Dredge 7

L5-83 HW
D7

D7-A1

Sample Description

Cruise I.D: L5-83-HW

Sample I.D: Sta: D 7-A1

Location: Necker Ridge

Size: 60x50x30 cm Weight: [illegible]

Mn crust thickness:

Total: min: max: ave: 1.5 cm

Inner crust: min: max: ave: [illegible]

Outer crust: min: max: ave: [illegible]

Surface texture: [illegible]

Internal structure:

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

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: ?

Description: [illegible] altered [illegible] [illegible]? sandy [illegible]??

Mineralogy (XRD):

See picture in photo section [illegible]

May 1998: crumbly, highly fractured 5 x 7 x 3.5 cm piece left, w/ several smaller, broken pcs ≈ 1 x 2 x 2 cm each

Analyses and subsamples:

analysis:	analyst:
1 piece 21x20x[illegible] to:	Bob Willard Minneapolis, Minn
1 piece to: for flotation separation	Don. G. Foot, Jr. Salt Lake City, Utah
1 piece	Lynn Ingram
Pt group (12/86)	Floyd Brown

Se Won Chang took subsample 10

May 1998 Sent pc. to Alex Halliday

want PIS [illegible] to substitute
want ~~to~~ endangered cust

[illegible] + polishes [illegible]
[illegible]

Chem - adjust sz cut to match rk
lg rk = larger column
sm rk = smaller column

uniform pc all the way down
or skew results

Sample Description

Cruise I.D: L5-83-HW

Sample I.D: Sta: D7-A2

Location: Necker Ridge

Size: 50X32X17cm Weight: 19Kg

Mn crust thickness:

Total: min: 3.5 max: 4cm ave: 3.8cm

Inner crust: min: max: ave:

Outer crust: min: max: ave:

Surface texture: [illegible]

Internal structure:

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

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

[illegible]

Substratum:

Rock type: Volc. Breccia

Description: Highly altered, red to brown volc. clasts, poorly sorted (1mm-5cm); loosely packed in an altered, yellow sandy [illegible] matrix

Mineralogy (XRD):

L5-83-HW

D7-A2

Analyses and subsamples:

analysis:	analyst: or sub-sampled by
end piece given to: 19X17X15cm	John Toth Analytical Services
piece to	A. Davis
REE (Denver) and CC (Reston) of Mn crust	Jung-Keuk Kang 6/8
I 0-3 mm 4 gm (CC)	Job # SW32 (REE
II 3-8 " 3 "	" # BZ89 (CC
III 8-16 " 6 "	
IV 16-26 " 5 "	
V 26-36 " 2 "	

from submittal sheet

Sample Description

Cruise I.D: L5-83-HW Sample I.D: Sta: D7-A3 Location: Necker Ridge

Size: 36x36x8 cm Weight: _____

Mn crust thickness:

Total: min: ____ max: ____ ave: 3.8 cm

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

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

Surface texture: smooth - slight botryoids

Internal structure: _____

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

Mineralogy (XRD): _____

Associated alteration, phosphorite, or hydrothermal deposits: _____

Substratum:

Rock type: Volc. breccia

Description: Highly altered red-orange, sub-rounded, poorly sorted (1mm-2cm) loosely packed volc. clasts in an altered yellow, zeolitized, silty sand matrix

Mineralogy (XRD): _____

Cut & broken up - pieces missing

L5-83-HW
D7-A3

Analyses and subsamples:

analysis:	analyst:
XRD:	C. Daniel
I: Substrate-composite	
II outer crust	
III inner crust	
Doubly Polished Thin Section	
Chemistry-substrate	
Density	

Sample Description

Cruise I.D: L5-83-HW

Sample I.D: Sta: D7-A5

Location: Necker Ridge

Size: [illegible] Weight: 3.62 Kg

now broken, [illegible]

Mn crust thickness:

Total: min: 1.5 max: 3cm ave: 2cm

Inner crust: min: max: ave:

Outer crust: min: max: ave:

Surface texture: Botryoidal abraded smooth

Internal structure:

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

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Fe oxides in Mn crust

Substratum:

Rock type: Volc. Breccia

Description: Highly altered yellow to brown to red orange sub-angular poorly sorted (1-10cm), tightly packed, volcanic clasts in a yellow, zeolitized silty sand matrix w/ pockets of tan, silty sediment, white, calcareous sediment.

Mineralogy (XRD):

D7-A5 L5-83-HW

Analyses and subsamples:

analysis:	analyst:

Sample Description

Cruise I.D: L5-83-HW Sample I.D: Sta: D7-A8-1 Location: Necker Ridge

Size: 15x10x5cm Weight: ≈300g

Mn crust thickness:

Total: min: 3 max: 4.5 ave: 4cm

Inner crust: min: 2 max: 2.5 ave: 2cm

Outer crust: min: 1 max: 1.5 ave: 1cm

Surface texture: Smooth Flat

Internal structure:

layered: ✓ ~4
laminated:
massive:
porous:
dendritic:
other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Red-orange Fe oxidized worm tube on crust

Substratum:

Rock type: NONE

Description:

Mineralogy (XRD):

L5-83-HW
D7-A8-1

Analyses and subsamples:

analysis:	analyst:
XRD:	Rosemary ?
inner	
outer	

Sample Description

Cruise I.D: L5-83-HW **Sample I.D: Sta:** D7-A8-2 **Location:** Necker Ridge

Size: [illegible] **Weight:** [illegible] kg

Mn crust thickness:

Total: min: 3cm max: 3.5cm ave: 3cm

Inner crust: min: 2.4cm max: 2.8cm ave: 2.6cm

Outer crust: min: 6mm max: 8mm ave: 7mm

Surface texture: Small botryoids - smooth

Internal structure:

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

L5-83-HW
D7-A8-2

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Fe oxides in crust

Substratum: small amount [illegible] thick

Rock type: volc. breccia

Description: Altered yellow-brown dessicated sub-rounded poorly sorted (1-4cm) closely packed volcanic clasts in a hard (zeolitized? & (or phosphatized) sandy matrix w/ white calcareous sediment on bottom

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:
Pt Group (12/86)	Floyd Brown
D7-A8-2A	
D7-A8-2B	

Sample Description

Cruise I.D: L5-83-HW

Sample I.D: Sta: D7-A8-3

Location: Necker Ridge

Size: 20x12x6cm Weight: [illegible] kg

Mn crust thickness:

Total: min: 3.2 max: 3.5 ave: 3.5cm

Inner crust: min: max: ave: 2.7cm

Outer crust: min: max: ave: 8mm

Surface texture: Smooth rounded

Internal structure:

layered: ✓ ?

laminated:

massive: ✓

porous: ✓

dendritic:

other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Fe oxides in crust

Substratum: [illegible]

Rock type: Volc. breccia?

Description: Altered subrounded yellow-brown poorly sorted volcanic? clasts in a hard white calcareous matrix. Thin white phosphate? lense between Mn crust? Substratum

Mineralogy (XRD):

L5-83-HW

D7-A8-3

Analyses and subsamples:

analysis:	analyst:

Sample Description

Cruise I.D: L5-83-HW Sample I.D: Sta: D7 A8-4 Location: Necker Ridge

Size: [illegible] Weight: _____

Mn crust thickness:

Total: min: 2.5 max: 4 ave: 2.5cm

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

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

Surface texture: Porous & smooth

Internal structure: _____

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

Mineralogy (XRD): _____

Associated alteration, phosphorite, or hydrothermal deposits:

Forams on crust

Substratum: [illegible]

Rock type: Volc. breccia

Description: Altered red to brown sub-rounded, poorly sorted (1-4cm) loosely packed volcanic clasts in a yellow-brown, well indurated sandy matrix speckled w/ Mn & small pockets of white phosphatic? material

Mineralogy (XRD): _____

L5-83-HW
D7-A8-4

Analyses and subsamples:

analysis:	analyst:
XRD	C. Daniel
D7-A8-4-I sfc. crust	
II 1.5-2.0 cm	
Doubly polished thin section	

Sample Description

Cruise I.D: L5-83-HW

Sample I.D: Sta: D 7-A8-5

Location: Necker

Size: 20x8x10cm Weight: 2.03 kg

missing! 9-24-85

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):

Analyses and subsamples:

analysis:	analyst:
2/3rx given to:	Buford Hall MMS 1 Golden Shore Suite 260 Long Beach, Ca. 90802

Sample Description

Cruise I.D: L5-83-HW Sample I.D: Sta: D7-A8-6 Location: Necker Ridge

Size: 21x16x6cm Weight: ~2.5kg

Mn crust thickness:

Total: min: ____ max: ____ ave: 3cm

Inner crust: min: ____ max: ____ ave: 2.5cm

Outer crust: min: ____ max: ____ ave: 0.5cm

Surface texture: Smooth

Internal structure: ____

layered: ✓ 2

laminated:

massive:

porous:

dendritic:

other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum: thin layer

Rock type: Volc. Breccia?

Description: Sub-rounded volcanic clasts coated w/ Mn cemented w/ phosphate

Mineralogy (XRD):

L5-83-HW

D7-A8-6

Analyses and subsamples:

analysis:	analyst:
XRD	C. Daniel
D7-A8-6-I bulk crust	
6-II bulk substrate	

Sample Description

Cruise I.D: L5-83-HW Sample I.D: Sta: D7 A8-7 Location: Necker Ridge

Size: 9X12X8cm Weight: ≈500g

Mn crust thickness:

Total: min: ____ max: ____ ave: 3.5cm

Inner crust: min: ____ max: ____ ave: 3cm

Outer crust: min: ____ max: ____ ave: 0.5cm

Surface texture: Smooth

Internal structure: ____

layered: ✓ in 4

laminated:

massive:

porous: ✓

dendritic:

other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Fe Oxide Staining

Substratum: thin layer

Rock type: Volc. Breccia

Description: One large (>6cm round) brown volc. clast with a few smaller ones loosely packed in a yellow, zeolitized, silty sand matrix

Mineralogy (XRD):

L5-83-HW

D7-A8-7

Analyses and subsamples:

analysis:	analyst:

Sample Description

Cruise I.D: L5-83-HW

Sample I.D: Sta: D7 A8-8

Location: Nectar Ridge

Size: 11x6x6cm Weight: ~250 g

Mn crust thickness:

Total: min: 3cm max: 5cm ave: 3.5cm

Inner crust: min: ____ max: ____ ave: 2cm

Outer crust: min: ____ max: ____ ave: 1.7cm

Surface texture: Smooth to porous

Internal structure: ____

layered: ✓ ~2-3

laminated:

massive: ✓

porous: ✓ columnar

dendritic:

other:

L5-83-HW

D7-A8-8

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum: very little

Rock type: Volc. breccia

Description: a few volc. clasts coated w/Mn & cemented w/an orange-brown silty sand sediment

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:

Sample Description

Cruise I.D: L5-83-HW Sample I.D: Sta: D7-A8-9 Location: Nector Ridge

2 pieces: 7x8x5cm

Size: 9x7x5cm Weight: ~500g

Same as D7-A8-4

Mn crust thickness:

Total: min: ____ max: ____ ave: 3.5cm

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

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

Surface texture: extremely porous

Internal structure: ____

layered: ____
laminated: ____
massive: ____
porous: / extremely
dendritic: ____
other: ____

Mineralogy (XRD): ____

Associated alteration, phosphorite, or hydrothermal deposits: ____

Substratum: same as D7-A8-4

Rock type: ____

Description: ____

Mineralogy (XRD): ____

L5-83-HW
D7-A8-9

Analyses and subsamples:

analysis:	analyst:

Sample Description

Cruise I.D: L5-83-HW Sample I.D: Sta: D7-A3-10 Location: Decker Ridge

Size: _____ Weight: ~1 kg

Mn crust thickness:

Total: min: ____ max: ____ ave: 3cm

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 small pieces of crust w/no substratum

Analyses and subsamples:

analysis:	analyst:

Sample Description

Cruise I.D: L5-83-HW Sample I.D: Sta: D7-A8-11 Location: Decker Ridge

Size: _____ Weight: 2 kg

Mn crust thickness:

Total: min: _____ max: _____ ave: 3cm

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

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

Surface texture: Smooth, porous, botryoidal

Internal structure: _____

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

Mineralogy (XRD): _____

Associated alteration, phosphorite, or hydrothermal deposits: _____

Substratum:

Rock type: Volc. breccia

Description: _____

Mineralogy (XRD): _____

Bag of small broken pieces of Mn crust w/ very little or no substratum

Analyses and subsamples:

analysis:	analyst:

Sample Description

Cruise I.D: L5-83-HW Sample I.D: Sta: D7-A8-12 Location: Decker Ridge

3 pieces: 12x8x6cm

Size: 13x9x5cm Weight: [illegible]

Mn crust thickness:

Total: min: ____ max: ____ ave: 1mm

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

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

Surface texture: [illegible]

Internal structure:

layered: ✓ 2

laminated:

massive:

porous: ✓

dendritic:

other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Volc. Breccia

Sample w/ thick crust has very little substratum

Description: Altered, dessicated, sub-rounded closely packed volc. clasts (1-4cm) in a yellow-orange silty sand & tan mud matrix

Mineralogy (XRD):

L5-83-HW

D7-A8-12

Analyses and subsamples:

analysis:	analyst:

Sample Description

Cruise I.D: L5-83-HW Sample I.D: Sta: D7-A8-13 Location: Necker Ridge

Size: [illegible] Weight: [illegible]

Mn crust thickness:

Total: min: ____ max: ____ ave: 2cm

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: Volc. Breccia
2 have no substratum

Description: One large volc. clast (8x5cm) w/ porous Mn on one side w/ red orange Fe oxide coating. Other 2 rocks have a white phosphorite layer between crust & breccia w/ extensive red orange Fe oxide staining on breccia.

Mineralogy (XRD): ____

L5-83-HW
D7-A8-13

Analyses and subsamples:

analysis:	analyst:

Sample Description

Cruise I.D: L5-83-HW

Sample I.D: Sta: D7-A8-14

Location: Necker Ridge

Size: Harrison Weight: 25000g

Mn crust thickness:

Total: min: max: 4.5 ave: 3cm

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: very little

Rock type: Vol. Breccia w/phosphate

Description:

Mineralogy (XRD):

L5-83-HW

D7-A8-14

Analyses and subsamples:

analysis:	analyst:

Sample Description

Cruise I.D: L5-83-HW

Sample I.D: Sta: D7-A8-15

Location: Necker Ridge

7 pieces

Size: 18x10x5cm (largest) Weight: 2.21kg

Mn crust thickness:

Total: min: max: ave: 3cm

Inner crust: min: max: ave:

Outer crust: min: max: ave:

Surface texture: rough & porous, botryoidal

Internal structure:

layered: ✓ ~2

laminated:

massive: ✓

porous: ✓

dendritic:

other:

L5-83-HW

D7-A8-15

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum: (not much substratum)

Rock type: volc breccia

Description: Highly altered yellow hyaloclastite? w/a few small (1-2cm) volc. clasts. The largest sample has thin layer of phosphate

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:
XRD:	C. Daniel
I: substratum	
II: porous crust (0-3cm)	
Chemistry - substrate	
Chemistry - bulk (of porous crust)	
Pt group (12/86)	Floyd Brown - Reston
Au analysis (12/86)	Dave McKown - Denver

Sample Description

Cruise I.D: L5-83-HW Sample I.D: Sta: D7-A8-16 Location: Nazca Ridge

Size: 5 pieces 4x8x4cm (largest) Weight: 2.5kg

Mn crust thickness:

Total: min: ___ max: ___ ave: 2cm

Inner crust: min: ___ max: ___ ave: ___

Outer crust: min: ___ max: ___ ave: ___

Surface texture: Smooth & Flat

Internal structure: ___

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

L5-83-HW
D7-A8-16

Mineralogy (XRD): ___

Associated alteration, phosphorite, or hydrothermal deposits: ___

Substratum:

Rock type: Lithified Talus Breccia

Description: Brown altered subrounded volcanic clasts (1-3cm) in a matrix of tan phosphate cement

Mineralogy (XRD): ___

Analyses and subsamples:

analysis:	analyst:

Sample Description

Cruise I.D: L5-83-HW **Sample I.D:** Sta: D 7-B1 **Location:** Necker Ridge

* **Size:** 23x10x10cm **Weight:** ≈ 500g

Already cut & piece taken

Mn crust thickness:

Total: min: 1.0 max: 2.3 ave: 1.8cm

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: Basalt to Volc. Breccia

Description: One half of rock is a gray-brown basalt "clast" w/ orange altered phenocrysts of olivine?? Other half is an altered yellow to orange subrounded fairly well sorted (1-3cm) closely packed volcanic breccia in a yellow zeolitized silty and calcareous sediment

Mineralogy (XRD):

LS-83-HW
D7-B1

Analyses and subsamples:

analysis:	analyst:
XRD	C Daniel
D7-B1-I bulk crust	
D7-B1-II bulk substrate	
Doubly Polished Thin Sec.	Mann Petrographic