SAMPLE DESCRIPTION

Cruise Id: EJ-91-WP Size (cm): 24 x 17 x 8 Location: ~~V2-91-CP~~ N. Flanks of Caroline Ridge Graben

Sample Id: D3-11 Weight (kg): 7 Depth (m): 2400-1900

Mn Crust Description

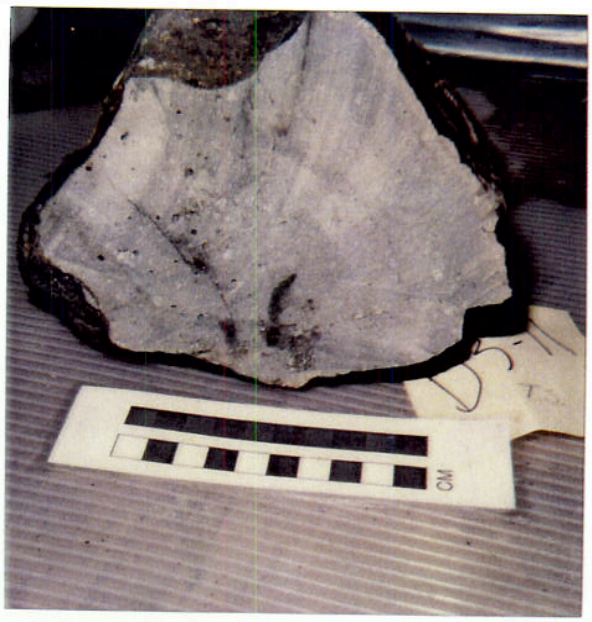
Surface Texture: Granular

Mn Crust Thickness (mm):

Min: < 1 Max: _____ Ave: _____

Outer to Inner Layers (mm)

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



D3-11

Comments and XRD Mineralogy:

Su

D3-11 TS
XRD

Substrate Description

Rock Type: Vesicular Basalt.

Description:

Glomeroporphyric pl + ol > px

1/4 to Koebi
3/4 to USGS

Biology (?): —

Described by: J. B. Park

Subsampled by:

HEIN

D3-11

20 pages

SAMPLE DESCRIPTION

Cruise Id: EW-91-WP Size (cm): 18 × 12 × ? Location: N. Flank of Caroline Ridge ~~V2-91-CP~~ Graben

Sample Id: D3-12 Weight (kg): 2.5 Depth (m): 2400 - 1900

Mn Crust Description

Surface Texture: Patina

Mn Crust Thickness (mm):

Min: <1 Max: _____ Ave: _____

Outer to Inner Layers (mm)

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

D3-12

Comments and XRD Mineralogy:

Subsampl

½ HORDT
½ USGS

Substrate Description

Rock Type: Basalt

Description: Dark gray.
outer part: Aphyric: (ol + pl)
inner part: pl >> ol - phyric
Some vesicles filled by ~~Chemical~~ Analcite, Calcite

Biology (?):

Described by: J. B. Park

Subsampled by:

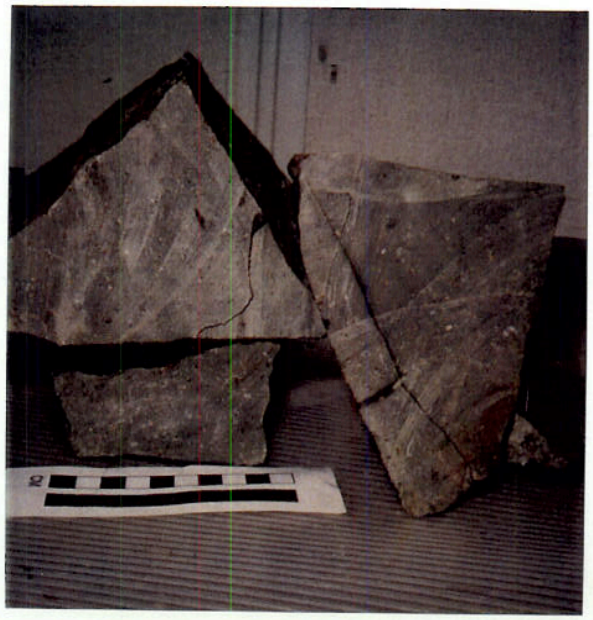
Fair Trough

SAMPLE DESCRIPTION

N. Flank of Carolina Ridge

Cruise Id: F7-91-WP Size (cm): 30 x 16 x 12 Location: [redacted] Graben

Sample Id: D3-13 Weight (kg): 8.5 Depth (m): 2400 - 1800



D3-13

Mn Crust Description

Surface Texture: Patina

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

Comments and XRD Mineralogy:

Sub

D3-13 TS

XRD

75% USGS

25% KORDI

Substrate Description

Rock Type: Basalt

Description: Medium grained.
about 2mm. ok (iddingsite >> pl + cpx(?))
- porphyric.
fractured along the outer margin

Biology (?): —

Described by: J. B. Paik

Subsampled by:

G.S.

SAMPLE DESCRIPTION

Cruise Id: FJ-91-WP Size (cm): ~4 x 10 x 10 Location: N. Flank [redacted] Caroline Ridge Grabs

Sample Id: D3-14 Weight (kg): 4.5 kg Depth (m): 2400-1900

Mn Crust Description

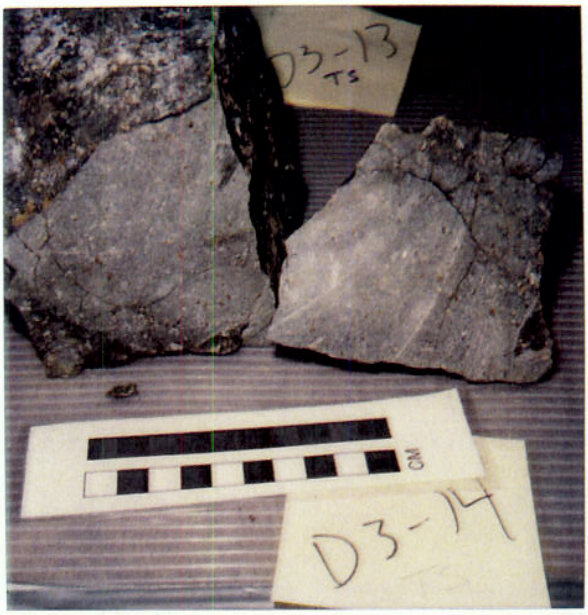
Surface Texture: Smooth

Mn Crust Thickness (mm):

Min: <1 Max: 8 Ave:

Outer to Inner Layers (mm)

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



D3-14

Comments and XRD Mineralogy:

Sub

D3-14 TS
XRD

75% USGS
25% NORDI

Substrate Description

Rock Type: Basalt

Description: medium-grained (ab. 2 mm)
ol >> pl – phyric.
holocrystalline
-fresh px. (or ol → partly altered)
slightly fractured

Biology (?): —

Described by: J. B. Park.

Subsampled by:

G.S.

SAMPLE DESCRIPTION

Cruise Id: FJ-91-WP Size (cm): 12 x 8 x 6 Location: ~~V2-91-CP~~ N. Flank of Caroline Ridge Graben.

Sample Id: D3-15 Weight (kg): 1 Depth (m): 2400 - 1900

Mn Crust Description

Surface Texture: Botryoidal

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D3-15

Comments and XRD Mineralogy:

Subs

Substrate Description

Rock Type: Basalt - diabase

½ USGS
½ HORDI

Description: medium grained aciculer Plagioclase + olivine Yellowish gray color, equigranular massive slightly altered.

Biology (?): —

Described by: J.B Park

Subsampled by:

SAMPLE DESCRIPTION

Fou's Trough

Cruise Id: FT-91-WP Size (cm): 14 x 12 x 3 Location: N. Flank of Caroline Ridge [redacted] Graben

Sample Id: D3-16 Weight (kg): 2.4 Depth (m): 2400 - 1900

Mn Crust Description

Surface Texture: Potato

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D3-16

Comments and XRD Mineralogy:

Subsa

Substrate Description

Rock Type: Basalt

Description: Massive fine-grained plagioclase-phyric sparsely distributed - (small vesicles (filled by 2nd. minerals) microcrystalline groundmass. slightly alteration

Biology (?):

Described by: J. P. Park

Subsampled by:

½ USGS
½ NORDI

Fais Trough

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 11 x 10 x 6 Location: N. Flank of Caroline Ridge Graben [redacted]

Sample Id: D3-17 Weight (kg): 7.5 Depth (m): 1100 - 1800

Mn Crust Description

Surface Texture: Petina

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D3-17

Comments and XRD Mineralogy:

Subsa

Substrate Description

Rock Type: Vesicular Basalt

Description: Fine grained Plagioclase-phenos. randomly distributed. Some vesicles filled by sed. minerals and other oxidized and empty. Partly fractured.

Biology (?): —

½ KGRDI
½ U.S.G.S.

Described by: J.B. Park.

Subsampled by:

SAMPLE DESCRIPTION

Fais Trough
N. Flank of Caroline Ridge
Graben

Cruise Id: FM-91-WP Size (cm): 10x7x7 11x6x4 Location: ~~V3-91-NP~~

Sample Id: D3-18 Weight (kg): 0.8 Depth (m): 2400 - 1900

Mn Crust Description

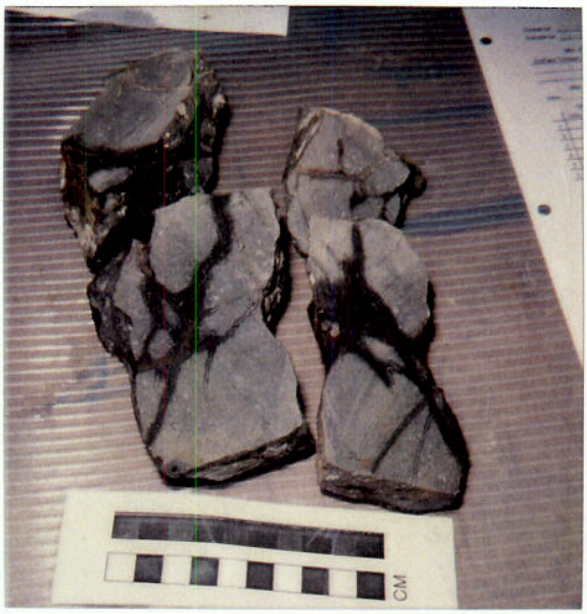
Surface Texture: Petina

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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



D3-18

Comments and XRD Mineralogy:

Subsamp

50% HORDI
50% USGS

Substrate Description

Rock Type: Basalt

Description: Fractured and vesicular
Plagioclase-phyric
slightly aphanitic.
fractures and vesicles filled by calcite.
about 1 mm carbonate crust.

Biology (?):

Described by: J. B. Park

Subsampled by:

SAMPLE DESCRIPTION

Fais Trough
N. Flank C.R.
Canada

Cruise Id: F7-91-WP Size (cm): 2x12x18 Location: ~~V2-91-GP~~

Sample Id: D3-19 Weight (kg): ~2.5kg Depth (m): 2900-1900

Mn Crust Description

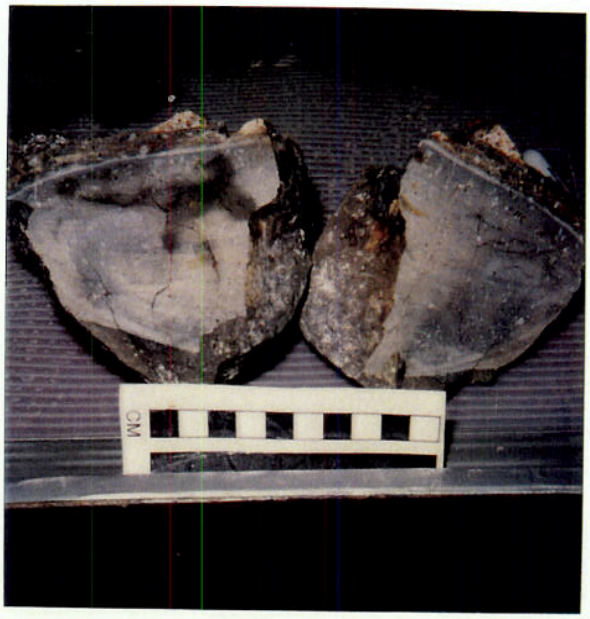
Surface Texture: Patchy
Patina

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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



D3-19

Comments and XRD Mineralogy:

Subsa

Substrate Description

Rock Type: Basalt

40% KORDT
60% 45GS

Description: 9-18mm highly altered glass rind
1mm - white alteration rind
Grey, aphanitic, moderatly
altered groundmass with
1-5mm plag. phenocrysts.

Biology (?): None

Described by: G.S.

Subsampled by:

SAMPLE DESCRIPTION

Fau Trough
N. Flank of Caroline Ridge

Cruise Id: EW-91-WP Size (cm): 17 x 10 x 7 Location: ~~W9-91-CP~~ Guahan

Sample Id: D3-20 Weight (kg): 1.5 Depth (m): 2400 - 1900

Mn Crust Description

Surface Texture: Patina

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D3-20

Comments and XRD Mineralogy:

Subsar

Substrate Description

Rock Type: Basalt.

50% HORD1
50% HORD1

Description: Massive
Aphyric, fresh olivine, acicular plag - Fresh
oxidized part along the fracture

Biology (?): —

Described by: J-B. Park

Subsampled by:

D3-20

SAMPLE DESCRIPTION

Fais Trough
N. Flank Caroline Ridge
Graben

Cruise Id: F7-91-WP Size (cm): 8 x 9 x 14 Location: [redacted]

Sample Id: D3-21 Weight (kg): ~2.5 Kg Depth (m): 2400 - 1900

D3-21

Mn Crust Description

Surface Texture: Patina

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

Comments and XRD Mineralogy:

Subs

½ KORDI
½ USGS

Substrate Description

Rock Type: Basalt

Description: aphanetic ground mass with plagioclase phenocrysts 1-2mm. Fresh 10-13mm alteration rind

Biology (?):

Described by: JS

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 7x11x12 Location: ~~F7-91-CR~~ Fais Trough

Sample Id: D3-22 Weight (kg): ~1Kg Depth (m): 2400-1900

Mn Crust Description

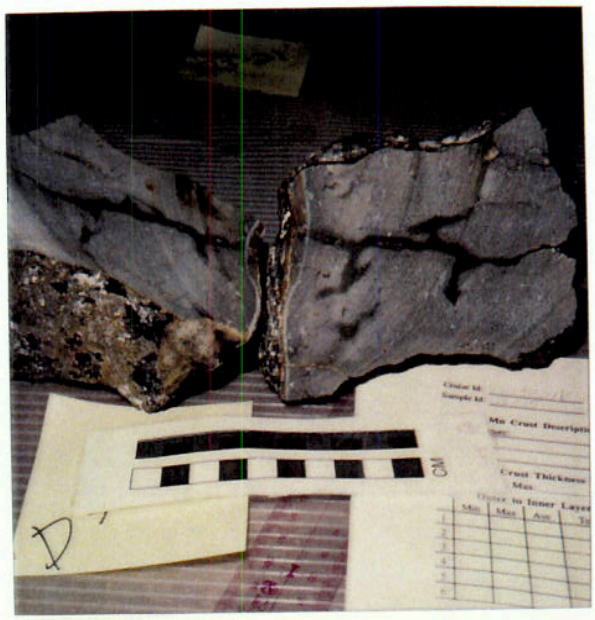
Surface Texture: eroded Patina

Mn Crust Thickness (mm):

Min:_____ Max: Patina Ave:_____

Outer to Inner Layers (mm)

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



D3-22

Comments and XRD Mineralogy:

Subs

Substrate Description

Rock Type: Pillow Basalt

½ KORDI
½ USGS

Description: Dark grey altered basalt, 2-5mm glass Rind 1mm white alteration Rim. 30mm Aphanetic layer with Plagio clase crystals - some weathered out center fine grained with 1mm plag. pheno crysts

Calcite lining fractures

Biology (?): None

Described by: GS.

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: F7-91-CJP Size (cm): ~100 Dibbles Location: ~~V2-91-CP~~ N. Flank of Caroline Ridge Graben

Sample Id: D3-2.3 Weight (kg): ~7 Kg Depth (m): 2400-1900

Mn Crust Description

Surface Texture: Patina

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

NO photo

Comments and XRD Mineralogy:

Analyses

Subsample No.	Analysis	Layer Thick.	Wt.(g)

Uncut

2/3 USGS

1/3 KORDI

Substrate Description

Rock Type: Misc. Basalt + Glass Rind Pieces

Description:

Biology (?):

Described by: J. S.

Subsampled by:

Fois Trough

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 220 Pebbles & small cobbles Location: N. Mank Caroline Graben [redacted]

Sample Id: D3-24 Weight (kg): 7 Kg Depth (m): 2400 - 1900

Mn Crust Description

Surface Texture: Patchy
granular
Patina

D3-24

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

Comments and XRD Mineralogy:

Subsa

Substrate Description

Rock Type: Pillow Basalt Frag
pebbles

½ KORDI
½ USGS

Description: Fine grain grey
groundmass. Varying degrees
to aphanitic of alteration
w/ minor plagioclase phenocrysts
Calcite vesicle fill.

Biology (?): None

Described by: [signature]

Subsampled by:

Fair Trout

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): med to large pebbles Location: ~~W2-91-CP~~ N. Flank of Caroline Ridge Graben

Sample Id: D3-25 Weight (kg): 3 kg Depth (m): 2400 - 1900

Mn Crust Description

Surface Texture: Patina

Mn Crust Thickness (mm):

Min:_____ Max: Patina Ave:_____

Outer to Inner Layers (mm)

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

D3.25

Comments and XRD Mineralogy:

Subs

Substrate Description

½ USGS
½ KORDI

Rock Type: Pillow Basalt fragments

Description: Fine grain Grey to Brown groundmass
alteration varies from slight
to highly altered. - some plag phyric
Calcite vesicle fill.
Alteration along fractures. Few 1-2cm plag. Phenocrysts.

Biology (?):

Described by: G.S.

Subsampled by:

Fais Trough

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 7 - Pebbles Location: [redacted] of Caroline Ridge Graben

Sample Id: D3-26 Weight (kg): ~ 2 Kg Depth (m): 2400 - 1900

Mn Crust Description

Surface Texture: Patina

Mn Crust Thickness (mm):

Min:_____ Max: Patina Ave:_____

Outer to Inner Layers (mm)

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

D3-26

Comments and XRD Mineralogy:

Subsa

Substrate Description

Rock Type: Pieces of Pillow Basalt

Description: fine grain crystalline ground mass with 1-3mm plagioclase phenocrysts - Fresh all Plag Phyric
Vesicle fill of calcite.
few alteration rims. some alteration along fractures

Biology (?): encrusting forams

Described by: G.S.

Subsampled by:

D3-26

SAMPLE DESCRIPTION

N Flank of [illegible]

Cruise Id: F7-91-WP Size (cm): Large to small Pebbles to Cobbles Location: ~~V2-91-CP~~

Sample Id: D3-27 Weight (kg): ~18 kg Depth (m): 2100-1900

Mn Crust Description

Surface Texture: Patina - eroded

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D3-27 out pieces

More Polar on Back

Comments and XRD Mineralogy:

Su

D3-27-1 XRD, Paleo
D3-27-2 XRD, Paleo
D3-27-3 XRD, Paleo
-3 OC 1987 gm.
Paleo ~10 gm
XRD

2A = Soft green Pait
2B = Hard white lenses

D3-27-4 TS - Sandstone
XRD
Also greenish-brown Tuffaceous siltstone-mudstone
everything Extensively bioturbated

Substrate Description

Rock Type: Carbonate Bioturbated siltstone To Tuffaceous mudstone

Description: yellowish tan to Brown siltstone Remanent bedding that has been heavely bioturbated + bored. Fractures + borings lined with manganese dendrites

Biology (?): None

Described by: G.S.

Subsampled by: HEIN G.S.

#2

D3-27-2

NOT so yellow!

D3-27

whole sample

#1 D3-27