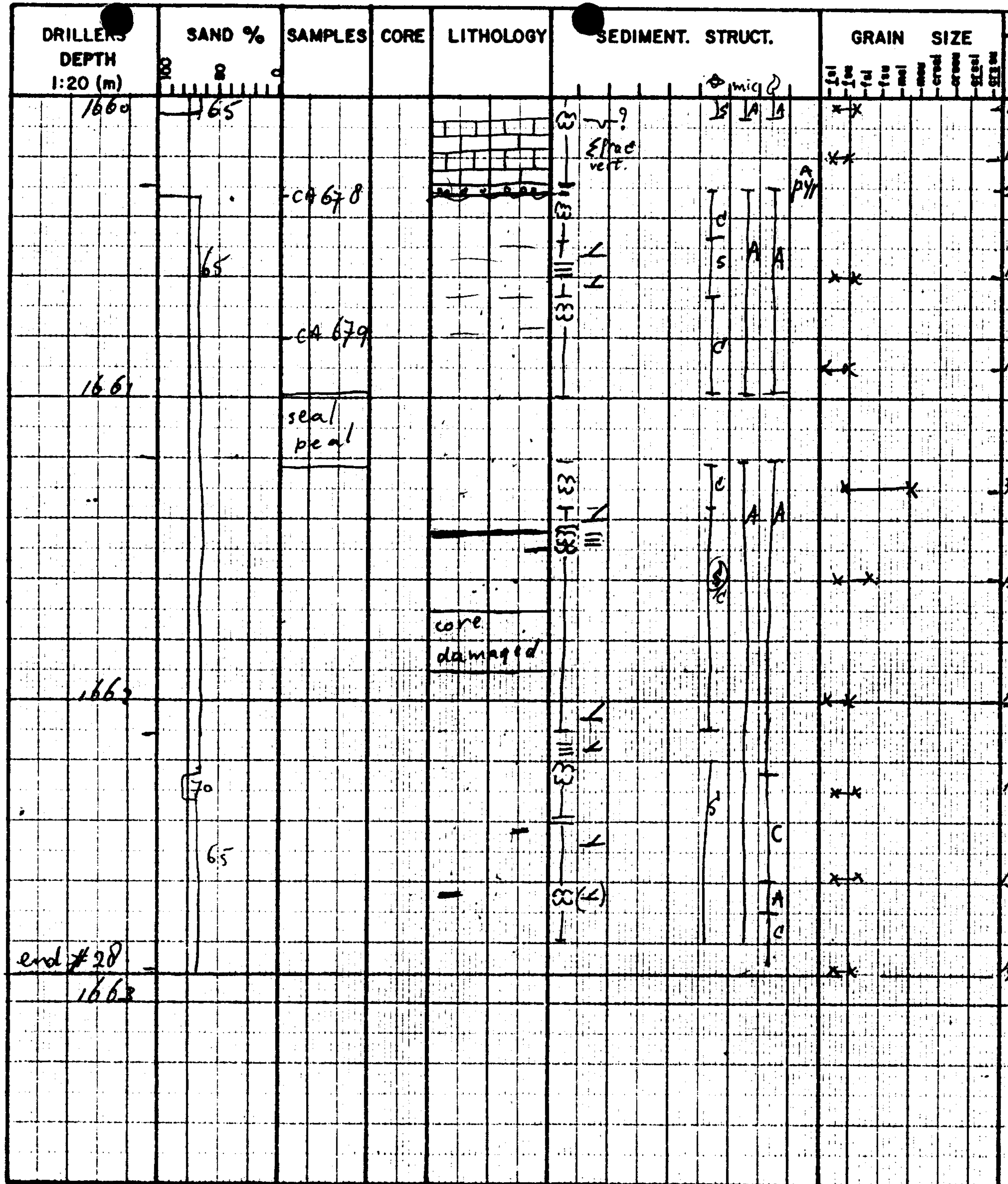




MAX	DOM.	SRT.	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
125	88	9	3/4	3/5	2	sst, dkgy, trans/ qts, (white qts), mic, bio, musc, carb	:	
88	62	9	3/4	3/5	2	siltst sst, mic, mon calc		
150	100	8	3/4	3/5	2	calc (no hard "degsei")	G-(E)	
100	75	9	3/4	3/5	2			
150	100	6	3/4	3/5	2	Bimodal few grains 600μ 1000μ		
2000	600	3	3/4	3/5	2	Fe? cmt + calc cmt py Abundant. sl burrowed		
2000	500	5	3/4	3/5	1	loose		
88	62	7	3/4	3/5	2	Bimodal few small pebbles not in sorting incl		
4000	710	3	3/4	3/5	2	grain size boundary of "pyritic" layer weathered		
1400	600	6	3/4	3/5	1/2			
1000	350	7	3/4	3/5	1/2		?	
1200	400	7	3/4	3/5	1/2			
2000	600	5	3/4	3/5	1/2			
1400	500	7	3/4	3/5	1/2			

