Item ID Number	03977	☐ **Not Scanned**
Author		
Corporate Author		
Report/Article Title	Notes: Meeting at Flammability Research Center, Salt Lake City, Utah, September 11, 1978	
Journal/Book Title		
Year	1978	
Month/Day	September 11	
Color	☐	
Number of Images	39	
Descripton Notes	Items filed together in folder labeled, "NCBC/JI Chemical Data". Oversized graph labeled, "Eglin FLT Line Orange" was not scanned	

Flammability Research Center
Salt Lake City, UT
MEETING: 1330HR, 11 SEP 78

- Final Report - Methods, Corrected Data, Recovery, Replication, etc
- Contract Proposals
- Technical Report - Preparation
- Publications
  Slides of JI, GP

- SAFETY - Laboratory - Laboratory has primarily used 1,2,3,4-TCDD
- Human MONITORING - SMA-12 for McCLENNAN
  Prior to TCDD (2,3,7,8) Recoveries.

FY 79 Contract

PHASE I — FIXED PRICE CONTRACT

100 Samples x $400/sample --- $40,000
PER FY 78 Contract

PHASE II

Identification of UNKNOWNS via GC-MS
10 SAMPLES x $1000/sample --- $10,000

PHASE III

TCDD Decontamination Methods
via radiology & GC-MS

10 Samples x $1,000/sample --- $10,000

TOTAL CONTRACT $60,000

DEGRADATION STUDIES - PPM HERBICIDE

NUMBER	JUL 77	JAN 78
GP 1	306	1
GP 2	21	<1
GP 4	38	2
GP 5	25,000	22,503
GP 9	52	3
GP 10	64,500	22,360
JI 3	42,780	30,000
JI 9	12	6
JI 12	46,150	43,496

PENETRATION STUDY - PPM HERBICIDE

	DEPTH	
JI 46	0-15 cm	29,770
JI 47	15-30	460
JI 48	30-45	<2

SAMPLING

CODE	DESCRIPTION		REPLICATES
O/O	No oder	NO stain	14
L/L	Low oder	Light stain.	14
H/H	Strong oder	Heavy stain	14
			42

NCBC

JUL 77 (12)
JAN 78
NOV 78
AUG 79

JI

AUG 77 (12)
JAN 78
OCT 78
AUG 79

Me Hugh

1	0.32 ✓
5	< 0.001 ✓
10	0.042 ✓
16	0.50
17	0.51
19	0.13 ✓
20	0.001 ✓
22	0.002 ✓
24	0.002 ✓
26	0.011 ✓
27	0.13 ✓
30	0.24
37	0.008 ✓
41	0.23 ✓

.001
.001
.002
.002
.008
.011
.042
0.13
0.13
0.23
0.24
0.32
0.50
0.51

H/H Soils

GP = mean = 0.152

Range. .001 — 0.510

Median — 0.13

J I

5	0.034	
6	.006	(4)
9	0.022	(7)
10	0.230	
12	0.081	
28	0.0002	(1)
32	0.0007	(2)
35	0.008	(5)
36	0.015	(6)
37	0.074	
38	0.006	(3)
40	0.055	
41	0.085	
42	0.025	(8)

mean 0.046

Range 0.0002 — 0.23

Median 0.025

HERBICIDE PROJECT

11 SEP 78

SAMPLE RERUN

JI 2, 3, 14, 35, 36
GP 1, 17, 20, 27, 28 } FY78

FOR UNKNOWNS
GP 1
GP 10
GP 27

JI 3
JI 35 } FY79

HERBICIDE

COMPONENT ANALYSES

		PPM	PERCENT
GP # 1	DCP	ND	
	TCP	635	1%
	2,4-D	5,220	8.5%
	2,4,5-T	6,010	9.8%
	n-butyl 2,4-D	13,000	21.2%
	n-butyl 2,4,5-T	28,000	47.1%
	Unidentified	7,520	12.3%
GP # 5	DCP	ND	
	TCP	379	1.4%
	2,4-D	5640	20.4%
	2,4,5-T	15,500	56.0%
	n-butyl 2,4-D	293	1.1%
	N-butyl 2,4,5-T	1,070	3.9%
	Unidentified	4,780	17.3%
JI # 7	DCP	6	0.1%
	TCP	11	0.2%
	2,4-D	1490	36.1%
	2,4,5-T	1340	32.5%
	n-butyl 2,4-D	19	0.3%
	n-butyl 2,4,5-T	151	3.7%
	unidentified	1110	26.9%

NCBC

Width = $9 \times 50 = 450$ ∴ $450 \times 1{,}200 = \cancel{495{,}000\ ft^2}$ 540,000

$24 \times 50 = 1{,}200$

12.4 Acres = 5 ha

JI

$16 \times 50 = 800$

$= 480{,}000 =$

$12 \times 50 = 600$

11.02 Acres = 4.5 ha

CONTROL - 1 Dog =

PROJECT LOG

TCDD Research may want to be funded separately by AFLC/LO. An unsolicited Research proposal may be appropriate. Emphasize a developing technology and its potential application to an Air Force Problem. Mention experience in site monitoring program.

USAF OEHL can furnish HR of Support (?), small quantities of Herbicide Orange and activated charcoal.

