ESSO AUSTRALIA LTD

# PALAEONTOLOGICAL REPORT: 1979/8

MARCH 22, 1979

David Taylor, Consultant

by

GIPPSLAND BASIN

THE FORAMINIFERA SEQUENCE IN SWEEP-1,

### FORAMINIFERAL SEQUENCE

- SWEEP # 1

by DAVID TAYLOR

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Esso Australia Ltd., Paleontological Report 1979/8

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# SUMMARY

The foraminiferal sequence commenced in "Greensand" sediment deposited in the late Oliogcene (Zone H-2). Although the most biostratigraphic units, apart from B-2, were recognised, the sedimentary record is far from complete. This is demonstrated by dramatic fluctuations in the accumulation rates for the Zones. Episodic canyon cutting and filling cycles are evident over a period of some 14m.y., between late early Miocene (F) to Pliocene (A-3). This is the longest recorded span for submarine canyon activity in the Gippsland Basin. Probably the Sweep site was at the proximal end of the modern Bass Canyon and that the last fill episode did not cease till the Quaternary ( 17,000 yr. BP)

#### INTRODUCTION

Fiftynine sidewall cores were examined from SWEEP # 1. No planktonic fauna was found in the eleven SWCs between 785 and 757. All depths quoted are in metres as labelled on submitted samples.

Data is collated on the following sheets.

FACTUAL Biostratigraphic Data Sheet
FACTUAL Sample data Sheets with observations on residue grains.
FACTUAL Distribution Chart - Sheet 1 - for planktonic foraminifera.
FACTUAL Distribution Chart - Sheet 2 - for benthonic foraminifera
and other grains.

#### BIOSTRATIGRAPHY.

LATE OLIGOCENE - ZONE H-2 - 755 to 747. The foraminiferal sequence commences with a low diversity H-2 association of *Globigerina woodi woodi* and *G. ciperoensis*. The apparent condensation of the zonal interval was probably due to the slow sedimentation rate of the "Greensand" which contains the H-2 faunas.

EARLY MIOCENE - ZONES H-1 to E-2 - 744.5 to 660. The base of early Miocene (= H-1) is designated at the *Globigerina woodi connecta* FAD\*with the top (= E-2) at 660, below the *Orbulina* FAD at 650. Units H-1 and G were extremely condensed, suggesting very slow sedimentation rates (see Environment section).

MID MIOCENE - ZONES E-1 to C - 650 to 507.5. The base of the mid Miocene corresponds to the appearance of a poorly preserved specimen of *Orbulina suturalis* within a typical E-1 association. The fauna

\*FAD = First Appearance Datum.

at 630 was more diverse and contained definite, though rare, specimens of *O. suturalis*.

The Zones D-2 and D-1 intervals were unusually thin. This interval was designated as that between the Orbulina universa FAD (at 605) and the Globorotalia miotumida miotumida FAD at 553.

LATE MIOCENE - ZONE B-2 - ? Absent.

Zone B-2 faunas were not recorded in Sweep # 1. As there was little or no room for B-2 sediments between the *G. mayeri* LAD\*at 507.5 (= Zone C) and the *G. conomiozea* FAD at 498.2, it must be concluded that Zone B-2 is absent or extremely condensed in this section.

# PLIOCENE - ZONES B-1 to A-3; 498.2 to 241.5.

Base of Pliocene in Austral region is believed to approximate the *G. conomiozea* FAD. Base of Zone A-4 at 397 was established on *G. puncticulata* FAD, whilst base of Zone A-3 has been tentatively positioned in next sample above the *G. conomiozea* LAD.\* The quality rating for the A-3 pick is very low as faunas at and above 327 lack definite *G. inflata*. As this cool temperate minimal layer species was normally common in A-3, its absence is puzzling. The presence of *G. miotumida* in Zones A-4 and A-3 is anomalous and probably due to reworking.

#### ENVIRONMENT.

Sweep # 1 is by far the best sample sequence on the northern margin of offshore Gippsland. A cyclic environmental pattern of:-

- 3) Shallow shelf platform sedimentation in
- Episodic shelf and slope canyon cutting and filling events from high in the early Miocene (Zone F) to the Pliocene (? Zone A-3).
- Shallow shelf platform sedimentation in latest Oliogcene and early Miocene (Zones H-2, H-1 & G).

This pattern is evident from the benthic foraminiferal distribution chart (Sheet 2) on which species are grouped according to their comparative distribution in other sections. Distribution of other grains (e.g. sponge

\* LAD = Last Appearance Datum.

spicules or bryozoal fragments) show coincidence with a particular benthic group. More detailed observations on grain components are summarised on the six data sheets.

Canyon fill sedimentation occupy a longer time span than normally observed in the Gippsland Miocene; some 14m.y. compared with 2 to 4m.y. in other sequences. The Sweep fill was characterised by reworked older planktonic foraminifera in younger faunas (e.g. D-2 mixed with C or B-1), together with deeper water benthic associations. Differences in preservation, both from corrosion and abrasion (e.g. the Battered *Robulus* fauna), separate the displaced specimens from the better preserved autochthonous specimens. Adhering limonite and pyrite as well as pyritic infilling (see below) is common on the allochthonous specimens.

Sporadic accumulation of siliceous sponge spicules are another feature of Gippsland canyon fills, as is size and/or shape sorting of foraminifera.

The fill indicators extend from 734 at base of F to 241.5 within ? A-3. However the canyon fill was episodic being interspersed by errosive canyon cutting episodes. This is evident from condensation or abbreviation or even absence of some biostratigraphic intervals interspersed with disproportionate developments of other units. This is illustrated by the following uncorrected accumulation rates (UR).

	SPAN IN	THICKNESS	U.R.
ZONE	<u> </u>	IN M.	cm/1,000 yrs.
A-3	1	86	860
A-4	1	46	460
B-1	1.7	88	517
B-2	5.5	<b>&lt;</b> 9	16
С	2.5	45.5	182
D1/D2	1.3	41.7	321
E-1	.2	28	1400
E-2	.3	30	1000
F	.5	30	500

The UR for Zones D-2/D-1 are unusually low. For instance in Halibut # 1 the UR for D-2/D-1 approximates 8,000cm/1,000 years. But Halibut was in the distal canyon situation, compared with a proximal one for Sweep. Therefore the disproportionate difference in URs probably reflects an up canyon decline in nutrient availability affecting biogenic productivity. Another factor is that canyon fill commenced in Zone F in Sweep, but later in Halibut (i.e. Zone D-2). The initial accumulation of most Gippsland Canyon fill sequences were coarser grained than higher in the sequences and thus had greater porosity and features, suggesting rapid dump/fill deposition. This could explain also the differences in URs for Zones D-2/D-1 between initial rapid filling (i.e. Halibut) and finer grained later sequence fill in Sweep.

It can be logically ascertained that canyons developed from the shelf into deeper water in a progressive and diachronous manner of cutting and filling with fill higher in the canyon constantly being redistributed down the canyon. Therefore the UR values for Sweep are artificial in that they imply constant The abbreviation of some units sedimentation during a selected time span. and exaggeration of thickness of other units indicates cycles of dumping, followed by non deposition and/or removal of previous fill, then more dumping. This model assumes fluctuation in energy within the system and rapid burial Fluctuating down canyon current energy is apparent from of accumulations. such observations as specimen number, benthic diversity, size and shape Rapidity of burial is an essential phenomenon sorting and specimen abrasion. in the anaerobic formation of iron sulphides from protoplasm in the presence of iron sulphates (e.g. Sugden, 1966). The observations of limonite and pyrite adhering or infilling foraminiferal specimens is noted on the data sheets.

Thus the Sweep canyon fill sequence is regarded as a discontinuous one; recording repeated episodes of cutting, filling and probably non deposition in a proximal or "Canyon Head" situation. The depth to the canyon floor, at any one time, is difficult to estimate as a number of the Basin Deep species (listed on Distribution Sheet 2) could have been "elevated" by the upwelling of cold, nutrient enriched waters. This "faunal elevation" was demonstrated by Taylor & Mee (1970) in modern Gippsland Canyon floor samples. However the canyon

initiation was sudden with a drop in base level at base of Zone F. This base level drop could have been from 100m with an inner shelf Zone G fauna to 200m, with an "elevated" slope fauna at base of Zone F.

Although circumstantial, the geographic linear fit of the Snowy River mouth, Sweep and the northern Tributary of the Bass Canyon (refer Conolly, 1968, figs. 1 & 2) is more than coincidental. Samples from the present North Bass Canyon floor (Taylor & Mee, 1970) showed that the canyon was dormant regarding mass sediment dumping, but that there was a steady supply of debris from the sponge gardens and bryozoal forests at the canyon head. This canyon head is an exposure at 120m of consolidated Quaternary calcarenite, which has all the features of having been deposited in much shallower water during a glacioeustatic sea level low (21,000 to 14,-00 years, BP-data in Jongsma, 1970). This barrier would have caused backfill of the canyon towards the shoreline.

The paucity of terrestial detritus in the Sweep Canyon fills, could preclude the connection with the Snowy River. But it must be remembered that the bed of the Snowy is at present incised and obviously a rejuvenation of the meandering, tortuous course it took pre-uplift. The terrestial detritus reaching the sea, would have been minimal. This is confirmed by the purity of the Miocene (Zones F to D-2 - pers. obs.) calcarenites outcropping along the Snowy Valley in the vicinity of Orbost.

#### REFERENCES

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WELL NAME AND NO. SWEEP # 1.

PREPARED BY: DAVID TAYLOR.

DATE: 21.1.79.

SHEET NO. 1 of 6.

DEPTH	SAMPLE TYPE	SLIDE	ADDITIONAL INFORMATION
IN METRES			
785	SWC 41	N.F.F Dom -	m ang qtz - rare subrd. qtz. & rock frags.
.780.5	SWC 71	N.F.F. ibid	
774	SWC 42	N.F.F. ibid	
771	SWC 43	N.F.F. orange common limonit	f-m ang qtz sdst - r. green glauc. but e "books" after glauc, after mica.
769	SWC 73	N.F.F. dom m. & subrd. rock	ang qtz. sdst with pellet glauc - r. c. ang. frags. (? Paleozoic quatzite).
767	SWC 44	<i>Cassidulina</i> sp qtz. sdst + 20 green (2) irre	? (5 specs) "L.E. GREENSAND" Dom. m. ang. % glauc of 2 species - (1) book - brighter gular pellets light apple green.
765	SWC 74	N.F.F. 60% f-m	ang clear qtz, 40% orange f ang qtz sdst.
763	SWC 45	N.F.F. Dom ora pellet glauc;	nge f ang qtz sdst with 10% "book" & irreg. r ang. rock frags.
761	SWC 75	N.F.F. Dom cle & irregular in (? biogenic) r	ar f-c ang qtz sdst 10% glauc - "book" pellet various stages of oxidation. 5% pyrite. subr rock frags.
759	SWC 46	N.F.F. Dom 1. form. 10% ora Bioturbation e	bn limonitic clay after glauc - some in pellet nge f. ang. qtz sdst; r c subr. qtz. vident.
757	SWC 76	<i>ibid</i> + 10% gn	glauc clay.
755	SWC 47	H-2(1) - Dom p with Dom. Cibi	ellet glauc & limonite. shallow water benths <i>cides</i> .
749	SWC 78	H-2(1) - ibid	+ fish teeth.
747	SWC 49	H-2(1) ibid	
744.5	SWC 79	H-l(l) - 70% p & bry count 50 shallow water.	ellet glauc - 25% forams + r f ang qtz sdst 0. 10% planks benth diversity 20, all

WELL NAME AND NO. SWEEP # 1.

DATE: 21.1.79.

SHEET NO. 2 of 6.

PREPARED BY: DAVID TAYLOR.

<u>DEPTH</u> IN METRES	SAMPLE TYPE	<u>SLIDE</u>	ADDITIONAL INFORMATION
·740	SWC 51	H-1(1) - bry. c limonite staini shallow benths Cibicides spp. &	alcaren <u>+</u> r. f. ang. qtz. sdst. with orange ng + r. ech. count 1000, 40% planks - v. with abundant <i>Carpentaria</i> spp., <i>Karrieras</i> pp.
738	SWC 81	G(1) - bry. cal coal frags. Cou deepening.	caren with ech spines, fecal pellets - nt 100, 40% planks, benth suggest slight
736	SWC 52	G(1) - c. bry. 800, 35% planks benths.	calcaren with ech spines & count , displaced incl. rafted bry. adherent
734	SWC 82	F(0) - Dom limon sponge spics br diversity 15-1	nitic stained lst. frags. r ang qtz & 7, ech, ost. count 800, planks 50% benth 7 + ? reworked. N.B. r <i>Cassidulina carinate.</i>
732	SWC 53	F(1) 75% forams & bry. count 15 deepening. not	20% limonitic stained lst. frags + r. glauc 00, 60% planks, benths indicate slight as diverse as 734.
730	SWC 83	F(1). Dom l gy. frags, vein qtz Count 1900, 45% rafted adherent deepening & mix	calc. mdst. + limonite, v.r. dirty coal frags, mica, bry. ech. <i>Tubiporid coral</i> planks. good pres. benth diversity 16 with forms & corroded miliolids. Obvious ing with shallow water displaced spp.
· 728	SWC 54	F(0) Dom forams Charophyphyites 9000 planks 70% spp. incl. BATT	. r. ang. qtz., ? epidote & botryoidal glauc. . Some glauc in filling of planks. Count . good pres. Benth diversity 12 + displaced ERED <i>ROBULUS</i> . Shelf edge.
724	SWC 55	F(1) Dom. foram frags, r. coal pres. poor suga spap sorted (be	s, limonite staining, r.c. ang. qtz. lst. epidote & glauc ech. count 800. 85% planks ry recryst. Benth low diversity. Spherical hth planks & benth). High energy shelf edge.
720	SWC 85	F(1) - Dom Fora mod. pres sugar Shelf/slope bre	ns, ost. bry. ech. count 3500, planks 70% - 7. Benth diversity 12 + etched miliolids. ak.

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WELL NAME AND NO. SWEEP # 1.

DATE: 28/2/79.

SHEET NO. 3 of 6.

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PREPARED BY: DAVID TAYLOR.

DEPTH	SAMPLE TYPE	SLIDE	ADDITIONAL INFORMATION
IN METRES			
709	SWC 56	F(1) Dom forams - 4500, 65% planks. stained shallow w	<ul> <li>10% bright grn. blauc. r. pyr. Count</li> <li>Benths with 45% reworked limonitic</li> <li>vater spp.</li> </ul>
700	SWC 86	indet - Dom micri shape sorted. Hi	te r. ost. ech. spic. count 10 - lens gh energy shelf/slope break.
690	SWC 57	E-2(1) Dom micrit recryst. after li spp. ? Canyon He	e Count 500, 60% planks. Pres. poor - monite stained slope benths + displaced ad.
680	SWC 87	E-2(0) Dom forams count 6000, 70% p Slope benths + 10	5, 20% micrite frags, worn bry. frags. spic. blanks. pres. good often limonite stained. D% displaced spp. incl. BATTERED <i>ROBULUS</i> .
670	SWC 58	E-2(1). Dom foran displaced spp. wi	ns count 2000. planks 60%.Slope Benths + .th adherent limonite.
660	SWC 88	E-2(0) Dom. foran charophytes, cour spec. size 90% benths + displace	ns. r.c. rd. qtz. common spics. 2 spp. at 10,000, planks 80%. Small residue, 2mm. size sorted. High energy slope ed spp.
650	SWC 59	E-1(2) 60% forams Count 4500, 75% p	, 30% micrite, limonite adherent grains. Dlanks. Slope benths + displaced spp.
630	SWC 60	E-1(0) Dom forams subrd. qtz. Cour	s r. adherent pyr. & limonite. r. pitted ht 3000, 65% planks slope benths.
622	SWC 90	E-1(1) - 60 % for infilled cibicidi count 450, 35% pl fill (e.g. <i>Cassic</i> with twofold buri	rams, 30% limonitic lst, 10% pyrite ds. r. rd. qtz, ech, worn bry. frags. lanks slope benths - high energy canyon <i>lulina carinata</i> ). Displaced <i>Cibicides</i> al history.
605	SWC 1	D-2(0) - forams, spics, ost., cour <i>Siphouvigerina ca</i> planks.	abundant limonite, r. adherent pyr. common nt 800 40% planks. slope benths (Dom. anariensis) + displaced shalf benths &

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SHEET NO.4 of 6.

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DEPTH	SAMPLE TYPE	SLIDE	ADDITIONAL INFORMATION
IN METRES			
592	SWC 2	D-2(1) - Dom stained + pyr planks. Most victoriensis.	forams. 30% benths pyr. infilled & limonitic . infilled ech. spines. Count 500, 30% benths displaced with Dom. <i>Cibicides</i>
563.3	SWC 4	D-1(2) - Dom r. ang. qtz. benths (e.g. energy canyon	forams (recryz). limonite to pyrite adherents spics (4), osts. count 450, 45% planks, slope <i>Cassidulina carinata</i> ) + displaced spp. High fill.
553	SWC 5	C(1) - Dom fo count 2500, 6 displaced she	rams with adherent limonite, spics, ech., 5% planks, shelf/slope break benths + lf benths + reworked planks (D-2 or E).
537	SWC 6	C(1) - Dom fo 2400, 65% pla displaced ben	rams - limonite + r. pyr. adhering. Count nks - mainly reworked D-2 spp. High % ? ths.
533.7	SWC 7	C(1) - Dom C limonite & py ech, bry. ost 40% planks, 9	, F <sub>e</sub> bonded clay (difficult to dis r. after limonite abundant common spics, . Most specs. pyr. infilled. Count 120, 0% infilled, displaced & recrys. see below.
527.5	SWC 8	C(2) - Dom fo Common pyr. i <i>Globorotalia</i> <i>Cibicides</i> spp specs incl. D environment o	rams. Abundant limonite & pyr after limonite. nfilling of both <i>Cibicides</i> spp. & reworked spp. Pyr. also adhering to externally . Count 2000, 50% planks, 90% displaced -2 planks. <u>Rapidly buried in anaerobic</u> f high energy proximal canyon fill.
517	SWC 9	C(2) Dom fora charophytes & reworked shal not as rapid	ms. Abundant limonite, common spics, r. reworked gastr. Count 6000, planks 60%, low benths & D-2 planks - 90% <u>Canyon fill but</u> as at 527.5 & 533.7 (note absence of Pyr.).
507.5	SWC 10	C(1) foram & r. ost. count displaced ben miliolids) wi specs, recrys burial.	calc. clay abundant limonite, commom spics, 500, 30% planks incl. D-2 reworkings. 90% ths (incl. <i>Massilina lapidera &amp;</i> corroded th outer shelf <i>Cassidulina carinate</i> . Most . Proximal canyon fill but not instantaneous
498.2	SWC 11	B-1(1). Dom. reworked D-2 <i>Cassidulina c</i>	planks Count 4500, 75% planks, incl. some spp. Outer shelf <i>Cibicides</i> spp. and arinata.

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SHEET NO.5 of 6.

PREPARED BY: DAVID TAYLOR.

DEPTH	SAMPLE TYPE	SLIDE	ADDITIONAL INFORMATION
<u>IN METRES</u> . 469	SWC 13	B-1(1) Dom. for Count 1200, 60 mid shelf bent	cams & clay. Abundant limonite. ech. bry. ost. b planks with minor D-2 reworked. Outer to hs. with minor displaced spp. inc. rafted.
446.5	SWC 14	B-1(1). Dom fo 1200, 65% plan outer shelf wi lapidigera & c	rams & clay. Common spics. ech. ostr. Count as incl. reworked Zone C. Benths mid to th displaced forms incl. <i>Massilina</i> prod. miliolids.Pres. poor.
430.6	SWC 15	B-1(1). Dom. r. ech. & ost. reworked incl.	Forams & clay limonite common. Abundant spics. Count 3000, 45% planks. Shelf benths + corroded miliolids.
410.5	SWC 16	B-1(2) - Dom c spics, ost. ec shelf benths in	alc. clay with secondary calcite. Abundant h., gast., Pres. poor. Count 200, 10% planks hcl. corroded miliolids.
397	SWC 17	A-4(1). Calc. forams with py "spots". Comm 400, 30% plank benth -some in	clay with limonite - limonitic infills of c. externally as aggregates or isolated on spics, v. poorly pres. bry. frags. Count s of v. small size. <i>Cibicides</i> spp = Dom coarse fraction.
382.5	A-4(1). Dom	limonitic calc. ost., Count 10 on most specs. corroded milio	clay + 40% forams. Abundant spics, gastr., 00, 10% planks - heavy calc. overgrowth Diverse mid to innershelf benths + abundant Lids.
351	SWC 20	A-4(1) - Dom. Count 3000, 20 in composition	biogenic with abundant diverse bry. gastr & ech a planks diverse inner shelf benths - similar to modern fauna (e.g. "Challenger" Sta. 162).
327	SWC 22 A-3	3(2) - calc. cla planks, Inner	y + spic, bry., ech., ost. Count 500 55% shelf benths.
315.5	SWC 23	- calc. cla shelf benths w	y v.r. glauc. Count 300, 10% planks. Inner th ? reworking (e.g. ? Hofkerina semiornata).
300	SWC 24	- bryo. cal shallow shelf	caren + ech. ostr. Count 300, 15% planks - Denths. Dom. <i>Cibicides</i> .

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SHEET NO. 6 of 6.

DEPTH IN METRES.	SAMPLE TYPE	<u>SLIDE</u>	ADDITIONAL INFORMATION
273.5	SWC 26	<i>ibid</i> - Count Dom. <i>Cibicides</i> .	100, 10% planks shallow shelf benths.
264.5	SWC 27	<i>ibid</i> - Count 5 <u>N.B.</u> <i>Lenticulina</i> <i>Cibicides</i> & adher	00, 10% planks, very shallow water benths. megalophoto & Elphidium crassatum. Dom. ent spp.
254.3	SWC 28	80% bry. Count for 264.5.	500 - 5% planks. Shallow water benths as
241.5	SWC 29	bry calcaren. spines. Count 10 264.5. Highest occ	Mixture of fresh & worn bry. frags. & ech 00, 15% planks. Shallow benths as for currence of reworked planks(eg. <i>G.miotumida)</i>
230.5	SWC 30	80% bry. frags count 400, 10% pl	. + ech. Moll. ostr, tubiporid coral, anks. Shallow benths

MICROPALEONTOLOGICAL DATA SHEET

ВA	s I	N:	GIPPSLAND	)	+		ELEVA	ATION: KB	<u>+2</u>	5.3m GL:	-69m					
WELL NAME:SWEEP # 1							TOTAL	DEPTH: 900m								
			HIG	НЕ	ST D	АТ	A	LO	WΕ	ST D	АТ	A				
		FORAM.	Preferred		Alternate		Two Way	Preferred		Alternate		Two Way				
A (	GE	ZONULES	Depth	Rtg	Depth	Rtg	Time	Depth	Rtg	Depth	Rtg	Time				
-SI		A <sub>1</sub>	•													
ЦĘ		<sup>A</sup> 2			 											
		A <sub>3</sub>	241.5	2				327	2							
LIO		<sup>A</sup> 4	351	1				397	1							
	61	<sup>B</sup> 1	410.5	2	430.6	1		498.2	1							
	AT	<sup>B</sup> 2														
	-	С	507.5	1	. <u></u>			553	1							
យ	ш Л	Dl	563.3	2				563.3	2							
z	Р	D <sub>2</sub>	592	1				605	٥							
Ш   С	Ω	E1	622	1				650	2	630	٥					
0	H M	E2	660	1				690	1							
H M		F	709	0				734	1							
	RLY	G	736	1				738	1							
	EA	H <sub>1</sub>	740	1				744.5	1							
	មា	H <sub>2</sub>	747	1				755	1							
E	H	I <sub>1</sub>														
CE	A	I <sub>2</sub>														
В Н	ז ז	J 1														
Ы	AR	J <sub>2</sub>														
	л — на	к														
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CON	NFIDE ATIN	INCE O: IG: 1:	SWC or C SWC or C	lore - lore -	- Complete a - Almost com	ssemb plete	lage (very assemblag	high confidence e (high confide	ce). ence)							
		2:	SWC or C	ore	- Close to zon	ule c	hange but	able to interpre	et (lo	w confidence).						
		3: 4:	Cuttings Cuttings		- Complete a - Incomplete	ssemb assem	olage (low o oblage, ne:	confidence). xt to uninterpre	etable	or SWC with						
			Ū		depth suspic	ion (v	very low co	onfidence).								
NOT	re:	If an entry	is given a 3 o	r 4 cc	mfidence ratin	g, an	alternativ	e depth with a	bette	r confidence						
		rating shou then no en	ild be entered, try should be r	if po nade.	unless a rang	ample e of z	cannot be ones is give	assigned to on en where the hi	e par ighest	ticular zone , coossible						
		limit will	appear in one	zone ;	and the lowest	possil	ble limit i	n another.	3	*····						
								•								
DAT	A RE	CORDED BY:	DAVI	D TA	YLOR			DATE: N	IOVE	MBER 10, 1	978					
DAT	A RE	EVISED BY:	DAVI	D TA	YLOR			DATE: H	FEBR	UARY 26, 1	<u>97</u> 9.					

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PLANKTIC SPECIES GROUP	SIDEWALL CORES IN	1.5	3.5	5.5	1.2.5	0.5	6.5	18.2 17.5	7.5		9.9	5 0	0 0	0 0	00	0 0 0	4 0	0 0		4.5
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