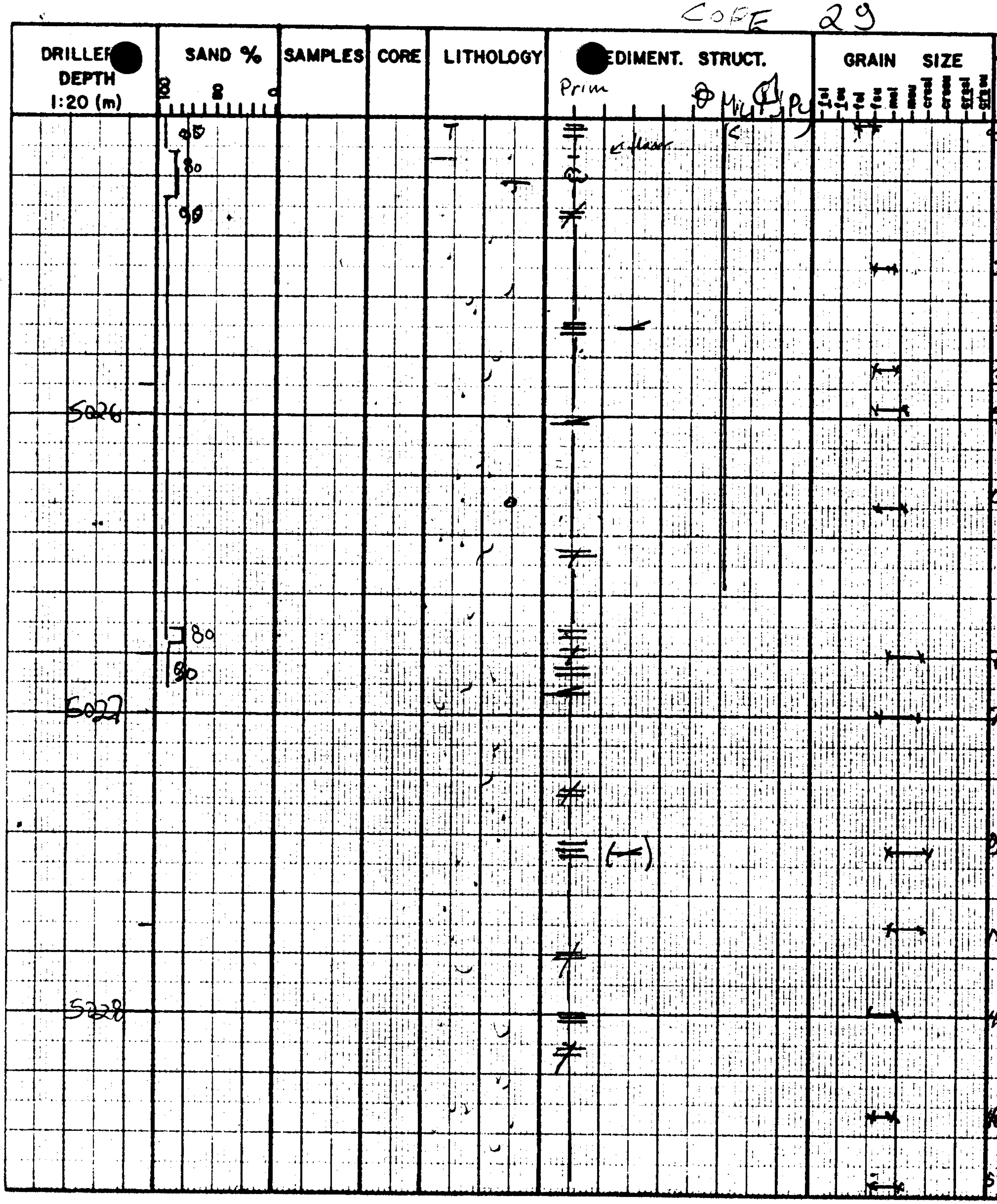


MAX	DOM.	SRT.	RND	SPH.	HARD.	DESCRIPTION	PALAEO.
1400	420	6	3/4	2/5	1/2	Sst, lt gy, fSL - crsSH loose - fria, uncons - cons Translusc qtz (dk gy	
1200	400	6	3/4	2/5	2	quartzitic fragm), (milk qtz?), Tr. muscovite, tr. carb., non calc	?
1200	400	6	3/4	2/5	1/2	as but br.	
1600	380	6	3/4	2/5	4	Sst ltgy, hd, calc (dm-scale) cross bedding	C?
1400	400	6	3/4	2/5	4		
1400	400	6	3/4	2/5	[illegible]	Sst, gy br, as	
800	320	6	3/4	2/5	1/2	Sst, ltgy-brn, as but (mic)	?
1400	380	6	3/4	2/5	2	tr. ~~blue~~ dk grey qtz	
800	340	7	3/4	2/5	4	(dm-scale) cross-bedding	C
300	400	6	3/4	2/5	3/4	Sst, ltgy-brn, calc, hd	
130	88	8	3/4	3/5	2	Sst, med gy slt - fSL + a few crsS, cons, fria,	
125	88	8	3/4	3/5	2	Translusc qtz, mic, carb, non calc ripple cross bedding	C
125	88	8	3/4	3/5	2		

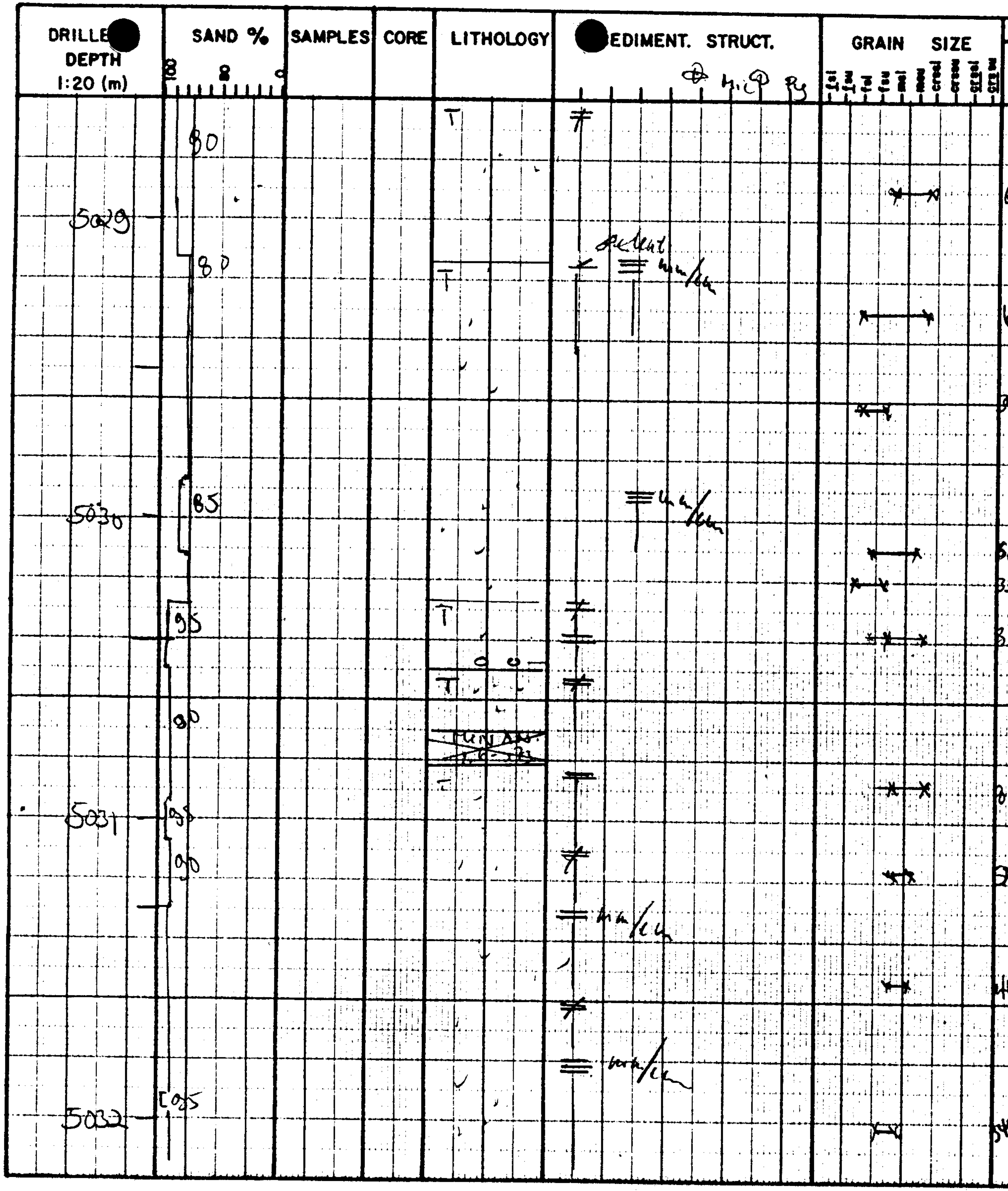


TEXTURE INPUT							
MAX	DOM.	SRT.	RND	SPH.	HARD.	DESCRIPTION	PALAEO.
177	100	8	3/4	3/5	2	mic sandst	
125	88	9	3/4	3/5	4	dogger	G
200	800	3	3/4	3/5	2	thin layer conglomeratic sst sl. bioturbated cose qts Fe+Calc cmt * ripple bedding with clay laminae	
125	88	9	3/4	3/5	2		
125	88	9	3/4	3/5	2		
350	125	8	3/4	3/5	2	Bimodal	G
177	125	8	3/4	3/5	2		
125	88	8	3/4	3/5	2	1 grain 1400μ	
140	100	8	3/4	3/5	2	sst, lt-med gy, cons fri, transl qts mic, carb-carb sl. bioturbated ripple cb non calc	
150	100	8	3/4	3/5	2		
140	100	8	3/4	3/5	2		