SEND Dr Hughes copy of TR-AFATL-74-12, TR-AFATL-75-142, TR-USAFA-76-18, Duquway Documents, & TR-AFATL-75-49.

How much TCDD in each canister?
How much Charcoal in each canister?
Send Agent Chem Inc. Report

Address for AFLC/LO
Address for Don Harrison

Project Log

Young & Cairney

AFLC Test Range Complex, UT
11 Sep 78

Herbicide Orange Biodegradation Test Plots.

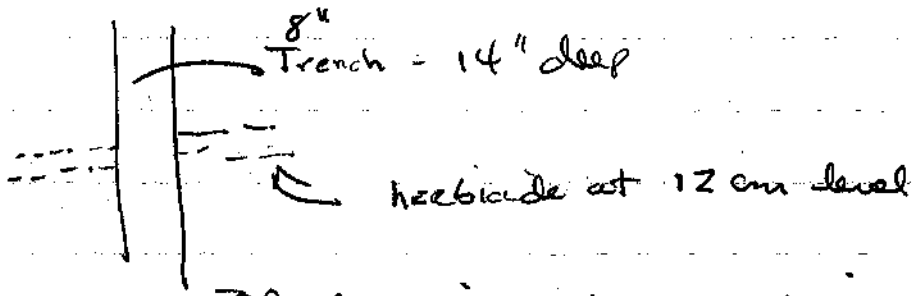
1. Vegetation was sparse and occurred only on the areas between rows of plots.

2. All the signs are still available and in good shape. Photographs were taken of all plots.

3. Four samples were collected from each plot.

2 from 0-15cm
2 from 15-30 cm.

4 samples × 6 plots = 24



Using a sniff technique, the herbicide was located in each trench. A section (2" x 6" x 1") was removed from the wall for each depth, uniformly mixed and subsampled for

AFLC PERSONNEL CENTER, UT

11 SEP.

Chief of Security - JOE Hood
Chief of Engineering Mr. Bingham
Commander of DET. 2

* Lt Col Robert L. Graetzel
Range Commander
DET 2, 2849 ABG/CC
AFLC TEST RANGE
Hill AFB, UT 84406

* Send consult to Col Graetzel on use of Herbicide Blue for Target maintenance - Halogeton and Kochia Control

LTR of Appreciation to
Lt Col Light AV 458-5501
for assistance of:

Excess Field Assistance

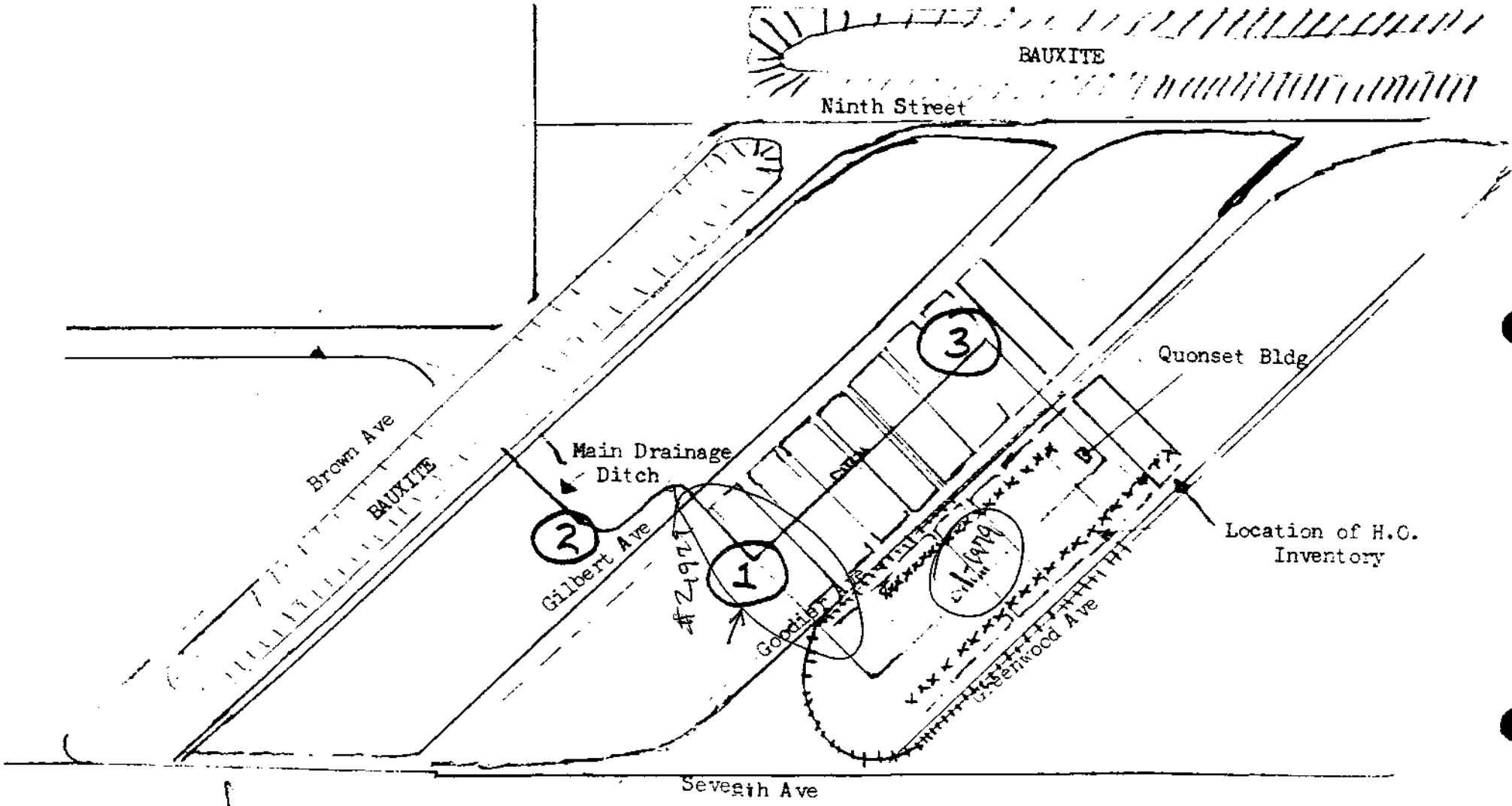
AIC Steven R. Allen
SSN 388-74-7320
2601 ST EOD
Hill AFB, UT 84406

GULFPORT

H/H

ID #	2,4-D ESTER + ACID	2,4,5-T ESTER + ACID
1	18220.0	34810.0
5	5933.0	16570.0
10	12260.0	10100.0
11 (16)	13,200 ~~7.7~~	31,260 ~~21.0~~
14 (19)	5,750 ~~1090.0~~	11,756.4 ~~3153.8~~
17	42,500.0	57500.0
20	18,000.0	49,440.0
24	17130.0	5,040.0
27	3058.0	3986.0
30	5130.0	12640.0
~~33~~ (31)	208.9 ~~5.1~~	700 ~~4.9~~
35 (22)	2503 ~~45.5~~	11,810 162.3
38 (26)	10,170 ~~1029.0~~	33,150 ~~5200.6~~
41	11520.0	14220.0
	18,970 ± 28,877	20,927 ± 17,464
Mean	~~9712.7~~	15203.4
Std. dev.	± ~~11738.1~~	± 18694.2

TCDD ~ 3 ppm for formulation



Jan 1976 BIOLOGICAL SAMPLES

	SITE 1	SITE 2	SITE 3
Snails	61.8 ppb	2.2	3.0
Tadpoles/fish	2.8	1.6	0.2
Crayfish	-	0.2	3.5

Insects from Storage Site = 0.14 ppb

Herbicide Orange Storage Site
Naval Construction Battalion Center
Gulfport MS

NCBC

	SNIFF			TEST		
	JAN 78		NOV 78	JAN 78		NOV 78
1	117	(77,000)	23	23 1	(7)	3
2	0	(10)	0	24 20	125,000	22
3	3	(6)	1	25 1	(25)	1
4	1	(11)	2	26 13	60,700	16
5	10	(33,900)	10	27 15	9,740	9
6	2	(22)	0	28 0	(9)	0
7	7	(3,240)	0	29 0	(252)	1
8	1	(7)	0	30 13	28,200	17
9	2	(5)	0	31 14	1,250	18
10 *	22	(85,800)	17	32 0	(30)	0
11	2	(46)	1	33 1	(19)	0
12	3	(7)	2	34 12	880	0
13	2	(45)	1	35 10	423	6
14	9	(5,960)	7	36 1	(163)	1
15	2	(22)	1	37 17	20,800	9
16	16	(63,900)	18	38 4	10,100	12
17	17	(137,000)	18	39 7	187	1
18	1	(142)	1	40 10	272	2
19	7	(24,200)	6	41 17	46,400	22
20	6	(90,000) acid	8	42 0	(11)	0
21	0	(16)	0			
22	11	20,800	16			

Rating	PPM (Total)
0 =	15
1-4 =	40
5-9 =	8700
10-14 =	18,000
15-19 =	59,000
20-24 =	105,000

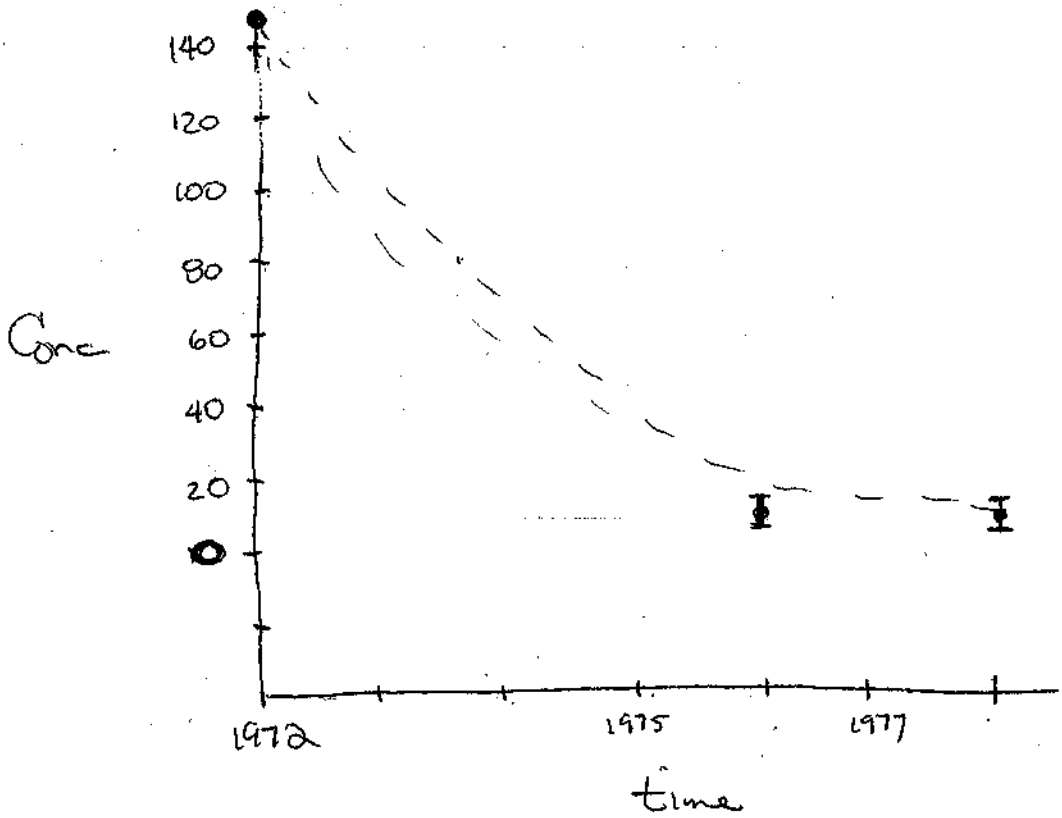
8 0 max 24
1 min 0
2
3

GULFPORT

L/L

ID #	2,4-D ESTER + ACID	2,4,5-T ESTER + ACID
3	0.0	0.6
7	437.5	944.7
8	0.2	0.5
9	0.3	0.21
13	6.0	7.3
~~14~~ → 11	7.7	21.0
~~16~~	~~13200.0~~	~~31260.0~~
→ 14	1090.0	3154
19	~~5250.0~~	~~11756.4~~ *
→ 35	46	162
22	~~2503.0~~	~~11810.0~~
→ 38	1079	5201
26	~~10170.0~~	33150.0 *
29	41.2	76.0
32	2.3	12.3
34	105.6	423.0
~~37~~ 31	209	700
	~~2760.0~~	~~8570.0~~
39	26.7	45.4
	400 ± 781	1,330 ± 2584
Mean	~~2500.2~~	~~7004~~.0
Std. dev.	± 4272.5	± 11574.3

	JI
5%	H/H
30%	L/L
65%	O/O



GULFPORT

O/O

ID #	2,4-D ESTER + ACID	2,4,5-T ESTER + ACID
2	0.6	0.4
4	0.1	0.8
6	2.5	6.6
12	0.6	0.3
15	0.7	4.4
18	83.6	0.5
21	0.9	5.9
23	0.2	0.12
25	10.4	0.5
28	0.4	0.51
31	33 ~~208.9~~ 5.1	~~700.0~~ 4.4
36	20.2	49.4
40	37.2	108.3
42	0.7	2.1
MEAN	26.2 (11.6)	62.8 (13.2)
Std. dev.	~~[illegible]~~ ±23.2	~~±185.8~~ ±30.2

Sample

GP 1	DCP	ND				
	TCP	635	1%			
	2,4-D	5220	8.5%	635	9.6%	635/600 = 10.6
	2,4,5-T	6,010	9.8	6010	90.4%	
	n-2,4-D	13,000	21.2	6,645		
	n-2,4,5-T	28,800	47.1			
	unidentified	7,520	12.3			
		61,185	99.9			

			PERCENT	
GP 5	DCP	ND		
	TCP	379	1.4	
	2,4-D	5640	20.4	
	2,4,5-T	15,500	56.0	379/15,500 = 2.4
	n-2,4-D	293	1.1	
	n-2,4,5-T	1,070	3.9	
	unidentified	4,780	17.3	
		27,662	100.1	

11. 0.8 - TCP / 4.3 = 18.6%

4/27

A-1

A-6 — 25,34

A-7 — 40

8 — <4] ←

11 — ~50 ± 20%

12

13 — 1.5 ppb Turtle

14

15

16 — 500 ppb

20

21

80

Cover Ltr - Soil levels - ?

1 Doc -
Det. 10, A
GAO -
AF/SG
24 NOV - Advance copy
OSD - 21 Dec with GAO
to present.
Mr George Sobers

Degradation Studies 2,4-D + 2,4,5-T

Johnston Island & Gulfport

#	28 Jul 77	#	15 Jan 78
GP #[illegible]	21 ppm	#2	<1
GP #44	37.6	#4	1.5
GP #45	52	#9	2.5
GP #46	306	#1	1.0
GP #47	37,220		
GP #48	43,970		
GP #49	25,630		
GP #50	117,800		
JI 46	29,990 ⟷	#9	42,780
JI 49	11.6	#3	5.8
JI 50	46,150	#12	43,496

Penetration Study - Johnson Island

JI 46	0 - 15 cm	29,779 ppm
JI 47	15 - 30 cm	460 ppm
JI 48	30 - 45 cm	<2 ppm

SOIL SAMPLES
HERBICIDE ORANGE STORAGE SITE
NCBC, Gulfport, MS
28 JULY 1977

CAPT YOUNG
KELLY AFB, TX
Phone: 925-6157

KEY. 1 - 12: Sample number

000 - 360: Compass heading, degrees, taken at storage site center point.

O/O, L/L, H/H: Refers to a subjective evaluation of the stain and herbicide odor present at the site where each sample was collected. (O/O = no stain and no odor; L/L = light stain and slight odor; H/H = dark stain and heavy odor.

SITE DESCRIPTION: Sample site characteristics

A = Asphalt
B = Ditch Bottom
C = Oyster Shells
D = Ditch bank
H = Hardpan
G = Gravelly
S = Sandy
V = Vegetation

117 - 750: Number of Feet in the specified direction to the area where the sample was collected.

NCBC SOIL SAMPLES

28 JULY 1977

SAMPLE NUMBER	CODE	DEPTH OF SAMPLE (cm)
1	1, 010, H/H, C, 160	0-5
2	2, 042, O/O, S, B, 117	0-5
3	3, 074, L/L, S, H, 160	0-2
4	4, 135, O/O, C, 117	0-5
5	5, 158, H/H, S, H, 216	0-5
6	6, 164, O/O, S, H, 180	0-5
7	7, 180, L/L, C, 255	0-5
8	8, 194, L/L, S, G, 294	0-2 —
9	9, 240, L/L, S, B, 435	0-5
10	10, 340, H/H, S, G, 210	0-5
11	11, 033, H/H, S, H, 168	0-1.5 —
12 Control →	12, 050, O/O, S, V, 750	0-5

HERBICIDE STORAGE SITE RECLAMATION PROJECT
NCBC, GULFPORT, MS
28 July 1977

On 25 July 1977 The ~~following~~ Twelve soil samples were collected from the site previously used for the storage of Herbicide Orange. The herbicide was removed in late Jun 1977. Those portions of the site where obvious herbicide spills had occurred received an approximate 5-cm layer of oyster shells. In general, the site was characterized by a thin-layer (2 - 15cm) of sandy to sandy gravel soil on a synthetic hardpan (constructed during world war II). The banks of the drainage ditches used to channel rain water from the storage site had been stabilized by thin asphalt coating.

SOIL SAMPLES
HERBICIDE ORANGE STORAGE SITE
NCBC, Gulfport, MS
28 JULY 1977

CAPT YOUNG
KELLY AFB, TX
Phone: 925-6157

KEY. 1 - 12: Sample number

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O/O, L/L, H/H: Refers to a subjective evaluation of the stain and herbicide odor present at the site where each sample was collected (O/O = no stain and no odor; L/L = light stain and slight odor; H/H = dark stain and heavy odor.

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A = Asphalt
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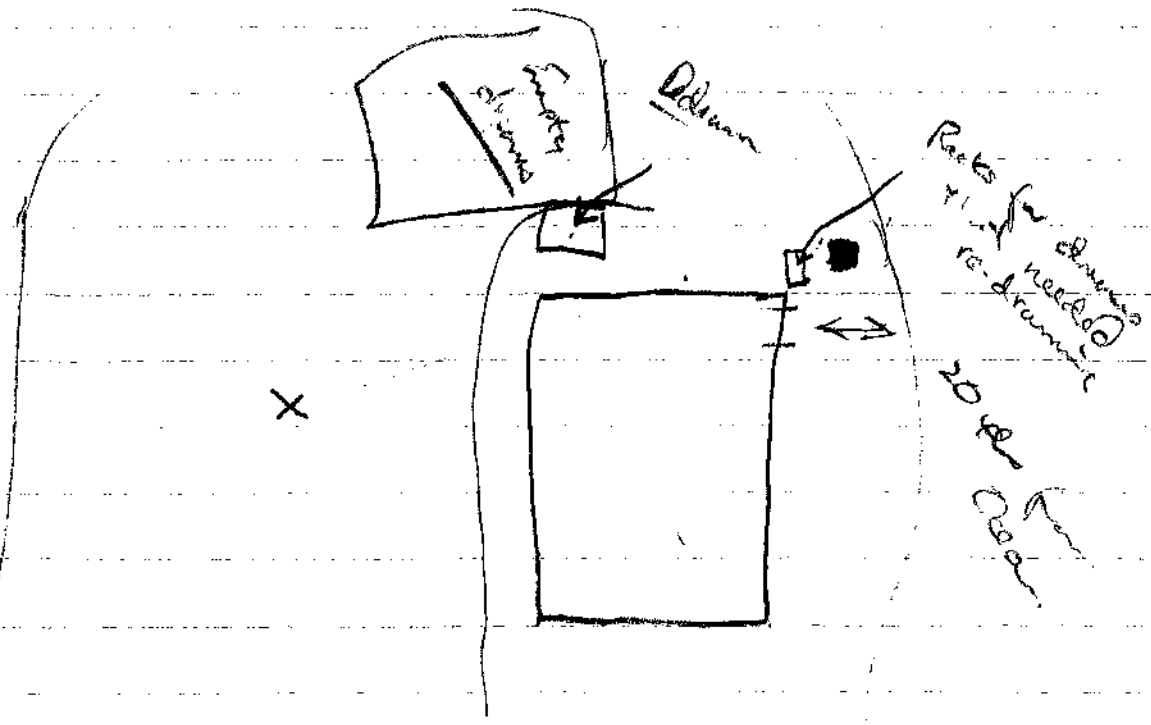
C = Oyster Shells
D = Ditch bank
H = Hardpan
G = Gravelly
S = Sandy
V = Vegetation

117 - 750: Number of Feet in the specified direction to the area where the sample was collected.

Sampling Johnston Island for Residue Study



1 control
2 Samples near dedrum operation
9 Samples from monitoring area

4 O/O (includes 1 control)
4 L/L
4 H/H

2oz Jar

2,4-D, 2,4,5-T (acid & esters)
Di- & Tri-chlorophenol
Microbial Analysis — (separate - send to William J. Carney USAMRDC)
TCDD Analysis

AV 259-2720

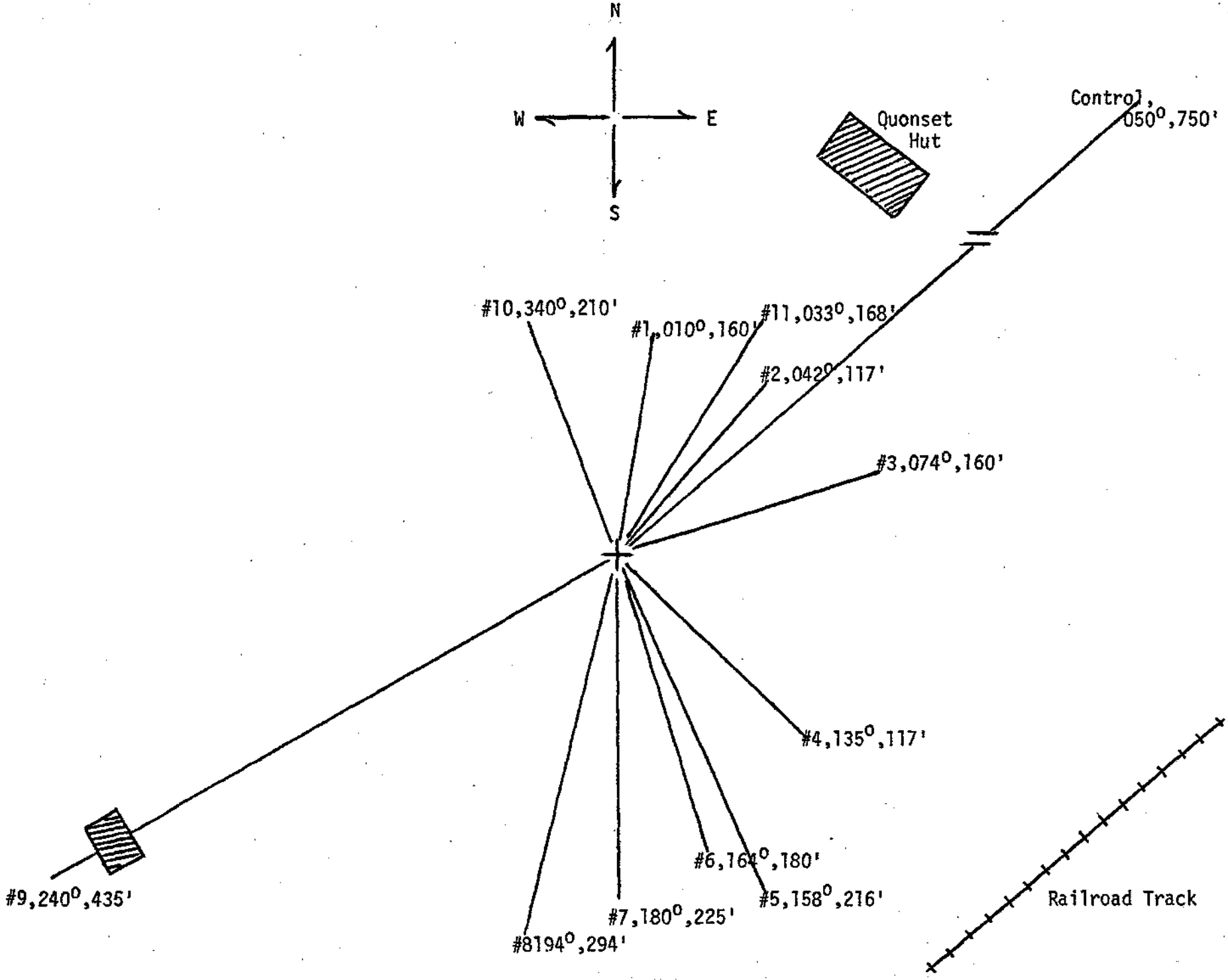


Figure 1. Soil Sampling Sites for Study of Herbicide Orange and TCDD Degradation, NCBC, Gulfport MS, 28 July 1977.

2 Aug 78

Univ of Nebraska

	PPB		50%	5 · 20%
#1	1.6 ppb	---	1.1	20%
2	87 ppt	---	26	80%
3	104 ppt	---	<120	50%
4	57 ppt		8.8	60%
5	<240 ppt		39	50%
6	<100	---	—	
7	<50	ND	9.4 ppt	75%
8	<250	ND	25.3 ppt	68%
9	<76		21 ppt	50%
10	440 ppt		207	65
#12	610 ppt		750 ppt	65
#13	110 ppt		150 ppt	35%

11.

Biological Samples

David Miller
Jack Lay
David Hilker

Phil De Lyon
Natural

0.9
1.6

Utah Data

5 Nov 76.

	Plots 1/2	Plots 3/4	Plots 5/6
0-6	650	1600	6600
6-12	11	90	200
12-18			14

23 Jun 75

	1/2		
0-6	4400/5100 (5100)	5000/5800 (5400)	11000/9200 (10,100)
6-12			
12-18			

Eglin data

19/20 280 Plots 5/6 0-6

350 mean

630 = 315 ppt

18 ND (8) ppt 6-12

18 NOV 76

22/24 = 380 Plots 9/10

350

730 = 365 ppt.

23 0-6

ND (9) 6-12

NOV 76

#21 Plots 7

120 ppt

19-12 [26 NOV 1976]

	1000 lb/A	2440 lb/A FCDO	4,000 lb/A	
HILL	650 ppt	1600 ppt	6,600 ppt	0-6
	11 ppt	90 ppt	200 ppt	6-12
			14 ppt	12-18

EGLIN

		280	0-6
		N.D. (8 ppt)	
		N.D. (6 ppt)	

WSU ANALYSIS NOV. 15-1975 to 76

Plot 5 0-6", 24 NOV 74 — 2,304
Plot 5 0-6", 23 JUN 75 — 1,078 (?)
Plot 5, 0-6", 24 NOV 75 — 3,492

ROUTING AND TRANSMITTAL SLIP

		ACTION
1 TO *(Name, office symbol or location)*	INITIALS	CIRCULATE
	DATE	COORDINATION
2	INITIALS	FILE
	DATE	INFORMATION
3	INITIALS	NOTE AND RETURN
	DATE	PER CONVERSATION
4	INITIALS	SEE ME
	DATE	SIGNATURE

REMARKS

AV

Do NOT use this form as a RECORD of approvals, concurrences, disapprovals, clearances, and similar actions.

FROM *(Name, office symbol or location)*	DATE
	PHONE

OPTIONAL FORM 41
AUGUST 1967
GSA FPMR (41CFR) 101-11.206

★GPO : 1970 O - 404-300 5041-101

#27	Plot 1	0-6	23 Jun 75	4,400	
#6		0-6	5 NOV 76	650 ppt	
#29	Plot 2	0-6	23 Jun 75	5,800	
#6		0-6	5 NOV 76	650 ppt	
#31	Plot 3	0-6	23 June 75	5,000	5,400
#6			5 NOV 76	1,600	1,600
#33	Plot 4	0-6	23 Jun 75	5,800	
				1,600	
#35	Plot 5	0-6	23 June 75	14,000 ppt	1975
					11,600
#137	Plot 6	0-6	23 Jun 75	9,300	7,000 1976
			5 NOV 76		

1975

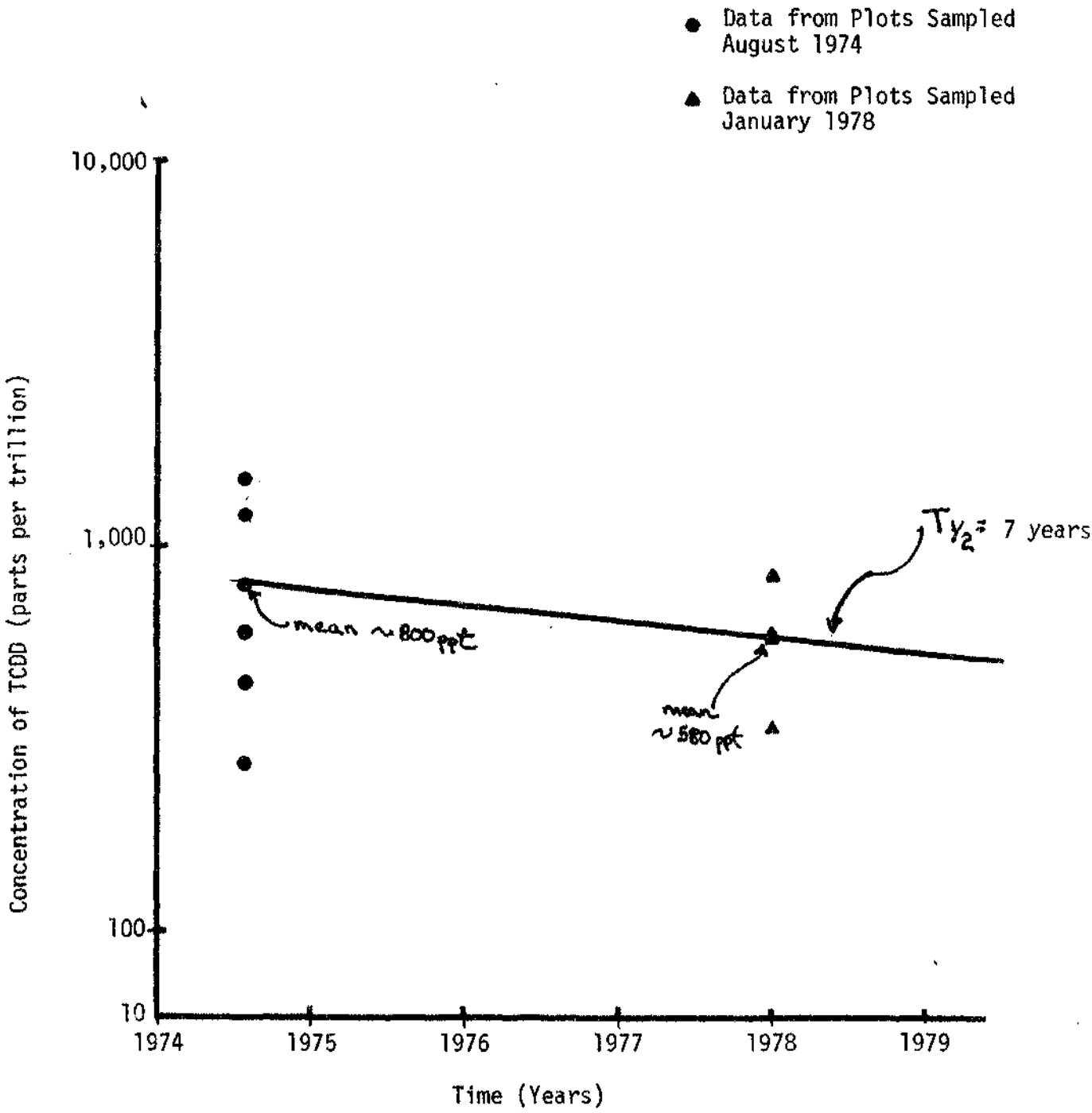


FIGURE 1. Semi-logarithmic Plot of Soil Concentration (0-15 cm) of TCDD in a Field Site Aerially-treated with 40,000 Kg 2,4,5-T, 1962-1964. Data for Each Date Represent Analysis of Five $1m^2$ Plots Established August 1974. (Unpublished Data, A. L. Young, USAF Occupational and Environmental Health Laboratory, Brooks AFB, Texas 78235.)

		NEB/DOW	NEB
1	1500	420 N	340
2	610	300 D	590
3	1200	580 N	580
4	270	100 D	570
5	440	400 D	840
	804	360	2920 = 584
	1975	1978	

Aug 1974 — Jan 78

4

75 = 12
76 = 12
77 = 12

40 months = $\frac{804}{362}$

$\frac{40}{48}$ months = .45 %

$\frac{40}{48} = \frac{45}{x}$

$x = (45)(48)$

40

54

mg/kg

420

PLOT	Single analysis Aug 1974	Jan 1978
1	1500	420 ±50
2	610	300
3	1200	580
4	270	100
5	440	400 ±150
mean	804	360

44%

mean std deviation ±50 ppt

The value reported is 2.5 times the noise level and should be taken as the detection limit

257 / 845
572
581
731
980

624 ppt

5 | 3121
30
12
10
21

245
840
568
501
894

270
440
610
1200
1500

mean

1. 1500
2. 610
3. 1200
4. 270
5. 440

5 | 4020

804

840

890

Nov 1974

Jan 1978

3 years.

1957
944
629
1253
2357
391
4 | 3558
32
35
32
38
36/20

137
71
208
2

189
168
357

66
86
239
391

889

MEMO

DATE:

Dow

TO:

2 — 0.3 ppb 0.59 = NE

4 — 0.1 ppb / 0.57 ppb

5 — ND 0.03 ppb = DL

Isomer — m/e 322 = .2 ppb

22 — 0.4 ppb, 0.05 ppb — NE = 0.84

< 0.2 ppb — NE = 3.6 ppb

33 — 3.0 ppb Dow 5.8 = NE

35 — 6 ppb = 1

Dec. 75

957 ppm 0-2
944 2-4
960 4-6
2660 — mound soil

60m depth 0-4

Mice - whole body 4X 10-day [illegible]
Biol. 17
18
19
20

5

24
38

100

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Biol 1 Toad
2 Insects
3 Snake - whole
4 T. Snake
5 T. Snake
6 T. Snake
7 C. Snake
8 C. Snake
9 C Snake
10 Spiders
12 } Mice Livers
13 } Mice Skins

Biol 14 - Mice whole (4 - 10 day-old pups)
15 - Mice pups - Body - four month old
16 - Mice pups Skin " " "
24

23
38
61
39
17
22

7 - O-U
3 - Turtle
2 - HARDstand
1 - whole body
Mice
Feminee
5

Johnston Island

4/L	Sniff	2,4-D	2,4,5-T	Bacteria	Fungi
7	(12)	1,509	1,491	5.0×10^8	6.5×10^7
18	(8)	560	2,424	6.2×10^7	7.6×10^7
34	(10)	1,782	2,115	5.5×10^8	ND
39	(5)	6,310	9,100	5.2×10^8	6.4×10^7
				4.1×10^8	7.0×10^7