D1 32

Dredge Sample Summary Sheet

Sample ID	Bulk CC	Layer CC	Pt & Au	Ree	OC	DPTS/TS	XRD	35mm Photo	Paleo	Archive
D32-2	✓						✓			
D32-3							✓			
D32-5	✓						✓			
D32-6A					✓		✓			
-6B	✓						✓			
D32-8A							✓			
-8B	✓						✓			
-8C		✓	✓	✓			✓			
-8D		✓	✓	✓			✓			
-8E		✓	✓	✓			✓			
D32-9A							✓			
-9B							✓			
-9C	✓		✓	✓			✓			
-9D		✓	✓	✓			✓			
-9E		✓	✓	✓			✓			
-9F		✓	✓	✓			✓			
-9G		✓	✓	✓			✓			
-9H		✓	✓	✓			✓			

SAMPLE DESCRIPTION

Cruise Id: Tunes 6 cut Size (cm): 15½ x 12 x 5½ Location: Oma Vlinder ~~V2-91-CP~~

Sample Id: D32-1 Weight (kg): 1.28 Depth (m):

Mn Crust Description

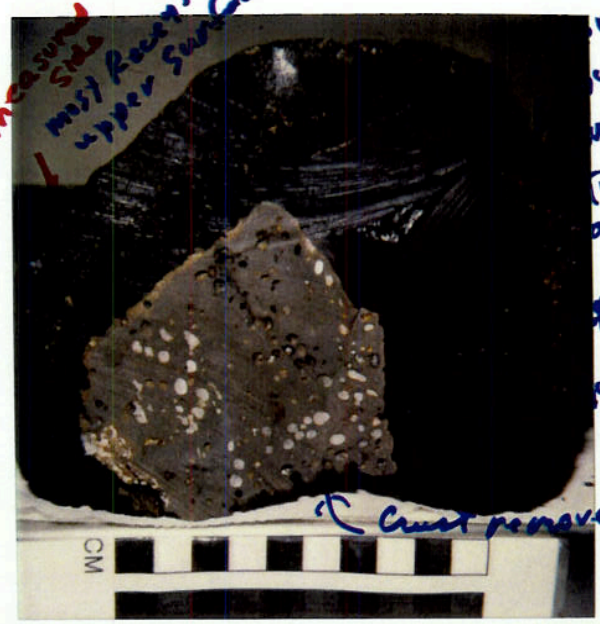
Surface Texture: Smooth to Granular botryoids side piece

Mn Crust Thickness (mm):

Min: 26 Max: 32 Ave: 28

Outer to Inner Layers (mm)

	Min	Max	Ave	Texture & Color
1	11	15	12	Black, porous, no sediment in pores
2				rare worm tubes in a vug some oxidation
3	15	17	16	Black, porous & vuggy sediment in vugs
4				
5				
6				



Comments and XRD Mineralogy:

Subs

Substrate Description

Rock Type: amygdaloidal basalt

Dark Grey

Description: Vesicular aphanitic basalt w/ calcite & minor phosphorite in voids minor alteration at the edges of the basalt. next to the basalt

Biology (?): encrusting foram is phosphorite w/ altered clasts filling a void?

Described by: JW

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: Tunes 6 Size (cm): 12.5 x 9.6 x 6 (cut) Location: Oma Vlinder ~~V2-91-CP~~

Sample Id: D32-2 Weight (kg): 1.89 Depth (m):

Mn Crust Description

Surface Texture: Smooth, abraded

Encrusted clast

Mn Crust Thickness (mm):

Min: 3 Max: 25 Ave: 18

Outer to Inner Layers (mm)

	Min	Max	Ave	Texture & Color
1	3	25	18	Black, porous
2				some red alteration along the substrate
3				an amygdular
4				basalt clast
5				in Mn
6				

Comments and XRD Mineralogy:

Su

D32-2 CC, XRD Bulk 0-22mm 30.79gm

Substrate Description

Rock Type: Sedimentary breccia

Description: Poorly sorted large pebble sized amygdaloidal basalt clast next to a phosphorite matrix with Mn clasts +

Biology (?): phosphorite clasts

Described by: JW

Subsampled by: JM

SAMPLE DESCRIPTION

Cruise Id: Tunes 6 Size (cm): 17 x 11½ x 10½ (cut) Location: Oma Vlinder ~~V2-91-CP~~

Sample Id: D32-3 Weight (kg): 1.5 Depth (m):

