D17, Ben

Ben Seamount

2925 - 2875 m

SAMPLE ID	*Mn CHEM	Pt & Au*	REE *	Si Chem*	P.Sect.	35mm Pho	Archive	Paleo	XRD				
D17 -1	Bulk												
D17 -2													
D17 - 3	Bulk							X	X				
D17 - 4	Bulk	Bulk	Bulk										
D17 - 5					TS			X	X 4				
D17 - 6	Bulk	Bulk	Bulk							44 BL			
D17 - 7				Hydrothermal									
D17 - 8				Phosphorite	TS								
D17 - 9													
D17 - 10													
D17 - 11													
D17 - 12													
D17 - 13													
D17 - 14													
D17 - 15													
D17 - 16													
D17 - 17													
D17 - 18													
D17 - 19													
D17 - 20													
D17 - 21													
D17 - 22	Bulk												
D17 - 23													

* All chemistry samples have XRD mineralogy done also.

SAMPLE ID	*Mn CHEM	Pt & Au*	REE *	Si Chem*	P.Sect.	35mm Pho	Archive	Paleo	XRD				
D17-24													
D17-25				Fresh Basalt	TS								
D17-26													
D17-27													
D17-28													
D17-29				Altered Basalt									
D17-30					TS				X				

* All chemistry samples have XRD mineralogy done also.

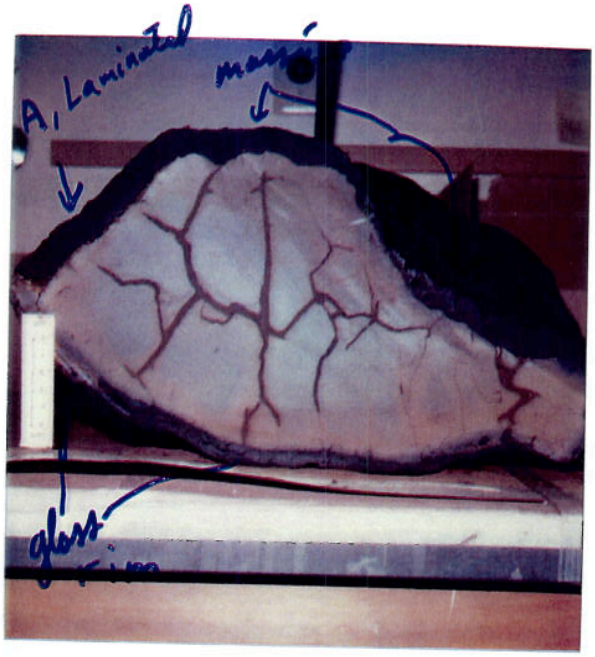
SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 64 x 36 x 23cm Location: Ben Seamount

Sample Id: D17-1 Weight: 30 kg (kept) Depth: 2925 - [illegible]

Mn Crust Description

Surface Texture: Smooth to granular in hollows



Mn Crust Thickness:
Min: 2mm Max: 20mm Ave: 5mm

Layers (Outer to Inner):

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

Comments and XRD Mineralogy:

massive in places, laminated in other places w/ phosphorite layer separating crust + Rx

ANALYSES

Subsample & Type	Analysis	Weight
D17-1	CC	0-18mm
	XRD	

Substrate Description

Rock Type: Basalt

Description:

Large basalt boulders, broke 1/2 off on deck sent back to Neptune

massive rel. Fresh; glass rim on ~~[illegible]~~ one edge

Described By: JSM, d.j. Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 42x32x27cm Location: Ben Sea mount

Sample Id: D17-2 Weight: ≈ 25 kg Depth: 2925-2875

8 kg kept

Mn Crust Description

Surface Texture: Smooth to granular

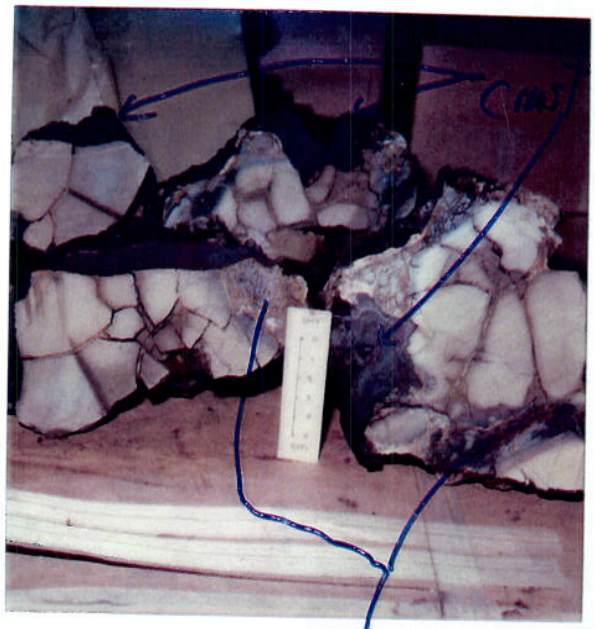
smooth to granular

Mn Crust Thickness:

Min: 5 Max: 35 Ave: 12

Layers (Outer to Inner):

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



D17-2

Comments and XRD Mineralogy:

massive w/ outer mm - Thick porous layer (granular)

Substrate Description

Rock Type: Brown Basalt

a basalt boulder with clay in the fractures

Description:

glass breccia surrounding a massive brown basalt w/ rare small plag xstals.

Vent boulder kept [illegible] back to Neptune

ANALYSE

Subsample & Type	Analysis	Weight

Described By: JSM, d.j. Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 52x27x24 Location: Ben Seamount

Sample Id: D17-3 Weight: 30 kg Depth: 2925 - 2895

Mn Crust Description

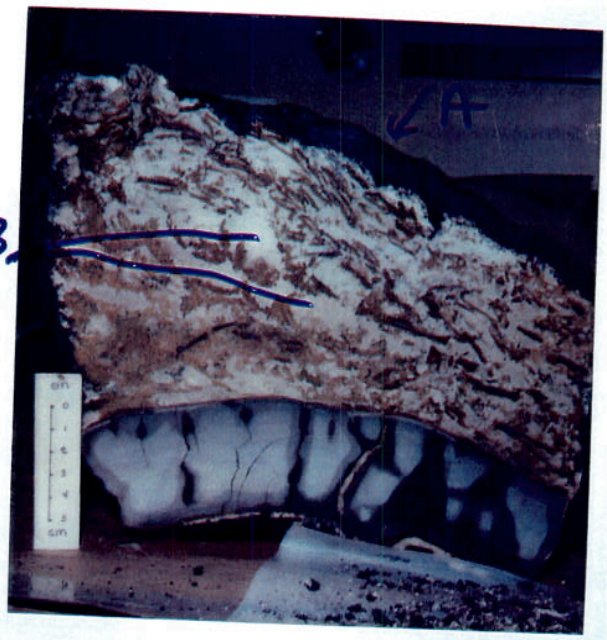
Surface Texture: Smooth to dendritic/granular dendritic granular topsoil, N e/

Mn Crust Thickness:

Min: 5 mm Max: 15 mm Ave: 10

Layers (Outer to Inner): NONE

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



Comments and XRD Mineralogy:

Crust is massive and resinous

ANALYSES

Subsample & Type	Analysis	Weight
D17-3A	CC	0-10 mm
	XRD	
D17-3B	Dolo	white matrix
	XRD	

Substrate Description

Rock Type: Basalt + hyaloclastite

Description:

Massive fresh basalt Flow over lain by hyaloclastite w/ oriented Tabular basalt + glass fragments - mixed w/ white phosphate replaced (?) carbonate matrix - altered glassy vole debris -

Described By: JSM

Subsampled By:

SAMPLE DESCRIPTION

many samples - biggest

Cruise Id: F7-87-SC Size: 9×8×4.5 cm (biggest) Location: Bx

Sample Id: D17-4 Weight: 1.5 Kg Depth: 2925-2875 m

Mn Crust Description

Surface Texture: granular w/minor smooth

Mn Crust Thickness:

Min: 10 (smallest) Max: 40 (biggest) Ave: 20

Layers (Outer to Inner):

	Min	Max	Ave	Texture
1.	12	31	25	massive to laminated [illegible] in upper layer
2.				
3.				
4.				
5.				
6.				

sampled for C.C.

D17-4

Comments and XRD Mineralogy:

Massive. A couple of samples are laminated & [illegible] minor clasts & possible phosphorite dendrites.

ANALYSI

Subsample & Type	Analysis	Weight
D17-4 bulk	CC, Pt. Au, REE, XRD	ground 1/2 of biggest sample - the one described as "layer one" 25 mm

Substrate Description

Rock Type: Miscellaneous crusts w/out substrate.

Description:

Described By: [illegible] Subsampled By: [illegible]

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 16 x 12.5 x 6.5cm Location: Ba

Sample Id: D17-5 Weight: 1Kg Depth: 2925 - 2875

Mn Crust Description

Surface Texture: granular to lizard skin

Mn Crust Thickness:

Min: 2 Max: 10 Ave: 5 mm

Layers (Outer to Inner):

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

D17-5

Comments and XRD Mineralogy:

Massive MnO_2

ANALYSE

Subsample & Type	Analysis	Weight
D17-5A	TS	in upper 50mm (no mudstone)
B	paleo, XRD	(9mm) mudstone
C	XRD	silty sandstone (26mm)
D	XRD	gravel zone (24mm)
E	XRD	upper Mn-rich sandy zone (3m

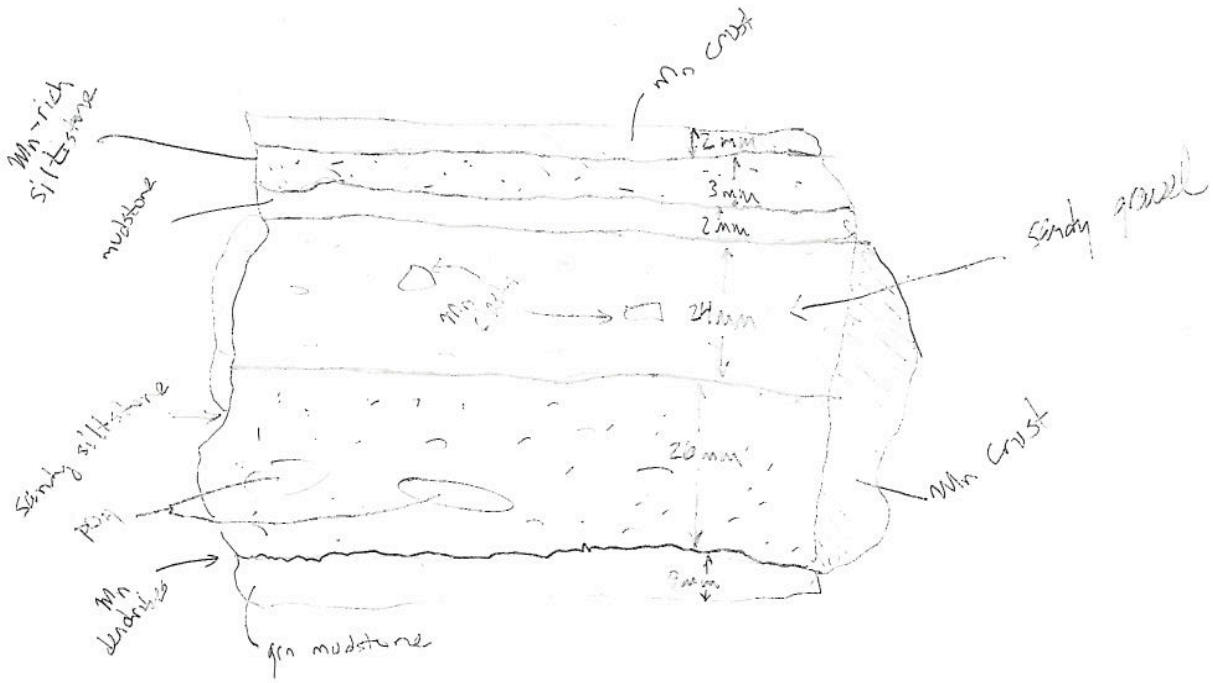
Substrate Description

Rock Type: Volcaniclastic sandstone and mudstone

Description:

Volcaniclastic sediment stone. Visible sand to gravel sized clasts include old Mn crust (<10 x 2mm) qtz and green glassy epidote?? Regular sharp contacts divides sandy gravel from sandy siltstone of similar composition. Sharp regular contacts (infilled by Mn dendrites) divides sandy siltstone from subtly laminated green beige mudstone. Local PO_4 in sandy siltstone region (OVER)

Described By: L B Subsampled By: L B


Mn crust
Mn-rich siltstone
mudstone
2mm
3mm
2mm
sandy gravel
24mm
sandy siltstone
20mm
Mn crust
Mn dendrites
grn mudstone

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 20 x 22 x 9.5 Location: Ben

Sample Id: D17-6 Weight: 8 Kg Depth: 2925-3875

Mn Crust Description

Surface Texture: Smooth to Lizard Skin
granular on Sides

Mn Crust Thickness:
Min: 12 Max: 20 Ave: 18 layered

Layers (Outer to Inner):

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

Comments and XRD Mineralogy:

ANALYSES

Subsample & Type	Analysis	Weight
A. Bulk Crust	CC, Pt, Au REE, 44 EL	18mm thick
B. Granular on Side	CC	

Substrate Description

Rock Type: Basalt?

Description:

Described By: Subsampled By:

K&E

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 14×10×7 cm Location: Ben

Sample Id: D17-7 Weight: 0.75 Kg Depth: 2925-2875

Mn Crust Description

Surface Texture: smooth, locally granular

Mn Crust Thickness:

Min: patina (<1) Max: 3.0 Ave: 1.0 (mm)

Layers (Outer to Inner):

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

D17-7

Comments and XRD Mineralogy:

Thin Mn crust is laminated, black to brown w/ Poy (?) dendrites.

Substrate Description

Rock Type: Hyaloclastite

Description:

Highly altered hyaloclastite w/ large (<15×55 mm) altered basalt (?) and aphanitic white soft, non effervescing in HCL mudstone clasts.

ANALYSIS

Subsample & Type	Analysis	Weight
D17-7	OC, XRD	lower 30-40 mm w/all MnO2 removed.

Described By: LB

Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 14x12x10 cm Location: Ben

Sample Id: D17-8 Weight: 2kg Depth: 2925-2875

Mn Crust Description

Surface Texture: smooth, lizard skin in hows

Mn Crust Thickness:

Min: <1.0 Max: 2.0 Ave: 1.0 mm

Layers (Outer to Inner):

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

D17-8

Comments and XRD Mineralogy:

ANALYSE

Subsample & Type	Analysis	Weight
D17-8	OC, XRD	
D17-9	ts	

Substrate Description

Rock Type: Phosphorite Breccia

Description:

Large "Grain" supported phosphorite clasts (<6 x 1.5 cm) in phosphorite matrix have Mn staining around clast edges. Secondary Mn fills numerous small voids (<1 mm) throughout rock.

Described By: AS Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 4.5 × 10 × 8 cm Location: Ben

Sample Id: D17-9 Weight: 1.25 kg Depth: 2925 - 2875

Mn Crust Description

Surface Texture: lizard skin on one side; small angular botryoids (1-3 mm) on one side [illegible] bottom

Mn Crust Thickness:

Min: 3 Max: 20 Ave: 15 mm

Layers (Outer to Inner):

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

Comments and XRD Mineralogy:

Upper 4 mm of crust is laminated w/ possible PC [illegible] (inner) crust more massive

D17-9

ANALYS

Subsample & Type	Analysis	Weight

Substrate Description

Rock Type: Porphyritic Basalt

Description:

Blue-gray groundmass [illegible] [illegible] [illegible] [illegible] feldspar [illegible] altered px(?) and large (up to 8 mm) dark crystals

Described By: JB

Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 3 x 12 x 5 cm Location: Ben

Sample Id: D17-10 Weight: [illegible] Depth: 2925 - 2875

Mn Crust Description

Surface Texture: Upper: [illegible] to lizardskin [illegible]: lizardskin to angular pointy [illegible] up to 2 mm

Mn Crust Thickness:

Min: 5 Max: 24 Ave: 14 mm

Layers (Outer to Inner):

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

D17-10

Comments and XRD Mineralogy:

Massive black. Porous [illegible] (<4mm [illegible]) on [illegible] (<2mm) [illegible] [illegible]

Substrate Description

Rock Type: Basalt

Description:

See D17-9. This has subtle yellow alteration rim on outer .7 mm [illegible]

ANALYSI

Subsample & Type	Analysis	Weight

Described By: [illegible]

Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 17 x 12 x 9.5 cm Location: Ben

Sample Id: D17-11 Weight: 1.5 Kg Depth: 2925-2875 m

Mn Crust Description

Surface Texture: [illegible] to 3mm high in [illegible]

Mn Crust Thickness:

Min: [illegible] Max: [illegible] Ave: 5 mm

Layers (Outer to Inner):

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

D17-11

Comments and XRD Mineralogy:

Massive, black w/vugs [illegible] to [illegible]. Thin PO_4 lens (2mm x 2mm) at base of thickest crust

Substrate Description

Rock Type: Aphanitic Basalt

Description:

[illegible] yellow alteration [illegible] 2-4 mm. Minor [illegible] [illegible] w/Mn

ANALYSIS

Subsample & Type	Analysis	Weight

Described By: LB Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 13 x 11.5 x 7.5 cm Location: Ben

Sample Id: D17-12 Weight: 1 kg Depth: 2925-2875

Mn Crust Description

Surface Texture: smooth

Mn Crust Thickness:

Min: Max: 18 Ave: 9 mm

Layers (Outer to Inner):

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

D17-12

Comments and XRD Mineralogy:

Massive black on top of [illegible] is brown, [illegible]. Poly tensor (<2mm thick) locally present.

Substrate Description

Rock Type: Aphanitic Basalt

Description:

[illegible] D17-12 [illegible]

Described By: LB

Subsampled By:

ANALYSE

Subsample & Type	Analysis	Weight

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: [illegible] Location: Ben

Sample Id: D17-13 Weight: ~0.5 kg Depth: 2925-2875 m

Mn Crust Description

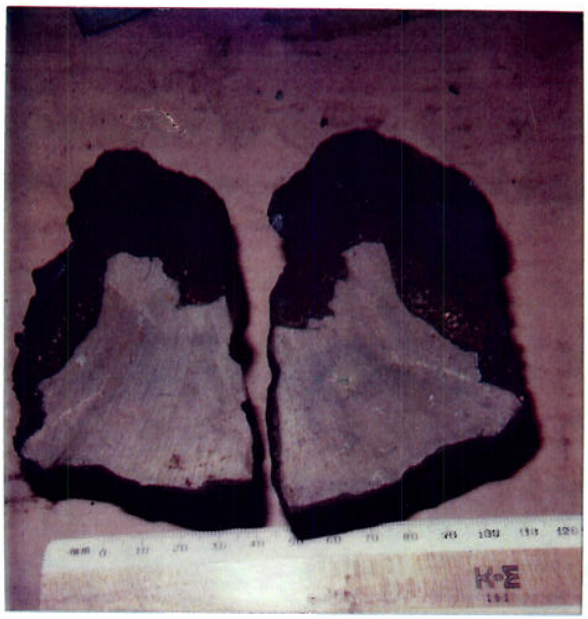
Surface Texture: [illegible]

Mn Crust Thickness:

Min: 25 Max: 35 Ave: 25 mm

Layers (Outer to Inner):

	Min	Max	Ave	Texture
1.	[illegible]	22	20	[illegible]
2.	[illegible]	13	6	[illegible]
3.				
4.				
5.				
6.				



D17-13

Comments and XRD Mineralogy:

Substrate Description

Rock Type: Basalt

Description:

Beige colored [illegible] [illegible] [illegible] clear [illegible] [illegible] brown square pyroxene [illegible]

Minor [illegible]

Described By: [illegible] Subsampled By:

ANALY

Subsample & Type	Analysis	Weight

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 12x10.5x7.5 cm Location: Ben

Sample Id: D17-14 Weight: 1kg Depth: 2925-2875

Mn Crust Description

Surface Texture: smoothed small [illegible] (<1 mm)

[illegible]

Mn Crust Thickness:

Min: 13 Max: 18 Ave: 16 mm

Layers (Outer to Inner):

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

D17-14

Comments and XRD Mineralogy:

[illegible] outer 3 to 5 mm [illegible] have brown [illegible]

Substrate Description

Rock Type: Basalt

Description:

[illegible]

ANALYS

Subsample & Type	Analysis	Weight

Described By: LB Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 9.5 x 7.5 x 9.5 cm Location: Ben

Sample Id: D17-15 Weight: ~0.4 kg Depth: 2925-2875

Mn Crust Description

Surface Texture: smooth

Mn Crust Thickness:

Min: 4 Max: 13 Ave: 7

Layers (Outer to Inner):

	Min	Max	Ave	Texture
1.	1	8	2	[illegible]
2.	3	5	5	[illegible]
3.				
4.				
5.				
6.				

D17-15

Comments and XRD Mineralogy:

ANALY

Subsample & Type	Analysis	Weight

Substrate Description

Rock Type: Rock

Description:

[illegible]

Described By: [illegible] Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 9x8 [illegible] Location: Bin [illegible]

Sample Id: D17-16 Weight: ~0.3 kg Depth: 2925-2875

Mn Crust Description

Surface Texture: Angular [illegible]

43mm [illegible]

Mn Crust Thickness:

Min: 2 Max: 12 Ave: 10 mm

Layers (Outer to Inner):

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

D17-16

Comments and XRD Mineralogy:

Black, [illegible]

Substrate Description

Rock Type: Basalt

Description:

See D17-15

ANALYSE

Subsample & Type	Analysis	Weight

Described By: LB

Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: [illegible] Location: [illegible]

Sample Id: D17-17 Weight: ~ 0.95 kg Depth: 2925-2895

Mn Crust Description

Surface Texture: smooth [illegible]

Mn Crust Thickness:
Min: 3 Max: 21 Ave: 11

D17-17

Layers (Outer to Inner):

	Min	Max	Ave	Texture
1.	7	12	10	massive [illegible]/porous.
2.	3	21	13	massive w/ [illegible]
3.				
4.				No [illegible]
5.				
6.				

Comments and XRD Mineralogy:

Phosphorite occurs locally between crust + substrate. PO4 has "flame structures" (see drawing)

Substrate Description

Rock Type: Basalt [illegible]

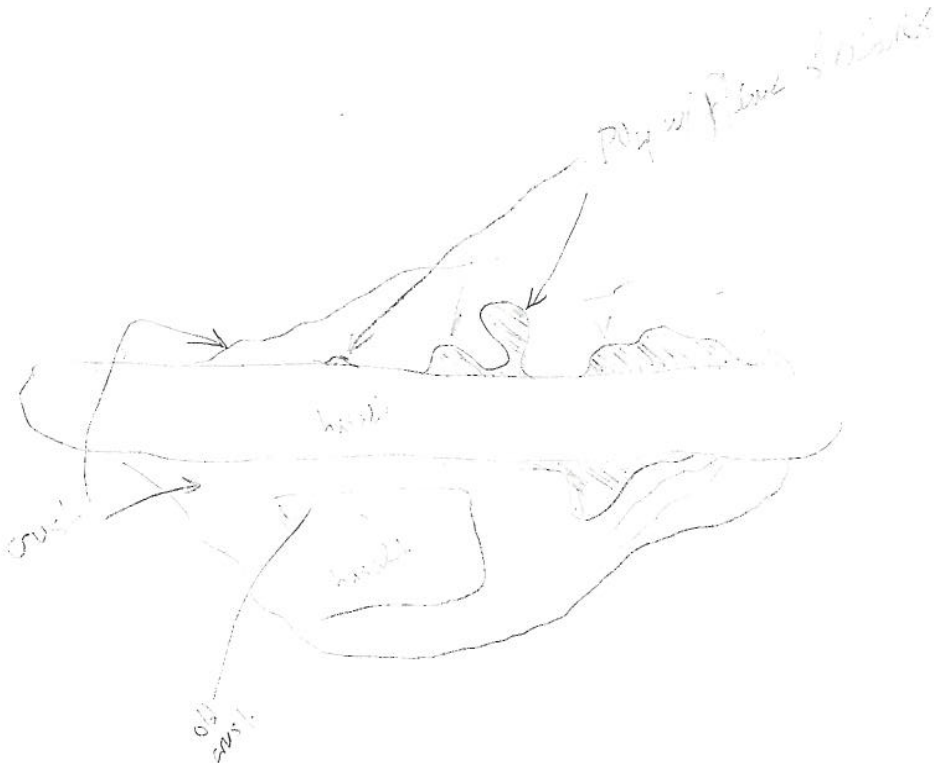
Description:

[illegible]
[illegible]

ANALYSE

Subsample & Type	Analysis	Weight

Described By: LB Subsampled By:



SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 14×9×6.3 cm Location: Ben

Sample Id: D17-18 Weight: [illegible] Depth: 2925-2875

Mn Crust Description

Surface Texture: [illegible]

w/smoothed [illegible]

[illegible] (1 mm) [illegible]

Mn Crust Thickness:

Min: 3 Max: 21 Ave: 12 mm

Layers (Outer to Inner):

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

D17-18

Comments and XRD Mineralogy:

Layers [illegible]

[illegible]

[illegible] outer crust

[illegible] + Mn [illegible]

[illegible]

[illegible]

ANALYS

Subsample & Type	Analysis	Weight

Substrate Description

Rock Type: Basalt [illegible]

[illegible] (1 mm) [illegible]

Description:

Described By: LB Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 11.5 x 8 x 4 cm Location: [illegible]

Sample Id: D17-19 Weight: 4.75 Kg Depth: [illegible]

Mn Crust Description

Surface Texture: smoothed small (<1mm) [illegible]

Mn Crust Thickness:

Min: 9 Max: 42 Ave: 28 mm

Layers (Outer to Inner):

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

D17-19

Comments and XRD Mineralogy:

Massive w/some [illegible] brown [illegible]

Substrate Description

Rock Type: Basalt

Description:

Beige colored [illegible] see D17-[illegible]

ANALY

Subsample & Type	Analysis	Weight

Described By: [illegible] Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: E7-87-SC Size: 20 x 12 x 11 cm Location: Ben

Sample Id: D17-20 Weight: 5 kg Depth: 3925-3975 m

Mn Crust Description

Surface Texture:

Mn Crust Thickness:

Min: 4 Max: 10 Ave: 6 mm

Layers (Outer to Inner):

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

D17-20

Comments and XRD Mineralogy:

Substrate Description

Rock Type:

Description:

Described By: KR

Subsampled By:

ANAL

Subsample & Type	Analysis	Weight

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 11x11x10 cm Location: Sea

Sample Id: D17-21 Weight: 1.5 Kg Depth: [illegible]

Phos study

Mn Crust Description

Surface Texture: [illegible]

Mn Crust Thickness:

Min: [illegible] Max: [illegible] Ave: 5 mm

Layers (Outer to Inner):

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

D17-21

Comments and XRD Mineralogy:

Black, [illegible]

[illegible]

Substrate Description

Rock Type: Basalt

Description:

[illegible]

local black glass [illegible]

[illegible]

ANALY

Subsample & Type	Analysis	Weight
35mm slide	6/90	G. Smith

Described By: LB Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: [illegible] cm Location: Bu

Sample Id: D17-22 Weight: ~1.5 kg Depth: 2925-2975

Mn Crust Description

Surface Texture: [illegible]

Mn Crust Thickness:

Min: 2 Max: 38 Ave: 24 mm

Layers (Outer to Inner):

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

D17-22

Comments and XRD Mineralogy:

Blade massive w/2 clasts one basalt, one [illegible] floating with [illegible]

Substrate Description

Rock Type: Porphyritic Basalt

Description:

Basalt w/ large phenocrysts up to 2 mm of feldspar

no sample taken [illegible] we need a big piece [illegible]

ANALY

Subsample & Type	Analysis	Weight
Bulk Crust	CC	25 mm
	XRD	

Described By: LB

Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 4x11x10 cm Location: [illegible]

Sample Id: D17-23 Weight: ~2 kg Depth: 2925-2875

Mn Crust Description

Surface Texture: [illegible]

Mn Crust Thickness:

Min: 1 Max: 5 Ave: 2 mm

Layers (Outer to Inner):

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

D17-23

Comments and XRD Mineralogy:

Black, massive.

Substrate Description

Rock Type: [illegible]

Description:

Blue-brown w/no phenocrysts. Brown color from [illegible] of ?

ANALYS

Subsample & Type	Analysis	Weight

Described By: LB

Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 22 x 18 x 14 cm Location: [illegible]

Sample Id: [illegible] - 24 Weight: [illegible] Depth: [illegible] mm

Mn Crust Description

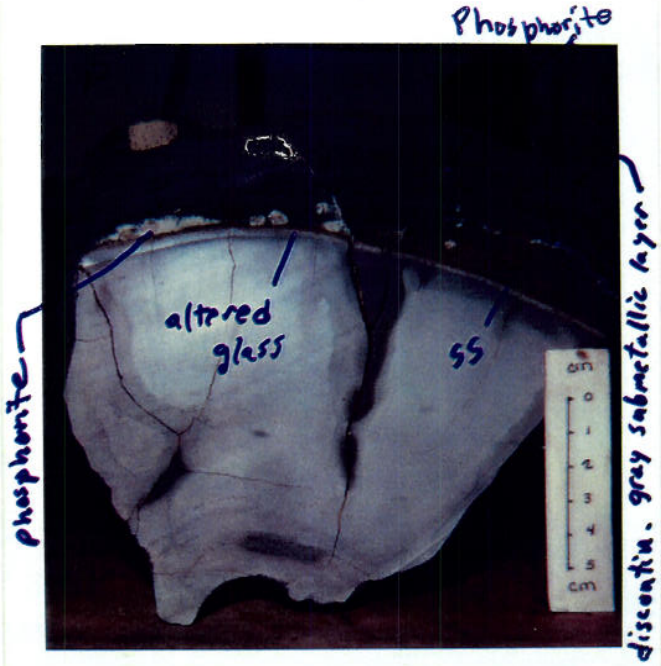
Surface Texture: [illegible]

Mn Crust Thickness:

Min: 15 Max: [illegible] Ave: 18 mm

Layers (Outer to Inner):

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



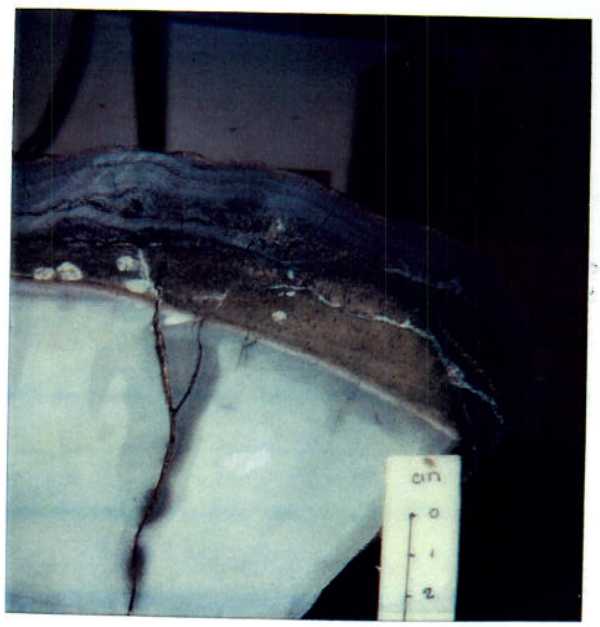
D17-24

Comments and XRD Mineralogy:

Black thickly laminated
possible 3 layers ~ 5mm thick
each
Innermost layer highly fractured
SS fragment cemented in Crust

ANALYSES

Subsample & Type	Analysis	Weight



Substrate Description

Rock Type: Basalt

Description:

[illegible] basalt
[illegible] rim
along [illegible]
Poy [illegible] w/in
glassy area

Described By: [illegible] Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 20x16 x 1 cm Location: Bn Seamount

Sample Id: D17-25 Weight: ~4.5 kg Depth: 2925-2875 m

Mn Crust Description

Surface Texture: smooth, granular [illegible]

Mn Crust Thickness:

Min: 2 Max: 7 Ave: 5 mm

Layers (Outer to Inner):

	Min	Max	Ave	Texture
1.	2	3	3	brown [illegible]
2.	0	4	2	black massive
3.				
4.				
5.				
6.				

D17-25

Comments and XRD Mineralogy:

massive brown crust

Substrate Description

Rock Type: Basalt

Description:

Relatively coarse-grained fresh basalt w/ rare plag. phenocrysts.

ANALYSES

Subsample & Type	Analysis	Weight
D17-25	OC	Coarse-grained
	TS	basalt
		WR - chem. [illegible]
		[illegible]

Described By: [illegible] Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 37×26×20 cm Location: Bar Seamount

Sample Id: D17-26 Weight: 17.6 kg Depth: 1925-2875 m

* [illegible] 3×3×3 cm [illegible] left, [illegible]

Mn Crust Description

Surface Texture: Bulbous [illegible]

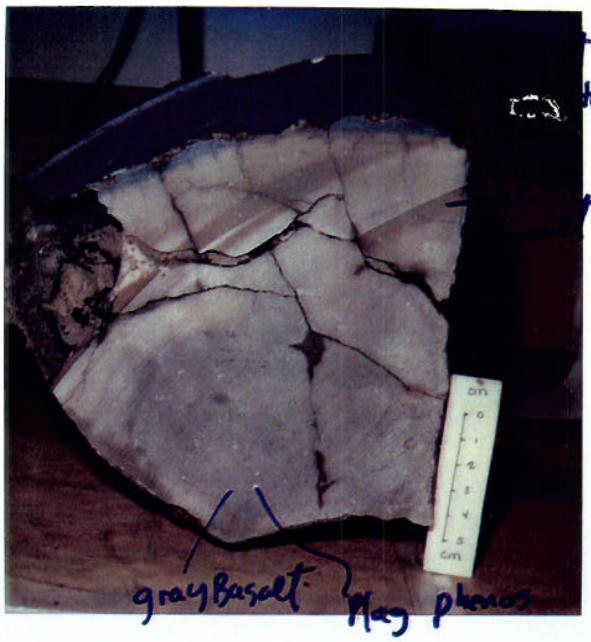
[illegible]

Mn Crust Thickness:

Min: 18 Max: 25 Ave: 22

Layers (Outer to Inner):

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



Comments and XRD Mineralogy:

outer brown laminated Crust, inner darker brown massive Crust

Crust separated from basalt w/ phosphorite layer -

Substrate Description

Rock Type: Basalt

Description:

gray to tan basalt w/ moderate # of large plag. phenos - up to 3mm

Thin, discontinuous cooling rind

big piece taken for K-Ar (AD)

ANALYSES

Subsample & Type	Analysis	Weight
D17-26A	probe glass	A. Davis
D17-26B	small chunk	for [illegible] Section

Described By: [illegible] Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: Various Location: Ben Seamount

Sample Id: D17-27 Weight: 30 kg Depth: 2925-2875

Mn Crust Description

Surface Texture: Smooth to Granular

Mn Crust Thickness:

Min: <1 Max: 5 Ave: 2

Layers (Outer to Inner):

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

35MM

Phos Study

Comments and XRD Mineralogy:

ANALYSES

Subsample & Type	Analysis	Weight
D17-27A		
" B	glass chips	for probe (N)
" C		
" D		
35mm slide		G. Smith 6/90

Substrate Description

Rock Type: Volcanic Breccia, hyaloclastite

Description:

Volcanic Breccia w/ clasts of basalt cemented by phosphorite, V.B w/ clasts of basaltic glass in matrix of hyaloclastite, Basalt + hyaloclastite clasts cemented w/ manganese, some tabular basalt sheet flows.-

5 pieces taken for glass (V.D)

Described By: Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: Various ≈ 18 rocks Location: Ben Seamount

Sample Id: D17-28 Weight: Total 20 kg Depth: 2925 - 2875

Mn Crust Description

Surface Texture: Smooth to lizard skin granular on sides & bottom

Mn Crust Thickness:
Min: <1 Max: 22 Ave: 5

Layers (Outer to Inner):

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

Comments and XRD Mineralogy:

Thin crusts, brown, massive

Substrate Description

Rock Type: Basalt

Description:

gray massive basalt, some pillow fragments

7 small cobble sized pieces taken (A.D.)

ANALYSES

Subsample & Type	Analysis	Weight
D17-28A	prolac glass	
" B	"	"
" C	bulk chemistry	
" D	+ T.S.	" (A.D.)
" E		
" F		
" G		

Described By: Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: Various ~ 20 rocks Location: Ben Seamount

Sample Id: D17-29 Weight: Total 35 kg Depth: 2925-2875

Mn Crust Description

Surface Texture: Smooth To Granular

Mn Crust Thickness:

Min: <1 Max: 11 Ave: 3

Layers (Outer to Inner):

	Min	Max	Ave	Texture
1.				massive
2.				
3.				
4.				
5.				
6.				

Comments and XRD Mineralogy:

Thin crusts, petina in many places, black. granular on sides + bottom

Substrate Description

Rock Type: Altered Basalt

Description:

Pale brown - yellowish brown + gray basalt w/ black glass + Thin crusts - Many are pillow Fragments

Seven small fragments were taken for glass analysis and XS.

ANALYSES

Subsample & Type	Analysis	Weight
D17-29	OC	one piece of yellow brown basalt, no dark glass included. Small fractures w/ Mn
D17-29A.3 C,D,E,F,G	probe	glass chips (~1)

Described By:

Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: 11x10x6.6cm Location: Ben Seamount

Sample Id: 17D-30 Weight: 1Kg Depth: 2925-2875

Mn Crust Description

Surface Texture: dominantly smooth, granular in areas, small botriods <1mm in areas

Mn Crust Thickness:

Min: patina Max: 2.0 Ave: 1.0 (mm)

Layers (Outer to Inner):

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

No photo

Comments and XRD Mineralogy:

ANALYSES

Subsample & Type	Analysis	Weight
17D-30	TS, XRD	

Substrate Description

Rock Type: Walt's Quartzite

Description:

Very hard blue-grey aphanitic glass [illegible]

Described By:

Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F7-87-SC Size: _____ Location: Ben seams.

Sample Id: D17-31 D17-32 Weight: _____ Depth: _____

Mn Crust Description

Surface Texture: D17-33

D17-31: cross-bedded sandstone with abundant glass chips. Glass chipped out and piece for T.S. taken.

D17-32, no glass-pieces taken for T.S.

D17-33.

Mn Crust Thickness:

Min: _____ Max: _____ Ave: _____

Layers (Outer to Inner):

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

Comments and XRD Mineralogy:

ANALYSES

Subsample & Type	Analysis	Weight
D17-31A	prime glass	(A.D.)

Substrate Description

Rock Type:

Description:

Described By: Subsampled By: