DATE: 19 August 1984 SAMPLE:
CRUISE ID: SO 33 58 DK Box dredge
LOC: VII
AREA: E

	time (GMT)	LAT (N)	LON (W)	water depth (m)	wire ou
ON BOTTOM =	2213				1566
OFF BOTTOM =	2305				1514

time on bottom = 52 min

RECOVERY WEIGHT = total 100 kg crust 30 kg

CRUST THICKNESS = 0.5 – 6 cm Avg 2.5 cm
Germans = (4 cm)
2 generations

SUBSTRATE = hyaloclastite, breccia cemented w/ phosphate.

COMMENTS: 2 large boulders covered w/ knobby crust largest = (75 x 35 x 25 cm)

* Bio sample
* microbio sample

* confidential

58 DK

	1	2
Rock Type:	Basaltic Hyaloclastite	Basaltic Hyaloclastite Breccia
Color:	light brown (5YR 5/6) →	-do- (matrix, white (N9) cement
Texture:	pyroclastic	clastic
Matrix:	Basaltic glass shards, ± 60% " rock fragments, ± 10%	Basaltic hyaloclastite derived from 58 DK 1 } ± 60%
Cement:	phosphorite, ± 20% zeolites, ± 10%	partially phosphorized foraminiferal chalk, ± 40%
Average grain size:	± 0.75 mm	± 15 mm
	(range: sand to gravel size) →	(coarse gravel to small pebble size)
" grain shape:	angular	subangular
Sorting:	poorly sorted →	-do-
Porosity:	± 60%	± 40%
Permeability:	± 50%	± 30%
Alteration:	complete (oxidation, zeolitization, smectitization, hydration, phosphorization) }	partial — complete → (partial phosphorization of cement)
		-∞-
Remarks:	very similar to both 57 DK 3 and to 57 DK 1; weakly cemented like 57 DK 1; with great disparity of grain sizes like 57 DK 3. Cement not homogeneous throughout the rock; in some places phosphorite dominates; in others, zeolites. It is likely that this rock may have had the same origin as that from the previous few dredges; serves as substrate for manganese oxide encrustations ± 30 mm thick (warty, knobby); some pieces are like giant deep sea nodules: the "nucleus" is formed of a clast of hyaloclastite with [illegible] all around, thick on upper surface. Has veinlets of phosphorite beneath & parallel to the bedding of the manganese crust, ± [illegible]	large pebble to large cobble-size clasts composed of smaller fragments of hyaloclastite cemented by foraminiferal chalk; developed on surface of hyaloclastite outcrop by mechanical weathering; the intra-clasts do not serve as substrate for encrustation by manganese oxide (rapid deposition and cementation); the breccia itself serves as substrate for deposition of ± 3 cm thick encrustation of ferromanganese oxides

	3	4
Rock Type:	Chalk - Phosphorite	Foraminiferal chalk
Color:	Very pale orange (10YR 8/2) [usually stained externally by $Fe(OH)_3$ to dark orange or orange-brown colors] →	white (N9) to medium dark gray (N4)
Texture:	microgranular →	granular
Matrix:	Globigerina(?)/Globorotalia? test remnants an "ghosts" left by phosphorization process, 15-20% →	do - 50-100%, ±0.25 mm dia. ferromanganese microconkules, ±10%, 0.20. manganese oxide dendrites, variable size ±0-50
Cement:	phosphorite (francolite?) 80-85%	Calcite, phosphorite(?) — not determined
Average grain size:	< 0.010 mm range: 0.005(?) — ±1mm) →	± 0.20 mm
" grainshape:	round - acicular(?) (possibly in the phosphorite) →	round, equant
Sorting:	well-sorted (prior to phosphorization) →	well-sorted
Porosity:	±5% →	± 80%
Permeability	±1% →	± 80%
Alteration:	extensive - nearly complete (phosphorization of calcite, oxidation of siderite components of tests) →	superficial(?) (replacement of calcite with francolite?)
Remarks:	fragments and clasts in the pebble range perhaps dislodged from breccia deposits, bed thickness not determined but forms, in places laminar deposits up to 1cm thick capping hyaloclastite, which is, in turn, capped by dendritic (internal morphology) to tryadal (external morphology) single generation ferromanganese deposits, the rock is quite hard and well on the way to complete phosphorization.	pebble-size clasts penetrated to varying degrees and in different spots by manganese oxide dendrites (more numerous peripherally), mottled appearance internally due to penetration by MnO_2(?) dendrites. Pebbles look water-worked. Serves as cement for 58 DK 2, often found, like phosphorite, as a layer between hyaloclastite and Mn-Oxide crust.