Mn Crust Description

Surface Texture: (Top) Smooth to gradular (bottom) Nodule Clast

Top side

Mn Crust Thickness (mm):

Min: 20 Max: 30 Ave: 25

Outer to Inner Layers (mm)

Top side

	Min	Max	Ave	Texture & Color
1	15	19	18	Black, dense
2			1	
3	5	11	7	Black, porous, some sediment in Mn, red iron stains
4				
5				
6				

Comments and XRD Mineralogy:

Subs

D32-3 XRD Green substrate

Substrate Description

Rock Type: Breccia

Black / Beige / Green

Description: Poorly sorted Mn clast cemented by a phosphatized Mn impregnated bioturbated mudstone and unconsolidated ash filling

Biology (?): voids

Described by: JW

Subsampled by: Jim

SAMPLE DESCRIPTION

Cruise Id: Tunes 6 Size (cm): 13X 10 X 8 Location: ~~V2-91-CP~~ Oma Vlinder

Sample Id: D32-4 Weight (kg): 0.12 Depth (m):

Mn Crust Description

Surface Texture: Smooth to gradular toward bottom

Nodule in center

Nodule diameter = 50x70 mm

Mn Crust Thickness (mm):

Top Min: 35 Max: 58 Ave: 38

Bottom 10 15 11

Outer to Inner Layers (mm)

		Min	Max	Ave	Texture & Color
Top	1	6	15	9	Black, porous, cream sediment filled vugs
	2	8	10	9	Black, slightly porous some sediment filled vugs
	3	7	13	7	Black, porous, vuggy sediment in vugs
	4	7	9	7	Black porous some sediment, rare clast
	5	6	10	6	Black, porous few small vugs of sediment
	6				outlining the substrate, a thin dotted phosphatic
Bottom		10	15	11	Black, porous sediment layer

Comments and XRD Mineralogy:

Subsa

Substrate Description

Rock Type: Manganese fragment

Black

Description: few phosphorite veins some cracks

Biology (?):

Described by: JW

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: Tunes 6 | Size (cm): cut 16.5 x 7.5 x 4.7 | Location: Oma Vlinder ~~V2-91-CP~~

Sample Id: D32-5 | Weight (kg): 0.81 | Depth (m):

Mn Crust Description

Surface Texture: smooth to semi-granular granular on bottom

Mn Crust Thickness (mm):

Min: 67 Max: 75 Ave: 70

Outer to Inner Layers (mm)

	Min	Max	Ave	Texture & Color
1	4	5	5	Black, porous, vugs with
~~2~~				sediment red, Fe stained
2 ~~3~~	22	25	23	Black, porous, some cracks minn
~~4~~				Fe stained sediment layer
3 ~~5~~	20	22	20	Black, porous,
~~6~~				vugs with sediment
4	21	23	22	Black, porous

D32-5 TUNES 6

Comments and XRD Mineralogy:

Su

D32-5 CC, XRD Bulk 0-72mm 8.39gm

↓ did not remove sediment from surface layer #1

or

from layer #3

what is the % of sediment infill in porous layers?

Substrate Description

Rock Type: NONE

Description:

Biology (?): encrusting worm tubes & forams

Described by: JW

Subsampled by: Jim

SAMPLE DESCRIPTION

Cruise Id: Tunes 6 Size (cm): Location: Oma Vlinder ~~V2-91-CP~~

Sample Id: D32-6 Weight (kg): 0.44 Depth (m):

Mn Crust Description

Surface Texture: Smooth to grandular botryoids

Mn Crust Thickness (mm):

Min: 3 Max: 20 Ave: 5

Outer to Inner Layers (mm)

	Min	Max	Ave	Texture & Color
1	3	20	5	Black, porous
2				Red alteration
3				on and near surface
4				
5				
6				

Tunes 6
D32-6

Comments and XRD Mineralogy:

Subs

D32-6A OC, XRD Substrate 10.8gm
-6B CC, XRD Crust 0-3mm 9.5gm

Substrate Description

Rock Type: limestone-phosphatized completely cream

Description: Bioturbated phosphorite

minor peppered Mn oxide impregnation Mn oxide lining bore hole w/ Fe-Mn - fully & partially

Biology (?): encrusting forams

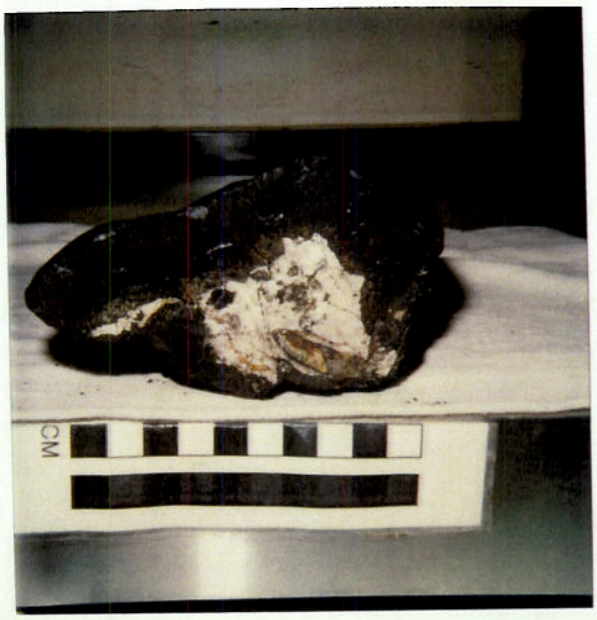
Described by: JW

Subsampled by: Jim

SAMPLE DESCRIPTION

Cruise Id: Tunes 6 cut Size (cm): 11 x 9½ x 7 Location: Oma Vlinder ~~V2-91-CP~~

Sample Id: D32-7 Weight (kg): 0.66 Depth (m):



Tunes 6

D32-7

Mn Crust Description

Surface Texture: Smooth, abraded bottom smooth lizard skin

Mn Crust Thickness (mm):

Top Min: 18 Max: 26 Ave: 20

Bottom Patina 7 4

Outer to Inner Layers (mm)

		Min	Max	Ave	Texture & Color
Top	1	16	21	17	Black, porous
	2				
	3	2	5	3	Red Blacked Lightly porous
	4				Fe stained, sediment in pores
	5				
Bottom	6	Patina	7	4	Black, porous

minor sediment, clasts, + phosphorite in Mn

Comments and XRD Mineralogy:

Subsam

Substrate Description

Rock Type: Phosphatized Mudstone or limestone Cream

Description: Bioturbated Phosphatized limestone w/ Mn oxide impregnations Mn oxide filling cracks and lining boreholes mud or volcanic ash fills one bore holes & Mn-Fe oxides the others

Biology (?):

Described by: JW

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: Tunes 6 Size (cm): cut 13x6.5x5.3 Location: ~~V2-91-CP~~ Oma Vlindor

Sample Id: D32-8 Weight (kg): 0.59 Depth (m):

Tunes 6

D32-8

Mn Crust Description

Surface Texture: Granular Botryoids

Bottom granular

Mn Crust Thickness (mm):

Min: 38 Max: 45 Ave: 40

Outer to Inner Layers (mm)

	Min	Max	Ave	Texture & Color
1	13	16	15	Black, porous sediment in pores
2				3 oxidized layers w/in the layer
3	25	29	25	Black, dendritic growth vuggy
4				sediment in vugs
5				some oxidation
6				rare clast & minor phosphorite in Mn

Comments and XRD Mineralogy:

Subsamp

D32-8A	XRD	substrate	
D32-8B	48.7 g CC, Pt, (REE) 5g	Bulk Crust	0-40
D32-8C	22.7 g CC, Pt, (REE) 3g	layer	0-5
D32-8D	27.9 g CC, Pt, (REE) 3.9g	layer	5-20
D32-8E	18.4 g CC, Pt, (REE) 3.1 g	layer	20-40

≈ 90% to 98 of mud removed from 8E + ≈ 80% from 8B bottom layer TO 90%

Substrate Description

Rock Type: Mudstone or Phosphatized limestone Biegs

Description: Partially phosphatized limestone. Some boreholes lined w/ Mn oxide. Mn Oxide filling cracks and peppered impregnations

Biology (?): lots of worm tubes

Described by: JW

Subsampled by: Jim

SAMPLE DESCRIPTION

Cruise Id: Tunes 6 Size (cm): 20X 10.2X5 Location: ~~V2-91-CP~~ Oma Vlinder

Sample Id: D32-9 Weight (kg): 1.14 Depth (m):

Mn Crust Description

Surface Texture: granular

Mn Crust Thickness (mm):

Min: 55 Max: 65 Ave: 60

Outer to Inner Layers (mm)

	Min	Max	Ave	Texture & Color
1	23	29	25	Black, moderately porous, some cracks
2	32	36	35	Black, porous, vuggy
3				Sediment + phosphorite + in vugs
4				some oxidation
5				
6				

D32-9 TUNES 6

Comments and XRD Mineralogy:

Subsampl

D32-9A	XRD			white substrate
-9B	XRD			Brown " (Fracture fill)
-9C	89g CC, Pt,	REE 5.8g		Bulk Cust
massive 9D	7.3g CC,	REE 3.2g		layer 0-2 mm
Columnar, vitreous, dense, brittle 9E	79.9g CC, Pt,	REE 6.1g		layer 2-17 mm
limestone		5.9g		
massive, soft porous? 9F	37g CC, Pt,	REE		layer 17-30 mm
vuggy w/ mud 9G	83g CC, Pt,	REE 5.6g		layer 30-50 mm
dense w/ some mud 9H	38.8g CC, Pt,	REE 6.5g		layer 50-60 mm

95-99% of mud removed from porous layer in 9C + from 9G

Substrate Description

Rock Type: Calcerous Phosphorite, Partly Phosphatized Cream

Description: Mn oxide & phosphorite filling fractures minor peppered Mn oxide impregnation Few boreholes lined by Mn oxide

Biology (?): * filled by Phosphorite - Fractures lined

Described by: JW

Subsampled by: Jim

SAMPLE DESCRIPTION

Cruise Id: Tunes 6 Size (cm): cut 8x7x5 Location: Oma Vlinder V2-91-CP

Sample Id: D32-10 Weight (kg): 3.45 Depth (m):

Mn Crust Description

Surface Texture: lizard skin

Mn Crust Thickness (mm):

Min: 43 Max: 52 Ave: 47

Outer to Inner Layers (mm)

	Min	Max	Ave	Texture & Color
1	20	28	22	Black, dense to slightly porous some fractures
~~2~~				
2 ~~3~~	23	26	25	Black, porous, vugs with sediment & phosphorite minor red alteration
4				
5				
6				

D32-10 Tunes 6

Comments and XRD Mineralogy:

Subs

Substrate Description

Rock Type: Hyaloclastite Breccia greenish brown

Description: Poorly sorted amygdaloidal basalt clasts in a hyaloclastite matrix Impregnation of Mn oxide as cement

Biology (?):

Described by: JW

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: Tunes 6 Size (cm): 5.9 x 5.2 x 5 Location: Oma Vlinder ~~V2-91-CP~~

Sample Id: D32 - 11 Weight (kg): 0.21 Depth (m):

Mn Crust Description

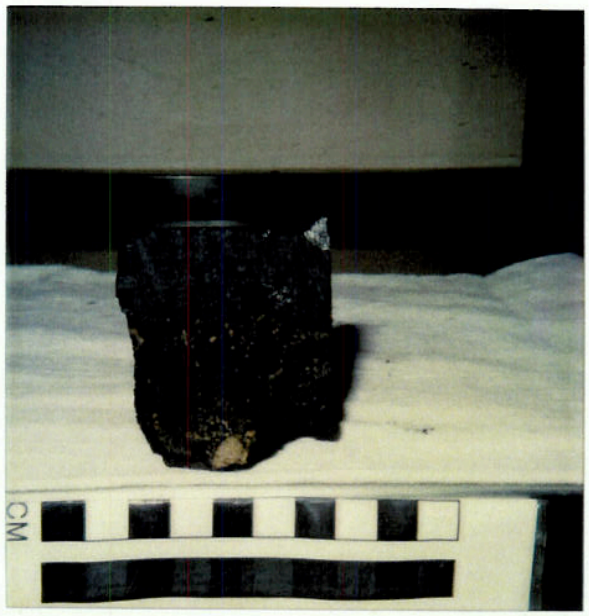
Surface Texture: Lizard Skin

Mn Crust Thickness (mm):

Min: 35 Max: 49 Ave: 43

Outer to Inner Layers (mm)

	Min	Max	Ave	Texture & Color
1	20	54	22	Black, dense to slightly porous some fractures
2				
3	15	25	21	Black, porous, vugs with sediment minor Fe stains
4				
5				
6				



D32 - 11 Tunes 6

Comments and XRD Mineralogy:

Subsa

10

or

some

Substrate Description

Rock Type: Hyaloclastite Breccia

Yellowish Brown

Description: Poorly sorted Vesicular basalt clasts in a hyaloclastite matrix some Mn oxide impregnation

Biology (?):

Described by: JW

Subsampled by: