Dredge 26

USGS DREDGE LOG

SHIP/LEG FARNELLA

STATION # 44

DREDGE # 26

DEPTH INTERVAL(m) 1740-1700

DEPTH(m)corrected 1740-1700

DATE JD 274 LOCAL 10-2-89

TIME GMT 2047 LOCAL 0847

LATITUDE 7°25.73' TO 7°25.45' N

LONGITUDE 169°45' TO 169°44.76 E

TOTAL WEIGHT: DREDGE 100 CRUST 30

PERCENTAGE OF ROCK COVERED BY CRUST 100 (except pumice)

PERCENT BROKEN FROM: OUTCROP 100 except pumice TALUS 0 except pumice

THICKNESS OF MN CRUST: MAXIMUM 64 MINIMUM <1 AVERAGE 35

DOMINANT SURFACE TEXTURE Smooth; botryoidal; granular

SUBSTRATE LITHOLOGY Breccia; basalt (probably clasts disaggregated from breccia); pumice

NODULES PRESENT NONE

REMARKS: Surface current smoothed

~8 kg overboard

USGS DREDGE LOG

Depth Interval 1740-1700

Julian Date 274

Cruise I.D. F10-89-CP

Local Date (m/d/y) 10/2/89

Station No. 44

Chief Scientist HEIN/KANG

Dredge No. 26

Tech(s) on Watch CORKIE/O'TOOLE

	On Station	Dredge on Btm	Dredge off btm	Off Station
GMT	1825	1900	2047	2118
LATITUDE	7°25.83'N	7°25.73'N	7°25.45N	7°25.33N
LONGITUDE	169°45.07'E	169°45.00E	169°44.76E	169 44.88E
WATER DEPTH	1710	1740	1700	1900

Site Description and Target : Rocks from 1740-1700

OPERATION*	GMT	DEPTH (m)	WIRE OUT (m)	TENSION	HDG/SPD	COMMENTS
ON BOTTOM	1900	1740	1876	—	—	—
PAYING OUT	1901	"	—	—	333/0.5	HEADING UP SLOPE
ROUTINE	1915	1575	2300	—	321/0.8	END OF WIRE OUT
BITE	1953	1490	"	3.8	320 1.4	
"	1954	"	"	2.7	"	
"	1958	1480	"	4.0	335/1.8	hung up again right away
"	"	"	"	3.8	"	
"	1959	"	"	3.2	"	
"	"	"	"	3.6	"	
"	2001	"	"	2.6	—	no Adj/SpD →
"	2003	1475	"	2.5	—	Rho-Rho too noisy
"		"	"	2.3	—	"
"	2008	"	"	2.7, 2.5	330/1.4	
"	2010	"	"	2.6, 2.3	332/1.6	
"	2012	1470	"	2.7, 2.4, 2.3,	2.3	
"	2032	1530	2040	5.7		stuck, drove down, broke o
	2033	1550	1995	4.0		
	2036	1560	1937	3.4	172/2.0	

*on/off bottom, bites, etc.

OTHER COMMENTS:

USGS DREDGE LOG

Depth Interval _____ Julian Date _____

Cruise I.D. F10-89-CD Local Date (m/d/y) _____

Station No. 44 Chief Scientist _____

Dredge No. 26 (cont.) Tech on Watch _____

	On Station	Dredge on Btm	Dredge off btm	Off Station
GMT				
LATITUDE				
LONGITUDE				
WATER DEPTH				

Site Description and Target : _____

OPERATION*	GMT	DEPTH (m)	WIRE OUT (m)	TENSION	HDG/SPD	COMMENTS
(BITE)	2038	1565	1900	—	182/2.0	STUCK @ 5.5 tons
bite	2046	1670	1810	5.5		bite
bite	2047	1695	1780	3.1		bite
off bottom	2047	1700	1725	—		off bottom

*on/off bottom, bites, etc.

OTHER COMMENTS:

Dredge Sample Summary Sheet

Sample ID	Bulk CC	Layer CC	Pt & Au	REE	OC	DPTS/TS	XRD	35mm Ph	Archive	Paleo
D26-1	(2/3 to KORDI)									
D26-2	(1/3 to RMI)									
D26-3						✓ FOR M. PRINGLE				
D26-4	✓									
D26-5							✓			
D26-6	(1/2 TO KORDI)									
D26-7	(1/2 TO KORDI)									
D26-8	BULK SURFACE ✓						✓			
D26-9					✓	✓	✓			
D26-10	(1/2 TO KORDI)									
D26-11	6 PIECES TO M.		PRINGLE	for dating						
D26-12	(1/2 TO KORDI)									
D26-13										
D26-14	(1/2 TO KORDI)									

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 26x21x7 (cm) Location: Seamount H

Sample Id: D26-1 Weight: 7 (kg) Depth: 1740-1700 (m)

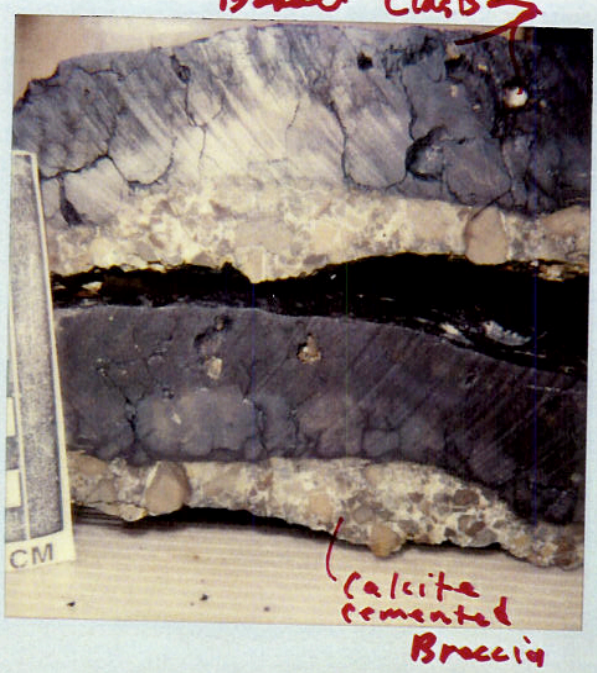
Mn Crust Description

Surface Texture: smooth but irregular; current polished

Mn Crust Thickness (mm):
Min: 35 Max: 40 Ave: 35

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	20	25	20 basalt	massive, slightly porous, clasts up to 5mm in crusts
2.	8	17	12	massive, dense, gray w/ fractures, also basalt clasts, fewer.
3.				
4.				
5.				
6.				



D26-1; F10-89-CP

Comments and XRD Mineralogy:
Looks like the upper crust layers may be missing and what we are seeing is only the older dense layers. However, it may be that current polish only stripped a few mm's of crust. D26-4 has botryoids and what look to be the same 2 crustal layers.

more likely

Fractured crust

Large vugs in crust may have contained basalt clasts

Substrate Description

Rock Type: Volcaniclastic breccia w/ calcite cement. May possibly have phosphate cement also; clast supported

Description:
clasts of brown (altered) massive basalt, some vesicular angular to subangular

Biology ?:

ANALY

Subsample Number	Analysis	Layer Thickness

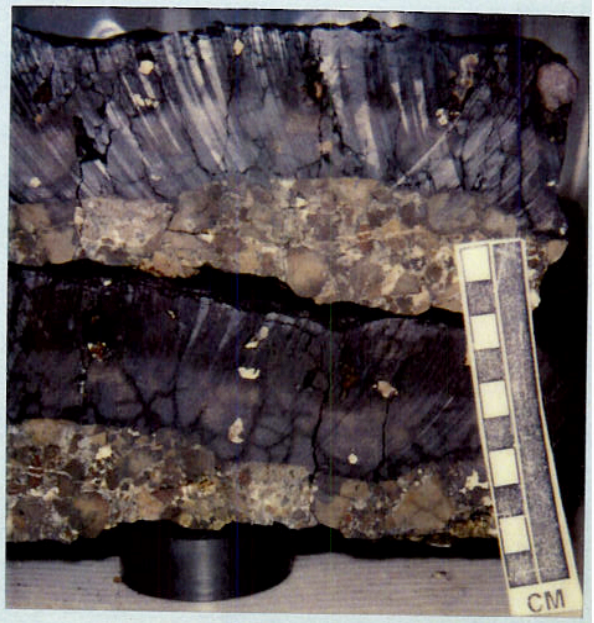
2/3 To GORDI

Described By: Schultz Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 40 x 23 x 7 (cm) Location: Seamount H

Sample Id: D26-2 Weight: ~20 (kg) Depth: 1740-1700 (m)



D26-2; F10-89-CP

Mn Crust Description

Surface Texture: irregular smoothed surface, current polished

Mn Crust Thickness (mm):
Min: 38 Max: 52 Ave: 48

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	15	22	20	massive slightly porous w/ pebbles up to 5mm
2.	18	27	22	Dense massive gray w/ fractures
3.				
4.				
5.				
6.				

Comments and XRD Mineralogy:
same kind of thing as D26-1; upper crust layers are probably missing (see D26-1)

Fractured Crust

Not as much stripped as in #1

large vugs in crust may have contained basalt clasts

Substrate Description

Rock Type: Volcaniclastic Breccia w/ calcite & phosphate cement, clast supported

Description: Angular to subangular clasts of brown massive and vesicular basalts (altered)

Biology ?: encrusting Foraminifera

ANALYS

Subsample Number	Analysis	Layer Thickness
	1/3 To RMI	

Described By: Schultz Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 19 x 14 x 8 (cm) Location: Seamount 14

Sample Id: D26-3 Weight: ~4 (kg) Depth: 1740-1700 (m)

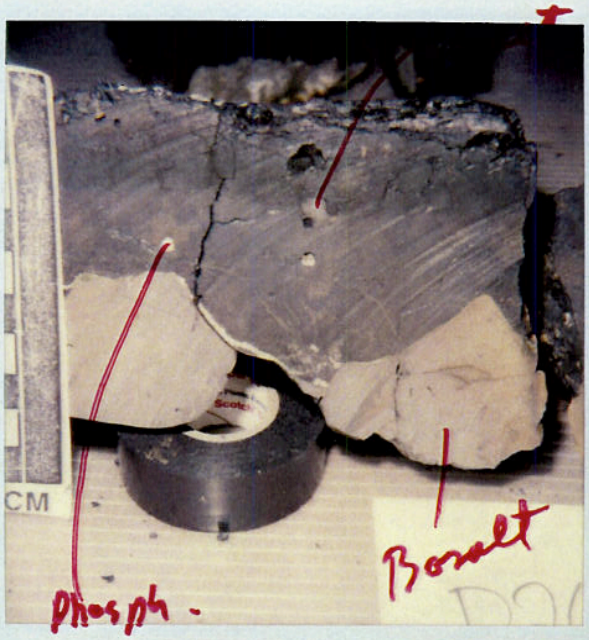
Mn Crust Description

Surface Texture: Irregular, very current polished like D20-2 & D26-1, smoothed

Mn Crust Thickness (mm):
Min: 44 Max: 104 Ave: 50

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	17	20	18	massive slightly porous laminar outer layers
2.	20	42	30	Dense grey, massive layer, Fractured
3.				
4.				
5.				
6.				



D26-3; F10-89-CP

Comments and XRD Mineralogy:
clasts in both crust layers of basalt & phosph

See (D26-1) for crustal polish explanation

phosphorite veins in crust

ANALYS

Subsample Number	Analysis	Layer Thickness

Rock taken Ar-Ar Isotopes Standard

Substrate Description

Rock Type: Basalt; slightly vesicular, mildly plagioclase phyric

Description: phosphate layer on top of basalt

Biology ?: encrusting Foram

Basalt pebble from ½ taken by Malcolm taken for t.s.

Described By: [illegible] Subsampled By:

SAMPLE DESCRIPTION

2 cobbles 13 x 10 x 7

Cruise Id: F10-89-CP Size: 16 x 8 x 12 (cm) Location: H Seamount

Sample Id: D26-4 Weight: ~8 (kg) Depth: 1740-1700 (m)

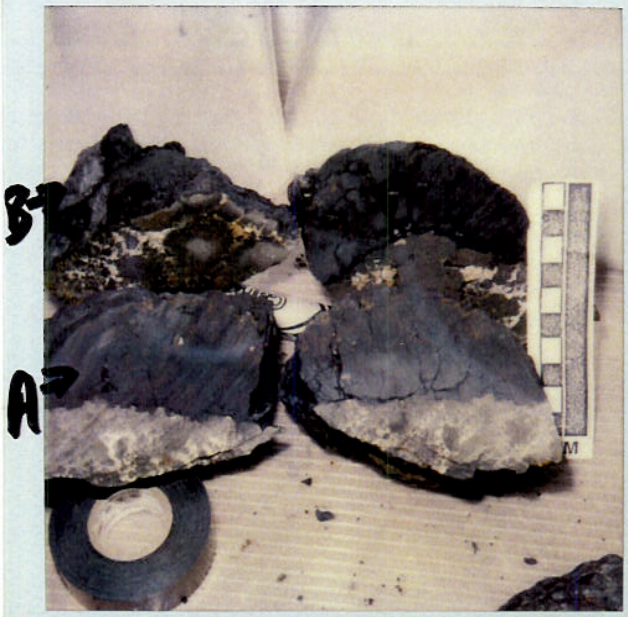
Mn Crust Description

Surface Texture: botryoidal to smoothed botryoidal

Mn Crust Thickness (mm):
Min: 33 / 27 Max: 43 / 35 Ave: 40 / 30

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.				
2.				2 layers on a massive
3.				
4.				1 massive layer on b
5.				
6.				



D26-4; F10-89-CP

Comments and XRD Mineralogy:

ANALYS

Subsample Number Analysis Layer Thickness

Substrate Description

Rock Type: Breccia

Description: gray to greenish gray basalt clasts - angular, grain supported in dk brown to cream phosph. cement (b) more void space w/ some calcite

Biology ?: plag phyric

Molcabn wants all of (b) → plag separate

Described By: HEIN

Subsampled By:

SAMPLE DESCRIPTION

3 cobbles, 6 large to small pebbles

Cruise Id: F10-89-CP Size: cobble, pebble (cm) Location: H Seamount

Sample Id: D26-5 Weight: 7 (kg) Depth: 1740-1700 (m)

Mn Crust Description

Surface Texture: Smoothed + polished

Mn Crust Thickness (mm):
Min: 10 Max: 37 Ave: 30

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.				
2.				
3.				
4.				
5.				
6.				

D26-5 ; F10-89-CP

Comments and XRD Mineralogy:
Fractured crusts + 1 or 2 massive layers

ANALY

Subsample Number	Analysis	Layer Thickness	
D26-5-1	CC	0-33	Bulk (88 gm)

Typical of the smooth + polished crust from this dredge

Substrate Description

Rock Type: Breccia

Description: phosphorite veins; same as D26-4

1/3 TO KORDI

Biology ?:

Described By: HEIN

Subsampled By: HEIN

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 3 large pebbles or small cobbles (cm) Location: H Seamount

Sample Id: D26-6 Weight: <1 (kg) Depth: 1740-1700 (m)

Mn Crust Description
Surface Texture: Smoothed + polished

Mn Crust Thickness (mm):
Min: 25 Max: 44 Ave: 40

NO PHOTO

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.				1 or 2 massive
2.				layers; fractured
3.				crusts
4.				
5.				
6.				

Comments and XRD Mineralogy:

ANALYSES

Subsample Number	Analysis	Layer Thickness
	½ TO KORDI	

Substrate Description
Rock Type: Breccia

Description: Phosphorite rich veins + layers; but basically same as earlier ones

Biology ?:

Described By: HEIN

Subsampled By:

SAMPLE DESCRIPTION

12 Pebbles and Cobbles

Cruise Id: F10-89-CP Size: Pebbles & Cobbles (cm) Location: H Seamount

Sample Id: D26-7 Weight: 3 (kg) Depth: 1740-1700 (m)

Mn Crust Description

Surface Texture: botryoidal; few (4) smooth & polished

Mn Crust Thickness (mm):
Min: 24 Max: 42 Ave: 35

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.				
2.				
3.				
4.				
5.				
6.				

NO PHOTO

Comments and XRD Mineralogy:

12 Crust Frags. w/out Substrate

Fractured Crusts & 1 or 2 massive layers

Substrate Description

Rock Type: NONE

Description:

Biology ?:

ANALYSES

Subsample Number	Analysis	Layer Thickness

& To HORDI

Described By: HEIN

Subsampled By:

SAMPLE DESCRIPTION

4 cobbles, & 14 large pebbles 16x19x7 (largest)

Cruise Id: F10-89-CP Size: ~5x4x3 (smallest) (cm) Location: Seamount H

Sample Id: D26-8 Weight: ~7 kg (kg) Depth: 1740-1700 (m)

Mn Crust Description

Surface Texture: Botryoidal to granular

Mn Crust Thickness (mm):
Min: 1 Max: 11 Ave: 6

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.				1 layer
2.				
3.				
4.				
5.				
6.				

Comments and XRD Mineralogy:
Massive and dense texture; partially porous

ANALYS: D26-8 ; F10-89-CP

Subsample Number	Analysis	Layer Thickness	
D26-8-1	Surface CC	≤.5mm	(5.3gm)
D26-8-2	Rim/cc	~7mm	(22.1gm)
	XRD		

Substrate Description

Rock Type: Breccia (highly altered)

Description:
Highly altered basalt clasts cemented by Calcite and phosphorite and volcanic mud; some clasts show weathered rims (yellow color)

Biology ?: Encrusting forams

* D26-8-1 was scraped from six pieces

M Pringle will need cobble circled on photo

Described By: Yoon Subsampled By: RD

SAMPLE DESCRIPTION

1 boulder, 3x12 cobbles

22 x 23 x 11 (largest)
9 x 7 x 5 (≈ Av.)

Cruise Id: F10-89-CP Size: 5x2.5x2.5 (smallest) (cm) Location: H Seamount

Sample Id: D26-9 Weight: 10 kg (kg) Depth: 1740-1700 (m)

Mn Crust Description

Surface Texture: granular to stain
most pieces w/out crust - broken from breccia

Mn Crust Thickness (mm):
Min: 0 Max: <1 Ave: <1

NO PHOTO

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.				
2.				
3.				
4.				
5.				
6.				

Comments and XRD Mineralogy:
Mn patina

ANALYSES

Subsample Number	Analysis	Layer Thickness
D26-9A	OC (28.4g)	Dark Breccia
" "	TS	"
" -9A	XRD	"
1/3 To KORDT		

Substrate Description

Rock Type: Breccia (relatively fresh)

Description: Pebble-sized, brown altered basalt clasts (dk br., some lt. brown) in matrix calcite-phillip. cements of altered glassy volcanic (greenish) debris and (minor) calcite; ≤ Sand-sized matrix debris.
; matrix supported (pebbly SS), subrounded clasts

Biology ?: Forams

Described By: Yoon Subsampled By: Yoon

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: small fragments of crust various (cm) Location: Seamount H

Sample Id: D26-10 Weight: ~1.5 kg (kg) Depth: 1740-1700 (m)

Mn Crust Description

Surface Texture: Botryoidal to granular

Mn Crust Thickness (mm):

Min: 5 Max: 33 Ave: 19

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.				
2.				
3.				
4.				
5.				
6.				

Comments and XRD Mineralogy:

Massive to porous

½ 60 crust fragments - uncut, Complete to incompletes

ANALYSES

Subsample Number	Analysis	Layer Thickness
½ To KORDI		

Substrate Description

Rock Type: Most of samples are devoid of substrate!

Description:

Biology ?: Encrusting forams

Described By: Yoon Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: ~2x2x1.5 (smallest) 7x7x6 (largest) (cm) Location: Seamount H

Sample Id: D26-11 Weight: < 1 kg (kg) Depth: 1740-1700 (m)

Mn Crust Description

Surface Texture:

Mn Crust Thickness (mm):

Min: Max: Ave:

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.				
2.				
3.				
4.				
5.				
6.				

Comments and XRD Mineralogy:

32 pumice pebbles

Substrate Description

Rock Type: white pumice to gray-brown

Description:

Some pumices include volcanic rock fragments (<5mm) + horneblende

Biology ?: forams

ANALYSES

Subsample Number	Analysis	LayerThickness
Rock Taken	Ar-Ar, Isotopes	Straudigel

Malcolm took 6 pebbles → all HBL-phyric (will try to date HBL)

Described By: Yoon

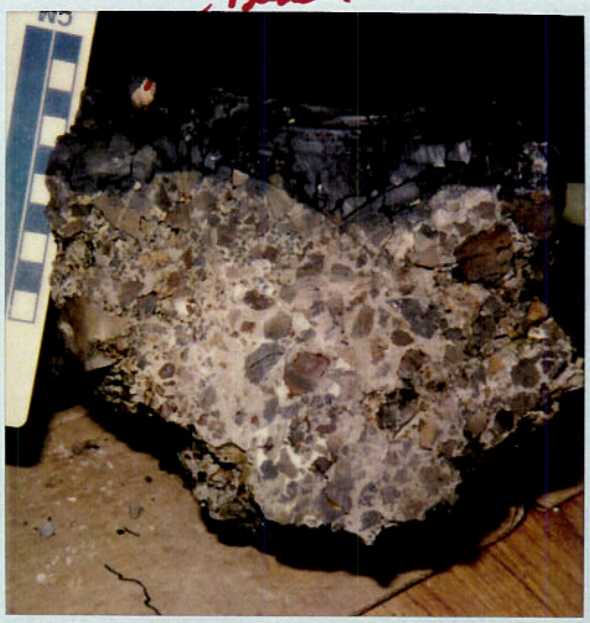
Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 31 X 16 X 18.5 (cm) Location: SEAMOUNT H

Sample Id: D26-12 Weight: 6 (kg) Depth: 1740-1700 (m)

Basalt



Mn Crust Description
Surface Texture: Smooth

Mn Crust Thickness (mm):
Min: 27 Max: 42 Ave: 30

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	10	20	15	POROUS, IRON STAINED EMBEDDED BASALT FRAGM'TS
2.	10	20	15	DENSE, FRACTURED, YELLOWISH MUD INFILLING CRACKS
3.				
4.				
5.				
6.				

Comments and XRD Mineralogy:
LAYERS ARE Variable in Thickness DUE TO THE SURFACE OF THE SUBSTRATE

ANALYS D26-12; F10-89-CP

Subsample Number	Analysis	Layer Thickness

Substrate Description
Rock Type: BRECCIA

Description: COMPOSED OF ALTERED VOLCANIC CLASTS; ANGULAR TO SUB-ANGULAR; PEBBLE TO SAND SIZED; POORLY SORTED; Matrix SUPPORTED; FRIABLE GREY volcanogenic / CALCAREOUS MUD MATRIX: CALCITE

Biology ?: AND PHOSPHORITE INFILLING OF PORE SPACES; RARE MANGANESE DIFFUSION.

½ TO 1 CORDI

Described By: RD Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 40x26x29 (cm) Location: SEAMOUNT H

Sample Id: D26-13 Weight: 15 (kg) Depth: 1740-1700 (m)

Mn Crust Description
Surface Texture: SMOOTH, polished

Mn Crust Thickness (mm):
Min: 20 Max: 40 Ave: 30

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	10	22	16	POROUS, IRON STAINED EMBEDDED BASALT FRAGMENTS
2.	10	18	12	DENSE, FRACTURED YELLOWISH MUD INFILLING CRACKS
3.				
4.				
5.				
6.				

NO PHOTO.

Comments and XRD Mineralogy:
CRUST LAYERS ARE VERY IRREGULAR in Thickness DUE TO SURFACE OF SUBSTRATE (irregular)

large uncut boulder

Substrate Description
Rock Type: BRECCIA

Description:
COMPOSED OF ALTERED VOLCANIC CLASTS; ANGULAR TO SUB-ANGULAR; MEDIUM PEBBLE TO SAND SIZED; POORLY SORTED; matrix SUPPORTED; GREY CALCAREOUS (Volcanogenic) MUD MATRIX; Biology ? PARTIALLY CALCITE RIM CEMENTED; CALCITE INFILLING OF PORE SPACES; MANGANESE DIFFUSION IN HAIRLINE FRACTURES

→ encrusting forams.

ANALYSES

Subsample Number	Analysis	LayerThickness

Described By: RO

Subsampled By:

SAMPLE DESCRIPTION

< 20 pieces

Cruise Id: F10-89-CP Size: Pebble sized (cm) Location: Seamount H

Sample Id: D26-14 Weight: 1.5 (kg) Depth: 1740-1700 (m)

Mn Crust Description

Surface Texture: Granular, smooth, patina

Mn Crust Thickness (mm):
Min: < 1 Max: 4 Ave: 1

NO PHOTO

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.				
2.				
3.				
4.				
5.				
6.				

Comments and XRD Mineralogy:
ASSORTMENT OF BASALT PEBBLES AND FRAGMENTS WITH VARYING TYPES OF THIN CRUST OR PATINA

ANALYSES

Subsample Number	Analysis	LayerThickness

Substrate Description

Rock Type: BASALT

Description:
RELATIVELY FRESH TO ALTERED, BROWNISH-GREY TO RUST-RED, APHANITIC aphyric, MASSIVE, RARE INFILLING OF VESICLES BY

½ TO HORD

Biology ?: PHOSPHORITE AND CARBONATE MUD

Described By: RD Subsampled By: