PROTOCOL DREDGE

Cruise No. SO 37	Stat. No. Equipm. 27 DK5	Location III	Area I
Date 26.5.1985	Protocol written by : Weber, Flemming		

Pinger on wire 300 m from dredge Kettensackdredge + Sediment-Tonne

	Time GMT	Latit. N	Longit. W	Water depth	Wire length	Tension (t)	Remark
begin operation	20.56	15°37.707	170°24.605	2256	0	0	
begin lowering	21.09	〃	〃	2211	300	—	
+ 1. bottom contact	21.35	15°37.782	170°24.503	2200	2220	2.4	
Winde STOP, Schiff weiter	21.42	15°37.84	170°24.47	2165	2439	2.4	
Kabel auf	—						
50 m fieren	22.05	15°38.104	170°23.682	2013	2489	2.4	
	22.14	15°38.17	170°23.65	1969	2499	2.8	
	22.16	〃	〃	1940	〃	3.0	
40 m fieren	22.20	15°38.22	170°23.53	1890	2539	3.4	
	22.22	15°38.23	170°23.50	1860	2539	3.9	
	22.40	15°38.35	170°23.27	1729	2539	3.4	
Winde STOP	22.42	〃	〃	1690	2539	3.0	
langsam fieren	22.48	15°38.33	170°23.23	1673	2539	4.6	
Hänger	22.58	15°38.44	170°23.22	1677	2407	6.5	
Dredge frei	23.01	〃	〃	1658	2375	2.8	
	23.19	15°38.70	170°22.97	1539	2005	3.2	
Pinger-Bojen Abstand 300 m	23.38	15°38.92	170°22.63	1322	1525	2.0	
begin heaving	23.38	15°38.92	170°22.63	1322	1525	2.0	
end heaving	00.05	15.38.96	170°22.341	1240	0	0	
end operation	00.10	〃	〃	—	—	—	

+Corrected data 15°37.88 N 170°24.12 W

ship course ...70..... calcul. mean water depth.....m

total time of bottom contact 13..min ship velocity 2.1..kts

bottom topography ..... length of dredge section .....m

Result

70.kg Total

....kg Nodules

50.kg Substrate

18.kg Sediment

Ringer 300 m from dredge

	Time (GMT)	Lat. N	Lon W	Water Depth	Wire Length	Tension
Beg. - operation	20:56	15° 37.707'	170° 24.503'	2231	0	0
Begin Lowering	21:09	15° — do —	— do —	2231	300	—
# bottom contact	21:35	15° 37.782'	170° 24.503'	2200	2220	24
Beg in hearing	23:38	15° 38.92'	170° 22.63'	1322	1525	20

Ship course 70°

70 kg total recovery
2 kg crust
50 kg substrate
18 kg sediment

Substrate: chalk
Volcanogenic breccia
Hyaloclastite

(Recovery was very poor: largely chalk fragments & debris with only a Sooting of Mn(O,OH)(?))

Rock type:	Andesite(?) Hyaloclastite	Trachyte/Andesite(?) Volcanogenic Breccia (very like 9DK4)	—do—
Color:	Light greenish-gray (5G 7/1) to Light olive gray (5Y 6/2)	White (N9) (matrix) to Pale yellowish-brown (10YR 7/2) (cement)	White (N9) to Very pale yellow (5Y 9/6) (cement) to moderate brown (5YR 3/4) and moderate yellowish brown (10YR 5/4) (matrix)
Texture:	Pyroclastic	clastic	—do—
Framework grains:	Andesite hyaloclasts ± 50% (≤3mm dia.) Augite(?) crystals, ± 5%, ± 2mm dia.	Trachyte clasts, ± 60%. Andesite(?) clasts, 20%. Augite(?) crystals, +5%. Sanidine crystals, ± 5%.	± 20%. —do—, ± 5%,
Matrix:	{finer hyaloclasts, zeolites} ± 45% (not determined)	—do—, (not determined) ± 10%	± 75% coccolith chalk
Cement:	{smectite, aragonite}		
Average grainsize:	± 3 mm	0.5 cm	(not determined)
(range ≤ 0.5 mm — ± 3 mm)		(0.10 mm — 5 cm)	(< 0.10 mm — 15 mm)
Average grain shape:	Subrounded	Subangular	Subrounded
Sorting:	moderately good	extremely poor	—do—
Porosity:	Very high	Extremely high	Very high
Permeability:	Moderately high	Extremely high	High
Alteration:	Penultimate (Smectitization, zeolitization, Oxidation of hyaloclasts)	—do—	moderate (minor phosphatization of chalk cement, oxidation, smectitization, zeolitization of matrix)
Remarks:	One flat, triangular large pebble clast (prob. talus, possibly not from this dredge) thinly and spottily covered with fine botryoidal, dendritic ferromanganese encrustation; the uniform grain size and rounding of the grains is unique among the hyaloclastites so far recovered.	pebble-to-boulder-size clasts, prob broken from outcrop; very much resembles a similar breccia from dredge 9 (9DK4) (Seamount-wide unit?)	Loosely-cemented, soft chalk puddingstone with water-worn gravel-to-pebble-size igneous rock volcaniclasts. Not much evidence of ferromanganese deposits (may have been broken off) not much evidence of Fe & Mn remobilization, either as stains or diffuse-deposits to speak of; probably is outcrop; One sample displays 2 distinct but related units (27DS 3, 4), in section, with the bedding plane (units each 2-5 cm thick)

Rock Type:	Volcanogenic Breccia	Coccolith(ic) Foram Chalk
Color:	as in 27 DS3, but cement is grayish-orange (10YR7/4)	white (N9) to very, very pale orange (10YR9/2)
Texture:	Clastic / granular	granular
Framework Grains/ matrix:	as in 27 DS3	foraminiferal & coccolith tests, ± 99%. rare crystals and igneous rock fragments (< 1%)
Cement:	- do -, but more intensely phosphorized (very hard)	calcite(?) ± 1%
Average grainsize:	(not determined)	≤ 0.10 mm
(range: < 0.10 mm - 20 mm)		(not determined)
Average grainshape:	Subangular (w.r. / ore subrounded)	round
Sorting:	extremely poor	well-sorted
Porosity:	High	Extremely high
		Extremely high
Permeability:	Moderately Low	
Alteration:	as in 27 DS3, except weakly developed phosphorization in the chalk cement	Superficial (recrystallization of calcite matrix ?)
Remarks:	lower(?) unit normally found in contact with 27 DS3; very similar to this unit except for degree of phosphorization. Unit boundary (bedding plane) is obvious.	Very abundant the most (?) constituent of 27DS; usually encountered as pebbles and cobbles of very irregular shape, (probably all talus, not outcrop); generally very cavernous, with very large open spaces (burrows?) these are coated with $Mn(OOH)$? and $Fe(OH)_3$ (?)