Dredge 8

Sample Description

Cruise I.D: L5-83-HW

Sample I.D: Sta: D8-A1

Location: Necker Ridge

Size: 18x12x8cm Weight: ≈750g

Mn crust thickness:

Total: min: max: ave: 2.5cm

Inner crust: min: max: ave:

Outer crust: min: max: ave:

Surface texture: Porous

Internal structure:

layered:
laminated:
massive: ✓
porous:
dendritic:
other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Mudstone

Description: Tan to green laminated mudstone speckled w/ Mn

Mineralogy (XRD):

L5-83-HW
D8-A1

Analyses and subsamples:

analysis:	analyst:
XRD	C. Daniel
D8-A1-I-bulk crust	
D8-A1-II-bulk substrate	

Sample Description

Cruise I.D: L5-83-HW

Sample I.D: Sta: 12 D 8 A2

Location: Necker Ridge

Size: 28x8x9 cm Weight: ~3½ lbs.

Depth: 4500 – 4800 m

Mn crust thickness:

Total: min: 0.3cm max: 1.8cm ave: ~1 cm

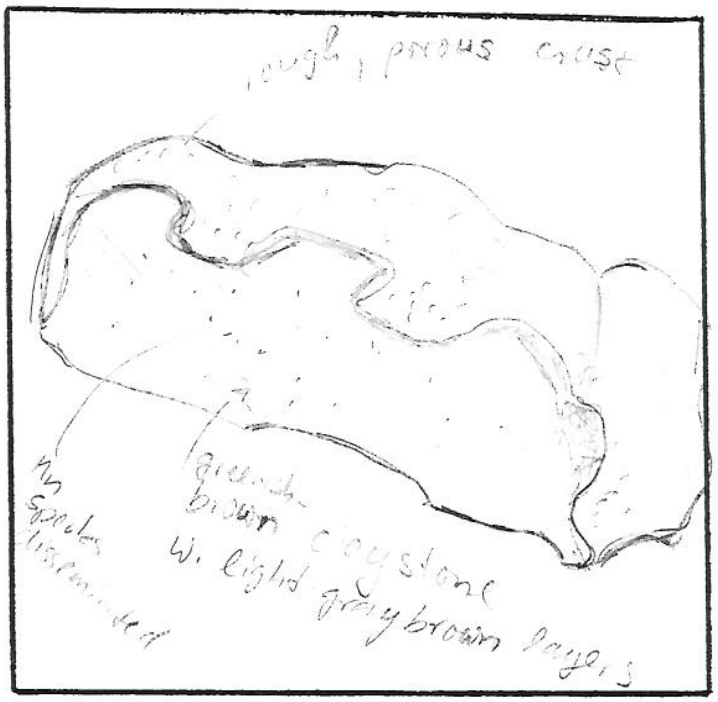
Inner crust: min: 0.1 max: 1cm ave: 0.3cm

Outer crust: min: 0.3 max: 1cm ave: 0.5cm

Surface texture: rough + porous almost clinkery in places

Internal structure:

layered:
laminated: ✓ faint in inner crust
massive: ✓ inner crust
porous: ✓ outer crust
dendritic:
other:



Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: claystone

Description: greenish-brown soft claystone w. lighter gray-brown layers (~3mm to 0.5cm) black Mn specks disseminated throughout – also white specks → fungus?

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:
organic matter geochem.	Bill Orem 3/23/
XRD:	C. David
I: substrate	
Chemistry-substrate	
Density	

Sample Description

Cruise I.D: L5-83-HW

Sample I.D: Sta: D8-A3

Location: Necker Ridge

Size: 24x3x5cm Weight: 1.7 Kg

Mn crust thickness:

Total: min: max: ave: 4mm

Inner crust: min: max: ave:

Outer crust: min: max: ave:

Surface texture: Botryoidal - porous

Internal structure:

layered:
laminated:
massive:
porous: ✓
dendritic:
other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Claystone

Description: Tan claystone speckled w/ Mn. Frozen phosphorite layer between crust & substrate

Mineralogy (XRD):

L5-83-HW
D8-A3

Analyses and subsamples:

analysis:	analyst:

Sample Description

Cruise I.D: L5-83-HW

Sample I.D: Sta: D8-A4-1

Location: Naker Ridge

Size: 2x4x8cm Weight: 250g

Mn crust thickness:

Total: min: 6mm max: 6mm ave: 6mm

Inner crust: min: max: ave:

Outer crust: min: max: ave:

Surface texture:

Internal structure:

layered:
laminated:
massive:
porous:
dendritic:
other:

Mineralogy (XRD):

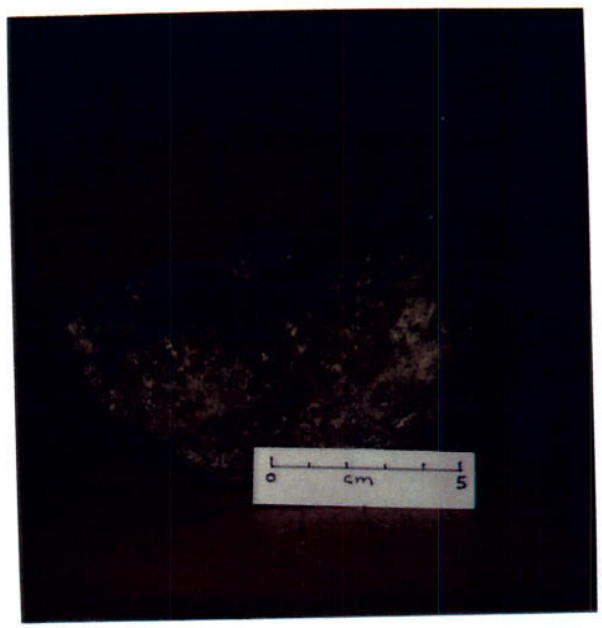
Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Claystone

Description: Tan to green claystone w/ brown cup sediment coating on one side of Mn

Mineralogy (XRD):



L5-83-HW

D8-A4-1

Analyses and subsamples:

analysis:	analyst:

Sample Description

Cruise I.D: L5-83-HW **Sample I.D: Sta:** D8-A4-2 **Location:** Necker Ridge

Size: 3.5x6x2cm 6.5x5x3cm **Weight:** ~400g

2 NODULES

Mn crust thickness:

Total: min: 10mm max: 12mm ave: 10mm

Inner crust: min: 8mm max: 8mm ave: 8mm

Outer crust: min: 2mm max: 4mm ave: 3mm

Surface texture: Smooth + porous

Internal structure:

layered: ✓ 2
laminated: ✓ Inner
massive:
porous: ✓ outer
dendritic:
other:

L5-83-HW
D8-A4-2

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: ? Phosphorite or Siltstone ^ Breccia ? Basalt

Description: Cream colored well indurated siltstone? or phosphorite w/ Mn clasts, ≈ 4.5 x 18cm
Gray sub-rounded basalt clast w/ altered orange phenocrysts of ?? & needles of plagioclase? Clast is rimmed w/ Mn & is ≈ 2.5 x 1cm w/ 2 smaller identical clasts < 1cm

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:
Doubly Polished Thin Section	by Mann Petro

LS-83-HW
D8-A4-2

LS-83-HW
D8-A4-2

Sample Description

Cruise I.D: L5-83-HW

Sample I.D: Sta: D8-A4-3

Location: Necker Ridge

Size: 8x8x3.5cm Weight: ≈400g

Mn crust thickness:

Total: min: max: ave: 3.5cm

Inner crust: min: max: ave: 2.4cm

Outer crust: min: max: ave: 1.1cm

Surface texture: Smooth & porous

Internal structure:

layered: ✓ ?

laminated: ✓ inner

massive:

porous: ✓ outer ? w/tan mud & Fe oxides

dendritic:

other:

L5-83-HW
D8-A4-3

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Basalt ?

Description: One basalt crust (3cm) w/altered orange phenocrysts ? one end of ? is phosphatized

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:
XRD:	C. Daniel
D8-A4-3-I - outer Mn (0-1.1cm)	
II - inner Mn (1.1-2.4cm)	
III - bulk substrate	

Sample Description

Cruise I.D: L5-83-HW

Sample I.D: Sta: D8-A4-4

Location: [illegible] Ridge

Size: 11x9x5cm Weight: 7.[illegible]kg

Mn crust thickness:

Total: min: 1.2 max: 1.7 ave: 1.5cm

Inner crust: min: .7 max: 1.2 ave: 1 cm

Outer crust: min: .3 max: .5 ave: .4cm

Surface texture: porous

Internal structure:

layered: ✓ ?

laminated: ✓ inner

massive:

porous: ✓ outer

dendritic:

other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Claystone in Mn nodule

Description: Orange-brown compact claystone speckled w/Mn

Mineralogy (XRD):

L5-83-HW

D8-A4-4

Analyses and subsamples:

analysis:	analyst:
XRD:	C. Daniel
D8-A4-4-I outer Mn (0-.5cm)	
-II inner Mn (.5-1.7cm)	
-III bulk substrate	

Sample Description

Cruise I.D: L5-83-HW Sample I.D: Sta: D8-A4-5 Location: Hecker Ridge

Size: 11x11x4cm Weight: 400g

Mn crust thickness:

Total: min: 3mm max: 14mm ave: 9mm

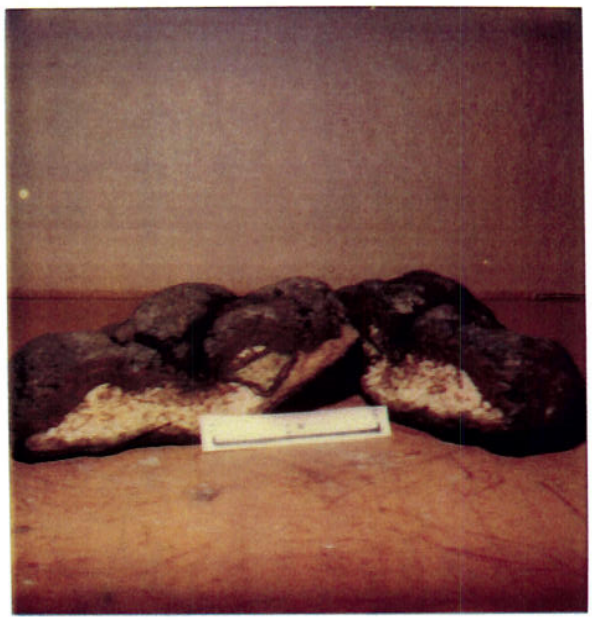
Inner crust: min: max: ave: 6mm

Outer crust: min: max: ave: 3mm

Surface texture: Botryoidal & porous

Internal structure:

layered: ✓ ?
laminated:
massive: ✓ inner
porous: ✓ outer
dendritic:
other: phosphorite layer btw. inner & outer



L5-83-HW
D8-A4-5

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Siltstone ? or Mudstone

Description: Tan to brown well indurated bioturbated siltstone ? speckled w/ Mn ≤ 10x1cm. Also one small 1.5cm cyst of altered, granular ? sandstone ?

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:

Sample Description

Cruise I.D: L5-83-HW

Sample I.D: Sta: D8-A4-6

Location: Necker Ridge

Size: 7x7x4cm Weight: 200g

Mn crust thickness:

Total: min: 5mm max: 6mm ave: 6mm

Inner crust: min: max: ave:

Outer crust: min: max: ave:

Surface texture: porous

Internal structure:

layered:
laminated:
massive:
porous: ✓
dendritic:
other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Siltstone or Mudstone

Description: Tan to brown well indurated bioturbated siltstone w/ burrows filled w/ Mn

Mineralogy (XRD):

L5-83-HW
D8-A4-6

Analyses and subsamples:

analysis:	analyst:
XRD-composite Mn	Rosemary ?

Sample Description

Cruise I.D: L5-83-HW **Sample I.D: Sta:** D 8-A4-7 **Location:** Necker Ridge

Size: 1) 8x6x2cm 2 rocks **Weight:** ~ 50g 2) ≈ 250g

Mn crust thickness:

Total: min: 3mm max: 6mm ave: 5mm

Inner crust: min: ____ max: ____ ave: ____

Outer crust: min: ____ max: ____ ave: ____

Surface texture: Smooth & porous

Internal structure:

layered:
laminated:
massive: ✓
porous:
dendritic:
other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Siltstone

Description: Tan to brown well indurated (slightly phosphatized?), bioturbated siltstone speckled w/Mn Alsi brecciated "clasts" of siltstone

Mineralogy (XRD):

L5-83-HW
D8-A4-7

Analyses and subsamples:

analysis:	analyst:
Doubly Polished Thin Section	by Mann Petro
Gave 1 nodule to Holly Wagner	

Sample Description

Cruise I.D: L5-83-HW Sample I.D: Sta: D8-A4-8 Location: Necker Ridge

Size: 2 rocks 1) 10x5x4cm 2) 8x8x4 cm Weight: 1) 115g 2) 235g

Mn crust thickness:

Total: min: 2mm 6mm max: 4mm 12mm ave: 3mm 8mm

Inner crust: min: max: ave:

Outer crust: min: max: ave:

Surface texture: smooth & porous

Internal structure:

layered:
laminated:
massive:
porous: ✓
dendritic:
other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Siltstone or Mudstone — SAME AS D8-A4-7

Description:

Mineralogy (XRD):

L5-83-HW

D8-A4-8

Analyses and subsamples:

analysis:	analyst:

Sample Description

Cruise I.D: L5-83-HW Sample I.D: Sta: D8-A4-9 Location: Necker Ridge

2 rocks

Size: 1) 7.5x7.5x2cm 2) 5x7x2cm Weight: 1) 55g 2) 75g

Mn crust thickness:

Total: min: ____ max: ____ ave: 5mm

Inner crust: min: ____ max: ____ ave: ____

Outer crust: min: ____ max: ____ ave: ____

Surface texture: porous & slightly knobby

Internal structure: ____

layered: ____
laminated: ____
massive: ____
porous: ✓
dendritic: ____
other: ____

Mineralogy (XRD): ____

Associated alteration, phosphorite, or hydrothermal deposits: ____

Substratum:

Rock type: Siltstone

Description: [illegible] indurated [illegible] [illegible] indurated siltstone w/ worm tubes

Mineralogy (XRD): ____

L5-83-HW
D8-A4-9

Analyses and subsamples:

analysis:	analyst:

Sample Description

Cruise I.D: L5-83-HW **Sample I.D:** Sta: D8-A4-10 **Location:** Necker Ridge

2 rocks 1 cast 1 w/one 2 missing

Size: 5x7x1.5cm **Weight:** 140g 2) 65g

2) 9x7x1.5cm

Mn crust thickness:

Total: min: 2mm max: 4mm ave: 3mm

Inner crust: min: ____ max: ____ ave: ____

Outer crust: min: ____ max: ____ ave: ____

Surface texture: Porous & knobby

Internal structure:

layered:
laminated:
massive:
porous: ✓
dendritic:
other:

L5-83-HW
D8-A4-10

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Siltstone

Description: Cream colored well-indurated, bioturbated (filled w/Mn) siltstone

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:

Sample Description

Cruise I.D: L5-83-HW

Sample I.D: Sta: D 8-C

Location: Norfolk Ridge

Size: _____ Weight: _____

Mn crust thickness:

Total: min: _____ max: _____ ave: _____

Inner crust: min: _____ max: _____ ave: _____

Outer crust: min: _____ max: _____ ave: _____

Surface texture: _____

Internal structure: _____

layered: _____
laminated: _____
massive: _____
porous: _____
dendritic: _____
other: _____

Mineralogy (XRD): _____

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: _____

Description: _____

Mineralogy (XRD):

Bag of ~ 50 small nodules all < 4cm

Analyses and subsamples:

analysis:	analyst:
Some 3 nodules to Holly Wages	