CORE 29

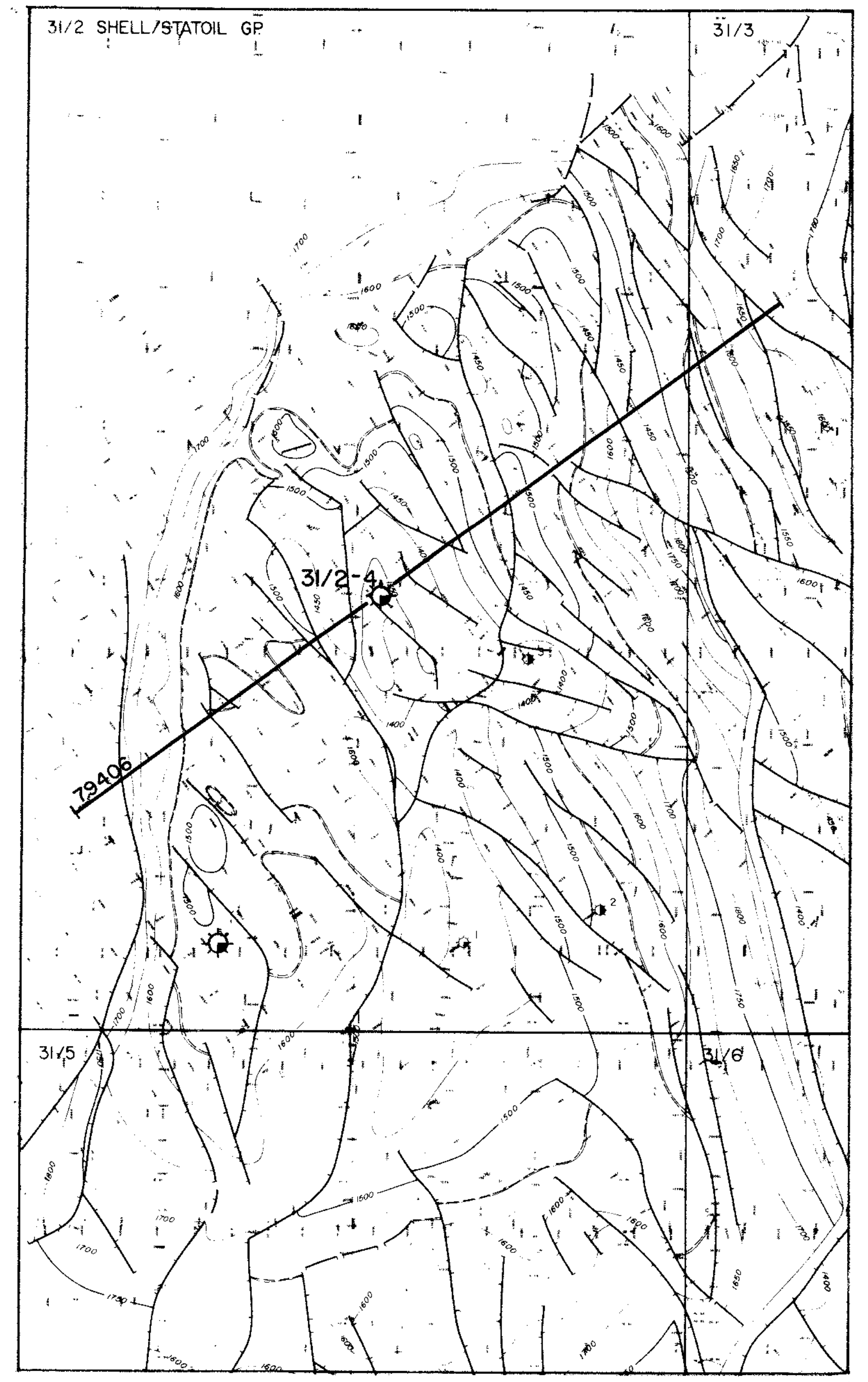


TEXT. INPUT MAX	DOM.	SRT.	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
260	172	7	2/3	3/4	3/4	Sst, ltgy (por), slt-m SL, (cmt), hd, transluc-~~matte~~ frosted qtz, ~~red-gn~~ (fgr), fsp, (mica: biotite), (chlorite), (gn min, apatite? (heavy min)), (calc)	largil clasts	
350	230	7	2/3	3/4	3/4			
							Dip 20°	
380	250	7	2/3	3/4	3/4	aa		
450	250	6	2/3	3/4	3/4	aa (calc)	Dip 2-7°	
450	250	6	2/3	3/4	4			
700	350	6	2/3	2/4	3/4	also 1 crs SL		
700	280	6	2/3	2/4	3			
800	350	6	2/3	3/4	3/4	Sst ltgy aa (calc)		
700	350	6	2/3	3/4	3/4	aa, slt-crs SL		
400	250	7	2/3	3/4	3/4	aa slt-m SL		
400	280	7	2/3	3/4	3/4	aa but 1 crs SL		
500	300	6	2/3	3/4	3/4			



TEST INPUT						DESCRIPTION	PALAEO.	MUD
MAX	DOM.	SRT.	RND	SPH.	HARD.			
600	350	6	2/3	2/4	3/4	Sst, ltgy, slt-crs SL, (por) bd cmt, translucent – frosted qtz, yell-pink fsp, (mic), (chlorite) ((heavy min)), (calc)	dip 2-25°	
600	210	5	2/3	2/4	3/4	aa but more ⊕ mic and med gy and ((calc))	occ. tangential type crossbed between more fine grained and coarse grained layers	
310	320	7	2/3	2/4	3/4			
						occ. heavy min lamina		
500	300	6	2/3	2/4	3/4	aa but ltgy		
320	220	6	2/3	2/4	3/4	aa but med gy		
300	350	6	2/3	2/4	3/4	aa ltgy		
						med gy		
300	340	6	2/3	2/4	3/4	lt gy		
320	350	7	2/3	2/4	3/4	lt-med gy		
400	300	7	2/3	2/4	3	lt-med gy		
340	200	7	2/3	2/4	3/4			

DRILLE DEPTH 1:20 (m)	SAND % 100 80 0	SAMPLES	CORE	LITHOLOGY	EDIMENT. STRUCT.	GRAIN SIZE	MAX	DOM.	SRT.	RND	SPH.	HARD.	DESCRIPTION	PALAEO.	MUD
	90				D, mm. mm/cm								Sst. lt gy. (por), wl. cmt,		
							350	200	7	2/3	3/4	3/4	transluc. -milky qtz - frosted qtz, yell. -pink fsp (mic), ((chlorite))	1 x 3cm	
					plant		300	200	7	2/3	3/4	3/4	((heavy min)), ((calc)) - calc)	Clay drape	
5033							500	300	6	2/3	3/4	3/4	Mud qz		
							300	200	7	2/3	3/4	3/4			
	5033,38			132 - 138											
5034															

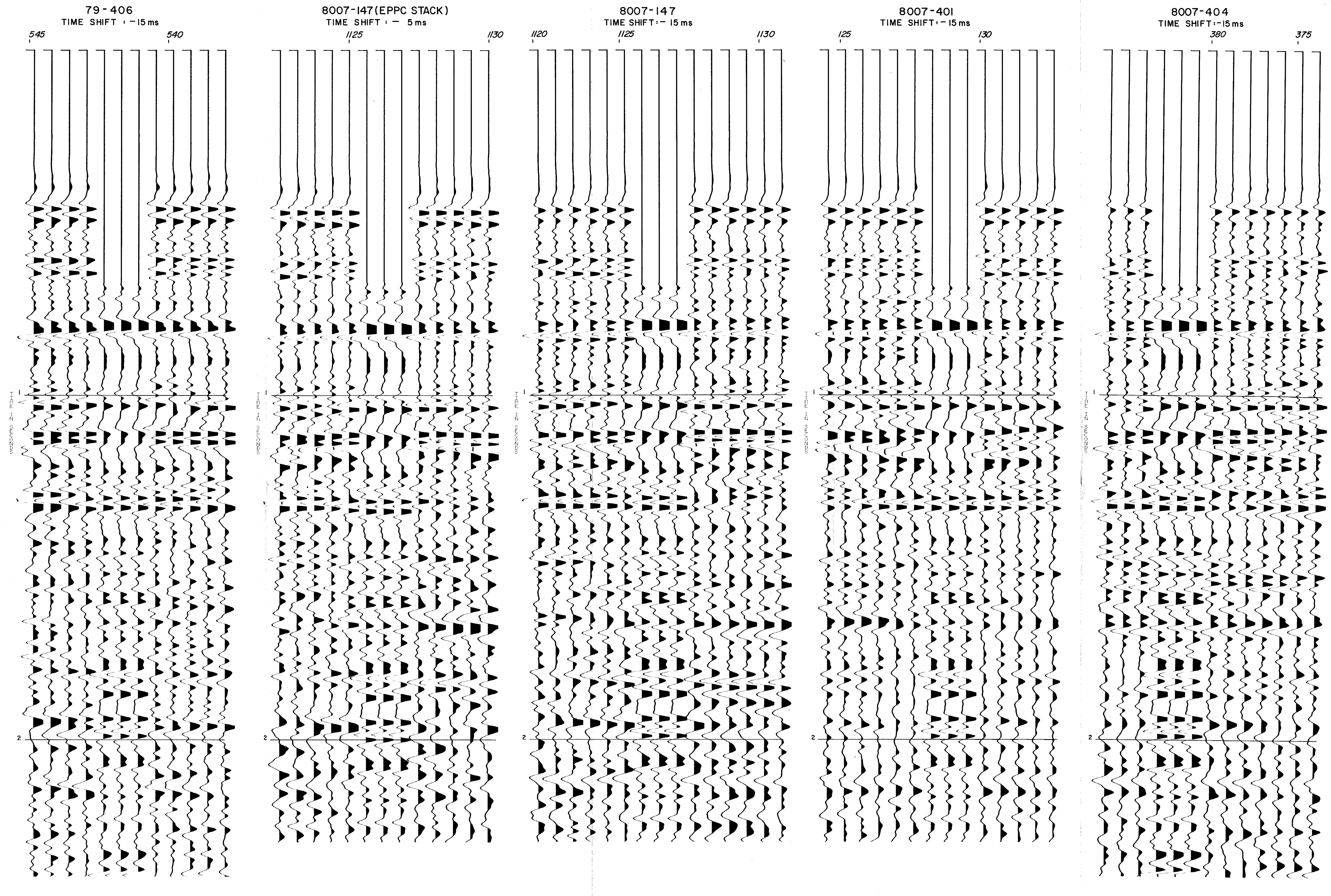


SITUATION MAP TOP JURASSIC SAND 1:150000

a·s Norske Shell
EXPLORATION & PRODUCTION FORUS

31/2-4
EXPLORATION WELL RESUME
SEISMO-STRATIGRAPHIC CALIBRATION
LINE 79406

AUTHOR: EPPP/30	ENCL:	DATE: FEB. 1982
REPORT NO.: NSEP 149	4	DRAW. NO.: G.1096/1



a·s Norske Shell
EXPLORATION & PRODUCTION FORUS

31/2-4
EXPLORATION WELL RESUME
IMPEDANCE SECTIONS

AUTHOR: EPPP/30	ENCL: 5	DATE: APRIL 1982
REPORT NO.: NSEP 149		DRAW.NO.: 1096/2

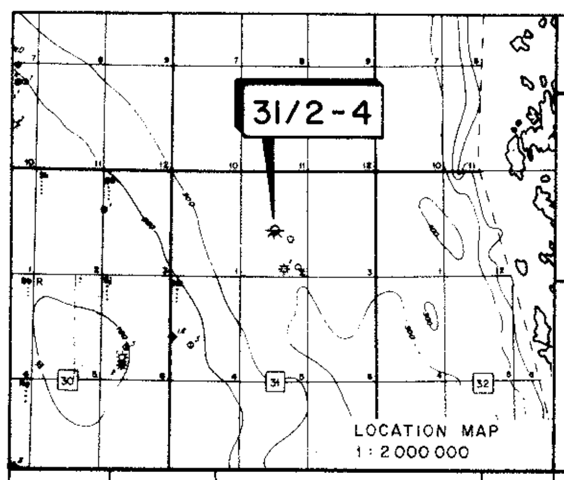
* CORED INTERVAL, SHOWS AND CORE EVALUATION COLUMNS ON DRILLER'S DEPTH.

a·s Norske Shell
EXPLORATION & PRODUCTION FORUS

WELL 31/2-4
LOG AND CORE COMPILATION
ROGALAND AND HUMBER GROUP

AUTHOR: EPXV/2	ENCL: 6	DATE: MAY 1982
REPORT NO.: NSEP 149		DRAW.NO.: G 1096/3

Encl.7 31/2-4 WELL RESUME

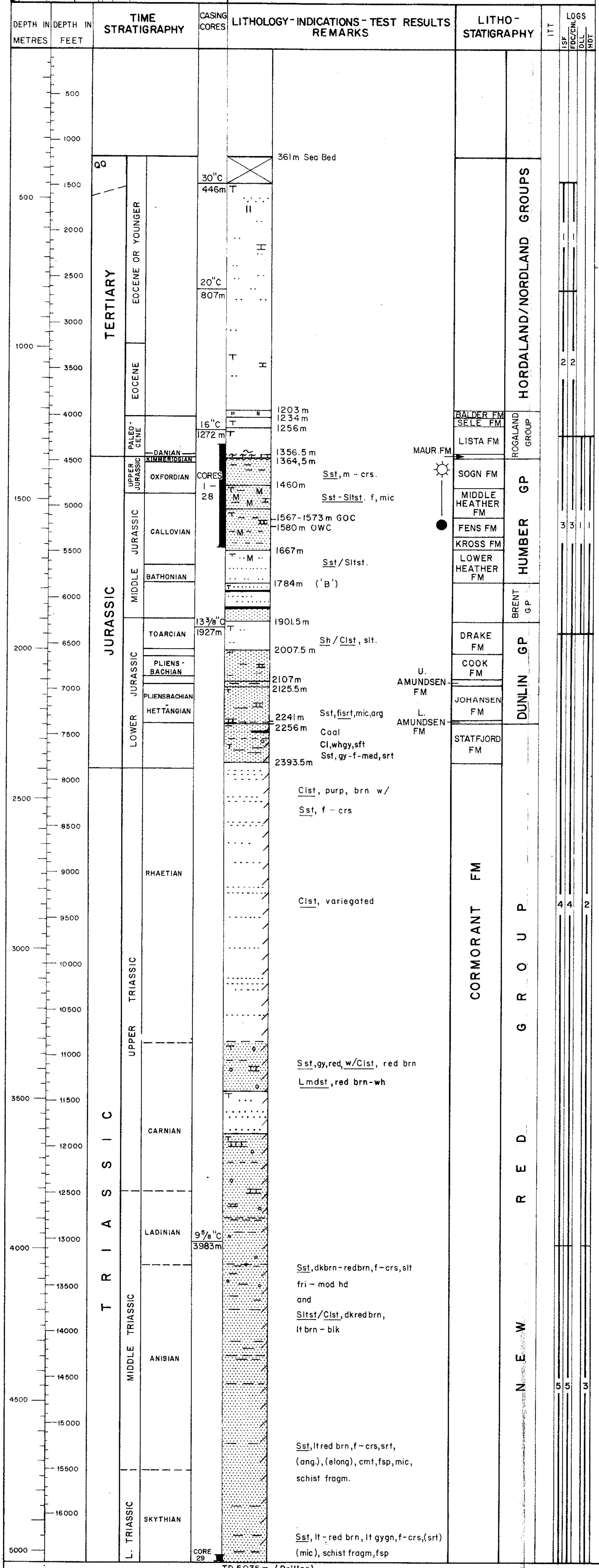


a·s Norske Shell
EXPLORATION & PRODUCTION FORUS

NORSKE SHELL
31/2-4

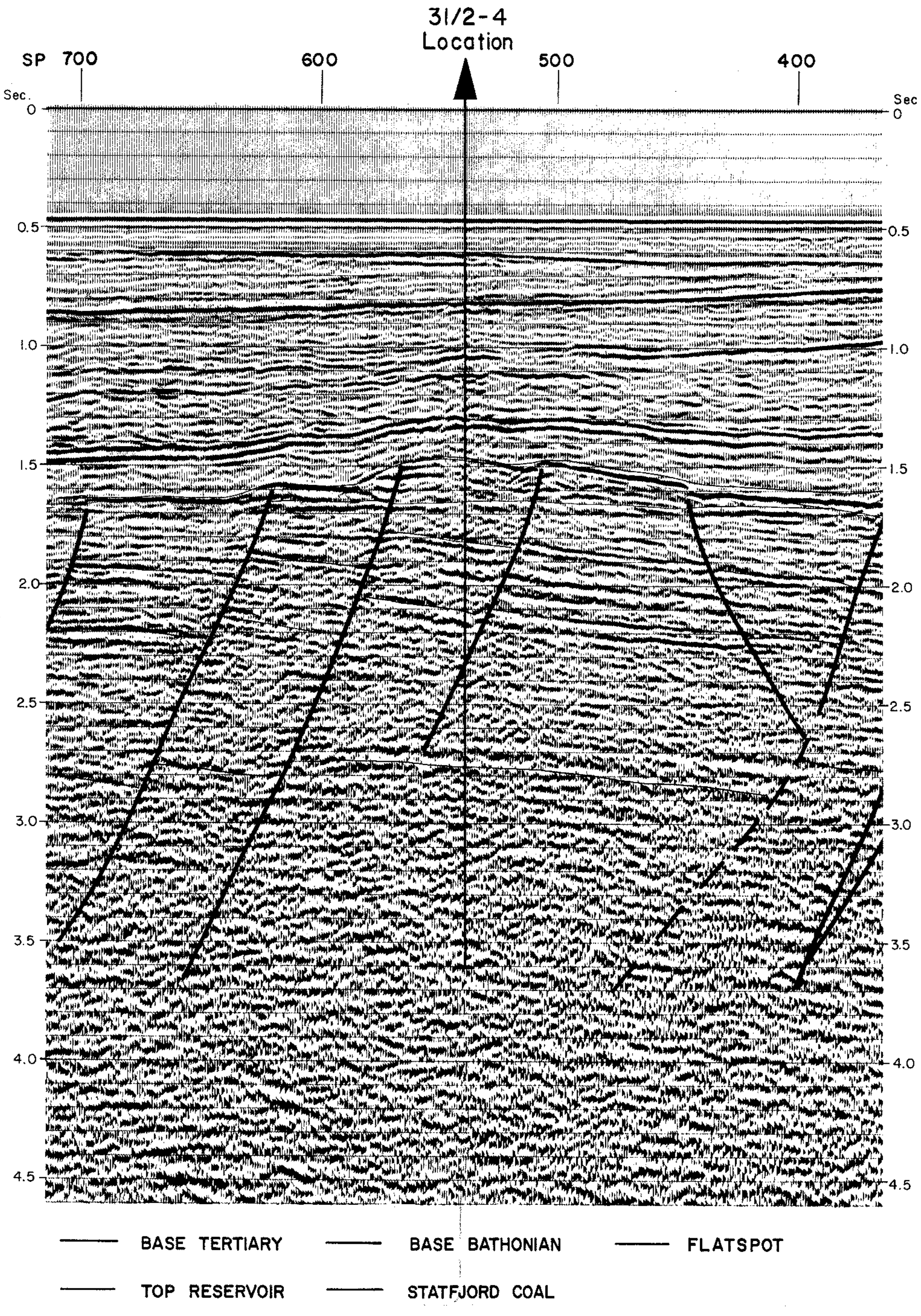
SCALE 1:10 000

COORDINATES LAT:	60° 51' 23.57"N	LONG.:	03° 30' 44.33" E
ELEVATION DF:	25 m	RIG:	BORGNY DOLPHIN
WATER DEPTH:	336 m	SPUDDED:	0.1 0.9. 80
TOTAL DEPTH:	5035 m (Driller) 5033 m (Logger)	SUSPENDED:	06.04.81
		COMPLETED:	

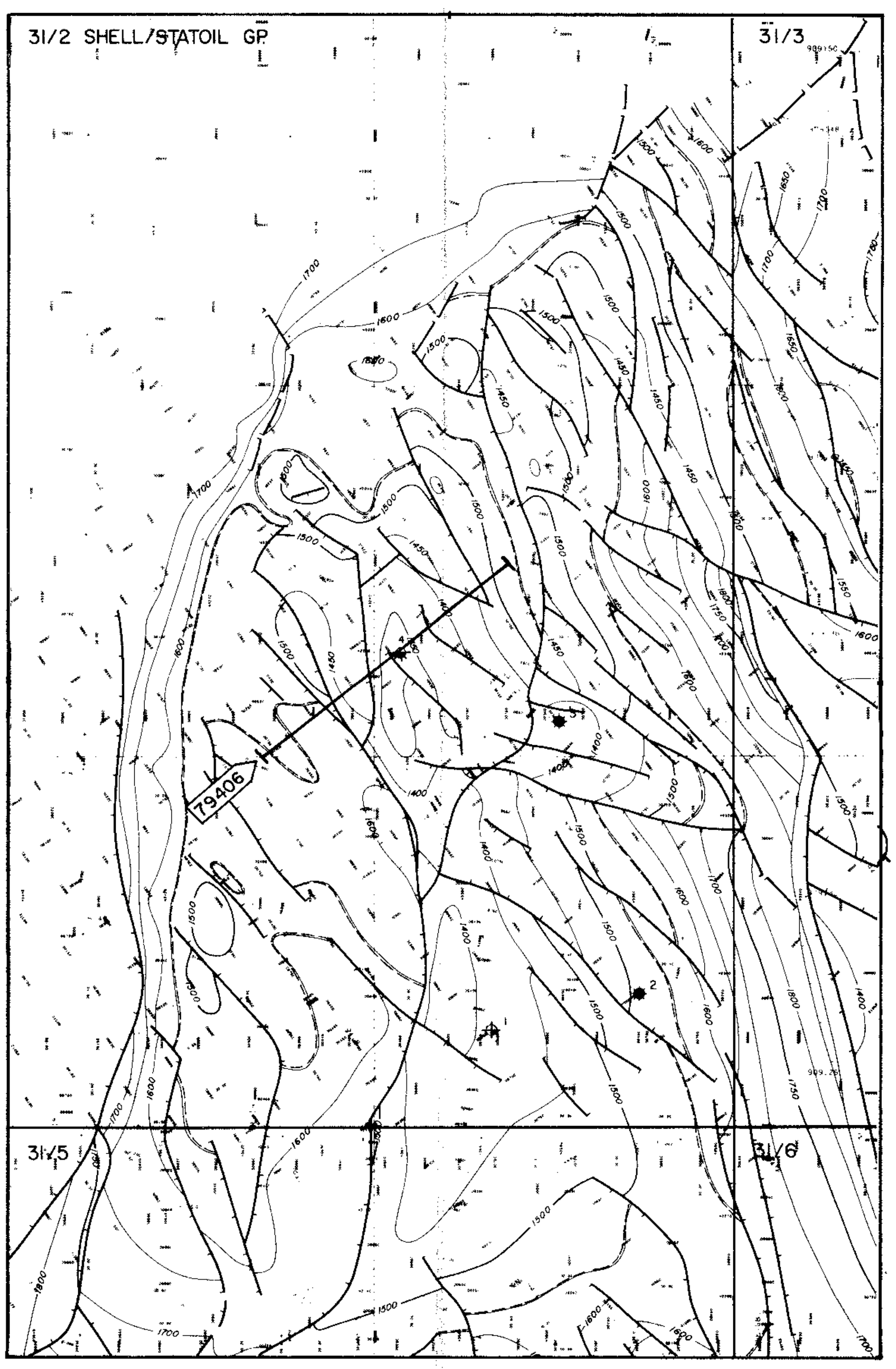


TD 5035 m (Driller)
5033 m (Logger)

SEISMIC LINE 79406



LOCATION MAP



STRUCTURE MAP HORIZON 'A'
Scale 1:150000

CORES. Driller Depth.

1.	1320.0 - 1326.0	rec. 5.75m	96%	
2.	1326.0 - 1334.0	rec. 0.45m	6%	
Int.	1334.0 - 1338.0	Drilled with normal bit		
*3.	1338.0 - 1347.0	rec. 9.00m	100%	
4.	1347.0 - 1365.0	rec. 10.00m	56%	
5.	1365.0 - 1379.0	rec. 13.00m	93%	
6.	1379.0 - 1397.0	rec. 18.00m	100%	
7.	1397.0 - 1410.0	rec. 13.00m	100%	
8.	1410.0 - 1415.5	rec. 5.00m	91%	
9.	1415.5 - 1426.5	rec. 9.50m	86%	
10.	1426.5 - 1443.5	rec. 0.18m	1%	
11.	1443.5 - 1452.5	rec. 9.00m	100%	
12.	1452.5 - 1454.5	rec. 1.80m	90%	
13.	1454.5 - 1472.5	rec. 12.30m	68%	
14.	1472.5 - 1482.5	rec. 7.00m	70%	
15.	1482.5 - 1484.5	rec. 0.65m	33%	
16.	1484.5 - 1490.0	rec. 5.50m	100%	
17.	1490.0 - 1508.0	rec. 16.30m	91%	
18.	1508.0 - 1526.0	rec. 16.60m	92%	
19.	1526.0 - 1544.0	rec. 17.30m	96%	
20.	1544.0 - 1562.0	rec. 18.00m	100%	
*21.	1562.0 - 1567.0	rec. 4.85m	97%	
22.	1567.0 - 1585.0	rec. 15.69m	87%	
23.	1585.0 - 1603.0	rec. 14.16m	79%	
24.	1603.0 - 1607.0	rec. 3.55m	89%	
25.	1607.0 - 1621.0	rec. 14.00m	100%	
26.	1621.0 - 1627.0	rec. 5.12m	85%	
27.	1627.0 - 1645.0	rec. 17.37m	97%	
28.	1645.0 - 1663.0	rec. 17.88m	99%	
29.	5025 - 5035	rec. 8.38m	84%	

*CORES 3 - 21 taken with fibreglass sleeve.

SWS's
Shot 240
Rec. 170

RFT - pressure gradients:

1396,5 - 1568,5m	0,058 psi/ft
1572 — 1580 m	*
1580 — 2713 m	0,45 psi/ft
3262 — 4969 m	0,46 psi/ft

* Not possible to define accurately